



DESCRIPTION

The MS5001 is an ultra-slim thermocouple temperature transmitter that converts input signals from a thermocouple into commonly used DC signals and provides an isolated single output.

ORDERING CODE

Model _____ **MS5001** -

Input _____

K: Type K thermocouple **B:** Type B thermocouple
E: Type E thermocouple **R:** Type R thermocouple
J: Type J thermocouple **S:** Type S thermocouple
T: Type T thermocouple **N:** Type N thermocouple
0: Other than those above.

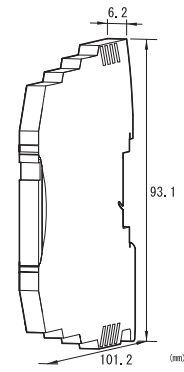
* Shunt resistor 50Ω

Output _____

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

Options _____

No code: None
/D: Downscale burnout protection
/X: Others (Special order)
* For non-standard options, ask MTT for availability.



SPECIFICATIONS

POWER SECTION

Power Requirement	24V DC±10%
Power Sensitivity	Better than ±0.1% of span.
Power Line Fuse	125mA fuse is installed (standard).
Current Rating	
Voltage Output	13mA max. (at 24V DC) (Approx. 11mA for 100% input)
Current Output	29mA max. (at 24V DC) (Approx. 27mA for 100% input)

INPUT SECTION

Input Resistance	With or without power: 1MΩ min.
Signal Source Resistance	1kΩ max.
Input Voltage	30V DC max., continuous.
Cold Junction Compensation	A built-in temperature-sensitive resistor is used.
Linearizer	Built-in digital linearizer

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

K	Specify between 0-100°C and 0-1350°C in steps of 50°C (e.g. K 0 to 350°C).
E	Specify between 0-100°C and 0-1000°C in steps of 50°C (e.g. E 0 to 150°C).
J	Specify between 0-100°C and 0-800°C in steps of 50°C (e.g. J 0 to 550°C).
T	Specify between 0-100°C and 0-400°C in steps of 50°C (e.g. T 0 to 250°C).
B	Specify between 0-1200°C and 0-1800°C in steps of 100°C (e.g. B 0 to 1700°C).
R	Specify between 0-400°C and 0-1700°C in steps of 100°C (e.g. R 0 to 1400°C).

ORDERING INFORMATION

To place an order, please use the ordering code format as shown above. Also specify a desired temperature range.
(e.g.) MS5001-KA (0 to 500°C)

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

Another Ordering Example:
For an output code of "0": MS5001-K0 (0 to 500°C / Output: 2 to 5V)

<Quasi-standard specifications>

Type	Temperature Range (°C)	(+) Bias	(-) Bias
K	-200 to +1370	Up to 5x input span.	Up to 1x input span.
E	-200 to +1000	Up to 3x input span.	Up to 0.5x input span.
J	-200 to +1200	Up to 5x input span.	Up to 0.5x input span.
T	-200 to +400	Up to 2x input span.	Up to 0.5x input span.
B	0 to +1820	Up to 5x input span.	N/A
R	-50 to +1760	Up to 10x input span.	No limitation.
S	-50 to +1760	Up to 10x input span.	No limitation.
N	-200 to +1300	Up to 5x input span.	Up to 0.5x input span.

Input Spec Ex. 1: For K -100 to 400°C, the input span is 500°C and the bias -0.2x the input span.

Input Spec Ex. 2: For J 300 to 400°C, the input span is 100°C and the bias 3x the input span.

Note 1: Input span: 3mV min.

Note 2: For input temperature ranges starting from any specified temperature below 0°C, the accuracy may partly be out of specification.

Note 3: For the type B thermocouple, the accuracy in the temperature range below 600°C is not guaranteed.

Note 4: 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)	10V	5kΩ min.
	5V	2.5kΩ min.
	1V	500Ω min.
	10mV	10kΩ min.
	100mV	100kΩ min.
Current Output (DC)	4 to 20mA output	550Ω max.

Zero Adjustment Approx. ±10% of span. (Adjustable by the front-accessible trimmer.)

Span Adjustment Approx. ±5% of span. (Adjustable by the front-accessible trimmer.)

Burnout Protection Standard: Upscale (Downscale is optional.)

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 ± [0.1% of span + 3°C {Cold junction compensation error} + Linearity error] (at 25°C±5°C)

* Linearity errors vary with input spans.

Input Span	Linearity Error (%)	Input Span	Linearity Error (%)
JIS K 0-300°C	0.1	JIS K 0-600°C	0.15
JIS J 0-200°C	0.15	JIS E 0-200°C	0.15
JIS E 0-600°C	0.25	JIS R 0-1600°C	0.3
JIS S 0-1000°C	0.25	JIS T 0-100°C	0.12

Temperature Effect Better than ±0.2% of span per 10°C change in ambient.

Response Time 160ms max. (0 to 90%) with a step input at 100%.

CMRR 100dB min. (500V AC, 50/60Hz)

Isolation 3-way isolation between input, output, and power.

Insulation Resistance 100MΩ min. (@ 500V DC) between input, output, and power.

Dielectric Strength 1500V AC for 1 minute between input, output, and power. (Cutoff current: 0.5mA)

Operating Environment Ambient temperature: -20 to 65°C Humidity: 5 to 90% RH (non-condensing)

Storage Temperature -25 to 70°C

● PHYSICAL

Installation DIN rail mounting

Wiring European style screw terminal block connection (M3)

Wire Size 0.2 to 2.5 mm²

Screwing Torque 0.5 to 0.6 [Nm] * Recommended

External Dimensions W93.1 × H101.2 × D6.2mm

Weight 60g max.

● MATERIALS

Housing PBT resin (UL 94V-0)

Screw Terminal Tin-plated copper alloy

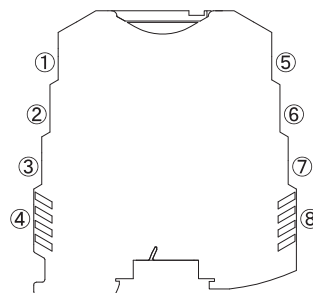
Printed Circuit Board Glass fabric epoxy resin (FR-4: UL 94V-0)

Anti-Humidity HumiSeal® 1A27NSLU

Coating (Polyurethane)

* HumiSeal® is a registered trademark of Chase Corporation.

TERMINAL ASSIGNMENT



①	TC +
②	TC -
③	N.C.
④	N.C.
⑤	+ OUTPUT
⑥	- OUTPUT
⑦	POWER
⑧	

BLOCK DIAGRAM

