



Plug-In High-Level Signal Conditioner (Isolator) with Isolated Dual Output

DESCRIPTION

The MS5304 is a plug-in high-level signal conditioner (isolator) that converts DC current or voltage signals into commonly used DC signals and provides an isolated dual output.

ORDERING CODE

**MS5304** -  -

**Model** \_\_\_\_\_

**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

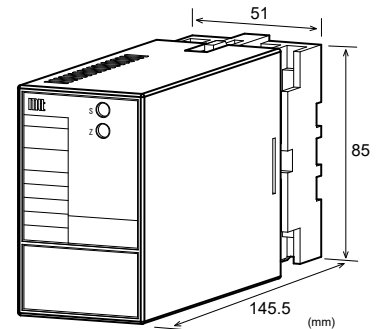
\*1: Shunt resistor 50Ω

**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** \_\_\_\_\_  
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.)  
**/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.) MS5304-A-AA6

Other Ordering Examples:  
For an input code of "Z": MS5304-A-ZAA (Input: 8 to 20mA)  
For an output code of "0": MS5304-A-A60 (Output: 2 to 5V)  
For an option code of "X": MS5304-A-666/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		
Maximum Power Consumption			
Power	100-240V AC	24V DC	100-240V DC
	Approx. 5.0VA	Approx. 1.6W	Approx. 6.0W

INPUT SECTION

Input Resistance		
Voltage Input (DC)	1MΩ min. with or without power.	
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>(*)</sup> to 200mA	200mV <sup>(*)</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>(\*)</sup>200 $\mu$ A to 200mA and <sup>(\*)</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		
Allowable 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	5-way isolation between input, output 1, output 2, power, and ground.
Insulation Resistance	100M $\Omega$ 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.

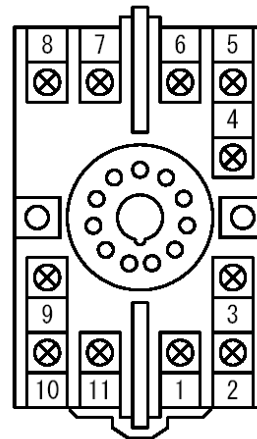
Operating Environment	Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	-10 to 60°C

● 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 $\times$ H85 $\times$ 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 <sup>®</sup> 1A27NS (Polyurethane)

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

### TERMINAL ASSIGNMENT



①	+ OUTPUT 1
②	- OUTPUT 1
③	N.C.
④	N.C.
⑤	+ INPUT
⑥	- INPUT
⑦	P (+) POWER
⑧	N (-) POWER
⑨	GND
⑩	+ OUTPUT 2
⑪	- OUTPUT 2

BLOCK DIAGRAM

