

373-GFR Ground fault relay



Caution, risk of electric shock

- During normal operation, voltages hazardous to life may be present at some of the terminals of this unit. Installation and servicing should be performed only by qualified, properly trained personnel abiding by local regulations. Ensure all supplies are de-energised before attempting connection or other procedures.
- This Product is intended as part of a permanent installation. Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.
- This product provides basic insulation for Installation category III (Aux Supply), Pollution degree 2, when used at altitudes up to 2000m. Maximum System working Voltage to ground is 600 Volts rms or dc
- If these units are used in a manner not specified by the manufacturer, protection may be impaired.

Installation

Units should be mounted in a reasonably stable ambient temperature within the range -10 to 60°C.

The product should be fastened to a standard 35mm DIN rail (DIN50022) and is also suitable for panel mounting when installed in an enclosure conforming to DIN43880. Consideration should be given to the space around the unit to allow for bends in the connecting cables. The connection terminals on this product are rated to IP20, and as such, should be protected from liquids. The unit should be in a location where vibration is kept to a minimum.

Install the Neutral to Ground shunt resistor in a suitable location. Connect the shunt sense wires directly to terminals N (Neutral side) and G (Ground side) on the relay.

Cabling between the shunt resistor and the ground fault relay should be kept as short as possible. For longer cable runs or in electrical environments with high interference levels, screened cable is preferred and may be required, with the screen terminated at the product.

The product contains a switch mode power supply which has a very wide input range. For products with a DC auxiliary, ensure correct polarity. Default relay operation is de-energise on trip. This configuration is a design feature for fail safe operation and cannot be changed.

Fusing and connections

- Connection wires must be sized to comply with local regulations.
- The product has no internal fuse; therefore, an external auxiliary supply fuse must be used for safety protection under fault conditions.
- Choose fuses of a type and with a breaking capacity appropriate to the supply and in accordance with local regulations.

Screw torque

Main terminal screws should be tightened to 0.8Nm or 0.6 ft/lbf only.

Product Ratings

Operating Temperature -10°C to +60°C

Maximum relative humidity 95% (non condensing)

Front Panel to IP50, Terminal Sealing to IP20

Maximum System working Voltage to ground is 600 Volts rms or dc.

See product's data label for auxiliary supply Voltage

Relay protection class II (VDE0700)

Relay Dielectric Strength, coil-contacts 5kV RMS

Relay Dielectric Strength, open contact circuit 1kV RMS

Relay Insulation to VDE0110b (2/79)

Relay Insulation category/reference Voltage C/250.B/400

1.1 Electromagnetic Compatibility

These units have been designed to provide protection against EM (electro-magnetic) interference in line with requirements of EU and other regulations. Precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:-

- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- To protect the product against incorrect operation or permanent damage, surges and transients must be controlled. It is good EMC practice to suppress differential surges to 2kV or less at the source.
- Screened communication and small signal leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.
- It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

Suitable Shunts

A range of shunts are available for use with the GFR. Lower current shunts are listed to enable a more cost effective shunt to be chosen when appropriate, but it is the installer's responsibility to ensure that the shunt is rated correctly for the maximum fault current which could occur. When a lower current shunt is chosen precautions must be taken to avoid the possibility of the relay being set, during or after initial commissioning, to a current or time delay beyond the rating of the shunt. If in doubt, choose a 1200A shunt.

CI Part Number	Continuous Rated Current	Voltage (mV)	Shunt Resistance	Link 19-20	Shunt Overload rating
882-92MB-000138	100	200	2m Ω	Open	10 times for 10 seconds
883-92MB-RSEC	250	50	200 μ Ω	link	10 times for 10 seconds
883-92MB-SFGB	500	100	200 μ Ω	link	10 times for 10 seconds
884-92M3-000137	800	160	200 μ Ω	link	10 times for 5 seconds
885-92M3-000136	1200	240	200 μ Ω	link	10 times for 5 seconds

COMMISSIONING

Trip Setting

Always select the most appropriate trip current for the installation. If in doubt, start at the most sensitive (100A) setting, and make use of the LED bar graph indicator or 0 to 1 mA output to determine the approximate level of ground fault current in the installation. When the product is set correctly, any abnormal ground fault current should cause a trip. In environments of high electrical noise, it may be necessary to select a higher trip setting to avoid nuisance tripping.

A trip condition can be reset either with the front panel reset switch or by interrupting the auxiliary supply to the product.

Time Delay

The time delay feature can be used:

- 1) To disregard a nuisance trip, which could occur due to high inrush currents, such as motor start up or noise pickup. Increase the delay setting to overcome the problem. The trip level setting should not be adjusted to overcome this, since this will degrade the level of protection.
- 2) For fault grading – where more ground fault relays are installed downstream. The time delay setting must be greater than those relays downstream to avoid cascade tripping.
- 3) For other operational requirements according to system design.

Testing the Relay

Once the product is installed, a wiring confidence check can be performed by pressing and holding the Test / Reset button. This will force the product to trip, so the relay contacts will change state, and all LEDs will illuminate. Releasing the button restores normal operation.

Specification

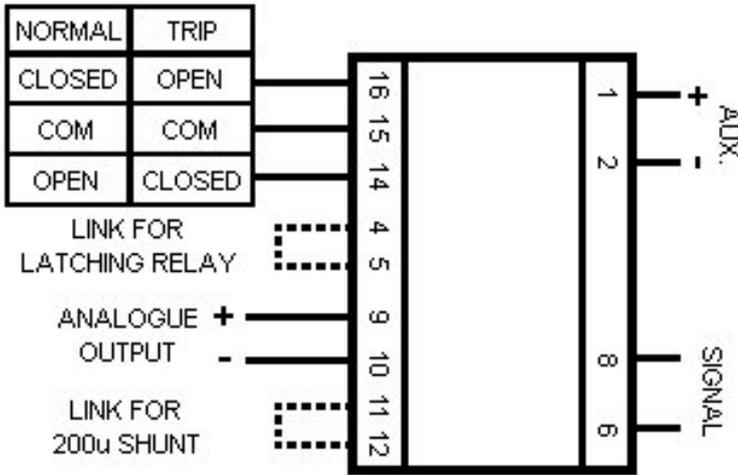
Standard supply voltage	100 - 250V AC nominal \pm 15% (85 - 287V AC absolute limits) or 100V to 250V DC nominal +25%, -15%(85 - 312V DC absolute limits)
a.c. supply frequency range	45 to 66 Hz
a.c. supply burden	2.5W
LV auxiliary d.c. supply	12 - 48V DC. nominal +25%, -15%(10.2 – 60VDC absolute limits)
d.c. supply burden	2.5W

Trip current setpoint:	100A, 150A, 200A, 250A, 300A, 450A, 600A, 750A, 800A, 1200A using one 10-position switch	
Time delay setpoint:	0ms, 50ms, 100ms, 200ms, 300ms, 400ms, 500ms, 600ms, 700ms, 800ms, 900ms, 1.0s, 2.0s, 5.0s, 10.0s using one 16-position switch.	
Response time:	Less than 200ms, plus preset time delay	
Relay contacts:	One SPCO contact, rated (Single Pole Change Over)	8A @ 250Vac 8A @30Vdc resistive 0.3A @ 250Vdc resistive
	electrical life	>10 ⁵ operations @ 8A, 250Vac
	mechanical life	30 \times 10 ⁶ operations
Temperature	Operating	-10°C to +60°C
	Storage	-20°C to +70°C

Maintenance

All units are fully calibrated before despatch and therefore no adjustments (other than setting the required trip point and delay) are required. During routine servicing and inspection of equipment the unit should be inspected to normal standards for this class of equipment. For example remove accumulations of dust and check connections for tightness and corrosion. In the event of a fault occurring and repair being necessary, it is recommended that the instruments be returned to the factory or to the nearest Crompton Instruments Sales and Service Centre.

CONNECTION DIAGRAM



Terminal Identification:

- 8 Neutral Input from shunt
- 6 Ground Input from shunt
- 2 Fused Auxiliary Supply (-)
- 1 Fused Auxiliary Supply (+)
- 4 Default operation is non-latching
- 5 Fit link to enable relay latch on trip.
- 9 + Analogue output 0/1 mA
- 10 - Analogue output 0/1 mA
- 11 Default input range is for 2mΩ Shunt
- 12 Link to select 200μΩ Shunt input.
- 16 Relay (NO)
- 15 Relay (COM)
- 14 Relay (NC)

Dimensions – as per DIN 43880

