

DGF100 Display

reference manual



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1. GENERAL DESCRIPTION

The DGF100 Display is a door mounted operator interface to be used in conjunction with the DGF100 Digital Ground Fault (G/F) protection unit. The DGF100 will supply power to the DGF100 Display. It has a four digit LCD panel that normally shows the magnitude of residual current flowing to ground as it is measured by the DGF100 G/F protection unit.

Three integrated pushbuttons provide a 'TEST', 'RESET' and 'VERIFY' function.

When the DGF100 G/F protection unit loses Control Voltage, pressing the 'VERIFY' button the DGF100 Display will show:

- A red LED, if the DGF100 tripped due to a ground fault prior to loss of its Control Voltage.
- A green LED, if there was a loss of Control Voltage without a ground fault.

A trip of the DGF100 G/F protection unit can be reset by pressing the 'RESET' button on the DGF100 Display.

A test can be invoked on the DGF100 G/F protection unit by using the buttons on the DGF100 Display. This feature can be enabled/ disabled by inserting the interconnecting cable into one of two sockets, TEST ON or TEST OFF, on the side of the display.

When the G/F current exceeds the system's measuring range, the display will show it is out of range.

The display is connected to the DGF100 base unit using up to 10 m of RJ-10 type, 4-wire telephone cable (1 m cable included). No separate power supply is needed.

2. FUNCTIONALITY

2.1 Pushbuttons

The DGF100 Display has three pushbuttons, 'VERIFY', 'RESET' and 'TEST'.

- 'VERIFY' pushbutton. Pressing the 'VERIFY' button on the DGF100 Display, will show if the DGF100, to which it was connected at the time of trip, tripped due to a ground fault prior to loss of its Control Voltage by lighting the red 'G/ F TRIP' LED. If there was no ground fault trip prior to loss of Control Voltage the green 'RUN' LED will light. This feature is especially useful when pulse tripping a breaker that also supplies Control Voltage to the DGF100. This indication will remain available for at least ten hours. The DGF100 Display will reset automatically when Control Voltage is restored.
- 'RESET' pushbutton. To reset the DGF100 after a trip.
- 'TEST' pushbutton. To invoke a test on the DGF100 as described in [section 2.4](#).

2.2 LCD test

The LCD panel can be tested at all times by keeping the 'TEST' button pressed longer than 2 seconds. The segments of the LCD panel will turn on, displaying .8.8.8 for 1 second.

2.3 G/F current display

The DGF100 Display shows a continuous reading of actual ground fault current, employing auto ranging. After a trip the display shows the actual current at the time of trip. If the current was too high to measure correctly, the display shows Out.

When the ground fault current has returned to zero, it shows a flashing display with the current value at the time of the trip.

2.4 Relay test

Keeping the 'RESET' button pressed and then clicking the 'TEST' button invokes a test on the DGF100 base unit. The 'RESET' button must be pressed to reset the trip.

The relay test function of this button can be enabled/ disabled by inserting the interconnecting cable from the DGF100 relay into one of two sockets, TEST ON or TEST OFF, on the side of the display. If the TEST feature is disabled and the 'RESET' and 'TEST' buttons are pressed, the display shows 'OFF' for 1 second and the red 'G/F TRIP' LED on the display flashes twice.

2.5 LED Indicators

There are two LED's present, green and red, showing which state the DGF100 base unit is in.

- Green 'RUN' LED

Flashing:	Okay
Off:	No Control Voltage, Control Voltage too low
- Red 'G/F TRIP' LED

Off:	No trip
Steady on:	Trip

After loss of Control Voltage to the DGF100 base unit, the DGF100 Display will show if the unit tripped because of a ground fault, by lighting the red LED, or it was a loss of Control Voltage without a trip, by lighting the green LED, after pressing the 'VERIFY' button.

2.6 External current sensors/ interposing current transformers

The Numerical LCD window displays actual ground fault current in A. When a 5000:5 ratio interposing CT is used, all displayed values are to be interpreted as kA rather than A.

Two blank boxes to the right of the LCD display window are marked 'A' and 'kA'. Use a permanent marker to check the appropriate box as follows:

- 'A' - when using the built-in CS, an external CS, or a 500:5 ratio interposing CT.
- 'kA' - when using a 5000:5 ratio interposing CT.

3. CONNECTIONS AND PRECAUTIONS

Please consult the following checklist when applying the DGF100 Display.

- 1) Please review [Figure 1](#) for typical field connections.
- 2) Place the DGF100 Display on the door or front panel of the clean dry enclosure that accommodates the DGF100 G/F Protection unit it is to be connected to. The panel cut-out is a rectangle measuring 85 mm vertically, and 70 mm horizontally. Use the U-shaped mounting bracket supplied with the unit to clamp it into the panel.
- 3) For good EMC behaviour it is important (as in any installation) to run all wiring, especially if unshielded, close along the chassis or in metal ducts, avoiding excess lengths.
- 4) A 1 meter long, type RJ-10, 4-wire telephone cable complete with both crimp-on connectors, is supplied to connect the DGF100 Display to the DGF100 base unit.

4. CATALOGUE NUMBERS

DGF100 Display	Digital Display Unit with LCD display and interconnecting cable, for use with DGF100
DGF100	Ground Fault Protection unit with built-in 46 mm CS, 24 - 240 V AC or DC Control Voltage, for use on 660 V maximum, 45 - 450 Hz power systems. Optional: external CS, remote Reset/Test pushbutton and DGF100 Display.

5. TECHNICAL SPECIFICATIONS

5.1 Display datalink circuit

Display datalink voltage	Max. 10 V DC
Maximum total length	10 m, within one enclosure
Terminals	RJ-10 telephone connector

5.2 Environment

Operating temperature	-20 °C to +50 °C
Storage temperature	-40 °C to +80 °C
Humidity	85% max (no condensation)
Ingress protection	IP55

5.3 Mechanical properties

Height	95 mm
Width	81 mm
Depth	38 mm (excluding bracket and screws)
Panel cut-out	85 x 70 mm (H x W)
Mounting bracket	2 pieces M5 x 16 plus rings and bracket supplied
Weight (open)	0,18 kg
Weight (packaged)	0,22 kg

6. APPLICABLE STANDARDS

EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential (=lowest levels). 30- 230 MHz 30 dB μ V at 10 m distance 230-1000 MHz 37 dB μ V at 10 m distance
EN 61000-6-4	Electromagnetic compatibility (EMC) Part 6-4: Generic standards - Emission standard for industrial environments.
EN 61000-6-8	Electromagnetic compatibility (EMC) – Part 6-8: Generic standards – Emission standard for professional equipment in commercial and light-industrial locations.
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments (=highest levels) 80-1000 MHz with 80% AM modulation up to 10 V/m at 3 m distance from source.
EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test.
EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test.
EN 61000-4-4	Electromagnetic compatibility (EMC) Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test.
EN 61000-4-5	Electromagnetic compatibility (EMC) Part 4-5: Testing and measurement techniques - Surge immunity test.
EN 61000-4-6	Electromagnetic compatibility (EMC) Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields.
EN 61000-4-11	Electromagnetic compatibility (EMC) Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase.
EN 60947-5-1	Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices.
IEC 60755	General requirements for residual current operated protective devices
c-UL-us	UL 1053 UL standard for Safety Ground-Fault Sensing and Relaying Equipment, Class 1. CSA C22.2 NO. 144-M1991 CSA standard for Ground Fault Circuit Interrupters. File E203514
CE	CE mark – Declaration of Conformity

7. TABLE AND FIGURES

7.1 Table 1 - DGF100 dipswitch settings

'D' denotes down and 'U' denotes up.

Values are primary currents for a 500:1 ratio internal or external Current Sensor.

For other ratio's see [Table 2](#).

Switch no.	Function	Set to	Meaning
1	CT configuration	D ♦ U	No interposing CT, With 500:1 External CS, or with 5000:5 interposing CT With 500:5 interposing CT
2 3 4 5	Ground Fault Trip level	D D D D ♦ D D D U D D U D D D U U D U D D D U D U D U U D D U U U U D D D U D D U U D U D U D U U U U D D U U D U	0,030 A 0,040 A 0,060 A 0,090 A 0,150 A 0,250 A 0,40 A 0,60 A 0,90 A 1,50 A 2,50 A 4,00 A 6,00 A 9,00 A
6 7 8	Ground Fault Trip Delay time	D D D ♦ D D U D U D D U U U D D U D U U U D U U U	20 ms 50 ms 100 ms 200 ms 500 ms 1000 ms 2000 ms 5000 ms
9 10	Operation Mode	D D ♦ D U U D U U	Continuous Non-Failsafe operation Continuous Failsafe operation Pulsed Auto Reset operation (Pulse turns off 3 sec after G/F removed) Pulsed Non-Failsafe operation
♦ Factory settings			

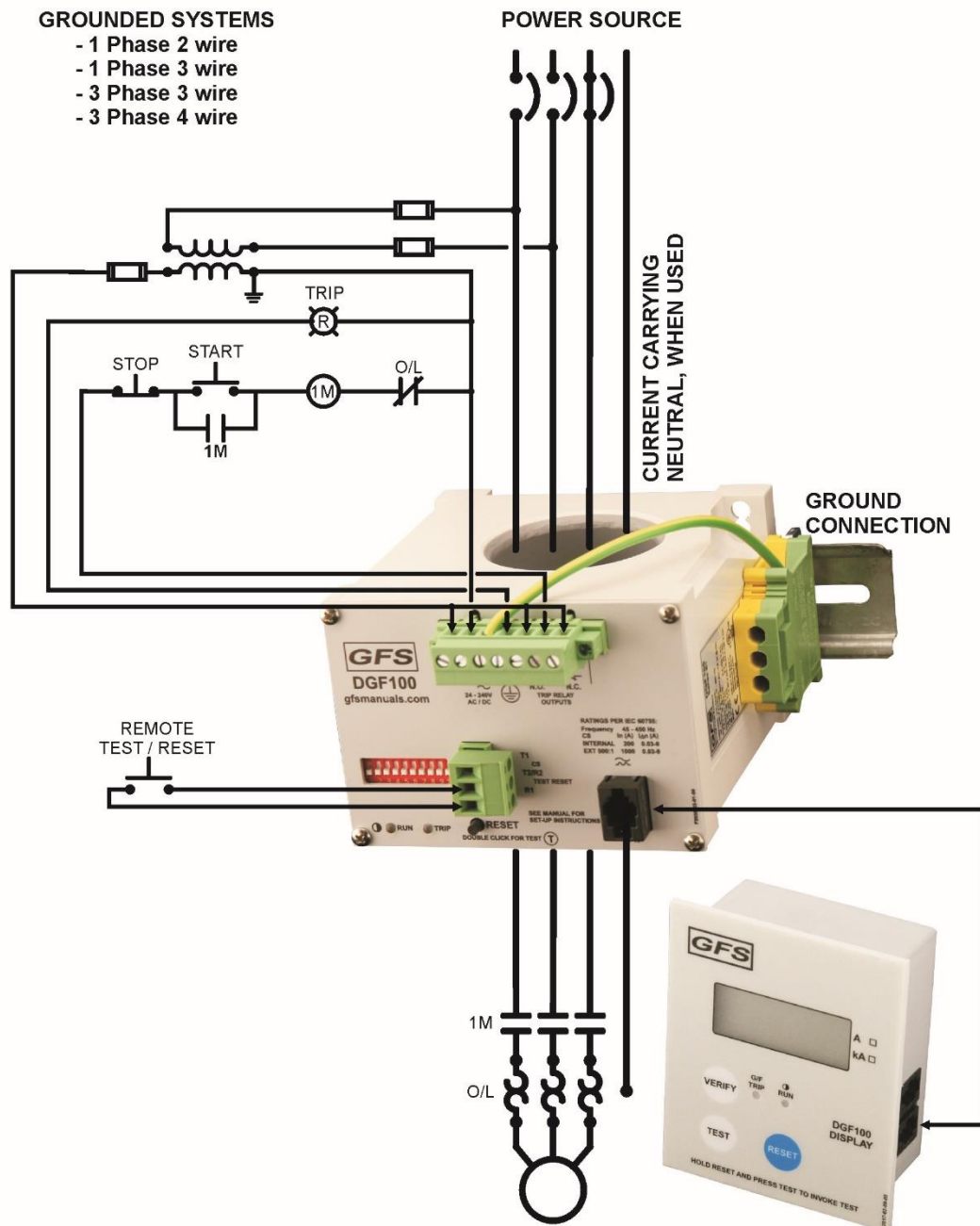
7.2 Table 2 - Primary current Trip Level

Values are primary currents.

DGF100 Setting	External Current Sensor ratio's				Interposing CT ratio's	
	500:1	1000:1	2000:1	10.000:1	500:5	5000:5
0,030 A	0,030 A	0,060 A	0,120 A	0,60 A	3 A	0,030 kA
0,040 A	0,040 A	0,080 A	0,160 A	0,80 A	4 A	0,040 kA
0,060 A	0,060 A	0,120 A	0,240 A	1,20 A	6 A	0,060 kA
0,090 A	0,090 A	0,180 A	0,360 A	1,80 A	9 A	0,090 kA
0,150 A	0,150 A	0,300 A	0,60 A	3,0 A	15 A	0,150 kA
0,250 A	0,250 A	0,50 A	1,00 A	5,0 A	25 A	0,250 kA
0,40 A	0,40 A	0,80 A	1,60 A	8,0 A	40 A	0,40 kA
0,60 A	0,60 A	1,20 A	2,40 A	12,0 A	60 A	0,60 kA
0,90 A	0,90 A	1,80 A	3,60 A	18,0 A	90 A	0,90 kA
1,50 A	1,50 A	3,00 A	6,00 A	30,0 A	150 A	1,50 kA
2,50 A	2,50 A	5,00 A	10,00 A	50,0 A	250 A	2,50 kA
4,00 A	4,00 A	8,00 A	16,00 A	80,0 A	400 A	4,00 kA
6,00 A	6,00 A	12,00 A	24,00 A	120,0 A	600 A	6,00 kA
9,00 A	9,00 A	18,00 A	36,00 A	180,0 A	900 A	9,00 kA

[Back to Table 1.](#)

7.3 Figure 1 - Typical field connection using built-in Current Sensor, remote test/reset and DGF100 Display



7.4 Figure 2 - Dimensions

