

# Current and Voltage Controls

## 3 Phase-neutral Max. and Min. Voltage Control

### Types S 1721, SYY 155



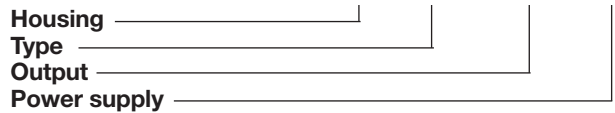
- Monitoring relay for 3-phase upper/lower phase-phase neutral voltage control
- Measures if all 3 phase-neutral voltages are within set limits
- Measures on own power supply
- Operates irrespective of phase sequence
- Upper and lower limits separately adjustable
- Built-in adjustable timer function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

### Product Description

3-phase and neutral monitoring plug-in relay for separate upper and lower voltage control. Often used to control all 3 phases and neutral where the supplied electrical power

is unstable or varies in value in order to monitor that the attached motors are performing as required. The S 1721 features built-in time delay.

### Ordering Key **S 1721 156 220**



### Type Selection

Plug	Output	Timer	Supply: 220 VAC	Supply: 380 VAC	Supply: 400 VAC	Supply: 415 VAC
Circular	SPDT	Yes	<b>S 1721 156 220</b>	<b>S 1721 156 380</b>	<b>S 1721 156 400</b>	<b>S 1721 156 415</b>
Circular	SPDT	No	<b>SYY 155 220</b>	<b>SYY 155 380</b>		<b>SYY 155 415</b>

### Input Specifications

<b>Input</b>	Arbitrary phase sequence		
Pins 5, 6 & 7	Neutral		
Pin 11			
<b>Measuring ranges (VAC)</b>			
Power supply (phase-phase)	<b>3x220 +N</b>	<b>3x380 +N</b>	<b>3x400+N</b>
	<b>± 18%</b>	<b>± 18%</b>	<b>± 18%</b>
Range (phase-neutral)	104-150	180-260	188-271
Upper level	130-150	225-260	235-271
Scale	102-118%	102-118%	102-118%
Lower level	104-124	180-215	188-225
Scale	82-98%	82-98%	82-98%
Power supply (phase-phase)	<b>3x415+N</b>		
	<b>± 18%</b>		
Range (phase-neutral)	204-276		
Upper level	252-276		
Scale	102-118%		
Lower level	204-228		
Scale	82-98%		
	measures value of own supply. Range equals rms value of a sinusoidal voltage		

### Output Specifications

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



## Supply Specifications

<b>Power supply AC types</b>	Overvoltage cat. III (IEC 60664)
Rated operational voltage	(IEC 60038)
Through pins 5, 6, 7 & 11 220 (neutral)	3 x 220 VAC ± 18%, 45 to 65 Hz
380	3 x 380 VAC ± 18%, 45 to 65 Hz
400	3 x 400 VAC ± 18%, 45 to 65 Hz
415	3 x 415 VAC ± 18%, 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 & 11	
<b>Rated operational power</b>	3.5 VA

## General Specifications

<b>Reaction time</b>	$\tau = 2$ s, worst case reaction time may be up to $5 \times \tau$ Adjustable delay on release built-in (0.2s - 10s) <b>Note:</b> Reaction time + set time = real delay on release time
<b>Accuracy</b>	
OFF delay	10s, -1/+3 s on max. < 0.1 s on min.
<b>Time function</b>	Delay on release 0.2-10 s. adj.
<b>Indication for</b>	
Power supply ON	LED, green
Output ON	LED, red
<b>Environment</b>	(IEC 60947-1)
Degree of protection	IP 20 B (IEC 60529)
Pollution degree	(IEC 60664) 1: S 1721 380/400/415 SYY 155 380/415 2: S 1721 220, SYY 155 220
Operating temperature	-20° to +50°C (-4° to +122°F)
Storage temperature	-50° to +85°C (-58° to +185°F)
<b>Weight</b>	200 g
<b>Approvals</b>	<b>S 1721:</b> UL, CSA, SEV <b>SYY 155:</b> UL, CSA, SEV (SEV only 3 x 220 VAC)

## Mode of Operation

Connected to 3 phases and neutral, the S 1721 and SYY 155 measure sinusoidal voltages. The phase sequence is arbitrary.

The relay operates as long as all 3 phase-neutral voltages are within the set upper and a lower limit. The two limits are set separately.

For S 1721 applies that if one or more of the phase-neutral voltages rises above the up-

per limit or drops below the lower limit, the relay releases after the set time period whereas SYY 155 releases immediately.

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

### Example 1

#### Mains monitoring

The relay measures if the 3 phase-neutral voltages are

within the upper and lower limits. The limits are adjusted on 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 blowing is indefinable and dependent on the mechanical performance when the failure occurs.

## Time/Range Setting

### Range setting

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

### Hysteresis

1-3% of rms-value

### Time setting

Bottom potentiometer:  
Time setting on relative scale (not SYY 155).

### Time

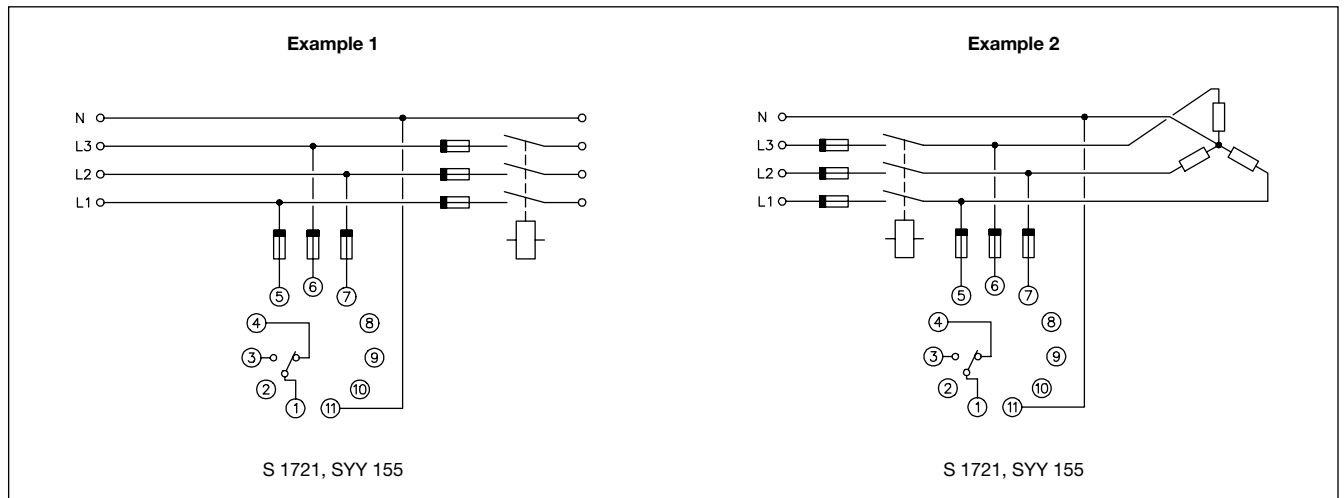
Adjustable delay on release:  
0.2 to 10 s

## 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

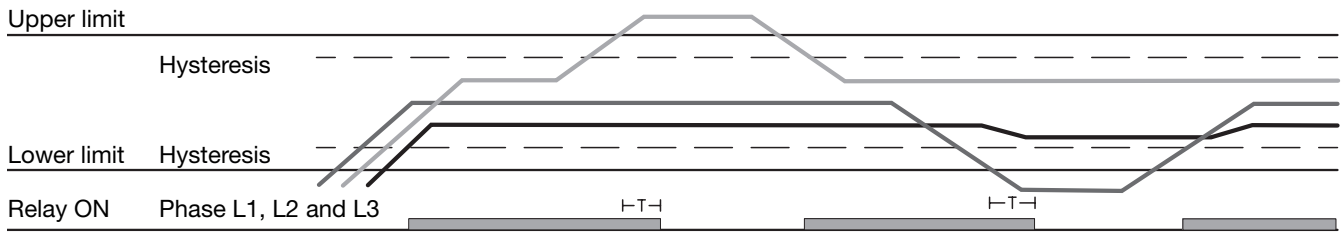
For further information refer to "Accessories".

## Wiring Diagrams



## Operation Diagrams

### S 1721



### SY Y 155

