

Features

- Wide range of battery voltages catered for
- High sensitivity
- 2L11 model differentiates between positive & negative earth faults
- Low burden
- Fast operate time
<35 ms with zero resistance E/F
- High output contact rating with optional magnetic arc blowouts
- Optional hand reset flag
- Size 2M draw out case

Application

Sub-station battery supplies are critical to the correct operation of critical protection & other functions. The 2L10 & 2L11 are designed to operate on earth faults or degradation of the insulation to earth of a battery or other DC supply which has neither pole connected to earth.

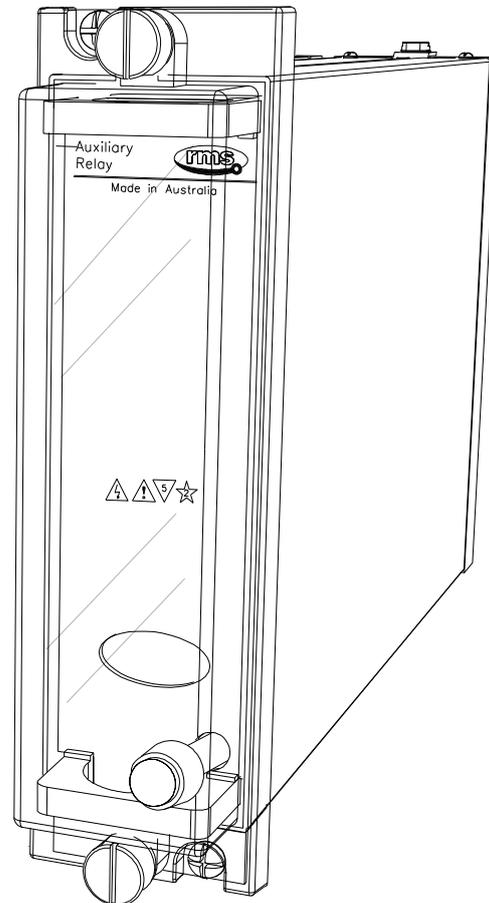
The relay earths the battery through a high resistance with a consequent limit to the earth fault current.

It should be noted that the relay will not operate for an earth fault to the centre of the battery.

Technical Bulletin

2L10 / 2L11

Battery Earth Fault Relays



2L10 depicted in a 2M28 case

Operation

Made in Australia

The 2L10 & 2L11 Series relays are double wound relays suitable for connection across a battery with the coils in series opposition, the centre tap being connected to earth. For a battery without an earth fault the relay remains inoperative due to the opposing coils. For an earth fault the centre earth connection shorts one coil & produces full voltage on the other thus operating the relay. The relays are rated to withstand an earth fault continuously.

The **2L10** relays are single relays which operate on earth faults of either polarity.

The **2L11** relays comprise two relay elements, one operates on positive earth faults & the other on negative earth faults.

Technical Data

OPERATE TIME

<35ms with zero resistance earth fault

SENSITIVITY & MAXIMUM FAULT CURRENT

Sensitivity in ohms earth fault to operate at nominal voltage.

Maximum earth fault current in mA on zero resistance fault.

Voltage V DC	Standard Sensitivity ohms	High Sensitivity * ohms	Max. Fault Current mA
12		300	24
24	150	800	24
32	350	1,750	16
50	1,000	3,250	25
110	5,500	15,750	11
125	6,500	18,750	12.5
240	20,000	50,000	12

Note: * Where a flag is specified the sensitivity of the high sensitivity model is reduced by 33%.

BURDEN

	Model	
	2L10	2L11
12V	1,000 Ohm	500 Ohm
24V	2,000 Ohm	1,000 Ohm
32V	4,000 Ohm	2,000 Ohm
50V	4,000 Ohm	2,000 Ohm
110V	20,000 Ohm	10,000 Ohm
125V	20,000 Ohm	10,000 Ohm
240V	40,000 Ohm	20,000 Ohm

DC SUPPLY OPERATIONAL MONITORING RANGE

70% to 120% of nominal battery voltage

TRANSIENT OVERVOLTAGE

Between all terminals & earth
Between independent circuits without
damage or flashover

IEC60255-5 CLASS III

5kV 1.2/50us 0.5J

5kV 1.2/50us 0.5J

INSULATION COORDINATION

Between all terminals & earth
Between independent circuits
Across normally open contacts

IEC60255-5 CLASS III

2.0kV RMS for 1 minute

2.0kV RMS for 1 minute

1.0kV RMS for 1 minute

HIGH FREQUENCY DISTURBANCE

2.5kV 1MHz common mode
1.0kV 1MHz differential mode

IEC60255-22-1 CLASS III

≤ 3% variation

ELECTROSTATIC DISCHARGE

6kV contact discharge

IEC60255-22-2 CLASS III

≤ 5% variation

FAST TRANSIENT

4kV, 5/50ns, 2.5KHz repetitive

IEC60255-22-4

≤ 3% variation

OUTPUT CONTACTS

2L10

Standard sensitivity: 2 C/O

High sensitivity: 1 N/O

2L11

Standard sensitivity: 2 C/O for each positive & negative

High sensitivity: 1 N/O for each positive & negative

Contacts are of fine silver & magnetic blowouts may be optionally specified to increase contact switching performance.

6R RELAY CONTACT RATINGS

Make & Carry Continuously

3,000 VA AC resistive with maximums of 660V & 12A

3,000 W DC resistive with maximums of 660V & 12A

Make & Carry for 3 Seconds

7,500 VA AC resistive with maximums of 660V & 30A

7,500 W DC resistive with maximums of 660V & 30A

AC Break Capacity

3,000 VA AC resistive with maximums of 660V & 12A

DC Break Capacity (Amps)

Voltage			24V	48V	125V	250V
Resistive rating	a	12	1.5	0.5	0.25	
	b	12	12	10	5	
L/R=40ms	Maximum break	a	12	1	0.25	0.15
		b	30	15	5.5	3.5
	1K operations (N3 Rating)	b	12	12	5	2.5

a = Without magnetic blowouts b = With magnetic blowouts

CASE

2L10 Size 2M28-S draw out

2L11 Size 4M28-S draw out

28 M4 screw terminals

Flush panel mount or 4U high 1/4 width 19 inch rack mount

IP RATING

IP5X category 2 dust protected and IP4X for solid ingress to IEC60529.

TEMPERATURE RANGE

Operating:

-10 to +55°C

Storage:

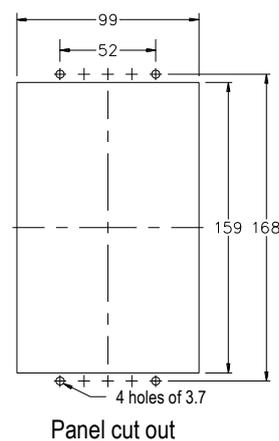
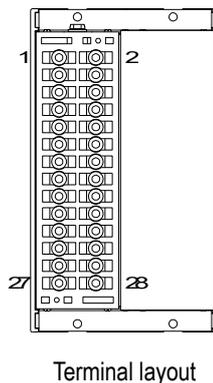
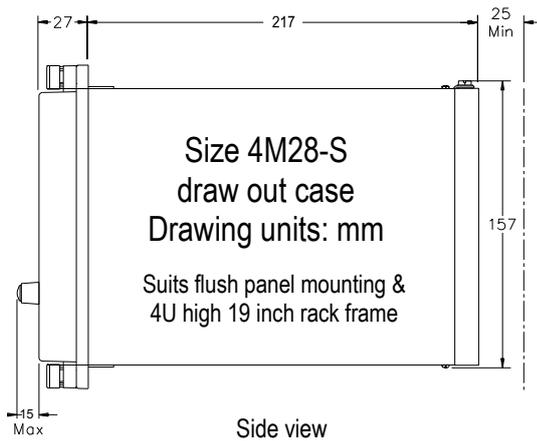
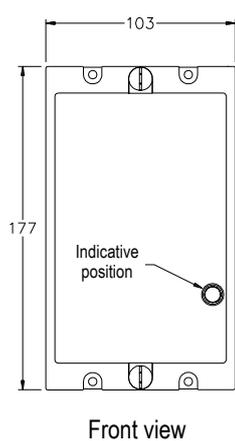
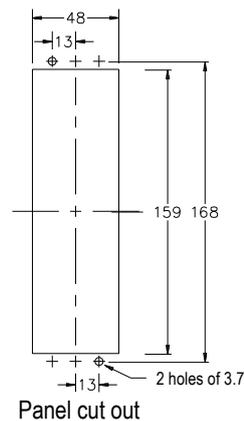
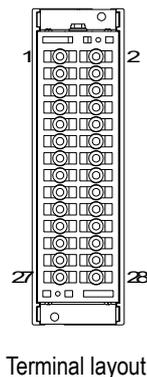
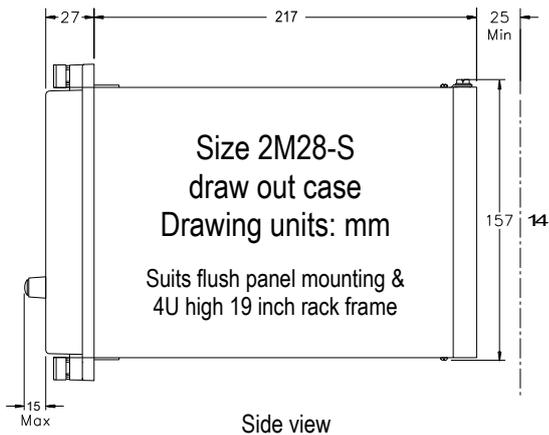
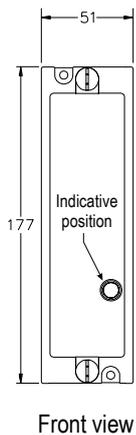
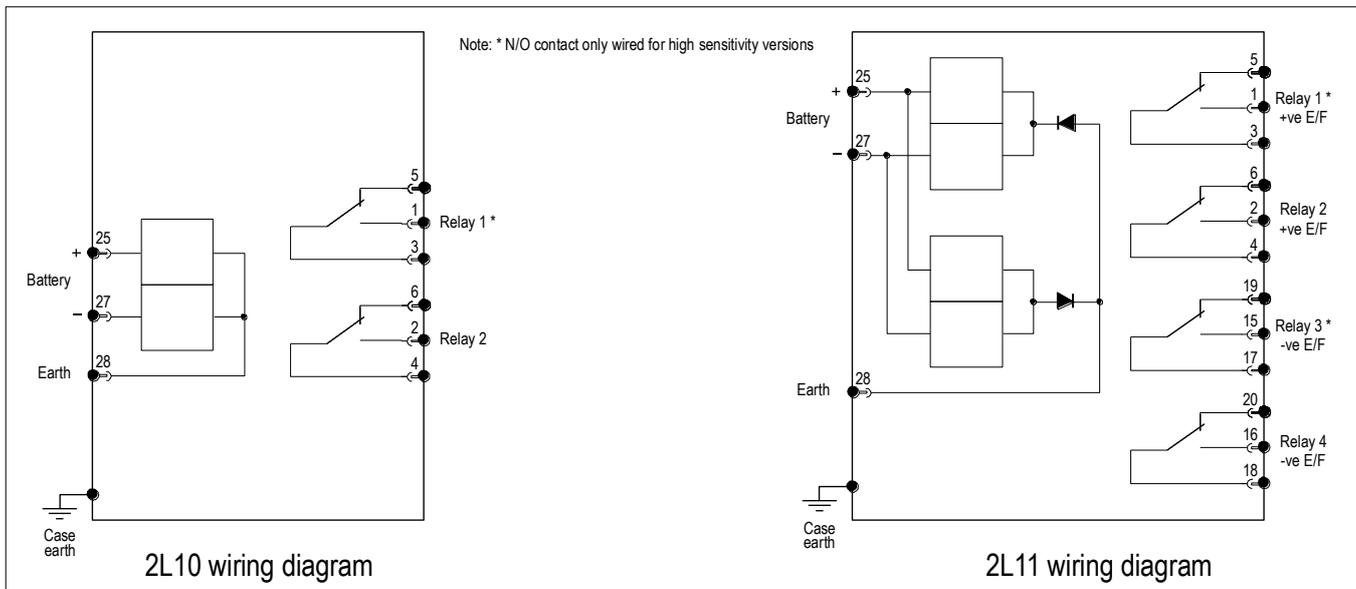
-25 to +75°C

HUMIDITY

40°C & 95% RH non condensing

IEC68-2-1/2

Case Wiring



Ordering Information

ORDER CODE

The order code determines the production build in the factory & cannot be changed in the field.

Generate the required order code as follows: e.g. 2L10-EAAA

General Type	Order Code				
	1	2	3	4	5
2L1	-				

1 ELEMENTS PER CASE

- 0 One element
- 1 Two elements

2 BATTERY SUPPLY

- | | |
|---------------------|---------------------|
| A 12V DC | B 24V DC |
| C 32V (30-32) DC | D 50V (48-50) DC |
| E 110V DC | F 125V (120-125) DC |
| G 240V (200-250) DC | |

3 TRIP FLAG

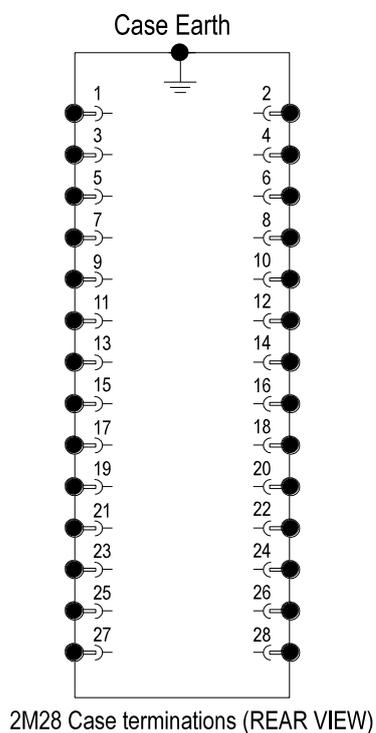
- A Hand reset flag
- B No flag fitted

4 SENSITIVITY

- A Standard
- B High

5 MAGNETIC BLOWOUTS

- A Not required
- B Required



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