



6RJ User Guide

High Speed Tripping Relay

relay monitoring systems pty ltd

Advanced Protection Devices



User Guide



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Due to RMS continuous product improvement policy this information is subject to change without notice. 6RJ_Guide/Iss A/12/08/13

6RJ User Guide

About This Manual

This User Guide covers all 6RJ relays manufactured from October 2013. Earlier relays do not necessarily incorporate all the features described. Our policy of continuous development means that extra features & functionality may have been added.

The 6RJ User Guide is designed as a generic document to describe the common operating parameters for all relays built on this platform. Some relay applications are described but for specific model information the individual "K" number Product / Test manuals should be consulted.

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To download a PDF version of this guide:
http://www.rmspl.com.au/userguide/6RJ_user_guide.pdf

To download the model specific Product Test Manual:
<http://www.rmspl.com.au/search.asp>



Part

1

How this Guide is Organised

This guide is divided into five parts:

Part 1 Overview

Part 2 Documentation

Part 3 Application

Part 4 Installation Preliminaries

Part 5 Maintenance





Documentation

Technical Bulletin

The detailed technical attributes, functional description & performance specifications for the 6RJ series are described in the product Technical Bulletins. For the most up to date version go to:

www.rmspl.com.au/6rmatrix_pre_defined.htm

The order of precedence for product information is as follows:

- Product Test Manual (PTM)
- Technical Bulletin
- User Guide

User Guide

This User Guide covers all 6RJ relay versions & describes the generic features & attributes common across all versions.

Different relay versions are required to cater for varying customer requirements such as auxiliary voltage range, I/O configuration, case style, relay functionality etc.

The product ordering code described in the Technical Bulletin is used to generate a unique version of the relay specification & is called a Type Number. This code takes the form 6RJKxx where the Kxx is the "K" or version number. For a complete description of the RMS "K" number system refer to: www.rmspl.com.au/handbook/parta3.pdf

Product Test Manual

Each 6RJ version has a specific PTM which provides details on the unique attributes of the relay. Each PTM includes the following information:

- Specific technical variations from the standard model if applicable
- Wiring diagram

If you require a copy of the PTM for an RMS product the following options are available:

- Check the RMS web site at: www.rmspl.com.au/search.asp
- RMS CD catalogue select: [List all Product/Test Manuals](#) under [Technical Library](#)
- Contact RMS or a representative & request a hard copy or PDF by email.





Application

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Introduction

The 6RJ High Speed Trip relay is a withdrawable High Speed Tripping relay with low contact bounce time and high contact rating.

High burden variants of 6RJ Relay allow for applications that have specific Capacitor Discharge Immunity requirements to ESI 48-4 EB2.

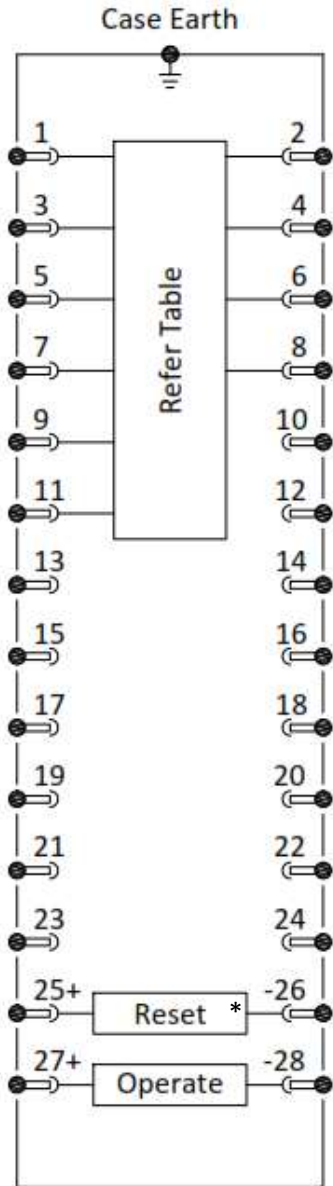
The 6RJ high speed tripping relay is available in 5, 10 or 20 contact variants with either self resetting or latched contacts, hand reset and/or electrical reset contacts and hand reset and/or electrical reset flags.

6RJ Series		High Speed Tripping Relays			
RMS	Alstom	Functional Description	Contacts	6R MATRIX	Case
6RJ11-5	MVAJ11, MVAJ051	Low burden high speed trip relay Self reset contacts Hand reset flag	5	2HSM502	2M28-S
6RJ11-10	MVAJ11, MVAJ101		10		
6RJ13-5	MVAJ13, MVAJ053	Low burden high speed trip relay Hand reset contacts & flag	5	2HSM504	2M28-S
6RJ13-10	MVAJ13, MVAJ103		10		
6RJ15-5	MVAJ15, MVAJ055	Low burden high speed trip relay Hand & electrical reset contacts Independent hand reset flag	5	2HSM509	2M28-S
6RJ15-10	MVAJ15, MVAJ105		10		
6RJ21-5	MVAJ21, MVAJ051	High burden high speed trip relay Self reset contacts Hand reset flag	5	2HSM512	2M28-S
6RJ21-10	MVAJ21, MVAJ101		10		
6RJ21-20	MVAJ201		20	2HSM520	4M56-S
6RJ23-5	MVAJ23, MVAJ053	High burden high speed trip relay Hand reset contacts & flag	5	2HSM514	2M28-S
6RJ23-10	MVAJ23, MVAJ103		10		4M56-S
6RJ23-20	MVAJ203		20		
6RJ24-5	MVAJ24, MVAJ054	High burden high speed trip relay Electrical reset contacts Independent hand reset flag	5	2HSM516	2M28-S
6RJ24-10	MVAJ24, MVAJ104		10		4M56-S
6RJ24-20	MVAJ204		20		
6RJ25-5	MVAJ25, MVAJ055	High burden high speed trip relay Hand & electrical reset contacts Independent hand reset flag	5	2HSM519	2M28-S
6RJ25-10	MVAJ25, MVAJ105		10		4M56-S
6RJ25-20	MVAJ205		20		
6RJ34-10	MVAJ34	Bistable control relay	10	NGTS 2.19	2M28-S
6RJ34-20			20		4M56-S

The relays are ordered with customer nominated contact arrangements.

Scheme Wiring

5 Contact 6RJ Relay Connection diagram



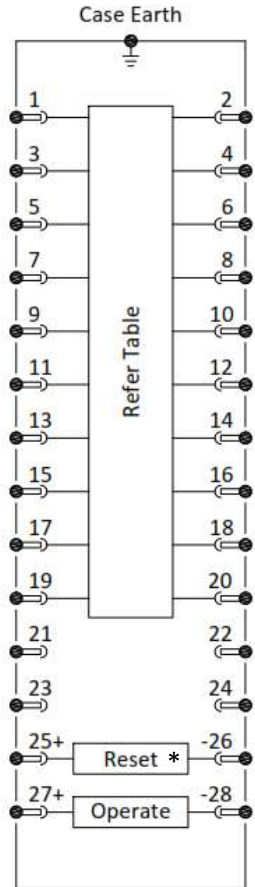
Terminal Number Pairs					
Contacts	1-3	2-4	5-7	6-8	9-11
5M 0B	M	M	M	M	M
4M 1B	M	M	M	M	B
3M 2B	M	M	M	B	B
2M 3B	M	M	B	B	B
1M 4B	M	B	B	B	B
0M 5B	B	B	B	B	B

M: Make

B: Break

* Reset fitted only on applicable models 6RJ15, 6RJ24 & 6RJ25

10 Contact 6RJ Relay Connection diagram



* Reset fitted only on applicable models 6RJ15, 6RJ24 and 6RJ25

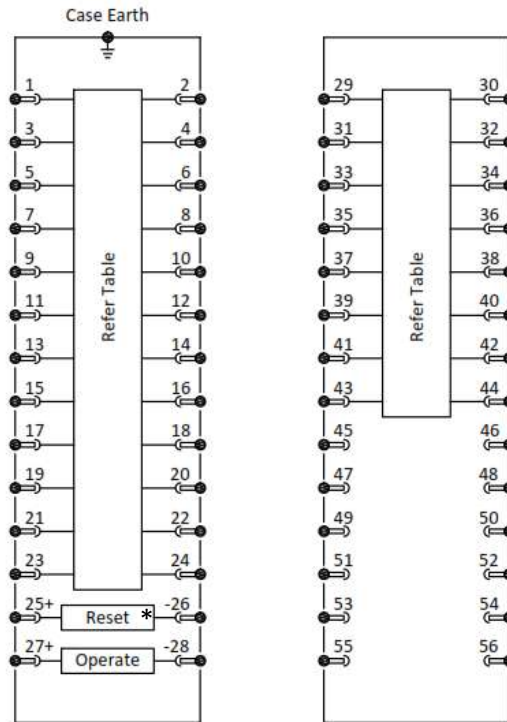
Terminal Number Pairs										
Contacts	1-3	2-4	5-7	6-8	9-11	10-12	13-15	14-16	17-19	18-20
10M 0B	M	M	M	M	M	M	M	M	M	M
9M 1B	M	M	M	M	M	M	M	M	M	B
8M 2B	M	M	M	M	M	M	M	M	B	B
7M 3B	M	M	M	M	M	M	M	B	B	B
6M 4B	M	M	M	M	M	M	B	B	B	B
5M 5B	M	M	M	M	M	B	B	B	B	B
4M 6B	M	M	M	M	B	B	B	B	B	B
3M 7B	M	M	M	B	B	B	B	B	B	B
2M 8B	M	M	B	B	B	B	B	B	B	B
1M 9B	M	B	B	B	B	B	B	B	B	B
0M 10B	B	B	B	B	B	B	B	B	B	B

M: Make

B: Break

Refer to specific connection diagram for the 6RJ34-10 variants.

20 Contact 6RJ Relay Connection diagram



* Reset fitted only on applicable models 6RJ24 and 6RJ25

Contacts	Terminal Number Pairs																				
	1-3	2-4	5-7	6-8	9-11	10-12	13-15	14-16	17-19	18-20	21-23	22-24	29-31	30-32	33-35	34-36	37-39	38-40	41-43	42-44	
20M 0B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
19M 1B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B
18M 2B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B
17M 3B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B
16M 4B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B
15M 5B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B
14M 6B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B
13M 7B	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B
12M 8B	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B
11M 9B	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B
10M 10B	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B
9M 11B	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B
8M 12B	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B
7M 13B	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6M 14B	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5M 15B	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4M 16B	M	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3M 17B	M	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2M 18B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
1M 19B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
0M 20B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

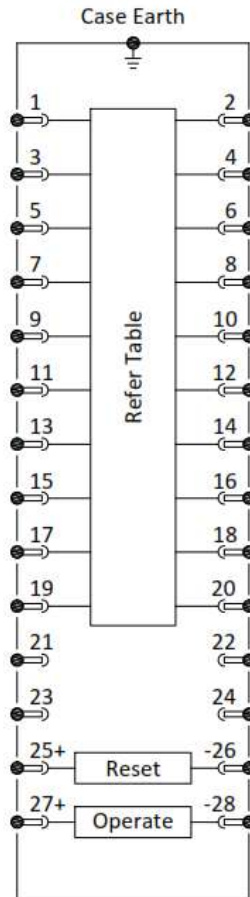
M: Make

B: Break


Refer to specific connection diagram for the 6RJ34-20 variants.



6RJ34-10 Relay Connection diagram



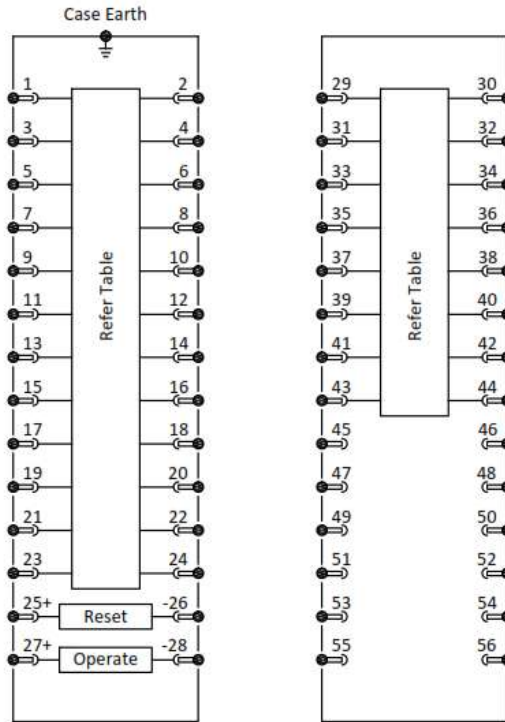
6RJ34-10 Terminal Number Pairs										
Contacts	1-3	2-4	5-7	6-8	9-11	10-12	13-15	14-16	17-19	18-20
10M 0B	M	M	M	M	M	M	M	M	M	M
9M 1B	M	M	M	M	M	M	M	M	M	B
8M 2B	M	M	M	M	M	M	M	M	B	B
7M 3B	M	M	M	M	M	M	M	B	B	B
6M 4B	M	M	M	M	M	M	B	B	B	B
5M 5B	M	M	M	M	M	B	B	B	B	B

M: Make 



B: Break 



6RJ34-20 Relay Connection diagram

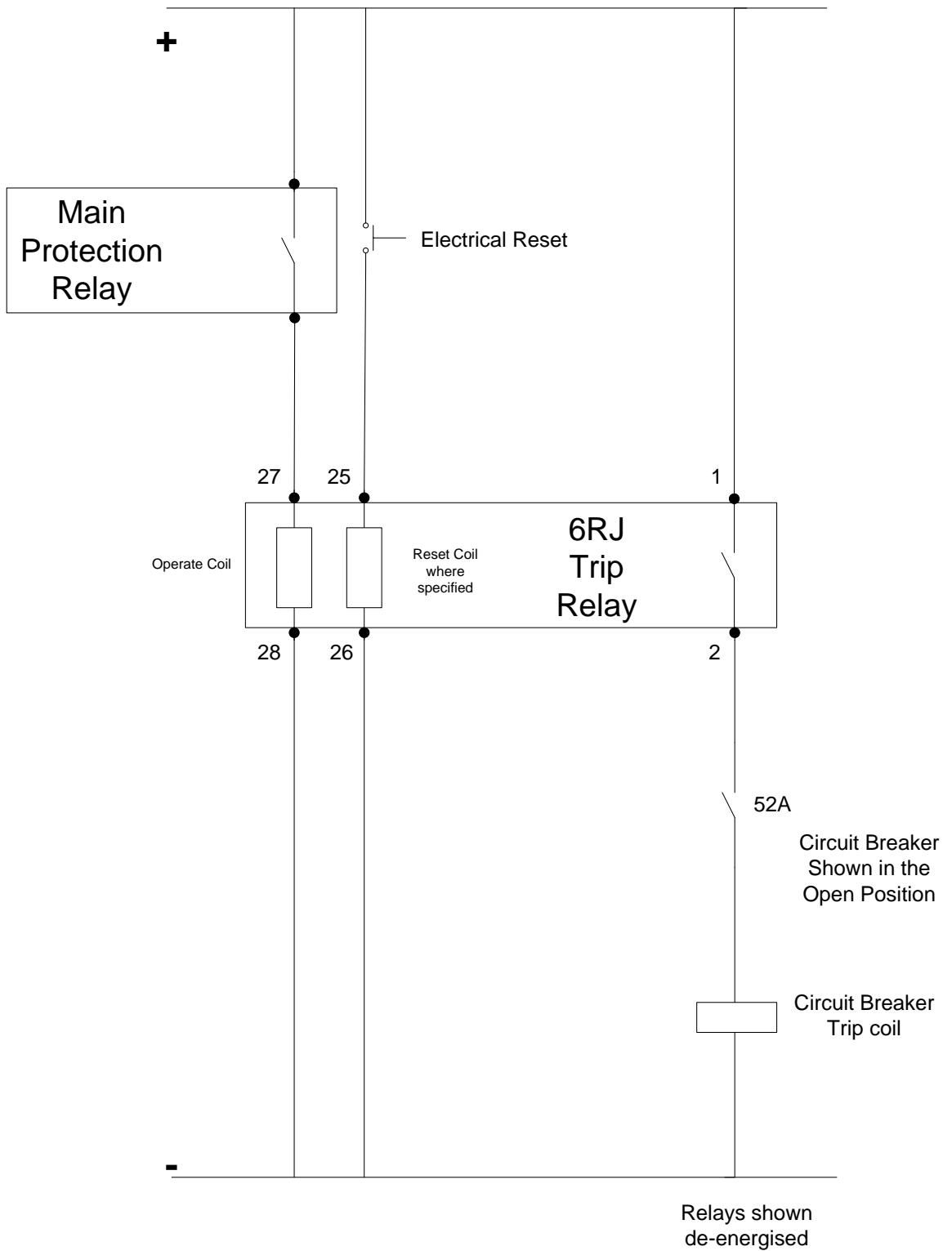


6RJ34-20 Terminal Number Pairs																				
Contacts	1-3	2-4	5-7	6-8	9-11	10-12	13-15	14-16	17-19	18-20	21-23	22-24	29-31	30-32	33-35	34-36	37-39	38-40	41-43	42-44
20M 0B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19M 1B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B
18M 2B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B
17M 3B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B
16M 4B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B
15M 5B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B
14M 6B	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B
13M 7B	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B
12M 8B	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B
11M 9B	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B
10M 10B	M	M	M	M	M	M	M	M	M	M	B	B	B	B	B	B	B	B	B	B

M: Make 
 B: Break 



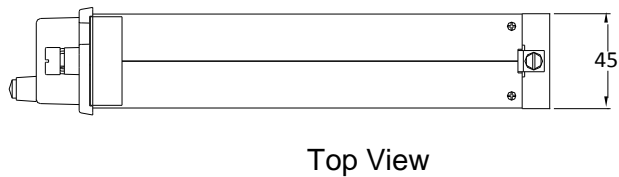
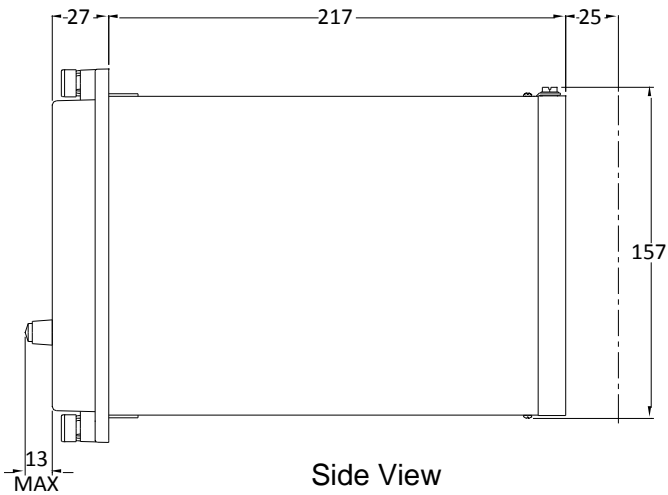
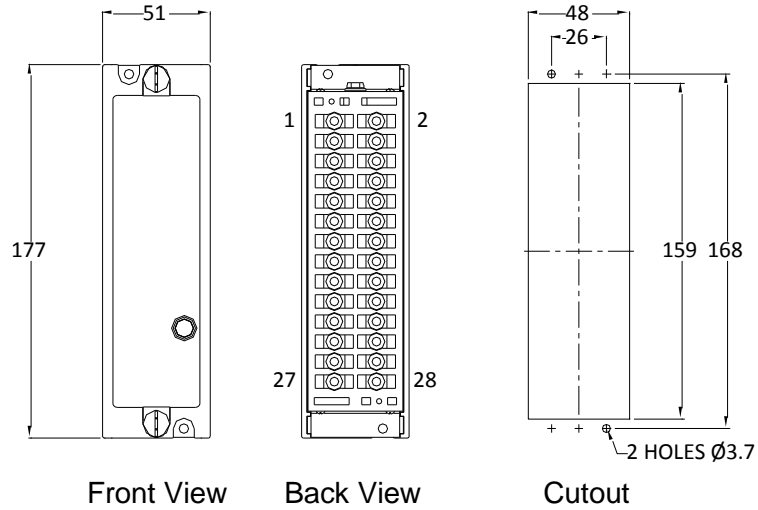
Example Schematic – Typical Trip Application





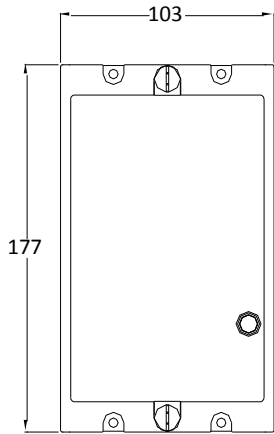
Terminal Layout and Relay Dimensions

5 or 10 Contact Relays in 2M28-S case

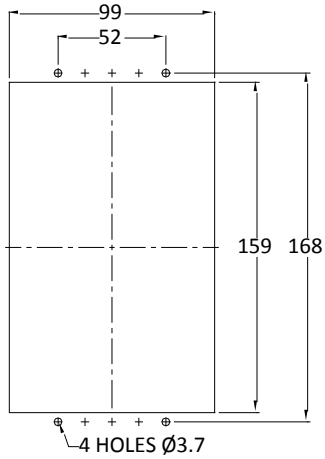




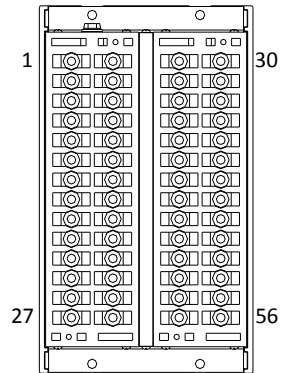
20 Contact Relays in 4M56-S case



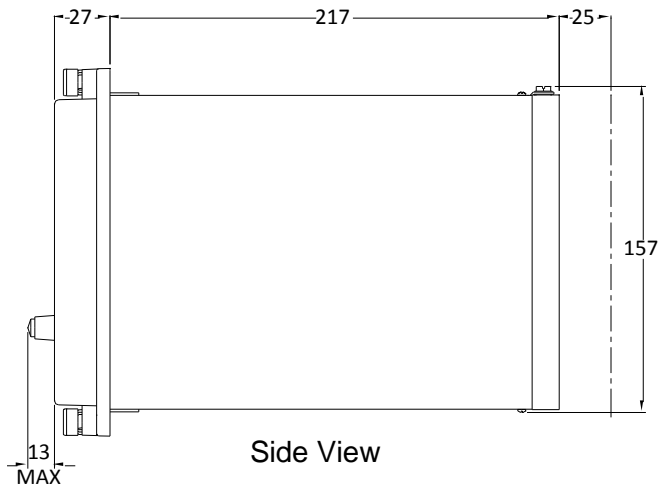
Front View



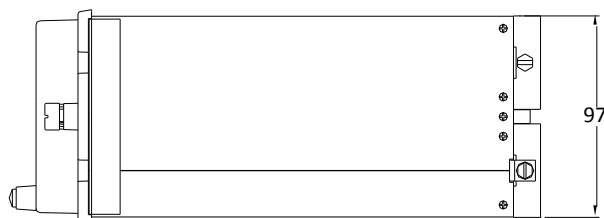
Cutout



Back View



Side View



Top View

The relay module is designed for rack or panel mounting.





6RJ Indications

Front Layout

The figure below depicts the flag indication and the reset push button on the front the relay.



Latched Contact Reset and Flag Reset Push Button



Relays fitted with latched contacts may be reset via the Reset push button on relay models capable of hand or hand/electrical resetting.

The flag drops upon operation of the relay. The Reset push button resets the flag on relay models with hand or hand/electrical reset flags.

On relay models with Independent Hand reset flag, the electrical reset of the contacts does not reset the flag. This feature allows the flag indication to be maintained as a record of trip operation even if the contacts have been electrically reset by remote control or by an auto reclose scheme.



Commissioning

Commissioning Preliminaries

Carefully examine the module to ensure that no damage has occurred during transit. Check that the model number and rating information are correct.

Insulation

The relay, and its associated wiring, may be insulation tested between:

- all electrically isolated circuits
- all circuits and earth

An electronic or brushless insulation tester should be used, having a dc voltage not exceeding 1000V. Accessible terminals of the same circuit should first be strapped together. Deliberate circuit earthing links, removed for the tests, subsequently must be replaced.

Injection Testing

Testing of relay function may be undertaken using a secondary test set injecting directly into the relay operate coil or alternatively as part of a complete protection scheme tested in conjunction with the main protection relays.

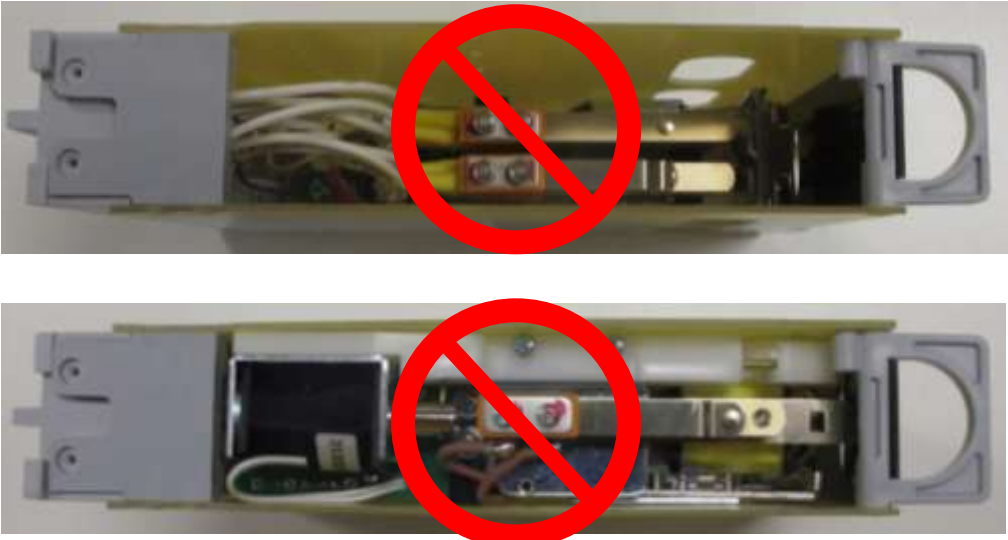





Site Commissioning Verification Checklist

Observe all site specific standard safety procedures.

The following tests are undertaken following the completion of all 6RJ relay wiring.

Preliminary Checks

Item	Description	Complete
1	Confirm all necessary primary equipment isolations	
2	Confirm all necessary secondary equipment isolations (including trip outputs)	
3	Check panel installation of the 6RJ relay	
4	Check the 6RJ relay is wired to the protection design schematic and the flag transit retainer has been removed	
5	<p>With the relay element withdrawn from the case check for any evidence of transit damage and confirm free and easy movement of the armature assembly.</p> <p>Note : care should be taken to avoid touching the adjusted contacts or other relay internals.</p> 	
6	For latching models confirm that the relay contacts are able to be reset and the flag is reset (on independent flag reset models reset the contacts first and then the flag)	

Item	Description	Complete
7	<p>To operate the relay contacts gently depress the armature mechanism using a blunt probe via the flag aperture taking care not to disturb any other relay internals</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;">     </div> <p>Gently remove the blunt probe when the flag drops</p>	



Item	Description	Complete
8	On latched contact models confirm that the armature mechanism latches when manually operated	
9	On latched contact models confirm that the latched contacts are able to be reset using the contact reset push button. Confirm that the fitted mechanical flags are able to be reset.	
10	In the non-operate state confirm the normally open and normally closed contact states against the relevant relay connection diagram using a suitable continuity tester	
11	Manually operate the relay contacts and confirm the contact state change against the relevant relay connection diagram using a suitable continuity tester	

Operate/Reset Operation

Item	Description	Complete
1	Insert the relay module into the case and ensure contacts are reset and the mechanical flags are in the reset position	
2	The operate circuit is terminated to case terminals 27(+) and 28(-)	
3	Where fitted the electrical reset circuit is terminated to case terminals 25(+) and 26(-)	
4	Disconnect external wiring from these terminals to allow application of the test supply	
5	<p>Check for operation of the operate circuit by energising the relay with 100% of the nominal supply voltage</p> <p>The test voltage is to be applied as a step</p> <p>The relays should switch cleanly with one movement</p> <p>On relays fitted with a mechanical flag, confirm that the flag drops to provide a visual indication of relay operation</p> <p>Confirm the operate time of the contacts is in accordance with the relay technical bulletin</p>	
6	With the relay in the operate state check the continuity of the closed contacts. The contact continuity test should be undertaken by applying 5A current & measuring the voltage across the closed output contact terminals	
7	Remove the operate circuit test supply	



Item	Description	Complete
8	<p>On latching relays perform a manual contact reset and confirm the contact state change with a suitable continuity tester</p> <p>On relays fitted with a mechanical flag reset the flag</p>	
9	<p>On relays fitted with an electrical reset circuit, repeat steps 5 through to 7</p> <p><u>Ensure that the operate circuit test supply is removed!</u></p> <p>Caution : failure to remove the operate circuit test supply for the following test will cause the reset coil to be damaged!</p> <p>Check for operation of the reset circuit by energising the reset input with 100% of the nominal supply voltage</p> <p>The test voltage is to be applied as a step and the relays should reset cleanly with one movement.</p> <p>Confirm the contact state change with a suitable continuity tester</p> <p>On relays fitted with a mechanical flag reset the flag</p>	
10	<p>Restore any external wiring connections that may have been disturbed during the above tests</p>	



Protection Scheme Confirmation

Item	Description	Complete
1	With the tripping relay connected in the tripping scheme perform a trip check of the main protection relay	
2	Confirm intended operation of the tripping relay upon operation of the main protection relay	
3	On latching relays perform a manual contact reset and confirm the contact state change with a suitable continuity tester On relays fitted with a mechanical flag reset the flag	
4	On relays fitted with an electrical reset circuit, repeat steps 1 through to 2 Ensure that the operate circuit test supply is removed Check operation of the reset circuit by performing an electrical reset Confirm the contact state change with a suitable continuity tester On relays fitted with a mechanical flag reset the flag	

Installation

Handling of Electronic Equipment

A person's normal movements can easily generate electrostatic potentials of several thousand volts. Discharge of these voltages into semiconductor devices when handling electronic circuits can cause serious damage, which often may not be immediately apparent but the reliability of the circuit will have been reduced.

The electronic circuits of Relay Monitoring Systems Pty Ltd products are immune to the relevant levels of electrostatic discharge when housed in the case. Do not expose them to the risk of damage by withdrawing modules unnecessarily.

Each module incorporates the highest practicable protection for its semiconductor devices. However, if it becomes necessary to withdraw a module, the following precautions should be taken to preserve the high reliability and long life for which the equipment has been designed and manufactured.

1. Before removing a module, ensure that you are at the same electrostatic potential as the equipment by touching the case.
2. Handle the module by its front-plate, frame, or edges of the printed circuit board.
3. Avoid touching the electronic components, printed circuit track or connectors.
4. Do not pass the module to any person without first ensuring that you are both at the same electrostatic potential. Shaking hands achieves equipotential.
5. Place the module on an antistatic surface, or on a conducting surface which is at the same potential as yourself.
6. Store or transport the module in a conductive bag.

If you are making measurements on the internal electronic circuitry of an equipment in service, it is preferable that you are earthed to the case with a conductive wrist strap.

Wrist straps should have a resistance to ground between 500k – 10M ohms. If a wrist strap is not available, you should maintain regular contact with the case to prevent the build up of static.

Instrumentation which may be used for making measurements should be earthed to the case whenever possible.



Safety Section

This Safety Section should be read before commencing any work on the equipment.

The information in the Safety Section of the product documentation is intended to ensure that products are properly installed and handled in order to maintain them in a safe condition. It is assumed that everyone who will be associated with the equipment will be familiar with the contents of the Safety Section.

Explanation of Symbols & Labels

The meaning of symbols and labels which may be used on the equipment or in the product documentation, is given below.

Caution: refer to product information

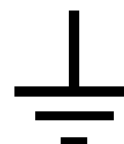


Caution: risk of electric shock



Functional earth terminal

Note: this symbol may also be used for a protective/safety earth terminal if that terminal is part of a terminal block or sub-assembly eg. power supply.





Unpacking

Upon receipt inspect the outer shipping carton or pallet for obvious damage.

Remove the individually packaged relays and inspect the cartons for obvious damage.

To prevent the possible ingress of dirt the carton should not be opened until the relay is to be used. Refer to the following images for unpacking the relay:



Outer packing carton showing shipping documentation pouch.
Address label on top of carton.



Inner packing carton showing front label detailing the customer name, order number, relay part number & description, the relay job number & packing date. (Size 2 inner packing carton depicted)



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Unpacking (Continued)



Inner packing carton with lid open showing protective foam insert.

CD depicted supplied with digital relay models or upon request at time of order.



Inner packing carton with protective foam insert removed showing relay location.



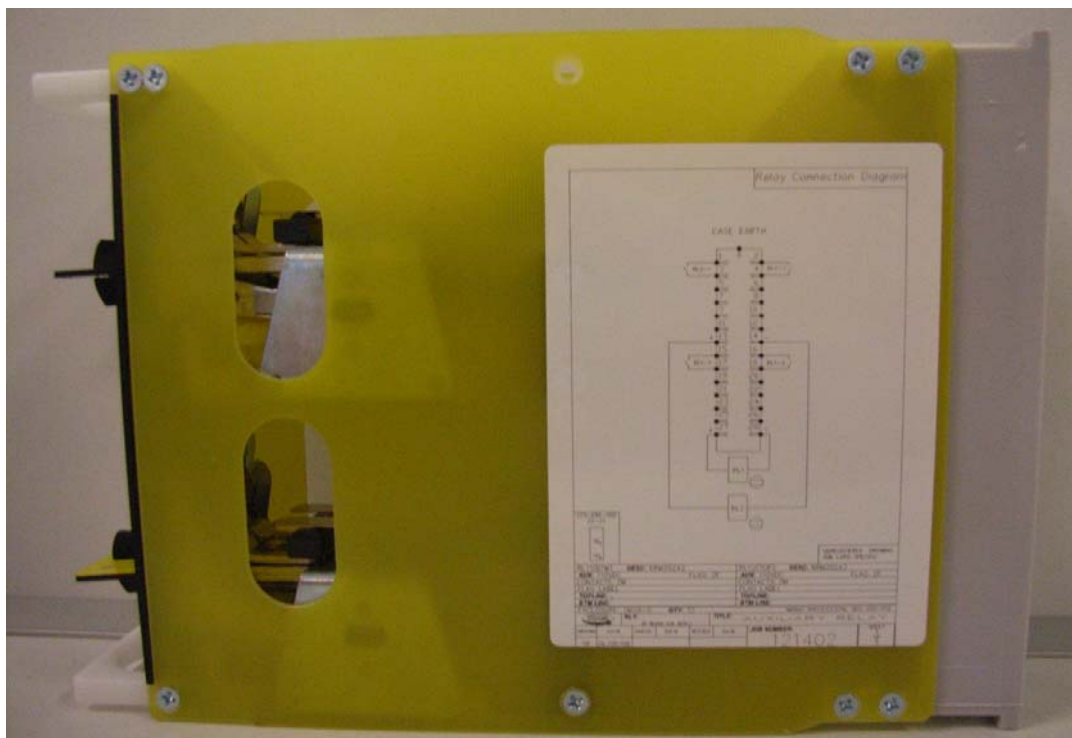
Where mechanical flags are fitted the yellow transit wedge must be removed before operation using a gentle twisting action. The wedge should be stored with the original packaging material.



Relay Module Side Label Depicting Product Details



Relay Module Side Label Depicting Wiring Diagram (6R MATRIX relays only)



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Accessories Supplied With Each Relay



Self threading M4 mounting screws



M4 terminal screws with captured lock washers

Storage & Handling

If damage has been sustained a claim should immediately be made against the carrier, also inform Relay Monitoring Systems Pty Ltd and the nearest RMS agent

When not required for immediate use, the relay should be returned to its original carton and stored in a clean, dry place.

Relays which have been removed from their cases should not be left in situations where they are exposed to dust or damp. This particularly applies to installations which are being carried out at the same time as constructional work.

If relays are not installed immediately upon receipt they should be stored in a place free from dust and moisture in their original cartons.

Dust which collects on a carton may, on subsequent unpacking, find its way into the relay; in damp conditions the carton and packing may become impregnated with moisture and the de-humidifying agent will lose its efficiency.



Equipment Operating Conditions

The equipment should be operated within the specified electrical and environmental limits.

Protective relays, although generally of robust construction, require careful treatment prior to installation and a wise selection of site. By observing a few simple rules the possibility of premature failure is eliminated and a high degree of performance can be expected.

Care must be taken when unpacking and installing the relays so that none of the parts are damaged or their settings altered and must at all times be handled by skilled persons only.

Relays should be examined for any wedges, clamps, or rubber bands necessary to secure moving parts to prevent damage during transit and these should be removed after installation and before commissioning.

The relay should be mounted on the circuit breaker or panel to allow the operator the best access to the relay functions.

Relay Dimensions & Other Mounting Accessories

Refer drawing in Technical Bulletin. Relevant Auto Cad files & details on other accessories such as 19 inch sub rack frames, semi projection mount kits & stud terminal kits may be down loaded from:

<http://www.rmspl.com.au/mseries.htm>



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Equipment Connections

Personnel undertaking installation, commissioning or servicing work on this equipment should be aware of the correct working procedures to ensure safety. The product documentation should be consulted before installing, commissioning or servicing the equipment.

Terminals exposed during installation, commissioning and maintenance may present hazardous voltage unless the equipment is electrically isolated.

If there is unlocked access to the rear of the equipment, care should be taken by all personnel to avoid electric shock or energy hazards.

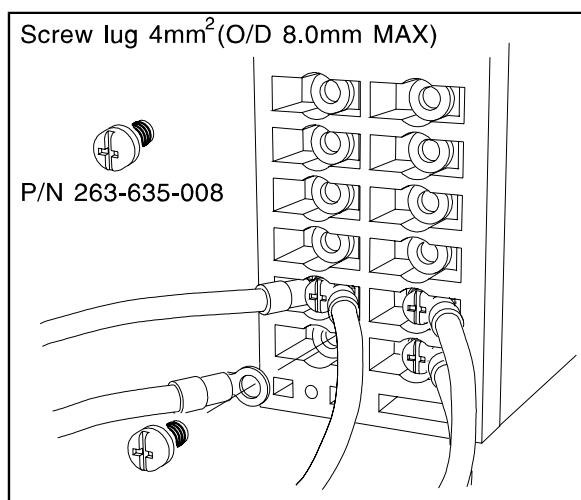
Voltage and current connections should be made using insulated crimp terminations to ensure that terminal block insulation requirements are maintained for safety. To ensure that wires are correctly terminated, the correct crimp terminal and tool for the wire size should be used.

Before energising the equipment it must be earthed using the protective earth terminal, or the appropriate termination of the supply plug in the case of plug connected equipment. Omitting or disconnecting the equipment earth may cause a safety hazard.

The recommended minimum earth wire size is 2.5mm², unless otherwise stated in the technical data section of the product documentation.

Before energising the equipment, the following should be checked:

1. Voltage rating and polarity;
2. CT circuit rating and integrity of connections;
3. Protective fuse rating;
4. Integrity of earth connection (where applicable)





Current Transformer Circuits

Do not open the secondary circuit of a live CT since the high voltage produced may be lethal to personnel and could damage insulation.

External Resistors

Where external resistors are fitted to relays, these may present a risk of electric shock or burns, if touched.

Insulation & Dielectric Strength Testing

Insulation testing may leave capacitors charged up to a hazardous voltage. At the end of each part of the test, the voltage should be gradually reduced to zero, to discharge capacitors, before the test leads are disconnected.

Insertion of Modules

These must not be inserted into or withdrawn from equipment whilst it is energised, since this may result in damage.

Electrical Adjustments

Pieces of equipment which require direct physical adjustments to their operating mechanism to change current or voltage settings, should have the electrical power removed before making the change, to avoid any risk of electric shock.

Mechanical Adjustments

The electrical power to the relay contacts should be removed before checking any mechanical settings, to avoid any risk of electric shock.

Draw Out Case Relays

Removal of the cover on equipment incorporating electromechanical operating elements, may expose hazardous live parts such as relay contacts.

Insertion & Withdrawal of Heavy Current Test Plugs

When using a heavy current test plug, CT shorting links must be in place before insertion or removal, to avoid potentially lethal voltages.



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Commissioning Preliminaries

Carefully examine the module and case to see that no damage has occurred during transit. Check that the relay serial number on the module, case and cover are identical, and that the model number and rating information are correct.

Carefully remove any elastic bands/packing fitting for transportation purposes.

Check that the external wiring is correct to the relevant relay diagram or scheme diagram. The relay diagram number appears inside the case.

Particular attention should be paid to the correct wiring and value of any external resistors indicated on the wiring diagram/relay rating information.

Note that shorting switches shown on the relay diagram are fitted internally across the relevant case terminals and close when the module is withdrawn. It is essential that such switches are fitted across all CT circuits.

If a test block system is to be employed, the connections should be checked to the scheme diagram, particularly that the supply connections are to the 'live' side of the test block.

Earthing

Ensure that the case earthing connection above the rear terminal block, is used to connect the relay to a local earth bar.

Insulation

The relay, and its associated wiring, may be insulation tested between:

- all electrically isolated circuits
- all circuits and earth

An electronic or brushless insulation tester should be used, having a dc voltage not exceeding 1000V. Accessible terminals of the same circuit should first be strapped together. Deliberate circuit earthing links, removed for the tests, subsequently must be replaced.



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Commissioning Tests

If the relay is wired through a test block it is recommended that all secondary injection tests should be carried out using this block.

Ensure that the main system current transformers are shorted before isolating the relay from the current transformers in preparation for secondary injection tests.

DANGER

DO NOT OPEN CIRCUIT THE SECONDARY CIRCUIT OF A CURRENT TRANSFORMER SINCE THE HIGH VOLTAGE PRODUCED MAY BE LETHAL AND COULD DAMAGE INSULATION.

It is assumed that the initial preliminary checks have been carried out.

Relay CT shorting switches

With the relay removed from its case, check electrically that the CT shorting switch is closed.

Primary injection testings

It is essential that primary injection testing is carried out to prove the correct polarity of current transformers.

Before commencing any primary injection testing it is essential to ensure that the circuit is dead, isolated from the remainder of the system and that only those earth connections associated with the primary test equipment are in position.

Decommissioning & Disposal

Decommissioning: The auxiliary supply circuit in the relay may include capacitors across the supply or to earth. To avoid electric shock or energy hazards, after completely isolating the supplies to the relay (both poles of any dc supply), the capacitors should be safely discharged via the external terminals prior to decommissioning.

Disposal: It is recommended that incineration and disposal to water courses is avoided. The product should be disposed of in a safe manner.

Maintenance

Mechanical Inspection

Relay Assembly

Inspect the relay for obvious signs of damage or ingress of moisture or other contamination.

Relay Module

Isolate the relay, remove the front cover & carefully withdraw the relay module from the case.

Care must be taken to avoid subjecting the relay element to static discharge which may damage or degrade sensitive electronic components.

Inspect the relay module for signs of any overheating or burn marks which may have been caused by overvoltage surge or transient conditions on the power supply or digital status inputs.

Inspect the VT & CT stages for degradation of insulation on the terminal wiring & transformer windings.



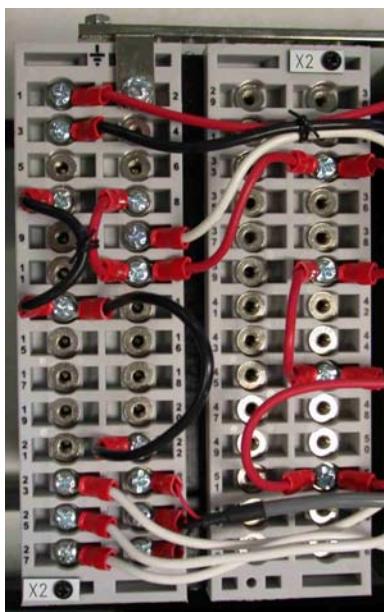
Remove cover by unscrewing black thumb screws & withdraw the relay module from the case.

Relay Case

Inspect the outer terminals checking insulation integrity & tightness.

Inspect inside the case and use a blower to remove dust.

Inspect the inner terminals for worn, distorted or tarnished contacts and if necessary clean the contacts using a brush dipped in a suitable substance.



Case outer terminals



Case inner terminals



Module plug in terminals

Test Intervals

The maintenance tests required will largely depend upon experience and site conditions, but as a general rule it is recommended that the following inspection and tests are performed every twelve months.

- ◆ Mechanical Inspection
- ◆ Check of Connections
- ◆ Insulation Resistance Test
- ◆ Fault Setting Tests by Secondary Injection
- ◆ Tests using Load Current
- ◆ Check the continuity of the neutral CT loop with a bell test set or an ohmmeter



Defect Report Form

Please copy this sheet and use it to report any defect which may occur.

Customers Name & Address:	Contact Name:
	Telephone No:
	Fax No:
Supplied by:	Date when installed:
Site:	Circuit:

When Defect Found

Date:	Commissioning?	Maintenance?	Systems Fault?	Other, Please State:
Product Part No:			Serial Number:	
Copy any message displayed by the relay:				
Describe Defect:				
Describe any other action taken:				
Signature:		Please Print Name:		Date:

For RMS use only

Date Received:	Contact Name:	Reference No:	Date Acknowledged:	Date of Reply:	Date Cleared:
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Relay Monitoring Systems Pty Ltd design, manufacture and market a wide range of electrical protection and control products for application on high voltage power systems. The company's depth of manufacturing and engineering expertise is backed up by many years of experience since the formation of its predecessor, Relays Pty Ltd (RPL), in 1955. This experience combined with a broad base of field proven product types enables RMS to service specific customer needs by producing relays on demand and with typically short lead times.

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ISO9001 Quality Accreditation

RMS holds NCSI (NCS International Pty Limited) registration number 6869 for the certification of a quality system to AS/NZS ISO9001:2008.

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