



# 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<br>3-phase 3- or 4-wire | Phase angle and voltage             | 25       | 256-PLL  |
| 1-phase, or<br>3-phase 3- or 4-wire | Phase angle and voltage<br>Dead bus | 25       | 256-PLD  |

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

## 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

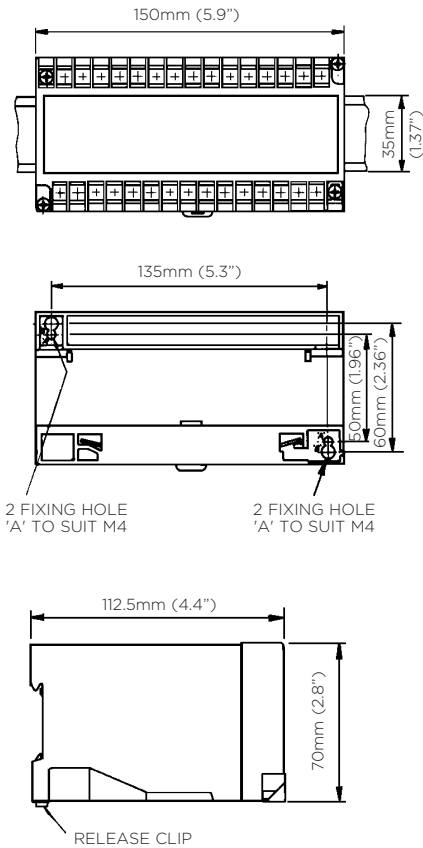
- Marine panels
- Switchgear
- Distribution systems
- Generator sets
- Co-generation
- Control panels

Specification – Synchro-Check (parallelling)

|                           |                                                                                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------|
| 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<br>6° to 20° electrical adjustment                                       |
| Output relay              | 1 pair NO (normally open),<br>1 pair NC (normally closed)<br>2 pair NO and 2 pair NC available on request |
| Relay contact rating      | AC: 240V 5A non inductive<br>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



Connections

256-PLL  
256-PLD

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

