

# 250 Series DIN-rail and Wall Mounted Relays

### Synchro-Check (parallelling)

The synchro-check relay can be used to assist in the semi-automatic parallelling of two ac power systems. The volt-free relay contacts change state when the voltage level, phase relationship and frequency are within the selected synchronising limits. Connecting two electrical systems that are not closely matched can cause expensive damage and disturbance to the electrical system. Using this relay will ensure that damage will not occur.

### Operation

As part of a manual control system, the operator will make adjustments to the generator voltage (excitation) and frequency (engine speed) using a synchroscope or lamps and will then attempt to manually close the breaker. This synchro check protector will qualify that the two systems are closely matched before permitting the breaker to close. As part of an automatic synchronising arrangement, this relay can be used as an independent backup or checking device to ensure the two systems are suitably matched before the breaker can close.

### Model 256-PLL

The relay continuously monitors the voltage, phase displacement and frequency of two supplies. A single set point adjustment permits selection of suitable matching and a red LED illuminates when the relay is energised, indicating that the two supplies are well matched and it is safe to close the breaker.

### Model 256-PLD

This version operates in the same way as model 256-PLL but includes an additional dead bus detection function. If there is a requirement for a continuous supply or emergency power, then the generator can be connected without synchronising, thus ensuring continuity of supply. The absence of bus voltage will cause the relay to energise.

### Product Codes

Relay	Protection	ANSI no.	Cat. no.
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	25	256-PLL
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage Dead bus	25	256-PLD

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

see 2nd page for selection

**SEE ATTACHED FOR PART NUMBERS**



### Features

- Single-phase or three-phase, three or four-wire
- Live and dead bus versions
- Adjustable set point
- LED trip indication
- Volt free relay contacts

### Benefits

- Monitors voltage phase displacement and frequency of 2 supplies
- Frequency matching
- Voltage matching
- Phase angle matching
- Synchronisation of Gen-Bus and Bus-Bus
- Monitors auto synchronising systems
- Assists in manual synchronisation

### Applications

- Marine panels
- Switchgear
- Distribution systems
- Generator sets
- Co-generation
- Control panels

### Approvals

CSA File Number 052952  
(up to 300V ac max)

## Specification - Synchro-Check (paralleling)

Nominal voltage	100V, 110V, 120V, 208V, 220V, 230V, 240V, 277V, 380V, 400V, 415V, 440V or 480V
System frequency	45, 50, 55, 60 or 65Hz
Burden	Bus: 2VA Generator: 4VA
Overload	-25 to +30% of the nominal voltage
Set point repeatability	>0.5% of full span
Differential (hysteresis)	Pre-set at 1%. Values 1 to 10% available on request
Trip level	10 to 30% of the nominal voltage 6° to 20° electrical adjustment
Output relay	1 pair NO (normally open), 1 pair NC (normally closed) 2 pair NO <b>OR</b> 2 pair NC available on request
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.

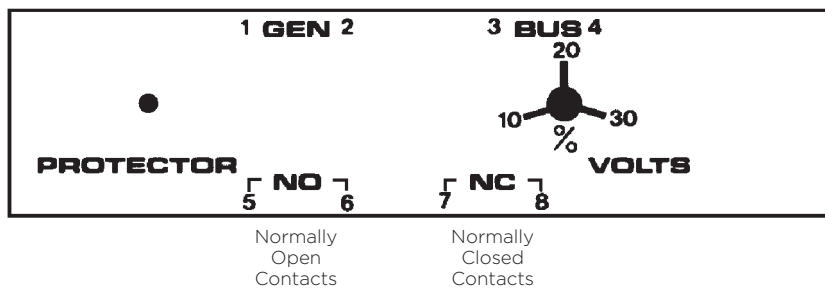
Time Delay = fixed 200 milliseconds

## Connections

### 256-PLL

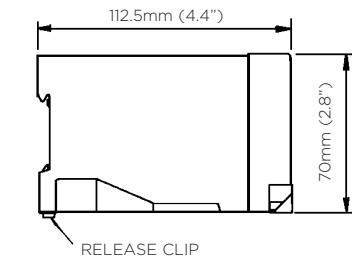
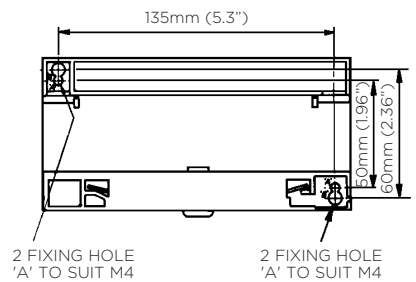
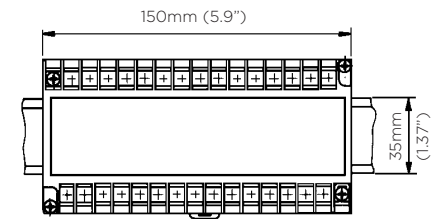
### 256-PLD

System	Generator Connections	Busbar Connections
3-phase 4-wire	1 2	3 4
3-phase 3-wire	L1 N	L1 N
1-phase 2-wire	L1 L2	L1 L2
	L1 N	L1 N



## Dimensions

### Model 256



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RELAY	PROTECTION	INPUT	FREQ	PART NUMBER
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	110 V AC	60 HZ	256-PLLU-PMBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	120 V AC	50 HZ	256-PLLU-PQBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	120 V AC	60 HZ	256-PLLU-PQBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	208 V AC	60 HZ	256-PLLU-RMBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	220 V AC	50 HZ	256-PLLU-R4BX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	220 V AC	60 HZ	256-PLLU-R4BX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	240 V AC	60 HZ	256-PLLU-RRBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	277 V AC	60 HZ	256-PLLU-R6BX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	380 V AC	50 HZ	256-PLLU-RUBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	415 V AC	50 HZ	256-PLLU-SBBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	415 V AC	60 HZ	256-PLLU-SBBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage	480 V AC	60 HZ	256-PLLU-SEBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	100 V AC	60 HZ	256-PLDU-PKBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	110 V AC	50 HZ	256-PLDU-PMBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	110 V AC	60 HZ	256-PLDU-PMBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	120 V AC	50 HZ	256-PLDU-PQBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	120 V AC	60 HZ	256-PLDU-PQBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	208 V AC	60 HZ	256-PLDU-RMBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	220 V AC	50 HZ	256-PLDU-R4BX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	220 V AC	60 HZ	256-PLDU-R4BX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	240 V AC	60 HZ	256-PLDU-RRBX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	277 V AC	60 HZ	256-PLDU-R4BX-C6
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	380 V AC	50 HZ	256-PLDU-RUBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	415 V AC	50 HZ	256-PLDU-SBBX-C5
1-phase, or 3-phase 3- or 4-wire	Phase angle and voltage and DEAD bus	480 V AC	60 HZ	256-PLDU-SEBX-C6