Plug-in Signal Conditioners M-UNIT

DIFFERENTIAL RTD TRANSMITTER

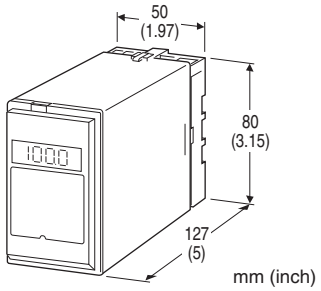
(isolated)

Functions & Features

- Providing a DC output in proportion to the temperature difference between two RTDs
- Isolation up to 2000 V AC
- Fast response type available
- LCD meter (engineering unit display selectable)
- Simple loop test output (0 % and 100 %)
- High-density mounting

Typical Applications

- Measuring temperature difference between the inlet and outlet of a heat exchanger
- Coolant
- Power plant



MODEL: DRS–[1]–[2][3]

ORDERING INFORMATION

- Code number: DRS-[1]-[2][3]
  Specify a code from below for each [1] through [3].
  (e.g. DRS-A-B/E/K/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q
  (e.g. /C01/S01)

INPUT (2-wire RTDs, dual input)

JPt100 (JIS'89) or Pt100 (JIS'97, IEC)

Pt100 (JIS ’89) is deviated from Pt100 (JIS ’97) only within the described accuracy.

[1] 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 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 100 Ω min.)
4: 0 – 10 V DC (Load resistance 1000 Ω min.)
5: 0 – 5 V DC (Load resistance 500 Ω min.)
6: 1 – 5 V DC (Load resistance 500 Ω min.)
0: Specify voltage (See OUTPUT SPECIFICATIONS)

[2] POWER INPUT

AC Power

B: 100 V AC
C: 110 V AC
D: 115 V AC
F: 120 V AC
G: 200 V AC
H: 220 V AC
J: 240 V AC

DC Power

S: 12 V DC
R: 24 V DC
V: 48 V DC
P: 110 V DC (Not selectable with Option /E2.)

[3] OPTIONS (multiple selections)

LCD Meter (for indicating temperature difference)

blank: Without
/E: With (0.0 - 100.0 % display)
/E2: With (in engineering unit with backlight and the simple loop test output)

Response Time (0 – 90 %)

blank: Standard (≤ 0.5 sec.)
/K: Fast response (Approx. 25 msec.)
(Not selectable with Option /E2)

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

TERMINAL SCREW MATERIAL

/S01: Stainless steel

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3.5 screw terminals
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)
Simple loop test output: 0 % and 100 % signal simulated by selecting the front switch positions. (Only for option code /E2)

■ **DISPLAY (LCD meter)**

• **Option code: /E**
LCD digital display: 0.0 - 100.0 % (min. digit 0.1 %)
(No scaling)

• **Option code: /E2**
LCD digital display: Engineering unit
Display scaling: -10000 – +10000
Decimal position: 10^{-1} - 10^{-4} or no decimal point
Engineering unit: %, µV, mV, V, mA, A, °C, °F, Ω, DEG K, mHz, Hz, kHz, VAC, AAC, mg, g, kg, t, rpm or rps selectable
Back light: Green at normal, red at loop test output enable
Factory setting: scaling 0.00 - 100.00, unit: %

INPUT SPECIFICATIONS

Input: 2-wire RTDs (two)
Maximum leadwire resistance: Difference 0.5 Ω maximum between the transmitter and each RTD; each leadwire resistance 10 Ω or less
Sensing current: 2 mA
Difference range: 0 – 20°C or 0 – 36°F (fixed)
Temperature range: 0 – 50°C or 32 – 122°F (fixed)

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.
■ **DC Voltage**: -10 – +12 V DC
Minimum span: 5 mV
Offset: Max. 1.5 times span
Load resistance: Output drive 10 mA max.; 5 mA for negative voltage output; at ≥ 0.5 V

INSTALLATION

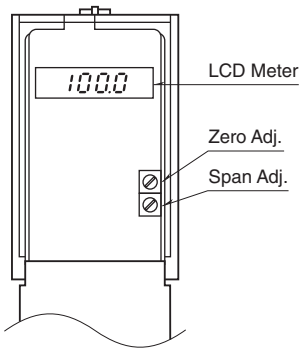
Power input
•**AC**: Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 2 VA
(approx. 3 VA with Option /E2)
•**DC**: Operational voltage range: rating ±10 %, or 85 – 150 V for 110 V rating (ripple 10 % p-p max.) approx. 2 W (80 mA at 24 V; approx. 3 W with Option /E2)
Operating temperature: -5 to +60°C (23 to 140°F)
Operating humidity: 30 to 90 %RH (non-condensing)
Mounting: Surface or DIN rail
Weight: 350 g (0.77 lb)

PERFORMANCE in percentage of span

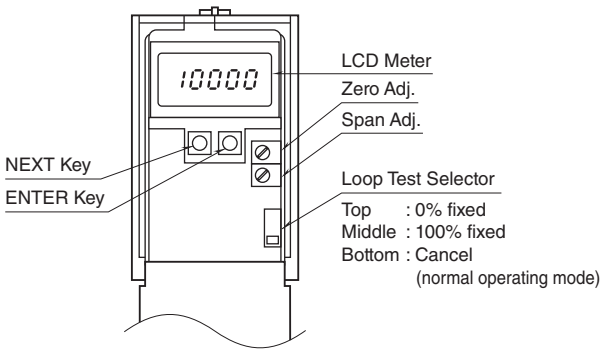
Accuracy: ±0.2 % (Temperature within 15 – 35°C or 59 – 95°F)
Display accuracy: ± (0.2 % of FS + 1 digit)
(Temperature within 15 – 35°C or 59 – 95°F)
Simple loop test output setting accuracy: ±0.5 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength: 2000 V AC @1 minute (input to output to power to ground)

EXTERNAL VIEW

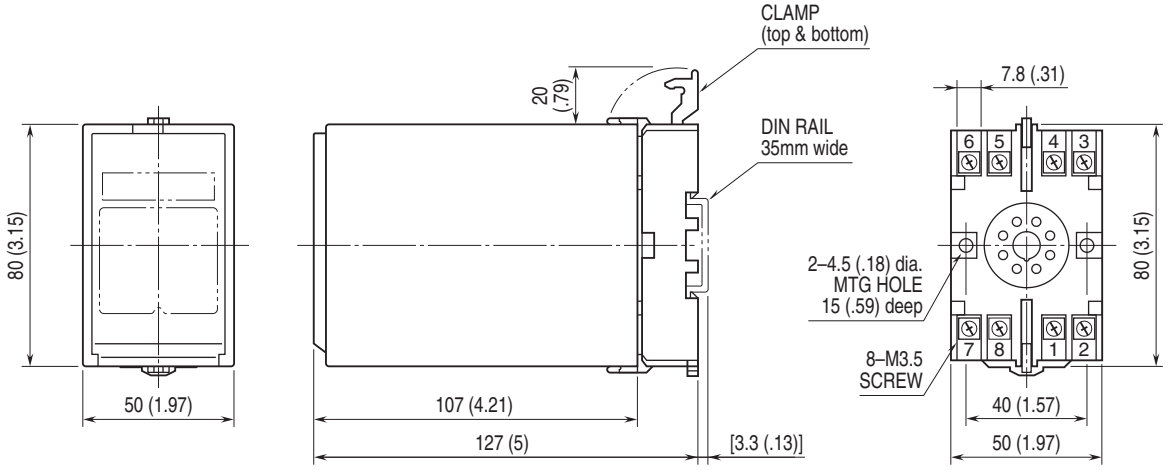
■ **OPTION /E**



■ **OPTION /E2**

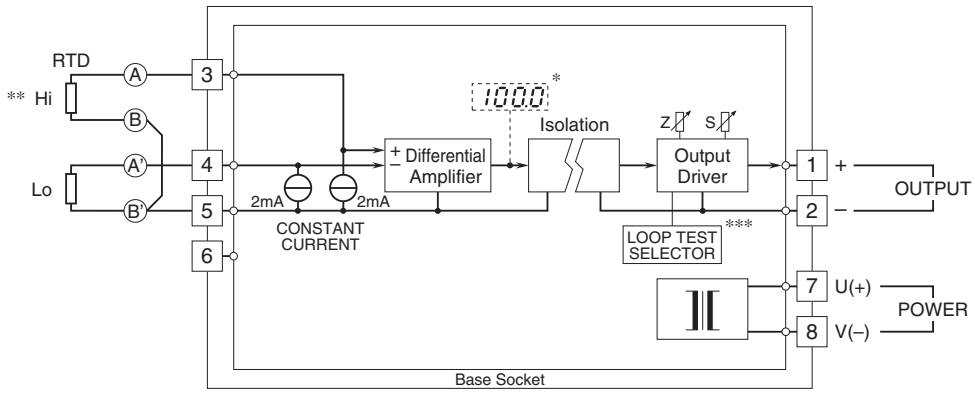


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



* Option /E, E2
** Be sure to connect the high temp. RTD to the terminal No. 3 for proper operation.
***Option /E2

⚠ Specifications are subject to change without notice.