

Space-saving Dual Output Signal Conditioners *Mini-MW Series*

THERMOCOUPLE TRANSMITTER

MODEL **W2TS**

MODEL & SUFFIX CODE SELECTION

MODEL _____ W2TS-□□□-□□□

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	Voltage
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	DC Power
M2: 100 – 240V AC	R : 24V DC
	R2: 11 – 27V DC *1
	P : 110V DC

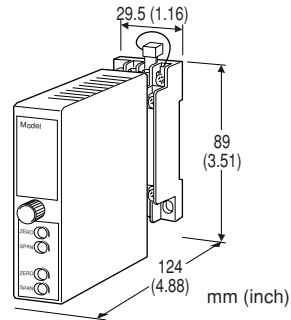
*1 : Select 'N' for 'Standards & Approvals' code.

OPTIONS (none or multiple selections) _____

/K : Fast response
 /BN: No burnout
 /BL: Downscale burnout

STANDARDS & APPROVALS (must be specified) _____

/N : Without CE or UL
 /CE: CE marking
 /UL: UL approval (CE marking)



Functions & Features

- Accepting direct input from a thermocouple
- Two independent output ranges
- 5-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Universal power input
- Fast response type available
- High-density mounting
- CE marking
- UL approval

Typical Applications

- High-accuracy cold junction compensation benefits narrow span measurements
- 0.1µA burnout sensing enables long distance transmission with minimum offset drifts
- Electric furnace (isolation ensured even when 200V AC power for heater leaks through furnace wall)
- No burnout type can connect to a single T/C in parallel with a recorder

ORDERING INFORMATION

Specify code number and variables. When the user requires a current and a voltage output, specify the current to be the Output 1 which allows a greater load.

- **Code number** (e.g. W2TS-2A6-M2/BL/CE)
- **Temperature range** (e.g. 0 – 800°C)
- **Special output ranges** (For codes Z & 0)

GENERAL SPECIFICATIONS

- Construction:** plug-in
- Connection:** M3 screw terminals (torque 0.8 N·m)
- Housing material:** flame-resistant resin (black)
- Isolation:** input to output 1 to output 2 to power
- Ovrange output:** approx. -10 – +120% at 1 – 5V
- Front adjustments:** zero and span; ±5%
- 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

Zero suppression/elevation: max. 1.5 times span

Input resistance: 30k Ω minimum

Burnout sensing: 0.1 μ A

Temperature range

T/C	USABLE RANGE		MIN. SPAN	
	$^{\circ}$ C	$^{\circ}$ F	$^{\circ}$ C	$^{\circ}$ F
(PR)	0 to 1760	32 to 3200	370	670
K (CA)	-270 to +1370	-450 to +2500	75	140
E (CRC)	-270 to +1000	-450 to +1830	50	100
J (IC)	-210 to +1200	-350 to +2190	60	110
T (CC)	-270 to +400	-450 to +750	75	140
B (RH)	0 to 1820	32 to 3300	780	1440
R	-50 to +1760	-50 to +3200	360	680
S	-50 to +1760	-50 to +3200	380	700
N	-270 to +1300	-450 to +2370	110	200

Remark: For the temperatures that range below 0 $^{\circ}$ C, the transmitter may partially not satisfy the described accuracy. Consult factory.

■ **OUTPUTS (two)**

• **DC Current:** 0 – 20mA DC

Minimum span: 1mA

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 15V max. for Output 1;
7V max. for Output 2

Output	Ch.1 L.R.	Ch.2 L.R.
4 – 20mA	: 750	350 (Ω max.)
2 – 10mA	: 1500	700
1 – 5mA	: 3000	1400
0 – 20mA	: 750	350
0 – 16mA	: 900	430
0 – 10mA	: 1500	700
0 – 1mA	: 15k	7000

• **DC Voltage:** -10 – +12V DC (up to +10V for Out. 2)

Minimum span: 5mV

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 1mA maximum at ≥ 0.5 V

Output	Load Resistance
0 – 10mV	: 10k (Ω minimum)
0 – 100mV	: 100k
0 – 1V	: 1000
0 – 10V	: 10k
0 – 5V	: 5000
1 – 5V	: 5000

INSTALLATION**Power input**

AC: operational voltage range 85 – 264V
(90 – 264V for UL);
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
(110V $\pm 10\%$ for UL);
ripple 10% p-p max.; approx. 3W

Operating temperature: -5 to +55 $^{\circ}$ C (23 to 131 $^{\circ}$ F)

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

Mounting: surface or DIN rail

Dimensions: W29.5xH102xD124 mm (1.16"x4.02"x4.88")

See General Spec. Sheet Figure A-1.

Weight: 200 g (0.44 lbs)

Terminal assignment: See General Spec. Sheet Figure B-3.

PERFORMANCE in percentage of span

Accuracy: $\pm 0.4\%$ (at over 400 $^{\circ}$ C or 750 $^{\circ}$ F for R, S and PR; over 770 $^{\circ}$ C or 1420 $^{\circ}$ F 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 maximum

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

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

(at over 770 $^{\circ}$ C or 1420 $^{\circ}$ F 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: ≥ 100 M Ω with 500V DC

Dielectric strength: 2000V AC @1 minute (input to output 1 to output 2 to power to ground)

STANDARDS & APPROVALS

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

EMI EN61000-6-4

EMS EN61000-6-2

Low Voltage Directive (73/23/EEC)

EN61010-1

Installation category II

Pollution degree 2

Max. operating voltage 300V

Input or output 1 or output 2 to power
– Reinforced insulation

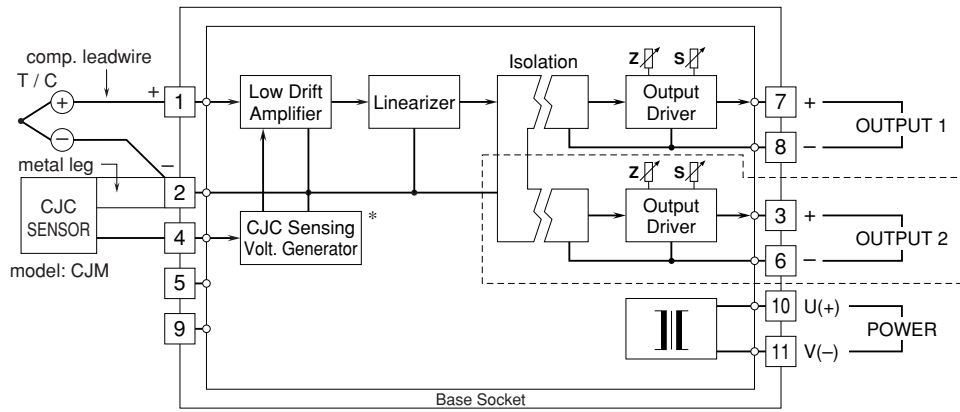
Input to output 1 to output 2 – Basic insulation

Approval: UL/C-UL nonincendive

Class I, Division 2, Groups A, B, C, and D
(UL 1604, CAN/CSA-C22.2 No.213)

UL/C-UL general safety requirements
(UL 3111-1, CAN/CSA-C22.2 No.1010-1)

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Deleted with B thermocouple.

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