

SP-320

Frequency Monitor

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SP	320	230V	AC	SP

SEE PAGE 32 FOR ORDERING OPTIONS

Application Examples

- Frequency supervision on AC generator sets.
- Over-frequency/under-frequency detection.
- Protection of frequency-sensitive equipment.
- Detection of over frequency on generator sets to prevent over heating.

Features

- Failsafe feature.
- Monitoring frequency of own power supply.
- High precision and repetitive accuracy.
- Independent setting of over and under-frequency tripping point.
- LED indication of type of fault and relay status.
- Programmable for over-frequency, under-frequency or frequency window detection.
- Start-up delay.
- 10A SPDT relay output.

Description of Operation

The **SP-320** monitors the frequency of an AC power supply and is programmable to respond to either over-frequency or under-frequency or both (frequency window).

Start-up Delay: When the start-up delay is enabled and power is applied to the module, the relay energises immediately, ignoring abnormal frequency conditions for approximately 10 seconds.

Over-frequency Sensing (OS): If programmed for over-frequency sensing, the relay de-energises when the frequency exceeds the over-frequency setpoint and the appropriate LED indicates the over-frequency condition. The relay will switch on again if the frequency drops below the over-frequency setpoint.

Under-frequency Sensing (US): When programmed for under-frequency sensing, the relay de-energises when the frequency drops below the under-frequency setpoint and the appropriate LED indicates the under-frequency

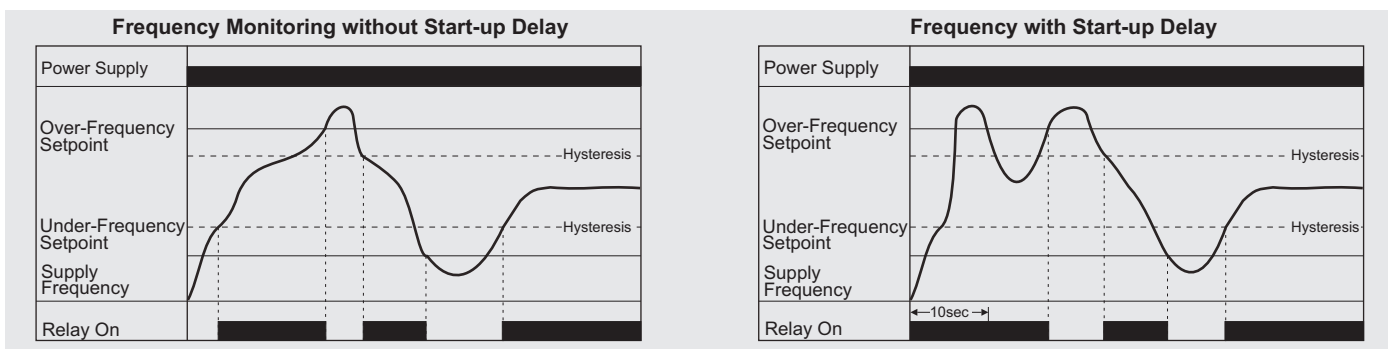
condition. The relay will switch on again if the frequency rises above the under-frequency setpoint.

Frequency Window Sensing: The relay remains energised when the frequency is maintained within the frequency setpoint. If the frequency deviates beyond these setpoints, the relay de-energises and the appropriate LED indicates “over-frequency” or “under-frequency”. The relay will energise again if the frequency recovers to within the set over-frequency/under-frequency window.

Hysteresis: Hysteresis represents the difference between the tripping point and the recovery point of the unit. The hysteresis is fixed to 0,5 Hz to prevent relay chatter when the frequency fluctuates around the set threshold.

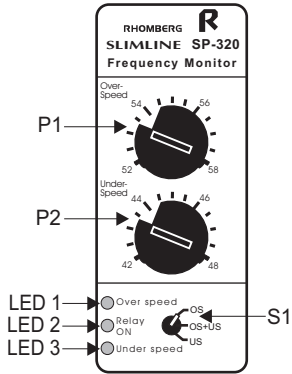
Adjustable between 42Hz to 58Hz (60Hz to 400Hz on request)

Operational Diagrams





Description of Controls



P1: The **Over-frequency** setpoint is adjusted on P1.

P2: The **Under-frequency** setpoint is adjusted on P2.

S1: With the function **Selector Switch** the unit can be programmed to:

- respond to over-frequency only (S1 set to "OS").
- respond to under-frequency only (S1 set to "US").
- respond to both over-frequency as well as under-frequency (S1 set to "OS + US").

LED 1: The red LED marked "**Over-speed**" illuminates whenever the frequency exceeds the set over-frequency threshold.

LED 2: The green LED marked "**Relay ON**" illuminates when the relay is energised, i.e. under normal frequency conditions.

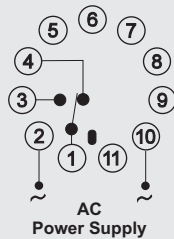
LED 3: The red LED marked "**Under-speed**" illuminates whenever the frequency drops below the set under-frequency setpoint.

Wiring and Connection

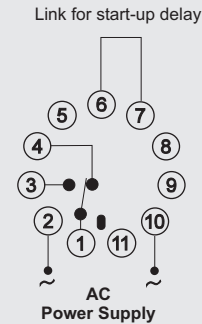
Power Supply	
Phase/ Positive	Pin 2
Neutral/ Negative	Pin 10

Relay Contacts	
Normally Open	1 + 3
Normally Closed	1 + 4

Start-up Delay
Start-up delay to be enabled by interconnecting pin 6 and 7.



APPLICATION 1
Without start-up delay



APPLICATION 2
With start-up delay

Technical Specifications

POWER SUPPLY

Supply voltage: 12, 24, 110, 230, 400, 415, 525V AC $\pm 15\%$
 Power consumption: 3VA (approx.)
 6VA for 415, 525V (approx.)
 Supply frequency: 42Hz - 58Hz.
 (60Hz and 400Hz versions available on special order)

FREQUENCY SENSING

Repetitive accuracy: 1%
 Hysteresis: 0.5 Hz fixed

RESPONSE

Start-up delay: Approximately 10 seconds standard
 (1 to 15 seconds available on special order)
 Response delay: 1 second.