

## Features

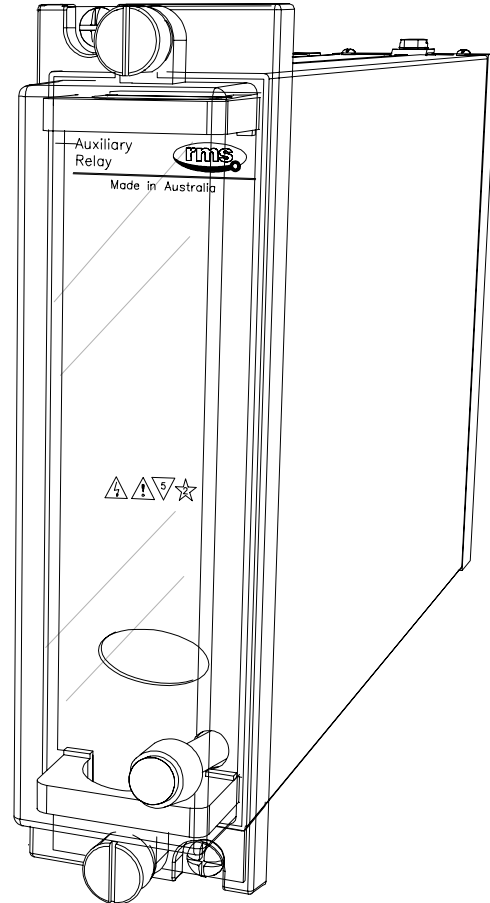
- Wide range of battery voltages catered for
- High sensitivity
- 2L11 model differentiates between positive & negative earth faults
- Low burden
- Fast operate time  
<35 ms with zero resistance E/F
- High output contact rating with optional magnetic arc blowouts
- Optional hand reset flag
- Size 2M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



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.

### 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

### 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
	b	30	15	5.5	3.5
	1K operations (N3 Rating)	b	12	12	5
				5	2.5

a = Without magnetic blowouts b = With magnetic blowouts

### CASE

Size 2M28-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.

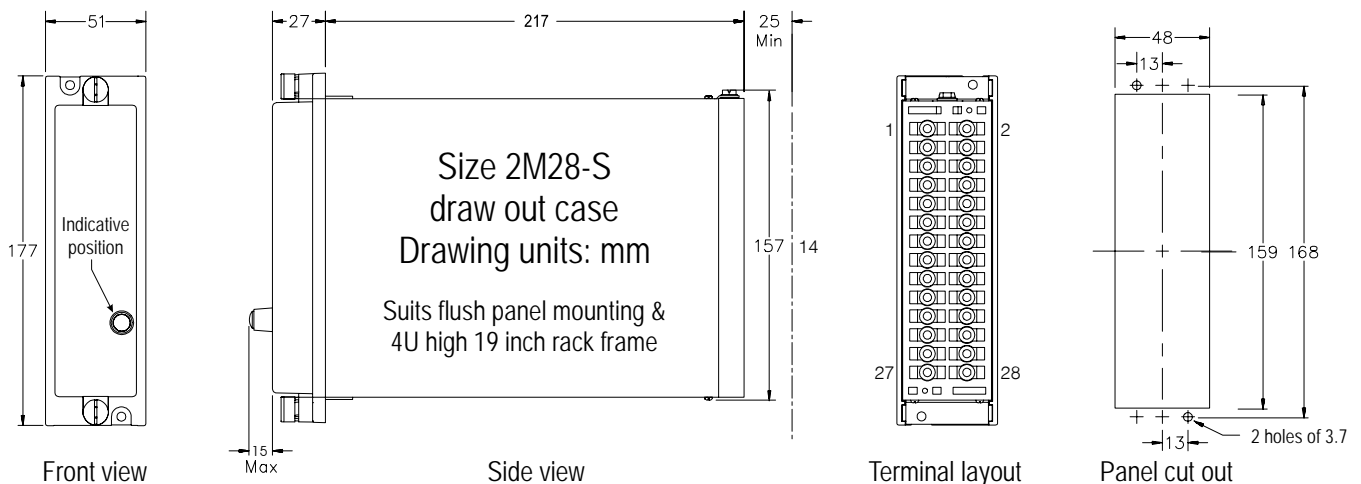
### TEMPERATURE RANGE

Operating: -10 to +55°C  
Storage: -25 to +75°C

### HUMIDITY

40°C & 95% RH non condensing

IEC68-2-1/2



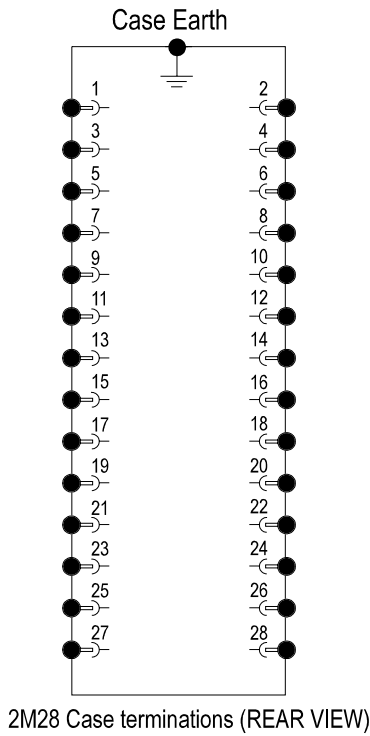
# Ordering Information

### 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

<b>General Type</b>	<b>Order Code</b>				
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>2L1</b>	-				



### 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

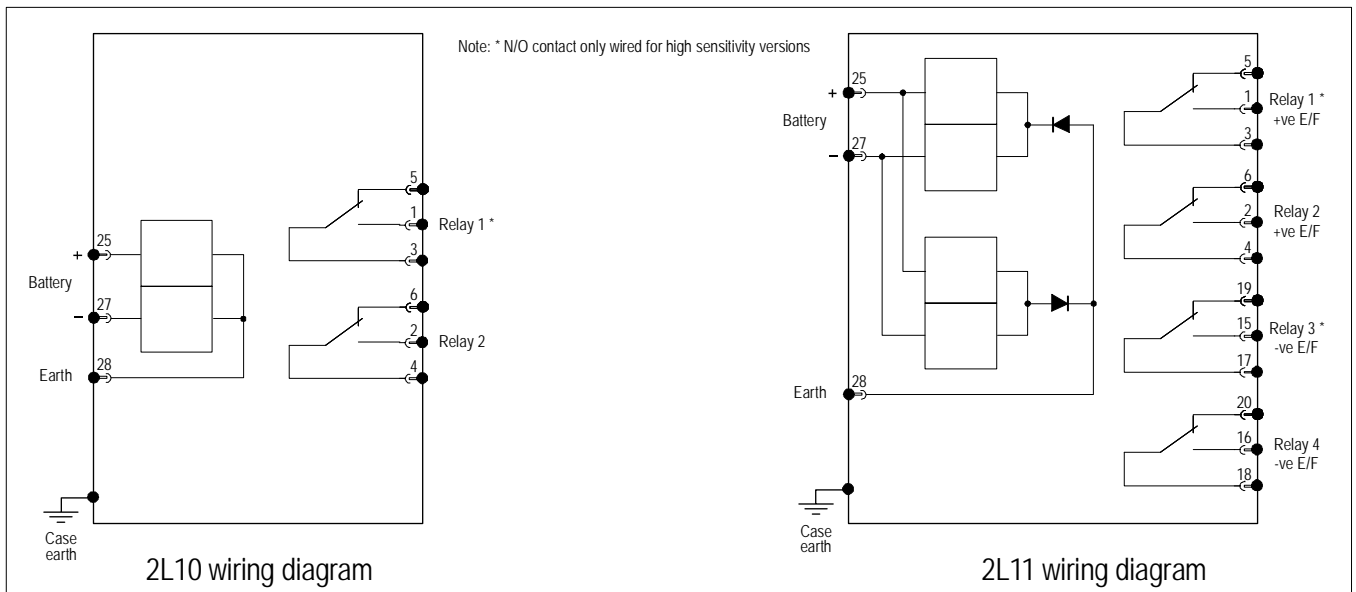
- A Hand reset flag
- B No flag fitted

### 4 SENSITIVITY

- A Standard
- B High

### 5 MAGNETIC BLOWOUTS

- A Not required
- B Required



## **Australian Content**

Unless otherwise stated the product(s) quoted are manufactured by RMS at our production facility in Melbourne Australia. Approximately 60% of our sales volume is derived from equipment manufactured in house with a local content close to 90%. Imported components such as semi-conductors are sourced from local suppliers & preference is given for reasonable stock holding to support our build requirements.

## **Quality Assurance**

RMS holds NCSI (NATA Certification Services International), registration number 6869 for the certification of a quality assurance system to AS/NZS ISO9001-2000. Quality plans for all products involve 100% inspection and testing carried out before despatch. Further details on specific test plans, quality policy & procedures may be found in section A4 of the RMS product catalogue.

## **Product Packaging**

Protection relays are supplied in secure individual packing cardboard boxes with moulded styrene inserts suitable for recycling. Each product & packing box is labeled with the product part number, customer name & order details.

## **Design References**

The products & components produced by RMS are based on many years of field experience since Relays Pty Ltd was formed in 1955. A large population of equipment is in service throughout Australia, New Zealand, South Africa & South East Asia attesting to this fact. Specific product & customer reference sites may be provided on application.

## **Product Warranty**

All utility grade protection & auxiliary relay products, unless otherwise stated, are warranted for a period of 24 months from shipment for materials & labour on a return to factory basis. Repair of products damaged through poor application or circumstances outside the product ratings will be carried out at the customer's expense.

## **Standard Conditions of Sale**

Unless otherwise agreed RMS Standard Terms & Conditions (QF 907) shall apply to all sales. These are available on request or from our web site.



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