

Space-saving Dual Output Signal Conditioners Mini-MW Series

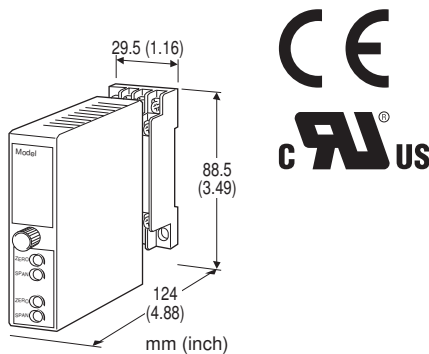
RTD TRANSMITTER

Functions & Features

- Accepts direct input from an RTD
- Linearization
- Burnout
- "Active bridge" circuit containing two constant current sources allows large leadwire resistances up to 200 Ω
- Fast response type available

Typical Applications

- Long distance transmission between the RTD and the transmitter
- Combination with intrinsic safety barriers



MODEL: W2RS-[1][2][3]-[4][5]

ORDERING INFORMATION

- Code number: W2RS-[1][2][3]-[4][5]

Specify a code from below for each [1] through [5].
(e.g. W2RS-4A6-M2/BL/CE/Q)

- Temperature range (e.g. 0 – 500°C)
- Special output ranges (For codes Z & 0)
- Specify the specification for option code /Q (e.g. /C01/V01)

For the input code C, specify also the following. If not specified, Cu 10 Ω @25°C (usable range -200 – +260°C) will be used.

- Input type (e.g. Cu 10 Ω)
- Resistance range (e.g. 9.038 – 12.891 Ω)

Note: If one of the outputs should be a current range, specify it for the Output 1 to allow a greater load.

[1] INPUT RTD (2- or 3-wire)

1: JPt 100 (JIS'89)

(Usable range: -200 to +500°C, -328 to +932°F; min.span: 50°C, 90°F)

3: Pt 100 (JIS'89)

(Usable range: -200 to +650°C, -328 to +1202°F; min.span: 50°C, 90°F)

4: Pt 100 (JIS'97, IEC)

(Usable range: -200 to +650°C, -328 to +1202°F; min.span: 50°C, 90°F)

5: Pt 50 Ω (JIS'81)

(Usable range: -200 to +500°C, -328 to +932°F; min.span: 100°C, 180°F)

6: Ni 508.4 Ω

(Usable range: -50 to +200°C, -58 to +392°F; min.span: 30°C, 54°F)

C: Cu (Refer to 'Cu INPUT'.)

0: Specify

Note: Consult M-System for 2-wire RTD

[2] OUTPUT 1

Current

A: 4 – 20 mA DC (Load resistance 750 Ω max.)

B: 2 – 10 mA DC (Load resistance 1500 Ω max.)

C: 1 – 5 mA DC (Load resistance 3000 Ω max.)

D: 0 – 20 mA DC (Load resistance 750 Ω max.)

E: 0 – 16 mA DC (Load resistance 900 Ω max.)

F: 0 – 10 mA DC (Load resistance 1500 Ω max.)

G: 0 – 1 mA DC (Load resistance 15 k Ω max.)

Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

1: 0 – 10 mV DC (Load resistance 10 k Ω min.)

2: 0 – 100 mV DC (Load resistance 100 k Ω min.)

3: 0 – 1 V DC (Load resistance 1000 Ω min.)

4: 0 – 10 V DC (Load resistance 10 k Ω min.)

5: 0 – 5 V DC (Load resistance 5000 Ω min.)

6: 1 – 5 V DC (Load resistance 5000 Ω min.)

0: Specify voltage (See OUTPUT SPECIFICATIONS)

[3] OUTPUT 2

Y: None

Current

A: 4 – 20 mA DC (Load resistance 350 Ω max.)

B: 2 – 10 mA DC (Load resistance 700 Ω max.)

C: 1 – 5 mA DC (Load resistance 1400 Ω max.)

D: 0 – 20 mA DC (Load resistance 350 Ω max.)

E: 0 – 16 mA DC (Load resistance 430 Ω max.)

F: 0 – 10 mA DC (Load resistance 700 Ω max.)

G: 0 – 1 mA DC (Load resistance 7000 Ω max.)

Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

Same range availability as Output 1

[4] POWER INPUT

AC Power

M2: 100 – 240 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)
(90 – 264 V for UL)

DC Power

R: 24 V DC
(Operational voltage range 24 V $\pm$ 10 %, ripple 10 %p-p max.)
R2: 11 – 27 V DC
(Operational voltage range 11 – 27 V, ripple 10 %p-p max.)
(Select 'N' for 'Standards & Approvals' code.)
P: 110 V DC
(Operational voltage range 85 – 150 V, ripple 10 %p-p max.)
(110 V $\pm$ 10 % for UL)

[5] OPTIONS (multiple selections)

Response Time (0 – 90 %)

blank: Standard ($\leq$ 0.5 sec.)
/K: Fast Response (Approx. 25 msec.)

Burnout

blank: Upscale burnout
/BL: Downscale burnout

Standards & Approvals (must be specified)

/N: Without CE or UL
/CE: CE marking
/UL: UL approval, CE marking

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 (UL not available)

ADJUSTMENT

/V01: Multi-turn fine adjustment (UL not available)

TERMINAL SCREW MATERIAL

/S01: Stainless steel (UL not available)

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3 screw terminals (torque 0.8 N·m)
Screw terminal: Chromated 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: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Adjustable individually for each output 1 and output 2.

Burnout protection: Upscale standard; downscale optional
At burnout: Downscale $\leq$ -10 %, Upscale $\geq$ 110 %
Linearization: Standard (not available for the input code C)

INPUT SPECIFICATIONS

Maximum leadwire resistance: 200 Ω per wire (3-wire)
Sensing current: 2 mA (Pt); 1 mA (Ni 508.4 Ω)
Refer to 'Cu Input' for the input code C.

OUTPUT SPECIFICATIONS

■ **DC Current:** 0 – 20 mA DC
Minimum span: 1 mA
Offset: Max. 1.5 times span
Load resistance: Output drive 15 V max. for Output 1; 7 V max. for Output 2
■ **DC Voltage:** -10 – +12 V DC (up to 10 V for Output 2)
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 1 mA max.; 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 240 V
• **DC:** Approx. 3 W

Operating temperature: -5 to +55°C (23 to 131°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 200 g (0.44 lb)

PERFORMANCE in percentage of span

Accuracy: $\pm$ 0.2 %
(Refer to 'Cu INPUT' for the input code C.)
Temp. coefficient: $\pm$ 0.015 %/°C ($\pm$ 0.008 %/°F)
Refer to 'Cu Input' for the input code C.
Burnout response: $\leq$ 10 sec.
Line voltage effect: $\pm$ 0.1 % over voltage range
Insulation resistance: $\geq$ 100 M Ω with 500 V DC
Dielectric strength: 2000 V AC @1 minute (input to output 1 to output 2 to power to ground)

Cu INPUT**■ INPUT****• Sensing current (resistance span):**

$140\ \Omega \leq \text{Span} \leq 300\ \Omega : 1\ \text{mA}$

$12\ \Omega \leq \text{Span} < 140\ \Omega : 2\ \text{mA}$

$8\ \Omega \leq \text{Span} < 12\ \Omega : 3\ \text{mA}$

$3.5\ \Omega \leq \text{Span} < 8\ \Omega : 5\ \text{mA}$

• Max. leadwire resistance:

200 Ω or the value calculated using the equation below,
whichever is smaller.

Leadwire resistance(Ω) = (2500 - 100% resistance(Ω) $\times$
Sensing current(mA)) $\div$ (3 $\times$ Sensing current(mA))

• Usable range:

$3.5\ \Omega \leq \text{Resistance span}(\Omega) \leq 300\Omega$

$100\ \% \text{ resistance}(\Omega) \leq (2500 - 3 \times \text{Leadwire resistance}(\Omega)) \div$
 $\times \text{Sensing current}(\text{mA}) \div \text{Sensing current}(\text{mA})$

■ PERFORMANCE**• Accuracy**

Resistance span $\geq 20\ \Omega$: $\pm 0.2\ \%$

Otherwise use the equation below:

Accuracy(%) = $0.02(\Omega) \div \text{Resistance span}(\Omega) \times 100 +$
 $0.1(\%) \times 40(\text{mV}) \div (\text{Resistance span}(\Omega) \times \text{Sensing}$
 $\text{current}(\text{mA}))$

• Temperature coefficient

Resistance span(Ω) $\times$ Sensing current(mA) $\geq 40(\text{mV})$:

$\pm 0.015\ \%/^{\circ}\text{C}$

Otherwise use the equation below:

Temperature coefficient(%/ $^{\circ}\text{C}$) = $0.015(\%/^{\circ}\text{C}) \times 40(\text{mV}) \div$
 $(\text{Resistance span}(\Omega) \times \text{Sensing current}(\text{mA}))$

STANDARDS & APPROVALS**EU conformity:**

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Installation Category II

Pollution Degree 2

Input or output 1 or output 2 to power input:

Reinforced insulation (300 V)

Input to output 1 to output 2: Basic insulation (300 V)

RoHS Directive

EN 50581

Approval:

UL/C-UL nonincendive Class I, Division 2,

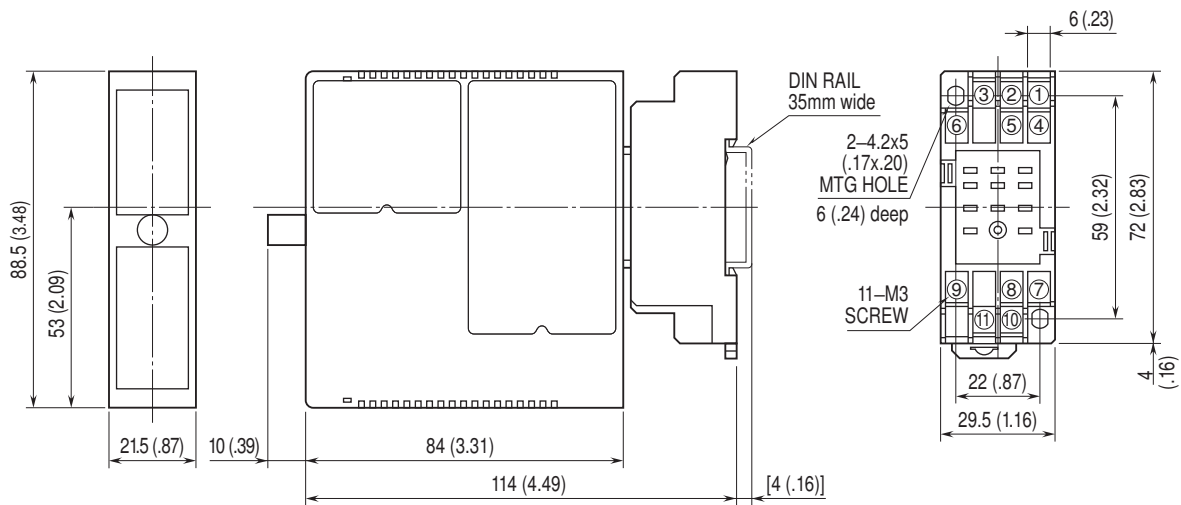
Groups A, B, C, and D

(ANSI/ISA-12.12.01, CAN/CSA-C22.2 No.213)

UL/C-UL general safety requirements

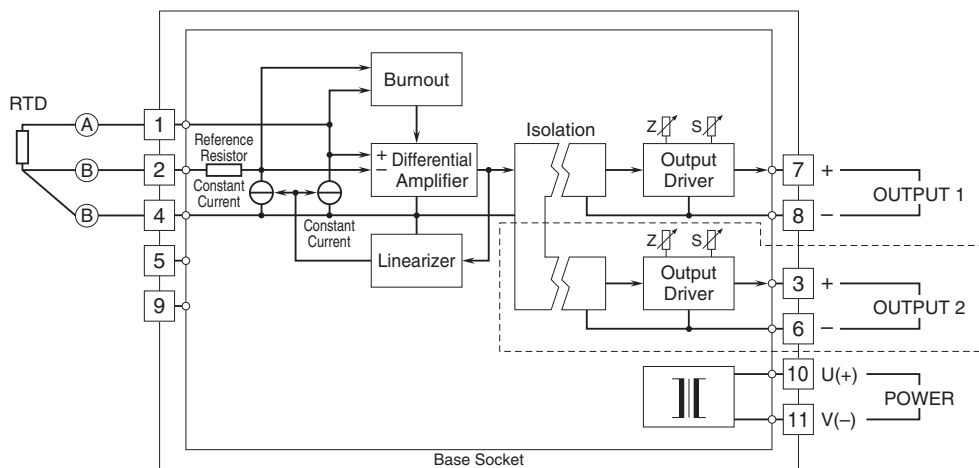
(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



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



Specifications are subject to change without notice.