

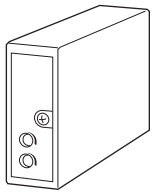
## Dual Output Super-mini Signal Conditioners Pico-M Series

### THERMOCOUPLE CONVERTER

(CE)

#### Functions & Features

- Accepting direct input from a thermocouple and providing two isolated process signals
- Linearization
- Burnout protection
- High-accuracy cold junction compensation
- Space-saving, easy-to-maintain, multi-channel installation base



### MODEL: M8TS1-[1][2]-R[3]

#### ORDERING INFORMATION

- Code number: M8TS1-[1][2]-R[3]  
Specify a code from below for each [1] through [3].  
(e.g. M8TS1-26A-R/BL/Q)
- Special Temperature range (e.g. 0 - 800°C)
- Specify the specification for option code /Q  
(e.g. /C01 /V01)

#### [1] INPUT THERMOCOUPLE

- 1: (PR) (Usable Range 0 to 1760°C, 32 to 3200°F)
- 2: K (CA) (Usable range -270 to +1370°C, -454 to +2498°F)
- 3: E (CRC) (Usable range -270 to +1000°C, -454 to +1832°F)
- 4: J (IC) (Usable range -210 to +1200°C, -346 to +2192°F)
- 5: T (CC) (Usable range -270 to +400°C, -454 to +752°F)
- 6: B (RH) (Usable range 0 to 1820°C, 32 to 3308°F)
- 7: R (Usable range -50 to +1760°C, -58 to +3200°F)
- 8: S (Usable range -50 to +1760°C, -58 to +3200°F)
- N: N (Usable range -270 to +1300°C, -454 to +2372°F)
- 0: Specify

#### [2] OUTPUT 1 / OUTPUT 2

- 6A: 1 - 5 V DC (Load resistance 2500 Ω min.)  
/ 4 - 20 mA DC (Load resistance 300 Ω max.)
- 44: 0 - 10 V DC (Load Resistance 5000 Ω min.)  
/ 0 - 10 V DC (Load Resistance 5000 Ω min.)
- 55: 0 - 5 V DC (Load resistance 2500 Ω min.)  
/ 0 - 5 V DC (Load resistance 2500 Ω min.)
- 66: 1 - 5 V DC (Load resistance 2500 Ω min.)

- / 1 - 5 V DC (Load resistance 2500 Ω min.)
- 99: 1 - 9 V DC (Load resistance 4500 Ω min.)
- / 1 - 9 V DC (Load resistance 4500 Ω min.)

#### POWER INPUT

##### DC Power

R: 24 V DC

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

#### [3] OPTIONS (multiple selections)

##### Burnout

blank: Upscale burnout

/BL: Downscale burnout

##### Mounting

blank: Multi-channel Installation Base mounting  
(Order Model M8BSx Installation Base separately.)

/SK: Single Base Socket mounting

(Order Model M8BS-1-1 Single Mount Base separately.)

For Model M8BS7, choose blank code.)

##### Other Options

blank: none

/Q: Option other than the above (specify the specification)

#### SPECIFICATIONS OF OPTION: Q (multiple selections)

##### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

##### ADJUSTMENT

/V01: Multi-turn fine adjustment

#### RELATED PRODUCTS

- Installation Base or Single Mount Base Socket (model: M8BSx)

This unit must be mounted on dedicated base or socket.

#### GENERAL SPECIFICATIONS

**Construction:** Plug-in

**Mounting screw:** M3 screw (torque 0.3 N·m)

**Housing material:** Flame-resistant resin (black)

**Power supply:** Via the Installation Base terminals  
(model: M8BSx)

**Isolation:** Input to output 1 to output 2 to power

**Zero adjustment:** -2 to +2 % (front)

**Span adjustment:** 98 to 102 % (front)

**Burnout protection:** Upscale standard; downscale optional;  
selectable with a switch

**Linearization:** Standard

**Cold junction compensation:** CJC sensor attached to the  
input terminals (B thermocouple is without CJC as standard)



## INPUT SPECIFICATIONS

**Minimum span:** 3 mV

**Offset:** max. 1.5 times span

**Input resistance:** 1 M $\Omega$  min. (10 k $\Omega$  min. at loss of power)

**Burnout sensing:** 0.1  $\mu$ A

**Minimum span in temperature**

**(PR):** 370°C, 670°F

**K (CA):** 75°C, 140°F

**E (CRC):** 50°C, 90°F

**J (IC):** 60°C, 110°F

**T (CC):** 75°C, 140°F

**B (RH):** 780°C, 1410°F

**R:** 360°C, 650°F

**S:** 380°C, 690°F

**N:** 110°C, 200°F

(For the temperatures that range below 0°C, the transmitter may partially not satisfy the described accuracy. Consult factory.)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

## INSTALLATION

**Current consumption:** Approx. 30 mA (50 mA for current output)

**Operating temperature:** 0 to 55°C (32 to 131°F)

**Operating humidity:** 30 to 95 %RH (non-condensing)

**Mounting:** Installation Base (model: M8BSx)

**Weight:** 70 g (2.5 oz)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.2$  % of F.S. typ.; varies according to the span (at over 400°C or 750°F for R and S; over 770°C or 1420°F for B)

**Cold junction compensation error**

(at 25°C  $\pm 5$ °C or 77°F  $\pm 9$ °F)

**K, E, J, T, N:**  $\pm 0.3$ °C or  $\pm 0.6$ °F

**S, R, PR:**  $\pm 0.5$ °C or  $\pm 0.9$ °F

**Temp. coefficient:**  $\pm 0.02$  %/°C ( $\pm 0.01$  %/°F)

(at over 400°C or 750°F for R and S; over 770°C or 1420°F for B)

**Response time:**  $\leq 0.2$  sec. (0 - 90 %)

**Burnout response:**  $\leq 10$  sec.

**Line voltage effect:**  $\pm 0.1$  % over voltage range

**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:**

1500 V AC @1 minute (input to output 1 or output 2 or power to ground)

500 V AC @1 minute (output 1 to output 2 to power)

**SWC test:** ANSI/IEEE-C37.90.1-1989

## STANDARDS & APPROVALS

**CE conformity:**

EMC Directive (2004/108/EC)



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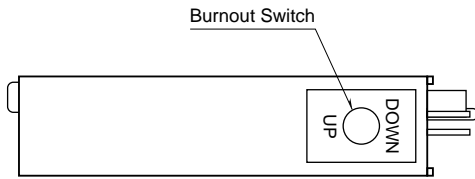
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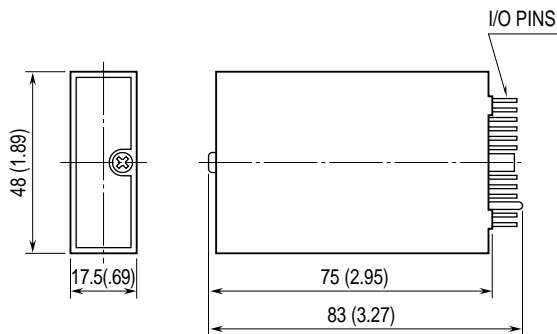
## BOTTOM VIEW

### • Burnout Switch

Turn the switch in UP direction for upscale burnout,  
DOWN for downscale burnout.



## DIMENSIONS unit: mm (inch)

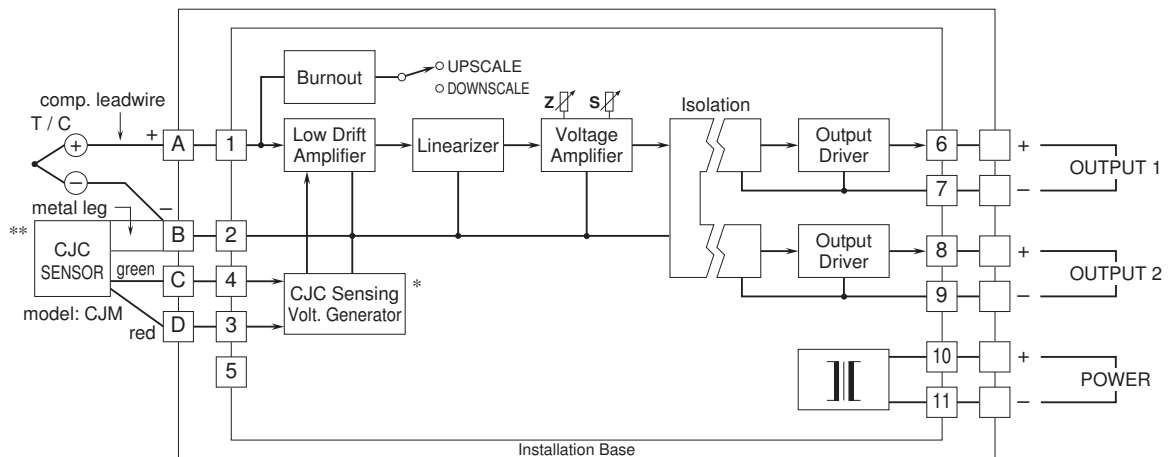


## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

### • Mounting on the Single Mount Base (model: M8BS-1-1)

Refer to the data sheet and the instruction manual for the M8BS-1-1.

### • Mounting on the Installation Base (model: M8BSx)



\*Deleted with B thermocouple input.

\*\* The CJC Sensor for the single mount base is not compatible with the one for the multiple mount base. Leadwires for the multiple mount type are replaced with metal legs with the single mount type.



Specifications are subject to change without notice.