



DESCRIPTION

The MS3104 is a terminal block type 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

Model **MS3104** - -

Power Supply
A: 100 to 240V AC (50 to 60Hz)
D: 24V DC **P:** 110V DC
Q: 12V 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

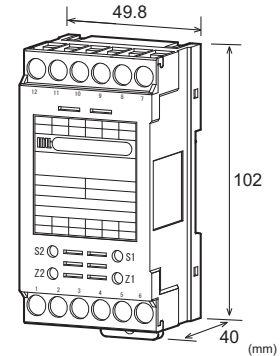
Output 1
A: 4 to 20mA DC **1:** 0 to 10mV DC
D: 0 to 20mA DC **2:** 0 to 100mV DC
Z: Other DC current signal **3:** 0 to 1V DC
 4: 0 to 10V DC
 5: 0 to 5V DC
 6: 1 to 5V DC
 3W: ±1V DC
 4W: ±10V DC
 5W: ±5V DC
 0: Other DC voltage signal

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.) MS3104-A-AA6

Other Ordering Examples:
 For an input code of "Z": MS3104-A-ZAA (Input: 8 to 20mA)
 For an output code of "0": MS3104-A-A60 (Output: 2 to 5V)
 For an option code of "X": MS3104-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%
	110V DC: 90 to 121V DC
	12V DC: 12V DC±20%
Power Sensitivity	Better than ±0.1% of span for each power supply range.
Power Line Fuse	160mA fuse 315mA fuse (for 12V DC power)
Maximum Power Consumption	100-240V AC Approx. 6.5VA 24V DC Approx. 1.6W 110V DC Approx. 2.5W 12V DC Approx. 1.3W

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)	100µA ⁽¹⁾ to 200mA	200mV ⁽²⁾ 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 ⁽¹⁾200µA to 200mA and ⁽²⁾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	10kΩ min.
Current Output (DC)	100mV	100kΩ min.
	4-20mA single output	750Ω max.
	4-20mA dual output	Output 1: 550Ω max. Output 2: 350Ω 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.)	

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 (at 25°C±5°C).
Temperature Effect	Better than ±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	100MΩ 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	DIN rail mounting
Wiring	M3.5 screw terminal connection (with drop-out prevention screws)
Screwing Torque	0.8 to 1.0 [Nm] * Recommended
External Dimensions	W49.8 × H102.0 × D40.0mm
Weight	140g max.

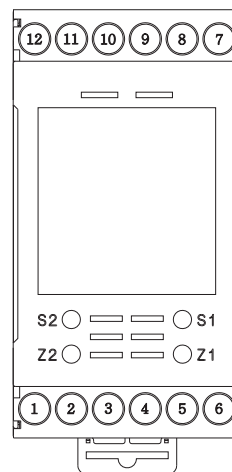
● MATERIALS	
Housing	ABS resin (UL 94V-0)
Screw Terminal	Nickel-plated steel
Printed Circuit Board	Glass fabric epoxy resin (FR-4: UL 94V-0)
Anti-Humidity Coating	HumiSeal [®] 1A27NS (Polyurethane)

* HumiSeal[®] is a registered trademark of Chase Corporation.

● STANDARDS CONFORMITY	
EC 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.

Note: The 12V DC version is not subject to CE approval.

TERMINAL ASSIGNMENT



①	+ OUTPUT 2
②	- OUTPUT 2
③	N.C.
④	P (+)
⑤	N (-)
⑥	GND
⑦	+ INPUT
⑧	- INPUT
⑨	N.C.
⑩	N.C.
⑪	+ OUTPUT 1
⑫	- OUTPUT 1

BLOCK DIAGRAM

