

High-density Signal Conditioners 10-RACK

0: Specify

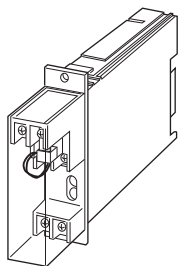
THERMOCOUPLE TRANSMITTER

Functions & Features

- Accepting direct input from a thermocouple and providing two standard process signals
- 5-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Optional second channel output available at the front terminals and at the Standard Rack connector

Typical Applications

- High-accuracy cold junction compensation benefits narrow span measurements
- 0.1 μ A burnout sensing enables long distance transmission with minimum offset drifts
- Electric furnace (isolation)
- No burnout type can connect to a single T/C in parallel with a recorder



MODEL: 10TS-[1][2][3]-R[4]

ORDERING INFORMATION

- Code number: 10TS-[1][2][3]-R[4]
Specify a code from below for each [1] through [4].
(e.g. 10TS-2A6-R/BL/Q)
- Temperature range (e.g. 0 – 800 °C)
- Specify the specification for option code /Q
(e.g. /C01)

[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)

[2] OUTPUT 1

Current

- A: 4 – 20 mA DC (Load resistance 600 Ω max.)
- B: 2 – 10 mA DC (Load resistance 1200 Ω max.)
- C: 1 – 5 mA DC (Load resistance 2400 Ω max.)
- D: 0 – 20 mA DC (Load resistance 600 Ω max.)
- E: 0 – 16 mA DC (Load resistance 750 Ω max.)
- F: 0 – 10 mA DC (Load resistance 1200 Ω max.)
- G: 0 – 1 mA DC (Load resistance 12 k Ω max.)

Voltage

- 1: 0 – 10 mV DC (Load resistance 10 k Ω min.)
- 2: 0 – 100 mV DC (Load resistance 100 k Ω min.)
- 3: 0 – 1 V DC (Load resistance 100 Ω min.)
- 4: 0 – 10 V DC (Load resistance 1000 Ω min.)
- 5: 0 – 5 V DC (Load resistance 500 Ω min.)
- 6: 1 – 5 V DC (Load resistance 500 Ω min.)

[3] OUTPUT 2

0: None

Voltage

- 6: 1 – 5 V DC (Load resistance 5000 Ω min.)

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V $\pm$ 10 %, ripple 10 %p-p max.)

[4] OPTIONS (multiple selections)

Burnout

blank: Upscale burnout

/BL: Downscale burnout

/BN: No burnout

CJC Sensor

blank: With Cold Junction Compensation Sensor

/N: Without Cold Junction Compensation Sensor

Other Options

blank: none

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

SPECIFICATIONS OF OPTION: Q

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

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

GENERAL SPECIFICATIONS

Construction: Rack-mounted; terminal access via screw terminals at the front and via card-edge connector at the

rear; terminal cover provided

Connection

Input: M3.5 screw terminals (torque 0.8 N·m)

Output: Card-edge connector and M3.5 screw terminals (torque 0.8 N·m)

Power input: Supplied from card-edge connector

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (black)

Isolation: Input to output 1 to output 2 to power

Overrange output: Approx. -10 to +120 % at 1 - 5 V

Zero adjustment: -5 to +5 % (front)

Span adjustment: 95 to 105 % (front)

At burnout: Downscale $\leq$ -10 %, Upscale $\geq$ 110 %

Linearization: Standard

Cold junction compensation (CJC): CJC sensor attached to the input terminals as standard; No CJC optional (B thermocouple is without CJC as standard.)

INPUT SPECIFICATIONS

Input resistance: 20 k Ω minimum

Burnout sensing: 0.1 μ A

Minimum span: 3 mV

Offset: Max. 1.5 times span

Minimum span (in °C)

(PR): 370°C

K (CA): 75°C

E (CRC): 50°C

J (IC): 60°C

T (CC): 75°C

B (RH): 780°C

R: 360°C

S: 380°C

N: 110°C

Minimum span (in °F)

(PR): 670°F

K (CA): 140°F

E (CRC): 90°F

J (IC): 110°F

T (CC): 140°F

B (RH): 1410°F

R: 650°F

S: 690°F

N: 200°F

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

INSTALLATION

Current consumption: Approx. 30mA with voltage output 1
Approx. 60mA with current output 1

Operating temperature: -5 to +55°C (23 to 131°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Standard Rack 10BXx

Weight: 200 g (0.44 lb)

PERFORMANCE in percentage of span

Accuracy: ± 0.4 % (at over 400°C or 750°F for R, S and PR; over 770°C or 1420°F for B)

Cold junction compensation error

(at 20°C ± 10 °C or 68°F ± 18 °F; with CJC sensor)

K, E, J, T, N: ± 0.5 °C or ± 0.9 °F

S, R, PR: ± 1 °C or ± 1.8 °F

Temp. coefficient: ± 0.015 %/°C (± 0.008 %/°F)

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

Response time: ≤ 0.5 sec. (0 - 90 %)

Burnout response: ≤ 10 sec.

Line voltage effect: ± 0.1 % over voltage range

Insulation resistance: ≥ 100 M Ω with 500 V DC

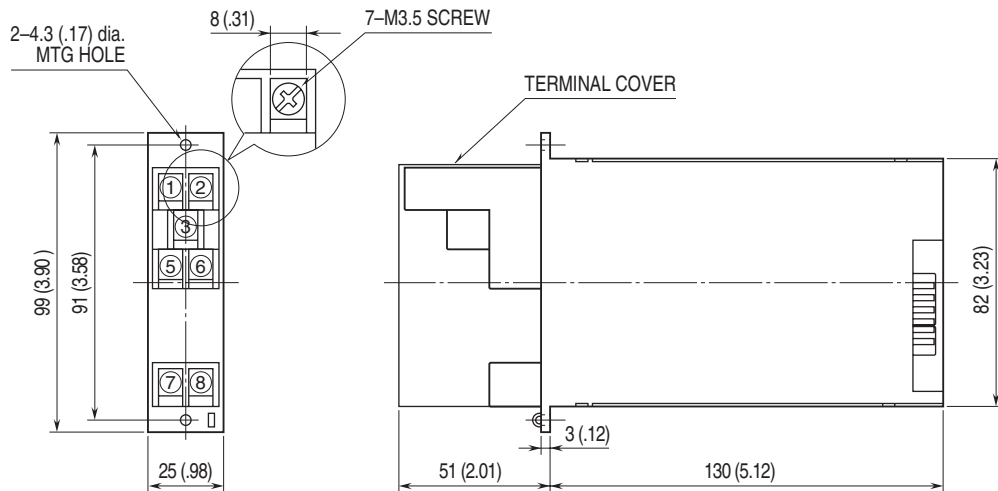
Dielectric strength: 500 V AC @ 1 minute

(input to output 1 to output 2 to power)

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

DIMENSIONS unit: mm (inch)

Terminal 3 is deleted with CJC sensor attached models.



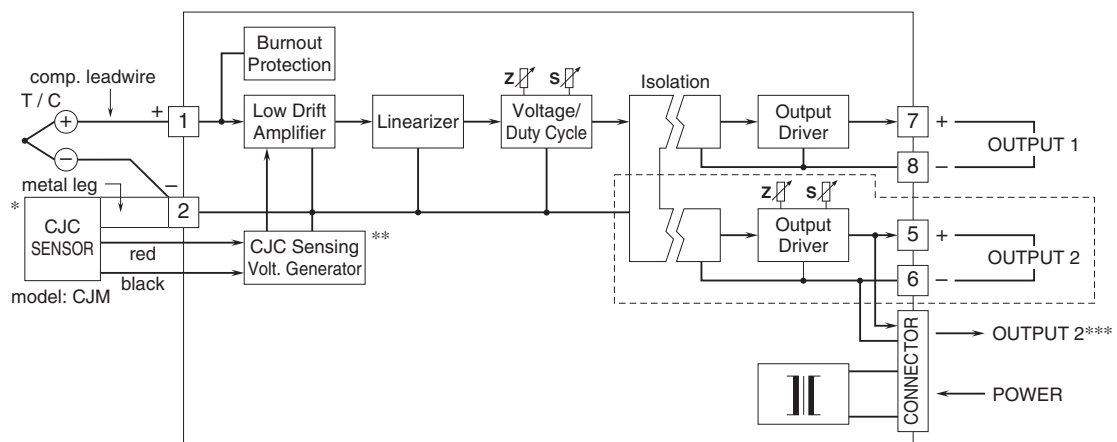
TERMINAL ASSIGNMENTS

CJC SENSOR*
(model: CJM)



*Deleted with Option /N

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



* Deleted with Option /N.

** Deleted with Option /N or B thermocouple.

***1 output type has the output 1 connected to the card-edge connector in parallel.

Remark 1) The section enclosed by broken line is only for 2nd output channel.



Specifications are subject to change without notice.