

### DIN30M Motor Protection Relay

The DIN30M Motor Relay is a member of Cooper Power Systems' DIN line of industrial microprocessor based relays. The DIN30M relay offers the following functions:

- Thermal overload protection (49)
- Unbalance (phase reversal or single phasing) protection (46)
- Locked rotor protection (51LR)
- Ground fault protection (51N or 64)
- No-load run protection (undercurrent) (37)
- Starter sequence control (48)
- Thermal probe input (26)
- Modbus communications

As a member of the DIN series of relays, the DIN30M also offers the following features:

- Standard DIN rail profile mounting (DIN-EN50022)
- Extremely compact, self contained package
- Auto-ranging power supplies
- 5A and 1A phase and neutral inputs provided as standard
- Automatic or manual reset modes
- Front panel test button to verify relay operation
- Built in relay diagnostics

#### APPLICATIONS

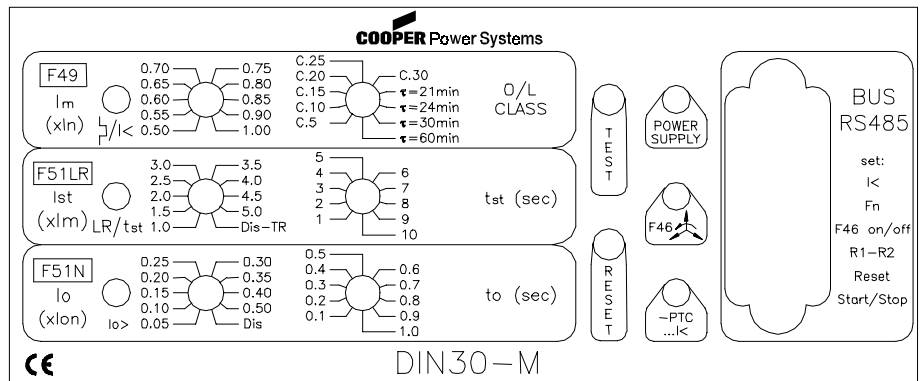
The DIN30M is ideally suited for the protection of small and medium induction motors.

The serial communication port allows the relay to be used for remote metering and monitoring.

The compact nature of the DIN30M makes it ideal for dense installations where space is at a premium, or where DIN rail mounted components are desired.

#### THERMAL IMAGE

Thermal overload protection is provided by a thermal image



**Figure 1:**  
Front Panel View of the DIN30M Motor Protection Relay

protective element based on the motor's rated current and overload class (cooling time constant).

#### UNBALANCE PROTECTION

To protect the motor against single phase or reversed phase connections, this element trips the motor off line 100msec after the negative sequence current has exceeded 40% of the positive sequence current.

#### LOCKED ROTOR PROTECTION

This is used to detect an unsuccessful start or other condition which has stopped or dramatically slowed the motor. Examples are mechanical jams or excessive loads being applied to the motor.

#### GROUND FAULT PROTECTION

Provides a fixed time delay ground overcurrent element to detect ground faults.

#### STARTER SEQUENCE CONTROL

This function is used to signal an external starter to switch over and connect the motor to the line. The DIN30M closes an output contact when the starting current drops below a set current level for a programmed period of time.

#### THERMAL PROBE INPUT

When used with an appropriate thermal probe, the relay will trip the motor off line 300 msec after the probe indicates the motor temperature is too high. The probe used must have a resistance greater than 1600Ω +/- 5% when the motor temperature is in the acceptable range.

#### COMMUNICATIONS

The RS-485 port on the DIN30M supports the Modbus communication protocol. Through this port it is possible to obtain the following information and perform the following functions:

- Control the Test and Reset functions
- Read the actual R.M.S. measurement of the input quantities in PU
- Read the actual motor estimated temperature given as a percentage of the steady state temperature reached when the nominal input current is injected.
- Read the settings made via the front panel rotary switches.
- Set the 37 undercurrent tripping level.

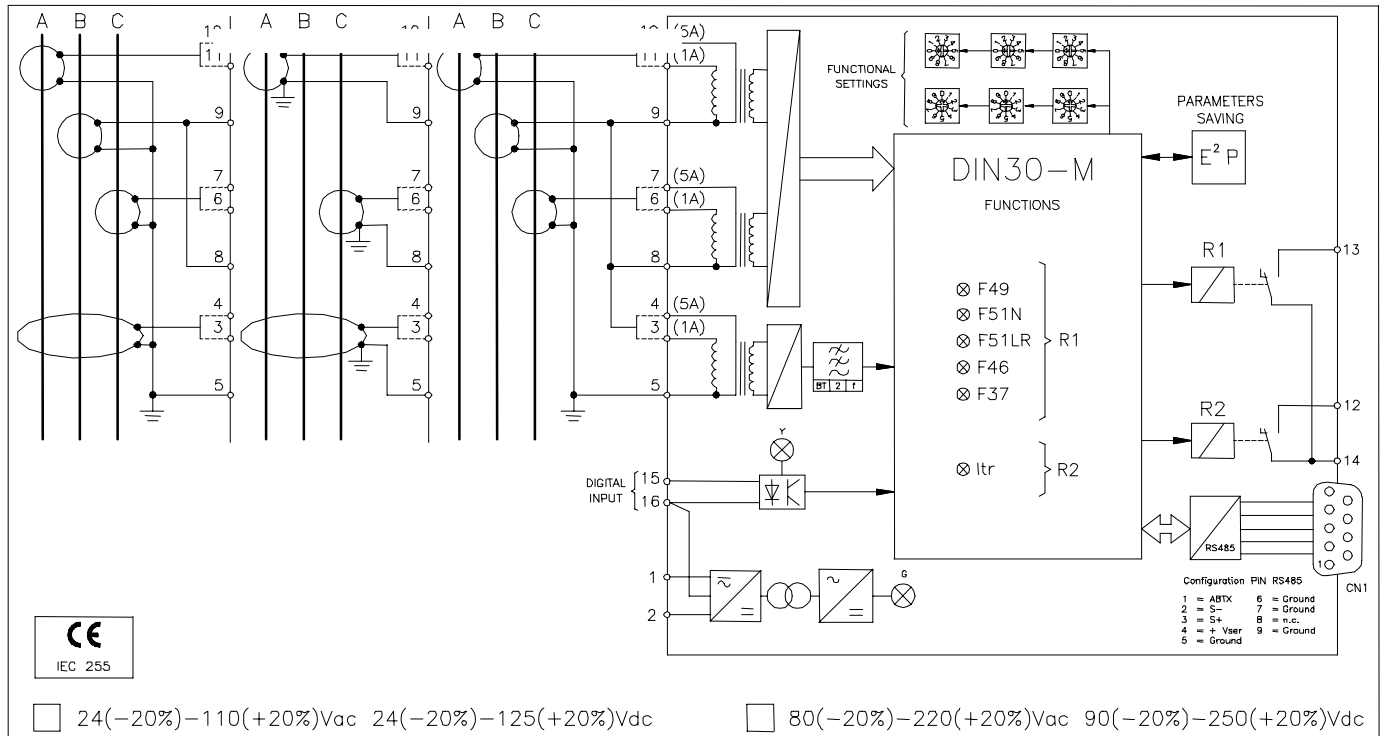
## DIN30M Motor Relay

- Set the operating frequency (50 or 60Hz).
- Enable or disable the unbalance element
- Change the status of the output relays from normally energized or normally de-energized.
- Toggle the reset mode between automatic and manual.
- Monitor the status of the protection elements (normal/above set level/tripped).
- Monitor the self diagnostic functions (E<sup>2</sup>P error, Calibration error).

## ORDERING INFORMATION

For the DIN30M relay with the low range power supply, use catalog number PRDIN30ML.

For the high range power supply, use catalog number PRDIN30MH.



**Figure 2:**  
Wiring Diagram for the DIN30M Motor Protection Relay

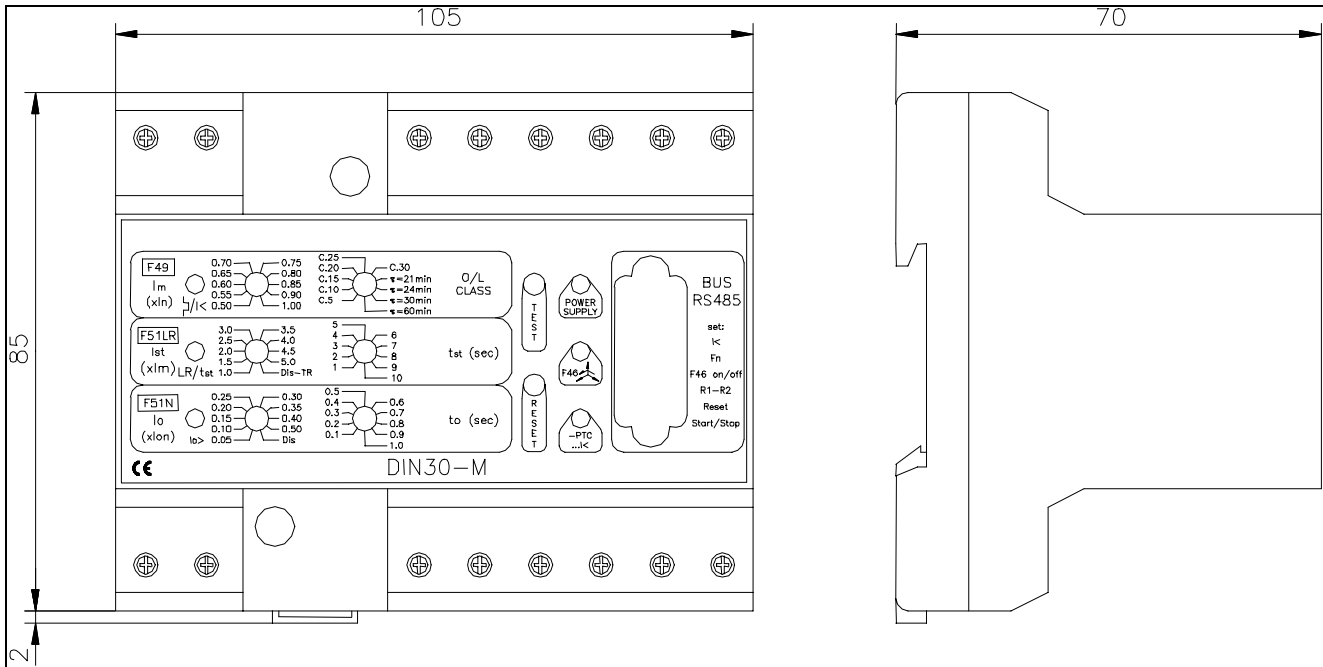


Figure 3: DIN30M Relay (All dimensions in millimeters)

## ELECTRICAL SPECIFICATIONS

Reference standards

Dielectric test voltage

Impulse test voltage

Immunity to high frequency burst

Immunity to electrostatic discharge

Immunity to sinusoidal wave burst

Immunity to radiated E.M. field

Immunity to 50-60 Hz magnetic field

Immunity to impulse magnetic field

Immunity to magnetic burst

Resistance to vibration and shocks

Rated current phase input

Rated current residual current input

Current overload

Burden on current inputs

Average power supply consumption

Output relays

Operation ambient temperature

Storage temperature

IEC 255, 801; CEI 41-1; IEEE C37; CE

2000 V, 50 Hz, 1 min.

5kV (MC), 1kV (MD) - 1,2/50 $\mu$ s

1 kV (MC), 0,5 kV (MD) - 0,1 MHz

2,5 kV (MC), 1 kV (MD) - 1 MHz

15 kV

100 V - (0,01-1) MHz

10 V/m - (20-1000) MHz

1000 A/m

1000 A/m - 8/20 $\mu$ s

100A/m - (0,1-1) MHz

10-500 Hz - 1 g - 0,075 mm

In = 1 or 5 A

On = 1 or 5 A

200 a for 1 sec; 10 A continuous

Z<sub>F</sub>=2m $\Omega$  phase at In; Z<sub>0</sub>=3/10m $\Omega$  at On = 1/5A

2,5 VA

rating 5 A; 250V AC

Max switching power = 1250VA

Max switching current = 5A (resistive)

Max switching voltage = 250V AC - 110V DC

Max make current = 0,2A, 110V DC, L/R=40ms

-20°C / +60°C

-30°C / +80°C