

Space-saving Plug-in Signal Conditioners F-UNIT

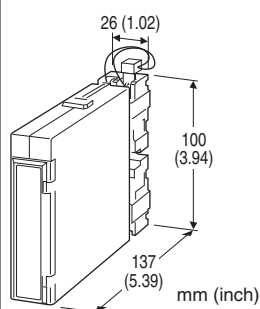
THERMOCOUPLE TRANSMITTER

Functions & Features

- Accepting direct input from a thermocouple and providing a standard process signal
- 5-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Fast response type available
- High-density mounting

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: FTS-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: FTS-[1][2]-[3][4]
- Specify a code from below for each of [1] through [4].
(e.g. FTS-2A-L/K/BL/Q)
- Temperature range (e.g. 0 - 800°C)
- Special output range (For codes Z & 0)
- 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] OUTPUT

Current

- A: 4 - 20 mA DC (Load resistance 750 Ω max.)
B: 2 - 10 mA DC (Load resistance 1500 Ω max.)
C: 1 - 5 mA DC (Load resistance 3000 Ω max.)
D: 0 - 20 mA DC (Load resistance 750 Ω max.)
E: 0 - 16 mA DC (Load resistance 900 Ω max.)
F: 0 - 10 mA DC (Load resistance 1500 Ω max.)
G: 0 - 1 mA DC (Load resistance 15 k Ω max.)
Z: Specify current (See OUTPUT SPECIFICATIONS)

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 1000 Ω min.)
4: 0 - 10 V DC (Load resistance 10 k Ω min.)
5: 0 - 5 V DC (Load resistance 5000 Ω min.)
6: 1 - 5 V DC (Load resistance 5000 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)

[3] POWER INPUT

AC Power

- K: 85 - 132 V AC
(Operational voltage range 85 - 132 V, 47 - 66 Hz)
L: 170 - 264 V AC
(Operational voltage range 170 - 264 V, 47 - 66 Hz)

DC Power

- R: 24 V DC
(Operational voltage range 24 V $\pm$ 10 %, ripple 10 %p-p max.)
P: 110 V DC
(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)

[4] OPTIONS (multiple selections)

Response Time (0 - 90 %)

- blank: Standard ($\leq$ 0.5 sec.)
/K: Fast Response (Approx. 25 msec.)

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

GENERAL SPECIFICATIONS**Construction:** Plug-in**Connection:** M3.5 screw terminals (torque 0.8 N·m)**Screw terminal:** Nickel-plated steel (standard) or stainless steel**Housing material:** Flame-resistant resin (black)**Isolation:** Input to output to power**Overrange output:** Approx. -10 to +120 % at 1 – 5 V**Zero adjustment:** -5 to +5 % (front)**Span adjustment:** 95 to 105 % (front)**Linearization:** Standard**Cold junction compensation:** CJC sensor attached to the input terminals**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****■ DC Current:** 0 – 20 mA DC**Minimum span:** 1 mA**Offset:** Max. 1.5 times span**Load resistance:** Output drive 15 V max.**■ DC Voltage:** -10 – +12 V DC**Minimum span:** 5 mV**Offset:** Max. 1.5 times span**Load resistance:** Output drive 1 mA max.; at ≥ 0.5 V**INSTALLATION****Power input****•AC:** Approx. 4.5 VA**•DC:** 24 V approx. 70 mA

110 V approx. 20 mA

Operating temperature: -5 to +55°C (23 to 131°F)**Operating humidity:** 30 to 90 %RH (non-condensing)**Mounting:** Surface or DIN rail; Standard Rack Mounting

Frame BX-16H available

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)**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)

Burnout response: ≤ 10 sec.**Line voltage effect:** ± 0.1 % over voltage range**Insulation resistance:** ≥ 100 MΩ with 500 V DC**Dielectric strength****Power input code R:**

1000 V AC @ 1 minute (input to output)

2000 V AC @ 1 minute (input or output or power to ground)

500 V AC @ 1 minute (I/O to power)

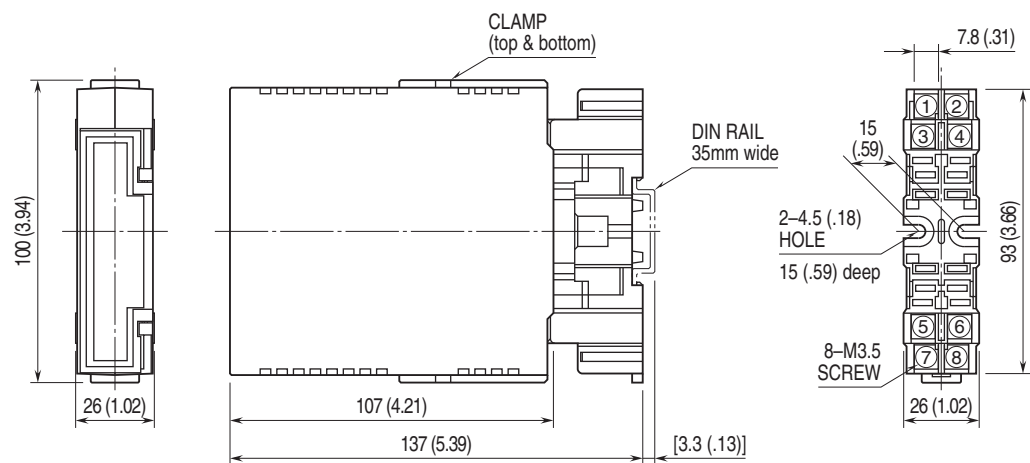
Power input code K, L, P:

1000 V AC @ 1 minute (input to output)

2000 V AC @ 1 minute (input or output or power to ground)

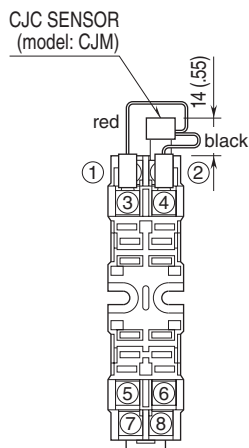
1500 V AC @ 1 minute (I/O to power)

EXTERNAL DIMENSIONS unit: mm (inch)

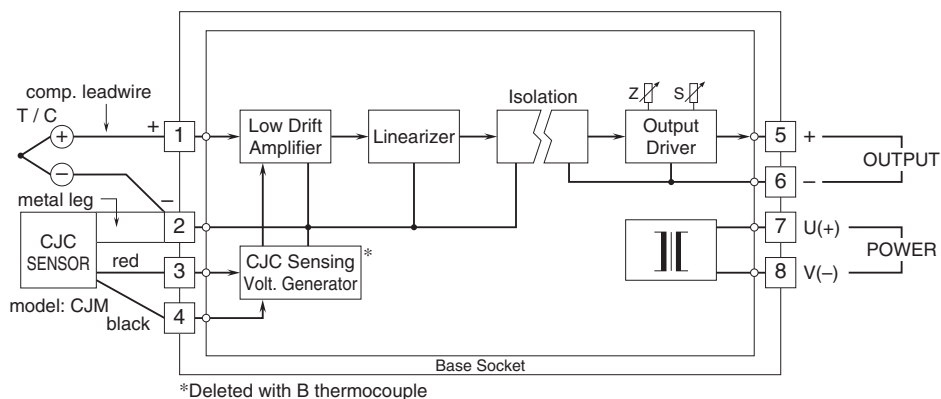


•When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.