

PRiMA

Plug-in Rapid-wire Integrated Multi-mount Auxiliary Relays for Electrical Substations

PRiMA is a compact, voltage operated, attracted armature auxiliary relay with instantaneous and time delayed auxiliary functions. PRiMA is designed to satisfy the needs for contact multiplication in protection and control environments and was developed as a result of worldwide market studies. PRiMA relays are ruggedised and specifically designed for operation and to be part of large scale electrical fixed installations, where robustness, reliability and compliance with substation norms are paramount. Great efforts were made to make it as easy as possible to specify, order, configure and install.

Ease of installation is ensured thanks to the two-part design in which the relay plugs into a socket which may be specified with front or rear connected terminals. A snaplock feature between relay and socket eliminates the need for separate wire clips. The front-connected socket, mainly for DIN rail mounting, may alternatively be mounted on a solid panel via a single fixing screw, whilst the rear-connected design clips or screw can be fixed to suitable panel cut-outs or to a special rack mounting frame.

The two types of terminal available include a unique captive nut design, which makes for wiring time reductions of up to 75%.

The relays are available as either self-reset, electrical-reset or hand/electrical-reset types.

The range includes a mechanical operation indicator as standard and an optional integrated timer to minimise panel space requirements.

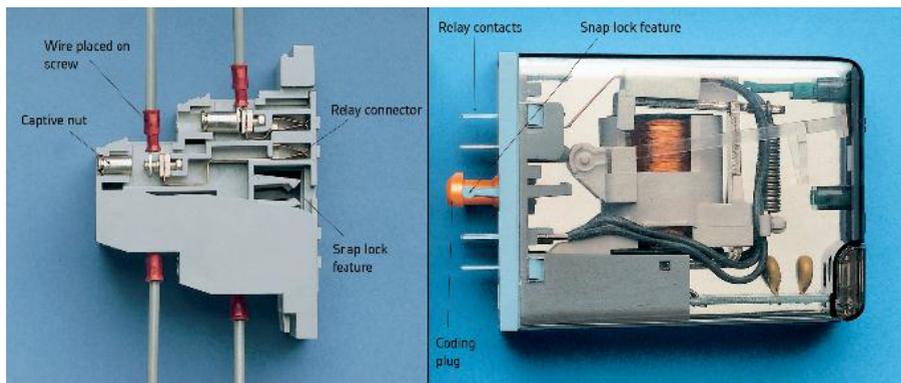
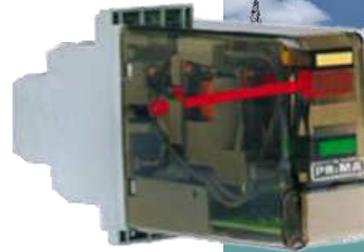


Figure 1: Relay and cross section of socket



Models Available

- PRE electrical-reset relays
- PRH hand/electrical-reset relays
- PRS self-reset relays

Key Features

- Wide operative voltage range
- Optional test feature
- Self-reset flag as standard
- Optional timer
- Choice of two types of terminal
- DIN rail, panel or rack mounting
- Manufactured from flame-retardant materials

Key Benefits

- Compact design - 12 relays per 19 inch rack
- Built-in snap lock feature automatically locks the relay to its socket
- Unique terminal design ensures rapid wiring (time savings of up to 75%)
- Simple mechanical coding for relay to socket connections

Relay

Contacts

Self-reset (PRS) models have four changeover contacts, except those with delayed drop-off timer, which have only three contacts.

Hand/electrical-reset models (RPH) and electrical-reset models (PRE) have three changeover contacts. All have silver contact tips to provide long life and reliability for a wide range of duties.

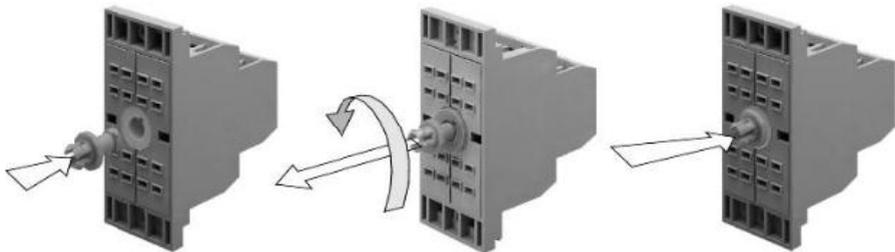
Optional magnetic blow-out contacts are recommended for heavy or highly inductive loads.

Operating Indicators

All relays are fitted with an operation indicator that follows the contact operation, with the exception of self-resetting PRS instantaneous relays which, when required, can be fitted with a hand-reset indicator.

Test/Reset Buttons

Relays other than the electrical-reset model are available with an optional test button to check contact and following indicator operation. A reset button is fitted on all models except the electrical-reset and self-reset relays with a following flag.



1. Insert relay plug (part way)
2. Rotate plug anti-clockwise
3. Pull assembly out (3 mm)
4. Rotate assembly to achieve the desired setting
5. Push assembly home
6. Insert relay into socket

Figure 3: Simple coding system for PRiMA sockets



Figure 2: Timer control adjustment

Time Delays

The DC self-reset relays can be fitted with adjustable timers for delayed operation or delayed reset. These have a wide range, from 0.1 to 270 s, to be set by the customer in four ranges with overlapping adjustment. By installing a rectifier type PA01 in series with a DC relay, time delayed relays can be used on AC supplies. The controls are behind a hinged cover.

An insulated screwdriver should be used for timer adjustments, see Figure 2. The rotary switch, on the right hand side, allows the customer to select from four timing ranges. The trim pot is then used for adjustment within the time range selected. The cover has provision for the customer to affix an identification label. No tools should be inserted into the control holes when the relay is not fitted with the timer board.

Design pedigree resulting from GE Vernova manufacturing of a million auxiliary relays

Terminal Options

- M3 screw suitable for crimped pre-insulated ring tongue connectors
- Cage clamp, suitable for crimped pre-insulated connectors (flat blade or boot-lace ferrule) or wires with stripped ends

Both M3 and cage clamp terminals will accept two standard crimped wired connectors per way. Terminals will accept wire sizes of 0.5 - 2.5 mm².

Mounting

PRiMA relays are generally suitable for mounting side by side, with no gap between adjacent sockets. This allows multiple schemes to be installed in the minimum panel space. However, PRiMA relays which are permanently energised at elevated ambient temperatures (greater than 40°C) should have a vacant space, equivalent to the width of one PRiMA, between adjacent relays. Panel designs should always consider thermal gradients and where PRiMA relays are installed near the top of non-ventilated panels, at least a 100 mm air gap must be allowed between the top of the relays and the underside of the panel roof.

Front-connected

This is designed primarily for DIN rail mounting. It can also be panel mounted using a single No 6 self-tapping screw. Two location pegs are moulded into the housing to prevent rotation.

Rear-connected

This is designed to be rack mounted using the clip-on mounting feature. Alternatively, it may be panel mounted using two No 6 self-tapping screws. A custom designed 483 mm (19 inch) rack is available into which 12 relays will fit.

Relay to Socket Coding

A simple mechanical relay to socket coding system offering 12 combinations is employed to prevent the relay being plugged into the wiring socket (Figure 3).

Contact Wetting

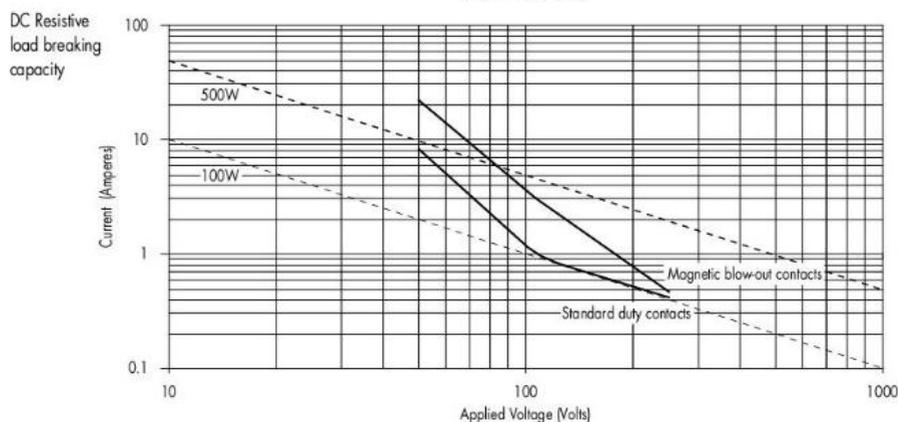
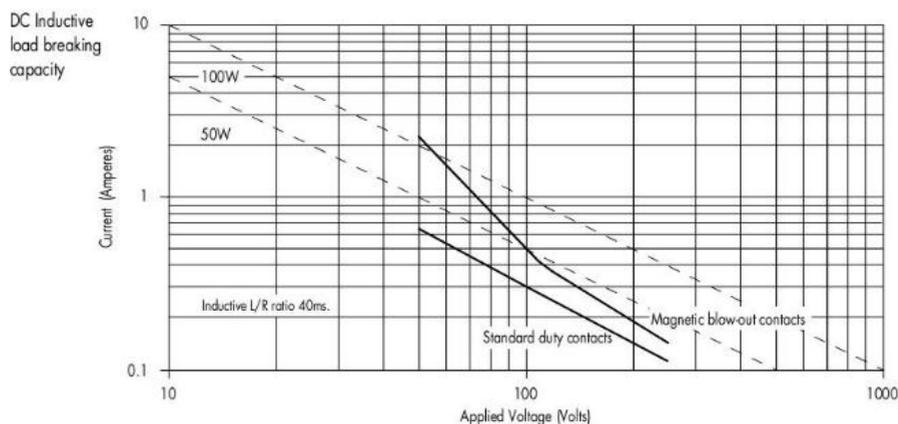
In SCADA or alarm applications, the minimum recommended “wetting” values to ensure the reliable making of contacts are 24 V and 0.5 VA. When PRiMA relays are installed such that the breaking of contacts will initiate the alarm, it is recommended that the SCADA has an alarm initiation delay of at least 2 ms. This prevents spurious alarming - when cubicle doors are closed and continuity may be broken for a fleeting instant due to the transmitted mechanical shock. In the most onerous application of relays being mounted directly on swing-frame cubicle doors, it is strongly recommended that any “break to alarm” circuits utilise 1 VA load for better contact wetting.

Rectifier Units

A PA01 rectifier unit may be used with relays with a timer or with 24/27 V rated relays to allow their use on AC supplies.

RTU Control Application

Some RTUs send out a short pulse of 5 V to measure that the input impedance of the connected control device is 500 ohms. This checks that the circuit is healthy and prevents any damage to the RTU if there is a short circuit in the wiring. If this check is correct, then the voltage is increased to 50 V to operate the control device. A special 500 ohm version of the PRiMA is available for such applications.



CAPTION_Black_InspiraSans_italic_8pts_(Optional)

Technical Data

Ratings

All models are for AC/DC operation except for the following, which are DC only:

- Self-reset relays with timers
- 24/27 V hand/electrical-reset models
- 500 ohm RTU compatible

Standard Coil Ratings

24/27 V, 30/34 V, 48/54 V, 110/125 V, 220/250 V

PA01

24/250 Vac

All models are suitable for continuous energisation except the 500 ohm RTU compatible version which has a 1 minute rating.

Operative Ranges

VOLTAGE RATING (V)	CONTINUOUS OPERATING VOLTAGE RATING (V)	MAXIMUM DC + PEAK RIPPLE VOLTAGE (V)
24/27	19-32.4	35.5
30/34	24-41	45
48/54	37.5-65	71.5
110/125	87.5-150	165
220/250	175-275	330

Frequency:

50/60 Hz

Number of Output Contacts

- Self-reset relay: 4
- Hand/electrical-reset relay: 3
- Electrical-reset relay: 3
- Self-reset timer - DPU: 4
- Self-reset timer - DDO: 3

Key: DPU = time delayed on pick-up

DDO = time delayed on drop-off

Burdens

(specified at lower rated voltage)

	OPERATE		RESET/TIMING	
	DC(W)	AC(VA)	DC(W)	AC(VA)
Self-rest	<3	<3	n/a	n/a
Hand/electrical-rest	<4	<4	<12*	<12
Self-rest-DPU	<4	n/a	<1	n/a
Self-rest-DDO	<4	n/a	<3	n/a

*cut-off approximately 30 ms

Operating Time

For a normally open contact to close at lower rated voltage:

- 30 ms typically for AC operated relays
- 25 ms typically for DC operated relays

Reset Time

For a normally closed contact to reset: <100 ms typically

Timer Range (Seconds)

The timer ranges shown here are approximate and for the lower rated voltage

SWITCH POSITION	DPU MODE	DDO MODE
1	0.10-0.15	0.10-0.20
2	0.13-1.6	0.18-2.0
3	1.0-17.0	1.2-20.0
4	16.0-270.0	16.0-270.

Note 1: Timer setting instructions on the reverse of blank identification labels are provided with each relay.

Note 2: Adjustments to the potentiometer and switch should be made using an insulated tool.

PRiMA Auxiliaries: compact, simple and cost-effective scheme designs

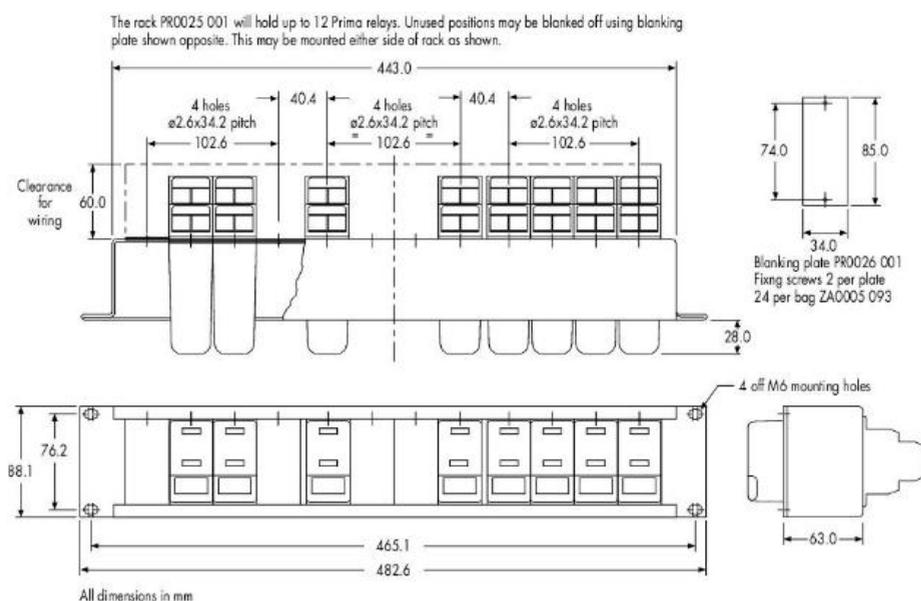
Contact Ratings

CONTACT TYPE	CURRENT	MAKE & CARRY CONTINUOUSLY	MAKE & CARRY FOR 3s	BREAK
Standard	AC	1250 VA with maxima of 10 A and 300 V	7500 VA with maxima of 30 A and 300 V	1250 VA with maxima of 10 A and 300 V, 120 W (resistive)
	DC	1250 W with maxima of 10 A and 300 V L/R=40 ms	7500 W with maxima of 30 A and 300 V	30 W* (inductive) at 100 V See fig 4 for curves
Magnetic blow-out	DC	1250 W with maxima of 10 A and 300 V L/R=40 ms	7500 W with maxima of 30 A and 300 V	350 W (resistive) 50 W* (inductive) at 100 V See fig 4 for curves

*Normally closed contacts breaking with positive potential applied to the moving contacts

CONTACTS IN USE	CONTINUOUS RATING PER CONTACT (Amps)
1	10
2	10
3	5
4	5

	Product Safety 72/23/EEC	Compliance with the European Commission Low Voltage Directive
	EN61010-1: 1993/A2: 1995 EN60950: 1992/A1: 1997	Compliance is demonstrated by reference to generic safety standards
	File no. E194075	UL recognised component for the US and Canada except for 500 ohm RTU compatible version



Durability

Loaded contact 100,000 operations
 Unloaded contact 1,000,000 operations

Figure 5: Outline and mounting details for rack and blanking plate

DEVICE TRACK RECORD - AUXILIARY RELAYS
Over 180,000 MVAJ tripping relays delivered since launch in 1983
Over 150,000 MVAJ auxiliary relays delivered since launch in 1983
Over 330,000 PRIMA auxiliaries delivered since launch in 1994
Underlines GE Vernova's commitment to the supply of quality electromechanical devices

Dimensions

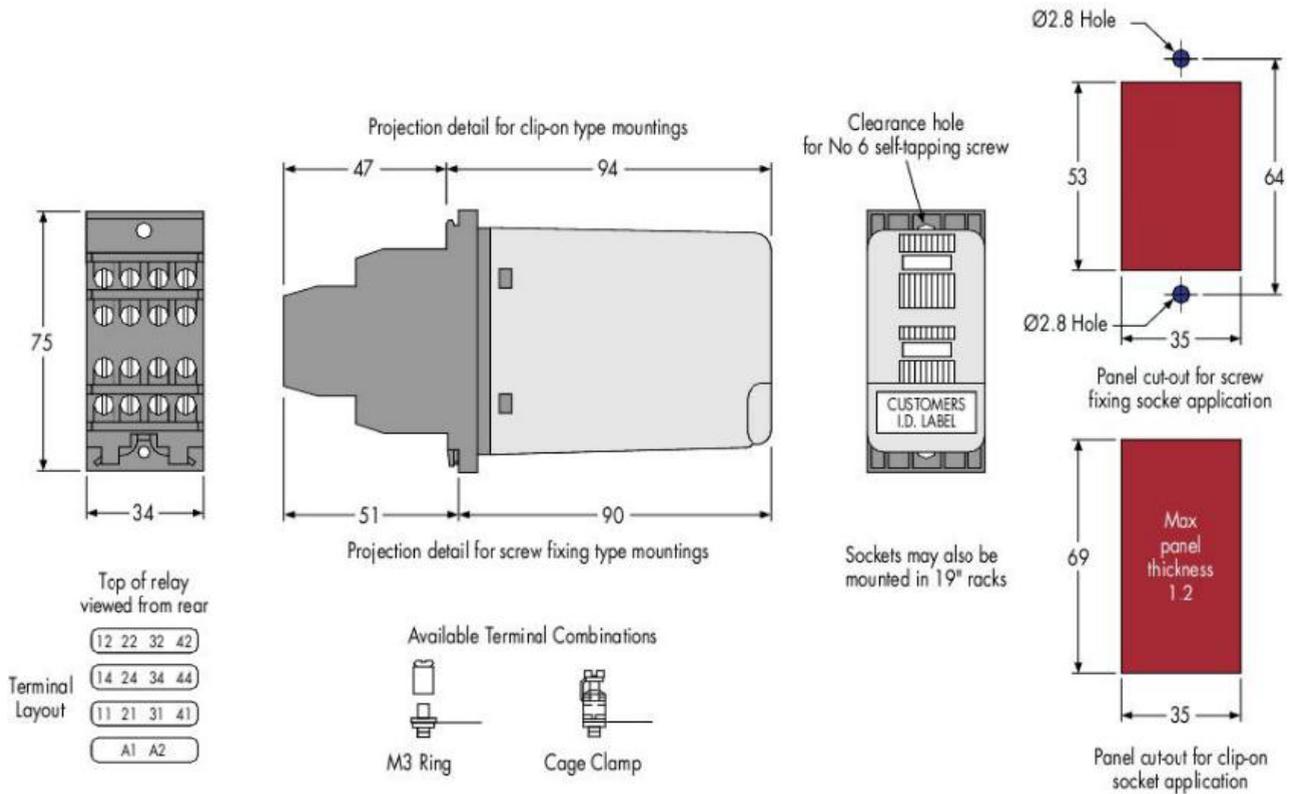


Figure 6: Case outline for rear connected relay

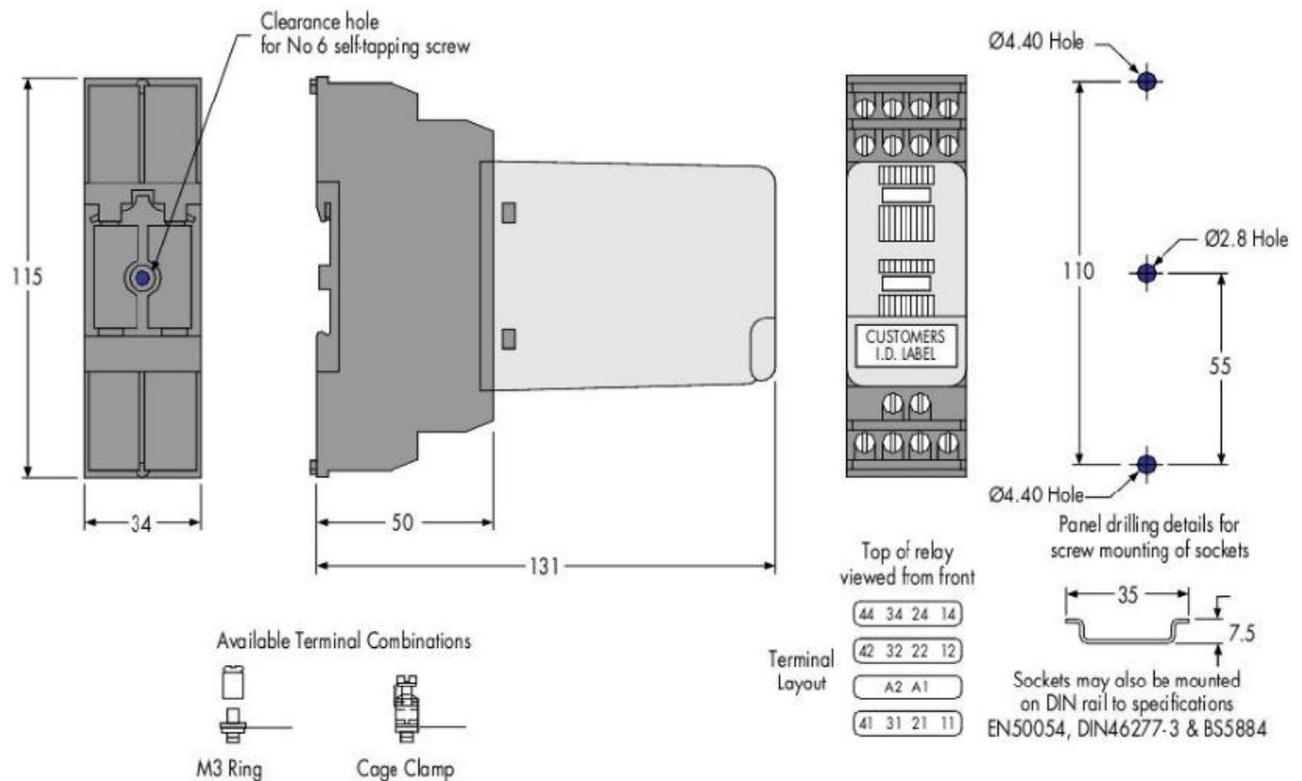


Figure 7: Case outline for front connected relay

PRiMA Cortec Code

Relay type	P R	<input type="checkbox"/>					
Contact Type (changeover)							
4 self-reset contacts (3 contacts DDO timer)	S	<input type="checkbox"/>					
3 hand/electrical-reset contacts	H	<input type="checkbox"/>					
3 electrical-reset contacts	E	<input type="checkbox"/>					
Contacts							
Standard contacts		<input type="checkbox"/>	1				
Magnetic blow-out contacts		<input type="checkbox"/>	2				
Flag							
Following flag		<input type="checkbox"/>	1				
Hand-reset flag (self-reset instantaneous only)		<input type="checkbox"/>	2				
Timer							
Delay on drop-off (self-reset dc only)		<input type="checkbox"/>	D				
Delay on pick-off (self-reset dc only)		<input type="checkbox"/>	P				
No delay (instantaneous)		<input type="checkbox"/>	N				
500 ohm RTU Scout compatible		<input type="checkbox"/>	U ¹				
Voltage							
Electrical or Self-reset ac/dc							
Hand/electrical reset dc							
24/27		<input type="checkbox"/>	01				
30/34		<input type="checkbox"/>	02				
48/54		<input type="checkbox"/>	03				
110/125		<input type="checkbox"/>	04				
220/250		<input type="checkbox"/>	05				
Electrical or Hand/electrical reset ac							
30/34		<input type="checkbox"/>	12				
48/54		<input type="checkbox"/>	13				
110/125		<input type="checkbox"/>	14				
220/250		<input type="checkbox"/>	15				
Self test							
Test button fitted		<input type="checkbox"/>	T				
No test button		<input type="checkbox"/>	B				

Socket type	P S	<input type="checkbox"/>	<input type="checkbox"/>
Socket type			
Front-connected	F	<input type="checkbox"/>	<input type="checkbox"/>
Rearconnected	R	<input type="checkbox"/>	<input type="checkbox"/>
Terminal type			
Cage clamp		<input type="checkbox"/>	1
M3 screw		<input type="checkbox"/>	3
Rack			
	P R	0	1
Rectifier			
	P A	0	1
Blanking Plate			
	P B	0	1
Fixing screws (24 screws per bag)			
	P F	0	1



Note 1: 500 ohm RTU Scout compatible only available in self-reset or hand/electrical-reset versions with standard contacts, following flag, test button fitted and 48/54 Vdc.

For more information, visit governova.com/grid-solutions



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