DIB81

1-phase True RMS AC/DC over or under current monitoring relay



Benefits

- **Multiple measurement ranges in one item**. Thanks to multi-input.
- **Fast installation**. Thanks to the ease of use of push-in terminals.
- **Wiring costs reduction**. Avoiding the need for dedicated tools thanks to push-in terminals.
- **Long-term clamping reliability**. Thanks to push-in terminals.
- **Multiple power sources in one item**. Thanks to the wide range of supply voltage.
- **Compactness of the housing**. To save space inside the cabinet or to fit into the cabinet without having to redesign it.
- **Output and status LED indication**. For quick troubleshooting.

Description

DIB81s are over or under current monitoring relays.

Inputs can be connected directly to the load for currents from 0.1 mA to 10 A AC/DC or through current transformers for AC currents or through external shunt for DC currents higher than 10 A.

Thanks to the latch function, the alarm position of the relay output can be maintained.

Inhibit function can be used to avoid relay operation when not desired (maintenance, transitions).

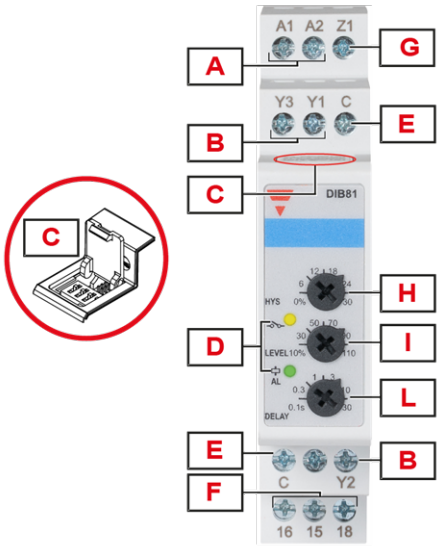
Main features

- Over or under current setpoint adjustment.
- Alarm ON delay adjustment.
- Hysteresis adjustment.
- 24 to 240 V AC/DC power supply.
- Push-in or screw terminals.
- 17.5 mm DIN rail housing.

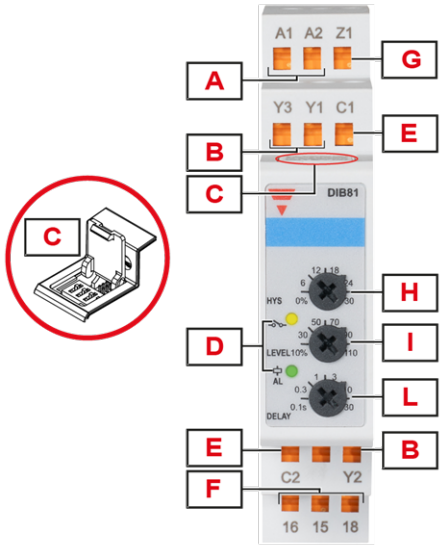
Order code

Mounting	Measuring ranges	Terminals	Component name/part number
DIN-rail	From 0.1 to 50 mA AC/DC	Screw	**DIB81CM2450MAN**
		Push-in	**DIB81CM2450MAP**
	From 10 mA to 10 A AC/DC	Screw	**DIB81CM2410AN**
		Push-in	**DIB81CM2410AP**

Structure



50 mA models



10 A models

Element	Component	Description
A	Power supply terminals	24 to 240 V AC/DC
B	Current input terminals	Input current measurement
C	DIP switches	Setting the input range, latch / inhibit function, monitoring function
D	Information LEDs	Bicolour: green for device ON / red for signal alarm status Yellow for relay output status
E	Common input terminal	Reference terminal for current input and latch / inhibit input
F	Output terminals	SPDT relay output
G	Latch / inhibit input terminal	To enable or disable the latch or inhibit function
H	Hysteresis dial (HYS)	Hysteresis setpoint adjustment
I	Current level dial (LEVEL)	Current setpoint adjustment
L	Delay time dial (DELAY)	Alarm ON delay time adjustment

Features

Power supply

Terminals	A1, A2
Overvoltage category	III (EN 61010-1)
Voltage range	24 to 240 V AC/DC ± 15%
Frequency range	50 to 60 Hz ± 10% sinusoidal waveform
Consumption	≤ 0.8 W ≤ 3.2 VA

Inputs

50 mA models

Terminals	Y1, Y2, Y3, C ***NOTE**: connect C terminals indistinctly with the input terminals (Y1, Y2, Y3) or the latch / inhibit terminal (Z1).*		
Measuring ranges	***Input terminals***	***Selectable by DIP switches***	
	Y1, C: 0.1 to 5 mA AC/DC	0.1 to 1 mA AC/DC	Internal resistance: 30 Ω Max current: 50 mA Max current for 1 s: 100 mA
		0.2 to 2 mA AC/DC	
		0.5 to 5 mA AC/DC	
	Y2, C: for shunt or CTV	6 to 60 mV AC/DC	Internal resistance: 7 kΩ Max voltage: 2 V Max voltage for 1 s: 15 V
		15 to 150 mV AC/DC	
		0 to 333 mV AC	
	Y3, C: 1 to 50 mA AC/DC	1 to 10 mA AC/DC	Internal resistance: 3 Ω Max current: 150 mA Max current for 1 s: 500 mA
		2 to 20 mA AC/DC	
		5 to 50 mA AC/DC	
Measurement type	Directly to the load or through shunt (DC measurement). ***Note**: the input voltage cannot raise over 300 V AC/DC with respect to ground.*		
Measured variables	Current level		
Latch / inhibit terminals	Z1, C		

10 A models

<table>
<tr><td>Terminals</td><td colspan="3">Y1, Y2, Y3, C1, C2</td></tr>
<tr><td rowspan="4">Measuring ranges</td><td>Input terminals</td><td colspan="2">Selectable by DIP switches</td></tr>
<tr><td>Y1, C1:
0.4 to 4 Vp AC</td><td colspan="2">Connection through CT
Internal resistance: 70 kΩ
1-phase | 3-phase | A AC | Max. current
MI5 | MP3005 | 0.5 to 5 A | 20 A AC
MI20 | MP3020 | 2 to 20 A | 50 A AC
MI100 | MP3100 | 10 to 100 A | 250 A AC
MI500 | MP3500 | 50 to 500 A | 750 A AC
Note: MP current transformers are not suitable for under current measurement due to the output signal that is proportional to the highest current value in the 3 conductors.</td></tr>
<tr><td>Y2, C2:
0.1 to 10 A AC/DC</td><td>0.1 to 1 A AC/DC
0.2 to 2 A AC/DC
0.5 to 5 A AC/DC
1 to 10 A AC/DC</td><td>Internal resistance: 3 mΩ
Max current: 11 A
Max current for 1 s: 50 A</td></tr>
<tr><td>Y3, C1:
10 to 500 mA AC/DC</td><td>10 to 100 mA AC/DC
20 to 200 mA AC/DC
50 to 500 mA AC/DC</td><td>Internal resistance: 0.3 Ω
Max current: 700 mA
Max current for 1 s: 1.4 A</td></tr>
<tr><td>Measurement type</td><td colspan="3">Directly to the load or through external current transformer (AC measurement).
Note: the input voltage cannot raise over 300 V AC/DC with respect to ground.</td></tr>
<tr><td>Measured variables</td><td colspan="3">Current level</td></tr>
<tr><td>Latch / inhibit terminals</td><td colspan="3">Z1, C1 or Z1, C2</td></tr>
</table>

Outputs

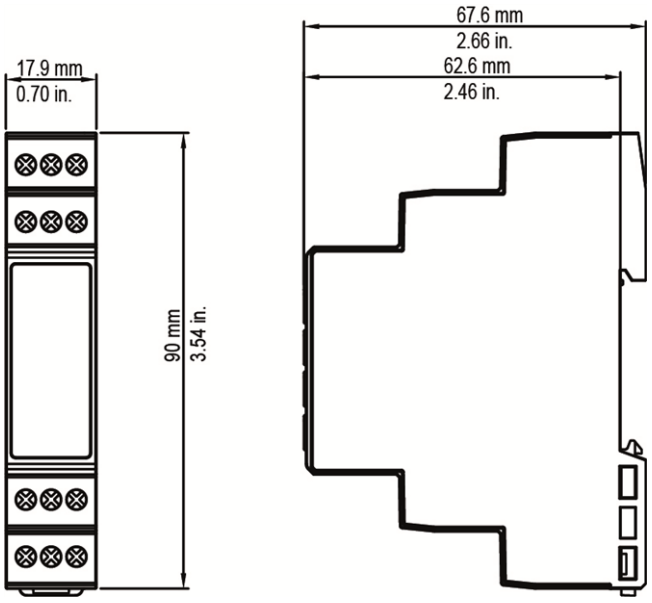
Terminals	15, 16, 18
Number of outputs	1
Type	SPDT electromechanical relay with changeover contacts
Logic	Output energised on alarm
Contact rating	**Ith:** 8 A @ 250 V AC **AC15:** 2.5 A @ 250 V AC **DC12:** 5 A @ 24 V DC **DC13:** 2.5 A @ 24 V DC
Electrical lifetime	≥ 50 x 10^3 operations (at 8 A, 250 V, cos φ= 1)
Mechanical lifetime	> 30 x 10^6 operations
Assignment	Associated to all alarm types

Insulation

Terminals	Basic
Power supply to input	4 kV impulse 1.2/50 µs
Power supply to output	
Input to output	

General

Material	Housing: Polybutylene Terephthalate (PBT) Dials: Polyamide (Nylon PA66)
	Flammability rating: V0 according to UL 94
Colour	RAL7035 (light grey)
Dimensions (W x H x D)	17.9 x 90 x 67.6 mm (0.70 x 3.54 x 2.66 in)
Weight	90 g (3.17 oz)
Terminals	**Screw**: cable size from 0.2 to 2.5 mm^2 (AWG24 to AWG12), stranded or solid **Push-in**: cable size from 0.5 to 1.5 mm^2 (AWG30 to AWG16), stranded or solid
Tightening torque	Max. 0.5 Nm (4.425 lbin)
Terminal type	Screw or push-in



Environmental

Operating temperature	-25 to 65 °C (-13 to 149 °F)
Storage temperature	-25 to 80 °C (-13 to 176 °F)
Relative humidity	5 - 95% non condensing
Protection degree	IP40
Pollution degree	2
Operating max altitude	2000 m amsl (6560 ft)
Salinity	Non saline environment
UV resistance	No

Vibration/Shock resistance

Test condition	Test
Tests with unpacked device	Vibration response (EN 60947-5-1)
	Shock (EN 60947-5-1)
Tests with packed device	Vibration random (IEC 60068-2-6) - Class 1
	Shock (IEC 60255-21-2) - Class 1
	Bump (IEC 60255-21-2) - Class 1

Class 1: monitoring devices for normal use in power plants, substations and industrial plants and for normal transportation conditions.

The packaging type is designed and implemented in such manner that the severity class parameters will not be exceeded during transportation.

Compatibility and conformity

Marking	CE RoHS COMPLIANT
Directives	2014/35/EU (LVD - Low voltage) 2014/30/EU (EMC - Electromagnetic compatibility) 2011/65/EU, 2015/863/EU (RoHS)
Standards	EN 60947-5-1 Immunity: EN 61000-6-2 Emission: EN 61000-6-3 RoHS: EN 63000
Approvals	c UL us LISTED 61010

Operating description

Device configuration

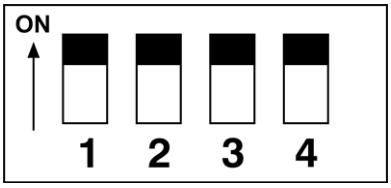
Function	Models	Connection	Description
Latch	10 A	Connection between terminals Z1, C1 or Z1, C2	When an alarm condition is triggered and the delay time expires, the relay output energises. When the alarm condition expires, the relay output de-energises as soon as the connection between the common and Z1 terminals or the power supply is interrupted.
	50 mA	Connection between terminals Z1, C	
Inhibit	10 A	Connection between terminals Z1, C1 or Z1, C2	When an alarm condition is triggered, relay output energisation can be avoided when not desired (e.g. maintenance, transients), while the red LED turns steady ON after the delay time expires. The relay output energisation can be restored as soon as the connection between the common and Z1 terminals is interrupted and the alarm is still active.
	50 mA	Connection between terminals Z1, C	

Hysteresis adjustment dial (HYS)	
Typology	Linear selection from 0 to 30% of set value
Resolution	3% setpoint increase per notch
Function	Adjustable hysteresis on relative scale

Over or under current level adjustment dial (LEVEL)	
Typology	Linear selection from 10 to 110% of full scale
Resolution	10% setpoint increase per notch
Function	Adjustable current on relative scale

Delay setting dial (DELAY)	
Typology	Logarithmic adjustment from 0.1 to 30 s
Resolution	From 100 ms/notch at 0.1 s to 10 s/notch at 30 s
Function	Adjustable alarm ON delay time on absolute scale

DIP switches	
Typology	4 switches (SW)
Function	Input range (SW1 and SW2) Latch / inhibit function (SW3) Monitoring function (SW4)



Input range - 50 mA models				
SW1	**SW2**	**Y1-C**	**Y2-C**	**Y3-C**
OFF	**OFF**	0.1 to 1 mA AC/DC	6 to 60 mV AC/DC	1 to 10 mA AC/DC
OFF	**ON**	0.2 to 2 mA AC/DC	15 to 150 mV AC/DC	2 to 20 mA AC/DC
ON	**OFF**	0.5 to 5 mA AC/DC	0 to 333 mV AC	5 to 50 mA AC/DC
ON	**ON**	Not used	Not used	Not used

Input range - 10 A models				
SW1	**SW2**	**Y1-C1**	**Y2-C2**	**Y3-C1**
OFF	**OFF**	0.4 to 4 Vp AC	0.1 to 1 A AC/DC	10 to 100 mA AC/DC
OFF	**ON**	Not used	0.2 to 2 A AC/DC	20 to 200 mA AC/DC
ON	**OFF**	Not used	0.5 to 5 A AC/DC	50 to 500 mA AC/DC
ON	**ON**	Not used	1 to 10 A AC/DC	Not used

SW3	**Latch / inhibit function**
OFF	Inhibit
ON	Latch

SW4	**Monitoring function**
OFF	Undercurrent
ON	Overcurrent

Alarms

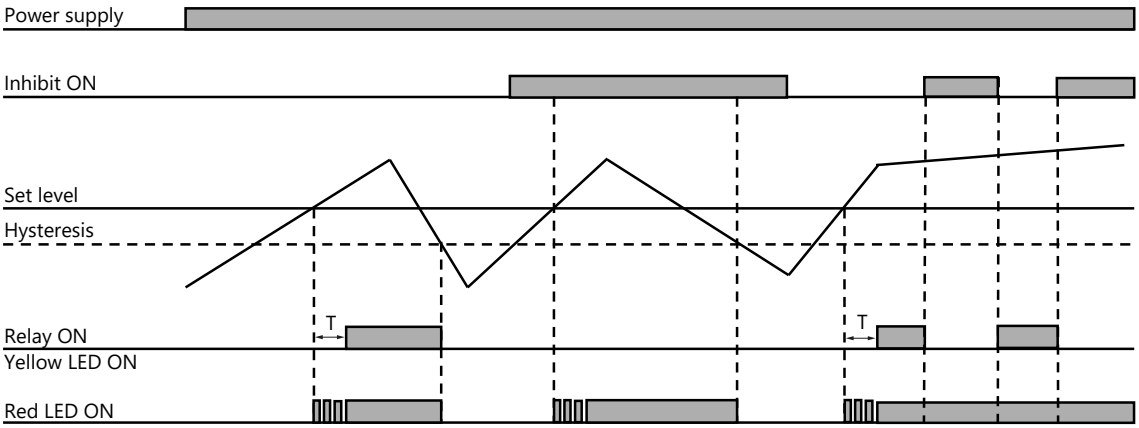
Over or under current causes output relay energisation after the delay time has elapsed.

Current level alarm	
Reaction time	Alarm ON < 100 ms Alarm OFF < 100 ms
Current level setting	From 10 to 110%
Power ON delay	1 s ± 0.5 s
Repeatability	0.5% of the measured value
Alarm ON delay	Adjustable from 0.1 to 30 s

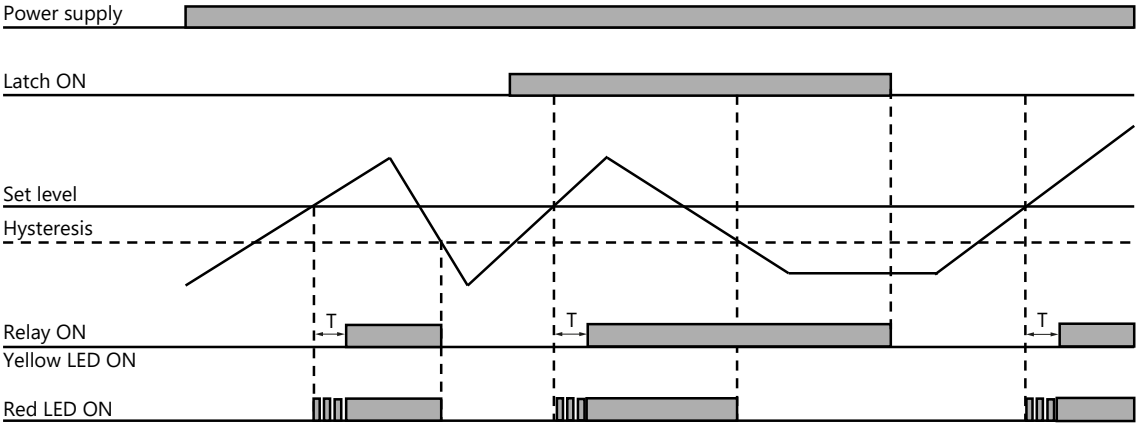
Information LEDs

Colour	Status		Description
Green (⏚) / Red (AL) (bicolour)	Power supply / Alarm	Green ON (steady)	Power supply ON and alarm OFF
		Red ON (steady)	Alarm ON for over or under current
		Green / red blinking at 2 Hz	Alarm triggered and delay time elapsing
		Green / red blinking at 5 Hz	Alarm ON for improper use: • more than one measuring input connected at the same time • invalid measure range selected by DIP-switch
Yellow (-o-o-)	Relay output	ON	Energised
		OFF	De-energised

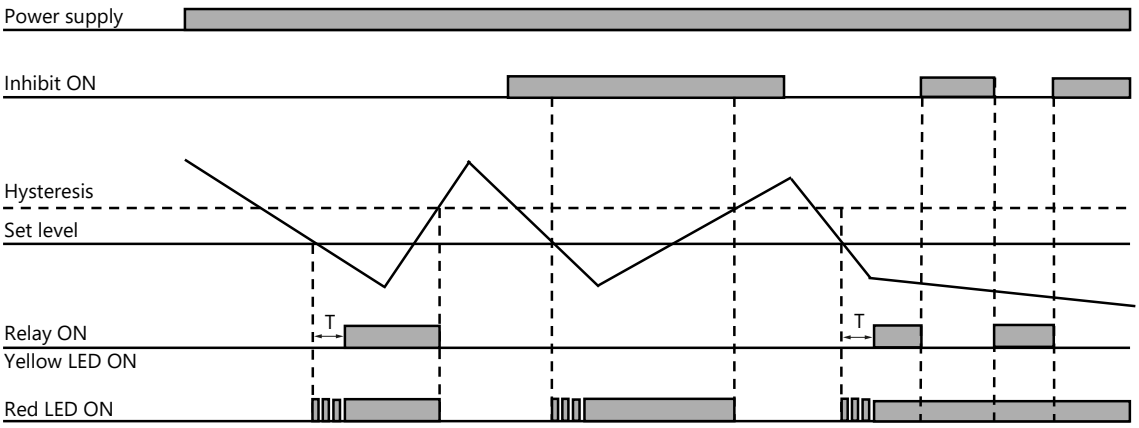
Operating diagrams



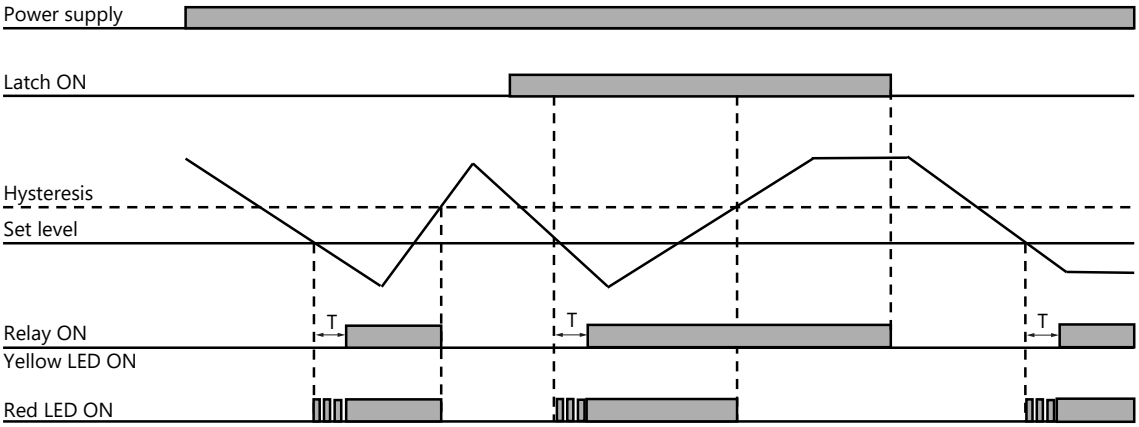
Overcurrent and inhibit function



Overcurrent and latch function



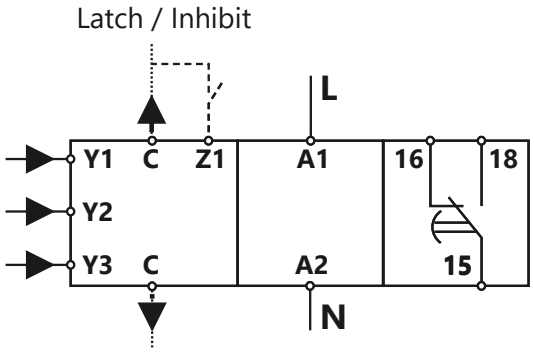
Undercurrent and inhibit function



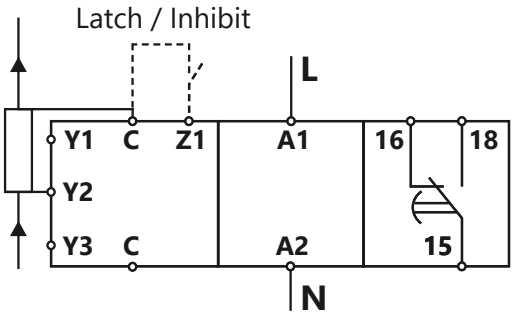
Undercurrent and latch function

Connection diagrams

50 mA models



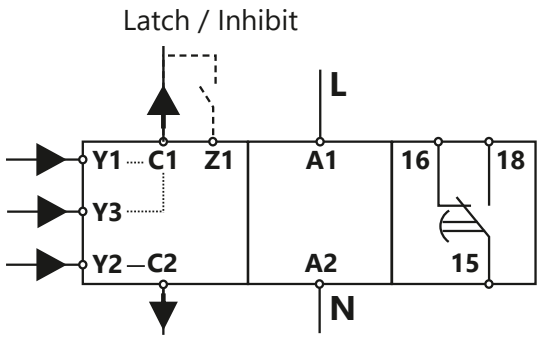
Direct connection



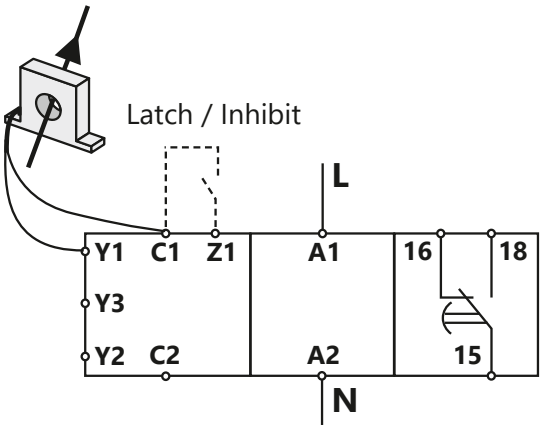
Connection with shunt

Terminals	Description
A1, A2	Power supply: 24 to 240 V AC/DC
Y1, C	Input range 1: 0.1 to 5 mA AC/DC
Y2, C	Input range 2: for shunt or CTV
Y3, C	Input range 3: 1 to 50 mA AC/DC
Z1, C	Latch / inhibit input
15, 16, 18	Relay output

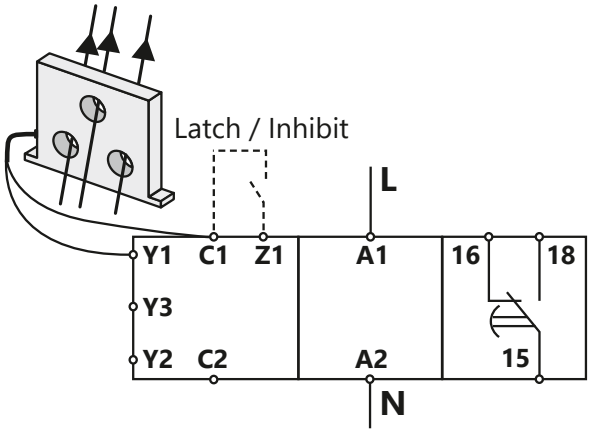
10 A models



Direct connection



Connection with MI



Connection with MP

Terminals	Description
A1, A2	Power supply: 24 to 240 V AC/DC
Y1, C1	Input range 1: 0.4 to 4 Vp AC
Y2, C2	Input range 2: 0.1 to 10 A AC/DC
Y3, C1	Input range 3: 10 to 500 mA AC/DC
C1, Z1 (C2, Z1)	Latch / inhibit input
15, 16, 18	Relay output

References

Further reading

Information	Where to find it	QR code
Installation manual	https://carlogavazzi-pss.com/manuals/DIB8_IM_html	
PSS selection tool	https://carlogavazzi-pss.com/	

CARLO GAVAZZI compatible components

Purpose	Component name/code	Datasheet
Current transformers	**MI**	https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/MI_DS_ENG.pdf
	MP	https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/MP_DS_ENG.pdf
	CTA	https://www.gavazziautomation.com/fileadmin/images/PIM/DATASHEET/ENG/CTA_DS_ENG.pdf

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