

# Thermocouple Input Field Configurable Limit Alarm



SMLA-TC



- ✓ Provides Relay Contact Closures at a Preset Temperature Input Level
- ✓ Field Configurable Input Ranges for Type J, K, T, E, R, and S Thermocouples
- ✓ Dynamic Deadband Prevents False Trips
- ✓ Burnout Detection
- ✓ Setpoints Programmable HI or LO
- ✓ Selectable Failsafe/Latching Operation
- ✓ Selectable 120/240 Vac Input Power

Model SMLA-TC thermocouple input field configurable limit alarm offers wide ranging inputs and flexible setpoint capability. It accepts six popular thermocouple types with inputs ranging from -270°C (454°F) to 1760°C (3200°F). The SMLA-TC provides two independent setpoint alarms (2 SPDT, 5A) and includes 0.25% to 50% adjustable deadbands and selectable 120/240 Vac power.

Model SMLA-TC is equipped with a dual function diagnostic LED. The green center LED indicates line power and input signal status. Active line power is indicated by an illuminated LED. If the center LED is off, check line power and the wiring connection. If the input signal is above 100% full scale, the LED will flash at approximately 8 Hz. Below 0%, the flash rate is approximately 4 Hz.

Setpoints are top accessed multi-turn potentiometers. The field configurable SMLA-TC limit alarm setpoints can be configured for HI, LO, latching or fail-safe trip operation. Non-latching HI and LO setpoints have respective HI and LO deadbands. In a tripped condition, the setpoint is exceeded and the appropriate red LED is lit. The trip will reset only when the process falls below the HI deadband or rises above the LO deadband. To reset a latched setpoint the signal must be in the safe region and the line power must be turned off for at least 5 seconds. For proper deadband operation, the HI setpoint must always be set above the LO setpoint.

In failsafe operation, the relay is energized when the process is below a HI setpoint or above a LO setpoint (opposite for non-failsafe). In the failsafe mode, a power failure results in an alarm condition.

The input must remain beyond the setpoint for 100 milliseconds, uninterrupted, to qualify as a valid trip condition. Likewise, the input must fall outside the deadband and remain there for 100 milliseconds to return the alarm to an untripped condition. This effectively results in a "dynamic deadband" - based on time - in addition to the normal deadband.

**The factory default configuration for the SMLA-TC is as follows:**

**Input:** Type J, 0 to 360°C (32 to 680°F)

**Burn Out:** Positive

**Output:** Dual, SPDT



SMLA-TC shown smaller than actual size.

**Trip:** A: HI, B: LO

**Latching:** No

**Failsafe:** No

**Deadband:** A/B: 0.25%

**Power:** 120 Vac

When switching inductive loads, maximum relay life and transient EMI suppression is achieved using external protection. Place all protection devices directly across the load and minimize lead lengths. For AC inductive loads, place a properly rated MOV across the load in parallel with a series RC snubber. Use a 0.01 to 0.1 mF pulse film capacitor (foil polypropylene recommended) of sufficient voltage, and a 47 Ω, ½ W carbon resistor. For DC inductive loads, place a diode across the load (PRV > DC supply, 1N4006 recommended) with (+) to cathode and (-) to anode (the RC snubber is an optional enhancement).

## Specifications

### INPUT

**Ranges:** Field configurable, see table

**Impedance:** >1 MΩ

**Input Bias Current (Burnout Detect):** <1.5 μA

**Overvoltage:** ±10 V differential

**Common Mode (Input to Ground):** 600 Vac or 1000 Vdc max

### LED Indications:

**Input Range (Green);**

>100% Input: 8 Hz flash

<0% Input: 4 Hz flash

**Setpoint (Red):** Tripped; Solid red (one LED for each setpoint)

**Limit Differential (Deadband):** 0.25% to 50% of span

### Response Time:

**Dynamic Deadband:** Relay status will change when proper setpoint/process condition exists uninterrupted for 100 msec

**Normal Mode (Analog Filtering):** <250 msec (10 to 90%)

### Setpoint:

**Effectivity:** Setpoints are adjustable over 100% of input span

**Repeatability (Constant Temp):** ±0.2% for inputs > 0°C;  
±0.3% for inputs < 0°C



## Thermocouple Types and Temperature Ranges (Field-Selectable)

Type	Temperature Range	Type	Temperature Range
<b>J</b>	0 to 190°C (32 to 374°F)	<b>E</b>	0 to 150°C (32 to 302°F)
	0 to 360°C (32 to 680°F)		0 to 290°C (32 to 554°F)
	0 to 760°C (32 to 1400°F)		0 to 660°C (32 to 1220°F)
	-210 to 190°C (-346 to 374°F)		0 to 1000°C (32 to 1832°F)
	-210 to 360°C (-346 to 680°F)		-270 to 150°C (-454 to 302°F)
<b>K</b>	0 to 250°C (32 to 482°F)	<b>R</b>	-270 to 290°C (-454 to 554°F)
	0 to 480°C (32 to 896°F)		0 to 970°C (32 to 1778°F)
	0 to 1230°C (32 to 2246°F)		0 to 1690°C (32 to 3074°F)
	0 to 1372°C (32 to 2501°F)	0 to 1760°C (32 to 3200°F)	
	-270 to 250°C (-454 to 482°F)	<b>S</b>	0 to 1050°C (32 to 1922°F)
-270 to 480°C (-454 to 896°F)	0 to 1760°C (32 to 3200°F)		
<b>T</b>	0 to 210°C (32 to 410°F)	<b>Power:</b> 120/240 Vac $\pm$ 10%, 50 to 60 Hz selectable, 2 W typical, 5 W max	
	0 to 390°C (32 to 734°F)	<b>Relay Contacts:</b> 1 SPDT (1 Form C) per setpoint	
	-270 to 210°C (-454 to 410°F)	<b>Current Rating (Resistive):</b>	
	-270 to 390°C (-454 to 734°F)	<b>120 Vac:</b> 5A <b>240 Vac:</b> 2A <b>28 Vdc:</b> 5A	

### Stability:

**Line Voltage:**  $\pm$ 0.01%/ % max

**Temperature:**  $\pm$ 0.05% of full scale/°C max

**Common Mode Rejection (DC to 60 Hz):** 120 dB

**Isolation:** 1000 Vdc between contacts, input and power

**ESD Susceptibility:** Meets IEC 801-2, Level 2 (4 KV)

### Humidity:

**Operating:** 15 to 95% RH @ 45°C (113°F)

**Soak:** 90% RH for 24 hours @ 65°C (149°F)

### Temperature Range:

**Operating:** 0 to 60°C (32 to 140°F)

**Storage:** -15 to 70°C (5 to 158°F)

**Material:** Silver-Cadmium Oxide

**Electrical Life:** 10<sup>5</sup> operations at rated load (external relay contact protection is required for use with inductive loads)

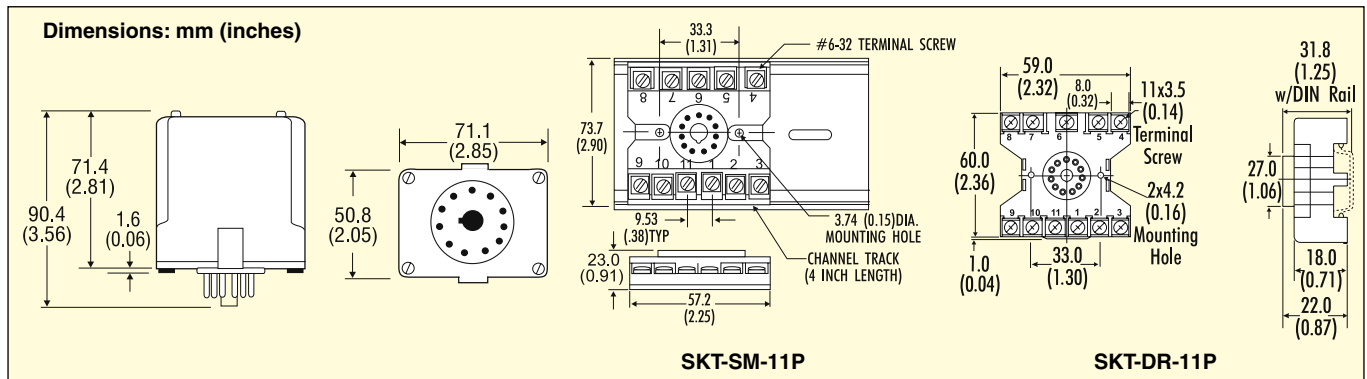
**Mechanical Life:** 10<sup>7</sup> operations

**Latch Reset Time:** 5 seconds (with power removed)

**Weight:** 291 g (0.64 lb)



OMEGACARE<sup>SM</sup> extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE<sup>SM</sup> covers parts, labor and equivalent loaners.



To Order	
Model No.	Description
<b>SMLA-TC</b>	Thermocouple input field configurable limit alarm
<b>SKT-DR-11P</b>	11-pin socket, DIN rail mount
<b>SKT-SM-11P</b>	11-pin socket, surface mount
<b>SM-RAIL-2</b>	35 mm DIN rail, 2 m (6.6') length
<b>SMRS</b>	Retaining spring (secures limit alarm module into DIN rail or surface mount socket)

Comes complete with operator's manual.

**Ordering Example:** SMLA-TC thermocouple input field configurable limit alarm, SKT-SM-11P 11-pin socket, surface mount and OCW-1 OMEGACARE extends standard 1 year warranty to a total of 2 years.