# Standard Specifications Type: MS3708

**MS3700**

## Slim-shaped Plug-in Frequency/Analog Converter with Isolated Single/Dual Output

## Overview

MS3708 is a slim-shaped plug-in frequency/analog converter with isolated single/dual output to convert pulse train frequency signals from a flow sensor, etc. into various DC signals as selected. (RoHS-conformed)

## Ordering Format

MS3708-□-□□□

**Type**

**Power Supply**

A: AC 85 ～ 264V D: DC 24V
P: DC 85 ～ 264V

**Input Signal**

O: Non-voltage contact, Open collector (Detecting power supply Approx.13V, 3.3kΩ)
A: AC voltage pulse (Threshold voltage: Approx. 0.06Vp-p)
D: DC voltage pulse (Threshold voltage: Approx. 2V)
I: DC4～20mA Pulse (Threshold current: Approx. 8mA)
Y: Others, designated threshold voltage

**Output-1**

A: 4 ～ 20mA DC
D: 0 ～ 20mA DC
Z: Designated DC

1 : 0 ～ 10mV DC
2 : 0 ～ 100mV DC
3 : 0 ～ 1V DC
4 : 0 ～ 10V DC
5 : 0 ～ 5V DC
6 : 1 ～ 5V DC
3W: ± 1V DC
4W: ±10V DC
5W: ± 5V DC
0 : Designated VDC

**Output-2**

**No entry**: None.
Similar to Output-1.

☞When Out-1 is set for Voltage, Out-2 cannot be designated for Current.
☞When both outputs are set for 4～20mA, the Output Load of Out-1 will be less than 550Ω, and that of Out-2 will be 350Ω.

**Option**

**No entry**: None.
／X : Custom Order……Additional cost required.
*Contact us for custom-order requirement.

## Please specify upon ordering

**・Product Model Number (Measuring Temperature Range)**
**(Example) MS3708-A-DA6(0～850Hz)**

Other items to be specified:
・For input "Y": MS3708-A-YAA(0～500Hz/Input DC Voltage pulse 0～12V SH=8.5V,SL=2.5V)
・For input "Y": MS3708-A-YAA(0～500Hz/Input AC pulse 200Vp-p S=2Vp-p)
*For DC pulse, specify the pulse width in the range between 0～100μA and 0～100mA.
*SH=High threshold level, SL=Low threshold level, S=Threshold level


## Specifications

### ●Power Supply Section

| | |
|---|---|
| **Power Supply** | AC85～264V(Rating100～240V)47～63Hz<br>DC24V±10%<br>DC85～264V(Rating100～240V) |
| **Power Sensitivity** | Within ±0.1% of Span for each power supply voltage. |
| **Power Supply Fuse** | 160mA Fuse |

**Maximum Power Consumption**

| Power Supply | AC85～264V | DC24V | DC85～264V |
|---|---|---|---|
| Single Output | 4.0VA max. / 1.5Wmax. / 4.8W max. | | |
| Dual Output | 5.0VA max. / 1.7W max. / 6.0W max. | | |

### ●Input Section

**Input Resistance**

| | |
|---|---|
| Voltage Input (DC) | 1MΩ min. with excitation<br>(30kΩ min. without excitation) |
| Current Input (DC) | 250Ω (4～20mA:Standard) |

**Input Voltage Allowable**

| | |
|---|---|
| DC voltage input | 30V DC max. continuous |
| DC current input | 40mA DC max. continuous |
| AC voltage input | 200Vp-p AC (±100V with reference value of 0V) max. continuous |

| | |
|---|---|
| **Input Pulse Width** | 20μsec. min. |
| **Duty Ratio** | 40～60% |

**Range of Products Available**

| | AC Voltage Pulse | DC Voltage Pulse |
|---|---|---|
| Input Range | -300～300V | 0～ 300V |
| Input Voltage Span | 0.1～600Vp-p | 1～ 300V |
| Input Bias | — | 0～+300% |
| Threshold Voltage | 50mVp-p min. | Hi-Lo width 0.2Vmin. |
| Input Frequency | Within range between 0～20Hz and 0～20kHz | |

(e.g.) DC Voltage pulse 10～15V⇒Input voltage span 5V, Bias 200%

### ●Output Section

**Maximum Output Load**

| | | |
|---|---|---|
| Voltage Output (DC) | 1V Span min. | 2mA max. |
| | 10mV | 10kΩ min. |
| | 100mV | 100kΩ min. |
| Current Output (DC) | 4～20mA Single output | 750Ω max. |
| | 4～20mA Dual output | Out-1 550Ω max. |
| | | Out-2 350Ω max. |

| | |
|---|---|
| Zero Adjustment Range | Approx.±5% of Span (Adjustable by Trimmer on front panel) |
| Span Adjustment Range | Approx.±5% of Span (Adjustable by Trimmer on front panel) |

## ●Output Section

**Range of Products Available**

| | Current Signal | Voltage Signal |
|---|---|---|
| Output Range (DC) | 0～20mA | −10～10V |
| Output Span(DC) | 4～20mA | 10mV～20V |
| Output Bias | 0～100% | −100～100% |

*For current output smaller than 0.1mA, the accuracy is not guaranteed.
(e.g.1) 4～20mA⇒Output Span 16mA, Bias 25%
(e.g.2) −1～4V⇒Output Span 5V, Bias −20%

## ●Standard Performance

| | |
|---|---|
| **Conversion Accuracy** | Within ±0.3%/F.S.<br>Ripple: Within 0.2%p-p/F.S.<br>(Input 10% min.) (@25℃±5℃) |
| **Temp. Characteristics** | Within ±0.2% of Span with every 10℃ variation |
| **Response Time** | |
| Input Frequency | (0～90%)@100% step input |
| 20Hz | 8sec max. |
| 200Hz | 1sec max. |
| 2kHz | 500msec max. |
| 20kHz | 500msec max. |
| **CMRR** | 100dB min. (500V AC, 50/60Hz) |
| **Signal Isolation** | Between Input − Out1−Out2−Power Supply−Ground |
| **Isolation Resistance** | 100MΩ min.(@500V DC)<br>Between Input−Out1−Out2−Power Supply−Ground |
| **Dielectric Strength** | Between Input—[Out1,Out2]—[Power Supply, Ground]<br>:2000V AC, Shut Down Current 0.5mA for 1 minute<br>Between Power Supply − Ground<br>:2000V AC, Shut Down Current 5mA for 1 minute<br>Between Out1 − Out2<br>:500V AC, Shut Down Current 0.5mA for 1 minute |
| **Measures against SWC** | Conform to ANSI/IEEE C37.90.1-1989 |
| **Operating Environment** | Temperature: −5～55℃<br>Humidity : 5～90%RH(Non-Condensing) |
| **Storage Temp.** | −10～60℃ |

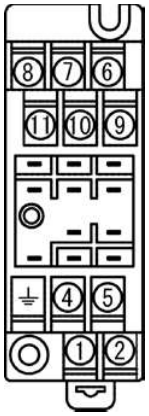
## ●Installation / Physical Specifications

| | |
|---|---|
| **Installation** | Wall mounting &/or DIN-rail mounting |
| **Wiring** | M3.5 screw terminal connection<br>(with P.S. terminal cover & screw crop-protection) |
| **Screw Tightening Torque** | 0.8～1[N･m] Recommendable |
| **Outer Dimension** | W29×H86×D125mm<br>(incl. set screws & socket terminal block) |
| **Mass** | Main body 120g max., Terminal Block 80g max. |

## ●Materials

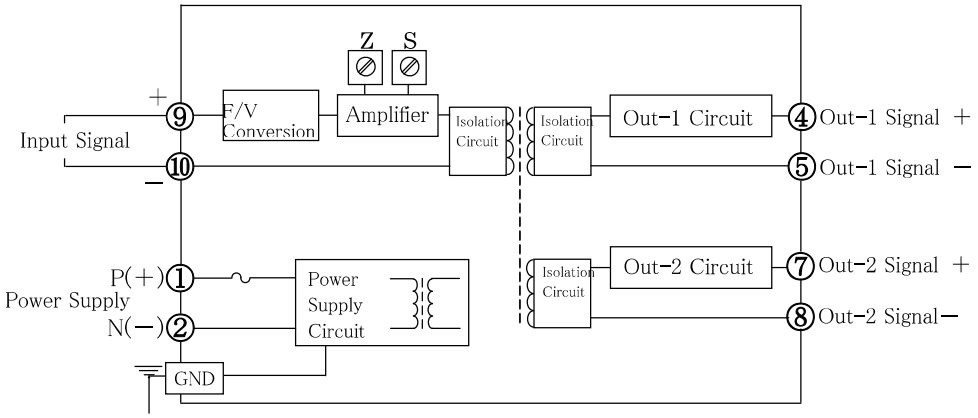
| | |
|---|---|
| **Housing** | ABS Resin (UL-94V-0) |
| **Terminal Block** | ABS Resin (UL-94V-0) |
| **Terminal Screws** | Iron/Nickel-plated |
| **Terminal Surface Treatment** | 0.2μm / Gold plated |
| **P.C. Board** | Glass-Epoxy (FR-4:UL-94V-0) |
| **Moisture-proof Coating** | HumiSeal Coating<br>:HumiSeal 1A27NS(Polyurethane Resin) |

## Terminal Arrangement / Signal Assignment

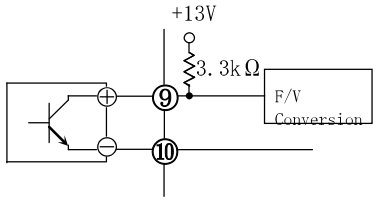



| | | |
|---|---|---|
| ① | P(＋) | POWER |
| ② | N(−) | |
| ⏚ | GND | |
| ④ | ＋ OUTPUT 1 | |
| ⑤ | − OUTPUT 1 | |
| ⑥ | N.C | |
| ⑦ | ＋ OUTPUT 2 | |
| ⑧ | − OUTPUT 2 | |
| ⑨ | ＋ INPUT | |
| ⑩ | − INPUT | |
| ⑪ | N.C | |

## Block Diagram




* In case of non-voltage contact, open collector input




*In case of voltage pulse input