

# Thermistor-/PTC resistor relay TKR-2

The TKR-2 thermistor/PTC resistor relay serves to monitor the winding temperature of motors. Thermal overload may occur owing to mechanical overloading on the shaft, or when operating with undervoltage. The coil temperature is recorded via the change in resistance of the PTC sensors installed in the coils (PTC resistors) or the position of thermal contacts relays. The PTC sensor circuit is monitored for wire breakage and short circuit.

- resistors or thermal contact switchable)
  - Thermal monitoring by means of PTC resistors  $>3.3k\Omega$ ,  $<1.8k\Omega$ , or thermal contact

Thermal motor winding monitoring (PTC

- Monitoring of wire breakage and short circuit

### Fault memory (Memory)

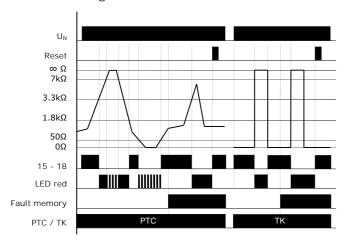
The fault memory can be switched on or off, as required. With alarm memory which can be deleted via the Reset button or remote acknowledgement.

#### DIN 45 mm housing

The Thermistor/PTC-resistor relay can be installed with its standardised housing behind the cover panel through a 45-mm cutout. The function and switching status indicators (LED) are clearly visible, with the connections located in a protected position behind the cover panel.

- Extremely compact size it only requires a width of 17.5 mm in the switching cabinet.
- 2 Changeover contacts 8 A The output contacts are capable of switching an output of 2000 VA ( 8 A / 250 V AC1 ).

#### Functional diagram



#### Function display

#### Normal state

Green LED shining: Un is in contact. Red LED not shining, output relay are energised

#### Fault display

Red LED shining: Coil temperature raised,

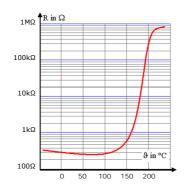
PTC - resistor raised  $3.3k\Omega$ , Output relay switched off.

Red LED flashing: Wire breakage or short circuit,

Output relay switched off

#### Characteristic curve

Typical characteristic curve of a PTC resistor. It is not linear

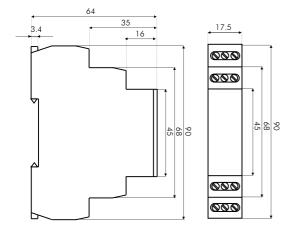




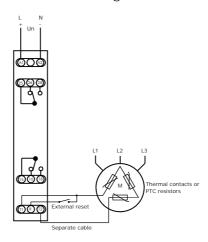
## Technical data

Supply voltage         24 - 240 V AC/DC           Toterance         -15 %; +10 %           Power consumption         2 VA           Measure circuit         T1 - T2 (the connection for the measuring range must be effected via a separate cable)           Measuring voltage         ca. 2.5 V DC           Upper resistance value         3.3 kΩ           Lower resistance value         1.8 kΩ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability           Repeatability         < 0.5 %           Switching difference         +7-5 %           Temperature dependency         < 0.1 % / °C           Output side         VI           Number of contacts         2 changeover contacts           Switching voltage         25 V AC / 24 V DC           Switching current / contact material         8 A / AC1 / AgNi           Maximum peak current         10 A < 3s           Switching capacity         2000 VA / AC1 / 192 W / DC           Output display         LED red           General data         Contact of the contact of t	Input side	
Tolerance	Supply terminals	A1 - A2 (L/+) - (N/-)
Power consumption         2 VA           Measuring retrinals         T1 - T2 (the connection for the measuring range must be effected via a separate cable)           Measuring voltage         ca. 2.5 V DC           Upper resistance value         3.3 kΩ           Lower resistance value         1.8 kΩ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability           Repeatability         < 0.5 %	Supply voltage	24 - 240 V AC/DC
Measure circuit         T1 - T2 (the connection for the measuring range must be effected via a separate cable)           Measuring voltage         ca. 2.5 V DC           Upper resistance value         3.3 kQ           Lower resistance value         1.8 kQ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability           Switching difference         +/- 5 %           Temperature dependency         < 0.1 % / °C	Tolerance	-15 %; +10 %
Measure circuit         T1 - T2 (the connection for the measuring range must be effected via a separate cable)           Measuring voltage         ca. 2.5 ∨ DC           Upper resistance value         3.3 kΩ           Lower resistance value         1.8 kΩ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability           Switching difference         +/- 5 %           Temperature dependency         < 0.1 % / °C	Power consumption	2 VA
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Upper resistance value         3.3 kΩ           Lower resistance value         1.8 kΩ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability           Repeatability         < 0.5 %	Measuring terminals	T1 - T2 (the connection for the measuring range must be effected via a separate cable)
Lower resistance value         1.8 kΩ           Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accouracy         Accouracy           Repeatability         < 0.5 %	Measuring voltage	ca. 2.5 V DC
Sensor         PTC resistor / thermal contact (can be switched to switch at the front)           Sensor malfunction signal         LED red           Accuracy         Repeatability         < 0.5 %           Switching difference         +/- 5 %           Temperature dependency         < 0.1 % / °C           Output side         Witching contacts         2 changeover contacts           Switching voltage         250 V AC / 24 V DC           Switching current / contact material         8 A / AC1 / AgNi           Maximum peak current         10A / < 3s           Switching capacity         2000 VA / AC1 / 192 W / DC           min. DC switching capacity         500 mW           Output display         LED red           General data         X           Mechanical life         3 x 10²           Electric life         0.7 x 10°           Dielectric strength between coil and contacts         2.5 kV           Ambient temperature         -20°C +55°C           Storage temperature         -30°C +70°C           Mounting position         any           Fixing DIN rail         EN 50022-35           Protection class of Front         IP 40           Voltage limitation class         III           Degree of contamination	Upper resistance value	3.3 kΩ
Sensor malfunction signal Accuracy Repeatability	Lower resistance value	1.8 kΩ
Accuracy           Repeatability         < 0.5 %	Sensor	PTC resistor / thermal contact (can be switched to switch at the front)
Repeatability         < 0.5 %	Sensor malfunction signal	LED red
Switching difference         +/- 5 %           Temperature dependency         < 0.1 % / °C	Accuracy	
Temperature dependency	Repeatability	< 0.5 %
Output side  Number of contacts 2 changeover contacts  Switching voltage 250 V AC / 24 V DC  Switching current / contact material 8 A / AC1 / AgNi  Maximum peak current 10A / < 3s  Switching capacity 2000 VA / AC1 / 192 W / DC  min. DC switching capacity 500 mW  Output display LED red  General data  Mechanical life 3 x 10 <sup>7</sup> Electric life 0.7 x 10 <sup>6</sup> Dielectric strength between coil and contacts 2.5 kV  Ambient temperature 20° C +55° C  Storage temperature -30° C +70° C  Mounting position any  Fixing DIN rail EN 50022-35  Protection class of Front IP 40  Voltage limitation class  III  Degree of contamination 2  Connection cross-section 2.5 mm²  Weight 77 g	Switching difference	+/- 5 %
Number of contacts 2 changeover contacts  Switching voltage 250 V AC / 24 V DC  Switching current / contact material 8 A / AC1 / AgNi  Maximum peak current 10A / < 3s  Switching capacity 2000 VA / AC1 / 192 W / DC  min. DC switching capacity 500 mW  Output display LED red  General data  Mechanical life 3 x 107  Electric life 0.7 x 105  Dielectric strength between coil and contacts 2.5 kV  Ambient temperature -20°C +55°C  Storage temperature -30°C +70°C  Mounting position any  Protection class of Front IP 40  Voltage limitation class III  Degree of contamination 2  Connection cross-section 2.5 mm²  Weight 77 g	Temperature dependency	< 0.1 % / °C
Switching voltage 250 V AC / 24 V DC  Switching current / contact material 8 A / AC1 / AgNi  Maximum peak current 10A / < 3s  Switching capacity 2000 VA / AC1 / 192 W / DC  min. DC switching capacity 500 mW  Output display LED red  General data  Mechanical life 3 x 10 <sup>7</sup> Electric life 0.7 x 10 <sup>5</sup> Dielectric strength between coil and contacts 2.5 kV  Ambient temperature -20°C +55°C  Storage temperature -30°C +70°C  Mounting position any  Fixing DIN rail EN 50022-35  Protection class of Front IP 40  Voltage limitation class III  Degree of contamination 2  Connection cross-section 2.5 mm²  Weight 77 g	Output side	
Switching current / contact material         8 A / AC1 / AgNi           Maximum peak current         10A / < 3s	Number of contacts	2 changeover contacts
Maximum peak current  10A / < 3s  Switching capacity  2000 VA / AC1 / 192 W / DC  min. DC switching capacity  500 mW  Output display  LED red  General data  Mechanical life  3 x 10 <sup>7</sup> Electric life  0.7 x 10 <sup>5</sup> Dielectric strength between coil and contacts  2.5 kV  Ambient temperature  -20° C +55° C  Storage temperature  -30° C +70° C  Mounting position  any  Fixing DIN rail  EN 50022-35  Protection class of Front  IP 40  Voltage limitation class  III  Degree of contamination  2  Connection cross-section  2.5 mm²  Weight  77 g	Switching voltage	250 V AC / 24 V DC
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Storage temperature -30°C +70°C  Mounting position any  Fixing DIN rail EN 50022-35  Protection class of Front IP 40  Voltage limitation class III  Degree of contamination 2  Connection cross-section 2.5 mm²  Weight 77 g	Dielectric strength between coil and contacts	2.5 kV
Mounting position any Fixing DIN rail EN 50022-35 Protection class of Front IP 40 Voltage limitation class III Degree of contamination 2 Connection cross-section 2.5 mm² Weight 77 g	Ambient temperature	-20°C +55°C
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Protection class of Front IP 40  Voltage limitation class III  Degree of contamination 2  Connection cross-section 2.5 mm²  Weight 77 g	Mounting position	any
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Degree of contamination 2 Connection cross-section 2.5 mm² Weight 77 g	Protection class of Front	IP 40
Connection cross-section 2.5 mm <sup>2</sup> Weight 77 g	Voltage limitation class	III
Weight 77 g	Degree of contamination	2
	Connection cross-section	2.5 mm <sup>2</sup>
Standards EN 60730-2-9, EN 61010-1	Weight	77 g
	Standards	EN 60730-2-9, EN 61010-1

## Dimensional drawing



## Connection diagram



Device		Order no.
Thermistor relay	Winding protection, 2 changeover contact 8 A / 250 V AC	TKR-2

Subject to changes! 02.2013

