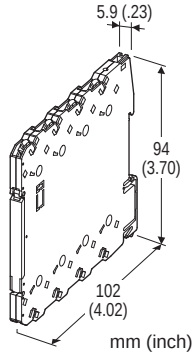
Tension-Clamp Ultra-Slim Signal Conditioners M6S Series

THERMOCOUPLE ALARM

(PC programmable)

Functions & Features

- Maintenance-free tension clamp connection
- 5.9-mm wide ultra-slim design
- Low profile allows the M6S module mounted in a 120-mm deep panel
- Provides a relay contact output at preset DC input levels
- PC programmable
- Linearization and upscale and downscale burnout protection
- High-density mounting
- Power and status indicator LEDs



CE

MODEL: M6SXAT–[1]–R

ORDERING INFORMATION

- Code number: M6SXAT-[1]-R
  Spacify a code from below for [1].
  (e.g. M6SXAT-2-R)
- Temperature range (e.g. 0 – 1000°C)

[1] INPUT THERMOCOUPLE

1: (PR)
2: K (CA)
3: E (CRC)
4: J (IC)
5: T (CC)
6: B (RH)
7: R
8: S
N: N
0: Specify (Please provide a emf table.)
(Configurator software is used to change the input type and precise range.)

OUTPUT

Relay; SPDT or transfer contact

POWER INPUT

DC Power
R: 24 V DC
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

RELATED PRODUCTS

- PC configurator software (model: M6CFG)
  Downloadable at M-System's web site.
  A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

GENERAL SPECIFICATIONS

Connection
Input and output: Tension clamp
Power input: Via the Installation Base (model: M6SBS) or Tension clamp
Applicable wire size: 0.2 to 2.5 mm^2, stripped length 8 mm
Housing material: Flame-resistant resin (black)
Isolation: Input to output to power
Burnout: Upscale standard; downscale or no burnout optional by programming
In case of upscale standard, the alarm operates as if the input signal has exceeded over the range.
Linearization: Standard
Cold Junction Compensation: CJC sensor incorporated
Power LED: Green light turns on when the power is supplied.
Status indicator LED: Orange LED; Flashing patterns indicate different operating status of the transmitter.
Alarm monitor LED: Red LED turns on when the alarm is tripped.
Programming: Downloaded from PC
Input type and range
Input fine adjustments
User's Thermocouple table
Burnout (Upscale, downscale or no burnout)
Alarm setpoint (input %)
Trip action (High or Low)
Relay coil (energized or de-energized)
Power ON delay time (0 to 999 sec.)
Alarm ON delay time (0 to 999 sec.)
Hysteresis (deadband) (input %)
Alarm test, and others
Configurator connection: 2.5 dia. miniature jack; RS-232C level
Factory default setting
Alarm setpoint: 80 %

Trip action: High
Relay coil at alarm: Energized
Power ON delay time: 5 sec.
Alarm ON delay time: 0 sec.
Hysteresis (deadband) : 1.0 %
Burnout: Upscale

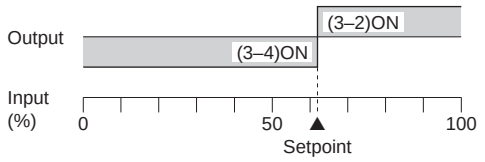
INPUT SPECIFICATIONS

Input resistance: 1 MΩ min.
Burnout sensing: ≤ 0.1 μA
Temperature range: See Table 1.
If not specified, the input range is shown below.
1 PR: 0 – 1600°C
2 K: 0 – 1000°C
3 E: 0 – 500°C
4 J: 0 – 500°C
5 T: 0 – 300°C
6 B: 500 – 1600°C
7 R: 500 – 1600°C
8 S: 0 – 1600°C
N N: 0 – 1000°C

OUTPUT SPECIFICATIONS

• **RELAY OUTPUT**
Relay rating:
250 V AC @2 A (cos ø = 1)
30 V DC @2 A (resistive load)
Maximum switching voltage: 250 V AC or 125 V DC
Maximum switching power: 500 VA or 60 W
Minimum load: 5 V DC @100 mA
Mechanical life: 5 × 10^6 cycles (rate 180/min.)

Alarm Trip Operation Terminal No. in parentheses
• **Setting Example**
Hi alarm (coil energized at alarm) or
Lo alarm (coil de-energized at alarm)



Trip operation in power failure: Terminals 3 – 4 turn ON.

INSTALLATION

Power consumption: Approx. 0.5 W
Operating temperature: -20 to +55°C (-4 to +131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Installation Base (model: M6SBS) or DIN rail
Weight: 65 g (2.3 oz)

PERFORMANCE in percentage of span

Setpoint accuracy (trip point accuracy):
Accuracy in Table 1 + Cold junction compensation error
Cold junction compensation error:
±3°C at 25 ±10°C
±5.4°F at 77 ±18°F
Temp. coefficient: ±0.01 %/°C (±0.006 %/°F) of max. span
Response time: ≤ 0.5 sec. (0 – 100 % at 90 % setpoint)
Burnout response time: ≤ 1 sec.
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @1 minute (input to output to power to ground)

CALCULATION EXAMPLES OF SETPOINT ACCURACY

[Example] K thermocouple, 0 – 1000°C
Absolute value accuracy (Table 1): 0.25°C
CJC error (3°C) added: 3.25°C
Setpoint accuracy = 3.25°C / 1000°C × 100 = 0.33 %

Table 1.

THERMOCOUPLE	°C			
	MIN. SPAN	MAXIMUM RANGE	CONFORMANCE RANGE	ACCURACY
(PR)	20	0 to 1760	0 to 1760	±1.00
K (CA)	20	-270 to +1370	-150 to +1370	±0.25
E (CRC)	20	-270 to +1000	-170 to +1000	±0.20
J (IC)	20	-210 to +1200	-180 to +1200	±0.25
T (CC)	20	-270 to +400	-170 to +400	±0.25
B (RH)	20	100 to 1820	400 to 1760	±0.75
R	20	-50 to +1760	200 to 1760	±0.50
S	20	-50 to +1760	0 to 1760	±0.50
N	20	-270 to +1300	-130 to +1300	±0.30
THERMOCOUPLE	°F			
	MIN. SPAN	MAXIMUM RANGE	CONFORMANCE RANGE	ACCURACY
(PR)	36	32 to 3200	32 to 3200	±1.80
K (CA)	36	-454 to +2498	-238 to +2498	±0.45
E (CRC)	36	-454 to +1832	-274 to +1832	±0.36
J (IC)	36	-346 to +2192	-292 to +2192	±0.45
T (CC)	36	-454 to +752	-274 to +752	±0.45
B (RH)	36	212 to 3308	752 to 3200	±1.35
R	36	-58 to +3200	392 to 3200	±0.90
S	36	-58 to +3200	32 to 3200	±0.90
N	36	-454 to +2372	-202 to +2372	±0.54

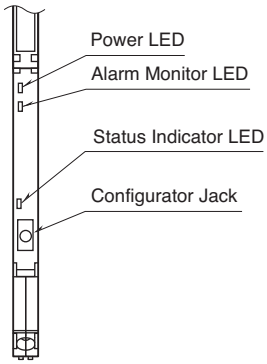
STANDARDS & APPROVALS

CE conformity:
EMC Directive (2004/108/EC)
EN 61000-6-4 (EMI)
EN 61000-6-2 (EMS)
Low Voltage Directive (2006/95/EC)
EN 61010-1
Overvoltage Category II

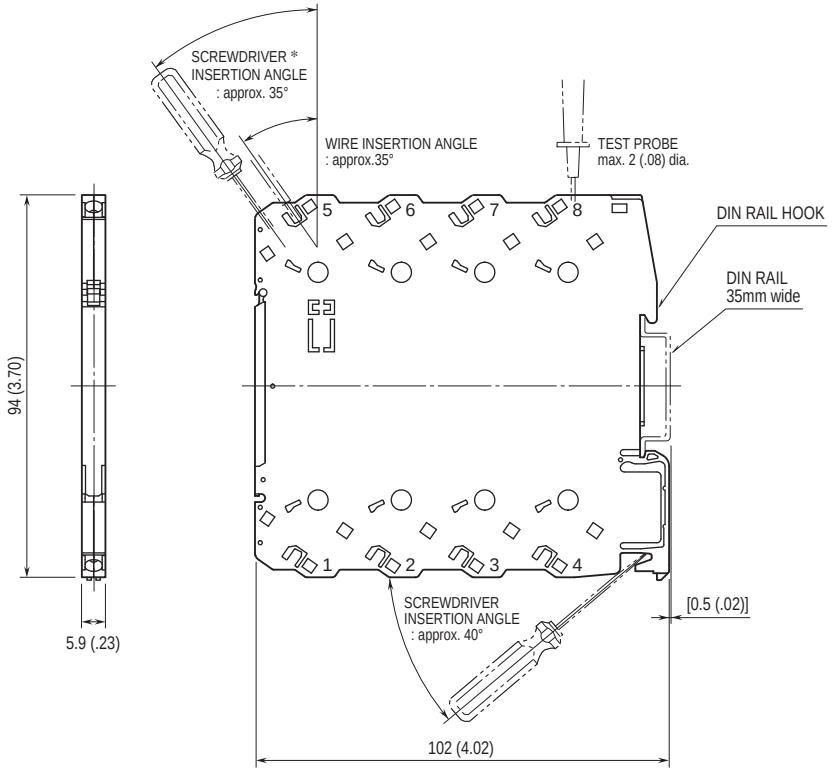
Pollution Degree 2
Max. operating voltage 250 V (relay output circuit)
Input or power to output: Reinforced insulation
Input to power: Basic insulation

EXTERNAL VIEW

(With the cover open)



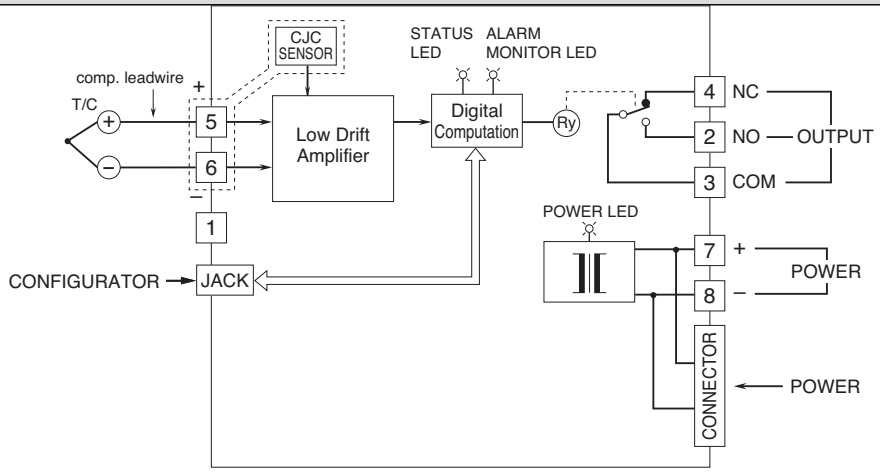
DIMENSIONS unit: mm (inch)



• When mounting, no extra space is needed between units.

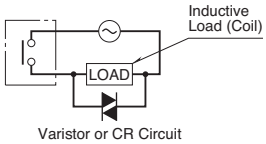
*Use a minus screwdriver: tip width 3.8 mm max., tip thickness 0.5 to 0.6 mm

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

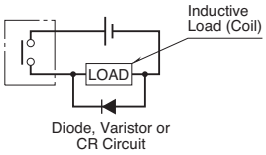


■ **Relay Protection**

• AC Powered



• DC Powered



⚠ Specifications are subject to change without notice.