

PCM1x Packages (Pxx) Genset Control
Installation Softwareversion 4.3



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WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overttemperature, or overpressure, where applicable) shutdown unit(s), that operates totally independently of the prime mover control unit(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the mechanical-hydraulic governor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the controlled unit(s) fail.



CAUTION

To prevent damage to a control system that uses an alternator or battery-charging unit, make sure the charging unit is turned off before disconnecting the battery from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).
- Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.
- Do not touch the components or conductors on a printed circuit board with your hands or with conductive units.

Important Definitions



WARNING

To avoid the destruction of electric components due to improper handling, please read and adhere to the relevant notes.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in damage to equipment. This note should absolutely be observed when connecting the control.



NOTE

References to other notes and supplements as well as tables and lists are identified by means of the "i" symbol. Most of the referenced sections are included in the Annex.

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1 General Information

1.1 Linked Documents

Type		English	German
PCM1x Packages (Pxx)			
PCM1x Packages (Pxx) - Installation	this manual ⇨	37275	GR37275
PCM1x Packages (Pxx) - Configuration		37276	GR37276
PCM1x Packages (Pxx) - Function/Operation		37274	GR37274

Table 1-1: Manual - Overview

Intended Use The control must only be operated according to the guidelines described in this manual. The prerequisite for a proper and safe operation of the product is correct transportation, storage, and installation as well as careful operation and maintenance.



NOTE

This manual has been developed for an control fitted with all available options. Inputs/outputs, functions, configuration screens and other details described, which do not exist on your control may be ignored.

The present manual has been prepared to enable the installation and commissioning of the control. On account of the large variety of parameter settings, it is not possible to cover every possible combination. The manual is therefore only a guide. In case of incorrect entries or a total loss of functions, the default settings can be taken from the enclosed list of parameters.

2 Electrostatic Discharge Awareness

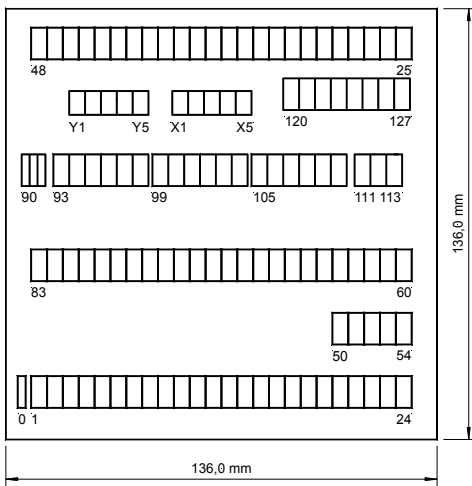
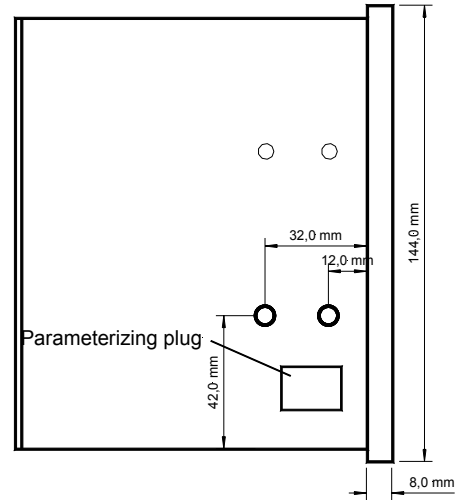
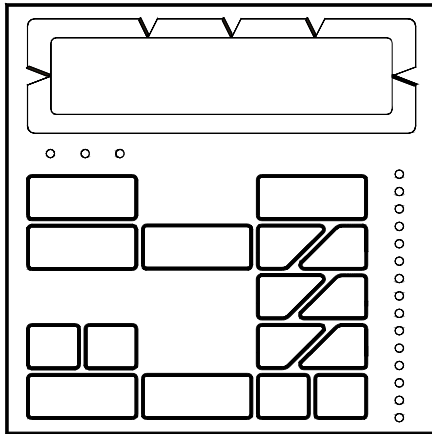
All electronic equipment is static-sensitive, some components more than others. To protect these components from static damage, you must take special precautions to minimize or eliminate electrostatic discharges.

Follow these precautions when working with or near the control.

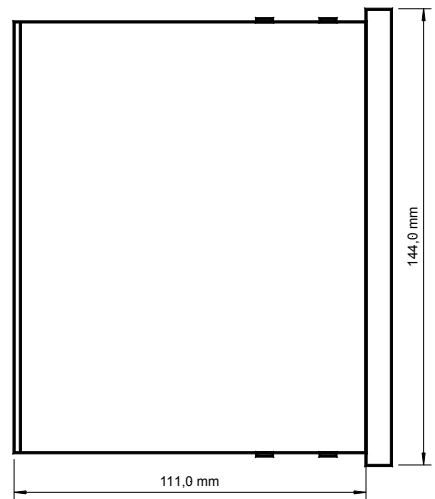
1. Before doing maintenance on the electronic control, discharge the static electricity on your body to ground by touching and holding a grounded metal object (pipes, cabinets, equipment, etc.).
2. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
3. Keep plastic, vinyl, and Styrofoam materials (such as plastic or Styrofoam cups, cup holders, cigarette packages, cellophane wrappers, vinyl books or folders, plastic bottles, and plastic ash trays) away from the control, the modules, and the work area as much as possible.
4. **With the opening of the unit the guarantee expires!**
Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
 - Make sure that the unit is completely de-energized (all connectors have to be pulled off).
 - Do not touch any part of the PCB except the edges.
 - Do not touch the electrical conductors, the connectors, or the components with conductive units or with your hands.
 - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

3 Housing

3.1 Dimensions



PCMx



2002-08-06 PCx Abmessungen SEG pcmxseg-3202-ab.skf

Figure 3-1: Housing - Dimensions

3.2 Panel Cut-Out

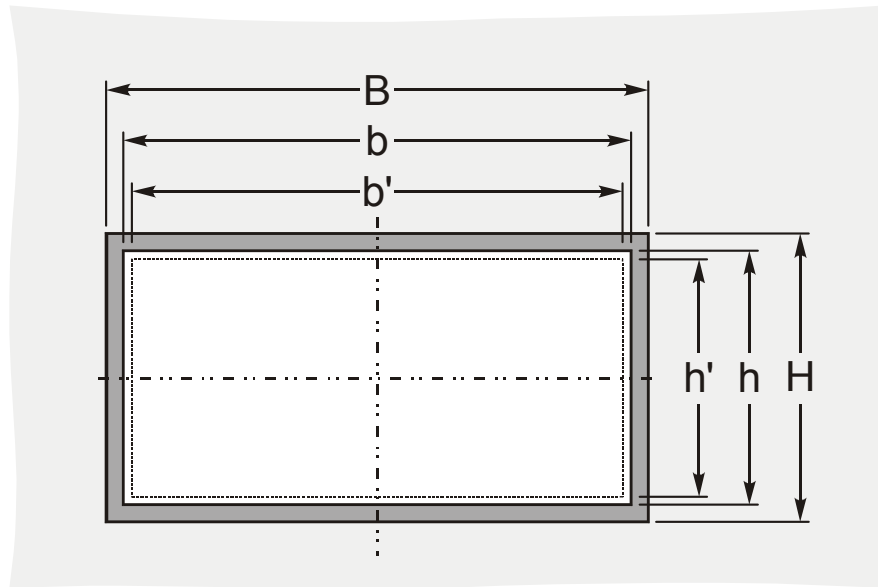


Figure 3-2: Housing - Panel-board cut-out

Measure	Description	Tolerance
H	Height	Total 144 mm —
h	Panel cut-out	138 mm + 1.0 mm
h'	Housing dimension	136 mm
B	Width	Total 144 mm —
b	Panel cut-out	138 mm + 1.0 mm
b'	Housing dimension	136 mm
	Depth	Total 118 —

Table 3-1: Housing - panel cut-out

3.3 Side view

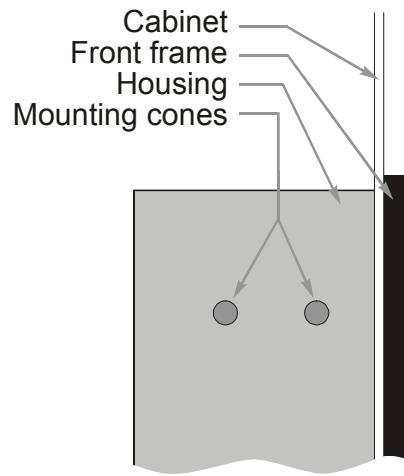


Figure 3-3: Side view – without clamps

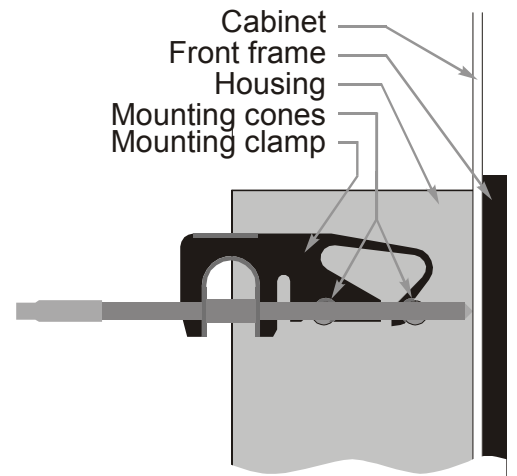


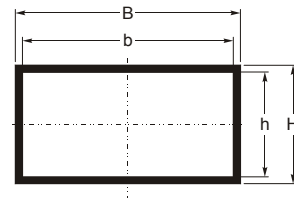
Figure 3-4: Side view – with clamps

3.4 Installation

For installation into a panel door please proceed as follows:

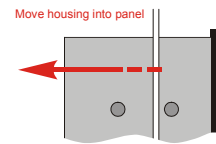
1. **Panel cut-out**

Cut out the panel according to the dimensions in Figure 3-1.



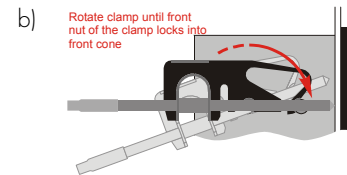
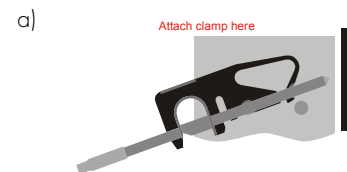
2. **Insert control into cut-out**

Insert the control into the panel cut-out. Verify that the control fits correctly in the cut-out. If the panel cut-out is not big enough, enlarge it accordingly.



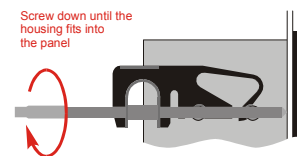
3. **Attach mounting clamps**

Rotate clamps according to the picture on the right until they snap into the mounting cones.



4. **Screw clamps**

Tighten the screw clamps until the housing is pressed and fixed against the panel. Be careful not to over tighten the clamps which can unsnap the frame from the housing. If this happens remove the control from the panel and reattach the frame by pressing firmly against the housing.



Note:

Using the gasket kit increases the IP protection from IP42 to IP54 from front. Mounting of the gasket is described in the manual supplied with the gasket kit.

4 Wiring Diagrams - Overview



WARNING

A circuit breaker must be provided near to the control and in a position easily accessible to the operator. This must also bear a sign identifying it as an isolating switch for the control.



NOTE

Connected inductances (e. g. Coils of operating current or undervoltage tripping devices, auxiliary contactors and power contactors) must be wired with an appropriate interference protection.

4.1 PCM1-G...P01 Package

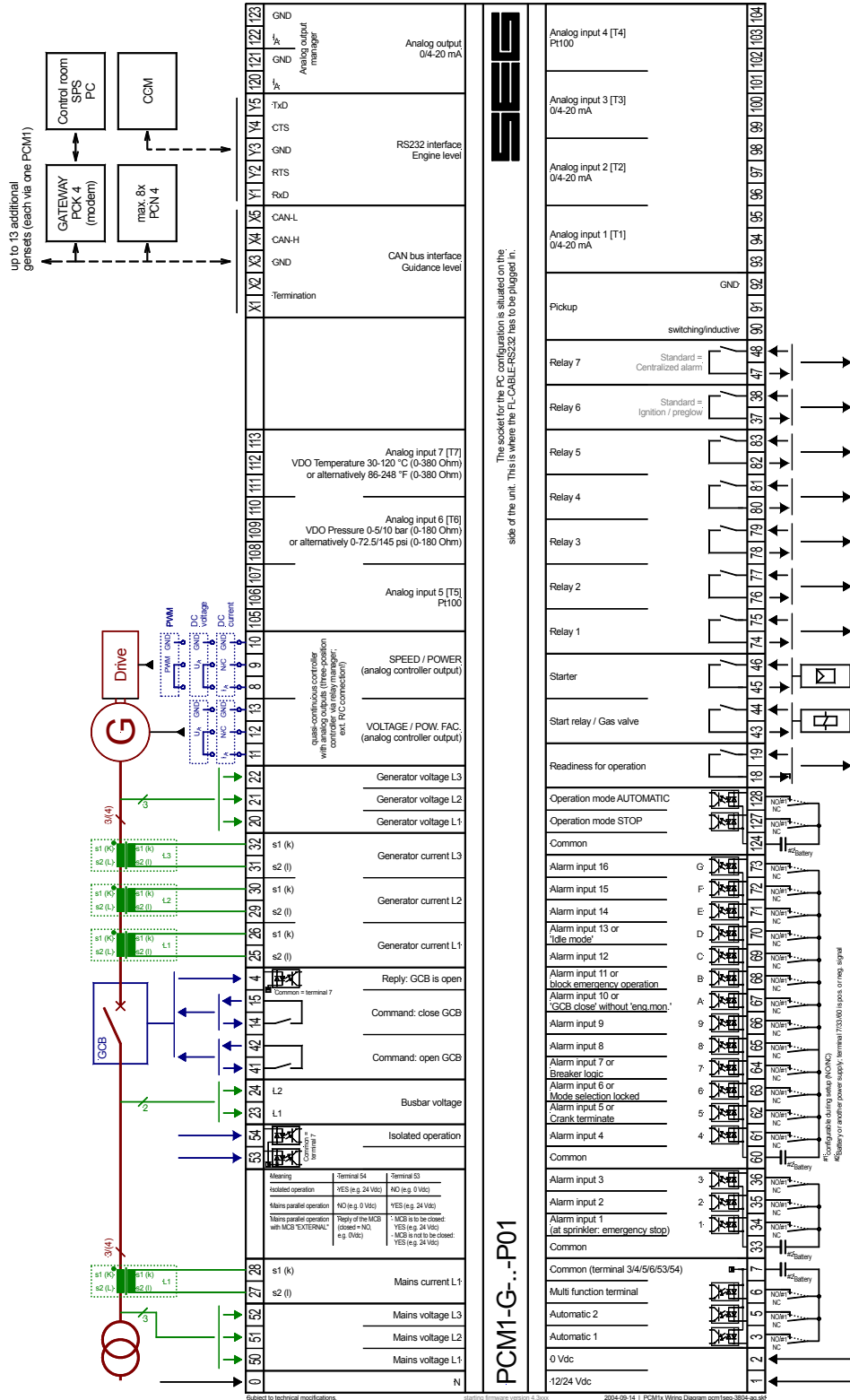


Figure 4-1: Wiring diagram PCM1-G...P01 Package

4.2 PCM1-M...-P01 Package

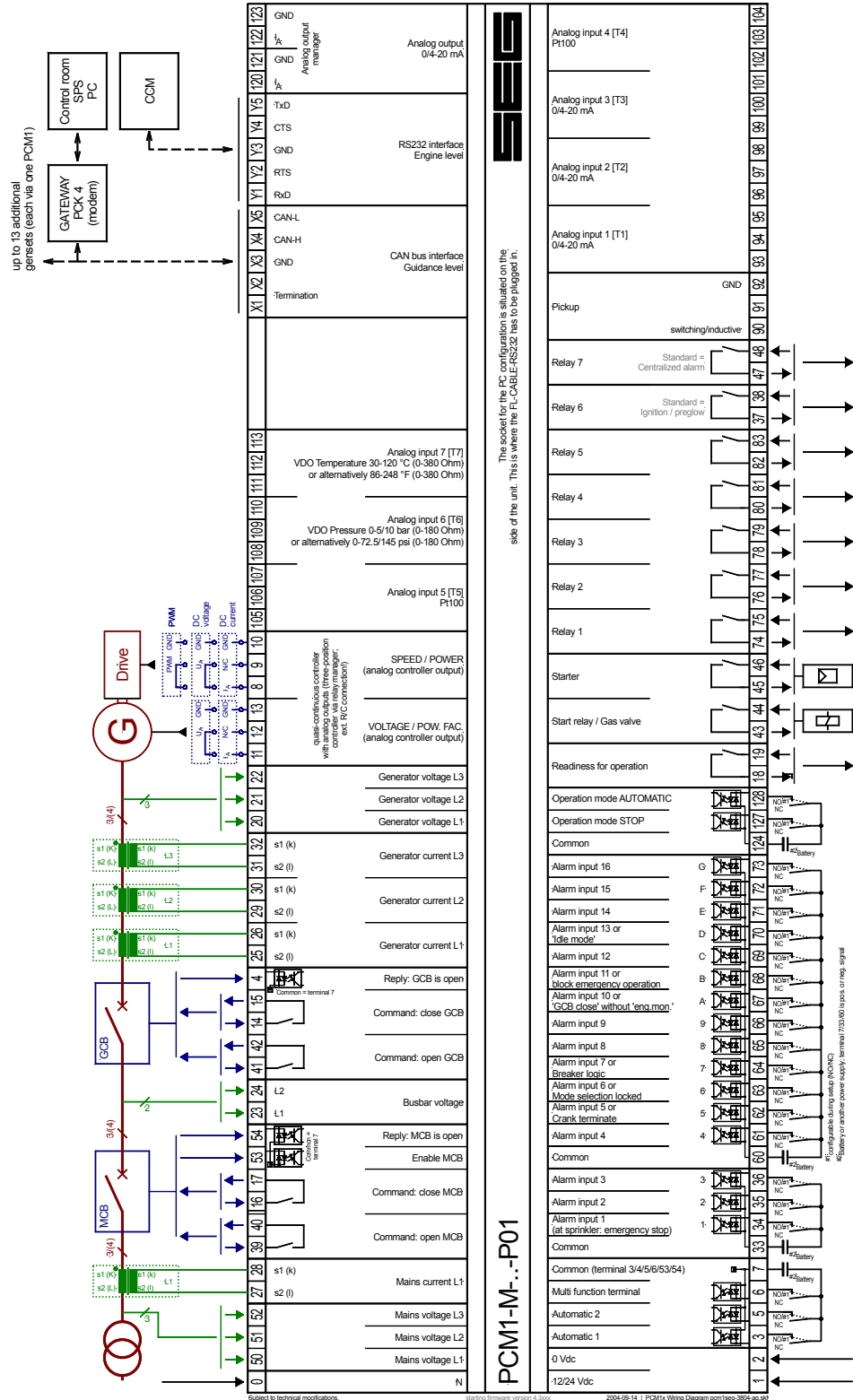


Figure 4-2: Wiring diagram PCM1-M...-P01 Package

5 Connectors - Details

5.1 Power Supply

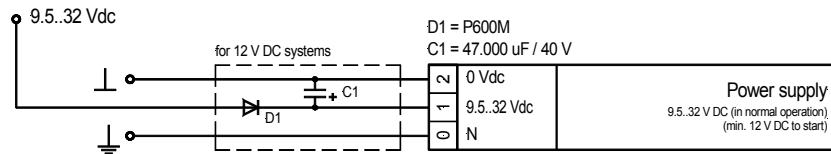


Figure 5-1: Power supply

Terminal	Description	A_{max}
0	Neutral point of the three-phase system or neutral terminal of the voltage transformer (Measuring reference point)	2.5 mm ²
1	9.5-32 Vdc, 15 W	2.5 mm ²
2	0 Vdc reference point	2.5 mm ²

Table 5-1: Terminal assignment - power supply



NOTE

Please note in an application with 12 Vdc the above described circuit of the power supply.

5.2 Measuring Inputs

5.2.1 Voltage

a.) Generator

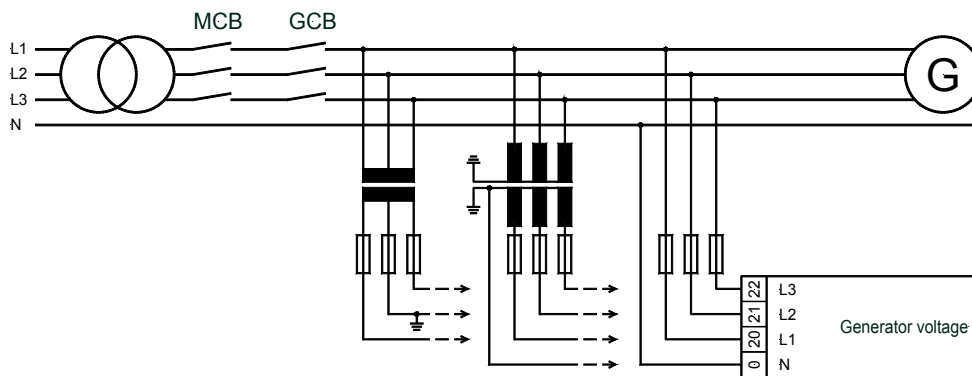


Figure 5-2: Measuring inputs - Voltage - Generator

Terminal	Measurement	Description	A_{max}
20	400 Vac or ../120 Vac	Generator voltage L1	2.5 mm ²
21		Generator voltage L2	2.5 mm ²
22		Generator voltage L3	2.5 mm ²
0		Neutral point of the 3-phase system/transformer	2.5 mm ²

Table 5-2: Terminal assignment - generator voltage measuring

b.) Busbar/Remanence

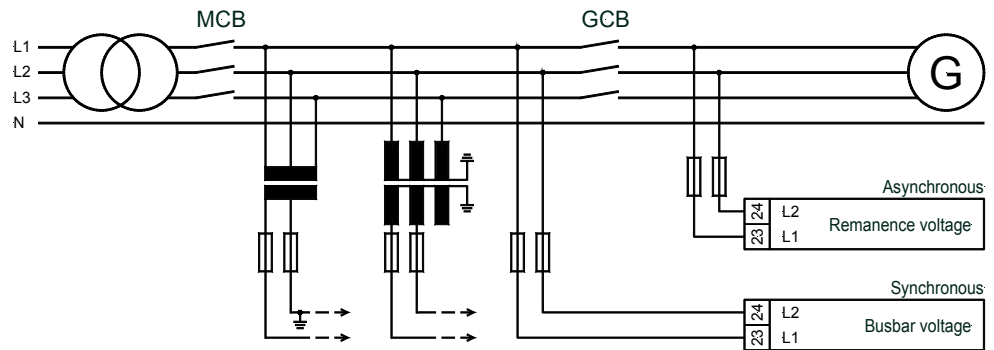


Figure 5-3: Measuring inputs - Voltage – Busbar

Terminal	Measurement	Description	A _{max}
Synchronous generators (standard)			
23	400 Vac or ../120 Vac	Busbar voltage L1	2.5 mm ²
24		Busbar voltage L2	2.5 mm ²
Induction (asynchronous) generators (special option)			
23	direct	Remanence voltage L1	2.5 mm ²
24		Remanence voltage L2	2.5 mm ²

Table 5-3: Terminal assignment - busbar voltage measuring

c.) Mains

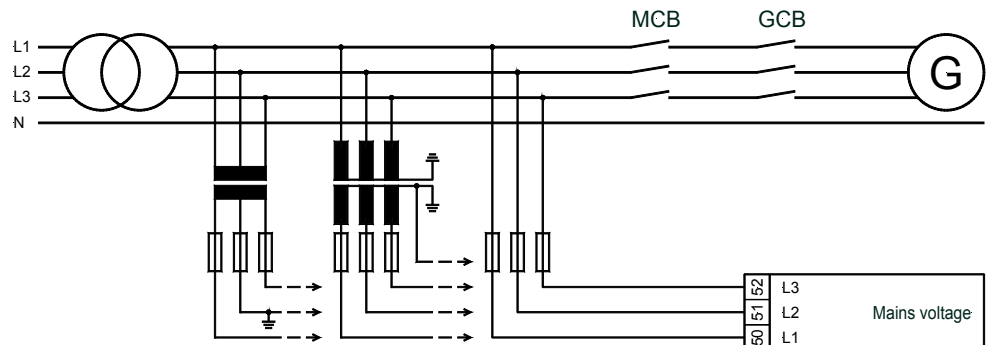


Figure 5-4: Measuring inputs - Voltage – Mains

Terminal	Measurement	Description	A _{max}
50	400 Vac or ../120 Vac	Mains voltage L1	2.5 mm ²
51		Mains voltage L2	2.5 mm ²
52		Mains voltage L3	2.5 mm ²
0		Neutral point of the 3-phase system / transformer	2.5 mm ²

Table 5-4: Terminal assignment - mains voltage measuring

5.2.2 Current



WARNING

Before disconnecting the secondary terminals of the transformer or the connections of the transformer at the control, make sure that the transformer is short-circuited.



NOTE

Current transducers are generally to be earthed secondarily and on one side.

a.) Generator

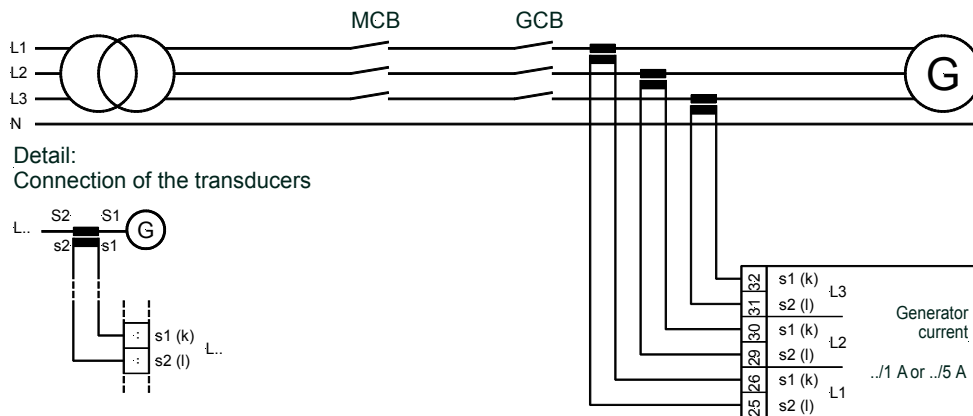


Figure 5-5: Measuring inputs - Current - Generator

Terminal	Measurement	Description	A_{max}
25	Transformer .. /1 A or .. /5 A	Generator current L1, transformer terminal s2/x2 (l)	2.5 mm ²
26		Generator current L1, transformer terminal s1/x1 (k)	2.5 mm ²
29		Generator current L2, transformer terminal s2/x2 (l)	2.5 mm ²
30		Generator current L2, transformer terminal s1/x1 (k)	2.5 mm ²
31		Generator current L3, transformer terminal s2/x2 (l)	2.5 mm ²
32		Generator current L3, transformer terminal s1/x1 (k)	2.5 mm ²

Table 5-5: Terminal assignment - generator current measuring

b.) Mains (Mains Current Measuring Via Transformer)

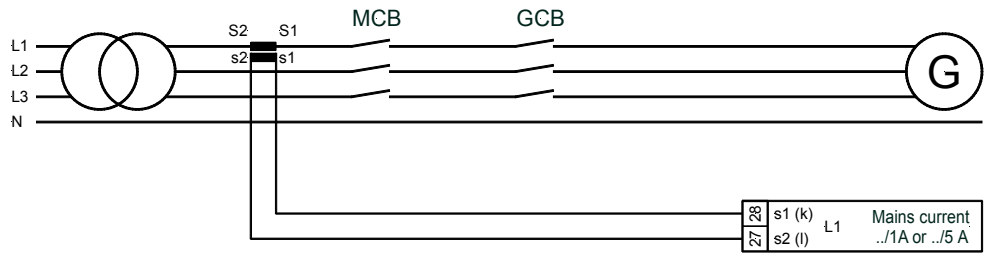


Figure 5-6: Measuring inputs - Current - Mains – via transformer

Terminal	Measurement	Description	A _{max}
27	Transformer	Mains current L1, transformer terminal s2 (l)	2.5 mm ²
28	.. /1A o. .. /5A	Mains current L1, transformer terminal s1 (k)	2.5 mm ²

Table 5-6: Terminal assignment - mains current measuring

c.) Mains (Mains Interchange Import/Export Real Power Actual Value Via Measuring Transducer)



NOTE

During configuration the free configurable 20 mA inputs can be provided with the following functions:

- Mains interchange (import/export) real power actual value,
- Real power setpoint value or
- Alarm input.

Please notice the details in the configuration manual.



NOTE

If several controls are connected to form an interconnection, the 20 mA measuring signal must not be looped through all controls. At each control, a 0/4-20 mA buffer amplifier must be connected to the mains interchange (import/export) real power actual value measurement. When selecting the external measuring transformer, please note that this has to transmit negative ranges on transmission of supply and reference power.

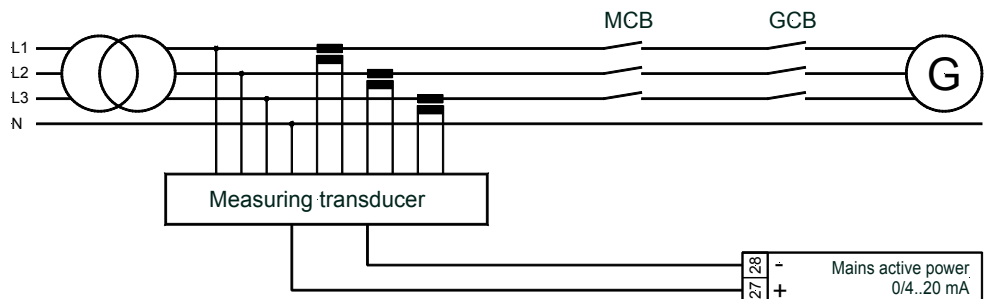


Figure 5-7: Measuring inputs - Current - Mains – via measuring transducer

Terminal	Measurement	Description	A _{max}
configurable	0/4-20 mA	Mains interchange (import/export) real power actual value via 0/4-20 mA signal of an external measuring transducer (e.g. UMT 1)	1.5 mm ²

Table 5-7: Terminal assignment - mains current measuring

5.3 Discrete Inputs



CAUTION

Please note that the maximum voltages which may be applied at the discrete inputs are defined as follows. Voltages higher than those specified destroy the hardware!

Maximum input range: $\pm 4-40$ Vdc.

5.3.1 Control Inputs

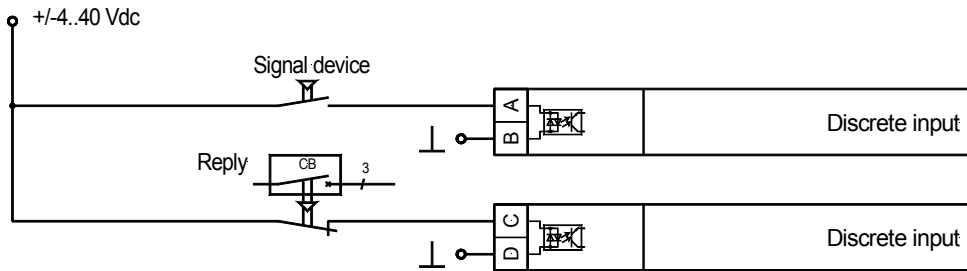


Figure 5-8: Discrete inputs – Control inputs

Terminal	Associated Common	Description (according to DIN 40 719 Part 3, 5.8.3)	A_{max}
A	B	NO contact	
3	7	Automatic 1	2.5 mm ²
5		Automatic 2	2.5 mm ²
6		Multi function (selectable in configuration): <ul style="list-style-type: none"> • Sprinkler operation • Engine enable • external acknowledgement • Engine stop • Operating mode STOP • Start without CB 	2.5 mm ²
53		[PCM1-G] Enable externally [PCM1-M] Enable MCB	2.5 mm ²
C	D	NC contact	
4	7	Reply: GCB is open	2.5 mm ²
54		[PCM1-G] Status: Isolated operation [PCM1-M] Reply: MCB is open	2.5 mm ²

Table 5-8: Terminal assignment - control inputs

5.3.2 Alarm Inputs

The discrete inputs can be connected in positive or negative logic:

- positive logic The discrete input is wired to $\pm 4-40\text{dc}$.
- negative logic The discrete input is wired to GND.

a.) Positive Logic

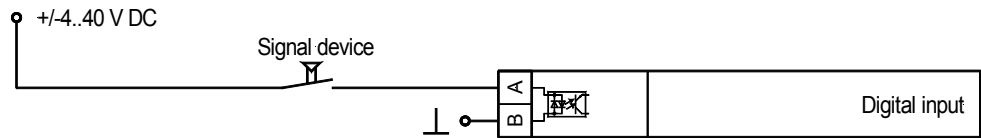


Figure 5-9: Discrete inputs – Alarm inputs - positive logic

Terminal	Associated Common	Description (according to DIN 40 719 Part 3, 5.8.3)	A_{max}
A	B		
34	33	Discrete input [D01] - Alarm input - in Sprinkler operation: EMERGENCY STOP	2.5 mm ²
35		Discrete input [D02] - Alarm input	2.5 mm ²
36		Discrete input [D03] - Alarm input	2.5 mm ²
61	60	Discrete input [D04] - Alarm input - if discrete input terminal 34 is not available in Sprinkler operation: EMERGENCY STOP	2.5 mm ²
62		Discrete input [D05] - Alarm input or - Firing speed reached ("Dynamo")	2.5 mm ²
63		Discrete input [D06] - Alarm input or - Operation mode selector blocked	2.5 mm ²
64		Discrete input [D07] - Alarm input or - Change breaker logic	2.5 mm ²
65		Discrete input [D08] - Alarm input	2.5 mm ²
66		Discrete input [D09] - Alarm input	2.5 mm ²
67		Discrete input [D10] - Alarm input or - 'Close GCB' before expiry of the delayed eng. monit.	2.5 mm ²
68		Discrete input [D11] - Alarm input or - Inhibition emergency power (from version 4.3010)	2.5 mm ²
69		Discrete input [D12] - Alarm input	2.5 mm ²
70		Discrete input [D13] - Alarm input or - No-load operation mode	2.5 mm ²
71		Discrete input [D14] - Alarm input	2.5 mm ²
72		Discrete input [D15] - Alarm input	2.5 mm ²
73		Discrete input [D16] - Alarm input	2.5 mm ²

Table 5-9: Terminal assignment - alarm inputs positive logic

b.) Negative Logic

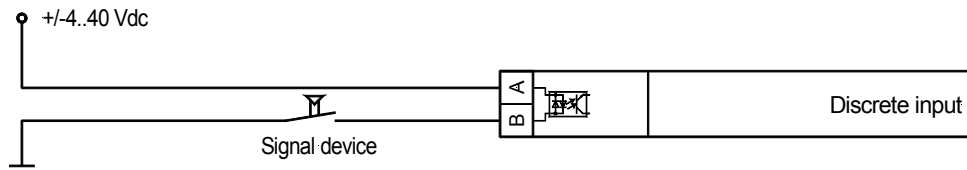


Figure 5-10: Discrete inputs – Alarm inputs - negative logic (Example)

Associated Common	Terminal	Description (according to DIN 40 719 Part 3, 5.8.3)	A _{max}
A	B		
33	34	Discrete input [D01] - Alarm input - in Sprinkler operation: EMERGENCY STOP	2.5 mm ²
	35	Discrete input [D02] - Alarm input	2.5 mm ²
	36	Discrete input [D03] - Alarm input	2.5 mm ²
60	61	Discrete input [D04] - Alarm input - if discrete input terminal 34 is not available in Sprinkler operation: EMERGENCY STOP	2.5 mm ²
	62	Discrete input [D05] - Alarm input or - Firing speed reached ("Dynamo")	2.5 mm ²
	63	Discrete input [D06] - Alarm input or - Operation mode selector blocked	2.5 mm ²
	64	Discrete input [D07] - Alarm input or - Change breaker logic	2.5 mm ²
	65	Discrete input [D08] - Alarm input	2.5 mm ²
	66	Discrete input [D09] - Alarm input	2.5 mm ²
	67	Discrete input [D10] - Alarm input or - 'Close GCB' before expiry of the delayed eng. monit.	2.5 mm ²
	68	Discrete input [D11] - Alarm input or - Inhibition emergency power (from version 4.3010)	2.5 mm ²
	69	Discrete input [D12] - Alarm input	2.5 mm ²
	70	Discrete input [D13] - Alarm input or - No-load operation mode	2.5 mm ²
	71	Discrete input [D14] - Alarm input	2.5 mm ²
72	Discrete input [D15] - Alarm input	2.5 mm ²	
73	Discrete input [D16] - Alarm input	2.5 mm ²	

Table 5-10: Terminal assignment - alarm inputs negative logic

5.3.3 Operation Mode Selection Via DI (Package P01, from V4.3010)

This package enables to select the operation mode using the terminals 127 and 128 externally from 4.3010. The discrete inputs can be connected using positive or negative logic as described above.

Terminal	Associated common	Description (according to DIN 40 719 Part 3, 5.8.3)	A_{max}
127	124	Control input [terminal 127] - Operation mode STOP	2,5 mm ²
128		Control input [terminal 128] - Operation mode AUTOMATIC	2,5 mm ²

Table 5-11: Discrete inputs - operation mode selection



NOTE

The selection of the operation mode is only possible if the discrete input on terminal 63 (Operation mode selector blocked) is energized. More detailed information can be found in the configuration manual (37276A) under 'Block operation mode selector switch via terminal 63'.

5.4 Analog Inputs (Packages P01)

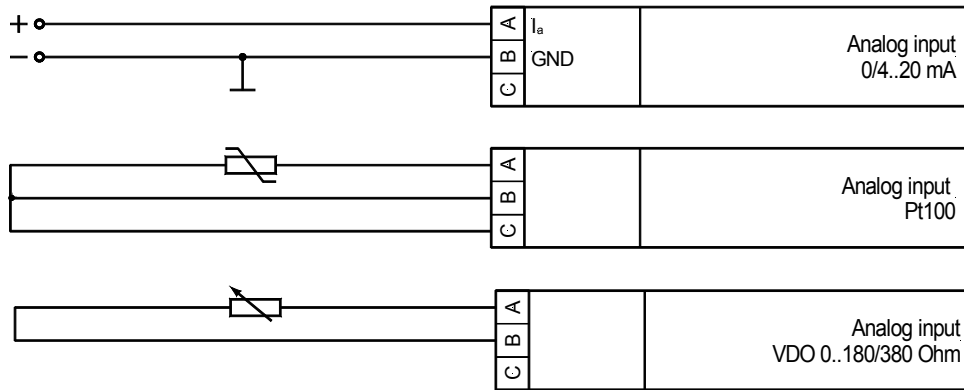


Figure 5-11: Analog inputs - Package P01

A	Terminal		Description (according to DIN 40 719 Part 3, 5.8.3)	A_{max}
	B	C		
93	94	95	Analog input 1 [T1] 0/4-20 mA , configurable function: - Alarm input or - Set value input or - Actual value input	1.5 mm ²
96	97	98	Analog input 2 [T2] 0/4-20 mA , configurable function: - Alarm input or - Set value input or - Actual value input	1.5 mm ²
99	100	101	Analog input 3 [T3] 0/4-20 mA , configurable function: - Alarm input or - Set value input or - Actual value input	1.5 mm ²
102	103	104	Analog input 4 [T4] Pt100 , configurable function: - Alarm input or - Actual value input	1.5 mm ²
105	106	107	Analog input 5 [T5] Pt100 , configurable function: - Alarm input or - Actual value input	1.5 mm ²
108	109	110	Analog input 6 [T6] VDO pressure 0-5/10 bar or 0-72.5/145 psi 0-180 Ohm , configurable function: - Alarm input or - Actual value input	1.5 mm ²
111	112	113	Analog input 7 [T7] VDO temperature 30-120°C or 86-248°F 0-380 Ohm , configurable function: - Alarm input or - Actual value input	1.5 mm ²

Table 5-12: Analog inputs - terminal assignment

5.5 Pick-Up

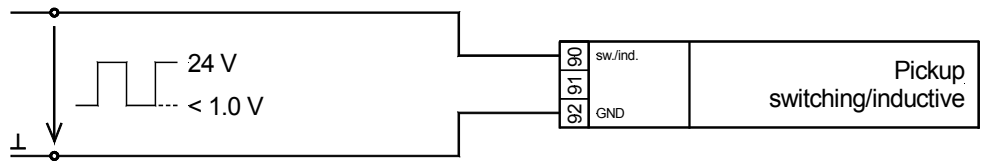


Figure 5-12: Pickup

Terminal	Description	A_{max}
90	Pickup	switching/inductive 2.5 mm ²
91		2.5 mm ²
92		GND 2.5 mm ²

Table 5-13: Pickup - terminal assignment

Specification of the input circuit for inductive speed sensors
Ambient temperature: 25 °C

Signal shape	Sinusoidal
Minimum input voltage in the range of 200-10,000 Hz	< 0.5 V _{eff}
Minimum input voltage in the range of 300-5,000 Hz	< 0.3 V _{eff}

Table 5-14: Pickup – minimum input voltage

Note: As the ambient temperature increases, the minimum input voltage increases at a rate of approximately 0.3 V/°C.

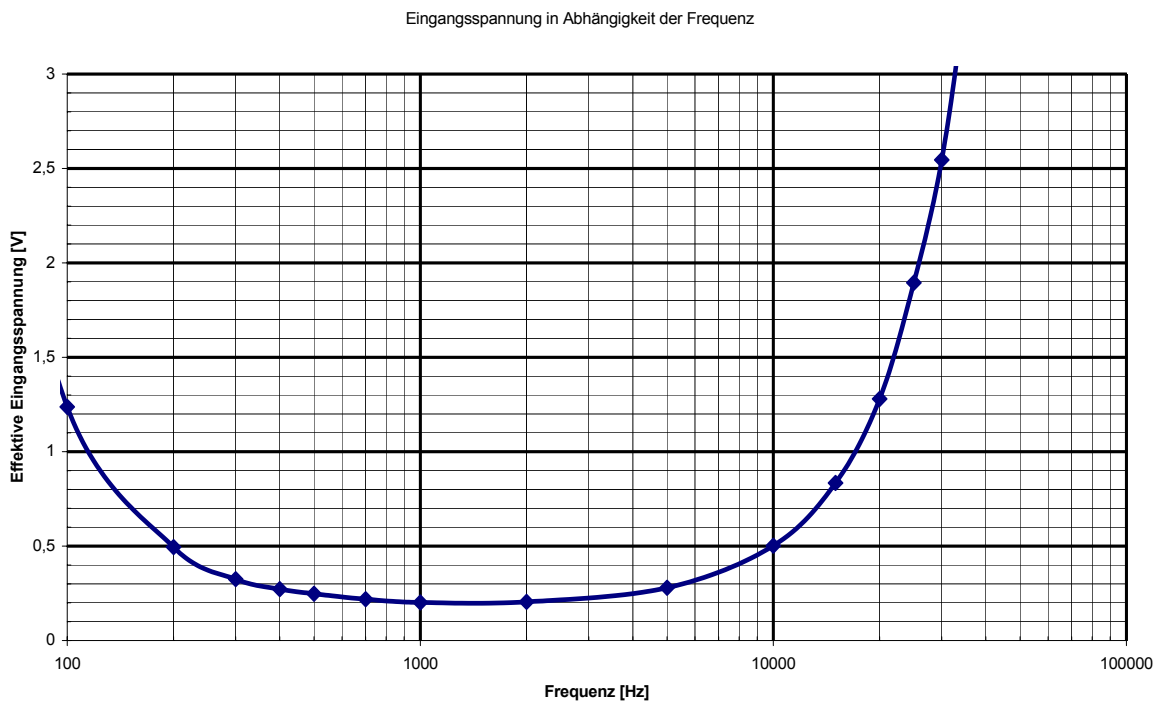


Figure 5-13: Pickup – Typical behavior of the input voltage sensitivity

5.6 Relay Outputs

5.6.1 Controller Outputs

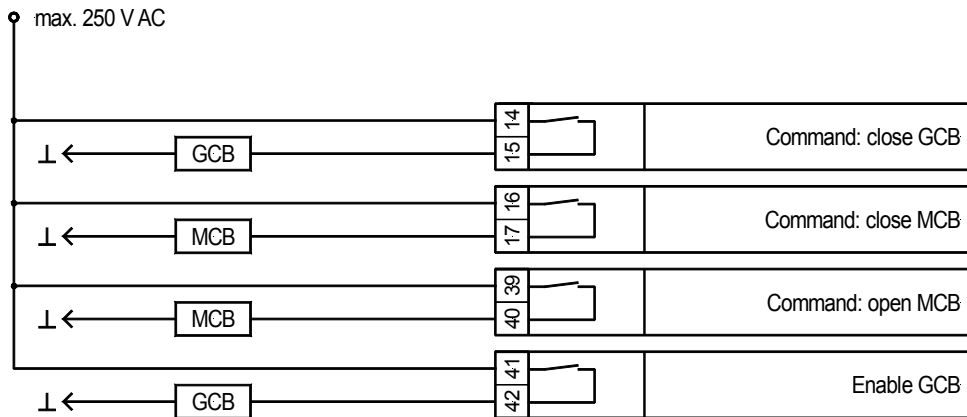


Figure 5-14: Relay outputs – Controller outputs – CB activation

Make cont.	Description	A_{max}
14/15	Command: close GCB	2.5 mm ²
16/17	[PCM1-M] Command: close MCB	2.5 mm ²
39/40	[PCM1-M] Command: open MCB	2.5 mm ²
41/42	Command: open GCB	2.5 mm ²

Table 5-15: Relay outputs - terminal assignment

5.6.2 Relay Manager

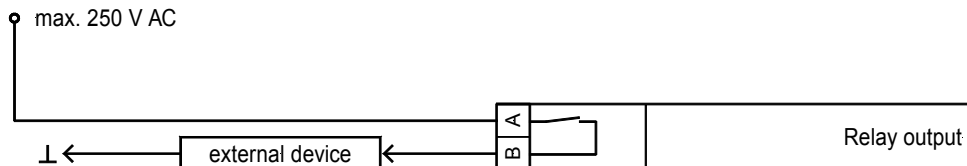


Figure 5-15: Relay outputs – Relay manager

Make cont.	Description	A_{max}
18/19	Readiness for operation	2.5 mm ²
43/44	Operating magnet/Stopping magnet	2.5 mm ²
45/46	Starter	2.5 mm ²
74/75	Relay [R1] (Relay manager)	2.5 mm ²
76/77	Relay [R2] (Relay manager)	2.5 mm ²
78/79	Relay [R3] (Relay manager)	2.5 mm ²
80/81	Relay [R4] (Relay manager)	2.5 mm ²
82/83	Relay [R5] (Relay manager)	2.5 mm ²
37/38	Relay [R6] (Relay manager; pre-assigned: Preheat/Ignition ON)	2.5 mm ²
47/48	Relay [R7] (Relay manager; pre-assigned: Centralized alarm horn)	2.5 mm ²

Table 5-16: Relay manager - terminal assignment

5.7 Analog Outputs (Package P01)

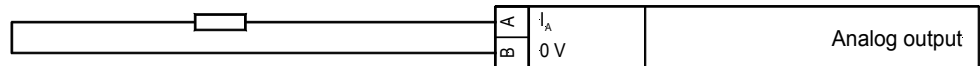


Figure 5-16: Analog outputs

I _a A	GND B	Description	A _{max}
120	121	Analog output [A1] - 0/4-20 mA	1.5 mm ²
122	123	Analog output [A2] - 0/4-20 mA	1.5 mm ²

Table 5-17: Analog outputs - terminal assignment

5.8 Controller Outputs

5.8.1 Multi Functional Controller Outputs (Package P01)

The multi functional controller outputs can be changed by configuration and an external jumper.

a.) Versions

- **Three-position controller** via relay manager
 - Control of n/f/P: Parameter "F/P contr.type" = THREESTEP
 - n+/f+/P+ = relay manager parameter 114
 - n-/f-/P- = relay manager parameter 115
 - Control of V/Q: Parameter "V/Q contr.output" = THREESTEP
 - V+/Q+ = relay manager parameter 116
 - V-/Q- = relay manager parameter 117

- **Analog controller** output
 - Control of n/f/P: Parameter "F/P contr.type" = ANALOG
 - Current output (mA) = no jumpers necessary
 - Voltage output (V) = jumpers between 8/9
 - Connect governor to terminals 9/10
 - Control of V/Q: Parameter "V/Q contr.output" = ANALOG
 - Current output (mA) = no jumpers necessary
 - Voltage output (V) = jumpers between 11/12
 - Connect governor to terminals 12/13

- **PWM controller** output
 - Control of n/f/P: Parameter "F/P contr.type" = PWM
 - PWM output = jumpers between 8/9
 - Connect governor to terminals 9/10

b.) Wiring Of Controller

- Setting: THREE-POSITION (Three-position controller)

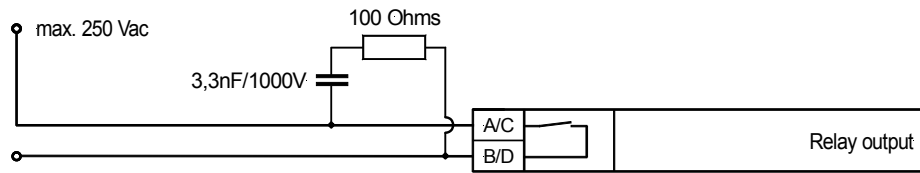


Figure 5-17: Three-position controller – external RC wiring for relay manager

Terminal		Description	A_{max}
A	higher	Speed / Frequency / Real power (RM: "+" = 114, "-" = 115) or	2.5 mm ²
B			2.5 mm ²
C	lower	Voltage / Reactive power (RM: "+" = 116, "-" = 117)	2.5 mm ²
D			2.5 mm ²

The selection and programming occurs via the relay manager (RM).

Table 5-18: Controller outputs - three-position



CAUTION

Refer to Technical Data on page 30 for information about current limits. Use an interposing relay if necessary. Currents higher than those specified destroy the hardware!

- Setting: ANALOG or PWM (Analog controller) - Frequency-/Power controller

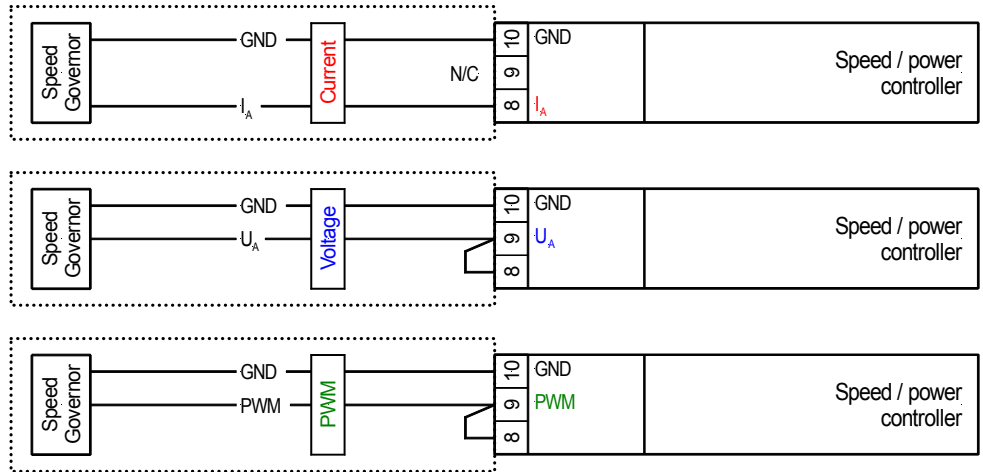


Figure 5-18: Analog controller output n/f/P – Wiring and external jumper setting

Type	Terminal	Description	A _{max}
I Current	8	Speed controller / Frequency controller / Real power controller	2.5 mm ²
	9		2.5 mm ²
	10		2.5 mm ²
V Voltage	8	Speed controller / Frequency controller / Real power controller	2.5 mm ²
	9		2.5 mm ²
	10		2.5 mm ²
PWM	8	Speed controller / Frequency controller / Real power controller	2.5 mm ²
	9		2.5 mm ²
	10		2.5 mm ²

Table 5-19: Controller outputs - analog or PWM

- Setting: ANALOG (Analog controller) - Voltage-/Reactive power controller

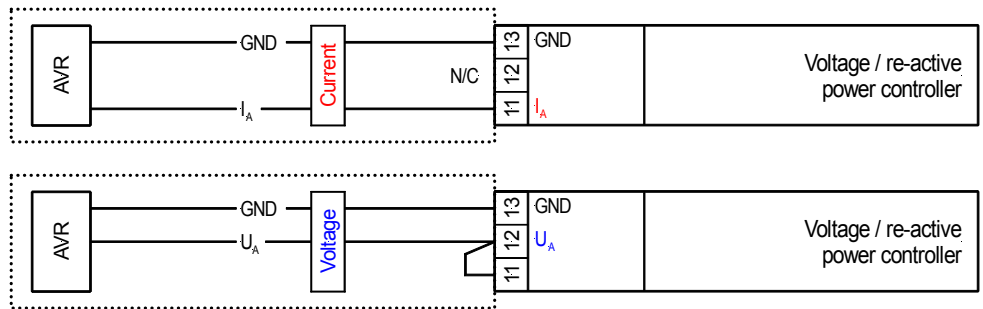


Figure 5-19: Analog controller output V/Q – Wiring and jumper setting

Type	Terminal	Description	A _{max}
I Current	11	Voltage controller / Reactive power controller	2.5 mm ²
	12		2.5 mm ²
	13		2.5 mm ²
V Voltage	11	Voltage controller / Reactive power controller	2.5 mm ²
	12		2.5 mm ²
	13		2.5 mm ²

Table 5-20: Controller outputs - analog

5.9 Interface

5.9.1 Interface Wiring

	A	B	C	D	E
Termination			GND	CAN-H	CAN-L
Interface	CAN bus				

Figure 5-20: Interface – Terminals

Wiring					Description
Whether the terminals are designated X or Y depends on the configuration of the system. Please refer to the wiring diagram (A = X/Y, B = X/Y, etc.)					
all					
A (X1)	B (X2)	C (X3)	D (X4)	E (X5)	
[1]	[1]	GND	CAN-H	CAN-L	CAN bus

[1]. . can be used to loop the CAN bus or/and to connect the termination resistance.

Table 5-21: Interface - terminal assignment

5.9.2 CAN Bus Screening

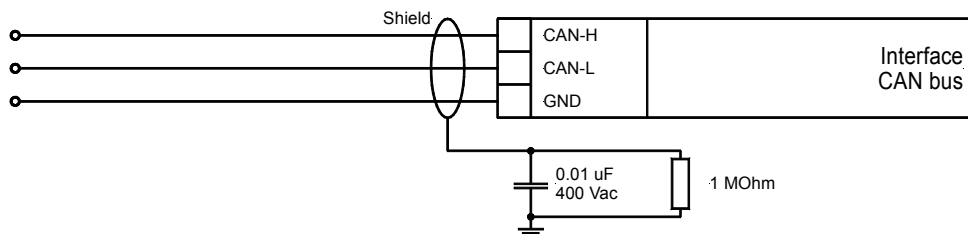


Figure 5-21: Interface – CAN bus screening

5.9.3 Loop The CAN Bus



NOTE

Please note that the CAN bus must be terminated with an impedance which corresponds to the wave impedance of the cable (e.g. 120 Ohm). The Engine CAN bus is terminated between CAN-H and CAN-L.

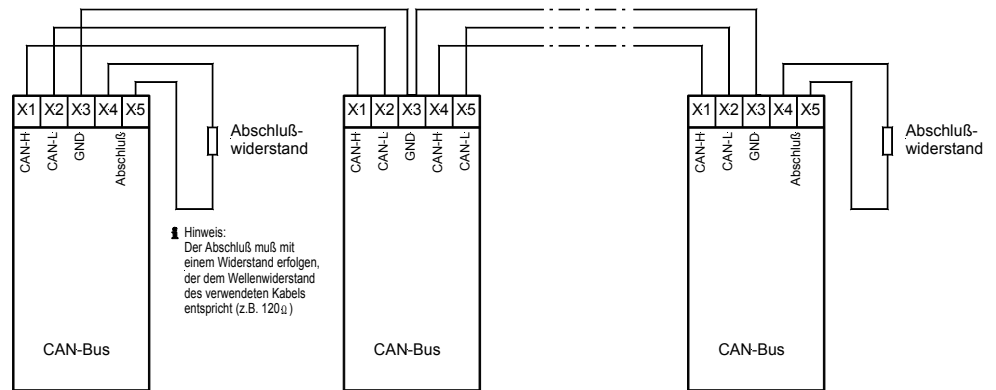


Figure 5-22: Interfaces – Loop the CAN bus

5.9.4 FL-CABLE-RS232 - Direct Configuration Interface



NOTE

To configure via the configuration interface (direct configuration) you need the configuration cable (ordering code "FL-CABLE-RS232"), the program FL-SOFT3 (is delivered with the cable) and the corresponding configuration files. Please consult the online help installed when the program is installed for a description of the FL-SOFT3 PC program and its setup.

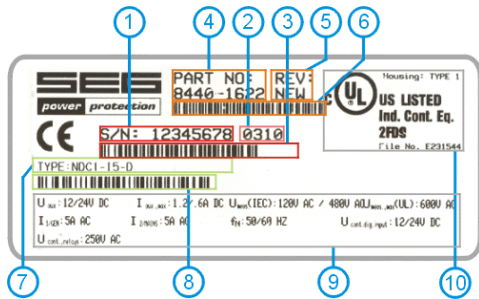
If the parameter "Direct config." is switched to ON a communication via the interface on terminals X1-X5 is switched off.

If the device detects that the engine is running (ignition speed exceeded), the direct configuration is disabled.

6

Technical Data

Name plate



1	S/N	serial number (numeric)
2	S/N	manufactured date (YYMM)
3	S/N	serial number (as Barcode)
4	P/N	item number
5	REV	item number revision
6	P/N+REV	item number + revision (Barcode)
7	Type	description
8	Type	description (as Barcode)
9	Details	technical data
10	UL	UL sign

Measuring values, voltages

λ/Δ

- Measuring voltages	[1] 120 Vac
	Rated value (V _n) 69/120 Vac
	Maximum value (V _l max) max. 150 Vac
	[4] 400 Vac
	Rated value (V _n) 231/400 Vac
	Maximum value (V _l max) max. 300 Vac
- Setting range (prim)	0.050 to 65.000 kVac
- Setting range (sec)	[1] λ 50 to 125 Vac Δ 50 to 114 Vac
	[4] λ 50 to 480 Vac Δ 50 to 380 Vac
- Measuring frequency	50/60 Hz (40.0-70.0 Hz)
- Accuracy	Class 1
- Input resistance per path	[1] 0.21 MΩ
	[4] 0.7 MΩ
- Maximum power consumption per path	< 0.15 W

Measuring values, currents

galvanically isolated

- Measuring current	[../1] Rated value (I _n)/1 A
	[../5] Rated value (I _n)/5 A
- Accuracy	Class 1	
- Linear measuring range	Generator (terminals x/x)	3.0 × I _n
	Mains/ground current (terminals x/x)	1.5 × I _n
- Maximum power consumption per path	< 0.15 W	
- Rated short-time current (1 s)	[../1 / A]	50.0 × I _n
	[../5 A]	10.0 × I _n

Ambient variables

- Power supply	12/24 Vdc (9.5-32.0 Vdc)	
- Intrinsic consumption	max. 20 W	
- Ambient temperature	Storage	30+80 °C / 22+176 °F
	Operation	20+70 °C / 4+158 °F
- Ambient humidity	95 %, non condensing	

- Discrete inputs** ————— **galvanically isolated**
- Input range ($U_{Cont, digital\ input}$) Rated voltage 12/24 Vdc (6-32 Vdc)
 - Input resistance..... approx. 6.8 k Ω
- Relay outputs** ————— **potential free**
- Contact material AgCdO
 - General purpose (GP) ($U_{Cont, relay\ output}$)

AC	2.00 Aac@250 Vac
DC	2.00 Adc@24 Vdc
	0.36 Adc@125 Vdc
	0.18 Adc@250 Vdc
 - Pilot duty (PD) ($U_{Cont, relay\ output}$)

AC	B300
DC	1.00 Adc@24 Vdc
	0.22 Adc@125 Vdc
	0.10 Adc@250 Vdc
- Analog inputs (Packages P01)** ————— **freely scaleable**
- Resolution..... 10 Bit
 - 0/4-20 mA input Difference measurement, load 150 Ω
 - 0-5/10 Vdc input..... Difference measurement, input resistance approx. 16.5 k Ω
 - Pt100-/Pt1000 input for measuring resistances according to IEC 751

[Pt100]	2/3-conductor measurement, 0-200 °C
[Pt1000]	2-conductor measurement, -30-200 °C
 - 0-180/380 Ω input difference measurement, sensor current \leq 1.9 mA
- Analog outputs (Packages P01)** ————— **isolated**
- at rated output.....freely scalable,
 - Insulation voltage.....3,000 Vdc
 - Versions 0-5 Vdc, \pm 5 Vdc, 0-10 Vdc, 0-20 mA
 - Resolution PWM..... 8/12 Bit (depending on model)
 - 0/4-20 mA output.....maximum load 500 Ω
 - 0-10 V/ \pm 5 V output internal resistance • 1 k Ω
- Pickup input** ————— **capacitive decoupled**
- Input impedance.....min. approx. 17 k Ω
 - Input voltage..... 875 mV eff

Interface

Service interface

- Version..... RS232
 - Signal level..... 5 V
- Level conversion and insulation by using FL-CABLE-RS232

CAN bus interface

isolated

- Insulation voltage 1,500 Vdc
- Version..... CAN bus
- Internal line termination..... Not available

Battery (Packages P01)

- Type..... NiCd
- Durability (at operation without power supply)..... approx. 5 years
- Battery field replacement not possible

Housing

- Type..... APRANORM DIN 43 700
 - Dimensions (W × H × D)..... 144 × 144 × 118 mm
 - Front cutout (W × H)..... 138 [+1.0] × 138 [+1.0] mm
 - Wiring..... screw-plug-terminals 1.5 mm² oder 2.5 mm²
 - Recommended locked torque 0.5 Nm
- use 60/75 °C copper wire only
use class 1 wire only or equivalent
- Weight approx. 1,000 g

Protection

- Protection system..... IP42 from front for proper installation
IP54 from front with gasket
IP21 from back
- Front folio insulating surface
- EMC test (CE) tested according to applicable EN guidelines
- Listings CE marking; UL listing for ordinary locations
- Type approval..... UL/cUL listed, Ordinary Locations

7 Accuracy

Measuring values	Display and ranges	Accuracy	Notes
Frequency			
Generator	$f_{L1N}, f_{L2N}, f_{L3N}$	15.0-85.0 Hz	1 % -
Busbar	f_{L12}	15.0-85.0 Hz	1 % -
Mains	$f_{L1N}, f_{L2N}, f_{L3N}$	40.0-85.0 Hz	1 % -
Voltage			
Generator	$V_{L1N}, V_{L2N}, V_{L3N}$	0-400 V	1 % Transformer ratio adjustable
	$V_{L12}, V_{L23}, V_{L31}$	0-400 V	1 %
Busbar	V_{L12}	0-400 V	1 % Transformer ratio adjustable
Mains	$V_{L1N}, V_{L2N}, V_{L3N}$	0-400 V	1 % Transformer ratio adjustable
	$V_{L12}, V_{L23}, V_{L31}$	0-400 V	1 %
Current			
Generator	I_{L1}, I_{L2}, I_{L3}	0-9,999 A	1 % -
Max. value	I_{L1}, I_{L2}, I_{L3}	0-9,999 A	1 % Slave pointer
Mains	I_{L1}	0-9,999 A	1 % -
Real power			
Current total real power value		32.0-0+32.0 MW	2 % -
Reactive power			
Current value in L1, L2, L3		32.0-0+32.0 Mvar	2 % -
cos			
Current value cos L1		0.00-1.00-0.00	2 % -
Miscellaneous			
Real energy		0-4,200 GWh	2 % not calibrated
Operating hours		0-65,000 h	-
Maintenance call		0-9,999 h	-
Start counter		0-32,750	-
Battery voltage		10-30 V	1 % -
Pickup speed		$f_N \pm 40\%$	-
Analog inputs (Packages P01)			
0/4-20 mA		freely scaleable	-
Pt100		0-250 °C	not calibrated
0-180 Ohm		freely scaleable	for VDO sensors
0-360 Ohm		freely scaleable	for VDO sensors

Reference conditions (to measure the accuracy):

- Input voltage..... sinusoidal rated voltage
- Input current..... sinusoidal rated current
- Frequency rated frequency $\pm 2\%$
- Power supply rated voltage $\pm 2\%$
- Power factor cos 1.00
- Ambient temperature 23 °C ± 2 K
- Warm-up period..... 20 minutes



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