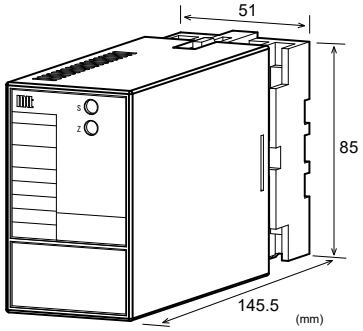
Product Specification Sheet Model: MS5308

Plug-In Frequency/Analog Converter with Isolated Dual Output

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 signal and/or threshold voltage

Output 1

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

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
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
/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
/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.
Power Line Fuse	160mA fuse

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)	

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	20μs min.
Duty Ratio	40 to 60%
Sensor Supply Current	30mA max.

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)	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 ±0.3% 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	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

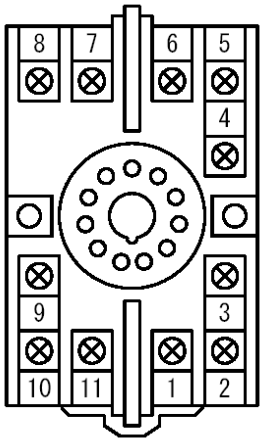
Installation	Wall/DIN rail mounting
Mounting Orientation	Vertical
Screwing Torque	0.78 to 1.18 [Nm] * Recommended
Wiring	M3.5 screw terminal connection
External Dimensions	W51 × H85 × D145.5mm (including the socket)
Weight	Main unit: 200g max. Socket: 80g max.

●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® 1A27NS (Polyurethane)

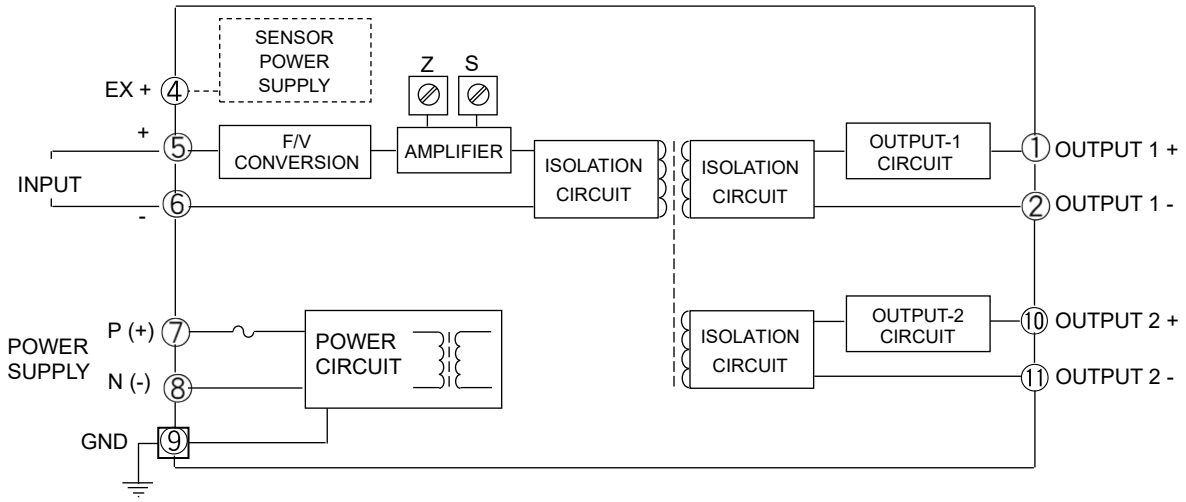
* HumiSeal® is a registered trademark of Chase Corporation.

TERMINAL ASSIGNMENT

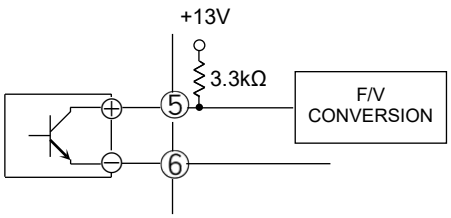


①	+ OUTPUT 1	
②	- OUTPUT 1	
③	N.C.	
④	EX +	
⑤	+ INPUT	
⑥	- INPUT	
⑦	P (+)	POWER
⑧	N (-)	
⑨	GND	
⑩	+ OUTPUT 2	
⑪	- OUTPUT 2	

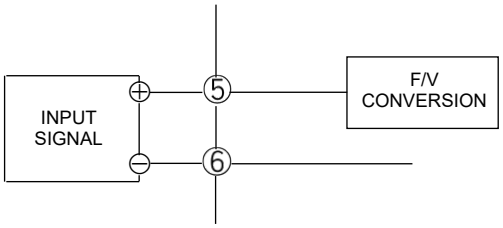
BLOCK DIAGRAM



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.