

## Load guard for 3-phase motors

**Power factor metering ( $\cos \varphi$ )**

**Adjustable time delay 0-20 sek. at motor start**

**Selectable release of relay at max. or min. load**

**1-pole relay output 8A / 250 VAC**

**Produced in accordance with  $\text{CE}$  and EMC regulations**



C-mac<sup>®</sup> module type RP81 is used for load monitoring of 3-phase motors, as the phase angle ( $\cos \varphi$ ) between motor current and -voltage changes in proportion to the mechanical load of the motor.

You will see the biggest change in phase angle, if the motor is loaded between 0 and 60% of nominal load, which makes the RP81 suitable for monitoring of V-belts, pumps running dry, etc. (see page 6-6).

RP81 can be connected directly to motors with nominal current up to 6 A. If the current is bigger, you use a standard current transformer.

The unit is supplied with an adjustable start-up delay, which keeps the output relay activated independent of the power consumption, when the motor is starting.

By connection of pins 7 and 2 you can select if the relay releases at over- or underload.

### Start-up:

When the supply voltage is connected, the output relay activates, and the start-delay will start, independent of the selected relay function.

### Relay function:

pins 2-7.

If pin 2 is not connected, the output relay releases immediately, if the power factor exceeds the set level, provided that the set start-delay has run out.

If pin 2 is connected to pin 7, the relay releases, if the power factor is lower than the set level, and the timer has run out.

### Technical data:

**Supply voltage:** 3 x 230 V +/- 10%  
3 x 400 V +/- 10%  
3 x 415 V +/- 10%

**Supply frequency:** 40-70 Hz

**Power consumption:** 2,5 VA

**Operation temp.:** -20°C to +60°C

**Humidity:** 0 - 90% RH, non-condensing

**Monitoring current:** min. 0,5 A, max. 6 A  
At bigger currents use a standard current transformer..

**Internal shunt:** 33 mΩ. At max. current 6 A the voltage across the shunt is 0,2 V

**Hysteresis:** 5% of adjusted level.

### Adjustments:

Start delay: Potentiometer, 0-20 sec.

Level: Potentiometer,  $\cos \varphi$  0-0,9

### Accuracy, scale:

Start delay: 20%

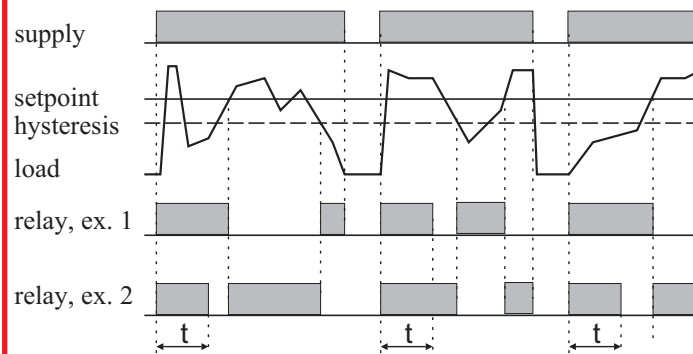
Level: 5%

### Indications:

Green LED: Supply voltage connected

Red LED: Relay activated

### Functional diagram:

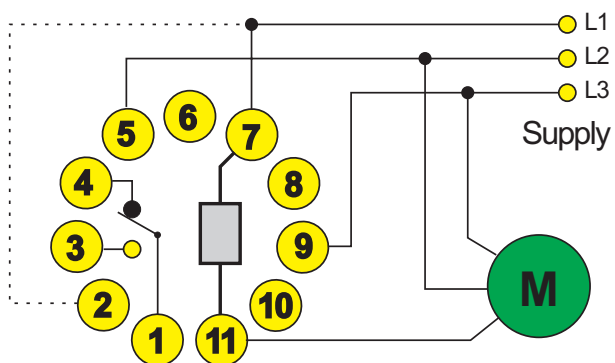


t = selected start-up delay

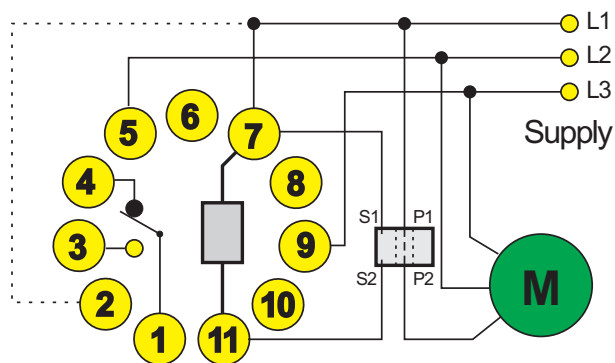
ex. 1: overload, pins 2-7 open

ex. 2: underload, pins 2-7 connected

## Connections:



Example 1: without current transformer.  
(motor current smaller than 6 A)



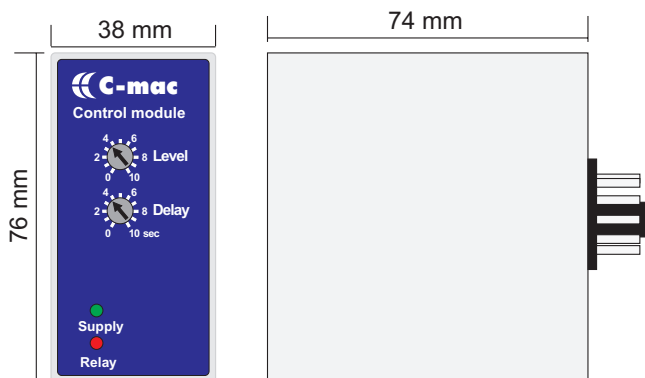
Example 2: With current transformer.  
(motor current bigger than 6 A)

Note: the current transformer must be connected as shown (P1 / P2 and S1 / S2)

## Ordering guide:

| Supply    | Type nr.     |
|-----------|--------------|
| 3 x 220 V | RP81-1-3-230 |
| 3 x 380 V | RP81-1-3-400 |
| 3 x 415 V | RP81-1-3-415 |

## Mechanical dimensions:



## Materials and weight:

|                        |                                              |
|------------------------|----------------------------------------------|
| <b>Housing:</b>        | NORYL-SE-1, grey, self-extinguishing         |
| <b>Housing bottom:</b> | NORYL SE-1, GFN-2, black, self-extinguishing |
| <b>Terminals:</b>      | Nickel-plated brass                          |
| <b>Weight:</b>         | 110 g                                        |