



1S25 User Guide

Arc Fault Monitor

relay monitoring systems pty ltd

Advanced Protection Devices



User Guide

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1S25 User Guide

About This Manual

This User Guide covers all 1S25 relays manufactured from January 2010. Earlier relays do not necessarily incorporate all the features described. Our policy of continuous improvement means that extra features & functionality may have been added.

The 1S25 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/1s25_user_guide.pdf

To download the model specific Product Test Manual:

<http://www.rmspl.com.au/ptmanual/>



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



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Documentation

The detailed technical attributes, functional description & performance specifications for the 1S25 are described in the product Technical Bulletin. For the most up to date version go to:

www.rmspl.com.au/1s25.htm

www.rmspl.com.au/handbook/1s30.pdf

The order of precedence for product information is as follows:

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

This User Guide covers all 1S25 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 1S25Kxx 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

Each 1S25 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/ptmanual/
- 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.

Great care has been taken to design a rugged, cost effective & flexible mechanical solution for the *MATRIX* range of RMS protection relays.

The *MATRIX* range provides a compact draw out case solution with M4 screw terminals. Complete details & attributes for the M (MATRIX) cases & accessories may be found at: <http://www.rmspl.com.au/mseries.htm>





Application

- Sensor Installation 2**
 - Sensor Spacing2
 - Sensor Placement4
 - Sensor Mounting4
 - Example Sensor Placement5
- Scheme Wiring 9**
 - 1S25 Connection diagram9
 - Example Schematic10
 - Terminal Layout and Relay Dimensions11
- Relay Configuration 12**
 - Configuration Switch Settings12
 - Setting Example14
- Operational Relay Indications..... 17**
 - Front Panel Layout17
 - Healthy LED17
 - Trip Indications18
 - Sensor FAIL Indications18
 - Relay Reset Push Button18
- Commissioning 19**
 - Commissioning Preliminaries19
 - Site Commissioning Verification Checklist20
 - System Power Up20
 - Sensor Failure Alarm Verification21
 - Arc Trip Testing21
 - Sensor Failure Alarm Trouble Shooting22
 - ARC Trip Trouble Shooting.....22

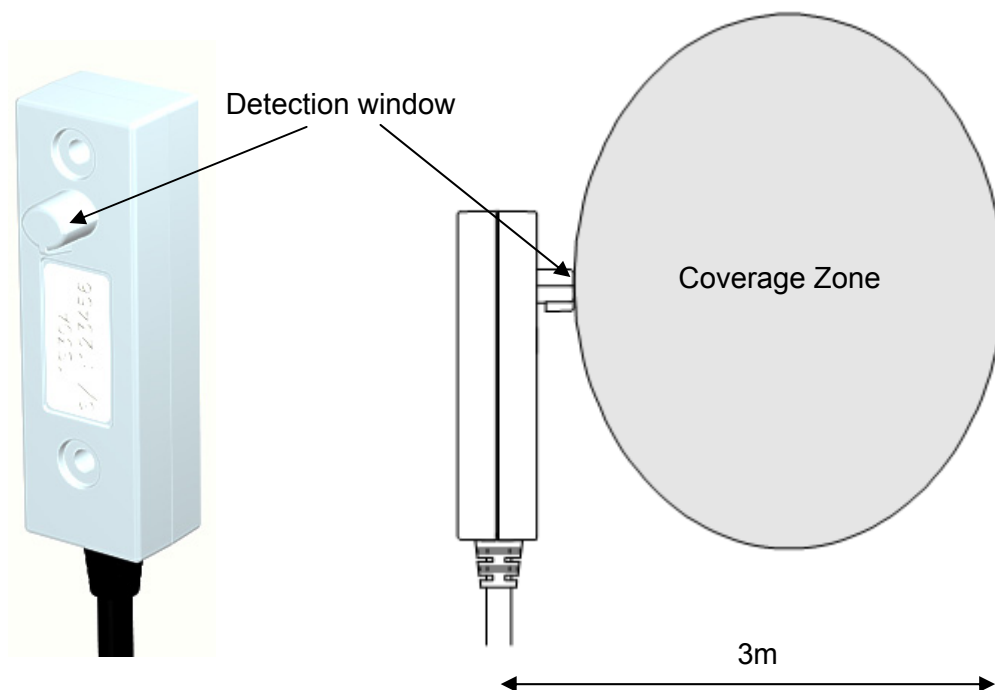


Sensor Installation

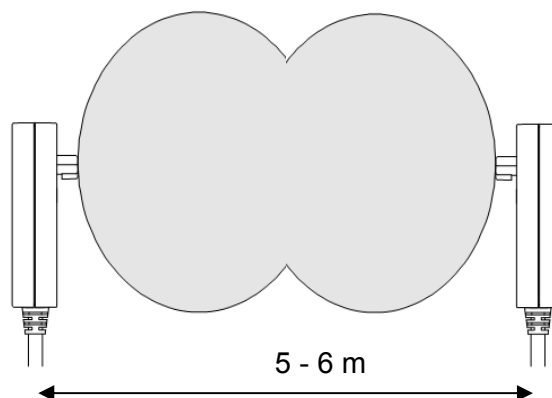
Sensor Spacing

The 1S30 sensor is available as a single detector or dual detector package.

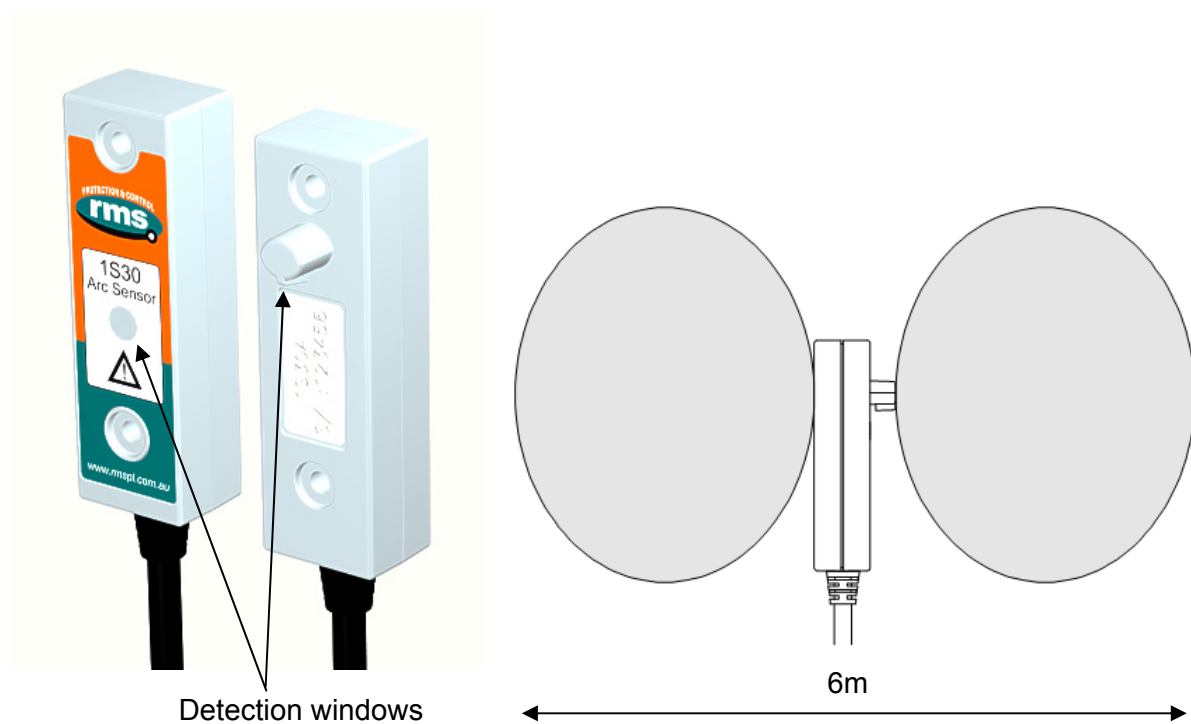
The 1S30A single detector version is depicted below showing the location of the detection window and the approximate coverage zone :



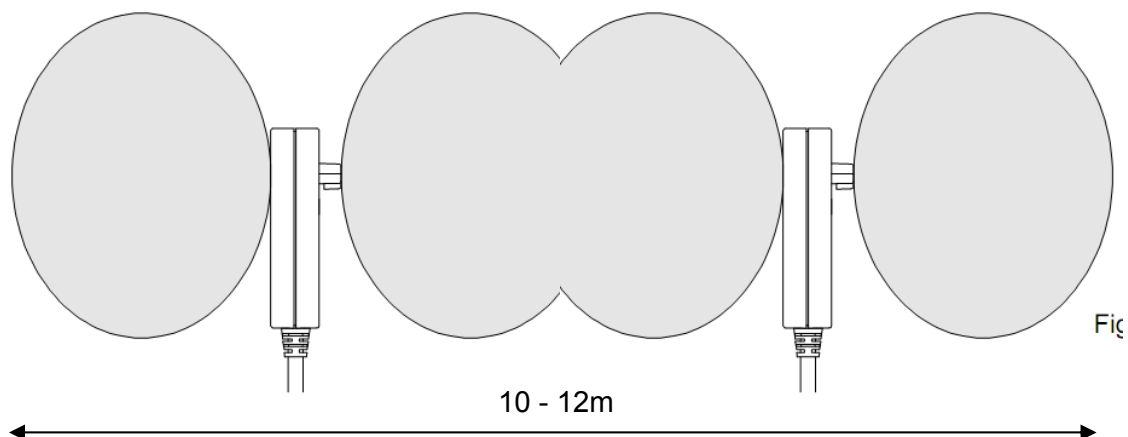
The recommended spacing for the 1S30A single detectors is approximately 5 - 6 m to ensure adequate detection overlap.



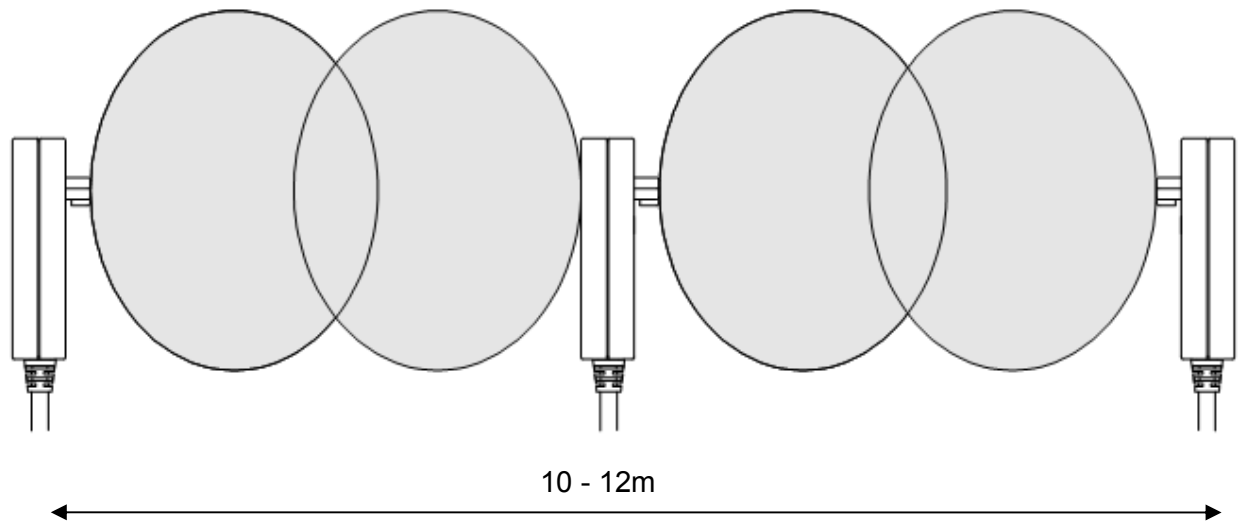
The 1S30B Dual detector version provides an additional detection window for dual zones of coverage as depicted below :



The recommended spacing for the 1S30B single detectors is approximately 5 - 6 m to ensure adequate detection overlap, this combination provides an overall coverage zone of approximately 10 - 12 m.



The 1S30A and 1S30B sensors may also be mixed to provide various coverage combinations, again spacings of approximately 5 - 6 m should be observed to ensure adequate detection overlap.



Sensor Placement

Sensors need to be mounted to provide full coverage of the switchgear cubicles to be protected. Where the protected zone is larger than the sensor coverage then the use of multiple sensors is required.

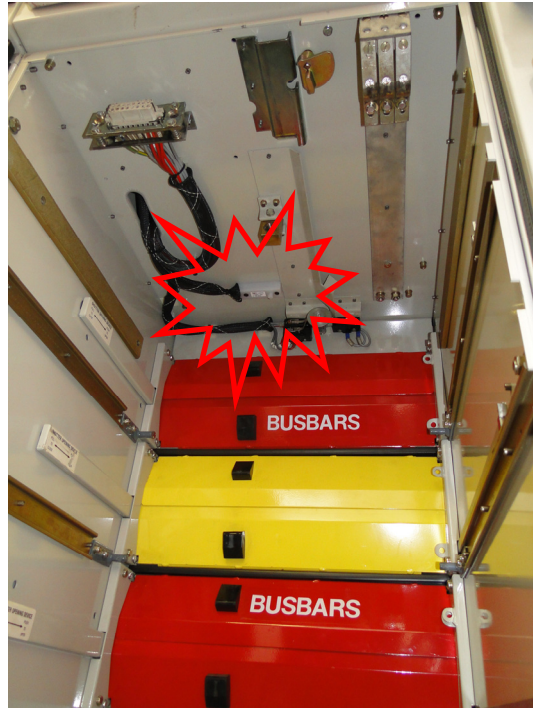
Precise positioning of the sensors is generally not required as the light caused by the arc is reflected from the walls.

Sensor Mounting

The 1S30 is suitable for flush panel mounting in a number of configurations, for further information on mounting arrangements and mounting hardware refer to the 1S30 Technical Bulletin.

Example Sensor Placement

The following are some typical examples of sensor placement.



Sensor placement inside CB racking chamber



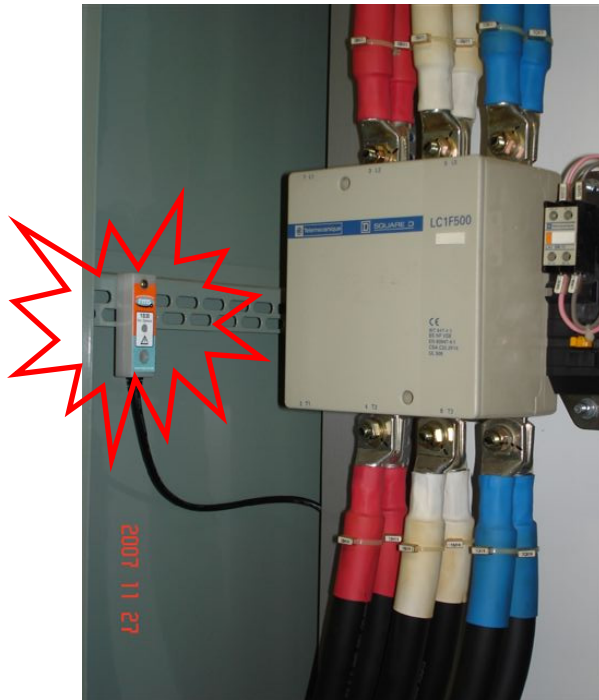
Sensor placement inside busbar chamber



Sensor placement inside cable termination chamber



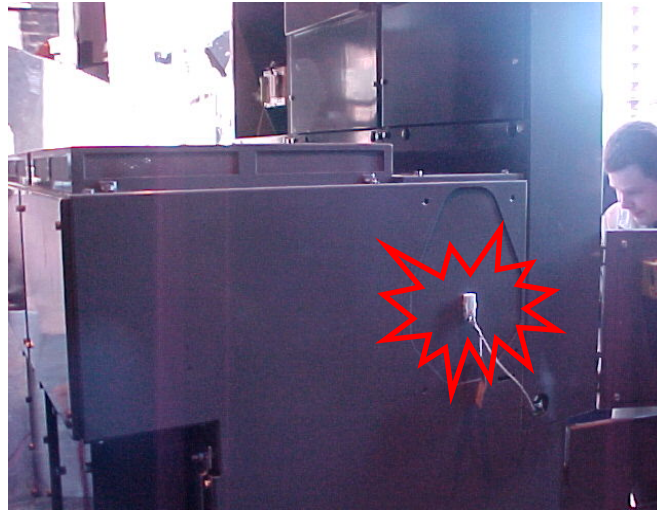
Sensor placement for switchgear Busbar coverage (External through Hole Detector)



Sensor placement near Low Voltage Contactor for a Variable Speed Drive



Sensor placement for Switchgear cable termination chamber (External through Hole Detector)



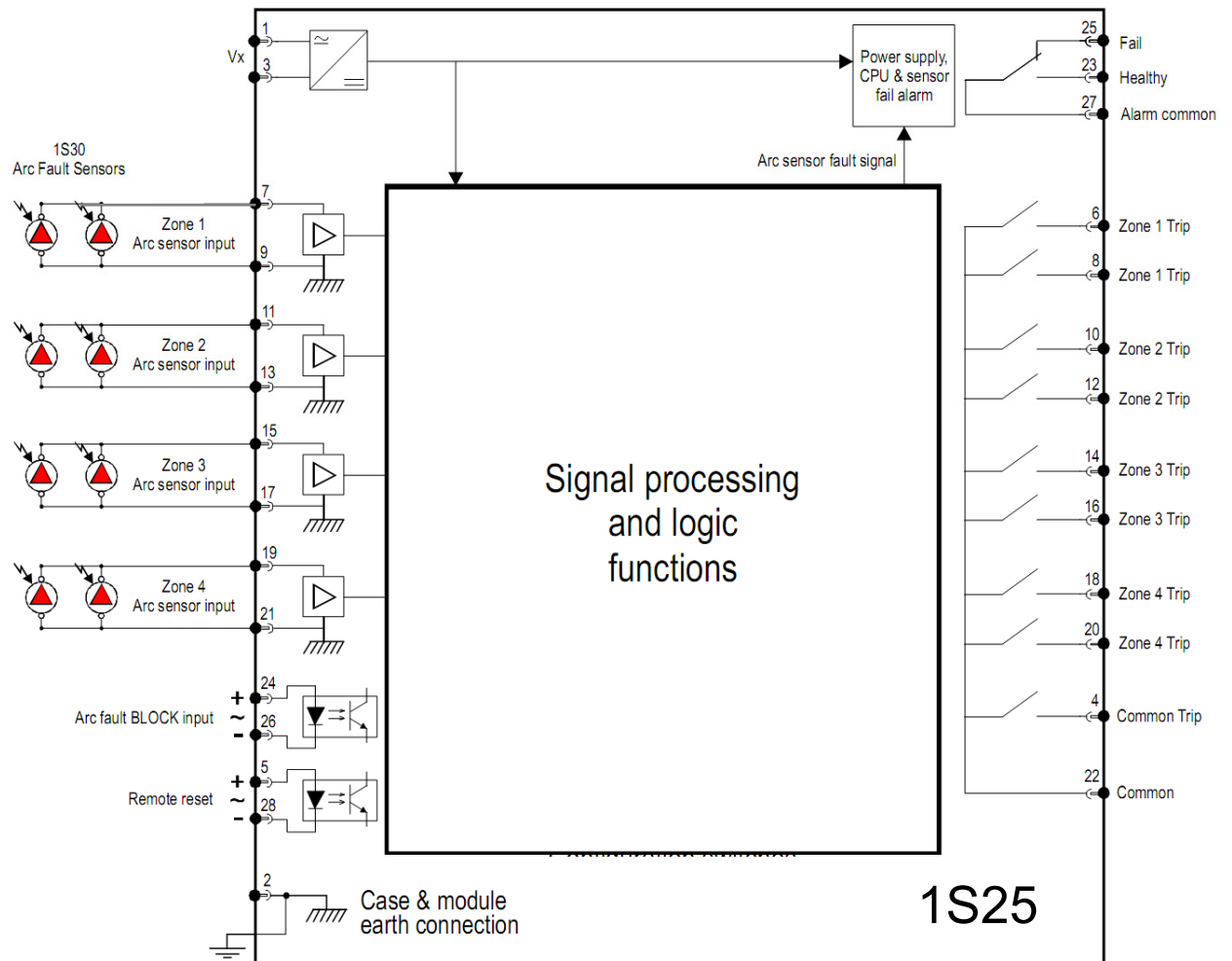
Sensor placement for end of Bus chamber (External through Hole Detector)



Sensor placement for Switchgear cable termination chamber (External through Hole Detector)

Scheme Wiring

1S25 Connection diagram

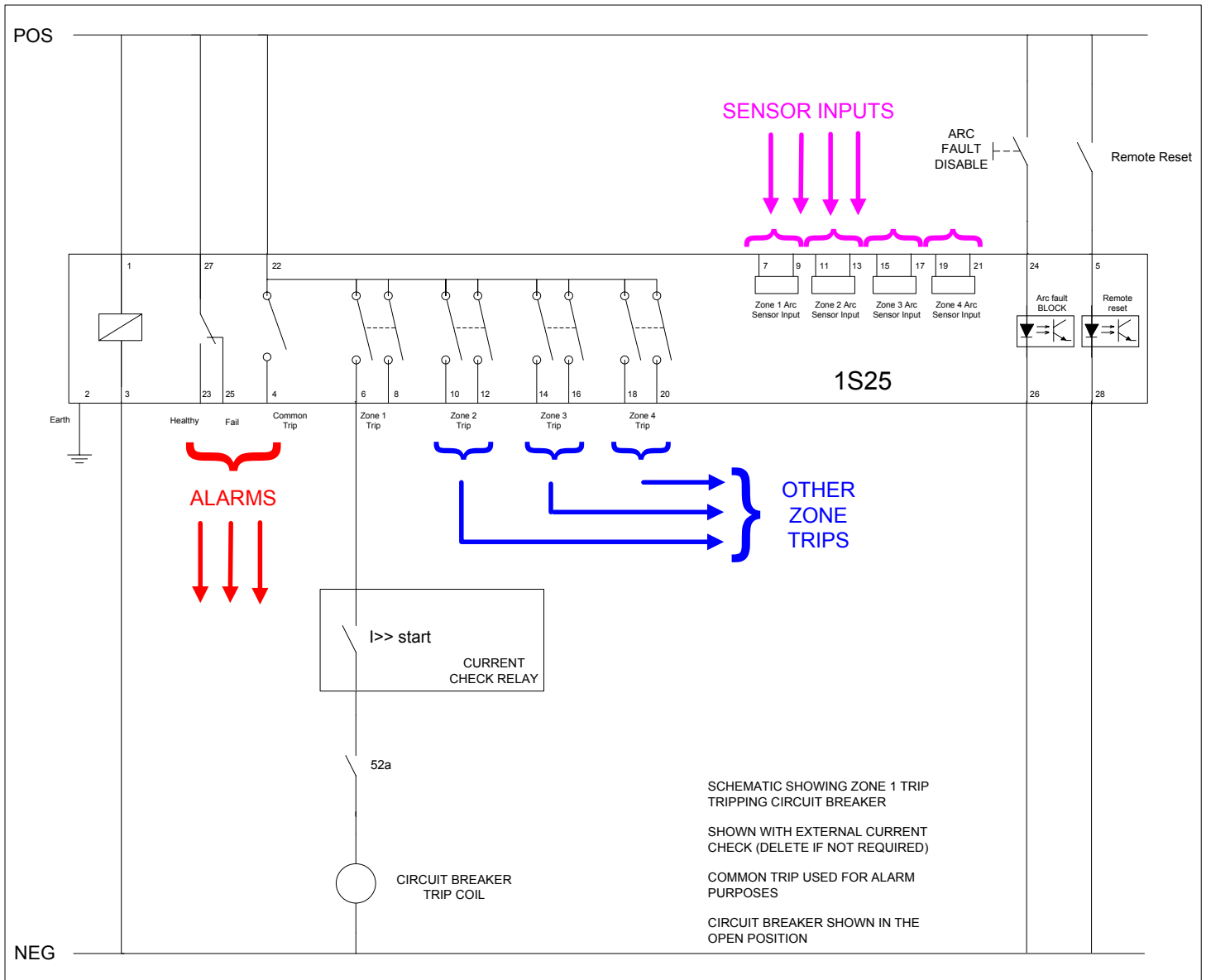


Each of the four 1S25 sensor inputs are capable of accepting either 1 or 2 sensors providing monitoring for up to 8 sensors in total.

When connecting 2 sensors to a single input the sensors are connected in parallel. The configuration switches need to be set according to the number of sensors connected, refer to Configuration Switch Settings.

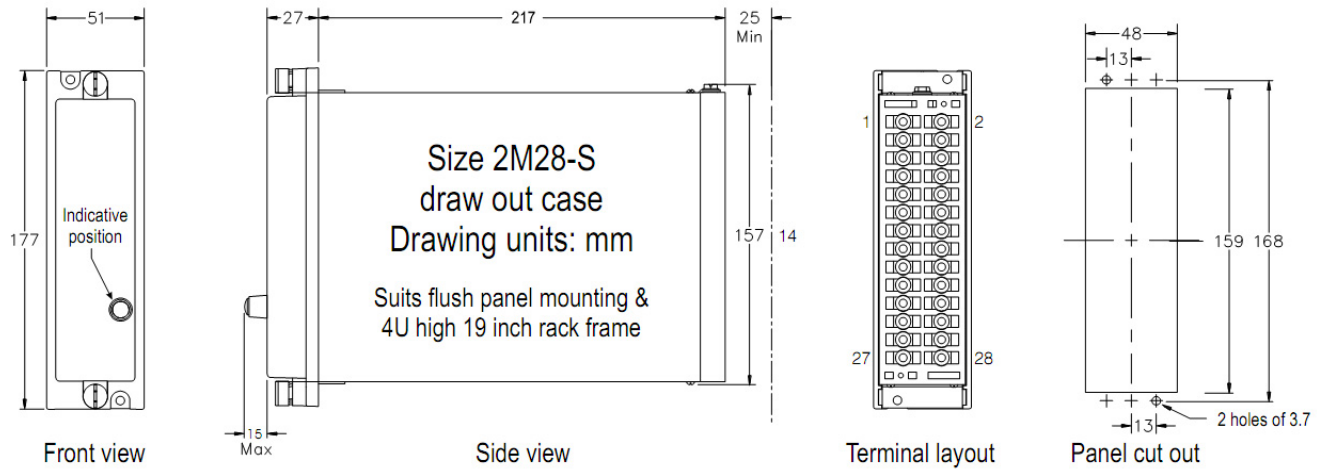
Example Schematic

The following typical schematic shows how the 1S25 is wired to interface with a circuit breaker tripping circuit.





Terminal Layout and Relay Dimensions



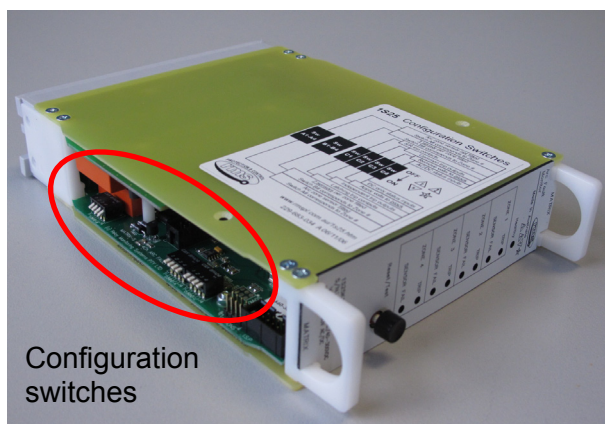
Refer to the 1S25 Technical Bulletin for complete installation details.

Relay Configuration

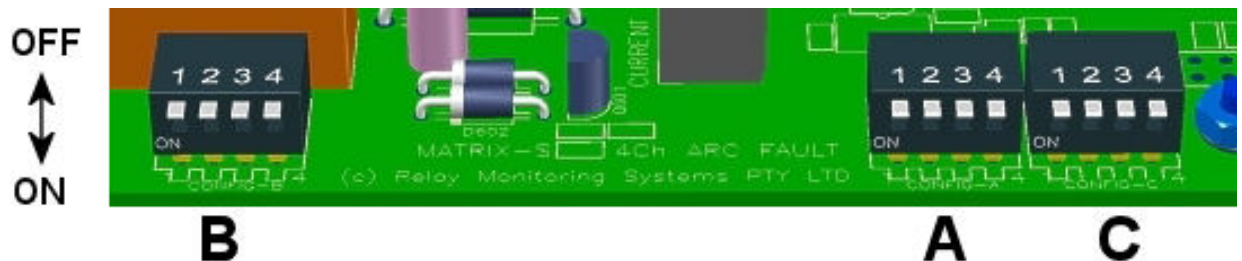
Configuration Switch Settings

The 1S25 Arc Fault Monitor needs to be correctly configured for each specific application. Three banks of four (4) configuration switches are used for the configuration of the 1S25.

The configuration switches are accessible to the user by withdrawing the relay module from the outer case. The location of the configuration switches is shown in the photos below :



The three banks of configuration switches designated A, B & C are identified according to the following diagram (the OFF and ON position is also identified) :



The tables below outlines the function of each switch :

Switch Bank A

Switch	ON	OFF
A1	Zone 1 Arc sensor fitted	Zone 1 Arc sensor not fitted
A2	Zone 2 Arc sensor fitted	Zone 2 Arc sensor not fitted
A3	Zone 3 Arc sensor fitted	Zone 3 Arc sensor not fitted
A4	Zone 4 Arc sensor fitted	Zone 4 Arc sensor not fitted

Switch Bank A defines which of the Arc sensor inputs have Arc sensors installed.

Note that unused sensor inputs need to be switched to the OFF position.

Switch Bank B

Switch	ON	OFF
B1	Zone 1 – 2 Arc sensors	Zone 1 – 1 Arc sensor
B2	Zone 2 – 2 Arc sensors	Zone 2 – 1 Arc sensor
B3	Zone 3 – 2 Arc sensors	Zone 3 -1 Arc sensor
B4	Zone 4 – 2 Arc sensors	Zone 4 – 1 Arc sensor

Switch Bank B defines whether 1 or 2 Arc Sensors are installed for the respective Arc sensor inputs.

The correct number of sensors on used inputs is required to ensure the correct operation of the arc sensor supervision.

Switch Bank C

Switch	ON	OFF
C1	Latching trip contacts	Self reset trip contacts
C2	Independent trip outputs	Common trip outputs
C3	Apply volts to BLOCK	Remove volts to BLOCK
C4	DC only status inputs	AC/DC status inputs

Switch C1 : Defines the output tripping contacts as being latched or unlatched.

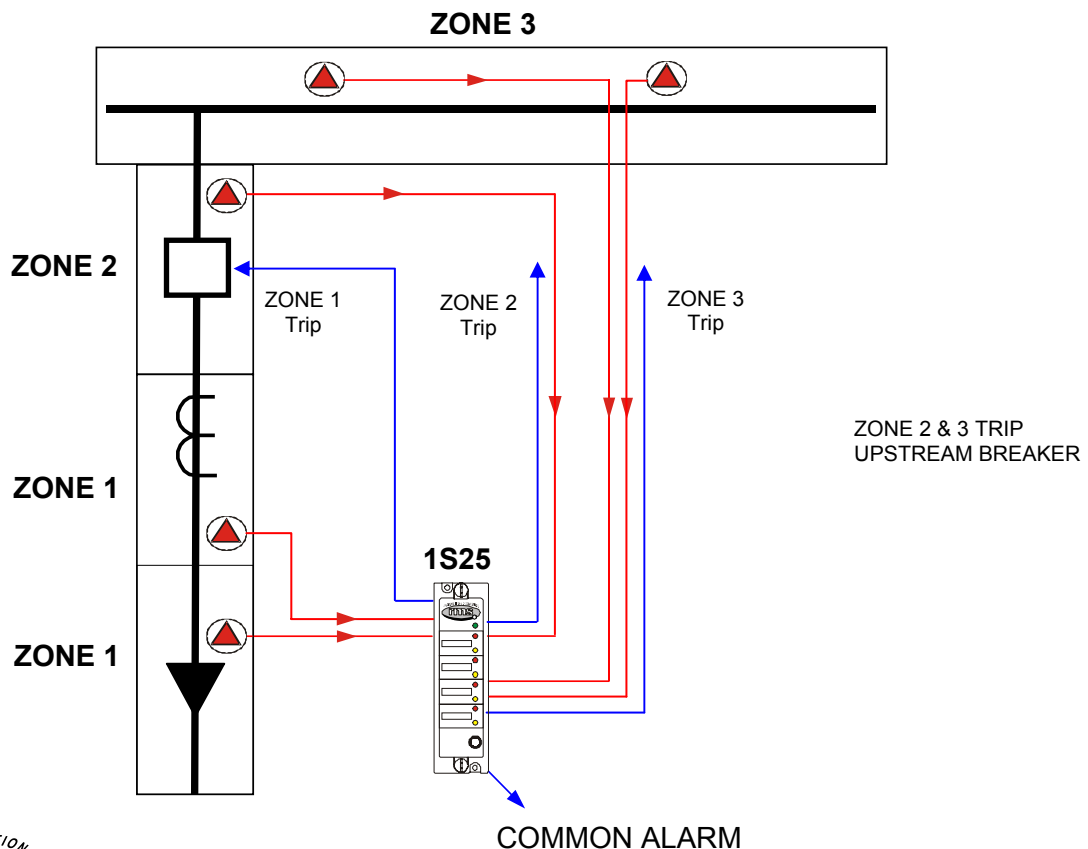
Switch C2 : Defines whether the Zone output tripping contacts operate only for their respective tripping zone (Independent trip outputs), or all output tripping contacts operate for an arc detected by any sensor (Common trip outputs).

Switch C3 : Defines whether the application or removal of voltage from the Arc Fault Block input asserts the Arc Fault Block. Note that the Arc Fault Block is level triggered.

Switch C4 : Selects whether the status inputs operate for DC only or for both AC and DC.

Setting Example

Arc fault protection is to be applied to a switchboard to provide coverage of the Busbar, Circuit breaker, Current Transformer and Cable termination chambers as shown in the diagram below.





The specific setting criteria for this example application are itemised below :

1. The Current Transformer and Cable termination chambers are to be covered in Zone 1 by 2 separate Arc fault sensors.
2. The Circuit Breaker chamber is to be covered in Zone 2 by a single Arc fault sensor.
3. The Busbar chamber is to be covered in Zone 3 by 2 separate Arc fault sensors.
4. Zone 4 will not be utilised and will have no Arc fault sensors connected.
5. All tripping contacts are to be latched and shall operate independently to allow the local circuit breaker to be tripped by a Zone 1 trip and an upstream circuit breaker to be tripped by a Zone 2 or Zone 3 trip.
6. The Arc Fault monitor shall be blocked by the application of a control voltage to the blocking input. The blocking input shall only respond to the application of a DC control voltage.

Switch Bank A is set to define which of the Zones have Arc Sensors Fitted :

Switch	Sensors Fitted	Switch Position
A1 - Zone 1	Yes	ON
A2 - Zone 2	Yes	ON
A3 - Zone 3	Yes	ON
A4 - Zone 4	No	OFF

Switch Bank B is set to define the number of Arc Sensors Fitted to each of the respective zones :

Switch	Number of Sensors Fitted	Switch Position
B1 - Zone 1	2	ON
B2 - Zone 2	1	OFF
B3 - Zone 3	2	ON
B4 - Zone 4	None	NA*

* No sensors fitted, switch position does not matter



Switch C1 is set for latched tripping contacts :

Switch	Required setting	Switch Position
C1	Latched	ON

Switch C2 is set for independent tripping contacts :

Switch	Required setting	Switch Position
C2	Independent	ON

Switch C3 is set to define that a control voltage needs to be applied to the blocking input to block Arc Fault tripping :

Switch	Required setting	Switch Position
C3	Apply Voltage to Block	ON

Switch C4 is set to define that the status inputs only respond to a DC control voltage :

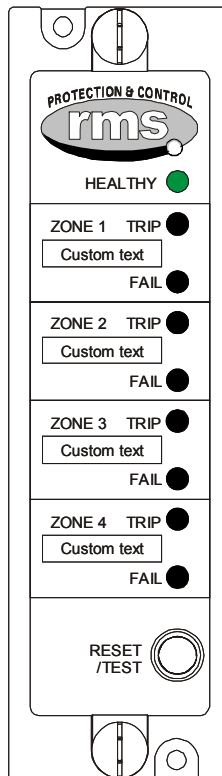
Switch	Required setting	Switch Position
C4	DC only status inputs	ON



Operational Relay Indications

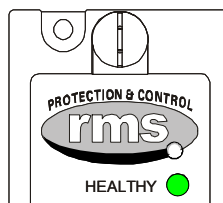
Front Panel Layout

The Front panel provides LED indication of relay health, zone trips and sensor failure. A push button is provided to reset latched trip LEDs, the push button also serves the purpose of testing LED operation.



Healthy LED

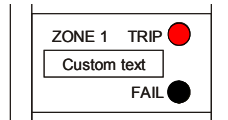
The Healthy LED illuminates when the 1S25 is energised and the internal relay self checking completes successfully. Continuous self checking is undertaken whilst the relay is energised - an error in the self checking routine will cause the Healthy LED to extinguish and operate the relay fail output.





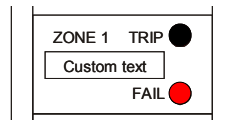
Trip Indications

Each ZONE is provided with a Trip LED. Upon detection of an ARC fault the LED will flash for 2 secs and then illuminate solid and remain latched. The latched LED is reset by depressing the Relay Reset.



Sensor FAIL Indications

Each Zone is provided with a Sensor FAIL LED. The sensor supervision checks the integrity of the wiring (for short circuit or open circuit) between the 1S30 sensor and the 1S25 monitor. The sensor supervision also checks for high ambient lighting conditions which continuously triggers the 1S30 sensor. Both conditions cause the Sensor FAIL LED to illuminate and operate the relay fail output.



The Sensor FAIL LED will self reset upon the failure condition being removed.

Relay Reset Push Button

The Relay Reset push button resets all latched trip conditions on all zones. Pressing and holding the Reset Push Button for more than 2 secs will start the LED test sequence.



Commissioning

Commissioning Preliminaries

Carefully examine the module and case to ensure 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.

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.

ARC Trip Verification

ARC Trip Verification will require a flash source to initiate sensor operation.

A high powered photographic flash is the most convenient means of initiating positive sensor operation.

Note that mobile phone or small compact camera flashes may not have sufficient power to cause sensor operation.

The RMS 'Arc Flash Timing Test Guide' outlines a suggested test setup to provide a flash source and determine ARC Trip times. The 'Arc Flash Timing Test Guide' is available on the RMS website :

www.rmspl.com.au/userguide/arc_flash_timing_test_guide.pdf



Site Commissioning Verification Checklist

Observe all site specific standard safety procedures.

The following tests are undertaken following the completion of all 1S25 scheme wiring and the wiring of all 1S30 sensors.

System Power Up

Item	Description	Complete
1	Confirm all necessary primary equipment isolations	
2	Confirm all necessary secondary equipment isolations (including trip outputs)	
3	Check fitment of 1S30 optical sensors and cable condition	
4	Check panel installation of the 1S25 monitor	
5	Check for correct case earthing	
6	Check the 1S25 is wired to the protection design schematic	
7	Withdraw the 1S25 module and confirm configuration switches match protection setting specifications and reinsert module into the case	
8	Confirm Fail alarm relay is closed (Terminals 25 and 27)	
9	Apply correct Auxiliary voltage to power up the 1S25	
10	Observe the green power LED becomes illuminated and the red trip and supervision LED's illuminate for a short interval to demonstrate correct system function	
11	Confirm Fail alarm relay is open (Terminals 25 and 27)	
12	Confirm all sensor fail LED's remain OFF (Refer Sensor Failure Trouble shooting if sensor fail illuminates)	
13	Confirm all Zone trip LED's remain OFF	



Sensor Failure Alarm Verification

Item	Description	Complete
1	Disconnect each sensor from the associated 1S25 sensor input	
2	Confirm operation of the associated sensor Fail LED and operation of the Relay Fail Alarm output contact	
3	Reconnect each sensor back to the associated 1S25 sensor input	
4	Confirm the associated sensor Fail LED clears and the Relay Fail Alarm output contact opens	
5	In turn short across each 1S25 sensor input	
6	Confirm operation the associated sensor Fail LED and operation of the Relay Fail Alarm output contact	
7	Remove the short on each 1S25 sensor input	
8	Confirm the associated sensor Fail LED clears and the Relay Fail Alarm output contact opens	

Arc Trip Testing

Ensure there is no ARC Fault block and all sensor wiring is reinstated.

Item	Description	Complete
1	Initiate the operation of each sensor by the use of a suitably powered camera flash	
2	Check operation of the corresponding Zone Trip LED and Zone Trip relay output	
3	Confirm operation of the common trip output	
4	Confirm operation of output contacts is in accordance with switch C1 setting for latching of outputs	
5	Check the setting of configuration switch bank C to explain any unexpected behavior	
6	Confirm operation of relay manual reset after each tripping operation. Repeat ARC trip and confirm correct operation of remote reset after each tripping operation	



Apply an ARC Fault block.

Item	Description	Complete
1	Initiate the operation of each sensor by the use of a suitably powered camera flash	
2	Confirm blocking of the corresponding Zone Trip	
3	Confirm blocking of the common trip output	

Sensor Failure Alarm Trouble Shooting

Item	Description	Complete
1	If any arc sensor fail LED's are flashing re-check the 1S30 wiring integrity	
2	Check that the correct sensors are wired to the correct zones	
3	Power down the relay and re-check the A and B configuration settings to ensure they match the system wiring	
4	After checking required configuration settings apply the correct Auxiliary voltage to power up the 1S25	
5	If the sensor fail alarm persists set the configuration switches A1-A4 to OFF	
6	Apply the correct Auxiliary voltage to power up the 1S25 and check that all sensor fail LED's are extinguished	

ARC Trip Trouble Shooting

If an arc trip LED is illuminated without an ARC being present this indicates either:

- a very high ambient light condition in that zone

or

- short circuit wiring of the 1S30 sensor

In both of these cases the sensor alarm for that zone will be energised after a 10 sec delay.

Item	Description	Complete
1	Check the 1S30 wiring integrity of the affected zone	
2	Check for high ambient lighting conditions in the affected zone	

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

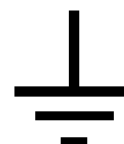


Caution: risk of electric shock



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)



Visit www.rmspl.com.au for the latest product information.

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Unpacking (Continued)

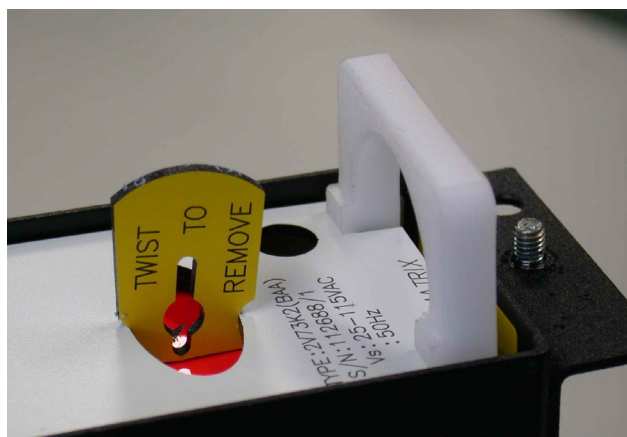


Inner packing carton with lid open showing protective foam insert.

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.



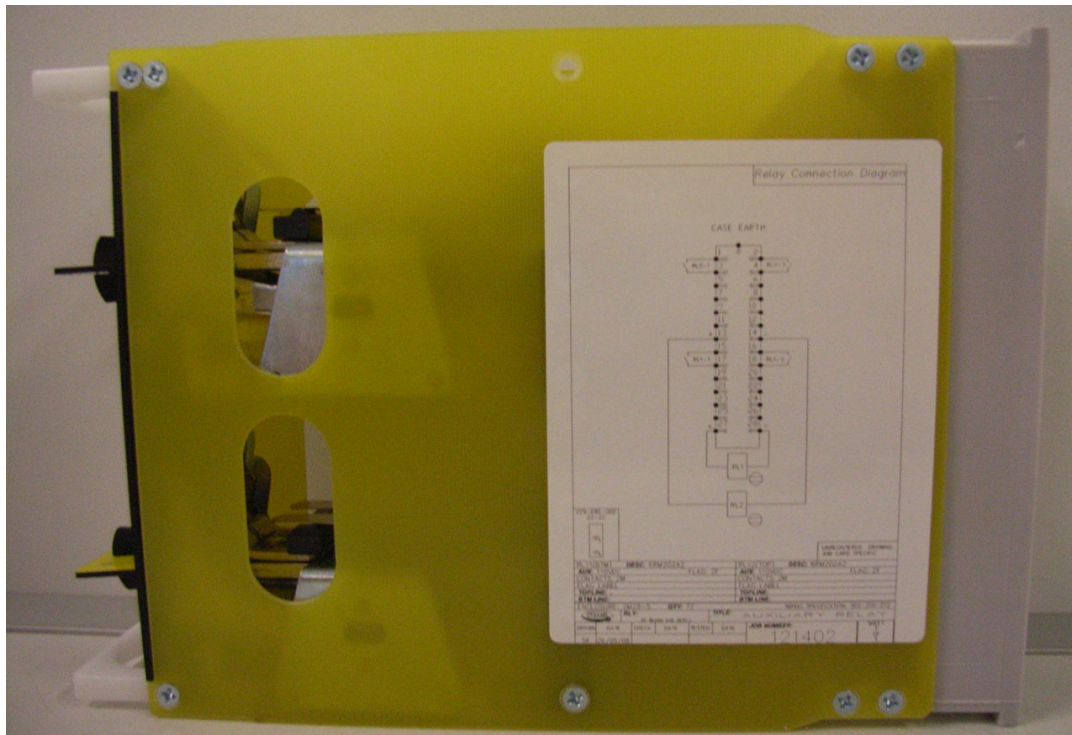
Where mechanical flags are fitted the yellow transit wedge must be removed before operation using a gentle twisting action. The wedge should be stored with the original packaging material.



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.

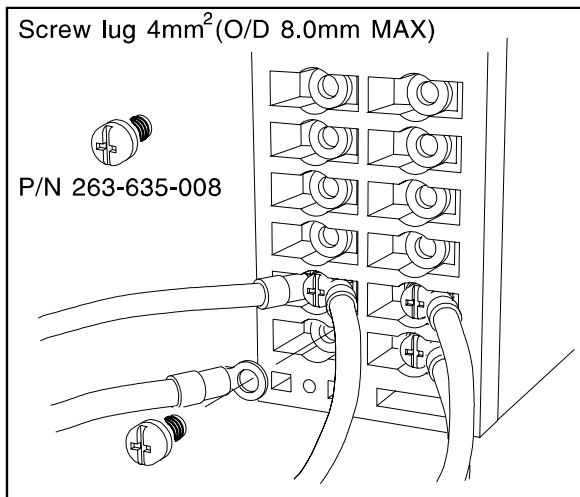
Voltage and current connections should be made using insulated crimp terminations to ensure that terminal block insulation requirements are maintained for safety. To ensure that wires are correctly terminated, the correct crimp terminal and tool for the wire size should be used.

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.



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Maintenance

Mechanical Inspection

Relay Assembly

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

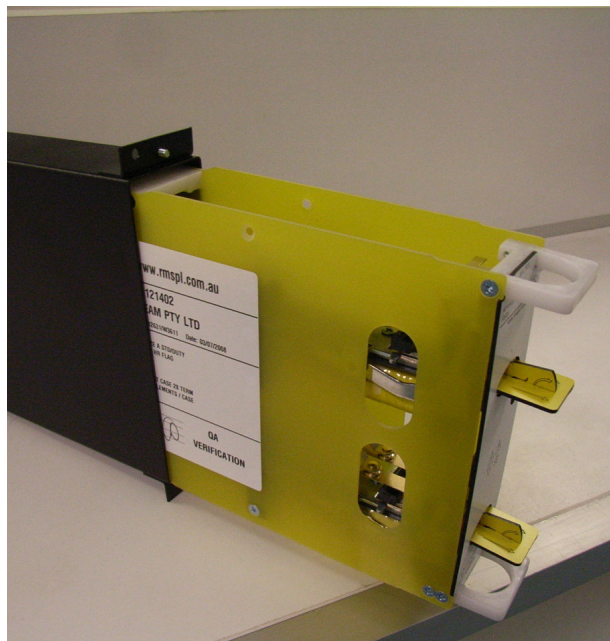
Relay Module

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.



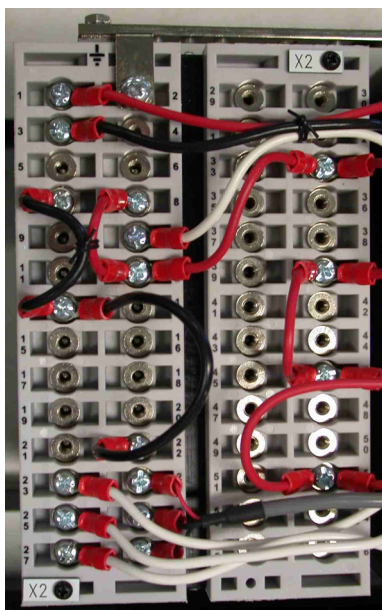
Remove cover by unscrewing black thumb screws & withdraw the relay module from the case.

Relay Case

Inspect the outer terminals checking insulation integrity & tightness.

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

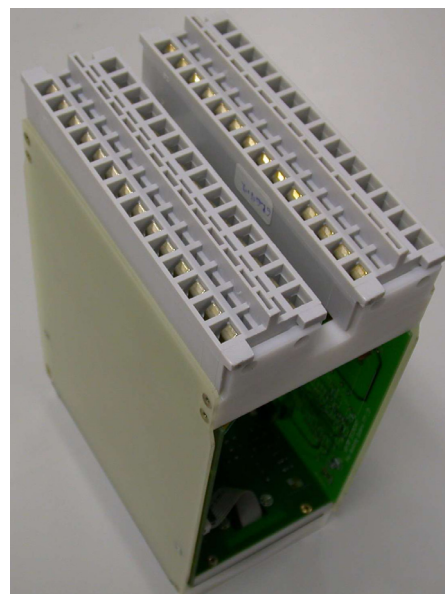
Inspect the inner terminals for worn, distorted or tarnished contacts and if necessary clean the contacts using a brush dipped in a suitable substance.



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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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 80%. 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 ISO9001-2008. 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, The Middle East & 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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