Specifications

Inputs:
- Ranges: See Table 1
- Impedance: >1 M Ohms
- Input Bias Current (burnout detect): <1.5 microamp
- Overvoltage: ±10V differential
- Common Mode (Input to Ground): 600VAC or 1000VDC, max

LED Indications:
- Input Range (Green)
  - >100% input: 8Hz flash
  - <0% input: 4Hz 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 100msec
- Normal Mode (analog filtering): <250msec, (10-90%)

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

Stability:
- Line Voltage: ±0.01%/%, max
- Temperature: ±0.05% of full scale/°C, max.

Common Mode Rejection:
- DC to 60Hz: 120dB

Isolation:
- 1000V DC between contacts, input and power

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

Humidity:
- Operating: 15 to 95% (@45°C)
- Soak: 90% for 24 hours (@65°C)

Temperature Range:
- Operating: 0 to 60°C (32 to 140°F)
- Storage: -15 to 70°C (5 to 158°F)

Power:
- Consumption: 2W typical, 5W max
- Standard: Selectable 120/240VAC (±10%, 50-60Hz)
- Optional: 9 to 30VDC Inverter-Isolated

Relay Contacts:
- 1 SPDT (1 Form C) per setpoint
- Current Rating (resistive) 120VAC: 5A; 240VAC: 2A; 28VDC: 5A
- Material: Silver-Cadmium Oxide
- Electrical Life: 10^5 operations at rated load
- Note: External relay contact protection is required for use with inductive loads. See relay protection.
- Mechanical Life: 10^7 operations

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

Weight: 0.64 lbs

Agency Approvals:
- UL recognized per standard UL 508, (File No. E99775)

Pin Connections

1	AC Power (Hot)
2	No Connection
3	AC Power (Neu)
4	Input (+)
5	Input (-)
6	(A) N.O.
7	(A) C
8	(A) N.C.
9	(B) N.O.
10	(B) C
11	(B) N.C.

Key:
N.O. = Normally Open
C = Common
N.C. = Normally Closed
DC Power: Pin 1 = (+)

Pin 3 = (-)

*Contacts are in the "normal" state when the relay is de-energized.

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If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.
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FOR **WARRANTY RETURNS**, please have the following information available BEFORE contacting OMEGA.
1. Purchase order number which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

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1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product and
3. Repair instructions and/or specific problems relative to the product.

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SMLA-TC

Thermocouple Input, Field Configurable Limit Alarms

INSTRUCTION SHEET

M5485/0715

Shop online at omega.com℠ e-mail: info@omega.com
For latest product manuals: www.omegamanual.info

Provides Relay Contact Closures
at a Preset Temperature Input Level

- Field Configurable Input Ranges for E, J, K, R, S and T Type Thermocouples
- Exclusive "Dynamic Deadband" Prevents False Trips
- Burnout Detection
- Setpoints Programmable HI or LO
- Selectable Failsafe/Latching Operation
- Selectable 120/240VAC Input Power (9 to 30 VDC Available)

Description

Model SMLA-TC 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. The SMLA-TC also includes 0.25%-50% adjustable deadbands and selectable 120/240VAC power.

Diagnostic LED

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 8Hz. Below 0%, the flash rate is approximately 4Hz.

Output Selection

The SMLA-TC thermocouple limit alarm features output and setpoint selection:

SMLA-TC Single/Dual Trip (2 SPDT, 5A)

Setpoints are top accessed multi-turn potentiometers (or option "P" provides top mounted ten-turn dials).

Operation

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 (see figure 1). 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.

Dynamic Deadband

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.

Options

U Urethane coating of internal circuitry for protection from corrosive atmospheres.

P Top mounted, ten-turn dial(s) for setpoint adjustment.

C620 Factory calibration of input range, set points and output relays. Not available with option P.

Configuration

The factory presets for SMLA-TC are as follows:

	SMLA-TC
Input	J-type 0-360°C
Burn Out	Positive
Output	Dual, SPDT
Trip	A: HI, B: LO
Latching	No
Failsafe	No
Deadband	A/B: 0.25%
Power	120VAC

Refer to Figure 5 for switch locations.

For other I/O ranges, remove the four base screws and case to access the configuration switches.

Replace the cover before applying power.

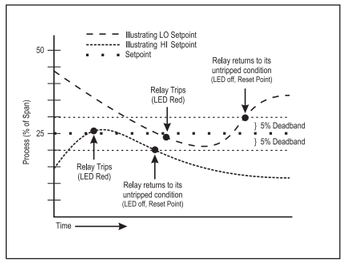


Figure 1: Limit alarm operation and effect of deadband.

Input

1. Using Table 1, configure positions 1 through 3 of SW1 and 1 through 5 of SW2 for the desired input range. Round desired maximum/minimum input values to the next highest range (e.g., 0-300°C = 0-350°C).

2. Choose the desired upscale/downscale thermocouple burnout detection by setting position 6 of SW2. See Figure 5.

Output

1. Configure positions 4 through 8 of SW1 for the desired alarm functions. See Figure 6.

Power

1. Configure the AC jumpers for either 120 or 240 VAC operation. See Figure 4.

Calibration

Note: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1-2 hours for warmup and thermal equilibrium of the system.

Setpoint: Set deadband at its minimum (factory default - fully CCW) before adjusting the setpoint. With the appropriate input applied, adjust setpoint until the relay trips. For HI trip calibration, start with the setpoint above the desired trip. For LO trip calibration, start below the desired trip.

Deadband: Set deadband to its minimum (factory default - fully CCW). Set setpoint to desired trip. Adjust input until relay trips. Readjust deadband to 50% (fully CW). Set input to desired deadband position. Slowly adjust deadband until relay untrips.

Note that Custom Calibration (option C620) is available from the factory (settings **MUST** be within specifications):

a) Input Type (see table)

b) Setpoint A trip point and reset point

c) Setpoint B trip point and reset point

d) Latching (ON/OFF)

e) Failsafe (ON/OFF)

Note that if a deadband entry is not specified, the default entry will be used.

Table 1: SMLA-TC Input Ranges

TC Type	Temperature Range	SW1	SW2
E	0 to 150°C (32 to 302°F)		
E	0 to 290°C (32 to 554°F)		
E	0 to 660°C (32 to 1220°F)		
E	0 to 1000°C (32 to 1832°F)		
E	-270 to 150°C (-454 to 302°F)		
E	-270 to 290°C (-454 to 554°F)		
J	0 to 190°C (32 to 374°F)		
J	0 to 360°C (32 to 680°F)		
J	0 to 760°C (32 to 1400°F)		
J	-210 to 190°C (-346 to 374°F)		
J	-210 to 360°C (-346 to 680°F)		
K	0 to 250°C (32 to 482°F)		
K	0 to 480°C (32 to 896°F)		
K	0 to 1230°C (32 to 2246°F)		
K	0 to 1372°C (32 to 2501°F)		
K	-270 to 250°C (-454 to 482°F)		
K	-270 to 480°C (-454 to 896°F)		
R	0 to 970°C (32 to 1778°F)		
R	0 to 1690°C (32 to 3074°F)		
R	0 to 1760°C (32 to 3200°F)		
S	0 to 1050°C (32 to 1922°F)		
S	0 to 1760°C (32 to 3200°F)		
T	0 to 210°C (32 to 410°F)		
T	0 to 390°C (32 to 734°F)		
T	-270 to 210°C (-454 to 410°F)		
T	-270 to 390°C (-454 to 734°F)		

Relay Protection and EMI Suppression

When switching inductive loads, maximum relay life and transient EMI suppression is achieved using external protection (see Figures 2 & 3). 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 0.1mF pulse film capacitor (foil polypropylene recommended) of sufficient voltage, and a 47ohm, 1/2W 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).

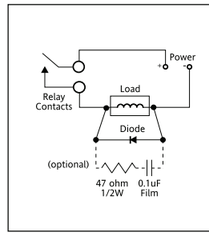


Figure 2: DC Inductive Loads

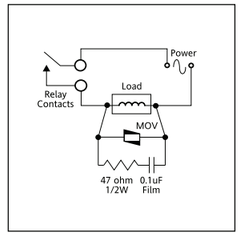
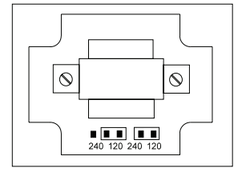
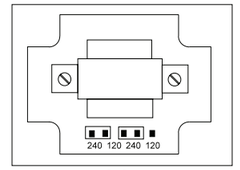


Figure 3: AC Inductive Loads



120 VAC Operation



240 VAC Operation

Figure 4: 120/240 VAC Selection

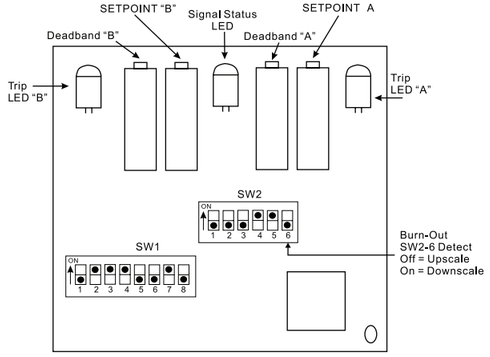


Figure 5: SMLA-TC Factory Calibration Type "J" 0-360°C Dual HI/LO, Non-Latching, Non-Failsafe

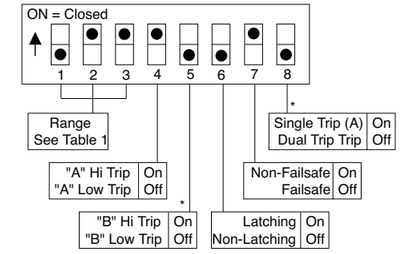


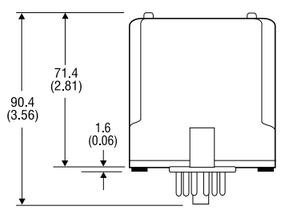
Figure 6: Mode Selection; Dual Trip/A: HI, B: LO, Non-Latching, Non-Failsafe

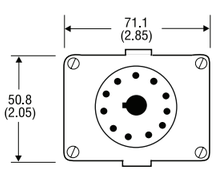
Mounting

All modules feature plug-in installation. Models SMLA-TC use an 11-pin base, either molded socket (SKT-SM-11P) or DIN rail socket (SKT-DR-11P).

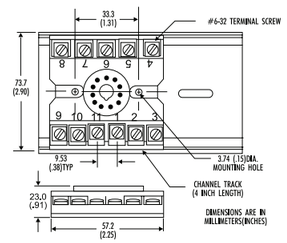
Dimensions

Dimensions are in millimeters (inches)

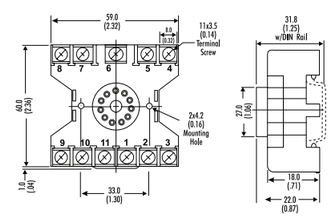




Mark II



SKT-SM-11P (Track/Surface)



SKT-DR-11P (DIN Rail)