

Super-mini Signal Conditioners Mini-M Series

RTD TRANSMITTER

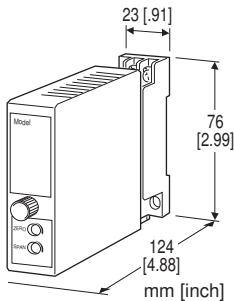
(photovoltaic system, instrument shelter)

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



MODEL: M2RT-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: M2RT-[1][2]-[3][4]

Specify a code from below for each of [1] through [4].

- (e.g. M2RT-4A-M2/BL/CE/Q)
- Temperature range (e.g. 0 – 500°C)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q (e.g. /C01/S01)

For the input code C, specify also the following. If not specified, Cu 10 Ω @25°C (usable range -140 – +260°C) will be used.

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

[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 (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 us for 2-wire RTD

[2] OUTPUT

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.)

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] POWER INPUT

AC Power

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

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.)

[4] 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

/CE: 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 our web site.)

- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber coating
- /C04: Polyolefin coating

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 to power
- Overrange output:** Approx. -10 to +120 % at 1 - 5 V
- Zero adjustment:** -5 to +5 % (front)
- Span adjustment:** 95 to 105 % (front)
- 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 Voltage:** -10 - +12 V DC
- 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. 3 VA at 100 V
 - Approx. 4 VA at 200 V
 - Approx. 5 VA at 264 V
 - **DC:** Approx. 3 W
- Performance-guaranteed temperature:** -15 to + 65°C (5 to 149 °F)
- Operating temperature:** -20 to +80 °C (-4 to +176°F); must be higher than -10°C (14°F) at power on
- Operating humidity:** 10 to 90 %RH (non-condensing)
- Mounting:** Surface or DIN rail
- Weight:** 150 g (0.33 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) (±0.03 %/°C (±0.02 %/°F) for outside of the performance-guaranteed temperature range)
- 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 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.
 - Max. leadwire resistance (Ω) = (2500 - 100 % resistance (Ω) × Sensing current (mA)) ÷ (3 × Sensing current (mA))
- **Usable range:**
 - 3.5 Ω ≤ Resistance span (Ω) ≤ 300 Ω
 - 0 % resistance (Ω) ≥ 3.25 Ω
 - 100 % resistance (Ω) ≤ (2500 - 3 × Max. leadwire resistance (Ω) × Sensing current (mA)) ÷ Sensing current (mA)

■ PERFORMANCE

- **Accuracy**
 - Resistance span ≥ 20 Ω:** ±0.2 %
 - Otherwise use the equation below:**
 - Accuracy (%) = 0.02 (Ω) ÷ Resistance span (Ω) × 100 + 0.1 (%) × 40 (mV) ÷ (Resistance span (Ω) × Sensing current (mA))
- **Temperature coefficient**
 - Resistance span (Ω) × Sensing current (mA) ≥ 40 (mV):** ±0.015 %/°C
 - Otherwise use the equation below:**
 - Temperature coefficient (%/°C) = 0.015 (%/°C) × 40 (mV) ÷ (Resistance span (Ω) × Sensing current (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

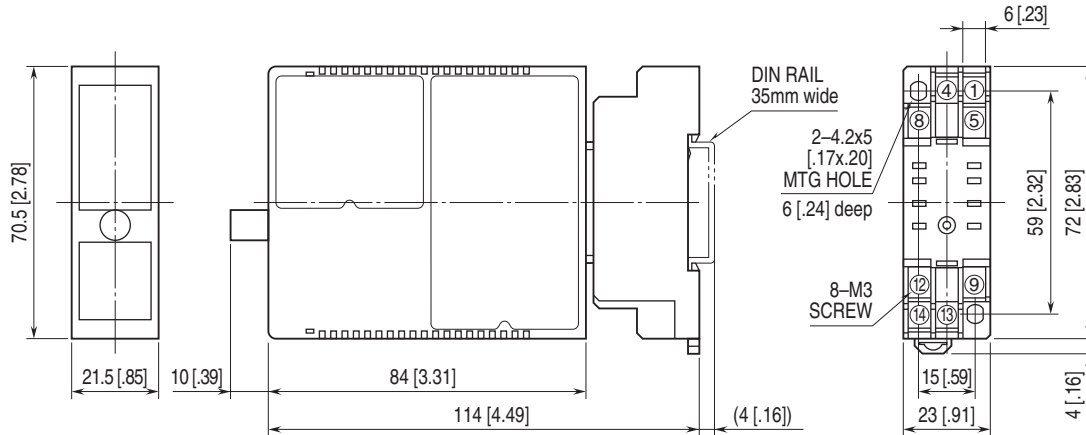
(Operational Temperature must be with -5 to +55°C (23 to 131°F))

Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

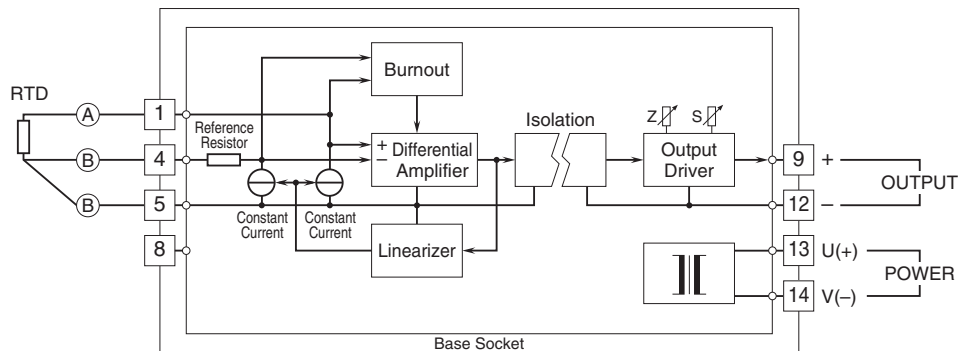
RoHS Directive

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.