

## Dual Output Plug-in Signal Conditioners W-UNIT

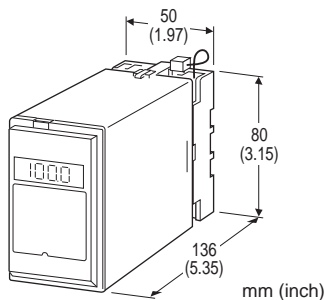
### THERMOCOUPLE TRANSMITTER

#### Functions & Features

- Accepting direct input from a thermocouple and providing two standard process signals
- 7-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Isolation up to 2000 V AC
- Fast response type available
- LCD meter
- High-density mounting

#### Typical Applications

- High-accuracy cold junction compensation benefits narrow span measurements
- 0.1  $\mu$ 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
- Power plant (2000 V AC isolation, 110 V DC power supply)



### MODEL: WTS-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: WTS-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5].  
(e.g. WTS-2AA-B/E/BL/Q)
- Temperature range (e.g. 0 - 800°C)
  - Special output ranges (For codes Z & 0)
  - Specify the specification for option code /Q  
(e.g. /C01/S01)

Note: When the user requires a current and a voltage output, specify the current to be the Output 1 which allows a greater load.

#### [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

##### Current

- A: 4 - 20 mA DC (Load resistance 600  $\Omega$  max.)
- B: 2 - 10 mA DC (Load resistance 1200  $\Omega$  max.)
- C: 1 - 5 mA DC (Load resistance 2400  $\Omega$  max.)
- D: 0 - 20 mA DC (Load resistance 600  $\Omega$  max.)
- E: 0 - 16 mA DC (Load resistance 750  $\Omega$  max.)
- F: 0 - 10 mA DC (Load resistance 1200  $\Omega$  max.)
- G: 0 - 1 mA DC (Load resistance 12 k $\Omega$  max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 k $\Omega$  min.)
- 2: 0 - 100 mV DC (Load resistance 100 k $\Omega$  min.)
- 3: 0 - 1 V DC (Load resistance 1000  $\Omega$  min.)
- 4: 0 - 10 V DC (Load resistance 10 k $\Omega$  min.)
- 5: 0 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 6: 1 - 5 V DC (Load resistance 5000  $\Omega$  min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [3] OUTPUT 2

##### Current

- A: 4 - 20 mA DC (Load resistance 350  $\Omega$  max.)
- B: 2 - 10 mA DC (Load resistance 700  $\Omega$  max.)
- C: 1 - 5 mA DC (Load resistance 1400  $\Omega$  max.)
- D: 0 - 20 mA DC (Load resistance 350  $\Omega$  max.)
- E: 0 - 16 mA DC (Load resistance 430  $\Omega$  max.)
- F: 0 - 10 mA DC (Load resistance 700  $\Omega$  max.)
- G: 0 - 1 mA DC (Load resistance 7000  $\Omega$  max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

Same range availability as Output 1

**[4] 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

V: 48 V DC

P: 110 V DC

**[5] OPTIONS (multiple selections)****Input Signal Indicator**

blank: Without

/E: With (0.0 - 100.0 % display)

**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**Screw terminal:** Chromated steel (standard) or stainless 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)

Adjustable individually for each output 1 and output 2.

**Linearization:** Standard**Cold junction compensation:** CJC sensor attached to the

input terminals

**■ DISPLAY (Input indicator)**

LCD digital display: 0.0 - 100.0 % (min. digit 0.1 %)

(No scaling)

**INPUT SPECIFICATIONS****Minimum span:** 3 mV**Offset:** Max. 1.5 times span**Input resistance:** 30 k $\Omega$  min.**Burnout sensing:** 0.1  $\mu$ A**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 12 V max. for Output 1;  
7 V max. for Output 2**■ DC Voltage: -10 - +12 V DC****Minimum span:** 5 mV**Offset:** Max. 1.5 times span**Load resistance:** Output drive 1 mA max. at  $\geq 0.5$  V

## INSTALLATION

### Power input

- AC: Operational voltage range: rating  $\pm 10\%$ , 50/60  $\pm 2$  Hz, approx. 3 VA
- DC: Operational voltage range: rating  $\pm 10\%$ , or 85 - 150 V for 110 V rating, ripple 10 %p-p max., approx. 3 W (125 mA at 24 V)

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

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

**Mounting:** Surface or DIN rail

**Weight:** 400 g (0.88 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)

**Display accuracy:**  $\pm (0.3\% \text{ of FS} + 1 \text{ digit})$  (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  $\pm 10^\circ\text{C}$  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:**  $\pm 0.015\%/\text{C}$  ( $\pm 0.008\%/\text{F}$ )

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

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

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

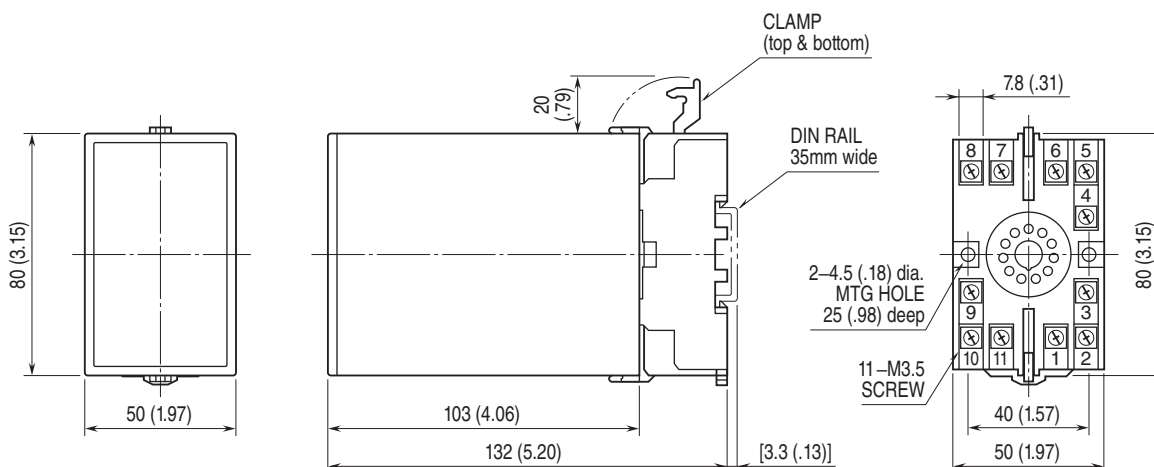
**Insulation resistance:**  $\geq 100 \text{ M}\Omega$  with 500 V DC

**Dielectric strength:** 2000 V AC @1 minute

(input to output to power to ground)

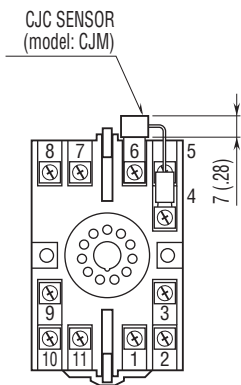
1000 V AC @ 1 minute (output 1 to output 2)

## EXTERNAL DIMENSIONS unit: mm (inch)

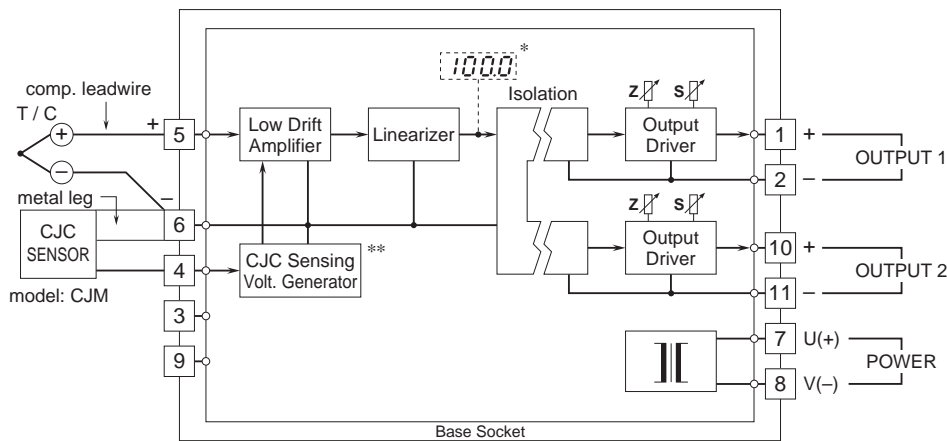


• When mounting, no extra space is needed between units.

**TERMINAL ASSIGNMENTS unit: mm (inch)**



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\* Option /E  
 \*\* Deleted with B thermocouple



Specifications are subject to change without notice.