

Motor protection relay

I> Overload protection

- Tripping current from $1.10 \times I_B$ set current ($1.10 \times I_B$).
- Trip classes 10, 20 and 30 (IEC 947-4-1)

Phase imbalance protection

- When phase imbalance is over 40%.

Phase loss protection

- For current $> 0.7 \times I_B$.
- Tripping time < 3 seconds.



Relay without external display module



Relay with external display module connected

- Gives excellent protection for L.V. motors up to 1000 Vac.
- Broad range of current adjustment (1 to 630 and over).
- Discriminative signalling of the relay trip cause.
- Suitable for any type of motor start or working cycle. Three types of adjustment for trip class, 10, 20 and 30.
- Memorizes the thermal image of the motor, either heating or cooling.
- Three-year guarantee.

Applications

This relay is especially applicable in motor control centers (MCC), pumps, compressors, ventilators, centrifugal machines, conveyor belts, cranes, valves, air conditioning, machine tools, and in general, to protect motors which need dependable and accurate protection relays for every type of start (trip classes 10, 20 and 30).

External display module (ODC)

This optional display module is mounted externally, i.e. on the panel door or a draw-out unit in a motor control centre (MCC) and connected to the relay by a flat cable (L = 2 meters). The module has the appropriate LED's, to signal the trip cause, and a reset push-button.

Code no.: 12530

General characteristics

- Manufactured to IEC-255, IEC-947.
- **UL, cUL** listed. Marked **CE**.
- Mounted on DIN rail EN50022-35.
- Not connected to the motor line (passing through wires).
- Manual reset: when tripping as result of asymmetry or phase failure, the relay could be reset after 2 seconds; should tripping be caused by an overload, the waiting time to reset will be directly proportional to its severity, up to approximately 8 minutes.
- Remote reset: after the waiting time has elapsed by interrupting the auxiliary power supply and reconnecting it again after 3 seconds.
- Maximum terminal section : 2.5 mm², No. 22-12 AWG.
- Maximum screw torque: 20 Ncm, 1.8 LB-IN.
- Electromagnetic compatibility: IEC 255-22, IEC 801, EN 50081-2.
- Insulation: 2000V - 50Hz - 1 min/3kV - 1.2/50 μ s.
- Degree of protection: IP203.
- Storage temperature: -30°C +70°C.
- Operation temperature / Maximum altitude:
 - 15°C +60°C / 1000 m.
 - 15°C +50°C / 2000 m.
 - 15°C +40°C / 3000 m.

Relay power supply

- A1 - A2 terminals.
- Nominal voltage 230V (50/60Hz) (+15% -10%).
- On request: 115V (50/60Hz), 24 Vac-dc (+15% -10%).
- Operating power consumption:
 - C9: 6.5 VA at 230 Vac (3 VA at 115 Vac)
 - C21 and C45: 2.5 VA

Output contacts

- 1 NO (97-98) normally open contact and 1 NC (95-96) normally closed contact (when the relay is deenergized or when it has tripped), with galvanic isolation and in opposition.
- Maximum contacts voltage: 250 Vac.
- Maximum switching power:
 - C300-125/250V
 - AC15-250V-2A
 - DC13-30V-2A
 - DC13-115V-0.2A
 - Maximum thermal current: 5A

Models

	Relay adjustment range I_B (A)	Motor Characteristics 400 Vac - 4 poles		Code no.	
		CV	kW	Aux. supply 230 V 50/60 Hz	Aux. supply 115 V 50/60 Hz
C9	3 - 9.3	2 - 5.5	1.5 - 4	11203	11202
C21	9 - 21.6	7.5 - 12	5.5 - 9	11223	11222
C45	20 - 45.2	15 - 30	11 - 22	11243	11242

- For current setting below 3A, refer to SETUP PROCEDURE point 1. b).
- For current setting between 45 and 90A, we recommend to use our GL90.
- For current setting above 90A, use the C9 in combination with current transformers .../5.

Setup procedure

After being fixed to the DIN rail, the cables for the three phases should be passed through the holes in the relay.

In Star-Delta Starting the relay or the current transformers must be installed between the fuses or circuit breaker and the contactor (Figure 3).

When the relay is used in combination with frequency inverters, the relay or current transformers and the relays auxiliary supply shouldn't be connected at the inverter output.

Once connected to the motor, set the relay as follows:

- Adjust the current I_B on the 6-position dipswitch (FULL LOAD CURRENT SETTING).
 - For motor rated currents between 3 and 45A, the setting I_B must be equal to the rated current of the motor I_N (Figure 1).
 - For motor rated currents lower than 3A the setting I_B must be equal to the rated current of the motor I_N multiplied by the number of times that the conductors have been passed through the relay holes.

c) For motor rated currents between 45 and 90A, we recommend to use the GL90 relay.

d) For motor rated currents above 90A, use .../5 current transformers in combination with the C9 relay (Figure 2).

When setting the current take into account that the base current of the relay always remains added to the current selected with the dipswitches in ON position (to the right). The total addition is the set current I_B .

- Adjust the trip class (10, 20 ó 30) with the 2 dipswitches (TRIP CLASS) according with the suggested values given on the setting tables.

Test function: simulating a phase imbalance or a phase failure can be performed by pressing the TEST push-button for 3 seconds. The phase failure LED will light on.

To perform this test the current through the relay must be higher that $0.7 \times I_B$.

Wiring diagram

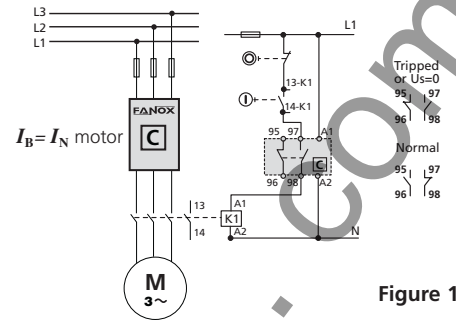


Figure 1

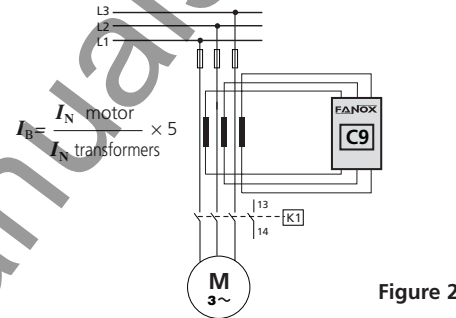
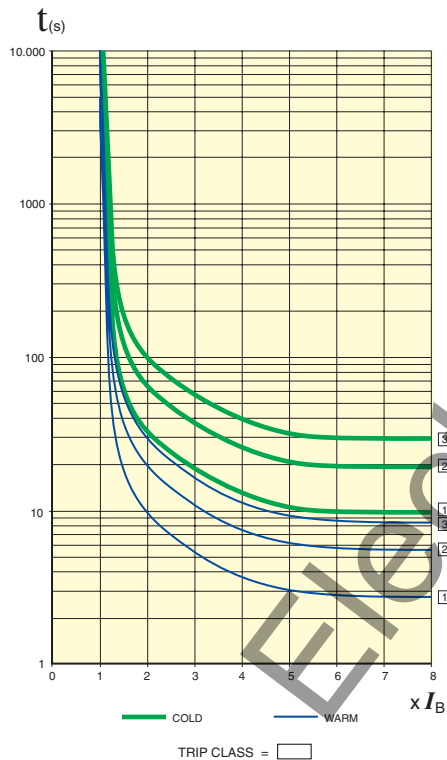


Figure 2

Average trip curves (IEC 947-4-1)



Setting tables

Direct motor starting

Direct motor starting time (s)	Tripping class to be set on the relay		
	C 9	C 21	C 45
1	10	10	10
2	10	10	10
3	10	20	20
4	20	20	20
5	20	30	30
6	20	30	30
7 - 10	30	30	30

Start-Delta motor starting

Star-Delta motor starting time (s)	Tripping class to be set on the relay		
	C 9	C 21	C 45
5	10	10	10
10	10	10	10
15	20	20	20
20	20	20	30
25 - 40	30	30	30

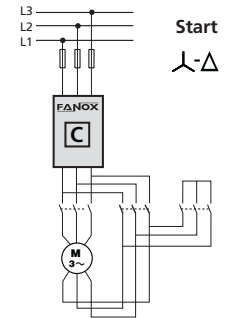


Figure 3

Dimensions

