Product Specification Sheet **Model: MS3008** **MS3000**

Terminal Block Type Frequency/Analog Converter with Isolated Single Output

DESCRIPTION

The MS3008 is a terminal block type frequency to analog converter that converts pulse train signals from flow sensors and the like into commonly used DC signals and provides an isolated single output.

ORDERING CODE

MS3008 - □ - □ □

Model

Power Supply

D: 24V DC **Q**: 12V DC

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

Input

O: Dry contact or open collector (Pull-up: Approx. 13V, 3.3kΩ)
A: AC voltage pulse (Threshold voltage: Approx. 0.06Vp-p)
D: DC voltage pulse (Threshold voltage: Approx. 2V)
I : 4 to 20mA DC pulse (Threshold current: Approx. 8mA)
Y: Other input signal and/or threshold voltage

Output

A: 4 to 20mA DC
D: 0 to 20mA DC
Z: Other DC current signals

1: 0 to 10mV DC
2: 0 to 100mV DC
3: 0 to 1V DC
4: 0 to 10V DC
5: 0 to 5V DC
6: 1 to 5V DC
1W: ±10mV DC
2W: ±100mV DC
3W: ±1V DC
4W: ±10V DC
5W: ±5V DC
0: Other DC voltage signals

Options

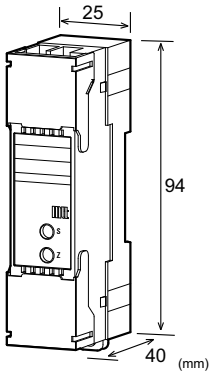
No code: None
/H: Polyurethane conformal coating
/X: Others (Special order)

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

ORDERING INFORMATION

To place an order, please use the ordering code format as shown above. Also specify a measuring frequency range.
(e.g.) MS3008-D-D6 (0 to 850Hz)

Other Ordering Examples:
For an input code of "Y": MS3008-D-YA (0 to 500Hz / Input DC voltage pulse: 0 to 12V / SH = 8.5V, SL = 2.5V)
For an input code of "Y": MS3008-D-YA (0 to 500Hz / Input AC voltage pulse: 200Vp-p / S = 2Vp-p)
Note: For DC current pulse input, specify an input range between 0-100μA and 0-100mA.
* SH = Threshold level HI, SL = Threshold level LO, S = Threshold level



SPECIFICATIONS

●POWER SECTION

Power Requirements	24V DC: 24V DC±10% 12V DC: 12V DC±20%
Power Sensitivity	Better than ±0.1% of span for each power supply range.
Power Line Fuse	250mA fuse is installed (standard).

Power Consumption

Power	24V DC	12V DC
Current Output	50mA max.	85mA max.
Voltage Output	25mA max.	40mA max.

Note: The above figures are in the condition of the rated voltage supplied.

●INPUT SECTION

Input Resistance

Voltage Input (DC)	With power. 1MΩ min. (Standard, 5V input) Without power: 30kΩ min.
Current Input (DC)	250Ω (Standard for 4 to 20mA)

Allowable Input Voltage

DC Voltage Input Model	30V DC max., continuous. (Standard for a span up to 10V)
DC Current Input Model	40mA DC max., continuous.
AC Voltage Input Model	200Vp-p AC max., continuous (up to ±100V with reference to 0V).
Input Pulse Width	20μs min.
Duty Ratio	40 to 60%

Ranges Available

	AC Voltage Pulse	DC Voltage Pulse
Input Range	-300 to 300V	0 to 300V
Input Voltage Span	0.1 to 600Vp-p	1 to 300V
Input Bias	N/A	0 to +300%
Threshold Voltage	50mVp-p min.	Hi-Lo voltage: 0.2V min.
Input Frequency	Within the range between 0-20Hz and 0-20kHz.	

Input Spec. Ex.: For 10 to 15V DC voltage pulse input, the input voltage span is 5V and the bias +200%.

●OUTPUT SECTION

Allowable Output Load		
Voltage Output (DC)	1V span and up	2mA max.
	10mV	10kΩ min.
	100mV	100kΩ min.
Current Output (DC)		550Ω max.
Zero Adjustment	Approx. ±2.5% of span. (Adjustable by the front-accessible trimmer.)	
Span Adjustment	Approx. ±2.5% 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 ±0.3% of span. Ripple: 0.2%p-p or less of span (for at least 10% input) (at 25°C±5°C)
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Response Time	
Input Frequency	0 to 90% with a step input at 100%
20Hz	8s max.
200Hz	1s max.
2kHz	500ms max.
20kHz	500ms max.
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: 1500V 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-proof screws)
Screwing Torque	0.8 to 1.0 [Nm] * Recommended
External Dimensions	W25.0 × H94.0 × D40.0 mm
Weight	90g max.

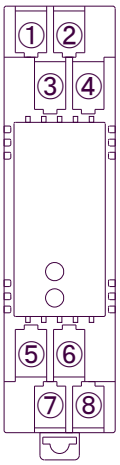
●MATERIAL

Housing	ABS resin (UL 94V-0)
Screw Terminal	Nickel-plated steel
Printed Circuit Board	Glass fabric epoxy resin (FR-4: UL 94V-0)

●STANDARDS CONFORMITY

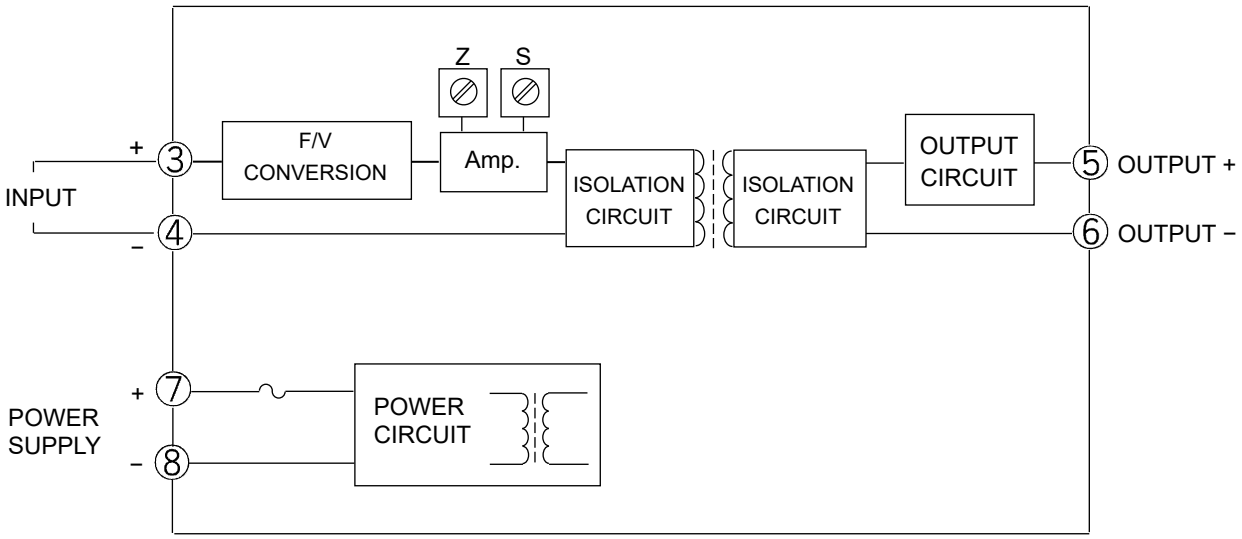
EC Directive Conformity	EMC Directive (2014/30/EU) EN61326-1:2013 Low Voltage Directive (2014/35/EU) IEC61010-1 EN61010-1:2010/A1:2019 Installation Category II Pollution Degree 2

TERMINAL ASSIGNMENTS

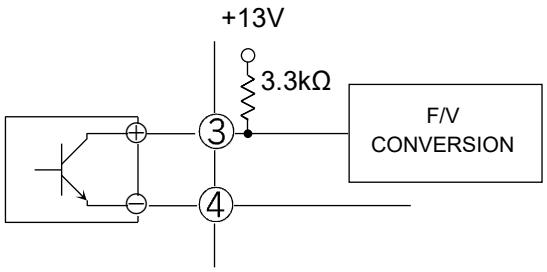


①	N.C.
②	N.C.
③	INPUT +
④	INPUT −
⑤	OUTPUT +
⑥	OUTPUT −
⑦	+ POWER
⑧	−

BLOCK DIAGRAM



For dry contact or open collector input:



For voltage pulse input: