INSTALLATION AND OPERATION MANUAL

toscano

ELECTRONIC MOTOR PROTECTION RELAY

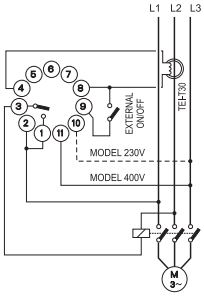
TPM5

Overload, Underload and Phase failure

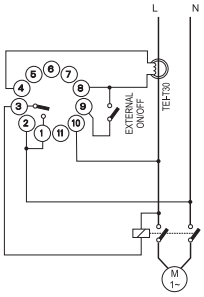
- Motor protection with three function in one relay:
  1) Overload 1 to 19,2 A. Detection by external current transformer.
  2) Underload 1 to 19,2 A. Detection by external current transformer.
  3) Phase failure/loss detection.
- Modular plug-in format (2 modules).
- Power supply: single voltage 230 or 400 Vac (depending on the model).
- Protection of single-phase or three-phase motors.
- Dry running detection application (without probes) in pumps whose consumption varies with underload.
- Overload trip time: 7 s.
- Underload trip time: 4 s (with 20 s starting inhibition).
- Automatic re-start time after underload trip, selectable and adjustable (up to 2 hours).
- Manual re-start push-button (Reset).
- 3 digits LED display for: measured current, trip current, remaining re-start time, overload alarm, underload alarm and setting values.
- Setting values through thumbwheels with direct visualization on display.
- Trip current is not influenced by environmental temperature.
- Connection for EXTERNAL auxiliary control at 12 Vdc available (pressure switch, float switch, etc).

Wiring connections

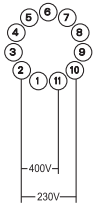
THREE PHASE 400V WIRING



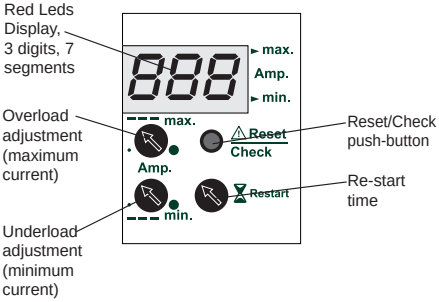
SINGLE PHASE 230V WIRING



MAIN SUPPLY (dependin on the model)

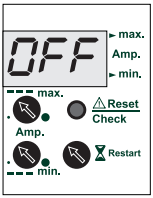


Front panel layout



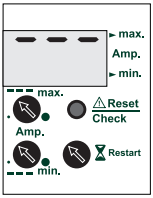
Important: In three phase systems, the current transformer must be wired in the phase “L2”.

Display messages



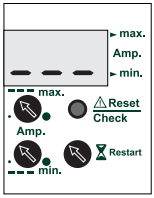
Stopped motor

Open External ON/OFF input.



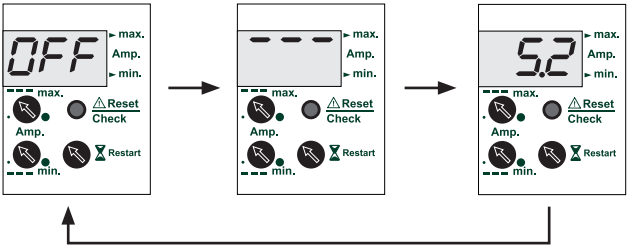
Motor Overload

Motor current greater than the set point current (maximum current).



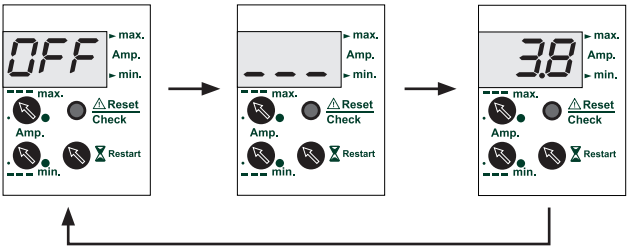
Motor Underload

Motor current lower than the set point current (minimum current).



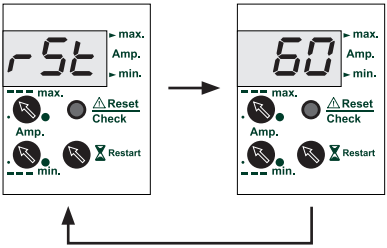
Motor stopped for exceeding the maximum current (overload).

Current measured at the moment of the failure: 5,2A.



Motor stopped for not attending the minimum current (underload).

Current measured at the moment of the failure: 3,8A.



Waiting the re-start time.

Time left before the re-connection: 60 minutes.

Remote control (External ON/OFF) - Terminal blocks 8 and 9

Closed contact: The unit measures the current and closes the relay.
Open contact: The unit stops the measurement and opens the relay.

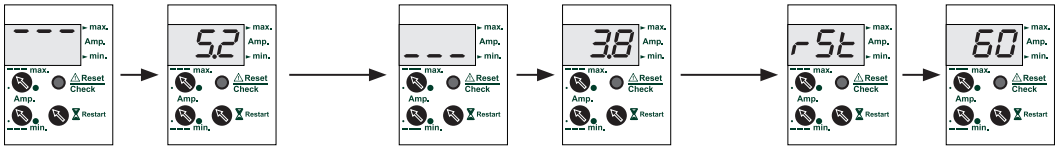
Use the remote control input External ON/OFF to connect a pressure switch, a float switch, a limit switch or any other start/stop control element with voltage free contacts. This input works with a 12 V voltage.

Important: All motor stop automatism must open this contact given that, otherwise, the underload alarm will trip and we will have to re-start the TPM5.

Manual reset (Reset/Check)

The push-button Reset/Check has the following functions:

- **It re-starts the unit** in case of stop for overload, underload or phase failure.
- **It ends the re-start time delay** making the pump starting.
- **It starts the presentation of the unit adjustments.** They appear in the following order: maximum current, minimum current and re-start time.

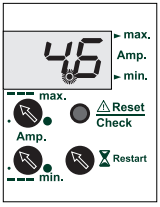


Maximun current | Minimum current | Re-start time

Current adjustments (min./max.)

For making the protection effective, it is necessary to adjust both the maximum and the minimum current.

Before starting the unit, adjust the control “max” to the maximum (turn fully to the right) and the control “min” to the minimum (turn fully to the left).



Close the remote control input External ON/OFF to start the motor. When we see in the display the consumed current, then we can adjust the values “max” y “min”.

When we move some of the adjustments, the display will shows the value which is being set. The decimal number will flash showing we are in adjustment phase. After finishing the adjustment, the display will show the current consumed.

Starting inhibition time

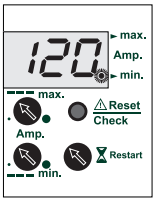
When the motor starts, the unit ignores the underload during 20 seconds, giving enough time to the motor for reaching the nominal current. The phase failure detection will remain active during this time.

Re-starting test

If, while re-starting the pump after a fist stop for underload, the minimum current set is not reached yet, the unit will stop the pump and it will not carry out any re-start test.

In case of phase failure, the display will show an UNDERLOAD ALARM or an OVERLOAD ALARM, depending on which phase is missing. Then the unit will stop the motor and it will not carry out any further re-start test.

Re-start time adjustment (Restart)



The unit can re-start automatically the motor after a stop for underload.

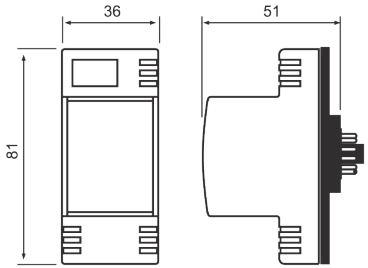
With the help of the thumbwheel select the re-start time we wish (0-120 minutes).

During the adjustment the decimal point on the right side of the thumbwheel keeps flashing.

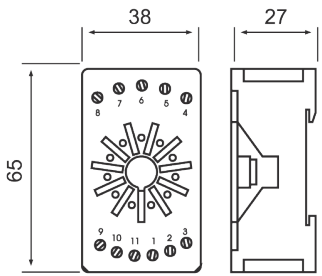
In order to cancel the automatic re-start of the pump, adjust the thumbwheel to the minimum, selecting the value OFF (manual re-start).

Size

Module



Socket (DIN rail)



Technical specifications

Electronic protections	OVERLOAD, UNDERLOAD and PHASE FAILURE
Supply voltage	Single voltage 230 or 400 Vac (depending on the model), 50/60 Hz
Power consumption	2 VA
Maximum current threshold	19,2 Amp. AC
Minimum current threshold	1,0 Amp. AC
Current adjustment accuracy	0,1 Amp.
Overload trip time	7 s
Underload trip time	4 s (with 20 s of inhibit at starting)
Re-start time	0-120 minutes
Maximum cross-section area	2,5 mm² (screw terminals)
Breaking capacity	5 Amp. 250 Vac 5 Amp. 30 Vdc
Weight	140 g (200 g socket included)

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