› Monitoring Relays

Current Control Relays

Overcurrent or undercurrent control, Selectable latching (memory) function

- Overcurrent or undercurrent control
- Control of AC and DC currents
- Automatic recognition of AC/DC
- 2 Changeover relays to cover 3 ranges of measurement (between 2 mA and 500 mA or between 0.1 A and 10 A)
- True RMS measurement
- Selectable latching (memory) function

HIL

EIL

HIH

EIH

Selection guide

Type	Function	Measuring range	Output	Power Supply	Part-Numbers
HIL	Overcurrent or undercurrent control Selectable latching (memory) function	2 → 500 mA I1 - G: 2 → 20 mA I2 - G: 10 → 100 mA I3 - G: 50 → 500 mA	2 x 5 A (changeover)	24 → 240 V~	**84871120**
EIL	Overcurrent or undercurrent control Selectable latching (memory) function	2 → 500 mA I1 - G: 2 → 20 mA I2 - G: 10 → 100 mA I3 - G: 50 → 500 mA	1 x 5 A (changeover)	24 → 240 V~	**84871025**
HIH	Overcurrent or undercurrent control Selectable latching (memory) function	0.1 → 10 A I1 - G: 0.1 → 1 A I2 - G: 0.5 → 5 A I3 - G: 1 → 10 A	2 x 5 A (changeover)	24 → 240 V~	**84871130**
EIH	Overcurrent or undercurrent control Selectable latching (memory) function	0.1 → 10 A I1 - G: 0.1 → 1 A I2 - G: 0.5 → 5 A I3 - G: 1 → 10 A	1 x 5 A (changeover)	24 → 240 V~	**84871035**

	HIL	EIL	HIH	EIH
Timing				
Delay on threshold crossing (Tt)	0.1 → 3 s			
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 2%			
Power ON delay	< 300 ms			
Reset time max	1500 ms			
Delays on power up (Ti)	1 → 20 s (0, +10%)			
Supply				
Voltage type for actuating	AC/DC			
Rated control supply voltage Un at AC	24-240 V~			
AC supply voltage frequency 50/60HZ	± 10%			
Rated control supply voltage Un at DC	24-240 V⎓			
Voltage supply tolerance	-15% / +10%			
Operating range	20.4 → 264 V~			
Polarity with DC voltage	No			
Galvanic isolation of power supply/Input circuit	No			
Galvanic isolation of power supply/Output circuit	Yes			
Galvanic isolation of Input circuit/Output circuit	Yes			

	HIL	EIL	HIH	EIH
Immunity from micro power cuts: typical	50 ms			
Maximum Power consumption at Un	AC: 3.7 VA @ 265 V, 50 Hz AC: 4 VA @ 265 V, 60 Hz DC: 1.2W			
Insulation				
Rated Insulation voltage (according to IEC/EN 60664-1)	250 V			
Insulation coordination (according to IEC/EN 60664-1)	Overvoltage category III; pollution degree 3			
Insulation resistance supply and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 MOhm(s) (500 V⎓)			
Insulation resistance Input circuit and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 MOhm(s) (500 V⎓)			
Insulation resistance between supply and Input circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 1 MOhm(s) (500 V⎓)			
Dielectric strength (according to IEC/EN 60664-1 and IEC/EN 60255-27)	2 kV / 1min / 1 mA / 50 Hz			
Impulse voltage (according to IEC/EN 60664-1 and IEC/EN 60255-27)	4 kV wave 1.2 / 50 µs			
Input and measuring specifications				
Measurement range	2 → 500 mA I1 - G: 2 → 20 mA I2 - G: 10 → 100 mA I3 - G: 50 → 500 mA		0.1 → 10 A I1 - G: 0.1 → 1 A I2 - G: 0.5 → 5 A I3 - G: 1 → 10 A	
Number of measuring ranges	3			
Display accuracy (according to IEC/EN 60255-1)	± 10% of full scale			
Measuring error with drift temperature	0.05%/°C			
Measuring error with drift voltage	± 1% across the whole range			
Measurement method or type	Shunt			
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 0.5%			
Input resistance	I1 - G: 5 Ω I2 - G: 1 Ω I3 - G: 0.2 Ω		I1 - G: 0.1 Ω I2 - G: 0.02 Ω I3 - G: 0.01 Ω	
Permanent overload at 25 °C	I1 - G: 0.4 A I2 - G: 1 A I3 - G: 2 A		I1 - G: 2 A I2 - G: 11 A I3 - G: 11 A	
Peak overload < 1 ms at 25 °C	N/A			
Peak overload < 1 s at 25 °C	I1 - G: 1 A I2 - G: 2 A I3 - G: 4 A		I1 - G: 17 A I2 - G: 20 A I3 - G: 50 A	
Peak overload < 3 s at 25 °C	N/A			
Current threshold adjustment	10 → 100% of the range			
Frequency of measured signal	0 Hz, 40 → 70 Hz			
Max. measuring cycle time	20 ms @ 40 Hz			
Current threshold hysteresis	5 → 50% of threshold			
Maximum 3-phase voltage	277 / 480 V (3-phase mains with earth)			
Output specifications				
Maximum switching power (resistive)	1250 VA			
Maximum rate (at max switching power)	360 operations/hour at full load			
Maximum breaking current	5 A AC/DC			
Minimum breaking current	10 mA / 5 V⎓			

	HIL	EIL	HIH	EIH
Operating categories (according to IEC/EN 60947-5-1 and IEC/EN 60947-5-2)	AC 15 - 1 A @ 250V, DC 13 - 1 A @ 24V			
Nominal rating	5 A			
Voltage breaking capacity (according to IEC/EN 60255-1)	250 V~ / 24 V⎓			
Electrical life (operations)	1 x 10^5			
Mechanical life (operations)	30 x 10^6			
1 or 2 changeover relays, AgNi (cadmium-free)	2 C/O	1 C/O	2 C/O	1 C/O
Functions				
Automatic recognition of AC/DC	True			
Overcurrent or undercurrent control Selectable latching (memory) function	True			
Control of AC and DC currents	True			
Overcurrent or undercurrent control	True			
General characteristics				
Temperature limits use (°C) (according to IEC/EN 60068-2)	-20 → +50			
Temperature limits stored (°C) (according to IEC/EN 60068-2)	-40 → +70			
MTBF in hours (according to IEC/TR 62380)	10838387.51			
MTTF (according to IEC/TR 62380)	1237.26 years			
Led status indicator	Un: Green LED (power on) R: Yellow LED (relay status ON) OFF LED (under/overcurrent) Flashing LED during time delay Un, R: Flashing LED (Position error) No Tt & Ti LEDs			
Creepage distance and clearance (according to IEC/EN 60664-1)	4 kV / 9.4 mm Pollution degree 3			
IP degree of protection Terminal block (according to IEC/EN 60529)	IP20			
IP degree of protection Housing (according to IEC/EN 60529)	IP30			
IP degree of protection Front face (according to IEC/EN 60529)	IP50			
Vibration resistance (according to IEC/EN 60255-21-1)	20 m/s^2 10 Hz → 150 Hz			
Relative humidity no condensation (according to IEC/EN 60068-2-30)	2 x 24h cycle 95% RH max. without condensation 55 °C			
Electromagnetic compatibility - Immunity to electrostatic discharges (according to IEC/EN 61000-4-2)	Level III (Air 8 kV / Contact 6 kV)			
Immunity to radiated, radio-frequency, electromagnetic field (according to IEC/EN 61000-4-3)	Level I (1 V/m: 2.0 GHz → 2.7 GHz) Level II (3 V/m: 1.4 GHz → 2.0 GHz) Level III (10 V/m: 80 MHz → 1 GHz)			
Immunity to rapid transient bursts (according to IEC/EN 61000-4-4)	Level III (direct 2 kV / Capacitive coupling clamp 1 kV)			
Immunity to shock waves on power supply (according to IEC/EN 61000-4-5)	Level III (2 kV / common mode 2 kV/residual current mode 1 kV)			
Immunity to radio frequency in common mode (according to IEC/EN 61000-4-6)	Level III (10 V rms: 0.15 MHz to 80 MHz)			
Immunity to voltage dips and breaks (according to IEC/EN 61000-4-11)	0% residual voltage, 1 cycle 70% residual voltage, 25/30 cycles			
Mains-borne and radiated emissions (according to EN55032 (CISPR22), EN55011 (CISPR11))	-	Class A	-	Class A

	HIL	EIL	HIH	EIH
Fixing: Symmetrical DIN rail (according to IEC/EN 60715)	35 mm			
Mounting position	All positions			
Drop to concrete floor (according to IEC/EN IEC 60068-2-31)	High: 1 m			
Rigid connecting capacity without ferrule	1 x 4² - 2 x 2.5² mm² 1 x AWG11 - 2 x AWG14			
Flexible connecting capacity with ferrule	1 x 2.5² - 2 x 1.5² mm² 1 x AWG14 - 2 x AWG16			
Tightening torque (according to IEC 60947-1)	0.5…0.6 N.m			
Housing material (according to IEC/EN 60695-2-11)	Self-extinguishing Incandescent wire test			
Shock and bump tests (according to IEC/EN 60255-21-2)	15 g - 11 ms			
Short interruption on power line (according to IEC/EN 61000-4-11)	0% residual voltage, 250/300 cycles			
Delivery: open terminals	True			
Type of electric connection	Screw connection			
Packaging	Compact carton recycled and recyclable No plastic			
Outline Dimensions				
Depth (mm)	69	104	69	104
Height (mm)	90	83	90	83
Weight (g)	115	81	115	81
Width (mm) according to DIN 43880	35	22.5	35	22.5
International Directives & Conformity Certification				
RoHS 2015/863/UE	Yes			
REACh regulation N°1907/2006/CE	Yes			
UK REACh regulation 2023 N°722	Yes			
LVD 2014/35/UE	Yes			
Directive 2012/19/EU	Yes			
European Directive 2005/20/CE	Yes			
ISO 14001: 2015	Yes			
Certification CE	Yes			
Certification UL	Yes			
Certification UKCA	Yes			
Certification CCC	Yes			

Principles

HIL, EIL, EIH and HIH monitoring relays are designed to control AC or DC currents.

They automatically recognise the shape of the DC or AC signal (50 or 60 Hz) and can control up to 10 A in DC. Above this level, a current transformer can be connected.

General principle:

The operating mode is set by the user.

A switch is used to select over or undercurrent modes, with or without latching.

The switch position, and hence the operating mode, is read by the product on energisation.

If the switch is set to a non-conforming position, the product goes into fault mode, the output relay stays open, and the LEDs flash to signal the position error.

If the switch position changes while the unit is operating, all the LEDs flash but the product continues to work normally with the function selected on energisation prior to the change of position.

The LEDs return to their normal state if the switch is reset to its initial position defined before the last energisation.

The over or undercurrent threshold value is set by a graduated potentiometer as a percentage of the I scale to be monitored.

The hysteresis is set by a graduated potentiometer from 5 to 50% of the preset threshold. The hysteresis value cannot be higher than the extremes of the measurement range.

An adjustable time delay from 1 to 20 s on energisation is used to prevent current peaks or troughs on starting.

Operating principles

HIL, EIL, EIH and HIH: Over-current function, under-current function with memory

AC/DC control with memory.

The output relay changes state at the end of time delay Tt and remains latched in this position. To reset the memory function the auxiliary supply must be disconnected.

Over-current function (UPPER).

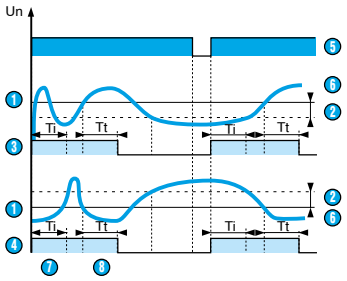
The time delay on energisation Ti prevents current peaks due to motor starting.

The delay on upward crossing of threshold Tt provides immunity to transients and other interference, thereby preventing spurious triggering of the output relay.

Under-current function (UNDER).

The time delay on energisation Ti prevents the occurrence of current troughs. The delay on downward crossing of threshold Tt provides immunity to random dips, thereby preventing spurious triggering of the output relay.

Note: In underload function, the absolute value of the hysteresis cannot be greater than the measurement range maximum.



1. Threshold
2. Hysteresis
3. UPPER function
4. UNDER function
5. Unit power-up
6. Controlled current
7. Delays on power up
8. Delay on threshold crossing

HIL, EIL, EIH and HIH: Over-current function, under-current function without memory

AC/DC control without memory.

When the value of the controlled current, either AC or DC, reaches the threshold displayed on the front face, the output relay changes state at the end of time delay Tt.

It returns instantly to the initial state when the current drops below the hysteresis threshold, or when the power supply is disconnected.

Over-current function (UPPER).

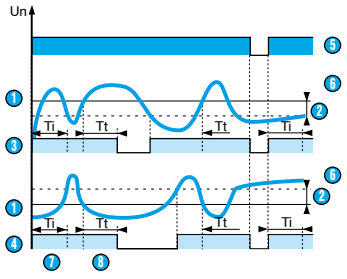
The time delay on energisation Ti prevents current peaks due to motor starting.

The delay on upward crossing of threshold Tt provides immunity to transients and other interference, thereby preventing spurious triggering of the output relay.

Under-current function (UNDER).

The time delay on energisation Ti prevents the occurrence of current troughs. The delay on downward crossing of threshold Tt provides immunity to random dips, thereby preventing spurious triggering of the output relay.

Note: In underload function, the absolute value of the hysteresis cannot be greater than the measurement range maximum.

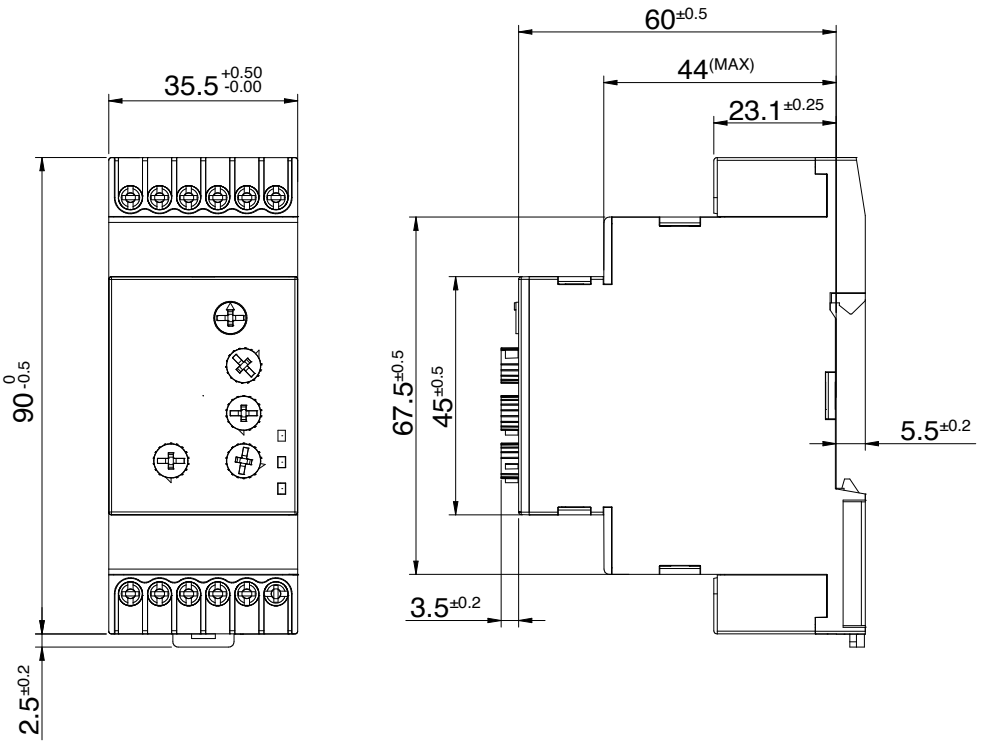


1. Threshold
2. Hysteresis
3. UPPER function
4. UNDER function
5. Unit power-up
6. Controlled current
7. Delays on power up
8. Delay on threshold crossing

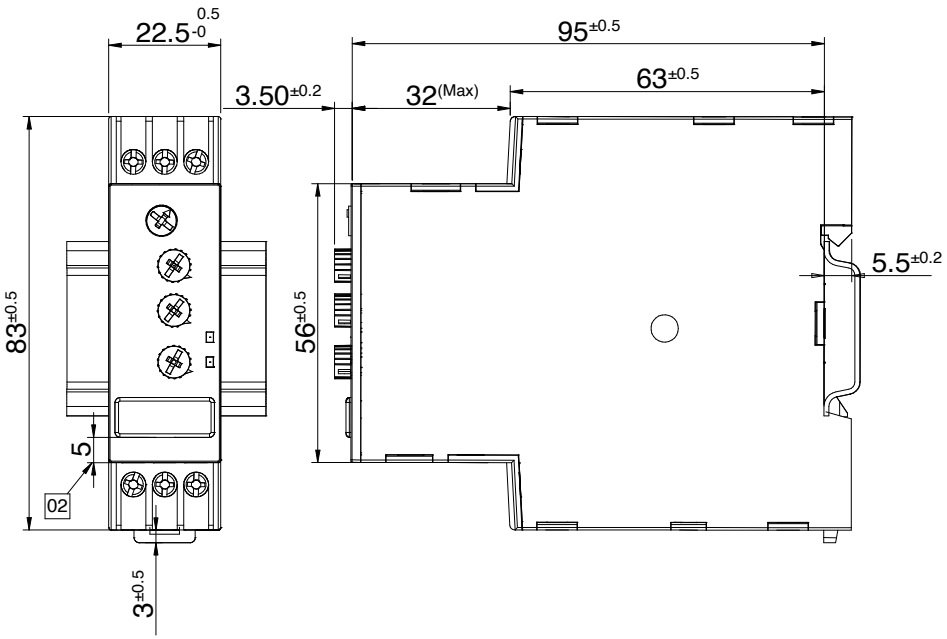
Product Dimensions

Front and Side

HIL-HIH



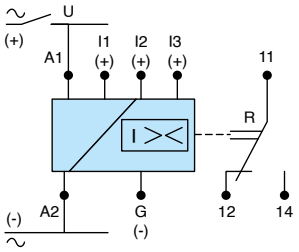
EIL-EIH



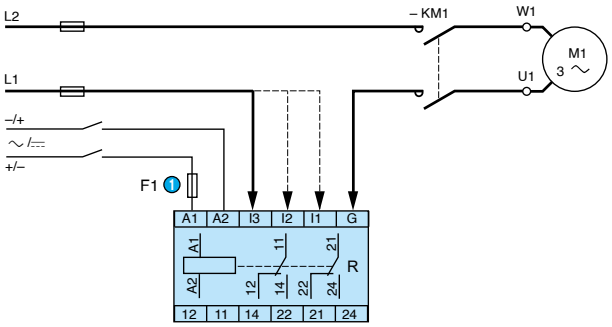
Electronic & Wiring Diagrams

Connections

EIL-EIH



HIL-HIH



1 100 mA fast-blow fuse