# Monitoring Relays 1-Phase Frequency Control Types SF 110, SF 125



## **Product Description**

1-phase plug-in frequency control relays with fixed as well as adjustable bandwidth.

Often used in connection with generator equipment.

Ordering Key SF 110 024 50/6
Housing
Function
Output
Type
Power supply
Centre frequency
Bandwidth

# **Type Selection**

Plug	Output	Centre frequency	Bandwidth	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC
Circula	ar SPDT	50 Hz	6 Hz	SF 110 024 50/6	SF 110 115 50/6	SF 110 230 50/6
		50 Hz	10 Hz	SF 110 024 50/10	SF 110 115 50/10	SF 110 230 50/10
		50 Hz	1, 3, 5 Hz	SF 125 024 50/5	SF 125 115 50/5	SF 125 230 50/5
		50 Hz	2, 4, 6 Hz	SF 125 024 50/6	SF 125 115 50/6	SF 125 230 50/6
		60 Hz	6 Hz	SF 110 024 60/6	SF 110 115 60/6	SF 110 230 60/6
		60 Hz	10 Hz	SF 110 024 60/10	SF 110 115 60/10	SF 110 230 60/10
		60 Hz	1, 3, 5 Hz	SF 125 024 60/5	SF 125 115 60/5	SF 125 230 60/5
		60 Hz	2, 4, 6 Hz	SF 125 024 60/6	SF 125 115 60/6	SF 125 230 60/6

#### **Input Specifications**

Input Pin 2 & 10	Supply voltage measures on own supply
Centre frequency	50 or 60 Hz
Bandwidth	Fixed (SF 110): 6 or 10 Hz ± 0.5 Hz Adjust. (SF 125): 1, 3, 5 Hz ± 0.02 Hz or 2, 4, 6 Hz ± 0.02 Hz

# **Supply Specifications**

• Frequency control relay

S-housing

Centre frequency: 50 or 60 Hz
 Output: 10 A SPDT relay
 Plug-in type module

LED-indication for output ON
AC power supply, 50 or 60 Hz

Fixed bandwidth, 6 or 10 Hz (SF 110) or knob-adjustable bandwidth (SF 125)
Quartz-controlled digital circuit (SF 125)

Power supply AC types Rated operational voltage Through pins 2 & 6 024 115 230	Overvoltage cat. III (IEC 60664) (IEC 60038) 24 VAC ± 15%, 50 or 60 Hz 115 VAC ± 15%, 50 or 60 Hz 230 VAC ± 15%, 50 or 60 Hz
Voltage interruption Dielectric voltage Rated impulse withstand volt.	≤40 ms 2 kVAC (rms) (supply/elect.) 4 kV (1.2/50 μs) (line/neutral, line/line), direct connection to electronics
Rated operational power AC supply	2.5 VA



#### **Output Specifications**

Output Rated insulation voltage	SPDT relay 250 VAC (rms) (cont./elect.)	
Contact ratings (AgCdO) Resistive loads AC 1 DC 1 or Small inductive loads AC 15	μ (micro gap) 10 A/250 VAC (2500 VA) 1 A/250 VDC (250 W) 10 A/25 VDC (250 W) 2 5 A/230 VAC	
DC 13	5  A/24  VDC	
Electrical life AC 1	$\geq 2.5 \times 10^5$ operations (at max. load)	
Operating frequency	≤ 7200 operations/h	
Dielectric strength Dielectric voltage Rated impulse withstand volt.	≥ 2.0 kVAC (rms) (cont./elect.) 4 kV (1.2/50 µs) (cont./elect.) (IEC 60664)	

## **General Specifications**

Reaction time	SF 110:	Relay operates: $\tau = 0.1$ s
	SF 125:	Relay releases: $\tau = 1$ s max. 2.5 s
Indication for		
Output ON		LED, red
Environment Degree of protec Pollution degree Operating tempe Storage tempera	tion rature ture	(IEC 60947-1) IP 20 B (IEC 60529) 2 (IEC 60664) -20° to +50°C (-4° to +122°F) -50° to +85°C (-58° to +185°F)
Weight		200 g
Approvals		UL, CSA
CE Marking		Yes

#### **Mode of Operation**

#### SF 110

The relay monitors that the frequency of the power supply - 50 or 60 Hz nominally - is kept within a fixed tolerance. The tolerance has a value of  $\pm 3$  Hz ( $\pm 5$  Hz), which equals a fixed bandwidth of 6 Hz (10 Hz).

As long as the frequency of the power supply is kept within the limits, e.g. 47 to 53 Hz,  $\pm$  0.5 Hz, the relay will be in operating position, otherwise it will release.

#### SF 125

The relay monitors that the frequency of the power supply - 50 or 60 Hz nominally - is kept within certain preselected tolerances. The bandwidth, which is set on the potentiometer at the front of the relay, is 1, 3, 5 or 2, 4, 6 Hz, equaling the below tolerances:

Frequency	Tolerance
1 Hz	± 0.5 Hz
3 Hz	± 1.5 Hz
5 Hz	± 2.5 Hz
2 Hz	±1Hz
4 Hz	± 2 Hz
6 Hz	± 3 Hz
As long as	the frequency of

the power supply is kept within the limits, e.g. 49 to 51 Hz,  $\pm$  0.01 Hz, the relay will be in operating position.

The relay responds within 1 s. The delay is due to the fact that the measuring principle is a digital counting of the half cycles on a quartz-controlled base time of 1 s.

# **Operation Diagram**



## Wiring Diagram



#### **Range Setting**

**Bandwidth setting (SF 125)** The bandwidth is set by builtin potentiometer at the front of the housing.

**Hysteresis** SF 110: < 1% of centre frequency.