

Super-mini Signal Conditioners *Mini-M Series*

THERMOCOUPLE TRANSMITTER

MODEL **M2TS**

MODEL & SUFFIX CODE SELECTION

MODEL _____ M2TS-□□-□□□□

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 _____

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

POWER INPUT _____

AC Power DC Power

M : 85 – 264V AC *1 R : 24V DC
 M2: 100 – 240V AC 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) _____

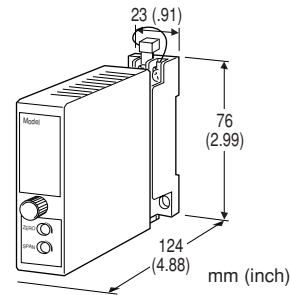
/N : Without CE or UL
 /CE: CE marking
 /UL : UL approval (CE marking)

ORDERING INFORMATION

- Specify code number and variables.
- **Code number** (e.g. M2TS-2A-M2/BL/CE)
 - **Temperature range** (e.g. 0 – 800°C)
 - **Special output range** (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 to power
Overrange output: approx. -10 – +120% at 1 – 5V
Front adjustments: zero and span; ±5%
Burnout protection: upscale standard; downscale or no burnout optional



Functions & Features

- Accepting direct input from a thermocouple and providing a standard process signal
- 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

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: 30kΩ minimum

Burnout sensing: 0.1µA

Temperature range

T/C	USABLE RANGE		MIN. SPAN	
	°C	°F	°C	°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°C, the transmitter may partially not satisfy the described accuracy. Consult factory.

OUTPUT

•DC Current: 0 – 20mA DC

Minimum span: 1mA

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 15V maximum

Output	Load Resistance
4 – 20mA	: 750 (Ω maximum)
2 – 10mA	: 1500
1 – 5mA	: 3000
0 – 20mA	: 750
0 – 16mA	: 900
0 – 10mA	: 1500
0 – 1mA	: 15k

•DC Voltage: -10 – +12V DC

Minimum span: 5mV

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 1mA maximum; at $\geq 0.5V$

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. 3VA at 100V
approx. 4VA at 200V
approx. 5VA 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°C (23 to 131°F)

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

Mounting: surface or DIN rail

Dimensions: W23×H90×D124 mm (0.91"×3.54"×4.88")

See General Spec. Sheet Figure A-1.

Weight: 150 g (0.33 lbs)

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

PERFORMANCE in percentage of span

Accuracy: $\pm 0.4\%$ (at over 400°C or 750°F for R, S and PR; over 770°C or 1420°F 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 770°C or 1420°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: $\geq 100M\Omega$ with 500V DC

Dielectric strength: 2000V AC @1 minute

(input to output 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 to power – Reinforced insulation

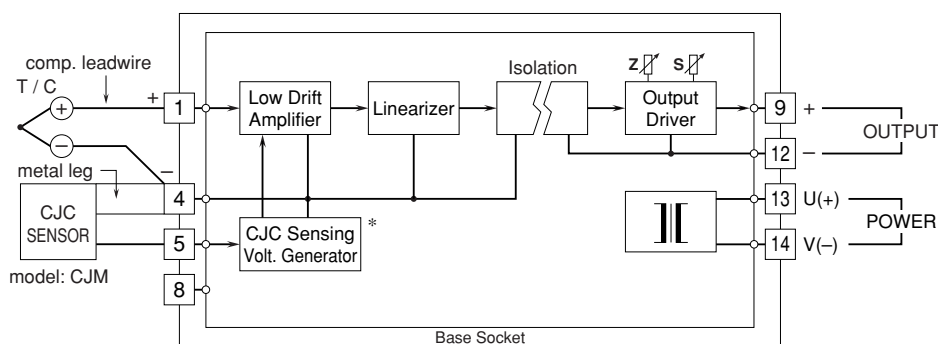
Input to output – Basic insulation

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.

Specifications subject to change without notice.