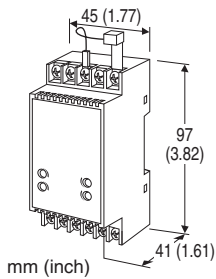


Terminal Block Dual Output Signal Conditioners W5-UNIT

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 [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 ≤ -10 %, Upscale ≥ 110 %, For output code 4W, Downscale ≤ -3 %, Upscale ≥ 103 %

Linearization: Standard

Cold junction compensation: CJC sensor attached to the input terminals

INPUT SPECIFICATIONS

Minimum span: 3 mV

Input resistance: 20 k Ω min.

Burnout sensing: 0.1 μ A

Lower temperature range & span (in $^{\circ}$ C)

(PR): Lower range 0 to 880 $^{\circ}$ C; min. span 370 $^{\circ}$ C

K (CA): Lower range -270 to +1200 $^{\circ}$ C; min. span 75 $^{\circ}$ C

E (CRC): Lower range -270 to +750 $^{\circ}$ C; min. span 50 $^{\circ}$ C

J (IC): Lower range -210 to +800 $^{\circ}$ C; min. span 60 $^{\circ}$ C

T (CC): Lower range -270 to +325 $^{\circ}$ C; min. span 75 $^{\circ}$ C

B (RH): Lower range 0 to 750 $^{\circ}$ C; min. span 780 $^{\circ}$ C

R: Lower range -50 to +550 $^{\circ}$ C; min. span 360 $^{\circ}$ C

S: Lower range -50 to +550 $^{\circ}$ C; min. span 380 $^{\circ}$ C

N: Lower range -270 to +1100 $^{\circ}$ C; min. span 110 $^{\circ}$ C

Lower temperature range & span (in $^{\circ}$ F)

(PR): Lower range 32 to 1616 $^{\circ}$ F; min. span 670 $^{\circ}$ F

K (CA): Lower range -454 to +2192 $^{\circ}$ F; min. span 140 $^{\circ}$ F

E (CRC): Lower range -454 to +1382 $^{\circ}$ F; min. span 90 $^{\circ}$ F

J (IC): Lower range -346 to +1472 $^{\circ}$ F; min. span 110 $^{\circ}$ F

T (CC): Lower range -454 to +617 $^{\circ}$ F; min. span 140 $^{\circ}$ F

B (RH): Lower range 32 to 1382 $^{\circ}$ F; min. span 1450 $^{\circ}$ F

R: Lower range -58 to +1022 $^{\circ}$ F; min. span 680 $^{\circ}$ F

S: Lower range -58 to +1022 $^{\circ}$ F; min. span 700 $^{\circ}$ F

N: Lower range -454 to +2012 $^{\circ}$ F; min. span 200 $^{\circ}$ F

Remark: 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 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 ≥ 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 $^{\circ}$ C (23 to 131 $^{\circ}$ 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: ± 0.1 % of FS or $\pm 0.2^{\circ}$ C ($\pm 0.36^{\circ}$ F)

T, N: ± 0.2 % of FS or $\pm 0.2^{\circ}$ C ($\pm 0.36^{\circ}$ F)

PR, B, R, S: ± 0.3 % of FS

(at over 400 $^{\circ}$ C for R, S and PR; over 770 $^{\circ}$ C 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: ± 0.015 %/ $^{\circ}$ C (± 0.008 %/ $^{\circ}$ 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:

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

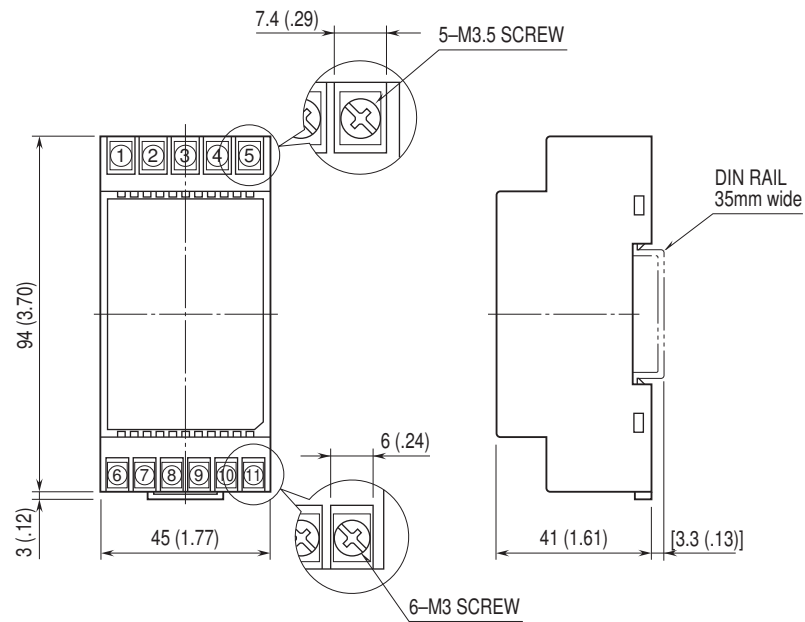
EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

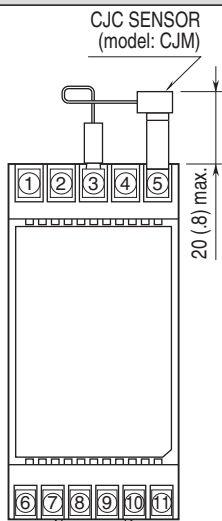
EN 50581

EXTERNAL DIMENSIONS unit: mm (inch)

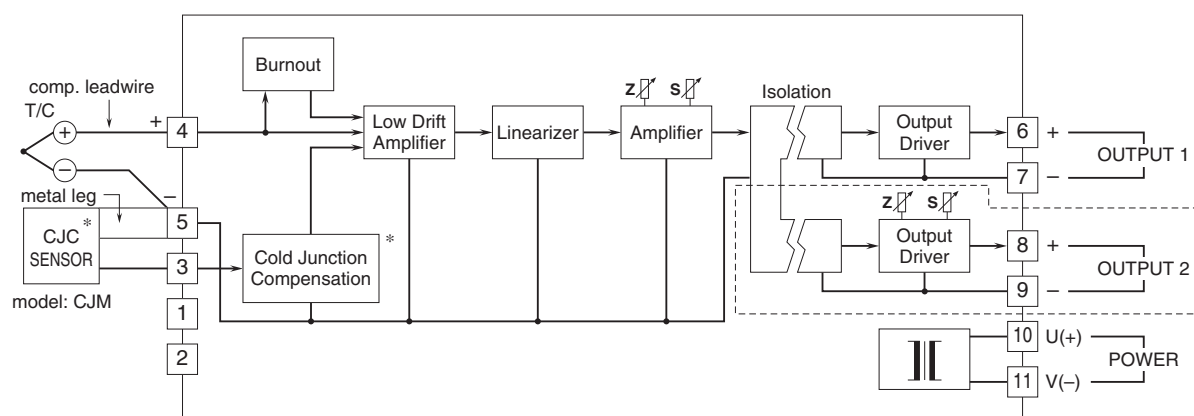


• When mounting, no extra space is needed between units.

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.