



Standard Specifications Type : MS3701

MS3700

Slim-shaped Plug-in Thermocouple Signal Conditioner with isolated Single / Dual Output

Overview

This Slim-shaped Plug-in Signal Conditioner, MS3701 functions to convert thermocouple input signals into any desired AC signals to generate isolated dual output. (RoHS - conformed)

Ordering Format

MS3701 - [] - [] - [] - []

Type _____

Power Supply _____

A: AC 85 ~ 264V D: DC 24V
 P: DC 85 ~ 264V

Input Signal _____

K: K-thermocouple B: B-thermocouple
 E: E-ditto R: R-ditto
 J: J-ditto S: S-ditto
 T: T-ditto N: N-ditto
 O: Others

Output-1 _____

A: 4 ~ 20mA DC 1 : 0 ~ 10mV DC
 D: 0 ~ 20mA DC 2 : 0 ~ 100mV DC
 Z: Designated DC 3 : 0 ~ 1V DC
 4 : 0 ~ 10V DC
 5 : 0 ~ 5V DC
 6 : 1 ~ 5V DC
 3W: ± 1V DC
 4W: ± 10V DC
 5W: ± 5V DC
 O : Designated VDC

Output-2 _____

No entry : None
 Similar to Output-1

☞ When Out-1 is set for Voltage, Out-2 cannot be designated for Current.
 ☞ When both outputs are set for 4-20mA, the Output Load will be less than 350ohm.
 ☞ Standard Burn-out Protection is Upscale.

Option _____

No entry : None
 /D : Burn-out Protection = Downscale
 /K : Fast Response (Faster than 10msec:0~90%)
 /X : Special Order + ¥10,000

* As for special order, consult MTT.

Items to be specified at ordering

• Type of instrument (Measuring Temperature Range)
 (Ex.) MS3701-A-KAA(0~500°C)
 * Specify the temperature range by a unit of 10°C.

Other items to be specified

- For Input "0" : MS3701-A-0AA(WRe5-26 0~2000°C)
- For Output "0" : MS3701-A-K60(0~500°C/output (2~5V))
- For Option "X" : MS3701-A-K6/X (0~500°C/Burn-out Time 500 msec max.)
- For more than one option : Enter Option Codes in succession (/KX)



SPECIFICATIONS

● Power Supply Section

Power Supply AC85~264V (47~63Hz, Rating 100~240V)
 DC24V±10%
 DC85~264V (Rating 100~240V)

Power Sensitivity Within ±0.1% of Span for each power supply voltage

Power Supply Fuse 160mA fuse

Maximum Power Consumption

Power Supply	AC85~264V	DC24V	DC85~264V
1 Single Output	5.5VA max. / 1.5W max.	6.0W max.	
2 Dual Output	6.5VA max. / 1.8W max.	6.0W max.	

● Input Section

Input Resistance : 1MΩ min. with excitation (same without excitation)

Signal Source Resistance allowable : 1KΩ max.

Input Voltage allowable : DC30V max. continuous

Cold Junction Compensation : with incorporated Temp. Sensitive Element.

C.J.C. Accuracy : within ±0.5°C (25°C±15°C)

Linearization : By Analog mode Linearizer incorporated (6 segments, max.)

Range of Products Available

< Standard Specifications > (At 0% input = 0°C)

K	Between 0~100°C and 0~1350°C by step of every 50°C (Ex. K 0~350°C)
E	Between 0~100°C and 0~1000°C by step of every 50°C (Ex. K 0~150°C)
J	Between 0~100°C and 0~800°C by step of every 50°C (Ex. K 0~550°C)
T	Between 0~100°C and 0~400°C by step of every 50°C (Ex. K 0~250°C)
B	Between 0~1200°C and 0~1800°C by step of every 100°C (Ex. K 0~1700°C)
R	Between 0~400°C and 0~1700°C by step of every 100°C (Ex. K 0~1400°C)

☞ Input Span : 3mV minimum

< Quasi-Standard Specifications >

T/C	Measuring Range (°C)	(+) bias (x Input Span)	(-) bias (x Input Span)
K	-200~+1370	up to 5 times	up to 5 times
E	-200~+1000	up to 3 times	up to 0.5 times
J	-200~+1200	up to 5 times	up to 0.5 times
T	-200~+400	up to 2 times	up to 0.5 times
B	0~+1820	up to 5 times	—
R	-50~+1760	up to 10 times	unlimited
S	-50~+1760	up to 10 times	unlimited
N	-200~+1300	up to 5 times	up to 0.5 times

(Ex.1) K-100~400°C ⇒ Input Span 500°C, Bias -0.2 times

(Ex.2) J 300~400°C ⇒ Input Span 100°C, Bias +3 times

- ☞ Such specifications as the measuring temperature range or the bias condition deviate from the above shall be made to special order.
- ☞ In case the measuring temperature range starts from below 0°C, the accuracy may partially be affected.

● Output Section

Output Load

Voltage Output (DC)	1V Span min.	2mA max.
	10mV Span min.	10kΩ min.
	100mV Span min.	100kΩ min.
Current Output (DC)	4~20mA Single output	750Ω max.
	4~20mA Dual output	Out-1 550Ω max.
		Out-2 350Ω max.

Zero Adjustment Range	Approx. ±5% of Span (Adjustable by Trimmer on front panel)
Span Adjustment Range	Approx. ±5% of Span (Adjustable by Trimmer on front panel)
Burn-out Protection	Upscale (standard) ("Downscale" is optional)

Range of Product available

	Current Signal	Voltage Signal
Output Range (DC)	0~20mA	-10~10V
Output Span (DC)	4~20mA	10mV~20V
Output Bias	0~100%	-100~100%
	(Ex.1) 4~20mA ⇒ output span 16mA, bias 25%	
	(Ex.2) -1~4V ⇒ output span 5V, bias -20%	

* The current output smaller than 0.1mA will be out the accuracy guarantee.

● Standard Performance

Conversion Accuracy

Within ±[0.1%/F.S.+0.5°C{ Temp. Element Accuracy } + Linearization Accuracy] (@25°C±5°C)

* Linearization Accuracy depends on Input Span (0.1%/F.S. typ.)

Input Span	Accuracy(%)	Input Span	Accuracy(%)
JIS K 0~ 300°C	0.1	JIS K 0~ 600°C	0.15
JIS J 0~ 200°C	0.1	JIS E 0~ 200°C	0.15
JIS E 0~ 600°C	0.1	JIS R 0~1600°C	0.15
JIS S 0~1000°C	0.15	JIS T 0~ 300°C	0.15

Temp. Characteristics	Within ±0.2% of Span with every 10°C variation
Response Time	160msec max. (0~90%) with 100% step input
C M R R	100dB min. (500V AC, 50/60Hz)
Signal Isolation	Between Input—Out1—Out2—Power Supply—Ground, mutually
Isolation Resistance	100MΩ min. (@500V DC) Between Input—Out1—Out2—Power Supply—Ground
Dielectric Strength	Between Input—[Out1, Out2]—[Power Supply, Ground] :2000V AC, Shut Down Current 0.5mA for 1 minute

Dielectric Strength	Between Power Supply — Ground :2000V AC, Shut Down Current 5mA for 1 minute Between Out1—Out2 :500V AC, Shut Down Current 0.5mA for 1 minute
S W C	Conformed to ANSI/IEEE C37.90.1-1989
Operating Environment	Temperature : -5~55°C Humidity : 5~90%RH (Non-Condensing)
Storage Temp	-10~60°C

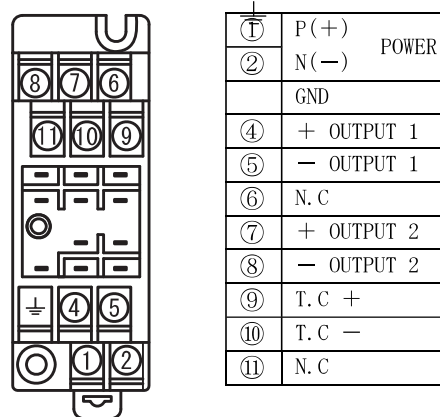
● Installation / Physical Specifications

Installation	Wall-mounting &/or DIN-rail mounting
Wiring	M3.5 screw terminal connection (with P.S. terminal cover /Screw drop protection)
Screw Tightening Torque	0.8~1[N·m] recommendable
Outer Dimension	W29×H86×D125mm (incl. set screws and terminal block)
Mass	Main Body 120g max, Terminal Block 80g max.

● Materials

Housing	ABS resin (UL-94V-0)
Terminal Block	ABS resin (UL-94V-0)
Terminal Screws	Iron / Nickel-plated
Terminal Surface Treatment	0.2 μm gold-plated
P.C. Board	Glass-Epoxy (FR-4:UL-94V-0)
Moisture-proof Coating	HumiSeal 1A27NS (Polyurethane Resin)

Terminal Arrangement / Signal Assignment



Block Diagram

