

# RPN-1A..-A230

## monitoring relays



RPN-1A16-A230



- **Multifunctions monitoring relays (6 versions of relays, AC current monitoring in 1-phase network, with adjustable thresholds ①)**
- Minimum and maximum value monitoring • Windowfunction
- Fault latch mode • Tripping delay
- Cadmium - free contacts 1 CO • AC input voltages
- Cover - modular, width 17,5 mm
- Direct mounting on 35 mm rail mount acc. to EN 60715
- Compliance with standard EN 50178
- Recognitions, certifications, directives: RoHS, **CE** **ENEC**

### Output circuit - contact data

Number and type of contacts		1 CO																		
Contact material		AgSnO <sub>2</sub>																		
Max. switching voltage		300 V AC																		
Rated load	AC1	12 A / 250 V AC																		
	DC1	12 A / 24 V DC																		
	DC1	0,3 A / 250 V DC																		
Rated current		12 A / 250 V AC																		
Max. breaking capacity	AC1	4 000 VA																		
Min. breaking capacity		1 W 10 mA																		
Contact resistance		≤ 100 mΩ																		
Max. operating frequency																				
• at rated load	AC1	600 cycles/hour																		
<b>Input circuit</b>																				
Supply voltage	AC	230 V																		
Rated voltage	50/60 Hz AC	230 V terminals (N)-L																		
Must release voltage		AC: ≥ 0,1 U <sub>n</sub>																		
Operating range of supply voltage		0,85...1,15 U <sub>n</sub>																		
Rated power consumption		0,6 W																		
Range of supply frequency	AC	48...63 Hz																		
<b>Measuring circuit ②</b>																				
• measured value		electrical current AC, RMS value, 50 Hz AC sinus, 48...63 Hz																		
		<table border="1"> <thead> <tr> <th>RPN-1A05</th> <th>RPN-1A1</th> <th>RPN-1A2</th> <th>RPN-1A5</th> <th>RPN-1A8</th> <th>RPN-1A16</th> </tr> </thead> <tbody> <tr> <td>0,5 A</td> <td>1 A</td> <td>2 A</td> <td>5 A</td> <td>8 A</td> <td>16 A</td> </tr> <tr> <td>2 A</td> <td>4 A</td> <td>8 A</td> <td>6,5 A</td> <td>11 A</td> <td>20 A</td> </tr> </tbody> </table>	RPN-1A05	RPN-1A1	RPN-1A2	RPN-1A5	RPN-1A8	RPN-1A16	0,5 A	1 A	2 A	5 A	8 A	16 A	2 A	4 A	8 A	6,5 A	11 A	20 A
RPN-1A05	RPN-1A1	RPN-1A2	RPN-1A5	RPN-1A8	RPN-1A16															
0,5 A	1 A	2 A	5 A	8 A	16 A															
2 A	4 A	8 A	6,5 A	11 A	20 A															
• measuring range		Lk-N																		
• overload capacity		0,05...1,0 I <sub>n</sub>																		
• measuring terminals		< 5 mΩ																		
• measuring range		MIN: 0,05...0,95 I <sub>n</sub> MAX: 0,1...1,0 I <sub>n</sub>																		
• input resistance																				
• switching thresholds																				
<b>Insulation according to EN 60664-1</b>																				
Insulation rated voltage		250 V AC																		
Rated surge voltage		4 000 V 1,2 / 50 μs																		
Overvoltage category		III																		
Insulation pollution degree		2																		
Flammability class		V-0 for modular cover, UL 94																		
Dielectric strength																				
• input - output		4 000 V AC type of insulation: basic																		
• contact clearance		1 000 V AC type of clearance: micro-disconnection																		

① Codes of versions - see "Ordering codes", page 5.

② The measuring circuit is not galvanically insulated from the relay supply circuit.

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### General data

Electrical life	• resistive AC1	> 0,5 x 10 <sup>5</sup>	12 A, 250 V AC
Mechanical life (cycles)		> 3 x 10 <sup>7</sup>	
Dimensions (L x W x H)		90 <sup>Ⓜ</sup> x 17,5 x 64,6 mm	
Weight		72 g	
Ambient temperature	• storage	-40...+70 °C	
(non-condensation and/or icing)	• operating	-20...+60 °C	
Cover protection category		IP 20	EN 60529
Relative humidity		up to 85%	
Shock resistance		15 g	
Vibration resistance		0,35 mm DA	10...55 Hz
<b>Measuring circuit data <sup>Ⓜ</sup></b>			
Functions		OD (OVER D), OD+L (OVER D + LATCH), UD (UNDER D), UD+L (UNDER D + LATCH), WD (WIN D), WD+L (WIN D + LATCH)	
Current ranges		MIN - smooth adjustment: 5...95% MAX - smooth adjustment: 10...100%	
Time ranges of tripping delay		step adjustment: OFF - permanent switching off; 0,5 s; 1 s; 1,5 s; 2 s; 2,5 s; 5 s; 10 s; 15 s; 20 s	
Current setting accuracy		threshold limits: ± 10% <sup>Ⓝ</sup>	
Accuracy of delay time settings		threshold limits: ± 5% <sup>Ⓞ</sup>	
Values affecting the timing adjustment	• temperature	± 0,05% / °C	
	• supply voltage	± 0,01% / V	
Recovery time		≤ 200 ms	
LED indicator <sup>Ⓟ</sup>		green LED U - indication of supply voltage U, tripping delay, fault latch red LED I - indication of error yellow LED R - output relay status	

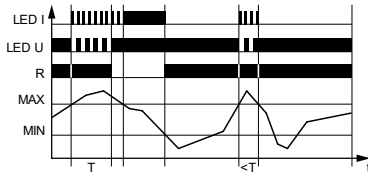
<sup>Ⓜ</sup> The measuring circuit is not galvanically insulated from the relay supply circuit. <sup>Ⓝ</sup> Length with 35 mm rail catches: 98,8 mm. <sup>Ⓞ</sup> From a measured value in the range of 0,2...1,0 In. <sup>Ⓟ</sup> Calculated from the final range values, for the setting direction from minimum to maximum. <sup>Ⓠ</sup> LED indication - see "Additional functions", page 4.



### Functions

**General principle: for the correct operation of the relay the current setpoints should meet the  $MAX > MIN$  condition.**

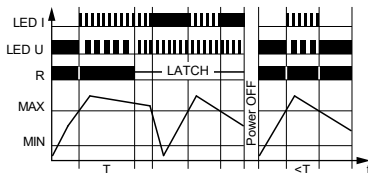
**OD (OVER D)** - Overcurrent monitoring (with delayed disconnection of contact R).



If the measured current has a value lower than MAX, then the operational relay R is switched on. When the measured current exceeds the MAX value, then after the set delay time the operational relay R will be switched off.

The operational relay R will be switched on again when the current falls below the MIN value.

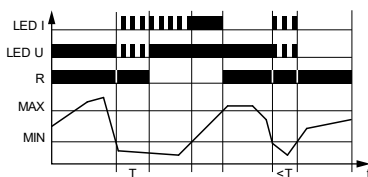
**OD+L (OVER D+LATCH)** - Overcurrent monitoring with fault latch (with delayed disconnection of contact R).



If the measured current has a value lower than MAX, then the operational relay R is switched on. When the measured current exceeds the MAX value, then after the set delay time the operational relay R will be switched off.

The operational relay R will remain switched on until the "error memory" is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current has a value lower than MAX. The control of the current in the circuit is then commenced in accordance with the selected function.

**UD (UNDER D)** - Undercurrent monitoring (with delayed disconnection of contact R).

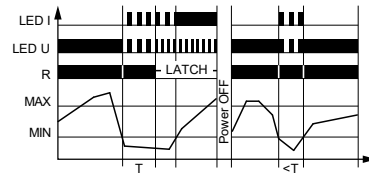


If the measured current has a value higher than MIN, then the operational relay R is switched on. When the measured current is lower than MIN, then after the set delay time the operational relay R will be switched off.

The operational relay R will be switched on again when the current exceeds the MAX value.

**U** - supply voltage; **I** - current; **MIN**, **MAX** - set current thresholds; **R** - output state of the relay; **LATCH** - fault latch; **T** - delay time; **t** - time axis

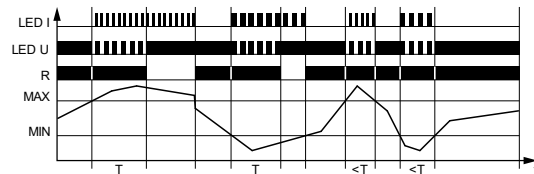
**UD+L (UNDER D+LATCH)** - Undercurrent monitoring with fault latch (with delayed disconnection of contact R).



If the measured current has a value higher than MIN, then the operational relay R is switched on. When the measured current is lower than MIN, then after the set delay time the operational relay R will be switched off.

The operational relay R will remain switched on until the "error memory" is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current has a value higher than MIN. The control of the current in the circuit is then commenced in accordance with the selected function.

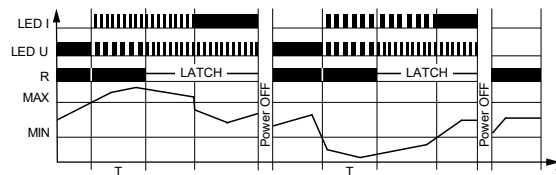
**WD (WIN D)** - Current monitoring in windowfunction between MIN and MAX values (with delayed disconnection of contact R).



If the measured current is within the set window ( $MIN < \text{measured } I < MAX$ ), then the operational relay R is switched on. When the measured current exceeds the set window between MIN and MAX ( $\text{measured } I < MIN$  or  $\text{measured } I > MAX$ ), then after the set delay time the operational relay R will be switched off.

The operational relay R will be switched on again when the current is back within the set window ( $MIN < \text{measured } I < MAX$ ).

**WD+L (WIN D+LATCH)** - Current monitoring in windowfunction between MIN and MAX values with fault latch (with delayed disconnection of contact R).



If the measured current is within the set window ( $MIN < \text{measured } I < MAX$ ), then the operational relay R is switched on. When the measured current exceeds the set window between MIN and MAX ( $\text{measured } I < MIN$  or  $\text{measured } I > MAX$ ), then after the set delay time the operational relay R will be switched off.

The operational relay R will remain switched on until the "error memory" is reset (the supply voltage is disconnected and connected again). After resetting the power supply voltage the operational relay R is switched on if the measured current is within the set window. The control of the current in the circuit is then commenced in accordance with the selected function.

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## monitoring relays

### Additional functions


**LEDs:** green U, red I - are lit permanently or flashes at 500 ms and 250 ms period where it is lit for 50% of the time, and off for 50% of the time. Yellow R is lit permanently.

- it is possible to change the function during operation of the relay, which results in triggering operation with a new setting. It is not necessary to switch the supply off and on again for the relay to start operating with a new setting.

#### Adjustment of the set values:

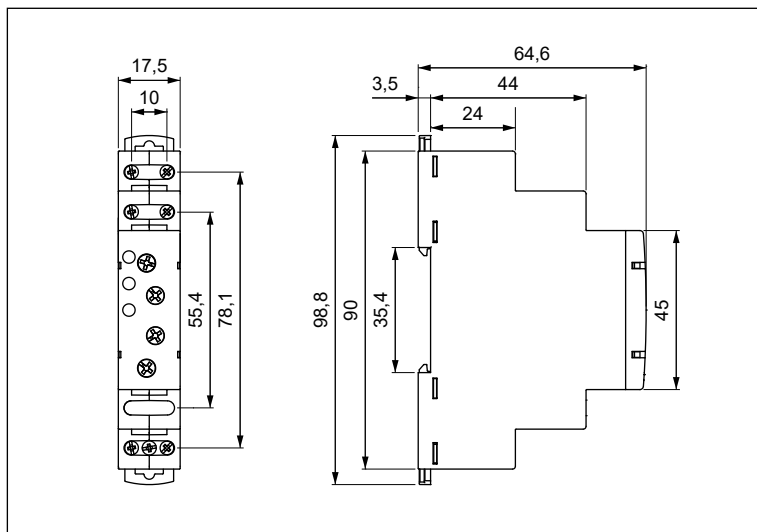
- the values of range of current and tripping delay are read in the course of the relay's operation. The set values may be modified at any moment,

**Supply:** the relay may be supplied with AC voltage 48...63 Hz of 195,5...264,5 V.

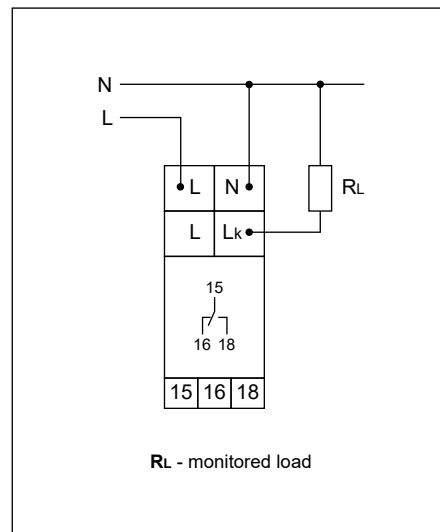
LED indication	U	I	R
green does not light up	power supply turned off	-	-
green lights up all the time	correct power supply	-	-
green slow flashes	measurement of the tripping delay time	-	-
green fast flashes	necessary error memory reset (power off and on)	-	-
red does not light up	-	function performed correctly	-
red lights up all the time	-	setting error  or function error	-
red slow flashes	-	there has been an excess of less than MIN	-
red fast flashes	-	there has been an excess above MAX	-
yellow does not light up	-	-	contact R disconnected
yellow lights up all the time	-	-	contact R connected

 Measured current outside the range of MIN and MAX threshold limits - required correction of settings.

### Dimensions



### Connection diagram



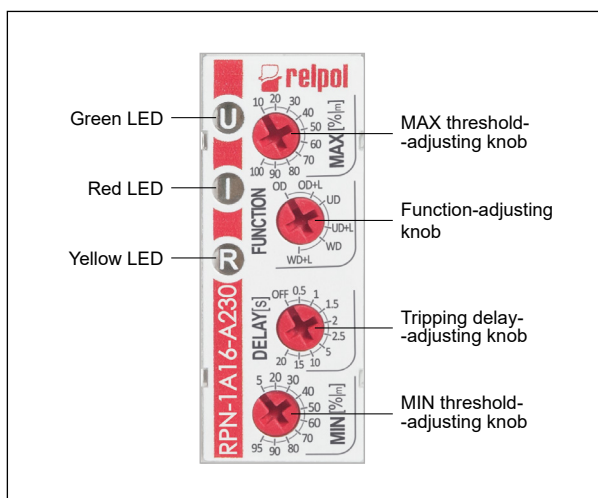
#### PRECAUTIONS:

1. Ensure that the parameters of the product described in its specification provide a safety margin for the appropriate operation of the device or system and never use the product in circumstances which exceed the parameters of the product. 2. Never touch any live parts of the device. 3. Ensure that the product has been connected correctly. An incorrect connection may cause malfunction, excessive heating or risk of fire. 4. In case of any risk of any serious material loss or death or injuries of humans or animals, the devices or systems shall be designed so to equip them with double safety system to guarantee their reliable operation.

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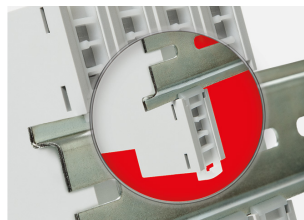
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### Front panel description

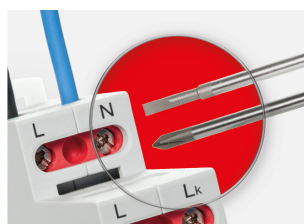


### Mounting

Relays **RPN-1A..-A230** are designed for direct mounting on 35 mm rail mount acc. to EN 60715. Operational position - any. **Connections:** max. cross section of the cables: 1 x 2,5 mm<sup>2</sup> (1 x 14 AWG), stripping length: 6,5 mm, max. tightening moment for the terminal: 0,5 Nm.

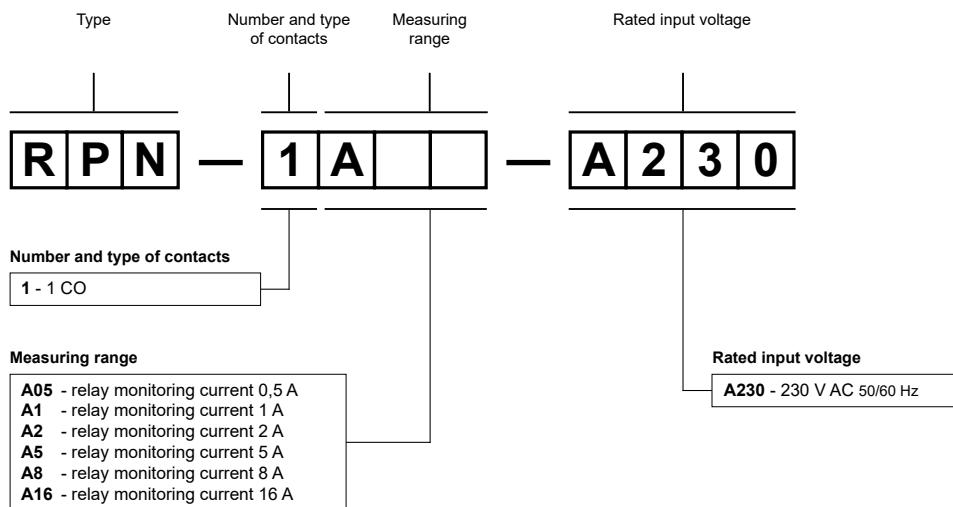


**Two catches:**  
easy mounting on 35 mm rail, firm hold (top and bottom).



**Mounting wires in clamps:**  
universal screw (cross-recessed or slotted head).

### Ordering codes



Examples of ordering codes:

**RPN-1A05-A230** monitoring relay **RPN-1A05-A230**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, contact material AgSnO<sub>2</sub>, rated input voltage 230 V AC 50/60 Hz, monitored current max. 0,5 A / 230 V AC

**RPN-1A16-A230** monitoring relay **RPN-1A16-A230**, multifunction (relay perform 6 functions), cover - modular, width 17,5 mm, one changeover contact, contact material AgSnO<sub>2</sub>, rated input voltage 230 V AC 50/60 Hz, monitored current max. 16 A / 230 V AC