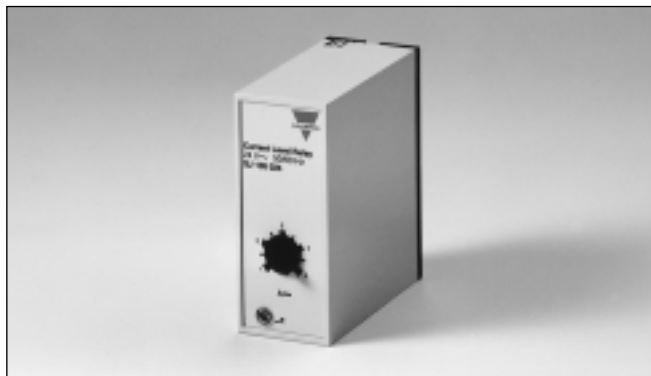


# Current and Voltage Controls

## 1-Phase AC/DC Current Control

### Types SJ 105, SJ 155

CARLO GAVAZZI



- Current control relay with absolute scale and internal shunt
- Measuring ranges:  
SJ 105: 0.2 - 5 ADC  
SJ 155: 0.2 - 5 AAC
- Knob-adjustable current level
- Latching at set level possible
- Output: 10 A SPDT relay
- Plug-in type module
- S-housing
- LED-indication for output ON
- AC or DC power supply

### Product Description

1-phase AC or DC plug-in current metering relay. Often used in applications where small loads have to be moni-

tored. Owing to the built-in latch function, the ON-position of the output relay can be maintained.

### Ordering Key

**SJ 105 024 1mA**



### Type Selection

Plug	Output	Measuring ranges	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
DC-measuring Circular SPDT		0.2 - 1 mADC	SJ 105 024 1mA	SJ 105 115 1mA	SJ 105 230 1mA	SJ 105 724 1mA
		4 - 20 mADC	SJ 105 024 20mA	SJ 105 115 20mA	SJ 105 230 20mA	SJ 105 724 20mA
		20 - 100 mADC	SJ 105 024 100mA	SJ 105 115 100mA	SJ 105 230 100mA	SJ 105 724 100mA
		100 - 500 mADC	SJ 105 024 500mA	SJ 105 115 500mA	SJ 105 230 500mA	SJ 105 724 500mA
		0.4 - 2 ADC	SJ 105 024 2A	SJ 105 115 2A	SJ 105 230 2A	SJ 105 724 2A
		1 - 5 ADC	SJ 105 024 5A	SJ 105 115 5A	SJ 105 230 5A	SJ 105 724 5A
AC-measuring Circular SPDT		0.2 - 1 mAAC	SJ 155 024 1mA	SJ 155 115 1mA	SJ 155 230 1mA	SJ 155 724 1mA
		4 - 20 mAAC	SJ 155 024 20mA	SJ 155 115 20mA	SJ 155 230 20mA	SJ 155 724 20mA
		20 - 100 mAAC	SJ 155 024 100mA	SJ 155 115 100mA	SJ 155 230 100mA	SJ 155 724 100mA
		100 - 500 mAAC	SJ 155 024 500mA	SJ 155 115 500mA	SJ 155 230 500mA	SJ 155 724 500mA
		0.4 - 2 AAC	SJ 155 024 2A	SJ 155 115 2A	SJ 155 230 2A	SJ 155 724 2A
		1 - 5 AAC	SJ 155 024 5A	SJ 155 115 5A	SJ 155 230 5A	SJ 155 724 5A

### Input Specifications

<b>Input</b> Pin 5 & 7	AC/DC current, pin 5 pos. at DC	
<b>Measuring ranges</b> Types (Max. cont.)	<b>Ranges</b>	<b>Internal resist.</b>
SJ 1.5 ... 1mA (10mA)	0.2 - 1 mA	100 Ω
SJ 1.5 ... 20mA (100mA)	4 - 20 mA	5.1 Ω
SJ 1.5 ... 100mA (500mA)	20 - 100 mA	1 Ω
SJ 1.5 ... 500mA (2A)	100 - 500 mA	0.2 Ω
SJ 1.5 ... 2A (6A)	0.4 - 2 A	0.05 Ω
SJ 1.5 ... 5A (10A)	1 - 5 A	0.02 Ω
	<b>SJ 155:</b> The ranges equal rms-value of a sinusoidal current	
<b>Max. overload current</b>		
≤ 2 A:	8 x I <sub>nom</sub> (30 sec.)	
5 A:	40 A (10 sec.) 25 A (30 sec.)	
<b>Latching</b>	Interconnect pins 8 & 9 latching at set level	

### Output Specifications

<b>Output</b> Rated insulation voltage	SPDT relay 250 VAC (rms) (cont./elect.)
<b>Contact ratings (AgCdO)</b> Resistive loads AC 1 DC 1 or Small inductive loads AC 15 DC 13	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 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 Rated impulse withstand volt.	≥ 2 kVAC (rms) (cont./elect.) 4 kV (1.2/50 μs) (cont./elect.) (IEC 60664)



## Supply Specifications

<b>Power supply AC types</b>	Overvoltage cat. III (IEC 60664) (IEC 60038)
Rated operational voltage	24 VAC ± 15%, 45 to 65 Hz
Through pins 2 & 10	115 VAC ± 15%, 45 to 65 Hz
	230 VAC ± 15%, 45 to 65 Hz
Voltage interruption	≤ 40 ms
Dielectric voltage	2 kVAC (rms) (supply/elect.)
Rated impulse withstand volt.	4 kV (1.2/50 μs) (line/neutral, line/line), no direct connection to electronics
<b>Power supply DC types</b>	Overvoltage cat. III (IEC 60664) (IEC 60038)
Rated operational voltage	24 VDC ± 15%
Through pins 2 & 10	724
Dielectric voltage	None (supply/elect.)
Rated impulse withstand volt.	800 V (1.2/50 μs)
<b>Rated operational power</b>	
AC supply	2.5 VA
DC supply	1.5 W

## General Specifications

<b>Reaction time</b>	Relay operates: $\tau = 22$ ms Relay releases: $\tau = 2.2$ s, worst case reaction time may be up to $5 \times \tau$
<b>Accuracy</b>	
Input	0 to +10% on max. Min. actual level ≤ min. set level
<b>Indication for Output ON</b>	LED, yellow
<b>Environment</b>	(IEC 60947-1) IP 20 B (IEC 60529) Pollution degree 2 (IEC 60664) Operating temperature -20° to +50°C (-4° to +122°F) Storage temperature -50° to +85°C (-58° to +185°F)
<b>Weight</b>	AC supply 200 g DC supply 125 g
<b>Approvals</b>	UL, CSA

## Mode of Operation

### SJ 105

#### Example 1

##### DC current metering

The relay operates when the measured current value exceeds set point. The relay releases when the current drops 10% below set point (see hysteresis) or when supply voltage is interrupted.

#### Example 2

##### DC current metering

##### - latching

The SJ 105 operates when the measured current value exceeds set point. The relay releases when removing latch between pins 8 and 9 provided that the current has drop-

ped at least 10% below set point (see hysteresis) or by interrupting supply voltage.

### SJ 155

The relay measures the average of a sinusoidal current. The set point, calibrated in rms-value, is set on the built-in potentiometer.

#### Example 1

##### AC current metering

The relay operates when the measured current value exceeds set point. The relay releases when the current drops 10% below set point (see hysteresis) or when supply voltage is interrupted.

### Example 2

#### AC current metering

##### - latching

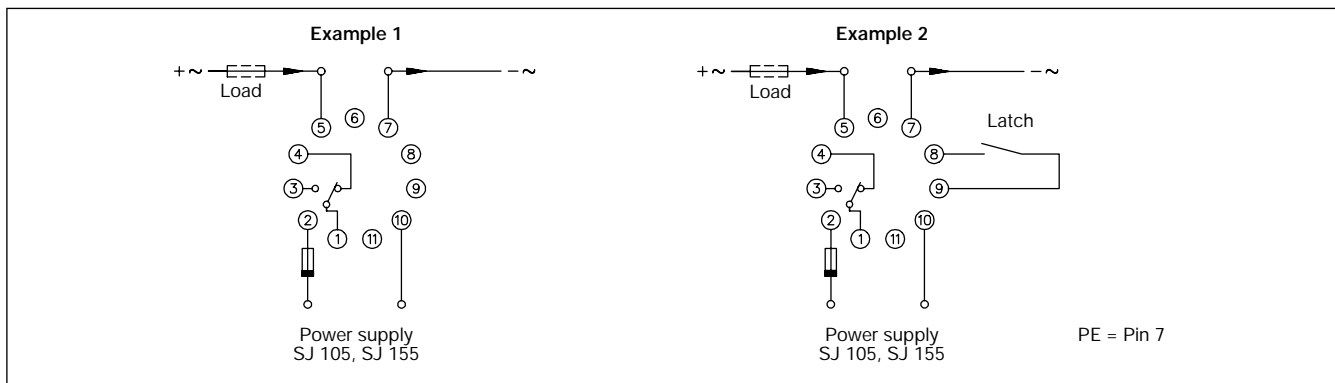
The SJ 155 operates when the measured current value exceeds set point. The relay releases when removing latch between pins 8 and 9 provided that the current has dropped at least 10% below set point (see hysteresis) or by interrupting supply voltage.

current is to pass through this internal connection.

#### Note:

At DC supply: Do not connect pin 7 with pin 10 as these pins are internally connected by a resistor of 3.9 kΩ. No

## Wiring Diagrams





## Range Setting

### Range setting

Relay set point adjustable on absolute scale.

### Hysteresis

Approx. 10%.  
The hysteresis may be exten-

ded to 75% by connecting a resistor between pins 8 and 9. Resistor limits are 470 kΩ and 3 kΩ (0.25 W). The hysteresis is increased by decreasing resistance.

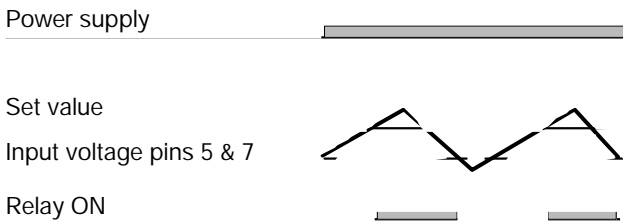
## Accessories

Sockets∅	S 411
Hold down spring∅	HF
Mounting rack	SM 13
Socket covers	BB 4
Front mounting bezel	FRS 2
Potentiometer lock	PL 1

For further information refer to "Accessories".

## Operation Diagrams

### Example 1



### Example 2

