



Plug-In Thermocouple Temperature Transmitter with Isolated Single Output

DESCRIPTION

The MS5501 is a plug-in thermocouple temperature transmitter that converts input signals from a thermocouple into commonly used DC signals and provides an isolated single output.

ORDERING CODE

Model MS5501 - ☐ - ☐ ☐

Power Supply

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

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.

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: ± 1 V DC
 4W: ± 10 V DC
 5W: ± 5 V DC
 0: Other DC voltage signal

Note: Upscale burnout protection is standard.

Options

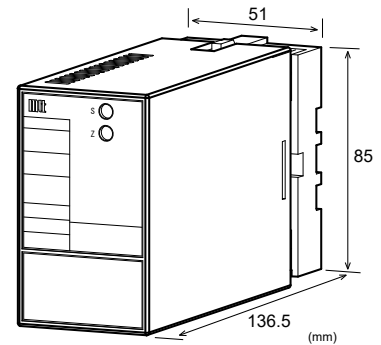
No code: None

/D: Downscale burnout protection

/K: Fast response (0 to 90% response time: 10ms max.)

/X: Others (Special order)

* For non-standard options, ask MTT for availability.



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.) MS5501-A-KA (0 to 500°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 "0": MS5501-A-0A (WR5-26 0 to 2000°C)

For an output code of "0": MS5501-A-K0 (0 to 500°C / Output: 2 to 5V)

For an option code of "X": MS5501-A-K6/X (0 to 500°C / Burnout drive time: 500ms max.)

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 $\pm 10\%$ 100 to 240V DC: 85 to 264V DC		
Power Sensitivity	Better than $\pm 0.1\%$ 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. 5.5VA	Approx. 1.5W	Approx. 6.0W

● INPUT SECTION

Input Resistance	With or without power: 1M Ω min.
Allowable Signal Source Resistance	1k Ω max.
Allowable Input Voltage	30V DC max., continuous.
Cold Junction Compensation	A built-in temperature-sensitive resistor is used.
Cold Junction Compensation Error	$\pm 0.5^\circ\text{C}$ max. ($25^\circ\text{C} \pm 15^\circ\text{C}$)
Linearizer	Built-in analog linearizer (6 segments maximum)

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).

<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 be partly 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)	1V span and up	2mA max.
	10mV	10kΩ min.
	100mV	100kΩ min.
Current Output (DC)	4 to 20mA	750Ω 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 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 + 0.5°C {Cold junction compensation error} + Linearity error] (at 25°C±5°C)

Note: 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	0.5
JIS S 0-1000°C	0.25	JIS T 0-300°C	0.25

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 Input / Output / Power: 2000V 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 × D136.5mm

(including the socket)

Weight Main unit: 200g max.

Socket: 60g max.

● MATERIALS

Housing ABS resin (UL 94V-0)

Socket ABS resin (UL 94V-0)

Screw Terminal Galvanized steel with trivalent chromate finish

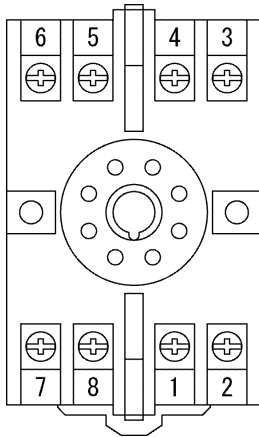
Printed Circuit Board Glass fabric epoxy resin (FR-4: UL 94V-0)

Conformal Coating HumiSeal® 1A27NSLU

(Polyurethane)

* HumiSeal® is a registered trademark of Chase Corporation.

TERMINAL ASSIGNMENT



①	+ OUTPUT
②	- OUTPUT
③	T.C. +
④	T.C. -
⑤	N.C.
⑥	N.C.
⑦	P (+)
⑧	N (-)
POWER	

BLOCK DIAGRAM

