

Terminal Block Dual Output Signal Conditioners *W5-UNIT*

THERMOCOUPLE TRANSMITTER

MODEL **W5TS**

MODEL & SUFFIX CODE SELECTION

W5TS-□□□-□□

MODEL _____

INPUT THERMOCOUPLE _____

- | | |
|-------------|-------------|
| 1 : (PR) | 6 : B (RH) |
| 2 : K (CA) | 7 : R |
| 3 : E (CRC) | 8 : S |
| 4 : J (IC) | N : N |
| 5 : T (CC) | 0 : Specify |

OUTPUT 1 _____

Current

- | | |
|-----------------|---------------------|
| A : 4 – 20mA DC | 1 : 0 – 10mV DC |
| B : 2 – 10mA DC | 2 : 0 – 100mV DC |
| C : 1 – 5mA DC | 3 : 0 – 1V DC |
| D : 0 – 20mA DC | 4 : 0 – 10V DC |
| E : 0 – 16mA DC | 5 : 0 – 5V DC |
| F : 0 – 10mA DC | 6 : 1 – 5V DC |
| G : 0 – 1mA DC | 0 : Specify voltage |

Z : Specify current

OUTPUT 2 _____

Same range availability as Output 1

Y : None

POWER INPUT _____

AC Power

M : 85 – 264V AC *1

DC Power

- R : 24V DC
R2: 11 – 27V DC *1
P : 110V DC *1

*1 : CE not available

OPTIONS _____

/K : Fast response

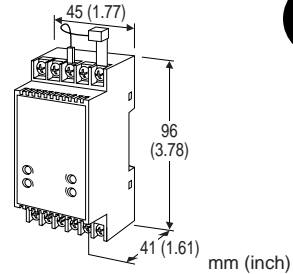
/BN: No burnout

/BL : Downscale burnout

ORDERING INFORMATION

Specify code number and variables. When only one (1) output is needed, the output must be assigned to Output 1 terminal.

- **Code number** (e.g. W5TS-2A6-R/K/BL)
- **Temperature range** (e.g. 0 – 800°C)
- **Special output range** (For codes Z & 0)



Functions & Features

- Accepts direct input from a thermocouple
- Two independent output ranges
- Universal power input
- Cold junction compensation
- Linearization
- Burnout protection
- Fast response type available
- High-density mounting
- CE marking for 24V DC power

GENERAL SPECIFICATIONS

Construction: Terminal block

Connection

Input: M3.5 screw terminals

Output & power: M3 screw terminals

Screw material: Nickel-plated steel
(torque 0.8 N·m)

Housing material: Flame-resistant resin (black)

Isolation: Input to output 1 to output 2 to power

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

Front adjustments: ±2% for zero and span

Burnout protection: Upscale standard; downscale or no burnout optional

Linearization: Standard

Cold Junction Compensation: CJC sensor attached to the input terminals

INPUT & OUTPUT

■ **INPUT:** Thermocouples

Minimum span: 3mV

Input resistance: 20k Ω minimum

Burnout sensing: 0.1 μ A

Temperature range

| T/C | USABLE RANGE | LOWER RANGE | MIN. SPAN |
|---------|-----------------|-----------------|-----------|
| (PR) | 0 to 1760°C | 0 to 880°C | 370°C |
| K (CA) | -270 to +1370°C | -270 to +1200°C | 75°C |
| E (CRC) | -270 to +1000°C | -270 to +750°C | 50°C |
| J (IC) | -210 to +1200°C | -210 to +800°C | 60°C |
| T (CC) | -270 to +400°C | -270 to +325°C | 75°C |
| B (RH) | 0 to 1820°C | 0 to 750°C | 780°C |
| R | -50 to +1760°C | -50 to +550°C | 360°C |
| S | -50 to +1760°C | -50 to +550°C | 380°C |
| N | -270 to +1300°C | -270 to +1100°C | 110°C |
| T/C | USABLE RANGE | LOWER RANGE | MIN. SPAN |
| (PR) | 32 to 3200°F | 32 to 1616°F | 670°F |
| K (CA) | -454 to +2498°F | -454 to +2192°F | 140°F |
| E (CRC) | -454 to +1832°F | -454 to +1382°F | 90°F |
| J (IC) | -346 to +2192°F | -346 to +1472°F | 110°F |
| T (CC) | -454 to +752°F | -454 to +617°F | 140°F |
| B (RH) | 32 to 3308°F | 32 to 1382°F | 1450°F |
| R | -58 to +3200°F | -58 to +1022°F | 680°F |
| S | -58 to +3200°F | -58 to +1022°F | 700°F |
| N | -454 to +2372°F | -454 to +2012°F | 200°F |

Remark: The transmitter may not satisfy specified accuracy for temperature ranges below 0°C. For more details, consult M-System.

■ **OUTPUTS (two)**

• **DC Current:** 0 – 20mA DC

Minimum span: 1mA

Zero suppression/elevation: Max. 1.5 times span

Load resistance: output drive 11V maximum

| Output | Load Resistance |
|----------|---------------------------|
| 4 – 20mA | : 550 (Ω maximum) |
| 2 – 10mA | : 1100 |
| 1 – 5mA | : 2200 |
| 0 – 20mA | : 550 |
| 0 – 16mA | : 685 |
| 0 – 10mA | : 1100 |
| 0 – 1mA | : 11k |

• **DC Voltage:** -10 – +12V DC

Spans: Min. 5mV, max. 20V

Zero suppression/elevation: Max. 1.5 times span

Load resistance: Output drive 10mA maximum;
5mA for negative voltage output; at ≥ 0.5 V

| Output | Load Resistance |
|-----------|---------------------------|
| 0 – 10mV | : 10k (Ω minimum) |
| 0 – 100mV | : 100k |
| 0 – 1V | : 100 |
| 0 – 10V | : 1000 |
| 0 – 5V | : 500 |
| 1 – 5V | : 500 |

INSTALLATION**Power input**

AC: Operational voltage range 85 – 264V;
47 – 66 Hz; approx. 4VA at 100V
approx. 5VA at 200V
approx. 6VA at 264V

DC: Operational voltage range for R: 24V
 $\pm 10\%$, R2: 11 – 27V, or P: 85 – 150V;
ripple 10% p-p max.; approx. 3W

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

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

Mounting: DIN rail

Dimensions: W45×H116×D41 mm (1.77"×4.57"×1.61")
See General Spec. Sheet Figure A-1.

Weight: 130 g (0.29 lbs)

Terminal assignment: See General Spec. Sheet Figure B-2.

PERFORMANCE in percentage of span

Accuracy (whichever is greater)

K, E, J: $\pm 0.1\%$ of FS or $\pm 0.2^\circ\text{C}$

T, N: $\pm 0.2\%$ of FS or $\pm 0.2^\circ\text{C}$

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 $\pm 10^\circ\text{C}$ or 68°F $\pm 18^\circ\text{F}$)

K, E, J, T & N: $\pm 0.5^\circ\text{C}$ or $\pm 0.9^\circ\text{F}$ maximum

S, R & PR: $\pm 1^\circ\text{C}$ or $\pm 1.8^\circ\text{F}$ maximum

Temp. coefficient: $\pm 0.015\%/^\circ\text{C}$ ($\pm 0.008\%/^\circ\text{F}$)

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

Response time: ≤ 0.5 seconds (0 – 90%)

approx. 25 milliseconds with option /K

Burnout response: ≤ 10 seconds

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

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

Dielectric strength: 2000V AC @1 minute

(input to output 1 or output 2 to power)

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

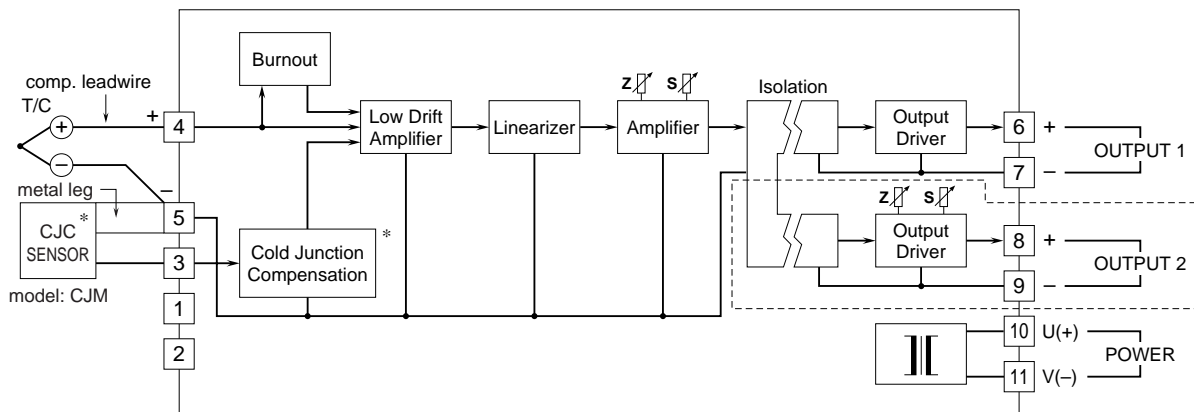
STANDARDS & APPROVALS

CE conformity: EMC Directive (89/336/EEC)

EMI EN61000-6-4

EMS EN61000-6-2

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Deleted with B thermocouple

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

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