

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

Housing _____
Function _____
Output _____
Type _____
Power supply _____
Measuring range _____

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

Input		AC/DC current, pin 5 pos. at DC	
Pin 5 & 7			
Measuring ranges			
Types	(Max. cont.)	Ranges resist.	Internal
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
		SJ 155: The ranges equal rms-value of a sinusoidal current	
Max. overload current			
≤ 2 A:		8 x I _{nom} (30 sec.)	
5 A:		40 A (10 sec.)	
		25 A (30 sec.)	
Latching		Interconnect pins 8 & 9 latching at set level	

Output Specifications

Output		SPDT relay
Rated insulation voltage		250 VAC (rms) (cont./elect.)
Contact ratings (AgCdO)		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
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)
Rated operational voltage		(IEC 60038)
Through pins 2 & 10	024	24 VAC ± 15%, 45 to 65 Hz
	115	115 VAC ± 15%, 45 to 65 Hz
	230	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/neu- tral, line/line), no direct con- nection to electronics
Power supply DC types		Overvoltage cat. III (IEC 60664)
Rated operational voltage		(IEC 60038)
Through pins 2 & 10	724	24 VDC ± 15%
Dielectric voltage		None (supply/elect.)
Rated impulse withstand volt.		800 V (1.2/50 µs)
Rated operational power		
AC supply	2.5 VA	
DC supply	1.5 W	

General Specifications

Reaction time		Relay operates: $\tau = 22\text{ ms}$ Relay releases: $\tau = 2.2\text{ s}$, worst case reaction time may be up to $5 \times \tau$
Accuracy		
Input		0 to +10% on max. Min. actual level ≤ min. set level
Indication for		
Output ON		LED, yellow
Environment		(IEC 60947-1)
Degree of protection		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)
Weight	AC supply	200 g
	DC supply	125 g
Approvals		UL, CSA, SEV

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

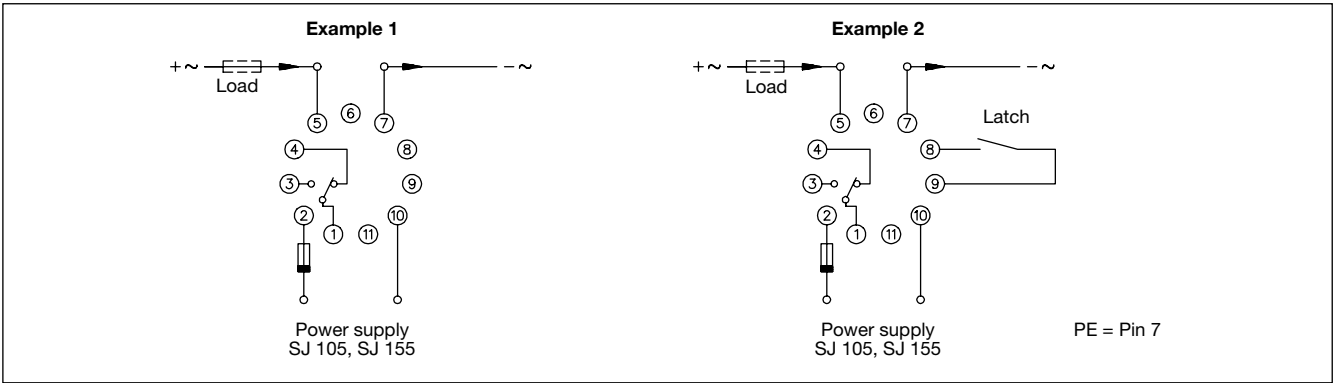
The SJ 155 operates when the measured current value exceeds set point. The relay releases when removing latch between pins 8 and 9 provided that the current has dropped at least 10% below set point (see hysteresis) or by interrupting supply voltage.

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

current is to pass through this internal connection.

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.

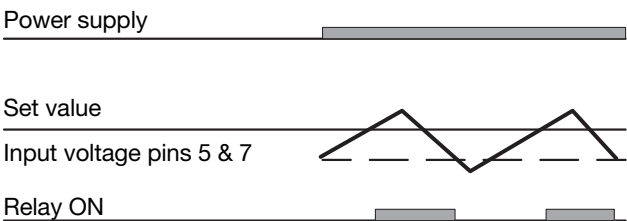
Accessories

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

