

# 250 Series DIN-rail and Wall Mounted Relays



### Features

- Three-phase, three or four-wire
- Adjustable set point
- Adjustable time delay
- Internal differential
- LED trip indication
- Double-pole relay contacts
- Automatic reset

### Benefits

- Current and power factor measurement
- Protects generators against 'motoring'
- Detects reverse power under fault conditions
- Customised options
- Nuisance tripping avoidance

### Applications

- Marine panels
- Switchgear
- Distribution systems
- Generator sets
- Control panels
- Process control
- Motor protection
- Transformers
- Overload protection

### Approvals

CSA File Number 052952  
(monitoring voltage 300v ac max, monitoring current 10A max)

### Reverse Power (current)

The reverse power protector provides continuous surveillance for ac generators operating in parallel or for boosting mains supplies. On site adjustment of the trip point and time delay ensures accurate protection against 'motoring' in the event of engine failure and prevents tripping from surges during synchronising.

### Operation

Reverse power protectors provide continuous surveillance of ac generators against motoring. Reverse power relays are used to detect the failure of the prime mover (engine) when active energy (Watts) flows into the generator causing rotation - the set will operate like an electric motor which can cause significant mechanical damage. This relay offers an adjustable reverse power set point between 2% and 20% of nominal power and time delay adjustment range of 0 to 20 seconds.

As soon as the reverse power level increases above the set point limit, the time delay is activated, after which a trip will occur. The time delay prevents the relay from tripping for a predetermined period to prevent nuisance tripping. The products also feature an internal differential (hysteresis) setting of 1% to reduce nuisance tripping if the measured signal is noisy or unstable. These units are powered from the measuring supply.

The protector relay estimates the power level in the system by measuring current and power factor, but does not actually measure the system voltage. When the reverse power level exceeds the set point, the time delay is started. When the time has elapsed, the relay will energise and the red LED will illuminate to indicate the trip condition. The relay will automatically re-set once the power level falls below the set point minus the differential. The LED will extinguish and the relay de-energises.

The time delay is not active when resetting. The reverse power level will trip as expected at the calibrated point for unity power factor. However, the system power factor does affect the trip point calibration. The relay becomes more sensitive at lagging power factors, as almost all systems exhibit inductance. At leading power factors, this relay is less sensitive.

### Setting Up

The '% set' potentiometer trimmer on the front label is calibrated as a percentage of the input current rating e.g. of 5A and not of the forward kW. Adjust the '% set' trimmer to the required tripping value, 7.5% to 10% is normal. Setting accuracy can be checked by reversing the current lead connections and, with forward power, measuring the trip point value on a suitable ammeter (reconnect leads on completion). Adjust the 'Delay' to the required time delay, 10 seconds is normally adequate.

### Options

250 series protector relays offer various customised options to suit individual requirements. Please consult factory.

- Adjustment ranges - different adjustment ranges are possible for the set point and time delay controls.
- Relay operation - standard models are fail safe, but the relays can be customised to de-energise on trip.

### Product Codes

Relay	Protection	ANSI no.	Cat. no.
1-phase or 3-phase 4-wire	Reverse power 2 - 20%	32	256-PAS
3-phase 3-wire	Reverse power 2 - 20%	32	256-PAT

Please specify system voltage, frequency and required options at time of ordering.

see 2nd page for selection

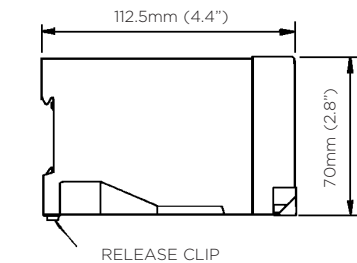
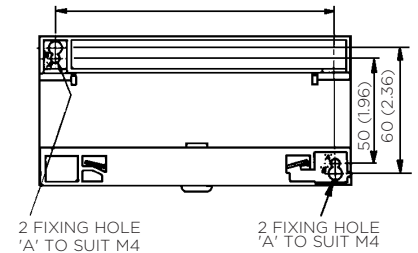
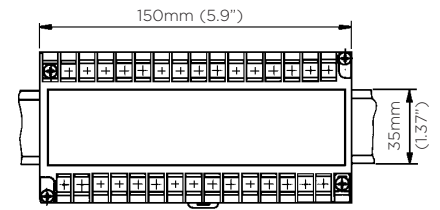
**SEE ATTACHED FOR PART NUMBERS**

## Specification - Reverse Power (Current)

Nominal voltage	100V, 110V, 120V, 220V, 230V, 240V, 277V, 380V, 400V, 415V, 440V or 480V
Nominal current	5A or 2, 3, 4, 6, 8 and 10A
System frequency	50, 60 or 400Hz
Burden	Voltage: 3VA maximum Current: 2VA maximum
Current overload	2 x rating continuously, 10 x rating for 3 seconds
Voltage overload	1.2 x rating continuously, 1.5 x rating for 10 seconds
Monitoring range capacitive	Power factor: 0.5 inductive/unity/0.2
Set point repeatability	>0.5% of full span
Differential (hysteresis)	Pre-set at 1%
Trip level adjustment	2 to 20%. Customised adjustment available
Time delay adjustable	0 to 20 seconds
Output relay	2-pole change over
Relay contact rating	AC: 240V 5A, non inductive DC: 24V 5A resistive
Relay mechanical life	0.2 million operations at rated loads
Relay reset	Automatic
Operating temperature	0°C to +60°C (0°C to +40°C for UL models)
Storage temperature	-20°C to +70°C
Temperature co-efficient	0.05% per °C
Interference immunity	Electrical stress surge withstand and non-function to ANSI/IEEE C37 90a
Enclosure style	DIN-rail with wall mounting facility
Material	Flame retardant polycarbonate/ABS
Enclosure integrity	IP50
Dimensions	150mm (5.9") wide x 70mm (2.8") high x 112mm (4.4") deep
Weight	1.0Kg approx.

## Dimensions

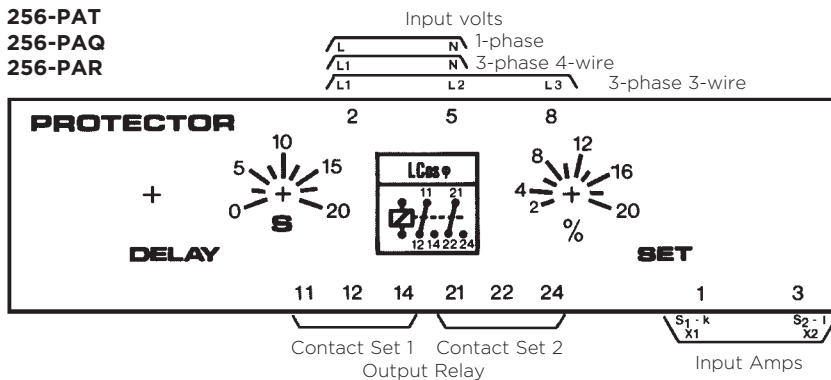
### Model 256



## SEE ATTACHED FOR PART NUMBERS

### Connections

256-PAS  
256-PAT  
256-PAQ  
256-PAR



**Note:** Only one CT connection is required, from the same phase as the voltage connection to terminal 2.



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**Reverse Power (current)**

RELAY	PROTECTION	INPUT	FREQ	PART NUMBER
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	120 V AC L-N, 5 A	50 HZ	256-PASU-LSBX-PQ-C5-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	120 V AC L-N, 5 A	60 HZ	256-PASU-LSBX-PQ-C6-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	208 V AC L-N, 5 A	60 HZ	256-PASU-LSBX-RM-C6-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	220 V AC L-N, 5 A	60 HZ	256-PASU-LSBX-R4-C6-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	230 V AC L-N, 5 A	50 HZ	256-PASU-LSBX-RQ-C5-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	230 V AC L-N, 5 A	60 HZ	256-PASU-LSBX-RQ-C6-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	240 V AC L-N, 5 A	50 HZ	256-PASU-LSBX-RR-C5-EA
1 phase or 3 phase 4 wire	Reverse power 2 – 20%	277 V AC L-N, 5 A	60 HZ	256-PASU-LSBX-R6-C6-EA
3-phase 3-wire	Reverse power 2 – 20%	120 V AC L-L, 5 A	50 HZ	256-PATU-LSBX-PQ-C5-EA
3-phase 3-wire	Reverse power 2 – 20%	220 V AC L-L, 5 A	50 HZ	256-PATU-LSBX-R4-C5-EA
3-phase 3-wire	Reverse power 2 – 20%	220 V AC L-L, 5 A	60 HZ	256-PATU-LSBX-R4-C6-EA
3-phase 3-wire	Reverse power 2 – 20%	230 V AC L-L, 5 A	50 HZ	256-PATU-LSBX-RQ-C5-EA
3-phase 3-wire	Reverse power 2 – 20%	230 V AC L-L, 5 A	60 HZ	256-PATU-LSBX-RQ-C6-EA
3-phase 3-wire	Reverse power 2 – 20%	240 V AC L-L, 5 A	60 HZ	256-PATU-LSBX-RR-C6-EA
3-phase 3-wire	Reverse power 2 – 20%	380 V AC L-L, 5 A	50 HZ	256-PATU-LSBX-RU-C5-EA
3-phase 3-wire	Reverse power 2 – 20%	400 V AC L-L, 5 A	50 HZ	256-PATU-LSBX-SC-C5-EA
3-phase 3-wire	Reverse power 2 – 20%	450 V AC L-L, 5 A	60 HZ	256-PATU-LSBX-SD-C6-EA
3-phase 3-wire	Reverse power 2 – 20%	480 V AC L-L, 5 A	60 HZ	256-PATU-LSBX-SE-C6-EA