

Current and Voltage Controls

3 Phase-phase Max. and Min. Voltage Control

Types S 172, SY Y 165

CARLO GAVAZZI



- Monitoring relay and 3-phased measuring relay for upper/lower phase-phase voltages control
- Measures if all 3 phase-phase voltages are within set limits
- Measures on own power supply
- Operates irrespective of phase sequence
- Upper and lower limits separately adjustable
- Built-in adjustable timer function
- Output: 10 A SPDT relay
- Plug-in type module
- S-housing
- LED-indication for power supply and output ON
- Power supply is the 3-phased measuring voltage

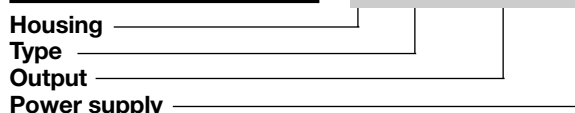
Product Description

3-phase monitoring plug-in relay for separate upper and lower voltage control. Often used where the generated electrical power is unstable

(or incorrect) in order to secure the equipment. The S 172 features built-in time delay.

Ordering Key

S 172 156 220



Type Selection

Plug	Output	Timer	Supply: 220 VAC	Supply: 380 VAC	Supply: 400 VAC	Supply: 415 VAC
Circular	SPDT	Yes	S 172 156 220	S 172 156 380	S 172 156 400	S 172 156 415
Circular	SPDT	No	SY Y 165 220	SY Y 165 380		SY Y 165 415

Input Specifications

Input Pins 5, 6 & 7	Arbitrary phase sequence		
Measuring ranges (VAC)			
Power supply (phase-phase)	3 x 220 ± 15%	3 x 380 ± 15%	3 x 400 ± 15%
Range	187-253	323-437	340-460
Upper level	231-253	399-437	420-460
Scale	105-115%	105-115%	105-115%
Lower level	187-209	323-361	340-480
Scale	85-95%	85-95%	85-95%
Power supply (phase-phase)	3 x 415 ± 15%		
Range	353-477		
Upper level	436-477		
Scale	105-115%		
Lower level	353-394		
Scale	85-95%		
	measures average value of own supply, whereas scale ranges are calibrated to rms-value		
Voltage interruption	≤ 40 ms		
Dielectric voltage	None (supply/elect.)		
Rated impulse withstand volt.	4 kV (1.2/50 μs) (line/neutral, line/line), direct connection to electronics		

Output Specifications

Output	SPDT relay
Rated insulation voltage	250 VAC (rms) (cont./elect.)
Contact ratings (AgCdO)	μ (micro gap)
Resistive loads	AC 1 DC 1 or 10 A/250 VAC (2500 VA) 1 A/250 VDC (250 W) 10 A/25 VDC (250 W)
Small inductive loads	AC 15 DC 13 2.5 A/230 VAC 5 A/24 VDC
Mechanical life	≥ 30 x 10 ⁶ operations
Electrical life	AC 1 ≥ 2.5 x 10 ⁵ operations (at max. load)
Operating frequency	≤ 7200 operations/h
Dielectric strength	
Dielectric voltage	≥ 2 kVAC (rms) (cont./elect.)
Rated impulse withstand volt.	4 kV (1.2/50 μs) (cont./elect.) (IEC 60664)



Supply Specifications

Power supply AC types	Overvoltage cat. III (IEC 60664) (IEC 60038)
Rated operational voltage through pins 5, 6 & 7	220 3 x 220 VAC ± 15%, 45 to 65 Hz
	380 3 x 380 VAC ± 15%, 45 to 65 Hz
	400 3 x 400 VAC ± 15%, 45 to 65 Hz
	415 3 x 415 VAC ± 15%, 45 to 65 Hz
Voltage interruption	≤ 40 ms
Dielectric voltage	None (supply/elect.)
Rated impulse withstand volt.	4 kV (1.2/50 μs) (line/neutral, line/line), direct connection to electronics.
Internal measuring circuit is connected to pins 5 & 7	
Rated operational power	5 VA

General Specifications

Reaction time	$\tau = 1$ s, worst case reaction time may be up to $5 \times \tau$ Adjustable delay on release built-in (0.2 - 10 s) Note: Reaction time + set time = real delay on release time
Accuracy	
OFF delay	10s, -1/+3 on max. < 0,1s on min.
Time function (only S 172)	Delay on release 0.2-10 s. adj.
Indication for	
Power supply ON	LED, green
Output ON	LED, red
Environment	(IEC 60947-1)
Degree of protection	IP 20 B (IEC 60529)
Pollution degree	(IEC 60664) 1: S 172 380/400/415 SYY 165 380/415 2: S 172 220, SYY 165 220, -20° to +50°C (-4° to +122°F) -50° to +85°C (-58° to +185°F)
Operating temperature	
Storage temperature	
Weight	200 g
Approvals	UL, CSA

Mode of Operation

Connected to 3 phases, the S 172 and SYY 165 measure sinusoidal voltages. The phase sequence is arbitrary.

The relay operates as long as all 3 phase-phase voltages are within the set upper and lower limits. The two limits can be adjusted separately. For S 172 applies that if one or more of the phase-phase voltages rises above the upper limit or drops below the

lower limit, the relay releases after the set time period whereas SYY 165 releases immediately.

The relay operates again when all 3 phase-phase voltages are within set limits. Hysteresis on operate is 2%.

Example 1

Mains monitoring

The relay measures if the 3 phase-phase voltages are

within the upper and lower limits. The limits are adjusted by the two built-in potentiometers.

Example 2

Monitoring load supply

The relay can protect loads, such as heating elements, against overvoltage and thereby against increase in current, which could otherwise destroy the heating elements.

Undervoltage to ohmic loads causes insufficient heating capacity, and this can also be monitored.

The relay cannot be used for load monitoring if the load is a motor, as the regenerated phase voltage, at e.g. fuse breakdown, is indefinable and dependent on the mechanical performance when the failure occurs (see S 171).

Time/Range Setting

Range setting

Upper potentiometer:
Adjustment of upper limit in %.
Middle potentiometer:
Adjustment of lower limit in %.

Hysteresis

≤2% of rms-value

Time setting

Bottom potentiometer:
Time setting on relative scale (not SYY 165).

Time

Adjustable delay on release:
0.2 to 10 s

Accessories

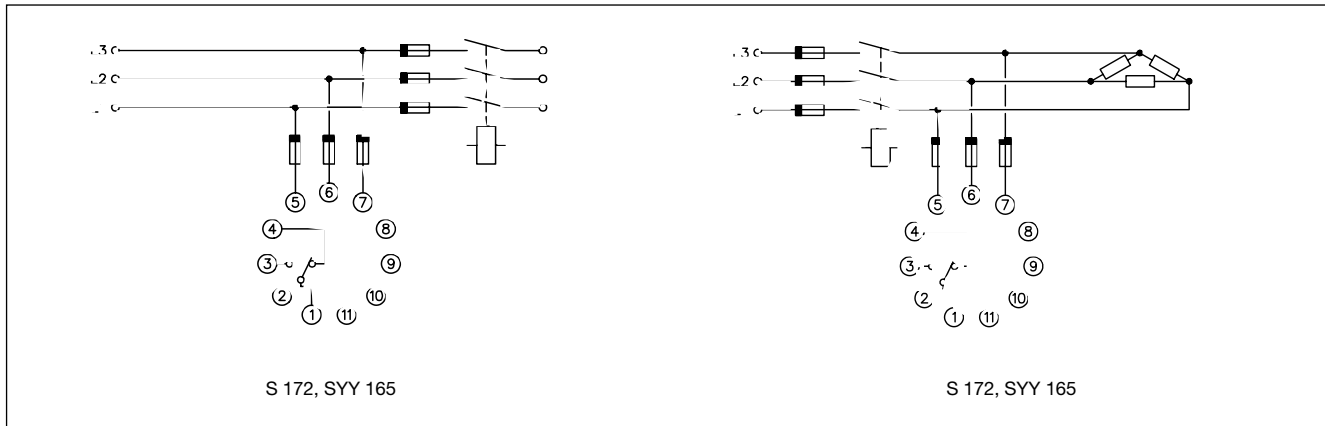
Sockets◇	S 411
Hold down spring◇	HF
Mounting rack	SM 13
Socket covers	BB 4
Front mounting bezel	FRS 2
Potentiometer lock	PL 2

For further information refer to "Accessories".

Wiring Diagrams

Example 1

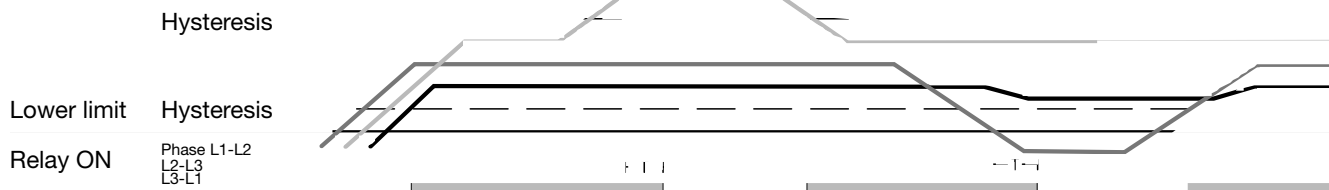
Example 2



Operation Diagrams

S 172

Upper limit



SY Y 165

Upper limit

