

## Features

- Modular packaging
- Rack or flush mounting
- Range of function types
- Draw out module
- M4 screw terminals
- Operating & reset coils are available for 24, 32, 48, 110, 125 or 250 Volts DC
- Contacts are of fine silver designed & manufactured to ensure low resistance & high reliability
- Optional gold plated contacts suitable for low currents
- Magnetic blowouts to further enhance contact breaking capability may be specified
- Custom contact configuration
- Custom labeling
- High visibility electro-mechanical flag indication
- Rugged modular construction

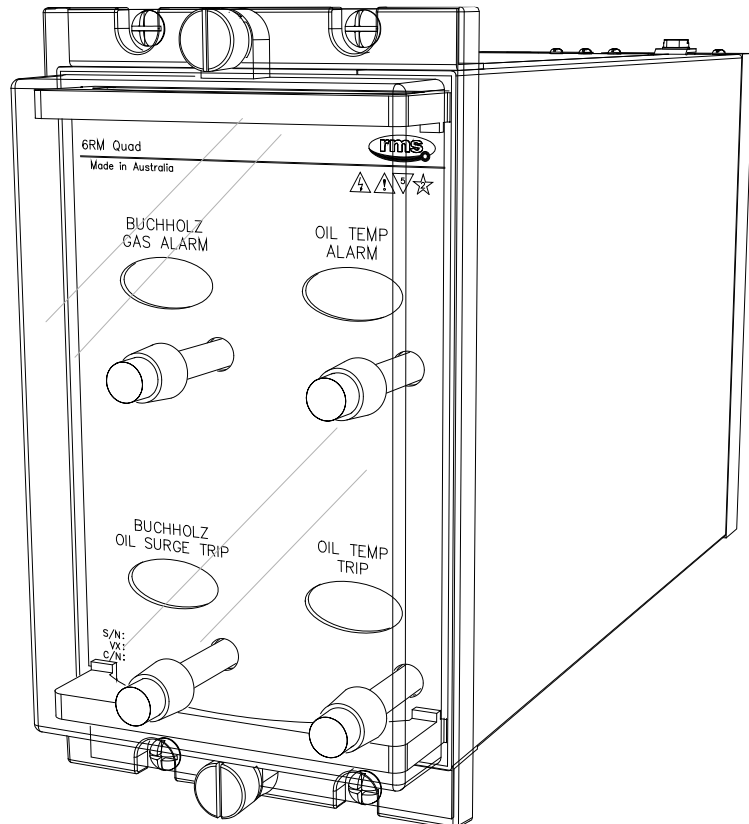
## Application

The 6R QUAD range of four element flag relays are particularly suited to transformer protection panel applications where indication & signaling functions are required for events such as:

- Buchholz Gas Alarm
- Buchholz Oil Surge Trip
- Oil Temperature Alarm
- Oil Temperature Trip
- Winding Temperature Alarm
- Winding Temperature Trip

The 6RM QUAD range is a sub set of the popular 6R MATRIX system. While offering all of the benefits associated with the 6R MATRIX, the 6R QUAD comprises four flag elements in a single case providing the following benefits:

- ▶ Lower cost than single or dual relay packages
- ▶ Increased packing density to further reduce panel space requirements
- ▶ Custom flag labeling



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## Other Information

Made in Australia

Refer also to the following RMS data sheets for detailed information on product applications & technical specifications:

6R MATRIX  
M Series Case System  
1A54 Alarm Panel

## Specification Process

- ▶ Select the functional elements required to meet system design requirements;
- ▶ Complete the ordering information section on page 6 for each element;
- ▶ Submit to RMS for checking & quotation.

## 6RM QUAD Construction

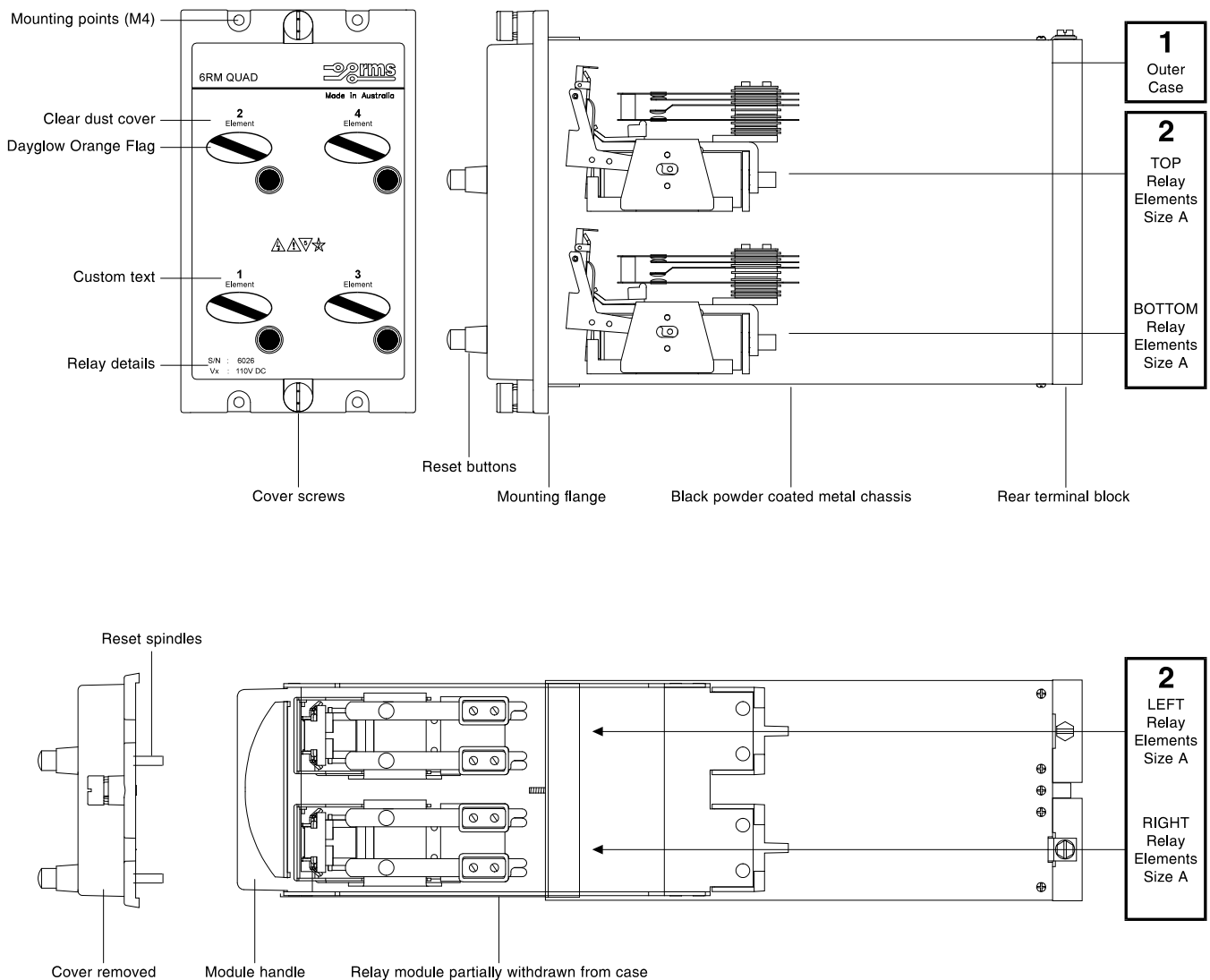
Each 6RM QUAD relay is comprised of the following elements:

1. **Outer casing**
2. **Draw out module comprising four flag relays**

The completed relay is shipped from the factory fully assembled but for flexibility, each part may be specified & numbered separately.

The main components & features are depicted below in a size 4M case:

### 6RM QUAD - Four elements per case



## Case Mounting

The following standard features are provided:

- RACK & FLUSH MOUNTING
- DRAW OUT RELAY MODULE
- REAR M4 SCREW TERMINALS

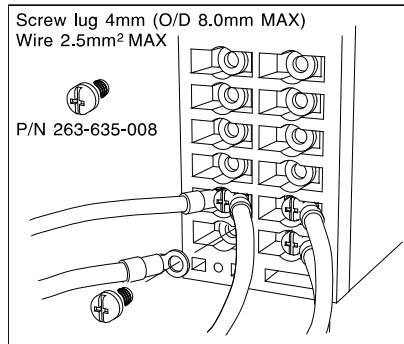
## Case Construction

The outer case is manufactured from zinc coated mild steel providing considerable strength & black powder coated surface finish for corrosion protection. Relay elements are mounted on fabricated fibreglass & Acetal components to provide reliable electrical isolation & simple cost effective construction.

## Terminal Blocks

High quality moulded terminal block(s) are utilized. The draw out function is made possible through the use of inner & outer terminal blocks, each with silver plated contact fingers to provide high current rating & very low electrical resistance.

M4 screw terminals allow 2x crimp lug connections per point. Space efficient design allows 28 contact points per terminal block.



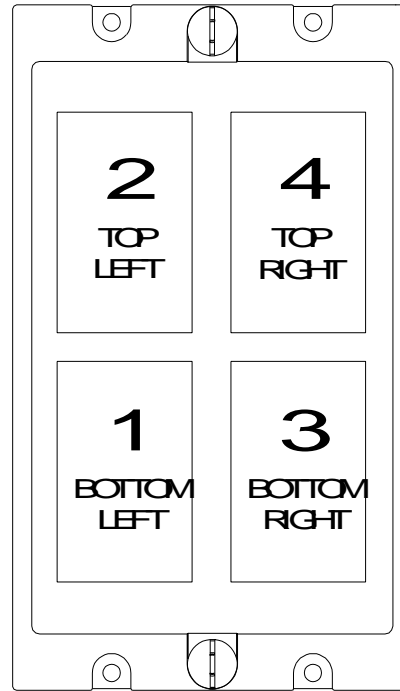
## Reset Buttons

Latching relays are provided with front mounted reset buttons.

## Flag Indicators

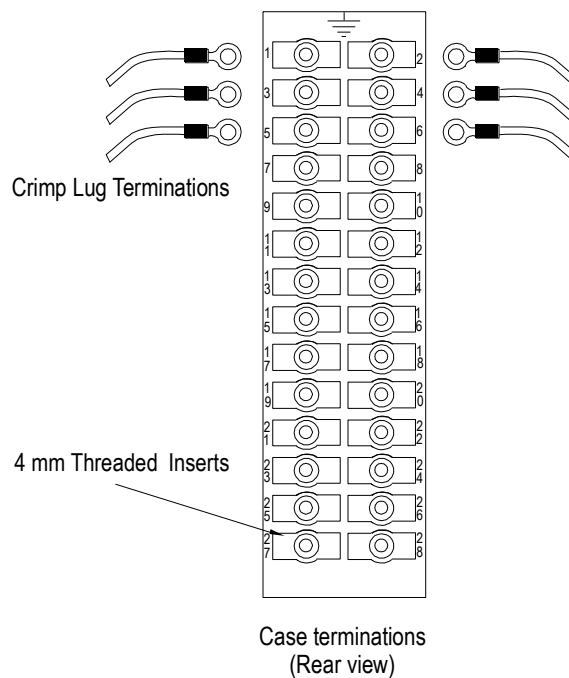
Each relay element is supplied with an operation (target) indicator. The indicator consists of a high visibility solid day glow orange mechanical flag which drops on energisation or de-energisation.

## Case System Summary



Size 4M28-S4A or 4M6-S4A case

Relay Element Fitment



## Application

The operating element for the 6RM QUAD Auxiliary Relays are based on our 6R MATRIX Series relays.

The type 6RM Series elements are low burden auxiliary relays which can be used where a scheme demands several contacts for event recording, alarm initiation, contact logic arrangements, etc.

The relay is supplied fitted with heavy duty contacts & magnetic blow-outs may be optionally specified for switching high DC inductive loads.

Contacts are constructed from silver / copper alloy, shaped & positioned to ensure very reliable, low resistance operation. Over travel of the contacts during each operation causes a wiping action ensuring a clean "make".

Heavy duty contacts fitted with magnetic blow-out are recommended for breaking heavy or highly inductive DC loads. When these are fitted, the number of contacts available may be reduced.

## Flag Indicators

Each relay element is supplied with a flag (target) indicator. The indicator consists of a high visibility solid dayglow orange mechanical flag which drops on energisation or de-energisation.

## Resets

Resetting of flags & contacts may be either manual at the relay panel or electrical via a remote signal or both. The provision to separately reset the flag & contacts is also possible.

## Electrical Reset Function

### COMBINED CONTACT / FLAG OPERATION & RESET 6RM210

With these types the flag & contacts operate & reset together. I.e.

When the relay is operated the flag changes state & the contacts latch. Both the flag & contacts are reset if either the reset button is pressed or the electrical reset coil is energized.

### COMBINED CONTACT / FLAG OPERATION & INDEPENDENT RESET 6RM211

With these types the flag & contacts operate together but may be reset independently. I.e.

When the relay is operated the flag changes state & the contacts latch. The contacts only are reset if the electrical reset coil is energized or the contact reset button is pressed. In both cases the flag is not reset.

The flag can only be reset if the independent flag reset button is pressed.

## Coil Operating Power

Relay elements may be specified with 1W or 2W operating power. 2W coils have the advantage of faster operation for armature operated contacts but obviously generate more heat when continuously energized. A second advantage which is particularly useful in high humidity climate installations is that the thicker gauge copper wire used in 2W coils is less susceptible to corrosion & going open circuit.

## 6RM QUAD Elements

### Operating Times

#### INSTANTANEOUS OPERATING TIMES (6RM2xx Series)

Contact Stack	Pick up* 1W coil	Pick up* 2W coil	Drop out* 1W coil	Drop out* 2W coil
1 N/O	25	22	34	35
2 N/O	32	25	24	25
3 N/O	35	25	18	19
4 N/O	40	30	14	15
6 N/O	50	35	12	13
1 N/C	25	22	38	38
2 N/C	40	25	25	26
3 N/C	52	35	20	21
4 N/C	62	40	18	19
6 N/C	70	52	13	14
1 C/O	35	22	26	27
2 C/O	45	25	20	21
3 C/O	60	40	13	14
4 C/O	75	45	12	13

Table 1

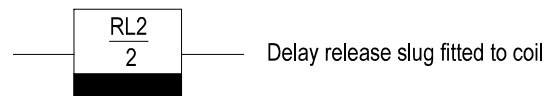
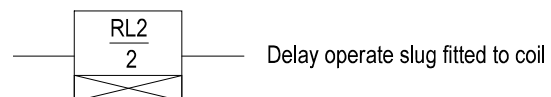
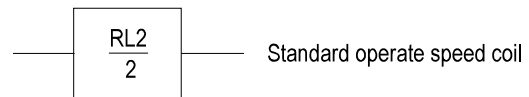
#### \* NOTES ON OPERATING TIMES:

1. Tolerance on stated operate times: +/-10%
2. Operate times are in ms & refer to armature operated contacts at nominal stated coil operating voltage.
3. For flag operated contacts operate time is typically 60ms & is independent of the coil power.
4. 1W nominal coils are used as the default coil specification.

#### OPERATING TIMES WITH TIME DELAY SLUGS FITTED

**DELAY ON DROP OFF** Heel end slugs (HES)  
Heel end slugs can be specified to provide delayed drop out times of up to 300ms. The more contacts specified the faster the drop out time.

**DELAY ON PICK UP** Armature end slugs (AES)  
Armature end slugs can be specified to provide delayed pick up times of up to 150ms. The more contacts specified the slower the pick up time.



## 6RM QUAD Versions

- ◆ There are 7 basic 6RM versions without a slug time delay.
- ◆ There are 4 versions with a slug delay release function.
- ◆ There are 7 versions with a slug delay operate function.

All versions are defined by the operation of the contact & flag reset mechanism & may be specified with contact configurations as described in table 2.

6R Element Part Numbers Timing Function			Maximum Contacts			
No Time Delay	Delay Release	Delay Operate	Contact	Flag	Magnetic Blowouts M or B* 1	Heavy Duty M or B* 2
6RM201A	6RM301A	6RM401A	SR	NF	4	6
6RM202A	6RM302A	6RM402A	SR	HR	4	6
6RM203A	6RM303A	6RM403A	SR		4	6
6RM204A	6RM304A	6RM404A	H/SR	HR	1SR / 1HR	2SR / 2HR
6RM206A	-	6RM406A	HR		4	6
6RM207A	-	6RM407A	ER		1	2
6RM210A	-	6RM410A	H/ER		1	2

Table 2

**KEY:** H/ER - Hand / electrical reset      SR - Self reset      HR - Hand reset  
H/SR - Hand / self reset      ER - Electrical reset      C/F - Consult factory  
M - Make (N/O) contacts      B - Break (N/C) contacts      NF - No flag

\*C/O - Changeover contacts may be specified but EACH C/O contact replaces 1.5 M or B contacts.

**EXAMPLE:** 6RM206-A1 represents an auxiliary relay with a maximum of 4 heavy duty M or B (Magnetic blowouts fitted), hand reset contacts. Four of these elements may be fitted in the 6RM QUAD relay.

## Rear Terminal Count

Depending on the number of terminals required, the 6RM QUAD can be supplied in either a 4M28 case with 28 screw terminals or a 4M56 case with 56 screw terminals.

Considerable cost can be saved if the number of terminals can be limited to 28 or less.

This can be achieved by limiting the number of output contacts & by wiring the operate coils with a common negative connection (Presuming they are operated from the same DC supply).

### Example 1:

6RM202 with 2M contacts per element & common negative on the operate coils equates to a requirement for 21 terminals.  
 $(2M \times 2 + 1 \text{ operate}) \times 4 \text{ elements} + 1 \text{ common} = 21$

A 4M28 case may be used.

### Example 2:

6RM202 with 6M contacts separate coil connections per element equates to a requirement for 56 terminals.  
 $(6M \times 2 + 2 \text{ operate}) \times 4 \text{ elements} = 56$

A 4M56 case is required.

### NUMBER OF OUTPUT RELAY CONTACTS

The number of contacts & configuration are specified in table 2. The number of enclosure terminals available is the limiting factor necessitating some contacts to be connected to a common circuit.

### BURDEN (Maximum)

Operating burden is <2W at nominal voltage.

### OPERATING VOLTAGE

75% to 120% of nominal rated DC operating voltage.

### THERMAL RATING

All operate & reset circuits are designed to withstand continuous application of 120% of nominal voltage

### INSULATION WITHSTAND

In accordance with IEC 255-5:  
 2KV RMS between input & frame, output & frame, output & input. 1.2/50  
 5KV impulse between each terminal & earth, between circuits not normally connected together & between terminals of the same circuit.

### 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

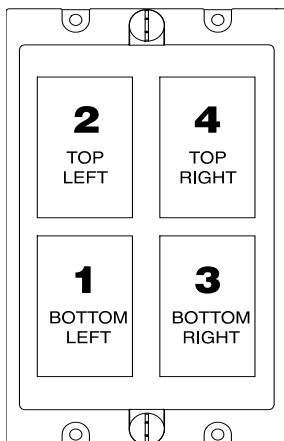
#### DC Break Capacity (Amps)

Voltage			24V	48V	125V	300V
Resistive rating	1	12	12	10	5	
	2	12	2	0.8	0.3	
L/R=40ms	Maximum break	1	30	15	5.5	3.5
	1K operations (N3 Rating)	2	12	1	0.25	0.15
		1	12	12	5	2.5

1 = With magnetic blowouts 2 = Without magnetic blowouts

Refer to the 6R Contact Rating supplementary data sheet for further details on contact specifications & magnetic blowouts.

### RELAY ELEMENT POSITIONS



## Ordering Information

Generate the required ordering code for each of the four relay elements as follows: e.g. 6RM202A1-D-2M1B-AA

Refer to 6R Matrix Technical Bulletin:

<https://www.morssmitt.com/products/201493/6r-matrix-auxiliary-6rm-trip-2hsm-supervision-1tm?catId=201478>

### 1 RELAY FUNCTION

Specify relay functional number from table 2.

### 2 CONTACT DUTY

- 1 Heavy duty contacts – magnetic blowouts fitted
- 2 Heavy duty contacts

### 3 NOMINAL OPERATE VOLTAGE

A 24V DC	D 110V DC	H 24V AC
B 32V DC	E 125V DC	K 60V AC
C 48V DC	F 250V DC	L 110V AC
		P 240V AC

### 4 CONTACT ARRANGEMENT

Specify the number of "MAKES" followed by M; i.e. 2M  
 Specify the number of "BREAKS" followed by B; i.e. 2B  
 Specify the number of "CHANGEOVER" followed by C; i.e. 3C

### 5 FLAG OPERATION

- A Flag drops on energisation (Factory default)
- B Flag drops on de-energisation

### 6 OPERATING TIME (Refer table 1)

- A 1W operating coil (Factory default)
- B 2W operating coil

### 7 CASE CONFIGURATION

- Element only – No case
- 4M28S4 Four identical elements in a 4M28-S case
- 4M56S4 Four identical elements in a 4M56-S case

#### ELEMENT ONE (Bottom left)

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>6RM</b>	-						

Custom Text (Optional)


#### ELEMENT TWO (Top left)

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>6RM</b>	-					

Custom Text (Optional)


#### ELEMENT THREE (Bottom right)

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>6RM</b>	-					

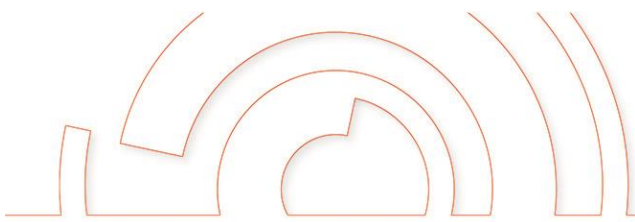
Custom Text (Optional)


#### ELEMENT FOUR (Top right)

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>6RM</b>	-					

Custom Text (Optional)



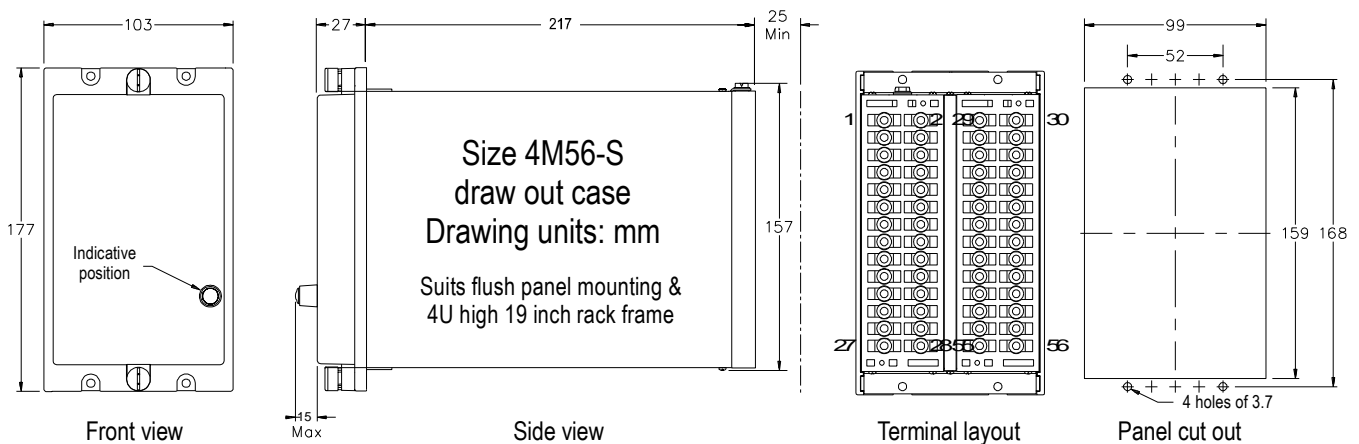
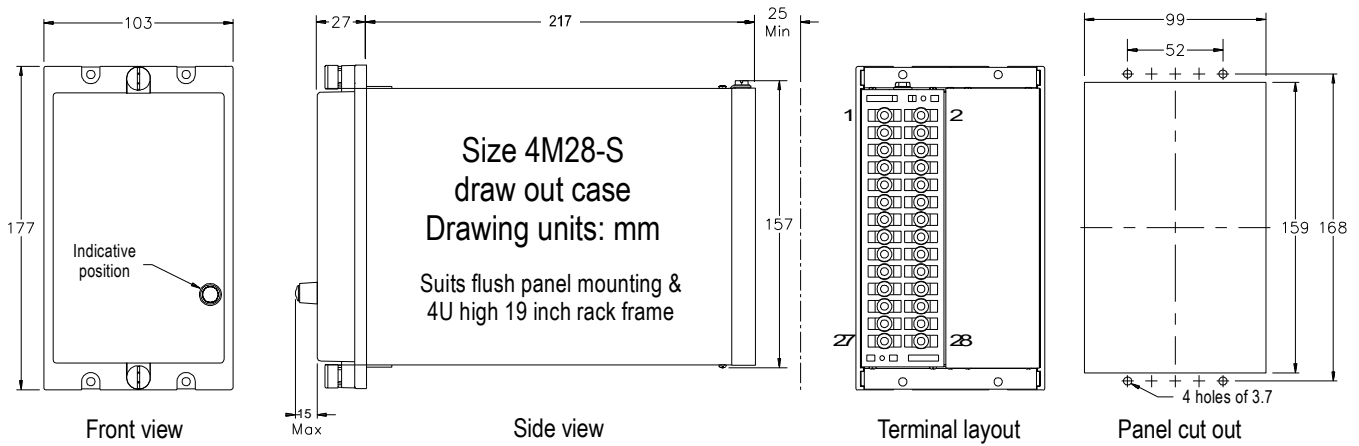
## M Series Case System

The M Series case range has been specifically designed to meet the demanding & varied requirements for applications in power utility sub-station environments. The standard 4U high 19 inch rack mounting modular configuration simplifies panel design & installation.

Mounting points & overall panel dimensions meet international standards such that the cases may be interchanged with other similar types available on the market.

The MATRIX-S version was released in mid August 2005 with the length reduced by 18mm to improve compatibility with shallow cubicles.

Care should be taken when ordering spare relay modules to ensure compatibility with existing units.



## Technical Data

### CURRENT RATINGS

CT terminals:	20A	continuous
	400A	1s
Other terminals:	10A	continuous
	200A	1s

### VOLTAGE RATINGS

All circuits & terminals:	600V AC continuous
	350V DC continuous

### AUXILIARY INSULATION WITHSTAND

In accordance IEC 255-5:  
2KV RMS between all terminals & all terminals & frame.  
1.2/50 5KV impulse between all terminals & all terminals & frame.

### IP RATING

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

## M Series Case Accessories

Refer to the M Series Technical Bulletin:

<https://www.morssmitt.com/products/400857/m-series-modular-rack-mount-protection-relay-cases>

- Sub rack mount frames
- Blanking plates
- Mounting screw kits
- Termination ring lugs
- Stud terminal kits
- Semi projection mount kits
- Earth bars

## Case Ordering Codes

Generate the required order code as follows: e.g. 4M28-S-4

Order Code				
		2		
4	M		- S -	4

**4** SIZE 4

**M** M SERIES CASE

**2** NUMBER OF TERMINALS

28 28 Terminals  
56 56 Terminals

**S** SHORT CASE VERSION

**4** 4 RELAY ELEMENTS PER CASE

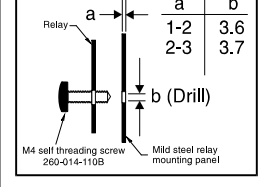
## Case Mounting Screws

### RELAY PANEL/RACK MOUNTING SCREWS

**P/N 290-406-151A**

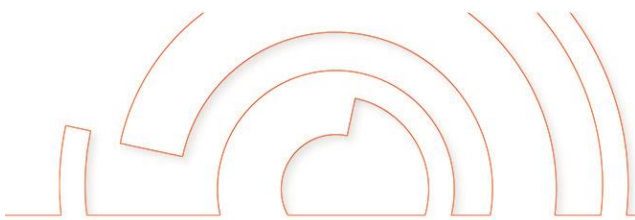
4 X M4 self threading screws

Use for RMS "D", "E" & "M" Series relay cases



M Series cases may be flush mounted to mild steel panels up to 3mm thick using the M4 self threading screws provided with the case. Panel mounting is simplified due to the location of the fixing screws at the front face of the relay. Alternatively the cases may be 19 inch rack mounted using a 4U high sub rack. The M4 self threading screws are suitable for application with the RMS type 4M800K1 sub rack.





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