

PROTECTION MADE SIMPLE.

**SEG**  
electronics

## Professional Line

### XUFD

#### NETZ- UND ANLAGENSCHUTZGERÄT



NETZ- UND ANLAGENSCHUTZGERÄT

Rev.: B

Originaldokument

Deutsch

**HANDBUCH XUFD-DE-MAN\_B**

## **Inhalt**

|        |   |    |
|--------|---|----|
| 1      | Sicherheit und Symbole .....                                | 7  |
| 1.1    | Bestimmungsgemäße Verwendung .....                          | 7  |
| 1.2    | Sicherheitshinweise .....                                   | 7  |
| 1.3    | Elektrofachkraft.....                                       | 8  |
| 2      | Montage und Anschluss .....                                 | 9  |
| 2.1    | Abmessungen und Bedienelemente .....                        | 9  |
| 2.2    | Vorsicherung der Versorgungsspannung .....                  | 9  |
| 2.3    | Klemmenbelegung .....                                       | 10 |
| 2.4    | Montage auf Hutschiene gemäß EN 60715.....                  | 10 |
| 2.5    | Anschlussbild 1 (allgemein, ohne FRT-Maßnahmen) .....       | 11 |
| 2.6    | Anschlussbild 2 (allgemein, mit FRT-Maßnahmen) .....        | 12 |
| 2.7    | Anschlussbild 3 (CEI 0-21) .....                            | 13 |
| 2.8    | Anschlussbild 4 (C10/11) .....                              | 14 |
| 3      | Funktion.....   | 15 |
| 3.1    | Features .....  | 15 |
| 3.2    | Inbetriebnahme.....   | 15 |
| 3.3    | Funktionsbeschreibung .....                                 | 15 |
| 3.4    | Schutzfunktionen / Komparatoren .....                       | 17 |
| 3.4.1  | Spannungsüberwachung .....                                  | 17 |
| 3.4.2  | Frequenzüberwachung .....                                   | 18 |
| 3.4.3  | Phasensprungüberwachung .....                               | 18 |
| 3.5    | Inselnetzerkennung.....                                     | 19 |
| 3.5.1  | Inselnetzerkennung mittels Spannungsmessung .....           | 19 |
| 3.5.2  | Inselnetzerkennung mittels RoCoF.....                       | 19 |
| 3.5.3  | Inselnetzerkennung mittels Vektorsprung .....               | 19 |
| 3.6    | Testfunktion .....  | 19 |
| 3.7    | Digitale Eingänge .....                                     | 19 |
| 3.8    | Ausgangsrelais R1, R2 und R3 .....                          | 20 |
| 3.9    | Fehler (Error).....   | 20 |
| 3.9.1  | Messwertfehler .....  | 20 |
| 3.9.2  | Systemfehler.....   | 20 |
| 3.9.3  | Fehlerspeicher (LOG) .....                                  | 21 |
| 3.10   | Neuheiten länderspezifische Parametersätze.....             | 21 |
| 3.10.1 | VDE-AR-N 4105:2018.....                                     | 21 |
| 3.10.2 | C10/11:2021 .....   | 22 |
| 3.10.3 | EN50549-1/2:2019 (Voreinstellungen Niederlande) .....       | 23 |
| 3.10.4 | OPEN_SETUP .....  | 23 |
| 4      | Bedienung und Inbetriebnahme.....                           | 24 |
| 4.1    | Erste Inbetriebnahme .....                                  | 24 |
| 4.2    | Menüführung.....  | 24 |
| 4.2.1  | Ebene 0 .....   | 24 |
| 4.2.2  | Ebene 1 .....   | 24 |
| 4.2.3  | Ebene 2 .....   | 24 |
| 4.2.4  | Ebene 3 .....   | 25 |
| 4.2.5  | Ebene 4 .....   | 25 |
| 4.2.6  | Ebene 5 .....   | 25 |
| 4.3    | Menüstruktur.....   | 26 |
| 4.4    | Plombierung .....   | 28 |
| 4.5    | Fallbeispiele .....   | 28 |
| 4.5.1  | Einsatz von Spannungswandlern in Mittelspannungsnetzen..... | 28 |

|       |   |    |
|-------|---|----|
| 4.5.2 | FRT (Fault Ride Through) Fähigkeit von Stromerzeugungsanlagen: .....                      | 29 |
| 4.5.3 | Selbsthalteschaltung für Fernabschaltung mit manueller Freigabe.....                      | 31 |
| 4.5.4 | Anschluss eines Rundsteuerempfängers für Leistungsreduktion 0% .....                      | 31 |
| 4.6   | Versorgungskreis .....  | 32 |
| 4.7   | Messkreis .....   | 32 |
| 4.8   | Messbereiche .....  | 33 |
| 4.9   | Digitale Eingänge .....   | 33 |
| 4.10  | Ausgangskreis.....  | 33 |
| 4.11  | Genauigkeit.....  | 33 |
| 4.12  | Isolationsdaten.....  | 34 |
| 4.13  | Umgebungsbedingungen.....   | 34 |
| 4.14  | Elektrischer Anschluss .....  | 34 |
| 4.15  | Plombierdraht .....   | 34 |
| 4.16  | Schutzart.....  | 34 |
| 5     | Settings der implementierten Parametersätze.....  | 35 |
| 5.1.1 | Connection Modes .....  | 35 |
| 5.1.2 | Einheiten .....   | 35 |
| 5.1.3 | Funktionale Sicherheit.....   | 35 |
| 5.1.4 | Operational Mode .....  | 35 |
| 5.1.5 | Schwellen.....  | 35 |
| 5.1.6 | Zeiten.....   | 36 |
| 5.1.7 | Hilfskontakt.....   | 36 |
| 5.1.8 | Ranges .....  | 36 |
| 6     | Sicherheitskonzept .....  | 37 |
| 7     | Glossar.....  | 38 |
| 8     | Verfügbare Normen und Standards .....   | 39 |
| 8.1   | Aktuell gültige Normen und Standards .....  | 39 |
| 8.2   | Frühere Versionen von Normen und Standards .....  | 43 |
| 9     | Übersicht der implementierten Parametersätze .....  | 44 |
| 9.1   | OVE TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen).....       | 44 |
| 9.2   | OVE TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen) .....  | 44 |
| 9.3   | OVE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen).....       | 44 |
| 9.4   | OVE TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen).....  | 45 |
| 9.5   | OOE TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen) .....      | 45 |
| 9.6   | OOE TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen) .....  | 45 |
| 9.7   | OOE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen) .....      | 46 |
| 9.8   | OOE TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen) ..... | 46 |
| 9.9   | W TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen) .....        | 46 |
| 9.10  | W TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen) .....    | 47 |
| 9.11  | W TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen) .....        | 47 |
| 9.12  | W TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht syncr. Stromerzeugungsanlagen) .....    | 47 |
| 9.13  | TIROL TOR NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen) .....        | 48 |
| 9.14  | TIROL TOR NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen) .....    | 48 |
| 9.15  | TIROL TOR MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen) .....        | 48 |
| 9.16  | TIROL TOR MS ASYNC (Typ A/B Mittelspng. für nicht syncr. Stromerzeugungsanlagen) .....    | 48 |
| 9.17  | VDE-AR-N 4105:2018-11 (Pn ≤ 50 kW) .....  | 49 |
| 9.18  | VDE-AR-N 4105:2018-11 (Pn > 50 kW) .....  | 49 |
| 9.19  | VDE-AR-N 4105:2018-11 (Umrichter).....  | 49 |
| 9.20  | VDE-AR-N 4110:2018-11 (geprüft nach TR3, Bewertungsbericht TR8).....                      | 50 |
| 9.21  | CEI 0-21:2019 .....   | 50 |

|       |  |     |
|-------|--|-----|
| 9.22  | G99/1/3 LV:2018 (Niederspannung).....  | 50  |
| 9.23  | G99/1/3 HV:2018 (Mittel/Hochspannung) .....  | 51  |
| 9.24  | G98/1/2:2018 (Niederspannung) .....  | 51  |
| 9.25  | C10-11:2021 LV-IP (Interface Protection / Niederspannung) .....                                    | 51  |
| 9.26  | C10-11:2019 LV-ASS (Automatic Separation System / Niederspannung) .....                            | 52  |
| 9.27  | C10-11:2021 HV-IP (Interface Protection / Hochspannung) .....                                      | 52  |
| 9.28  | C10-11:2019 HV-ASS (Automatic Separation System / Hochspannung).....                               | 52  |
| 9.29  | NA/EEA- CH 2014 Typ A <1MW (Niederspannung) .....  | 53  |
| 9.30  | NA/EEA-NE7 - CH 2020 Typ A 800W bis 250kW (Niederspannung) .....                                   | 53  |
| 9.31  | NA/EEA-NE7 - CH 2020 Typ B 250kW bis 36MW (Niederspannung).....                                    | 53  |
| 9.32  | EN 50549-1:2019 LV (Niederlande) .....   | 54  |
| 9.33  | EN 50549-2:2019 HV (Niederlande) .....   | 54  |
| 9.34  | EN 50438:2013 (DK) .....   | 55  |
| 9.35  | VDE 0126-1-1:2013 (ERDF-NOI-RES_13E Frankreich).....   | 55  |
| 9.36  | AB AS 4777.2:2020 .....  | 55  |
| 9.37  | C AS 4777.2:2020 .....   | 56  |
| 9.38  | NZS 4777.2:2020 .....  | 56  |
| 9.39  | NRS 097-2-1:2017.....  | 57  |
| 9.40  | OPEN SETUP.....  | 57  |
| 9.41  | EN 50438:2013 .....  | 58  |
| 9.42  | E 8001/8101 (Vorgänger von OVE TOR R25) .....  | 58  |
| 9.43  | VDE 0124-100:2013 (Vorgänger von VDE-AR-N 4105:2018-11).....                                       | 58  |
| 9.44  | TR3 Rev23:2013 (Vorgänger von VDE-AR-N 4110:2018-11) .....   | 58  |
| 9.45  | AS/NZS 4777.2:2015 (Niederspannung) .....  | 59  |
| 9.46  | G59/3/3:2015 LV (Niederspannung – Vorgänger von G99/1/3 LV:2018).....                              | 59  |
| 9.47  | G59/3/3:2015 MV (Mittelspannung Vorgänger von G99/1/3 HV:2018) .....                               | 59  |
| 9.48  | G83/2:2012 (Niederspannung Vorgänger von G98/1/2:2018) .....                                       | 60  |
| 9.49  | C10-11:2012 LV (Niederspannung Vorgänger von C10-11:2019).....                                     | 60  |
| 9.50  | C10-11:2012 MV (Mittelspannung Vorgänger von C10-11:2019) .....                                    | 60  |
| 9.51  | C10-11:2019 LV-IP (Interface Protection / Niederspannung Vorgänger von C10-11:2021) .....          | 61  |
| 9.52  | C10-11:2019 HV-IP (Interface Protection / Hochspannung Vorgänger von C10-11:2021)).....            | 61  |
| 10    | ANHANG (Parameter der implementierten Standards im Detail).....                                    | 62  |
| 10.1  | <b>OVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators .....</b>                   | 62  |
| 10.2  | <b>OVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators.....</b>                  | 66  |
| 10.3  | <b>OVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators.....</b>                 | 71  |
| 10.4  | <b>OVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators .....</b>              | 75  |
| 10.5  | <b>Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage synchr. generators .....</b>    | 79  |
| 10.6  | <b>Oberösterreich OOE TOR R25 NS ASYNC [ID 823] Typ A/B low voltage asynchr. generators .....</b>  | 83  |
| 10.7  | <b>Oberösterreich OOE TOR R25 MS SYNC [ID 872] Typ A/B medium voltage synchr. generators .....</b> | 87  |
| 10.8  | <b>Oberösterreich OOE TOR R25 MS ASYNC [ID 873] Typ A/B med. voltage asynchr. generators .....</b> | 92  |
| 10.9  | <b>Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators.....</b>                   | 97  |
| 10.10 | <b>Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators .....</b>                | 102 |
| 10.11 | <b>Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators .....</b>               | 107 |
| 10.12 | <b>Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators .....</b>             | 112 |
| 10.13 | <b>TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators .....</b>                     | 117 |
| 10.14 | <b>TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators .....</b>                   | 122 |
| 10.15 | <b>TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators .....</b>                  | 127 |
| 10.16 | <b>TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators .....</b>                | 132 |

|              |   |     |
|--------------|---|-----|
| <b>10.17</b> | <b>BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators .....</b> | 137 |
| <b>10.18</b> | <b>BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators.....</b> | 142 |
| <b>10.19</b> | <b>BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators .</b>  | 147 |
| <b>10.20</b> | <b>BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage asynchr. generators</b>  |     |
|              | <b>152</b>  |     |
| <b>10.21</b> | <b>VDE-AR-N 4105:2018 ≤50kW [ID 311] .....</b>  | 157 |
| <b>10.22</b> | <b>VDE-AR-N 4105:2018 &gt;50kW [ID 312] .....</b>                                       | 162 |
| <b>10.23</b> | <b>VDE-AR-N 4105:2018 Umr [ID 313] .....</b>  | 167 |
| <b>10.24</b> | <b>VDE-AR-N 4110:2018 TR3-25 [ID 707] .....</b>   | 172 |
| <b>10.25</b> | <b>CEI 0-21:2019 [ID 102].....</b>  | 178 |
| <b>10.26</b> | <b>G99/1/3:2018 LV [ID 410] .....</b>   | 184 |
| <b>10.27</b> | <b>G99/1/3:2018 HV [ID 460] .....</b>   | 188 |
| <b>10.28</b> | <b>G98/1/2:2018 [ID 510].....</b>   | 192 |
| <b>10.29</b> | <b>C10-11:2021 LV-IP [ID 603] Interface Protection low voltage .....</b>                | 196 |
| <b>10.30</b> | <b>C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage .....</b>      | 202 |
| <b>10.31</b> | <b>C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage .....</b>             | 207 |
| <b>10.32</b> | <b>C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage .....</b>     | 212 |
| <b>10.33</b> | <b>NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW .....</b>                     | 217 |
| <b>10.34</b> | <b>NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A &gt; 800W to ≤ 250kW .....</b>     | 222 |
| <b>10.35</b> | <b>NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B &gt; 250kW to ≤ 36MW .....</b>     | 228 |
| <b>10.36</b> | <b>EN50549-1:2019 LV Netherlands [ID 901] .....</b>                                     | 234 |
| <b>10.37</b> | <b>EN50549-2:2019 HV Netherlands [ID 926].....</b>                                      | 242 |
| <b>10.38</b> | <b>EN50549-1:2019 LV Ireland [ID 905].....</b>  | 250 |
| <b>10.39</b> | <b>EN50438:2013 DK [ID 950] .....</b>   | 258 |
| <b>10.40</b> | <b>SRPS EN 50549-1:2020 LV (Serbia) [ID 910] .....</b>                                  | 263 |
| <b>10.41</b> | <b>VDE 0126-1-1:2013 [ID 200] .....</b>   | 271 |
| <b>10.42</b> | <b>Romania ANRE 2021 [ID 1300] .....</b>  | 276 |
| <b>10.43</b> | <b>AB AS 4777.2:2020 [ID 1110] .....</b>  | 279 |
| <b>10.44</b> | <b>C AS 4777.2:2020 [ID 1120] .....</b>   | 284 |
| <b>10.45</b> | <b>NSW-Augrid 23 [ID 1135] .....</b>  | 294 |
| <b>10.46</b> | <b>NSW-Essential 23 [ID 1140] .....</b>   | 300 |
| <b>10.47</b> | <b>NSW-Endeavour 23 [ID 1145] .....</b>   | 306 |
| <b>10.48</b> | <b>VIC-United Energy 23 [ID 1150] .....</b>   | 311 |
| <b>10.49</b> | <b>VIC-Ausnet Energy 23 [ID 1155] .....</b>   | 318 |
| <b>10.50</b> | <b>VIC-Citipower 23 [ID 1160] .....</b>   | 323 |
| <b>10.51</b> | <b>VIC-Jemana 23 [ID 1165] .....</b>  | 329 |
| <b>10.52</b> | <b>VIC-Powercor 23 [ID 1170] .....</b>  | 335 |
| <b>10.53</b> | <b>VIC-Western Power 23 [ID 1175] .....</b>   | 341 |
| <b>10.54</b> | <b>ACT-Evoenergy 23 [ID 1180] .....</b>   | 348 |
| <b>10.55</b> | <b>QLD-Energex 23 [ID 1185] .....</b>   | 354 |
| <b>10.56</b> | <b>QLD-Ergon 23 [ID 1190] .....</b>   | 360 |
| <b>10.57</b> | <b>SA-Power networks23 [ID 1195] .....</b>  | 366 |
| <b>10.58</b> | <b>NRS 097-2-1:2017 [ID 1000] .....</b>   | 372 |
| <b>10.59</b> | <b>OPEN SETUP [ID 9006] .....</b>   | 378 |
| <b>10.60</b> | <b>CZ-2024 [ID: 930] .....</b>  | 385 |
| <b>10.61</b> | <b>EN50549-1: SI Uf A/B [ID: 940] .....</b>   | 393 |
| <b>10.62</b> | <b>EN50549-2: SI Uf C [ID: 945] .....</b>   | 401 |
| <b>10.63</b> | <b>Bulgaria LV 2024 [ID: 1400] .....</b>  | 410 |
| <b>10.64</b> | <b>Bulgaria MV 2024 [ID: 1450] .....</b>  | 415 |
| <b>10.65</b> | <b>EN50438:2013 [ID 900] .....</b>  | 421 |

|              |   |     |
|--------------|---|-----|
| <b>10.66</b> | <b>OVE E8001/8101:2014 [ID 801] renewed standard .....</b>                  | 423 |
| <b>10.67</b> | <b>VDE 0124-100:2013 [ID 300] renewed standard .....</b>                    | 428 |
| <b>10.68</b> | <b>AS/NZS 4777.2:2015 [ID 1102] renewed standard.....</b>                   | 435 |
| <b>10.69</b> | <b>G59/3/3:2015 MV [ID 455] renewed standard .....</b>                      | 442 |
| <b>10.70</b> | <b>G83/2:2012 [ID 500] renewed standard .....</b>                           | 446 |
| <b>10.71</b> | <b>C10-11:2013 LV [ID 600] renewed standard .....</b>                       | 450 |
| <b>10.72</b> | <b>C10-11:2013 MV [ID 650] renewed standard .....</b>                       | 453 |
| <b>10.73</b> | <b>C10-11:2019 LV-IP [ID 601] Interface Protection low voltage .....</b>    | 457 |
| <b>10.74</b> | <b>C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage .....</b> | 460 |

# 1 Sicherheit und Symbole



**Vorsicht! Niemals bei angelegter Spannung arbeiten.  
Es besteht Lebensgefahr! Das Gerät bei erkennbarer Beschädigung  
auf keinen Fall verwenden! Verwendung nur durch geschultes  
Fachpersonal!**



**Fachprodukt!  
Dieses Produkt setzt besondere Fachkenntnisse bei der Installation  
voraus!**



**Dieses Gerät unterliegt der Elektro- und Elektronik-  
Altgeräteverordnung (WEEE) und darf nicht im normalen Hausmüll  
entsorgt werden.  
Das Gerät besteht aus Werkstoffen, die von darauf spezialisierten  
Recycling-Betrieben wiederverwertet werden können. Entsorgen  
Sie es entsprechend den nationalen gesetzlichen Bestimmungen.**

## 1.1 Bestimmungsgemäße Verwendung

Das XUFD dient dem Netz- und Anlagenschutz (NA-Schutz) bei einspeisenden Blockheizkraftwerken, Windkraft-, Wasserkraft- und Photovoltaikanlagen.

Im Falle eines Stromausfalls oder einer Störung im Netz des Energieversorgungsunternehmens müssen private Kleinkraftwerke sofort vom öffentlichen Netz getrennt werden, um die ungewollte Einspeisung zu verhindern. Ohne sofortige Netztrennung würde einerseits das Wartungspersonal gefährdet, andererseits könnten Verbraucher unzulässigen Spannungen und Frequenzen ausgesetzt werden.

Für den Fall, dass Netzbetreiber von den Standards abweichende Grenzwerte fordern, ist es teilweise möglich, Grenzwerte außerhalb des normativ definierten Bereiches einzustellen.

Außerhalb dieses Bereiches ist das Gerät nicht mehr normkonform und die entsprechenden Zertifikate verlieren ihre Gültigkeit. Dieser Status wird am Display durch die Kennung „ncnf“ dargestellt. Einstellungen außerhalb dieses Bereiches liegen somit in der Verantwortung des Betreibers und/oder der Abnahmestelle der Anlage.

## 1.2 Sicherheitshinweise

Dieses Gerät wurde nach anerkannten sicherheitstechnischen Regeln gebaut und geprüft. Dennoch kann bei unsachgemäßer Verwendung Gefahr für Mensch und Gerät entstehen.

Benutzen Sie dieses Gerät nur für die bestimmungsgemäße Verwendung, im sicherheitstechnisch einwandfreien Zustand und unter Beachtung der für den Einsatzort geltenden Regeln und Vorschriften zur Unfallverhütung.

- Beseitigen Sie sofort alle Störungen, die die Sicherheit beeinträchtigen können.
- Nehmen Sie keine unzulässigen Änderungen vor und verwenden Sie ausschließlich Ersatzteile und Zusatzeinrichtungen, welche vom Hersteller des Gerätes verkauft oder ausdrücklich empfohlen werden.
- Bei offensichtlicher Beschädigung darf das Gerät nicht mehr verwendet werden.
- Die länderspezifischen Normen und Richtlinien sind zu beachten.
- Das XUFD kann nach der Inbetriebnahme mittels Passwortschutz oder Plombierung gegen unbefugte Änderungen geschützt werden. Sollte dies in der jeweils länderspezifischen Norm bzw. Richtlinie gefordert sein, muss einer der oben genannten Schutzmechanismen angewandt werden.

### **1.3 Elektrofachkraft**

Eine Elektrofachkraft kann Gefahren durch die Elektrizität selbstständig erkennen und vermeiden. Voraussetzungen dafür sind:

- Kenntnisse der Elektrotechnik
- Erfahrungen mit elektrotechnischer Arbeit
- Kenntnisse und Arbeitserfahrung an der jeweiligen Anlage oder ähnlichen Anlagen (Anlagenart)
- Kenntnisse der Gefährdungen und Gegenmaßnahmen
- Die Fähigkeit zu erkennen, ob die Sicherheit bei der Arbeitsdurchführung gegeben ist

Die Elektrofachkraft ist speziell für das Arbeitsumfeld, in dem sie tätig ist, ausgebildet und kennt relevante Normen und Bestimmungen. Es gelten die Vorschriften des jeweiligen Landes.



Dieses Dokument kann seit Erstellung dieser Kopie überarbeitet oder aktualisiert worden sein. Um sicherzustellen, dass Sie über die aktuelle Revision verfügen, sollten Sie auf dem Download-Bereich der SEG Electronics GmbH nachsehen:

- <https://docs.SEGelectronics.de/xufd>

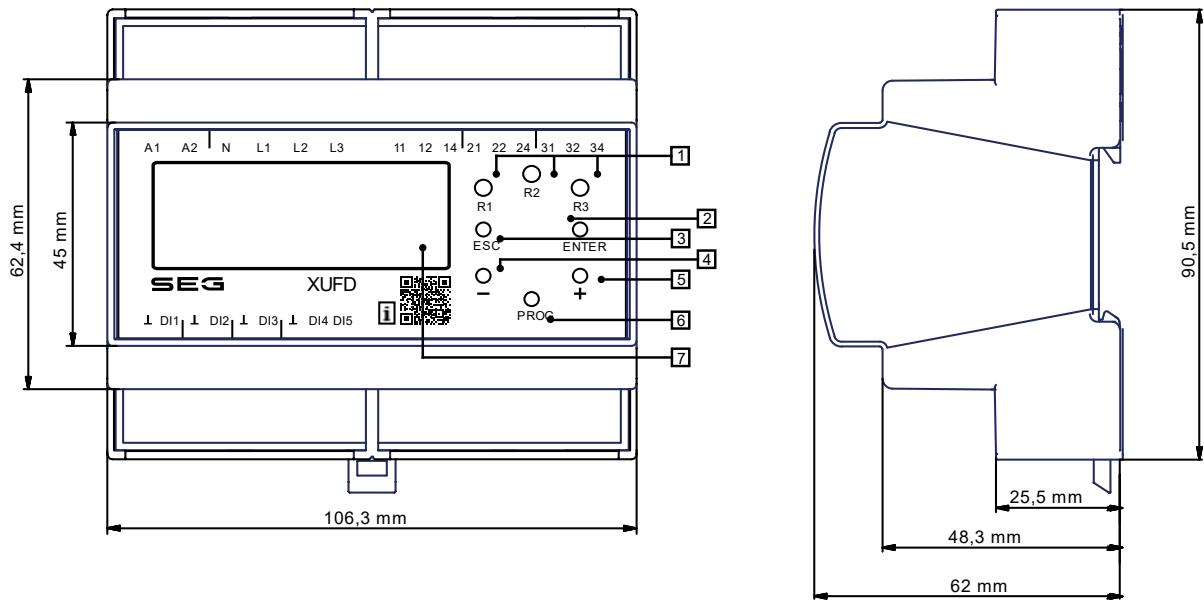
Prüfen Sie in diesem Download-Bereich, ob es eine neuere Version der Betriebsanleitung gibt oder ob ein Errata-Sheet (Änderungsdokument) vorliegt. (Die ID eines jeden Dokuments finden Sie auf der Titelseite.)

**Die SEG Electronics GmbH bietet auch die XUFD-Konfiguration als Service an:**

**Alle Schutzeinstellungen werden auf Grundlage individueller Kunden-Anforderungen bzw. vom Kunden übermittelter Check-Listen erstellt und im Gerät eingestellt.**

## 2 Montage und Anschluss

### 2.1 Abmessungen und Bedienelemente



| Legende | Beschriftung | Typ                        | Funktion                                 |
|---------|--------------|----------------------------|--|
| 1       | R1, R2, R3   | LED (gelb)                 | Statusanzeige Ausgangsrelais             |
| 2       | ENT          | Taster                     | ENTER, Eingabe, nächste Ebene            |
| 3       | ESC          | Taster                     | ESCAPE, Retour, Ebene zurück, Test/Reset |
| 4       | -            | Taster                     | Parametereinstellung, Anzeigenwechsel    |
| 5       | +            | Taster                     | Parametereinstellung, Anzeigenwechsel    |
| 6       | PROG         | Taster (plombierbar)       | PROGRAMM, Programmieren                  |
| 7       |              | LCD-Display 4x20 Character | Anzeige                                  |

### 2.2 Vorsicherung der Versorgungsspannung

Die Versorgungs- und Messspannungen aller Systemkomponenten sind mit Vorsicherungen abzusichern. Die Vorsicherungen sind gemäß dem verwendeten Leiterquerschnitt zu dimensionieren.

Wir empfehlen, die Ausgangsrelais bei Gefahr von Kurzschluss mit einer Sicherung 5A flink abzusichern!

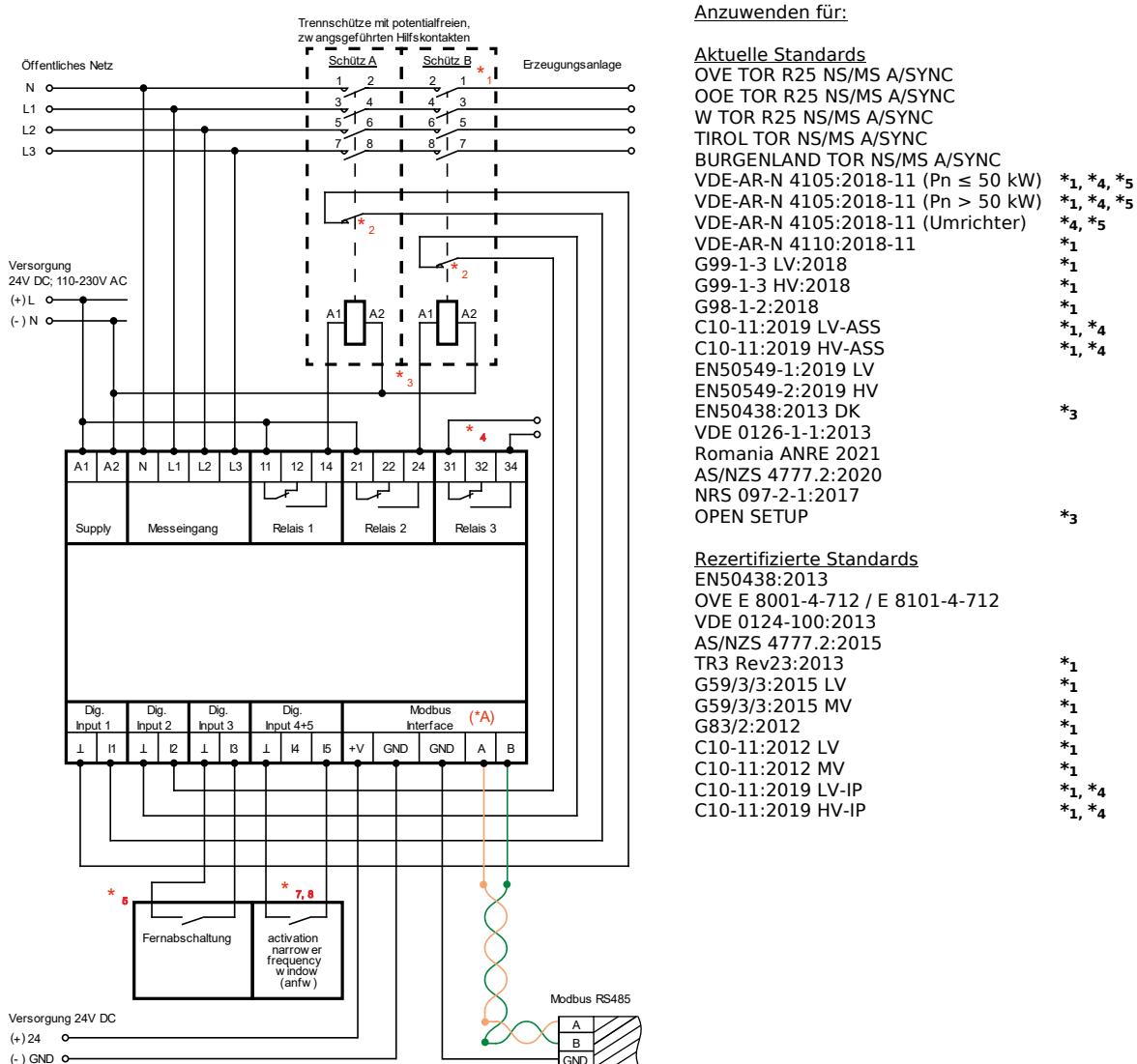
## 2.3 Klemmenbelegung

|               |  |  |
|---------------|--|--|
| A1, A2        | Versorgungskreis   | DC: 24V<br>AC: 110 - 230V<br>A1: L (+)<br>A2: N (-)  |
| L1, L2, L3, N | Messkreis  | UN: 3 x 400V AC  |
| 11, 12, 14    | Ausgangsrelais Kanal A<br>(Wechsler)<br>Statusanzeige durch gelbe LED R1         | Kontaktausgang (potentialfrei)<br>11: Wurzel<br>12: Öffner<br>14: Schließer  |
| 21, 22, 24    | Ausgangsrelais Kanal B<br>(Wechsler)<br>Statusanzeige durch gelbe LED R2         | Kontaktausgang (potentialfrei)<br>21: Wurzel<br>22: Öffner ( <i>n.c. / normally closed</i> )<br>24: Schließer ( <i>n.o. / normally open</i> )  |
| 31, 32, 34    | Ausgangsrelais D (Wechsler)<br>Statusanzeige durch gelbe LED R3                  | Kontaktausgang (potentialfrei)<br>31: Wurzel<br>32: Öffner ( <i>n.c. / normally closed</i> )<br>34: Schließer ( <i>n.o. / normally open</i> )  |
| I1, ⊥         | Digitaler Eingang 1<br>(Rückmeldekontakt Schütz A)                               | Kontakteingang (24V/5mA)<br>Eingang aktiv, wenn I1 und ⊥ verbunden<br>(konfigurierbar)   |
| I2, ⊥         | Digitaler Eingang 2<br>(Rückmeldekontakt Schütz B)                               | Kontakteingang (24V/5mA)<br>Eingang aktiv, wenn I2 und ⊥ verbunden<br>(konfigurierbar)<br>Entfällt bei allen länderspezifischen<br>Normen bei denen keine funktionale<br>Sicherheit gefordert ist! |
| I3, ⊥         | Digitaler Eingang 3<br>(Fernabschaltung)   | Kontakteingang (24V/5mA)<br>Eingang aktiv: I3 und ⊥ verbunden<br>(konfigurierbar)  |
| I4, I5, ⊥     | Digitale Eingänge 4 und 5<br>(Umschaltung auf <i>narrower frequency window</i> ) | Für CEI 0-21 und C10/11<br>Kontakteingang (24V/5mA)<br>Eingang aktiv, wenn I4 bzw. I5 und ⊥ verbunden  |

## 2.4 Montage auf Hutschiene gemäß EN 60715

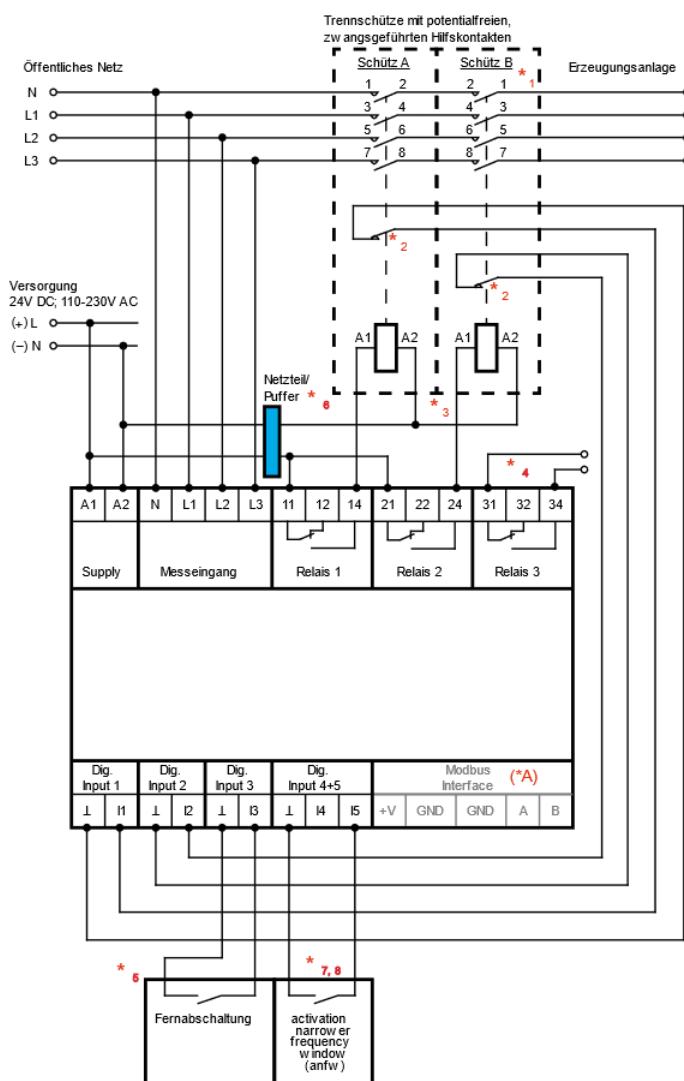
Rasten Sie den rückseitigen Montageclip des Geräts auf der Hutschiene so ein, dass ein sicherer und fester Sitz gewährleistet ist.

## 2.5 Anschlussbild 1 (allgemein, ohne FRT-Maßnahmen)



- \*<sub>1</sub> ... Schütz B entfällt bei allen länderspezifischen Normen, bei denen keine funktionale Sicherheit gefordert ist!
- \*<sub>2</sub> ... Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar.
- \*<sub>3</sub> ... 1- oder 2-kanaliger Anschluss möglich und konfigurierbar.
- \*<sub>4</sub> ... Auswertung, Kontaktfehler für Eigenerzeugungsanlagen nur für VDE-AR-N 4105:2018-11 und C10-11:2019
- \*<sub>5</sub> ... siehe nächste Seite - VDE-AR-N 4105:2018-11 mit gepufferten Trennschützen für ein FRT-(Fault-Ride-Through-)Verhalten

## 2.6 Anschlussbild 2 (allgemein, mit FRT-Maßnahmen)



Anzuwenden für:

Standards wie in 2.5 beschrieben

\*<sub>5</sub> **Verhalten von Trennschützen bei Unterspannung (FRT/fault ride through)**

Netzteil/Puffer. Trennschütze und, wenn vorhanden, Koppelrelais müssen bei Unterspannung für 3s / 0,3s gepuffert werden (FRT).

Auch in Niederspannungsnetze einspeisende Anlagen müssen das Netz unterstützen. Deshalb darf der Trennschütz bei einem Spannungseinbruch auf einen Wert knapp über  $U << (0,45 \text{ Un})$  bzw. 0,3s bei Spannungsunterbrechung wegen Unterspannung nicht abfallen, sondern erst wenn ihn das XUFD nach 3s ( $U <$ ) bzw. 0,3s ( $U <<$ ) abschaltet (Netzteil/Puffer nötig).

Bei Verwendung von 2 Trennschützen müssen beide für 3s versorgt werden. Das XUFD verfügt über ein internes Breitbandnetzgerät und braucht daher keine gepufferte Steuerspannung.

**ACHTUNG bei Signalfolge:**  
Puffer - XUFD - Trennschütz. Das Abschaltsignal darf NICHT verzögert werden!

\*<sub>1</sub> ... Schütz B entfällt bei allen länderspezifischen Normen, bei denen keine funktionale Sicherheit gefordert ist!

\*<sub>2</sub> ... Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar.

\*<sub>3</sub> ... 1- oder 2-kanaliger Anschluss möglich und konfigurierbar.

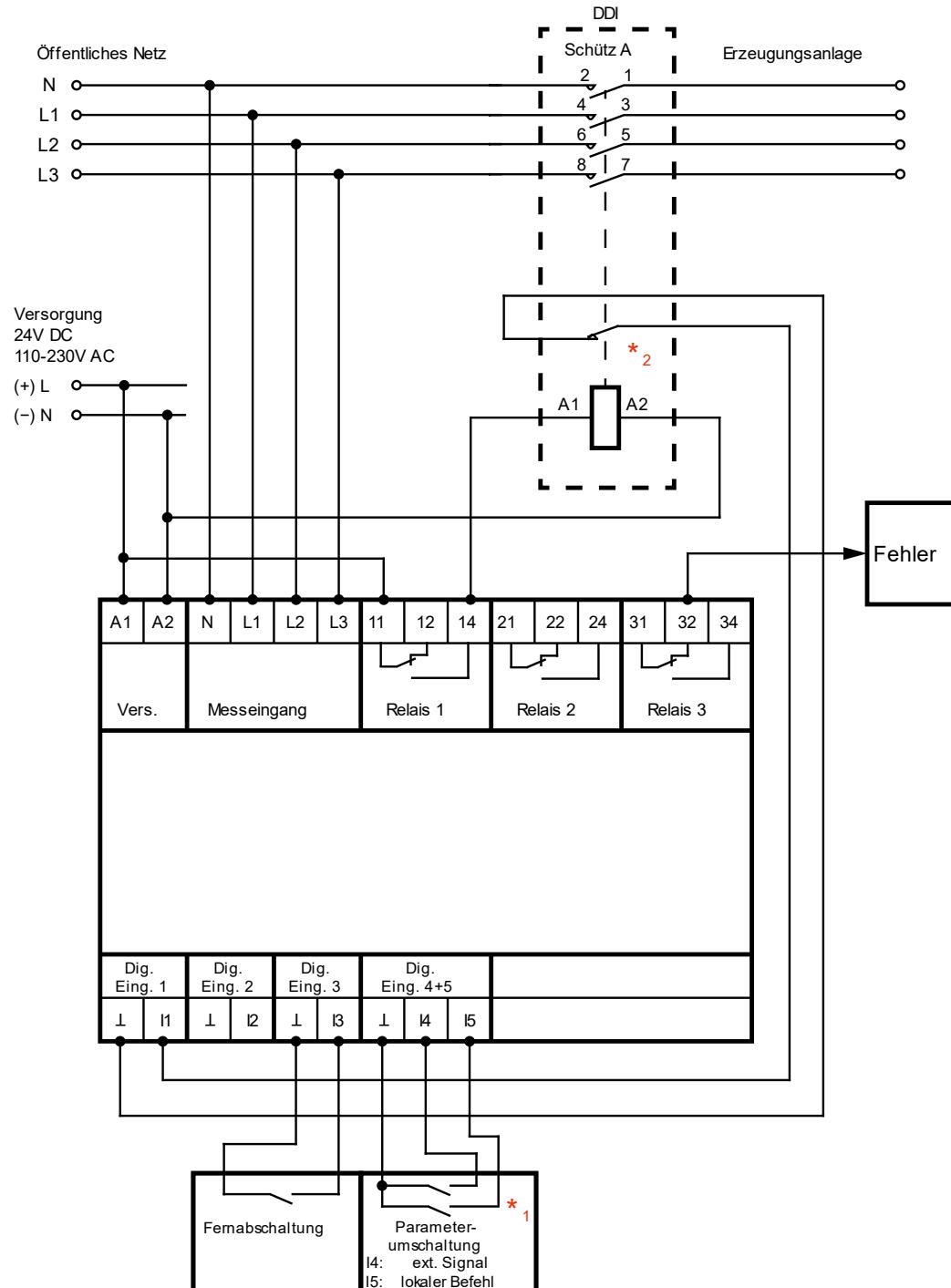
\*<sub>4</sub> ... Auswertung, Kontaktfehler für Eigenerzeugungsanlagen nur für VDE-AR-N 4105:2018-11 und C10-11:2019

\*<sub>5</sub> ... Mit gepufferten Trennschützen, um ein FRT (fault ride through) Verhalten zu gewährleisten

## 2.7 Anschlussbild 3 (CEI 0-21)

Anzuwenden für:

CEI 0-21:2019



\*<sub>1</sub> Parameterumschaltung:

definitive mode (Operational mode 0):

I4 inaktiv / Kontakt geöffnet:

Overfrequency 1, Underfrequency 1

I4 aktiv / Kontakt geschlossen:

Overfrequency 2, Underfrequency 2

transitory mode (Operational mode 1):

I5 aktiv / Kontakt geschlossen:

Overfrequency 2, Underfrequency 2

I5 inaktiv / Kontakt geöffnet:

Overfrequency 3, Underfrequency 3

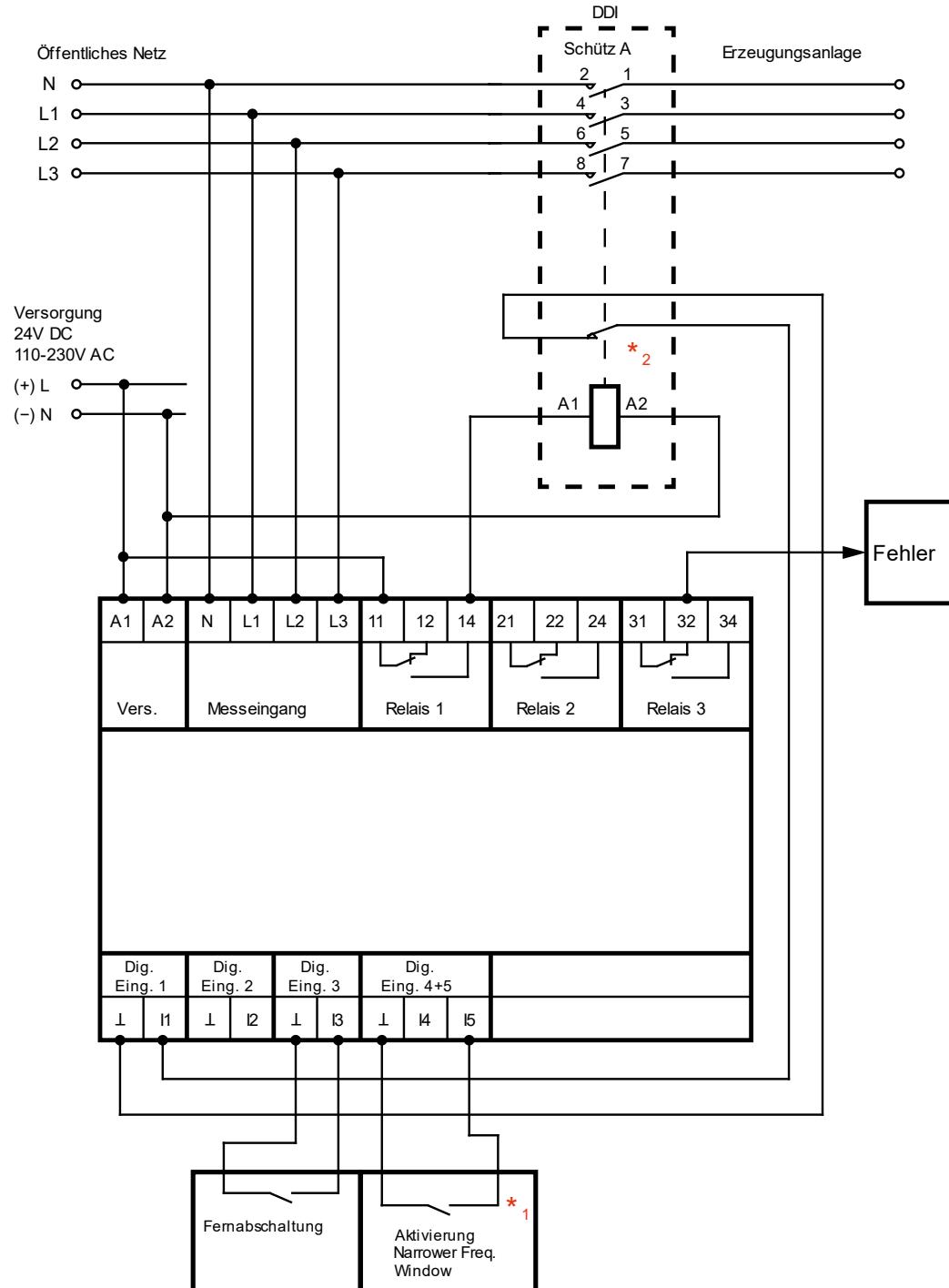
\*<sub>2</sub> Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar

## 2.8 Anschlussbild 4 (C10/11)

Anzuwenden für:

C10/11:2021 LV

C10/11:2021 HV



\*<sub>1</sub> Parameterumschaltung:

I5 inaktiv / Kontakt geöffnet: Overfrequency 1, Underfrequency 1  
 I5 aktiv / Kontakt geschlossen: Overfrequency 2, Underfrequency 2 (narrower frequency window)  
 (based on local voltage criteria / local setting)

\*<sub>2</sub> Hilfskontakt als Öffner, Schließer oder „nicht überwacht“ konfigurierbar

## 3 Funktion

### 3.1 Features

- Einfache Inbetriebnahme durch vordefinierte Setups für länderspezifische Normen und Richtlinien mit in weiten Grenzen einstellbaren Parametern.
- Weiter Nennspannungs- und Nennfrequenzbereich, Einstellbare Nennspannung
- Schutzfunktionen  $U_{<<}, U_{<}, U_{>}, U_{>>}$ ,  $U_{10\min}, f_{<} f_{>}$  ( $f_{<<}, f_{>>}$ )
- Zusätzliches „Open Setup“ für freie, praktisch unbeschränkte Parametrierbarkeit im Feld
- Einfliersicherheit
- Zyklischer Selbsttest
- Überwachung der angeschlossenen Kuppelschalter
- Fernabschaltung
- Inselnetzerkennung (RoCoF, PShift, Außenleiterspannung)
- Testfunktion mit Ermittlung der Abschaltzeit der angeschlossenen Trennschütze
- Überwachung von 1- und 3-phasigen Netzen für Nieder- und Mittelspannungsnetze
- Fehlerspeicher mit Zeitstempel (50 Einträge)
- Passwortschutz und Plombierbarkeit
- Zufällige Abschaltschwellen und Zuschaltzeiten für nichtregelbare Energieerzeuger (z.B. BHKW)
- Erfassung der symmetrischen Komponente Zero Sequence im 3-Phasennetz (Uzero)
- Umschaltung auf unterschiedliche Frequenzbänder (narrower frequency window)
- FRT-Fähigkeit (fault ride through)
- Konfigurationsservice und Einzelprüfprotokolle

### 3.2 Inbetriebnahme

Nach dem Anlegen der Versorgungsspannung an A1 und A2 erscheint am Display für 5 sek die Startanzeige. Das Gerät wird ohne eingestellten Parametersatz ausgeliefert. Bei der Erstinbetriebnahme geht das Gerät in die Parametersatzauswahl (Ebene 5 - Menüpunkt 5.001). Hier muss mittels +/- der entsprechende länderspezifische Parametersatz/Norm ausgewählt und mit ENTER bestätigt werden. Nähere Informationen dazu finden sie unter 4.3 „Menüstruktur“.

### 3.3 Funktionsbeschreibung

Je nach ausgewähltem länderspezifischen Parametersatz führt das Gerät mehrere Überwachungsfunktionen (Schutzfunktionen) gleichzeitig durch.

Soweit nicht anders angegeben beträgt die Nennspannung 230V/400V und die Nennfrequenz 50Hz (Kontrolle Menüpunkt 1.010)

|       |        |           |
|-------|--------|-----------|
| 1.010 | dflt   | 60        |
| U1    | 230.0V | f 50.00Hz |
| U2    | 230.0V |           |
| U3    | 230.0V |           |

Beim Über- oder Unterschreiten eines Grenzwertes schalten R1 und R2 nach einer für jeden Grenzwert eigens definierten Ansprechverzögerung ab. Beim Selbsttest und bei Aktivierung der Fernabschaltung schalten R1 und R2 sofort ab. Erst wenn alle überwachten Größen innerhalb der zulässigen Grenzen liegen und die Fernabschaltung deaktiviert wurde, schalten R1 und R2 nach einer definierten Einschaltzeit wieder zu.

R1 und R2 sorgen mit den angeschlossenen Trennschützen (A und B) für die geforderte Netztrennung (Erzeugungsanlage - öffentliches Netz) bei Ansprechen einer Schutzfunktion.

Durch die Rückmeldekontakte der Trennschütze, die mit den digitalen Eingängen des XUFD verbunden sind, werden die Schalthandlungen der Trennschütze ebenfalls überwacht, was die Anlagensicherheit weiter erhöht.

Achten Sie darauf, dass die Rückmeldekontakte der Trennschütze A/B korrekt angeschlossen sind. Menüpunkt 1.040 gibt Auskunft über den Zustand der Schütze A und B (DI1 und DI2). Möglicherweise müssen die Rückmeldekontakte umparametriert werden unter Menüpunkt 3.099

(n.c. versus n.o.). Eine weitere Fehlerquelle bilden die Massen der digitalen Eingänge I1 und I2, die intern nicht miteinander verbunden sind und deshalb immer angeschlossen werden müssen.

R1(2) dunkel bedeutet R1(2) sind OFF (unbetätigt):

|       |      |     |     |     |
|-------|------|-----|-----|-----|
| 1.040 | dflt | 60  |     |     |
| Toff  | ---  | ms  |     |     |
| DI1   | DI2  | DI3 | DI4 | DI5 |
| 1     | 1    | 0   | 0   | 0   |

Die digitalen Eingänge DI1(2) signalisieren mit „1“ einen geschlossenen Rückmeldekontakt der Trennschütze. Wenn bei Parameter 3.099 n.c. (normally closed) ausgewählt ist, wurde korrekt verdrahtet.

Signalisieren die digitalen Eingänge DI1(2) jedoch „0“ einen offenen Rückmeldekontakt der Trennschütze wie in folgendem Bild,

|       |      |     |     |     |
|-------|------|-----|-----|-----|
| 1.040 | dflt | 60  |     |     |
| Toff  | ---  | ms  |     |     |
| DI1   | DI2  | DI3 | DI4 | DI5 |
| 0     | 0    | 0   | 0   | 0   |

müsste Parameter 3.099 auf n.o. (normally open) umgestellt werden, oder die Verdrahtung zwischen den Trennschützen A(B) und den digitalen Eingängen wurde nicht korrekt durchgeführt.

Tabellarische Ansicht Einstellung Parameter 3.099:

| Art des Trennschütz-Hilfskontakte |                             |        | Parameter 3.099 (Einstellwert) |
|-----------------------------------|-----------------------------|--------|--------------------------------|
| Kontakttyp                        | Kontaktbezeichnung          | Symbol |                                |
| Schließer<br>(n.o.)               | 13/14, 23/24, 33/34,<br>... |        | n.o.                           |
| Öffner (n.c.)                     | 11/12, 21/22, 31/32,<br>... |        | n.c.                           |

### 3.4 Schutzfunktionen / Komparatoren

Je nach gewähltem Parametersatz sind bestimmte Schutzfunktionen / Komparatoren editierbar.

#### 3.4.1 Spannungsüberwachung

|  |                                    |  |
|--|------------------------------------|--|
| Außenleiter<br>59.S1<br>59.S2  | Überspannung 1<br>Überspannung 2   | Alle 3 Außenleiterspannungen werden entsprechend den eingestellten Überspannungsschaltschwellen überwacht. Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF. Diese Überwachung ist im 2-phasigen (L+N) sowie 4-phasigen (L1,L2,L3+N) Connection Mode deaktiviert!  |
| Außenleiter<br>27.S1<br>27.S2  | Unterspannung 1<br>Unterspannung 2 | Alle 3 Außenleiterspannungen werden entsprechend den eingestellten Unterspannungsschaltschwellen überwacht. Bei Unterschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF. Diese Überwachung ist im 2-phasigen (L+N) sowie 4-phasigen (L1, L2, L3+N) Connection Mode deaktiviert!  |
| Stern<br>59.S1<br>59.S2  | Überspannung 1<br>Überspannung 2   | Alle 3 Sternspannungen werden entsprechend den eingestellten Überspannungsschaltschwellen überwacht. Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF. Ausnahme: Im 2-phasigen (L+N) Connection Mode erfolgt eine Spannungsmessung nur zwischen L1 und N! Diese Überwachung ist im 3-phasigen (L1, L2, L3) Connection Mode deaktiviert!    |
| Stern<br>27.S1<br>27.S2  | Unterspannung 1<br>Unterspannung 2 | Alle 3 Sternspannungen werden entsprechend den eingestellten Unterspannungsschaltschwellen überwacht. Bei Unterschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF. Ausnahme: Im 2-phasigen (L+N) Connection Mode erfolgt nur eine Überspannungsmessung zwischen L1 und N! Diese Überwachung ist 3-phasigen (L1, L2, L3) Connection Mode deaktiviert! |
| Mittelwert<br>59-AV  | Überspannung                       | Die gebildeten 10-Minuten Mittelwerte werden entsprechend den eingestellten Schaltschwellen für den langsamen Spannungssteigerungsschutz überwacht. Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Im 2-phasigen Connection Mode: L-N<br>Im 3-phasigen Connection Mode: L1-L2-L3<br>Im 4-phasigen Connection Mode: L1-N; L2-N; L3-N  |
| U (Zero Sequence)<br>Uzero<br>Stern<br>Außenleiter<br>59V0                                       | Überspannung                       | Alle 3 Sternspannungen werden mit Betrag und Phasenlage addiert, die resultierende Spannung betragsmäßig zum Nulleiter ermittelt und in Folge gedrittelt. Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Die Zero Sequence ist nur im 4 phasigen (LN +LL) Connection Mode aktiviert!   |
| U (resultierend)<br>Ures<br>Stern<br>Außenleiter   | Überspannung                       | Aktivierung des narrower frequency window bei Überschreiten der Schaltschwelle von 3 x Zero Sequence nach der eingestellten Ansprechverzögerung $t_{off}$ .  |
| U (activation<br><b>narrower</b><br><b>frequency</b><br><b>window</b> )<br><b>Uanfw</b><br>Stern | Unterspannung                      | Alle 3 Sternspannungen werden entsprechend den eingestellten Unterspannungsschaltschwellen überwacht. Bei Unterschreiten der Schaltschwelle kommt es nach der eingestellten Ansprechverzögerung $t_{off}$ zur Aktivierung des <b>narrower frequency window</b> .   |

### 3.4.2 Frequenzüberwachung

|  |  |
|--|--|
| Überfrequenz 1<br>Überfrequenz 2<br>Überfrequenz 3<br>Überfrequenz 4<br><br>81O.S1, 81O.S2, 81O.S3, 81O.S4     | Die Frequenz der 3 Sternspannungen werden entsprechend den eingestellten Überfrequenzschaltschwellen überwacht.<br>Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Ausnahme: im 2-wire mode wird nur U L1-N überwacht.                          |
| Unterfrequenz 1<br>Unterfrequenz 2<br>Unterfrequenz 3<br>Unterfrequenz 4<br><br>81U.S1, 81U.S2, 81U.S3, 81U.S4 | Die Frequenzen der 3 Sternspannungen werden entsprechend den eingestellten Unterfrequenzschaltschwellen überwacht.<br>Bei Unterschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Ausnahme: im 2-wire mode wird nur U L1-N überwacht.                      |
| Überfrequenz Zufall  | Die Frequenz der 3 Sternspannungen werden entsprechend den eingestellten Überfrequenzschaltschwellen (zufällige Max Frequenz) überwacht.<br>Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Ausnahme: im 2-wire mode wird nur U L1-N überwacht. |
| Frequenzüberwachung Unterspannung LL<br>Frequenzüberwachung Unterspannung LN                                   | Je nach Modus (2, 3, 4 wire) führt ein Unterschreiten der eingestellten Schwelle zur Deaktivierung der Frequenzüberwachung.  |
| RoCoF<br><br>81R   | Die Frequenzänderungsraten der 3 Sternspannungen werden entsprechend den eingestellten Parametern überwacht.<br>Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Ausnahme: im 2-wire mode wird nur U L1-N überwacht.                             |

### 3.4.3 Phasensprungüberwachung

|                       |   |
|-----------------------|---|
| Phase Shift<br><br>78 | Das Phasensprungverhalten der 3 Sternspannungen wird entsprechend den eingestellten Parametern überwacht.<br>Bei Überschreiten der Schaltschwelle schalten R1 und R2 nach der eingestellten Ansprechverzögerung $t_{off}$ auf OFF.<br>Ausnahme: im 2-wire mode wird nur U L1-N überwacht. |
|-----------------------|---|

### **3.5 Inselnetzerkennung**

Dabei handelt es sich um ein lokal abgegrenztes Stromnetz, das nur aus einem oder wenigen Stromerzeugern besteht, nur mehr ein kleines Gebiet versorgt und keinen Anschluss mehr zu anderen Stromnetzen hat.

#### **3.5.1 Inselnetzerkennung mittels Spannungsmessung**

Bei diesem Verfahren wird mit Hilfe der 3-phasigen Spannungsüberwachung (Außenleiter) ein Inselnetz erkannt.

#### **3.5.2 Inselnetzerkennung mittels RoCoF**

Bei diesem Verfahren wird ein Inselnetz mit Hilfe der Frequenzänderungsrate (Rate of change of frequency) erkannt. Die Messung beruht auf Frequenzmessung und spricht bei einer über mehrere Perioden andauernden Frequenzänderung an. Der df/dt-Grenzwert wird in mHz/s angegeben und eingestellt.

#### **3.5.3 Inselnetzerkennung mittels Vektorsprung**

Bei diesem Verfahren wird durch Zeitmessung der Halbwellen und dem Vergleich mit vorhergehenden Messungen ein Phasen-/ bzw. Vektorsprung erkannt. Ein Vektorsprung kann durch einen plötzlichen Lastwechsel oder Kurzschlüsse im übergeordneten Netz auftreten. Der Grenzwert wird in Grad angegeben und eingestellt.

### **3.6 Testfunktion**

Die Testfunktion kann auf 2 Arten ausgelöst werden:

- Betätigen der ESC Taste in jeder beliebigen Anzeige der Menüebene 1
- Betätigen der ENT Taste im Fenster 1.050

Die beiden Ausgangsrelais R1 und R2 werden bei Aktivierung der Testfunktion abgeschaltet und die Zuschaltzeit beginnt abzulaufen.

Wie bei jeder Abschaltung wird auch bei der Testfunktion die Abschaltzeit der angeschlossenen Trennschütze / Kuppelschalter gemessen: Die jeweils letzte Abschaltzeit kann in Anzeige 1.040 abgelesen werden (Toff)

### **3.7 Digitale Eingänge**

Die aktuellen Zustände der digitalen Eingänge können mit dem Menüpunkt 1.040 festgestellt werden.

Die digitalen Eingänge 1 und 2 (jeweils mit  $\perp$ ) dienen als Rückmeldekontakte der beiden Trennschütze A und B. Sie werden über den Hilfskontakt des Trennschützes angesteuert. Hierbei kann der Hilfskontakt als Öffner oder Schließer angeschlossen und der digitale Eingang im Gerät entsprechend konfiguriert werden.

Der digitale Eingang 3 (I3 und  $\perp$ ) dient der Fernabschaltung. Bei Konfiguration .114 (I3 STOP) mit n.o. (normally open) werden R1 und R2 durch Brücken von I3 mit  $\perp$  abgeschaltet. Verwendet man n.c. (normally closed), muß für einen normalen Betrieb (R1 und R2 eingeschaltet) I3 mit  $\perp$  gebrückt sein. Durch ein Öffnen I3 von  $\perp$  werden R1 und R2 abgeschaltet und damit auch die angeschlossenen Trennschütze A und B (Öffentliches Netz von Erzeugereinheit getrennt). Wird für .114 dis. (disabled) gewählt, kann gar keine Fernabschaltung durchgeführt werden.

Die beiden digitalen Eingänge 4 und 5 dienen der Parameterumschaltung für den italienischen Parametersatz CEI 0-21:2019.

Der digitale Eingang 5 dient der Aktivierung des narrower frequency window für die belgischen und europäischen Parametersätze C10/11:2021 und EN50549-1/2:2019

Die unterschiedlichen  $\perp$  bei den digitalen Eingängen sind intern nicht miteinander verbunden, müssen bei Verwendung also einzeln angeschlossen werden.

### **3.8 Ausgangsrelais R1, R2 und R3**

Die beiden Ausgangsrelais R1 und R2 steuern die Trennschütze/Kuppelschalter an. Ist das vom XUFD gemessene öffentliche Netz ok, darf die Erzeugungseinheit einspeisen. R1 und R2 schalten dazu auf ON (LED R1 und LED R2 leuchten), die angeschlossenen Trennschütze an 11-14 (21-24) werden betätigt und verbinden die Erzeugungseinheit mit dem öffentlichen Netz. Bewegen sich gemessene Stern/Außenleiterspannungen, die Netzfrequenz, (oder RoCoF, Pshift, Uzero) außerhalb der ihnen zugeordneten Grenzwerte, wird eine Schutzfunktion verletzt. In diesem Fall schalten R1 und R2 auf OFF, welche wiederum die Trennschütze durch Öffnen 11-14 (21-24) zum Abfallen bringen und somit die Erzeugungseinheit vom öffentlichen Netz trennen.

Das Ausgangsrelais R3 wird länderspezifisch behandelt, Damit können Fehlerzustände (Verletzungen der Schutzfunktion, falsch konfigurierte/verdrahtete Rückmeldekontakte) ausgewertet werden. Je nachdem, für welchen Fehlerfall R3 konfiguriert ist, schaltet es im Fehlerfall auf ON (LED R3 leuchtet) wenn z.B. ein Spannungsfehler besteht, oder die Rückmeldekontakte nicht/falsch angeschlossen sind).

### **3.9 Fehler (Error)**

Die Anzeige aktueller Fehler befindet sich in Ebene „1.060 Error“, die Anzeige des Fehlerspeichers befindet sich in Ebene 2. Es wird zwischen Messwert- und Systemfehlern unterschieden:

#### **3.9.1 Messwertfehler**

|                      |
|----------------------|
| 1.060      Error     |
| M: UΔ UY Ü f Δf ΔΦ C |
| S: T0123456789ABCDEF |
| ENT ->               |

Hier wird nur der aktuell anliegende Fehler angezeigt!

Fehlerarten:

|    |  |
|----|--|
| UΔ | Fehler Außenleiterspannung (Unter- oder Überspannung)          |
| UY | Fehler Sternspannung (Unter- oder Überspannung, Zero Sequence) |
| Ü  | Fehler 10 Minuten Spannungsmittelwert                          |
| f  | Fehler Frequenz (Unter- oder Überfrequenz)                     |
| Δf | Fehler Frequenzrampe (RoCoF)                                   |
| ΔΦ | Fehler Phasensprung (PShift)                                   |
| C  | Fehler Rückmeldekontakt - Schütz fälschlich geschlossen        |
| c  | Fehler Rückmeldekontakt - Schütz fälschlich offen              |

#### **3.9.2 Systemfehler**

|                      |
|----------------------|
| 1.060      Error     |
| M: UΔ UY Ü f Δf ΔΦ C |
| S: T0123456789ABCDEF |
| ENT ->               |

Fehlerarten:

|          |  |
|----------|--|
| T        | Fernabschaltung aktiv  |
| 0-9, A-F | Tritt einer dieser Fehler permanent auf, kontaktieren Sie bitte unseren technischen Support. |

Im Auslieferungszustand befinden sich im Fehlerspeicher Systemfehleinträge. Diese entstehen werkseitig bei der Endprüfung des Gerätes, bei der diese Fehler bewusst herbeigeführt wurden. Da der Fehlerspeicher nicht lösbar sein darf, stellen diese Einträge keinen Gerätefehler dar und können ignoriert werden.

### 3.9.3 Fehlerspeicher (LOG)

Die Anzeige des Fehlerspeichers für max. 50 LOGs befindet sich in Ebene 2.  
Im Fehlerspeicher wird sowohl das Auftreten als auch das Wegfallen jedes Fehlers mit einem Zeitstempel gespeichert. Ein Eintrag ohne Fehlercodes ist daher kein Fehlerverhalten.

```
2.0nn Error
M: UΔ UY Ü f Δf ΔΦ C
S: T0123456789ABCDEF
t: 9999d 15h 03m 01s
```

nn ... Nummer des Eintrages im Fehlerspeicher  
t ... Zeitstempel: Zeitdauer seit Auftritt des Fehlers in Tagen/Stunden/Minuten/Sekunden

## 3.10 Neuheiten länderspezifische Parametersätze

### 3.10.1 VDE-AR-N 4105:2018

Bei den 3 Parametersätzen der VDE-AR-N 4105 (ID:311,312,313) gilt folgendes für die Inbetriebnahme:

Bei der Inbetriebnahme ist darauf zu achten, dass nur mehr ein Kuppelschalter (an R1) angewendet werden soll. VDE-AR-N 4105 für Umrichter bildet hier eine Ausnahme- hier müssen weiterhin 2 Kuppelschalter (an R1 und R2) zur Anwendung kommen.

Im Weiteren müssen die/der Rückmeldekontakt/e an den dafür vorgesehenen digitalen Eingängen I1(2) und 1 angeschlossen sein. Letztendlich wird unter Parameter 3.099 festgelegt, ob es sich bei den/m Rückmelde-kontakt/en um normally closed (n.c.) oder normally open (n.o.) handelt.

Am Display erscheint ein Error C (Contact), insofern dies nicht berücksichtigt wurde. XUFD darf für die VDE-AR-N 4105 während Error C die Ausgangsrelais R1 und R2 nicht einschalten, solange die Rückmeldekontakte nicht korrekt angeschlossen und parametriert sind.

Contact Error-Reset:

Liegt UN 3x400V AC ordnungsgemäß an, kann erst durch Drücken der Taste Esc (Ebene 1.010) oder Ent (Ebene 1.050) ein Reset durchgeführt werden. Der Contact Error wird dadurch gelöscht und die Ausgangsrelais R1 und R2 ziehen nach Ablauf der Einschaltzeit an.

Ein bestehender Contact Error kann zusätzlich über R3 an die Erzeugungsanlage gemeldet werden. In diesem Zusammenhang möchten wir auf Kapitel 3.6 „Testfunktion“ hinweisen (Ermittlung der Auslösezeit des Kuppelschalters).

Neuer Parameter T ConDelOn:

Durch Synchronisereinrichtungen oder Leistungsschalter ist es erlaubt, dass nach der Freigabe durch das XUFD der/die Kuppelschütz/e erst verzögert eingeschaltet werden. Daher erfolgt auch die Rückmeldung vom Rückmeldekontakt verzögert. Die zulässige Ansprechverzögerung wird mit dem **Parameter 3.110**.

**T ConDelOn** definiert. In der Grundeinstellung ist diese Zeit mit **100ms** parametriert und kann bis auf maximal 300.000ms (5min) gestellt werden. Die Konformität ist bis 10.000ms gewährleistet.

Kriterien für den eingesetzten Kuppelschalter:

Bei den eingestellten 100 ms Auslösezeit für die unterschiedlichen Schutzfunktionen ergibt sich bei den **deutschen Parametersätzen** eine maximale Auslösezeit des XUFD von 119ms. Um die Gesamtauslösezeit von ≤200ms (XUFD + Kuppelschalter) zu gewährleisten, **muss der eingesetzte Kuppelschalter innerhalb von 81ms auslösen** können.

Passwortschutz:

Die Geräte sind bezüglich der VDE-AR-N 4105 bei Auslieferung mit einem fixen Passwortschutz versehen. Das Passwort lautet „4105“. Der Inbetriebnehmer ist aufgefordert, das Passwort aus Sicherheitsgründen unverzüglich zu ändern.

### 3.10.2 C10/11:2021

#### Schutzfunktion Zero Sequence:

Die Erfassung der Zero Sequence (Uzero) im Dreiphasensystem bildet eine weitere Ergänzung der Schutzfunktionen. Durch die Zero Sequence können beispielsweise Kurzschlüsse im übergeordneten Mittelspannungsnetz erfasst werden. Dazu werden die drei im Normalfall um 120° verschobenen Sternspannungen L1, L2 und L3 sowohl unter Betrachtung der Betrages als auch der Phasenlage zueinander addiert, die so entstehende betragsmäßige Spannungsdifferenz (ohne Winkel) zum Neutralleiter ermittelt und durch drei dividiert.

Wenn alle drei Sternspannungen den gleichen Betrag aufweisen und exakt 120° zueinander verschoben sind, beträgt die Zero Sequence 0VAC.

In der derzeit gültigen Fassung der C10/11 beträgt der Grenzwert für die Zero Sequence 20% Un (46VAC). Bei Überschreitung dieses Grenzwertes >1,5s schalten R1 und R2 ab und schalten nach Ablauf der Ton delay erst wieder ein, wenn die Zero Sequence 15% Un (34,5VAC) unterschreitet. Die zugehörigen Parameter findet man im Parametersatz ID:603 von 3.115 bis 3.118 (siehe Anhang).

Für die Ermittlung der Zero Sequence wird der Connection Mode 4-wire (LN+LL) benötigt. Dieser ist im Parametersatz ID 603 für C10-11:2021 LV-IP standardmäßig aktiviert und darf bei vorgeschriebener Schutzfunktion Zero Sequence durch den lokalen Netzbetreiber auch nicht abgeändert werden. Im Parametersatz ID 653 für C10-11:2021 HV-IP muß die Ermittlung der Zero Sequence mit dem lokalen Netzbetreiber individuell abgesprochen und entsprechend eingestellt werden.

Für eine fehlerfreie Erfassung der Zero Sequence darf keiner der 3 Winkel (Phi1, Phi2 oder Phi3) zwischen L1, L2 und L3 größer als 180° werden. Des Weiteren muss die Drehrichtung der 3 Phasen L1→L2→L3 unbedingt eingehalten werden. Dazu müssen L1, L2 Und L3 des öffentlichen Netzes parallel zu den Anschlüssen L1, L2 und L3 des XUFD angeschlossen werden. Für die Erfassung der Zero Sequence ist der Neutralleiter verpflichtend anzuschließen (auch aufgrund Connection Mode 4-wire (LN+LL)).

#### Aktivierung des narrower frequency window:

Diese basiert auf 2 Kriterien der lokal vorherrschenden Spannungen bei Inselbildung. Bei Ansprechen wird zusätzlich zur normalen Frequenzüberwachung  $\leq 47,5\text{Hz}$  und  $\geq 51,5\text{Hz}$  ( $<100\text{ms}$ ) ein engeres Frequenzfenster  $<49,7\text{Hz}$  und  $>50,3\text{Hz}$  ( $500\text{ms}$ ) überwacht und bildet so eine weitere Schutzfunktion für eine Abschaltung von R1 und R2 zur Netztrennung.

1. Kriterium: Aktivierung des narrower frequency window bei Überschreitung Ures-anfw  $> 5\%$  Un (Ures-anfw =  $3 \cdot$  Uzero). Zugehörige Parameter für Deaktivierung beispielsweise beginnend von 3.119 bis 3.122.  
Bei diesem Kriterium ist zu beachten, dass es bereits bei kleinsten betraglichen Änderungen einer der 3 Sternspannungen  $<218,5\text{VAC}$  (bei Un = 230VAC) oder einer Winkeländerung einer der drei Sternspannungen um  $>2,87^\circ$  zur Aktivierung des narrower frequency windows kommt.
2. Kriterium: Aktivierung des narrower frequency window bei Unterschreitung bei einer der drei Sternspannungen  $<85\%$ . Dieses Kriterium ersetzt die Messung der mit- und gegenläufigen symmetrischen Komponenten des 3-Phasensystems. Zugehörige Parameter für beispielweise Deaktivierung Beginnend mit 3.123 bis 3.126.

Eine weitere Möglichkeit zur Aktivierung des narrower frequency windows ist das Brücken des digitalen Einganges I5 mit L, um hier weitere Messmöglichkeiten anschließen zu können, wie in der EN50549-1:2019 + AC:2019 empfohlen (siehe Anschlussbild 4 (C10/11)).

**Wichtig:** Die Einstellungen zur Aktivierung des narrower frequency window (3.062 bis 3.069 und 3.119 bis 3.126) müssen unbedingt mit dem lokalen Netzbetreiber abgesprochen und dokumentiert werden.

### **3.10.3 EN50549-1/2:2019 (Voreinstellungen Niederlande)**

Für die europäische EN50549-1/2 gelten betreffend der Aktivierung des narrower frequency window die gleichen Voraussetzungen wie unter Kapitel 3.10.2 Die entsprechenden Parameter (3.062 bis 3.069 und 3.119 bis 3.126) sind allerdings deaktiviert und müssen nach Absprache mit dem lokalen Netzbetreiber parametriert werden. Im Weiteren kann in den Parametersätzen der EN50549-1/2 ebenfalls die Schutzfunktion Zero Sequence aktiviert werden wie in 3.10.2 erwähnt. Die Voreinstellungen im Parametersatz sind für die standardmäßigen Schutzfunktionen der Niederlande ausgelegt.

### **3.10.4 OPEN\_SETUP**

Innerhalb des Parametersets 9006\_OPEN\_SETUP können ab sofort Spannungsschwellwerte für die Deaktivierung aller 3 möglichen Frequenzüberwachungen aktiviert werden.

Aktivierung/Deaktivierung erfolgt mit Parameter .046 für LL-Messungen und Parameter .050 für LN-Messungen. Mit .047 (für LL) bzw. mit .051 (für LN) können im Weiteren die Spannungsschwellen für die Deaktivierung der Frequenzüberwachungen eingestellt werden. In den meisten Ländern bewegen sich diese um die 20%Un. Die Hysterese für die abermalige Zuschaltung ist automatisch mit 1% definiert.

Beim OPEN\_SETUP können auch die Zero Sequence als die Activation of narrower frequency band aktiviert werden.

## 4 Bedienung und Inbetriebnahme

### 4.1 Erste Inbetriebnahme

Das XUFD wird ohne voreingestellten Standard ausgeliefert. Deswegen wechselt die Anzeige beim ersten Einschalten auf die Parametersatz-Abfrage (Ebene 5, Menüpunkt 5.001). Der einzusetzende Standard muss mit den Tasten +/- ausgewählt und mit ENTER bestätigt werden. Weitere Informationen befinden sich in 4.3 „Menüstruktur“.

### 4.2 Menüführung

Die Anzeigeeinheit besteht aus einem 4 zeiligen Text-Display mit je 20 Zeichen pro Zeile. Die Anzeige hat 5 Ebenen. Mittels + und - kann durch die verschiedenen Anzeigen der Ebenen navigiert werden.

#### 4.2.1 Ebene 0

##### *Startanzeige (Anzeige für 5 Sekunden beim Power Up)*

Hier werden Basisinformationen wie die SW-Version und die Geräte-ID angezeigt. Diese Anzeige erscheint nach dem Einschalten und bleibt für 5s sichtbar. Danach springt die Anzeige auf das erste Fenster in Ebene1.

#### 4.2.2 Ebene 1

##### Messwerte (Anzeige 1.010-1.032)

Anzeige der aktuellen Messwerte.

Außerdem wird hier angezeigt, ob das Parameterset der Default Konfiguration entspricht (dflt - default = Grund- oder Werkseinstellung), innerhalb der normativ zulässigen Grenzwerte editiert wurde (edit - edited = bearbeitet) oder außerhalb der normativ zulässigen Grenzwerte eingestellt ist (ncnf - non conform = nicht mit der ausgewählten Norm bzw. dem ausgewählten Standard konform).

Gegebenenfalls Anzeige Zeitablauf „reconnection timer“ (Zuschaltzeit) in Sekunden.

Navigation +/- Von diesen Anzeigen gelangt man mittels ENT in Ebene 3

##### Digitale Inputs und Abschaltzeit (Anzeige 1.040)

Anzeige der aktuellen Zustände der digitalen Eingänge, sowie der letzten Abschaltzeit (Toff) der angeschlossenen Schütze (für zweikanalige Systeme der jeweils größere Wert).

##### Test/Reset (Anzeige 1.050)

Durch Betätigen der ENT-Taste wird ein Relaistest ausgelöst. Dabei schalten die Relais A und B ab und der „reconnection-timer“ (Zuschaltzeit) beginnt abzulaufen.

Im Weiteren kann mit der Test/Reset-Funktion ein Reset-Ereignis durchgeführt werden, dass die Relais 1/2 nach einem Contact-Error (C) wieder zuschalten lässt (Notwendig für die drei Parametersätze der VDE-AR-N 4105). Das Test/Reset-Ereignis lässt sich auch durch Drücken der Taste ESC in Ebene 1 durchführen.

##### Error (Anzeige 1.060)

Anzeige aktueller Fehler:

|   |                |
|---|----------------|
| M | Messwertfehler |
| S | Systemfehler   |

Navigation +/- Durch Betätigen der ENT-Taste gelangt man in Ebene 2.

#### 4.2.3 Ebene 2

##### Fehlerspeicher

Hier werden die letzten Fehler mit Zeitstempel (Zeit seit dem Auftreten) angezeigt. Die Zeit wird nur gezählt, wenn das Gerät versorgt ist. Es werden sowohl positive als auch negative Fehlerflanken gespeichert und angezeigt.

Navigation +/- Von dieser Anzeige gelangt man mittels ESC in Ebene 1.

#### **4.2.4 Ebene 3**

##### Parameteranzeige

Hier werden für den jeweiligen Parametersatz die sichtbar geschaltenen Parameter angezeigt.

Navigation +/- . Von dieser Anzeige gelangt man mittels ESC in Ebene 1.

Mittels PROG (plombierbar) gelangt man in den Editiermodus des gewählten Parameters.

Ist das Passwort „0000“ wird die Passwortabfrage übersprungen und man gelangt direkt in den Editiermodus in Ebene 5.

Wurde innerhalb der letzten 60 Sekunden ein gültiges Passwort eingegeben, so wird ebenfalls die Passwortabfrage übersprungen und man gelangt direkt in Ebene 5.

Wurde ein Passwort ungleich „0000“ festgelegt, so gelangt man zur Passworteingabe in Ebene 4.

#### **4.2.5 Ebene 4**

##### Passworteingabe

Mit +/- kann die jeweils aktive Stelle des Passwortes inkrementiert / dekrementiert (0...9) werden.

Mit ENT wird auf die jeweils nächste Stelle der Passworteingabe gesprungen.

Nach Drücken von ENT bei der 4. Stelle wird das eingegebene Passwort überprüft.

Mit ESC wird auf die jeweils vorhergehende Stelle der Passworteingabe gesprungen.

Nach Drücken von ESC bei der 1. Stelle des Passwortes wird in Ebene 3 zurückgesprungen.

Sollten Sie das eingestellte Passwort vergessen haben, kontaktieren Sie bitte unter Bekanntgabe der Geräte-ID unseren technischen Support. Sie erhalten ein nur für Ihr Gerät gültiges Masterpasswort.

#### **4.2.6 Ebene 5**

##### Parametereditierung

In dieser Ebene kann der zuvor in Ebene 3 ausgewählte Parameter mit +/- geändert werden.

Bestätigt wird mit ENT. Mit ESC wird die Änderung verworfen. In beiden Fällen springt die Anzeige auf den entsprechenden Parameter in Ebene 3.

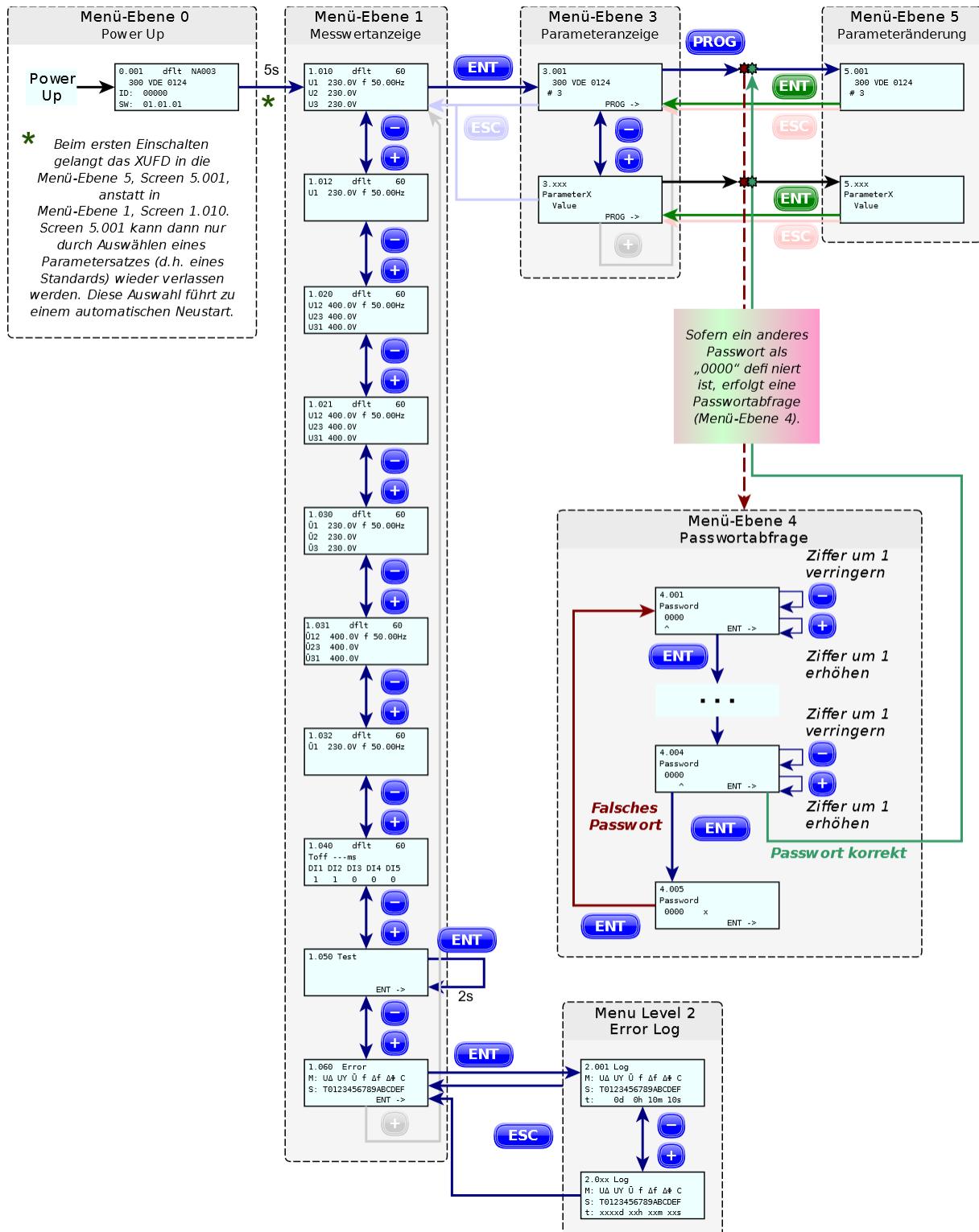
Außerdem wird hier angezeigt, ob der Wert des gerade bearbeiteten Parameters der Defaultkonfiguration entspricht (dflt - default = Grund- oder Werkseinstellung), innerhalb der normativ zulässigen Grenzwerte editiert wurde (edit - edited = bearbeitet) oder außerhalb der normativ zulässigen Grenzwerte eingestellt ist (ncnf - non conform = nicht mit der ausgewählten Norm bzw. dem ausgewählten Standard konform).

Neben Schwellen, Zeiten und Modi sind auch die 4 Stellen des Passwortes je 1 Parameter.

Auch der aktuelle Standard ist ein Parameter, d.h. durch Ändern dieses Parameters wird der neue ausgewählte Standard aktiviert. Sämtliche bisherigen Änderungen werden dabei verworfen.

Wird der bereits eingestellte Standard ausgewählt, wird der Standard auf Werkseinstellungen (default) zurückgesetzt.

### 4.3 Menüstruktur



**Anmerkung Menü-Ebenen 1, 3, 5:**

- dflt = default
- edit = edited
- ncnf = non-conform

In Menü-Ebene 1 beziehen sich diese Kennzeichnungen auf den gesamten eingestellten Standard, in den Menü-Ebenen 3 und 5 nur auf den jeweils angezeigten Parameter.

**Anmerkung zur Messwertanzeige, Menü-Ebene 1:** Die Anzeige ist abhängig vom eingestellten Standard sowie von der Konfiguration, insbesondere von 3.003 Connection:

| Einstellwert 3.003 Connection | Verfügbare Screens in Menü-Ebene 1 |
|-------------------------------|------------------------------------|
| 2-wire                        | 1.012, 1.032                       |
| 3-wire                        | 1.021, 1.031                       |
| 4-wire (LN)                   | 1.010, 1.030                       |
| 4-wire (LN+LL)                | 1.010, 1.020, 1.030                |

**Anmerkungen zum Passwort:** Bei einem Wechsel des Standards wird das Passwort auf „0000“ zurückgesetzt (Ausnahme: VDE-AR-N 4105, Standard-Passwort „4105“, siehe 4.2, 3.10.1).

Ist das Passwort „0000“, kommt es zu keiner Passwortabfrage. Nach korrekter Passworteingabe erfolgt keine weitere Passwortabfrage mehr, solange nicht die Menü-Ebene 3 bzw. 5 verlassen wird. Wenn für circa 2 Minuten keine Taste gedrückt wurde, wird automatisch in die Messwertanzeige (Menü-Ebene 1) zurückgekehrt, eventuell noch offene Änderungen werden dabei verworfen.

Falls ein gesetztes Passwort vergessen wurde, kann beim Hersteller ein Master-Passwort erfragt werden. Hierfür wird die ID benötigt, die im Screen 0.001 angezeigt wird.

**Anmerkung zum Fehlerspeicher, Screen 1.060 und Menü-Ebene 2:**

M: Messfehler-Flags

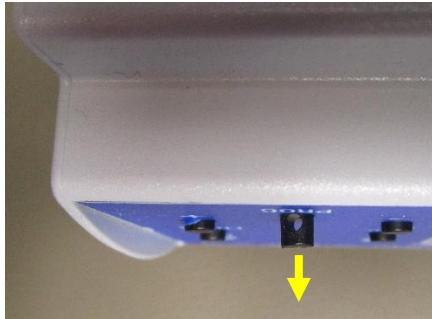
- $U\Delta$  = Dreiecksspannung
- $UY$  = Sternspannung
- $\bar{U}$  = Mittelwertspannung
- $F$  = Frequenz
- $\Delta f$  = RoCoF
- $\Delta\Phi$  = Phasensprung
- $C$  = Rückmeldekontakt

S: Systemfehler-Flags

- T = Fernabschaltung
- 0 = CODEID
- 1 = CCODEVERS
- 2 = CODECRC
- 3 = FLASHCRC
- 4 = EEPROMCRC
- 5 = LOGICVERS
- 6 = LOGICCRC
- 7 = reserviert
- 8 = POWER6V
- 9 = POWERDIGINP
- A = MEASCOMPAB
- B = PWDINACTIVE
- C = INTERCOM1
- D = reserviert
- E = reserviert
- F = reserviert

## 4.4 Plombierung

Das Gerät ist nach der Inbetriebnahme mittels einstellbaren Passworts gegen unbefugte Änderungen der schutzrelevanten Einstellparameter zu sichern! Wird der Passwortschutz nicht genutzt oder fordert es die länderspezifische Norm oder der Standard, so ist das Gerät zu plombieren!



[1.] Die Taste „PROG“ lässt sich (ohne Kraftaufwand!) ein Stück weit herausziehen.



[2.] Diese Taste ist mit einer Bohrung versehen, durch die der Plombierdraht geführt werden kann  
(max. Durchmesser: siehe 4.15.).

## 4.5 Fallbeispiele

### 4.5.1 Einsatz von Spannungswandlern in Mittelspannungsnetzen

Am Beispiel Österreich wird bei Mittelspng. zwischen zwei grundlegenden Spngs.niveaus unterschieden:

21kV und [31,7kV für Sonderfälle, z.B. Windparks]. Außenleiter (Phase-Phase-Spannung).

Zum Einsatz kommt ein 200:1 Spannungswandler bei  $U_c=21\text{kV}$ :

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **60.4/105.0V**. Rechnerisch ergibt sich der Wert aus  $21\text{kV} / 200 = 105\text{V}$  (die 60.4V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **60.4/105.0V** beschrieben möglich.

Zum Einsatz kommt ein 200:1 Spannungswandler bei  $U_c=31,7\text{kV}$  (z.B. Windpark):

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **91.0/158.1V**. Rechnerisch ergibt sich der Wert aus  $31,7\text{kV} / 200 = 158,5\text{V}$  (die 91.0V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **91/158,1V** beschrieben möglich.

Zum Einsatz kommt ein 300:1 Spannungswandler bei  $U_c=31,7\text{kV}$  (z.B. Windpark):

1. Wahl des Parametersatzes **852** (OVE/OOE TOR R25 MS SYNC) für synchrone bzw. **853** (OVE/OOE TOR R25 NS ASYNC) für nicht synchrone Erzeugungsanlagen (Umrichter).
2. Parameter .005 (Einstellung der Nominalspannung ULN/LL nom) auf **60.4/105.0V**. Rechnerisch ergibt sich der Wert aus  $31,7\text{kV} / 300 = 105,6\text{V}$  (die 60,4V stehen für die Sternspannungen, die bei Mittelspannungsanwendungen nicht relevant sind). Die Einstellmöglichkeiten sind wie mit **60.4/105.0V** beschrieben möglich.

In jedem Fall gilt: Alle Schutzfunktionen U>>, U>, U<<, U< stellen sich automatisch auf die neu eingestellten Spannungsniveaus ein, d.h. hier brauchen nur Änderungen durchgeführt zu werden, wenn diese den Vorgaben des Netzbetreibers nicht entsprechen.

### Änderung der Schutzfunktion U> und U>> nach Vorgaben des Netzbetreibers:

Im Auslieferungszustand (default) betragen diese Schwellen für  $U>\text{off}$   $1,06 \times U_c$  (106%) und für  $U>>\text{off}$   $1,1 \times U_c$  (110%). Sollte der Netzbetreiber hier Einstellungen für  $U>\text{off}$  von beispielsweise  $1,04 \times U_c$  (104%) und  $U>>\text{off}$  von  $1,15 \times U_c$  (115%) verlangen, müssen sowohl Parameter .011 als auch .027 dementsprechend verstellt werden. Gibt es auch abweichende Vorgaben für die Unterspannungsschwellen, so müssen zusätzlich Parameter .015 ( $U<\text{off}$ ) und .031 ( $U<<\text{off}$ ) angepasst werden.

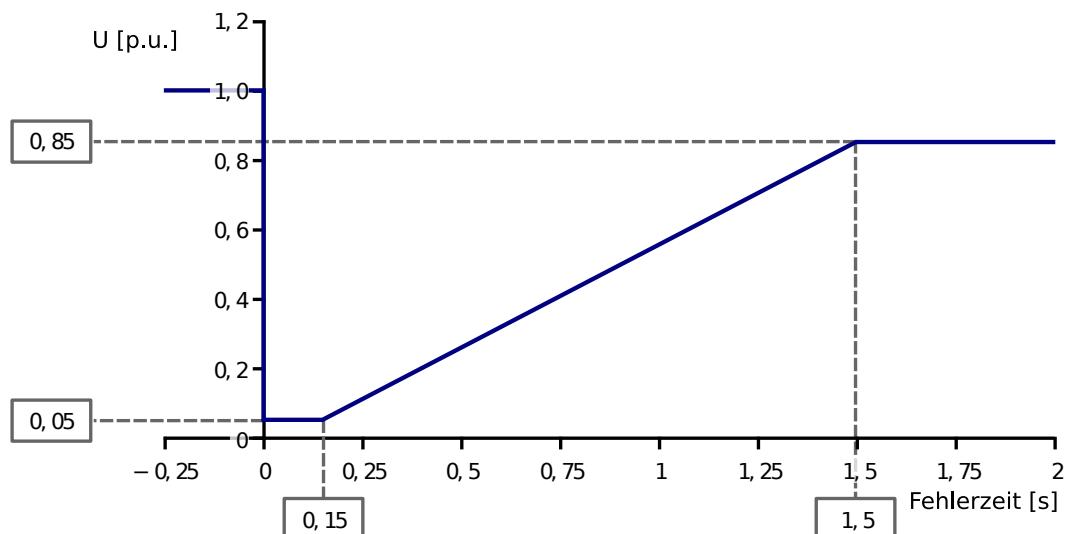
Hinweis: In Niederspungsnetzen wird die Nennspannung  $U_n$  bezeichnet und in Mittelpungsnetzen  $U_c$ .

### **4.5.2 FRT (Fault Ride Through) Fähigkeit von Stromerzeugungsanlagen:**

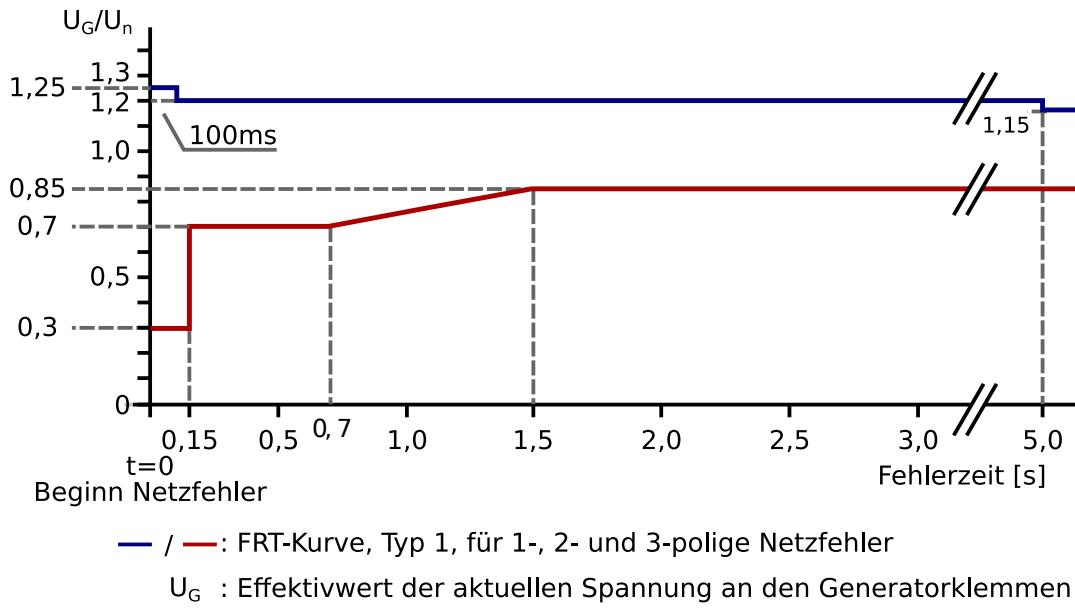
Die FRT-Fähigkeit muss für die unterschiedlichen Komponenten einer Stromerzeugungsanlage getrennt voneinander betrachtet werden. Die FRT-Fähigkeit von Trennschützen wird in Kapitel 2.6 dargestellt, dabei muss der Errichter der Stromerzeugungsanlage dafür sorgen, dass für die Trennschütze ausreichend Pufferung zur Verfügung steht.

Der Errichter der Stromerzeugungsanlage muss zusätzlich darauf achten, dass sich die Anforderungen aus der FRT (Unterschiedliche Anforderungen zwischen den Ländern) und den Schutzeinstellungen für Unterspannung (Höhe  $U</U<<$  und Time OFF) nicht gegenseitig beeinflussen.

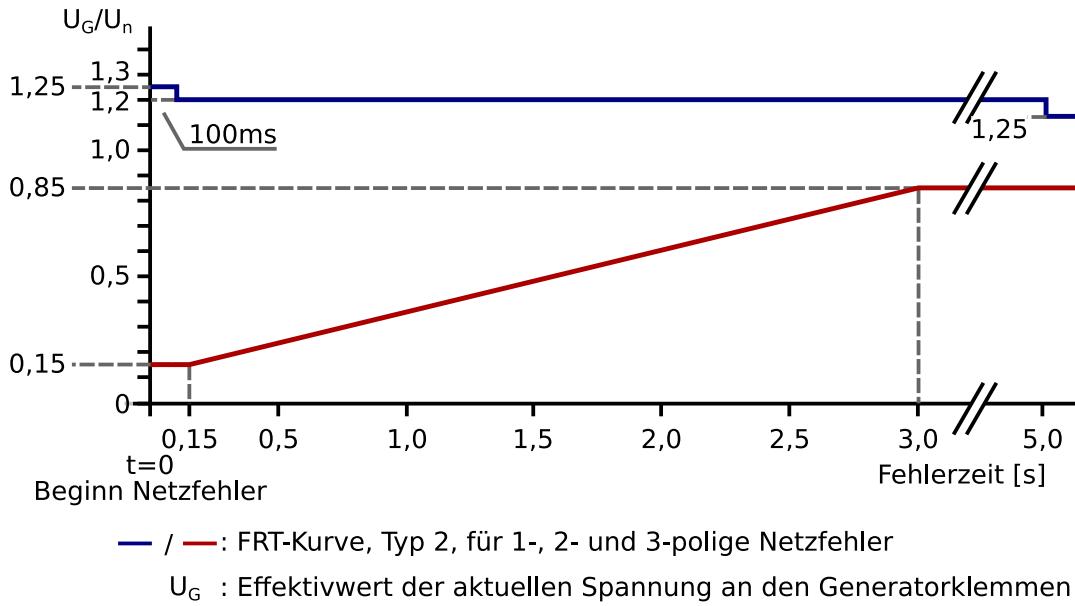
Sollte das XUFD versorgungsseitig (A1/A2) mit dem Hauptnetz verbunden sein (nicht getrennt vom Messkreis versorgt), kann gewährleistet werden, dass folgende FRT-Anforderungen aus der TOR 1.1 und VDE-AR-N 4105:2018 problemlos (auch öfters hintereinander) durchlaufen werden können, ohne dass die Ausgangsrelais R1/R2 fälschlicherweise, bedingt durch das interne Netzteil, abfallen.



(FRT-Profil nichtsynchrone Stromerzeugungsanlagen nach TOR 1.1 2019; ausgewählt, weil schwierigstes FRT-Verhalten)



(FRT-Profil nach VDE-AR-N 4105:2018 Typ1 – nur Synchrongeneratoren)



(FRT-Profil nach VDE-AR-N 4105:2018 Typ2 – Umrichter und andere)

Dieses FRT-Verhalten gilt für den gesamten AC-Versorgungsbereich 110-230VAC. Für eine Versorgung mit 24VDC ist das FRT-Verhalten (kein Abfallen der Ausgangsrelais R1/R2) nicht gewährleistet. In diesem Fall muss der Errichter der Stromerzeugungsanlage für eine ausreichende Pufferung der 24VDC Sorge tragen (Geräteverbrauch 1,25W/4VA).

Sollte es zu einem Komplett-Ausfall z.B. von L1 kommen, während A1 und A2 des NA-Schutzes mit L1 und N verbunden sind, kann das interne Netzteil des NA-Schutzes die folgenden Zeiten überbrücken, d.h. es kommt weder zu einem Reset des NA-Schutzes noch fallen die Relais R1/2 ab:

230VAC <580ms

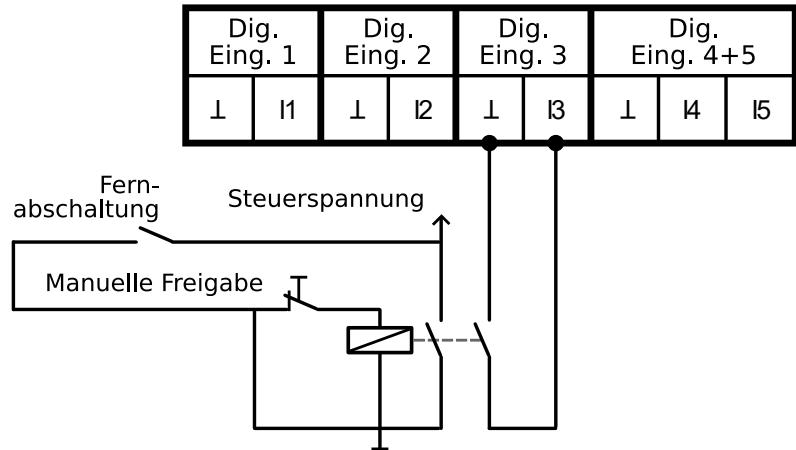
110VAC <200ms

24VDC < 70ms (Schutz getrennt vom Messkreis versorgt)

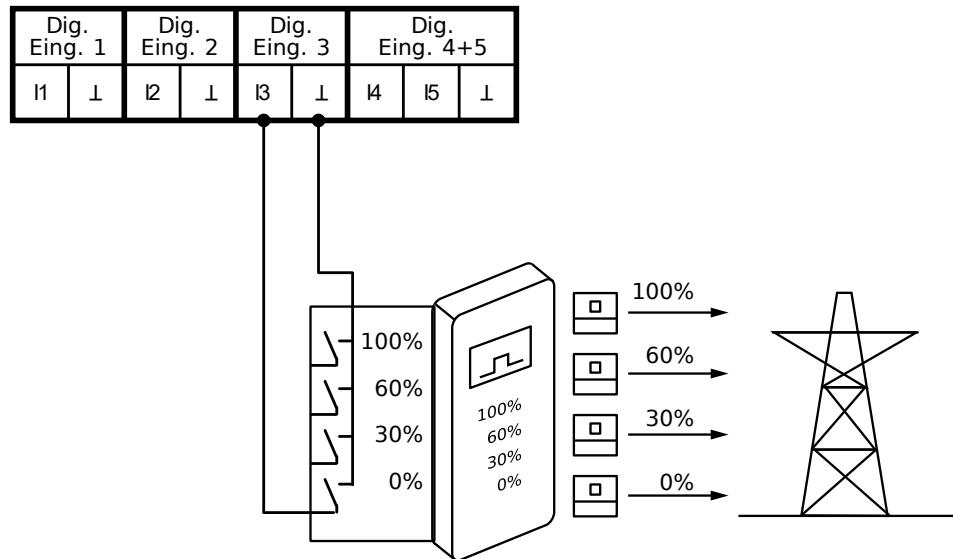
Die genannte Überbrückung betrifft aber nur das XUFD selbst. Hängt das XUFD mit den Trennschützen zusammen an A1/A2, muß immer eine eigene Berechnung mit dem Eigenverbrauch der Trennschütze durchgeführt werden.

#### 4.5.3 Selbstthalteschaltung für Fernabschaltung mit manueller Freigabe

Für spezielle Anwendungen kann vom Netzbetreiber gefordert werden, dass nach einer Fernabschaltung erst wieder manuell freigegeben (zugeschaltet) werden darf. Das ist momentan durch die Verwirklichung einer Selbstthalteschaltung möglich:



#### 4.5.4 Anschluss eines Rundsteuerempfängers für Leistungsreduktion 0%



## 4.6 Versorgungskreis

|                                  |  |
|----------------------------------|--|
| Klemmen                          | A1 (L bzw. +); A2 (N bzw. -)                   |
| Versorgungsspannung              | DC: 24V<br>AC: 110 – 230V                      |
| Toleranz der Versorgungsspannung | DC: $\pm 10\%$<br>AC: $\pm 30\%$               |
| Nennverbrauch                    | max. 1,25W / 4VA @ 230V AC                     |
| Nennfrequenz                     | 50 / 60Hz                                      |
| Toleranz der Nennfrequenz        | 48 – 63Hz                                      |
| Einschaltzeit                    | 100%   |
| Wiederbereitschaftszeit          | 6 Sekunden + eingestellte Einschaltverzögerung |
| Abfallspannung                   | 7V   |
| Überspannungskategorie           | III  |
| Bemessungsstoßspannung           | 6 kV   |
| Interne Absicherung              | 250V / 500mA träge (eingelötet)                |

Um die Gerätefunktion während eines Netzausfalls zu gewährleisten, ist das Gerät über eine externe USV-Anlage zu versorgen!

## 4.7 Messkreis

|                    |   |
|--------------------|---|
| Klemmen            | L1-L2-L3-N  |
| Messeingang        | 3x 400V AC  |
| Eingangswiderstand | 1MΩ   |
| Messgrößen         | Außenleiterspannung, Sternspannung,<br>10 Minuten Spannungsmittelwert,<br>Frequenz, Frequenzänderung (RoCoF),<br>Phasensprung (PShift), Zero Sequence |

## 4.8 Messbereiche

|                        |   |
|------------------------|---|
| Außenleiterspannung    | 0 - 560VAC  |
| Sternspannung          | 0 - 325VAC  |
| Frequenz               | 40 - 65Hz (gemessen zw. L1/N)   |
| RoCoF                  | 100mHz/s - 2.000mHz/s   |
| Pshift                 | 1 - 15°   |
| Überlastbarkeit        | Dauerhaft $1,4 \times U_{\text{Nom}}$<br>Impuls $1,6 \times U_{\text{Nom}}$ (1 Sekunde) |
| Überspannungskategorie | III   |
| Bemessungsstoßspannung | 4 kV  |

## 4.9 Digitale Eingänge

|                |  |
|----------------|--|
| Klemmen        | I1 und $\perp$ ; I2 und $\perp$ ; I3 und $\perp$ ; I4 bzw. I5 und $\perp$<br>I1, I2, I3 können als n.c., n.o. und dis. konfiguriert werden |
| Kontaktart     | Potentialfrei (max. Leitungslänge 30m, Verlegung als Steuerleitung, getrennt von Energiekabeln)  |
| Schaltleistung | 24V DC / 5mA   |

## 4.10 Ausgangskreis

|                                      |   |
|--------------------------------------|---|
| Klemmen                              | 11-12-14; 21-22-24; 31-32-34                                      |
| Anzahl und Art der Kontakte          | 3 Wechsler  |
| Kontaktmaterial                      | AgNi  |
| Schaltleistung                       | 5A / 250V AC  |
| Schalthäufigkeit elektrisch (AC-1)   | $100 \times 10^3$ Schaltspiele                                    |
| Schalthäufigkeit mechanisch          | $15 \times 10^6$ Schaltspiele                                     |
| Dauerlast                            | 5A  |
| Impulslast (1s)                      | 5A  |
| Spannungsfestigkeit offener Kontakte | Relaiskontakte: 1000V <sub>rms</sub> Klemmen: 450V <sub>rms</sub> |
| Überspannungskategorie               | III   |
| Bemessungsstoßspannung               | 4 kV  |
| Absicherung                          | 5A flink  |

## 4.11 Genauigkeit

|  |   |
|--|---|
| Spannungsmessung:                        |   |
| Grundgenauigkeit                         | < 0,5% @ +25°C  |
| Temperatureinfluss                       | < 0,01%/°C  |
| Auflösung                                | 10mV  |
| Frequenzmessung:                         |   |
| Grundgenauigkeit                         | < 0,01Hz @ +25°C  |
| Temperatureinfluss                       | < 0,0002Hz/°C   |
| Auflösung                                | 1mHz  |
| Anlaufverzögerung Ton delay              | 0...600s $\pm$ 0,6%   |
| Ansprechverzögerung (TIME OFF) tUTHR OFF | 0...300s $\pm$ 0,6%   |
| Rückfallverzögerung tUTHR ON_total       | 130ms $\pm$ 45%   |
| Ansprechverz. bei Überspng. tover        | 95ms $\pm$ 50%  |
| Ansprechverz. bei Unterspng. tunder      | 95ms $\pm$ 40%  |
| Ansprechzeit, toff_total_over/under      | $\text{toff\_total\_over} = \text{tovver} + \text{tUTHR OFF}$<br>$\text{toff\_total\_under} = \text{tunder} + \text{tUTHR OFF}$ |
| Überschwingzeit                          | 40ms  |

#### 4.12 Isolationsdaten

|                                      |                  |
|--------------------------------------|------------------|
| Bemessungsisolationsspannung         | 400V             |
| Isolierung                           |                  |
| Versorgungskreis / Messkreis         | Sichere Trennung |
| Versorgungskreis / Ausgangskreis     | Sichere Trennung |
| Versorgungskreis / Digitale Eingänge | Sichere Trennung |
| Ausgangskreis / Messkreis            | Basisisolierung  |
| Ausgangskreis / Digitale Eingänge    | Basisisolierung  |

#### 4.13 Umgebungsbedingungen

|                              |   |
|------------------------------|---|
| Umgebungstemperatur Betrieb  | -25 bis +65°C   |
| Umgebungstemperatur Lagerung | -40 bis +70°C   |
| Anzeigefähigkeit Display     | -15 bis +65°C   |
| Relative Luftfeuchtigkeit    | 5 bis 95%   |
| Verschmutzungsgrad           | 2   |
| Gewicht                      | 300g  |
| MTTF                         | 93000h (für Displaytemperatur 25°C ±5°C)  |
| Aufstellungshöhe:            | Bis 2000m über Normalhöhennull (Meeresspiegel)  |
| Installation:                | Für die Netzinstallation des Geräts ist ein externer Leitungsschutzschalter erforderlich. Die Montage muss Installationsklasse 1 am Einsatzort realisieren.             |
| Aufstellungsart:             | Nur zur Verwendung in Innenräumen.  |
| Belüftung:                   | Keine Belüftung der Umgebungsluft erforderlich.   |
| Reinigung:                   | Falls erforderlich, kann die Oberfläche des Gehäuses mit einem trockenen Tuch gereinigt werden, jedoch nur, wenn alle Stromquellen abgeschaltet sind.                   |
| Installationshinweise:       | Leistungsschütze können erhebliche Störungen verursachen.<br>Daher sollte der XUFD mit einem Mindestabstand von 5 cm zu benachbarten Leistungsschützen montiert werden. |

#### 4.14 Elektrischer Anschluss

|  |   |
|--|---|
| Anschlussquerschnitt   | max. 2,5mm <sup>2</sup>   |
| Abisolierlänge   | max. 8mm  |
| Elektrische Belastbarkeit der Klemmen:<br>Relaisausgänge / Digitale Eingänge<br>Messeingänge | max. 450V/16A<br>max. 750V/16A  |
| Anzugsdrehmoment   | max. 0,5Nm  |
| Schraube   | M3, Längsschlitz für Schraubendreher 0,6 × 3,5mm                      |
| Digitale Eingänge und Ausgangsrelais   | Keine Beschränkung für gleichzeitigen Betrieb von Ein- und Ausgängen. |

#### 4.15 Plombierdraht

|                  |               |
|------------------|---------------|
| Drahtdurchmesser | Ø max. 1,32mm |
|------------------|---------------|

#### 4.16 Schutzart

|         |       |
|---------|-------|
| Klemmen | IP 20 |
| Gehäuse | IP 20 |

## 5 Settings der implementierten Parametersätze

Definition zu den folgenden Tabellen:

Grau hinterlegte Zeilen bedeuten, dass die zugehörigen Parameter editierbar sind. Alle anderen Parameter sind nicht verstellbar.

### 5.1.1 Connection Modes

|                |  |
|----------------|--|
| 2-wire         | Es wird nur die Spannung zwischen L1 und N ausgewertet   |
| 3-wire         | Es werden nur die Außenleiterspannungen $U_{L1-L2}$ , $U_{L2-L3}$ und $U_{L3-L1}$  |
| 4-wire (LN)    | Es werden nur die Sternleiterspannungen $U_{L1-N}$ , $U_{L2-N}$ und $U_{L3-N}$ ausgewertet   |
| 4-wire (LN+LL) | Es werden sowohl die Sternspannungen $U_{L1-N}$ , $U_{L2-N}$ und $U_{L3-N}$ als auch die Außenleiterspannungen $U_{L1-L2}$ , $U_{L2-L3}$ und $U_{L3-L1}$ ausgewertet |

### 5.1.2 Einheiten

|       |  |
|-------|--|
| %Unom | Prozent der Nennspannung (Nennspannungsfaktor) |
|-------|--|

### 5.1.3 Funktionale Sicherheit

|            |   |
|------------|---|
| Errtol 2ch | es werden 2 getrennte Schütze mit 2 getrennten Hilfskontakten angeschlossen |
| Errtol 1ch | es wird 1 externer Schütz mit 1 Hilfskontakt angeschlossen                  |

### 5.1.4 Operational Mode

Hier kann zwischen 2 verschiedenen Betriebsmodi umgeschaltet werden  
Wird momentan nur für die CEI-021 verwendet

|         |                 |
|---------|-----------------|
| Mode 0: | transitory mode |
| Mode 1: | definitive mode |

### 5.1.5 Schwellen

|                    |   |
|--------------------|---|
| $U_{THR}$ OFF      | Spannungsschwelle für Abschaltung         |
| $U_{THR}$ ON       | Spannungsschwelle für Zuschaltung         |
| $f_{THR}$ OFF      | Frequenzschwelle für Abschaltung          |
| $f_{THR}$ ON       | Frequenzschwelle für Zuschaltung          |
| $RoCoF_{THR}$ OFF  | Frequenzänderungsschwelle für Abschaltung |
| $RoCoF_{THR}$ ON   | Frequenzänderungsschwelle für Zuschaltung |
| $PShift_{THR}$ OFF | Phasensprungschwelle für Abschaltung      |
| $PShift_{THR}$ ON  | Phasensprungschwelle für Zuschaltung      |

### 5.1.6 Zeiten

|                     |   |
|---------------------|---|
| Time OFF            | Abschaltverzögerung   |
| T on delay          | Einschaltverzögerung  |
| F wnd               | window length frequency measuring (beobachtetes Zeitfenster, das für die Ermittlung der Frequenzgröße f / Hz herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz)   |
| RoCoF wnd           | window length RoCoF (Rate of Change of Frequency) measuring (beobachtetes Zeitfenster, das für die Ermittlung des RoCoF Hz/s herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz)   |
| PShift wnd          | window length PShift (Phase Shift) measuring (beobachtetes Zeitfenster, das für die Ermittlung des PShift / ° herangezogen wird, einstellbar von 0,1s bis 1s abhängig vom verwendeten Parametersatz, wobei nur eine Einstellung von 0,1 bis 0,6s Sinn ergibt. Ein Pshift wnd von 0,6s bis 1s wirkt sich nicht auf die Gesamtabschaltverzögerung aus)  |
| Gesamtabschaltverz. | Diese setzt sich bei der Messung von Frequenz, RoCoF oder Pshift wie folgt zusammen: <ul style="list-style-type: none"> <li>• Frequenzmessung:<br/> <math display="block">\text{TIME OFF}_{\text{gesamt}_f} = \text{Time OFF}_f + F \text{ wnd}</math> </li> <li>• RoCoF-Messung:<br/> <math display="block">\text{TIME OFF}_{\text{gesamt}_{\text{RoCoF}}} = \text{Time OFF}_{\text{RoCoF}} + \text{RoCoF wnd}</math> </li> <li>• Phase-Shift-Messung:<br/> <math display="block">\text{TIME OFF}_{\text{gesamt}_{\text{PShift}}} = \text{Time OFF}_{\text{PShift}} + \text{PShift wnd}</math> </li> </ul> |

### 5.1.7 Hilfskontakt

Bei geforderter funktionaler Sicherheit ist das Rücklesen der Stellung der angesteuerten Schütze (über zwangsgeführte Hilfskontakte) notwendig. Für diese Hilfskontakte kann folgendes ausgewählt werden:

Contact n.c. (normally closed) Hilfskontakt ist ein Öffner (empfohlene Ausführung)

Contact n.o. (normally opened) Hilfskontakt ist ein Schließer

Contact dis. (disabled) Hilfskontakt wird ignoriert (unzulässig für Standards, die funktionale Sicherheit fordern)

Contact t Einstellung der Zeit beim Abschalten, die vergehen darf, bis der Hilfskontakt an I1/2 zurückmelden muss, ansonsten wird ein contact error angezeigt

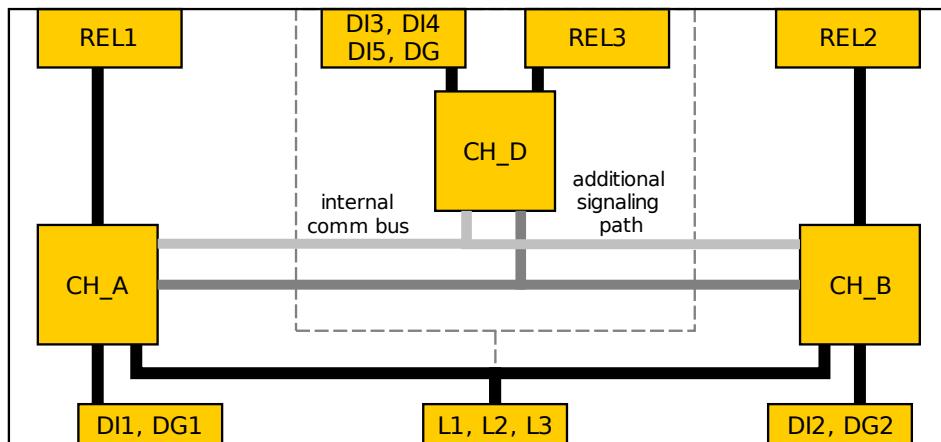
T ConDelOn Einstellung der Zeit beim Zuschalten, die vergehen darf, bis der Hilfskontakt des Kuppelschalters an den Klemmen I1/2 zurückmelden muss. Andernfalls wird R1/2 abgeschaltet und ein contact error angezeigt. Zusätzlich wird R3 aktiviert.

### 5.1.8 Ranges

|                  |   |
|------------------|---|
| Conformity Range | Innerhalb dieser Grenzen ist das Gerät normkonform konfiguriert. Außerhalb dieser Grenzen ist das Gerät nicht mehr normkonform und die entsprechenden Zertifikate verlieren ihre Gültigkeit. Dieser Status wird am Display durch die Kennung „ncnf“ dargestellt. Einstellungen außerhalb dieses Bereiches liegen somit in der Verantwortung des Betreibers und/oder der Abnahmestelle der Anlage. |
| Possible Range   | Technisch möglicher Einstellbereich   |

## 6 Sicherheitskonzept

Das System besteht aus drei Microkontrollern. CH\_A und CH\_B sind die Messkanäle. Diese erfassen, berechnen und überwachen die Messwerte, lesen den Eingang für den Rückmeldekontakt ein und schalten eigenständig das zugehörige Relais. Beide Messkanäle sind redundant aufgebaut (u.a. Spannungsreferenz, Zeitbasis). Der dritte Kontroller CH\_D überwacht beide Messkanäle auf Abweichungen, steuert die Benutzerschnittstelle (LEDs, Display, Tasten) und kontrolliert nicht-sicherheitsrelevante Ein- und Ausgänge.



### Fehlerbehandlung

Fehler werden in drei Klassen eingeteilt:

1. **Grenzwertüberschreitung**  
Dabei handelt es sich um einen normalen Betriebszustand. Dazu zählt unter anderem die Erkennung einer Überspannung oder Unterfrequenz. Diese Fehler werden nach der normativen Spezifikation behandelt. Normalerweise werden die Relais von CH\_A und CH\_B nach einer Auslöseverzögerung abgeworfen. Nachdem der Fehler nicht mehr erkannt wird und alle anderen Parameter innerhalb der zulässigen Grenzen sind, werden die Relais nach einer Einschaltverzögerung wieder zugeschaltet.
2. **Nicht-kritische Systemfehler**  
Diese Fehler deuten auf ein Problem hin, sind aber nicht sicherheitskritisch. Dazu zählen eine zu niedrige Versorgungsspannung, ein als offen erkannter Rückmeldekontakt, der geschlossen sein sollte oder vereinzelte Fehler in der internen Kommunikation.
3. **Kritische Systemfehler**  
Diese Fehler sind sicherheitskritische Fehler. Dazu zählen unter anderem eine zu hohe Messabweichung der beiden Messkanäle, die Speicherintegrität ist nicht gegeben. Wird ein solcher Fehler erkannt, geht das System in den Sicherheitszustand (Relais im Ruhezustand – OFF).

### **Systemfehler:**

- T Fernabschaltung aktiv
- 0 CH\_A oder CH\_B enthält ungültige Software (CODEID)
- 1 Software in CH\_A und CH\_B ist unterschiedlich (CODEVERS)
- 2 Fehlerhafte Prüfsumme des Codespeicher (CODECRC)
- 3 Fehlerhafte Prüfsumme der Firmware (derzeit nicht verwendet - FLASHCRC)
- 4 Fehlerhafte Prüfsumme des EEPROM (EEPROMCRC)
- 5 Konfiguration ist inkonsistent (LOGICVERS)
- 6 Fehlerhafte Prüfsumme der Konfiguration (LOGICCRC)
- 8 Fehler in der Versorgungsspannung für die Ausgänge (POWER6V)
- 9 Fehler in der Versorgungsspannung für die Eingänge (POWERDIGINP)
- A Abweichung der Messkanäle (MEASCOMPAB)
- B Password-Abfrage deaktiviert (PWDINACTIVE)
- C Messkanal kommuniziert intern nicht (INTERCOM1)
- 7, D-F Reserviert

## **7 Glossar**

|            |   |
|------------|---|
| OVE        | Österreichischer Verband für Elektrotechnik         |
| TOR        | Technische und organisatorische Regeln (Österreich) |
| OOE        | Oberösterreich                                      |
| W          | Wien  |
| NS         | Niederspannung                                      |
| MS         | Mittelspannung                                      |
| VDE        | Verband der Elektrotechnik                          |
| AR         | Anschlussregeln                                     |
| NA/EEA- CH | Netzanlagen/Eigenerzeugungsanlagen-Schweiz          |
| AS         | Australien  |
| NZS        | Neuseeland  |
| DK         | Dänemark  |
| IP         | Interface Protection                                |
| ASS        | Automatic Separation System                         |

## 8 Verfügbare Normen und Standards

### 8.1 Aktuell gültige Normen und Standards

| Slot | ID  | Norm/Standard        | Regions                                       | Number of channels |   |                    |
|------|-----|----------------------|---|--------------------|---|--------------------|
|      |     |                      |   | 1                  | 2 | 1 or 2 select able |
| #00  | 802 | OVE TOR R25 NS SYNC  | Austria (low voltage)                         |                    | X |                    |
| #01  | 803 | OVE TOR R25 NS ASYNC | Austria (low voltage)                         |                    | X |                    |
| #02  | 852 | OVE TOR R25 MS SYNC  | Austria (medium voltage)                      |                    | X |                    |
| #03  | 853 | OVE TOR R25 MS ASYNC | Austria (medium voltage)                      |                    | X |                    |
| #04  | 822 | OOE TOR R25 NS SYNC  | Upper Austria Oberösterreich (low voltage)    |                    | X |                    |
| #05  | 823 | OOE TOR R25 NS ASYNC | Upper Austria Oberösterreich (low voltage)    |                    | X |                    |
| #06  | 872 | OOE TOR R25 MS SYNC  | Upper Austria Oberösterreich (medium voltage) |                    | X |                    |
| #07  | 873 | OOE TOR R25 MS ASYNC | Upper Austria Oberösterreich (medium voltage) |                    | X |                    |
| #08  | 832 | W TOR R25 NS SYNC    | Vienna (low voltage)                          |                    | X |                    |
| #09  | 833 | W TOR R25 NS ASYNC   | Vienna (low voltage)                          |                    | X |                    |
| #10  | 882 | W TOR R25 MS SYNC    | Vienna (medium voltage)                       |                    | X |                    |
| #11  | 883 | W TOR R25 MS ASYNC   | Vienna (medium voltage)                       |                    | X |                    |
| #12  | 812 | TIROL TOR NS SYNC    | Tyrol (low voltage)                           |                    | X |                    |
| #13  | 813 | TIROL TOR NS ASYNC   | Tyrol (low voltage)                           |                    | X |                    |
| #14  | 862 | TIROL TOR MS SYNC    | Tyrol (medium voltage)                        |                    | X |                    |

|     |      |                                     |   |   |   |  |
|-----|------|-------------------------------------|---|---|---|--|
| #15 | 863  | TIROL TOR MS ASYNC                  | Tyrol (medium voltage)                                    |   | X |  |
| #16 | 842  | B TOR R25 NS SYNC                   | Burgenland (low voltage)                                  |   | X |  |
| #17 | 843  | B TOR R25 NS ASYNC                  | Burgenland (low voltage)                                  |   | X |  |
| #18 | 892  | B TOR R25 MS SYNC                   | Burgenland (medium voltage)                               |   | X |  |
| #19 | 893  | B TOR R25 MS ASYNC                  | Burgenland (medium voltage)                               |   | X |  |
| #20 | 311  | VDE-AR-N 4105: 2018<br>(Pn ≤ 50kW)  | Germany (low voltage)                                     | X |   |  |
| #21 | 312  | VDE-AR-N 4105: 2018<br>(Pn > 50kW)  | Germany (low voltage)                                     | X |   |  |
| #22 | 313  | VDE-AR-N 4105: 2018<br>(converter)  | Germany (low voltage)                                     |   | X |  |
| #23 | 707  | VDE-AR-N 4110: 2018<br>(Pn > 135kW) | Germany (medium voltage)                                  | X |   |  |
| #24 | 102  | CEI 0-21: 2019                      | Italy   | X |   |  |
| #25 | 410  | G99/1/3: 2018 LV                    | Great Britain (low voltage)                               | X |   |  |
| #26 | 460  | G99/1/3: 2018 HV                    | Great Britain (medium/high voltage)                       | X |   |  |
| #27 | 510  | G98/1/2: 2018                       | Great Britain (low voltage)                               | X |   |  |
| #28 | 603  | C10-11: 2021 LV-IP                  | Belgium (low voltage) interface protection                | X |   |  |
| #29 | 602  | C10-11: 2019 LV-ASS                 | Belgium (low voltage) automatic separation system         | X |   |  |
| #30 | 653  | C10-11: 2021 HV-IP                  | Belgium (medium/high voltage) interface protection        | X |   |  |
| #31 | 652  | C10-11: 2019 HV-ASS                 | Belgium (medium/high voltage) automatic separation system | X |   |  |
| #32 | 1200 | NA/EEA- CH 2014<br>(Type A)         | Switzerland 2014 (low voltage)                            |   | X |  |
| #33 | 1220 | NA/EEA-NE7 - CH 2020<br>(Type A)    | Switzerland 2020 (low voltage)                            |   | X |  |

|     |      |                                  |                                      |  |   |   |
|-----|------|----------------------------------|--------------------------------------|--|---|---|
| #34 | 1221 | NA/EEA-NE7 - CH 2020<br>(Type B) | Switzerland 2020 (low voltage)       |  | X |   |
| #35 | 901  | EN 50549-1:2019                  | Europe LV (Netherlands)              |  | X |   |
| #36 | 926  | EN 50549-2:2019                  | Europe HV (Netherlands)              |  | X |   |
| #37 | 905  | EN 50549-1 Ireland               | Europe LV (Ireland)                  |  | X |   |
| #38 | 950  | EN 50438: 2013 DK                | Denmark                              |  |   | X |
| #39 | 910  | SRPS EN 50549-1:2020             | Europe LV (Serbia)                   |  | X |   |
| #40 | 200  | VDE V 0126-1-1:2013              | France, Turkey, Belgium, Greece, ... |  | X |   |
| #41 | 1300 | Romania ANRE 2021                | Romania                              |  | X |   |
| #42 | 1110 | AB AS 4777.2:2020                | Australia                            |  | X |   |
| #43 | 1120 | C AS 4777.2:2020                 | Australia                            |  | X |   |
| #44 | 1130 | NZS 4777.2:2020                  | New Zealand                          |  | X |   |
| #45 | 1135 | NSW-Augrid 23                    | Australia                            |  | X |   |
| #46 | 1140 | NSW-Essential 23                 | Australia                            |  | X |   |
| #47 | 1145 | NSW-Endeavour 23                 | Australia                            |  | X |   |
| #48 | 1150 | VIC-United Energy 23             | Australia                            |  | X |   |
| #49 | 1155 | VIC-Ausnet Energy 23             | Australia                            |  | X |   |
| #50 | 1160 | VIC-Citipower 23                 | Australia                            |  | X |   |
| #51 | 1165 | VIC-Jemana 23                    | Australia                            |  | X |   |
| #52 | 1170 | VIC-Powercor 23                  | Australia                            |  | X |   |

|     |      |                      |                           |  |          |          |
|-----|------|----------------------|---------------------------|--|----------|----------|
| #53 | 1175 | VIC-Western Power 23 | Australia                 |  | <b>X</b> |          |
| #54 | 1180 | ACT-Evoenergy 23     | Australia                 |  | <b>X</b> |          |
| #55 | 1185 | QLD-Energex 23       | Australia                 |  | <b>X</b> |          |
| #56 | 1190 | QLD-Ergon 23         | Australia                 |  | <b>X</b> |          |
| #57 | 1195 | SA-Power networks23  | Australia                 |  | <b>X</b> |          |
| #58 | 1000 | NRS 097-2-1: 2017    | South Africa              |  | <b>X</b> |          |
| #59 | 9006 | OPEN SETUP           | Freely configurable setup |  |          | <b>X</b> |

## 8.2 Frühere Versionen von Normen und Standards

| Recertified Standards |      |   |                                    |   |   |  |
|-----------------------|------|---|------------------------------------|---|---|--|
| #52                   | 900  | EN 50438:2013   | Europe                             |   | X |  |
| #53                   | 801  | OVE E 8001/8101:2014                                      | Austria                            |   | X |  |
| #54                   | 300  | VDE-AR-N 4105<br>tested according to<br>VDE 0124-100:2013 | Germany (low voltage)              |   | X |  |
| #55                   | 700  | TR3 Rev23:2013<br>certified according to<br>BDEW 2008     | Germany (medium voltage)           | X |   |  |
| #56                   | 1102 | AS/NZS 4777.2:2015  | Australia / Victoria (New Zealand) |   | X |  |
| #57                   | 405  | G59/3/3: 2015 LV  | Great Britain (low voltage)        | X |   |  |
| #58                   | 455  | G59/3/3: 2015 MV  | Great Britain (high voltage)       | X |   |  |
| #59                   | 500  | G83/2: 2012   | Great Britain (low voltage)        | X |   |  |
| #60                   | 600  | C10-11: 2012 LV   | Belgium (low voltage)              | X |   |  |
| #61                   | 650  | C10-11: 2012 MV   | Belgium medium voltage             | X |   |  |
| #62                   | 601  | C10-11: 2019 LV   | Belgium (low voltage)              | X |   |  |
| #63                   | 651  | C10-11: 2019 HV   | Belgium (high voltage)             | X |   |  |

## **9 Übersicht der implementierten Parametersätze**

### **9.1 OVE TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.2 OVE TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.3 OVE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

#### **9.4 OVE TOR R25 MS ASYNC (Typ A/B Mittelspann. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

#### **9.5 OOE TOR R25 NS SYNC (Typ A/B Niederspann. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

#### **9.6 OOE TOR R25 NS ASYNC (Typ A/B Niederspann. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.7 OOE TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen – Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.8 OOE TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen – Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.9 W TOR R25 NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.10 W TOR R25 NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.11 W TOR R25 MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.12 W TOR R25 MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.13 TIROL TOR NS SYNC (Typ A/B Niederspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.14 TIROL TOR NS ASYNC (Typ A/B Niederspng. für nicht syncr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.15 TIROL TOR MS SYNC (Typ A/B Mittelspng. für synchrone Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.16 TIROL TOR MS ASYNC (Typ A/B Mittelspng. für nicht synchr. Stromerzeugungsanlagen)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.17 VDE-AR-N 4105:2018-11 (Pn ≤ 50 kW)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

### **9.18 VDE-AR-N 4105:2018-11 (Pn > 50 kW)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

### **9.19 VDE-AR-N 4105:2018-11 (Umrichter)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte beim Zuschalten
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.20 VDE-AR-N 4110:2018-11 (geprüft nach TR3, Bewertungsbericht TR8)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung (autom. Auswahl abhängig von Connection Mode)
- 2 Unterspannungsschwellen - Außenleiterspannung (autom. Auswahl abhängig von Connection Mode)
- 2 Überspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Überfrequenzschwellen
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

## **9.21 CEI 0-21:2019**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbarer Operational Mode (transitory mode / definitive mode)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung (autom. Auswahl abh. vom Connection Mode)
- 2 Unterspannungsschwellen - Außenleiterspannung (autom. Auswahl abh. vom Connection Mode)
- 1 Überspannungsschwelle - Sternspannung (autom. Auswahl abh. vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abh. vom Connection Mode)
- 10-Minuten Mittelwert Überspannungsschwelle
- 3 umschaltbare Überfrequenzschwellen (Umschaltung über Operational Mode und digitale Inputs)
- 3 umschaltbare Unterfrequenzschwellen (Umschaltung über Operational Mode und digitale Inputs)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar), RoCoF-Window verstellbar
- Auswählbare RoCoF window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.22 G99/1/3 LV:2018 (Niederspannung)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.23 G99/1/3 HV:2018 (Mittel/Hochspannung)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.24 G98/1/2:2018 (Niederspannung)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.25 C10-11:2021 LV-IP (Interface Protection / Niederspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 1 Überspannungsschwelle Zero Sequence
- activation narrower frequency window (anfw) bei Unterspannung
- activation narrower frequency window (anfw) bei Zero Sequence
- activation narrower frequency window (anfw) mit digital input (DI5)
- 1 Überfrequenzschwelle
- 1 Überfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Unterfrequenzschwelle
- 1 Unterfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.26 C10-11:2019 LV-ASS (Automatic Separation System / Niederspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwellen – Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.27 C10-11:2021 HV-IP (Interface Protection / Hochspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen – Außenleiterspannung
- activation narrower frequency window (anfw) bei Unterspannung
- activation narrower frequency window (anfw) mit digital input (DI5)
- 1 Überfrequenzschwelle
- 1 Überfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Unterfrequenzschwelle
- 1 Unterfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.28 C10-11:2019 HV-ASS (Automatic Separation System / Hochspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwellen – Außenleiterspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

### **9.29 NA/EEA- CH 2014 Typ A <1MW (Niederspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.30 NA/EEA-NE7 - CH 2020 Typ A 800W bis 250kW (Niederspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.31 NA/EEA-NE7 - CH 2020 Typ B 250kW bis 36MW (Niederspannung)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.32 EN 50549-1:2019 LV (Niederlande)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen – Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen – Sternspannung
- 1 Überspannungsschwelle Zero Sequence
- 10-Minuten Mittelwert Überspannungsschwelle
- activation narrower frequency window (anfw) bei Unterspannung
- activation narrower frequency window (anfw) bei Zero Sequence
- activation narrower frequency window (anfw) mit digital input (DI5)
- 1 Überfrequenzschwelle
- 1 Überfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Unterfrequenzschwelle
- 1 Unterfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.33 EN 50549-2:2019 HV (Niederlande)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen – Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen – Sternspannung
- 1 Überspannungsschwelle Zero Sequence
- 10-Minuten Mittelwert Überspannungsschwelle
- activation narrower frequency window (anfw) bei Unterspannung
- activation narrower frequency window (anfw) bei Zero Sequence
- activation narrower frequency window (anfw) mit digital input (DI5)
- 1 Überfrequenzschwelle
- 1 Überfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Unterfrequenzschwelle
- 1 Unterfrequenzschwelle bei activation narrower frequency window (anfw)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.34 EN 50438:2013 (DK)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Safety Mode (1 Schütz oder 2 Schütze angesteuert und überwacht)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

### **9.35 VDE 0126-1-1:2013 (ERDF-NOI-RES\_13E Frankreich)**

- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)

### **9.36 AB AS 4777.2:2020**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer/ kein)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.37 C AS 4777.2:2020**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer/ kein)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen – Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

### **9.38 NZS 4777.2:2020**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer/ kein)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen – Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.39 NRS 097-2-1:2017**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Überspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

## **9.40 OPEN SETUP**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Safety Mode (1 Schütz oder 2 Schütze angesteuert und überwacht)
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Unterspannungsschwellen - Außenleiterspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Überspannungsschwellen - Sternspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 2 Unterspannungsschwellen - Sternspannung (automatische Auswahl abhängig vom Connection Mode, bei Bedarf manuell deaktivierbar)
- 1 Überspannungsschwelle Zero Sequence Component (nur in Connection Mode 4-wire (LN+LL))
- 10-Minuten Mittelwert Überspannungsschwelle (bei Bedarf manuell deaktivierbar)
- 2 Überfrequenzschwellen (bei Bedarf manuell deaktivierbar)
- 2 Unterfrequenzschwelle (bei Bedarf manuell deaktivierbar)
- 1 Überfrequenzschwelle für narrower frequency window aktivierbar (NAFW) (nur in Connection Mode 4-wire (LN+LL))
- 1 Unterfrequenzschwelle für narrower frequency window aktivierbar (NAFW) (nur in Connection Mode 4-wire (LN+LL))
- Auswählbare Frequenz window length
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt und Spannungs/Frequenzfehlern
- Auswählbare Deaktivierung der Frequenzschwellen bei Unterspannung

#### **9.41 EN 50438:2013**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

#### **9.42 E 8001/8101 (Vorgänger von OVE TOR R25)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

#### **9.43 VDE 0124-100:2013 (Vorgänger von VDE-AR-N 4105:2018-11)**

- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 1 Unterspannungsschwelle - Außenleiterspannung
- 1 Überspannungsschwelle - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 zufällige Überfrequenzschwelle (bei Bedarf aktivierbar)
- Einschaltverzögerung
- zufällige Einschaltverzögerung (bei Bedarf aktivierbar)

#### **9.44 TR3 Rev23:2013 (Vorgänger von VDE-AR-N 4110:2018-11)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle – Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen – Außenleiterspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überspannungsschwelle - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 2 Unterspannungsschwellen - Sternspannung (autom. Auswahl abhängig vom Connection Mode)
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- Einschaltverzögerung

#### **9.45 AS/NZS 4777.2:2015 (Niederspannung)**

- Local standards must be taken into account
- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer/ kein)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 1 Unterspannungsschwelle - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 10-Minuten Mittelwert Überspannungsschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- Auswählbare RoCoF window length
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Auswählbare Pshift window length
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Ansprechen einer Schutzfunktion U/f oder bei Fehler Rückmeldekontakt

#### **9.46 G59/3/3:2015 LV (Niederspannung - Vorgänger von G99/1/3 LV:2018)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung

#### **9.47 G59/3/3:2015 MV (Mittelspannung Vorgänger von G99/1/3 HV:2018)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf deaktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf aktivierbar)
- Einschaltverzögerung

#### **9.48 G83/2:2012 (Niederspannung Vorgänger von G98/1/2:2018)**

- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 2 Überfrequenzschwellen
- 2 Unterfrequenzschwellen
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

#### **9.49 C10-11:2012 LV (Niederspannung Vorgänger von C10-11:2019)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

#### **9.50 C10-11:2012 MV (Mittelspannung Vorgänger von C10-11:2019)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 1 Überspannungsschwelle - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung

## **9.51 C10-11:2019 LV-IP (Interface Protection / Niederspannung Vorgänger von C10-11:2021)**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Sternspannung
- 2 Unterspannungsschwellen - Sternspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **9.52 C10-11:2019 HV-IP (Interface Protection / Hochspannung Vorgänger von C10-11:2021))**

- Auswählbarer Connection Mode (1 phasig, 3 phasig)
- Auswählbare Nennspannung
- Auswählbarer Rückmeldekontakt (Öffner / Schließer)
- Zusätzliche zeitliche Überwachung des Rückmeldekontakte
- Auswählbare Fernabschaltung (Öffner / Schließer)
- 2 Überspannungsschwellen - Außenleiterspannung
- 2 Unterspannungsschwellen - Außenleiterspannung
- 1 Überfrequenzschwelle
- 1 Unterfrequenzschwelle
- 1 Frequenzrampenschwelle (RoCoF ... bei Bedarf aktivierbar)
- 1 Phasensprungschwelle (PShift ... bei Bedarf deaktivierbar)
- Einschaltverzögerung
- Melderelais R3 - Aktivierung (LED R3 ON) bei Fehler Rückmeldekontakt

## **10 ANHANG (Parameter der implementierten Standards im Detail)**

## **10.1 ÖVE TOR R25 NS SYNC [ID 802] Typ A/B low voltage synchr. generators**

| Connection Mode |            |             | Conformity Range | Possible Range                                 |
|-----------------|------------|-------------|------------------|--|
| ID              |            | Default     |                  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |        |         | Conformity Range |       | Possible Range |      |       |
|-----------------|------------|--------|---------|------------------|-------|----------------|------|-------|
| ID              |            |        | Default | Min              | Max   | Min            | Max  |       |
| .005            | ULN/LL nom | Unom Y | V       | 230.0            | 57.5  | 230.0          | 28.8 | 241.4 |
|                 |            | Unom Δ | V       | 400.0            | 100.0 | 400.0          | 50.0 | 420.0 |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

| Undervoltage1 Line to Neutral |            |                      |       |         | Conformity Range |        | Possible Range |        |
|-------------------------------|------------|----------------------|-------|---------|------------------|--------|----------------|--------|
| ID                            |            |                      |       | Default | Min              | Max    | Min            | Max    |
| .023                          | Ueff < off | U <sub>THR</sub> OFF | %Unom | 80      | 10               | 100    | 10             | 100    |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 90      | 86               | 100    | 10             | 100    |
| .025                          | T Ueff <   | Time OFF             | ms    | 1000    | 50               | 180000 | 50             | 180000 |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Comment:         | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |  |  |  |  |  |  |
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |  |  |  |  |  |  |

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 108              | 100 | 108            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                        |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |

| Underfrequency1  |         |   |         | Conformity Range |       | Possible Range |       |        |
|------------------|---------|---|---------|------------------|-------|----------------|-------|--------|
| ID               |         |   | Default | Min              | Max   | Min            | Max   |        |
| .059             | f < off | fTHR OFF  | Hz      | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON   | Hz      | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF  | ms      | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |         |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% U <sub>NOM</sub>                                    |         |                  |       |                |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     | Default   |          |                        | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |  | Conformity Range |     | Possible Range |     |     |
|---------------|--|------------------|-----|----------------|-----|-----|
| ID            |  | Default          | Min | Max            | Min | Max |

|      |           |              |   |    |   |     |   |     |
|------|-----------|--------------|---|----|---|-----|---|-----|
| .102 | Ton delay | Turn on time | s | 60 | 0 | 300 | 0 | 900 |
|------|-----------|--------------|---|----|---|-----|---|-----|

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b> |  |
|---|--|
| On  | = it is possible to detect this error                      |
| Off   | = it is <u>not</u> possible to show this error on relay R3 |
| Overvoltage LL (UΔ)                                     | on   |
| Undervoltage LL (UΔ)                                    | on   |
| Overvoltage LN (UY)                                     | on   |
| Undervoltage LN (UY)                                    | on   |
| 10-min overvoltage ( $\ddot{U}$ )                       | on   |
| Overfrequency (f)                                       | on   |
| Underfrequency (f)                                      | on   |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )      | on   |
| Phase shift ( $\Delta\Phi$ )                            | on   |

|   |    |
|---|----|
| Remote shutdown / self-test (R) (T)   | on |
| Contactor feedback contact reports closed, although it should be open (C) (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) (c) | on |

| Device Information |                                |
|--------------------|--------------------------------|
| ID                 |                                |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb |

xxxxxxxxxx = Device ID  
 dd: Software version of Display Software  
 aa: Software version of Measuring Software  
 cc: Index of Configuration set  
 b: Version of Configuration set

## 10.2 ÖVE TOR R25 NS ASYNC [ID 803] Typ A/B low voltage asynchr. generators

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |         |   | Conformity Range |       |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min   | Max            |       |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 57.5  | 230.0 | 28.8           | 241.4 |
|                 |            | Unom Δ  | V | 400.0            | 100.0 | 400.0 | 50.0           | 420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

|                              |                  |                |
|------------------------------|------------------|----------------|
| Overvoltage1 Line to Neutral | Conformity Range | Possible Range |
|------------------------------|------------------|----------------|

| ID               |            |   |       | Default | Min      | Max    | Min     | Max    |
|------------------|------------|---|-------|---------|----------|--------|---------|--------|
| .018             | Ueff >     | Enable function   |       | on      | on / off |        | on /off |        |
| .019             | Ueff > off | U <sub>THR</sub> OFF  | %Unom | 111     | 100      | 130    | 100     | 135    |
| .020             | Ueff > on  | U <sub>THR</sub> ON   | %Unom | 108     | 100      | 108    | 100     | 135    |
| .021             | T Ueff >   | Time OFF  | ms    | 60000   | 50       | 180000 | 50      | 180000 |
| Comment:         |            | Ueff > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |         |          |        |         |        |
| Only active for: |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |         |          |        |         |        |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min | Max    |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 10  | 100    |
| .025                          | T Ueff <   | Time OFF   | ms    | 1500             | 50  | 180000         | 50  | 180000 |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |     |        |

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 108              | 100 | 108            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |                      |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|----------------------|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |                      |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function      |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF | %Unom | 25               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF             | ms    | 500              | 50  | 180000         | 50      | 180000 |

|                  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|
| Comment:         | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |  |  |  |  |  |
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |  |  |  |  |  |

| 10 minutes average overvoltage |            |                 |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|-----------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                 |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | UTHR OFF        | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | UTHR ON         | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF        | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | fTHR OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | fTHR ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% UNOM   |    |                  |       |                |       |        |

| Underfrequency1  |         |   |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|---|----|------------------|-------|----------------|-------|--------|
| ID               |         |   |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off | fTHR OFF  | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON   | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF  | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% UNOM  |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type | Conformity Range | Possible Range |
|------------------------|------------------|----------------|
|                        |                  |                |

| ID   |           |          | Default                |                | Min                    | Max                    | Min                    | Max             |
|------|-----------|----------|------------------------|----------------|------------------------|------------------------|------------------------|-----------------|
| .099 | Contact   | Type     | n.c. (normally closed) |                | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |
| .100 | T Contact | Time OFF | ms                     | Fixed to 500ms |                        |                        |                        |                 |
| .114 | I3 STOP   | Type     | n.o. (normally opened) |                | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

**10.3 ÖVE TOR R25 MS SYNC [ID 852] Typ A/B medium voltage synchr. generators**

| Connection Mode |            |         | Conformity Range |  |  | Possible Range                              |  |
|-----------------|------------|---------|------------------|--|--|---|--|
| ID              |            | Default |                  |  |  |   |  |
| .003            | Connection | 3-wire  | 3-wire           |  |  | 2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL) |  |

| Nominal Voltage |            |  |     | Conformity Range |               |                | Possible Range |                |
|-----------------|------------|--|-----|------------------|---------------|----------------|----------------|----------------|
| ID              |            | Default  |     | Min              | Max           | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V V | 60.4<br>105.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0   | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |     |                  |               |                |                |                |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |     |
|-------------------|--------|---|------------------|--|--|----------------|-----|
| ID                |        | Default   |                  |  |  | Min            | Max |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |     |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |     |

| Overvoltage1 Line to Line |         |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|---------|--|-------|------------------|-----|----------------|-----|
| ID                        |         | Default  |       | Min              | Max | Min            | Max |
| .011                      | U > off | U <sub>THR</sub> OFF   | %Unom | 106              | 100 | 130            | 100 |
| .012                      | U > on  | U <sub>THR</sub> ON  | %Unom | 104              | 100 | 108            | 100 |
| .013                      | T U >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  |
| Comment:                  |         | U > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |
| Only active for:          |         | Connection Modes: 3-wire, 4-wire (LN+LL)                                   |       |                  |     |                |     |

| Undervoltage1 Line to Line |         |   |       | Conformity Range |     | Possible Range |     |
|----------------------------|---------|---|-------|------------------|-----|----------------|-----|
| ID                         |         | Default   |       | Min              | Max | Min            | Max |
| .015                       | U < off | U <sub>THR</sub> OFF  | %Unom | 70               | 10  | 100            | 10  |
| .016                       | U < on  | U <sub>THR</sub> ON   | %Unom | 90               | 86  | 100            | 10  |
| .017                       | T U <   | Time OFF  | ms    | 1500             | 50  | 180000         | 50  |
| Comment:                   |         | U < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 110              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 700              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |  |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|--|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | on  |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |   |
|--------------------|------------------------------------|---|
| ID                 |                                    |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.4 ÖVE TOR R25 MS ASYNC [ID 853] Typ A/B medium voltage asynchr. generators**

| Connection Mode |            |         | Conformity Range |  |  | Possible Range                              |  |
|-----------------|------------|---------|------------------|--|--|---|--|
| ID              |            | Default |                  |  |  |   |  |
| .003            | Connection | 3-wire  | 3-wire           |  |  | 2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL) |  |

| Nominal Voltage |            |  |     | Conformity Range |               |                | Possible Range |                |
|-----------------|------------|--|-----|------------------|---------------|----------------|----------------|----------------|
| ID              |            | Default  |     | Min              | Max           | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V V | 60.4<br>105.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0   | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |     |                  |               |                |                |                |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |     |
|-------------------|--------|---|------------------|--|--|----------------|-----|
| ID                |        | Default   |                  |  |  | Min            | Max |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |     |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |     |

| Overvoltage1 Line to Line |         |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|---------|--|-------|------------------|-----|----------------|-----|
| ID                        |         | Default  |       | Min              | Max | Min            | Max |
| .011                      | U > off | U <sub>THR</sub> OFF   | %Unom | 106              | 100 | 130            | 100 |
| .012                      | U > on  | U <sub>THR</sub> ON  | %Unom | 104              | 100 | 108            | 100 |
| .013                      | T U >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  |
| Comment:                  |         | U > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |
| Only active for:          |         | Connection Modes: 3-wire, 4-wire (LN+LL)                                   |       |                  |     |                |     |

| Undervoltage1 Line to Line |         |   |       | Conformity Range |     | Possible Range |     |
|----------------------------|---------|---|-------|------------------|-----|----------------|-----|
| ID                         |         | Default   |       | Min              | Max | Min            | Max |
| .015                       | U < off | U <sub>THR</sub> OFF  | %Unom | 80               | 10  | 100            | 10  |
| .016                       | U < on  | U <sub>THR</sub> ON   | %Unom | 90               | 86  | 100            | 10  |
| .017                       | T U <   | Time OFF  | ms    | 1500             | 50  | 180000         | 50  |
| Comment:                   |         | U < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 110              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 700              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |  |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |  |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | on  |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |   |
|--------------------|------------------------------------|---|
| ID                 |                                    |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.5 Oberösterreich OOE TOR R25 NS SYNC [ID 822] Typ A/B low voltage  
synchr. generators**

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 57.5  | 230.0          | 28.8  |
|                 |            | Unom Δ  | V | 400.0            | 100.0 | 400.0          | 50.0  |
|                 |            |         |   |                  |       |                | 241.4 |
|                 |            |         |   |                  |       |                | 420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 10  |
| .025                          | T Ueff <   | Time OFF   | ms    | 200              | 50  | 180000         | 50  |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |                  |     |                |     |

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |     |
|------------------------------|------------|---|-------|------------------|-----|----------------|-----|
| ID                           |            | Default   |       | Min              | Max | Min            | Max |
| .034                         | Ueff>>     | Enable function   | on    | on               |     | on /off        |     |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100 |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 109            | 100 |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50  |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | on                                      | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% UNOM   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |        |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|--------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max    |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061            | T f <   | Time OFF             | ms | 50               | 50    | 50             | 50    | 180000 |

|                  |   |
|------------------|---|
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |
| Only active for: | Voltage > 60% UNOM  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     | Default   |          |                        | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled)        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |
|                        |           |          |                        | dis. (disabled)        |                        |                        |                        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.6 Oberösterreich OOE TOR R25 NS ASYNC [ID 823] Typ A/B low voltage  
asynchr. generators**

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 57.5  | 230.0          | 28.8  |
|                 |            | Unom Δ  | V | 400.0            | 100.0 | 400.0          | 50.0  |
|                 |            |         |   |                  |       |                | 241.4 |
|                 |            |         |   |                  |       |                | 420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 10  |
| .025                          | T Ueff <   | Time OFF   | ms    | 1500             | 50  | 180000         | 50  |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |                  |     |                |     |

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |     |
|------------------------------|------------|---|-------|------------------|-----|----------------|-----|
| ID                           |            | Default   |       | Min              | Max | Min            | Max |
| .034                         | Ueff>>     | Enable function   | on    | on               |     | on /off        |     |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100 |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 109            | 100 |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50  |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 25               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 500              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | on                                      | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% UNOM   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |        |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|--------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max    |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061            | T f <   | Time OFF             | ms | 50               | 50    | 50             | 50    | 180000 |

|                  |   |
|------------------|---|
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |
| Only active for: | Voltage > 60% UNOM  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     | Default   |          |                        | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled)        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |
|                        |           |          |                        | dis. (disabled)        |                        |                        |                        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## **10.7 Oberösterreich OOE TOR R25 MS SYNC [ID 872] Typ A/B medium voltage synchr. generators**

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              |            | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |  |         | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|--|---------|------------------|---------------|----------------|--------------|----------------|
| ID              |            |  | Default | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V<br>V  | 60.4<br>105.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |         |                  |               |                |              |                |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 108              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104.5            | 100 | 109            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 104.5                                   | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |                        |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |                        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## **10.8 Oberösterreich OOE TOR R25 MS ASYNC [ID 873] Typ A/B med. voltage asynchr. generators**

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              |            | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |  |         | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|--|---------|------------------|---------------|----------------|--------------|----------------|
| ID              |            |  | Default | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V<br>V  | 60.4<br>105.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |         |                  |               |                |              |                |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 108              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104.5            | 100 | 109            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 500              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 104.5                                   | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |  | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|--|------------------|-------|----------------|-------|-------|
| ID             |         |                      |  | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF |  | Hz               | 51.50 | 50.00          | 55.00 | 50.00 |
| .056           | f > on  | f <sub>THR</sub> ON  |  | Hz               | 50.10 | 50.00          | 50.10 | 50.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) |  |
|                        |           |          |                        | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |                        |                        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |  |
|                        |           |          |                        | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |                        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.9 Wien TOR R25 NS SYNC [ID 832] Typ A/B low voltage synchr. generators

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |            | Default   |       | Min              | Max      | Min            | Max     |        |
| .018                         | Ueff >     | Enable function   |       | on               | on / off |                | on /off |        |
| .019                         | Ueff > off | U <sub>THR</sub> OFF  | %Unom | 108              | 100      | 130            | 100     | 135    |
| .020                         | Ueff > on  | U <sub>THR</sub> ON   | %Unom | 107              | 100      | 108            | 100     | 135    |
| .021                         | T Ueff >   | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |          |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|--------|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |        |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 10  | 100    |
| .025                          | T Ueff <   | Time OFF   | ms    | 1000             | 50  | 180000         | 50  | 180000 |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 107              | 100 | 108            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 108                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) |  |
|                        |           |          |                        | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |                        |                        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |  |
|                        |           |          |                        | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |                        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.10 Wien TOR R25 NS ASYNC [ID 833] Typ A/B low voltage asynchr. generators

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                              |  |
|-----------------|------------|-------------|------------------|--|--|---|--|
| ID              |            | Default     |                  |  |  |   |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL) |  |

| Nominal Voltage |            |                    |   | Conformity Range |       |       | Possible Range |       |
|-----------------|------------|--------------------|---|------------------|-------|-------|----------------|-------|
| ID              |            | Default            |   | Min              | Max   | Min   | Max            |       |
| .005            | ULN/LL nom | U <sub>nom</sub> Y | V | 230.0            | 57.5  | 230.0 | 28.8           | 241.4 |
|                 |            | U <sub>nom</sub> Δ | V | 400.0            | 100.0 | 400.0 | 50.0           | 420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |

| Overvoltage1 Line to Neutral |                        |   |                   | Conformity Range |     | Possible Range |     |
|------------------------------|------------------------|---|-------------------|------------------|-----|----------------|-----|
| ID                           |                        | Default   |                   | Min              | Max | Min            | Max |
| .018                         | U <sub>eff</sub> >     | Enable function   | on                | on / off         |     | on /off        |     |
| .019                         | U <sub>eff</sub> > off | U <sub>THR</sub> OFF  | %U <sub>nom</sub> | 108              | 100 | 130            | 100 |
| .020                         | U <sub>eff</sub> > on  | U <sub>THR</sub> ON   | %U <sub>nom</sub> | 107              | 100 | 108            | 100 |
| .021                         | T U <sub>eff</sub> >   | Time OFF  | ms                | 60000            | 50  | 180000         | 50  |
| Comment:                     |                        | U <sub>eff</sub> > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |                   |                  |     |                |     |
| Only active for:             |                        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                                     |                   |                  |     |                |     |

| Undervoltage1 Line to Neutral |                        |  |                   | Conformity Range |     | Possible Range |     |
|-------------------------------|------------------------|--|-------------------|------------------|-----|----------------|-----|
| ID                            |                        | Default  |                   | Min              | Max | Min            | Max |
| .023                          | U <sub>eff</sub> < off | U <sub>THR</sub> OFF   | %U <sub>nom</sub> | 80               | 10  | 100            | 10  |
| .024                          | U <sub>eff</sub> < on  | U <sub>THR</sub> ON  | %U <sub>nom</sub> | 90               | 86  | 100            | 10  |
| .025                          | T U <sub>eff</sub> <   | Time OFF   | ms                | 1000             | 50  | 180000         | 50  |
| Comment:                      |                        | U <sub>eff</sub> < on has a fixed offset of 0.5% UNOM added to the displayed value |                   |                  |     |                |     |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 107              | 100 | 108            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 108                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |                        |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |                        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## **10.11 Wien TOR R25 MS SYNC [ID 882] Typ A/B medium voltage synchr. generators**

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              |            | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |  |         | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|--|---------|------------------|---------------|----------------|--------------|----------------|
| ID              |            |  | Default | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V<br>V  | 58.7<br>102.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |         |                  |               |                |              |                |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 107              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |  |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|--|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## **10.12 Wien TOR R25 MS ASYNC [ID 883] Typ A/B medium voltage asynchr. generators**

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              |            | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 107              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 90               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |  |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |  |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

### 10.13 TIROL TOR NS SYNC [ID 812] Typ A/B low voltage synchr. generators

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |            | Default   |       | Min              | Max      | Min            | Max     |        |
| .018                         | Ueff >     | Enable function   |       | on               | on / off |                | on /off |        |
| .019                         | Ueff > off | U <sub>THR</sub> OFF  | %Unom | 111              | 100      | 130            | 100     | 135    |
| .020                         | Ueff > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100      | 109            | 100     | 135    |
| .021                         | T Ueff >   | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |          |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|--------|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |        |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 10  | 100    |
| .025                          | T Ueff <   | Time OFF   | ms    | 1000             | 50  | 180000         | 50  | 180000 |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 109            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |                        |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |                        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 300              | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.14 TIROL TOR NS ASYNC [ID 813] Typ A/B low voltage asynchr. generators

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |            | Default   |       | Min              | Max      | Min            | Max     |        |
| .018                         | Ueff >     | Enable function   |       | on               | on / off |                | on /off |        |
| .019                         | Ueff > off | U <sub>THR</sub> OFF  | %Unom | 111              | 100      | 130            | 100     | 135    |
| .020                         | Ueff > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100      | 109            | 100     | 135    |
| .021                         | T Ueff >   | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |          |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|--------|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |        |
| .023                          | Ueff < off | U <sub>THR</sub> OFF   | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | Ueff < on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 10  | 100    |
| .025                          | T Ueff <   | Time OFF   | ms    | 1500             | 50  | 180000         | 50  | 180000 |
| Comment:                      |            | Ueff < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

|                  |   |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|---|--|--|--|--|--|--|

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |         |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|---------|--------|
| ID                           |            |   |       | Default          | Min | Max            | Min     | Max    |
| .034                         | Ueff>>     | Enable function   |       | on               | on  |                | on /off |        |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 109            | 100     | 135    |
| .037                         | T Ueff>>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                     |            | Ueff>> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |       |                  |     |                |         |        |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |         |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|---------|--------|
| ID                            |            |  |       | Default          | Min | Max            | Min     | Max    |
| .038                          | Ueff<<     | Enable function  |       | on               | on  |                | on /off |        |
| .039                          | Ueff<< off | U <sub>THR</sub> OFF   | %Unom | 25               | 10  | 100            | 10      | 100    |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 0       | 100    |
| .041                          | T Ueff<<   | Time OFF   | ms    | 500              | 50  | 180000         | 50      | 180000 |
| Comment:                      |            | Ueff<< on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |         |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |         |        |

| 10 minutes average overvoltage |            |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|------------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |            |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | U10min     | Enable function      |       | off                                     | on / off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom | 111                                     | 100      | 130            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |          |                |         |     |
|                                |            | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00 |

|                  |  |          |    |    |    |    |    |        |
|------------------|--|----------|----|----|----|----|----|--------|
| .057             | T f >  | Time OFF | ms | 50 | 50 | 50 | 50 | 180000 |
| Comment:         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |          |    |    |    |    |    |        |
| Only active for: | Voltage > 60% UNOM   |          |    |    |    |    |    |        |

| Underfrequency1  |   |          |    | Conformity Range |       | Possible Range |       |        |
|------------------|---|----------|----|------------------|-------|----------------|-------|--------|
| ID               |   |          |    | Default          | Min   | Max            | Min   | Max    |
| .059             | f < off   | fTHR OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00  |
| .060             | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061             | T f <   | Time OFF | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         | f < on has a fixed offset of 0.01 Hz added to the displayed value |          |    |                  |       |                |       |        |
| Only active for: | Voltage > 60% UNOM  |          |    |                  |       |                |       |        |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |                        |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) |                        |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        |                        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.c. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        | n.c. (normally closed) |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 300              | 0   | 300            | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.15 TIROL TOR MS SYNC [ID 862] Typ A/B medium voltage synchr. generators

| Connection Mode |            |         | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|---------|------------------|--|--|--|--|
| ID              |            | Default |                  |  |  |  |  |
| .003            | Connection | 3-wire  | 3-wire           |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|--|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default  |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | V V | 57.5<br>100.0    | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |     |                  |               |                |              |                |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |         |  |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|---------|--|-------|------------------|-----|----------------|-----|--------|
| ID                        |         | Default  |       | Min              | Max | Min            | Max |        |
| .011                      | U > off | U <sub>THR</sub> OFF   | %Unom | 105              | 100 | 130            | 100 | 135    |
| .012                      | U > on  | U <sub>THR</sub> ON  | %Unom | 104              | 100 | 108            | 100 | 135    |
| .013                      | T U >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  | 180000 |
| Comment:                  |         | U > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |        |
| Only active for:          |         | Connection Modes: 3-wire, 4-wire (LN+LL)                                   |       |                  |     |                |     |        |

| Undervoltage1 Line to Line |         |   |       | Conformity Range |     | Possible Range |     |        |
|----------------------------|---------|---|-------|------------------|-----|----------------|-----|--------|
| ID                         |         | Default   |       | Min              | Max | Min            | Max |        |
| .015                       | U < off | U <sub>THR</sub> OFF  | %Unom | 70               | 10  | 100            | 10  | 100    |
| .016                       | U < on  | U <sub>THR</sub> ON   | %Unom | 86               | 86  | 100            | 10  | 100    |
| .017                       | T U <   | Time OFF  | ms    | 1000             | 50  | 180000         | 50  | 180000 |
| Comment:                   |         | U < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 200              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                 |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|-----------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max             |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                 |  |
| .114                   | I3 STOP   | Type     | n.c. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 300              | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## **10.16 TIROL TOR MS ASYNC [ID 863] Typ A/B medium voltage asynchr. generators**

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              |            | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage2 Line to Line |          |   |       | Conformity Range |     | Possible Range |         |        |
|---------------------------|----------|---|-------|------------------|-----|----------------|---------|--------|
| ID                        |          |   |       | Default          | Min | Max            | Min     | Max    |
| .026                      | U >>     | Enable function   |       | on               | on  |                | on /off |        |
| .027                      | U >> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 130            | 100     | 135    |
| .028                      | U >> on  | U <sub>THR</sub> ON   | %Unom | 104              | 100 | 108            | 100     | 135    |
| .029                      | T U >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50      | 180000 |
| Comment:                  |          | U >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |         |        |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |                  |     |                |         |        |

| Undervoltage2 Line to Line |          |  |       | Conformity Range |     | Possible Range |         |        |
|----------------------------|----------|--|-------|------------------|-----|----------------|---------|--------|
| ID                         |          |  |       | Default          | Min | Max            | Min     | Max    |
| .030                       | U <<     | Enable function  |       | on               | on  |                | on /off |        |
| .031                       | U << off | U <sub>THR</sub> OFF   | %Unom | 30               | 10  | 100            | 10      | 100    |
| .032                       | U << on  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 0       | 100    |
| .033                       | T U <<   | Time OFF   | ms    | 500              | 50  | 180000         | 50      | 180000 |
| Comment:                   |          | U << on has a fixed offset of 0.5% Unom added to the displayed value |       |                  |     |                |         |        |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |     |                |         |        |

| Overfrequency1   |         |  |    | Conformity Range |       | Possible Range |       |        |
|------------------|---------|--|----|------------------|-------|----------------|-------|--------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max    |
| .055             | f > off | f <sub>THR</sub> OFF   | Hz | 51.50            | 50.00 | 55.00          | 50.00 | 55.00  |
| .056             | f > on  | f <sub>THR</sub> ON  | Hz | 50.10            | 50.00 | 50.10          | 50.00 | 55.00  |
| .057             | T f >   | Time OFF   | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |        |
| Only active for: |         | Voltage > 60% Unom   |    |                  |       |                |       |        |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 45.00 | 50.00          | 45.00 | 50.00 |

|                  |        |   |    |       |       |       |       |        |
|------------------|--------|---|----|-------|-------|-------|-------|--------|
| .060             | f < on | fTHR ON   | Hz | 47.50 | 47.50 | 50.00 | 45.00 | 50.00  |
| .061             | T f <  | Time OFF  | ms | 50    | 50    | 50    | 50    | 180000 |
| Comment:         |        | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |       |       |       |       |        |
| Only active for: |        | Voltage > 60% UNOM  |    |       |       |       |       |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                 |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|-----------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max             |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                 |  |
| .114                   | I3 STOP   | Type     | n.c. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 300              | 0   | 300            | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.17 BURGENLAND TOR R25 NS SYNC [ID 842] Typ A/B low voltage synchr. generators**

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 4-wire LN | 4-wire LN        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|--|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default  | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | 230,00V<br>/400,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |                     |                    |                     |                   |                     |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Neutral |            |   |                 | Conformity Range     |                              | Possible Range       |                          |
|------------------------------|------------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|
| ID                           |            | Default   |                 | Min                  | Max                          | Min                  | Max                      |
| .018                         | Ueff >     | Enable function                                       | on              | on / off             |                              | on /off              |                          |
| .019                         | Ueff > off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 111,00%<br>(255,30V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) |
| .020                         | Ueff > on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 108,00%<br>(248,40V) | 100,00<br>%<br>(230,00<br>V) | 108,00%<br>(248,40V) | 100,00%<br>(230,00V<br>) |
| .021                         | T Ueff >   | Time OFF  |                 | 60000 ms             | 50 ms                        | 180000<br>ms         | 50 ms                    |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |

| Undervoltage1 Line to Neutral |  |  | Conformity Range |  | Possible Range |  |
|-------------------------------|--|--|------------------|--|----------------|--|
|                               |  |  |                  |  |                |  |

| Overvoltage2 Line to Neutral |            |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|------------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |            |   | Default                                | Min                  | Max                          | Min                  | Max                      |                      |
| .034                         | Ueff>>     | Enable function                                       |  | on                   | on                           |                      | on /off                  |                      |
| .035                         | Ueff>> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 115,00%<br>(264,50V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 108,00%<br>(248,40V) | 100,00<br>%<br>(230,00<br>V) | 108,00%<br>(248,40V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .037                         | T Ueff>>   | Time OFF  |  | 100 ms               | 50 ms                        | 180000<br>ms         | 50 ms                    | 180000 ms            |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Neutral |            |   |  | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|--|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default                                | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | Ueff<<     | Enable function                                       |  | on                  | on                   |                      | on /off            |                      |
| .039                          | Ueff<< off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 30,00%<br>(69,00V)  | 10,00%<br>(23,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 90,00%<br>(207,00V) | 86,00%<br>(197,80 V) | 100,00%<br>(230,00V) | 0,00%<br>(0,00V)   | 100,00%<br>(230,00V) |
| .041                          | T Ueff<<   | Time OFF  |  | 200 ms              | 50 ms                | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                      |                      |                    |                      |

| 10 minutes average overvoltage |               |                         |  | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|---------------|-------------------------|--|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |               |                         | Default                                | Min                              | Max                              | Min                              | Max                                  |                                  |
| .042                           | U10min        | Enable function         |  | off                              | on / off                         |                                  | on /off                              |                                  |
| .043                           | U10min<br>off | U <sub>THR</sub><br>OFF | %U <sub>nom</sub><br>/V <sub>nom</sub> | 111,00%<br>(255,30V<br>/444,00V) | 100,00%<br>(230,00V<br>/400,00V) | 130,00%<br>(299,00V<br>/520,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |

| Overfrequency1 |         |                      |         | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|---------|------------------|-----------|----------------|-----------|
| ID             |         |                      | Default | Min              | Max       | Min            | Max       |
| .054           | f oA    | Enable function      |         | on               |           |                |           |
| .055           | f > off | f <sub>THR</sub> OFF |         | 51,500 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz |
| .056           | f > on  | f <sub>THR</sub> ON  |         | 50,10 Hz         | 50,000 Hz | 50,10 Hz       | 50,000 Hz |
| .057           | T f >   | Time OFF             |         | 50 ms            | 50 ms     | 50 ms          | 180000 ms |

| Underfrequency1 |         |                      |         | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|---------|------------------|-----------|----------------|-----------|
| ID              |         |                      | Default | Min              | Max       | Min            | Max       |
| .058            | f uA    | Enable function      |         | on               |           |                |           |
| .059            | f < off | f <sub>THR</sub> OFF |         | 47,500 Hz        | 45,000 Hz | 50,000 Hz      | 45,000 Hz |
| .060            | f < on  | f <sub>THR</sub> ON  |         | 47,500 Hz        | 47,500 Hz | 50,000 Hz      | 45,000 Hz |
| .061            | T f <   | Time OFF             |         | 50 ms            | 50 ms     | 50 ms          | 180000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--------|--|
| ID                             |       |               | Default | Min              | Max    |        |  |
| .113                           | F wnd | Window length |         | 100 ms           | 100 ms | 100 ms |  |

| Auxiliary Contact type |         |      |                        | Conformity Range                                 |     | Possible Range                                   |     |
|------------------------|---------|------|------------------------|--|-----|--|-----|
| ID                     |         |      | Default                | Min  | Max | Min  | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed) |     |

|      |           |          |   |  |   |
|------|-----------|----------|---|--|---|
|      |           |          |   |  | dis. (disabled)   |
| .100 | T Contact | Time OFF | Fixed to 500 ms   |  |   |
| .114 | I3 STOP   | Type     | n.c. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.o. (normally closed)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 300 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b> |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)                                     | on  |
| Undervoltage LL (UΔ)                                    | on  |
| Overvoltage LN (UY)                                     | on  |
| Undervoltage LN (UY)                                    | on  |
| 10-min overvoltage ( $\bar{U}$ )                        | on  |
| Overfrequency (f)                                       | on  |
| Underfrequency (f)                                      | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )      | on  |
| Phase shift ( $\Delta\Phi$ )                            | on  |

|   |    |
|---|----|
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>SN: xxxxxxxxxxxx      xxxxxxxxxxxx = Device Serial Number</p> <p>SW: aa.ddccb      dd: Software version of Display Software<br/>aa: Software version of Measuring Software<br/>cc: Index of Configuration set<br/>b: Version of Configuration set</p> |

**10.18 BURGENLAND TOR R25 NS ASYNC [ID 843] Typ A/B low voltage synchr. generators**

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 4-wire LN | 4-wire LN        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|--|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default  | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | 230,00V<br>/400,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |                     |                    |                     |                   |                     |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Neutral |            |   |                 | Conformity Range     |                              | Possible Range       |                          |
|------------------------------|------------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|
| ID                           |            | Default   |                 | Min                  | Max                          | Min                  | Max                      |
| .018                         | Ueff >     | Enable function                                       | on              | on / off             |                              | on /off              |                          |
| .019                         | Ueff > off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 111,00%<br>(255,30V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) |
| .020                         | Ueff > on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 108,00%<br>(248,40V) | 100,00<br>%<br>(230,00<br>V) | 108,00%<br>(248,40V) | 100,00%<br>(230,00V<br>) |
| .021                         | T Ueff >   | Time OFF  |                 | 60000 ms             | 50 ms                        | 180000<br>ms         | 50 ms                    |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |

| Undervoltage1 Line to Neutral |  |  | Conformity Range |  | Possible Range |  |
|-------------------------------|--|--|------------------|--|----------------|--|
|                               |  |  |                  |  |                |  |

| Overvoltage2 Line to Neutral |            |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|------------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |            |   | Default                                | Min                  | Max                          | Min                  | Max                      |                      |
| .034                         | Ueff>>     | Enable function                                       |  | on                   | on                           |                      | on /off                  |                      |
| .035                         | Ueff>> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 115,00%<br>(264,50V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 108,00%<br>(248,40V) | 100,00<br>%<br>(230,00<br>V) | 108,00%<br>(248,40V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .037                         | T Ueff>>   | Time OFF  |  | 100 ms               | 50 ms                        | 180000<br>ms         | 50 ms                    | 180000 ms            |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Neutral |            |   |  | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|--|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default                                | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | Ueff<<     | Enable function                                       |  | on                  | on                   |                      | on /off            |                      |
| .039                          | Ueff<< off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 25,00%<br>(57,50V)  | 10,00%<br>(23,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | Ueff<< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 90,00%<br>(207,00V) | 86,00%<br>(197,80 V) | 100,00%<br>(230,00V) | 0,00%<br>(0,00V)   | 100,00%<br>(230,00V) |
| .041                          | T Ueff<<   | Time OFF  |  | 500 ms              | 50 ms                | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                      |                      |                    |                      |

| 10 minutes average overvoltage |               |                         |                 | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|---------------|-------------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |               |                         | Default         | Min                              | Max                              | Min                              | Max                                  |                                  |
| .042                           | U10min        | Enable function         |                 | off                              | on / off                         |                                  | on /off                              |                                  |
| .043                           | U10min<br>off | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 111,00%<br>(255,30V<br>/444,00V) | 100,00%<br>(230,00V<br>/400,00V) | 130,00%<br>(299,00V<br>/520,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |

| Overfrequency1 |         |                      |         | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|---------|------------------|-----------|----------------|-----------|
| ID             |         |                      | Default | Min              | Max       | Min            | Max       |
| .054           | f oA    | Enable function      |         | on               |           |                |           |
| .055           | f > off | f <sub>THR</sub> OFF |         | 51,500 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz |
| .056           | f > on  | f <sub>THR</sub> ON  |         | 50,10 Hz         | 50,000 Hz | 50,10 Hz       | 50,000 Hz |
| .057           | T f >   | Time OFF             |         | 50 ms            | 50 ms     | 50 ms          | 180000 ms |

| Underfrequency1 |         |                      |         | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|---------|------------------|-----------|----------------|-----------|
| ID              |         |                      | Default | Min              | Max       | Min            | Max       |
| .058            | f uA    | Enable function      |         | on               |           |                |           |
| .059            | f < off | f <sub>THR</sub> OFF |         | 47,500 Hz        | 45,000 Hz | 50,000 Hz      | 45,000 Hz |
| .060            | f < on  | f <sub>THR</sub> ON  |         | 47,500 Hz        | 47,500 Hz | 50,000 Hz      | 45,000 Hz |
| .061            | T f <   | Time OFF             |         | 50 ms            | 50 ms     | 50 ms          | 180000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--------|--|
| ID                             |       |               | Default | Min              | Max    |        |  |
| .113                           | F wnd | Window length |         | 100 ms           | 100 ms | 100 ms |  |

| Auxiliary Contact type |         |      |                        | Conformity Range       |     | Possible Range         |     |
|------------------------|---------|------|------------------------|------------------------|-----|------------------------|-----|
| ID                     |         |      | Default                | Min                    | Max | Min                    | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |         |      |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |

|      |           |          |   |  |   |
|------|-----------|----------|---|--|---|
|      |           |          |   |  | dis. (disabled)   |
| .100 | T Contact | Time OFF | Fixed to 500 ms   |  |   |
| .114 | I3 STOP   | Type     | n.c. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.o. (normally closed)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 300 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b> |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)                                     | on  |
| Undervoltage LL (UΔ)                                    | on  |
| Overvoltage LN (UY)                                     | on  |
| Undervoltage LN (UY)                                    | on  |
| 10-min overvoltage ( $\bar{U}$ )                        | on  |
| Overfrequency (f)                                       | on  |
| Underfrequency (f)                                      | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )      | on  |
| Phase shift ( $\Delta\Phi$ )                            | on  |

|   |    |
|---|----|
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>SN: xxxxxxxxxxxx<br/>                  xxxxxxxxxx = Device Serial Number</p> <p>SW: aa.ddccb<br/>                  dd: Software version of Display Software<br/>                  aa: Software version of Measuring Software<br/>                  cc: Index of Configuration set<br/>                  b: Version of Configuration set</p> |

**10.19 BURGENLAND TOR R25 MS SYNC [ID 892] Typ A/B medium voltage synchr. generators**

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 3-wire LL | 3-wire LL        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range   |                    | Possible Range      |                   |                     |
|-----------------|------------|--|--------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default  | Min                | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | 59,23V<br>/103,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |                    |                    |                     |                   |                     |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |         |  |                 | Conformity Range     |                              | Possible Range       |                          |
|---------------------------|---------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|
| ID                        |         | Default                                  |                 | Min                  | Max                          | Min                  | Max                      |
| .011                      | U > off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 105,00%<br>(108,15V) | 100,00<br>%<br>(103,00<br>V) | 130,00%<br>(133,90V) | 100,00%<br>(103,00V<br>) |
| .012                      | U > on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 103,00%<br>(106,09V) | 100,00<br>%<br>(103,00<br>V) | 108,00%<br>(111,24V) | 100,00%<br>(103,00V<br>) |
| .013                      | T U >   | Time OFF                                 |                 | 60000 ms             | 50 ms                        | 180000<br>ms         | 50 ms                    |
| Only active for:          |         | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |

| Undervoltage1 Line to Line |  |         | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|------------------|-----|----------------|-----|
| ID                         |  | Default | Min              | Max | Min            | Max |

|                  |         |  |                 |                    |                     |                      |                    |                      |
|------------------|---------|--|-----------------|--------------------|---------------------|----------------------|--------------------|----------------------|
| .015             | U < off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 70,00%<br>(72,10V) | 10,00%<br>(10,30V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .016             | U < on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 90,00%<br>(92,70V) | 86,00%<br>(88,58V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .017             | T U <   | Time OFF                                 |                 | 1500 ms            | 50 ms               | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for: |         | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                    |                     |                      |                    |                      |

| Overvoltage2 Line to Line |          |  |                 | Conformity Range     |                        | Possible Range       |                       |                      |
|---------------------------|----------|--|-----------------|----------------------|------------------------|----------------------|-----------------------|----------------------|
| ID                        |          |  | Default         | Min                  | Max                    | Min                  | Max                   |                      |
| .026                      | U >>     | Enable function                          |                 | on                   | on                     |                      | on /off               |                      |
| .027                      | U >> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 110,00%<br>(113,30V) | 100,00 %<br>(103,00 V) | 130,00%<br>(133,90V) | 100,00%<br>(103,00V ) | 135,00%<br>(139,05V) |
| .028                      | U >> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 103,00%<br>(106,09V) | 100,00 %<br>(103,00 V) | 108,00%<br>(111,24V) | 100,00%<br>(103,00V ) | 135,00%<br>(139,05V) |
| .029                      | T U >>   | Time OFF                                 |                 | 100 ms               | 50 ms                  | 180000 ms            | 50 ms                 | 180000 ms            |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                        |                      |                       |                      |

| Undervoltage2 Line to Line |          |  |                 | Conformity Range   |                     | Possible Range       |                    |                      |
|----------------------------|----------|--|-----------------|--------------------|---------------------|----------------------|--------------------|----------------------|
| ID                         |          |  | Default         | Min                | Max                 | Min                  | Max                |                      |
| .030                       | U <<     | Enable function                          |                 | on                 | on                  |                      | on /off            |                      |
| .031                       | U << off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 30,00%<br>(30,90V) | 10,00%<br>(10,30V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .032                       | U << on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 90,00%<br>(92,70V) | 86,00%<br>(88,58V ) | 100,00%<br>(103,00V) | 0,00%<br>(0,00V)   | 100,00%<br>(103,00V) |
| .033                       | T U <<   | Time OFF                                 |                 | 700 ms             | 50 ms               | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                    |                     |                      |                    |                      |

| Overfrequency1 |  |  |  | Conformity Range |  | Possible Range |  |
|----------------|--|--|--|------------------|--|----------------|--|
|                |  |  |  |                  |  |                |  |

| ID   |         |                      | Default   | Min       | Max       | Min       | Max       |
|------|---------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .055 | f > off | f <sub>THR</sub> OFF | 51,500 Hz | 50,000 Hz | 55,000 Hz | 50,000 Hz | 55,000 Hz |
| .056 | f > on  | f <sub>THR</sub> ON  | 50,10 Hz  | 50,000 Hz | 50,10 Hz  | 50,000 Hz | 55,000 Hz |
| .057 | T f >   | Time OFF             | 50 ms     | 50 ms     | 50 ms     | 50 ms     | 180000 ms |

| Underfrequency1 |         |                      |           | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID              | f uA    | Enable function      | on        |                  |           |                |           |
| .058            | f < off | f <sub>THR</sub> OFF | 47,500 Hz | 45,000 Hz        | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .059            | f < on  | f <sub>THR</sub> ON  | 47,500 Hz | 47,500 Hz        | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .060            | T f <   | Time OFF             | 50 ms     | 50 ms            | 50 ms     | 50 ms          | 180000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        |                        |                        | dis. (disabled)        |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |                        |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.c. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        |                        |                        | dis. (disabled)        |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 300 s | 0 s            | 900 s |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) (Δf)  | on |
| Phase shift (ΔΦ)  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |               |  |  |
|--------------------|---------------|--|--|
| ID                 |               |  |  |
| .105               | SN:xxxxxxxxxx | xxxxxxxxxx = Device Serial Number  |  |
|                    | SW: aa.dd.ccb | dd: Software version of Display Software<br>aa: Software version of Measuring Software |  |

|  |  |   |
|--|--|---|
|  |  | cc: Index of Configuration set<br>b: Version of Configuration set |
|--|--|---|

**10.20 BURGENLAND TOR R25 MS ASYNC [ID 893] Typ A/B medium voltage  
asynchr. generators**

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 3-wire LL | 3-wire LL        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range   |                    | Possible Range      |                   |                     |
|-----------------|------------|--|--------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default  | Min                | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ   | 59,23V<br>/103,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |
| Comment:        |            | Default for Uc=21kV and 200:1 voltage transformer or Uc=31,7kV and 300:1 |                    |                    |                     |                   |                     |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |         |  |                 | Conformity Range     |                              | Possible Range       |                          |
|---------------------------|---------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|
| ID                        |         | Default                                  |                 | Min                  | Max                          | Min                  | Max                      |
| .011                      | U > off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 105,00%<br>(108,15V) | 100,00<br>%<br>(103,00<br>V) | 130,00%<br>(133,90V) | 100,00%<br>(103,00V<br>) |
| .012                      | U > on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 103,00%<br>(106,09V) | 100,00<br>%<br>(103,00<br>V) | 108,00%<br>(111,24V) | 100,00%<br>(103,00V<br>) |
| .013                      | T U >   | Time OFF                                 |                 | 60000 ms             | 50 ms                        | 180000<br>ms         | 50 ms                    |
| Only active for:          |         | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |

| Undervoltage1 Line to Line |  |         | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|------------------|-----|----------------|-----|
| ID                         |  | Default | Min              | Max | Min            | Max |

|                  |         |  |                 |                    |                     |                      |                    |                      |
|------------------|---------|--|-----------------|--------------------|---------------------|----------------------|--------------------|----------------------|
| .015             | U < off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 80,00%<br>(82,40V) | 10,00%<br>(10,30V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .016             | U < on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 90,00%<br>(92,70V) | 86,00%<br>(88,58V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .017             | T U <   | Time OFF                                 |                 | 1500 ms            | 50 ms               | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for: |         | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                    |                     |                      |                    |                      |

| Overvoltage2 Line to Line |          |  |                 | Conformity Range     |                        | Possible Range       |                       |                      |
|---------------------------|----------|--|-----------------|----------------------|------------------------|----------------------|-----------------------|----------------------|
| ID                        |          |  | Default         | Min                  | Max                    | Min                  | Max                   |                      |
| .026                      | U >>     | Enable function                          |                 | on                   | on                     |                      | on /off               |                      |
| .027                      | U >> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 110,00%<br>(113,30V) | 100,00 %<br>(103,00 V) | 130,00%<br>(133,90V) | 100,00%<br>(103,00V ) | 135,00%<br>(139,05V) |
| .028                      | U >> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 103,00%<br>(106,09V) | 100,00 %<br>(103,00 V) | 108,00%<br>(111,24V) | 100,00%<br>(103,00V ) | 135,00%<br>(139,05V) |
| .029                      | T U >>   | Time OFF                                 |                 | 100 ms               | 50 ms                  | 180000 ms            | 50 ms                 | 180000 ms            |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                        |                      |                       |                      |

| Undervoltage2 Line to Line |          |  |                 | Conformity Range   |                     | Possible Range       |                    |                      |
|----------------------------|----------|--|-----------------|--------------------|---------------------|----------------------|--------------------|----------------------|
| ID                         |          |  | Default         | Min                | Max                 | Min                  | Max                |                      |
| .030                       | U <<     | Enable function                          |                 | on                 | on                  |                      | on /off            |                      |
| .031                       | U << off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 30,00%<br>(30,90V) | 10,00%<br>(10,30V ) | 100,00%<br>(103,00V) | 10,00%<br>(10,30V) | 100,00%<br>(103,00V) |
| .032                       | U << on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 90,00%<br>(92,70V) | 86,00%<br>(88,58V ) | 100,00%<br>(103,00V) | 0,00%<br>(0,00V)   | 100,00%<br>(103,00V) |
| .033                       | T U <<   | Time OFF                                 |                 | 700 ms             | 50 ms               | 180000 ms            | 50 ms              | 180000 ms            |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                    |                     |                      |                    |                      |

| Overfrequency1 |  |  |  | Conformity Range |  | Possible Range |  |
|----------------|--|--|--|------------------|--|----------------|--|
|                |  |  |  |                  |  |                |  |

| ID   |         |                      | Default   | Min       | Max       | Min       | Max       |
|------|---------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .055 | f > off | f <sub>THR</sub> OFF | 51,500 Hz | 50,000 Hz | 55,000 Hz | 50,000 Hz | 55,000 Hz |
| .056 | f > on  | f <sub>THR</sub> ON  | 50,10 Hz  | 50,000 Hz | 50,10 Hz  | 50,000 Hz | 55,000 Hz |
| .057 | T f >   | Time OFF             | 50 ms     | 50 ms     | 50 ms     | 50 ms     | 180000 ms |

| Underfrequency1 |         |                      | Conformity Range |           | Possible Range |           |           |
|-----------------|---------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID              |         |                      | Default          | Min       | Max            | Min       | Max       |
| .059            | f < off | f <sub>THR</sub> OFF | 47,500 Hz        | 45,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .060            | f < on  | f <sub>THR</sub> ON  | 47,500 Hz        | 47,500 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .061            | T f <   | Time OFF             | 50 ms            | 50 ms     | 50 ms          | 50 ms     | 180000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|
| ID                             |       |               | Default          | Min    | Max    |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |

| Auxiliary Contact type |           |          | Conformity Range       |   | Possible Range  |   |     |
|------------------------|-----------|----------|------------------------|---|---|---|-----|
| ID                     |           |          | Default                | Min   | Max   | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)                    |   | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |   |   |     |
| .114                   | I3 STOP   | Type     | n.c. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |   |     |

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 300 s          | 0 s | 900 s |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |    |
|---|----|
| Overvoltage LL (UΔ)   | on |
| Undervoltage LL (UΔ)  | on |
| Overvoltage LN (UY)   | on |
| Undervoltage LN (UY)  | on |
| 10-min overvoltage (Ü)  | on |
| Overfrequency (f)   | on |
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) (Δf)  | on |
| Phase shift (ΔΦ)  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |               |  |  |
|--------------------|---------------|--|--|
| ID                 |               |  |  |
| .105               | SN:xxxxxxxxxx | xxxxxxxxxx = Device Serial Number        |  |
|                    | SW: aa.dd.ccb | dd: Software version of Display Software | aa: Software version of Measuring Software |

|  |  |   |
|--|--|---|
|  |  | cc: Index of Configuration set<br>b: Version of Configuration set |
|--|--|---|

10.21 VDE-AR-N 4105:2018 ≤50kW [ID 311]

| Connection Mode |            |                | Conformity Range                               | Possible Range                                 |
|-----------------|------------|----------------|--|--|
| ID              |            | Default        |  |  |
| .003            | Connection | 4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |                  |         | Conformity Range       |     | Possible Range |     |  |
|-----------------|------------|------------------|---------|------------------------|-----|----------------|-----|--|
| ID              |            |                  | Default | Min                    | Max | Min            | Max |  |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V  | Fixed to 230.0 / 400.0 |     |                |     |  |

| Functional Safety |        | Conformity Range   | Possible Range  |
|-------------------|--------|--|-----------------|
| ID                |        | Default  |                 |
| .007              | Errtol | 1ch  | 1ch<br>2ch, 1ch |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br><br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                 |

| Overvoltage1 Line to Neutral |            |  |       | Conformity Range                        |     | Possible Range |     |     |  |
|------------------------------|------------|--|-------|---|-----|----------------|-----|-----|--|
| ID                           |            |  |       | Default                                 | Min | Max            | Min | Max |  |
| .019                         | ULN >> off | $U_{THR}$ OFF  | %Unom | Fixed to 115% $U_{NOM}$                 |     |                |     |     |  |
| .020                         | ULN >> on  | $U_{THR}$ ON   | %Unom | 110                                     | 110 | 110            | 100 | 110 |  |
|                              |            | Time OFF   | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                     |            | ULN >> on has a fixed offset of 0.5% $U_{NOM}$ subtracted from the displayed value |       |   |     |                |     |     |  |

| Undervoltage1 Line to Neutral |           |  |       | Conformity Range                        |     | Possible Range |     |     |  |
|-------------------------------|-----------|--|-------|---|-----|----------------|-----|-----|--|
| ID                            |           |  |       | Default                                 | Min | Max            | Min | Max |  |
| .023                          | ULN < off | $U_{THR}$ OFF  | %Unom | 80                                      | 80  | 85             | 80  | 85  |  |
| .024                          | ULN < on  | $U_{THR}$ ON   | %Unom | 85                                      | 85  | 85             | 85  | 100 |  |
|                               |           | Time OFF   | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                      |           | ULN < on has a fixed offset of 0.5% $U_{NOM}$ added to the displayed value |       |   |     |                |     |     |  |

| 10 minutes average overvoltage |         |               |       | Conformity Range                        |     | Possible Range |     |     |  |
|--------------------------------|---------|---------------|-------|---|-----|----------------|-----|-----|--|
| ID                             |         |               |       | Default                                 | Min | Max            | Min | Max |  |
| .043                           | U > off | $U_{THR}$ OFF | %Unom | 110                                     | 110 | 115            | 110 | 115 |  |
|                                |         | $U_{THR}$ ON  | %Unom | Fixed Hysteresis (0.9% $U_{NOM}$ )      |     |                |     |     |  |
|                                |         | Time OFF      | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |

| Overfrequency1 |         |               |    | Conformity Range                        |       | Possible Range |       |       |  |
|----------------|---------|---------------|----|---|-------|----------------|-------|-------|--|
| ID             |         |               |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .055           | f > off | $f_{THR}$ OFF | Hz | Fixed to 51.50Hz                        |       |                |       |       |  |
| .056           | f > on  | $f_{THR}$ ON  | Hz | 50.10                                   | 50.10 | 50.10          | 50.00 | 50.10 |  |
|                |         | Time OFF      | ms | Fixed to fastest possible disconnection |       |                |       |       |  |

| Underfrequency1 |         |               |    | Conformity Range                        |       | Possible Range |       |       |  |
|-----------------|---------|---------------|----|---|-------|----------------|-------|-------|--|
| ID              |         |               |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .059            | f < off | $f_{THR}$ OFF | Hz | Fixed to 47.50Hz                        |       |                |       |       |  |
| .060            | f < on  | $f_{THR}$ ON  | Hz | 47.50                                   | 47.50 | 47.50          | 47.50 | 50.00 |  |
|                 |         | Time OFF      | ms | Fixed to fastest possible disconnection |       |                |       |       |  |

|          |  |  |  |  |  |  |  |
|----------|--|--|--|--|--|--|--|
| Comment: | f < on has a fixed offset of 0.025 Hz added to the displayed value |  |  |  |  |  |  |
|----------|--|--|--|--|--|--|--|

| Random overfrequency |            |   |    | Conformity Range                        |          | Possible Range |         |       |
|----------------------|------------|---|----|---|----------|----------------|---------|-------|
| ID                   |            |   |    | Default                                 | Min      | Max            | Min     | Max   |
| .086                 | f > random | Enable function   |    | off                                     | on / off |                | on /off |       |
| .087                 | f > random | fTHR OFF  | Hz |   | 50.20    | 51.50          | 50.20   | 51.50 |
|                      |            | fTHR ON   | Hz | Fixed reconnection frequency of 50.10Hz |          |                |         |       |
|                      |            | Time OFF  | ms | Fixed to fastest possible disconnection |          |                |         |       |
| Comment:             |            | The random fTHR OFF threshold is shown in .087 and cannot be edited |    |   |          |                |         |       |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |            |          |                        | Conformity Range |                        | Possible Range |                        |        |
|------------------------|------------|----------|------------------------|------------------|------------------------|----------------|------------------------|--------|
| ID                     |            |          |                        | Default          | Min                    | Max            | Min                    | Max    |
| .099                   | Contact    | Type     | n.c. (normally closed) |                  | n.o. (normally opened) |                | n.o. (normally opened) |        |
|                        |            |          |                        |                  | n.c. (normally closed) |                | n.c. (normally closed) |        |
|                        |            |          |                        |                  |                        |                | dis. (disabled)        |        |
| .100                   | T Contact  | Time OFF | ms                     | Fixed to 100ms   |                        |                |                        |        |
| .110                   | T ConDelOn | Time ON  | ms                     | 100              | 100                    | 10000          | 100                    | 300000 |
| .114                   | I3 STOP    | Type     | n.o. (normally opened) |                  | n.o. (normally opened) |                | n.o. (normally opened) |        |
|                        |            |          |                        |                  | n.c. (normally closed) |                | n.c. (normally closed) |        |
|                        |            |          |                        |                  | dis. (disabled)        |                | dis. (disabled)        |        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 1   | 900 |

| Random Turn-on delay |            |   |   | Conformity Range |          | Possible Range |          |     |
|----------------------|------------|---|---|------------------|----------|----------------|----------|-----|
| ID                   |            |   |   | Default          | Min      | Max            | Min      | Max |
| .103                 | Ton random | Enable function   |   | off              | on / off |                | on / off |     |
| .104                 | Ton random | Turn on time  | s |                  | 60       | 600            | 60       | 600 |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |                  |          |                |          |     |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 4       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 1       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 5       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

#### **Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) (Δf)  | off |
| Phase shift (ΔΦ)  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

#### Device Information

| ID   |                                      |   |
|------|--------------------------------------|---|
| .105 | ID: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## **10.22 VDE-AR-N 4105:2018 >50kW [ID 312]**

| Connection Mode |            |                | Conformity Range                               | Possible Range                                 |
|-----------------|------------|----------------|--|--|
| ID              |            | Default        |  |  |
| .003            | Connection | 4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |                  |        | Conformity Range       |     | Possible Range |     |     |
|-----------------|------------|------------------|--------|------------------------|-----|----------------|-----|-----|
| ID              |            |                  |        | Default                | Min | Max            | Min | Max |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V | Fixed to 230.0 / 400.0 |     |                |     |     |

| Functional Safety |        | Conformity Range   | Possible Range  |
|-------------------|--------|--|-----------------|
| ID                |        | Default  |                 |
| .007              | Errtol | 1ch  | 1ch<br>2ch, 1ch |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br><br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                 |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range                        |     | Possible Range |     |     |  |
|------------------------------|------------|---|-------|---|-----|----------------|-----|-----|--|
| ID                           |            |   |       | Default                                 | Min | Max            | Min | Max |  |
| .019                         | ULN >> off | U <sub>THR</sub> OFF  | %Unom | Fixed to 125% U <sub>NOM</sub>          |     |                |     |     |  |
| .020                         | ULN >> on  | U <sub>THR</sub> ON   | %Unom | 110                                     | 110 | 110            | 100 | 110 |  |
|                              |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                     |            | ULN >> on has a fixed offset of 0.5% U <sub>NOM</sub> subtracted from the displayed value |       |   |     |                |     |     |  |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range              |     | Possible Range |     |       |  |
|-------------------------------|-----------|---|-------|-------------------------------|-----|----------------|-----|-------|--|
| ID                            |           |   |       | Default                       | Min | Max            | Min | Max   |  |
| .023                          | ULN < off | U <sub>THR</sub> OFF  | %Unom | Fixed to 80% U <sub>NOM</sub> |     |                |     |       |  |
| .024                          | ULN < on  | U <sub>THR</sub> ON   | %Unom | 85                            | 85  | 85             | 85  | 100   |  |
| .025                          | T ULN <   | Time OFF  | ms    | 1000                          | 50  | 1000           | 50  | 10000 |  |
| Comment:                      |           | ULN < on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |       |  |

| Undervoltage2 Line to Line |            |  |       | Conformity Range              |     | Possible Range |     |       |  |
|----------------------------|------------|--|-------|-------------------------------|-----|----------------|-----|-------|--|
| ID                         |            |  |       | Default                       | Min | Max            | Min | Max   |  |
| .031                       | ULL << off | U <sub>THR</sub> OFF   | %Unom | Fixed to 45% U <sub>NOM</sub> |     |                |     |       |  |
| .032                       | ULL << on  | U <sub>THR</sub> ON  | %Unom | 85                            | 85  | 85             | 85  | 100   |  |
| .033                       | T ULL <<   | Time OFF   | ms    | 300                           | 50  | 300            | 50  | 10000 |  |
| Comment:                   |            | ULL << on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |       |  |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range              |     | Possible Range |     |        |  |
|-------------------------------|------------|--|-------|-------------------------------|-----|----------------|-----|--------|--|
| ID                            |            |  |       | Default                       | Min | Max            | Min | Max    |  |
| .039                          | ULN << off | U <sub>THR</sub> OFF   | %Unom | Fixed to 45% U <sub>NOM</sub> |     |                |     |        |  |
| .040                          | ULN << on  | U <sub>THR</sub> ON  | %Unom | 85                            | 85  | 85             | 85  | 100    |  |
| .041                          | T ULN <<   | Time OFF   | ms    | 200                           | 50  | 300000         | 50  | 300000 |  |
| Comment:                      |            | ULN << on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |        |  |

| 10 minutes average overvoltage |         |                      |       | Conformity Range |     | Possible Range |     |     |
|--------------------------------|---------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                             |         |                      |       | Default          | Min | Max            | Min | Max |
| .043                           | U > off | U <sub>THR</sub> OFF | %Unom | 110              | 110 | 115            | 110 | 115 |

|  |  |                     |       |   |  |  |  |
|--|--|---------------------|-------|---|--|--|--|
|  |  | U <sub>THR</sub> ON | %Unom | Fixed Hysteresis (0.9% UNOM)            |  |  |  |
|  |  | Time OFF            | ms    | Fixed to fastest possible disconnection |  |  |  |

| Overfrequency1 |         |                      |    | Conformity Range                        |       | Possible Range |       |       |  |
|----------------|---------|----------------------|----|---|-------|----------------|-------|-------|--|
| ID             |         |                      |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | Fixed to 51.50Hz                        |       |                |       |       |  |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10                                   | 50.10 | 50.10          | 50.00 | 50.10 |  |
|                |         | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |  |

| Underfrequency1 |         |  |    | Conformity Range                        |       | Possible Range |       |       |  |
|-----------------|---------|--|----|---|-------|----------------|-------|-------|--|
| ID              |         |  |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .059            | f < off | f <sub>THR</sub> OFF   | Hz | Fixed to 47.50Hz                        |       |                |       |       |  |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50                                   | 47.50 | 47.50          | 47.50 | 50.00 |  |
|                 |         | Time OFF   | ms | Fixed to fastest possible disconnection |       |                |       |       |  |
| Comment:        |         | f < on has a fixed offset of 0.025 Hz added to the displayed value |    |   |       |                |       |       |  |

| Random overfrequency |            |   |    | Conformity Range                        |          | Possible Range |         |       |  |
|----------------------|------------|---|----|---|----------|----------------|---------|-------|--|
| ID                   |            |   |    | Default                                 | Min      | Max            | Min     | Max   |  |
| .086                 | f > random | Enable function   |    | off                                     | on / off |                | on /off |       |  |
| .087                 | f > random | f <sub>THR</sub> OFF  | Hz |   | 50.20    | 51.50          | 50.20   | 51.50 |  |
|                      |            | f <sub>THR</sub> ON   | Hz | Fixed reconnection frequency of 50.10Hz |          |                |         |       |  |
|                      |            | Time OFF  | ms | Fixed to fastest possible disconnection |          |                |         |       |  |
| Comment:             |            | The random f <sub>THR</sub> OFF threshold is shown in .087 and cannot be edited |    |   |          |                |         |       |  |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |         |      |                        | Conformity Range       |     | Possible Range |                        |     |
|------------------------|---------|------|------------------------|------------------------|-----|----------------|------------------------|-----|
| ID                     |         |      |                        | Default                | Min | Max            | Min                    | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened) |     |                | n.o. (normally opened) |     |

|      |            |          |    |                        |                        |                        |
|------|------------|----------|----|------------------------|------------------------|------------------------|
|      |            |          |    |                        | n.c. (normally closed) | n.c. (normally closed) |
|      |            |          |    |                        | dis. (disabled)        |                        |
| .100 | T Contact  | Time OFF | ms | Fixed to 100ms         |                        |                        |
| .110 | T ConDelOn | Time ON  | ms | 100                    | 100                    | 10000                  |
| .114 | I3 STOP    | Type     |    | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) |
|      |            |          |    | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |
|      |            |          |    | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 1   | 900 |

| Random Turn-on delay |            |   |   | Conformity Range |          | Possible Range |          |     |  |
|----------------------|------------|---|---|------------------|----------|----------------|----------|-----|--|
| ID                   |            |   |   | Default          | Min      | Max            | Min      | Max |  |
| .103                 | Ton random | Enable function   |   | off              | on / off |                | on / off |     |  |
| .104                 | Ton random | Turn on time  | s |                  | 60       | 600            | 60       | 600 |  |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |                  |          |                |          |     |  |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 4   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 1   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 5   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

|   |     |
|---|-----|
| <b>Errorlogic signalled (shown) on output relay R3.</b> |     |
| On = it is possible to detect this error                |     |
| Off = it is not possible to show this error on relay R3 |     |
| Overvoltage LL (UΔ)                                     | off |

|   |     |
|---|-----|
| Undervoltage LL (UΔ)  | off |
| Oversupply LN (UY)  | off |
| Undervoltage LN (UY)  | off |
| 10-min oversupply (Ü)   | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) (Δf)  | off |
| Phase shift (ΔΦ)  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

10.23 VDE-AR-N 4105:2018 Umr [ID 313]

| Connection Mode |            |                | Conformity Range                               | Possible Range                                 |
|-----------------|------------|----------------|--|--|
| ID              |            | Default        |  |  |
| .003            | Connection | 4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |                  |        | Conformity Range       |     | Possible Range |     |     |
|-----------------|------------|------------------|--------|------------------------|-----|----------------|-----|-----|
| ID              |            |                  |        | Default                | Min | Max            | Min | Max |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V | Fixed to 230.0 / 400.0 |     |                |     |     |

| Functional Safety |        | Conformity Range   | Possible Range |
|-------------------|--------|--|----------------|
| ID                |        | Default  |                |
| .007              | Errtol | 2ch  | 2ch<br>1ch     |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br><br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range                        |     | Possible Range |     |     |  |
|------------------------------|------------|---|-------|---|-----|----------------|-----|-----|--|
| ID                           |            |   |       | Default                                 | Min | Max            | Min | Max |  |
| .019                         | ULN >> off | U <sub>THR</sub> OFF  | %Unom | Fixed to 125% U <sub>NOM</sub>          |     |                |     |     |  |
| .020                         | ULN >> on  | U <sub>THR</sub> ON   | %Unom | 110                                     | 110 | 110            | 100 | 110 |  |
|                              |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                     |            | ULN >> on has a fixed offset of 0.5% U <sub>NOM</sub> subtracted from the displayed value |       |   |     |                |     |     |  |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range              |     | Possible Range |     |     |  |
|-------------------------------|-----------|---|-------|-------------------------------|-----|----------------|-----|-----|--|
| ID                            |           |   |       | Default                       | Min | Max            | Min | Max |  |
| .023                          | ULN < off | U <sub>THR</sub> OFF  | %Unom | Fixed to 80% U <sub>NOM</sub> |     |                |     |     |  |
| .024                          | ULN < on  | U <sub>THR</sub> ON   | %Unom | 85                            | 85  | 85             | 85  | 100 |  |
|                               |           | Time OFF  | ms    | Fixed to 3000ms               |     |                |     |     |  |
| Comment:                      |           | ULN < on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |     |  |

| Undervoltage2 Line to Line |            |  |       | Conformity Range              |     | Possible Range |     |     |  |
|----------------------------|------------|--|-------|-------------------------------|-----|----------------|-----|-----|--|
| ID                         |            |  |       | Default                       | Min | Max            | Min | Max |  |
| .031                       | ULL << off | U <sub>THR</sub> OFF   | %Unom | Fixed to 45% U <sub>NOM</sub> |     |                |     |     |  |
| .032                       | ULL << on  | U <sub>THR</sub> ON  | %Unom | 85                            | 85  | 85             | 85  | 100 |  |
|                            |            | Time OFF   | ms    | Fixed to 300ms                |     |                |     |     |  |
| Comment:                   |            | ULL << on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |     |  |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range              |     | Possible Range |     |     |  |
|-------------------------------|------------|--|-------|-------------------------------|-----|----------------|-----|-----|--|
| ID                            |            |  |       | Default                       | Min | Max            | Min | Max |  |
| .039                          | ULN << off | U <sub>THR</sub> OFF   | %Unom | Fixed to 45% U <sub>NOM</sub> |     |                |     |     |  |
| .040                          | ULN << on  | U <sub>THR</sub> ON  | %Unom | 85                            | 85  | 85             | 85  | 100 |  |
|                               |            | Time OFF   | ms    | Fixed to 300ms                |     |                |     |     |  |
| Comment:                      |            | ULN << on has a fixed offset of 0.5% U <sub>NOM</sub> added to the displayed value |       |                               |     |                |     |     |  |

| 10 minutes average overvoltage |         |                      |       | Conformity Range |     | Possible Range |     |     |
|--------------------------------|---------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                             |         |                      |       | Default          | Min | Max            | Min | Max |
| .043                           | U > off | U <sub>THR</sub> OFF | %Unom | 110              | 110 | 115            | 110 | 115 |

|  |  |                     |       |   |  |  |  |
|--|--|---------------------|-------|---|--|--|--|
|  |  | U <sub>THR</sub> ON | %Unom | Fixed Hysteresis (0.9% UNOM)            |  |  |  |
|  |  | Time OFF            | ms    | Fixed to fastest possible disconnection |  |  |  |

| Overfrequency1 |         |                      |    | Conformity Range                        |       | Possible Range |       |       |  |
|----------------|---------|----------------------|----|---|-------|----------------|-------|-------|--|
| ID             |         |                      |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | Fixed to 51.50Hz                        |       |                |       |       |  |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.10                                   | 50.10 | 50.10          | 50.00 | 50.10 |  |
|                |         | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |  |

| Underfrequency1 |         |  |    | Conformity Range                        |       | Possible Range |       |       |  |
|-----------------|---------|--|----|---|-------|----------------|-------|-------|--|
| ID              |         |  |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .059            | f < off | f <sub>THR</sub> OFF   | Hz | Fixed to 47.50Hz                        |       |                |       |       |  |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50                                   | 47.50 | 47.50          | 47.50 | 50.00 |  |
|                 |         | Time OFF   | ms | Fixed to fastest possible disconnection |       |                |       |       |  |
| Comment:        |         | f < on has a fixed offset of 0.025 Hz added to the displayed value |    |   |       |                |       |       |  |

| Random overfrequency |            |   |    | Conformity Range                        |          | Possible Range |         |       |  |
|----------------------|------------|---|----|---|----------|----------------|---------|-------|--|
| ID                   |            |   |    | Default                                 | Min      | Max            | Min     | Max   |  |
| .086                 | f > random | Enable function   |    | off                                     | on / off |                | on /off |       |  |
| .087                 | f > random | f <sub>THR</sub> OFF  | Hz |   | 50.20    | 51.50          | 50.20   | 51.50 |  |
|                      |            | f <sub>THR</sub> ON   | Hz | Fixed reconnection frequency of 50.10Hz |          |                |         |       |  |
|                      |            | Time OFF  | ms | Fixed to fastest possible disconnection |          |                |         |       |  |
| Comment:             |            | The random f <sub>THR</sub> OFF threshold is shown in .087 and cannot be edited |    |   |          |                |         |       |  |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |         |      |                        | Conformity Range       |     | Possible Range         |     |     |
|------------------------|---------|------|------------------------|------------------------|-----|------------------------|-----|-----|
| ID                     |         |      |                        | Default                | Min | Max                    | Min | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |     |

|      |            |          |    |                        |                        |                        |
|------|------------|----------|----|------------------------|------------------------|------------------------|
|      |            |          |    |                        | n.c. (normally closed) | n.c. (normally closed) |
|      |            |          |    |                        | dis. (disabled)        |                        |
| .100 | T Contact  | Time OFF | ms | Fixed to 100ms         |                        |                        |
| .110 | T ConDelOn | Time ON  | ms | 100                    | 100                    | 10000                  |
| .114 | I3 STOP    | Type     |    | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) |
|      |            |          |    | n.c. (normally closed) | n.c. (normally closed) | n.c. (normally closed) |
|      |            |          |    | dis. (disabled)        | dis. (disabled)        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 1   | 900 |

| Random Turn-on delay |            |   |   | Conformity Range |          | Possible Range |          |     |  |
|----------------------|------------|---|---|------------------|----------|----------------|----------|-----|--|
| ID                   |            |   |   | Default          | Min      | Max            | Min      | Max |  |
| .103                 | Ton random | Enable function   |   | off              | on / off |                | on / off |     |  |
| .104                 | Ton random | Turn on time  | s |                  | 60       | 600            | 60       | 600 |  |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |                  |          |                |          |     |  |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 4   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 1   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 5   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

|   |     |
|---|-----|
| <b>Errorlogic signalled (shown) on output relay R3.</b> |     |
| On = it is possible to detect this error                |     |
| Off = it is not possible to show this error on relay R3 |     |
| Overvoltage LL (UΔ)                                     | off |

|   |     |
|---|-----|
| Undervoltage LL (UΔ)  | off |
| Oversupply LN (UY)  | off |
| Undervoltage LN (UY)  | off |
| 10-min oversupply (Ü)   | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | off |
| Phase shift ( $\Delta\Phi$ )  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.24 VDE-AR-N 4110:2018 TR3-25 [ID 707]

| Connection Mode |            |             | Conformity Range    |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|---------------------|--|--|--|--|
| ID              |            | Default     |                     |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 3-wire, 4-wire (LN) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 1ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                        |           | Default                                  |       | Min              | Max | Min            | Max |
| .010                      | ULL>      | Enable function                          | on    | on / off         |     | on / off       |     |
| .011                      | ULL > off | U <sub>THR</sub> OFF                     | %Unom | 110              | 100 | 130            | 100 |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %Unom | 109              | 103 | 109            | 100 |
| .013                      | T ULL >   | Time OFF                                 | ms    | 18000<br>0       | 100 | 180000         | 100 |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |     |                |     |

| Undervoltage1 Line to Line |           |   |       | Conformity Range |      | Possible Range |     |
|----------------------------|-----------|---|-------|------------------|------|----------------|-----|
| ID                         |           | Default   |       | Min              | Max  | Min            | Max |
| .015                       | ULL < off | U <sub>THR</sub> OFF  | %Unom | 80               | 10   | 100            | 10  |
| .016                       | ULL < on  | U <sub>THR</sub> ON   | %Unom | 95               | 95   | 95             | 10  |
| .017                       | T ULL <   | Time OFF  | ms    | 1500             | 1500 | 2400           | 50  |
| Comment:                   |           | ULL < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |      |                |     |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |   |                      |       | Conformity Range |          | Possible Range |          |        |
|------------------------------|---|----------------------|-------|------------------|----------|----------------|----------|--------|
| ID                           |   |                      |       | Default          | Min      | Max            | Min      | Max    |
| .018                         | ULN >   | Enable function      |       | on               | on / off |                | on / off |        |
| .019                         | ULN > off   | U <sub>THR</sub> OFF | %Unom | 110              | 100      | 130            | 100      | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON  | %Unom | 109              | 103      | 109            | 100      | 135    |
| .021                         | T ULN >   | Time OFF             | ms    | 18000<br>0       | 100      | 180000         | 100      | 180000 |
| Only active for:             | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                      |       |                  |          |                |          |        |

| Undervoltage1 Line to Neutral |   |                      |       | Conformity Range |      | Possible Range |     |       |
|-------------------------------|---|----------------------|-------|------------------|------|----------------|-----|-------|
| ID                            |   |                      |       | Default          | Min  | Max            | Min | Max   |
| .023                          | ULN < off   | U <sub>THR</sub> OFF | %Unom | 80               | 10   | 100            | 10  | 100   |
| .024                          | ULN < on  | U <sub>THR</sub> ON  | %Unom | 95               | 95   | 95             | 10  | 100   |
| .025                          | T ULN <   | Time OFF             | ms    | 1500             | 1500 | 2400           | 50  | 60000 |
| Comment:                      | ULN < on has a fixed offset of 0.5% UNOM added to the displayed value |                      |       |                  |      |                |     |       |
| Only active for:              | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |                      |       |                  |      |                |     |       |

| Overvoltage2 Line to Line |  |                      |       | Conformity Range |     | Possible Range |          |       |
|---------------------------|--|----------------------|-------|------------------|-----|----------------|----------|-------|
| ID                        |  |                      |       | Default          | Min | Max            | Min      | Max   |
| .026                      | ULL >>                                   | Enable function      |       | on               | on  |                | on / off |       |
| .027                      | ULL >> off                               | U <sub>THR</sub> OFF | %Unom | 125              | 100 | 130            | 100      | 135   |
| .028                      | ULL >> on                                | U <sub>THR</sub> ON  | %Unom | 124              | 103 | 124            | 100      | 135   |
| .029                      | T ULL >>                                 | Time OFF             | ms    | 100              | 100 | 100            | 100      | 10000 |
| Only active for:          | Connection Modes: 3-wire, 4-wire (LN+LL) |                      |       |                  |     |                |          |       |

| Undervoltage2 Line to Line |            |                      |       | Conformity Range |     | Possible Range |     |     |
|----------------------------|------------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                         |            |                      |       | Default          | Min | Max            | Min | Max |
| .031                       | ULL << off | U <sub>THR</sub> OFF | %Unom | 30               | 10  | 100            | 10  | 100 |
| .032                       | ULL << on  | U <sub>THR</sub> ON  | %Unom | 95               | 95  | 95             | 10  | 100 |

|                  |  |          |    |     |     |     |    |       |
|------------------|--|----------|----|-----|-----|-----|----|-------|
| .033             | T ULL <<   | Time OFF | ms | 800 | 800 | 800 | 50 | 60000 |
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL)                               |          |    |     |     |     |    |       |
| Comment:         | ULL << on has a fixed offset of 0.5% UNOM added to the displayed value |          |    |     |     |     |    |       |

| Overvoltage2 Line to Neutral |   |                      |       |         | Conformity Range |     | Possible Range |          |  |
|------------------------------|---|----------------------|-------|---------|------------------|-----|----------------|----------|--|
| ID                           |   |                      |       | Default | Min              | Max | Min            | Max      |  |
| .034                         | ULN >>  | Enable function      |       |         | on               | on  |                | on / off |  |
| .035                         | ULN >> off  | U <sub>THR</sub> OFF | %Unom | 125     | 100              | 130 | 100            | 135      |  |
| .036                         | ULN >> on   | U <sub>THR</sub> ON  | %Unom | 124     | 103              | 124 | 100            | 135      |  |
| .037                         | T ULN >>  | Time OFF             | ms    | 100     | 100              | 100 | 100            | 10000    |  |
| Only active for:             | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                      |       |         |                  |     |                |          |  |

| Undervoltage2 Line to Neutral |  |                      |       |         | Conformity Range |     | Possible Range |       |
|-------------------------------|--|----------------------|-------|---------|------------------|-----|----------------|-------|
| ID                            |  |                      |       | Default | Min              | Max | Min            | Max   |
| .039                          | ULN << off   | U <sub>THR</sub> OFF | %Unom | 30      | 10               | 100 | 10             | 100   |
| .040                          | ULN << on  | U <sub>THR</sub> ON  | %Unom | 95      | 95               | 95  | 10             | 100   |
| .041                          | T ULN <<   | Time OFF             | ms    | 800     | 800              | 800 | 50             | 60000 |
| Only active for:              | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |                      |       |         |                  |     |                |       |
| Comment:                      | ULN << on has a fixed offset of 0.5% UNOM added to the displayed value |                      |       |         |                  |     |                |       |

| Overfrequency1 |  |                      |    |         | Conformity Range |       | Possible Range |       |
|----------------|--|----------------------|----|---------|------------------|-------|----------------|-------|
| ID             |  |                      |    | Default | Min              | Max   | Min            | Max   |
| .055           | f > off  | f <sub>THR</sub> OFF | Hz | 51.50   | 50.00            | 55.00 | 50.00          | 55.00 |
| .056           | f > on   | f <sub>THR</sub> ON  | Hz | 50.10   | 50.10            | 50.10 | 50.00          | 55.00 |
| .057           | T f >  | Time OFF             | ms | 5000    | 150              | 5000  | 150            | 10000 |
| Comment:       | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |                      |    |         |                  |       |                |       |

| Underfrequency1 |         |                      |    |         | Conformity Range |       | Possible Range |       |
|-----------------|---------|----------------------|----|---------|------------------|-------|----------------|-------|
| ID              |         |                      |    | Default | Min              | Max   | Min            | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50   | 45.00            | 50.00 | 45.00          | 50.00 |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 49.90   | 49.90            | 49.90 | 45.00          | 50.00 |

|          |       |   |    |    |    |    |    |       |  |
|----------|-------|---|----|----|----|----|----|-------|--|
| .061     | T f < | Time OFF  | ms | 50 | 50 | 70 | 50 | 10000 |  |
| Comment: |       | f < off has a fixed offset of 0.01 Hz added to the displayed value<br>f < on has a fixed offset of 0.01 Hz added to the displayed value |    |    |    |    |    |       |  |

| Overfrequency 2 |          |  |    | Conformity Range |       | Possible Range |       |       |
|-----------------|----------|--|----|------------------|-------|----------------|-------|-------|
| ID              |          |  |    | Default          | Min   | Max            | Min   | Max   |
| .063            | f >> off | fTHR OFF   | Hz | 52.50            | 50.00 | 55.00          | 50.00 | 55.00 |
| .064            | f >> on  | fTHR ON  | Hz | 50.10            | 50.10 | 50.10          | 50.00 | 55.00 |
| .065            | T f >>   | Time OFF   | ms | 50               | 50    | 70             | 50    | 10000 |
| Comment:        |          | f >> off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |       |       |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range  |                        |  |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|-----------------|------------------------|--|
| ID                     |           |          | Default                | Min                    | Max                    | Min             | Max                    |  |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) | n.o. (normally opened) |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                 |                        |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) | n.o. (normally opened) |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |      |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|------|
| ID            |           |              |   | Default          | Min | Max            | Min | Max  |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 60             | 0   | 1800 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) (Δf)  | off |
| Phase shift (ΔΦ)  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | off |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | off |

| Device Information |                                       |  |  |
|--------------------|---------------------------------------|--|--|
| ID                 |                                       |  |  |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software |  |

|  |  |   |
|--|--|---|
|  |  | cc: Index of Configuration set<br>b: Version of Configuration set |
|--|--|---|

## 10.25 CEI 0-21:2019 [ID 102]

| Connection Mode |            |             | Conformity Range            |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|-----------------------------|--|--|--|--|
| ID              |            | Default     |                             |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |        | Conformity Range       |     | Possible Range |     |
|-----------------|------------|------------------|--------|------------------------|-----|----------------|-----|
| ID              |            | Default          |        | Min                    | Max | Min            | Max |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V | Fixed to 230.0 / 400.0 |     |                |     |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Operational Mode |      |                | Conformity Range               |  |  | Possible Range                 |  |
|------------------|------|----------------|--------------------------------|--|--|--------------------------------|--|
| ID               |      | Default        |                                |  |  |                                |  |
| .009             | Mode | 1 (transitory) | 0 (definitive), 1 (transitory) |  |  | 0 (definitive), 1 (transitory) |  |

| Overvoltage1 Line to Line |            |  |       | Conformity Range                        |     | Possible Range |     |
|---------------------------|------------|--|-------|---|-----|----------------|-----|
| ID                        |            | Default                                  |       | Min                                     | Max | Min            | Max |
| .011                      | V 59.S2 LL | U <sub>THR</sub> OFF                     | %Unom | 115                                     | 100 | 130            | 100 |
|                           |            | U <sub>THR</sub> ON                      | %Unom | Fixed Hysteresis (4% U <sub>THR</sub> ) |     |                |     |
| .013                      | T 59.S2 LL | Time OFF                                 | ms    | 200                                     | 50  | 1000           | 50  |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL) |       |   |     |                |     |

| Undervoltage1 Line to Line |            |                      |        | Conformity Range                        |     | Possible Range |     |
|----------------------------|------------|----------------------|--------|---|-----|----------------|-----|
| ID                         |            | Default              |        | Min                                     | Max | Min            | Max |
| .015                       | V 27.S1 LL | U <sub>THR</sub> OFF | % Unom | 85                                      | 20  | 100            | 0   |
|                            |            | U <sub>THR</sub> ON  | %Unom  | Fixed Hysteresis (4% U <sub>THR</sub> ) |     |                |     |



| 10 minutes average overvoltage |         |                      |       | Conformity Range                        |     | Possible Range |     |       |
|--------------------------------|---------|----------------------|-------|---|-----|----------------|-----|-------|
| ID                             |         |                      |       | Default                                 | Min | Max            | Min | Max   |
| .043                           | V 59.S1 | U <sub>THR</sub> OFF | %Unom | 110                                     | 100 | 120            | 100 | 135   |
|                                |         | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (4% U <sub>THR</sub> ) |     |                |     |       |
| .045                           | T 59.S1 | Time OFF             | ms    | 0                                       | 0   | 0              | 0   | 10000 |

| Overfrequency1   |               |   |         | Conformity Range             |       | Possible Range |       |       |
|------------------|---------------|---|---------|------------------------------|-------|----------------|-------|-------|
| ID               |               |   | Default | Min                          | Max   | Min            | Max   |       |
| .055             | F 81>S2<br>ws | fTHR OFF  | Hz      | 51.50                        | 50.00 | 52.00          | 50.00 | 55.00 |
|                  |               | fTHR ON   | Hz      | Fixed Hysteresis (0.2% fTHR) |       |                |       |       |
| .057             | T 81>S2<br>ws | Time OFF  | ms      | 1000                         | 50    | 5000           | 50    | 10000 |
| Only active for: |               | Operational Mode 0 (definitive mode) when DigIn4 is inactive (contact open) |         |                              |       |                |       |       |
|                  |               | Voltage > 20% UNOM  |         |                              |       |                |       |       |

|  |                    |
|--|--------------------|
|  | Voltage > 20% UNOM |
|--|--------------------|

| Underfrequency2  |            |  |    | Conformity Range             |       | Possible Range |       |       |  |
|------------------|------------|--|----|------------------------------|-------|----------------|-------|-------|--|
| ID               |            |  |    | Default                      | Min   | Max            | Min   | Max   |  |
| .067             | F 81<S1 nf | fTHR OFF   | Hz | 49.80                        | 47.00 | 50.00          | 45.00 | 50.00 |  |
|                  |            | fTHR ON  | Hz | Fixed Hysteresis (0.2% fTHR) |       |                |       |       |  |
| .069             | T 81<S1 nf | Time OFF   | ms | 100                          | 50    | 5000           | 50    | 10000 |  |
| Only active for: |            | Operational Mode 0 (definitive mode) when DigIn4 is active (contact closed)<br>Operational Mode 1 (transitory mode) when DigIn5 is active (contact closed)<br>Voltage > 20% UNOM |    |                              |       |                |       |       |  |

| Overfrequency3   |            |   |    | Conformity Range             |       | Possible Range |       |       |  |
|------------------|------------|---|----|------------------------------|-------|----------------|-------|-------|--|
| ID               |            |   |    | Default                      | Min   | Max            | Min   | Max   |  |
| .071             | F 81>S2 wf | fTHR OFF  | Hz | 51.50                        | 50.00 | 52.00          | 50.00 | 55.00 |  |
|                  |            | fTHR ON   | Hz | Fixed Hysteresis (0.2% fTHR) |       |                |       |       |  |
| .073             | T 81>S2 wf | Time OFF  | ms | 100                          | 50    | 5000           | 50    | 10000 |  |
| Only active for: |            | Operational Mode 1 (transitory mode) when DigIn5 is inactive (contact open)<br>Voltage > 20% UNOM |    |                              |       |                |       |       |  |

| Underfrequency3  |            |   |    | Conformity Range             |       | Possible Range |       |       |  |
|------------------|------------|---|----|------------------------------|-------|----------------|-------|-------|--|
| ID               |            |   |    | Default                      | Min   | Max            | Min   | Max   |  |
| .075             | F 81<S2 wf | fTHR OFF  | Hz | 47.50                        | 47.00 | 50.00          | 45.00 | 50.00 |  |
|                  |            | fTHR ON   | Hz | Fixed Hysteresis (0.2% fTHR) |       |                |       |       |  |
| .077             | T 81<S2 wf | Time OFF  | ms | 100                          | 50    | 5000           | 50    | 10000 |  |
| Only active for: |            | Operational Mode 1 (transitory mode) when DigIn5 is inactive (contact open)<br>Voltage > 20% UNOM |    |                              |       |                |       |       |  |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |       | Conformity Range |          | Possible Range |          |       |
|-------------------------------------|-----------|--------------------------|-------|------------------|----------|----------------|----------|-------|
| ID                                  |           |                          |       | Default          | Min      | Max            | Min      | Max   |
| .090                                | RoCoF     | Enable Function          |       | off              | on / off |                | on / off |       |
| .091                                | RoCoF OFF | RoCoF <sub>THR</sub> OFF | mHz/s | 2700             | 1000     | 4000           | 100      | 8000  |
| .092                                | RoCoF ON  | RoCoF <sub>THR</sub> ON  | mHz/s | 2300             | 1000     | 4000           | 100      | 8000  |
| .093                                | T RoCoF   | Time OFF                 | ms    | 0                | 0        | 1000           | 0        | 10000 |
| .111                                | RoCoF wnd | Window length            | ms    | 100              | 100      | 1000           | 100      | 1000  |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                 |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|-----------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max             |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) |

| Turn-on delay |           |              |   |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---|---------|------------------|-----|----------------|-----|
| ID            |           |              |   | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s | 5       | 0                | 300 | 0              | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | off |
| Phase shift ( $\Delta\Phi$ )  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | off |

**Device Information**

| ID   |                                     |   |
|------|-------------------------------------|---|
| .105 | ID: xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

**10.26 G99/1/3:2018 LV [ID 410]**

| Connection Mode |            |                      | Conformity Range |  |  | Possible Range |  |
|-----------------|------------|----------------------|------------------|--|--|----------------|--|
| ID              |            | Default              |                  |  |  |                |  |
| .003            | Connection | Fixed to 4-wire (LN) |                  |  |  |                |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Overvoltage1 Line to Neutral |            |                      |       | Conformity Range                           |      | Possible Range |           |
|------------------------------|------------|----------------------|-------|--|------|----------------|-----------|
| ID                           |            | Default              |       | Min  | Max  | Min            | Max       |
| .019                         | O/V st 1   | U <sub>THR</sub> OFF | %Unom | 114  | 114  | 114            | 100 135   |
|                              |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |      |                |           |
| .021                         | T O/V st 1 | Time OFF             | ms    | 1000                                       | 1000 | 1000           | 50 300000 |

| Overvoltage2 Line to Neutral |            |                      |       | Conformity Range                           |     | Possible Range |           |
|------------------------------|------------|----------------------|-------|--|-----|----------------|-----------|
| ID                           |            | Default              |       | Min  | Max | Min            | Max       |
| .035                         | O/V st 2   | U <sub>THR</sub> OFF | %Unom | 119  | 119 | 119            | 100 135   |
|                              |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |           |
| .037                         | T O/V st 2 | Time OFF             | ms    | 500  | 500 | 500            | 50 300000 |

| Undervoltage2 Line to Neutral |     |                      |       | Conformity Range                           |     | Possible Range |       |
|-------------------------------|-----|----------------------|-------|--|-----|----------------|-------|
| ID                            |     | Default              |       | Min  | Max | Min            | Max   |
| .039                          | U/V | U <sub>THR</sub> OFF | %Unom | 80   | 80  | 80             | 0 100 |
|                               |     | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |       |

|      |       |          |    |      |      |      |    |        |
|------|-------|----------|----|------|------|------|----|--------|
| .041 | T U/V | Time OFF | ms | 2500 | 2500 | 2500 | 50 | 300000 |
|------|-------|----------|----|------|------|------|----|--------|

| Underfrequency1 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | fTHR OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF | ms | 20000                      | 20000 | 20000          | 1000  | 300000 |

| Overfrequency2 |       |          |    | Conformity Range           |       | Possible Range |       |        |
|----------------|-------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID             |       |          |    | Default                    | Min   | Max            | Min   | Max    |
| .063           | O/F   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00  |
|                |       | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .065           | T O/F | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |            |                          |  | Conformity Range |                           | Possible Range |          |     |
|-------------------------------------|------------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|
| ID                                  |            |                          |  | Default          | Min                       | Max            | Min      | Max |
| .090                                | RoCoF      | Enable Function          |  | on               | on / off                  |                | on / off |     |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 10             | 3000     | 10  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 950                       | 10             | 3000     | 10  |
| .093                                | RoCoFDelay | Time OFF                 |  | ms               | 500                       | 50             | 500      | 50  |
| .111                                | RoCoF wnd  | Window length            |  | ms               | Fixed window length 225ms |                |          |     |

| Phase Shift (PShift) |            |                           |  |         | Conformity Range                        |          | Possible Range |          |    |
|----------------------|------------|---------------------------|--|---------|---|----------|----------------|----------|----|
| ID                   |            |                           |  | Default | Min                                     | Max      | Min            | Max      |    |
| .094                 | PShift     | Enable Function           |  |         | off                                     | on / off |                | on / off |    |
| .095                 | PShift off | PShift <sub>THR</sub> OFF |  | °       | 12                                      | --       | --             | 3        | 15 |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °       | 9                                       | --       | --             | 3        | 15 |
|                      |            | Time OFF                  |  | ms      | Fixed to fastest possible disconnection |          |                |          |    |
| .112                 | PShift wnd | Window length             |  | ms      | Fixed window length 200ms               |          |                |          |    |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range |   |  |
|------------------------|-----------|----------|------------------------|------------------|---|----------------|---|--|
| ID                     |           |          | Default                | Min              | Max   | Min            | Max   |  |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms   |   |                |   |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 20               | 20  | 20             | 0   | 900 |

| Password |     |                                   |  |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|--|---------|-----|-----|
| ID       |     |                                   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |   |
|--------------------|------------------------------------|---|
| ID                 |                                    |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.27 G99/1/3:2018 HV [ID 460]

| Connection Mode |            |                 | Conformity Range |  |  | Possible Range |  |
|-----------------|------------|-----------------|------------------|--|--|----------------|--|
| ID              |            | Default         |                  |  |  |                |  |
| .003            | Connection | Fixed to 3-wire |                  |  |  |                |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400   | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |            |                      |       | Conformity Range                           |      | Possible Range |           |
|---------------------------|------------|----------------------|-------|--|------|----------------|-----------|
| ID                        |            | Default              |       | Min  | Max  | Min            | Max       |
| .011                      | O/V st 1   | U <sub>THR</sub> OFF | %Unom | 110  | 110  | 110            | 100 135   |
|                           |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |      |                |           |
| .013                      | T O/V st 1 | Time OFF             | ms    | 1000                                       | 1000 | 1000           | 50 300000 |

| Overvoltage2 Line to Line |            |                      |       | Conformity Range                           |     | Possible Range |           |
|---------------------------|------------|----------------------|-------|--|-----|----------------|-----------|
| ID                        |            | Default              |       | Min  | Max | Min            | Max       |
| .027                      | O/V st 2   | U <sub>THR</sub> OFF | %Unom | 113  | 113 | 113            | 100 135   |
|                           |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |           |
| .029                      | T O/V st 2 | Time OFF             | ms    | 500  | 500 | 500            | 50 300000 |

| Undervoltage2 Line to Line |     |                      |       | Conformity Range                           |     | Possible Range |       |
|----------------------------|-----|----------------------|-------|--|-----|----------------|-------|
| ID                         |     | Default              |       | Min  | Max | Min            | Max   |
| .031                       | U/V | U <sub>THR</sub> OFF | %Unom | 80   | 80  | 80             | 0 100 |
|                            |     | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |       |

|      |       |          |    |      |      |      |    |        |
|------|-------|----------|----|------|------|------|----|--------|
| .033 | T U/V | Time OFF | ms | 2500 | 2500 | 2500 | 50 | 300000 |
|------|-------|----------|----|------|------|------|----|--------|

| Underfrequency1 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | fTHR OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF | ms | 20000                      | 20000 | 20000          | 1000  | 300000 |

| Overfrequency2 |       |          |    | Conformity Range           |       | Possible Range |       |        |
|----------------|-------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID             |       |          |    | Default                    | Min   | Max            | Min   | Max    |
| .063           | O/F   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00  |
|                |       | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .065           | T O/F | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |            |                          |  | Conformity Range |                           | Possible Range |          |     |
|-------------------------------------|------------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|
| ID                                  |            |                          |  | Default          | Min                       | Max            | Min      | Max |
| .090                                | RoCoF      | Enable Function          |  | on               | on / off                  |                | on / off |     |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 10             | 3000     | 10  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 950                       | 10             | 3000     | 10  |
| .093                                | RoCoFDelay | Time OFF                 |  | ms               | 500                       | 50             | 500      | 50  |
| .111                                | RoCoF wnd  | Window length            |  | ms               | Fixed window length 225ms |                |          |     |

| Phase Shift (PShift) |            |                           |  |         | Conformity Range                        |          | Possible Range |          |    |
|----------------------|------------|---------------------------|--|---------|---|----------|----------------|----------|----|
| ID                   |            |                           |  | Default | Min                                     | Max      | Min            | Max      |    |
| .094                 | PShift     | Enable Function           |  |         | off                                     | on / off |                | on / off |    |
| .095                 | PShift off | PShift <sub>THR</sub> OFF |  | °       | 12                                      | --       | --             | 3        | 15 |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °       | 9                                       | --       | --             | 3        | 15 |
|                      |            | Time OFF                  |  | ms      | Fixed to fastest possible disconnection |          |                |          |    |
| .112                 | PShift wnd | Window length             |  | ms      | Fixed window length 200ms               |          |                |          |    |

| Auxiliary Contact type |           |          |          | Conformity Range       |                | Possible Range         |                        |  |
|------------------------|-----------|----------|----------|------------------------|----------------|------------------------|------------------------|--|
| ID                     |           |          | Default  | Min                    | Max            | Min                    | Max                    |  |
| .099                   | Contact   |          | Type     | dis. (disabled)        |                | n.o. (normally opened) | n.o. (normally opened) |  |
|                        |           |          |          |                        |                | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |          |                        |                | dis. (disabled)        | dis. (disabled)        |  |
| .100                   | T Contact |          | Time OFF | ms                     | Fixed to 500ms |                        |                        |  |
| .114                   | I3 STOP   |          | Type     | n.o. (normally opened) |                | n.o. (normally opened) | n.o. (normally opened) |  |
|                        |           |          |          |                        |                | n.c. (normally closed) | n.c. (normally closed) |  |
|                        |           |          |          |                        |                | dis. (disabled)        | dis. (disabled)        |  |
| .100                   | T Contact | Time OFF | ms       | Fixed to 500ms         |                |                        |                        |  |

| Turn-on delay |           |              |   |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---|---------|------------------|-----|----------------|-----|
| ID            |           |              |   | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s | 20      | 20               | 20  | 0              | 900 |

| Password |     |                                   |  |  |   |         |     |     |
|----------|-----|-----------------------------------|--|--|---|---------|-----|-----|
| ID       |     |                                   |  |  |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0 | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  | 0 | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  | 0 | 0       | 0   | 9   |

|         |   |                                   |   |   |   |
|---------|---|-----------------------------------|---|---|---|
| .109    | PW4   | 4 <sup>th</sup> digit of Password | 0 | 0 | 9 |
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |                                   |   |   |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                   |   |
|--------------------|-----------------------------------|---|
| ID                 |                                   |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.28 G98/1/2:2018 [ID 510]**

| Connection Mode |            |                      | Conformity Range |  |  | Possible Range |  |
|-----------------|------------|----------------------|------------------|--|--|----------------|--|
| ID              |            | Default              |                  |  |  |                |  |
| .003            | Connection | Fixed to 4-wire (LN) |                  |  |  |                |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Overvoltage1 Line to Neutral |            |                      |       | Conformity Range                           |      | Possible Range |          |
|------------------------------|------------|----------------------|-------|--|------|----------------|----------|
| ID                           |            | Default              |       | Min  | Max  | Min            | Max      |
| .019                         | O/V st 1   | U <sub>THR</sub> OFF | %Unom | 114  | 114  | 114            | 100 135  |
|                              |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |      |                |          |
| .021                         | T O/V st 1 | Time OFF             | ms    | 1000                                       | 1000 | 1000           | 50 10000 |

| Overvoltage2 Line to Neutral |            |                      |       | Conformity Range                           |     | Possible Range |          |
|------------------------------|------------|----------------------|-------|--|-----|----------------|----------|
| ID                           |            | Default              |       | Min  | Max | Min            | Max      |
| .035                         | O/V st 2   | U <sub>THR</sub> OFF | %Unom | 119  | 119 | 119            | 100 135  |
|                              |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |          |
| .037                         | T O/V st 2 | Time OFF             | ms    | 500  | 500 | 500            | 50 10000 |

| Undervoltage2 Line to Neutral |     |                      |       | Conformity Range                           |     | Possible Range |       |
|-------------------------------|-----|----------------------|-------|--|-----|----------------|-------|
| ID                            |     | Default              |       | Min  | Max | Min            | Max   |
| .039                          | U/V | U <sub>THR</sub> OFF | %Unom | 80   | 80  | 80             | 0 100 |
|                               |     | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% U <sub>NOM</sub> ) |     |                |       |

|      |       |          |    |      |      |      |    |       |
|------|-------|----------|----|------|------|------|----|-------|
| .041 | T U/V | Time OFF | ms | 2500 | 2500 | 2500 | 50 | 10000 |
|------|-------|----------|----|------|------|------|----|-------|

| Underfrequency1 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | fTHR OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF | ms | 20000                      | 20000 | 20000          | 1000  | 120000 |

| Overfrequency2 |       |          |    | Conformity Range           |       | Possible Range |       |       |
|----------------|-------|----------|----|----------------------------|-------|----------------|-------|-------|
| ID             |       |          |    | Default                    | Min   | Max            | Min   | Max   |
| .063           | O/F   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00 |
|                |       | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |       |
| .065           | T O/F | Time OFF | ms | 500                        | 500   | 500            | 50    | 10000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |       |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|-------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max   |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00 |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |       |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 10000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |  | Conformity Range |   | Possible Range |          |     |
|-------------------------------------|-----------|--------------------------|--|------------------|---|----------------|----------|-----|
| ID                                  |           |                          |  | Default          | Min                                     | Max            | Min      | Max |
| .090                                | RoCoF     | Enable Function          |  | on               | on / off                                |                | on / off |     |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                                    | 10             | 3000     | 10  |
| .092                                | RoCoF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 950                                     | 10             | 3000     | 10  |
|                                     |           | Time OFF                 |  | ms               | Fixed to fastest possible disconnection |                |          |     |
| .111                                | RoCoF wnd | Window length            |  | ms               | Fixed window length 535ms               |                |          |     |

| Phase Shift (PShift) |            |                           |    | Conformity Range                            |          | Possible Range |          |     |
|----------------------|------------|---------------------------|----|---|----------|----------------|----------|-----|
| ID                   |            |                           |    | Default                                     | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function           |    | off   | on / off |                | on / off |     |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | °  | 12  | --       | --             | 3        | 15  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 9   | --       | --             | 3        | 15  |
|                      |            | Time OFF                  | ms | Fixed to the fastest possible disconnection |          |                |          |     |
| .112                 | PShift wnd | Window length             | ms | Fixed window length 200ms                   |          |                |          |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        |                        |                        | dis. (disabled)        | dis. (disabled)        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|                        |           |          |                        |                        |                        | dis. (disabled)        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 20               | 20  | 20             | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | off |
| Phase shift ( $\Delta\Phi$ )  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | off |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | off |

**Device Information**

| ID   |                                      |  |
|------|--------------------------------------|--|
| .105 | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.29 C10-11:2021 LV-IP [ID 603] Interface Protection low voltage

| Connection Mode |            |                | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|----------------|------------------|--|--|--|--|
| ID              |            | Default        |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN+LL) | 4-wire (LN+LL)   |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 1ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |     |       |
|------------------------------|------------|---|-------|------------------|-----|----------------|-----|-------|
| ID                           |            | Default   |       | Min              | Max | Min            | Max |       |
| .019                         | U LN > off | U <sub>THR</sub> OFF  | %Unom | 110              | 100 | 110            | 100 | 135   |
| .020                         | U LN > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 120            | 100 | 135   |
| .021                         | T U LN >   | Time OFF  | ms    | 1000             | 0   | 3000           | 0   | 10000 |
| Comment:                     |            | U LN > off has a fixed offset of 0.25% U <sub>NOM</sub> subtracted from the displayed value |       |                  |     |                |     |       |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                                       |       |                  |     |                |     |       |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |       |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|-------|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |       |
| .023                          | U LN < off | U <sub>THR</sub> OFF   | %Unom | 70               | 50  | 85             | 0   | 100   |
| .024                          | U LN < on  | U <sub>THR</sub> ON  | %Unom | 85               | 50  | 100            | 0   | 100   |
| .025                          | T U LN <   | Time OFF   | ms    | 1500             | 0   | 1500           | 0   | 10000 |
| Comment:                      |            | U LN < off has a fixed offset of 0.25% U <sub>NOM</sub> added to the displayed value |       |                  |     |                |     |       |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                               |       |                  |     |                |     |       |

| Overvoltage2 Line to Neutral |            |   |       | Conformity Range                        |     | Possible Range |     |       |  |  |  |  |  |
|------------------------------|------------|---|-------|---|-----|----------------|-----|-------|--|--|--|--|--|
| ID                           |            |   |       | Default                                 | Min | Max            | Min | Max   |  |  |  |  |  |
| .035                         | U LN>> off | U <sub>THR</sub> OFF  | %Unom | 115                                     | 110 | 130            | 100 | 135   |  |  |  |  |  |
| .036                         | U LN>> on  | U <sub>THR</sub> ON   | %Unom | 114                                     | 100 | 120            | 100 | 135   |  |  |  |  |  |
| .037                         | T ULN>>    | Time OFF  | ms    | 0                                       | 0   | 0              | 0   | 10000 |  |  |  |  |  |
|                              |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |       |  |  |  |  |  |
| Comment:                     |            | U LN > off has a fixed offset of 0.25% Unom subtracted from the displayed value |       |   |     |                |     |       |  |  |  |  |  |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                           |       |   |     |                |     |       |  |  |  |  |  |

| Undervoltage2 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |       |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|-------|
| ID                            |            |  |       | Default          | Min | Max            | Min | Max   |
| .039                          | U LN<< off | U <sub>THR</sub> OFF   | %Unom | 15               | 15  | 50             | 0   | 100   |
| .040                          | U LN<< on  | U <sub>THR</sub> ON  | %Unom | 85               | 50  | 100            | 0   | 100   |
| .041                          | T U LN<<   | Time OFF   | ms    | 250              | 0   | 5000           | 0   | 10000 |
| Comment:                      |            | U LN < off has a fixed offset of 0.25% Unom added to the displayed value |       |                  |     |                |     |       |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                    |       |                  |     |                |     |       |

| Zero Voltage Line to Neutral |            |                                  | Conformity Range |      | Possible Range |        |     |       |
|------------------------------|------------|----------------------------------|------------------|------|----------------|--------|-----|-------|
| ID                           |            |                                  | Default          | Min  | Max            | Min    | Max |       |
| .115                         | Uzero >    | Enable Function                  | on               | on   |                | on/off |     |       |
| .116                         | Uzero> off | U <sub>THR</sub> OFF             | %Unom            | 20   | 20             | 20     | 5   | 100   |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %Unom            | 15   | 1              | 19     | 1   | 100   |
| .118                         | T Uzero >  | Time OFF                         | ms               | 1500 | 0              | 1500   | 0   | 10000 |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |                  |      |                |        |     |       |

| Residual Voltage (3 x Zero Voltage) Line to Neutral |            |                      |       | Conformity Range |     | Possible Range |        |     |
|---|------------|----------------------|-------|------------------|-----|----------------|--------|-----|
| Activation of a narrower frequency window           |            |                      |       |                  |     |                |        |     |
| ID  |            |                      |       | Default          | Min | Max            | Min    | Max |
| .119  | Ures-anfw> | Enable Function      |       | on               | on  |                | on/off |     |
| .120  | Ures > on  | U <sub>THR</sub> OFF | %Unom | 5                | 5   | 5              | 2      | 100 |
| .121  | Ures > off | U <sub>THR</sub> ON  | %Unom | 3                | 1   | 3              | 1      | 100 |

| Overfrequency1   |         |   |         | Conformity Range |       | Possible Range |       |       |
|------------------|---------|---|---------|------------------|-------|----------------|-------|-------|
| ID               |         |   | Default | Min              | Max   | Min            | Max   |       |
| .055             | f > off | fTHR OFF  | Hz      | 51.50            | 51.50 | 51.50          | 50.00 | 55.00 |
| .056             | f > on  | fTHR ON   | Hz      | 50.10            | 50.00 | 52.00          | 50.00 | 55.00 |
| .057             | T f >   | Time OFF  | ms      | 0                | 0     | 0              | 0     | 10000 |
| Comment:         |         | f > off has a fixed offset of 0.01 Hz subtracted to the displayed value |         |                  |       |                |       |       |
| Only active for: |         | Voltage > 20% U <sub>NOM</sub>  |         |                  |       |                |       |       |

| Underfrequency1  |         |  |         | Conformity Range |       | Possible Range |       |       |
|------------------|---------|--|---------|------------------|-------|----------------|-------|-------|
| ID               |         |  | Default | Min              | Max   | Min            | Max   |       |
| .059             | f < off | fTHR OFF   | Hz      | 47.50            | 47.50 | 47.50          | 40.00 | 50.00 |
| .060             | f < on  | fTHR ON  | Hz      | 49.90            | 47.00 | 50.00          | 40.00 | 50.00 |
| .061             | T f <   | Time OFF   | ms      | 0                | 0     | 0              | 0     | 10000 |
| Comment:         |         | f < off has a fixed offset of 0.01 Hz added to the displayed value |         |                  |       |                |       |       |
| Only active for: |         | Voltage > 20% UNOM   |         |                  |       |                |       |       |

| Overfrequency nw (narrower window) |  | Conformity Range |     | Possible Range |     |     |
|------------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                                 |  | Default          | Min | Max            | Min | Max |

|                  |            |  |    |       |       |       |        |       |
|------------------|------------|--|----|-------|-------|-------|--------|-------|
| .062             | f nw >     | Enable Function  |    | on    | on    |       | on/off |       |
| .063             | f nw > off | fTHR OFF   | Hz | 50.30 | 50.30 | 50.30 | 50.00  | 55.00 |
| .064             | f nw > on  | fTHR ON  | Hz | 50.10 | 50.00 | 52.00 | 50.00  | 55.00 |
| .065             | T f nw >   | Time OFF   | ms | 500   | 500   | 500   | 0      | 10000 |
| Comment:         |            | f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |       |       |       |        |       |
| Only active for: |            | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                          |    |       |       |       |        |       |

| Underfrequency nw (narrower window) |            |   |    | Conformity Range |       | Possible Range |        |       |
|-------------------------------------|------------|---|----|------------------|-------|----------------|--------|-------|
| ID                                  |            |   |    | Default          | Min   | Max            | Min    | Max   |
| .066                                | f nw <     | Enable Function   |    | on               | on    |                | on/off |       |
| .067                                | f nw < off | fTHR OFF  | Hz | 49.70            | 49.70 | 49.70          | 45.00  | 50.00 |
| .068                                | f nw < on  | fTHR ON   | Hz | 49.90            | 47.00 | 50.00          | 45.00  | 50.00 |
| .069                                | T f nw <   | Time OFF  | ms | 500              | 500   | 500            | 0      | 10000 |
| Comment:                            |            | f nw < off has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |        |       |
| Only active for:                    |            | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                     |    |                  |       |                |        |       |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                 |       | Conformity Range          |          | Possible Range |          |      |
|-------------------------------------|-----------|-----------------|-------|---------------------------|----------|----------------|----------|------|
| ID                                  |           |                 |       | Default                   | Min      | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function |       | on                        | on / off |                | on / off |      |
| .091                                | RoCoF off | RoCoFTHR OFF    | mHz/s | 1000                      | 1000     | 2000           | 100      | 5000 |
| .092                                | RoCoF on  | RoCoFTHR ON     | mHz/s | 800                       | 100      | 2000           | 100      | 5000 |
| .093                                | RoCoF t   | Time OFF        | ms    | 0                         | 0        | 0              | 0        | 5000 |
| .111                                | RoCoF wnd | Window length   | ms    | Fixed window length 100ms |          |                |          |      |

| Phase Shift (PShift) |  |  |  | Conformity Range |     | Possible Range |     |     |
|----------------------|--|--|--|------------------|-----|----------------|-----|-----|
| ID                   |  |  |  | Default          | Min | Max            | Min | Max |
|                      |  |  |  |                  |     |                |     |     |

|          |            |   |  |    |   |          |   |          |    |
|----------|------------|---|--|----|---|----------|---|----------|----|
| .094     | PShift     | Enable Function   |  |    | off   | on / off |   | on / off |    |
| .095     | PShift off | PShift <sub>THR</sub> OFF   |  | °  | 7   | 7        | 7 | 3        | 15 |
| .096     | PShift on  | PShift <sub>THR</sub> ON  |  | °  | 5   | 3        | 7 | 3        | 15 |
|          |            | Time OFF  |  | ms | Fixed to the fastest possible disconnection |          |   |          |    |
| .112     | PShift wnd | Window length   |  | ms | Fixed window length 100ms                   |          |   |          |    |
| Comment: |            | PShift off has a fixed offset of 1° subtracted from the displayed value |  |    |   |          |   |          |    |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |      |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|------|
| ID                     | Default   |          |                        | Min   | Max | Min   | Max |      |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |      |
| .100                   | Contact t | Time OFF | ms                     | 300   | 100 | 300   | 10  | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |      |

| Turn-on delay |            |              |   | Conformity Range |     | Possible Range |     |
|---------------|------------|--------------|---|------------------|-----|----------------|-----|
| ID            | Default    |              |   | Min              | Max | Min            | Max |
| .102          | T on delay | Turn on time | s | 60               | 60  | 0              | 900 |

| Password |         |   |  |  |   |     |     |
|----------|---------|---|--|--|---|-----|-----|
| ID       | Default |   |  |  |   | Min | Max |
| .106     | PW1     | 1 <sup>st</sup> digit of Password   |  |  | 0 | 0   | 9   |
| .107     | PW2     | 2 <sup>nd</sup> digit of Password   |  |  | 0 | 0   | 9   |
| .108     | PW3     | 3 <sup>rd</sup> digit of Password   |  |  | 0 | 0   | 9   |
| .109     | PW4     | 4 <sup>th</sup> digit of Password   |  |  | 0 | 0   | 9   |
| Remark:  |         | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |   |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | off |
| Phase shift ( $\Delta\Phi$ )  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.30 C10-11:2019 LV-ASS [ID 602] Automatic Separation System / Low Voltage**

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 1ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |     |        |
|------------------------------|------------|---|-------|------------------|-----|----------------|-----|--------|
| ID                           |            | Default   |       | Min              | Max | Min            | Max |        |
| .019                         | U LN > off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 120            | 100 | 135    |
| .020                         | U LN > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 120            | 100 | 135    |
| .021                         | T U LN >   | Time OFF  | ms    | 100              | 100 | 100000         | 100 | 100000 |
| Comment:                     |            | U LN > off has a fixed offset of 0.25% UNOM subtracted from the displayed value |       |                  |     |                |     |        |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                           |       |                  |     |                |     |        |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|--------|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |        |
| .023                          | U LN < off | U <sub>THR</sub> OFF   | %Unom | 80               | 20  | 100            | 0   | 100    |
| .024                          | U LN < on  | U <sub>THR</sub> ON  | %Unom | 85               | 50  | 100            | 0   | 100    |
| .025                          | T U LN <   | Time OFF   | ms    | 100              | 100 | 100000         | 100 | 100000 |
| Comment:                      |            | U LN < off has a fixed offset of 0.25% UNOM added to the displayed value |       |                  |     |                |     |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                   |       |                  |     |                |     |        |

| 10 minutes average overvoltage |          |                      |       | Conformity Range                        |     | Possible Range |         |     |
|--------------------------------|----------|----------------------|-------|---|-----|----------------|---------|-----|
| ID                             |          |                      |       | Default                                 | Min | Max            | Min     | Max |
| .042                           | Uavg     | Enable function      |       | on                                      | on  |                | on /off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 110                                     | 100 | 115            | 100     | 135 |
|                                |          | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (1% UNOM)              |     |                |         |     |
|                                |          | Time OFF             | ms    | Fixed to fastest possible disconnection |     |                |         |     |

| Overfrequency1   |         |   |    | Conformity Range                        |       | Possible Range |       |       |  |  |  |  |  |
|------------------|---------|---|----|---|-------|----------------|-------|-------|--|--|--|--|--|
| ID               |         |   |    | Default                                 | Min   | Max            | Min   | Max   |  |  |  |  |  |
| .055             | f > off | f <sub>THR</sub> OFF  | Hz | 51.50                                   | 50.00 | 52.00          | 50.00 | 55.00 |  |  |  |  |  |
| .056             | f > on  | f <sub>THR</sub> ON   | Hz | 50.10                                   | 50.00 | 52.00          | 50.00 | 55.00 |  |  |  |  |  |
|                  |         | Time OFF  | ms | Fixed to fastest possible disconnection |       |                |       |       |  |  |  |  |  |
| Comment:         |         | f > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |   |       |                |       |       |  |  |  |  |  |
| Only active for: |         | Voltage > 20% UNOM  |    |   |       |                |       |       |  |  |  |  |  |

| Underfrequency1  |         |  |    | Conformity Range                        |       | Possible Range |       |       |  |  |  |  |  |
|------------------|---------|--|----|---|-------|----------------|-------|-------|--|--|--|--|--|
| ID               |         |  |    | Default                                 | Min   | Max            | Min   | Max   |  |  |  |  |  |
| .059             | f < off | f <sub>THR</sub> OFF   | Hz | 47.50                                   | 47.00 | 50.00          | 40.00 | 50.00 |  |  |  |  |  |
| .060             | f < on  | f <sub>THR</sub> ON  | Hz | 49.90                                   | 47.00 | 50.00          | 40.00 | 50.00 |  |  |  |  |  |
|                  |         | Time OFF   | ms | Fixed to fastest possible disconnection |       |                |       |       |  |  |  |  |  |
| Comment:         |         | f < off has a fixed offset of 0.01 Hz added to the displayed value |    |   |       |                |       |       |  |  |  |  |  |
| Only active for: |         | Voltage > 20% UNOM   |    |   |       |                |       |       |  |  |  |  |  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |       |                 |  | Conformity Range |          | Possible Range |          |     |
|-------------------------------------|-------|-----------------|--|------------------|----------|----------------|----------|-----|
| ID                                  |       |                 |  | Default          | Min      | Max            | Min      | Max |
| .090                                | RoCoF | Enable Function |  | off              | on / off |                | on / off |     |

|      |           |                          |       |                           |      |      |     |      |
|------|-----------|--------------------------|-------|---------------------------|------|------|-----|------|
| .091 | RoCoF off | RoCoF <sub>THR</sub> OFF | mHz/s | 1000                      | 1000 | 1000 | 100 | 2000 |
| .092 | RoCoF on  | RoCoF <sub>THR</sub> ON  | mHz/s | 800                       | 100  | 1000 | 100 | 1000 |
| .093 | RoCoF t   | Time OFF                 | ms    | 0                         | 0    | 0    | 0   | 1000 |
| .111 | RoCoF wnd | Window length            | ms    | Fixed window length 100ms |      |      |     |      |

| Phase Shift (PShift) |            |   |  | Conformity Range |   | Possible Range |     |          |
|----------------------|------------|---|--|------------------|---|----------------|-----|----------|
| ID                   |            |   |  | Default          | Min   | Max            | Min | Max      |
| .094                 | PShift     | Enable Function   |  |                  | on  | on / off       |     | on / off |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   |  | °                | 7   | 7              | 3   | 15       |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °                | 5   | 3              | 3   | 15       |
|                      |            | Time OFF  |  | ms               | Fixed to the fastest possible disconnection |                |     |          |
| .112                 | PShift wnd | Window length   |  | ms               | Fixed window length 100ms                   |                |     |          |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |  |                  |   |                |     |          |

| Auxiliary Contact type |           |          |                        | Conformity Range |     | Possible Range         |                        |    |      |
|------------------------|-----------|----------|------------------------|------------------|-----|------------------------|------------------------|----|------|
| ID                     |           |          | Default                | Min              | Max | Min                    | Max                    |    |      |
| .099                   | Contact   | Type     | dis. (disabled)        |                  |     | n.o. (normally opened) | n.o. (normally opened) |    |      |
|                        |           |          |                        |                  |     | n.c. (normally closed) | n.c. (normally closed) |    |      |
|                        |           |          |                        |                  |     | dis. (disabled)        | dis. (disabled)        |    |      |
| .100                   | Contact t | Time OFF | ms                     | 300              |     | 100                    | 300                    | 10 | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  |     | n.o. (normally opened) | n.o. (normally opened) |    |      |
|                        |           |          |                        |                  |     | n.c. (normally closed) | n.c. (normally closed) |    |      |
|                        |           |          |                        |                  |     | dis. (disabled)        | dis. (disabled)        |    |      |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 0   | 900 |

|          |  |
|----------|--|
| Password |  |
|----------|--|

| ID      |     |   | Default | Min | Max |
|---------|-----|---|---------|-----|-----|
| .106    | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) (Δf)  | off |
| Phase shift (ΔΦ)  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set |

|  |  |                                 |
|--|--|---------------------------------|
|  |  | b: Version of Configuration set |
|--|--|---------------------------------|

### 10.31 C10-11:2021 HV-IP [ID 653] Interface Protection / High Voltage

| Connection Mode |            |         | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|---------|------------------|--|--|--|--|
| ID              |            | Default |                  |  |  |  |  |
| .003            | Connection | 3-wire  | 3-wire           |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |
| .007              | Errtol | Fixed to 1ch  |                  |  |  |                |  |  |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |  |                |  |  |  |

| Overvoltage1 Line to Line |            |   |       | Conformity Range |     | Possible Range |     |       |
|---------------------------|------------|---|-------|------------------|-----|----------------|-----|-------|
| ID                        |            | Default   |       | Min              | Max | Min            | Max |       |
| .011                      | U LL > off | U <sub>THR</sub> OFF  | %Unom | 110              | 100 | 110            | 100 | 135   |
| .012                      | U LL > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 120            | 100 | 135   |
| .013                      | T U LL >   | Time OFF  | ms    | 1000             | 0   | 3000           | 0   | 10000 |
| Comment:                  |            | U LL > off has a fixed offset of 0.25% UNOM subtracted from the displayed value |       |                  |     |                |     |       |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)  |       |                  |     |                |     |       |

| Undervoltage1 Line to Line |            |  |       | Conformity Range |     | Possible Range |     |       |
|----------------------------|------------|--|-------|------------------|-----|----------------|-----|-------|
| ID                         |            | Default  |       | Min              | Max | Min            | Max |       |
| .015                       | U LL < off | U <sub>THR</sub> OFF   | %Unom | 70               | 50  | 85             | 0   | 100   |
| .016                       | U LL < on  | U <sub>THR</sub> ON  | %Unom | 90               | 50  | 100            | 0   | 100   |
| .017                       | T U LL <   | Time OFF   | ms    | 1500             | 0   | 1500           | 0   | 10000 |
| Comment:                   |            | U LL < off has a fixed offset of 0.25% UNOM added to the displayed value |       |                  |     |                |     |       |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                 |       |                  |     |                |     |       |

| Overvoltage2 Line to Line |            |   |         | Conformity Range |     | Possible Range |     |       |
|---------------------------|------------|---|---------|------------------|-----|----------------|-----|-------|
| ID                        |            |   | Default | Min              | Max | Min            | Max |       |
| .027                      | U LL>> off | U <sub>THR</sub> OFF  | %Unom   | 115              | 110 | 130            | 100 | 135   |
| .028                      | U LL>> on  | U <sub>THR</sub> ON   | %Unom   | 114              | 100 | 120            | 100 | 135   |
| .029                      | T U LL>>   | Time OFF  | ms      | 0                | 0   | 0              | 0   | 10000 |
| Comment:                  |            | U LL>> off has a fixed offset of 0.25% UNOM subtracted from the displayed value |         |                  |     |                |     |       |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)  |         |                  |     |                |     |       |

|                  |                    |  |  |  |  |  |  |
|------------------|--------------------|--|--|--|--|--|--|
| Only active for: | Voltage > 20% UNOM |  |  |  |  |  |  |
|------------------|--------------------|--|--|--|--|--|--|

| Underfrequency1  |         |  |    | Conformity Range |       | Possible Range |       |       |
|------------------|---------|--|----|------------------|-------|----------------|-------|-------|
| ID               |         |  |    | Default          | Min   | Max            | Min   | Max   |
| .059             | f < off | fTHR OFF   | Hz | 47.50            | 47.50 | 47.50          | 40.00 | 50.00 |
| .060             | f < on  | fTHR ON  | Hz | 49.90            | 47.00 | 50.00          | 40.00 | 50.00 |
| .061             | T f <   | Time OFF   | ms | 0                | 0     | 0              | 0     | 10000 |
| Comment:         |         | f < off has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |       |       |
| Only active for: |         | Voltage > 20% UNOM   |    |                  |       |                |       |       |

| Overfrequency nw (narrower window) |            |  |    | Conformity Range |       | Possible Range |        |       |
|------------------------------------|------------|--|----|------------------|-------|----------------|--------|-------|
| ID                                 |            |  |    | Default          | Min   | Max            | Min    | Max   |
| .062                               | f nw >     | Enable Function  |    | on               | on    |                | on/off |       |
| .063                               | f nw > off | fTHR OFF   | Hz | 50.30            | 50.30 | 50.30          | 50.00  | 55.00 |
| .064                               | f nw > on  | fTHR ON  | Hz | 50.10            | 50.00 | 52.00          | 50.00  | 55.00 |
| .065                               | T f nw >   | Time OFF   | ms | 500              | 500   | 500            | 0      | 10000 |
| Comment:                           |            | f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |       |                |        |       |
| Only active for:                   |            | Dig Input5=HIGH (local setting)  |    |                  |       |                |        |       |

| Underfrequency nw (narrower window) |            |   |    | Conformity Range |       | Possible Range |        |       |
|-------------------------------------|------------|---|----|------------------|-------|----------------|--------|-------|
| ID                                  |            |   |    | Default          | Min   | Max            | Min    | Max   |
| .066                                | f nw <     | Enable Function   |    | on               | on    |                | on/off |       |
| .067                                | f nw < off | fTHR OFF  | Hz | 49.70            | 49.70 | 49.70          | 45.00  | 50.00 |
| .068                                | f nw < on  | fTHR ON   | Hz | 49.90            | 47.00 | 50.00          | 45.00  | 50.00 |
| .069                                | T f nw <   | Time OFF  | ms | 500              | 500   | 500            | 0      | 10000 |
| Comment:                            |            | f nw < off has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |        |       |
| Only active for:                    |            | Dig Input5=HIGH (local setting)                                       |    |                  |       |                |        |       |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |  | Conformity Range |                           | Possible Range |          |     |      |
|-------------------------------------|-----------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|------|
| ID                                  |           |                          |  | Default          | Min                       | Max            | Min      | Max |      |
| .090                                | RoCoF     | Enable Function          |  | on               | on / off                  |                | on / off |     |      |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 1000           | 2000     | 100 | 5000 |
| .092                                | RoCoF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 800                       | 100            | 2000     | 100 | 5000 |
| .093                                | RoCoF t   | Time OFF                 |  | ms               | 0                         | 0              | 0        | 0   | 5000 |
| .111                                | RoCoF wnd | Window length            |  | ms               | Fixed window length 100ms |                |          |     |      |

| Phase Shift (PShift) |            |   |  | Conformity Range |   | Possible Range |          |     |    |
|----------------------|------------|---|--|------------------|---|----------------|----------|-----|----|
| ID                   |            |   |  | Default          | Min   | Max            | Min      | Max |    |
| .094                 | PShift     | Enable Function   |  | off              | on / off                                    |                | on / off |     |    |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   |  | °                | 7   | 7              | 7        | 3   | 15 |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °                | 5   | 3              | 7        | 3   | 15 |
|                      |            | Time OFF  |  | ms               | Fixed to the fastest possible disconnection |                |          |     |    |
| .112                 | PShift wnd | Window length   |  | ms               | Fixed window length 100ms                   |                |          |     |    |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |  |                  |   |                |          |     |    |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range |   |      |
|------------------------|-----------|----------|------------------------|------------------|---|----------------|---|------|
| ID                     |           |          | Default                | Min              | Max   | Min            | Max   |      |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |      |
| .100                   | Contact t | Time OFF | ms                     | 300              | 100   | 300            | 10  | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |      |

| Turn-on delay |  |  |  | Conformity Range |     | Possible Range |     |     |
|---------------|--|--|--|------------------|-----|----------------|-----|-----|
| ID            |  |  |  | Default          | Min | Max            | Min | Max |
|               |  |  |  |                  |     |                |     |     |

|      |            |              |   |    |    |    |   |     |
|------|------------|--------------|---|----|----|----|---|-----|
| .102 | T on delay | Turn on time | s | 60 | 60 | 60 | 0 | 900 |
|------|------------|--------------|---|----|----|----|---|-----|

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | off   |
| Undervoltage LL (UΔ)  | off   |
| Overvoltage LN (UY)   | off   |
| Undervoltage LN (UY)  | off   |
| 10-min overvoltage (Ü)  | off   |
| Overfrequency (f)   | off   |
| Underfrequency (f)  | off   |
| RoCoF (Rate of Change of Frequency) (Δf)  | off   |
| Phase shift (ΔΦ)  | off   |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |               |  |
|--------------------|---------------|--|
| ID                 |               |  |
| .105               | ID:xxxxxxxxxx | xxxxxxxxxx = Device ID                   |
|                    | SW: aa.dd.ccb | dd: Software version of Display Software |

|  |  |   |
|--|--|---|
|  |  | aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |
|--|--|---|

### 10.32 C10-11:2019 HV-ASS [ID 652] Automatic Separation System / High Voltage

| Connection Mode |            |         | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|---------|------------------|--|--|--|--|
| ID              |            | Default |                  |  |  |  |  |
| .003            | Connection | 3-wire  | 3-wire           |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |            |   |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|------------|---|-------|------------------|-----|----------------|-----|--------|
| ID                        |            | Default   |       | Min              | Max | Min            | Max |        |
| .011                      | U LL > off | UTHR OFF  | %Unom | 115              | 100 | 120            | 100 | 135    |
| .012                      | U LL > on  | UTHR ON   | %Unom | 109              | 100 | 120            | 100 | 135    |
| .013                      | T U LL >   | Time OFF  | ms    | 100              | 100 | 100000         | 100 | 100000 |
| Comment:                  |            | U LL > off has a fixed offset of 0.25% UNOM subtracted from the displayed value |       |                  |     |                |     |        |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)  |       |                  |     |                |     |        |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| 10 minutes average overvoltage |          |                      |       | Conformity Range                        |     | Possible Range |         |     |
|--------------------------------|----------|----------------------|-------|---|-----|----------------|---------|-----|
| ID                             |          |                      |       | Default                                 | Min | Max            | Min     | Max |
| .042                           | Uavg     | Enable function      |       | on                                      | on  |                | on /off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 110                                     | 100 | 115            | 100     | 135 |
|                                |          | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (1% UNOM)              |     |                |         |     |
|                                |          | Time OFF             | ms    | Fixed to fastest possible disconnection |     |                |         |     |

| Frequency measuring in general |  |         | Conformity Range |     | Possible Range |     |
|--------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                             |  | Default | Min              | Max | Min            | Max |

|      |       |               |    |                           |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|
| .113 | F wnd | Window length | ms | Fixed window length 100ms |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|

| Rate of Change of Frequency (RoCoF) |           |                          |       | Conformity Range          |          | Possible Range |          |      |
|-------------------------------------|-----------|--------------------------|-------|---------------------------|----------|----------------|----------|------|
| ID                                  |           |                          |       | Default                   | Min      | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function          |       | off                       | on / off |                | on / off |      |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF | mHz/s | 1000                      | 1000     | 1000           | 100      | 2000 |
| .092                                | RoCoF on  | RoCoF <sub>THR</sub> ON  | mHz/s | 800                       | 100      | 1000           | 100      | 1000 |
| .093                                | RoCoF t   | Time OFF                 |       | ms                        | 0        | 0              | 0        | 1000 |
| .111                                | RoCoF wnd | Window length            | ms    | Fixed window length 100ms |          |                |          |      |

| Phase Shift (PShift) |            |   |    | Conformity Range                            |          | Possible Range |          |     |
|----------------------|------------|---|----|---|----------|----------------|----------|-----|
| ID                   |            |   |    | Default                                     | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function   |    | on  | on / off |                | on / off |     |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   | °  | 7   | 7        | 7              | 3        | 15  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 5   | 3        | 7              | 3        | 15  |
|                      |            | Time OFF  | ms | Fixed to the fastest possible disconnection |          |                |          |     |
| .112                 | PShift wnd | Window length   | ms | Fixed window length 100ms                   |          |                |          |     |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |    |   |          |                |          |     |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range  |     |      |
|------------------------|-----------|----------|------------------------|------------------|---|---|-----|------|
| ID                     |           |          | Default                | Min              | Max   | Min   | Max |      |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |      |
| .100                   | Contact t | Time OFF | ms                     | 300              | 100   | 300   | 10  | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |      |

| Turn-on delay |           |              |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---------|------------------|-----|----------------|-----|
| ID            |           |              | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s       | 60               | 60  | 0              | 900 |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | off   |
| Undervoltage LL (UΔ)  | off   |
| Overvoltage LN (UY)   | off   |
| Undervoltage LN (UY)  | off   |
| 10-min overvoltage (Ü)  | off   |
| Overfrequency (f)   | off   |
| Underfrequency (f)  | off   |
| RoCoF (Rate of Change of Frequency) (Δf)  | off   |
| Phase shift (ΔΦ)  | off   |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |  |
|--------------------|--|
| ID                 |  |
|                    |  |

|      |                                   |   |
|------|-----------------------------------|---|
| .105 | ID:xxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |
|------|-----------------------------------|---|

### 10.33 NA/EEA- CH 2014 [ID 1200] Low Voltage Type A up to 1MW

| Connection Mode |            |                | Conformity Range                               |  |  | Possible Range                                 |  |
|-----------------|------------|----------------|--|--|--|--|--|
| ID              |            | Default        |  |  |  |  |  |
| .003            | Connection | 4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                        |           | Default  |       | Min              | Max | Min            | Max |
| .010                      | ULL >     | Enable function  | off   | on / off         |     | on /off        |     |
| .011                      | ULL > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100 | 115            | 100 |
| .012                      | ULL > on  | U <sub>THR</sub> ON  | %Unom | 110              | 100 | 110            | 100 |
| .013                      | T ULL >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                     |       |                  |     |                |     |
| Comment:                  |           | ULL > on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |     |

| Undervoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|----------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                         |           | Default                                  |       | Min              | Max | Min            | Max |
| .015                       | ULL < off | U <sub>THR</sub> OFF                     | %Unom | 80               | 10  | 100            | 10  |
| .016                       | ULL < on  | U <sub>THR</sub> ON                      | %Unom | 90               | 90  | 100            | 10  |
| .017                       | T ULL <   | Time OFF                                 | ms    | 100              | 50  | 180000         | 50  |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |     |                |     |

|          |   |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|
| Comment: | ULL < on has a fixed offset of 0.5% UNOM added to the displayed value |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |  |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|-----------|--|-------|------------------|----------|----------------|---------|--------|
| ID                           |           |  |       | Default          | Min      | Max            | Min     | Max    |
| .018                         | ULN >     | Enable function  |       | off              | on / off |                | on /off |        |
| .019                         | ULN > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100      | 115            | 100     | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON  | %Unom | 110              | 100      | 110            | 100     | 135    |
| .021                         | T ULN >   | Time OFF   | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                        |       |                  |          |                |         |        |
| Comment:                     |           | ULN > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|-----------|---|-------|------------------|-----|----------------|-----|--------|
| ID                            |           |   |       | Default          | Min | Max            | Min | Max    |
| .023                          | ULN < off | U <sub>THR</sub> OFF  | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | ULN < on  | U <sub>THR</sub> ON   | %Unom | 90               | 90  | 100            | 10  | 100    |
| .025                          | T ULN <   | Time OFF  | ms    | 100              | 50  | 180000         | 50  | 180000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                |       |                  |     |                |     |        |
| Comment:                      |           | ULN < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|------------|---|-------|------------------|-----|----------------|-----|--------|
| ID                        |            |   |       | Default          | Min | Max            | Min | Max    |
| .027                      | ULL >> off | U <sub>THR</sub> OFF  | %Unom | 115              | 100 | 125            | 100 | 135    |
| .028                      | ULL >> on  | U <sub>THR</sub> ON   | %Unom | 110              | 100 | 110            | 100 | 135    |
| .029                      | T ULL >>   | Time OFF  | ms    | 100              | 50  | 180000         | 50  | 180000 |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |     |                |     |        |
| Comment:                  |            | ULL >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |        |

| Overvoltage2 Line to Neutral |            |                      |       | Conformity Range |     | Possible Range |     |     |
|------------------------------|------------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                           |            |                      |       | Default          | Min | Max            | Min | Max |
| .035                         | ULN >> off | U <sub>THR</sub> OFF | %Unom | 115              | 100 | 125            | 100 | 135 |
| .036                         | ULN >> on  | U <sub>THR</sub> ON  | %Unom | 110              | 100 | 110            | 100 | 135 |

|                  |   |          |    |     |    |        |    |        |
|------------------|---|----------|----|-----|----|--------|----|--------|
| .037             | T ULN >>  | Time OFF | ms | 100 | 50 | 180000 | 50 | 180000 |
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                        |          |    |     |    |        |    |        |
| Comment:         | ULN >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |          |    |     |    |        |    |        |

| 10 minutes average overvoltage |            |                      |         | Conformity Range                        |        | Possible Range |         |     |
|--------------------------------|------------|----------------------|---------|---|--------|----------------|---------|-----|
| ID                             |            |                      | Default | Min                                     | Max    | Min            | Max     |     |
| .042                           | U10min     | Enable function      |         | on                                      | on/off |                | on /off |     |
| .043                           | U10min off | U <sub>THR</sub> OFF | %Unom   | 110                                     | 110    | 115            | 100     | 135 |
|                                |            | U <sub>THR</sub> ON  | %Unom   | Fixed Hysteresis (0.9% UNOM)            |        |                |         |     |
|                                |            | Time OFF             | ms      | Fixed to fastest possible disconnection |        |                |         |     |

| Overfrequency1 |  |                      |         | Conformity Range |       | Possible Range |       |        |
|----------------|--|----------------------|---------|------------------|-------|----------------|-------|--------|
| ID             |  |                      | Default | Min              | Max   | Min            | Max   |        |
| .055           | f > off  | f <sub>THR</sub> OFF | Hz      | 51.50            | 50.00 | 53.00          | 50.00 | 55.00  |
| .056           | f > on   | f <sub>THR</sub> ON  | Hz      | 50.05            | 50.00 | 50.05          | 50.00 | 55.00  |
| .057           | T f >  | Time OFF             | ms      | 50               | 50    | 50             | 50    | 180000 |
| Comment:       | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |                      |         |                  |       |                |       |        |

| Underfrequency1 |   |                      |         | Conformity Range |       | Possible Range |       |        |
|-----------------|---|----------------------|---------|------------------|-------|----------------|-------|--------|
| ID              |   |                      | Default | Min              | Max   | Min            | Max   |        |
| .059            | f < off   | f <sub>THR</sub> OFF | Hz      | 47.50            | 47.00 | 50.00          | 45.00 | 50.00  |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz      | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061            | T f <   | Time OFF             | ms      | 50               | 50    | 50             | 50    | 180000 |
| Comment:        | f < on has a fixed offset of 0.01 Hz added to the displayed value |                      |         |                  |       |                |       |        |

| Frequency measuring in general |       |               |         | Conformity Range             |     | Possible Range |     |
|--------------------------------|-------|---------------|---------|------------------------------|-----|----------------|-----|
| ID                             |       |               | Default | Min                          | Max | Min            | Max |
| .113                           | F wnd | Window length |         | ms Fixed window length 100ms |     |                |     |

| Auxiliary Contact type |  |  |         | Conformity Range |     | Possible Range |     |
|------------------------|--|--|---------|------------------|-----|----------------|-----|
| ID                     |  |  | Default | Min              | Max | Min            | Max |
|                        |  |  |         |                  |     |                |     |

|      |           |          |                        |                |   |   |
|------|-----------|----------|------------------------|----------------|---|---|
| .099 | Contact   | Type     | n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)                    | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |
| .100 | T Contact | Time OFF | ms                     | Fixed to 500ms |   |   |
| .114 | I3 STOP   | Type     | n.o. (normally opened) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |      |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|------|
| ID            |           |              |   | Default          | Min | Max            | Min | Max  |
| .102          | Ton delay | Turn on time | s | 120              | 0   | 1800           | 0   | 1800 |

| Password |     |   |  |  |  |         |     |     |
|----------|-----|---|--|--|--|---------|-----|-----|
| ID       |     |   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |  |         | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |  |         | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |  |         | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b> |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)                                     | on  |
| Undervoltage LL (UΔ)                                    | on  |
| Overvoltage LN (UY)                                     | on  |
| Undervoltage LN (UY)                                    | on  |
| 10-min overvoltage ( $\bar{U}$ )                        | on  |
| Overfrequency (f)                                       | on  |

|   |    |
|---|----|
| Underfrequency (f)  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| Phase shift ( $\Delta\Phi$ )  | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |  |
|--------------------|--------------------------------|--|
| ID                 |                                |  |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.34 NA/EEA-NE7 - CH 2020 [ID 1220] Low Voltage Type A > 800W to ≤ 250kW**

| Connection Mode |            |                | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|----------------|------------------|--|--|--|--|
| ID              |            | Default        |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN+LL) | 4-wire (LN+LL)   |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|-----------|--|-------|------------------|-----|----------------|-----|--------|
| ID                        |           | Default  |       | Min              | Max | Min            | Max |        |
| .010                      | ULL >     | Enable function  | off   | on / off         |     | on /off        |     |        |
| .011                      | ULL > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100 | 115            | 100 | 135    |
| .012                      | ULL > on  | U <sub>THR</sub> ON  | %Unom | 110              | 100 | 110            | 100 | 135    |
| .013                      | T ULL >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  | 180000 |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                     |       |                  |     |                |     |        |
| Comment:                  |           | ULL > on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |     |        |

| Undervoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |        |
|----------------------------|-----------|--|-------|------------------|-----|----------------|-----|--------|
| ID                         |           | Default                                  |       | Min              | Max | Min            | Max |        |
| .015                       | ULL < off | U <sub>THR</sub> OFF                     | %Unom | 80               | 10  | 100            | 10  | 100    |
| .016                       | ULL < on  | U <sub>THR</sub> ON                      | %Unom | 85               | 85  | 100            | 10  | 100    |
| .017                       | T ULL <   | Time OFF                                 | ms    | 1500             | 50  | 10000          | 50  | 180000 |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |     |                |     |        |

|          |   |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|
| Comment: | ULL > on has a fixed offset of 0.5% UNOM added to the displayed value |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|-----------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |           |   |       | Default          | Min      | Max            | Min     | Max    |
| .018                         | ULN >     | Enable function   |       | off              | on / off |                | on /off |        |
| .019                         | ULN > off | U <sub>THR</sub> OFF  | %Unom | 110              | 100      | 115            | 100     | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON   | %Unom | 110              | 100      | 110            | 100     | 135    |
| .021                         | T ULN >   | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |       |                  |          |                |         |        |
| Comment:                     |           | ULN > on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|-----------|---|-------|------------------|-----|----------------|-----|--------|
| ID                            |           |   |       | Default          | Min | Max            | Min | Max    |
| .023                          | ULN < off | U <sub>THR</sub> OFF  | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | ULN < on  | U <sub>THR</sub> ON   | %Unom | 85               | 85  | 100            | 10  | 100    |
| .025                          | T ULN <   | Time OFF  | ms    | 1500             | 50  | 10000          | 50  | 180000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |       |                  |     |                |     |        |
| Comment:                      |           | ULN > on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|------------|---|-------|------------------|-----|----------------|-----|--------|
| ID                        |            |   |       | Default          | Min | Max            | Min | Max    |
| .027                      | ULL >> off | U <sub>THR</sub> OFF  | %Unom | 120              | 100 | 125            | 100 | 135    |
| .028                      | ULL >> on  | U <sub>THR</sub> ON   | %Unom | 110              | 100 | 110            | 100 | 135    |
| .029                      | T ULL >>   | Time OFF  | ms    | 100              | 50  | 1000           | 50  | 180000 |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |     |                |     |        |
| Comment:                  |            | ULL >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |        |

| Undervoltage2 Line to Line |            |                      |       | Conformity Range |     | Possible Range |     |     |
|----------------------------|------------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                         |            |                      |       | Default          | Min | Max            | Min | Max |
| .031                       | ULL << off | U <sub>THR</sub> OFF | %Unom | 45               | 10  | 100            | 10  | 100 |
| .032                       | ULL << on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 10  | 100 |

|                  |  |          |    |     |    |      |    |        |
|------------------|--|----------|----|-----|----|------|----|--------|
| .033             | T ULL <<   | Time OFF | ms | 300 | 50 | 1000 | 50 | 180000 |
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL)                               |          |    |     |    |      |    |        |
| Comment:         | ULL << on has a fixed offset of 0.5% UNOM added to the displayed value |          |    |     |    |      |    |        |

| Overvoltage2 Line to Neutral |   |          |       |         | Conformity Range |      | Possible Range |        |
|------------------------------|---|----------|-------|---------|------------------|------|----------------|--------|
| ID                           |   |          |       | Default | Min              | Max  | Min            | Max    |
| .035                         | ULN >> off  | UTHR OFF | %Unom | 120     | 100              | 125  | 100            | 135    |
| .036                         | ULN >> on   | UTHR ON  | %Unom | 110     | 100              | 110  | 100            | 135    |
| .037                         | T ULN >>  | Time OFF | ms    | 100     | 50               | 1000 | 50             | 180000 |
| Only active for:             | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                        |          |       |         |                  |      |                |        |
| Comment:                     | ULN >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |          |       |         |                  |      |                |        |

| Undervoltage2 Line to Neutral |  |          |       |         | Conformity Range |      | Possible Range |        |
|-------------------------------|--|----------|-------|---------|------------------|------|----------------|--------|
| ID                            |  |          |       | Default | Min              | Max  | Min            | Max    |
| .039                          | ULN << off   | UTHR OFF | %Unom | 45      | 10               | 100  | 10             | 100    |
| .040                          | ULN << on  | UTHR ON  | %Unom | 85      | 85               | 100  | 10             | 100    |
| .041                          | T ULN <<   | Time OFF | ms    | 300     | 50               | 1000 | 50             | 180000 |
| Only active for:              | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |          |       |         |                  |      |                |        |
| Comment:                      | ULN << on has a fixed offset of 0.5% UNOM added to the displayed value |          |       |         |                  |      |                |        |

| 10 minutes average overvoltage |            |                 |       | Conformity Range                        |        | Possible Range |         |     |  |
|--------------------------------|------------|-----------------|-------|---|--------|----------------|---------|-----|--|
| ID                             |            |                 |       | Default                                 | Min    | Max            | Min     | Max |  |
| .042                           | U10min     | Enable function |       | On                                      | on/off |                | on /off |     |  |
| .043                           | U10min off | UTHR OFF        | %Unom | 110                                     | 110    | 115            | 100     | 135 |  |
|                                |            | UTHR ON         | %Unom | Fixed Hysteresis (0.9% UNOM)            |        |                |         |     |  |
|                                |            | Time OFF        | ms    | Fixed to fastest possible disconnection |        |                |         |     |  |

| Overfrequency1 |         |          |    | Conformity Range |       | Possible Range |       |       |  |
|----------------|---------|----------|----|------------------|-------|----------------|-------|-------|--|
| ID             |         |          |    | Default          | Min   | Max            | Min   | Max   |  |
| .055           | f > off | fTHR OFF | Hz | 51.50            | 50.00 | 53.00          | 50.00 | 55.00 |  |
| .056           | f > on  | fTHR ON  | Hz | 50.1             | 50.00 | 50.1           | 50.00 | 55.00 |  |

|          |       |   |    |    |    |    |    |        |  |
|----------|-------|---|----|----|----|----|----|--------|--|
| .057     | T f > | Time OFF  | ms | 50 | 50 | 50 | 50 | 180000 |  |
| Comment: |       | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |    |    |    |    |        |  |

| Underfrequency1 |         |   |    | Conformity Range |       | Possible Range |       |        |
|-----------------|---------|---|----|------------------|-------|----------------|-------|--------|
| ID              |         |   |    | Default          | Min   | Max            | Min   | Max    |
| .059            | f < off | fTHR OFF  | Hz | 47.50            | 47.00 | 50.00          | 45.00 | 50.00  |
| .060            | f < on  | fTHR ON   | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061            | T f <   | Time OFF  | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:        |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |       |        |

| Rate of Change of Frequency (RoCoF) |           |                 |  | Conformity Range |                           | Possible Range |          |      |
|-------------------------------------|-----------|-----------------|--|------------------|---------------------------|----------------|----------|------|
| ID                                  |           |                 |  | Default          | Min                       | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function |  | off              | on / off                  |                | on / off |      |
| .091                                | RoCoF off | RoCoFTHR OFF    |  | mHz/s            | 2000                      | 2000           | 100      | 5000 |
| .092                                | RoCoF on  | RoCoFTHR ON     |  | mHz/s            | 1900                      | 100            | 100      | 5000 |
| .093                                | RoCoF t   | Time OFF        |  | ms               | 0                         | 0              | 500      | 0    |
| .111                                | RoCoF wnd | Window length   |  | ms               | Fixed window length 500ms |                |          |      |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range |                        | Possible Range |                        |     |
|------------------------|-----------|----------|------------------------|------------------|------------------------|----------------|------------------------|-----|
| ID                     |           |          |                        | Default          | Min                    | Max            | Min                    | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) |                  | n.o. (normally opened) |                | n.o. (normally opened) |     |
|                        |           |          |                        |                  | n.c. (normally closed) |                | n.c. (normally closed) |     |
|                        |           |          |                        |                  | dis. (disabled)        |                |                        |     |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms   |                        |                |                        |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened) |                | n.o. (normally opened) |     |

|  |  |  |  |   |   |
|--|--|--|--|---|---|
|  |  |  |  | n.c. (normally closed)<br>dis. (disabled) | n.c. (normally closed)<br>dis. (disabled) |
|--|--|--|--|---|---|

| Turn-on delay |           |              |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---------|------------------|-----|----------------|-----|
| ID            |           |              | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s       | 60               | 60  | 1800           | 0   |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | on  |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>ID: xxxxxxxxxxxx</p> <p>SW: aa.ddccb</p> <p>xxxxxxxxxx = Device ID</p> <p>dd: Software version of Display Software</p> <p>aa: Software version of Measuring Software</p> <p>cc: Index of Configuration set</p> <p>b: Version of Configuration set</p> |

**10.35 NA/EEA-NE7 - CH 2020 [ID 1221] Low Voltage Type B > 250kW to ≤ 36MW**

| Connection Mode |            |                | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|----------------|------------------|--|--|--|--|
| ID              |            | Default        |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN+LL) | 4-wire (LN+LL)   |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 230.0<br>400.0 | 28.8<br>50.0 | 241.4<br>420.0 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                        |           | Default  |       | Min              | Max | Min            | Max |
| .010                      | ULL >     | Enable function  | off   | on / off         |     | on /off        |     |
| .011                      | ULL > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100 | 115            | 100 |
| .012                      | ULL > on  | U <sub>THR</sub> ON  | %Unom | 110              | 100 | 110            | 100 |
| .013                      | T ULL >   | Time OFF   | ms    | 60000            | 50  | 180000         | 50  |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                     |       |                  |     |                |     |
| Comment:                  |           | ULL > on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |     |                |     |

| Undervoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|----------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                         |           | Default                                  |       | Min              | Max | Min            | Max |
| .015                       | ULL < off | U <sub>THR</sub> OFF                     | %Unom | 80               | 10  | 100            | 10  |
| .016                       | ULL < on  | U <sub>THR</sub> ON                      | %Unom | 85               | 85  | 100            | 10  |
| .017                       | T ULL <   | Time OFF                                 | ms    | 1000             | 50  | 10000          | 50  |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |     |                |     |

|          |   |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|
| Comment: | ULL > on has a fixed offset of 0.5% UNOM added to the displayed value |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|-----------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |           |   |       | Default          | Min      | Max            | Min     | Max    |
| .018                         | ULN >     | Enable function   |       | off              | on / off |                | on /off |        |
| .019                         | ULN > off | U <sub>THR</sub> OFF  | %Unom | 110              | 100      | 115            | 100     | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON   | %Unom | 110              | 100      | 110            | 100     | 135    |
| .021                         | T ULN >   | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |       |                  |          |                |         |        |
| Comment:                     |           | ULN > on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range |     | Possible Range |     |        |
|-------------------------------|-----------|---|-------|------------------|-----|----------------|-----|--------|
| ID                            |           |   |       | Default          | Min | Max            | Min | Max    |
| .023                          | ULN < off | U <sub>THR</sub> OFF  | %Unom | 80               | 10  | 100            | 10  | 100    |
| .024                          | ULN < on  | U <sub>THR</sub> ON   | %Unom | 85               | 85  | 100            | 10  | 100    |
| .025                          | T ULN <   | Time OFF  | ms    | 1000             | 50  | 10000          | 50  | 180000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |       |                  |     |                |     |        |
| Comment:                      |           | ULN > on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |     | Possible Range |     |        |
|---------------------------|------------|---|-------|------------------|-----|----------------|-----|--------|
| ID                        |            |   |       | Default          | Min | Max            | Min | Max    |
| .027                      | ULL >> off | U <sub>THR</sub> OFF  | %Unom | 120              | 100 | 125            | 100 | 135    |
| .028                      | ULL >> on  | U <sub>THR</sub> ON   | %Unom | 11010            | 100 | 110            | 100 | 135    |
| .029                      | T ULL >>   | Time OFF  | ms    | 100              | 50  | 1000           | 50  | 180000 |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |     |                |     |        |
| Comment:                  |            | ULL >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |        |

| Undervoltage2 Line to Line |            |                      |       | Conformity Range |     | Possible Range |     |     |
|----------------------------|------------|----------------------|-------|------------------|-----|----------------|-----|-----|
| ID                         |            |                      |       | Default          | Min | Max            | Min | Max |
| .031                       | ULL << off | U <sub>THR</sub> OFF | %Unom | 45               | 10  | 100            | 10  | 100 |
| .032                       | ULL << on  | U <sub>THR</sub> ON  | %Unom | 85               | 85  | 100            | 10  | 100 |

|                  |  |          |    |     |    |      |    |        |
|------------------|--|----------|----|-----|----|------|----|--------|
| .033             | T ULL <<   | Time OFF | ms | 300 | 50 | 1000 | 50 | 180000 |
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL)                               |          |    |     |    |      |    |        |
| Comment:         | ULL << on has a fixed offset of 0.5% UNOM added to the displayed value |          |    |     |    |      |    |        |

| Overvoltage2 Line to Neutral |   |          |       |         | Conformity Range |      | Possible Range |        |
|------------------------------|---|----------|-------|---------|------------------|------|----------------|--------|
| ID                           |   |          |       | Default | Min              | Max  | Min            | Max    |
| .035                         | ULN >> off  | UTHR OFF | %Unom | 120     | 100              | 125  | 100            | 135    |
| .036                         | ULN >> on   | UTHR ON  | %Unom | 11010   | 100              | 110  | 100            | 135    |
| .037                         | T ULN >>  | Time OFF | ms    | 100     | 50               | 1000 | 50             | 180000 |
| Only active for:             | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                        |          |       |         |                  |      |                |        |
| Comment:                     | ULN >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |          |       |         |                  |      |                |        |

| Undervoltage2 Line to Neutral |  |          |       |         | Conformity Range |      | Possible Range |        |
|-------------------------------|--|----------|-------|---------|------------------|------|----------------|--------|
| ID                            |  |          |       | Default | Min              | Max  | Min            | Max    |
| .039                          | ULN << off   | UTHR OFF | %Unom | 45      | 10               | 100  | 10             | 100    |
| .040                          | ULN << on  | UTHR ON  | %Unom | 85      | 85               | 100  | 10             | 100    |
| .041                          | T ULN <<   | Time OFF | ms    | 300     | 50               | 1000 | 50             | 180000 |
| Only active for:              | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |          |       |         |                  |      |                |        |
| Comment:                      | ULN << on has a fixed offset of 0.5% UNOM added to the displayed value |          |       |         |                  |      |                |        |

| 10 minutes average overvoltage |            |                 |       | Conformity Range                        |        | Possible Range |         |     |  |
|--------------------------------|------------|-----------------|-------|---|--------|----------------|---------|-----|--|
| ID                             |            |                 |       | Default                                 | Min    | Max            | Min     | Max |  |
| .042                           | U10min     | Enable function |       | On                                      | on/off |                | on /off |     |  |
| .043                           | U10min off | UTHR OFF        | %Unom | 110                                     | 110    | 115            | 100     | 135 |  |
|                                |            | UTHR ON         | %Unom | Fixed Hysteresis (0.9% UNOM)            |        |                |         |     |  |
|                                |            | Time OFF        | ms    | Fixed to fastest possible disconnection |        |                |         |     |  |

| Overfrequency1 |         |          |    | Conformity Range |       | Possible Range |       |       |  |
|----------------|---------|----------|----|------------------|-------|----------------|-------|-------|--|
| ID             |         |          |    | Default          | Min   | Max            | Min   | Max   |  |
| .055           | f > off | fTHR OFF | Hz | 51.50            | 50.00 | 53.00          | 50.00 | 55.00 |  |
| .056           | f > on  | fTHR ON  | Hz | 50.1             | 50.00 | 50.1           | 50.00 | 55.00 |  |

|          |       |   |    |    |    |    |    |        |  |
|----------|-------|---|----|----|----|----|----|--------|--|
| .057     | T f > | Time OFF  | ms | 50 | 50 | 50 | 50 | 180000 |  |
| Comment: |       | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |    |    |    |    |        |  |

| Underfrequency1 |         |   |    | Conformity Range |       | Possible Range |       |        |
|-----------------|---------|---|----|------------------|-------|----------------|-------|--------|
| ID              |         |   |    | Default          | Min   | Max            | Min   | Max    |
| .059            | f < off | fTHR OFF  | Hz | 47.50            | 47.00 | 50.00          | 45.00 | 50.00  |
| .060            | f < on  | fTHR ON   | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00  |
| .061            | T f <   | Time OFF  | ms | 50               | 50    | 50             | 50    | 180000 |
| Comment:        |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |       |        |

| Rate of Change of Frequency (RoCoF) |           |                 |  | Conformity Range |                           | Possible Range |          |      |
|-------------------------------------|-----------|-----------------|--|------------------|---------------------------|----------------|----------|------|
| ID                                  |           |                 |  | Default          | Min                       | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function |  | off              | on / off                  |                | on / off |      |
| .091                                | RoCoF off | RoCoFTHR OFF    |  | mHz/s            | 2000                      | 2000           | 100      | 5000 |
| .092                                | RoCoF on  | RoCoFTHR ON     |  | mHz/s            | 1900                      | 100            | 100      | 5000 |
| .093                                | RoCoF t   | Time OFF        |  | ms               | 0                         | 0              | 500      | 0    |
| .111                                | RoCoF wnd | Window length   |  | ms               | Fixed window length 500ms |                |          |      |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range |                        | Possible Range |                        |     |
|------------------------|-----------|----------|------------------------|------------------|------------------------|----------------|------------------------|-----|
| ID                     |           |          |                        | Default          | Min                    | Max            | Min                    | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) |                  | n.o. (normally opened) |                | n.o. (normally opened) |     |
|                        |           |          |                        |                  | n.c. (normally closed) |                | n.c. (normally closed) |     |
|                        |           |          |                        |                  | dis. (disabled)        |                |                        |     |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms   |                        |                |                        |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened) |                | n.o. (normally opened) |     |

|  |  |  |  |   |   |
|--|--|--|--|---|---|
|  |  |  |  | n.c. (normally closed)<br>dis. (disabled) | n.c. (normally closed)<br>dis. (disabled) |
|--|--|--|--|---|---|

| Turn-on delay |           |              |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---------|------------------|-----|----------------|-----|
| ID            |           |              | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s       | 600              | 60  | 1800           | 0   |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | on  |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>ID: xxxxxxxxxxxx</p> <p>SW: aa.ddccb</p> <p>xxxxxxxxxx = Device ID</p> <p>dd: Software version of Display Software</p> <p>aa: Software version of Measuring Software</p> <p>cc: Index of Configuration set</p> <p>b: Version of Configuration set</p> |

### 10.36 EN50549-1:2019 LV Netherlands [ID 901]

| Connection Mode |            |                | Conformity Range                               |  |  | Possible Range                                 |  |
|-----------------|------------|----------------|--|--|--|--|--|
| ID              |            | Default        |  |  |  |  |  |
| .003            | Connection | 4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |               |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|---------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max           |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 100.0<br>50.0 | 230.0<br>400.0 |

| Functional Safety |        |              | Conformity Range |  | Possible Range |  |  |
|-------------------|--------|--------------|------------------|--|----------------|--|--|
| ID                |        | Default      |                  |  |                |  |  |
| .007              | Errtol | Fixed to 2ch |                  |  |                |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |        | Possible Range |        |        |
|---------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                        |           | Default  |       | Min              | Max    | Min            | Max    |        |
| .010                      | ULL >     | Enable Function  |       | on               | on/off |                | on/off |        |
| .011                      | ULL > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100    | 120            | 100    | 135    |
| .012                      | ULL > on  | U <sub>THR</sub> ON  | %Unom | 109              | 100    | 120            | 100    | 135    |
| .013                      | T ULL >   | Time OFF   | ms    | 200              | 100    | 100000         | 100    | 300000 |
| Comment:                  |           | ULL > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                     |       |                  |        |                |        |        |

| Undervoltage1 Line to Line |           |   |       | Conformity Range |        | Possible Range |        |         |
|----------------------------|-----------|---|-------|------------------|--------|----------------|--------|---------|
| ID                         |           | Default   |       | Min              | Max    | Min            | Max    |         |
| ,014                       | ULL <     | Enable Function   |       | on               | on/off |                | on/off |         |
| .015                       | ULL < off | U <sub>THR</sub> OFF  | %Unom | 80               | 20     | 100            | 10     | 100     |
| .016                       | ULL < on  | U <sub>THR</sub> ON   | %Unom | 85               | 50     | 100            | 10     | 100     |
| .017                       | T ULL <   | Time OFF  | ms    | 3000             | 100    | 100000         | 100    | 3000000 |
| Comment:                   |           | ULL < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |        |                |        |         |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                           |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .018                         | ULN >     | Enable Function  |       | on               | on/off |                | on/off |        |
| .019                         | ULN > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100    | 120            | 100    | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON  | %Unom | 109              | 100    | 120            | 100    | 135    |
| .021                         | T ULN >   | Time OFF   | ms    | 200              | 100    | 100000         | 100    | 300000 |
| Comment:                     |           | ULN > on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                        |       |                  |        |                |        |        |

| Undervoltage1 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|-------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                            |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .022                          | ULN <     | Enable Function  |       | on               | on/off |                | on/off |        |
| .023                          | ULN < off | U <sub>THR</sub> OFF   | %Unom | 80               | 20     | 100            | 10     | 100    |
| .024                          | ULN < on  | U <sub>THR</sub> ON  | %Unom | 85               | 50     | 100            | 10     | 100    |
| .025                          | T LN <    | Time OFF   | ms    | 3000             | 100    | 100000         | 0      | 300000 |
| Comment:                      |           | ULN < off has a fixed offset of 0.5% Unom added to the displayed value |       |                  |        |                |        |        |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |                  |        |                |        |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |        | Possible Range |        |        |
|---------------------------|------------|---|-------|------------------|--------|----------------|--------|--------|
| ID                        |            |   |       | Default          | Min    | Max            | Min    | Max    |
| .026                      | ULL >>     | Enable Function   |       | on               | on/off |                | on/off |        |
| .027                      | ULL >> off | U <sub>THR</sub> OFF  | %Unom | 120              | 100    | 120            | 100    | 135    |
| .028                      | ULL >> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100    | 120            | 100    | 135    |
| .029                      | T ULL >    | Time OFF  | ms    | 100              | 100    | 5000           | 100    | 300000 |
| Comment:                  |            | ULL >> on has a fixed offset of 0.5% Unom subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |        |                |        |        |

| Undervoltage2 Line to Line |  |  |  | Conformity Range |  | Possible Range |  |
|----------------------------|--|--|--|------------------|--|----------------|--|
|                            |  |  |  |                  |  |                |  |

| ID               |            |  |       | Default | Min    | Max  | Min    | Max     |
|------------------|------------|--|-------|---------|--------|------|--------|---------|
| ,030             | ULL <<     | Enable Function  |       | on      | on/off |      | on/off |         |
| .031             | ULL << off | U <sub>THR</sub> OFF   | %Unom | 30      | 20     | 100  | 10     | 100     |
| .032             | ULL << on  | U <sub>THR</sub> ON  | %Unom | 85      | 50     | 100  | 10     | 100     |
| .033             | T ULL <<   | Time OFF   | ms    | 100     | 100    | 5000 | 100    | 3000000 |
| Comment:         |            | ULL << on has a fixed offset of 0.5% UNOM added to the displayed value |       |         |        |      |        |         |
| Only active for: |            | Connection Modes: 3-wire, 4-wire (LN+LL)                               |       |         |        |      |        |         |

| Overvoltage2 Line to Neutral |           |  |       | Conformity Range                        |        | Possible Range |        |        |  |  |  |  |  |
|------------------------------|-----------|--|-------|---|--------|----------------|--------|--------|--|--|--|--|--|
| ID                           |           |  |       | Default                                 | Min    | Max            | Min    | Max    |  |  |  |  |  |
| .034                         | ULN>>     | Enable Function  |       | on                                      | on/off |                | on/off |        |  |  |  |  |  |
| .035                         | ULN>> off | U <sub>THR</sub> OFF   | %Unom | 120                                     | 100    | 130            | 100    | 135    |  |  |  |  |  |
| .036                         | ULN>> on  | U <sub>THR</sub> ON  | %Unom | 109                                     | 100    | 120            | 100    | 135    |  |  |  |  |  |
| .037                         | T ULN>>   | Time OFF   | ms    | 100                                     | 100    | 5000           | 100    | 300000 |  |  |  |  |  |
|                              |           | Time OFF   | ms    | Fixed to fastest possible disconnection |        |                |        |        |  |  |  |  |  |
| Comment:                     |           | U LN > off has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |   |        |                |        |        |  |  |  |  |  |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                          |       |   |        |                |        |        |  |  |  |  |  |

| Undervoltage2 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|-------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                            |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .038                          | ULN<<     | Enable Function  |       | on               | on/off |                | on/off |        |
| .039                          | ULN<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 20     | 100            | 10     | 100    |
| .040                          | ULN<< on  | U <sub>THR</sub> ON  | %Unom | 85               | 50     | 100            | 10     | 100    |
| .041                          | T ULN<<   | Time OFF   | ms    | 100              | 100    | 5000           | 100    | 300000 |
| Comment:                      |           | U LN < off has a fixed offset of 0.25% UNOM added to the displayed value |       |                  |        |                |        |        |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                    |       |                  |        |                |        |        |

| 10 minutes average overvoltage |          |                      |       | Conformity Range |          | Possible Range |          |     |
|--------------------------------|----------|----------------------|-------|------------------|----------|----------------|----------|-----|
| ID                             |          |                      |       | Default          | Min      | Max            | Min      | Max |
| .042                           | Uavg     | Enable function      |       | on               | on / off |                | on / off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 110              | 100      | 115            | 100      | 135 |

|      |         |                     |       |   |     |     |     |     |
|------|---------|---------------------|-------|---|-----|-----|-----|-----|
| .044 | Uavg on | U <sub>THR</sub> ON | %Unom | 109                                     | 100 | 115 | 100 | 135 |
|      |         | Time OFF            | ms    | Fixed to fastest possible disconnection |     |     |     |     |

| Zero Voltage Line to Neutral |            |                                  |         | Conformity Range |        | Possible Range |        |        |
|------------------------------|------------|----------------------------------|---------|------------------|--------|----------------|--------|--------|
| ID                           |            |                                  | Default | Min              | Max    | Min            | Max    |        |
| .115                         | Uzero >    | Enable Function                  |         | off              | on/off |                | on/off |        |
| .116                         | Uzero> off | U <sub>THR</sub> OFF             | %Unom   | 20               | 1      | 100            | 1      | 100    |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %Unom   | 15               | 1      | 100            | 1      | 100    |
| .118                         | T Uzero >  | Time OFF                         | ms      | 1500             | 200    | 100000         | 0      | 300000 |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |         |                  |        |                |        |        |

| Overfrequency1 |  |         | Conformity Range |     | Possible Range |     |
|----------------|--|---------|------------------|-----|----------------|-----|
| ID             |  | Default | Min              | Max | Min            | Max |

|                  |         |  |    |       |       |        |        |        |
|------------------|---------|--|----|-------|-------|--------|--------|--------|
| .054             | f >     | Enable Function  |    | on    | on    |        | on/off |        |
| .055             | f > off | fTHR OFF   | Hz | 51.50 | 50.00 | 52.00  | 50.00  | 55.00  |
| .056             | f > on  | fTHR ON  | Hz | 50.10 | 50.00 | 52.00  | 50.00  | 55.00  |
| .057             | T f >   | Time OFF   | ms | 100   | 100   | 100000 | 100    | 300000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |       |       |        |        |        |
| Only active for: |         | Voltage > 20% UNOM   |    |       |       |        |        |        |

| Underfrequency1  |         |   |    | Conformity Range |       | Possible Range |        |        |
|------------------|---------|---|----|------------------|-------|----------------|--------|--------|
| ID               |         |   |    | Default          | Min   | Max            | Min    | Max    |
| .058             | f <     | Enable Function   |    | on               | on    |                | on/off |        |
| .059             | f < off | fTHR OFF  | Hz | 47.50            | 47.00 | 50.00          | 45.00  | 50.00  |
| .060             | f < on  | fTHR ON   | Hz | 48.50            | 47.00 | 50.00          | 45.00  | 50.00  |
| .061             | T f <   | Time OFF  | ms | 100              | 100   | 100000         | 100    | 300000 |
| Comment:         |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |        |        |
| Only active for: |         | Voltage > 20% UNOM  |    |                  |       |                |        |        |

| Overfrequency nw (narrower window) |            |  |    | Conformity Range |        | Possible Range |        |        |
|------------------------------------|------------|--|----|------------------|--------|----------------|--------|--------|
| ID                                 |            |  |    | Default          | Min    | Max            | Min    | Max    |
| .062                               | f nw >     | Enable Function  |    | off              | on/off |                | on/off |        |
| .063                               | f nw > off | fTHR OFF   | Hz | 50.30            | 50.00  | 52.00          | 50.00  | 55.00  |
| .064                               | f nw > on  | fTHR ON  | Hz | 50.10            | 50.00  | 52.00          | 50.00  | 55.00  |
| .065                               | T f nw >   | Time OFF   | ms | 500              | 100    | 5000           | 100    | 300000 |
| Comment:                           |            | f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |        |                |        |        |
| Only active for:                   |            | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                          |    |                  |        |                |        |        |

| Underfrequency nw (narrower window) |            |                 |    | Conformity Range |        | Possible Range |        |       |
|-------------------------------------|------------|-----------------|----|------------------|--------|----------------|--------|-------|
| ID                                  |            |                 |    | Default          | Min    | Max            | Min    | Max   |
| .066                                | f nw <     | Enable Function |    | off              | on/off |                | on/off |       |
| .067                                | f nw < off | fTHR OFF        | Hz | 49.70            | 47.00  | 50.00          | 45.00  | 50.00 |
| .068                                | f nw < on  | fTHR ON         | Hz | 49.80            | 47.00  | 50.00          | 45.00  | 50.00 |

|                  |   |          |    |     |     |      |     |        |
|------------------|---|----------|----|-----|-----|------|-----|--------|
| .069             | T f nw <  | Time OFF | ms | 500 | 100 | 5000 | 100 | 300000 |
| Comment:         | f nw < off has a fixed offset of 0.01 Hz added to the displayed value |          |    |     |     |      |     |        |
| Only active for: | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                     |          |    |     |     |      |     |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |  | Conformity Range |                           | Possible Range |          |     |
|-------------------------------------|-----------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|
| ID                                  |           |                          |  | Default          | Min                       | Max            | Min      | Max |
| .090                                | ROCOF     | Enable Function          |  | off              | on / off                  |                | on / off |     |
| .091                                | ROCOF off | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 200            | 9990     | 100 |
| .092                                | ROCOF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 800                       | 100            | 9990     | 100 |
| .093                                | ROCOF t   | Time OFF                 |  | ms               | 0                         | 0              | 5000     | 0   |
| .111                                | RoCoF wnd | Window length            |  | ms               | Fixed window length 100ms |                |          |     |

| Phase Shift (PShift) |   |                           |  | Conformity Range |   | Possible Range |          |     |
|----------------------|---|---------------------------|--|------------------|---|----------------|----------|-----|
| ID                   |   |                           |  | Default          | Min   | Max            | Min      | Max |
| .094                 | PShift  | Enable Function           |  | off              | on / off                                    |                | on / off |     |
| .095                 | PShift off  | PShift <sub>THR</sub> OFF |  | °                | 7   | 2              | 15       | 2   |
| .096                 | PShift on   | PShift <sub>THR</sub> ON  |  | °                | 5   | 1              | 15       | 1   |
|                      |   | Time OFF                  |  | ms               | Fixed to the fastest possible disconnection |                |          |     |
| .112                 | PShift wnd  | Window length             |  | ms               | Fixed window length 100ms                   |                |          |     |
| Comment:             | PShift off has a fixed offset of 1° subtracted from the displayed value |                           |  |                  |   |                |          |     |

| Auxiliary Contact type |         |      |                 | Conformity Range       |     | Possible Range         |     |
|------------------------|---------|------|-----------------|------------------------|-----|------------------------|-----|
| ID                     |         |      | Default         | Min                    | Max | Min                    | Max |
| .099                   | Contact | Type | dis. (disabled) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |         |      |                 | n.c. (normally closed) |     | n.c. (normally closed) |     |

|      |           |          |                        |     |   |  |   |  |
|------|-----------|----------|------------------------|-----|---|--|---|--|
|      |           |          |                        |     | dis. (disabled)   |  | dis. (disabled)   |  |
| .100 | Contact t | Time OFF | ms                     | 500 |   |  |   |  |
| .114 | I3 STOP   | Type     | n.o. (normally opened) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |

| Turn-on delay |            |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|------------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |            |              |   | Default          | Min | Max            | Min | Max |
| .102          | T on delay | Turn on time | s | 60               | 10  | 600            | 10  | 900 |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

#### **Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|  |     |
|--|-----|
| Overvoltage LL (UΔ)                      | off |
| Undervoltage LL (UΔ)                     | off |
| Overvoltage LN (UY)                      | off |
| Undervoltage LN (UY)                     | off |
| 10-min overvoltage (Ü)                   | off |
| Overfrequency (f)                        | off |
| Underfrequency (f)                       | off |
| RoCoF (Rate of Change of Frequency) (Δf) | off |
| Phase shift (ΔΦ)                         | off |

|   |     |
|---|-----|
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                               |   |
|--------------------|-------------------------------|---|
| ID                 |                               |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

### 10.37 EN50549-2:2019 HV Netherlands [ID 926]

| Connection Mode |            |                | Conformity Range                    |  |  | Possible Range                              |  |
|-----------------|------------|----------------|-------------------------------------|--|--|---|--|
| ID              |            | Default        |                                     |  |  |   |  |
| .003            | Connection | 4-wire (LN+LL) | 3-wire, 4-wire (LN), 4-wire (LN+LL) |  |  | 2-wire, 3-wire, 4-wire (LN), 4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |               | Possible Range |               |                |
|-----------------|------------|------------------|-----|------------------|---------------|----------------|---------------|----------------|
| ID              |            | Default          |     | Min              | Max           | Min            | Max           |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 57.5<br>100.0 | 230.0<br>400.0 | 100.0<br>50.0 | 240.0<br>420.0 |

| Functional Safety |        |              | Conformity Range |  | Possible Range |  |  |
|-------------------|--------|--------------|------------------|--|----------------|--|--|
| ID                |        | Default      |                  |  |                |  |  |
| .007              | Errtol | Fixed to 2ch |                  |  |                |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |        | Possible Range |        |        |
|---------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                        |           | Default  |       | Min              | Max    | Min            | Max    |        |
| .010                      | ULL >     | Enable Function  |       | on               | on/off |                | on/off |        |
| .011                      | ULL > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100    | 120            | 100    | 135    |
| .012                      | ULL > on  | U <sub>THR</sub> ON  | %Unom | 109              | 100    | 120            | 100    | 135    |
| .013                      | T ULL >   | Time OFF   | ms    | 200              | 100    | 100000         | 100    | 300000 |
| Comment:                  |           | ULL > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                     |       |                  |        |                |        |        |

| Undervoltage1 Line to Line |           |   |       | Conformity Range |        | Possible Range |        |         |
|----------------------------|-----------|---|-------|------------------|--------|----------------|--------|---------|
| ID                         |           | Default   |       | Min              | Max    | Min            | Max    |         |
| ,014                       | ULL <     | Enable Function   |       | on               | on/off |                | on/off |         |
| .015                       | ULL < off | U <sub>THR</sub> OFF  | %Unom | 80               | 20     | 100            | 10     | 100     |
| .016                       | ULL < on  | U <sub>THR</sub> ON   | %Unom | 90               | 50     | 100            | 10     | 100     |
| .017                       | T ULL <   | Time OFF  | ms    | 3000             | 100    | 100000         | 100    | 3000000 |
| Comment:                   |           | ULL < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |        |                |        |         |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                           |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .018                         | ULN >     | Enable Function  |       | on               | on/off |                | on/off |        |
| .019                         | ULN > off | U <sub>THR</sub> OFF   | %Unom | 110              | 100    | 120            | 100    | 135    |
| .020                         | ULN > on  | U <sub>THR</sub> ON  | %Unom | 109              | 100    | 120            | 100    | 135    |
| .021                         | T ULN >   | Time OFF   | ms    | 200              | 100    | 100000         | 100    | 300000 |
| Comment:                     |           | ULN > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                        |       |                  |        |                |        |        |

| Undervoltage1 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|-------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                            |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .022                          | ULN <     | Enable Function  |       | on               | on/off |                | on/off |        |
| .023                          | ULN < off | U <sub>THR</sub> OFF   | %Unom | 80               | 20     | 100            | 10     | 100    |
| .024                          | ULN < on  | U <sub>THR</sub> ON  | %Unom | 90               | 50     | 100            | 10     | 100    |
| .025                          | T LN <    | Time OFF   | ms    | 3000             | 100    | 100000         | 0      | 300000 |
| Comment:                      |           | ULN < off has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |        |                |        |        |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |                  |        |                |        |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |        | Possible Range |        |        |
|---------------------------|------------|---|-------|------------------|--------|----------------|--------|--------|
| ID                        |            |   |       | Default          | Min    | Max            | Min    | Max    |
| .026                      | ULL >>     | Enable Function   |       | on               | on/off |                | on/off |        |
| .027                      | ULL >> off | U <sub>THR</sub> OFF  | %Unom | 120              | 100    | 120            | 100    | 135    |
| .028                      | ULL >> on  | U <sub>THR</sub> ON   | %Unom | 109              | 100    | 120            | 100    | 135    |
| .029                      | T ULL >    | Time OFF  | ms    | 100              | 100    | 5000           | 100    | 300000 |
| Comment:                  |            | ULL >> on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |        |                |        |        |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |        |                |        |        |

| Undervoltage2 Line to Line |  |  |  | Conformity Range |  | Possible Range |  |
|----------------------------|--|--|--|------------------|--|----------------|--|
|                            |  |  |  |                  |  |                |  |

| ID               |            |  |       | Default | Min    | Max  | Min    | Max     |
|------------------|------------|--|-------|---------|--------|------|--------|---------|
| ,030             | ULL <<     | Enable Function  |       | on      | on/off |      | on/off |         |
| .031             | ULL << off | U <sub>THR</sub> OFF   | %Unom | 30      | 20     | 100  | 10     | 100     |
| .032             | ULL << on  | U <sub>THR</sub> ON  | %Unom | 90      | 50     | 100  | 10     | 100     |
| .033             | T ULL <<   | Time OFF   | ms    | 100     | 100    | 5000 | 100    | 3000000 |
| Comment:         |            | ULL << on has a fixed offset of 0.5% UNOM added to the displayed value |       |         |        |      |        |         |
| Only active for: |            | Connection Modes: 3-wire, 4-wire (LN+LL)                               |       |         |        |      |        |         |

| Overvoltage2 Line to Neutral |           |  |       | Conformity Range                        |        | Possible Range |        |        |  |  |  |  |  |
|------------------------------|-----------|--|-------|---|--------|----------------|--------|--------|--|--|--|--|--|
| ID                           |           |  |       | Default                                 | Min    | Max            | Min    | Max    |  |  |  |  |  |
| .034                         | ULN>>     | Enable Function  |       | on                                      | on/off |                | on/off |        |  |  |  |  |  |
| .035                         | ULN>> off | U <sub>THR</sub> OFF   | %Unom | 120                                     | 100    | 130            | 100    | 135    |  |  |  |  |  |
| .036                         | ULN>> on  | U <sub>THR</sub> ON  | %Unom | 109                                     | 100    | 120            | 100    | 135    |  |  |  |  |  |
| .037                         | T ULN>>   | Time OFF   | ms    | 100                                     | 100    | 5000           | 100    | 300000 |  |  |  |  |  |
|                              |           | Time OFF   | ms    | Fixed to fastest possible disconnection |        |                |        |        |  |  |  |  |  |
| Comment:                     |           | U LN > off has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |   |        |                |        |        |  |  |  |  |  |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                          |       |   |        |                |        |        |  |  |  |  |  |

| Undervoltage2 Line to Neutral |           |  |       | Conformity Range |        | Possible Range |        |        |
|-------------------------------|-----------|--|-------|------------------|--------|----------------|--------|--------|
| ID                            |           |  |       | Default          | Min    | Max            | Min    | Max    |
| .038                          | ULN<<     | Enable Function  |       | on               | on/off |                | on/off |        |
| .039                          | ULN<< off | U <sub>THR</sub> OFF   | %Unom | 30               | 20     | 100            | 10     | 100    |
| .040                          | ULN<< on  | U <sub>THR</sub> ON  | %Unom | 90               | 50     | 100            | 10     | 100    |
| .041                          | T ULN<<   | Time OFF   | ms    | 100              | 100    | 5000           | 100    | 300000 |
| Comment:                      |           | U LN < off has a fixed offset of 0.25% UNOM added to the displayed value |       |                  |        |                |        |        |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                    |       |                  |        |                |        |        |

| 10 minutes average overvoltage |          |                      |       | Conformity Range |          | Possible Range |          |     |
|--------------------------------|----------|----------------------|-------|------------------|----------|----------------|----------|-----|
| ID                             |          |                      |       | Default          | Min      | Max            | Min      | Max |
| .042                           | Uavg     | Enable function      |       | on               | on / off |                | on / off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 110              | 100      | 115            | 100      | 135 |

|      |         |                     |       |   |     |     |     |     |
|------|---------|---------------------|-------|---|-----|-----|-----|-----|
| .044 | Uavg on | U <sub>THR</sub> ON | %Unom | 109                                     | 100 | 115 | 100 | 135 |
|      |         | Time OFF            | ms    | Fixed to fastest possible disconnection |     |     |     |     |

| Zero Voltage Line to Neutral |            |                                  |         | Conformity Range |        | Possible Range |        |        |
|------------------------------|------------|----------------------------------|---------|------------------|--------|----------------|--------|--------|
| ID                           |            |                                  | Default | Min              | Max    | Min            | Max    |        |
| .115                         | Uzero >    | Enable Function                  |         | off              | on/off |                | on/off |        |
| .116                         | Uzero> off | U <sub>THR</sub> OFF             | %Unom   | 20               | 1      | 100            | 1      | 100    |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %Unom   | 15               | 1      | 100            | 1      | 100    |
| .118                         | T Uzero >  | Time OFF                         | ms      | 1500             | 200    | 100000         | 0      | 300000 |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |         |                  |        |                |        |        |

| Overfrequency1 |  |         | Conformity Range |     | Possible Range |     |
|----------------|--|---------|------------------|-----|----------------|-----|
| ID             |  | Default | Min              | Max | Min            | Max |

|                  |         |  |    |       |       |        |        |        |
|------------------|---------|--|----|-------|-------|--------|--------|--------|
| .054             | f >     | Enable Function  |    | on    | on    |        | on/off |        |
| .055             | f > off | fTHR OFF   | Hz | 51.50 | 50.00 | 52.00  | 50.00  | 55.00  |
| .056             | f > on  | fTHR ON  | Hz | 50.10 | 50.00 | 52.00  | 50.00  | 55.00  |
| .057             | T f >   | Time OFF   | ms | 100   | 100   | 100000 | 100    | 300000 |
| Comment:         |         | f > on has a fixed offset of 0.01 Hz subtracted to the displayed value |    |       |       |        |        |        |
| Only active for: |         | Voltage > 20% UNOM   |    |       |       |        |        |        |

| Underfrequency1  |         |   |    | Conformity Range |       | Possible Range |        |        |
|------------------|---------|---|----|------------------|-------|----------------|--------|--------|
| ID               |         |   |    | Default          | Min   | Max            | Min    | Max    |
| .058             | f <     | Enable Function   |    | on               | on    |                | on/off |        |
| .059             | f < off | fTHR OFF  | Hz | 47.50            | 47.00 | 50.00          | 45.00  | 50.00  |
| .060             | f < on  | fTHR ON   | Hz | 48.50            | 47.00 | 50.00          | 45.00  | 50.00  |
| .061             | T f <   | Time OFF  | ms | 100              | 100   | 100000         | 100    | 300000 |
| Comment:         |         | f < on has a fixed offset of 0.01 Hz added to the displayed value |    |                  |       |                |        |        |
| Only active for: |         | Voltage > 20% UNOM  |    |                  |       |                |        |        |

| Overfrequency nw (narrower window) |            |  |    | Conformity Range |        | Possible Range |        |        |
|------------------------------------|------------|--|----|------------------|--------|----------------|--------|--------|
| ID                                 |            |  |    | Default          | Min    | Max            | Min    | Max    |
| .062                               | f nw >     | Enable Function  |    | off              | on/off |                | on/off |        |
| .063                               | f nw > off | fTHR OFF   | Hz | 50.30            | 50.00  | 52.00          | 50.00  | 55.00  |
| .064                               | f nw > on  | fTHR ON  | Hz | 50.10            | 50.00  | 52.00          | 50.00  | 55.00  |
| .065                               | T f nw >   | Time OFF   | ms | 500              | 100    | 5000           | 100    | 300000 |
| Comment:                           |            | f nw > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |                  |        |                |        |        |
| Only active for:                   |            | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                          |    |                  |        |                |        |        |

| Underfrequency nw (narrower window) |            |                 |    | Conformity Range |        | Possible Range |        |       |
|-------------------------------------|------------|-----------------|----|------------------|--------|----------------|--------|-------|
| ID                                  |            |                 |    | Default          | Min    | Max            | Min    | Max   |
| .066                                | f nw <     | Enable Function |    | off              | on/off |                | on/off |       |
| .067                                | f nw < off | fTHR OFF        | Hz | 49.70            | 47.00  | 50.00          | 45.00  | 50.00 |
| .068                                | f nw < on  | fTHR ON         | Hz | 49.80            | 47.00  | 50.00          | 45.00  | 50.00 |

|                  |   |          |    |     |     |      |     |        |
|------------------|---|----------|----|-----|-----|------|-----|--------|
| .069             | T f nw <  | Time OFF | ms | 500 | 100 | 5000 | 100 | 300000 |
| Comment:         | f nw < off has a fixed offset of 0.01 Hz added to the displayed value |          |    |     |     |      |     |        |
| Only active for: | Ures-anfw, Uanfw, Dig Input5=HIGH (local setting)                     |          |    |     |     |      |     |        |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |  | Conformity Range |                           | Possible Range |          |     |
|-------------------------------------|-----------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|
| ID                                  |           |                          |  | Default          | Min                       | Max            | Min      | Max |
| .090                                | ROCOF     | Enable Function          |  | off              | on / off                  |                | on / off |     |
| .091                                | ROCOF off | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 200            | 9990     | 100 |
| .092                                | ROCOF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 800                       | 100            | 9990     | 100 |
| .093                                | ROCOF t   | Time OFF                 |  | ms               | 0                         | 0              | 5000     | 0   |
| .111                                | RoCoF wnd | Window length            |  | ms               | Fixed window length 100ms |                |          |     |

| Phase Shift (PShift) |   |                           |  | Conformity Range |   | Possible Range |          |     |
|----------------------|---|---------------------------|--|------------------|---|----------------|----------|-----|
| ID                   |   |                           |  | Default          | Min   | Max            | Min      | Max |
| .094                 | PShift  | Enable Function           |  | off              | on / off                                    |                | on / off |     |
| .095                 | PShift off  | PShift <sub>THR</sub> OFF |  | °                | 7   | 2              | 15       | 2   |
| .096                 | PShift on   | PShift <sub>THR</sub> ON  |  | °                | 5   | 1              | 15       | 1   |
|                      |   | Time OFF                  |  | ms               | Fixed to the fastest possible disconnection |                |          |     |
| .112                 | PShift wnd  | Window length             |  | ms               | Fixed window length 100ms                   |                |          |     |
| Comment:             | PShift off has a fixed offset of 1° subtracted from the displayed value |                           |  |                  |   |                |          |     |

| Auxiliary Contact type |         |      |                 | Conformity Range       |     | Possible Range         |     |
|------------------------|---------|------|-----------------|------------------------|-----|------------------------|-----|
| ID                     |         |      | Default         | Min                    | Max | Min                    | Max |
| .099                   | Contact | Type | dis. (disabled) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |         |      |                 | n.c. (normally closed) |     | n.c. (normally closed) |     |

|      |           |          |                        |     |   |  |   |  |
|------|-----------|----------|------------------------|-----|---|--|---|--|
|      |           |          |                        |     | dis. (disabled)   |  | dis. (disabled)   |  |
| .100 | Contact t | Time OFF | ms                     | 500 |   |  |   |  |
| .114 | I3 STOP   | Type     | n.o. (normally opened) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |

| Turn-on delay |            |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|------------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |            |              |   | Default          | Min | Max            | Min | Max |
| .102          | T on delay | Turn on time | s | 60               | 10  | 600            | 10  | 900 |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

#### **Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|  |     |
|--|-----|
| Overvoltage LL (UΔ)                      | off |
| Undervoltage LL (UΔ)                     | off |
| Overvoltage LN (UY)                      | off |
| Undervoltage LN (UY)                     | off |
| 10-min overvoltage (Ü)                   | off |
| Overfrequency (f)                        | off |
| Underfrequency (f)                       | off |
| RoCoF (Rate of Change of Frequency) (Δf) | off |
| Phase shift (ΔΦ)                         | off |

|   |     |
|---|-----|
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                               |   |
|--------------------|-------------------------------|---|
| ID                 |                               |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

### 10.38 EN50549-1:2019 LV Ireland [ID 905]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 2-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|--|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default                                  | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | U <sub>nom</sub> Y<br>U <sub>nom</sub> Δ | 230,00V<br>/400,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |           |  |   | Conformity Range     |                          | Possible Range       |                          |                      |
|---------------------------|-----------|--|---|----------------------|--------------------------|----------------------|--------------------------|----------------------|
| ID                        |           | Default                                  |   | Min                  | Max                      | Min                  | Max                      |                      |
| .010                      | ULL >     | Enable function                          |   | on                   | on / off                 |                      | on /off                  |                      |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 117,00%<br>(468,00V) | 100,00%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 109,00%<br>(436,00V) | 100,00%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .013                      | T ULL >   | Time OFF                                 |   | 70000 ms             | 100 ms                   | 100000 ms            | 100 ms                   | 300000 ms            |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |   |                      |                          |                      |                          |                      |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |



| Overvoltage2 Line to Line |            |  |  | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|------------|--|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |            |  | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .026                      | ULL >>     | Enable function                          |  | on                   | on / off                     |                      | on /off                  |                      |
| .027                      | ULL >> off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 122,00%<br>(488,00V) | 100,00<br>%<br>(400,00<br>V) | 130,00%<br>(520,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .028                      | ULL >> on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 109,00%<br>(436,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .029                      | T ULL >>   | Time OFF                                 |  | 700 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Line |            |  |  | Conformity Range    |                         | Possible Range       |                    |                      |
|----------------------------|------------|--|--|---------------------|-------------------------|----------------------|--------------------|----------------------|
| ID                         |            |  | Default  | Min                 | Max                     | Min                  | Max                |                      |
| .030                       | ULL <<     | Enable function                          |  | off                 | on / off                |                      | on /off            |                      |
| .031                       | ULL << off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 30,00%<br>(120,00V) | 20,00%<br>(80,00V<br>)  | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .032                       | ULL << on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 85,00%<br>(340,00V) | 50,00%<br>(200,00<br>V) | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .033                       | T ULL <<   | Time OFF                                 |  | 100 ms              | 100 ms                  | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                     |                         |                      |                    |                      |

| Overvoltage2 Line to Neutral |            |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|------------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |            |   | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .034                         | ULN >>     | Enable function                                       |  | on                   | on / off                     |                      | on /off                  |                      |
| .035                         | ULN >> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 122,00%<br>(280,60V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .036                         | ULN >> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 109,00%<br>(250,70V) | 100,00<br>%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .037                         | T ULN >>   | Time OFF  |  | 700 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Neutral |            |   |                 | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default         | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | ULN <<     | Enable function                                       |                 | off                 | on / off             |                      | on /off            |                      |
| .039                          | ULN << off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 30,00%<br>(69,00V)  | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | ULN << on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .041                          | T ULN <<   | Time OFF  |                 | 100 ms              | 100 ms               | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Zero Voltage Line to Neutral |            |                                  |                 | Conformity Range   |                  | Possible Range       |                  |                      |
|------------------------------|------------|----------------------------------|-----------------|--------------------|------------------|----------------------|------------------|----------------------|
| ID                           |            |                                  | Default         | Min                | Max              | Min                  | Max              |                      |
| .115                         | Uzero >    | Enable Function                  |                 | off                | on/off           |                      | on/off           |                      |
| .116                         | Uzero> off | UTHR<br>OFF                      | %Unom<br>/VUnom | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117                         | Uzero> on  | UTHR ON                          | %Unom<br>/VUnom | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118                         | T Uzero >  | Time OFF                         |                 | 1500 ms            | 200 ms           | 100000 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |                 |                    |                  |                      |                  |                      |

| Undervoltage LN (UY) Activation of a narrower frequency window |            |                                  |                 | Conformity Range    |                     | Possible Range       |                  |                      |
|--|------------|----------------------------------|-----------------|---------------------|---------------------|----------------------|------------------|----------------------|
| ID   |            |                                  | Default         | Min                 | Max                 | Min                  | Max              |                      |
| .123   | Uanfw <    | Enable Function                  |                 | off                 | on/off              |                      | on/off           |                      |
| .124   | Uanfw< on  | U <sub>THR</sub><br>OFF          | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V ) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .125   | Uanfw< off | U <sub>THR</sub> ON              | %Unom<br>/VUnom | 86,00%<br>(197,80V) | 21,00%<br>(48,30V ) | 100,00%<br>(230,00V) | 2,00%<br>(4,60V) | 100,00%<br>(230,00V) |
| .126   | T Uanfw <  | Time OFF                         |                 | 0 ms                | 0 ms                | 240000 ms            | 0 ms             | 240000 ms            |
| Only active for:   |            | Connection Modes: 4-wire (LN+LL) |                 |                     |                     |                      |                  |                      |

| 10 minutes average overvoltage |          |                      |                 | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|----------|----------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |          |                      | Default         | Min                              | Max                              | Min                              | Max                                  |                                  |
| .042                           | Uavg     | Enable function      |                 | off                              | on / off                         |                                  | on /off                              |                                  |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom<br>/VUnom | 110,00%<br>(253,00V<br>/440,00V) | 100,00%<br>(230,00V<br>/400,00V) | 115,00%<br>(264,50V<br>/460,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom<br>/VUnom | 109,00%<br>(250,70V<br>/436,00V) | 100,00%<br>(230,00V<br>/400,00V) | 115,00%<br>(264,50V<br>/460,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |

| Overfrequency1 |         |                 |           | Conformity Range |           | Possible Range |           |
|----------------|---------|-----------------|-----------|------------------|-----------|----------------|-----------|
| ID             |         |                 | Default   | Min              | Max       | Min            | Max       |
| .054           | f >     | Enable function | on        | on / off         |           | on /off        |           |
| .055           | f > off | fTHR OFF        | 52,000 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .056           | f > on  | fTHR ON         | 50,100 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .057           | T f >   | Time OFF        | 500 ms    | 100 ms           | 100000 ms | 100 ms         | 300000 ms |

| Underfrequency1 | Conformity Range | Possible Range |
|-----------------|------------------|----------------|
|-----------------|------------------|----------------|

| ID   |         |                 | Default   | Min       | Max       | Min       | Max       |
|------|---------|-----------------|-----------|-----------|-----------|-----------|-----------|
| .058 | f <     | Enable function | on        | on / off  |           | on /off   |           |
| .059 | f < off | fTHR OFF        | 47,000 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .060 | f < on  | fTHR ON         | 48,500 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .061 | T f <   | Time OFF        | 500 ms    | 100 ms    | 100000 ms | 100 ms    | 300000 ms |

| Overfrequency2 |            |                 | Conformity Range |           | Possible Range |           |           |
|----------------|------------|-----------------|------------------|-----------|----------------|-----------|-----------|
| ID             |            |                 | Default          | Min       | Max            | Min       | Max       |
| .062           | f nw >     | Enable function | off              | on / off  |                | on /off   |           |
| .063           | f nw > off | fTHR OFF        | 50,300 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .064           | f nw > on  | fTHR ON         | 50,100 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .065           | T f nw >   | Time OFF        | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Underfrequency2 |            |                 | Conformity Range |           | Possible Range |           |           |
|-----------------|------------|-----------------|------------------|-----------|----------------|-----------|-----------|
| ID              |            |                 | Default          | Min       | Max            | Min       | Max       |
| .066            | f nw <     | Enable function | off              | on / off  |                | on /off   |           |
| .067            | f nw < off | fTHR OFF        | 49,700 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .068            | f nw < on  | fTHR ON         | 49,800 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .069            | T f nw <   | Time OFF        | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|
| ID                             |       |               | Default          | Min    | Max    |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |       |                 | Conformity Range |          | Possible Range |          |     |
|-------------------------------------|-------|-----------------|------------------|----------|----------------|----------|-----|
| ID                                  |       |                 | Default          | Min      | Max            | Min      | Max |
| .090                                | ROCOF | Enable Function | on               | on / off |                | on / off |     |

|      |           |                          |            |           |            |           |            |
|------|-----------|--------------------------|------------|-----------|------------|-----------|------------|
| .091 | ROCOF off | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 200 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .092 | ROCOF on  | RoCoF <sub>THR</sub> ON  | 800 mHz/s  | 100 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .093 | T ROCOF   | Time OFF                 | 0 ms       | 0 ms      | 5000 ms    | 0 ms      | 5000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |        |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|--------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max    |
| .094                 | Pshift     | Enable Function           | off     | off              |        | on / off       |        |
| .095                 | Pshift off | PShift <sub>THR</sub> OFF | 7,0 °   | 2,0 °            | 15,0 ° | 2,0 °          | 15,0 ° |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 5,0 °   | 1,0 °            | 15,0 ° | 1,0 °          | 15,0 ° |

| Auxiliary Contact type |           |          | Conformity Range       |   | Possible Range |   |     |
|------------------------|-----------|----------|------------------------|---|----------------|---|-----|
| ID                     |           |          | Default                | Min   | Max            | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)                    |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |                |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              | Conformity Range |      | Possible Range |     |       |
|---------------|------------|--------------|------------------|------|----------------|-----|-------|
| ID            |            |              | Default          | Min  | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 20 s             | 10 s | 600 s          | 0 s | 900 s |

| Password |     |                                   |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|---------|-----|-----|
| ID       |     |                                   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  | 0       | 0   | 9   |

|         |   |                                   |   |   |   |
|---------|---|-----------------------------------|---|---|---|
| .109    | PW4   | 4 <sup>th</sup> digit of Password | 0 | 0 | 9 |
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |                                   |   |   |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | off   |
| Undervoltage LL (UΔ)  | off   |
| Overvoltage LN (UY)   | off   |
| Undervoltage LN (UY)  | off   |
| 10-min overvoltage (Ü)  | off   |
| Overfrequency (f)   | off   |
| Underfrequency (f)  | off   |
| RoCoF (Rate of Change of Frequency) (Δf)  | off   |
| Phase shift (ΔΦ)  | off   |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |  |
|--------------------|------------------------------------|--|
| ID                 |                                    |  |
| .105               | SN:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.39 EN50438:2013 DK [ID 950]**

| Connection Mode |            |             | Conformity Range    | Possible Range                                 |
|-----------------|------------|-------------|---------------------|--|
| ID              |            | Default     |                     |  |
| .003            | Connection | 4-wire (LN) | 3-wire, 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |        |         | Conformity Range |       | Possible Range |       |
|-----------------|------------|--------|---------|------------------|-------|----------------|-------|
| ID              |            |        | Default | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y | V       | 230.0            | 230.0 | 100.0          | 240.0 |
|                 |            | Unom Δ | V       | 400.0            | 400.0 | 173.9          | 417.4 |

| Functional Safety |        | Conformity Range   | Possible Range |
|-------------------|--------|--|----------------|
| ID                |        | Default  |                |
| .007              | Errtol | 2ch  | 2ch, 1ch       |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br><br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range           |       | Possible Range |     |       |
|------------------------------|------------|---|-------|----------------------------|-------|----------------|-----|-------|
| ID                           |            |   |       | Default                    | Min   | Max            | Min | Max   |
| .019                         | ULN max 1  | $U_{THR}$ OFF   | %Unom | 110                        | 110   | 110            | 100 | 135   |
|                              |            | $U_{THR}$ ON  | %Unom | Fixed Hysteresis (1% UNOM) |       |                |     |       |
| .021                         | ULN max 1t | Time OFF  | ms    | 39500                      | 39500 | 39500          | 50  | 60000 |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |       |                            |       |                |     |       |

| Undervoltage1 Line to Neutral |           |  |       | Conformity Range           |      | Possible Range |     |       |
|-------------------------------|-----------|--|-------|----------------------------|------|----------------|-----|-------|
| ID                            |           |  |       | Default                    | Min  | Max            | Min | Max   |
| .023                          | ULN min   | $U_{THR}$ OFF  | %Unom | 90                         | 90   | 90             | 10  | 100   |
|                               |           | $U_{THR}$ ON   | %Unom | Fixed Hysteresis (1% UNOM) |      |                |     |       |
| .025                          | ULN min t | Time OFF   | ms    | 9500                       | 9500 | 9500           | 50  | 60000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)) |       |                            |      |                |     |       |

| Overvoltage2 Line to Line |           |  |       | Conformity Range           |     | Possible Range |     |     |
|---------------------------|-----------|--|-------|----------------------------|-----|----------------|-----|-----|
| ID                        |           |  |       | Default                    | Min | Max            | Min | Max |
| .027                      | ULL max 2 | $U_{THR}$ OFF                            | %Unom | 113                        | 113 | 113            | 100 | 135 |
|                           |           | $U_{THR}$ ON                             | %Unom | Fixed Hysteresis (1% UNOM) |     |                |     |     |
|                           |           | Time OFF                                 | ms    | Fixed to 100ms             |     |                |     |     |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                            |     |                |     |     |

| Overvoltage2 Line to Neutral |           |   |       | Conformity Range           |     | Possible Range |     |     |
|------------------------------|-----------|---|-------|----------------------------|-----|----------------|-----|-----|
| ID                           |           |   |       | Default                    | Min | Max            | Min | Max |
| .035                         | ULN max 2 | $U_{THR}$ OFF   | %Unom | 113                        | 113 | 113            | 100 | 135 |
|                              |           | $U_{THR}$ ON  | %Unom | Fixed Hysteresis (1% UNOM) |     |                |     |     |
|                              |           | Time OFF  | ms    | Fixed to 100ms             |     |                |     |     |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |       |                            |     |                |     |     |

| Overfrequency1 |         |               |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|---------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |               |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | $f_{THR}$ OFF | Hz | 52.00            | 52.00 | 52.00          | 50.00 | 55.00 |

|      |        |          |    |                |       |       |       |       |  |
|------|--------|----------|----|----------------|-------|-------|-------|-------|--|
| .056 | f > on | fTHR ON  | Hz | 50.05          | 50.05 | 50.05 | 50.00 | 55.00 |  |
|      |        | Time OFF | ms | Fixed to 150ms |       |       |       |       |  |

| Underfrequency1 |         |  |    | Conformity Range |       | Possible Range |       |       |  |
|-----------------|---------|--|----|------------------|-------|----------------|-------|-------|--|
| ID              |         |  |    | Default          | Min   | Max            | Min   | Max   |  |
| .059            | f < off | fTHR OFF   | Hz | 47.50            | 47.50 | 47.50          | 45.00 | 50.00 |  |
| .060            | f < on  | fTHR ON  | Hz | 47.50            | 47.50 | 47.50          | 45.00 | 50.00 |  |
|                 |         | Time OFF   | ms | Fixed to 150ms   |       |                |       |       |  |
| Comment:        |         | f < on has a fixed offset of 0.025 Hz added to the displayed value |    |                  |       |                |       |       |  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                 |    | Conformity Range          |   | Possible Range |          |      |
|-------------------------------------|-----------|-----------------|----|---------------------------|---|----------------|----------|------|
| ID                                  |           |                 |    | Default                   | Min   | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function |    | on                        | on / off                                    |                | on / off |      |
| .091                                | RoCoF off | RoCoFTHR OFF    |    | mHz/s                     | 2500  | 2500           | 100      | 3000 |
| .092                                | RoCoF on  | RoCoFTHR ON     |    | mHz/s                     | 2300  | 2300           | 100      | 3000 |
|                                     |           | Time OFF        |    | ms                        | Fixed to the fastest possible disconnection |                |          |      |
| .111                                | RoCoF wnd | Window length   | ms | Fixed window length 200ms |   |                |          |      |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |  |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|--|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     |                        |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |

|  |  |  |  |   |   |
|--|--|--|--|---|---|
|  |  |  |  | n.c. (normally closed)<br>dis. (disabled) | n.c. (normally closed)<br>dis. (disabled) |
|--|--|--|--|---|---|

| Turn-on delay |           |              |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---------|------------------|-----|----------------|-----|
| ID            |           |              | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s       | 60               | 60  | 0              | 900 |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | off   |
| Undervoltage LL (UΔ)  | off   |
| Overvoltage LN (UY)   | off   |
| Undervoltage LN (UY)  | off   |
| 10-min overvoltage ( $\bar{U}$ )  | off   |
| Overfrequency (f)   | off   |
| Underfrequency (f)  | off   |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | off   |
| Phase shift ( $\Delta\Phi$ )  | off   |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | off   |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | off   |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>ID: xxxxxxxxxxxx</p> <p>SW: aa.ddccb</p> <p>xxxxxxxxxx = Device ID</p> <p>dd: Software version of Display Software</p> <p>aa: Software version of Measuring Software</p> <p>cc: Index of Configuration set</p> <p>b: Version of Configuration set</p> |

**10.40 SRPS EN 50549-1:2020 LV (Serbia) [ID 910]**

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 2-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|--|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default                                  | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | U <sub>nom</sub> Y<br>U <sub>nom</sub> Δ | 230,00V<br>/400,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |           |  |   | Conformity Range     |                          | Possible Range       |                          |                      |
|---------------------------|-----------|--|---|----------------------|--------------------------|----------------------|--------------------------|----------------------|
| ID                        |           | Default                                  |   | Min                  | Max                      | Min                  | Max                      |                      |
| .010                      | ULL >     | Enable function                          |   | on                   | on / off                 |                      | on /off                  |                      |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 110,00%<br>(440,00V) | 100,00%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 109,00%<br>(436,00V) | 100,00%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .013                      | T ULL >   | Time OFF                                 |   | 200 ms               | 100 ms                   | 100000 ms            | 100 ms                   | 300000 ms            |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |   |                      |                          |                      |                          |                      |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |



| Overvoltage2 Line to Line |            |  |  | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|------------|--|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |            |  | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .026                      | ULL >>     | Enable function                          |  | off                  | on / off                     |                      | on / off                 |                      |
| .027                      | ULL >> off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 120,00%<br>(480,00V) | 100,00<br>%<br>(400,00<br>V) | 130,00%<br>(520,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .028                      | ULL >> on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 109,00%<br>(436,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .029                      | T ULL >>   | Time OFF                                 |  | 100 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Line |            |  |  | Conformity Range    |                         | Possible Range       |                    |                      |
|----------------------------|------------|--|--|---------------------|-------------------------|----------------------|--------------------|----------------------|
| ID                         |            |  | Default  | Min                 | Max                     | Min                  | Max                |                      |
| .030                       | ULL <<     | Enable function                          |  | off                 | on / off                |                      | on / off           |                      |
| .031                       | ULL << off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 30,00%<br>(120,00V) | 20,00%<br>(80,00V<br>)  | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .032                       | ULL << on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 85,00%<br>(340,00V) | 50,00%<br>(200,00<br>V) | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .033                       | T ULL <<   | Time OFF                                 |  | 100 ms              | 100 ms                  | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                     |                         |                      |                    |                      |

| Overvoltage2 Line to Neutral |            |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|------------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |            |   | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .034                         | ULN >>     | Enable function                                       |  | off                  | on / off                     |                      | on / off                 |                      |
| .035                         | ULN >> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 120,00%<br>(276,00V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .036                         | ULN >> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 109,00%<br>(250,70V) | 100,00<br>%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .037                         | T ULN >>   | Time OFF  |  | 100 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                  | Possible Range       |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------|----------------------|------------------|----------------------|
| ID                           |            |                                  | Default                                | Min                | Max              | Min                  | Max              |                      |
| .115                         | Uzero >    | Enable Function                  |  | off                | on / off         |                      | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/V <sub>nom</sub> | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/V <sub>nom</sub> | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118                         | T Uzero >  | Time OFF                         |  | 1500 ms            | 200 ms           | 100000<br>ms         | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                  |                      |                  |                      |

| Undervoltage LN (UY) Activation of a narrower frequency window |            |                                  |  |                     | Conformity Range       |                      | Possible Range   |                      |
|--|------------|----------------------------------|--|---------------------|------------------------|----------------------|------------------|----------------------|
| ID   |            |                                  |  | Default             | Min                    | Max                  | Min              | Max                  |
| .123   | Uanfw <    | Enable Function                  |  | off                 | on / off               |                      | on / off         |                      |
| .124   | Uanfw< on  | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 85,00%<br>(195,50V) | 20,00%<br>(46,00V<br>) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .125   | Uanfw< off | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 86,00%<br>(197,80V) | 21,00%<br>(48,30V<br>) | 100,00%<br>(230,00V) | 2,00%<br>(4,60V) | 100,00%<br>(230,00V) |
| .126   | T Uanfw <  | Time OFF                         |  | 0 ms                | 0 ms                   | 240000<br>ms         | 0 ms             | 240000 ms            |
| Only active for:   |            | Connection Modes: 4-wire (LN+LL) |  |                     |                        |                      |                  |                      |

| 10 minutes average overvoltage |          |                         |  |                                  | Conformity Range                 |                                  | Possible Range                       |                                  |
|--------------------------------|----------|-------------------------|--|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |          |                         |  | Default                          | Min                              | Max                              | Min                                  | Max                              |
| .042                           | Uavg     | Enable function         |  | off                              | on / off                         |                                  | on / off                             |                                  |
| .043                           | Uavg off | U <sub>THR</sub><br>OFF | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 110,00%<br>(253,00V<br>/440,00V) | 100,00%<br>(230,00V<br>/400,00V) | 115,00%<br>(264,50V<br>/460,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON     | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 109,00%<br>(250,70V<br>/436,00V) | 100,00%<br>(230,00V<br>/400,00V) | 115,00%<br>(264,50V<br>/460,00V) | 100,00%<br>(230,00V<br>/400,00V<br>) | 135,00%<br>(310,50V<br>/540,00V) |
| .045                           | Uavg o t | Time OFF                |  | 50 ms                            | 200 ms                           | 10000 ms                         | 100 ms                               | 10000 ms                         |

| Overfrequency1 |         |                      |  | Conformity Range |           | Possible Range |              |           |  |
|----------------|---------|----------------------|--|------------------|-----------|----------------|--------------|-----------|--|
| ID             |         |                      |  | Default          | Min       | Max            | Min          | Max       |  |
| .054           | f >     | Enable function      |  | on               | on / off  |                | on / off     |           |  |
| .055           | f > off | f <sub>THR</sub> OFF |  | 50,200 Hz        | 50,000 Hz | 52,000 Hz      | 50,000<br>Hz | 55,000 Hz |  |
| .056           | f > on  | f <sub>THR</sub> ON  |  | 50,100 Hz        | 50,000 Hz | 52,000 Hz      | 50,000<br>Hz | 55,000 Hz |  |
| .057           | T f >   | Time OFF             |  | 100 ms           | 100 ms    | 100000<br>ms   | 100 ms       | 300000 ms |  |

| Underfrequency1 |         |                      | Conformity Range |           | Possible Range |           |           |
|-----------------|---------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID              |         |                      | Default          | Min       | Max            | Min       | Max       |
| .058            | f <     | Enable function      | on               | on / off  |                | on / off  |           |
| .059            | f < off | f <sub>THR</sub> OFF | 49,500 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .060            | f < on  | f <sub>THR</sub> ON  | 49,500 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .061            | T f <   | Time OFF             | 100 ms           | 100 ms    | 100000 ms      | 100 ms    | 300000 ms |

| Overfrequency2 |            |                      | Conformity Range |           | Possible Range |           |           |
|----------------|------------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID             |            |                      | Default          | Min       | Max            | Min       | Max       |
| .062           | f nw >     | Enable function      | off              | on / off  |                | on / off  |           |
| .063           | f nw > off | f <sub>THR</sub> OFF | 50,300 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .064           | f nw > on  | f <sub>THR</sub> ON  | 50,100 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .065           | T f nw >   | Time OFF             | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Underfrequency2 |            |                      | Conformity Range |           | Possible Range |           |           |
|-----------------|------------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID              |            |                      | Default          | Min       | Max            | Min       | Max       |
| .066            | f nw <     | Enable function      | off              | on / off  |                | on / off  |           |
| .067            | f nw < off | f <sub>THR</sub> OFF | 49,700 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .068            | f nw < on  | f <sub>THR</sub> ON  | 49,800 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .069            | T f nw <   | Time OFF             | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|--|
| ID                             |       |               | Default          | Min    | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |  |  | Conformity Range |     | Possible Range |     |     |
|-------------------------------------|--|--|------------------|-----|----------------|-----|-----|
| ID                                  |  |  | Default          | Min | Max            | Min | Max |
|                                     |  |  |                  |     |                |     |     |

|      |           |                          |            |           |            |           |            |
|------|-----------|--------------------------|------------|-----------|------------|-----------|------------|
| .090 | ROCOF     | Enable Function          | off        | on / off  |            | on / off  |            |
| .091 | ROCOF off | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 200 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .092 | ROCOF on  | RoCoF <sub>THR</sub> ON  | 800 mHz/s  | 100 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .093 | T ROCOF   | Time OFF                 | 0 ms       | 0 ms      | 5000 ms    | 0 ms      | 5000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |        |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|--------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max    |
| .094                 | Pshift     | Enable Function           | off     | on / off         |        | on / off       |        |
| .095                 | Pshift off | PShift <sub>THR</sub> OFF | 7,0 °   | 2,0 °            | 15,0 ° | 2,0 °          | 15,0 ° |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 5,0 °   | 1,0 °            | 15,0 ° | 1,0 °          | 15,0 ° |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|
| ID                     |           |          | Default                | Min   | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)                    |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 10 s             | 600 s | 0 s            | 900 s |

| Password |     |                                   |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|---------|-----|-----|
| ID       |     |                                   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0       | 0   | 9   |

|         |     |   |   |   |   |
|---------|-----|---|---|---|---|
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0 | 0 | 9 |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0 | 0 | 9 |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0 | 0 | 9 |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |   |   |   |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | off |
| Undervoltage LL (UΔ)  | off |
| Overvoltage LN (UY)   | off |
| Undervoltage LN (UY)  | off |
| 10-min overvoltage (Ü)  | off |
| Overfrequency (f)   | off |
| Underfrequency (f)  | off |
| RoCoF (Rate of Change of Frequency) (Δf)  | off |
| Phase shift (ΔΦ)  | off |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.41 VDE 0126-1-1:2013 [ID 200]

| Connection Mode |            |                         | Conformity Range |  |  | Possible Range |  |
|-----------------|------------|-------------------------|------------------|--|--|----------------|--|
| ID              |            | Default                 |                  |  |  |                |  |
| .003            | Connection | Fixed to 4-wire (LN+LL) |                  |  |  |                |  |

| Nominal Voltage |            |                  |        | Conformity Range       |     | Possible Range |     |
|-----------------|------------|------------------|--------|------------------------|-----|----------------|-----|
| ID              |            | Default          |        | Min                    | Max | Min            | Max |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V | Fixed to 230.0 / 400.0 |     |                |     |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |            |   |       | Conformity Range                        |     | Possible Range |            |
|---------------------------|------------|---|-------|---|-----|----------------|------------|
| ID                        |            | Default   |       | Min                                     | Max | Min            | Max        |
| .011                      | ULLmax off | U <sub>THR</sub> OFF  | %Unom | 115                                     | 115 | 115            | 100<br>135 |
| .012                      | ULLmax on  | U <sub>THR</sub> ON   | %Unom | 110                                     | 110 | 110            | 100<br>135 |
|                           |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |            |
| Comment:                  |            | ULLmax on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |   |     |                |            |

| Undervoltage1 Line to Line |            |  |        | Conformity Range                        |     | Possible Range |           |
|----------------------------|------------|--|--------|---|-----|----------------|-----------|
| ID                         |            | Default  |        | Min                                     | Max | Min            | Max       |
| .015                       | ULLmin off | U <sub>THR</sub> OFF   | % Unom | 80                                      | 80  | 80             | 10<br>100 |
| .016                       | ULLmin on  | U <sub>THR</sub> ON  | %Unom  | 85                                      | 85  | 85             | 10<br>100 |
|                            |            | Time OFF   | ms     | Fixed to fastest possible disconnection |     |                |           |
| Comment:                   |            | ULLmin on has a fixed offset of 0.5% UNOM added to the displayed value |        |   |     |                |           |

| Overvoltage1 Line to Neutral |  |         |  | Conformity Range |     | Possible Range |     |
|------------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                           |  | Default |  | Min              | Max | Min            | Max |

| Undervoltage1 Line to Neutral |         |   |         | Conformity Range                        |     | Possible Range |     |     |
|-------------------------------|---------|---|---------|---|-----|----------------|-----|-----|
| ID                            |         |   | Default | Min                                     | Max | Min            | Max |     |
| .023                          | U < off | U <sub>THR</sub> OFF  | %Unom   | 80                                      | 80  | 80             | 10  | 100 |
| .024                          | U < on  | U <sub>THR</sub> ON   | %Unom   | 85                                      | 85  | 85             | 10  | 100 |
|                               |         | Time OFF  | ms      | Fixed to fastest possible disconnection |     |                |     |     |
| Comment:                      |         | U < on has a fixed offset of 0.5% Unom added to the displayed value |         |   |     |                |     |     |

| 10 minutes average overvoltage |    |                      |       | Conformity Range                        |     | Possible Range |     |     |
|--------------------------------|----|----------------------|-------|---|-----|----------------|-----|-----|
| ID                             |    |                      |       | Default                                 | Min | Max            | Min | Max |
| .043                           | U> | U <sub>THR</sub> OFF | %Unom | 110                                     | 110 | 115            | 100 | 135 |
|                                |    | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |     |                |     |     |
|                                |    | Time OFF             | ms    | Fixed to fastest possible disconnection |     |                |     |     |

| Overfrequency1 |         |                      |    | Conformity Range                        |       | Possible Range |       |       |
|----------------|---------|----------------------|----|---|-------|----------------|-------|-------|
| ID             |         |                      |    | Default                                 | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50                                   | 51.50 | 51.50          | 50.00 | 55.00 |
| .056           | F > on  | f <sub>THR</sub> ON  | Hz | 50.05                                   | 50.05 | 50.05          | 50.00 | 55.00 |
|                |         | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |

| Underfrequency1 |         |  |         | Conformity Range                        |       | Possible Range |       |       |
|-----------------|---------|--|---------|---|-------|----------------|-------|-------|
| ID              |         |  | Default | Min                                     | Max   | Min            | Max   |       |
| .059            | f < off | fTHR OFF   | Hz      | 47.50                                   | 47.50 | 47.50          | 45.00 | 50.00 |
| .060            | f < on  | fTHR ON  | ms      | 47.50                                   | 47.50 | 47.50          | 45.00 | 50.00 |
|                 |         | Time OFF   | ms      | Fixed to fastest possible disconnection |       |                |       |       |
| Comment:        |         | f < on has a fixed offset of 0.025 Hz added to the displayed value |         |   |       |                |       |       |

| Random overfrequency |           |   |    | Conformity Range                        |          | Possible Range |          |       |
|----------------------|-----------|---|----|---|----------|----------------|----------|-------|
| ID                   |           |   |    | Default                                 | Min      | Max            | Min      | Max   |
| .086                 | f> random | Enable function   |    | off                                     | on / off |                | on / off |       |
| .087                 | f> random | fTHR OFF  | Hz |   | 50.20    | 51.50          | 50.20    | 51.50 |
|                      |           | fTHR ON   | Hz | Fixed reconnection frequency of 50.05Hz |          |                |          |       |
|                      |           | Time OFF  | ms | Fixed to fastest possible disconnection |          |                |          |       |
| Comment:             |           | The random fTHR OFF threshold is shown in .087 and cannot be edited |    |   |          |                |          |       |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |  |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|--|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     |                        |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |  |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |  |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 0   | 900 |

| Random Turn-on delay |            |                 |  | Conformity Range |          | Possible Range |          |     |
|----------------------|------------|-----------------|--|------------------|----------|----------------|----------|-----|
| ID                   |            |                 |  | Default          | Min      | Max            | Min      | Max |
| .103                 | Ton random | Enable function |  | off              | on / off |                | on / off |     |

|          |            |   |   |  |    |     |    |     |  |
|----------|------------|---|---|--|----|-----|----|-----|--|
| .104     | Ton random | Turn on time  | s |  | 60 | 600 | 60 | 600 |  |
| Comment: |            | The random time value is shown in .104 and cannot be edited |   |  |    |     |    |     |  |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | off   |
| Undervoltage LL (UΔ)  | off   |
| Overvoltage LN (UY)   | off   |
| Undervoltage LN (UY)  | off   |
| 10-min overvoltage (Ü)  | off   |
| Overfrequency (f)   | off   |
| Underfrequency (f)  | off   |
| RoCoF (Rate of Change of Frequency) (Δf)  | off   |
| Phase shift (ΔΦ)  | off   |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | off   |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | off   |

| Device Information |                  |                        |
|--------------------|------------------|------------------------|
| ID                 |                  |                        |
| .105               | ID: xxxxxxxxxxxx | xxxxxxxxxx = Device ID |

|  |               |   |
|--|---------------|---|
|  | SW: aa.dd.ccb | dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |
|--|---------------|---|

## 10.42 Romania ANRE 2021 [ID 1300]

| Connection Mode |            |           | Conformity Range |  | Possible Range              |  |
|-----------------|------------|-----------|------------------|--|-----------------------------|--|
| ID              |            | Default   |                  |  |                             |  |
| .003            | Connection | 4-wire LN | 4-wire LN        |  | 2-wire LN –<br>4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|------------------|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default          | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 230,00V<br>/400,00V | 57,50V<br>/100,00V | 230,00V<br>/400,00V | 28,75V<br>/50,00V | 241,50V<br>/420,00V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Neutral |            |   |                 | Conformity Range     |                          | Possible Range       |                          |
|------------------------------|------------|---|-----------------|----------------------|--------------------------|----------------------|--------------------------|
| ID                           |            | Default   |                 | Min                  | Max                      | Min                  | Max                      |
| .018                         | Ueff >     | Enable function                                       | on              |                      |                          |                      |                          |
| .019                         | Ueff > off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 115,00%<br>(264,50V) | 100,00%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) |
| .020                         | Ueff > on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 110,00%<br>(253,00V) | 100,00%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) |
| .021                         | T Ueff >   | Time OFF  |                 | 500 ms               | 100 ms                   | 5000 ms              | 100 ms                   |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                          |                      |                          |

| Undervoltage1 Line to Neutral |   |                 |    | Conformity Range |     | Possible Range |     |
|-------------------------------|---|-----------------|----|------------------|-----|----------------|-----|
| ID                            |   | Default         |    | Min              | Max | Min            | Max |
| .022                          | 0 | Enable function | on |                  |     |                |     |

|                  |            |   |                 |                     |                      |                      |                    |                      |
|------------------|------------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| .023             | Ueff < off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .024             | Ueff < on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 90,00%<br>(207,00V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .025             | T Ueff <   | Time OFF  |                 | 3200 ms             | 100 ms               | 100000 ms            | 100 ms             | 180000 ms            |
| Only active for: |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| 10 minutes average overvoltage |            |                         |                 | Conformity Range                 |                                  | Possible Range                   |                                   |                                  |
|--------------------------------|------------|-------------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| ID                             |            |                         |                 | Default                          | Min                              | Max                              | Min                               | Max                              |
| .042                           | U10min     | Enable function         |                 | on                               | on / off                         |                                  | on /off                           |                                  |
| .043                           | U10min off | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 110,00%<br>(253,00V<br>/440,00V) | 100,00%<br>(230,00V<br>/400,00V) | 115,00%<br>(264,50V<br>/460,00V) | 100,00%<br>(230,00V<br>/400,00V ) | 135,00%<br>(310,50V<br>/540,00V) |

| Overfrequency1 |         |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|---------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |         |                      |  | Default          | Min       | Max            | Min       | Max       |
| .054           | f oA    | Enable function      |  | on               |           |                |           |           |
| .055           | f > off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | f > on  | f <sub>THR</sub> ON  |  | 51,000 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T f >   | Time OFF             |  | 500 ms           | 100 ms    | 100000 ms      | 100 ms    | 180000 ms |

| Underfrequency1 |         |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|---------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |         |                      |  | Default          | Min       | Max            | Min       | Max       |
| .058            | f uA    | Enable function      |  | on               |           |                |           |           |
| .059            | f < off | f <sub>THR</sub> OFF |  | 47,500 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .060            | f < on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .061            | T f <   | Time OFF             |  | 500 ms           | 100 ms    | 100000 ms      | 100 ms    | 180000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |     | Possible Range |     |
|--------------------------------|-------|---------------|---------|------------------|-----|----------------|-----|
| ID                             |       |               | Default | Min              | Max | Min            | Max |
| .113                           | F wnd | Window length | 100 ms  |                  |     |                |     |

| Auxiliary Contact type |           |          |                        | Conformity Range  |   | Possible Range                                   |   |  |
|------------------------|-----------|----------|------------------------|---|---|--|---|--|
| ID                     |           |          | Default                | Min   | Max                                       | Min  | Max                                       |  |
| .099                   | Contact   | Type     | (normally closed)      | n.o. (normally opened)  | n.c. (disabled)                           | n.o. (normally opened)                           | n.c. (normally closed)                    |  |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |   |  |   |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) | n.c. (normally closed)<br>dis. (disabled) |  |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 900 s   | 0 s              | 900 s | 0 s            | 900 s |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

|                      |    |
|----------------------|----|
| ErrorLogic           |    |
| Overvoltage LL (UΔ)  | on |
| Undervoltage LL (UΔ) | on |
| Overvoltage LN (UY)  | on |
| Undervoltage LN (UY) | on |

|   |    |
|---|----|
| 10-min overvoltage ( $\bar{U}$ )  | on |
| Overfrequency (f)   | on |
| underfrequency  | on |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on |
| phase shift   | on |
| Remote shutdown / self-test (R)   | on |
| Contactor feedback contact reports closed, although it should be open (C)                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on |

| Device Information |                                |
|--------------------|--------------------------------|
| ID                 |                                |
| .105               | SN:xxxxxxxxxx<br>SW: aa.dd.ccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

#### 10.43 AB AS 4777.2:2020 [ID 1110]

| Connection Mode |            |             | Conformity Range |  | Possible Range |  |
|-----------------|------------|-------------|------------------|--|----------------|--|
| ID              |            | Default     |                  |  |                |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |                | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 230.0 | 240.0          | 100.0 |
|                 |            | Unom Δ  | V | 400.0            | 400.0 | 417.4          | 173.9 |

| Functional Safety |  |         | Conformity Range |  | Possible Range |  |
|-------------------|--|---------|------------------|--|----------------|--|
| ID                |  | Default |                  |  |                |  |
|                   |  |         |                  |  |                |  |

|         |        |   |  |  |  |  |  |
|---------|--------|---|--|--|--|--|--|
| .007    | Errtol | Fixed to 2ch  |  |  |  |  |  |
| Remark: |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |  |  |  |  |  |

| Overvoltage1 Line to Neutral |        |                      |       | Conformity Range |       | Possible Range |     |        |
|------------------------------|--------|----------------------|-------|------------------|-------|----------------|-----|--------|
| ID                           |        |                      |       | Default          | Min   | Max            | Min | Max    |
| .019                         | V> off | U <sub>THR</sub> OFF | %Unom | 115.2            | 115.2 | 115.2          | 100 | 135    |
| .020                         | V> on  | U <sub>THR</sub> ON  | %Unom | 110              | 100   | 110            | 100 | 135    |
| .021                         | T V>   | Time OFF             | ms    | 1000             | 1000  | 1900           | 50  | 300000 |

| Undervoltage1 Line to Neutral |        |                      |       | Conformity Range |       | Possible Range |     |        |
|-------------------------------|--------|----------------------|-------|------------------|-------|----------------|-----|--------|
| ID                            |        |                      |       | Default          | Min   | Max            | Min | Max    |
| .023                          | V< off | U <sub>THR</sub> OFF | %Unom | 78.3             | 78.3  | 78.3           | 0   | 100    |
| .024                          | V< on  | U <sub>THR</sub> ON  | %Unom | 89               | 89    | 100            | 0   | 100    |
| .025                          | T V<   | Time OFF             | ms    | 10000            | 10000 | 10900          | 50  | 300000 |

| Overvoltage2 Line to Neutral |         |                      |       | Conformity Range |         | Possible Range |         |        |
|------------------------------|---------|----------------------|-------|------------------|---------|----------------|---------|--------|
| ID                           |         |                      |       | Default          | Min     | Max            | Min     | Max    |
| .034                         | V>>     | Enable function      |       | off              | on /off |                | on /off |        |
| .035                         | V>> off | U <sub>THR</sub> OFF | %Unom | 119.6            | 119.6   | 119.6          | 100     | 135    |
| .036                         | V>> on  | U <sub>THR</sub> ON  | %Unom | 110              | 100     | 110            | 100     | 135    |
| .037                         | T V>>   | Time OFF             | ms    | 100              | 100     | 200            | 100     | 300000 |

| Undervoltage2 Line to Neutral |         |                      |       | Conformity Range |      | Possible Range |     |        |
|-------------------------------|---------|----------------------|-------|------------------|------|----------------|-----|--------|
| ID                            |         |                      |       | Default          | Min  | Max            | Min | Max    |
| .039                          | V<< off | U <sub>THR</sub> OFF | %Unom | 30.4             | 30.4 | 30.4           | 0   | 100    |
| .040                          | V<< on  | U <sub>THR</sub> ON  | %Unom | 89               | 89   | 100            | 0   | 100    |
| .041                          | T V<<   | Time OFF             | ms    | 1000             | 1000 | 1900           | 50  | 300000 |

| 10 minutes average overvoltage |      |                 |  | Conformity Range |          | Possible Range |         |     |
|--------------------------------|------|-----------------|--|------------------|----------|----------------|---------|-----|
| ID                             |      |                 |  | Default          | Min      | Max            | Min     | Max |
| .042                           | Uavg | Enable function |  | on               | on / off |                | on /off |     |

|      |          |                      |       |   |       |       |     |     |
|------|----------|----------------------|-------|---|-------|-------|-----|-----|
| .043 | Uavg off | U <sub>THR</sub> OFF | %Unom | 112.2                                   | 106.1 | 112.2 | 100 | 135 |
| .044 | Uavg on  | U <sub>THR</sub> ON  | %Unom | 110                                     | 100   | 110   | 100 | 135 |
|      |          | Time OFF             | ms    | Fixed to fastest possible disconnection |       |       |     |     |

| Overfrequency1 |        |                      |    | Conformity Range |       | Possible Range |       |        |
|----------------|--------|----------------------|----|------------------|-------|----------------|-------|--------|
| ID             |        |                      |    | Default          | Min   | Max            | Min   | Max    |
| .055           | F> off | f <sub>THR</sub> OFF | Hz | 52.00            | 52.00 | 52.00          | 50.00 | 55.00  |
| .056           | F> on  | f <sub>THR</sub> ON  | Hz | 50.15            | 50.00 | 50.15          | 50.00 | 55.00  |
| .057           | T F>   | Time OFF             | ms | 100              | 100   | 200            | 100   | 300000 |

| Underfrequency1 |        |                      |    | Conformity Range |       | Possible Range |       |        |
|-----------------|--------|----------------------|----|------------------|-------|----------------|-------|--------|
| ID              |        |                      |    | Default          | Min   | Max            | Min   | Max    |
| .059            | F< off | f <sub>THR</sub> OFF | Hz | 47.00            | 47.00 | 47.00          | 40.00 | 50.00  |
| .060            | F< on  | f <sub>THR</sub> ON  | Hz | 47.50            | 47.50 | 50.00          | 40.00 | 50.00  |
| .061            | T F<   | Time OFF             | ms | 1000             | 1000  | 1900           | 50    | 300000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |            |                          |       | Conformity Range |          | Possible Range |          |       |
|-------------------------------------|------------|--------------------------|-------|------------------|----------|----------------|----------|-------|
| ID                                  |            |                          |       | Default          | Min      | Max            | Min      | Max   |
| .090                                | RoCoF      | Enable Function          |       | off              | on / off |                | on / off |       |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | mHz/s | 1000             | 10       | 9990           | 10       | 9990  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | mHz/s | 950              | 10       | 9990           | 10       | 9990  |
| .093                                | RoCoFDelay | Time OFF                 | ms    | 500              | 50       | 500            | 50       | 10000 |
| .111                                | RoCoF wnd  | Window length            | ms    | 225              | 100      | 1000           | 100      | 1000  |

| Phase Shift (PShift) |        |                 |  | Conformity Range |          | Possible Range |          |     |
|----------------------|--------|-----------------|--|------------------|----------|----------------|----------|-----|
| ID                   |        |                 |  | Default          | Min      | Max            | Min      | Max |
| .094                 | PShift | Enable Function |  | off              | on / off |                | on / off |     |

| .095                   | PShift off | PShift <sub>THR</sub> OFF | °                      | 8              | 1                      | 8                | 1                      | 15    |
|------------------------|------------|---------------------------|------------------------|----------------|------------------------|------------------|------------------------|-------|
| .096                   | PShift on  | PShift <sub>THR</sub> ON  | °                      | 6              | 1                      | 7                | 1                      | 15    |
| .097                   | PShiftDel  | Time OFF                  | ms                     | 50             | 50                     | 50               | 50                     | 10000 |
| .112                   | PShift wnd | Window length             | ms                     | 50             | 50                     | 500              | 50                     | 1000  |
| Auxiliary Contact type |            |                           |                        |                |                        | Conformity Range | Possible Range         |       |
| ID                     |            |                           | Default                |                | Min                    | Max              | Min                    | Max   |
| .099                   | Contact    | Type                      | n.c. (normally closed) |                | n.o. (normally opened) |                  | n.o. (normally opened) |       |
|                        |            |                           |                        |                | n.c. (normally closed) |                  | n.c. (normally closed) |       |
|                        |            |                           |                        |                | dis. (disabled)        |                  |                        |       |
| .100                   | T Contact  | Time OFF                  | ms                     | Fixed to 500ms |                        |                  |                        |       |
| .114                   | I3 STOP    | Type                      | n.o. (normally opened) |                | n.o. (normally opened) |                  | n.o. (normally opened) |       |
|                        |            |                           |                        |                | n.c. (normally closed) |                  | n.c. (normally closed) |       |
|                        |            |                           |                        |                | dis. (disabled)        |                  |                        |       |

| Turn-on delay |           |              |   |         |     | Conformity Range | Possible Range |     |
|---------------|-----------|--------------|---|---------|-----|------------------|----------------|-----|
| ID            |           |              |   | Default | Min | Max              | Min            | Max |
| .102          | Ton delay | Turn on time | s | 60      | 0   | 60               | 0              | 900 |

| Password |     |   |  |  |         |     |
|----------|-----|---|--|--|---------|-----|
| ID       |     |   |  |  | Default | Min |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |

|   |  |  |  |  |  |    |
|---|--|--|--|--|--|----|
| <b>Errorlogic signalled (shown) on output relay R3.</b> |  |  |  |  |  |    |
| On = it is possible to detect this error                |  |  |  |  |  |    |
| Off = it is not possible to show this error on relay R3 |  |  |  |  |  |    |
| Overvoltage LL (UΔ)                                     |  |  |  |  |  | on |

|   |     |
|---|-----|
| Undervoltage LL (UΔ)  | on  |
| Oversupply LN (UY)  | on  |
| Undervoltage LN (UY)  | on  |
| 10-min oversupply (Ü)   | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                |   |
|--------------------|--------------------------------|---|
| ID                 |                                |   |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**10.44 C AS 4777.2:2020 [ID 1120]**

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |  |  |  |
|-------------------|--------|---|------------------|--|--|----------------|--|--|--|--|
| ID                |        | Default   |                  |  |  |                |  |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |  |  |  |

| Overvoltage1 Line to Neutral |        |          |       | Conformity Range |       | Possible Range |           |
|------------------------------|--------|----------|-------|------------------|-------|----------------|-----------|
| ID                           |        | Default  |       | Min              | Max   | Min            | Max       |
| .019                         | V> off | UTHR OFF | %Unom | 115.2            | 115.2 | 115.2          | 100 135   |
| .020                         | V> on  | UTHR ON  | %Unom | 110              | 100   | 110            | 100 135   |
| .021                         | T V>   | Time OFF | ms    | 1000             | 1000  | 1900           | 50 300000 |

| Undervoltage1 Line to Neutral |        |          |       | Conformity Range |       | Possible Range |           |
|-------------------------------|--------|----------|-------|------------------|-------|----------------|-----------|
| ID                            |        | Default  |       | Min              | Max   | Min            | Max       |
| .023                          | V< off | UTHR OFF | %Unom | 78.3             | 78.3  | 78.3           | 0 100     |
| .024                          | V< on  | UTHR ON  | %Unom | 89               | 89    | 100            | 0 100     |
| .025                          | T V<   | Time OFF | ms    | 10000            | 10000 | 10900          | 50 300000 |

| Overvoltage2 Line to Neutral |     |                 |     | Conformity Range |     | Possible Range |         |  |
|------------------------------|-----|-----------------|-----|------------------|-----|----------------|---------|--|
| ID                           |     | Default         |     | Min              | Max | Min            | Max     |  |
| .034                         | V>> | Enable function | off | on /off          |     |                | on /off |  |

|      |         |                      |       |       |       |       |     |        |
|------|---------|----------------------|-------|-------|-------|-------|-----|--------|
| .035 | V>> off | U <sub>THR</sub> OFF | %Unom | 119.6 | 119.6 | 119.6 | 100 | 135    |
| .036 | V>> on  | U <sub>THR</sub> ON  | %Unom | 110   | 100   | 110   | 100 | 135    |
| .037 | T V>>   | Time OFF             | ms    | 100   | 100   | 200   | 100 | 300000 |

| Undervoltage2 Line to Neutral |         |          |         | Conformity Range |      | Possible Range |     |        |
|-------------------------------|---------|----------|---------|------------------|------|----------------|-----|--------|
| ID                            |         |          | Default | Min              | Max  | Min            | Max |        |
| .039                          | V<< off | UTHR OFF | %Unom   | 30.4             | 30.4 | 30.4           | 0   | 100    |
| .040                          | V<< on  | UTHR ON  | %Unom   | 89               | 89   | 100            | 0   | 100    |
| .041                          | T V<<   | Time OFF | ms      | 1000             | 1000 | 1900           | 50  | 300000 |

| 10 minutes average overvoltage |          |                      |         | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|----------|----------------------|---------|---|----------|----------------|---------|-----|
| ID                             |          |                      | Default | Min                                     | Max      | Min            | Max     |     |
| .042                           | Uavg     | Enable function      |         | on                                      | on / off |                | on /off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom   | 112.2                                   | 106.1    | 112.2          | 100     | 135 |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom   | 110                                     | 100      | 110            | 100     | 135 |
|                                |          | Time OFF             | ms      | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |        |          |    | Conformity Range |       | Possible Range |       |        |
|----------------|--------|----------|----|------------------|-------|----------------|-------|--------|
| ID             |        |          |    | Default          | Min   | Max            | Min   | Max    |
| .055           | F> off | fTHR OFF | Hz | 55.00            | 55.00 | 55.00          | 50.00 | 55.00  |
| .056           | F> on  | fTHR ON  | Hz | 50.15            | 50.00 | 50.15          | 50.00 | 55.00  |
| .057           | T F>   | Time OFF | ms | 100              | 100   | 200            | 100   | 300000 |

| Underfrequency1 |        |          |    | Conformity Range |       | Possible Range |       |        |
|-----------------|--------|----------|----|------------------|-------|----------------|-------|--------|
| ID              |        |          |    | Default          | Min   | Max            | Min   | Max    |
| .059            | F< off | fTHR OFF | Hz | 45.00            | 45.00 | 45.00          | 40.00 | 50.00  |
| .060            | F< on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 40.00 | 50.00  |
| .061            | T F<   | Time OFF | ms | 5000             | 5000  | 5900           | 50    | 300000 |

| Frequency measuring in general |  |         | Conformity Range |     | Possible Range |     |
|--------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                             |  | Default | Min              | Max | Min            | Max |

|      |       |               |    |                           |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|
| .113 | F wnd | Window length | ms | Fixed window length 100ms |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|

| Rate of Change of Frequency (RoCoF) |            |                          |       |         | Conformity Range |          | Possible Range |          |  |
|-------------------------------------|------------|--------------------------|-------|---------|------------------|----------|----------------|----------|--|
| ID                                  |            |                          |       | Default | Min              | Max      | Min            | Max      |  |
| .090                                | RoCoF      | Enable Function          |       |         | off              | on / off |                | on / off |  |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | mHz/s | 1000    | 10               | 9990     | 10             | 9990     |  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | mHz/s | 950     | 10               | 9990     | 10             | 9990     |  |
| .093                                | RoCoFDelay | Time OFF                 |       | ms      | 500              | 50       | 500            | 50       |  |
| .111                                | RoCoF wnd  | Window length            | ms    | 225     | 100              | 1000     | 100            | 1000     |  |

| Phase Shift (PShift) |            |                           |    |         | Conformity Range |          | Possible Range |          |  |
|----------------------|------------|---------------------------|----|---------|------------------|----------|----------------|----------|--|
| ID                   |            |                           |    | Default | Min              | Max      | Min            | Max      |  |
| .094                 | PShift     | Enable Function           |    |         | off              | on / off |                | on / off |  |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | °  | 8       | 1                | 8        | 1              | 15       |  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 6       | 1                | 7        | 1              | 15       |  |
| .097                 | PShiftDel  | Time OFF                  |    | ms      | 50               | 50       | 50             | 10000    |  |
| .112                 | PShift wnd | Window length             | ms | 50      | 50               | 500      | 50             | 1000     |  |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |

| Turn-on delay | Conformity Range | Possible Range |
|---------------|------------------|----------------|
|---------------|------------------|----------------|

| ID   |           |              |   | Default | Min | Max | Min | Max |
|------|-----------|--------------|---|---------|-----|-----|-----|-----|
| .102 | Ton delay | Turn on time | s | 60      | 0   | 60  | 0   | 900 |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                  |                        |
|--------------------|------------------|------------------------|
| ID                 |                  |                        |
| .105               | ID: xxxxxxxxxxxx | xxxxxxxxxx = Device ID |

|  |              |   |
|--|--------------|---|
|  | SW: aa.ddccb | dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |
|--|--------------|---|

**00. NZS 4777.2:2020 [ID 1130]**

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Overvoltage1 Line to Neutral |        |                      |       | Conformity Range |       | Possible Range |           |
|------------------------------|--------|----------------------|-------|------------------|-------|----------------|-----------|
| ID                           |        | Default              |       | Min              | Max   | Min            | Max       |
| .019                         | V> off | U <sub>THR</sub> OFF | %Unom | 115.2            | 115.2 | 115.2          | 100 135   |
| .020                         | V> on  | U <sub>THR</sub> ON  | %Unom | 110              | 100   | 110            | 100 135   |
| .021                         | T V>   | Time OFF             | ms    | 1000             | 1000  | 1900           | 50 300000 |

| Undervoltage1 Line to Neutral |        |                      |       | Conformity Range |       | Possible Range |           |
|-------------------------------|--------|----------------------|-------|------------------|-------|----------------|-----------|
| ID                            |        | Default              |       | Min              | Max   | Min            | Max       |
| .023                          | V< off | U <sub>THR</sub> OFF | %Unom | 78.3             | 78.3  | 78.3           | 0 100     |
| .024                          | V< on  | U <sub>THR</sub> ON  | %Unom | 89               | 89    | 100            | 0 100     |
| .025                          | T V<   | Time OFF             | ms    | 10000            | 10000 | 10900          | 50 300000 |

| Overvoltage2 Line to Neutral |     |                 |     | Conformity Range |     | Possible Range |     |
|------------------------------|-----|-----------------|-----|------------------|-----|----------------|-----|
| ID                           |     | Default         |     | Min              | Max | Min            | Max |
| .034                         | V>> | Enable function | off | on /off          |     | on /off        |     |

|      |         |                      |       |       |       |       |     |        |
|------|---------|----------------------|-------|-------|-------|-------|-----|--------|
| .035 | V>> off | U <sub>THR</sub> OFF | %Unom | 119.6 | 119.6 | 119.6 | 100 | 135    |
| .036 | V>> on  | U <sub>THR</sub> ON  | %Unom | 110   | 100   | 110   | 100 | 135    |
| .037 | T V>>   | Time OFF             | ms    | 100   | 100   | 200   | 100 | 300000 |

| Undervoltage2 Line to Neutral |         |                      |         | Conformity Range |      | Possible Range |     |        |
|-------------------------------|---------|----------------------|---------|------------------|------|----------------|-----|--------|
| ID                            |         |                      | Default | Min              | Max  | Min            | Max |        |
| .039                          | V<< off | U <sub>THR</sub> OFF | %Unom   | 30.4             | 30.4 | 30.4           | 0   | 100    |
| .040                          | V<< on  | U <sub>THR</sub> ON  | %Unom   | 89               | 89   | 100            | 0   | 100    |
| .041                          | T V<<   | Time OFF             | ms      | 1000             | 1000 | 1900           | 50  | 300000 |

| 10 minutes average overvoltage |          |                      |         | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|----------|----------------------|---------|---|----------|----------------|---------|-----|
| ID                             |          |                      | Default | Min                                     | Max      | Min            | Max     |     |
| .042                           | Uavg     | Enable function      |         | on                                      | on / off |                | on /off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom   | 108.3                                   | 106.1    | 112.2          | 100     | 135 |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom   | 106.1                                   | 100      | 110            | 100     | 135 |
|                                |          | Time OFF             | ms      | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |        |          |    | Conformity Range |       | Possible Range |       |        |
|----------------|--------|----------|----|------------------|-------|----------------|-------|--------|
| ID             |        |          |    | Default          | Min   | Max            | Min   | Max    |
| .055           | F> off | fTHR OFF | Hz | 55.00            | 55.00 | 55.00          | 50.00 | 55.00  |
| .056           | F> on  | fTHR ON  | Hz | 50.15            | 50.00 | 50.15          | 50.00 | 55.00  |
| .057           | T F>   | Time OFF | ms | 100              | 100   | 200            | 100   | 300000 |

| Underfrequency1 |        |          |    | Conformity Range |       | Possible Range |       |        |
|-----------------|--------|----------|----|------------------|-------|----------------|-------|--------|
| ID              |        |          |    | Default          | Min   | Max            | Min   | Max    |
| .059            | F< off | fTHR OFF | Hz | 45.00            | 45.00 | 45.00          | 40.00 | 50.00  |
| .060            | F< on  | fTHR ON  | Hz | 47.50            | 47.50 | 50.00          | 40.00 | 50.00  |
| .061            | T F<   | Time OFF | ms | 1000             | 1000  | 1900           | 50    | 300000 |

| Frequency measuring in general |  |         | Conformity Range |     | Possible Range |     |
|--------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                             |  | Default | Min              | Max | Min            | Max |

|      |       |               |    |                           |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|
| .113 | F wnd | Window length | ms | Fixed window length 100ms |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|

| Rate of Change of Frequency (RoCoF) |            |                          |       | Conformity Range |          | Possible Range |          |      |
|-------------------------------------|------------|--------------------------|-------|------------------|----------|----------------|----------|------|
| ID                                  |            |                          |       | Default          | Min      | Max            | Min      | Max  |
| .090                                | RoCoF      | Enable Function          |       | off              | on / off |                | on / off |      |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | mHz/s | 1000             | 10       | 9990           | 10       | 9990 |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | mHz/s | 950              | 10       | 9990           | 10       | 9990 |
| .093                                | RoCoFDelay | Time OFF                 |       | ms               | 500      | 50             | 500      | 50   |
| .111                                | RoCoF wnd  | Window length            | ms    | 225              | 100      | 1000           | 100      | 1000 |

| Phase Shift (PShift) |            |                           |    | Conformity Range |          | Possible Range |          |       |
|----------------------|------------|---------------------------|----|------------------|----------|----------------|----------|-------|
| ID                   |            |                           |    | Default          | Min      | Max            | Min      | Max   |
| .094                 | PShift     | Enable Function           |    | off              | on / off |                | on / off |       |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | °  | 8                | 1        | 8              | 1        | 15    |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 6                | 1        | 7              | 1        | 15    |
| .097                 | PShiftDel  | Time OFF                  |    | ms               | 50       | 50             | 50       | 10000 |
| .112                 | PShift wnd | Window length             | ms | 50               | 50       | 500            | 50       | 1000  |

| Auxiliary Contact type |           |          |                        | Conformity Range       |     | Possible Range         |     |
|------------------------|-----------|----------|------------------------|------------------------|-----|------------------------|-----|
| ID                     |           |          | Default                | Min                    | Max | Min                    | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |     |                        |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) |     | n.o. (normally opened) |     |
|                        |           |          |                        | n.c. (normally closed) |     | n.c. (normally closed) |     |
|                        |           |          |                        | dis. (disabled)        |     | dis. (disabled)        |     |

| Turn-on delay | Conformity Range | Possible Range |
|---------------|------------------|----------------|
|---------------|------------------|----------------|

| ID   |           |              |   | Default | Min | Max | Min | Max |
|------|-----------|--------------|---|---------|-----|-----|-----|-----|
| .102 | Ton delay | Turn on time | s | 60      | 0   | 60  | 0   | 900 |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                  |                        |
|--------------------|------------------|------------------------|
| ID                 |                  |                        |
| .105               | ID: xxxxxxxxxxxx | xxxxxxxxxx = Device ID |

|  |               |   |
|--|---------------|---|
|  | SW: aa.dd.ccb | dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |
|--|---------------|---|

## 10.45 NSW-Augrid 23 [ID 1135]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                    |                     |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------|---------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V/<br>417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V | 240,01V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on /off                  |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |              |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|--------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero >    | Enable Function                  |              | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |              | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |              |                 |                  |                 |               |                   |  |

| 10 minutes average overvoltage |          |                      |              | Conformity Range               |                                | Possible Range                 |                                 |                                |
|--------------------------------|----------|----------------------|--------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|
| ID                             |          |                      |              | Default                        | Min                            | Max                            | Min                             | Max                            |
| .042                           | Uavg     | Enable function      |              | on                             | on / off                       |                                | on /off                         |                                |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 107,00% (256,81V)<br>/446,62V) | 107,00% (256,81V)<br>/446,62V) | 107,00% (256,81V)<br>/446,62V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 105,00% (252,01V)<br>/438,27V) | 105,00% (252,01V)<br>/438,27V) | 105,00% (252,01V)<br>/438,27V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |       |               | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|
| ID                             |       |               | Default          | Min    | Max    |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |            |                          | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|------------|--------------------------|------------------|------------|----------------|----------|------------|
| ID                                  |            |                          | Default          | Min        | Max            | Min      | Max        |
| .090                                | RoCoF      | En Function              | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 4000 mHz/s       | 4000 mHz/s | 4000 mHz/s     | 10 mHz/s | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 3950 mHz/s       | 3950 mHz/s | 3950 mHz/s     | 10 mHz/s | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 100 ms           | 100 ms     | 100 ms         | 100 ms   | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms           | 100 ms     | 1000 ms        | 100 ms   | 1000 ms    |

| Phase Shift (PShift) |            |                           | Conformity Range |          | Possible Range |          |          |
|----------------------|------------|---------------------------|------------------|----------|----------------|----------|----------|
| ID                   |            |                           | Default          | Min      | Max            | Min      | Max      |
| .094                 | PShift     | Enable Function           | on               | on / off |                | on / off |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 20,0 °           | 20,0 °   | 20,0 °         | 1,0 °    | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 18,0 °           | 17,0 °   | 17,0 °         | 1,0 °    | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms            | 50 ms    | 50 ms          | 50 ms    | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms            | 50 ms    | 500 ms         | 50 ms    | 1000 ms  |

| Auxiliary Contact type |           |          | Conformity Range       |  | Possible Range |   |     |
|------------------------|-----------|----------|------------------------|--|----------------|---|-----|
| ID                     |           |          | Default                | Min  | Max            | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |                |   |     |

|      |         |      |                        |  |   |
|------|---------|------|------------------------|--|---|
| .114 | I3 STOP | Type | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |
|------|---------|------|------------------------|--|---|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |
|--------------------|------------------------------------|
| ID                 |                                    |
| .105               | SN: xxxxxxxxxx<br><br>SW: aa.ddccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

## 10.46 NSW-Essential 23 [ID 1140]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |              |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|--------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |              | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |              | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |              |                 |                  |                 |               |                   |  |

| 10 minutes average overvoltage |          |                      |              | Conformity Range               |                                | Possible Range                 |                                 |                                |
|--------------------------------|----------|----------------------|--------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|
| ID                             |          |                      |              | Default                        | Min                            | Max                            | Min                             | Max                            |
| .042                           | Uavg     | Enable function      |              | on                             | on / off                       |                                | on / off                        |                                |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |                          |            | Conformity Range |            | Possible Range |            |
|-------------------------------------|------------|--------------------------|------------|------------------|------------|----------------|------------|
| ID                                  |            |                          | Default    | Min              | Max        | Min            | Max        |
| .090                                | RoCoF      | En Function              | on         | on / off         |            | on / off       |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 1000 mHz/s       | 1000 mHz/s | 10 mHz/s       | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 950 mHz/s  | 950 mHz/s        | 950 mHz/s  | 10 mHz/s       | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 850 ms     | 850 ms           | 850 ms     | 100 ms         | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms     | 100 ms           | 1000 ms    | 100 ms         | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |

|      |         |      |  |   |  |
|------|---------|------|--|---|--|
| .114 | I3 STOP | Type | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) |
|------|---------|------|--|---|--|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Ovvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Ovvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |
|--------------------|------------------------------------|
| ID                 |                                    |
| .105               | SN: xxxxxxxxxx<br><br>SW: aa.ddccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

## 10.47 NSW-Endeavour 23 [ID 1145]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

|                  |          |  |                 |                     |                     |                     |                  |                      |
|------------------|----------|--|-----------------|---------------------|---------------------|---------------------|------------------|----------------------|
| .014             | VLL<     | Enable function                          |                 | on                  | on / off            |                     | on / off         |                      |
| .015             | VLL< off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 75,00%<br>(313,05V) | 75,00%<br>(313,05V) | 75,00%<br>(313,05V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .016             | VLL< on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 78,00%<br>(325,57V) | 78,00%<br>(325,57V) | 78,00%<br>(325,57V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .017             | T VLL<   | Time OFF                                 |                 | 2000 ms             | 2000 ms             | 2000 ms             | 50 ms            | 300000 ms            |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                     |                     |                  |                      |

| Overvoltage1 Line to Neutral |        |   |                 |                      | Conformity Range             |                      | Possible Range           |                      |
|------------------------------|--------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |        |   |                 | Default              | Min                          | Max                  | Min                      | Max                  |
| .019                         | V> off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 108,00%<br>(259,21V) | 108,00<br>%<br>(259,21<br>V) | 108,00%<br>(259,21V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .020                         | V> on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 105,00%<br>(252,01V) | 110,00<br>%<br>(264,01<br>V) | 110,00%<br>(264,01V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .021                         | T V>   | Time OFF  |                 | 2000 ms              | 2000 ms                      | 2000 ms              | 50 ms                    | 300000 ms            |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Neutral |        |   |                 |                     | Conformity Range    |                     | Possible Range   |                      |
|-------------------------------|--------|---|-----------------|---------------------|---------------------|---------------------|------------------|----------------------|
| ID                            |        |   |                 | Default             | Min                 | Max                 | Min              | Max                  |
| .023                          | V< off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 75,00%<br>(180,00V) | 75,00%<br>(180,00V) | 75,00%<br>(180,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .024                          | V< on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .025                          | T V<   | Time OFF  |                 | 2000 ms             | 2000 ms             | 2000 ms             | 50 ms            | 300000 ms            |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                     |                     |                  |                      |

| Zero Voltage Line to Neutral |  |  |  |         | Conformity Range |     | Possible Range |     |
|------------------------------|--|--|--|---------|------------------|-----|----------------|-----|
| ID                           |  |  |  | Default | Min              | Max | Min            | Max |
|                              |  |  |  |         |                  |     |                |     |

|                  |            |                                  |                                     |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|-------------------------------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |                                     | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %U <sub>nom</sub> /V <sub>nom</sub> | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub> /V <sub>nom</sub> | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |                                     | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |                                     |                 |                  |                 |               |                   |  |

| Overfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID             | Default |                      | Min              | Max       | Min            | Max       |
| .055           | F> off  | f <sub>THR</sub> OFF | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz |
| .056           | F> on   | f <sub>THR</sub> ON  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz |
| .057           | T F>    | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    |

| Underfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID              | Default |                      | Min              | Max       | Min            | Max       |
| .059            | F< off  | f <sub>THR</sub> OFF | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz |
| .060            | F< on   | f <sub>THR</sub> ON  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz |
| .061            | T F<    | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    |

| Frequency measuring in general |         |               | Conformity Range |        |        |  |
|--------------------------------|---------|---------------|------------------|--------|--------|--|
| ID                             | Default |               | Min              | Max    |        |  |
| .113                           | F wnd   | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |           |                          | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|-----------|--------------------------|------------------|------------|----------------|----------|------------|
| ID                                  | Default   |                          | Min              | Max        | Min            | Max      |            |
| .090                                | RoCoF     | En Function              | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF | 1000 mHz/s       | 1000 mHz/s | 1000 mHz/s     | 10 mHz/s | 5000 mHz/s |

|      |            |                         |           |           |           |          |            |
|------|------------|-------------------------|-----------|-----------|-----------|----------|------------|
| .092 | RoCoF on   | RoCoF <sub>THR</sub> ON | 950 mHz/s | 950 mHz/s | 950 mHz/s | 10 mHz/s | 4950 mHz/s |
| .093 | RoCoFDelay | Time OFF                | 850 ms    | 850 ms    | 850 ms    | 100 ms   | 10000 ms   |
| .111 | RoCoF wnd  | Window length           | 225 ms    | 100 ms    | 1000 ms   | 100 ms   | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |                                   |  |   |         |     |     |
|----------|-----|-----------------------------------|--|---|---------|-----|-----|
| ID       |     |                                   |  |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  | 0 | 0       | 0   | 9   |

|         |     |   |   |   |   |
|---------|-----|---|---|---|---|
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0 | 0 | 9 |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0 | 0 | 9 |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0 | 0 | 9 |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |   |   |   |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.48 VIC-United Energy 23 [ID 1150]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 110,00%<br>(459,14V) | 110,00%<br>(459,14<br>V) | 110,00%<br>(459,14V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> off | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 107,00%<br>(446,62V) | 107,00%<br>(446,62<br>V) | 107,00%<br>(446,62V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

|                  |          |  |  |                     |                     |                     |                  |                      |
|------------------|----------|--|--|---------------------|---------------------|---------------------|------------------|----------------------|
| .014             | VLL<     | Enable function                          |  | on                  |                     |                     |                  |                      |
| .015             | VLL< off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 75,00%<br>(313,05V) | 75,00%<br>(313,05V) | 75,00%<br>(313,05V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .016             | VLL< on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 78,00%<br>(325,57V) | 78,00%<br>(325,57V) | 78,00%<br>(325,57V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .017             | T VLL<   | Time OFF                                 |  | 11000 ms            | 11000 ms            | 11000 ms            | 50 ms            | 300000 ms            |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                     |                     |                     |                  |                      |

| Overvoltage1 Line to Neutral |        |   |  |                      | Conformity Range             |                      | Possible Range           |                      |
|------------------------------|--------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |        |   |  | Default              | Min                          | Max                  | Min                      | Max                  |
| .019                         | V> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 110,00%<br>(264,01V) | 110,00<br>%<br>(264,01<br>V) | 110,00%<br>(264,01V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .020                         | V> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 107,00%<br>(256,81V) | 107,00<br>%<br>(256,81<br>V) | 107,00%<br>(256,81V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .021                         | T V>   | Time OFF  |  | 2000 ms              | 2000<br>ms                   | 2000 ms              | 50 ms                    | 300000 ms            |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Neutral |        |   |  |                     | Conformity Range    |                     | Possible Range   |                      |
|-------------------------------|--------|---|--|---------------------|---------------------|---------------------|------------------|----------------------|
| ID                            |        |   |  | Default             | Min                 | Max                 | Min              | Max                  |
| .023                          | V< off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 75,00%<br>(180,00V) | 75,00%<br>(180,00V) | 75,00%<br>(180,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .024                          | V< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .025                          | T V<   | Time OFF  |  | 11000 ms            | 11000 ms            | 11000 ms            | 50 ms            | 300000 ms            |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                     |                     |                  |                      |

| Overvoltage2 Line to Line |       |                 |  | Conformity Range |     | Possible Range |     |  |
|---------------------------|-------|-----------------|--|------------------|-----|----------------|-----|--|
| ID                        |       |                 |  | Default          | Min | Max            | Min |  |
| .026                      | VLL>> | Enable function |  | on               |     |                |     |  |

|                  |           |  |                 |                      |                               |                      |                          |                      |
|------------------|-----------|--|-----------------|----------------------|-------------------------------|----------------------|--------------------------|----------------------|
| .027             | VLL>> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 114,00%<br>(475,84V) | 114,00%<br>%<br>(475,84<br>V) | 114,00%<br>(475,84V) | 100,00%<br>(417,40V<br>) | 135,00%<br>(563,49V) |
| .028             | VLL>> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 107,00%<br>(446,62V) | 107,00<br>%<br>(446,62<br>V)  | 107,00%<br>(446,62V) | 100,00%<br>(417,40V<br>) | 135,00%<br>(563,49V) |
| .029             | T VLL>>   | Time OFF                                 |                 | 200 ms               | 200 ms                        | 200 ms               | 50 ms                    | 300000 ms            |
| Only active for: |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                               |                      |                          |                      |

| Undervoltage2 Line to Line |           |  |                 | Conformity Range    |                         | Possible Range      |                  |                      |
|----------------------------|-----------|--|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| ID                         |           |  |                 | Default             | Min                     | Max                 | Min              | Max                  |
| .030                       | VLL<<     | Enable function                          |                 | on                  |                         |                     |                  |                      |
| .031                       | VLL<< off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 29,20%<br>(121,88V) | 29,20%<br>(121,88<br>V) | 29,20%<br>(121,88V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .032                       | VLL<< on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 78,00%<br>(325,57V) | 78,00%<br>(325,57<br>V) | 78,00%<br>(325,57V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .033                       | T VLL<<   | Time OFF                                 |                 | 2000 ms             | 2000<br>ms              | 2000 ms             | 50 ms            | 300000 ms            |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                         |                     |                  |                      |

| Overvoltage2 Line to Neutral |         |   |                 | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|---------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |         |   |                 | Default              | Min                          | Max                  | Min                      | Max                  |
| .034                         | V>>     | Enable function                                       |                 | on                   | on / off                     |                      | on / off                 |                      |
| .035                         | V>> off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 114,00%<br>(273,61V) | 114,00<br>%<br>(273,61<br>V) | 114,00%<br>(273,61V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .036                         | V>> on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 107,00%<br>(256,81V) | 107,00<br>%<br>(256,81<br>V) | 107,00%<br>(256,81V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .037                         | T V>>   | Time OFF  |                 | 200 ms               | 200 ms                       | 200 ms               | 100 ms                   | 300000 ms            |
| Only active for:             |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Neutral |           |                         |                 | Conformity Range     |                              | Possible Range       |                          |                      |
|-------------------------------|-----------|-------------------------|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                            |           |                         |                 | Default              | Min                          | Max                  | Min                      | Max                  |
| .027                          | VLL>> off | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 114,00%<br>(475,84V) | 114,00<br>%<br>(475,84<br>V) | 114,00%<br>(475,84V) | 100,00%<br>(417,40V<br>) | 135,00%<br>(563,49V) |

| ID               |         |   |  | Default             | Min                     | Max                 | Min              | Max                  |
|------------------|---------|---|--|---------------------|-------------------------|---------------------|------------------|----------------------|
| .038             | V<<     | Enable function                                       |  | on                  | on / off                |                     | on / off         |                      |
| .039             | V<< off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 29,20%<br>(70,08V)  | 29,20%<br>(70,08V<br>)  | 29,20%<br>(70,08V)  | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .040             | V<< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 78,00%<br>(187,20V) | 78,00%<br>(187,20<br>V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .041             | T V<<   | Time OFF  |  | 2000 ms             | 2000<br>ms              | 2000 ms             | 50 ms            | 300000 ms            |
| Only active for: |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                         |                     |                  |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                        | Possible Range     |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------------|--------------------|------------------|----------------------|
| ID                           |            |                                  |  | Default            | Min                    | Max                | Min              | Max                  |
| .115                         | Uzero>     | Enable Function                  |  | off                | on / off               |                    | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/V <sub>nom</sub> | 20,00%<br>(48,00V) | 20,00%<br>(48,00V<br>) | 20,00%<br>(48,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/V <sub>nom</sub> | 15,00%<br>(36,00V) | 15,00%<br>(36,00V<br>) | 15,00%<br>(36,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .118                         | T Uzero>   | Time OFF                         |  | 1500 ms            | 1500<br>ms             | 1500 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                        |                    |                  |                      |

| 10 minutes average overvoltage |          |                         |  | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|----------|-------------------------|--|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |          |                         |  | Default                          | Min                              | Max                              | Min                                  | Max                              |
| .042                           | Uavg     | Enable function         |  | on                               | on / off                         |                                  | on / off                             |                                  |
| .043                           | Uavg off | U <sub>THR</sub><br>OFF | %U <sub>nom</sub><br>/V <sub>nom</sub> | 106,00%<br>(254,41V<br>/442,44V) | 106,00%<br>(254,41V<br>/442,44V) | 106,00%<br>(254,41V<br>/442,44V) | 100,00%<br>(240,01V<br>/417,40V<br>) | 135,00%<br>(324,01V<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON     | %U <sub>nom</sub><br>/V <sub>nom</sub> | 104,00%<br>(249,61V<br>/434,10V) | 104,00%<br>(249,61V<br>/434,10V) | 104,00%<br>(249,61V<br>/434,10V) | 100,00%<br>(240,01V<br>/417,40V<br>) | 135,00%<br>(324,01V<br>/563,49V) |

| Overfrequency1 |  |  |  | Conformity Range |  | Possible Range |  |
|----------------|--|--|--|------------------|--|----------------|--|
|                |  |  |  |                  |  |                |  |

| ID   |        |                      | Default   | Min       | Max       | Min       | Max       |
|------|--------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .055 | F> off | f <sub>THR</sub> OFF | 52,000 Hz | 52,000 Hz | 52,000 Hz | 50,000 Hz | 55,000 Hz |
| .056 | F> on  | f <sub>THR</sub> ON  | 51,900 Hz | 51,900 Hz | 51,900 Hz | 50,000 Hz | 55,000 Hz |
| .057 | T F>   | Time OFF             | 2000 ms   | 2000 ms   | 2000 ms   | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |
| .061            | T F<   | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|
| ID                             |       |               | Default          | Min    | Max    |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |            |                          | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|------------|--------------------------|------------------|------------|----------------|----------|------------|
| ID                                  |            |                          | Default          | Min        | Max            | Min      | Max        |
| .090                                | RoCoF      | En Function              | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 3000 mHz/s       | 3000 mHz/s | 3000 mHz/s     | 10 mHz/s | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 2950 mHz/s       | 2950 mHz/s | 2950 mHz/s     | 10 mHz/s | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 850 ms           | 850 ms     | 850 ms         | 100 ms   | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms           | 100 ms     | 1000 ms        | 100 ms   | 1000 ms    |

| Phase Shift (PShift) |        |                 | Conformity Range |          | Possible Range |          |     |
|----------------------|--------|-----------------|------------------|----------|----------------|----------|-----|
| ID                   |        |                 | Default          | Min      | Max            | Min      | Max |
| .094                 | PShift | Enable Function | on               | on / off |                | on / off |     |

|      |            |                           |        |        |        |       |          |
|------|------------|---------------------------|--------|--------|--------|-------|----------|
| .095 | PShift off | PShift <sub>THR</sub> OFF | 21,0 ° | 21,0 ° | 21,0 ° | 1,0 ° | 25,0 °   |
| .096 | Pshift on  | PShift <sub>THR</sub> ON  | 19,0 ° | 19,0 ° | 19,0 ° | 1,0 ° | 24,0 °   |
| .097 | PshiftDel  | Time OFF                  | 50 ms  | 50 ms  | 50 ms  | 50 ms | 10000 ms |
| .112 | PShift wnd | Window length             | 50 ms  | 50 ms  | 500 ms | 50 ms | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |  |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|--|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

|   |    |
|---|----|
| <b>Errorlogic signalled (shown) on output relay R3.</b> |    |
| On = it is possible to detect this error                |    |
| Off = it is not possible to show this error on relay R3 |    |
| Overvoltage LL (UΔ)                                     | on |

|   |     |
|---|-----|
| Undervoltage LL (UΔ)  | on  |
| Oversupply LN (UY)  | on  |
| Undervoltage LN (UY)  | on  |
| 10-min oversupply (Ü)   | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.49 VIC-Ausnet Energy 23 [ID 1155]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |                                     |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|-------------------------------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |                                     | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %U <sub>nom</sub> /V <sub>nom</sub> | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub> /V <sub>nom</sub> | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |                                     | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |                                     |                 |                  |                 |               |                   |  |

| Overfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID             | Default |                      | Min              | Max       | Min            | Max       |
| .055           | F> off  | f <sub>THR</sub> OFF | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz |
| .056           | F> on   | f <sub>THR</sub> ON  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz |
| .057           | T F>    | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    |

| Underfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID              | Default |                      | Min              | Max       | Min            | Max       |
| .059            | F< off  | f <sub>THR</sub> OFF | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz |
| .060            | F< on   | f <sub>THR</sub> ON  | 48,000 Hz        | 48,000 Hz | 48,000 Hz      | 40,000 Hz |
| .061            | T F<    | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    |

| Frequency measuring in general |         |               | Conformity Range |        |        |  |
|--------------------------------|---------|---------------|------------------|--------|--------|--|
| ID                             | Default |               | Min              | Max    |        |  |
| .113                           | F wnd   | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |           |                          | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|-----------|--------------------------|------------------|------------|----------------|----------|------------|
| ID                                  | Default   |                          | Min              | Max        | Min            | Max      |            |
| .090                                | RoCoF     | En Function              | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF | 4000 mHz/s       | 4000 mHz/s | 4000 mHz/s     | 10 mHz/s | 5000 mHz/s |

|      |            |                         |            |            |            |          |            |
|------|------------|-------------------------|------------|------------|------------|----------|------------|
| .092 | RoCoF on   | RoCoF <sub>THR</sub> ON | 3950 mHz/s | 3950 mHz/s | 3950 mHz/s | 10 mHz/s | 4950 mHz/s |
| .093 | RoCoFDelay | Time OFF                | 850 ms     | 850 ms     | 850 ms     | 100 ms   | 10000 ms   |
| .111 | RoCoF wnd  | Window length           | 225 ms     | 100 ms     | 1000 ms    | 100 ms   | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |                                   |  |   |         |     |     |
|----------|-----|-----------------------------------|--|---|---------|-----|-----|
| ID       |     |                                   |  |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  | 0 | 0       | 0   | 9   |

|         |     |   |   |   |   |
|---------|-----|---|---|---|---|
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0 | 0 | 9 |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0 | 0 | 9 |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0 | 0 | 9 |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |   |   |   |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.50 VIC-Citipower 23 [ID 1160]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |              |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|--------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |              | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |              | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |              |                 |                  |                 |               |                   |  |

| 10 minutes average overvoltage |          |                      |              | Conformity Range               |                                | Possible Range                 |                                 |                                |
|--------------------------------|----------|----------------------|--------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|
| ID                             |          |                      |              | Default                        | Min                            | Max                            | Min                             | Max                            |
| .042                           | Uavg     | Enable function      |              | on                             | on / off                       |                                | on / off                        |                                |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |                          |            | Conformity Range |            | Possible Range |            |
|-------------------------------------|------------|--------------------------|------------|------------------|------------|----------------|------------|
| ID                                  |            |                          | Default    | Min              | Max        | Min            | Max        |
| .090                                | RoCoF      | En Function              | on         | on / off         |            | on / off       |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 1000 mHz/s       | 1000 mHz/s | 10 mHz/s       | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 950 mHz/s  | 950 mHz/s        | 950 mHz/s  | 10 mHz/s       | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 850 ms     | 850 ms           | 850 ms     | 100 ms         | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms     | 100 ms           | 1000 ms    | 100 ms         | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |

|      |         |      |  |   |  |
|------|---------|------|--|---|--|
| .114 | I3 STOP | Type | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) |
|------|---------|------|--|---|--|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Ovvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Ovvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |
|--------------------|------------------------------------|
| ID                 |                                    |
| .105               | SN: xxxxxxxxxx<br><br>SW: aa.ddccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

## 10.51 VIC-Jemana 23 [ID 1165]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |              |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|--------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |              | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |              | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |              |                 |                  |                 |               |                   |  |

| 10 minutes average overvoltage |          |                      |              | Conformity Range               |                                | Possible Range                 |                                 |                                |
|--------------------------------|----------|----------------------|--------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|
| ID                             |          |                      |              | Default                        | Min                            | Max                            | Min                             | Max                            |
| .042                           | Uavg     | Enable function      |              | on                             | on / off                       |                                | on / off                        |                                |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |                          |            | Conformity Range |            | Possible Range |            |
|-------------------------------------|------------|--------------------------|------------|------------------|------------|----------------|------------|
| ID                                  |            |                          | Default    | Min              | Max        | Min            | Max        |
| .090                                | RoCoF      | En Function              | on         | on / off         |            | on / off       |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 1000 mHz/s       | 1000 mHz/s | 10 mHz/s       | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 950 mHz/s  | 950 mHz/s        | 950 mHz/s  | 10 mHz/s       | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 1850 ms    | 850 ms           | 850 ms     | 100 ms         | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms     | 100 ms           | 1000 ms    | 100 ms         | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |

|      |         |      |  |   |  |
|------|---------|------|--|---|--|
| .114 | I3 STOP | Type | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) |
|------|---------|------|--|---|--|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Ovvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Ovvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |
|--------------------|------------------------------------|
| ID                 |                                    |
| .105               | SN: xxxxxxxxxx<br><br>SW: aa.ddccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

## 10.52 VIC-Powercor 23 [ID 1170]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 108,00%<br>(450,79V) | 108,00%<br>(450,79<br>V) | 108,00%<br>(450,79V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 105,00%<br>(438,27V) | 105,00%<br>(438,27<br>V) | 105,00%<br>(438,27V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  | Conformity Range |     | Possible Range |     |     |
|------------------------------|--|------------------|-----|----------------|-----|-----|
| ID                           |  | Default          | Min | Max            | Min | Max |

|                  |            |                                  |              |                 |                  |                 |               |                   |  |
|------------------|------------|----------------------------------|--------------|-----------------|------------------|-----------------|---------------|-------------------|--|
| .115             | Uzero>     | Enable Function                  |              | off             | on / off         |                 | on / off      |                   |  |
| .116             | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V) | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V) | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |  |
| .118             | T Uzero>   | Time OFF                         |              | 1500 ms         | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |  |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |              |                 |                  |                 |               |                   |  |

| 10 minutes average overvoltage |          |                      |              | Conformity Range               |                                | Possible Range                 |                                 |                                |
|--------------------------------|----------|----------------------|--------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|
| ID                             |          |                      |              | Default                        | Min                            | Max                            | Min                             | Max                            |
| .042                           | Uavg     | Enable function      |              | on                             | on / off                       |                                | on / off                        |                                |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 106,00% (254,41V)<br>/442,44V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 104,00% (249,61V)<br>/434,10V) | 100,00% (240,01V)<br>/417,40V ) | 135,00% (324,01V)<br>/563,49V) |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |                          |            | Conformity Range |            | Possible Range |            |
|-------------------------------------|------------|--------------------------|------------|------------------|------------|----------------|------------|
| ID                                  |            |                          | Default    | Min              | Max        | Min            | Max        |
| .090                                | RoCoF      | En Function              | on         | on / off         |            | on / off       |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 1000 mHz/s       | 1000 mHz/s | 10 mHz/s       | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 950 mHz/s  | 950 mHz/s        | 950 mHz/s  | 10 mHz/s       | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 850 ms     | 850 ms           | 850 ms     | 100 ms         | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms     | 100 ms           | 1000 ms    | 100 ms         | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 6,0 °   | 6,0 °            | 6,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |

|      |         |      |  |   |  |
|------|---------|------|--|---|--|
| .114 | I3 STOP | Type | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) |
|------|---------|------|--|---|--|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            |              | Default          | Min | Max            | Min | Max   |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>   |   |
|---|---|
| On  | = it is possible to detect this error               |
| Off   | = it is not possible to show this error on relay R3 |
| Ovvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Ovvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                    |
|--------------------|------------------------------------|
| ID                 |                                    |
| .105               | SN: xxxxxxxxxx<br><br>SW: aa.ddccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

### 10.53 VIC-Western Power 23 [ID 1175]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  | Conformity Range |                      | Possible Range       |                      |                           |                      |
|---------------------------|----------|--|------------------|----------------------|----------------------|----------------------|---------------------------|----------------------|
| ID                        |          | Default                                  | Min              | Max                  | Min                  | Max                  |                           |                      |
| .010                      | VLL>     | Enable function                          | on               | on / off             |                      | on / off             |                           |                      |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom  | 106,00%<br>(442,44V) | 106,00%<br>(442,44V) | 106,00%<br>(442,44V) | 100,00%<br>(417,40V)<br>) | 135,00%<br>(563,49V) |
| .012                      | VLL> off | U <sub>THR</sub> ON                      | %Unom<br>/VUnom  | 103,00%<br>(429,92V) | 103,00%<br>(429,92V) | 103,00%<br>(429,92V) | 100,00%<br>(417,40V)<br>) | 135,00%<br>(563,49V) |
| .013                      | T VLL>   | Time OFF                                 | 10000 ms         | 10000 ms             | 10000 ms             | 50 ms                | 300000 ms                 |                      |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                  |                      |                      |                      |                           |                      |

| Undervoltage1 Line to Line |      |                 | Conformity Range |     | Possible Range |     |
|----------------------------|------|-----------------|------------------|-----|----------------|-----|
| ID                         |      | Default         | Min              | Max | Min            | Max |
| .014                       | VLL< | Enable function | on               |     |                |     |

|                  |          |  |                 |                     |                     |                     |                  |                      |
|------------------|----------|--|-----------------|---------------------|---------------------|---------------------|------------------|----------------------|
| .015             | VLL< off | $U_{THR}$<br>OFF                         | %Unom<br>/VUnom | 80,00%<br>(333,92V) | 80,00%<br>(333,92V) | 80,00%<br>(333,92V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .016             | VLL< on  | $U_{THR}$ ON                             | %Unom<br>/VUnom | 83,00%<br>(346,44V) | 83,00%<br>(346,44V) | 83,00%<br>(346,44V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .017             | T VLL<   | Time OFF                                 |                 | 10000 ms            | 10000 ms            | 10000 ms            | 50 ms            | 300000 ms            |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                     |                     |                  |                      |

| Overvoltage1 Line to Neutral |        |   |                 | Conformity Range     |                      | Possible Range       |                       |                      |
|------------------------------|--------|---|-----------------|----------------------|----------------------|----------------------|-----------------------|----------------------|
| ID                           |        |   |                 | Default              | Min                  | Max                  | Min                   | Max                  |
| .019                         | V> off | $U_{THR}$<br>OFF                                      | %Unom<br>/VUnom | 106,00%<br>(254,41V) | 106,00%<br>(254,41V) | 106,00%<br>(254,41V) | 100,00%<br>(240,01V ) | 135,00%<br>(324,01V) |
| .020                         | V> on  | $U_{THR}$ ON  | %Unom<br>/VUnom | 103,00%<br>(247,21V) | 103,00%<br>(247,21V) | 103,00%<br>(247,21V) | 100,00%<br>(240,01V ) | 135,00%<br>(324,01V) |
| .021                         | T V>   | Time OFF  |                 | 10000 ms             | 10000 ms             | 10000 ms             | 50 ms                 | 300000 ms            |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                      |                      |                       |                      |

| Undervoltage1 Line to Neutral |        |   |                 | Conformity Range    |                     | Possible Range      |                  |                      |
|-------------------------------|--------|---|-----------------|---------------------|---------------------|---------------------|------------------|----------------------|
| ID                            |        |   |                 | Default             | Min                 | Max                 | Min              | Max                  |
| .023                          | V< off | $U_{THR}$<br>OFF                                      | %Unom<br>/VUnom | 80,00%<br>(192,00V) | 80,00%<br>(192,00V) | 80,00%<br>(192,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .024                          | V< on  | $U_{THR}$ ON  | %Unom<br>/VUnom | 83,00%<br>(199,20V) | 83,00%<br>(199,20V) | 83,00%<br>(199,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .025                          | T V<   | Time OFF  |                 | 10000 ms            | 10000 ms            | 10000 ms            | 50 ms            | 300000 ms            |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                     |                     |                  |                      |

| Overvoltage2 Line to Line |           |                  |                 | Conformity Range     |                        | Possible Range       |                       |                      |
|---------------------------|-----------|------------------|-----------------|----------------------|------------------------|----------------------|-----------------------|----------------------|
| ID                        |           |                  |                 | Default              | Min                    | Max                  | Min                   | Max                  |
| .026                      | VLL>>     | Enable function  |                 | on                   |                        |                      |                       |                      |
| .027                      | VLL>> off | $U_{THR}$<br>OFF | %Unom<br>/VUnom | 110,00%<br>(459,14V) | 110,00 %<br>(459,14 V) | 110,00%<br>(459,14V) | 100,00%<br>(417,40V ) | 135,00%<br>(563,49V) |

|                  |          |  |              |                   |                    |                   |                    |                   |
|------------------|----------|--|--------------|-------------------|--------------------|-------------------|--------------------|-------------------|
| .028             | VLL>> on | U <sub>THR</sub> ON                      | %Unom /VUnom | 103,00% (429,92V) | 103,00% (429,92 V) | 103,00% (429,92V) | 100,00% (417,40V ) | 135,00% (563,49V) |
| .029             | T VLL>>  | Time OFF                                 |              | 500 ms            | 500 ms             | 500 ms            | 50 ms              | 300000 ms         |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |              |                   |                    |                   |                    |                   |

| Undervoltage2 Line to Line |           |  |              |                  | Conformity Range  |                  | Possible Range |                   |
|----------------------------|-----------|--|--------------|------------------|-------------------|------------------|----------------|-------------------|
| ID                         |           |  |              | Default          | Min               | Max              | Min            | Max               |
| .030                       | VLL<<     | Enable function                          |              |                  | on                |                  |                |                   |
| .031                       | VLL<< off | U <sub>THR</sub> OFF                     | %Unom /VUnom | 50,00% (208,70V) | 50,00% (208,70 V) | 50,00% (208,70V) | 0,00% (0,00V)  | 100,00% (417,40V) |
| .032                       | VLL<< on  | U <sub>THR</sub> ON                      | %Unom /VUnom | 83,00% (346,44V) | 83,00% (346,44 V) | 83,00% (346,44V) | 0,00% (0,00V)  | 100,00% (417,40V) |
| .033                       | T VLL<<   | Time OFF                                 |              | 500 ms           | 500 ms            | 500 ms           | 50 ms          | 300000 ms         |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL) |              |                  |                   |                  |                |                   |

| Overvoltage2 Line to Neutral |         |   |              |                   | Conformity Range   |                   | Possible Range     |                   |
|------------------------------|---------|---|--------------|-------------------|--------------------|-------------------|--------------------|-------------------|
| ID                           |         |   |              | Default           | Min                | Max               | Min                | Max               |
| .034                         | V>>     | Enable function                                       |              |                   | on                 |                   | on / off           |                   |
| .035                         | V>> off | U <sub>THR</sub> OFF                                  | %Unom /VUnom | 110,00% (264,01V) | 110,00% (264,01 V) | 110,00% (264,01V) | 100,00% (240,01V ) | 135,00% (324,01V) |
| .036                         | V>> on  | U <sub>THR</sub> ON                                   | %Unom /VUnom | 103,00% (247,21V) | 103,00% (247,21 V) | 103,00% (247,21V) | 100,00% (240,01V ) | 135,00% (324,01V) |
| .037                         | T V>>   | Time OFF  |              | 500 ms            | 500 ms             | 500 ms            | 100 ms             | 300000 ms         |
| Only active for:             |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |              |                   |                    |                   |                    |                   |

| Undervoltage2 Line to Neutral |     |                 |  |         | Conformity Range |     | Possible Range |     |
|-------------------------------|-----|-----------------|--|---------|------------------|-----|----------------|-----|
| ID                            |     |                 |  | Default | Min              | Max | Min            | Max |
| .038                          | V<< | Enable function |  |         | on               |     | on / off       |     |

|                  |         |   |                 |                     |                         |                     |                  |                      |
|------------------|---------|---|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| .039             | V<< off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 50,00%<br>(120,00V) | 50,00%<br>(120,00<br>V) | 50,00%<br>(120,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .040             | V<< on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 83,00%<br>(199,20V) | 83,00%<br>(199,20<br>V) | 83,00%<br>(199,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .041             | T V<<   | Time OFF  |                 | 500 ms              | 500 ms                  | 500 ms              | 50 ms            | 300000 ms            |
| Only active for: |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                         |                     |                  |                      |

| Zero Voltage Line to Neutral |            |                                  |                 | Conformity Range   |                        | Possible Range     |                  |                      |
|------------------------------|------------|----------------------------------|-----------------|--------------------|------------------------|--------------------|------------------|----------------------|
| ID                           |            |                                  |                 | Default            | Min                    | Max                | Min              | Max                  |
| .115                         | Uzero>     | Enable Function                  |                 | off                | on / off               |                    | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %Unom<br>/VUnom | 20,00%<br>(48,00V) | 20,00%<br>(48,00V<br>) | 20,00%<br>(48,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %Unom<br>/VUnom | 15,00%<br>(36,00V) | 15,00%<br>(36,00V<br>) | 15,00%             | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .118                         | T Uzero>   | Time OFF                         |                 | 1500 ms            | 1500<br>ms             | 1500 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |                 |                    |                        |                    |                  |                      |

| Overfrequency1 |        |                      |  | Conformity Range |           | Possible Range |              |           |
|----------------|--------|----------------------|--|------------------|-----------|----------------|--------------|-----------|
| ID             |        |                      |  | Default          | Min       | Max            | Min          | Max       |
| .055           | F> off | f <sub>THR</sub> OFF |  | 51,500 Hz        | 51,500 Hz | 51,500 Hz      | 50,000<br>Hz | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  |  | 51,400 Hz        | 51,400 Hz | 51,400 Hz      | 50,000<br>Hz | 55,000 Hz |
| .057           | T F>   | Time OFF             |  | 2000 ms          | 0 ms      | 2000 ms        | 0 ms         | 300000 ms |

| Underfrequency1 |        |                      |  | Conformity Range |           | Possible Range |              |           |
|-----------------|--------|----------------------|--|------------------|-----------|----------------|--------------|-----------|
| ID              |        |                      |  | Default          | Min       | Max            | Min          | Max       |
| .059            | F< off | f <sub>THR</sub> OFF |  | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000<br>Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  |  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000<br>Hz | 50,000 Hz |
| .061            | T F<   | Time OFF             |  | 10000 ms         | 10000 ms  | 10000 ms       | 100 ms       | 300000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |        |        |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--------|--|
| ID                             |       |               | Default | Min              | Max    |        |  |
| .113                           | F wnd | Window length |         | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |            |                          |         | Conformity Range |               | Possible Range |                        |
|-------------------------------------|------------|--------------------------|---------|------------------|---------------|----------------|------------------------|
| ID                                  |            |                          | Default | Min              | Max           | Min            | Max                    |
| .090                                | RoCoF      | En Function              |         | on / off         |               | on / off       |                        |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF |         | 4000<br>mHz/s    | 4000<br>mHz/s | 4000<br>mHz/s  | 10 mHz/s    5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  |         | 3950<br>mHz/s    | 3950<br>mHz/s | 3950<br>mHz/s  | 10 mHz/s    4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 |         | 0 ms             | 0 ms          | 0 ms           | 10000 ms               |
| .111                                | RoCoF wnd  | Window length            |         | 100 ms           | 100 ms        | 1000 ms        | 1000 ms                |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |                  |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|------------------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max              |
| .094                 | PShift     | Enable Function           |         | on / off         |        | on / off       |                  |
| .095                 | PShift off | PShift <sub>THR</sub> OFF |         | 12,0 °           | 12,0 ° | 12,0 °         | 1,0 °    25,0 °  |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  |         | 10,0 °           | 10,0 ° | 10,0 °         | 1,0 °    24,0 °  |
| .097                 | PshiftDel  | Time OFF                  |         | 50 ms            | 50 ms  | 50 ms          | 10000 ms         |
| .112                 | PShift wnd | Window length             |         | 50 ms            | 50 ms  | 500 ms         | 50 ms    1000 ms |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)                    |     |

|  |  |  |  |  |                 |
|--|--|--|--|--|-----------------|
|  |  |  |  |  | dis. (disabled) |
|--|--|--|--|--|-----------------|

| Turn-on delay |            |              | Conformity Range |     | Possible Range |     |       |
|---------------|------------|--------------|------------------|-----|----------------|-----|-------|
| ID            |            | Default      | Min              | Max | Min            | Max |       |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s | 900 s |

| Password |     |   |     |     |   |  |
|----------|-----|---|-----|-----|---|--|
| ID       |     | Default   | Min | Max |   |  |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   | 0   | 0   | 9 |  |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   | 0   | 0   | 9 |  |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   | 0   | 0   | 9 |  |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   | 0   | 0   | 9 |  |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |     |     |   |  |

#### **Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |
|--------------------|---------------------------------------|
| ID                 |                                       |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb |

xxxxxxxxxx = Device Serial Number

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

## 10.54 ACT-Evoenergy 23 [ID 1180]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                          | Possible Range       |                          |  |
|---------------------------|----------|--|-----------------|----------------------|--------------------------|----------------------|--------------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                      | Min                  | Max                      |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                 |                      | on / off                 |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 110,00%<br>(459,14V) | 110,00%<br>(459,14<br>V) | 110,00%<br>(459,14V) | 100,00%<br>(417,40V<br>) |  |
| .012                      | VLL> off | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 107,00%<br>(446,62V) | 107,00%<br>(446,62<br>V) | 107,00%<br>(446,62V) | 100,00%<br>(417,40V<br>) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000 ms                  | 2000 ms              | 50 ms                    |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                          |                      |                          |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

|                  |          |  |   |                  |                  |                  |               |                   |
|------------------|----------|--|---|------------------|------------------|------------------|---------------|-------------------|
| .014             | VLL<     | Enable function                          |   | on               |                  |                  |               |                   |
| .015             | VLL< off | U <sub>THR</sub> OFF                     | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 75,00% (313,05V) | 75,00% (313,05V) | 75,00% (313,05V) | 0,00% (0,00V) | 100,00% (417,40V) |
| .016             | VLL< on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 78,00% (325,57V) | 78,00% (325,57V) | 78,00% (325,57V) | 0,00% (0,00V) | 100,00% (417,40V) |
| .017             | T VLL<   | Time OFF                                 |   | 11000 ms         | 11000 ms         | 11000 ms         | 50 ms         | 300000 ms         |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |   |                  |                  |                  |               |                   |

| Overvoltage1 Line to Neutral |        |   |   | Conformity Range  |                   | Possible Range    |                   |                   |
|------------------------------|--------|---|---|-------------------|-------------------|-------------------|-------------------|-------------------|
| ID                           |        |   |   | Default           | Min               | Max               | Min               | Max               |
| .019                         | V> off | U <sub>THR</sub> OFF                                  | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 110,00% (264,01V) | 110,00% (264,01V) | 110,00% (264,01V) | 100,00% (240,01V) | 135,00% (324,01V) |
| .020                         | V> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 107,00% (256,81V) | 107,00% (256,81V) | 107,00% (256,81V) | 100,00% (240,01V) | 135,00% (324,01V) |
| .021                         | T V>   | Time OFF  |   | 2000 ms           | 2000 ms           | 2000 ms           | 50 ms             | 300000 ms         |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |   |                   |                   |                   |                   |                   |

| Undervoltage1 Line to Neutral |        |   |   | Conformity Range |                  | Possible Range   |               |                   |
|-------------------------------|--------|---|---|------------------|------------------|------------------|---------------|-------------------|
| ID                            |        |   |   | Default          | Min              | Max              | Min           | Max               |
| .023                          | V< off | U <sub>THR</sub> OFF                                  | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 75,00% (180,00V) | 75,00% (180,00V) | 75,00% (180,00V) | 0,00% (0,00V) | 100,00% (240,01V) |
| .024                          | V< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 78,00% (187,20V) | 78,00% (187,20V) | 78,00% (187,20V) | 0,00% (0,00V) | 100,00% (240,01V) |
| .025                          | T V<   | Time OFF  |   | 11000 ms         | 11000 ms         | 11000 ms         | 50 ms         | 300000 ms         |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |   |                  |                  |                  |               |                   |

| Undervoltage2 Line to Line |           |                      |   | Conformity Range |                  | Possible Range   |               |                   |
|----------------------------|-----------|----------------------|---|------------------|------------------|------------------|---------------|-------------------|
| ID                         |           |                      |   | Default          | Min              | Max              | Min           | Max               |
| .030                       | VLL<<     | Enable function      |   | on               | on / off         |                  | on / off      |                   |
| .031                       | VLL<< off | U <sub>THR</sub> OFF | %U <sub>nom</sub> /V <sub>U<sub>nom</sub></sub> | 70,80% (295,52V) | 70,80% (295,52V) | 70,80% (295,52V) | 0,00% (0,00V) | 100,00% (417,40V) |

|                  |          |  |              |                  |                   |                  |               |                   |
|------------------|----------|--|--------------|------------------|-------------------|------------------|---------------|-------------------|
| .032             | VLL<< on | U <sub>THR</sub> ON                      | %Unom /VUnom | 78,00% (325,57V) | 78,00% (325,57 V) | 78,00% (325,57V) | 0,00% (0,00V) | 100,00% (417,40V) |
| .033             | T VLL<<  | Time OFF                                 |              | 2000 ms          | 2000 ms           | 2000 ms          | 50 ms         | 300000 ms         |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |              |                  |                   |                  |               |                   |

| Undervoltage2 Line to Neutral |         |   |              | Conformity Range |                   | Possible Range   |               |                   |
|-------------------------------|---------|---|--------------|------------------|-------------------|------------------|---------------|-------------------|
| ID                            |         |   |              | Default          | Min               | Max              | Min           | Max               |
| .038                          | V<<     | Enable function                                       |              | on               | on / off          |                  | on / off      |                   |
| .039                          | V<< off | U <sub>THR</sub> OFF                                  | %Unom /VUnom | 70,80% (169,92V) | 70,80% (169,92 V) | 70,80% (169,92V) | 0,00% (0,00V) | 100,00% (240,01V) |
| .040                          | V<< on  | U <sub>THR</sub> ON                                   | %Unom /VUnom | 78,00% (187,20V) | 78,00% (187,20 V) | 78,00% (187,20V) | 0,00% (0,00V) | 100,00% (240,01V) |
| .041                          | T V<<   | Time OFF  |              | 2000 ms          | 2000 ms           | 2000 ms          | 50 ms         | 300000 ms         |
| Only active for:              |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |              |                  |                   |                  |               |                   |

| Zero Voltage Line to Neutral |            |                                  |              | Conformity Range |                  | Possible Range  |               |                   |
|------------------------------|------------|----------------------------------|--------------|------------------|------------------|-----------------|---------------|-------------------|
| ID                           |            |                                  |              | Default          | Min              | Max             | Min           | Max               |
| .115                         | Uzero>     | Enable Function                  |              | off              | on / off         |                 | on / off      |                   |
| .116                         | Uzero> off | U <sub>THR</sub> OFF             | %Unom /VUnom | 20,00% (48,00V)  | 20,00% (48,00V ) | 20,00% (48,00V) | 1,00% (2,40V) | 100,00% (240,01V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %Unom /VUnom | 15,00% (36,00V)  | 15,00% (36,00V ) | 15,00% (36,00V) | 1,00% (2,40V) | 100,00% (240,01V) |
| .118                         | T Uzero>   | Time OFF                         |              | 1500 ms          | 1500 ms          | 1500 ms         | 0 ms          | 300000 ms         |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |              |                  |                  |                 |               |                   |

| 10 minutes average overvoltage |          |                      |       | Conformity Range  |                   | Possible Range    |                   |                   |
|--------------------------------|----------|----------------------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| ID                             |          |                      |       | Default           | Min               | Max               | Min               | Max               |
| .042                           | Uavg     | Enable function      |       | on                | on / off          |                   | on / off          |                   |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 106,00% (254,41V) | 106,00% (254,41V) | 106,00% (254,41V) | 100,00% (240,01V) | 135,00% (324,01V) |

|      |         |                     | /VUnom          | /442,44V)                        | /442,44V)                        | /442,44V)                        | /417,40V )                        | /563,49V)                        |
|------|---------|---------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|
| .044 | Uavg on | U <sub>THR</sub> ON | %Unom<br>/VUnom | 104,00%<br>(249,61V<br>/434,10V) | 104,00%<br>(249,61V<br>/434,10V) | 104,00%<br>(249,61V<br>/434,10V) | 100,00%<br>(240,01V<br>/417,40V ) | 135,00%<br>(324,01V<br>/563,49V) |

| Overfrequency1 |        |                      |           | Conformity Range |           | Possible Range |           |
|----------------|--------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID             |        |                      | Default   | Min              | Max       | Min            | Max       |
| .055           | F> off | f <sub>THR</sub> OFF | 52,000 Hz | 52,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .056           | F> on  | f <sub>THR</sub> ON  | 51,900 Hz | 51,900 Hz        | 51,900 Hz | 50,000 Hz      | 55,000 Hz |
| .057           | T F>   | Time OFF             | 2000 ms   | 2000 ms          | 2000 ms   | 100 ms         | 300000 ms |

| Underfrequency1 |        |                      |           | Conformity Range |           | Possible Range |           |
|-----------------|--------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID              |        |                      | Default   | Min              | Max       | Min            | Max       |
| .059            | F< off | f <sub>THR</sub> OFF | 47,000 Hz | 47,000 Hz        | 47,000 Hz | 40,000 Hz      | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  | 47,500 Hz | 47,500 Hz        | 47,500 Hz | 40,000 Hz      | 50,000 Hz |
| .061            | T F<   | Time OFF             | 2000 ms   | 2000 ms          | 2000 ms   | 100 ms         | 300000 ms |

| Frequency measuring in general |       |               |         | Conformity Range |        |  |  |
|--------------------------------|-------|---------------|---------|------------------|--------|--|--|
| ID                             |       |               | Default | Min              | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms  | 100 ms           | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |           |                          |               | Conformity Range |               | Possible Range |               |
|-------------------------------------|-----------|--------------------------|---------------|------------------|---------------|----------------|---------------|
| ID                                  |           |                          | Default       | Min              | Max           | Min            | Max           |
| .090                                | RoCoF     | En Function              | on            | on / off         |               | on / off       |               |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF | 1000<br>mHz/s | 1000<br>mHz/s    | 1000<br>mHz/s | 10 mHz/s       | 5000<br>mHz/s |

|      |            |                         |           |           |           |          |            |
|------|------------|-------------------------|-----------|-----------|-----------|----------|------------|
| .092 | RoCoF on   | RoCoF <sub>THR</sub> ON | 950 mHz/s | 950 mHz/s | 950 mHz/s | 10 mHz/s | 4950 mHz/s |
| .093 | RoCoFDelay | Time OFF                | 1850 ms   | 1850 ms   | 1850 ms   | 100 ms   | 10000 ms   |
| .111 | RoCoF wnd  | Window length           | 225 ms    | 100 ms    | 1000 ms   | 100 ms   | 1000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |          |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|----------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max      |
| .094                 | PShift     | Enable Function           | on      | on / off         |        | on / off       |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | 10,0 °  | 10,0 °           | 10,0 ° | 1,0 °          | 25,0 °   |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 8,0 °   | 8,0 °            | 8,0 °  | 1,0 °          | 24,0 °   |
| .097                 | PshiftDel  | Time OFF                  | 50 ms   | 50 ms            | 50 ms  | 50 ms          | 10000 ms |
| .112                 | PShift wnd | Window length             | 50 ms   | 50 ms            | 500 ms | 50 ms          | 1000 ms  |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |                                   |  |   |         |     |     |
|----------|-----|-----------------------------------|--|---|---------|-----|-----|
| ID       |     |                                   |  |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  | 0 | 0       | 0   | 9   |

|         |     |   |   |   |   |
|---------|-----|---|---|---|---|
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0 | 0 | 9 |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0 | 0 | 9 |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0 | 0 | 9 |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |   |   |   |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.55 QLD-Enerex 23 [ID 1185]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |          |
|-------------------|--------|--|------------------|--|----------------|----------|
| ID                |        | Default  |                  |  |                |          |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  |                | 2ch, 1ch |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |          |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|----------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |          | Default                                  |                 | Min                  | Max                          | Min                  | Max                      |                      |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                     |                      | on / off                 |                      |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 114,00%<br>(475,84V) | 114,00<br>%<br>(475,84<br>V) | 114,00%<br>(475,84V) | 100,00%<br>(417,40V<br>) | 135,00%<br>(563,49V) |
| .012                      | VLL> off | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 111,00%<br>(463,31V) | 111,00<br>%<br>(463,31<br>V) | 111,00%<br>(463,31V) | 100,00%<br>(417,40V<br>) | 135,00%<br>(563,49V) |
| .013                      | T VLL>   | Time OFF                                 |                 | 200 ms               | 200 ms                       | 200 ms               | 50 ms                    | 300000 ms            |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Line |      |                 |  | Conformity Range |     | Possible Range |     |
|----------------------------|------|-----------------|--|------------------|-----|----------------|-----|
| ID                         |      | Default         |  | Min              | Max | Min            | Max |
| .014                       | VLL< | Enable function |  | on               |     |                |     |

|                  |          |  |                 |                     |                         |                     |                  |                      |
|------------------|----------|--|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| .015             | VLL< off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 75,00%<br>(313,05V) | 75,00%<br>(313,05<br>V) | 75,00%<br>(313,05V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .016             | VLL< on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 78,00%<br>(325,57V) | 78,00%<br>(325,57<br>V) | 78,00%<br>(325,57V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .017             | T VLL<   | Time OFF                                 |                 | 3000 ms             | 3000<br>ms              | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                         |                     |                  |                      |

| Overvoltage1 Line to Neutral |        |   |                 |                      | Conformity Range             |                      | Possible Range           |                      |
|------------------------------|--------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |        |   |                 | Default              | Min                          | Max                  | Min                      | Max                  |
| .019                         | V> off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 114,00%<br>(273,61V) | 114,00<br>%<br>(273,61<br>V) | 114,00%<br>(273,61V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .020                         | V> on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 111,00%<br>(266,41V) | 111,00<br>%<br>(266,41<br>V) | 111,00%<br>(266,41V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .021                         | T V>   | Time OFF  |                 | 200 ms               | 200 ms                       | 200 ms               | 50 ms                    | 300000 ms            |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Neutral |        |  |                 |                     | Conformity Range        |                     | Possible Range   |                      |
|-------------------------------|--------|--|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| ID                            |        |  |                 | Default             | Min                     | Max                 | Min              | Max                  |
| .023                          | V< off | U <sub>THR</sub><br>OFF                                | %Unom<br>/VUnom | 75,00%<br>(180,00V) | 75,00%<br>(180,00<br>V) | 75,00%<br>(180,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .024                          | V< on  | U <sub>THR</sub> ON                                    | %Unom<br>/VUnom | 78,00%<br>(187,20V) | 78,00%<br>(187,20<br>V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .025                          | T V<   | Time OFF   |                 | 3000 ms             | 3000<br>ms              | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)) |                 |                     |                         |                     |                  |                      |

| Undervoltage2 Line to Line |       |                 |  | Conformity Range |          | Possible Range |          |     |
|----------------------------|-------|-----------------|--|------------------|----------|----------------|----------|-----|
| ID                         |       |                 |  | Default          | Min      | Max            | Min      | Max |
| .030                       | VLL<< | Enable function |  | on               | on / off |                | on / off |     |

| Undervoltage2 Line to Neutral |         |   |  | Conformity Range    |                      | Possible Range      |                  |                      |
|-------------------------------|---------|---|--|---------------------|----------------------|---------------------|------------------|----------------------|
| ID                            |         |   | Default                                | Min                 | Max                  | Min                 | Max              |                      |
| .038                          | V<<     | Enable function                                       |  | on                  | on / off             |                     | on / off         |                      |
| .039                          | V<< off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 29,20%<br>(70,08V)  | 29,20%<br>(70,08V )  | 29,20%<br>(70,08V)  | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .040                          | V<< on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 78,00%<br>(187,20V) | 78,00%<br>(187,20 V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .041                          | T V<<   | Time OFF  |  | 3000 ms             | 3000 ms              | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for:              |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                      |                     |                  |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                        | Possible Range     |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------------|--------------------|------------------|----------------------|
| ID                           |            |                                  | Default                                | Min                | Max                    | Min                | Max              |                      |
| .115                         | Uzero>     | Enable Function                  |  | off                | on / off               |                    | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/V <sub>nom</sub> | 20,00%<br>(48,00V) | 20,00%<br>(48,00V<br>) | 20,00%<br>(48,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/V <sub>nom</sub> | 15,00%<br>(36,00V) | 15,00%<br>(36,00V<br>) | 15,00%<br>(36,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .118                         | T Uzero>   | Time OFF                         |  | 1500 ms            | 1500<br>ms             | 1500 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                        |                    |                  |                      |

| Overfrequency1 |  | Conformity Range |     | Possible Range |     |     |
|----------------|--|------------------|-----|----------------|-----|-----|
| ID             |  | Default          | Min | Max            | Min | Max |

|      |        |          |           |           |           |           |           |
|------|--------|----------|-----------|-----------|-----------|-----------|-----------|
| .055 | F> off | fTHR OFF | 52,000 Hz | 52,000 Hz | 52,000 Hz | 50,000 Hz | 55,000 Hz |
| .056 | F> on  | fTHR ON  | 51,900 Hz | 51,900 Hz | 51,900 Hz | 50,000 Hz | 55,000 Hz |
| .057 | T F>   | Time OFF | 2000 ms   | 2000 ms   | 2000 ms   | 100 ms    | 300000 ms |

| Underfrequency1 |        |          | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------|------------------|-----------|----------------|-----------|-----------|
| ID              |        |          | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | fTHR OFF | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | fTHR ON  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |
| .061            | T F<   | Time OFF | 3000 ms          | 3000 ms   | 3000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|--|
| ID                             |       |               | Default          | Min    | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |               | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|------------|---------------|------------------|------------|----------------|----------|------------|
| ID                                  |            |               | Default          | Min        | Max            | Min      | Max        |
| .090                                | RoCoF      | En Function   | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off  | RoCoFTHR OFF  | 4000 mHz/s       | 4000 mHz/s | 4000 mHz/s     | 10 mHz/s | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoFTHR ON   | 3950 mHz/s       | 3950 mHz/s | 3950 mHz/s     | 10 mHz/s | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF      | 350 ms           | 350 ms     | 350 ms         | 100 ms   | 10000 ms   |
| .111                                | RoCoF wnd  | Window length | 225 ms           | 100 ms     | 1000 ms        | 100 ms   | 1000 ms    |

| Auxiliary Contact type |  |  | Conformity Range |     | Possible Range |     |     |
|------------------------|--|--|------------------|-----|----------------|-----|-----|
| ID                     |  |  | Default          | Min | Max            | Min | Max |
|                        |  |  |                  |     |                |     |     |

|      |           |          |                        |  |   |
|------|-----------|----------|------------------------|--|---|
| .099 | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |
| .100 | T Contact | Time OFF | Fixed to 500 ms        |  |   |
| .114 | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

#### **Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|  |    |
|--|----|
| Overvoltage LL (UΔ)                      | on |
| Undervoltage LL (UΔ)                     | on |
| Overvoltage LN (UY)                      | on |
| Undervoltage LN (UY)                     | on |
| 10-min overvoltage (Ü)                   | on |
| Overfrequency (f)                        | on |
| Underfrequency (f)                       | on |
| RoCoF (Rate of Change of Frequency) (Δf) | on |

|   |     |
|---|-----|
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |  |
|--------------------|--|
| ID                 |  |
| .105               | <p>SN: xxxxxxxxxxxx<br/>                  xxxxxxx = Device Serial Number</p> <p>SW: aa.dd.ccb<br/>                  dd: Software version of Display Software<br/>                  aa: Software version of Measuring Software<br/>                  cc: Index of Configuration set<br/>                  b: Version of Configuration set</p> |

## 10.56 QLD-Ergon 23 [ID 1190]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                                |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                            |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 240,01V<br>/417,40V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                      | Possible Range       |                      |  |
|---------------------------|----------|--|-----------------|----------------------|----------------------|----------------------|----------------------|--|
| ID                        |          | Default                                  |                 | Min                  | Max                  | Min                  | Max                  |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off             |                      | on / off             |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 114,00%<br>(475,84V) | 114,00%<br>(475,84V) | 100,00%<br>(417,40V) | 135,00%<br>(563,49V) |  |
| .012                      | VLL> off | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 111,00%<br>(463,31V) | 111,00%<br>(463,31V) | 100,00%<br>(417,40V) | 135,00%<br>(563,49V) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 200 ms               | 200 ms               | 200 ms               | 50 ms                |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                      |                      |                      |  |

| Undervoltage1 Line to Line |      |                 |  | Conformity Range |     | Possible Range |     |  |
|----------------------------|------|-----------------|--|------------------|-----|----------------|-----|--|
| ID                         |      | Default         |  | Min              | Max | Min            | Max |  |
| .014                       | VLL< | Enable function |  | on               |     |                |     |  |

|                  |          |  |                 |                     |                         |                     |                  |                      |
|------------------|----------|--|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| .015             | VLL< off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 75,00%<br>(313,05V) | 75,00%<br>(313,05<br>V) | 75,00%<br>(313,05V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .016             | VLL< on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 78,00%<br>(325,57V) | 78,00%<br>(325,57<br>V) | 78,00%<br>(325,57V) | 0,00%<br>(0,00V) | 100,00%<br>(417,40V) |
| .017             | T VLL<   | Time OFF                                 |                 | 3000 ms             | 3000<br>ms              | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for: |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                         |                     |                  |                      |

| Overvoltage1 Line to Neutral |        |   |                 |                      | Conformity Range             |                      | Possible Range           |                      |
|------------------------------|--------|---|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |        |   |                 | Default              | Min                          | Max                  | Min                      | Max                  |
| .019                         | V> off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 114,00%<br>(273,61V) | 114,00<br>%<br>(273,61<br>V) | 114,00%<br>(273,61V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .020                         | V> on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 111,00%<br>(266,41V) | 111,00<br>%<br>(266,41<br>V) | 111,00%<br>(266,41V) | 100,00%<br>(240,01V<br>) | 135,00%<br>(324,01V) |
| .021                         | T V>   | Time OFF  |                 | 200 ms               | 200 ms                       | 200 ms               | 50 ms                    | 300000 ms            |
| Only active for:             |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Neutral |        |  |                 |                     | Conformity Range        |                     | Possible Range   |                      |
|-------------------------------|--------|--|-----------------|---------------------|-------------------------|---------------------|------------------|----------------------|
| ID                            |        |  |                 | Default             | Min                     | Max                 | Min              | Max                  |
| .023                          | V< off | U <sub>THR</sub><br>OFF                                | %Unom<br>/VUnom | 75,00%<br>(180,00V) | 75,00%<br>(180,00<br>V) | 75,00%<br>(180,00V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .024                          | V< on  | U <sub>THR</sub> ON                                    | %Unom<br>/VUnom | 78,00%<br>(187,20V) | 78,00%<br>(187,20<br>V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .025                          | T V<   | Time OFF   |                 | 3000 ms             | 3000<br>ms              | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for:              |        | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)) |                 |                     |                         |                     |                  |                      |

| Undervoltage2 Line to Line |       |                 |  | Conformity Range |          | Possible Range |          |     |
|----------------------------|-------|-----------------|--|------------------|----------|----------------|----------|-----|
| ID                         |       |                 |  | Default          | Min      | Max            | Min      | Max |
| .030                       | VLL<< | Enable function |  | on               | on / off |                | on / off |     |

| Undervoltage2 Line to Neutral |         |   |                 | Conformity Range    |                     | Possible Range      |                  |                      |
|-------------------------------|---------|---|-----------------|---------------------|---------------------|---------------------|------------------|----------------------|
| ID                            |         |   | Default         | Min                 | Max                 | Min                 | Max              |                      |
| .038                          | V<<     | Enable function                                       |                 | on                  | on / off            |                     | on / off         |                      |
| .039                          | V<< off | UTHR<br>OFF   | %Unom<br>/VUnom | 29,20%<br>(70,08V)  | 29,20%<br>(70,08V)  | 29,20%<br>(70,08V)  | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .040                          | V<< on  | UTHR ON   | %Unom<br>/VUnom | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 78,00%<br>(187,20V) | 0,00%<br>(0,00V) | 100,00%<br>(240,01V) |
| .041                          | T V<<   | Time OFF  |                 | 3000 ms             | 3000<br>ms          | 3000 ms             | 50 ms            | 300000 ms            |
| Only active for:              |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                     |                     |                  |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                        | Possible Range     |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------------|--------------------|------------------|----------------------|
| ID                           |            |                                  | Default                                | Min                | Max                    | Min                | Max              |                      |
| .115                         | Uzero>     | Enable Function                  |  | off                | on / off               |                    | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/V <sub>nom</sub> | 20,00%<br>(48,00V) | 20,00%<br>(48,00V<br>) | 20,00%<br>(48,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/V <sub>nom</sub> | 15,00%<br>(36,00V) | 15,00%<br>(36,00V<br>) | 15,00%<br>(36,00V) | 1,00%<br>(2,40V) | 100,00%<br>(240,01V) |
| .118                         | T Uzero>   | Time OFF                         |  | 1500 ms            | 1500<br>ms             | 1500 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                        |                    |                  |                      |

| Overfrequency1 |  |         | Conformity Range |     | Possible Range |     |
|----------------|--|---------|------------------|-----|----------------|-----|
| ID             |  | Default | Min              | Max | Min            | Max |

|      |        |                      |           |           |           |           |           |
|------|--------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .055 | F> off | f <sub>THR</sub> OFF | 52,000 Hz | 52,000 Hz | 52,000 Hz | 50,000 Hz | 55,000 Hz |
| .056 | F> on  | f <sub>THR</sub> ON  | 51,900 Hz | 51,900 Hz | 51,900 Hz | 50,000 Hz | 55,000 Hz |
| .057 | T F>   | Time OFF             | 2000 ms   | 2000 ms   | 2000 ms   | 100 ms    | 300000 ms |

| Underfrequency1 |        |                      | Conformity Range |           | Possible Range |           |           |
|-----------------|--------|----------------------|------------------|-----------|----------------|-----------|-----------|
| ID              |        |                      | Default          | Min       | Max            | Min       | Max       |
| .059            | F< off | f <sub>THR</sub> OFF | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz | 50,000 Hz |
| .060            | F< on  | f <sub>THR</sub> ON  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz | 50,000 Hz |
| .061            | T F<   | Time OFF             | 3000 ms          | 3000 ms   | 3000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |  |  |
|--------------------------------|-------|---------------|------------------|--------|--------|--|--|
| ID                             |       |               | Default          | Min    | Max    |  |  |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |  |  |

| Rate of Change of Frequency (RoCoF) |            |                          | Conformity Range |            | Possible Range |          |            |
|-------------------------------------|------------|--------------------------|------------------|------------|----------------|----------|------------|
| ID                                  |            |                          | Default          | Min        | Max            | Min      | Max        |
| .090                                | RoCoF      | En Function              | on               | on / off   |                | on / off |            |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 4000 mHz/s       | 4000 mHz/s | 4000 mHz/s     | 10 mHz/s | 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 3950 mHz/s       | 3950 mHz/s | 3950 mHz/s     | 10 mHz/s | 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 350 ms           | 350 ms     | 350 ms         | 100 ms   | 10000 ms   |
| .111                                | RoCoF wnd  | Window length            | 225 ms           | 100 ms     | 1000 ms        | 100 ms   | 1000 ms    |

| Auxiliary Contact type |         |      | Conformity Range       |  | Possible Range |   |     |
|------------------------|---------|------|------------------------|--|----------------|---|-----|
| ID                     |         |      | Default                | Min  | Max            | Min   | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

|      |           |          |                        |  |  |                 |
|------|-----------|----------|------------------------|--|--|-----------------|
| .100 | T Contact | Time OFF | Fixed to 500 ms        |  |  |                 |
| .114 | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) | dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |      | Possible Range |       |
|---------------|------------|--------------|---------|------------------|------|----------------|-------|
| ID            |            |              | Default | Min              | Max  | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 0 s              | 60 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay R3.</b>                   |   |
|---|---|
| On =  | it is possible to detect this error               |
| Off =   | it is not possible to show this error on relay R3 |
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)                                  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off   |
| Contactor feedback contact reports closed, although it should be open (C) | on  |

Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.57 SA-Power networks23 [ID 1195]

| Connection Mode |            |              | Conformity Range         |  | Possible Range           |  |
|-----------------|------------|--------------|--------------------------|--|--------------------------|--|
| ID              |            | Default      |                          |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 4-wire LN - 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                     | Possible Range      |                    |                     |
|-----------------|------------|------------------|---------------------|---------------------|---------------------|--------------------|---------------------|
| ID              |            | Default          | Min                 | Max                 | Min                 | Max                |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 230,00V<br>/400,00V | 230,00V<br>/400,00V | 240,01V<br>/417,40V | 99,99V<br>/173,90V | 240,01V<br>/417,40V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |          |  |                 | Conformity Range     |                              | Possible Range       |  |  |
|---------------------------|----------|--|-----------------|----------------------|------------------------------|----------------------|--|--|
| ID                        |          | Default                                  |                 | Min                  | Max                          | Min                  | Max  |  |
| .010                      | VLL>     | Enable function                          |                 | on                   | on / off                     |                      | on / off                                     |  |
| .011                      | VLL> off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 113,00%<br>(452,00V) | 113,00<br>%<br>(452,00<br>V) | 113,00%<br>(452,00V) | 100,00%<br>(400,00V)<br>135,00%<br>(540,00V) |  |
| .012                      | VLL> on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 110,00%<br>(440,00V) | 110,00<br>%<br>(440,00<br>V) | 110,00%<br>(440,00V) | 100,00%<br>(400,00V)<br>135,00%<br>(540,00V) |  |
| .013                      | T VLL>   | Time OFF                                 |                 | 2000 ms              | 2000<br>ms                   | 2000 ms              | 50 ms<br>300000 ms                           |  |
| Only active for:          |          | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |  |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Zero Voltage Line to Neutral |  |         | Conformity Range |     | Possible Range |     |
|------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                           |  | Default | Min              | Max | Min            | Max |

|                  |            |                                  |                 |                    |                    |                    |                  |                      |
|------------------|------------|----------------------------------|-----------------|--------------------|--------------------|--------------------|------------------|----------------------|
| .115             | Uzero>     | Enable Function                  |                 | off                | on / off           |                    | on / off         |                      |
| .116             | Uzero> off | U <sub>THR</sub><br>OFF          | %Unom<br>/VUnom | 20,00%<br>(46,00V) | 20,00%<br>(46,00V) | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117             | Uzero> on  | U <sub>THR</sub> ON              | %Unom<br>/VUnom | 15,00%<br>(34,50V) | 15,00%<br>(34,50V) | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118             | T Uzero>   | Time OFF                         |                 | 1500 ms            | 1500 ms            | 1500 ms            | 0 ms             | 300000 ms            |
| Only active for: |            | Connection Modes: 4-wire (LN+LL) |                 |                    |                    |                    |                  |                      |

| 10 minutes average overvoltage |                 |                         |                 | Conformity Range                  |                                   | Possible Range                    |                                   |
|--------------------------------|-----------------|-------------------------|-----------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| ID                             | Enable function |                         | Default         | Min                               | Max                               | Min                               | Max                               |
| .042                           | Uavg            | on                      |                 |                                   |                                   |                                   |                                   |
| .043                           | Uavg off        | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 112,00%<br>(257,60V)<br>/448,00V) | 112,00%<br>(257,60V)<br>/448,00V) | 112,00%<br>(257,60V)<br>/448,00V) | 100,00%<br>(230,00V)<br>/400,00V) |
| .044                           | Uavg on         | U <sub>THR</sub> ON     | %Unom<br>/VUnom | 110,00%<br>(253,00V)<br>/440,00V) | 110,00%<br>(253,00V)<br>/440,00V) | 110,00%<br>(253,00V)<br>/440,00V) | 100,00%<br>(230,00V)<br>/400,00V) |

| Overfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID             | Default |                      | Min              | Max       | Min            | Max       |
| .055           | F> off  | f <sub>THR</sub> OFF | 52,000 Hz        | 52,000 Hz | 52,000 Hz      | 50,000 Hz |
| .056           | F> on   | f <sub>THR</sub> ON  | 51,900 Hz        | 51,900 Hz | 51,900 Hz      | 50,000 Hz |
| .057           | T F>    | Time OFF             | 2000 ms          | 2000 ms   | 2000 ms        | 100 ms    |

| Underfrequency1 |         |                      | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------------------|------------------|-----------|----------------|-----------|
| ID              | Default |                      | Min              | Max       | Min            | Max       |
| .059            | F< off  | f <sub>THR</sub> OFF | 47,000 Hz        | 47,000 Hz | 47,000 Hz      | 40,000 Hz |
| .060            | F< on   | f <sub>THR</sub> ON  | 47,500 Hz        | 47,500 Hz | 47,500 Hz      | 40,000 Hz |

|      |      |          |         |         |         |        |           |
|------|------|----------|---------|---------|---------|--------|-----------|
| .061 | T F< | Time OFF | 2000 ms | 2000 ms | 2000 ms | 100 ms | 300000 ms |
|------|------|----------|---------|---------|---------|--------|-----------|

| Frequency measuring in general |         |               | Conformity Range |        |        |  |
|--------------------------------|---------|---------------|------------------|--------|--------|--|
| ID                             | Default |               | Min              | Max    |        |  |
| .113                           | F wnd   | Window length | 100 ms           | 100 ms | 100 ms |  |

| Rate of Change of Frequency (RoCoF) |            |                          | Conformity Range |            | Possible Range |                     |
|-------------------------------------|------------|--------------------------|------------------|------------|----------------|---------------------|
| ID                                  | Default    |                          | Min              | Max        | Min            | Max                 |
| .090                                | RoCoF      | En Function              | on               |            | on / off       |                     |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | 4000 mHz/s       | 4000 mHz/s | 4000 mHz/s     | 10 mHz/s 5000 mHz/s |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | 3950 mHz/s       | 3950 mHz/s | 3950 mHz/s     | 10 mHz/s 4950 mHz/s |
| .093                                | RoCoFDelay | Time OFF                 | 100 ms           | 850 ms     | 850 ms         | 100 ms 10000 ms     |
| .111                                | RoCoF wnd  | Window length            | 225 ms           | 100 ms     | 1000 ms        | 100 ms 1000 ms      |

| Auxiliary Contact type |           |          | Conformity Range       |  | Possible Range |   |
|------------------------|-----------|----------|------------------------|--|----------------|---|
| ID                     | Default   |          | Min                    | Max  | Min            | Max   |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |                |   |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              | Conformity Range |     | Possible Range |           |
|---------------|------------|--------------|------------------|-----|----------------|-----------|
| ID            | Default    |              | Min              | Max | Min            | Max       |
| .102          | T on delay | Turn on time | 60 s             | 0 s | 60 s           | 0 s 900 s |

|          |  |
|----------|--|
| Password |  |
|----------|--|

| ID      |     |   | Default | Min | Max |
|---------|-----|---|---------|-----|-----|
| .106    | PW1 | 1 <sup>st</sup> digit of Password   | 0       | 0   | 9   |
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0       | 0   | 9   |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0       | 0   | 9   |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0       | 0   | 9   |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |     |
|---|-----|
| Overvoltage LL (UΔ)   | on  |
| Undervoltage LL (UΔ)  | on  |
| Overvoltage LN (UY)   | on  |
| Undervoltage LN (UY)  | on  |
| 10-min overvoltage (Ü)  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) (Δf)  | on  |
| Phase shift (ΔΦ)  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                       |   |
|--------------------|---------------------------------------|---|
| ID                 |                                       |   |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set |

|  |  |                                 |
|--|--|---------------------------------|
|  |  | b: Version of Configuration set |
|--|--|---------------------------------|

**10.58 NRS 097-2-1:2017 [ID 1000]**

| Connection Mode |            |             | Conformity Range                               |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|--|--|--|--|--|
| ID              |            | Default     |  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 230.0<br>400.0 | 28.8<br>50.0 | 250.0<br>434.8 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |           |   |       | Conformity Range |     | Possible Range |     |       |
|---------------------------|-----------|---|-------|------------------|-----|----------------|-----|-------|
| ID                        |           | Default   |       | Min              | Max | Min            | Max |       |
| .011                      | ULL>1 OFF | U <sub>THR</sub> OFF  | %Unom | 111              | 111 | 111            | 100 | 135   |
| .012                      | ULL>1 ON  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 109            | 100 | 135   |
| .013                      | ULL>1 T   | Time OFF  | ms    | 2000             | 200 | 2000           | 200 | 60000 |
| Comment:                  |           | ULL>1 OFF has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |     |       |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |     |                |     |       |

| Undervoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |       |
|----------------------------|-----------|--|-------|------------------|-----|----------------|-----|-------|
| ID                         |           | Default  |       | Min              | Max | Min            | Max |       |
| .015                       | ULL<1 OFF | U <sub>THR</sub> OFF   | %Unom | 84               | 84  | 84             | 10  | 100   |
| .016                       | ULL<1 ON  | U <sub>THR</sub> ON  | %Unom | 86               | 86  | 100            | 10  | 100   |
| .017                       | ULL<1 T   | Time OFF   | ms    | 10000            | 600 | 10000          | 200 | 60000 |
| Comment:                   |           | ULL<1 OFF has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |       |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL)                               |       |                  |     |                |     |       |



| Overvoltage2 Line to Neutral |           |  |       | Conformity Range |     | Possible Range |     |       |
|------------------------------|-----------|--|-------|------------------|-----|----------------|-----|-------|
| ID                           |           |  |       | Default          | Min | Max            | Min | Max   |
| .035                         | ULN>2 OFF | U <sub>THR</sub> OFF   | %Unom | 121              | 121 | 121            | 100 | 135   |
| .036                         | ULN>2 ON  | U <sub>THR</sub> ON  | %Unom | 119              | 100 | 119            | 100 | 135   |
| .037                         | ULN>2 T   | Time OFF   | ms    | 160              | 110 | 160            | 110 | 60000 |
| Comment:                     |           | ULN>2 OFF has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |       |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |     |       |

| Undervoltage2 Line to Neutral |           |  |       | Conformity Range |     | Possible Range |     |       |
|-------------------------------|-----------|--|-------|------------------|-----|----------------|-----|-------|
| ID                            |           |  |       | Default          | Min | Max            | Min | Max   |
| .039                          | ULN<2 OFF | U <sub>THR</sub> OFF   | %Unom | 49               | 49  | 49             | 10  | 100   |
| .040                          | ULN<2 ON  | U <sub>THR</sub> ON  | %Unom | 51               | 51  | 100            | 10  | 100   |
| .041                          | ULN<2 T   | Time OFF   | ms    | 200              | 150 | 200            | 150 | 60000 |
| Comment:                      |           | ULN<2 OFF has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |     |                |     |       |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |       |                  |     |                |     |       |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f>1 OFF | f <sub>THR</sub> OFF | Hz | 52.00            | 52.00 | 52.00          | 50.00 | 60.00 |
| .056           | f>1 ON  | f <sub>THR</sub> ON  | Hz | 50.50            | 50.00 | 50.50          | 50.00 | 60.00 |
| .057           | f>1 T   | Time OFF             | ms | 4000             | 4000  | 4000           | 200   | 60000 |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f<1 OFF | f <sub>THR</sub> OFF | Hz | 47.00            | 47.00 | 47.00          | 40.00 | 50.00 |
| .060            | f<1 ON  | f <sub>THR</sub> ON  | Hz | 47.10            | 47.10 | 50.00          | 40.00 | 50.00 |
| .061            | f<1 T   | Time OFF             | ms | 200              | 200   | 200            | 200   | 60000 |

| Random overfrequency |       |                 |  | Conformity Range |          | Possible Range |         |     |
|----------------------|-------|-----------------|--|------------------|----------|----------------|---------|-----|
| ID                   |       |                 |  | Default          | Min      | Max            | Min     | Max |
| .086                 | f>RND | Enable function |  | off              | on / off |                | on /off |     |

|          |           |   |    |       |       |       |       |       |  |
|----------|-----------|---|----|-------|-------|-------|-------|-------|--|
| .087     | f>RND OFF | f <sub>THR</sub> OFF  | Hz |       | 50.50 | 52.00 | 50.50 | 52.00 |  |
| .088     | f>RND ON  | f <sub>THR</sub> ON   | Hz | 50.10 | 50.00 | 50.49 | 50.00 | 50.49 |  |
| .089     | f>RND T   | Time OFF  | ms | 4000  | 4000  | 4000  | 50    | 60000 |  |
| Comment: |           | The random f <sub>THR</sub> OFF threshold is shown in .087 and cannot be edited |    |       |       |       |       |       |  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |            |                          |    | Conformity Range          |          | Possible Range |          |     |
|-------------------------------------|------------|--------------------------|----|---------------------------|----------|----------------|----------|-----|
| ID                                  |            |                          |    | Default                   | Min      | Max            | Min      | Max |
| .090                                | RoCoF      | Enable Function          |    | off                       | on / off |                | on / off |     |
| .091                                | RoCoF OFF  | RoCoF <sub>THR</sub> OFF |    | mHz/s                     | 1000     | 10             | 9990     | 10  |
| .092                                | RoCoF ON   | RoCoF <sub>THR</sub> ON  |    | mHz/s                     | 950      | 10             | 9990     | 100 |
| .093                                | RoCoFDelay | Time OFF                 |    | ms                        | 500      | 50             | 60000    | 50  |
| .111                                | RoCoF wnd  | Window length            | ms | Fixed window length 225ms |          |                |          |     |

| Phase Shift (PShift) |            |                           |    | Conformity Range          |          | Possible Range |          |     |
|----------------------|------------|---------------------------|----|---------------------------|----------|----------------|----------|-----|
| ID                   |            |                           |    | Default                   | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function           |    | off                       | on / off |                | on / off |     |
| .095                 | PShift OFF | PShift <sub>THR</sub> OFF |    | °                         | 7        | 2              | 20       | 2   |
| .096                 | PShift ON  | PShift <sub>THR</sub> ON  |    | °                         | 5        | 2              | 20       | 2   |
| .097                 | PShift T   | Time OFF                  |    | ms                        | 0        | 0              | 60000    | 0   |
| .112                 | PShift wnd | Window length             | ms | Fixed window length 200ms |          |                |          |     |

| Auxiliary Contact type |         |      |                        | Conformity Range                                 |     | Possible Range  |     |
|------------------------|---------|------|------------------------|--|-----|---|-----|
| ID                     |         |      | Default                | Min  | Max | Min   | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

|      |           |          |    |                        |   |   |  |
|------|-----------|----------|----|------------------------|---|---|--|
| .100 | T Contact | Time OFF | ms | Fixed to 500ms         |   |   |  |
| .114 | I3 STOP   | Type     |    | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 600            | 0   | 900 |

| Random Turn-on delay |            |   |   | Conformity Range |          | Possible Range |          |     |  |
|----------------------|------------|---|---|------------------|----------|----------------|----------|-----|--|
| ID                   |            |   |   | Default          | Min      | Max            | Min      | Max |  |
| .103                 | Ton random | Enable function   |   | off              | on / off |                | on / off |     |  |
| .104                 | Ton random | Turn on time  | s |                  | 60       | 600            | 60       | 600 |  |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |                  |          |                |          |     |  |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

|   |  |
|---|--|
| <b>Errorlogic signalled (shown) on output relay R3.</b> |  |
| On = it is possible to detect this error                |  |
| Off = it is not possible to show this error on relay R3 |  |
| Overvoltage LL (UΔ)                                     |  |
| Undervoltage LL (UΔ)                                    |  |
| Overvoltage LN (UY)                                     |  |
| Undervoltage LN (UY)                                    |  |

|   |     |
|---|-----|
| 10-min overvoltage ( $\bar{U}$ )  | on  |
| Overfrequency (f)   | on  |
| Underfrequency (f)  | on  |
| RoCoF (Rate of Change of Frequency) ( $\Delta f$ )  | on  |
| Phase shift ( $\Delta\Phi$ )  | on  |
| Remote shutdown / self-test (R)   | off |
| Contactor feedback contact reports closed, although it should be open (C)                       | on  |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | on  |

| Device Information |                                |  |
|--------------------|--------------------------------|--|
| ID                 |                                |  |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.59 OPEN SETUP [ID 9006]

| Connection Mode |            |             | Conformity Range                               |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|--|--|--|--|--|
| ID              |            | Default     |  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |              | Possible Range |              |                |
|-----------------|------------|------------------|-----|------------------|--------------|----------------|--------------|----------------|
| ID              |            | Default          |     | Min              | Max          | Min            | Max          |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 28.8<br>50.0 | 250.0<br>434.8 | 28.8<br>50.0 | 250.0<br>434.8 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |  |                |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range |     | Possible Range |     |
|---------------------------|-----------|--|-------|------------------|-----|----------------|-----|
| ID                        |           | Default                                  |       | Min              | Max | Min            | Max |
| .010                      | ULL>1     | Enable function                          | on    | on / off         |     | on /off        |     |
| .011                      | ULL>1 OFF | U <sub>THR</sub> OFF                     | %Unom | 110              | 0   | 180            | 0   |
| .012                      | ULL>1 ON  | U <sub>THR</sub> ON                      | %Unom | 109              | 0   | 180            | 0   |
| .013                      | ULL>1 T   | Time OFF                                 | ms    | 200              | 50  | 300000         | 50  |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |     |                |     |

| Undervoltage1 Line to Line |           |                      |       | Conformity Range |     | Possible Range |     |
|----------------------------|-----------|----------------------|-------|------------------|-----|----------------|-----|
| ID                         |           | Default              |       | Min              | Max | Min            | Max |
| .014                       | ULL<1     | Enable function      | on    | on / off         |     | on /off        |     |
| .015                       | ULL<1 OFF | U <sub>THR</sub> OFF | %Unom | 90               | 0   | 180            | 0   |
| .016                       | ULL<1 ON  | U <sub>THR</sub> ON  | %Unom | 91               | 0   | 180            | 0   |
| .017                       | ULL<1 T   | Time OFF             | ms    | 200              | 50  | 300000         | 50  |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Overvoltage1 Line to Neutral |           |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|-----------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |           |   |       | Default          | Min      | Max            | Min     | Max    |
| .018                         | ULN>1     | Enable function                                       |       | on               | on / off |                | on /off |        |
| .019                         | ULN>1 OFF | U <sub>THR</sub> OFF                                  | %Unom | 110              | 0        | 180            | 0       | 180    |
| .020                         | ULN>1 ON  | U <sub>THR</sub> ON                                   | %Unom | 109              | 0        | 180            | 0       | 180    |
| .021                         | ULN>1 T   | Time OFF  | ms    | 200              | 50       | 300000         | 50      | 300000 |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |       |                  |          |                |         |        |

| Undervoltage1 Line to Neutral |           |  |       | Conformity Range |          | Possible Range |         |        |
|-------------------------------|-----------|--|-------|------------------|----------|----------------|---------|--------|
| ID                            |           |  |       | Default          | Min      | Max            | Min     | Max    |
| .022                          | ULN<1     | Enable function  |       | on               | on / off |                | on /off |        |
| .023                          | ULN<1 OFF | U <sub>THR</sub> OFF                                   | %Unom | 90               | 0        | 180            | 0       | 180    |
| .024                          | ULN<1 ON  | U <sub>THR</sub> ON                                    | %Unom | 91               | 0        | 180            | 0       | 180    |
| .025                          | ULN<1 T   | Time OFF   | ms    | 200              | 50       | 300000         | 50      | 300000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)) |       |                  |          |                |         |        |

| Overvoltage2 Line to Line |           |  |       | Conformity Range |          | Possible Range |         |        |
|---------------------------|-----------|--|-------|------------------|----------|----------------|---------|--------|
| ID                        |           |  |       | Default          | Min      | Max            | Min     | Max    |
| .026                      | ULL>2     | Enable function                          |       | on               | on / off |                | on /off |        |
| .027                      | ULL>2 OFF | U <sub>THR</sub> OFF                     | %Unom | 120              | 0        | 180            | 0       | 180    |
| .028                      | ULL>2 ON  | U <sub>THR</sub> ON                      | %Unom | 119              | 0        | 180            | 0       | 180    |
| .029                      | ULL>2 T   | Time OFF                                 | ms    | 100              | 50       | 300000         | 50      | 300000 |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                  |          |                |         |        |

| Undervoltage2 Line to Line |           |                      |       | Conformity Range |          | Possible Range |         |     |
|----------------------------|-----------|----------------------|-------|------------------|----------|----------------|---------|-----|
| ID                         |           |                      |       | Default          | Min      | Max            | Min     | Max |
| .030                       | ULL<2     | Enable function      |       | on               | on / off |                | on /off |     |
| .031                       | ULL<2 OFF | U <sub>THR</sub> OFF | %Unom | 80               | 0        | 180            | 0       | 180 |
| .032                       | ULL<2 ON  | U <sub>THR</sub> ON  | %Unom | 81               | 0        | 180            | 0       | 180 |

|                  |         |  |    |     |    |        |    |        |
|------------------|---------|--|----|-----|----|--------|----|--------|
| .033             | ULL<2 T | Time OFF                                 | ms | 100 | 50 | 300000 | 50 | 300000 |
| Only active for: |         | Connection Modes: 3-wire, 4-wire (LN+LL) |    |     |    |        |    |        |

| Overvoltage2 Line to Neutral |           |   |       | Conformity Range |          | Possible Range |         |        |
|------------------------------|-----------|---|-------|------------------|----------|----------------|---------|--------|
| ID                           |           |   |       | Default          | Min      | Max            | Min     | Max    |
| .034                         | ULN>2     | Enable function                                       |       | on               | on / off |                | on /off |        |
| .035                         | ULN>2 OFF | U <sub>THR</sub> OFF                                  | %Unom | 120              | 0        | 180            | 0       | 180    |
| .036                         | ULN>2 ON  | U <sub>THR</sub> ON                                   | %Unom | 119              | 0        | 180            | 0       | 180    |
| .037                         | ULN>2 T   | Time OFF  | ms    | 100              | 50       | 300000         | 50      | 300000 |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |       |                  |          |                |         |        |

| Undervoltage2 Line to Neutral |           |   |       | Conformity Range |          | Possible Range |         |        |
|-------------------------------|-----------|---|-------|------------------|----------|----------------|---------|--------|
| ID                            |           |   |       | Default          | Min      | Max            | Min     | Max    |
| .038                          | ULN<2     | Enable function                                       |       | on               | on / off |                | on /off |        |
| .039                          | ULN<2 OFF | U <sub>THR</sub> OFF                                  | %Unom | 80               | 0        | 180            | 0       | 180    |
| .040                          | ULN<2 ON  | U <sub>THR</sub> ON                                   | %Unom | 81               | 0        | 180            | 0       | 180    |
| .041                          | ULN<2 T   | Time OFF  | ms    | 100              | 50       | 300000         | 50      | 300000 |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |       |                  |          |                |         |        |

| 10 minutes average overvoltage |           |                      |       | Conformity Range |          | Possible Range |         |        |
|--------------------------------|-----------|----------------------|-------|------------------|----------|----------------|---------|--------|
| ID                             |           |                      |       | Default          | Min      | Max            | Min     | Max    |
| .042                           | UAVG>     | Enable function      |       | on               | on / off |                | on /off |        |
| .043                           | UAVG> OFF | U <sub>THR</sub> OFF | %Unom | 110              | 0        | 180            | 0       | 180    |
| .044                           | UAVG> ON  | U <sub>THR</sub> ON  | %Unom | 109              | 0        | 180            | 0       | 180    |
| .045                           | UAVG> T   | Time OFF             | ms    | 0                | 0        | 300000         | 0       | 300000 |

| Deactivation frequency monitoring LL |            |                      |       | Conformity Range           |          | Possible Range |         |     |
|--------------------------------------|------------|----------------------|-------|----------------------------|----------|----------------|---------|-----|
| ID                                   |            |                      |       | Default                    | Min      | Max            | Min     | Max |
| .046                                 | fdeac ULL< | Enable function      |       | off                        | on / off |                | on /off |     |
| .047                                 | ULL< OFF   | U <sub>THR</sub> OFF | %Unom | 9.5                        | 9.5      | 60             | 2       | 100 |
|                                      |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (1% UNOM) |          |                |         |     |

| Deactivation frequency monitoring LN |               |                      |       | Conformity Range           |          | Possible Range |         |     |
|--------------------------------------|---------------|----------------------|-------|----------------------------|----------|----------------|---------|-----|
| ID                                   |               |                      |       | Default                    | Min      | Max            | Min     | Max |
| .050                                 | fdeac<br>ULN< | Enable function      |       | off                        | on / off |                | on /off |     |
| .051                                 | ULN< OFF      | U <sub>THR</sub> OFF | %Unom | 9.5                        | 9.5      | 60             | 2       | 100 |
|                                      |               | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (1% UNOM) |          |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range |          | Possible Range |         |        |
|----------------|---------|----------------------|----|------------------|----------|----------------|---------|--------|
| ID             |         |                      |    | Default          | Min      | Max            | Min     | Max    |
| .054           | f>1     | Enable function      |    | on               | on / off |                | on /off |        |
| .055           | f>1 OFF | f <sub>THR</sub> OFF | Hz | 51.00            | 40.00    | 65.00          | 40.00   | 65.00  |
| .056           | f>1 ON  | f <sub>THR</sub> ON  | Hz | 50.90            | 40.00    | 65.00          | 40.00   | 65.00  |
| .057           | f>1 T   | Time OFF             | ms | 200              | 75       | 300000         | 75      | 300000 |

| Underfrequency1 |         |                      |    | Conformity Range |          | Possible Range |         |        |
|-----------------|---------|----------------------|----|------------------|----------|----------------|---------|--------|
| ID              |         |                      |    | Default          | Min      | Max            | Min     | Max    |
| .058            | f<1     | Enable function      |    | on               | on / off |                | on /off |        |
| .059            | f<1 OFF | f <sub>THR</sub> OFF | Hz | 49.00            | 40.00    | 65.00          | 40.00   | 65.00  |
| .060            | f<1 ON  | f <sub>THR</sub> ON  | Hz | 49.10            | 40.00    | 65.00          | 40.00   | 65.00  |
| .061            | f<1 T   | Time OFF             | ms | 200              | 75       | 300000         | 75      | 300000 |

| Overfrequency2 |         |                      |    | Conformity Range |          | Possible Range |         |        |
|----------------|---------|----------------------|----|------------------|----------|----------------|---------|--------|
| ID             |         |                      |    | Default          | Min      | Max            | Min     | Max    |
| .062           | f>2     | Enable function      |    | on               | on / off |                | on /off |        |
| .063           | f>2 OFF | f <sub>THR</sub> OFF | Hz | 52.00            | 40.00    | 65.00          | 40.00   | 65.00  |
| .064           | f>2 ON  | f <sub>THR</sub> ON  | Hz | 51.90            | 40.00    | 65.00          | 40.00   | 65.00  |
| .065           | f>1 T   | Time OFF             | ms | 100              | 75       | 300000         | 75      | 300000 |

| Underfrequency2 |     |                 |  | Conformity Range |          | Possible Range |         |     |
|-----------------|-----|-----------------|--|------------------|----------|----------------|---------|-----|
| ID              |     |                 |  | Default          | Min      | Max            | Min     | Max |
| .066            | f<2 | Enable function |  | on               | on / off |                | on /off |     |

|      |         |                      |    |       |       |        |       |        |
|------|---------|----------------------|----|-------|-------|--------|-------|--------|
| .067 | f<2 OFF | f <sub>THR</sub> OFF | Hz | 48.00 | 40.00 | 65.00  | 40.00 | 65.00  |
| .068 | f<2 ON  | f <sub>THR</sub> ON  | Hz | 48.10 | 40.00 | 65.00  | 40.00 | 65.00  |
| .069 | f<2 T   | Time OFF             | ms | 100   | 75    | 300000 | 75    | 300000 |

| Random overfrequency |           |   |    | Conformity Range |          | Possible Range |         |        |
|----------------------|-----------|---|----|------------------|----------|----------------|---------|--------|
| ID                   |           |   |    | Default          | Min      | Max            | Min     | Max    |
| .086                 | f>RND     | Enable function   |    | off              | on / off |                | on /off |        |
| .087                 | f>RND OFF | f <sub>THR</sub> OFF  | Hz |                  | 50.20    | 51.50          | 50.20   | 51.50  |
| .088                 | f>RND ON  | f <sub>THR</sub> ON   | Hz | 50.05            | 50.00    | 50.19          | 50.00   | 50.19  |
| .089                 | f>RND T   | Time OFF  | ms | 100              | 50       | 300000         | 50      | 300000 |
| Comment:             |           | The random f <sub>THR</sub> OFF threshold is shown in .087 and cannot be edited |    |                  |          |                |         |        |

| Frequency measuring in general |       |               |    | Conformity Range |     | Possible Range |     |      |
|--------------------------------|-------|---------------|----|------------------|-----|----------------|-----|------|
| ID                             |       |               |    | Default          | Min | Max            | Min | Max  |
| .113                           | F wnd | Window length | ms | 100              | 100 | 1000           | 100 | 1000 |

| Rate of Change of Frequency (RoCoF) |            |                          |       | Conformity Range |          | Possible Range |          |        |
|-------------------------------------|------------|--------------------------|-------|------------------|----------|----------------|----------|--------|
| ID                                  |            |                          |       | Default          | Min      | Max            | Min      | Max    |
| .090                                | RoCoF      | Enable Function          |       | off              | on / off |                | on / off |        |
| .091                                | RoCoF OFF  | RoCoF <sub>THR</sub> OFF | mHz/s | 1000             | 10       | 9990           | 10       | 9990   |
| .092                                | RoCoF ON   | RoCoF <sub>THR</sub> ON  | mHz/s | 950              | 10       | 9990           | 10       | 9990   |
| .093                                | RoCoFDelay | Time OFF                 |       | 500              | 50       | 300000         | 50       | 300000 |
| .111                                | RoCoF wnd  | Window length            | ms    | 225              | 100      | 1000           | 100      | 1000   |

| Phase Shift (PShift) |            |                           |    | Conformity Range |          | Possible Range |          |        |
|----------------------|------------|---------------------------|----|------------------|----------|----------------|----------|--------|
| ID                   |            |                           |    | Default          | Min      | Max            | Min      | Max    |
| .094                 | PShift     | Enable Function           |    | off              | on / off |                | on / off |        |
| .095                 | PShift OFF | PShift <sub>THR</sub> OFF | °  | 7                | 2        | 20             | 2        | 20     |
| .096                 | PShift ON  | PShift <sub>THR</sub> ON  | °  | 5                | 2        | 20             | 2        | 20     |
| .097                 | PShift T   | Time OFF                  | ms | 0                | 0        | 300000         | 0        | 300000 |
| .112                 | PShift wnd | Window length             | ms | 200              | 50       | 500            | 50       | 1000   |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        | dis. (disabled)        |                        | dis. (disabled)        |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 600            | 0   | 900 |

| Random Turn-on delay |            |   |   | Conformity Range |          | Possible Range |          |     |  |
|----------------------|------------|---|---|------------------|----------|----------------|----------|-----|--|
| ID                   |            |   |   | Default          | Min      | Max            | Min      | Max |  |
| .103                 | Ton random | Enable function   |   | off              | on / off |                | on / off |     |  |
| .104                 | Ton random | Turn on time  | s |                  | 60       | 600            | 60       | 600 |  |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |                  |          |                |          |     |  |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

**Errorlogic signalled (shown) on output relay R3.**

On = it is possible to detect this error

Off = it is not possible to show this error on relay R3

|   |        |
|---|--------|
| Overvoltage LL (UΔ)   | On/off |
| Undervoltage LL (UΔ)  | On/off |
| Overvoltage LN (UY)   | On/off |
| Undervoltage LN (UY)  | On/off |
| 10-min overvoltage (Ü)  | On/off |
| Overfrequency (f)   | On/off |
| Underfrequency (f)  | On/off |
| RoCoF (Rate of Change of Frequency) (Δf)  | On/off |
| Phase shift (ΔΦ)  | On/off |
| Remote shutdown / self-test (R)   | On/off |
| Contactor feedback contact reports closed, although it should be open (C)                       | On/off |
| Contactor feedback contact reports open, although it should be closed (no error, only info) (c) | On/off |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | ID: xxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.60 CZ-2024 [ID: 930]

| Connection Mode |            |              | Conformity Range                           |  | Possible Range                             |  |
|-----------------|------------|--------------|--|--|--|--|
| ID              |            | Default      |  |  |  |  |
| .003            | Connection | 4-wire LL+LN | 2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN |  | 2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN |  |

| Nominal Voltage |            |  | Conformity Range    |                    | Possible Range      |                   |
|-----------------|------------|--|---------------------|--------------------|---------------------|-------------------|
| ID              |            | Default                                  | Min                 | Max                | Min                 | Max               |
| .005            | ULN/LL nom | U <sub>nom</sub> Y<br>U <sub>nom</sub> Δ | 230,00V/<br>400,00V | 57,50V/<br>100,00V | 230,00V/<br>400,00V | 28,75V/<br>50,00V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 1ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |           |  |   | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|-----------|--|---|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |           | Default                                  |   | Min                  | Max                          | Min                  | Max                      |                      |
| .010                      | ULL >     | Enable function                          |   | off                  | on / off                     |                      | on / off                 |                      |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 115,00%<br>(460,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/VU <sub>nom</sub> | 110,00%<br>(440,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .013                      | T ULL >   | Time OFF                                 |   | 5000 ms              | 100 ms                       | 100000<br>ms         | 100 ms                   | 300000 ms            |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |   |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Line |  |         | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|------------------|-----|----------------|-----|
| ID                         |  | Default | Min              | Max | Min            | Max |

| Undervoltage1 Line to Neutral |           |   |                 | Conformity Range    |                         | Possible Range       |                    |                      |
|-------------------------------|-----------|---|-----------------|---------------------|-------------------------|----------------------|--------------------|----------------------|
| ID                            |           |   | Default         | Min                 | Max                     | Min                  | Max                |                      |
| .022                          | ULN <     | Enable function                                       |                 | on                  | on / off                |                      | on / off           |                      |
| .023                          | ULN < off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 70,00%<br>(161,00V) | 20,00%<br>(46,00V)<br>) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .024                          | ULN < on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 50,00%<br>(115,00<br>V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .025                          | T ULN <   | Time OFF  |                 | 2700 ms             | 100 ms                  | 100000<br>ms         | 100 ms             | 300000 ms            |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                         |                      |                    |                      |

| Overvoltage2 Line to Line |            |  |  | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|------------|--|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |            |  | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .026                      | ULL >>     | Enable function                          |  | off                  | on / off                     |                      | on / off                 |                      |
| .027                      | ULL >> off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 120,00%<br>(480,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .028                      | ULL >> on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 110,00%<br>(440,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .029                      | T ULL >>   | Time OFF                                 |  | 100 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Line |            |  |  | Conformity Range    |                         | Possible Range       |                    |                      |
|----------------------------|------------|--|--|---------------------|-------------------------|----------------------|--------------------|----------------------|
| ID                         |            |  | Default  | Min                 | Max                     | Min                  | Max                |                      |
| .030                       | ULL <<     | Enable function                          |  | off                 | on / off                |                      | on / off           |                      |
| .031                       | ULL << off | U <sub>THR</sub><br>OFF                  | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 45,00%<br>(180,00V) | 20,00%<br>(80,00V<br>)  | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .032                       | ULL << on  | U <sub>THR</sub> ON                      | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 85,00%<br>(340,00V) | 50,00%<br>(200,00<br>V) | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .033                       | T ULL <<   | Time OFF                                 |  | 200 ms              | 100 ms                  | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL) |  |                     |                         |                      |                    |                      |

| Overvoltage2 Line to Neutral |            |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|------------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |            |   | Default  | Min                  | Max                          | Min                  | Max                      |                      |
| .034                         | ULN >>     | Enable function                                       |  | on                   | on / off                     |                      | on / off                 |                      |
| .035                         | ULN >> off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 120,00%<br>(276,00V) | 100,00<br>%<br>(230,00<br>V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .036                         | ULN >> on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>U<sub>nom</sub></sub> | 110,00%<br>(253,00V) | 100,00<br>%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .037                         | T ULN >>   | Time OFF  |  | 100 ms               | 100 ms                       | 5000 ms              | 100 ms                   | 300000 ms            |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage2 Line to Neutral |            |   |  | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|--|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default                                | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | ULN <<     | Enable function                                       |  | on                  | on / off             |                      | on / off           |                      |
| .039                          | ULN << off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 45,00%<br>(103,50V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | ULN << on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 85,00%<br>(195,50V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .041                          | T ULN <<   | Time OFF  |  | 200 ms              | 100 ms               | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                     |                      |                      |                    |                      |

| Zero Voltage Line to Neutral |            |                                  |                 | Conformity Range   |                  | Possible Range       |                  |                      |
|------------------------------|------------|----------------------------------|-----------------|--------------------|------------------|----------------------|------------------|----------------------|
| ID                           |            |                                  | Default         | Min                | Max              | Min                  | Max              |                      |
| .115                         | Uzero >    | Enable Function                  |                 | off                | on / off         |                      | on / off         |                      |
| .116                         | Uzero> off | UTHR<br>OFF                      | %Unom<br>/VUnom | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117                         | Uzero> on  | UTHR ON                          | %Unom<br>/VUnom | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118                         | T Uzero >  | Time OFF                         |                 | 1500 ms            | 200 ms           | 100000 ms            | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |                 |                    |                  |                      |                  |                      |

| Undervoltage LN Activation of a narrower frequency winw |            |                                  |                 | Conformity Range    |                     | Possible Range       |                  |                      |
|---|------------|----------------------------------|-----------------|---------------------|---------------------|----------------------|------------------|----------------------|
| ID  |            |                                  | Default         | Min                 | Max                 | Min                  | Max              |                      |
| .123  | Uanfw <    | Enable Function                  |                 | off                 | on / off            |                      | on / off         |                      |
| .124  | Uanfw< on  | UTHR<br>OFF                      | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V ) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .125  | Uanfw< off | UTHR ON                          | %Unom<br>/VUnom | 86,00%<br>(197,80V) | 21,00%<br>(48,30V ) | 100,00%<br>(230,00V) | 2,00%<br>(4,60V) | 100,00%<br>(230,00V) |
| .126  | T Uanfw <  | Time OFF                         |                 | 0 ms                | 0 ms                | 240000 ms            | 0 ms             | 240000 ms            |
| Only active for:  |            | Connection Modes: 4-wire (LN+LL) |                 |                     |                     |                      |                  |                      |

| 10 minutes average overvoltage |          |                         |                 | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|----------|-------------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |          |                         | Default         | Min                              | Max                              | Min                              | Max                                  |                                  |
| .042                           | Uavg     | Enable function         |                 | on                               | on / off                         |                                  | on / off                             |                                  |
| .043                           | Uavg off | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 111,00%<br>(255,30V/<br>444,00V) | 100,00%<br>(230,00V/<br>400,00V) | 115,00%<br>(264,50V/<br>460,00V) | 100,00%<br>(230,00V/<br>400,00V<br>) | 135,00%<br>(310,50V/<br>540,00V) |
| .044                           | Uavg on  | U <sub>THR</sub><br>ON  | %Unom<br>/VUnom | 110,00%<br>(253,00V/<br>440,00V) | 100,00%<br>(230,00V/<br>400,00V) | 115,00%<br>(264,50V/<br>460,00V) | 100,00%<br>(230,00V/<br>400,00V<br>) | 135,00%<br>(310,50V/<br>540,00V) |

| Overfrequency1 |         |                      |           | Conformity Range |           | Possible Range |           |
|----------------|---------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID             |         |                      | Default   | Min              | Max       | Min            | Max       |
| .054           | f >     | Enable function      | on        | on / off         |           | on / off       |           |
| .055           | f > off | f <sub>THR</sub> OFF | 51,500 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .056           | f > on  | f <sub>THR</sub> ON  | 50,050 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .057           | T f >   | Time OFF             | 100 ms    | 100 ms           | 100000 ms | 100 ms         | 300000 ms |

| Underfrequency1 |  |         | Conformity Range |     | Possible Range |     |
|-----------------|--|---------|------------------|-----|----------------|-----|
| ID              |  | Default | Min              | Max | Min            | Max |

|      |         |                 |           |           |           |           |           |
|------|---------|-----------------|-----------|-----------|-----------|-----------|-----------|
| .058 | f <     | Enable function | on        | on / off  |           | on / off  |           |
| .059 | f < off | fTHR OFF        | 47,500 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .060 | f < on  | fTHR ON         | 47,500 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .061 | T f <   | Time OFF        | 100 ms    | 100 ms    | 100000 ms | 100 ms    | 300000 ms |

| Overfrequency2 |            |                 | Conformity Range |           | Possible Range |           |           |
|----------------|------------|-----------------|------------------|-----------|----------------|-----------|-----------|
| ID             |            | Default         | Min              | Max       | Min            | Max       |           |
| .062           | f nw >     | Enable function | off              | on / off  |                | on / off  |           |
| .063           | f nw > off | fTHR OFF        | 50,300 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .064           | f nw > on  | fTHR ON         | 50,100 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .065           | T f nw >   | Time OFF        | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Underfrequency2 |            |                 | Conformity Range |           | Possible Range |           |           |
|-----------------|------------|-----------------|------------------|-----------|----------------|-----------|-----------|
| ID              |            | Default         | Min              | Max       | Min            | Max       |           |
| .066            | f nw <     | Enable function | off              | on / off  |                | on / off  |           |
| .067            | f nw < off | fTHR OFF        | 49,700 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .068            | f nw < on  | fTHR ON         | 49,800 Hz        | 47,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .069            | T f nw <   | Time OFF        | 500 ms           | 100 ms    | 5000 ms        | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |
|--------------------------------|-------|---------------|------------------|--------|--------|
| ID                             |       | Default       | Min              | Max    |        |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |

| Rate of Change of Frequency (RoCoF) |       |                 | Conformity Range |          | Possible Range |          |  |
|-------------------------------------|-------|-----------------|------------------|----------|----------------|----------|--|
| ID                                  |       | Default         | Min              | Max      | Min            | Max      |  |
| .090                                | ROCOF | Enable Function | off              | on / off |                | on / off |  |

|      |           |                          |            |           |            |           |            |
|------|-----------|--------------------------|------------|-----------|------------|-----------|------------|
| .091 | ROCOF off | RoCoF <sub>THR</sub> OFF | 1000 mHz/s | 200 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .092 | ROCOF on  | RoCoF <sub>THR</sub> ON  | 800 mHz/s  | 100 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .093 | T ROCOF   | Time OFF                 | 0 ms       | 0 ms      | 5000 ms    | 0 ms      | 5000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |        |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|--------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max    |
| .094                 | Pshift     | Enable Function           | off     | on / off         |        | on / off       |        |
| .095                 | Pshift off | PShift <sub>THR</sub> OFF | 7,0 °   | 2,0 °            | 15,0 ° | 2,0 °          | 15,0 ° |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 5,0 °   | 1,0 °            | 15,0 ° | 1,0 °          | 15,0 ° |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|
| ID                     |           |          | Default                | Min   | Max | Min   | Max |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |        | Possible Range |        |
|---------------|------------|--------------|---------|------------------|--------|----------------|--------|
| ID            |            |              | Default | Min              | Max    | Min            | Max    |
| .102          | T on delay | Turn on time | 300 s   | 10 s             | 1200 s | 0 s            | 1200 s |

| Password |     |                                   |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|---------|-----|-----|
| ID       |     |                                   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  | 0       | 0   | 9   |

|         |   |                                   |   |   |   |
|---------|---|-----------------------------------|---|---|---|
| .109    | PW4   | 4 <sup>th</sup> digit of Password | 0 | 0 | 9 |
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |                                   |   |   |   |

| <b>Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.</b> |  |
|--|--|
| On   | = it is possible to detect this error            |
| Off  | = it is <u>not</u> possible to detect this error |
| Overvoltage LL   | off  |
| Undervoltage LL  | off  |
| Overvoltage LN   | on   |
| Undervoltage LN  | on   |
| 10-min overvoltage   | on   |
| Overfrequency  | on   |
| Underfrequency   | on   |
| RoCoF (Rate of Change of Frequency)  | off  |
| Phase shift  | off  |
| Remote shutdown / self-test  | on   |
| Contactor feedback contact reports closed, although it should be open                                | on   |
| Contactor feedback contact reports open, although it should be closed (no error, only info)          | on   |

| Device Information |                                       |  |
|--------------------|---------------------------------------|--|
| ID                 |                                       |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.61 EN50549-1: SI Uf A/B [ID: 940]

| Connection Mode |            |              | Conformity Range                           |  | Possible Range                             |  |
|-----------------|------------|--------------|--|--|--|--|
| ID              |            | Default      |  |  |  |  |
| .003            | Connection | 4-wire LL+LN | 2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN |  | 2-wire LN, 3-wire, 4-wire LN, 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                    | Possible Range      |                    |
|-----------------|------------|------------------|---------------------|--------------------|---------------------|--------------------|
| ID              |            | Default          | Min                 | Max                | Min                 | Max                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 230,00V/<br>400,00V | 57,50V/<br>100,00V | 230,00V/<br>400,00V | 57,50V/<br>100,00V |

| Functional Safety |        |   | Conformity Range |  | Possible Range |  |
|-------------------|--------|---|------------------|--|----------------|--|
| ID                |        | Default   |                  |  |                |  |
| .007              | Errtol | 2ch   | 2ch              |  | 2ch            |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |                |  |

| Overvoltage1 Line to Line |           |  |                 | Conformity Range     |                              | Possible Range       |                          |
|---------------------------|-----------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|
| ID                        |           | Default                                  |                 | Min                  | Max                          | Min                  | Max                      |
| .010                      | ULL >     | Enable function                          | off             | on / off             |                              | on / off             |                          |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 111,00%<br>(444,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 110,00%<br>(440,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) |
| .013                      | T ULL >   | Time OFF                                 |                 | 2000 ms              | 100 ms                       | 100000<br>ms         | 100 ms                   |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |

| Undervoltage1 Line to Line |       |                 |     | Conformity Range |     | Possible Range |     |
|----------------------------|-------|-----------------|-----|------------------|-----|----------------|-----|
| ID                         |       | Default         |     | Min              | Max | Min            | Max |
| .014                       | ULL < | Enable function | off | on / off         |     | on / off       |     |

| Overvoltage1 Line to Neutral |           |   |  | Conformity Range     |                              | Possible Range       |                          |                      |
|------------------------------|-----------|---|--|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                           |           |   | Default                                | Min                  | Max                          | Min                  | Max                      |                      |
| .018                         | ULN >     | Enable function                                       |  | on                   | on / off                     |                      | on / off                 |                      |
| .019                         | ULN > off | U <sub>THR</sub><br>OFF                               | %U <sub>nom</sub><br>/V <sub>nom</sub> | 111,00%<br>(255,30V) | 100,00<br>%<br>(230,00<br>V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .020                         | ULN > on  | U <sub>THR</sub> ON                                   | %U <sub>nom</sub><br>/V <sub>nom</sub> | 110,00%<br>(253,00V) | 100,00<br>%<br>(230,00<br>V) | 110,00%<br>(253,00V) | 100,00%<br>(230,00V<br>) | 135,00%<br>(310,50V) |
| .021                         | T ULN >   | Time OFF  |  | 2000 ms              | 100 ms                       | 100000<br>ms         | 100 ms                   | 300000 ms            |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |  |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Neutral |           |   |                 | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|-----------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |           |   | Default         | Min                 | Max                  | Min                  | Max                |                      |
| .022                          | ULN <     | Enable function                                       |                 | on                  | on / off             |                      | on / off           |                      |
| .023                          | ULN < off | UTHR<br>OFF   | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .024                          | ULN < on  | UTHR ON   | %Unom<br>/VUnom | 90,00%<br>(207,00V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .025                          | T ULN <   | Time OFF  |                 | 2000 ms             | 100 ms               | 100000 ms            | 100 ms             | 300000 ms            |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Overvoltage2 Line to Line | Conformity Range | Possible Range |
|---------------------------|------------------|----------------|
|---------------------------|------------------|----------------|



| Undervoltage2 Line to Neutral |            |   |                 | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default         | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | ULN <<     | Enable function                                       |                 | on                  | on / off             |                      | on / off           |                      |
| .039                          | ULN << off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 70,00%<br>(161,00V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | ULN << on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 90,00%<br>(207,00V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .041                          | T ULN <<   | Time OFF  |                 | 200 ms              | 100 ms               | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                  | Possible Range       |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------|----------------------|------------------|----------------------|
| ID                           |            |                                  | Default                                | Min                | Max              | Min                  | Max              |                      |
| .115                         | Uzero >    | Enable Function                  |  | off                | on / off         |                      | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/U <sub>nom</sub> | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/U <sub>nom</sub> | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118                         | T Uzero >  | Time OFF                         |  | 1500 ms            | 200 ms           | 100000<br>ms         | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                  |                      |                  |                      |

| Undervoltage LN Activation of a narrower frequency winw |            |                                  |                 | Conformity Range    |                     | Possible Range       |                  |                      |
|---|------------|----------------------------------|-----------------|---------------------|---------------------|----------------------|------------------|----------------------|
| ID  |            |                                  | Default         | Min                 | Max                 | Min                  | Max              |                      |
| .123  | Uanfw <    | Enable Function                  |                 | off                 | on / off            |                      | on / off         |                      |
| .124  | Uanfw< on  | UTHR<br>OFF                      | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V ) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .125  | Uanfw< off | UTHR ON                          | %Unom<br>/VUnom | 86,00%<br>(197,80V) | 21,00%<br>(48,30V ) | 100,00%<br>(230,00V) | 2,00%<br>(4,60V) | 100,00%<br>(230,00V) |
| .126  | T Uanfw <  | Time OFF                         |                 | 0 ms                | 0 ms                | 240000 ms            | 0 ms             | 240000 ms            |
| Only active for:  |            | Connection Modes: 4-wire (LN+LL) |                 |                     |                     |                      |                  |                      |

| 10 minutes average overvoltage |          |                         |                 | Conformity Range                 |                                  | Possible Range                   |                                      |                                  |
|--------------------------------|----------|-------------------------|-----------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| ID                             |          |                         | Default         | Min                              | Max                              | Min                              | Max                                  |                                  |
| .042                           | Uavg     | Enable function         |                 | off                              | on / off                         |                                  | on / off                             |                                  |
| .043                           | Uavg off | U <sub>THR</sub><br>OFF | %Unom<br>/VUnom | 110,00%<br>(253,00V/<br>440,00V) | 100,00%<br>(230,00V/<br>400,00V) | 115,00%<br>(264,50V/<br>460,00V) | 100,00%<br>(230,00V/<br>400,00V<br>) | 135,00%<br>(310,50V/<br>540,00V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON     | %Unom<br>/VUnom | 109,00%<br>(250,70V/<br>436,00V) | 100,00%<br>(230,00V/<br>400,00V) | 115,00%<br>(264,50V/<br>460,00V) | 100,00%<br>(230,00V/<br>400,00V<br>) | 135,00%<br>(310,50V/<br>540,00V) |

| Overfrequency1 |         |                 | Conformity Range |           | Possible Range |           |           |
|----------------|---------|-----------------|------------------|-----------|----------------|-----------|-----------|
| ID             |         | Default         | Min              | Max       | Min            | Max       |           |
| .054           | f >     | Enable function | on               | on / off  |                | on / off  |           |
| .055           | f > off | fTHR OFF        | 52,000 Hz        | 50,000 Hz | 52,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | f > on  | fTHR ON         | 50,100 Hz        | 50,000 Hz | 51,000 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T f >   | Time OFF        | 200 ms           | 100 ms    | 60000 ms       | 100 ms    | 300000 ms |

| Underfrequency1 |  |         | Conformity Range |     | Possible Range |     |
|-----------------|--|---------|------------------|-----|----------------|-----|
| ID              |  | Default | Min              | Max | Min            | Max |

|      |         |                      |           |           |           |           |           |
|------|---------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .058 | f <     | Enable function      | on        | on / off  |           | on / off  |           |
| .059 | f < off | f <sub>THR</sub> OFF | 47,000 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .060 | f < on  | f <sub>THR</sub> ON  | 49,900 Hz | 47,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .061 | T f <   | Time OFF             | 200 ms    | 100 ms    | 60000 ms  | 100 ms    | 300000 ms |

| Overfrequency2 |            |                      |           | Conformity Range |           | Possible Range |           |
|----------------|------------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID             |            |                      | Default   | Min              | Max       | Min            | Max       |
| .062           | f nw >     | Enable function      | off       | on / off         |           | on / off       |           |
| .063           | f nw > off | f <sub>THR</sub> OFF | 50,300 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .064           | f nw > on  | f <sub>THR</sub> ON  | 50,100 Hz | 50,000 Hz        | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .065           | T f nw >   | Time OFF             | 500 ms    | 100 ms           | 5000 ms   | 100 ms         | 300000 ms |

| Underfrequency2 |            |                      |           | Conformity Range |           | Possible Range |           |
|-----------------|------------|----------------------|-----------|------------------|-----------|----------------|-----------|
| ID              |            |                      | Default   | Min              | Max       | Min            | Max       |
| .066            | f nw <     | Enable function      | off       | on / off         |           | on / off       |           |
| .067            | f nw < off | f <sub>THR</sub> OFF | 49,700 Hz | 47,000 Hz        | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .068            | f nw < on  | f <sub>THR</sub> ON  | 49,900 Hz | 47,000 Hz        | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .069            | T f nw <   | Time OFF             | 500 ms    | 100 ms           | 5000 ms   | 100 ms         | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |     |        |
|--------------------------------|-------|---------------|------------------|--------|-----|--------|
| ID                             |       |               | Default          | Min    | Max |        |
| .113                           | F wnd | Window length | 100 ms           | 100 ms |     | 100 ms |

| Rate of Change of Frequency (RoCoF) |           |                          |            | Conformity Range |            | Possible Range |            |
|-------------------------------------|-----------|--------------------------|------------|------------------|------------|----------------|------------|
| ID                                  |           |                          | Default    | Min              | Max        | Min            | Max        |
| .090                                | ROCOF     | Enable Function          | off        | on / off         |            | on / off       |            |
| .091                                | ROCOF off | RoCoF <sub>THR</sub> OFF | 5000 mHz/s | 200 mHz/s        | 9990 mHz/s | 100 mHz/s      | 9990 mHz/s |

|      |          |                         |            |           |            |           |            |
|------|----------|-------------------------|------------|-----------|------------|-----------|------------|
| .092 | ROCOF on | RoCoF <sub>THR</sub> ON | 4900 mHz/s | 100 mHz/s | 9990 mHz/s | 100 mHz/s | 9990 mHz/s |
| .093 | T ROCOF  | Time OFF                | 500 ms     | 0 ms      | 5000 ms    | 0 ms      | 5000 ms    |

| Phase Shift (PShift) |            |                           |         | Conformity Range |        | Possible Range |        |
|----------------------|------------|---------------------------|---------|------------------|--------|----------------|--------|
| ID                   |            |                           | Default | Min              | Max    | Min            | Max    |
| .094                 | Pshift     | Enable Function           | off     | on / off         |        | on / off       |        |
| .095                 | Pshift off | PShift <sub>THR</sub> OFF | 7,0 °   | 2,0 °            | 15,0 ° | 2,0 °          | 15,0 ° |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 5,0 °   | 1,0 °            | 15,0 ° | 1,0 °          | 15,0 ° |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|
| ID                     |           |          | Default                | Min   | Max | Min   | Max |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |   |     |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 10 s             | 600 s | 0 s            | 900 s |

| Password |     |                                   |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|---------|-----|-----|
| ID       |     |                                   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password |  |  | 0       | 0   | 9   |

|         |   |
|---------|---|
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |
|---------|---|

| <b>Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.</b> |  |
|--|--|
| On =   | it is possible to detect this error            |
| Off =  | it is <u>not</u> possible to detect this error |
| Overvoltage LL   | on   |
| Undervoltage LL  | on   |
| Overvoltage LN   | on   |
| Undervoltage LN  | on   |
| 10-min overvoltage   | on   |
| Overfrequency  | on   |
| Underfrequency   | on   |
| RoCoF (Rate of Change of Frequency)  | on   |
| Phase shift  | on   |
| Remote shutdown / self-test  | on   |
| Contactor feedback contact reports closed, although it should be open                                | on   |
| Contactor feedback contact reports open, although it should be closed (no error, only info)          | on   |

| Device Information |                                    |  |
|--------------------|------------------------------------|--|
| ID                 |                                    |  |
| .105               | SN:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 10.62 EN50549-2: SI Uf C [ID: 945]

| Connection Mode |            |              | Conformity Range                   |  | Possible Range           |  |
|-----------------|------------|--------------|------------------------------------|--|--------------------------|--|
| ID              |            | Default      |                                    |  |                          |  |
| .003            | Connection | 4-wire LL+LN | 3-wire LL, 4-wire LN, 4-wire LL+LN |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                    | Possible Range      |                     |
|-----------------|------------|------------------|---------------------|--------------------|---------------------|---------------------|
| ID              |            | Default          | Min                 | Max                | Min                 | Max                 |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 230,00V/<br>400,00V | 57,50V/<br>100,00V | 230,00V/<br>400,00V | 57,50V/<br>100,00V  |
|                 |            |                  |                     |                    |                     | 240,01V/<br>417,40V |

| Functional Safety |        |   | Conformity Range |  | Possible Range |     |
|-------------------|--------|---|------------------|--|----------------|-----|
| ID                |        | Default   |                  |  |                |     |
| .007              | Errtol | 2ch   | 2ch              |  |                | 2ch |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |                |     |

| Overvoltage1 Line to Line |           |  |                 | Conformity Range     |                              | Possible Range       |                          |                      |
|---------------------------|-----------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |           | Default                                  |                 | Min                  | Max                          | Min                  | Max                      |                      |
| .010                      | ULL >     | Enable function                          |                 | on                   | on / off                     |                      | on / off                 |                      |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 111,00%<br>(444,00V) | 100,00<br>%<br>(400,00<br>V) | 120,00%<br>(480,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 110,00%<br>(440,00V) | 100,00<br>%<br>(400,00<br>V) | 110,00%<br>(440,00V) | 100,00%<br>(400,00V<br>) | 135,00%<br>(540,00V) |
| .013                      | T ULL >   | Time OFF                                 |                 | 2000 ms              | 100 ms                       | 100000<br>ms         | 100 ms                   | 300000 ms            |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Line |       |                 |  | Conformity Range |          | Possible Range |          |  |
|----------------------------|-------|-----------------|--|------------------|----------|----------------|----------|--|
| ID                         |       | Default         |  | Min              | Max      | Min            | Max      |  |
| .014                       | ULL < | Enable function |  | on               | on / off |                | on / off |  |

|                  |           |  |                 |                     |                      |                      |                    |                      |
|------------------|-----------|--|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| .015             | ULL < off | $U_{THR}$<br>OFF                         | %Unom<br>/VUnom | 85,00%<br>(340,00V) | 20,00%<br>(80,00V )  | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .016             | ULL < on  | $U_{THR}$ ON                             | %Unom<br>/VUnom | 90,00%<br>(360,00V) | 50,00%<br>(200,00 V) | 100,00%<br>(400,00V) | 10,00%<br>(40,00V) | 100,00%<br>(400,00V) |
| .017             | T ULL <   | Time OFF                                 |                 | 2000 ms             | 100 ms               | 100000 ms            | 100 ms             | 300000 ms            |
| Only active for: |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Overvoltage1 Line to Neutral |           |   |                 | Conformity Range     |                        | Possible Range       |                       |                      |
|------------------------------|-----------|---|-----------------|----------------------|------------------------|----------------------|-----------------------|----------------------|
| ID                           |           |   |                 | Default              | Min                    | Max                  | Min                   | Max                  |
| .018                         | ULN >     | Enable function                                       |                 | on                   | on / off               |                      | on / off              |                      |
| .019                         | ULN > off | $U_{THR}$<br>OFF                                      | %Unom<br>/VUnom | 111,00%<br>(255,30V) | 100,00 %<br>(230,00 V) | 120,00%<br>(276,00V) | 100,00%<br>(230,00V ) | 135,00%<br>(310,50V) |
| .020                         | ULN > on  | $U_{THR}$ ON  | %Unom<br>/VUnom | 110,00%<br>(253,00V) | 100,00 %<br>(230,00 V) | 110,00%<br>(253,00V) | 100,00%<br>(230,00V ) | 135,00%<br>(310,50V) |
| .021                         | T ULN >   | Time OFF  |                 | 2000 ms              | 100 ms                 | 100000 ms            | 100 ms                | 300000 ms            |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                        |                      |                       |                      |

| Undervoltage1 Line to Neutral |           |   |                 | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|-----------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |           |   |                 | Default             | Min                  | Max                  | Min                | Max                  |
| .022                          | ULN <     | Enable function                                       |                 | on                  | on / off             |                      | on / off           |                      |
| .023                          | ULN < off | $U_{THR}$<br>OFF                                      | %Unom<br>/VUnom | 85,00%<br>(195,50V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .024                          | ULN < on  | $U_{THR}$ ON  | %Unom<br>/VUnom | 90,00%<br>(207,00V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .025                          | T ULN <   | Time OFF  |                 | 2000 ms             | 100 ms               | 100000 ms            | 100 ms             | 300000 ms            |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Overvoltage2 Line to Line |  |  |  | Conformity Range |  | Possible Range |  |
|---------------------------|--|--|--|------------------|--|----------------|--|
|                           |  |  |  |                  |  |                |  |



| Undervoltage2 Line to Neutral |            |   |                 | Conformity Range    |                      | Possible Range       |                    |                      |
|-------------------------------|------------|---|-----------------|---------------------|----------------------|----------------------|--------------------|----------------------|
| ID                            |            |   | Default         | Min                 | Max                  | Min                  | Max                |                      |
| .038                          | ULN <<     | Enable function                                       |                 | on                  | on / off             |                      | on / off           |                      |
| .039                          | ULN << off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 70,00%<br>(161,00V) | 20,00%<br>(46,00V )  | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .040                          | ULN << on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 90,00%<br>(207,00V) | 50,00%<br>(115,00 V) | 100,00%<br>(230,00V) | 10,00%<br>(23,00V) | 100,00%<br>(230,00V) |
| .041                          | T ULN <<   | Time OFF  |                 | 200 ms              | 100 ms               | 5000 ms              | 100 ms             | 300000 ms            |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                     |                      |                      |                    |                      |

| Zero Voltage Line to Neutral |            |                                  |  | Conformity Range   |                  | Possible Range       |                  |                      |
|------------------------------|------------|----------------------------------|--|--------------------|------------------|----------------------|------------------|----------------------|
| ID                           |            |                                  | Default                                | Min                | Max              | Min                  | Max              |                      |
| .115                         | Uzero >    | Enable Function                  |  | off                | on / off         |                      | on / off         |                      |
| .116                         | Uzero> off | U <sub>THR</sub><br>OFF          | %U <sub>nom</sub><br>/U <sub>nom</sub> | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .117                         | Uzero> on  | U <sub>THR</sub> ON              | %U <sub>nom</sub><br>/U <sub>nom</sub> | 15,00%<br>(34,50V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .118                         | T Uzero >  | Time OFF                         |  | 1500 ms            | 200 ms           | 100000<br>ms         | 0 ms             | 300000 ms            |
| Only active for:             |            | Connection Modes: 4-wire (LN+LL) |  |                    |                  |                      |                  |                      |

| Residual Voltage (3 x Zero Voltage) Line to Neutral Activation of a narrower frequency window |            |                                  |                 | Conformity Range  |                  | Possible Range     |                  |                      |
|---|------------|----------------------------------|-----------------|-------------------|------------------|--------------------|------------------|----------------------|
| ID  |            |                                  | Default         | Min               | Max              | Min                | Max              |                      |
| .119  | Ures-anfw> | Enable Function                  |                 | off               | on / off         |                    | on / off         |                      |
| .120  | U res > on | U <sub>THR</sub><br>OFF          | %Unom<br>/VUnom | 5,00%<br>(11,50V) | 2,00%<br>(4,60V) | 20,00%<br>(46,00V) | 2,00%<br>(4,60V) | 100,00%<br>(230,00V) |
| .121  | Ures > off | U <sub>THR</sub> ON              | %Unom<br>/VUnom | 3,00%<br>(6,90V)  | 1,00%<br>(2,30V) | 20,00%<br>(46,00V) | 1,00%<br>(2,30V) | 100,00%<br>(230,00V) |
| .122  | T Ures >   | Time OFF                         |                 | 200 ms            | 0 ms             | 240000 ms          | 0 ms             | 240000 ms            |
| Only active for:  |            | Connection Modes: 4-wire (LN+LL) |                 |                   |                  |                    |                  |                      |

| Undervoltage LN Activation of a narrower frequency winw |            |                                  |              |                   | Conformity Range |                    | Possible Range |                    |
|---|------------|----------------------------------|--------------|-------------------|------------------|--------------------|----------------|--------------------|
| ID  |            |                                  |              | Default           | Min              | Max                | Min            | Max                |
| .123  | Uanfw <    | Enable Function                  |              | off               | on / off         |                    | on / off       |                    |
| .124  | Uanfw< on  | U <sub>THR</sub> OFF             | %Unom /VUnom | 85,00% (195,50V ) | 20,00% (46,00V ) | 100,00% (230,00V ) | 1,00% (2,30V)  | 100,00% (230,00V ) |
| .125  | Uanfw< off | U <sub>THR</sub> ON              | %Unom /VUnom | 86,00% (197,80V ) | 21,00% (48,30V ) | 100,00% (230,00V ) | 2,00% (4,60V)  | 100,00% (230,00V ) |
| .126  | T Uanfw <  | Time OFF                         |              | 0 ms              | 0 ms             | 240000 ms          | 0 ms           | 240000 ms          |
| Only active for:  |            | Connection Modes: 4-wire (LN+LL) |              |                   |                  |                    |                |                    |

| 10 minutes average overvoltage |          |                      |              | Conformity Range           |                            | Possible Range             |                             |                            |
|--------------------------------|----------|----------------------|--------------|----------------------------|----------------------------|----------------------------|-----------------------------|----------------------------|
| ID                             |          |                      |              | Default                    | Min                        | Max                        | Min                         | Max                        |
| .042                           | Uavg     | Enable function      |              | off                        | on / off                   |                            | on / off                    |                            |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom /VUnom | 111,00% (255,30V/ 444,00V) | 100,00% (230,00V/ 400,00V) | 115,00% (264,50V/ 460,00V) | 100,00% (230,00V/ 400,00V ) | 135,00% (310,50V/ 540,00V) |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom /VUnom | 110,00% (253,00V/ 440,00V) | 100,00% (230,00V/ 400,00V) | 115,00% (264,50V/ 460,00V) | 100,00% (230,00V/ 400,00V ) | 135,00% (310,50V/ 540,00V) |

| Overfrequency1 |         |                      |  | Conformity Range |           | Possible Range |           |           |
|----------------|---------|----------------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |         |                      |  | Default          | Min       | Max            | Min       | Max       |
| .054           | f >     | Enable function      |  | on               | on / off  |                | on / off  |           |
| .055           | f > off | f <sub>THR</sub> OFF |  | 55,000 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | f > on  | f <sub>THR</sub> ON  |  | 50,100 Hz        | 50,000 Hz | 51,000 Hz      | 50,000 Hz | 55,000 Hz |
| .057           | T f >   | Time OFF             |  | 5000 ms          | 100 ms    | 60000 ms       | 100 ms    | 300000 ms |

| Underfrequency1 |     |                 |  | Conformity Range |          | Possible Range |          |     |
|-----------------|-----|-----------------|--|------------------|----------|----------------|----------|-----|
| ID              |     |                 |  | Default          | Min      | Max            | Min      | Max |
| .058            | f < | Enable function |  | on               | on / off |                | on / off |     |

|      |         |               |           |           |           |           |           |
|------|---------|---------------|-----------|-----------|-----------|-----------|-----------|
| .059 | f < off | $f_{THR}$ OFF | 45,000 Hz | 45,000 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .060 | f < on  | $f_{THR}$ ON  | 49,900 Hz | 47,500 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .061 | T f <   | Time OFF      | 5000 ms   | 100 ms    | 60000 ms  | 100 ms    | 300000 ms |

| Overfrequency2 |            |                 | Conformity Range |           |           | Possible Range |           |
|----------------|------------|-----------------|------------------|-----------|-----------|----------------|-----------|
| ID             |            | Default         | Min              | Max       |           | Min            | Max       |
| .062           | f nw >     | Enable function | off              | on / off  |           | on / off       |           |
| .063           | f nw > off | $f_{THR}$ OFF   | 50,300 Hz        | 50,000 Hz | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .064           | f nw > on  | $f_{THR}$ ON    | 50,100 Hz        | 50,000 Hz | 52,000 Hz | 50,000 Hz      | 55,000 Hz |
| .065           | T f nw >   | Time OFF        | 500 ms           | 100 ms    | 5000 ms   | 100 ms         | 300000 ms |

| Underfrequency2 |            |                 | Conformity Range |           |           | Possible Range |           |
|-----------------|------------|-----------------|------------------|-----------|-----------|----------------|-----------|
| ID              |            | Default         | Min              | Max       |           | Min            | Max       |
| .066            | f nw <     | Enable function | off              | on / off  |           | on / off       |           |
| .067            | f nw < off | $f_{THR}$ OFF   | 49,700 Hz        | 47,000 Hz | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .068            | f nw < on  | $f_{THR}$ ON    | 49,900 Hz        | 47,000 Hz | 50,000 Hz | 45,000 Hz      | 50,000 Hz |
| .069            | T f nw <   | Time OFF        | 500 ms           | 100 ms    | 5000 ms   | 100 ms         | 300000 ms |

| Overfrequency3 |          |                 | Conformity Range |           |           | Possible Range |           |
|----------------|----------|-----------------|------------------|-----------|-----------|----------------|-----------|
| ID             |          | Default         | Min              | Max       |           | Min            | Max       |
| .070           | f >>     | Enable function | on               | on / off  |           | on / off       |           |
| .071           | f >> off | $f_{THR}$ OFF   | 60,000 Hz        | 50,000 Hz | 60,000 Hz | 50,000 Hz      | 60,000 Hz |
| .072           | f >> on  | $f_{THR}$ ON    | 50,100 Hz        | 50,000 Hz | 51,000 Hz | 50,000 Hz      | 55,000 Hz |
| .073           | T f >>   | Time OFF        | 200 ms           | 100 ms    | 100000 ms | 100 ms         | 300000 ms |

| Underfrequency3 |  |         | Conformity Range |     |  | Possible Range |     |
|-----------------|--|---------|------------------|-----|--|----------------|-----|
| ID              |  | Default | Min              | Max |  | Min            | Max |
|                 |  |         |                  |     |  |                |     |

| ID   |          |                      | Default   | Min       | Max       | Min       | Max       |
|------|----------|----------------------|-----------|-----------|-----------|-----------|-----------|
| .074 | f <<     | Enable function      | on        | on / off  |           | on / off  |           |
| .075 | f << off | f <sub>THR</sub> OFF | 40,000 Hz | 40,000 Hz | 50,000 Hz | 40,000 Hz | 50,000 Hz |
| .076 | f << on  | f <sub>THR</sub> ON  | 49,900 Hz | 47,500 Hz | 50,000 Hz | 45,000 Hz | 50,000 Hz |
| .077 | T f <<   | Time OFF             | 200 ms    | 100 ms    | 100000 ms | 100 ms    | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |  |        |
|--------------------------------|-------|---------------|------------------|--------|--|--------|
| .113                           | F wnd | Window length | 100 ms           | 100 ms |  | 100 ms |

| Rate of Change of Frequency (RoCoF) |           |                          | Conformity Range |           | Possible Range |           |            |
|-------------------------------------|-----------|--------------------------|------------------|-----------|----------------|-----------|------------|
| ID                                  |           |                          | Default          | Min       | Max            | Min       | Max        |
| .090                                | ROCOF     | Enable Function          | off              | on / off  |                | on / off  |            |
| .091                                | ROCOF off | RoCoF <sub>THR</sub> OFF | 5000 mHz/s       | 200 mHz/s | 9990 mHz/s     | 100 mHz/s | 9990 mHz/s |
| .092                                | ROCOF on  | RoCoF <sub>THR</sub> ON  | 4900 mHz/s       | 100 mHz/s | 9990 mHz/s     | 100 mHz/s | 9990 mHz/s |
| .093                                | T ROCOF   | Time OFF                 | 500 ms           | 0 ms      | 5000 ms        | 0 ms      | 5000 ms    |

| Phase Shift (PShift) |            |                           | Conformity Range |          | Possible Range |          |        |
|----------------------|------------|---------------------------|------------------|----------|----------------|----------|--------|
| ID                   |            |                           | Default          | Min      | Max            | Min      | Max    |
| .094                 | Pshift     | Enable Function           | off              | on / off |                | on / off |        |
| .095                 | Pshift off | PShift <sub>THR</sub> OFF | 7,0 °            | 2,0 °    | 15,0 °         | 2,0 °    | 15,0 ° |
| .096                 | Pshift on  | PShift <sub>THR</sub> ON  | 5,0 °            | 1,0 °    | 15,0 °         | 1,0 °    | 15,0 ° |

| Auxiliary Contact type |         |      | Conformity Range       |   | Possible Range |   |     |
|------------------------|---------|------|------------------------|---|----------------|---|-----|
| ID                     |         |      | Default                | Min   | Max            | Min   | Max |
| .099                   | Contact | Type | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

|      |           |          |                        |   |   |   |
|------|-----------|----------|------------------------|---|---|---|
| .100 | T Contact | Time OFF | Fixed to 500 ms        |   |   |   |
| .114 | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 60 s    | 10 s             | 600 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

**Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.**

On = it is possible to detect this error

Off = it is not possible to detect this error

|                                     |    |
|-------------------------------------|----|
| Overvoltage LL                      | on |
| Undervoltage LL                     | on |
| Overvoltage LN                      | on |
| Undervoltage LN                     | on |
| 10-min overvoltage                  | on |
| Overfrequency                       | on |
| Underfrequency                      | on |
| RoCoF (Rate of Change of Frequency) | on |
| Phase shift                         | on |
| Remote shutdown / self-test         | on |

|   |    |
|---|----|
| Contactor feedback contact reports closed, although it should be open                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) | on |

| Device Information |                                    |  |
|--------------------|------------------------------------|--|
| ID                 |                                    |  |
| .105               | SN:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.63 Bulgaria LV 2024 [ID: 1400]

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 4-wire LN | 4-wire LN        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range    |                    | Possible Range      |                   |                     |
|-----------------|------------|------------------|---------------------|--------------------|---------------------|-------------------|---------------------|
| ID              |            | Default          | Min                 | Max                | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 230,00V/<br>400,00V | 57,50V/<br>100,00V | 230,00V/<br>400,00V | 28,75V/<br>50,00V | 250,01V/<br>434,80V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Neutral |            |   |                 | Conformity Range     |                      | Possible Range       |  |
|------------------------------|------------|---|-----------------|----------------------|----------------------|----------------------|--|
| ID                           |            | Default   |                 | Min                  | Max                  | Min                  | Max  |
| .018                         | Ueff >     | Enable function                                       | on              | on                   |                      | on / off             |  |
| .019                         | Ueff > off | U <sub>THR</sub><br>OFF                               | %Unom<br>/VUnom | 111,00%<br>(255,30V) | 100,00%<br>(230,00V) | 130,00%<br>(299,00V) | 100,00%<br>(230,00V)<br>135,00%<br>(310,50V) |
| .020                         | Ueff > on  | U <sub>THR</sub> ON                                   | %Unom<br>/VUnom | 110,00%<br>(253,00V) | 100,00%<br>(230,00V) | 110,00%<br>(253,00V) | 100,00%<br>(230,00V)<br>135,00%<br>(310,50V) |
| .021                         | T Ueff >   | Time OFF  |                 | 60000 ms             | 50 ms                | 180000 ms            | 50 ms  |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |                 |                      |                      |                      |  |

| Undervoltage1 Line to Neutral |  |         |  | Conformity Range |     | Possible Range |     |
|-------------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                            |  | Default |  | Min              | Max | Min            | Max |

|                  |            |   |              |                  |                  |                   |                 |                   |
|------------------|------------|---|--------------|------------------|------------------|-------------------|-----------------|-------------------|
| .022             | Ueff <     | Enable function                                       |              | on               | on               |                   | on / off        |                   |
| .023             | Ueff < off | U <sub>THR</sub> OFF                                  | %Unom /VUnom | 80,00% (184,00V) | 10,00% (23,00V ) | 100,00% (230,00V) | 10,00% (23,00V) | 100,00% (230,00V) |
| .024             | Ueff < on  | U <sub>THR</sub> ON                                   | %Unom /VUnom | 84,00% (193,20V) | 10,00% (23,00V ) | 100,00% (230,00V) | 10,00% (23,00V) | 100,00% (230,00V) |
| .025             | T Ueff <   | Time OFF  |              | 1500 ms          | 50 ms            | 180000 ms         | 50 ms           | 300000 ms         |
| Only active for: |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |              |                  |                  |                   |                 |                   |

| Overvoltage2 Line to Neutral |            |   |              | Conformity Range  |                     | Possible Range    |                    |                   |  |
|------------------------------|------------|---|--------------|-------------------|---------------------|-------------------|--------------------|-------------------|--|
| ID                           |            |   |              | Default           | Min                 | Max               | Min                | Max               |  |
| .034                         | Ueff>>     | Enable function                                       |              |                   | on                  | on                |                    | on / off          |  |
| .035                         | Ueff>> off | U <sub>THR</sub> OFF                                  | %Unom /VUnom | 115,00% (264,50V) | 100,00 % (230,00 V) | 130,00% (299,00V) | 100,00% (230,00V ) | 135,00% (310,50V) |  |
| .036                         | Ueff>> on  | U <sub>THR</sub> ON                                   | %Unom /VUnom | 110,00% (253,00V) | 100,00 % (230,00 V) | 110,00% (253,00V) | 100,00% (230,00V ) | 135,00% (310,50V) |  |
| .037                         | T Ueff>>   | Time OFF  |              | 100 ms            | 50 ms               | 180000 ms         | 50 ms              | 300000 ms         |  |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |              |                   |                     |                   |                    |                   |  |

| Deactivation frequency monitoring LN |            |                      |       |  | Conformity Range |                  | Possible Range |                   |
|--------------------------------------|------------|----------------------|-------|--|------------------|------------------|----------------|-------------------|
| ID                                   |            |                      |       | Default  | Min              | Max              | Min            | Max               |
| .051                                 | f deact U< | U <sub>THR</sub> OFF | %Unom | 60,00% (138,00V)                                     | 9,50% (21,85V )  | 60,00% (138,00V) | 2,00% (4,60V)  | 100,00% (230,00V) |
|                                      |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis ( 0,50% (1,150V) U <sub>NOM</sub> ) |                  |                  |                |                   |

| Overfrequency1 |         |          | Conformity Range |           | Possible Range |           |
|----------------|---------|----------|------------------|-----------|----------------|-----------|
| ID             |         | Default  | Min              | Max       | Min            | Max       |
| .055           | f > off | fTHR OFF | 50,300 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz |
| .056           | f > on  | fTHR ON  | 50,200 Hz        | 50,000 Hz | 50,200 Hz      | 50,000 Hz |
| .057           | T f >   | Time OFF | 2000 ms          | 50 ms     | 2000 ms        | 50 ms     |
|                |         |          |                  |           |                | 300000 ms |

| Underfrequency1 |         |          | Conformity Range |           | Possible Range |           |
|-----------------|---------|----------|------------------|-----------|----------------|-----------|
| ID              |         | Default  | Min              | Max       | Min            | Max       |
| .059            | f < off | fTHR OFF | 47,500 Hz        | 45,000 Hz | 50,000 Hz      | 45,000 Hz |
| .060            | f < on  | fTHR ON  | 47,600 Hz        | 47,550 Hz | 50,000 Hz      | 45,000 Hz |
| .061            | T f <   | Time OFF | 50 ms            | 50 ms     | 50 ms          | 50 ms     |
|                 |         |          |                  |           |                | 300000 ms |

| Overfrequency2 |          |          | Conformity Range |           | Possible Range |           |
|----------------|----------|----------|------------------|-----------|----------------|-----------|
| ID             |          | Default  | Min              | Max       | Min            | Max       |
| .063           | f >> off | fTHR OFF | 51,500 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz |
| .064           | f >> on  | fTHR ON  | 51,400 Hz        | 50,000 Hz | 51,400 Hz      | 50,000 Hz |
| .065           | T f >>   | Time OFF | 50 ms            | 50 ms     | 50 ms          | 50 ms     |
|                |          |          |                  |           |                | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |
|--------------------------------|-------|---------------|------------------|--------|--------|
| ID                             |       | Default       | Min              | Max    |        |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |

| Auxiliary Contact type |         |         | Conformity Range      |  | Possible Range  |     |
|------------------------|---------|---------|-----------------------|--|---|-----|
| ID                     |         | Default | Min                   | Max  | Min   | Max |
| .099                   | Contact | Type    | n.c (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

|      |           |          |                        |  |  |   |
|------|-----------|----------|------------------------|--|--|---|
| .100 | T Contact | Time OFF | Fixed to 500 ms        |  |  |   |
| .114 | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |            |              |         | Conformity Range |       | Possible Range |       |
|---------------|------------|--------------|---------|------------------|-------|----------------|-------|
| ID            |            |              | Default | Min              | Max   | Min            | Max   |
| .102          | T on delay | Turn on time | 600 s   | 0 s              | 600 s | 0 s            | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

**Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.**

On = it is possible to detect this error

Off = it is not possible to detect this error

|                                     |    |
|-------------------------------------|----|
| Overvoltage LL                      | on |
| Undervoltage LL                     | on |
| Overvoltage LN                      | on |
| Undervoltage LN                     | on |
| 10-min overvoltage                  | on |
| Overfrequency                       | on |
| Underfrequency                      | on |
| RoCoF (Rate of Change of Frequency) | on |
| Phase shift                         | on |
| Remote shutdown / self-test         | on |

|   |    |
|---|----|
| Contactor feedback contact reports closed, although it should be open                       | on |
| Contactor feedback contact reports open, although it should be closed (no error, only info) | on |

| Device Information |                                      |  |
|--------------------|--------------------------------------|--|
| ID                 |                                      |  |
| .105               | SN: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device Serial Number<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 10.64 Bulgaria MV 2024 [ID: 1450]

| Connection Mode |            |           | Conformity Range |  | Possible Range           |  |
|-----------------|------------|-----------|------------------|--|--------------------------|--|
| ID              |            | Default   |                  |  |                          |  |
| .003            | Connection | 3-wire LL | 3-wire LL        |  | 2-wire LN - 4-wire LL+LN |  |

| Nominal Voltage |            |                  | Conformity Range   |                   | Possible Range      |                   |                     |
|-----------------|------------|------------------|--------------------|-------------------|---------------------|-------------------|---------------------|
| ID              |            | Default          | Min                | Max               | Min                 | Max               |                     |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | 57,50V/<br>100,00V | 51,75V/<br>90,00V | 230,00V/<br>400,00V | 28,75V/<br>50,00V | 250,01V/<br>434,80V |

| Functional Safety |        |  | Conformity Range |  | Possible Range |  |
|-------------------|--------|--|------------------|--|----------------|--|
| ID                |        | Default  |                  |  |                |  |
| .007              | Errtol | 2ch  | 2ch, 1ch         |  | 2ch, 1ch       |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary<br>1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |

| Overvoltage1 Line to Line |           |  |                 |                      | Conformity Range             |                      | Possible Range           |                      |
|---------------------------|-----------|--|-----------------|----------------------|------------------------------|----------------------|--------------------------|----------------------|
| ID                        |           |  | Default         |                      | Min                          | Max                  | Min                      | Max                  |
| .011                      | ULL > off | U <sub>THR</sub><br>OFF                  | %Unom<br>/VUnom | 111,00%<br>(111,00V) | 100,00<br>%<br>(100,00<br>V) | 130,00%<br>(130,00V) | 100,00%<br>(100,00V<br>) | 135,00%<br>(135,00V) |
| .012                      | ULL > on  | U <sub>THR</sub> ON                      | %Unom<br>/VUnom | 110,00%<br>(110,00V) | 100,00<br>%<br>(100,00<br>V) | 110,00%<br>(110,00V) | 100,00%<br>(100,00V<br>) | 135,00%<br>(135,00V) |
| .013                      | T ULL >   | Time OFF                                 |                 | 60000 ms             | 50 ms                        | 180000<br>ms         | 50 ms                    | 300000 ms            |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |                 |                      |                              |                      |                          |                      |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

| Undervoltage1 Line to Neutral |           |  |  | Conformity Range   |                   | Possible Range      |                   |                     |
|-------------------------------|-----------|--|--|--------------------|-------------------|---------------------|-------------------|---------------------|
| ID                            |           |  | Default                                | Min                | Max               | Min                 | Max               |                     |
| .022                          | ULN <     | Enable function  |  | off                | off               |                     | on / off          |                     |
| .023                          | ULN < off | U <sub>THR</sub><br>OFF                                | %U <sub>nom</sub><br>/U <sub>nom</sub> | 80,00%<br>(46,00V) | 10,00%<br>(5,75V) | 100,00%<br>(57,50V) | 10,00%<br>(5,75V) | 100,00%<br>(57,50V) |
| .024                          | ULN < on  | U <sub>THR</sub> ON                                    | %U <sub>nom</sub><br>/U <sub>nom</sub> | 84,00%<br>(48,30V) | 10,00%<br>(5,75V) | 100,00%<br>(57,50V) | 10,00%<br>(5,75V) | 100,00%<br>(57,50V) |
| .025                          | T ULN <   | Time OFF   |  | 60000 ms           | 50 ms             | 180000 ms           | 50 ms             | 300000 ms           |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)) |  |                    |                   |                     |                   |                     |

| Overvoltage2 Line to Line |  | Conformity Range |     | Possible Range |     |     |
|---------------------------|--|------------------|-----|----------------|-----|-----|
| ID                        |  | Default          | Min | Max            | Min | Max |

|                  |           |  |              |                   |                   |                   |                   |                   |
|------------------|-----------|--|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| .027             | ULL>> off | $U_{THR}$ OFF                            | %Unom /VUnom | 115,00% (115,00V) | 100,00% (100,00V) | 130,00% (130,00V) | 100,00% (100,00V) | 135,00% (135,00V) |
| .028             | ULL>> on  | $U_{THR}$ ON                             | %Unom /VUnom | 110,00% (110,00V) | 100,00% (100,00V) | 110,00% (110,00V) | 100,00% (100,00V) | 135,00% (135,00V) |
| .029             | T ULL>>   | Time OFF                                 |              | 100 ms            | 50 ms             | 180000 ms         | 50 ms             | 300000 ms         |
| Only active for: |           | Connection Modes: 3-wire, 4-wire (LN+LL) |              |                   |                   |                   |                   |                   |

| Overvoltage2 Line to Neutral |           |   |              |                  | Conformity Range |                  | Possible Range   |                  |  |
|------------------------------|-----------|---|--------------|------------------|------------------|------------------|------------------|------------------|--|
| ID                           |           |   |              | Default          | Min              | Max              | Min              | Max              |  |
| .034                         | ULN>>     | Enable function                                       |              |                  | off              | off              |                  | on / off         |  |
| .035                         | ULN>> off | $U_{THR}$ OFF   | %Unom /VUnom | 115,00% (66,13V) | 100,00% (57,50V) | 130,00% (74,75V) | 100,00% (57,50V) | 135,00% (77,63V) |  |
| .036                         | ULN>> on  | $U_{THR}$ ON  | %Unom /VUnom | 110,00% (63,25V) | 100,00% (57,50V) | 110,00% (63,25V) | 100,00% (57,50V) | 135,00% (77,63V) |  |
| .037                         | T ULN>>   | Time OFF  |              | 100 ms           | 50 ms            | 180000 ms        | 50 ms            | 300000 ms        |  |
| Only active for:             |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |              |                  |                  |                  |                  |                  |  |

| Deactivation frequency monitoring LL |            |               |       |  | Conformity Range |                 | Possible Range |                   |
|--------------------------------------|------------|---------------|-------|--|------------------|-----------------|----------------|-------------------|
| ID                                   |            |               |       | Default  | Min              | Max             | Min            | Max               |
| .047                                 | f deact U< | $U_{THR}$ OFF | %Unom | 60,00% (60,00V)                                | 9,50% (9,50V)    | 60,00% (60,00V) | 2,00% (2,00V)  | 100,00% (100,00V) |
|                                      |            | $U_{THR}$ ON  | %Unom | Fixed Hysteresis ( 0,50% (0,500 V) $U_{NOM}$ ) |                  |                 |                |                   |

| Overfrequency1 |         |               |  | Conformity Range |           | Possible Range |           |           |
|----------------|---------|---------------|--|------------------|-----------|----------------|-----------|-----------|
| ID             |         |               |  | Default          | Min       | Max            | Min       | Max       |
| .055           | f > off | $f_{THR}$ OFF |  | 50,300 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz | 55,000 Hz |
| .056           | f > on  | $f_{THR}$ ON  |  | 50,200 Hz        | 50,000 Hz | 50,200 Hz      | 50,000 Hz | 55,000 Hz |

|      |       |          |         |       |         |       |           |
|------|-------|----------|---------|-------|---------|-------|-----------|
| .057 | T f > | Time OFF | 2000 ms | 50 ms | 2000 ms | 50 ms | 300000 ms |
|------|-------|----------|---------|-------|---------|-------|-----------|

| Underfrequency1 |         |          | Conformity Range |           | Possible Range |           |           |
|-----------------|---------|----------|------------------|-----------|----------------|-----------|-----------|
| ID              |         |          | Default          | Min       | Max            | Min       | Max       |
| .059            | f < off | fTHR OFF | 47,500 Hz        | 45,000 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .060            | f < on  | fTHR ON  | 47,600 Hz        | 47,550 Hz | 50,000 Hz      | 45,000 Hz | 50,000 Hz |
| .061            | T f <   | Time OFF | 50 ms            | 50 ms     | 50 ms          | 50 ms     | 300000 ms |

| Overfrequency2 |          |          | Conformity Range |           | Possible Range |           |           |
|----------------|----------|----------|------------------|-----------|----------------|-----------|-----------|
| ID             |          |          | Default          | Min       | Max            | Min       | Max       |
| .063           | f >> off | fTHR OFF | 51,500 Hz        | 50,000 Hz | 55,000 Hz      | 50,000 Hz | 55,000 Hz |
| .064           | f >> on  | fTHR ON  | 51,400 Hz        | 50,000 Hz | 51,400 Hz      | 50,000 Hz | 55,000 Hz |
| .065           | T f >>   | Time OFF | 50 ms            | 50 ms     | 50 ms          | 50 ms     | 300000 ms |

| Frequency measuring in general |       |               | Conformity Range |        |        |
|--------------------------------|-------|---------------|------------------|--------|--------|
| ID                             |       |               | Default          | Min    | Max    |
| .113                           | F wnd | Window length | 100 ms           | 100 ms | 100 ms |

| Auxiliary Contact type |           |          | Conformity Range       |  | Possible Range |   |     |
|------------------------|-----------|----------|------------------------|--|----------------|---|-----|
| ID                     |           |          | Default                | Min  | Max            | Min   | Max |
| .099                   | Contact   | Type     | n.c (normally closed)  | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |
| .100                   | T Contact | Time OFF | Fixed to 500 ms        |  |                |   |     |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |

| Turn-on delay |  |  | Conformity Range |  | Possible Range |  |
|---------------|--|--|------------------|--|----------------|--|
|               |  |  |                  |  |                |  |

| ID   |            |              | Default | Min | Max   | Min | Max   |
|------|------------|--------------|---------|-----|-------|-----|-------|
| .102 | T on delay | Turn on time | 600 s   | 0 s | 600 s | 0 s | 900 s |

| Password |     |   |  |         |     |     |   |
|----------|-----|---|--|---------|-----|-----|---|
| ID       |     |   |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |   |

| <b>Errorlogic signalled (shown) on output relay channel D. Status display through yellow LED R3.</b> |  |
|--|--|
| On   | = it is possible to detect this error            |
| Off  | = it is <u>not</u> possible to detect this error |
| Overvoltage LL   | on   |
| Undervoltage LL  | on   |
| Overvoltage LN   | on   |
| Undervoltage LN  | on   |
| 10-min overvoltage   | on   |
| Overfrequency  | on   |
| Underfrequency   | on   |
| RoCoF (Rate of Change of Frequency)  | on   |
| Phase shift  | on   |
| Remote shutdown / self-test  | on   |
| Contactor feedback contact reports closed, although it should be open                                | on   |
| Contactor feedback contact reports open, although it should be closed (no error, only info)          | on   |

| Device Information |                  |                                   |
|--------------------|------------------|-----------------------------------|
| ID                 |                  |                                   |
| .105               | SN: xxxxxxxxxxxx | xxxxxxxxxx = Device Serial Number |

|  |               |   |
|--|---------------|---|
|  | SW: aa.dd.ccb | dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |
|--|---------------|---|

## 10.65 EN50438:2013 [ID 900]

| Connection Mode |            |                      | Conformity Range |  |  | Possible Range |  |
|-----------------|------------|----------------------|------------------|--|--|----------------|--|
| ID              |            | Default              |                  |  |  |                |  |
| .003            | Connection | Fixed to 4-wire (LN) |                  |  |  |                |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                                  |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------------------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max                              |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 230.0<br>400.0 | 100.0<br>173.9<br>240.0<br>417.4 |

| Functional Safety |        |   | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|---|------------------|--|--|----------------|--|
| ID                |        | Default   |                  |  |  |                |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |  |                |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |  |                |  |

| Overvoltage1 Line to Neutral |         |  |       | Conformity Range |     | Possible Range |            |
|------------------------------|---------|--|-------|------------------|-----|----------------|------------|
| ID                           |         | Default  |       | Min              | Max | Min            | Max        |
| .019                         | U > off | U <sub>THR</sub> OFF   | %Unom | 115              | 115 | 115            | 100<br>135 |
| .020                         | U > on  | U <sub>THR</sub> ON  | %Unom | 110              | 110 | 110            | 100<br>135 |
|                              |         | Time OFF   | ms    | Fixed to 100ms   |     |                |            |
| Comment:                     |         | U > on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |     |                |            |

| Undervoltage1 Line to Neutral |         |   |       | Conformity Range |      | Possible Range |             |
|-------------------------------|---------|---|-------|------------------|------|----------------|-------------|
| ID                            |         | Default   |       | Min              | Max  | Min            | Max         |
| .023                          | U < off | U <sub>THR</sub> OFF  | %Unom | 85               | 85   | 85             | 10<br>100   |
| .024                          | U < on  | U <sub>THR</sub> ON   | %Unom | 85               | 85   | 85             | 10<br>100   |
| .025                          | U < t   | Time OFF  | ms    | 1300             | 1300 | 1300           | 50<br>10000 |
| Comment:                      |         | U < on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |      |                |             |

| 10 minutes average overvoltage |  |         |  | Conformity Range |     | Possible Range |     |
|--------------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                             |  | Default |  | Min              | Max | Min            | Max |

|      |           |                      |       |   |     |     |     |     |
|------|-----------|----------------------|-------|---|-----|-----|-----|-----|
| .043 | U avg off | U <sub>THR</sub> OFF | %Unom | 110                                       | 110 | 110 | 100 | 135 |
|      |           | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% U <sub>NOM</sub> ) |     |     |     |     |
|      |           | Time OFF             | ms    | Fixed to fastest possible disconnection   |     |     |     |     |

| Overfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID             |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 52.00            | 52.00 | 52.00          | 50.00 | 55.00 |
| .056           | f > on  | f <sub>THR</sub> ON  | Hz | 50.05            | 50.05 | 50.05          | 50.00 | 55.00 |
| .057           | f > t   | Time OFF             | ms | 400              | 400   | 400            | 50    | 10000 |

| Underfrequency1 |         |                      |    | Conformity Range |       | Possible Range |       |       |
|-----------------|---------|----------------------|----|------------------|-------|----------------|-------|-------|
| ID              |         |                      |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50            | 47.50 | 47.50          | 45.00 | 50.00 |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50            | 47.50 | 47.50          | 45.00 | 50.00 |
| .061            | f < t   | Time OFF             | ms | 400              | 400   | 400            | 50    | 10000 |

Comment: f < on has a fixed offset of 0.025 Hz added to the displayed value

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range                                 |     | Possible Range  |     |  |
|------------------------|-----------|----------|------------------------|--|-----|---|-----|--|
| ID                     |           |          | Default                | Min  | Max | Min   | Max |  |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms                                   |     |   |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed)                    |     |  |

|  |  |  |  |                 |                 |
|--|--|--|--|-----------------|-----------------|
|  |  |  |  | dis. (disabled) | dis. (disabled) |
|--|--|--|--|-----------------|-----------------|

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 0   | 900 |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

| Device Information |                                       |   |  |  |  |
|--------------------|---------------------------------------|---|--|--|--|
| ID                 |                                       |   |  |  |  |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |  |  |  |

## 10.66 OVE E8001/8101:2014 [ID 801] renewed standard

| Connection Mode |            |             | Conformity Range |  | Possible Range |  |
|-----------------|------------|-------------|------------------|--|----------------|--|
| ID              | Default    |             |                  |  |                |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |                | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |      |       |
|-----------------|------------|---------|---|------------------|-------|----------------|------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max  |       |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 230.0 | 230.0          | 28.8 | 241.4 |

|  |  |               |   |       |       |       |      |       |
|--|--|---------------|---|-------|-------|-------|------|-------|
|  |  | Unom $\Delta$ | V | 400.0 | 400.0 | 400.0 | 50.0 | 420.0 |
|--|--|---------------|---|-------|-------|-------|------|-------|

| Functional Safety |        | Conformity Range  | Possible Range |
|-------------------|--------|---|----------------|
| ID                |        | Default   |                |
| .007              | Errtol | Fixed to 2ch  |                |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                |

| Undervoltage1 Line to Neutral |            |  |       |         | Conformity Range |        | Possible Range |        |
|-------------------------------|------------|--|-------|---------|------------------|--------|----------------|--------|
| ID                            |            |  |       | Default | Min              | Max    | Min            | Max    |
| .023                          | ULNmin1off | U <sub>THR</sub> OFF   | %Unom | 80      | 80               | 80     | 10             | 100    |
| .024                          | ULNmin1on  | U <sub>THR</sub> ON  | %Unom | 90      | 90               | 90     | 10             | 100    |
| .025                          | T ULN min1 | Time OFF   | ms    | 50      | 50               | 180000 | 50             | 180000 |
| Comment:                      |            | ULNmin1on has a fixed offset of 0.5% UNOM added to the displayed value |       |         |                  |        |                |        |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                 |       |         |                  |        |                |        |

| Overvoltage2 Line to Line |            |   |       | Conformity Range |          | Possible Range |         |        |
|---------------------------|------------|---|-------|------------------|----------|----------------|---------|--------|
| ID                        |            |   |       | Default          | Min      | Max            | Min     | Max    |
| .026                      | ULL max 2  | Enable function   |       | off              | on / off |                | on /off |        |
| .027                      | ULLmax2off | U <sub>THR</sub> OFF  | %Unom | 105              | 100      | 135            | 100     | 135    |
| .028                      | ULLmax2on  | U <sub>THR</sub> ON   | %Unom | 110              | 110      | 110            | 100     | 135    |
| .029                      | T ULL max2 | Time OFF  | ms    | 60000            | 50       | 180000         | 50      | 180000 |
| Comment:                  |            | ULLmax2on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |                  |          |                |         |        |
| Only active for:          |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                      |       |                  |          |                |         |        |

| Undervoltage2 Line to Line |            |  |       | Conformity Range |          | Possible Range |         |        |
|----------------------------|------------|--|-------|------------------|----------|----------------|---------|--------|
| ID                         |            |  |       | Default          | Min      | Max            | Min     | Max    |
| .030                       | ULL min 2  | Enable function  |       | off              | on / off |                | on /off |        |
| .031                       | ULLmin2off | U <sub>THR</sub> OFF   | %Unom | 30               | 10       | 100            | 10      | 100    |
| .032                       | ULLmin2on  | U <sub>THR</sub> ON  | %Unom | 90               | 90       | 90             | 0       | 100    |
| .033                       | T ULL min2 | Time OFF   | ms    | 50               | 50       | 180000         | 50      | 180000 |
| Comment:                   |            | ULLmin2on has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |          |                |         |        |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL)                               |       |                  |          |                |         |        |

| Overvoltage2 Line to Neutral |            |                      |       | Conformity Range |          | Possible Range |         |     |
|------------------------------|------------|----------------------|-------|------------------|----------|----------------|---------|-----|
| ID                           |            |                      |       | Default          | Min      | Max            | Min     | Max |
| .034                         | ULN max 2  | Enable function      |       | off              | on / off |                | on /off |     |
| .035                         | ULNmax2off | U <sub>THR</sub> OFF | %Unom | 105              | 100      | 135            | 100     | 135 |
| .036                         | ULNmax2on  | U <sub>THR</sub> ON  | %Unom | 110              | 110      | 110            | 100     | 135 |

|                  |   |          |    |       |    |        |    |        |
|------------------|---|----------|----|-------|----|--------|----|--------|
| .037             | T ULN max2  | Time OFF | ms | 60000 | 50 | 180000 | 50 | 180000 |
| Comment:         | ULNmax2on has a fixed offset of 0.5% UNOM subtracted from the displayed value |          |    |       |    |        |    |        |
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                         |          |    |       |    |        |    |        |

| Undervoltage2 Line to Neutral |  |                      |       |         | Conformity Range |        | Possible Range |        |
|-------------------------------|--|----------------------|-------|---------|------------------|--------|----------------|--------|
| ID                            |  |                      |       | Default | Min              | Max    | Min            | Max    |
| .038                          | ULN min 2  | Enable function      |       | off     | on / off         |        | on /off        |        |
| .039                          | ULNmin2off   | U <sub>THR</sub> OFF | %Unom | 30      | 10               | 100    | 10             | 100    |
| .040                          | ULNmin2on  | U <sub>THR</sub> ON  | %Unom | 90      | 90               | 90     | 0              | 100    |
| .041                          | T ULN min2   | Time OFF             | ms    | 50      | 50               | 180000 | 50             | 180000 |
| Comment:                      | ULNmin2on has a fixed offset of 0.5% UNOM added to the displayed value |                      |       |         |                  |        |                |        |
| Only active for:              | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                  |                      |       |         |                  |        |                |        |

| 10 minutes average overvoltage |           |                      |       | Conformity Range                        |     | Possible Range |         | Min |
|--------------------------------|-----------|----------------------|-------|---|-----|----------------|---------|-----|
| ID                             |           |                      |       | Default                                 | Min | Max            | Min     |     |
| .042                           | U avg     | Enable function      |       | on                                      | on  |                | on /off |     |
| .043                           | U avg off | U <sub>THR</sub> OFF | %Unom | 112                                     | 110 | 115            | 100     | 135 |
|                                |           | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |     |                |         |     |
|                                |           | Time OFF             | ms    | Fixed to fastest possible disconnection |     |                |         |     |

| Overfrequency1 |         |                      |    | Conformity Range                        |       | Possible Range |       | Min   |
|----------------|---------|----------------------|----|---|-------|----------------|-------|-------|
| ID             |         |                      |    | Default                                 | Min   | Max            | Min   |       |
| .055           | f > off | f <sub>THR</sub> OFF | Hz | 51.50                                   | 51.50 | 51.50          | 50.00 | 55.00 |
|                |         | f <sub>THR</sub> ON  | Hz | Fixed reconnection frequency of 50.05Hz |       |                |       |       |
|                |         | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |

| Underfrequency1 |         |                      |    | Conformity Range                        |       | Possible Range |       | Min   |
|-----------------|---------|----------------------|----|---|-------|----------------|-------|-------|
| ID              |         |                      |    | Default                                 | Min   | Max            | Min   |       |
| .059            | f < off | f <sub>THR</sub> OFF | Hz | 47.50                                   | 47.50 | 47.50          | 45.00 | 50.00 |
| .060            | f < on  | f <sub>THR</sub> ON  | Hz | 47.50                                   | 47.50 | 47.50          | 45.00 | 50.00 |
|                 |         | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |

|          |   |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|
| Comment: | f < on has a fixed offset of 0.01 Hz added to the displayed value |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|

| Frequency measuring in general |       |               |    |                           | Conformity Range |     | Possible Range |     |
|--------------------------------|-------|---------------|----|---------------------------|------------------|-----|----------------|-----|
| ID                             |       |               |    | Default                   | Min              | Max | Min            | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |                  |     |                |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range         |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min                    | Max                    |
| .099                   | Contact   | Type     | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                        |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.o. (normally opened) | n.c. (normally closed) |
|                        |           |          |                        |                        | dis. (disabled)        |                        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 30               | 30  | 30             | 0   | 900 |

| Password |     |   |  |  |  |         |     |     |
|----------|-----|---|--|--|--|---------|-----|-----|
| ID       |     |   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |  |         |     |     |

|                    |
|--------------------|
| Device Information |
|--------------------|

|      |                                       |   |  |  |
|------|---------------------------------------|---|--|--|
| ID   |                                       |   |  |  |
| .105 | ID: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br><br>b: Version of Configuration set |  |  |

### 10.67 VDE 0124-100:2013 [ID 300] renewed standard

| Connection Mode |            |                         | Conformity Range |  | Possible Range |  |  |
|-----------------|------------|-------------------------|------------------|--|----------------|--|--|
| ID              |            | Default                 |                  |  |                |  |  |
| .003            | Connection | Fixed to 4-wire (LN+LL) |                  |  |                |  |  |

| Nominal Voltage |            |                  |        | Conformity Range       |     | Possible Range |     |  |
|-----------------|------------|------------------|--------|------------------------|-----|----------------|-----|--|
| ID              |            | Default          |        | Min                    | Max | Min            | Max |  |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V<br>V | Fixed to 230.0 / 400.0 |     |                |     |  |

| Functional Safety |        |   | Conformity Range |  | Possible Range |  |  |  |
|-------------------|--------|---|------------------|--|----------------|--|--|--|
| ID                |        | Default   |                  |  |                |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |                |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |                |  |  |  |

| Overvoltage1 Line to Line |            |   |       | Conformity Range                        |     | Possible Range |         |  |
|---------------------------|------------|---|-------|---|-----|----------------|---------|--|
| ID                        |            | Default   |       | Min                                     | Max | Min            | Max     |  |
| .011                      | ULLmax off | UTHR OFF  | %Unom | 115                                     | 115 | 115            | 100 135 |  |
| .012                      | ULLmax on  | UTHR ON   | %Unom | 110                                     | 110 | 110            | 100 135 |  |
|                           |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |         |  |
| Comment:                  |            | ULLmax on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |   |     |                |         |  |

| Undervoltage1 Line to Line |  |         |  | Conformity Range |     | Possible Range |     |
|----------------------------|--|---------|--|------------------|-----|----------------|-----|
| ID                         |  | Default |  | Min              | Max | Min            | Max |

|          |            |  |       |   |    |    |    |     |  |
|----------|------------|--|-------|---|----|----|----|-----|--|
| .015     | ULLmin off | $U_{THR}$ OFF  | %Unom | 80                                      | 80 | 80 | 10 | 100 |  |
| .016     | ULLmin on  | $U_{THR}$ ON   | %Unom | 85                                      | 85 | 85 | 10 | 100 |  |
|          |            | Time OFF   | ms    | Fixed to fastest possible disconnection |    |    |    |     |  |
| Comment: |            | ULLmin on has a fixed offset of 0.5% UNOM added to the displayed value |       |   |    |    |    |     |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range                        |     | Possible Range |     |     |  |
|------------------------------|------------|---|-------|---|-----|----------------|-----|-----|--|
| ID                           |            |   |       | Default                                 | Min | Max            | Min | Max |  |
| .019                         | $U >>$ off | $U_{THR}$ OFF   | %Unom | 115                                     | 115 | 115            | 100 | 135 |  |
| .020                         | $U >>$ on  | $U_{THR}$ ON  | %Unom | 110                                     | 110 | 110            | 100 | 135 |  |
|                              |            | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                     |            | $U >>$ on has a fixed offset of 0.5% UNOM subtracted from the displayed value |       |   |     |                |     |     |  |

| Undervoltage1 Line to Neutral |           |   |       | Conformity Range                        |     | Possible Range |     |     |  |
|-------------------------------|-----------|---|-------|---|-----|----------------|-----|-----|--|
| ID                            |           |   |       | Default                                 | Min | Max            | Min | Max |  |
| .023                          | $U <$ off | $U_{THR}$ OFF   | %Unom | 80                                      | 80  | 80             | 10  | 100 |  |
| .024                          | $U <$ on  | $U_{THR}$ ON  | %Unom | 85                                      | 85  | 85             | 10  | 100 |  |
|                               |           | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                      |           | $U <$ on has a fixed offset of 0.5% UNOM added to the displayed value |       |   |     |                |     |     |  |

| 10 minutes average overvoltage |       |               |       | Conformity Range                        |     | Possible Range |     |     |  |
|--------------------------------|-------|---------------|-------|---|-----|----------------|-----|-----|--|
| ID                             |       |               |       | Default                                 | Min | Max            | Min | Max |  |
| .043                           | $U >$ | $U_{THR}$ OFF | %Unom | 110                                     | 110 | 115            | 100 | 135 |  |
|                                |       | $U_{THR}$ ON  | %Unom | Fixed Hysteresis (0.9% UNOM)            |     |                |     |     |  |
|                                |       | Time OFF      | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |

| Overfrequency1 |           |               |    | Conformity Range                        |       | Possible Range |       |       |  |
|----------------|-----------|---------------|----|---|-------|----------------|-------|-------|--|
| ID             |           |               |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .055           | $f >$ off | $f_{THR}$ OFF | Hz | 51.50                                   | 51.50 | 51.50          | 50.00 | 55.00 |  |
| .056           | $f >$ on  | $f_{THR}$ ON  | Hz | 50.05                                   | 50.05 | 50.05          | 50.00 | 55.00 |  |
|                |           | Time OFF      | ms | Fixed to fastest possible disconnection |       |                |       |       |  |

| Underfrequency1 |         |  |         | Conformity Range                        |       | Possible Range |       |
|-----------------|---------|--|---------|---|-------|----------------|-------|
| ID              |         |  | Default | Min                                     | Max   | Min            | Max   |
| .059            | f < off | fTHR OFF   | Hz      | 47.50                                   | 47.50 | 47.50          | 45.00 |
| .060            | f < on  | fTHR ON  | ms      | 47.50                                   | 47.50 | 47.50          | 45.00 |
|                 |         | fTHR ON  | Hz      | Fixed reconnection frequency of 50.05Hz |       |                |       |
|                 |         | Time OFF   | ms      | Fixed to fastest possible disconnection |       |                |       |
| Comment:        |         | f < on has a fixed offset of 0.025 Hz added to the displayed value |         |   |       |                |       |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Turn-on delay |           |              |   |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---|---------|------------------|-----|----------------|-----|
| ID            |           |              |   | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s | 60      | 60               | 60  | 0              | 900 |

| Random Turn-on delay |            |   |   |         | Conformity Range |     | Possible Range |     |
|----------------------|------------|---|---|---------|------------------|-----|----------------|-----|
| ID                   |            |   |   | Default | Min              | Max | Min            | Max |
| .103                 | Ton random | Enable function   |   | off     | on / off         |     | on / off       |     |
| .104                 | Ton random | Turn on time  | s |         | 60               | 600 | 60             | 600 |
| Comment:             |            | The random time value is shown in .104 and cannot be edited |   |         |                  |     |                |     |

| Password |     |   |  |  |         |     |     |
|----------|-----|---|--|--|---------|-----|-----|
| ID       |     |   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0       | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0       | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |

| Device Information |                                    |   |
|--------------------|------------------------------------|---|
| ID                 |                                    |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

## 24. TR3 Rev23:2013 [ID 700] renewed standard

| Connection Mode |            |             | Conformity Range    | Possible Range               |
|-----------------|------------|-------------|---------------------|------------------------------|
| ID              | Connection | Default     |                     |                              |
| .003            | Connection | 4-wire (LN) | 3-wire, 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN), |

|  |  |  |  |  |  |  |                |
|--|--|--|--|--|--|--|----------------|
|  |  |  |  |  |  |  | 4-wire (LN+LL) |
|--|--|--|--|--|--|--|----------------|

| Nominal Voltage |            |        |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|--------|---|------------------|-------|----------------|-------|
| ID              | Default    |        |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y | V | 230.0            | 57.5  | 230.0          | 28.8  |
|                 |            | Unom Δ | V | 400.0            | 100.0 | 400.0          | 50.0  |
|                 |            |        |   |                  |       |                | 241.4 |
|                 |            |        |   |                  |       |                | 420.0 |

| Functional Safety |         |   | Conformity Range |  | Possible Range |  |  |  |  |  |
|-------------------|---------|---|------------------|--|----------------|--|--|--|--|--|
| ID                | Default |   |                  |  |                |  |  |  |  |  |
| .007              | Errtol  | Fixed to 1ch  |                  |  |                |  |  |  |  |  |
| Remark:           |         | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |  |  |  |  |

| Overvoltage1 Line to Line |           |  |       | Conformity Range           |     | Possible Range |     |
|---------------------------|-----------|--|-------|----------------------------|-----|----------------|-----|
| ID                        | Default   |  |       | Min                        | Max | Min            | Max |
| .011                      | ULL>> Off | U <sub>THR</sub> OFF                     | %Unom | 120                        | 100 | 130            | 100 |
|                           |           | U <sub>THR</sub> ON                      | %Unom | Fixed Hysteresis (1% UNOM) |     |                |     |
| .013                      | T ULL>>   | Time OFF                                 | ms    | 50                         | 50  | 50             | 50  |
| Only active for:          |           | Connection Modes: 3-wire, 4-wire (LN+LL) |       |                            |     |                |     |

| Undervoltage1 Line to Line |          |  |       | Conformity Range |      | Possible Range |     |
|----------------------------|----------|--|-------|------------------|------|----------------|-----|
| ID                         | Default  |  |       | Min              | Max  | Min            | Max |
| .015                       | ULL< Off | U <sub>THR</sub> OFF   | %Unom | 80               | 10   | 100            | 10  |
| .016                       | ULL< On  | U <sub>THR</sub> ON  | %Unom | 95               | 95   | 95             | 10  |
| .017                       | T ULL<   | Time OFF   | ms    | 1500             | 1500 | 2400           | 50  |
| Comment:                   |          | ULL< On has a fixed offset of 0.5% UNOM added to the displayed value |       |                  |      |                |     |
| Only active for:           |          | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                  |      |                |     |

| Overvoltage1 Line to Neutral |           |                      |       | Conformity Range           |     | Possible Range |     |
|------------------------------|-----------|----------------------|-------|----------------------------|-----|----------------|-----|
| ID                           | Default   |                      |       | Min                        | Max | Min            | Max |
| .019                         | ULN>> Off | U <sub>THR</sub> OFF | %Unom | 120                        | 100 | 130            | 100 |
|                              |           | U <sub>THR</sub> ON  |       | Fixed Hysteresis (1% UNOM) |     |                |     |

|                  |         |   |    |    |    |    |    |       |
|------------------|---------|---|----|----|----|----|----|-------|
| .021             | T ULN>> | Time OFF  | ms | 50 | 50 | 50 | 50 | 10000 |
| Only active for: |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL) |    |    |    |    |    |       |

| Undervoltage1 Line to Neutral |          |  |       |         | Conformity Range |      | Possible Range |       |
|-------------------------------|----------|--|-------|---------|------------------|------|----------------|-------|
| ID                            |          |  |       | Default | Min              | Max  | Min            | Max   |
| .023                          | ULN< Off | U <sub>THR</sub> OFF   | %Unom | 80      | 10               | 100  | 10             | 100   |
| .024                          | ULN< On  | U <sub>THR</sub> ON  | %Unom | 95      | 95               | 95   | 10             | 100   |
| .025                          | T ULN<   | Time OFF   | ms    | 1500    | 1500             | 2400 | 50             | 10000 |
| Comment:                      |          | ULN< On has a fixed offset of 0.5% UNOM added to the displayed value |       |         |                  |      |                |       |
| Only active for:              |          | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))               |       |         |                  |      |                |       |

| Undervoltage2 Line to Line |           |   |       |         | Conformity Range |     | Possible Range |       |
|----------------------------|-----------|---|-------|---------|------------------|-----|----------------|-------|
| ID                         |           |   |       | Default | Min              | Max | Min            | Max   |
| .031                       | ULL<< Off | U <sub>THR</sub> OFF  | %Unom | 45      | 10               | 100 | 0              | 100   |
| .032                       | ULL<< On  | U <sub>THR</sub> ON   | %Unom | 95      | 95               | 95  | 10             | 100   |
| .033                       | T ULL<<   | Time OFF  | ms    | 300     | 300              | 300 | 50             | 10000 |
| Comment:                   |           | ULL<< On has a fixed offset of 0.5% UNOM added to the displayed value |       |         |                  |     |                |       |
| Only active for:           |           | Connection Modes: 3-wire, 4-wire (LN+LL)                              |       |         |                  |     |                |       |

| Undervoltage2 Line to Neutral |           |   |       |         | Conformity Range |     | Possible Range |       |
|-------------------------------|-----------|---|-------|---------|------------------|-----|----------------|-------|
| ID                            |           |   |       | Default | Min              | Max | Min            | Max   |
| .039                          | ULN<< Off | U <sub>THR</sub> OFF  | %Unom | 45      | 10               | 100 | 0              | 100   |
| .040                          | ULN<< On  | U <sub>THR</sub> ON   | %Unom | 95      | 95               | 95  | 10             | 100   |
| .041                          | T ULN<<   | Time OFF  | ms    | 300     | 300              | 300 | 50             | 10000 |
| Comment:                      |           | ULN<< On has a fixed offset of 0.5% UNOM added to the displayed value |       |         |                  |     |                |       |
| Only active for:              |           | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |       |         |                  |     |                |       |

| Overfrequency1 |        |                      |    |         | Conformity Range |       | Possible Range |       |
|----------------|--------|----------------------|----|---------|------------------|-------|----------------|-------|
| ID             |        |                      |    | Default | Min              | Max   | Min            | Max   |
| .055           | f> Off | f <sub>THR</sub> OFF | Hz | 51.50   | 50.00            | 52.00 | 50.00          | 55.00 |
| .056           | f> On  | f <sub>THR</sub> ON  | Hz | 50.05   | 50.05            | 50.05 | 50.00          | 55.00 |

|      |      |          |    |    |    |    |    |       |
|------|------|----------|----|----|----|----|----|-------|
| .057 | T f> | Time OFF | ms | 50 | 50 | 50 | 50 | 10000 |
|------|------|----------|----|----|----|----|----|-------|

| Underfrequency1 |        |   |    | Conformity Range |       | Possible Range |       |       |
|-----------------|--------|---|----|------------------|-------|----------------|-------|-------|
| ID              |        |   |    | Default          | Min   | Max            | Min   | Max   |
| .059            | f< Off | fTHR OFF  | Hz | 47.50            | 47.50 | 50.00          | 45.00 | 50.00 |
| .060            | f< On  | fTHR ON   | Hz | 47.50            | 47.50 | 47.50          | 45.00 | 50.00 |
| .061            | T f<   | Time OFF  | ms | 50               | 50    | 50             | 50    | 10000 |
| Comment:        |        | f< On has a fixed offset of 0.025 Hz added to the displayed value |    |                  |       |                |       |       |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Auxiliary Contact type |           |          |                        | Conformity Range       |                        | Possible Range  |                        |
|------------------------|-----------|----------|------------------------|------------------------|------------------------|-----------------|------------------------|
| ID                     |           |          | Default                | Min                    | Max                    | Min             | Max                    |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) | n.o. (normally opened) |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms         |                        |                 |                        |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | dis. (disabled) | n.o. (normally opened) |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 60             | 0   | 900 |

| Password |  |  |  |  |         |     |     |
|----------|--|--|--|--|---------|-----|-----|
| ID       |  |  |  |  | Default | Min | Max |
|          |  |  |  |  |         |     |     |

|         |     |   |   |   |   |
|---------|-----|---|---|---|---|
| .106    | PW1 | 1 <sup>st</sup> digit of Password   | 0 | 0 | 9 |
| .107    | PW2 | 2 <sup>nd</sup> digit of Password   | 0 | 0 | 9 |
| .108    | PW3 | 3 <sup>rd</sup> digit of Password   | 0 | 0 | 9 |
| .109    | PW4 | 4 <sup>th</sup> digit of Password   | 0 | 0 | 9 |
| Remark: |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |   |   |   |

| Device Information |                                |
|--------------------|--------------------------------|
| ID                 |                                |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb |

xxxxxxxxxx = Device ID

dd: Software version of Display Software

aa: Software version of Measuring Software

cc: Index of Configuration set

b: Version of Configuration set

#### 10.68 AS/NZS 4777.2:2015 [ID 1102] renewed standard

| Connection Mode |            |             | Conformity Range |  | Possible Range |  |
|-----------------|------------|-------------|------------------|--|----------------|--|
| ID              |            | Default     |                  |  |                |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |                | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 230.0 | 240.0          | 100.0 |
|                 |            | Unom Δ  | V | 400.0            | 400.0 | 417.4          | 173.9 |
|                 |            |         |   |                  |       |                | 417.4 |

| Functional Safety |        |   | Conformity Range |  | Possible Range |  |  |  |
|-------------------|--------|---|------------------|--|----------------|--|--|--|
| ID                |        | Default   |                  |  |                |  |  |  |
| .007              | Errtol | Fixed to 2ch  |                  |  |                |  |  |  |
| Remark:           |        | 2ch means: 2 channel with functional safety and 2 auxilliary contacts necessary |                  |  |                |  |  |  |

|                              |                  |                |
|------------------------------|------------------|----------------|
| Overvoltage1 Line to Neutral | Conformity Range | Possible Range |
|------------------------------|------------------|----------------|

| ID   |        |                      |       | Default | Min  | Max  | Min | Max    |
|------|--------|----------------------|-------|---------|------|------|-----|--------|
| .019 | V> off | U <sub>THR</sub> OFF | %Unom | 113     | 113  | 113  | 100 | 135    |
| .020 | V> on  | U <sub>THR</sub> ON  | %Unom | 111     | 100  | 112  | 100 | 135    |
| .021 | T V>   | Time OFF             | ms    | 2000    | 1100 | 2000 | 100 | 300000 |

| Undervoltage1 Line to Neutral |        |                      |       | Conformity Range |      | Possible Range |     |        |
|-------------------------------|--------|----------------------|-------|------------------|------|----------------|-----|--------|
| ID                            |        |                      |       | Default          | Min  | Max            | Min | Max    |
| .023                          | V< off | U <sub>THR</sub> OFF | %Unom | 78               | 78   | 78             | 0   | 100    |
| .024                          | V< on  | U <sub>THR</sub> ON  | %Unom | 80               | 79   | 100            | 0   | 100    |
| .025                          | T V<   | Time OFF             | ms    | 2000             | 1100 | 2000           | 100 | 300000 |

| Overvoltage2 Line to Neutral |         |                      |       | Conformity Range |         | Possible Range |         |        |
|------------------------------|---------|----------------------|-------|------------------|---------|----------------|---------|--------|
| ID                           |         |                      |       | Default          | Min     | Max            | Min     | Max    |
| .034                         | V>>     | Enable function      |       | off              | on /off |                | on /off |        |
| .035                         | V>> off | U <sub>THR</sub> OFF | %Unom | 115              | 115     | 115            | 100     | 135    |
| .036                         | V>> on  | U <sub>THR</sub> ON  | %Unom | 111              | 100     | 112            | 100     | 135    |
| .037                         | T V>>   | Time OFF             | ms    | 200              | 100     | 200            | 100     | 300000 |

| 10 minutes average overvoltage |          |                      |       | Conformity Range                        |          | Possible Range |         |     |
|--------------------------------|----------|----------------------|-------|---|----------|----------------|---------|-----|
| ID                             |          |                      |       | Default                                 | Min      | Max            | Min     | Max |
| .042                           | Uavg     | Enable function      |       | on                                      | on / off |                | on /off |     |
| .043                           | Uavg off | U <sub>THR</sub> OFF | %Unom | 112                                     | 112      | 112            | 100     | 135 |
| .044                           | Uavg on  | U <sub>THR</sub> ON  | %Unom | 111                                     | 100      | 111            | 100     | 135 |
|                                |          | Time OFF             | ms    | Fixed to fastest possible disconnection |          |                |         |     |

| Overfrequency1 |        |                      |    | Conformity Range |       | Possible Range |       |        |
|----------------|--------|----------------------|----|------------------|-------|----------------|-------|--------|
| ID             |        |                      |    | Default          | Min   | Max            | Min   | Max    |
| .055           | F> off | f <sub>THR</sub> OFF | Hz | 52.00            | 52.00 | 52.00          | 50.00 | 55.00  |
| .056           | F> on  | f <sub>THR</sub> ON  | Hz | 51.90            | 50.00 | 51.90          | 50.00 | 55.00  |
| .057           | T F>   | Time OFF             | ms | 2000             | 100   | 2000           | 100   | 300000 |

| Underfrequency1 |        |          |    | Conformity Range |       | Possible Range |       |        |
|-----------------|--------|----------|----|------------------|-------|----------------|-------|--------|
| ID              |        |          |    | Default          | Min   | Max            | Min   | Max    |
| .059            | F< off | fTHR OFF | Hz | 47.00            | 45.00 | 47.00          | 40.00 | 50.00  |
| .060            | F< on  | fTHR ON  | Hz | 47.50            | 45.50 | 50.00          | 40.00 | 50.00  |
| .061            | T F<   | Time OFF | ms | 2000             | 1100  | 2000           | 1000  | 300000 |

| Frequency measuring in general |       |               |  | Conformity Range |                           | Possible Range |     |     |  |
|--------------------------------|-------|---------------|--|------------------|---------------------------|----------------|-----|-----|--|
| ID                             |       |               |  | Default          | Min                       | Max            | Min | Max |  |
| .113                           | F wnd | Window length |  | ms               | Fixed window length 100ms |                |     |     |  |

| Rate of Change of Frequency (RoCoF) |            |                          |  | Conformity Range |          | Possible Range |          |     |       |
|-------------------------------------|------------|--------------------------|--|------------------|----------|----------------|----------|-----|-------|
| ID                                  |            |                          |  | Default          | Min      | Max            | Min      | Max |       |
| .090                                | RoCoF      | Enable Function          |  | on               | on / off |                | on / off |     |       |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000     | 10             | 3000     | 10  | 3000  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 950      | 10             | 3000     | 10  | 3000  |
| .093                                | RoCoFDelay | Time OFF                 |  | ms               | 500      | 50             | 500      | 50  | 10000 |
| .111                                | RoCoF wnd  | Window length            |  | ms               | 225      | 100            | 1000     | 100 | 1000  |

| Phase Shift (PShift) |            |                           |  | Conformity Range |          | Possible Range |          |     |       |
|----------------------|------------|---------------------------|--|------------------|----------|----------------|----------|-----|-------|
| ID                   |            |                           |  | Default          | Min      | Max            | Min      | Max |       |
| .094                 | PShift     | Enable Function           |  | on               | on / off |                | on / off |     |       |
| .095                 | PShift off | PShift <sub>THR</sub> OFF |  | °                | 8        | 1              | 8        | 1   | 15    |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °                | 6        | 1              | 7        | 1   | 15    |
| .097                 | PShiftDel  | Time OFF                  |  | ms               | 50       | 50             | 50       | 50  | 10000 |
| .112                 | PShift wnd | Window length             |  | ms               | 50       | 50             | 500      | 50  | 1000  |

| Auxiliary Contact type |         |      |                 | Conformity Range                                 |     | Possible Range                                   |     |     |
|------------------------|---------|------|-----------------|--|-----|--|-----|-----|
| ID                     |         |      |                 | Default  | Min | Max  | Min | Max |
| .099                   | Contact | Type | dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed) |     | n.o. (normally opened)<br>n.c. (normally closed) |     |     |

|      |           |          |                        |   |   |                 |
|------|-----------|----------|------------------------|---|---|-----------------|
|      |           |          |                        |   | dis. (disabled)   | dis. (disabled) |
| .100 | T Contact | Time OFF | ms                     | Fixed to 500ms  |   |                 |
| .114 | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                 |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 0   | 60             | 0   | 900 |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

| Device Information |                                      |   |
|--------------------|--------------------------------------|---|
| ID                 |                                      |   |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

## 25. G59/3/3:2015 LV [ID 405] renewed standard

| Connection Mode |         | Conformity Range | Possible Range |
|-----------------|---------|------------------|----------------|
| ID              | Default |                  |                |
|                 |         |                  |                |

|      |            |                      |  |  |  |  |  |
|------|------------|----------------------|--|--|--|--|--|
| .003 | Connection | Fixed to 4-wire (LN) |  |  |  |  |  |
|------|------------|----------------------|--|--|--|--|--|

| Nominal Voltage |            |        |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|--------|---|------------------|-------|----------------|-------|
| ID              | Default    |        |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y | V | 230.0            | 230.0 | 240.0          | 100.0 |
|                 |            | Unom Δ | V | 400.0            | 400.0 | 417.4          | 173.9 |
|                 |            |        |   |                  |       |                | 417.4 |

| Functional Safety |         |   | Conformity Range |  | Possible Range |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------|---|------------------|--|----------------|--|--|--|--|--|--|--|--|--|--|
| ID                | Default |   |                  |  |                |  |  |  |  |  |  |  |  |  |  |
| .007              | Errtol  | Fixed to 1ch  |                  |  |                |  |  |  |  |  |  |  |  |  |  |
| Remark:           |         | 1ch means: 1 channel without functional safety and 1 auxilliary contact necessary |                  |  |                |  |  |  |  |  |  |  |  |  |  |

| Overvoltage1 Line to Neutral |            |          |       | Conformity Range              |      | Possible Range |     |
|------------------------------|------------|----------|-------|-------------------------------|------|----------------|-----|
| ID                           | Default    |          |       | Min                           | Max  | Min            | Max |
| .019                         | O/V st 1   | UTHR OFF | %Unom | 114                           | 114  | 114            | 100 |
|                              |            | UTHR ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |      |                |     |
| .021                         | T O/V st 1 | Time OFF | ms    | 1000                          | 1000 | 1000           | 50  |
|                              |            |          |       | 300000                        |      |                |     |

| Undervoltage1 Line to Neutral |            |          |       | Conformity Range              |      | Possible Range |     |
|-------------------------------|------------|----------|-------|-------------------------------|------|----------------|-----|
| ID                            | Default    |          |       | Min                           | Max  | Min            | Max |
| .023                          | U/V st 1   | UTHR OFF | %Unom | 87                            | 87   | 87             | 0   |
|                               |            | UTHR ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |      |                |     |
| .025                          | T U/V st 1 | Time OFF | ms    | 2500                          | 2500 | 2500           | 50  |
|                               |            |          |       | 300000                        |      |                |     |

| Overvoltage2 Line to Neutral |            |          |       | Conformity Range              |     | Possible Range |     |
|------------------------------|------------|----------|-------|-------------------------------|-----|----------------|-----|
| ID                           | Default    |          |       | Min                           | Max | Min            | Max |
| .035                         | O/V st 2   | UTHR OFF | %Unom | 119                           | 119 | 119            | 100 |
|                              |            | UTHR ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |     |                |     |
| .037                         | T O/V st 2 | Time OFF | ms    | 500                           | 500 | 500            | 50  |
|                              |            |          |       | 300000                        |     |                |     |

| Undervoltage2 Line to Neutral |  |  |  | Conformity Range |  | Possible Range |  |
|-------------------------------|--|--|--|------------------|--|----------------|--|
|                               |  |  |  |                  |  |                |  |

| ID   |            |                      |       | Default                       | Min | Max | Min | Max    |
|------|------------|----------------------|-------|-------------------------------|-----|-----|-----|--------|
| .039 | U/V st 2   | U <sub>THR</sub> OFF | %Unom | 80                            | 80  | 80  | 0   | 100    |
|      |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |     |     |     |        |
| .041 | T U/V st 2 | Time OFF             | ms    | 500                           | 500 | 500 | 50  | 300000 |

| Overfrequency1 |            |          |         | Conformity Range           |       | Possible Range |       |        |
|----------------|------------|----------|---------|----------------------------|-------|----------------|-------|--------|
| ID             |            |          | Default | Min                        | Max   | Min            | Max   |        |
| .055           | O/F st 1   | fTHR OFF | Hz      | 51.50                      | 51.50 | 51.50          | 50.00 | 55.00  |
|                |            | fTHR ON  | Hz      | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .057           | T O/F st 1 | Time OFF | ms      | 90000                      | 90000 | 90000          | 1000  | 300000 |

| Underfrequency1 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | fTHR OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF | ms | 20000                      | 20000 | 20000          | 1000  | 300000 |

| Overfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID             |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .063           | O/F st 2   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00  |
|                |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .065           | T O/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Frequency measuring in general |  |         | Conformity Range |     | Possible Range |     |
|--------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                             |  | Default | Min              | Max | Min            | Max |

|      |       |               |    |                           |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|
| .113 | F wnd | Window length | ms | Fixed window length 100ms |  |  |  |
|------|-------|---------------|----|---------------------------|--|--|--|

| Rate of Change of Frequency (RoCoF) |            |                          |       | Conformity Range          |          | Possible Range |          |      |
|-------------------------------------|------------|--------------------------|-------|---------------------------|----------|----------------|----------|------|
| ID                                  |            |                          |       | Default                   | Min      | Max            | Min      | Max  |
| .090                                | RoCoF      | Enable Function          |       | on                        | on / off |                | on / off |      |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF | mHz/s | 1000                      | 10       | 3000           | 10       | 3000 |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  | mHz/s | 950                       | 10       | 3000           | 10       | 3000 |
| .093                                | RoCoFDelay | Time OFF                 |       | ms                        | 500      | 50             | 2000     | 50   |
| .111                                | RoCoF wnd  | Window length            | ms    | Fixed window length 225ms |          |                |          |      |

| Phase Shift (PShift) |            |                           |    | Conformity Range                            |          | Possible Range |          |     |
|----------------------|------------|---------------------------|----|---|----------|----------------|----------|-----|
| ID                   |            |                           |    | Default                                     | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function           |    | off   | on / off |                | on / off |     |
| .095                 | PShift off | PShift <sub>THR</sub> OFF | °  | 12  | 6        | 12             | 3        | 15  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 9   | 5        | 11             | 3        | 15  |
|                      |            | Time OFF                  | ms | Fixed to the fastest possible disconnection |          |                |          |     |
| .112                 | PShift wnd | Window length             | ms | Fixed window length 200ms                   |          |                |          |     |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range |   |  |
|------------------------|-----------|----------|------------------------|------------------|---|----------------|---|--|
| ID                     |           |          | Default                | Min              | Max   | Min            | Max   |  |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms   |   |                |   |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |  |

|               |                  |                |
|---------------|------------------|----------------|
| Turn-on delay | Conformity Range | Possible Range |
|---------------|------------------|----------------|

| ID   |           |              |   | Default | Min | Max | Min | Max |
|------|-----------|--------------|---|---------|-----|-----|-----|-----|
| .102 | Ton delay | Turn on time | s | 20      | 20  | 20  | 0   | 900 |

| Password |     |   |  |  |         |     |     |   |
|----------|-----|---|--|--|---------|-----|-----|---|
| ID       |     |   |  |  | Default | Min | Max |   |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |         | 0   | 0   | 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |         |     |     |   |

| Device Information |                                      |   |
|--------------------|--------------------------------------|---|
| ID                 |                                      |   |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

### 10.69 G59/3/3:2015 MV [ID 455] renewed standard

| Connection Mode |            |                 | Conformity Range |  | Possible Range |  |  |
|-----------------|------------|-----------------|------------------|--|----------------|--|--|
| ID              |            | Default         |                  |  |                |  |  |
| .003            | Connection | Fixed to 3-wire |                  |  |                |  |  |

| Nominal Voltage |            |        |   | Conformity Range |       | Possible Range |      |       |
|-----------------|------------|--------|---|------------------|-------|----------------|------|-------|
| ID              |            |        |   | Default          | Min   | Max            | Min  | Max   |
| .005            | ULN/LL nom | Unom Y | V | 230.0            | 57.5  | 230.0          | 28.8 | 241.4 |
|                 |            | Unom Δ | V | 400.0            | 100.0 | 400.0          | 50.0 | 420.0 |

| Functional Safety |  |         | Conformity Range |  | Possible Range |  |
|-------------------|--|---------|------------------|--|----------------|--|
| ID                |  | Default |                  |  |                |  |
|                   |  |         |                  |  |                |  |

|         |        |  |  |  |  |  |  |
|---------|--------|--|--|--|--|--|--|
| .007    | Errtol | Fixed to 1ch   |  |  |  |  |  |
| Remark: |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |  |  |  |  |  |

| Overvoltage1 Line to Line |            |                      |       | Conformity Range              |      | Possible Range |     |        |
|---------------------------|------------|----------------------|-------|-------------------------------|------|----------------|-----|--------|
| ID                        |            |                      |       | Default                       | Min  | Max            | Min | Max    |
| .011                      | O/V st 1   | U <sub>THR</sub> OFF | %Unom | 110                           | 110  | 110            | 100 | 135    |
|                           |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |      |                |     |        |
| .013                      | T O/V st 1 | Time OFF             | ms    | 1000                          | 1000 | 1000           | 50  | 300000 |

| Undervoltage1 Line to Line |            |                      |       | Conformity Range              |      | Possible Range |     |        |
|----------------------------|------------|----------------------|-------|-------------------------------|------|----------------|-----|--------|
| ID                         |            |                      |       | Default                       | Min  | Max            | Min | Max    |
| .015                       | U/V st 1   | U <sub>THR</sub> OFF | %Unom | 87                            | 87   | 87             | 0   | 100    |
|                            |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |      |                |     |        |
| .017                       | T U/V st 1 | Time OFF             | ms    | 2500                          | 2500 | 2500           | 50  | 300000 |

| Overvoltage2 Line to Line |            |                      |       | Conformity Range              |     | Possible Range |     |        |
|---------------------------|------------|----------------------|-------|-------------------------------|-----|----------------|-----|--------|
| ID                        |            |                      |       | Default                       | Min | Max            | Min | Max    |
| .027                      | O/V st 2   | U <sub>THR</sub> OFF | %Unom | 113                           | 113 | 113            | 100 | 135    |
|                           |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |     |                |     |        |
| .029                      | T O/V st 2 | Time OFF             | ms    | 500                           | 500 | 500            | 50  | 300000 |

| Undervoltage2 Line to Line |            |                      |       | Conformity Range              |     | Possible Range |     |        |
|----------------------------|------------|----------------------|-------|-------------------------------|-----|----------------|-----|--------|
| ID                         |            |                      |       | Default                       | Min | Max            | Min | Max    |
| .031                       | U/V st 2   | U <sub>THR</sub> OFF | %Unom | 80                            | 80  | 80             | 0   | 100    |
|                            |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% UNOM) |     |                |     |        |
| .033                       | T U/V st 2 | Time OFF             | ms    | 500                           | 500 | 500            | 50  | 300000 |

| Overfrequency1 |          |                      |    | Conformity Range           |       | Possible Range |       |       |
|----------------|----------|----------------------|----|----------------------------|-------|----------------|-------|-------|
| ID             |          |                      |    | Default                    | Min   | Max            | Min   | Max   |
| .055           | O/F st 1 | f <sub>THR</sub> OFF | Hz | 51.50                      | 51.50 | 51.50          | 50.00 | 55.00 |
|                |          | f <sub>THR</sub> ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |       |

|      |            |          |    |       |       |       |      |        |
|------|------------|----------|----|-------|-------|-------|------|--------|
| .057 | T O/F st 1 | Time OFF | ms | 90000 | 90000 | 90000 | 1000 | 300000 |
|------|------------|----------|----|-------|-------|-------|------|--------|

| Underfrequency1 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | fTHR OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF | ms | 20000                      | 20000 | 20000          | 1000  | 300000 |

| Overfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID             |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .063           | O/F st 2   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00  |
|                |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .065           | T O/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max    |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00  |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 300000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |            |                          |  | Conformity Range |                           | Possible Range |          |     |
|-------------------------------------|------------|--------------------------|--|------------------|---------------------------|----------------|----------|-----|
| ID                                  |            |                          |  | Default          | Min                       | Max            | Min      | Max |
| .090                                | RoCoF      | Enable Function          |  | on               | on / off                  |                | on / off |     |
| .091                                | RoCoF off  | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 1000                      | 10             | 3000     | 10  |
| .092                                | RoCoF on   | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 950                       | 10             | 3000     | 10  |
| .093                                | RoCoFDelay | Time OFF                 |  | ms               | 500                       | 50             | 2000     | 50  |
| .111                                | RoCoF wnd  | Window length            |  | ms               | Fixed window length 225ms |                |          |     |

| Phase Shift (PShift) |            |   |    |   | Conformity Range |          | Possible Range |          |  |
|----------------------|------------|---|----|---|------------------|----------|----------------|----------|--|
| ID                   |            |   |    | Default                                     | Min              | Max      | Min            | Max      |  |
| .094                 | PShift     | Enable Function   |    |   | off              | on / off |                | on / off |  |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   | °  | 12  | 6                | 12       | 3              | 15       |  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 9   | 5                | 11       | 3              | 15       |  |
|                      |            | Time OFF  | ms | Fixed to the fastest possible disconnection |                  |          |                |          |  |
| .112                 | PShift wnd | Window length   | ms | Fixed window length 200ms                   |                  |          |                |          |  |
| Comment:             |            | PShift off has a fixed offset of 0.2° subtracted from the displayed value |    |   |                  |          |                |          |  |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |  |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|--|
| ID                     |           |          | Default                | Min   | Max | Min   | Max |  |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms  |     |   |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 20               | 20  | 20             | 0   | 900 |

| Password |     |                                   |  |  |         |     |     |
|----------|-----|-----------------------------------|--|--|---------|-----|-----|
| ID       |     |                                   |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password |  |  | 0       | 0   | 9   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password |  |  | 0       | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password |  |  | 0       | 0   | 9   |

|         |   |                                   |   |   |   |
|---------|---|-----------------------------------|---|---|---|
| .109    | PW4   | 4 <sup>th</sup> digit of Password | 0 | 0 | 9 |
| Remark: | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |                                   |   |   |   |

| Device Information |                                |  |
|--------------------|--------------------------------|--|
| ID                 |                                |  |
| .105               | ID:xxxxxxxxxx<br>SW: aa.dd.ccb | xxxxxxxxxxx = Device ID<br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

### 10.70 G83/2:2012 [ID 500] renewed standard

| Connection Mode |            |                      | Conformity Range |  | Possible Range |  |  |
|-----------------|------------|----------------------|------------------|--|----------------|--|--|
| ID              |            | Default              |                  |  |                |  |  |
| .003            | Connection | Fixed to 4-wire (LN) |                  |  |                |  |  |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |       |
|-----------------|------------|---------|---|------------------|-------|----------------|-------|
| ID              |            | Default |   | Min              | Max   | Min            | Max   |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 230.0 | 240.0          | 100.0 |
|                 |            | Unom Δ  | V | 400.0            | 400.0 | 417.4          | 173.9 |
|                 |            |         |   |                  |       |                | 417.4 |

| Functional Safety |  |              | Conformity Range |  | Possible Range |  |  |
|-------------------|--|--------------|------------------|--|----------------|--|--|
| ID                |  | Default      |                  |  |                |  |  |
| .007              | Errtol   | Fixed to 1ch |                  |  |                |  |  |
| Remark:           | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |              |                  |  |                |  |  |

| Overvoltage1 Line to Neutral |          |                      |       | Conformity Range              |     | Possible Range |     |
|------------------------------|----------|----------------------|-------|-------------------------------|-----|----------------|-----|
| ID                           |          | Default              |       | Min                           | Max | Min            | Max |
| .019                         | O/V st 1 | U <sub>THR</sub> OFF | %Unom | 114                           | 114 | 114            | 100 |
|                              |          | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% Unom) |     |                |     |

|      |            |          |    |      |      |      |    |       |
|------|------------|----------|----|------|------|------|----|-------|
| .021 | T O/V st 1 | Time OFF | ms | 1000 | 1000 | 1000 | 50 | 10000 |
|------|------------|----------|----|------|------|------|----|-------|

| Undervoltage1 Line to Neutral |            |                      |       | Conformity Range              |      | Possible Range |     |       |
|-------------------------------|------------|----------------------|-------|-------------------------------|------|----------------|-----|-------|
| ID                            |            |                      |       | Default                       | Min  | Max            | Min | Max   |
| .023                          | U/V st 1   | U <sub>THR</sub> OFF | %Unom | 87                            | 87   | 87             | 0   | 100   |
|                               |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% Unom) |      |                |     |       |
| .025                          | T U/V st 1 | Time OFF             | ms    | 2500                          | 2500 | 2500           | 50  | 10000 |

| Overvoltage2 Line to Neutral |            |                      |       | Conformity Range              |     | Possible Range |     |       |
|------------------------------|------------|----------------------|-------|-------------------------------|-----|----------------|-----|-------|
| ID                           |            |                      |       | Default                       | Min | Max            | Min | Max   |
| .035                         | O/V st 2   | U <sub>THR</sub> OFF | %Unom | 119                           | 119 | 119            | 100 | 135   |
|                              |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% Unom) |     |                |     |       |
| .037                         | T O/V st 2 | Time OFF             | ms    | 500                           | 500 | 500            | 50  | 10000 |

| Undervoltage2 Line to Neutral |            |                      |       | Conformity Range              |     | Possible Range |     |       |
|-------------------------------|------------|----------------------|-------|-------------------------------|-----|----------------|-----|-------|
| ID                            |            |                      |       | Default                       | Min | Max            | Min | Max   |
| .039                          | U/V st 2   | U <sub>THR</sub> OFF | %Unom | 80                            | 80  | 80             | 0   | 100   |
|                               |            | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.75% Unom) |     |                |     |       |
| .041                          | T U/V st 2 | Time OFF             | ms    | 500                           | 500 | 500            | 50  | 10000 |

| Overfrequency1 |            |                      |    | Conformity Range           |       | Possible Range |       |        |
|----------------|------------|----------------------|----|----------------------------|-------|----------------|-------|--------|
| ID             |            |                      |    | Default                    | Min   | Max            | Min   | Max    |
| .055           | O/F st 1   | f <sub>THR</sub> OFF | Hz | 51.50                      | 51.50 | 51.50          | 50.00 | 55.00  |
|                |            | f <sub>THR</sub> ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .057           | T O/F st 1 | Time OFF             | ms | 90000                      | 90000 | 90000          | 1000  | 120000 |

| Underfrequency1 |            |                      |    | Conformity Range           |       | Possible Range |       |        |
|-----------------|------------|----------------------|----|----------------------------|-------|----------------|-------|--------|
| ID              |            |                      |    | Default                    | Min   | Max            | Min   | Max    |
| .059            | U/F st 1   | f <sub>THR</sub> OFF | Hz | 47.50                      | 47.50 | 47.50          | 40.00 | 50.00  |
|                 |            | f <sub>THR</sub> ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |        |
| .061            | T U/F st 1 | Time OFF             | ms | 20000                      | 20000 | 20000          | 1000  | 120000 |

| Overfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |       |
|----------------|------------|----------|----|----------------------------|-------|----------------|-------|-------|
| ID             |            |          |    | Default                    | Min   | Max            | Min   | Max   |
| .063           | O/F st 2   | fTHR OFF | Hz | 52.00                      | 52.00 | 52.00          | 50.00 | 55.00 |
|                |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |       |
| .065           | T O/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 10000 |

| Underfrequency2 |            |          |    | Conformity Range           |       | Possible Range |       |       |
|-----------------|------------|----------|----|----------------------------|-------|----------------|-------|-------|
| ID              |            |          |    | Default                    | Min   | Max            | Min   | Max   |
| .067            | U/F st 2   | fTHR OFF | Hz | 47.00                      | 47.00 | 47.00          | 40.00 | 50.00 |
|                 |            | fTHR ON  | Hz | Fixed Hysteresis (0.05 Hz) |       |                |       |       |
| .069            | T U/F st 2 | Time OFF | ms | 500                        | 500   | 500            | 50    | 10000 |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |  | Conformity Range |   | Possible Range |          |          |
|-------------------------------------|-----------|--------------------------|--|------------------|---|----------------|----------|----------|
| ID                                  |           |                          |  | Default          | Min   | Max            | Min      | Max      |
| .090                                | RoCoF     | Enable Function          |  | off              | on / off                                    |                | on / off |          |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF |  | mHz/s            | 200   | 190            | 210      | 100 1000 |
| .092                                | RoCoF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s            | 190   | 180            | 210      | 100 1000 |
|                                     |           | Time OFF                 |  | ms               | Fixed to the fastest possible disconnection |                |          |          |
| .111                                | RoCoF wnd | Window length            |  | ms               | Fixed window length 535ms                   |                |          |          |

| Phase Shift (PShift) |            |                           |  | Conformity Range |   | Possible Range |          |          |
|----------------------|------------|---------------------------|--|------------------|---|----------------|----------|----------|
| ID                   |            |                           |  | Default          | Min   | Max            | Min      | Max      |
| .094                 | PShift     | Enable Function           |  | on               | on / off                                    |                | on / off |          |
| .095                 | PShift off | PShift <sub>THR</sub> OFF |  | °                | 12.0  | 11.0           | 13.0     | 3.0 15.0 |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °                | 10.5  | 9.5            | 13.0     | 3.0 15.0 |
|                      |            | Time OFF                  |  | ms               | Fixed to the fastest possible disconnection |                |          |          |
| .112                 | PShift wnd | Window length             |  | ms               | Fixed window length 200ms                   |                |          |          |

| Auxiliary Contact type |           |          |                        | Conformity Range  |   | Possible Range  |   |
|------------------------|-----------|----------|------------------------|---|---|---|---|
| ID                     |           |          | Default                | Min   | Max   | Min   | Max   |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms  |   |   |   |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 20               | 20  | 20             | 0   | 900 |

| Password |     |   |  |  |   |         |     |     |
|----------|-----|---|--|--|---|---------|-----|-----|
| ID       |     |   |  |  |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  | 0 | 0       | 9   |     |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  | 0 | 0       | 9   |     |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  | 0 | 0       | 9   |     |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  | 0 | 0       | 9   |     |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |   |         |     |     |

| Device Information |                                   |  |
|--------------------|-----------------------------------|--|
| ID                 |                                   |  |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set |

b: Version of Configuration set

10.71 C10-11:2013 LV [ID 600] renewed standard

| Connection Mode |            |             | Conformity Range                               | Possible Range                                 |
|-----------------|------------|-------------|--|--|
| ID              |            | Default     |  |  |
| .003            | Connection | 4-wire (LN) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |        |         | Conformity Range |       | Possible Range |       |       |
|-----------------|------------|--------|---------|------------------|-------|----------------|-------|-------|
| ID              |            |        | Default | Min              | Max   | Min            | Max   |       |
| .005            | ULN/LL nom | Unom Y | V       | 230.0            | 230.0 | 230.0          | 100.0 | 240.0 |
|                 |            | Unom Δ | V       | 400.0            | 400.0 | 400.0          | 173.9 | 417.4 |

| Functional Safety |        | Conformity Range   | Possible Range |
|-------------------|--------|--|----------------|
| ID                |        | Default  |                |
| .007              | Errtol | Fixed to 1ch   |                |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                |

| Undervoltage1 Line to Neutral |          |                      |       | Conformity Range             |     | Possible Range |     |       |
|-------------------------------|----------|----------------------|-------|------------------------------|-----|----------------|-----|-------|
| ID                            |          |                      |       | Default                      | Min | Max            | Min | Max   |
| .023                          | U LN <   | U <sub>THR</sub> OFF | %Unom | 85                           | 50  | 85             | 0   | 100   |
|                               |          | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.5% UNOM) |     |                |     |       |
| .025                          | T U LN < | Time OFF             | ms    | 1500                         | 100 | 1500           | 100 | 10000 |

|                  |  |
|------------------|--|
| Comment:         | U LN < has a fixed offset of 0.25% UNOM added to the displayed value |
| Only active for: | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                |

| Undervoltage2 Line to Neutral |         |   |         | Conformity Range                        |     | Possible Range |     |     |
|-------------------------------|---------|---|---------|---|-----|----------------|-----|-----|
| ID                            |         |   | Default | Min                                     | Max | Min            | Max |     |
| .039                          | U LN << | U <sub>THR</sub> OFF  | %Unom   | 50                                      | 25  | 50             | 0   | 100 |
|                               |         | U <sub>THR</sub> ON   | %Unom   | Fixed Hysteresis (0.5% UNOM)            |     |                |     |     |
|                               |         | Time OFF  | ms      | Fixed to fastest possible disconnection |     |                |     |     |
| Comment:                      |         | U LN << has a fixed offset of 0.25% UNOM added to the displayed value |         |   |     |                |     |     |
| Only active for:              |         | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                 |         |   |     |                |     |     |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |  |         | Conformity Range |     | Possible Range |     |
|-------------------------------------|--|---------|------------------|-----|----------------|-----|
| ID                                  |  | Default | Min              | Max | Min            | Max |

|      |           |                          |       |                           |          |      |          |      |
|------|-----------|--------------------------|-------|---------------------------|----------|------|----------|------|
| .090 | RoCoF     | Enable Function          |       | off                       | on / off |      | on / off |      |
| .091 | RoCoF off | RoCoF <sub>THR</sub> OFF | mHz/s | 1000                      | 1000     | 1000 | 100      | 2000 |
| .092 | RoCoF on  | RoCoF <sub>THR</sub> ON  | mHz/s | 800                       | 100      | 1000 | 100      | 1000 |
| .093 | RoCoF T   | Time OFF                 | ms    | 0                         | 0        | 100  | 0        | 1000 |
| .111 | RoCoF wnd | Window length            | ms    | Fixed window length 100ms |          |      |          |      |

| Phase Shift (PShift) |            |   |    | Conformity Range                            |          | Possible Range |          |     |
|----------------------|------------|---|----|---|----------|----------------|----------|-----|
| ID                   |            |   |    | Default                                     | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function   |    | on  | on / off |                | on / off |     |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   | °  | 7   | 7        | 7              | 3        | 15  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 5   | 3        | 7              | 3        | 15  |
|                      |            | Time OFF  | ms | Fixed to the fastest possible disconnection |          |                |          |     |
| .112                 | PShift wnd | Window length   | ms | Fixed window length 100ms                   |          |                |          |     |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |    |   |          |                |          |     |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range  |     |  |
|------------------------|-----------|----------|------------------------|------------------|---|---|-----|--|
| ID                     |           |          | Default                | Min              | Max   | Min   | Max |  |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |
| .100                   | T Contact | Time OFF | ms                     | Fixed to 500ms   |   |   |     |  |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |  |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |         | 0   | 0 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |         | 0   | 0 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |         | 0   | 0 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |         | 0   | 0 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

| Device Information |                                       |  |   |  |  |  |
|--------------------|---------------------------------------|--|---|--|--|--|
| ID                 |                                       |  |   |  |  |  |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.dd.ccb |  | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |  |  |  |

### 10.72 C10-11:2013 MV [ID 650] renewed standard

| Connection Mode |            |         | Conformity Range |  | Possible Range |  |
|-----------------|------------|---------|------------------|--|----------------|--|
| ID              |            | Default |                  |  |                |  |
| .003            | Connection | 3-wire  | 3-wire           |  |                | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage |            |         |   | Conformity Range |       | Possible Range |            |
|-----------------|------------|---------|---|------------------|-------|----------------|------------|
| ID              |            | Default |   | Min              | Max   | Min            | Max        |
| .005            | ULN/LL nom | Unom Y  | V | 230.0            | 230.0 | 230.0          | 28.8 241.4 |
|                 |            | Unom Δ  | V | 400.0            | 400.0 | 400.0          | 50.0 420.0 |

| Functional Safety |        |              | Conformity Range |  | Possible Range |  |
|-------------------|--------|--------------|------------------|--|----------------|--|
| ID                |        | Default      |                  |  |                |  |
| .007              | Errtol | Fixed to 1ch |                  |  |                |  |

|         |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|
| Remark: | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|

| Overvoltage1 Line to Line |        |   |       | Conformity Range                        |     | Possible Range |     |     |  |  |  |
|---------------------------|--------|---|-------|---|-----|----------------|-----|-----|--|--|--|
| ID                        |        |   |       | Default                                 | Min | Max            | Min | Max |  |  |  |
| .011                      | U LL > | U <sub>THR</sub> OFF  | %Unom | 110                                     | 100 | 110            | 100 | 135 |  |  |  |
|                           |        | U <sub>THR</sub> ON   | %Unom | Fixed Hysteresis (0.5% UNOM)            |     |                |     |     |  |  |  |
|                           |        | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |  |  |
| Comment:                  |        | U LL > has a fixed offset of 0.25% Unom subtracted from the displayed value |       |   |     |                |     |     |  |  |  |
| Only active for:          |        | Connection Modes: 3-wire, 4-wire (LN+LL)                                    |       |   |     |                |     |     |  |  |  |

| Undervoltage1 Line to Line |         |  |       | Conformity Range             |     | Possible Range |     |       |
|----------------------------|---------|--|-------|------------------------------|-----|----------------|-----|-------|
| ID                         |         |  |       | Default                      | Min | Max            | Min | Max   |
| .015                       | U LL <  | U <sub>THR</sub> OFF   | %Unom | 85                           | 50  | 85             | 0   | 100   |
|                            |         | U <sub>THR</sub> ON  | %Unom | Fixed Hysteresis (0.5% UNOM) |     |                |     |       |
| .017                       | T ULL < | Time OFF   | ms    | 1500                         | 100 | 1500           | 100 | 10000 |
| Comment:                   |         | U LL < has a fixed offset of 0.25% Unom added to the displayed value |       |                              |     |                |     |       |
| Only active for:           |         | Connection Modes: 3-wire, 4-wire (LN+LL)                             |       |                              |     |                |     |       |

| Undervoltage2 Line to Line |         |   |       | Conformity Range                        |     | Possible Range |     |     |  |  |  |
|----------------------------|---------|---|-------|---|-----|----------------|-----|-----|--|--|--|
| ID                         |         |   |       | Default                                 | Min | Max            | Min | Max |  |  |  |
| .031                       | U LL << | U <sub>THR</sub> OFF  | %Unom | 50                                      | 25  | 50             | 0   | 100 |  |  |  |
|                            |         | U <sub>THR</sub> ON   | %Unom | Fixed Hysteresis (0.5% UNOM)            |     |                |     |     |  |  |  |
|                            |         | Time OFF  | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |  |  |
| Comment:                   |         | U LL << has a fixed offset of 0.25% Unom added to the displayed value |       |   |     |                |     |     |  |  |  |
| Only active for:           |         | Connection Modes: 3-wire, 4-wire (LN+LL)                              |       |   |     |                |     |     |  |  |  |

| Overfrequency1 |     |                      |    | Conformity Range                        |       | Possible Range |       |       |
|----------------|-----|----------------------|----|---|-------|----------------|-------|-------|
| ID             |     |                      |    | Default                                 | Min   | Max            | Min   | Max   |
| .055           | f > | f <sub>THR</sub> OFF | Hz | 51.50                                   | 50.00 | 51.50          | 50.00 | 55.00 |
|                |     | f <sub>THR</sub> ON  | Hz | Fixed reconnection frequency of 50.05Hz |       |                |       |       |
|                |     | Time OFF             | ms | Fixed to fastest possible disconnection |       |                |       |       |

|          |   |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|
| Comment: | f > has a fixed offset of 0.01 Hz subtracted from the displayed value |  |  |  |  |  |  |
|----------|---|--|--|--|--|--|--|

| Underfrequency1 |   |          |    | Conformity Range                        |       | Possible Range |       |       |
|-----------------|---|----------|----|---|-------|----------------|-------|-------|
| ID              |   |          |    | Default                                 | Min   | Max            | Min   | Max   |
| .059            | f < off   | fTHR OFF | Hz | 47.50                                   | 47.50 | 50.00          | 40.00 | 50.00 |
| .060            | f < on  | fTHR ON  | Hz | 47.50                                   | 47.50 | 47.50          | 40.00 | 50.00 |
|                 |   | Time OFF | ms | Fixed to fastest possible disconnection |       |                |       |       |
| Comment:        | f < on has a fixed offset of 0.02 Hz added to the displayed value |          |    |   |       |                |       |       |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                 |  | Conformity Range |                           | Possible Range |          |      |
|-------------------------------------|-----------|-----------------|--|------------------|---------------------------|----------------|----------|------|
| ID                                  |           |                 |  | Default          | Min                       | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function |  | off              | on / off                  |                | on / off |      |
| .091                                | RoCoF off | RoCoFTHR OFF    |  | mHz/s            | 1000                      | 1000           | 100      | 2000 |
| .092                                | RoCoF on  | RoCoFTHR ON     |  | mHz/s            | 800                       | 100            | 100      | 1000 |
| .093                                | RoCoF T   | Time OFF        |  | ms               | 0                         | 0              | 100      | 1000 |
| .111                                | RoCoF wnd | Window length   |  | ms               | Fixed window length 100ms |                |          |      |

| Phase Shift (PShift) |   |                 |  | Conformity Range |   | Possible Range |          |     |
|----------------------|---|-----------------|--|------------------|---|----------------|----------|-----|
| ID                   |   |                 |  | Default          | Min   | Max            | Min      | Max |
| .094                 | PShift  | Enable Function |  | on               | on / off                                    |                | on / off |     |
| .095                 | PShift off  | PShiftTHR OFF   |  | °                | 7   | 7              | 3        | 15  |
| .096                 | PShift on   | PShiftTHR ON    |  | °                | 5   | 3              | 3        | 15  |
|                      |   | Time OFF        |  | ms               | Fixed to the fastest possible disconnection |                |          |     |
| .112                 | PShift wnd  | Window length   |  | ms               | Fixed window length 100ms                   |                |          |     |
| Comment:             | PShift off has a fixed offset of 1° subtracted from the displayed value |                 |  |                  |   |                |          |     |

| Auxiliary Contact type | Conformity Range | Possible Range |
|------------------------|------------------|----------------|
|------------------------|------------------|----------------|

| ID   |           |          | Default                |                | Min                    | Max                    | Min                    | Max                    |
|------|-----------|----------|------------------------|----------------|------------------------|------------------------|------------------------|------------------------|
| .099 | Contact   | Type     | dis. (disabled)        |                | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
| .100 | T Contact | Time OFF | ms                     | Fixed to 270ms |                        |                        |                        |                        |
| .114 | I3 STOP   | Type     | n.o. (normally opened) |                | n.o. (normally opened) | n.o. (normally opened) | n.c. (normally closed) | n.c. (normally closed) |
|      |           |          |                        |                |                        |                        | dis. (disabled)        | dis. (disabled)        |

| Turn-on delay |           |              |   | Conformity Range |     | Possible Range |     |     |
|---------------|-----------|--------------|---|------------------|-----|----------------|-----|-----|
| ID            |           |              |   | Default          | Min | Max            | Min | Max |
| .102          | Ton delay | Turn on time | s | 60               | 60  | 60             | 0   | 900 |

| Password |     |   |  |  |  |         |     |     |
|----------|-----|---|--|--|--|---------|-----|-----|
| ID       |     |   |  |  |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |  |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |  |  |         | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |  |  |         | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |  |  |         | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |  |  |         |     |     |

| Device Information |                                      |   |
|--------------------|--------------------------------------|---|
| ID                 |                                      |   |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br><br>aa: Software version of Measuring Software<br><br>cc: Index of Configuration set<br><br>b: Version of Configuration set |

### 10.73 C10-11:2019 LV-IP [ID 601] Interface Protection low voltage

| Connection Mode |            |             | Conformity Range |  |  | Possible Range                                 |  |
|-----------------|------------|-------------|------------------|--|--|--|--|
| ID              |            | Default     |                  |  |  |  |  |
| .003            | Connection | 4-wire (LN) | 4-wire (LN)      |  |  | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |  |

| Nominal Voltage |            |                  |     | Conformity Range |                | Possible Range |                |                |
|-----------------|------------|------------------|-----|------------------|----------------|----------------|----------------|----------------|
| ID              |            | Default          |     | Min              | Max            | Min            | Max            |                |
| .005            | ULN/LL nom | Unom Y<br>Unom Δ | V V | 230.0<br>400.0   | 230.0<br>400.0 | 240.0<br>417.4 | 100.0<br>173.9 | 240.0<br>417.4 |

| Functional Safety |        |  | Conformity Range |  |  | Possible Range |  |
|-------------------|--------|--|------------------|--|--|----------------|--|
| ID                |        | Default  |                  |  |  |                |  |
| .007              | Errtol | Fixed to 1ch   |                  |  |  |                |  |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                  |  |  |                |  |

| Overvoltage1 Line to Neutral |            |   |       | Conformity Range |     | Possible Range |     |
|------------------------------|------------|---|-------|------------------|-----|----------------|-----|
| ID                           |            | Default   |       | Min              | Max | Min            | Max |
| .019                         | U LN > off | U <sub>THR</sub> OFF  | %Unom | 110              | 100 | 110            | 100 |
| .020                         | U LN > on  | U <sub>THR</sub> ON   | %Unom | 109              | 100 | 120            | 100 |
| .021                         | T U LN >   | Time OFF  | ms    | 1000             | 0   | 3000           | 0   |
| Comment:                     |            | U LN > off has a fixed offset of 0.25% UNOM subtracted from the displayed value |       |                  |     |                |     |
| Only active for:             |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL)                           |       |                  |     |                |     |

| Undervoltage1 Line to Neutral |            |  |       | Conformity Range |     | Possible Range |     |
|-------------------------------|------------|--|-------|------------------|-----|----------------|-----|
| ID                            |            | Default  |       | Min              | Max | Min            | Max |
| .023                          | U LN < off | U <sub>THR</sub> OFF   | %Unom | 70               | 50  | 85             | 0   |
| .024                          | U LN < on  | U <sub>THR</sub> ON  | %Unom | 85               | 50  | 100            | 0   |
| .025                          | T U LN <   | Time OFF   | ms    | 1500             | 0   | 1500           | 0   |
| Comment:                      |            | U LN < off has a fixed offset of 0.25% UNOM added to the displayed value |       |                  |     |                |     |
| Only active for:              |            | Connection Modes: 2-wire, 4-wire (LN), 4-wire (LN+LL))                   |       |                  |     |                |     |



|                  |                    |  |  |  |  |  |
|------------------|--------------------|--|--|--|--|--|
| Only active for: | Voltage > 20% UNOM |  |  |  |  |  |
|------------------|--------------------|--|--|--|--|--|

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |

| Rate of Change of Frequency (RoCoF) |           |                          |       | Conformity Range          |          | Possible Range |          |      |
|-------------------------------------|-----------|--------------------------|-------|---------------------------|----------|----------------|----------|------|
| ID                                  |           |                          |       | Default                   | Min      | Max            | Min      | Max  |
| .090                                | RoCoF     | Enable Function          |       | off                       | on / off |                | on / off |      |
| .091                                | RoCoF off | RoCoF <sub>THR</sub> OFF | mHz/s | 1000                      | 1000     | 1000           | 100      | 2000 |
| .092                                | RoCoF on  | RoCoF <sub>THR</sub> ON  | mHz/s | 800                       | 100      | 1000           | 100      | 1000 |
| .093                                | RoCoF t   | Time OFF                 | ms    | 0                         | 0        | 0              | 0        | 1000 |
| .111                                | RoCoF wnd | Window length            | ms    | Fixed window length 100ms |          |                |          |      |

| Phase Shift (PShift) |            |   |    | Conformity Range                            |          | Possible Range |          |     |
|----------------------|------------|---|----|---|----------|----------------|----------|-----|
| ID                   |            |   |    | Default                                     | Min      | Max            | Min      | Max |
| .094                 | PShift     | Enable Function   |    | on  | on / off |                | on / off |     |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   | °  | 7   | 7        | 7              | 3        | 15  |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  | °  | 5   | 3        | 7              | 3        | 15  |
|                      |            | Time OFF  | ms | Fixed to the fastest possible disconnection |          |                |          |     |
| .112                 | PShift wnd | Window length   | ms | Fixed window length 100ms                   |          |                |          |     |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |    |   |          |                |          |     |

| Auxiliary Contact type |           |          |                        | Conformity Range  |     | Possible Range  |     |      |
|------------------------|-----------|----------|------------------------|---|-----|---|-----|------|
| ID                     |           |          | Default                | Min   | Max | Min   | Max |      |
| .099                   | Contact   | Type     | dis. (disabled)        | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |     |      |
| .100                   | Contact t | Time OFF | ms                     | 300   | 100 | 300   | 10  | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) | n.o. (normally opened)  |     | n.o. (normally opened)  |     |      |

|  |  |  |  |   |   |
|--|--|--|--|---|---|
|  |  |  |  | n.c. (normally closed)<br>dis. (disabled) | n.c. (normally closed)<br>dis. (disabled) |
|--|--|--|--|---|---|

| Turn-on delay |           |              |         | Conformity Range |     | Possible Range |     |
|---------------|-----------|--------------|---------|------------------|-----|----------------|-----|
| ID            |           |              | Default | Min              | Max | Min            | Max |
| .102          | Ton delay | Turn on time | s       | 60               | 60  | 0              | 900 |

| Password |     |   |  |         |     |     |
|----------|-----|---|--|---------|-----|-----|
| ID       |     |   |  | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |  |         | 0   | 0   |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |  |         | 0   | 9   |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |  |         | 0   | 9   |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |  |         | 0   | 9   |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |  |         |     |     |

| Device Information |                                      |   |
|--------------------|--------------------------------------|---|
| ID                 |                                      |   |
| .105               | ID: xxxxxxxxxxxx<br><br>SW: aa.ddccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

#### 10.74 C10-11:2019 HV-IP [ID 651] Interface Protection / High Voltage

| Connection Mode |            |         | Conformity Range | Possible Range                                 |
|-----------------|------------|---------|------------------|--|
| ID              | Connection | Default |                  |  |
| .003            | Connection | 3-wire  | 3-wire           | 2-wire, 3-wire, 4-wire (LN),<br>4-wire (LN+LL) |

| Nominal Voltage | Conformity Range | Possible Range |
|-----------------|------------------|----------------|
|-----------------|------------------|----------------|

| ID   |            |        |   | Default | Min   | Max   | Min  | Max   |
|------|------------|--------|---|---------|-------|-------|------|-------|
| .005 | ULN/LL nom | Unom Y | V | 230.0   | 57.5  | 230.0 | 28.8 | 241.4 |
|      |            | Unom Δ | V | 400.0   | 100.0 | 400.0 | 50.0 | 420.0 |

| Functional Safety |        | Conformity Range   | Possible Range |
|-------------------|--------|--|----------------|
| ID                |        | Default  |                |
| .007              | Errtol | Fixed to 1ch   |                |
| Remark:           |        | 1ch means: 1 channel without functional safety and 1 auxilliary contact1 necessary |                |

|                  |  |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|
| Only active for: | Connection Modes: 3-wire, 4-wire (LN+LL) |  |  |  |  |  |  |
|------------------|--|--|--|--|--|--|--|

| Undervoltage2 Line to Line |            |  |       | Conformity Range                        |     | Possible Range |     |     |  |
|----------------------------|------------|--|-------|---|-----|----------------|-----|-----|--|
| ID                         |            |  |       | Default                                 | Min | Max            | Min | Max |  |
| .031                       | U LL<< off | U <sub>THR</sub> OFF   | %Unom | 25                                      | 25  | 50             | 0   | 100 |  |
| .032                       | U LL<< on  | U <sub>THR</sub> ON  | %Unom | 90                                      | 50  | 100            | 0   | 100 |  |
|                            |            | Time OFF   | ms    | Fixed to fastest possible disconnection |     |                |     |     |  |
| Comment:                   |            | U LL<< off has a fixed offset of 0.25% UNOM added to the displayed value |       |   |     |                |     |     |  |
| Only active for:           |            | Connection Modes: 3-wire, 4-wire (LN+LL)                                 |       |   |     |                |     |     |  |

| Overfrequency1   |         |   |    | Conformity Range                        |       | Possible Range |       |       |  |
|------------------|---------|---|----|---|-------|----------------|-------|-------|--|
| ID               |         |   |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .055             | f > off | f <sub>THR</sub> OFF  | Hz | 51.50                                   | 51.50 | 51.50          | 50.00 | 55.00 |  |
| .056             | f > on  | f <sub>THR</sub> ON   | Hz | 50.10                                   | 50.00 | 52.00          | 50.00 | 55.00 |  |
|                  |         | Time OFF  | ms | Fixed to fastest possible disconnection |       |                |       |       |  |
| Comment:         |         | f > off has a fixed offset of 0.01 Hz subtracted to the displayed value |    |   |       |                |       |       |  |
| Only active for: |         | Voltage > 20% UNOM  |    |   |       |                |       |       |  |

| Underfrequency1  |         |  |    | Conformity Range                        |       | Possible Range |       |       |  |
|------------------|---------|--|----|---|-------|----------------|-------|-------|--|
| ID               |         |  |    | Default                                 | Min   | Max            | Min   | Max   |  |
| .059             | f < off | f <sub>THR</sub> OFF   | Hz | 47.50                                   | 47.50 | 47.50          | 40.00 | 50.00 |  |
| .060             | f < on  | f <sub>THR</sub> ON  | Hz | 49.90                                   | 47.00 | 50.00          | 40.00 | 50.00 |  |
|                  |         | Time OFF   | ms | Fixed to fastest possible disconnection |       |                |       |       |  |
| Comment:         |         | f < off has a fixed offset of 0.01 Hz added to the displayed value |    |   |       |                |       |       |  |
| Only active for: |         | Voltage > 20% UNOM   |    |   |       |                |       |       |  |

| Frequency measuring in general |       |               |    | Conformity Range          |     | Possible Range |     |     |  |
|--------------------------------|-------|---------------|----|---------------------------|-----|----------------|-----|-----|--|
| ID                             |       |               |    | Default                   | Min | Max            | Min | Max |  |
| .113                           | F wnd | Window length | ms | Fixed window length 100ms |     |                |     |     |  |

| Rate of Change of Frequency (RoCoF) |  |  |  | Conformity Range |  | Possible Range |  |
|-------------------------------------|--|--|--|------------------|--|----------------|--|
|                                     |  |  |  |                  |  |                |  |

| ID   |           |                          |  | Default | Min                       | Max  | Min      | Max |      |
|------|-----------|--------------------------|--|---------|---------------------------|------|----------|-----|------|
| .090 | RoCoF     | Enable Function          |  | off     | on / off                  |      | on / off |     |      |
| .091 | RoCoF off | RoCoF <sub>THR</sub> OFF |  | mHz/s   | 1000                      | 1000 | 1000     | 100 | 2000 |
| .092 | RoCoF on  | RoCoF <sub>THR</sub> ON  |  | mHz/s   | 800                       | 100  | 1000     | 100 | 1000 |
| .093 | RoCoF t   | Time OFF                 |  | ms      | 0                         | 0    | 0        | 0   | 1000 |
| .111 | RoCoF wnd | Window length            |  | ms      | Fixed window length 100ms |      |          |     |      |

| Phase Shift (PShift) |            |   |  | Conformity Range |   | Possible Range |          |     |    |
|----------------------|------------|---|--|------------------|---|----------------|----------|-----|----|
| ID                   |            |   |  | Default          | Min   | Max            | Min      | Max |    |
| .094                 | PShift     | Enable Function   |  | on               | on / off                                    |                | on / off |     |    |
| .095                 | PShift off | PShift <sub>THR</sub> OFF   |  | °                | 7   | 7              | 7        | 3   | 15 |
| .096                 | PShift on  | PShift <sub>THR</sub> ON  |  | °                | 5   | 3              | 7        | 3   | 15 |
|                      |            | Time OFF  |  | ms               | Fixed to the fastest possible disconnection |                |          |     |    |
| .112                 | PShift wnd | Window length   |  | ms               | Fixed window length 100ms                   |                |          |     |    |
| Comment:             |            | PShift off has a fixed offset of 1° subtracted from the displayed value |  |                  |   |                |          |     |    |

| Auxiliary Contact type |           |          |                        | Conformity Range |   | Possible Range |   |    |      |
|------------------------|-----------|----------|------------------------|------------------|---|----------------|---|----|------|
| ID                     |           |          | Default                | Min              | Max   | Min            | Max   |    |      |
| .099                   | Contact   | Type     | dis. (disabled)        |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |    |      |
| .100                   | Contact t | Time OFF | ms                     | 300              |   | 100            | 300   | 10 | 5000 |
| .114                   | I3 STOP   | Type     | n.o. (normally opened) |                  | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |                | n.o. (normally opened)<br>n.c. (normally closed)<br>dis. (disabled) |    |      |

| Turn-on delay |           |              |  | Conformity Range |     | Possible Range |     |     |     |
|---------------|-----------|--------------|--|------------------|-----|----------------|-----|-----|-----|
| ID            |           |              |  | Default          | Min | Max            | Min | Max |     |
| .102          | Ton delay | Turn on time |  | s                | 60  | 60             | 60  | 0   | 900 |

| Password |     |   |         |     |     |
|----------|-----|---|---------|-----|-----|
| ID       |     |   | Default | Min | Max |
| .106     | PW1 | 1 <sup>st</sup> digit of Password   |         | 0   | 0 9 |
| .107     | PW2 | 2 <sup>nd</sup> digit of Password   |         | 0   | 0 9 |
| .108     | PW3 | 3 <sup>rd</sup> digit of Password   |         | 0   | 0 9 |
| .109     | PW4 | 4 <sup>th</sup> digit of Password   |         | 0   | 0 9 |
| Remark:  |     | If all 4 digits of the Password are 0 (default setting) the Password request is skipped |         |     |     |

| Device Information |                                    |   |
|--------------------|------------------------------------|---|
| ID                 |                                    |   |
| .105               | ID:xxxxxxxxxx<br><br>SW: aa.dd.ccb | xxxxxxxxxx = Device ID<br><br>dd: Software version of Display Software<br>aa: Software version of Measuring Software<br>cc: Index of Configuration set<br>b: Version of Configuration set |

**PROTECTION MADE SIMPLE.**

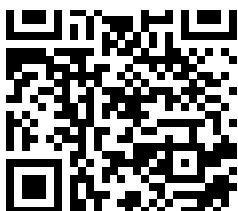


# **Professional Line**

## **XUFD**

### **MANUAL**

[docs.SEGelectronics.de/xufd](http://docs.SEGelectronics.de/xufd)



SEG Electronics GmbH reserves the right to update any portion of this publication at any time.  
Information provided by SEG Electronics GmbH is believed to be correct and reliable.  
However, SEG Electronics GmbH assumes no responsibility unless otherwise expressly undertaken.



**SEG Electronics GmbH**  
Krefelder Weg 47 • D-47906 Kempen (Germany)  
Telephone: +49 (0) 21 52 145 1  
Internet: [www.SEGelectronics.de](http://www.SEGelectronics.de)

Sales  
Telephone: +49 (0) 21 52 145 331  
Fax: +49 (0) 21 52 145 354  
E-mail: [sales@SEGelectronics.de](mailto:sales@SEGelectronics.de)

Service  
Telephone: +49 (0) 21 52 145 600  
Fax: +49 (0) 21 52 145 354  
E-mail: [support@SEGelectronics.de](mailto:support@SEGelectronics.de)

Complete address / phone / fax / email information for all locations is available on our website.