

Measuring and Monitoring Relays

Motor Protection Relay



TMR-E12

230 V AC / 24 V AC/DC - 1 or 2 changeover

- controlled by thermistor
- with or without error memory
- LED indication

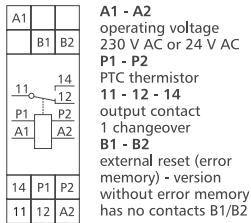
Part Numbers

110 315 05	230 V AC, 1 changeover, no memory
110 315 05 22	230 V AC, 2 changeover, no memory
110 315 13 22	24 V AC/DC, 2 changeover, no memory
110 316 05	230 V AC, 1 changeover, with memory
110 316 05 22	230 V AC, 2 changeover, with memory
110 316 13 22	24 V AC/DC, 2 changeover, with memory

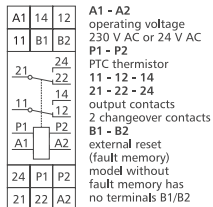
Housing Dimensions



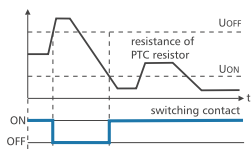
Wiring - 1 changeover contact



Wiring 2 changeover contacts



Function Diagram



Description

The thermistor relay TMR-E12 is used to protect motors against thermal overload (impermissible heating). Such heating can be caused by excessive mechanical stress of the shaft or operation of the motor with overvoltage. A PTC thermistor is used as sensor, it should be placed at that part of the motor which is most heated under overload conditions (e.g. integrated in the motor winding). The relay can also be used for motors having an integrated thermo-switch. Available with or without fault memory.

Functional Description

TMR-E12 without error memory

Upon application of the operating voltage the output relay responds immediately and remains in this position as long as no thermal overload occurs. If, under thermal overload the thermistor resistance rises to ≥ 3 kOhms the output relay releases immediately. If the thermal resistance falls to ≤ 1.8 kOhms the output relay responds again after a delay of about 100 ms. Hysteresis is 40 %. The output relay of the TMR-E12 drops off immediately at a power failure. Temperature data can be taken from the thermistor diagram.

TMR-E12 with error memory

Use and function same as for the thermistor relay without error memory. However, the output relay of this model remains in released position until the thermistor resistance has fallen to ≤ 2.8 kOhms and the reset button at the front of the instrument has been pressed.

Operating status is indicated by two LEDs: green LED - ON = operating voltage applied
red LED - ON = output relay released

Technical Data

Input

nominal voltage U_N	230 V AC, 24 V AC/DC
power consumption	1.6 W / 2 VA
operating voltage range	0.9 ... 1.1 U_N
release voltage	$\geq 0.15 U_N$
frequency range	50 ... 60 Hz
turn-on-resistance	
without error memory	1.8 k Ω
with error memory	2.8 k Ω
turn-off resistance	3.0 k $\Omega \pm 5 \%$
response delay	
without error memory	100 ms
with error memory	10 ms
short circuit current at thermistor (P1/P2)	1 mA
thermistor current at threshold $R_m = 3$ k Ω	0.8 mA
open circuit voltage at open thermistor contact (P1/P2)	12 V
operating temperature range	0 °C ... + 55 °C
storage temperature range	-30 °C ... +100 °C

Output

output contact	1 changeover contact or 2 changeover contacts
contact material	AgNi
switching voltage max.	250 V
continuous current max.	6 A
switching power	1500 VA
contact fuse	6 A
mechanical endurance	3×10^7 switching cycles
electrical endurance	2×10^5 switching cycles
permissible switching frequency	600 switching cycles/h
isolation per VDE 0110	
rated voltage	250 V AC/DC
overvoltage category	III
pollution degree	2
test voltage (coil/contact)	2000 V, 50 Hz 1 min
EMC test	emission per EN 50 081 T1 interference immunity per EN 50 082 T2

Housing

type of protection (EN 60529)	housing IP50, terminal blocks IP20
relative humidity range per IEC 60721-3-3	
environmental class	3k3
wire cross section	2.5 mm ²
mounting position	any
colour	green
weight	150 g
housing dimensions WxHxL	22.5 x 75 x 100 mm
modular	without spacing