Plug-In RTD Temperature Transmitter with Isolated Dual Output

## DESCRIPTION

The MS5302 is a plug-in RTD temperature transmitter that converts input signals from an RTD into commonly used DC signals and provides an isolated dual output.

## ORDERING CODE

**MS5302 - ☐ - ☐ ☐ ☐**

**Model**

**Power Supply**
**A**: 100 to 240V AC (50 to 60Hz)
**D**: 24V DC      **P**: 100 to 240V DC

**Input**
**P1**: Pt 100Ω          **J**: JPt 100Ω
**P5**: Pt 50Ω           **N**: Ni 508.4Ω
                         **Y**: Other than those above.

**Output 1**
**A**: 4 to 20mA DC       **1**: 0 to 10mV DC
**D**: 0 to 20mA DC       **2**: 0 to 100mV DC
**Z**: Other DC current signal  **3**: 0 to 1V DC
                          **4**: 0 to 10V DC
                          **5**: 0 to 5V DC
                          **6**: 1 to 5V DC
                          **3W**: ±1V DC
                          **4W**: ±10V DC
                          **5W**: ±5V DC
                          **0**: Other DC voltage signal

**Output 2**
**The codes are the same as for Output 1.**

Note 1: When a voltage output is selected for Output 1, a current output cannot be selected for Output 2.
Note 2: When the code A (4 to 20mA) is selected for both of the two outputs, the output load will be 550Ω maximum for Output 1 and 350Ω maximum for Output 2.
Note 3: Upscale burnout protection is standard.

**Options**
**No code**: None
**/K**: Fast response (0 to 90% response time: 10ms max.)
**/X**: Others (Special order)
* For non-standard options, ask MTT for availability.



51
85
145.5
(mm)

## ORDERING INFORMATION

To place an order, please use the ordering code format as shown on the left. Also specify a measuring temperature range.
  (e.g.) MS5302-A-P1A6 (0 to 150°C)

* Note that the temperature range should be specified in steps of at least 10 degrees Celsius.

Other Ordering Examples:
For an input code of "Y": MS5302-A-YAA (Input: Cu 10Ω at 0°C / 0 to 100°C)
For an output code of "0": MS5302-A-P106 (0 to 150°C / Output: 2 to 5V)
For an option code of "X": MS5302-A-P1AA/X (0 to 150°C / Response frequency 50Hz)
Note: If you wish to include multiple options in your order, specify the option codes in series (e.g. /KX).

## SPECIFICATIONS

### ●POWER SECTION

| Power Requirements | 100 to 240V AC: 85 to 264V AC (47 to 63Hz) 24V DC: 24V DC±10% 100 to 240V DC: 85 to 264V DC |
|---|---|
| Power Sensitivity | Better than ±0.1% of span for each power supply range. |
| Power Line Fuse | 160mA fuse |

Maximum Power Consumption

| Power | 100-240V AC | 24V DC | 100-240V DC |
|---|---|---|---|
| | Approx. 6.5VA | Approx. 1.8W | Approx. 6.0W |

### ●INPUT SECTION

| Excitation Current | Approx. 1mA with Pt for 0 to 100°C |
|---|---|
| Lead Wire Resistance | 200Ω max. per wire |

Ranges Available
The latest edition of the relevant JIS standard is used, unless otherwise specified.

<Standard specifications>          (Temp at 0% input = 0°C)

| Pt 100Ω | Specify between 0-50°C and 0-500°C in steps of 50°C (e.g. Pt 100Ω, 0 to 150°C). |
|---|---|
| JPt 100Ω | Specify between 0-50°C and 0-500°C in steps of 50°C (e.g. JPt 100Ω, 0 to 250°C). |
| Pt 50Ω | 0 to 100°C |

## MTT Corporation

<Quasi-standard specifications>

| RTD | Temperature Range (°C) | Input Span | Input Bias |
|---|---|---|---|
| Pt 100Ω | -200 to +850 | 50°C min. | |
| JPt 100Ω | -200 to +500 | 50°C min. | Up to 4x the input span. |
| Pt 50Ω | -200 to +600 | 100°C min. | |
| Ni 508.4Ω | -50 to +250 | 30°C min. | |

Input Spec Ex.: For Pt 100Ω (150 to 200°C), the input span is 50°C and the bias 150°C (3x the span).

Note: Any specification out of the temperature range or bias requirement listed above is handled as a special order.

● OUTPUT SECTION

Allowable Output Load

| | | |
|---|---|---|
| Voltage Output (DC) | 1V span and up | 2mA max. |
| | 10mV | 10kΩ min. |
| | 100mV | 100kΩ min. |
| Current Output (DC) | 4-20mA single output | 750Ω max. |
| | 4-20mA dual output | Output 1: 550Ω max. Output 2: 350Ω max. |

| | |
|---|---|
| Zero Adjustment | Approx. ±5% of span. (Adjustable by the front-accessible trimmer.) |
| Span Adjustment | Approx. ±5% of span. (Adjustable by the front-accessible trimmer.) |
| Burnout Protection | Upscale (even if any of the three wires, A, B, and B' is opened) |

Ranges Available

| | Current Signal | Voltage Signal |
|---|---|---|
| Output Range (DC) | 0 to 20mA | -10 to 10V |
| Output Span (DC) | 4 to 20mA | 10mV to 20V |
| Output Bias | 0 to 100% | -100 to 100% |

* For current output signals, the accuracy of any current output smaller than 0.1mA is not guaranteed.

Output Spec Ex. 1: For 4 to 20mA output, the output span is 16mA and the bias +25%.

Output Spec Ex. 2: For -1 to 4V output, the output span is 5V and the bias -20%.

● PERFORMANCE

| | |
|---|---|
| Accuracy Rating | Better than ±0.15% of span (at 25°C±5°C). |
| Temperature Effect | Better than ±0.2% of span per 10°C change in ambient. |
| Response Time | 170ms max. (0 to 90%) with a step input at 100%. |
| CMRR | 100dB min. (500V AC, 50/60Hz) |
| Isolation | 5-way isolation between input, output 1, output 2, power, and ground. |
| Insulation Resistance | 100MΩ min. (@ 500V DC) between input, output 1, output 2, power, and ground. |
| Dielectric Strength | Input / [Output 1, Output 2] / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 5mA) Output 1 / Output 2: 500V AC for 1 minute (Cutoff current: 0.5mA) |
| Surge Withstand Capability | Tested as per ANSI/IEEE C37.90.1-1989. |

| | |
|---|---|
| Operating Environment | Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing) |
| Storage Temperature | -10 to 60°C |

● PHYSICAL

| | |
|---|---|
| Installation | Wall/DIN rail mounting |
| Mounting Orientation | Vertical |
| Screwing Torque | 0.78 to 1.18 [Nm] * Recommended |
| Wiring | M3.5 screw terminal connection |
| External Dimensions | W51 × H85 × D145.5mm (including the socket) |
| Weight | Main unit: 200g max. Socket: 80g max. |

● MATERIALS

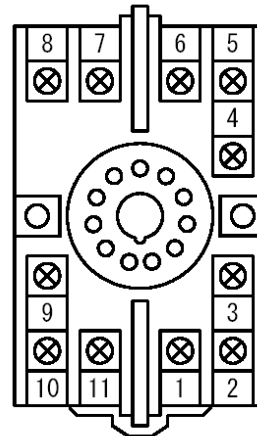| | |
|---|---|
| Housing | ABS resin (UL 94V-0) |
| Socket | ABS resin (UL 94V-0) |
| Screw Terminal | Galvanized steel with trivalent chromate finish |
| Printed Circuit Board | Glass fabric epoxy resin (FR-4: UL 94V-0) |
| Conformal Coating | HumiSeal® 1A27NS (Polyurethane) |

* HumiSeal® is a registered trademark of Chase Corporation.

**TERMINAL ASSIGNMENT**



| ① | + OUTPUT 1 | |
|---|---|---|
| ② | - OUTPUT 1 | |
| ③ | N.C. | |
| ④ | A RTD | |
| ⑤ | B RTD | |
| ⑥ | B' RTD | |
| ⑦ | P (+) | POWER |
| ⑧ | N (-) | |
| ⑨ | GND | |
| ⑩ | + OUTPUT 2 | |
| ⑪ | - OUTPUT 2 | |

## BLOCK DIAGRAM