

Plug-in Signal Conditioners M-UNIT

THERMOCOUPLE TRANSMITTER

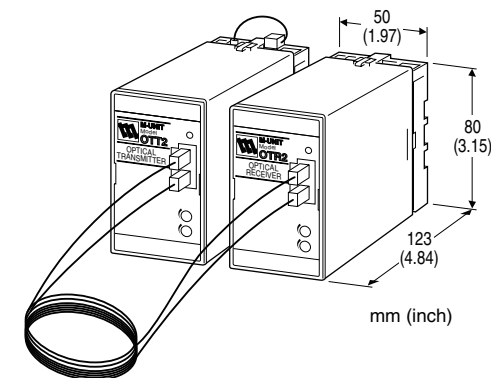
(fiber optics isolation)

Functions & Features

- Isolation up to several hundred thousand volts with a fiber optics cable
- ON/OFF temperature control signal
- Linearization
- Burnout
- High-density mounting

Typical Applications

- Ion implanter
- Electron-beam devices
- Dust chamber
- Protection against inductive noises in power substations



MODEL: OTT2-[1]-[2][3]

ORDERING INFORMATION

- Code number: OTT2-[1]-[2][3]

Specify a code from below for each of [1] through [3].

- (e.g. OTT2-2-B/BL/Q)
- Temperature range (e.g. 0 - 800°C)
- Specify the specification for option code /Q (e.g. /C01/S01)

[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] POWER INPUT

AC Power

- B: 100 V AC
- C: 110 V AC
- D: 115 V AC
- F: 120 V AC
- G: 200 V AC
- H: 220 V AC
- J: 240 V AC

DC Power

- S: 12 V DC
- R: 24 V DC

[3] OPTIONS (multiple selections)

Burnout

- blank: Upscale burnout
- /BL: Downscale burnout
- /BN: No burnout

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

TERMINAL SCREW MATERIAL

- /S01: Stainless steel

RELATED PRODUCTS

- Thermocouple receiver (model: OTR2)
- Fiber optics cable:
 - 10 meters (model: AMPCP2-10M)
 - 20 meters (model: AMPCP2-20M)
 - 30 meters (model: AMPCP2-30M)
- Optical cable used for the AMPCP2
 - Mitsubishi Chemical Super Esha SH 4001
 - Minimum bend radius: 25 mm
 - Tension strength: ≤ 70 N
- Connector used for the AMPCP2
 - Broadcom HFBR-4532Z
- Recommended SSR: OMRON G3NA

GENERAL SPECIFICATIONS

Construction: Plug-in
Transmission method: Light pulse (100 – 500 Hz)
Maximum transmission distance: 30 meters (98 ft)
Connection
I/O & power input: M3.5 screw terminals
Optical fiber: Connector
Screw terminal: Chromated steel (standard) or stainless steel
Housing material: Flame-resistant resin (black)
Isolation: Input or control output to power
Zero adjustment: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Burnout: Upscale standard; downscale or no burnout optional
Linearization: Standard
Cold junction compensation: CJC sensor attached to the input terminals (B thermocouple is without CJC as standard)
Power indicator LED: Green LED turns on when the power is supplied.

INPUT SPECIFICATIONS

Minimum span: 3 mV
Offset: Max. 1.5 times span
Input resistance: 30 kΩ min.
Burnout sensing: 0.1 μA

Minimum span (in °C)
(PR): min. span 370°C
K (CA): min. span 75°C
E (CRC): min. span 50°C
J (IC): min. span 60°C
T (CC): min. span 75°C
B (RH): min. span 780°C
R: min. span 360°C
S: min. span 380°C
N: min. span 110°C

Minimum span (in °F)
(PR): min. span 670°F
K (CA): min. span 140°F
E (CRC): min. span 90°F
J (IC): min. span 110°F
T (CC): min. span 140°F
B (RH): min. span 1410°F
R: min. span 650°F
S: min. span 690°F
N: min. span 200°F

Note: The described accuracy may be partially not satisfied when the temperature ranges below 0°C. Consult factory.

OUTPUT SPECIFICATIONS

■ **Control Output:** External SSR
(output from the OTT2)
Drive: Approx. 15 V; $Z_0 = 1.2 \text{ k}\Omega$

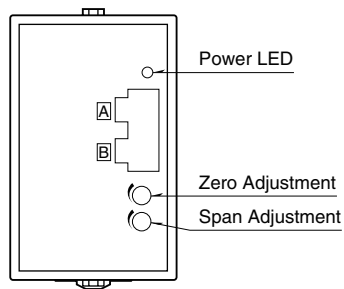
INSTALLATION

Power input
• **AC:** Operational voltage range: rating $\pm 10 \%$, 50/60 ± 2 Hz, approx. 3 VA
• **DC:** Operational voltage range: rating $\pm 10 \%$ ripple 10 %p-p max., approx. 2.6 W (110 mA at 24 V)
Operating temperature: -5 to +60°C (23 to 140°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 350 g (0.77 lb)

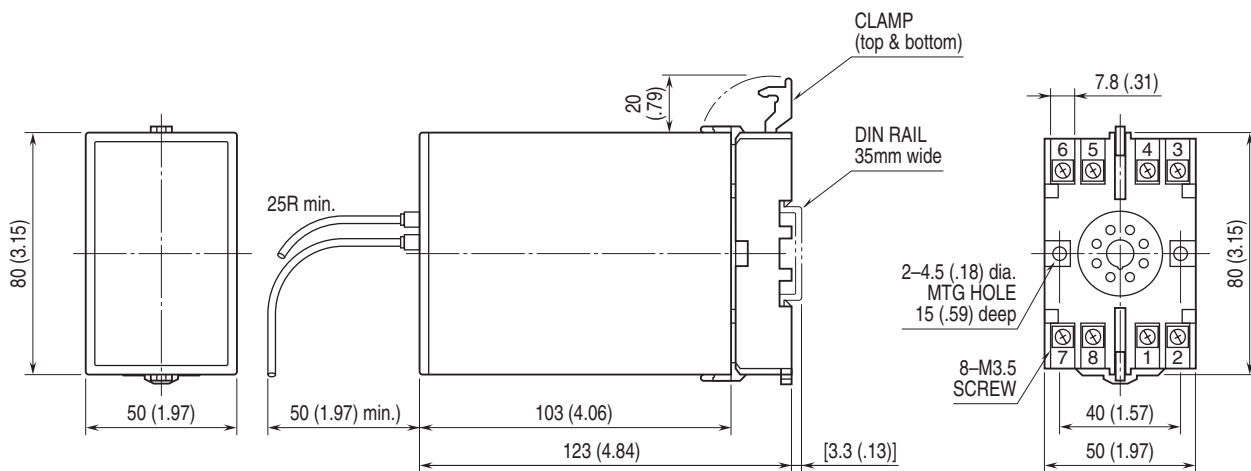
PERFORMANCE in percentage of span

Accuracy: $\pm 0.3 \%$ (at over 400°C or 750°F for R, S and PR; over 770°C or 1420°F for B)
(Overall performance with the OTT2 and OTR2 combined)
Cold junction compensation error
(at 20°C $\pm 10^\circ\text{C}$ or 68°F $\pm 18^\circ\text{F}$)
K, E, J, T & N: $\pm 0.5^\circ\text{C}$ or $\pm 0.9^\circ\text{F}$
S, R & PR: $\pm 1^\circ\text{C}$ or $\pm 1.8^\circ\text{F}$
Temp. coefficient: $\pm 0.015 \%/^\circ\text{C}$ ($\pm 0.008 \%/^\circ\text{F}$)
(at over 770°C or 1420°F for B)
Response time: ≤ 0.6 second (0 – 90 %) (Overall performance with the OTT2 and OTR2 combined)
Burnout response: ≤ 10 sec.
Line voltage effect: $\pm 0.1 \%$ over voltage range
Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC
Dielectric strength: 2000 V AC @ 1 minute
(input or temp. control output to power to ground)

EXTERNAL VIEW

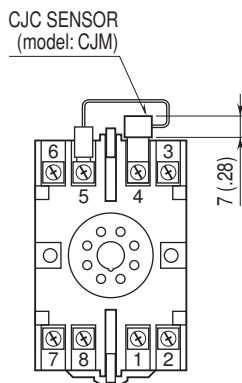


EXTERNAL DIMENSIONS unit: mm (inch)

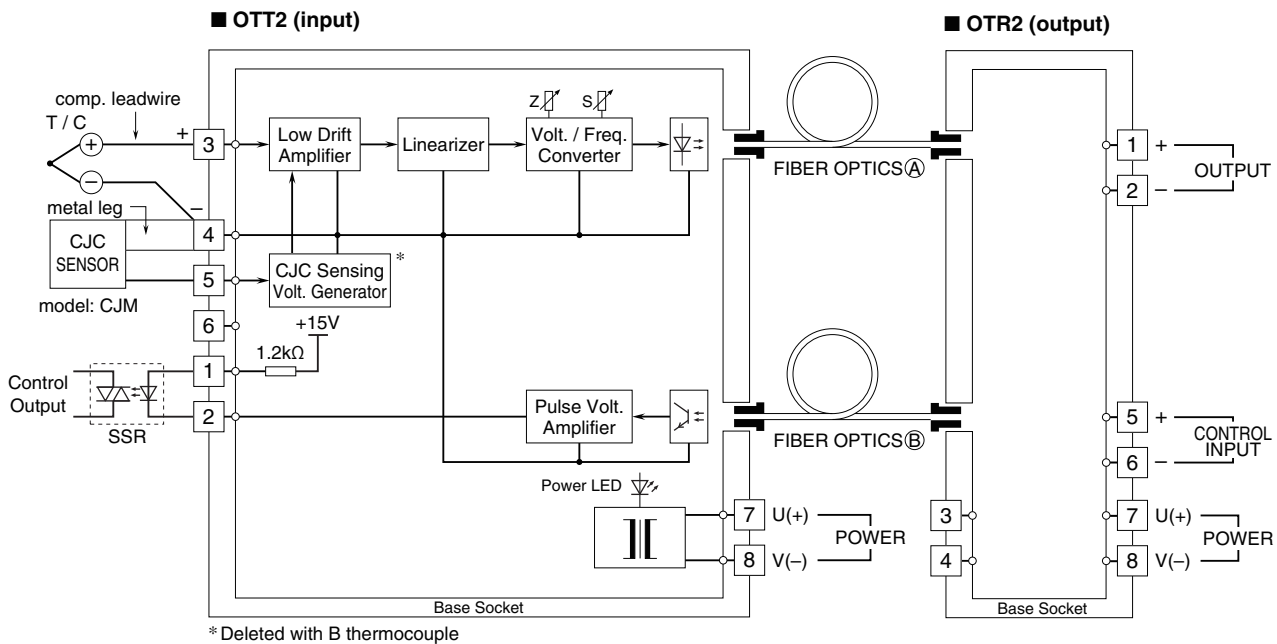


• When mounting, no extra space is needed between units.

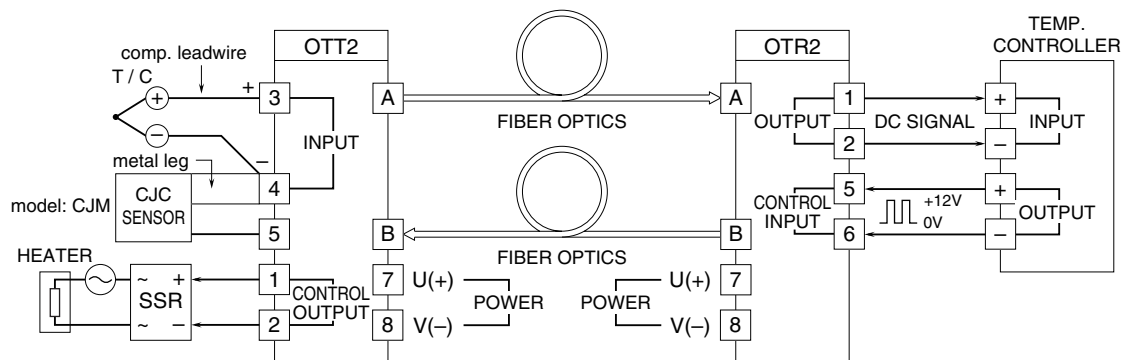
TERMINAL ASSIGNMENTS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



FUNCTIONS



The OTT2 unit converts mV input signals from a thermocouple into light pulse reflections, and transmits them to the OTR2 unit via fiber optics cable (A), while the OTR2 converts the light pulse reflections into analog signals and output them to a temperature controller.

The OTR2 transmits also ON-OFF control signals from the controller in the same manner via fiber optics cable (B), to the OTT2 unit while produces voltage pulse signals for driving the SSR for the heater.

The SSR must accept a DC input and have zero-cross function.



Specifications are subject to change without notice.