

**DESCRIPTION**

The MS3704 is a slim, plug-in high-level signal conditioner (isolator) that converts DC current or voltage signals into commonly used DC signals and provides isolated single or dual output.

**ORDERING CODE**

Model **MS3704** -  -

**Power Supply**

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

**Input**

**A:** 4 to 20mA DC                      **3:** 0 to 1V DC  
**B:** 2 to 10mA DC                      **4:** 0 to 10V DC  
**C:** 1 to 5mA DC                        **5:** 0 to 5V DC  
**D:** 0 to 20mA DC                      **6:** 1 to 5V DC  
**E:** 4 to 20mA DC \*1                  **4W:** ±10V DC  
**H:** 10 to 50mA DC                    **5W:** ±5V DC  
**Z:** Other DC current signal        **0:** Other DC voltage signal

\*1: Shunt resistor 50Ω

**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**

**No code:** None

**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.

**Options**

**No code:** None

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

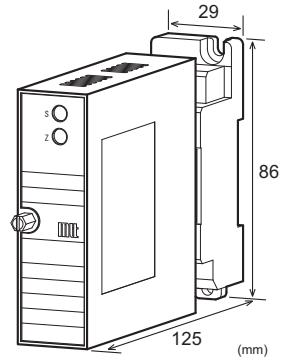
**/L:** Dual current output with high output load

\* Not subject to CE approval.

(OUT-1: 750Ω / OUT-2: 550Ω)

**/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.  
(e.g.) MS3704-A-AA6

**Other Ordering Examples:**

For an input code of "Z": MS3704-A-ZAA (Input: 8 to 20mA)

For an output code of "0": MS3704-A-A60 (Output: 2 to 5V)

For an option code of "X": MS3704-A-66/X (0-90% response time: 5ms 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±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 is installed (standard).

**Power Consumption**

	100-240V AC	24V DC	100-240V DC
Single Output	4.0VA max	1.2W max	4.8W max
Dual Output	5.0VA max	1.6W max	6.0W max

**INPUT SECTION**
**Input Resistance**

Voltage Input (DC)	With or without power: 1MΩ min.	
Current Input (DC)	4 to 20mA (std.)	250Ω
	2 to 10mA	250Ω
	1 to 5 mA	100Ω
	0 to 20mA	250Ω
	10 to 50mA	10Ω

**Allowable Input Voltage**

Voltage Input Model	30V DC max., continuous. (Standard for a span up to 10V)
Current Input Model	40mA DC max., continuous. (Standard for 4 to 20mA)

Ranges Available		
	Current Signal	Voltage Signal
Input Range (DC)	-100 to 100mA	-300 to 300V
Input Span (DC)	100 $\mu$ A <sup>(1)</sup> to 200mA	200mV <sup>(2)</sup> to 600V
Input Bias	-100 to 100%	-100 to 100%

Note: For any input range including negative input signals, the input spans for current and voltage signals range from <sup>(1)</sup>200 $\mu$ A to 200mA and <sup>(2)</sup>400mV to 600V, respectively.

Input Spec. Ex. 1: For 3 to 8V input, the input span is 5V and the bias +60%.

Input Spec. Ex. 2: For -5 to 0V input, the input span is 5V and the bias -100%.

● OUTPUT SECTION		
Maximum Output Load		
Voltage Output (DC)	1V span and up	2mA max.
	10mV	10k $\Omega$ min.
	100mV	100k $\Omega$ min.
Current Output (DC)	4-20mA single output	750 $\Omega$ max.
	4-20mA dual output	Output 1: 550 $\Omega$ max. Output 2: 350 $\Omega$ max.
Zero Adjustment	Approx. $\pm$ 5% of span. (Adjustable by the front-accessible trimmer.)	
Span Adjustment	Approx. $\pm$ 5% of span. (Adjustable by the front-accessible trimmer.)	

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 $\pm$ 0.1% of span (at 25°C $\pm$ 5°C).
Temperature Effect	Better than $\pm$ 0.2% of span per 10°C change in ambient.
Response Time	85ms max. (0 to 90%) with a step input at 100%.
CMRR	100dB min. (500V AC, 50/60Hz)
Isolation	4-way isolation between input, output [Output 1/Output 2], power, and ground.
Insulation Resistance	100M $\Omega$ min. (@ 500V DC) between input, output [Output 1/Output 2], and power.
Dielectric Strength	Input / Output [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

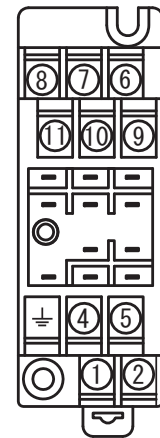
● PHYSICAL	
Installation	Wall/DIN rail mounting
Wiring	M3.5 screw terminal connection (with a power terminal block cover & drop-out prevention screws)
Screwing Torque	0.8 to 1.0 [Nm] * Recommended
External Dimensions	W29 x H86 x D125mm (including the mounting screw and socket)
Weight	Main unit: 120g max. Socket: 80g max.

● MATERIALS	
Housing	ABS resin (UL 94V-0)
Terminal Block	PBT resin (UL 94V-0)
Terminal Block Cover	PC resin (UL 94V-2)
DIN Rail Stopper	PP resin (UL 94HB)
Screw Terminal	Nickel-plated steel
Contacts Material and Finish	Brass with 0.2 $\mu$ m gold plating
Printed Circuit Board	Glass fabric epoxy resin (FR-4: UL 94V-0)
Anti-Humidity Coating	HumiSeal <sup>®</sup> 1A27NS (Polyurethane)

\* HumiSeal<sup>®</sup> is a registered trademark of Chase Corporation.

● STANDARDS CONFORMITY	
CE Directive Conformity	EMC Directive (2014/30/EU) EN61326-1: 2013 Low Voltage Directive (2014/35/EU) IEC61010-1/EN61010-1: 2010 Installation Category II Pollution Degree 2 Maximum operating voltage 300V Reinforced insulation between [input/output/GND] and power.

**TERMINAL ASSIGNMENT**



①	P (+)	POWER
②	N (-)	
⊥	GND	
④	+ OUTPUT 1	
⑤	- OUTPUT 1	
⑥	N.C.	
⑦	+ OUTPUT 2	
⑧	- OUTPUT 2	
⑨	+ INPUT	
⑩	- INPUT	
⑪	N.C.	

BLOCK DIAGRAM

