

# High Tech Line 3

Withdrawable 19" Relays

# High Tech Line

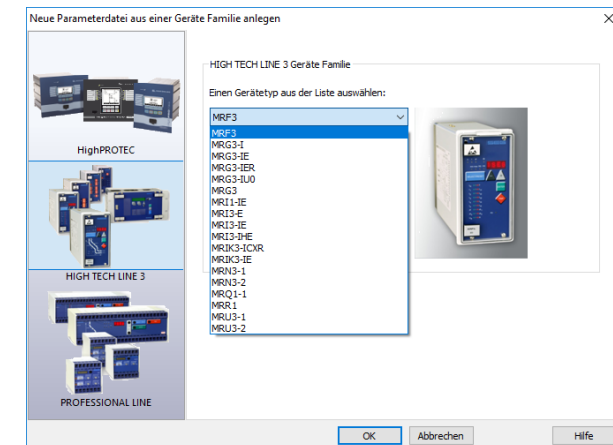
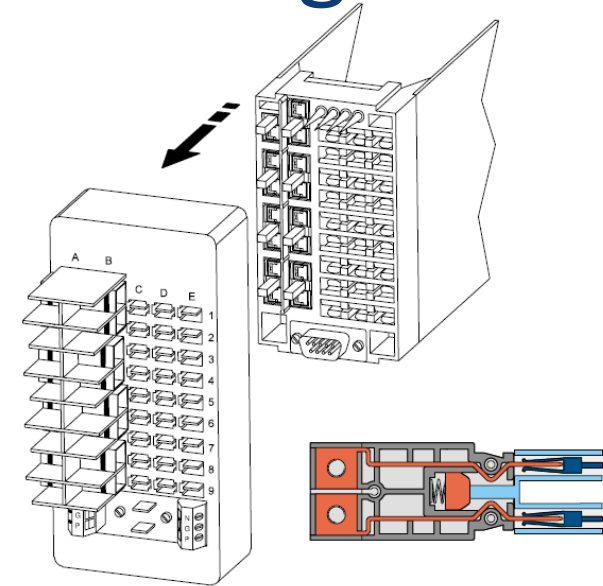
Reliable comprehensive protection in compact housing

- Overcurrent protection
- Voltage Protection
- Frequency protection
- Mains decoupling
- Generator protection
- Motor protection
- Auxiliary relays



# High Tech Line – Why overcomplicate things?

- 19" racks - fully withdrawable
- Door mounting –withdrawable and sealable
- Panel mounting – fully withdrawable
- Fault / disturbance recorder (MR series)
- Intuitive HMI
- Display (of primary values) (MR series)
- Easy setting software – Smart view
- Compact form factor

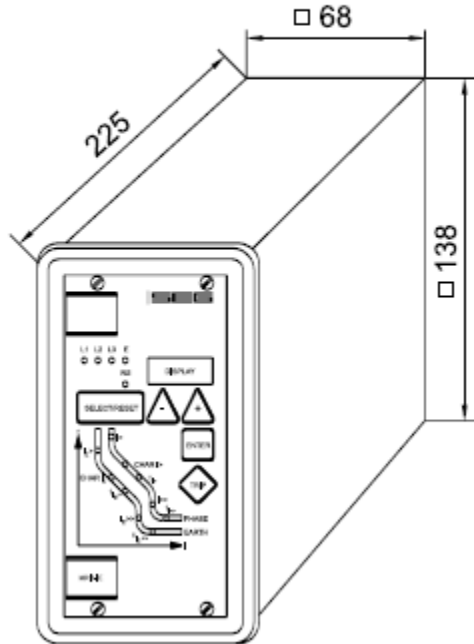




# Mounting Option 1 – In the Front door



Flush mounting D-housing

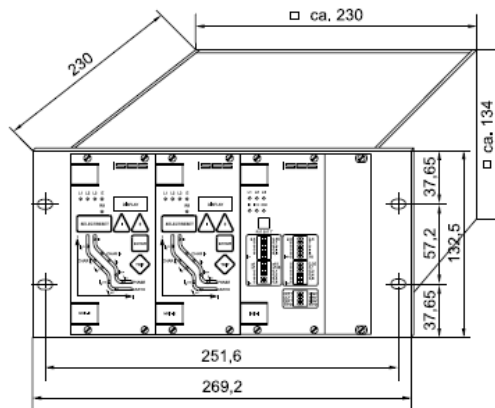


# Mounting Option 2 – Into 19" racks (front door)

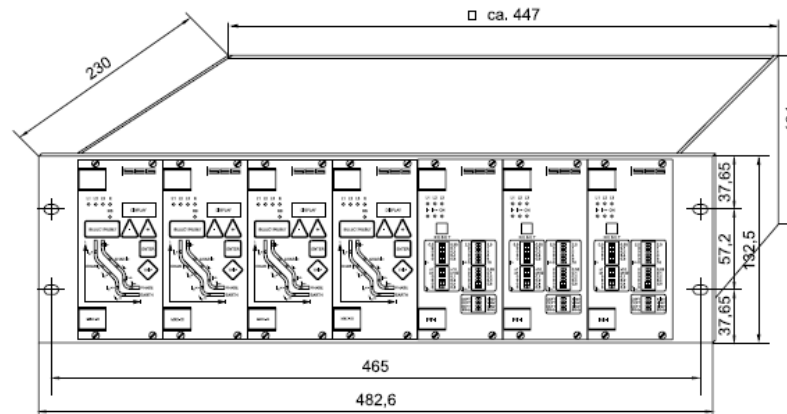


19" subunit rack for door installation A-housing

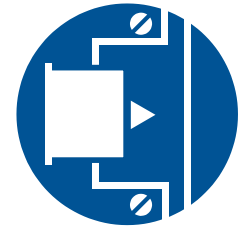
HTL-3F42



HTL-3F84

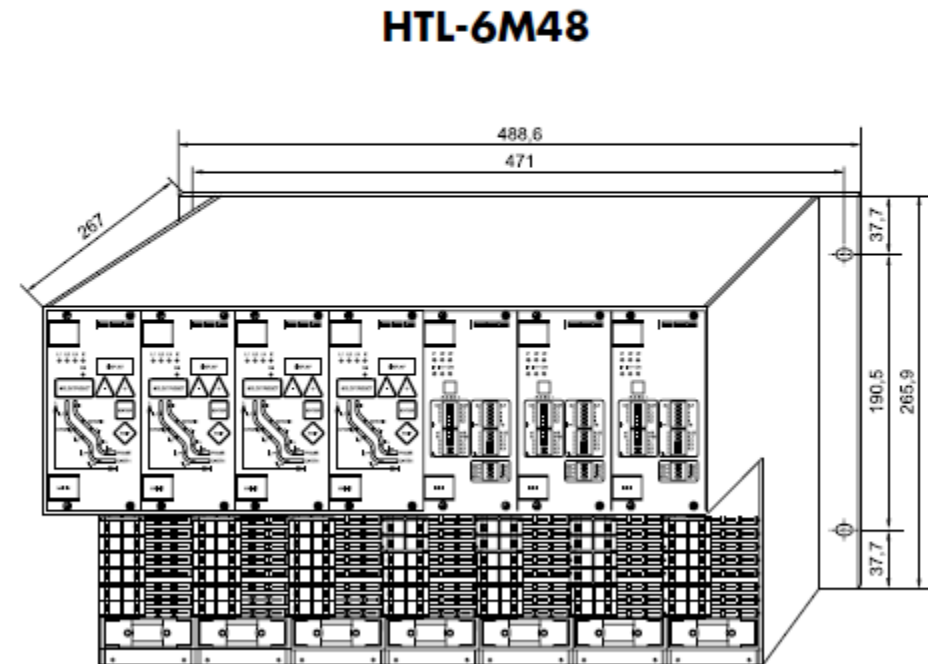
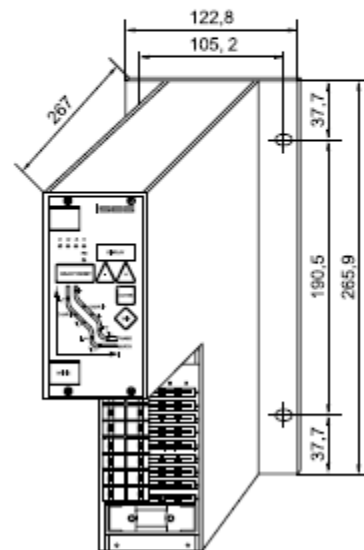
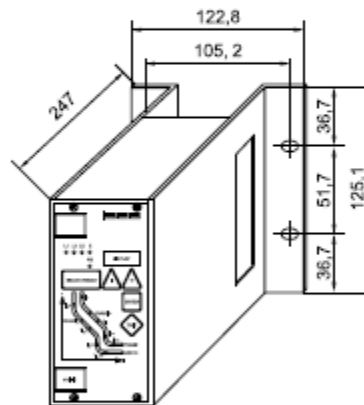


# Mounting Option 3 – Mounting plate



## Mounting plate set-up A-housing

## 19" subunit rack for panel mounting A-housing (also available with 42TE)



All dimensions in mm

# HTL3 Device Names Legend

- MRI = **Current** based protection (Options: TOC and EOC directional features, sensitive earth, voltage controlled, thermal replica, control, modbus)
- MRU = **Voltage** based protection (Over- / Undervoltage, Negative sequence,...)
- MRN = **Mains (Net)** decoupling (Voltage, frequency, vector surge, Options: V(t), ROCOF, additional f-elements, modbus)
- MRF = **Frequency**
- MRG = **Generator** (voltage, frequency, ROCOF, vector jump, options: EOC directional feature, residual voltage)
- MRR = **Rotor** earth fault protection
- MRP = directional active **Power**
- MRS = negative **Sequence** protection
- MRQ = field failure relay (**impedance**)
- MRL = **lockout** relay
- MRA = **trip circuit** supervision
- MRM = **motor** protection
- MRT = **test** unit
- IRI = **Current** based protection (e.g. 64 REF)
- IRU = **Voltage** based protection

# HTL3 Order Code Legend

- I = current
- I1 = 1A phase CTs
- I5 = 5A phase CTs
- E1 = 1A earth CTs
- E5 = 5A earth CTs
- X1 = 1A sensitive earth CTs
- X5 = 5A sensitive earth CTs
- LE5 = just earth current input 5A
- K = Auto Reclosure
- T = Thermal Replica
- C = control
- U = voltage
- U0 = residual voltage
- U1/U4 = rated voltage (e.g for 51V)
- R1 = directional feature or rated voltage
- A = 19" rack
- D = flush mounting
- M = modbus



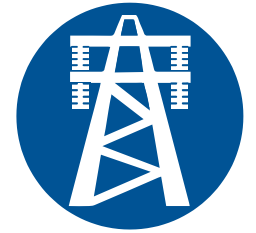
# HTL3 Order Code Example

## MRI3 Time Overcurrent and Earth Fault Current Relay

	MRI3					
3-phase current I>, I>> Rated current	none 1 A 5 A	*	I1 I5			
Phase fault directional feature Rated voltage <sup>2</sup>	none 100 V			*	R1	
Earth current measuring Rated current	none standard 1 A 5 A sensitive 1 A 5 A			*	E1 E5 X1 X5	
Directional feature in earth path Rated voltage <sup>2</sup> in earth circuits	none 100 V				*	R1
Housing (12 TE)	19"-rack Flush mounting				A D	
Communication protocol RS485 Pro Open Data; MODBUS RTU						* M

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- X1 = 1A sensitive earth CTs
- X5 = 5A sensitive earth CTs
- LE5 = just earth current input (5A)
- K = Auto Reclosure
- T = Thermal Replica
- C = control
- U = voltage
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# Overcurrent (MRI3, MRIK3,+++)



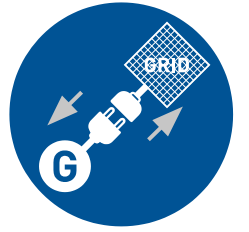
Product Overview								
MRI3-I						1	1	1
MRI3-IR				1		1	1	1
MRI3-IE			1			1	1	1
MRI3-IRE			1	1		1	1	1
MRI3-IER		1	1			1	1	1
MRI3-IRER		1	1	1		1	1	1
MRIK3-IE		1				1	1	1
MRI3-ICE	1				1		1	1
MRI3-ICER	1		1	1			1	1
MRIK3-ICE	1	1			1		1	1
MRIK3-ICER	1	1	1	1			1	1
	Control	AR	Direction E	$I_{E>}, I_{E>>}$	Direction I	$I_{I>}, I_{I>>}$	$I_{E>}$	Lock out

Function	ANSI	Description
Overcurrent ( $I_{>}$ )	50/51	Phase current protection with dependent and independent characteristic curve
Short circuit ( $I_{>>}$ )	50	Phase current protection, high set element, DEFT
Phase direction	67	Direction element for $I_{>}, I_{>>}$ with separate adjustment parameters for each direction
Earth fault current ( $I_{E>}$ )	50N/51N	Earth fault current protection with dependent and independent characteristic curve
Earth short circuit ( $I_{E>>}$ )	50N/51N	Earth current protection, high set element, DEFT
Sensitive earth current	50S/51S	Sensitive earth fault current measurement for resonant earthed/isolated grids
Earth current direction	67N	Direction element $I_{E>}, I_{E>>}$ with separate adjustment parameters for each direction
AR	79	Auto-reclosing, up to 4 shots
Lock out	86	Free assignment of functions, common indication
Switch failure protection	50BF	Zero current criteria and switching time supervision

Control functions
Control of the circuit breaker via potential free output relay
Supervision of the circuit breaker via wide range digital input
Display of the CB position on the front panel
Remote control of the CB settings via a communication interface
Switching from local to remote control, with a separate password.
Integrated operation cycle counter
Integrated I <sup>2</sup> t recorder, pre-settable with alarm
Operation of the CB via three independent (interlocking) methods
a) via digital inputs, assignable to logic functions
b) via the scada interface
c) via the front panel

Additional functions	Description
I <sup>2</sup> t-counter	only C-Version Breaking capacity counter, pre-settable
Fault data	5 to 25 events All measurement values at moment of tripping, non-volatile
Disturbance value recorder	max. 16 s Diverse trigger possibilities, volatile
Output relay matrix	Free function allocation
Reset matrix	Manual i.e. Auto-reset for every function
Digital inputs	2 to 7 Reset, block, free matrix
2 Parameter sets	Manual, Interface, Digital Inputs
Communication	RS485 Modbus RTU i.e. SEG Pro Open Data
Clock module	Display for date, time and time stamp
Display of primary value	Display adjustment of the transformer ratio





# Mains decoupling

- MRN3 Voltage, Frequency, ROCOF, Vector jump  
Options: 2 flexible voltage time characteristics  $V(t)$ , modbus
- MRU3 Voltage, Residual Voltage  
Options: Unbalance ( $U_2$ ), modbus
- MRF3 Frequency, ROCOF



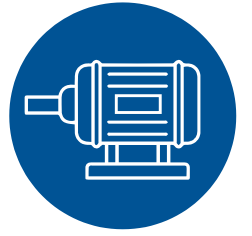
# Generator Protection

- MRG3 Voltage, Frequency, ROCOF, Vector Surge, Overcurrent, Earth current  
Options: Residual Voltage, directional earth current, modbus
- Generator Auxiliary Relays
  - MRP2 Directional Active Power
  - MRS1 Negative Sequence
  - MRQ1 Field Failure Relays
  - MRR1 Rotor Earth Fault



# Motor Protection

- MRM3 max start up time, thermal replica, modbus





# Auxiliary Relays

- MRL1 Lockout Relay
- MRR1 Rotor Earth Fault
- MRA1 Trip circuit supervision
- MRT1 Test unit
- IRI1
- IRU1



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electronics

THANK YOU