

Space-saving Dual Output Signal Conditioners Mini-MW Series

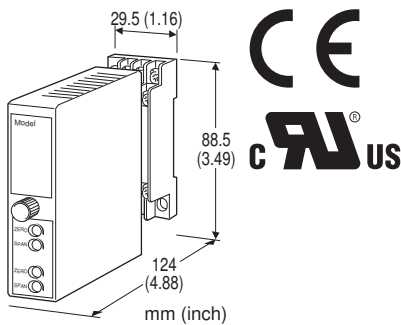
RTD TRANSMITTER

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 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 1000 Ω min.)
- 4:** 0 - 10 V DC (Load resistance 10 kΩ 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 ±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 ±10 % for UL)

[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

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)
(UL not available)

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: 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)

Burnout: Upscale standard;downscale optional

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 ≥ 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: ±0.2 %

Refer to 'Cu INPUT' for the input code C.

Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)

Refer to 'Cu Input' for the input code C.

Burnout response: ≤ 10 sec.

Line voltage effect: ±0.1 % over voltage range

Insulation resistance: ≥ 100 MΩ 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 Ω ≤ Span ≤ 300 Ω : 1 mA

12 Ω ≤ Span < 140 Ω : 2 mA

8 Ω ≤ Span < 12 Ω : 3 mA

3.5 Ω ≤ Span < 8 Ω : 5 mA

• **Max. leadwire resistance:**

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

Leadwire resistance(Ω) = (2500 - 100% resistance(Ω)) × Sensing current(mA) ÷ (3 × Sensing current(mA))

• **Usable range:**

3.5 Ω ≤ Resistance span(Ω) ≤ 300Ω

100 % resistance(Ω) < (2500 - 3 × Leadwire resistance (Ω) × Sensing current (mA)) ÷ Sensing current (mA)



■ PERFORMANCE

• Accuracy

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

Otherwise use the equation below:

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

• Temperature coefficient

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

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

Otherwise use the equation below:

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

STANDARDS & APPROVALS

CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

Low Voltage Directive (2006/95/EC)

EN 61010-1: 2001

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)

Approval:

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

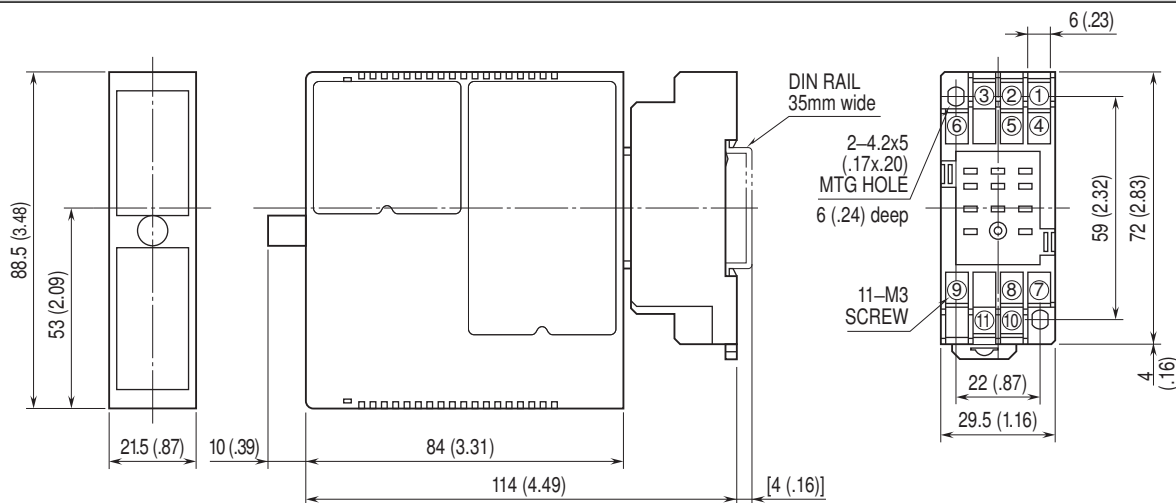
Groups A, B, C, and D

(ANSI/ISA-12.12.01:2011, CAN/CSA-C22.2 No.213:1987)

UL/C-UL general safety requirements

(UL 61010B-1:2003, CAN/CSA-C22.2 No.61010-1:1992)

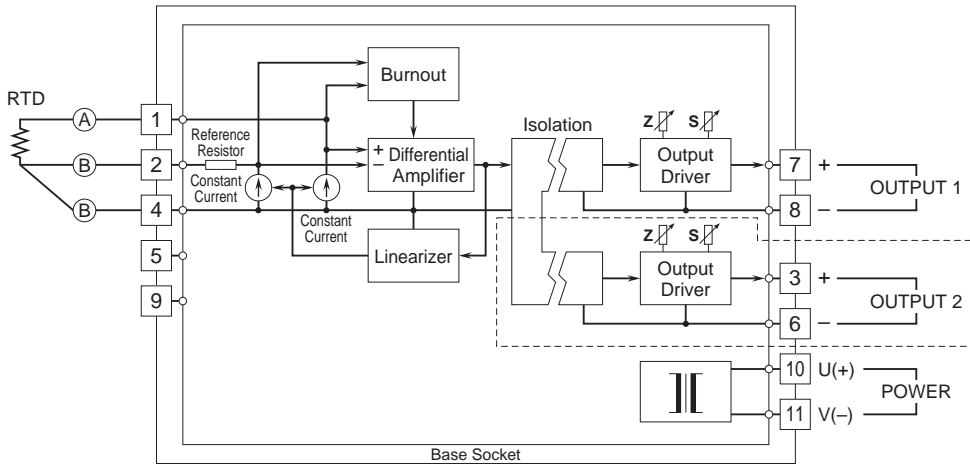
DIMENSIONS unit: mm (inch)



When mounting, no extra space is needed between units.



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



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



Specifications are subject to change without notice.