

**DESCRIPTION**

The MS5308 is a plug-in frequency-to-analog converter that converts pulse train signals from flow sensors and the like into commonly used DC signals and provides an isolated dual output.

**ORDERING CODE**
**MS5308 -**  -   
**Model**
**Power Supply**
**A:** 100 to 240V AC (50 to 60Hz)

**D:** 24V DC

**P:** 100 to 240V DC

**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 signals and/or threshold voltages

**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 signals

**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

**/A:** Sensor power supply: 24V DC (±10%), 2-wire type

**/B:** Sensor power supply: 12V DC (±10%), 2-wire type

**/C:** Sensor power supply: 24V DC (±10%), 3-wire type

**/D:** Sensor power supply: 12V DC (±10%), 3-wire type

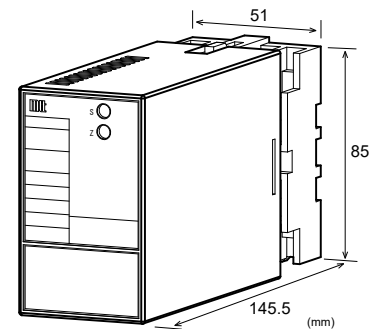
**/E:** Sensor power supply: 5V DC (±10%), 2-wire type

**/F:** Sensor power supply: 5V DC (±10%), 3-wire type

**/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 on the left. Also specify a measuring frequency range.

(e.g.) MS5308-A-DA6 (0 to 850Hz)

Other Ordering Examples:

For an input code of "Y": MS5308-A-YAA (0 to 500Hz / Input DC voltage pulse: 0 to 12V / SH = 8.5V, SL = 2.5V)

For an input code of "Y": MS5308-A-YAA (0 to 500Hz / Input AC voltage pulse: 200Vp-p / S = 2Vp-p)

\* SH = Threshold level HI, SL = Threshold level LO, S = Threshold level

Note: For DC current pulse input, the range should be specified between 0-100μA and 0-100mA.

**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.
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Power Line Fuse	160mA fuse
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**Maximum Power Consumption**

Power	100-240V AC	24V DC	100-240V DC
	Approx. 9.0VA	Approx. 3.0W	Approx. 9.0W

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

Voltage Input Model (DC)	With power:	1MΩ min. (Standard, 5V input)
	Without power:	30kΩ min.

Current Input Model (DC)	250Ω (Standard for 4 to 20mA)
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Note: When a 2-wire type sensor power supply is specified, a shunt resistor of 100Ω is used.

**Allowable Input Voltage**

DC Voltage Input Model	30V DC max., continuous.
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	20 $\mu$ s min.	
Duty Ratio	40 to 60%	
Maximum Sensor Supply Current	30mA	
Ranges Available		
	AC Voltage Pulse	DC Voltage Pulse
Input Range	-300 to 300V	0 to 300V
Input Voltage Span	0.1 to 600V <sub>p-p</sub>	1 to 300V
Input Bias	N/A	0 to +300%
Threshold Voltage	50mV <sub>p-p</sub> 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 10mV 100mV	2mA max. 10k $\Omega$ min. 100k $\Omega$ min.
Current Output (DC)	4-20mA single output 4-20mA dual output	750 $\Omega$ max. 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 $\pm$ 0.3% of span. Ripple: 0.2%p-p or less of span (for at least 10% input) (at 25 $^{\circ}$ C $\pm$ 5 $^{\circ}$ C)
Temperature Effect	Better than $\pm$ 0.2% of span per 10 $^{\circ}$ 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	4-way isolation between input, output 1, output 2, and power.
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 $^{\circ}$ C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	-10 to 60 $^{\circ}$ C

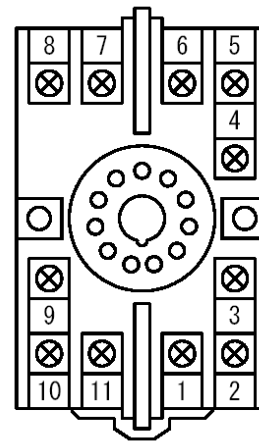
### ● PHYSICAL

Installation	Wall/DIN rail mounting
Mounting Direction	Vertical
Screwing Torque	0.78 to 1.18 [Nm] * Recommended
Wiring	M3.5 screw terminal connection
External Dimensions	W51 $\times$ H85 $\times$ D145.5 mm (including the socket)
Weight	Main unit: 200g max. Socket: 80g max.

### ● MATERIAL

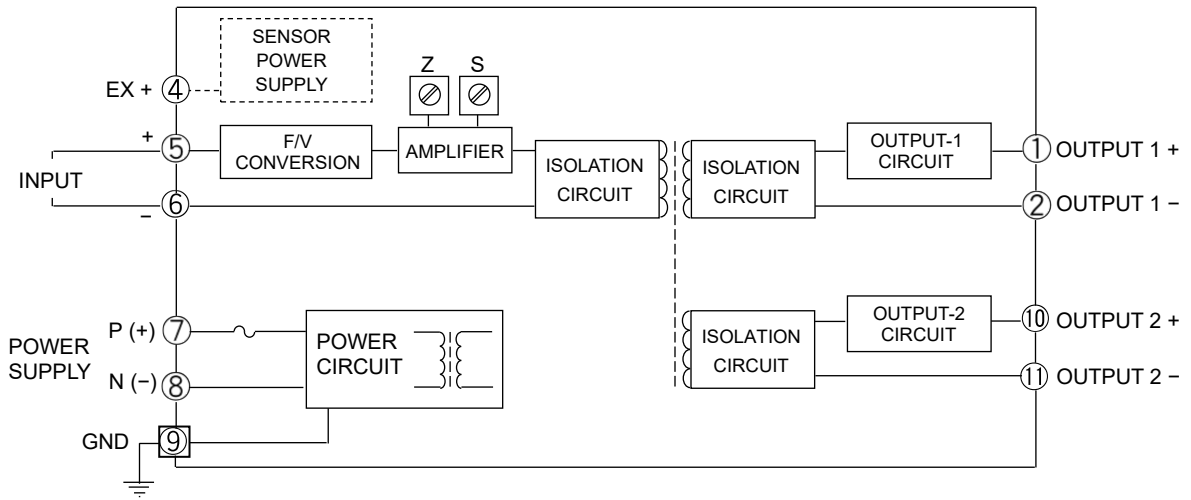
Housing	ABS resin (UL 94V-0)
Socket	ABS resin (UL 94V-0)
Screw Terminal	Galvanized steel with trivalent chromate finish
Printed Circuit Board	Glass fabric, epoxy resin (FR-4: UL 94V-0)

### TERMINAL ASSIGNMENTS

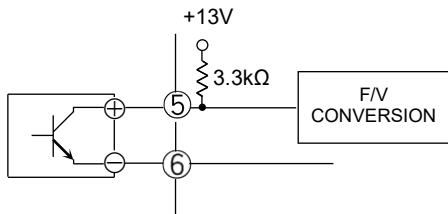


①	+ OUTPUT 1
②	- OUTPUT 1
③	N.C.
④	EX +
⑤	+ INPUT
⑥	- INPUT
⑦	P (+)
⑧	N (-)
⑨	GND
⑩	+ OUTPUT 2
⑪	- OUTPUT 2

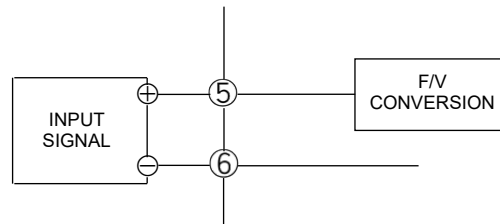
**BLOCK DIAGRAM**



For dry contact or open collector input:



For voltage pulse input:



When a 2-wire sensor is used:

Note: The connections may vary depending on the type of the sensor used.

