

Motor protection relay

GL

I> Overload protection

- Tripping current from $1.10 \times I_B$ set current ($1.10 \times I_B$).
- Selectable Trip classes: 5, 10, 15, 20, 25, 30, 35 (CEI 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.

Overtemperature protection

- By means of PTC sensor (positive temperature coefficient resistor thermistor).

Phase sequence protection

- It actuates during the motor start. In order to detect a wrong phase sequence the starting time has to be longer than 0.2 seconds. Selectable.

- 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 motor start or working cycle. Broad range of trip class setting.
- Memorizes the thermal image of the motor, either heating or cooling.
- The wrong phase sequence protection can be activated or not by the user.
- Three-years guarantee.

Applications

This relay is especially applicable in motor control centers (MCC), pumps, compressors, ventilators, centrifugal machines, conveyor belts, cranes, valves, air conditioning, industrial refrigeration, machine tools, and in general, to protect motors with need dependable and accurate protection relays for every type of start (trip classes 5, 10, 15, 20, 25, 30 and 35). Suitable for motors with PTC's.

External display module (ODGL)

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.: 12535

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 and 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: 3000V - 50Hz - 1 min/3kV - 1.2/50 μs.
- Degree of protection: IP203.
- Cold resistance of PTC sensor, max/min: 1500/25 Ω.
- Trip / reset resistance: 3.600 / 1.800 Ω.
- 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: 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



Relay without external display module



Relay with external display module connected

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
GL 16	4 - 16.7	3 - 10	2.2 - 7.5	11303	11302
GL 40	15 - 40.5	10 - 25	7.5 - 18.5	11323	11322
GL 90	40 - 91	30 - 60	22 - 45	11343	11342

- For current setting below 4A, refer to SETUP PROCEDURE point 1.b).
- For current setting above 90A, use the GL16 with 3 current transformers .../5.

FANOX

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).

For PTC connection lengths over 100m or when the influence of high frequency transient voltages is expected, it is advisable to use screened cable and connect the shield mesh to terminal T1.

When the relay is used in combination with frequency inverters, the wrong phase sequence selector must be in OFF; in this conditions the relay or current transformers and the relay's 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 8-position dipswitch (FULL LOAD CURRENT SETTING).
 - For motor rated currents between 4 and 90A, the setting I_B must be equal to the rated current of the motor I_N (Figure 1).
 - For motor rated currents lower than 4A 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.
 - For motor rated currents above 90A, use .../5 current transformers in combination with the GL16 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 (5, 10, 15, 20, 25, 30 and 35) with the 3 dipswitches (TRIP CLASS) according with the suggested values given on the setting tables.
- Should the motor rotation sense be critical, activate the wrong phase sequence protection by moving the corresponding dipswitch to ON position; shouldn't this protection be necessary, leave this dipswitch in OFF position.

When it is required to protect a wrong phase sequence in installations with frequency inverters, move the corresponding dipswitch to the OFF position and install additionally a "S" type relay (voltage relay for wrong phase sequence protection).

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

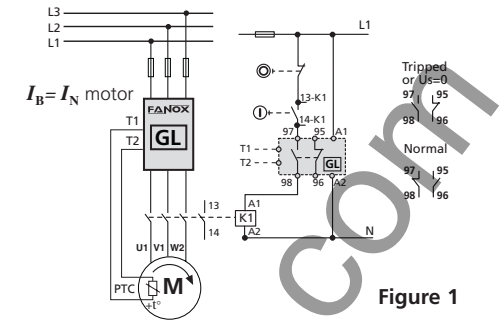


Figure 1

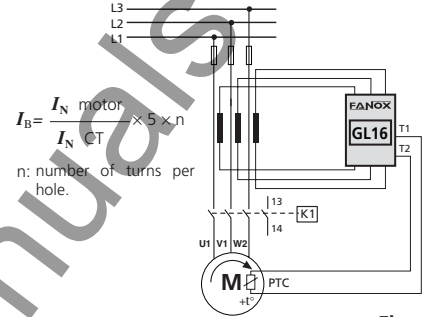
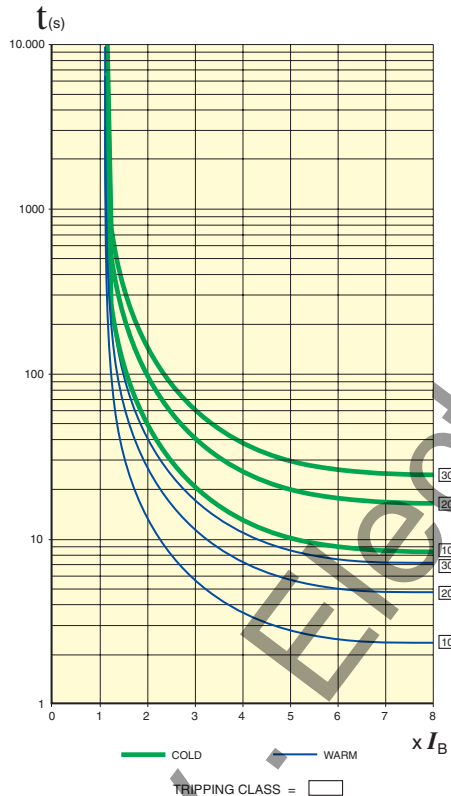


Figure 2

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		
	GL 16	GL 40	GL 90
1	10	10	10
2	10	10	10
3	15	15	15
4	20	20	20
5	20	20	25
6	25	25	25
7	30	30	30
8	30	30	35
9	35	35	35
10	35	35	35

Start-Delta motor starting

Star-Delta motor starting time (s)	Tripping class to be set on the relay		
	GL 16	GL 40	GL 90
5	10	10	10
10	10	10	10
15	10	15	15
20	20	20	20
25	20	20	25
30	20	25	30
35	20	30	35
40	25	30	35

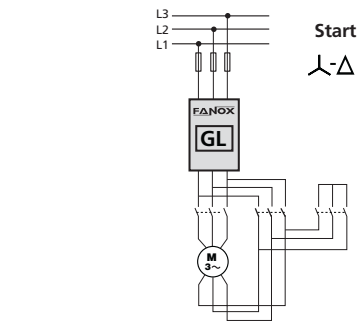


Figure 3

Dimensions

