

Plug-in Signal Conditioners K-UNIT

THERMOCOUPLE TRANSMITTER

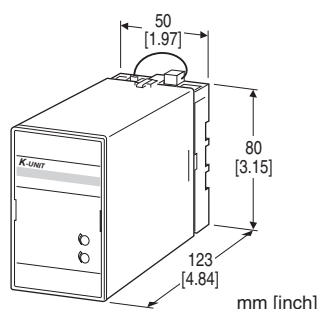
(CE, isolated)

Functions & Features

- Accepting direct input from a thermocouple and providing a standard process signal
- 7-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Signal isolation
- 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: KTS-[1][2]-[3][4]/CE

ORDERING INFORMATION

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

[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 3000 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

- G: 200 V AC
 H: 220 V AC
 J: 240 V AC

DC Power

- S: 12 V DC
 R: 24 V DC

[4] OPTIONS (multiple selections)

Response Time (0 - 90 %)

blank: Standard (≤ 0.5 sec.)

/K: Fast Response (Approx. 25 msec.)

Burnout

blank: Upscale burnout

/BL: Downscale burnout

/BN: No burnout

Standards & Approvals (must be specified)

/CE: CE marking

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3.5 screw terminals

Screw terminal: Chromated 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)
At burnout: Downscale ≤ -10 %, Upscale ≥ 110 %
 (When the offset is negative, downscale ≤ -8 %, upscale ≥ 108 %.)
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 k Ω min.
Burnout sensing: 0.1 μ A

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

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

Note: The described accuracy may be partially not satisfied when the temperature ranges below 0 $^{\circ}$ 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 ≥ 3 V

INSTALLATION

Power input

- **AC:** Operational voltage range: rating ± 10 %, 50/60 ± 2 Hz, approx. 2 VA
- **DC:** Operational voltage range: rating ± 10 % ripple 10 %p-p max., approx. 2.6 W (110 mA at 24 V)

Operating temperature: -5 to +55 $^{\circ}$ C (23 to 131 $^{\circ}$ F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 350 g (0.77 lb)

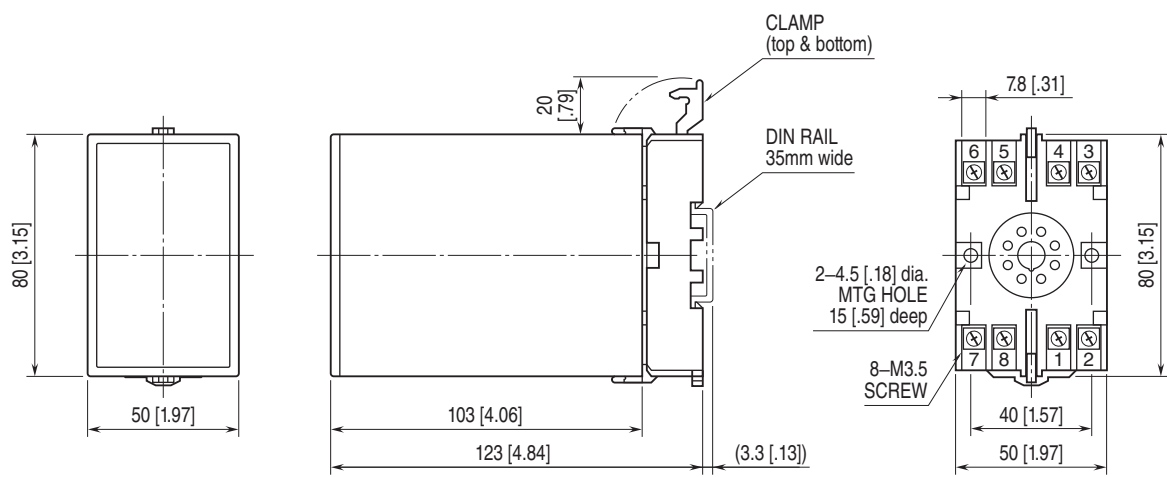
PERFORMANCE in percentage of span

Accuracy: ± 0.3 % (at over 400 $^{\circ}$ C or 750 $^{\circ}$ F for R, S and PR; over 770 $^{\circ}$ C or 1420 $^{\circ}$ F for B)
Cold junction compensation error
 (at 20 $^{\circ}$ C $\pm 10^{\circ}$ C or 68 $^{\circ}$ F $\pm 18^{\circ}$ F)
K, E, J, T, N: $\pm 0.5^{\circ}$ C or $\pm 0.9^{\circ}$ F
S, R, PR: $\pm 1^{\circ}$ C or $\pm 1.8^{\circ}$ F
Temp. coefficient: ± 0.02 %/ $^{\circ}$ C (± 0.01 %/ $^{\circ}$ F)
 (at over 400 $^{\circ}$ C or 750 $^{\circ}$ F for R, S and PR; over 770 $^{\circ}$ C or 1420 $^{\circ}$ F for B)
Burnout response: ≤ 10 sec.
Line voltage effect: ± 0.1 % over voltage range
Insulation resistance: ≥ 100 M Ω with 500 V DC
Dielectric strength:
 1350 V AC @1 minute (input to output)
 2300 V AC @1 minute (input or output to power to ground)

STANDARDS & APPROVALS

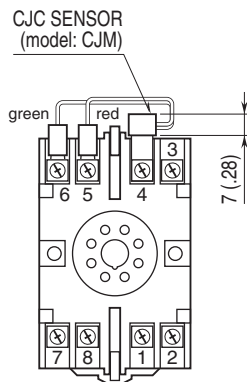
EU conformity:
 EMC Directive
 EMI EN 61000-6-4
 EMS EN 61000-6-2
 Low Voltage Directive
 EN 61010-1
 Installation Category II
 Pollution Degree 2
 Input or output to power: Reinforced insulation (300 V)
 Input to output: Basic insulation (300 V)
 RoHS Directive

EXTERNAL DIMENSIONS unit: mm [inch]

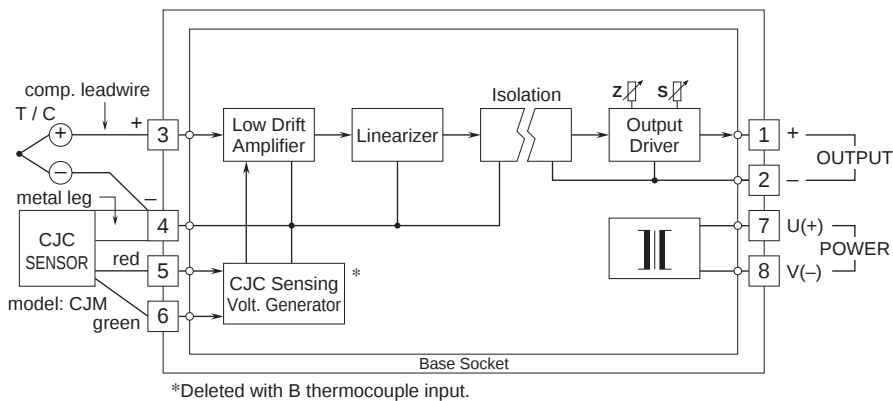


• When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm [inch]



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.