

Current and Voltage Controls

1-Phase AC/DC Voltage - AC Current Control

Types SM 115, SM 125

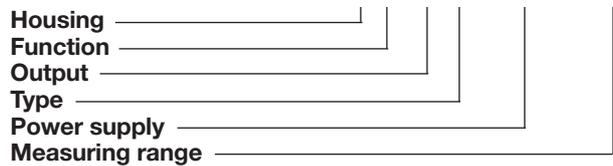


- AC/DC voltage/current control relay
- Current measuring range: 0.5 - 500 AAC through current metering transformer
- Voltage measuring range: 0.4 - 500 VAC/DC, divided into 5 ranges
- Knob-adjustable set point
- Latching at set level possible
- Output: 10 A SPDT relay
- Plug-in type module
- S-housing
- LED-indication for power supply and output ON
- AC or DC power supply

Product Description

An AC/DC voltage and current metering plug-in relay. Often used where heating elements are wanted to be controlled for break or short-circuit to avoid damage to the equipment.

Ordering Key **SM 125 024 200**



Type Selection

Plug	Output	Measuring ranges	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC	Supply: 24 VDC
Current measuring						
Circ.	SPDT	0.5 - 500 AAC	SM 115 024	SM 115 115	SM 115 230	SM 115 724
Voltage measuring						
Circ.	SPDT	0.4 - 4 VAC/DC	SM 125 024 4	SM 125 115 4	SM 125 230 4	SM 125 724 4
		2 - 20 VAC/DC	SM 125 024 20	SM 125 115 20	SM 125 230 20	SM 125 724 20
		5 - 50 VAC/DC	SM 125 024 50	SM 125 115 50	SM 125 230 50	SM 125 724 50
		20 - 200 VAC/DC	SM 125 024 200	SM 125 115 200	SM 125 230 200	SM 125 724 200
		50 - 500 VAC/DC	SM 125 024 500	SM 125 115 500	SM 125 230 500	SM 125 724 500

Input Specifications

Input			Types	Ranges VAC/DC	Internal resist.	Max. volt. VAC/DC
Pins 5 & 7	voltage or current through current transformer					
Measuring ranges						
Types	Ranges AAC RMS	Max. current rms				
MI 5	0.5 - 5	20 AAC	SM 115 ...	0.4- 4*	8 kΩ	20
MI 20	2 - 20	50 AAC	SM 125 ... 4	0.4- 4	8 kΩ	50
MI 100	10 - 100	250 AAC	SM 125 ... 20	2 - 20	50 kΩ	100
MI 500	50 - 500	700 AAC	SM 125 ... 50	5 - 50	100 kΩ	200
			SM 125 ... 200	20 -200	450 kΩ	350
			SM 125 ... 500	50 -500	1 MΩ	500

SM 125: at AC voltages peak value is measured

* only VAC

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)
	or	10 A/25 VDC (250 W)
Small inductive loads	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)

General Specifications

Hysteresis		10% ± 6%
Reaction time		Relay operates: τ = typ. 20 ms Relay releases: τ = typ. 300 ms, worst case reaction time may be up to 5 x τ
Accuracy		
Input		+ 5 to 15% on max. (AC @50HZ)
Temperature drift		≤ 0.2%/°C (≤ 0.11%/°F)
Indication for		
Power supply ON		LED, green (SM 115 only)
Output ON		LED, red
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

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/neutral, line/line), no direct connec- tion 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

Mode of Operation

SM 115

Example 1

AC current metering

The relay operates when the current through the current transformer reaches set point. The relay releases when the voltage drops below set point (see hysteresis) or by interrupting power supply.

Example 2

AC current metering - latching

The relay operates when the current through the current transformer reaches set point and latches in operating position. The relay releases by removing the latch i.e. by opening the contact between pins 8 and 9, provided that the current has dropped below set point (see hysteresis), or by interrupting power supply.

SM 125

Example 3

AC/DC voltage metering

The relay operates when the voltage (peak voltage at AC) reaches set point. The relay releases when the voltage drops below set point (see hysteresis), or by interrupting power supply.

Example 4

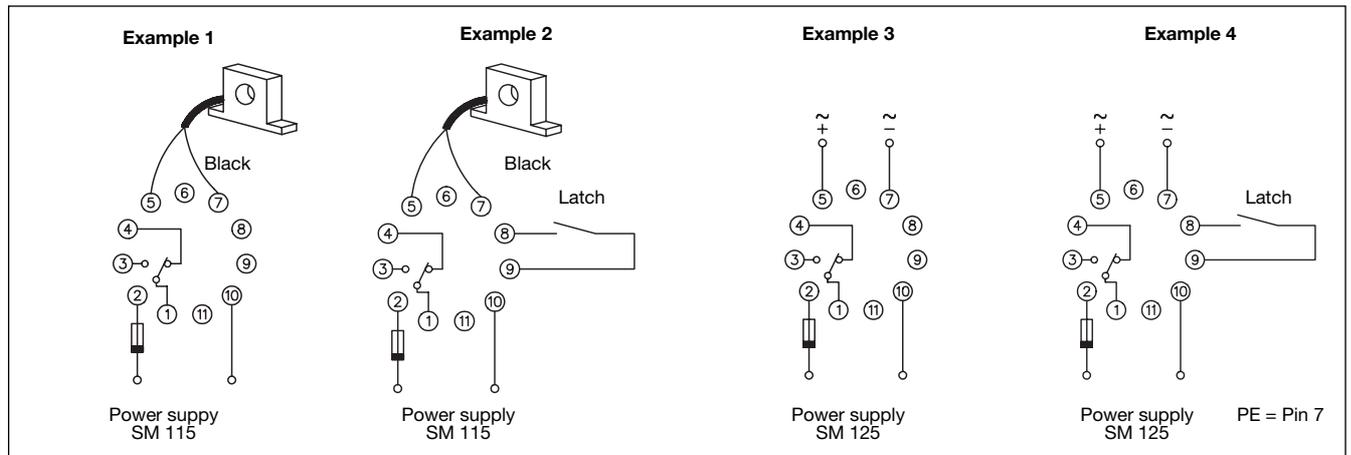
AC/DC voltage metering - latching

The relay operates when the voltage (peak voltage at AC) reaches set point and latches in operating position. The relay releases by removing the latch i.e. by opening the contact between pins 8 and 9, provided that the voltage in all 3 phases has dropped below set point (see hysteresis), or by interrupting power supply.

Note:

At DC supply, do not connect pins 7 and 10 as these pins are internally connected via a resistor of 3.9 kΩ. No current must pass through this internal connection.

Wiring Diagrams



Range Setting

Range setting

Adjustment of set point on relative scale.

Hysteresis

10% ± 6%.

The hysteresis may be extended to 75% by connecting a resistor between pins 8 and 9. Resistor limits are 1 MΩ and 15 kΩ. The hysteresis is increased by decreasing resistance.

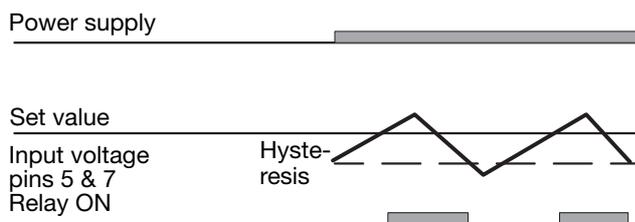
Accessories

Sockets◊	S 411
Hold down spring◊	HF
Mounting rack	SM 13
Socket covers	BB 4
Front mounting bezel	FRS 2
Current metering transformers	MI 5, MI 20, MI 100, MI 500
Potentiometer lock	PL 1

For further information refer to "Accessories".

Operation Diagrams

Example 1 and 3



Example 2 and 4

