



## Motor phase and temperature control relay - 35 mm HWTM Part number 84873027



- Control of 3-phase networks : phase sequence, phase failure
- Multi-voltage
- True RMS measurement
- Motor temperature control via PTC probes
- With line break or probe short-circuit detection
- Version with fault latching function and reset / test
- LED status indication

### Part numbers

Type	Functions	Nominal voltage (V)	Phase control voltage range
84873027	HWTM Phase sequence, phase failure, motor temperature via PTC probe, test, memory	24 →240 V AC/DC	3 x 208 →3 x 480 V AC

### Specifications

#### Supply

Supply voltage Un	24 V →240 V AC/DC
Voltage supply tolerance	-15 % / +10 %
Operating range	20,4 V →264 V AC/DC
Polarity with DC voltage	No
AC supply voltage frequency	50 / 60 Hz ± 10 %
Galvanic isolation of power supply/measurement	No (current limiting)
Power consumption at Un	4 VA in AC/0.5 W in DC
Immunity from micro power cuts	20 ms / 20,4 V

#### Inputs and measuring circuit

##### 3-phase control

Measurement ranges	3 x 208 →3 x 480 VAC *
Operating range	176 →528 VAC
Frequency of measured signal	50 / 60 Hz ±10 %
Input resistance	602 KΩ / line

##### Contrôle thermique

Maximum voltage of heat detection circuit	3.6 V (T1-T2 open)
Short-circuit current	7 mA (T1, T2 short-circuited)
Maximum heat detector resistance at 20 °C	1500 Ω
Trip threshold	3100 Ω± 10 %
Reset threshold	1650 Ω± 10 %
Short-circuit detection range	0 →15 Ω± 5 Ω
Resistance measurement temperature drift	± 0,1 % / °C max.
Repetition accuracy with constant parameters	± 0,5 %

##### Timing

Delay on threshold crossing	300 ms max. (phase) 300 ms typical (temperature)
Y1 input response time (Y1-T1 contact) and PB	typically 50 ms
Reset time	10 s max. at 264 V AC
Delay on pick-up	500 ms

##### Output

Type of output	2 NO relays
Type of contacts	No cadmium
Maximum breaking voltage	250 V AC/DC
Max. breaking current	5 A AC/DC
Min. breaking current	10 mA / 5 V AC/DC
Electrical life (number of operations)	1 x 10 <sup>4</sup>
Breaking capacity (resistive)	1250 VA AC
Maximum rate	360 operations/hour at full load
Operating categories acc. to IEC/EN 60947-5-1	AC12, AC13, AC14, AC15, DC12, DC13, DC14
Mechanical life (operations)	30 x 10 <sup>6</sup>

##### Insulation

Nominal insulation voltage IEC/EN 60664-1	400 V
Insulation coordination (IEC/EN 60664-1)	Overvoltage category III : degree of pollution 3
Rated impulse withstand voltage (IEC/EN 60664-1)	4 kV (1,2 / 50 μs)
Dielectric strength (IEC/EN 60664-1)	2 kV AC 50 Hz 1 min.

Insulation resistance (IEC/EN 60664-1)	> 500 MΩ / 500 V DC
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**General characteristics**

"Phase" relay status indication	Yellow LED
"Temperature" relay status indication	Yellow LED
Display power supply	Green LED
Casing	35 mm
Mounting	On 35 mm symmetrical DIN rail, IEC/EN 60715
Mounting position	All positions
Material : enclosure plastic type VO to UL94 standard	Incandescent wire test according to IEC 60695-2-11 & NF EN 60695-2-11
Protection (IEC/EN 60529)	Terminal block : IP20 Casing : IP30
Weight	107.1 g
Connecting capacity IEC/EN 60947-1	Rigid : 1 x 4 <sup>2</sup> - 2 x 2.5 <sup>2</sup> mm <sup>2</sup> 1 x 11 AWG - 2 x 14 AWG Flexible with ferrules : 1 x 2.5 <sup>2</sup> - 2 x 1.5 <sup>2</sup> mm <sup>2</sup> 1 x 14 AWG - 2 x 16 AWG
Max. tightening torques IEC/EN 60947-1	0,6 → 1 Nm / 5,3 → 8,8 Lbf.In
Operating temperature IEC/EN 60068-2	-20 → +50 °C
Storage temperature IEC/EN 60068-2	-40 → +70 °C
Humidity IEC/EN 60068-2-30	2 x 24 hr cycle 95 % RH max. without condensation 55 °C
Vibrations according to IEC/EN 60068-2-6	10 → 150 Hz, A = 0.035 mm
Shocks IEC/EN 60068-2-6	5 g

**Standards**

Marking	CE (LVD) 73/23/EEC - EMC 89/336/EEC
Product standard	NF EN 60255-6 / IEC 60255-6 / CEI 60034-11-2 / UL 508 / CSA C22.2 N°14
Electromagnetic compatibility	Immunity EN 61000-6-2/IEC 61000-6-2 Emission EN 61000-6-4/EN 61000-6-3 IEC 61000-6-4/IEC 61000-6-3 Emission EN 55022 class B
Certifications	UL, CSA, GL
Conformity with environmental directives	RoHS, WEEE

**Comments**

**Accessories**

Description	Code
Removable sealable cover for 35 mm casing	84800001

**Principles**



**Overview**

Relays HWTM and HWTM2 check the availability of the 3-phase network and the temperature of the motors using integrated PTC probes.

The "phase" and "temperature" control functions are independent of one another.

The 3-phase (208 to 480 V) network control verifies the sequence of phases L1, L2, L3 and their presence :

- the complete failure of a phase is detected, also in the event of regeneration (U measured < 0.7 x Un).

The result of the check is indicated by the status of the "phase" output relay. NO contact 21-24 will be open in case of fault.

The temperature control accepts up to 6 PTC probes (positive temperature coefficient resistor) wired in series between terminals T1 and T2.

A fault is reported if the resistance of the thermal detector circuit exceeds 3100 Ω.

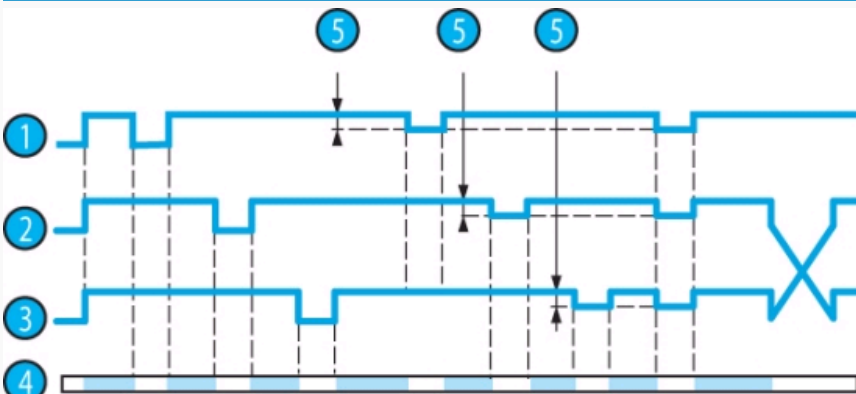
Return to normal is verified when the resistance falls below 1650 Ω.

The result of the check is indicated by the status of the "temperature" output relay. NO contact 11-14 will be open in case of fault.

Opening of the thermal detector circuit has the same effect as high temperature (resistance exceeding 3100 Ω) and is therefore interpreted as a fault.

Total short-circuit of the thermal probe (s), detected when resistance is less than 15 Ω ± 5 Ω is treated as a fault.

**Principles**



**Control of 3-phase network**

As soon as the phase sequence (L1 L2 L3) and phase amplitude symmetry ( $D < 30\%$ ) are considered correct, the contact of the output relay closes and, subject to the result of the temperature check, LED "R2" lights up.

In case of total failure or a drop in the amplitude of a phase (absence of phase with regeneration) or inversion of the phase sequence, the contact of the output relay opens and LED "R2" is extinguished.

**Temperature control without latching**

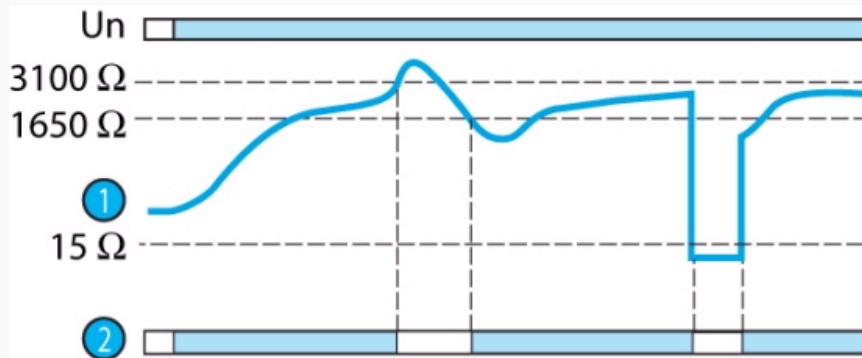
As soon as it is verified that the resistance of the thermal detector is between 15 and 3,100Ω, the contact of the output relay closes and, subject to the result of the phase control check, LED "R1" lights up.

If the resistance of the thermal detector circuit exceeds 3,100 Ω, the output relay opens and LED "R1" is extinguished. After an overheating fault, the resistance must fall below 1,650 Ω for the output relay contact to reclose and, subject to the result of the phase check, LED "R1" to light up.

If the resistance falls below 15 Ω (short-circuit), the output relay opens and LED "R1" is extinguished. As soon as it returns to between 15 and 3,100Ω, the contact of the output relay closes again and, subject to the result of the phase control check, LED "R1" lights up.

N°	Legend
①	Phase L1
②	Phase L2
③	Phase L3
④	Relay R2
⑤	30 % of Un

**Principles**



**Control of 3-phase network**

As soon as the phase sequence (L1 L2 L3) and phase amplitude symmetry ( $D < 30\%$ ) are considered correct, the contact of the output relay closes and, subject to the result of the temperature check, LED "R2" lights up.

In case of total failure or a drop in the amplitude of a phase (absence of phase with regeneration) or inversion of the phase sequence, the contact of the output relay opens and LED "R2" is extinguished.

**Temperature control without latching**

As soon as it is verified that the resistance of the thermal detector is between 15 and 3,100Ω, the contact of the output relay closes and, subject to the result of the phase control check, LED "R1" lights up.

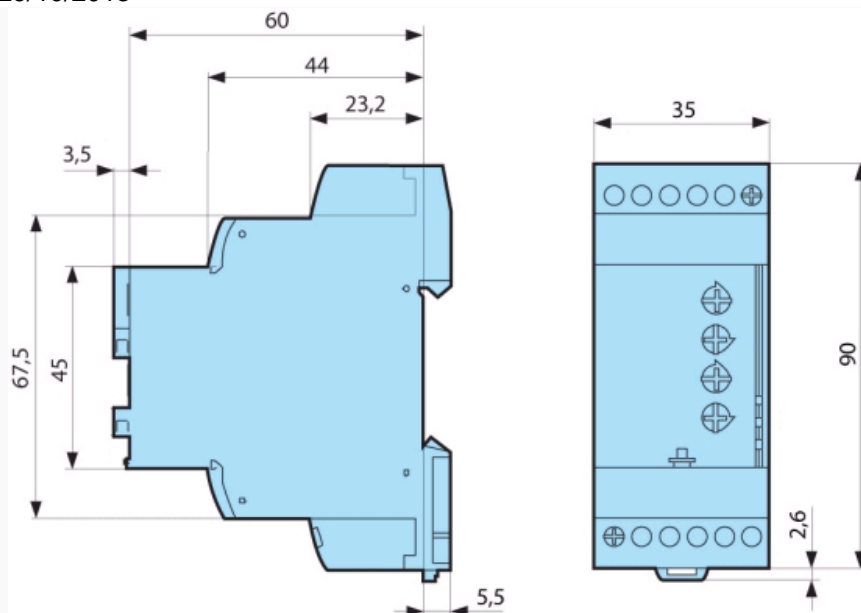
If the resistance of the thermal detector circuit exceeds 3,100 Ω, the output relay opens and LED "R1" is extinguished. After an overheating fault, the resistance must fall below 1,650 Ω for the output relay contact to reclose and, subject to the result of the phase check, LED "R1" to light up.

If the resistance falls below 15 Ω (short-circuit), the output relay opens and LED "R1" is extinguished. As soon as it returns to between 15 and 3,100Ω, the contact of the output relay closes again and, subject to the result of the phase control check, LED "R1" lights up.

N°	Legend
①	Resistance between terminals T1 and T2
②	Relay R1

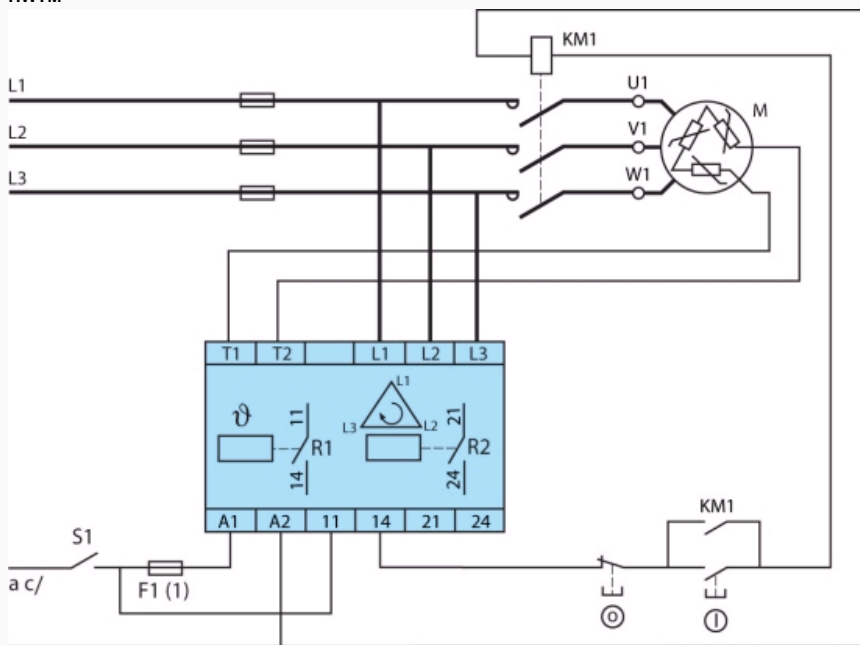
**Dimensions (mm)**

HWTM



**Connections**

**HWTM**



N°	Legend
①	1 A fast-blow fuse or cut-out

**Product adaptations**



- Customisable colours and labels