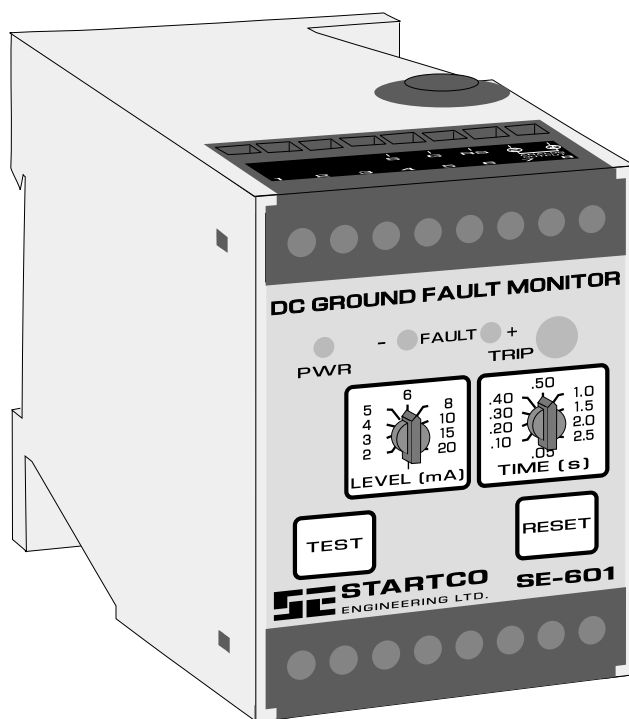


SE-601 MANUAL

DC GROUND-FAULT MONITOR

JULY 4, 2002

REVISION 0



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1. GENERAL

The SE-601 is a microprocessor-based ground-fault monitor for ungrounded dc systems. Its output relay can operate in the fail-safe or non-fail-safe mode for undervoltage or shunt-trip applications, and the output contacts are isolated for use in independent control circuits. Additional features include LED and fluorescent-flag indication, front-panel and remote reset, self test, 0 to 5-V analog output, digital selector switches, and autoreset or latching trips. The SE-601 can be DIN-rail, surface, or panel mounted.

Ground-fault current is sensed using an SE-GRM Ground-Reference Module—a resistor network that limits ground-fault current to 25 mA. The trip level of the ground-fault circuit is selectable from 1 to 20 mA. Trip time is selectable from 0.05 to 2.5 s.

2. OPERATION

2.1 CONFIGURATION-SWITCH SETTINGS (See Fig. 1)

2.1.1 RELAY OPERATING MODE

The SE-601 has one output relay with isolated normally open and normally closed contacts. The relay contacts (terminals 13, 14, 15, and 16) are shown with the SE-601 de-energized. Switch 1 is used to set the operating mode of the output relay. In the fail-safe mode, the output relay energizes and the contacts change state when the SE-601 is energized and remain in that state unless the ground-fault circuit trips or the SE-601 is de-energized. In the non-fail-safe mode, the output contacts do not change state when the SE-601 is energized or de-energized—the output relay only energizes when a trip occurs.

2.1.2 AUTORESET

Switch 2 is used to select autoreset or latching trips. See 2.2.3.

2.2 FRONT-PANEL CONTROLS

2.2.1 TRIP LEVEL

The LEVEL (mA) selector switch is used to set the ground-fault trip level.

Ground-fault current is a function of fault resistance, system voltage, and the SE-GRM Ground-Reference Module. Table 1 lists the SE-601 trip levels and fault-resistance values for 24-, 48-, 125-, and 250-Vdc systems.

TABLE 1. SE-601 TRIP LEVELS AND
FAULT-RESISTANCE VALUES

TRIP LEVEL (mA)	FAULT RESISTANCE (k Ω)			
	24 Vdc SYSTEM SE-GRM024	48 Vdc SYSTEM SE-GRM048	125 Vdc SYSTEM SE-GRM125	250 Vdc SYSTEM SE-GRM250
1	11.5	22.3	60.0	120.0
2	5.5	11.0	28.7	57.5
3	3.5	7.0	18.3	36.6
4	2.5	5.0	13.1	26.2
5	1.9	3.8	10.0	20.0
6	1.5	3.0	7.9	15.8
8	1.0	2.0	5.3	10.6
10	0.7	1.4	3.7	7.5
15	0.3	0.6	1.6	3.3
20	0.1	0.2	0.6	1.2

2.2.2 TRIP TIME

The TIME (s) selector switch is used to set the ground-fault trip time.

2.2.3 RESET

The reset circuit responds only to a momentary closure so that a jammed or shorted switch will not maintain a reset signal. The front-panel RESET switch is disabled when remote-reset terminals 6 and 7 are shorted.

If Switch 2 is in the LATCHING position, a trip remains latched until the RESET switch is pressed, the remote-reset terminals are momentarily shorted, or the supply voltage is cycled. Cycling the supply voltage will not reset (black) the fluorescent flag.

If Switch 2 is in the AUTORESET position, a trip will reset when the fault is removed. The fluorescent flag will not reset until the RESET switch is pressed or the remote-reset terminals are momentarily shorted. Cycling the supply voltage will not reset the fluorescent flag unless the remote-reset terminals are shorted.

2.2.4 TEST

The TEST switch is used to test the ground-fault circuit, trip indication, and the output relay. When the TEST switch is pressed for one second the circuit will trip, both "-" and "+" FAULT LED's will illuminate, the fluorescent flag will be set (red), and the output relay will operate.

2.3 FRONT-PANEL INDICATION

2.3.1 POWER

The green LED labeled PWR indicates presence of the supply voltage.

2.3.2 TRIP

The FAULT LED's and the fluorescent flag labeled TRIP indicate a ground-fault trip. The "-" FAULT LED indicates a ground-fault on the negative dc bus. The "+" FAULT LED indicates a ground-fault on the positive dc bus.

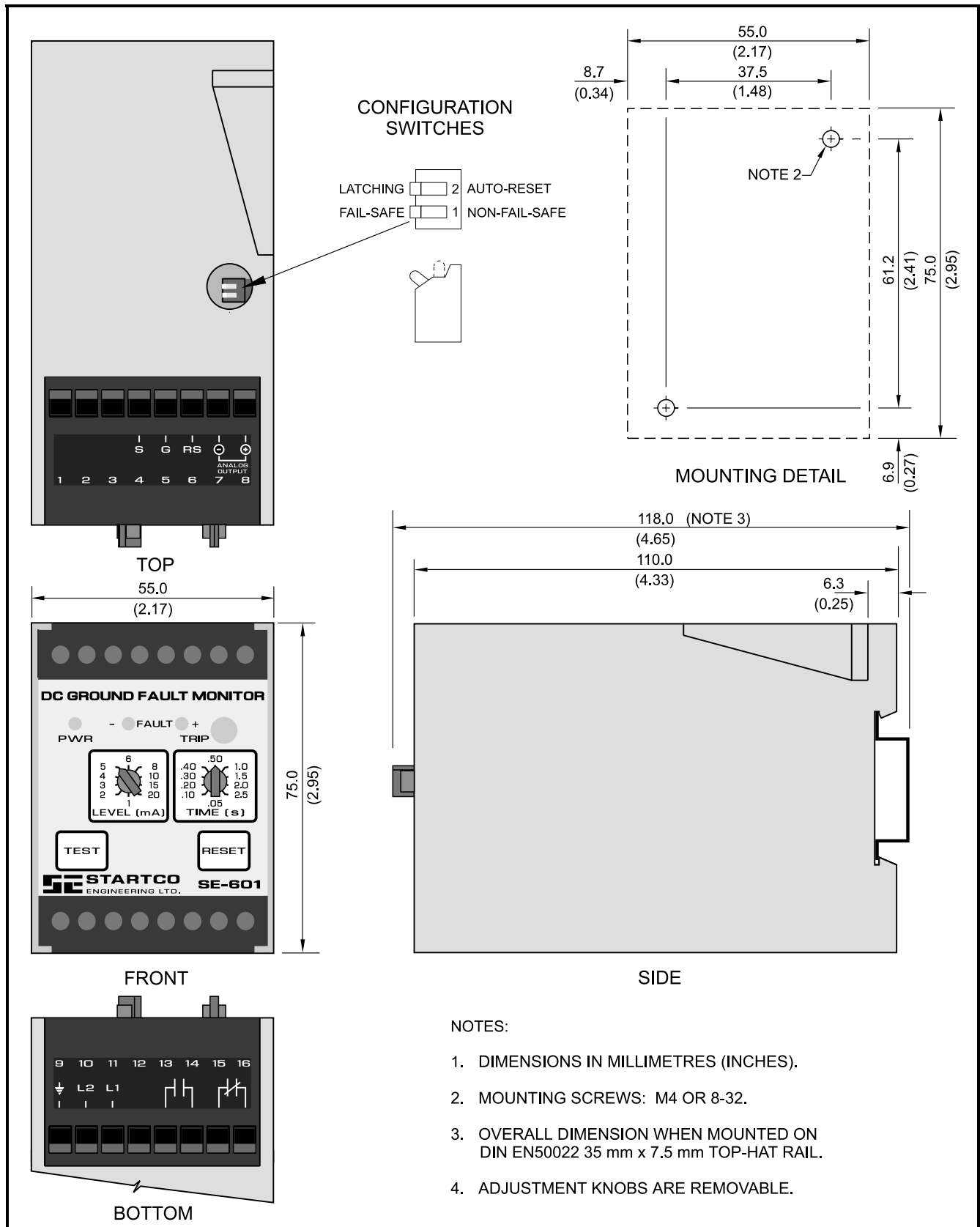


FIGURE 1. SE-601 Outline and Mounting Details.



2.4 ANALOG OUTPUT

The non-isolated, 0 to 5-V analog output indicates ground-fault current. The output is 5 V when ground-fault current is 22 mA.

3. INSTALLATION

Connect the SE-601 DC Ground-Fault Monitor and SE-GRM Ground-Reference Module as shown in Fig. 2.

Remove the connection to terminals 5 and 9 for dielectric-strength testing—all inputs and outputs have ANSI/IEEE C37.90 surge-protection circuits that conduct above 300 Vac.

4. TECHNICAL SPECIFICATIONS

4.1 SE-601

Supply:

0U Option55 to 275 Vac, 50/60 Hz, 3.5 VA
75 to 275 Vdc, 2.0 W
0D Option9 to 36 Vdc, 3.0 W
0T Option30 to 70 Vdc, 3.0 W

Dimensions:

Height 75 mm (3.0")
Width 55 mm (2.2")
Depth 115 mm (4.5")

Shipping Weight 0.45 kg (1 lb.)

Trip-Level Settings 1, 2, 3, 4, 5, 6, 8, 10, 15,
and 20 mA

Trip-Time Settings 0.05, 0.10, 0.20, 0.30, 0.40,
0.50, 1.0, 1.5, 2.0, and 2.5 s

Accuracies:

Trip Level 10% of setting or
0.5 mA, whichever is less
Trip Time 10% of setting or
20 ms, whichever is less

Operating Mode Latching or Autoreset

Analog Output:

Range 0 to 5 V, 0.23 V per mA
Output Impedance 220 Ω

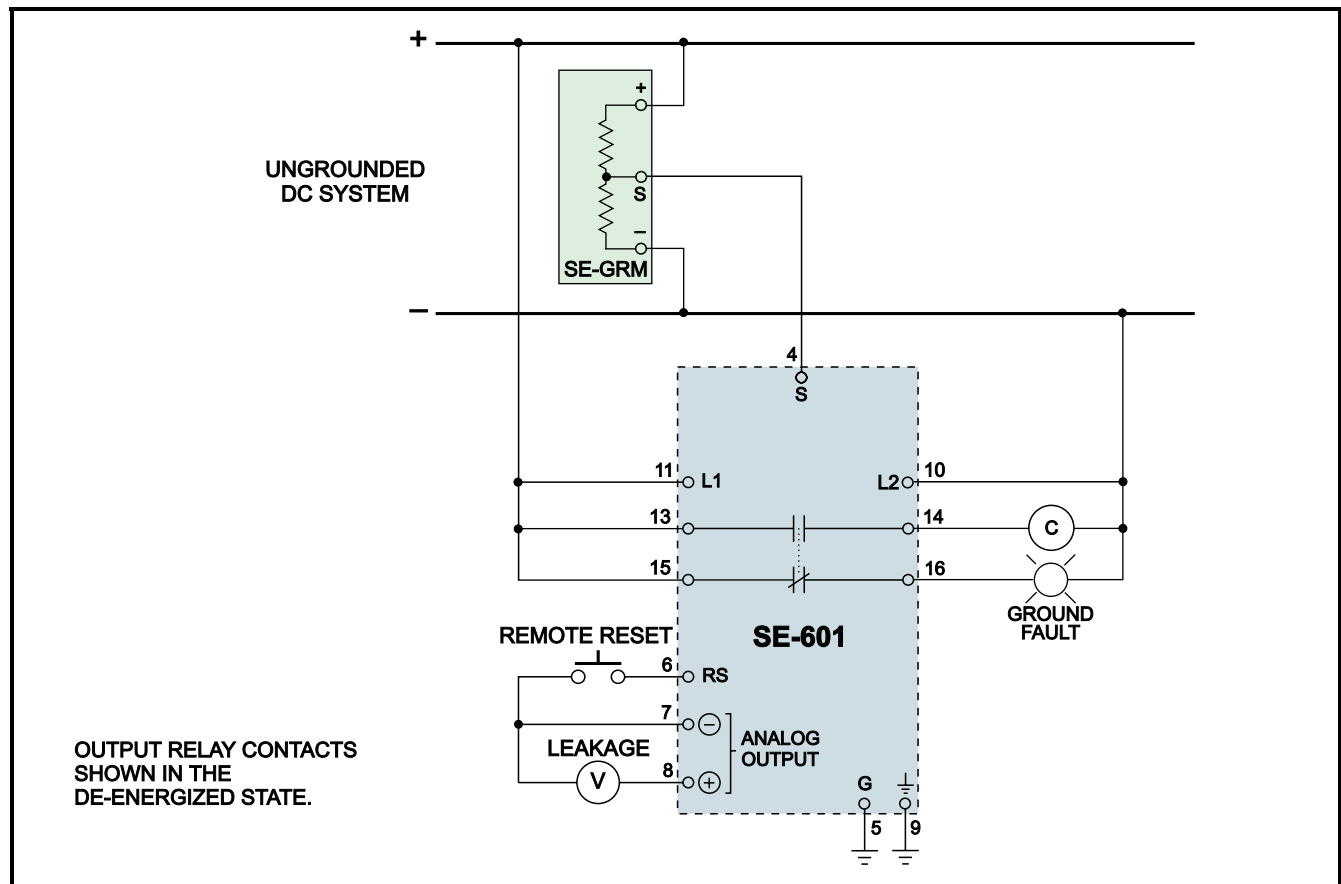


FIGURE 2. Typical Connection Diagram.



Reset.....Front-Panel Switch and
Remote, N.O. Contact

Functional Test.....Front-Panel Switch

Output Relay:
CSA/UL Rating8 A resistive,
250 Vac/30 Vdc
Contact ConfigurationIsolated N.O. and N.C.
Operating Mode.....Fail-Safe or Non-Fail-Safe

Supplemental Contact Ratings:
Make/Carry 0.2 s20 A
Break:
dc30 W resistive,
15 W inductive
(L/R = 0.4 s)
ac2000 VA resistive
1400 VA inductive
(PF = 0.4)
Subject to maximums of 8 A and 250 V (ac or dc).

Environment:
Operating Temperature.....-40 to 60°C
Storage Temperature.....-55 to 80°C
Humidity85% Non-Condensing

Surge Withstand.....ANSI/IEEE 37.90.1-1989
(Oscillatory and Fast
Transient)

4.2 SE-GRM

Nominal Current..... 12.5 mA

Maximum Fault Current..... 25 mA

Duty Cycle..... Continuous

Dimensions: (for units listed below)
Height..... 105.0 mm (4.13")
Width..... 40.0 mm (1.57")
Depth..... 41.5 mm (1.63")

Shipping Weight..... 300 g (0.7 lb)

Environment:
Operating Temperature -40 to 60°C
Storage Temperature -55 to 80°C
Humidity..... 85% Non-Condensing

5. ORDERING INFORMATION

SE-601-0 ☐ — U Universal ac/dc Supply
D 9- to 36-Vdc Supply
T 30- to 70-Vdc Supply

SE-GRM024....Ground-Reference Module for 24-Vdc
system.

SE-GRM048....Ground-Reference Module for 48-Vdc
system.

SE-GRM125....Ground-Reference Module for 125-Vdc
system.

SE-GRM250....Ground-Reference Module for 250-Vdc
system.

Consult factory for other ground-reference modules.

PMA-55..... Panel-Mount Adapter (See Fig. 4)
Consult factory for custom mounting adapters.

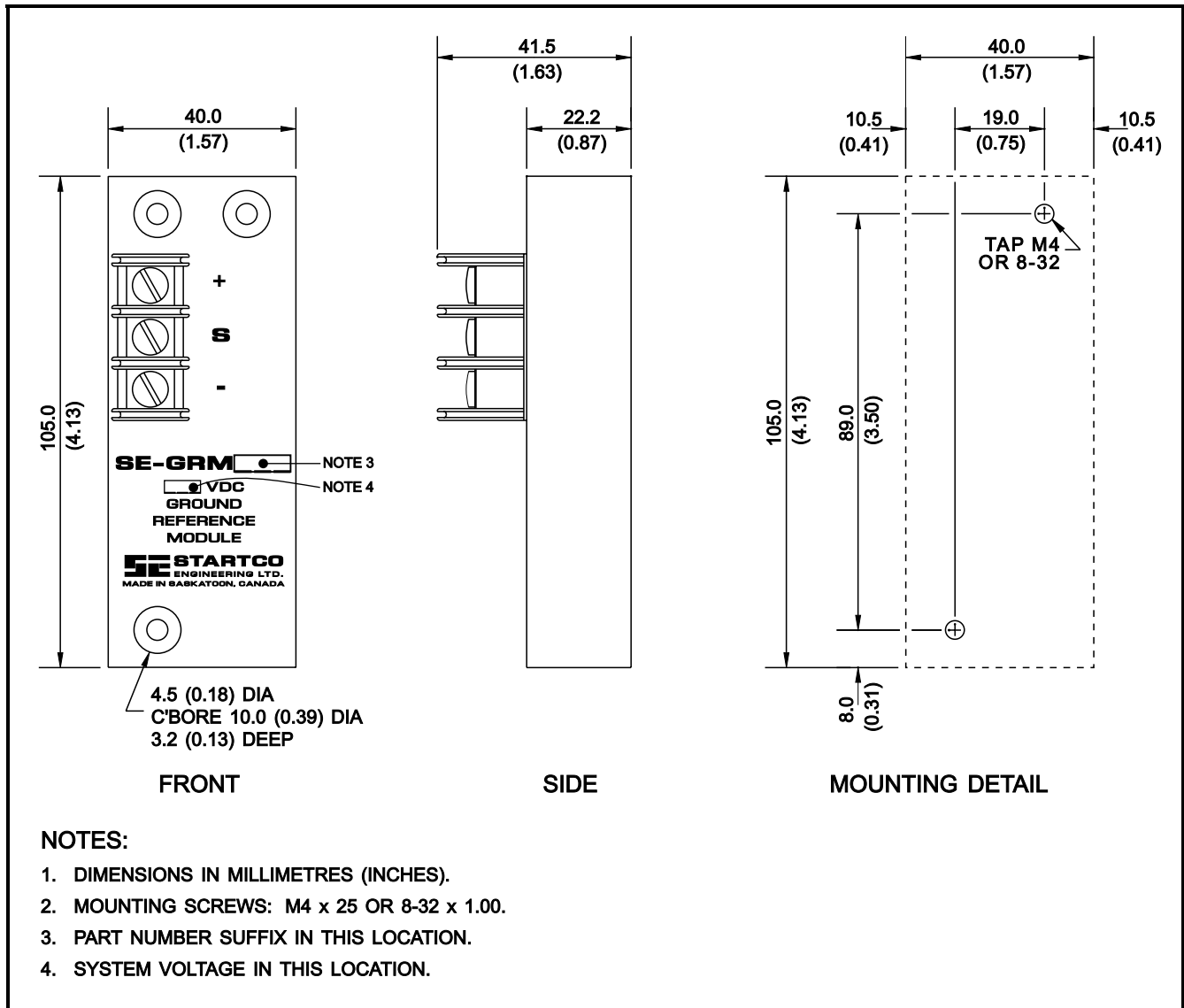


FIGURE 3. SE-GRM Ground-Reference Module.

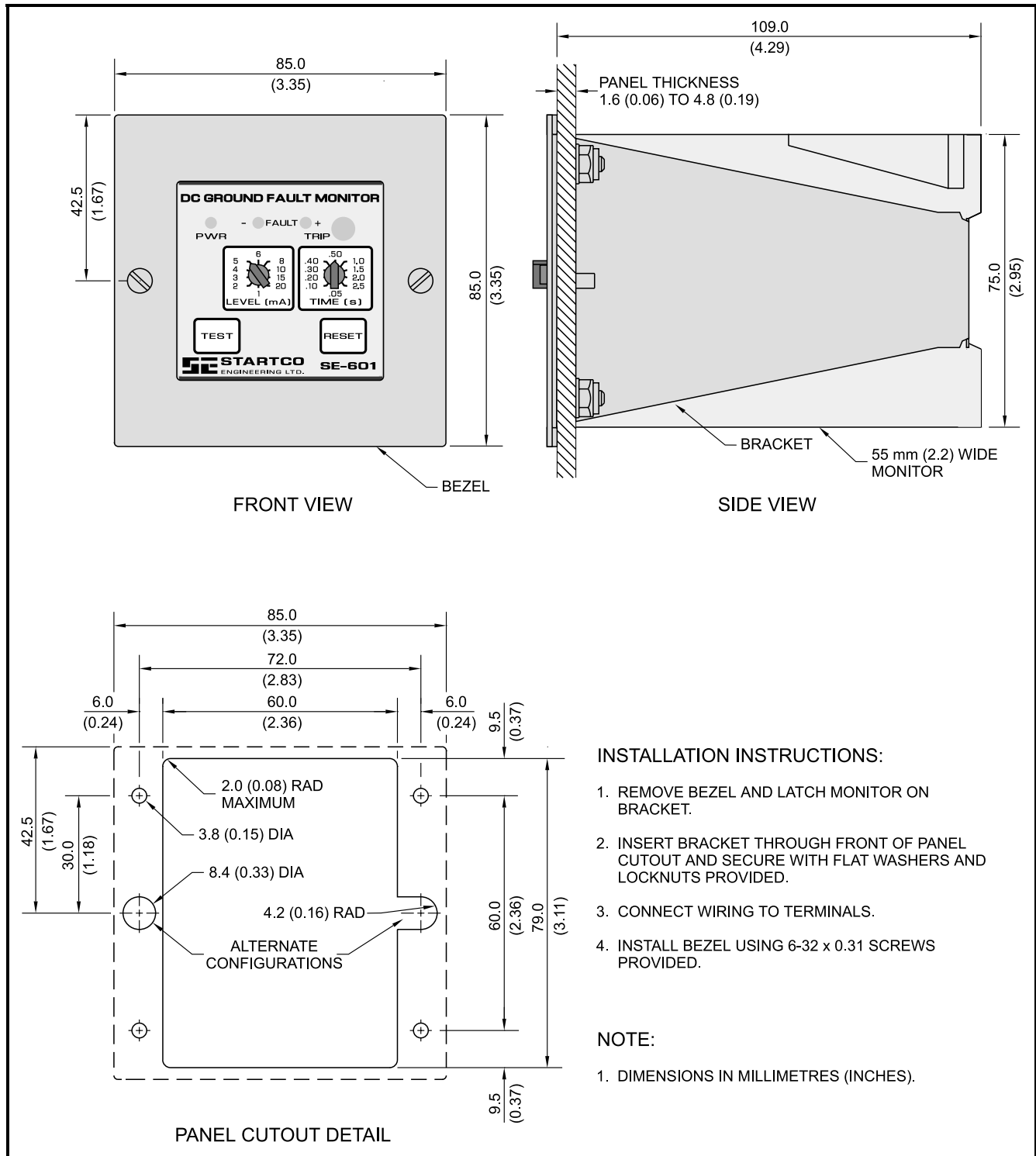


FIGURE 4. PMA-55 Panel-Mount Adapter.