

AUXILIARY | **TRIPPING** | SUPERVISION

# TRD8

Fast tripping plug-in industrial relay with 8 C/O latching contacts.  
Compact electro-mechanical tripping relay for power utility protection and control applications.

- > Latching (bistable) relay
- > Fast tripping: < 10 ms
- > 8 C/O contacts
- > Contact position indicator
- > Manual and electrical reset
- > Wide range of sockets
- > Optional positive mechanical keying relay to socket





## Features

- > Latching (bistable) relay
- > Fast tripping: < 10 ms
- > Reset inhibitor to avoid simultaneous energization of Operate and Reset Coil
- > Compact plug-in design
- > 8 C/O contacts
- > Back EMF suppression diode on operate and reset coils
- > Contact position indicator
- > Less than 0.2W power consumption after switching
- > Magnetic arc blow-out for high breaking capacity and long contact life
- > Mechanical and electrical reset
- > Panel, rack, surface or rail mounting options
- > High DC breaking capacity
- > Optional high burden operation to comply with capacitor discharge test requirements

## Description

The TRD8 relay is a plug-in fast trip bistable tripping relay that features 8 changeover (C/O) contacts. The contacts of this relay remain in the last powered position, and the position is clearly shown to the user via a position indicator.

The TRD8 relay has a trip time of less than 10 ms.

Equipped with magnetic arc blow-out contacts as standard for high breaking capacity and long contact life.

Including mechanical reset button.

Input voltage must be a rising edge with

- minimum slew rate: 1 V/ms
- minimum time: 10 ms

## Application

The TRD8 relay is a rugged plug-in tripping relay for extreme reliable, long endurance applications in harsh environment. This relay is designed for heavy duty applications in power utilities, petro-chemical industries and mining.

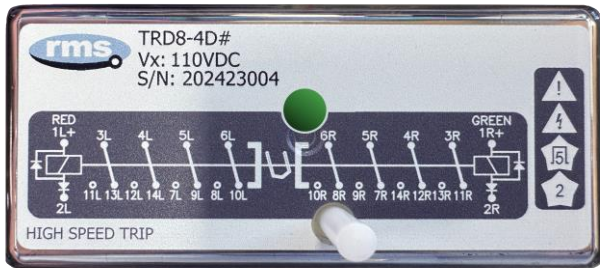
The TRD8 relay is used in applications where high-speed tripping is necessary and contacts are set and reset with permanent power or impulses.

## Remark

- Never energize the trip or reset coil when the reset push button is depressed.
- After installation all relays must be checked on correct state of the contacts and activate both coils 10 times alternately for correct operation.

Adherence to these remarks is essential for the proper and safe operation of the TRD8 relay.

## Front Panel Layout



## Front Panel Configuration

The TRD8 plug-in relay can be flush panel, rack, surface or rail mounted. The specific mounting option can be ordered as part of the relay order code.

Alternatively, the plug-in relay and mounting can be ordered separately to suit project needs.

Please check the order code page in this datasheet for further details.

## Contact Configuration

Latching contacts

8 C/O

## Mechanical and Electrical Reset Contacts

All contacts operate and mechanically latch when a voltage in the specified range is applied to the relay coil. The contacts reset when the reset button located on the front of the relay is pressed. A voltage applied to the reset coil may also be used to reset the contacts.

## Contact Position Indicator

Operate and reset position indicator displays current state of the relay. Pressing manual push button will reset the relay and changes the indicator position to green.

## Reset Inhibitor

In traditionally designed tripping relays, if the reset circuit is held energized while the relay operate input also remains energized, the relay will oscillate between the operated and reset states. The reset inhibitor feature eliminates this condition. If operate input command is present, reset command will not work. If reset command is present and operate input command is given, relay will follow the command i.e. operate will always have preference.

## Magnetic Arc Blowouts

The TRD8 relay is equipped with magnetic arc blowout magnets, which provide greatly enhanced switching capabilities for inductive DC loads. These magnets work to extinguish the electrical arcs that are initiated when the load is broken, resulting in improved performance and extended contact life.

The inclusion of the magnetic arc blowout mechanism is a key feature of the TRD8 relay, as it enables reliable operation and switching even in demanding applications involving inductive DC loads. This design element contributes to the overall robustness and durability of the TRD8 relay, making it well-suited for use in a wide range of industrial and power system environments.

## Operating Time

Make contacts	< 10 ms (at Rated Voltage)
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\*All Speeds are first touch excluding bounce time. Above data is only for electrical set operations at nominal rated operating voltage.

## High Burden Operation

The TRD8 tripping relay is designed for high burden operation, making it suitable for application in high-security circuit breaker tripping circuits, particularly where the initiating contact may be located remotely from the relay. The high burden configuration of the TRD8 relay also facilitates the satisfactory operation of external series elements.

This high burden design provides the TRD8 relay with maximum immunity to electrical disturbances and noise. The high burden relay is specifically engineered to be immune to capacitive discharges, as per the requirements of ENA TS 48-4, Issue 6, 2021.

## Operating Burden

ENA TS 48-4 Issue 6, 2021

Low burden relay	< 100 Watts
High burden relay	> 100 Watts < 150 Watts

## Operated Burden

Less than 0.2 Watts after switching. No hold current needed as relays are latching.

TRD8 relay remains in the last energized state even when power is removed completely.

## Minimum Operating Current

High burden	50 mA minimum
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## Time Delayed Cut Off

Economizing delay -Operate	< 60 ms
-Reset	< 60 ms

## Operating Voltage

Guaranteed operation between 80% and 110% of nominal rated DC operating voltage.

## Non Operate Voltage

Relay will not operate below 60% Rated Voltage.

## Reset Voltage

This relay will reset at 80% to 110% of nominal rated voltage.

## Operation of Series Elements

External relay elements are sometimes employed for additional flagging and alarm functions. These elements are typically much slower than the primary high speed tripping relay so care must be taken to ensure reliable operation of all series element before the series trip signal is cut off or economized. The incorporation of a time delay cut off in the TRD8 relay provides for such circumstances.

## Coil Thermal Rating

The operate- and reset inputs are designed to withstand continuous application of 110% of the nominal rated voltage.

## Contact Ratings

Contact material	Ag, AgSnO <sub>2</sub> (Optional)	
Isolation across open contacts	2.0 kV, 50 Hz, 1 min	
Make and carry	7 A all contacts 10 A any two contacts	
Peak inrush current (make and carry)	200 A (withstand > 10 x 200 A @ 10 ms, 1 min)	
DC break capacity (rated load)	Resistive (DC1)	7 A / 110 V 3 A / 220 V
	Inductive (L/R = 40 ms)	0.5 A / 110 V 0.15 A / 220 V
Maximum switching voltage	250 VDC / 440 VAC	
Minimum switching voltage	12 V	
Minimum switching current	10 mA	

## ATMOSPHERIC ENVIRONMENT

### Temperature

Standard	IEC 60068-2-1, IEC 60068-2-2	
Test Identification	Test specification	Auxiliary power Supply voltage
Operating Range	-10 to +55°C	Min and Max
Storage Range	-25 to +70°C	Non-energized
Test duration	16 hours at top and bottom temperatures	

### Damp Heat (Humidity)

Standard	IEC 680068-2-78	
Test Identification	Test specification	
Operating Range	40°C and 93% RH non-condensing	
Test duration	16 hours	

### IP Rating

Standard	IEC 60529	
Test Identification	Test specification	
Installed	IP4x relay on socket	

## EMC EMISSIONS

### Emission Enclosure

Standard	IEC 60255-26	
Test Identification	Frequency range	Limits, dB (µV/m)
Radiated emission <1 GHz	30 – 230 MHz	40, quasi-peak at 10 m 50, quasi-peak at 3 m
	230 - 1000 MHz	47, quasi-peak at 10 m 57, quasi-peak at 3 m
Radiated emission > 1 GHz	1 – 3 GHz	56, average at 3 m 76, peak at 3 m
	3 – 6 GHz	60, average at 3 m 80, peak at 3 m

## ELECTRICAL ENVIRONMENT

### Clearances and Creepage Distances

Standard	IEC 60255-27
Test Identification	Test specification
Pollution degree	2
Overvoltage category	III
Rated insulation voltage	300 V d.c.
Clearances and Creepage Compliance	CAD drawings assessment

### Safety-related Electrical Tests

Standard	IEC 60255-27
Test Identification	Test specification
Between Independent Circuits	5 kV 1.2/50 µs 0.5 J 3 pulses of each polarity
	2.0 kV ac rms for 1 minute
Any Terminal and Earth	5 kV 1.2/50 µs 0.5 J 3 pulses of each polarity
	2.0 kV ac rms for 1 minute
Across Normally Open Contacts	2.0 kV 50Hz, 1 min

### Electrical Environment and Flammability

Standard	IEC 60255-27, #10.6.5
Test Identification	Test specification
Single-fault condition	Assessment for Opened and Closed-circuit cases
Maximum temperature of accessible parts at ambient temperature +40°C	< 80°C
Flammability of insulating materials, components and fire enclosures	Assessment

### Reverse Polarity and Slow Ramp Test

Standard	IEC 60255-27, #10.6.6
Test Identification	Test specification
Bistable latching relay	Relay remains in last energized condition
Input voltage must be a rising edge	Minimum slew rate: 1 V/min Minimum time: 10ms



## MECHANICAL ENVIRONMENT

### Vibration - Sinusoidal

Standard	IEC 60255-21-1 Class 1	
Test Identification	Test specification	Variation
Vibration Response in each of 3 axes	0.035 mm/0.5 gn peak 1 sweep cycle 10-150 Hz	≤5%
Vibration Endurance in each of 3 axes	1.0 gn peak 20 sweep cycles 10-150 Hz	Non-energized

### Shock and Bump

Standard	IEC 60255-21-3 Class 1	
Test Identification	Test specification	Variation
Shock Response in each of 3 axes	5 gn, 11 ms, 3 pulses in each direction	≤5%
Shock Withstand in each of 3 axes	15 gn, 11 ms, 3 pulses in each direction	Non-energized
Bump Test in each of 3 axes	10 gn, 16 ms, 1000 bumps in each direction	Non-energized

### Seismic

Standard	IEC 60255-21-3 Class 1	
Test Identification	Test specification	Variation
Seismic Response Horizontal, on each axis	3.5 mm/1.0 gn, 1 sweep cycle 1-35Hz	≤5%
Seismic Response Vertical	1.5 mm/0.5 gn, 1 sweep cycle 1-35Hz	≤5%

## EMC IMMUNITY

### Electrostatic Discharge (ESD)

Standard	IEC 60255-26, #7.2.3, Acceptance criterion B	
Port	Enclosure	
Test Identification	Test specification	Variation
Air Discharge	8 kV	≤5%

### Radiated Electromagnetic Field

Standard	IEC 60255-26, #7.2.4, Acceptance criterion A	
Port	Enclosure	
Test Identification	Test specification	Variation
Frequency sweep	10 V rms, 80 to 1000 MHz 1400 to 2700 MHz	≤5%
Spot frequencies	10 V rms, 80, 160, 380, 450, 900, 1850 & 2150 MHz	≤5%

### Fast Transients (EFT)

Standard	IEC 60255-26, #7.2.5, Acceptance criterion B	
Port	Input and Output ports	
Test level	Test specification	Variation
Zone A	4 kV peak, 5/50 ns, 5 kHz	≤5%

### Slow Damped Oscillatory Wave (HFD)

Standard	IEC 60255-26, #7.2.6, Acceptance criterion B	
Port	Auxiliary power supply, Input and Output	
Test Identification	Test specification	Variation
Common Mode	1 MHz 2.5 kV peak	≤5%
Differential Mode	1 MHz 1.0 kV peak	≤5%

### Surge

Standard	IEC 60255-26, #7.2.7, Acceptance criterion B	
Port	Auxiliary power supply, Input and Output	
Test Identification	Test specification	Variation
Line-to-earth	4 kV peak	≤10%
Line-to-line	2 kV peak	≤10%

### Conducted Disturbance Induced by RF Fields

Standard	IEC 60255-26, #7.2.8, Acceptance criterion A	
Port	Auxiliary power supply, Input and Output	
Test Identification	Test specification	Variation
Frequency sweep	10 V rms, 0.15 to 80 MHz	≤5%
Spot frequencies	10 V rms, 27 & 68 MHz	≤5%

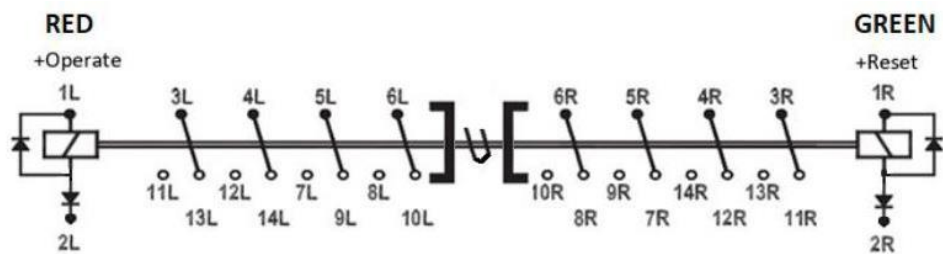
### Power Frequency Magnetic Field

Standard	IEC 60255-26, #7.2.10	
Port	Enclosure only	
Test Identification	Test specification	
Continuous ≥ 60 s	30 A/m - Acceptance criterion A	
Short time 1 s to 3 s	300 A/m - Acceptance criterion B	

### Capacitive Discharge Immunity

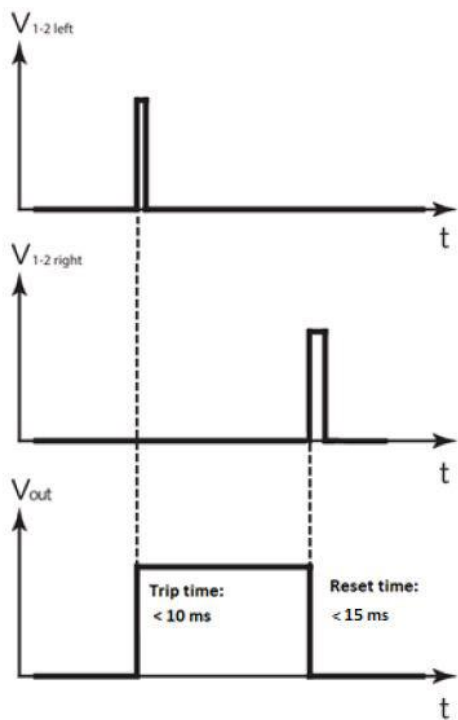
Standard	ENA TS 48-4, Issue 6, 2021	
Port	Operate port of a high burden relay	
Test Identification	Nominal voltage	Criterion
Relay immune to capacitive discharges as per ENA TS 48-4, Issue 6, 2021		

## Connectiong Diagram



Contacts shown in reset state.

## Timing Diagram



## Contact Ratings

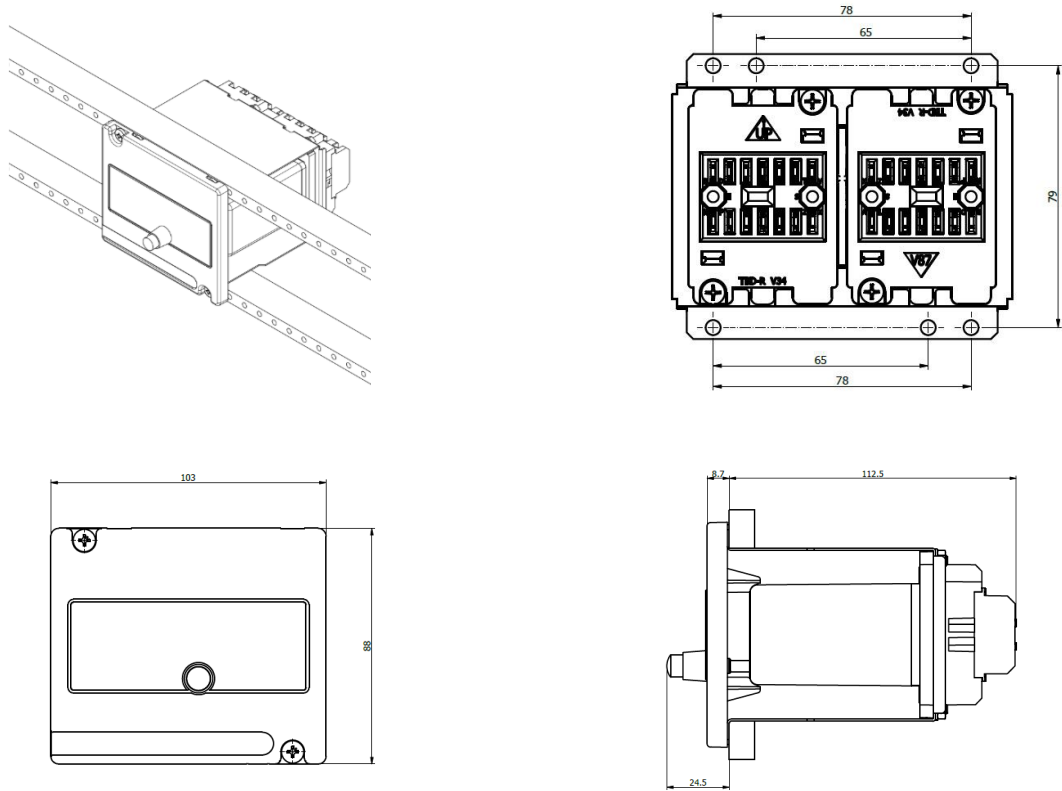
### Mechanical endurance

Unloaded contact	1 Million Cycles
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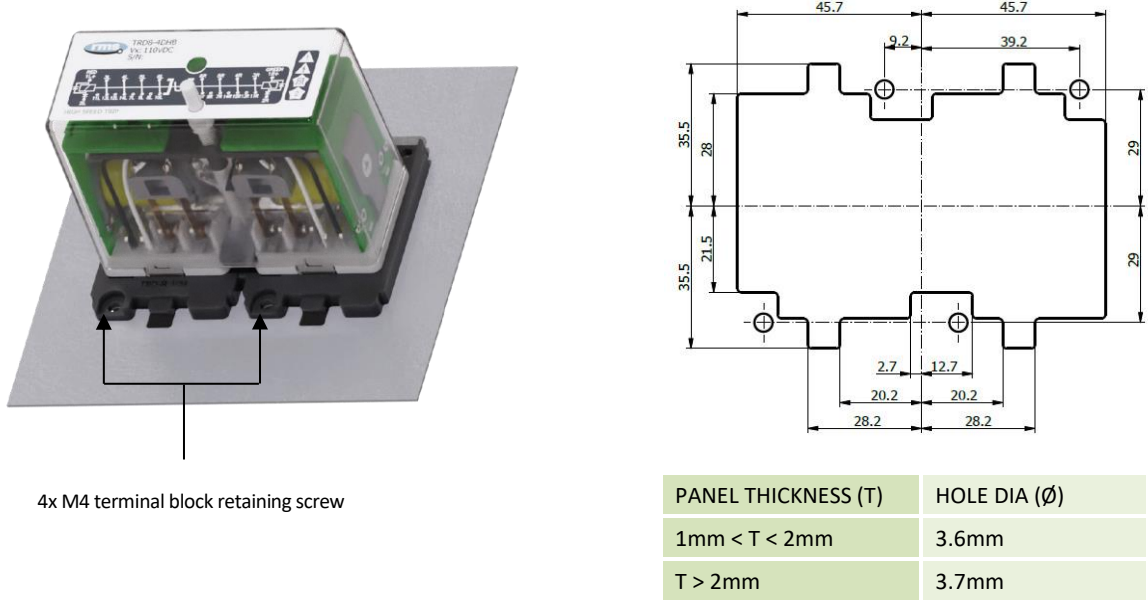
### Electrical endurance

50K operations for defined breaking capacity

## Rack Mount Rear Connect B-V87-2 with Flush Mounting Socket and Kit



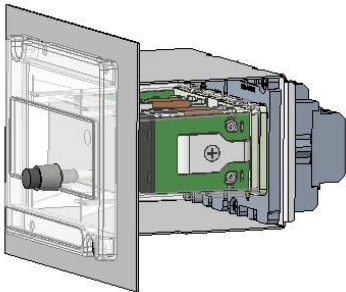
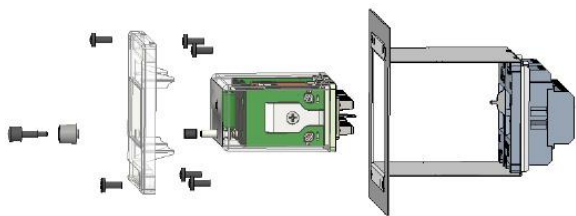
## Surface Mount Rear Connect with V87 Socket



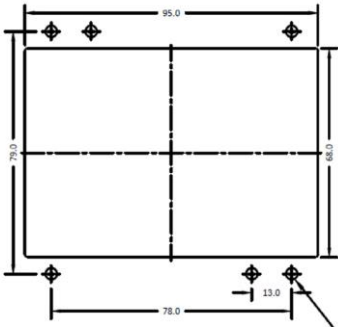
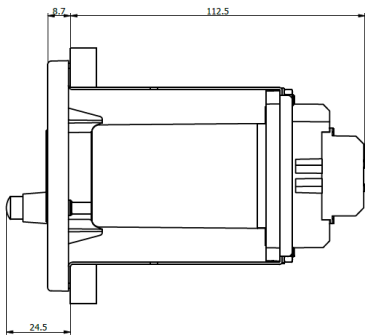


# Mounting and Dimensions

## Flush Panel Mount Rear Connect (B-V87-2 with Flush Mounting Socket and Kit)

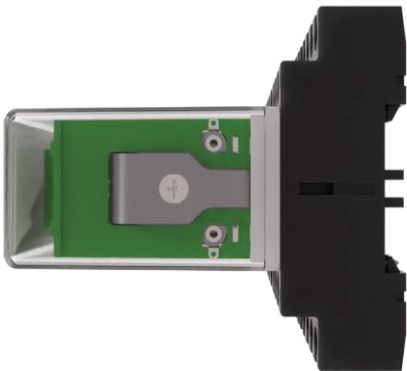


Panel cut-out to flush mount relay with rear connect socket.



PANEL THICKNESS (T)	HOLE DIA (Ø)
1mm < T < 2mm	3.6mm
T > 2mm	3.7mm

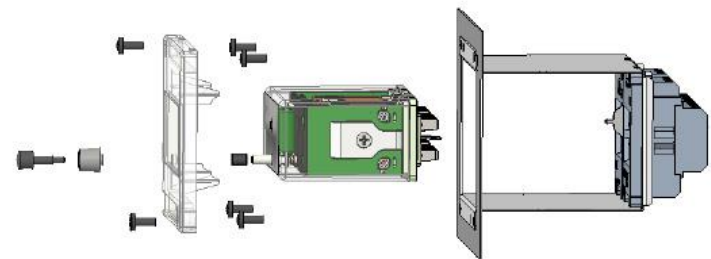
## Surface or Rail Mount Front Connect with A-V93 Socket



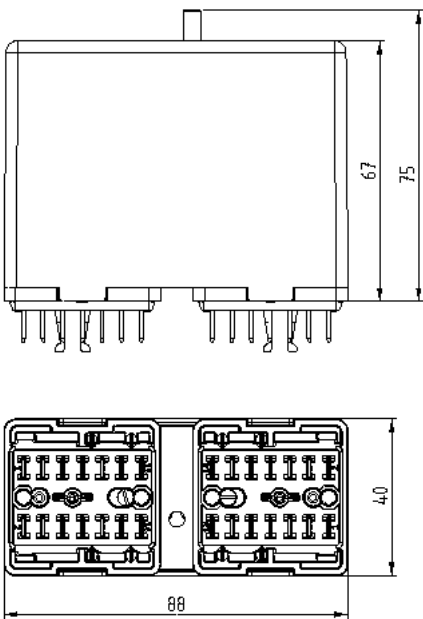
## Mounting

The V87 panel mount design includes a cover to maintain IP4X at the front of the panel.

Relay is IP4X at product level with socket.



## Dimensions (mm)



## Delta TRD8 Relay Order Code

TRD8 -					
Contact Function	4				Latching contacts with hand and electrical reset
Nominal Operate Voltage	A				24 V dc
	B				32 V dc
	C				48 V dc
	D				110 V dc
	E				125 V dc
	F				220 V dc
Mounting Configuration	-				Plug in relay only (no terminal block or mounting hardware)
	A-V93				Surface or rail mounting including V93 terminal block
	B-V87-2				TRD8-4 Panel mount – V87 term block, retention bracket and cover
Options	-				None
	-HB				High Burden

NOTE 1    The TRD8 relay will be supplied for mounting as per the order code specified.

## Delta Terminal Block Order Codes

V87 -		Socket – Surface/panel mount – 28 terminals
Flush Mount Kit	-	Not required (terminal base only without mounting kit)
	2	Required – TRD8-4 relay (67mm long – with push button)



**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



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