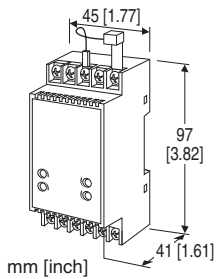


## Terminal Block Dual Output Signal Conditioners W5-UNIT

### THERMOCOUPLE TRANSMITTER

#### Functions & Features

- Accepts direct input from a thermocouple
- Two independent output ranges
- Linearization and burnout
- Cold junction compensation
- Fast response type available
- High-density mounting



### MODEL: W5TS-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: W5TS-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5].  
(e.g. W5TS-2A6-R/K/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/V01/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 1

##### Current

- A: 4 - 20 mA DC (Load resistance 550 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1100 Ω max.)
- C: 1 - 5 mA DC (Load resistance 2200 Ω max.)
- D: 0 - 20 mA DC (Load resistance 550 Ω max.)
- E: 0 - 16 mA DC (Load resistance 685 Ω max.)

- F: 0 - 10 mA DC (Load resistance 1100 Ω max.)
- G: 0 - 1 mA DC (Load resistance 11 kΩ max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

##### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 100 Ω min.)
- 4: 0 - 10 V DC (Load resistance 1000 Ω min.)
- 5: 0 - 5 V DC (Load resistance 500 Ω min.)
- 6: 1 - 5 V DC (Load resistance 500 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [3] OUTPUT 2

- Same range availability as Output 1
- Y: None

#### [4] POWER INPUT

##### AC Power

- M: 85 - 264 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)  
(CE not available)

##### DC Power

- R: 24 V DC  
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)
- R2: 11 - 27 V DC  
(Operational voltage range 11 - 27 V, ripple 10 %p-p max.)  
(CE not available)
- P: 110 V DC  
(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)  
(CE not available)

#### [5] 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

##### 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

##### ADJUSTMENT

- /V01: Multi-turn fine adjustment

## TERMINAL SCREW MATERIAL

/S01: Stainless steel

## GENERAL SPECIFICATIONS

**Construction:** Terminal block

**Connection**

**Input:** M3.5 screw terminals (torque 0.8 N·m)

**Output & power:** M3 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 1 to output 2 to power

**Overrange output:** Approx. -10 to +120 % at 1 - 5 V

**Zero adjustment:** -2 to +2 % (front)

**Span adjustment:** 98 to 102 % (front)

**At burnout:** Downscale  $\leq$  -10 %, Upscale  $\geq$  110 %, For output code 4W, Downscale  $\leq$  -3%, Upscale  $\geq$  103%

**Linearization:** Standard

**Cold junction compensation:** CJC sensor attached to the input terminals

**Cold junction compensation:** CJC sensor attached to the input terminals

## INPUT SPECIFICATIONS

**Minimum span:** 3 mV

**Input resistance:** 20 k $\Omega$  min.

**Burnout sensing:** 0.1  $\mu$ A

### Lower temperature range & span (in °C)

(PR): Lower range 0 to 880°C; min. span 370°C

K (CA): Lower range -270 to +1200°C; min. span 75°C

E (CRC): Lower range -270 to +750°C; min. span 50°C

J (IC): Lower range -210 to +800°C; min. span 60°C

T (CC): Lower range -270 to +325°C; min. span 75°C

B (RH): Lower range 0 to 750°C; min. span 780°C

R: Lower range -50 to +550°C; min. span 360°C

S: Lower range -50 to +550°C; min. span 380°C

N: Lower range -270 to +1100°C; min. span 110°C

### Lower temperature range & span (in °F)

(PR): Lower range 32 to 1616°F; min. span 670°F

K (CA): Lower range -454 to +2192°F; min. span 140°F

E (CRC): Lower range -454 to +1382°F; min. span 90°F

J (IC): Lower range -346 to +1472°F; min. span 110°F

T (CC): Lower range -454 to +617°F; min. span 140°F

B (RH): Lower range 32 to 1382°F; min. span 1450°F

R: Lower range -58 to +1022°F; min. span 680°F

S: Lower range -58 to +1022°F; min. span 700°F

N: Lower range -454 to +2012°F; 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 11 V max.

■ **DC Voltage:** -10 - +12 V DC

**Spans:** Min. 5 mV, max. 20 V

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 10 mA max.; 5 mA for negative voltage output; at  $\geq$  0.5 V

## INSTALLATION

**Power Consumption**

• **AC:**

Approx. 4 VA at 100 V

Approx. 5 VA at 200 V

Approx. 6 VA at 264 V

• **DC:** Approx. 3 W

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

**Operating humidity:** 0 to 90 %RH (non-condensing)

**Mounting:** DIN rail

**Weight:** 130 g (0.29 lb)

## PERFORMANCE in percentage of span

**Accuracy** (whichever is greater)

K, E, J:  $\pm$ 0.1 % of FS or  $\pm$ 0.2°C ( $\pm$ 0.36°F)

T, N:  $\pm$ 0.2 % of FS or  $\pm$ 0.2°C ( $\pm$ 0.36°F)

PR, B, R, S:  $\pm$ 0.3 % of FS

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

**Cold junction compensation error**

(at 20°C  $\pm$ 10°C or 68°F  $\pm$ 18°F)

K, E, J, T, N:  $\pm$ 0.5°C or  $\pm$ 0.9°F

S, R, PR:  $\pm$ 1°C or  $\pm$ 1.8°F

**Temp. coefficient:**  $\pm$ 0.015 %/°C ( $\pm$ 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:**  $\leq$  10 sec.

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

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

**Dielectric strength:**

2000 V AC @1 minute (input to output 1 or output 2 to power to ground)

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

## STANDARDS & APPROVALS

EU conformity:

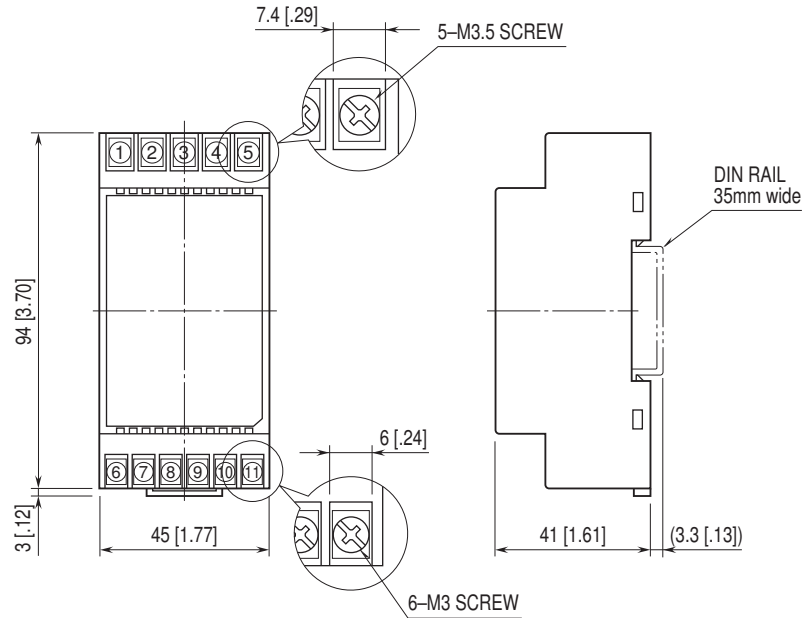
EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

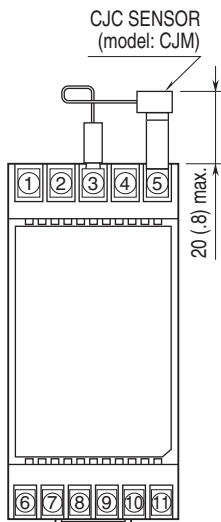
RoHS Directive

## EXTERNAL DIMENSIONS unit: mm [inch]

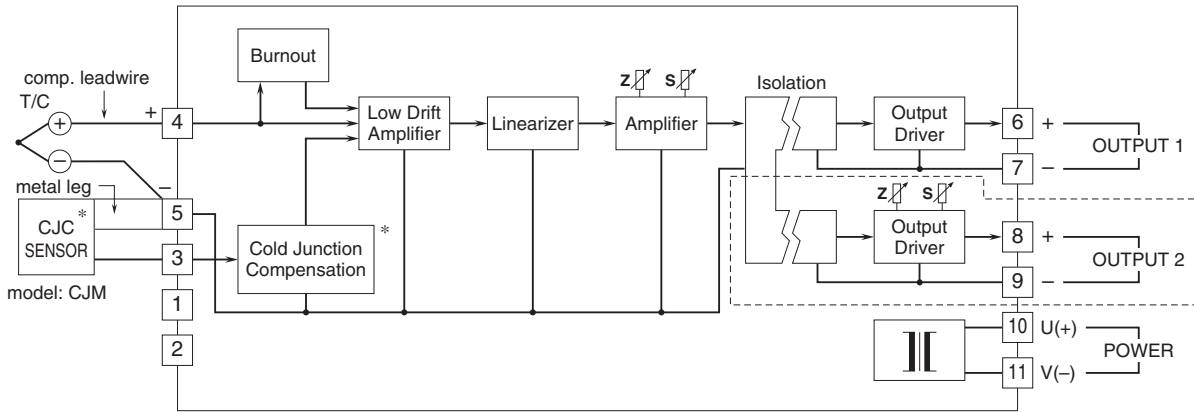


• When mounting, no extra space is needed between units.

## TERMINAL ASSIGNMENTS unit: mm [inch]



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\*Deleted with B thermocouple

Note 1: The section enclosed by broken line is only with 2nd output option.

Note 2: DO NOT connect to the terminals 1 – 2.



Specifications are subject to change without notice.