

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

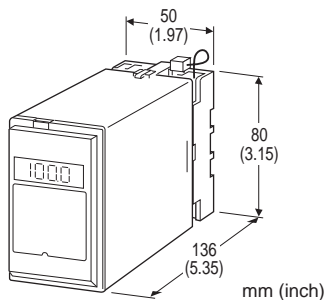
### THERMOCOUPLE TRANSMITTER

#### 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 [1] through [5].  
(e.g. WTS-2AA-B/E/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)

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)  
**Linearization:** Standard  
**Cold junction compensation:** CJC sensor attached to the input terminals  
**LCD meter:** Indicating input; 0.1 % increments

## 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

**Remark:** 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  $400^{\circ}\text{C}$  or  $750^{\circ}\text{F}$  for R, S and PR; over  $770^{\circ}\text{C}$  or  $1420^{\circ}\text{F}$  for B)

**Display accuracy:**  $\pm (0.3\% \text{ of FS} + 1 \text{ digit})$  (at over  $400^{\circ}\text{C}$  or  $750^{\circ}\text{F}$  for R, S and PR; over  $770^{\circ}\text{C}$  or  $1420^{\circ}\text{F}$  for B)

**Cold junction compensation error**

(at  $20^{\circ}\text{C} \pm 10^{\circ}\text{C}$  or  $68^{\circ}\text{F} \pm 18^{\circ}\text{F}$ )

**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  $400^{\circ}\text{C}$  or  $750^{\circ}\text{F}$  for R, S and PR; over  $770^{\circ}\text{C}$  or  $1420^{\circ}\text{F}$  for B)

**Burnout response:**  $\leq 10 \text{ sec.}$

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

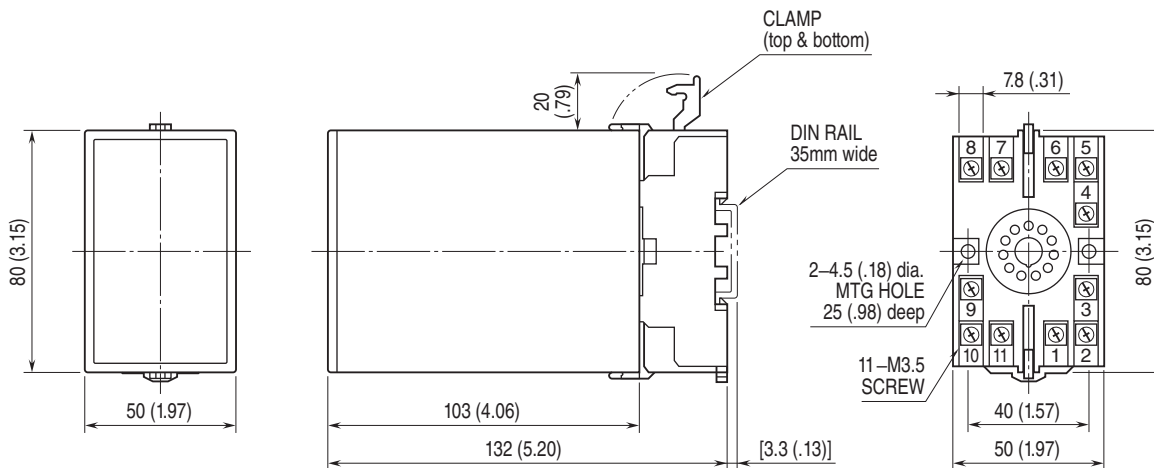
**Insulation resistance:**  $\geq 100 \text{ M}\Omega$  with  $500 \text{ V DC}$

**Dielectric strength:**  $2000 \text{ V AC @ 1 minute}$

(input to output to power to ground)

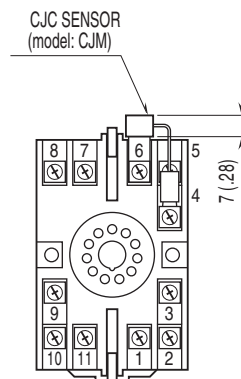
$1000 \text{ V AC @ 1 minute}$  (output 1 to output 2)

## DIMENSIONS unit: mm (inch)

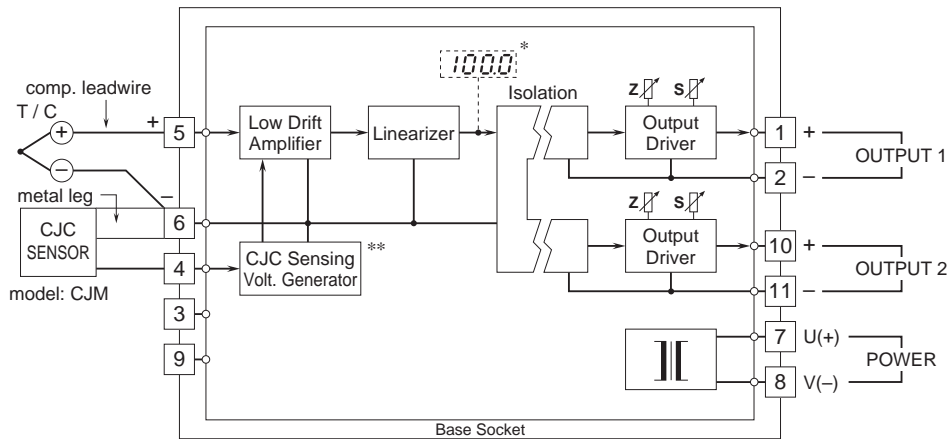


• When mounting, no extra space is needed between units.

## TERMINAL ASSIGNMENTS unit: mm (inch)



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



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



Specifications are subject to change without notice.

