

**DESCRIPTION**

The MS3729 is a slim, plug-in analog to frequency converter that converts DC current or voltage signals into pulse train signals. The unit provides isolated single or dual output.

**ORDERING CODE**

**MS3729** -  -

**Model** \_\_\_\_\_

**Power Supply** \_\_\_\_\_  
**A:** 100 to 240V AC (50 to 60Hz)  
**D:** 24V DC                   **P:** 100 to 240V DC

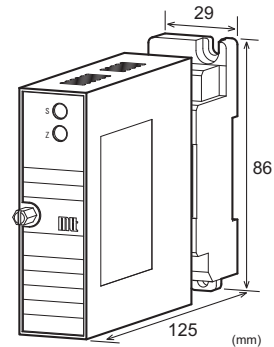
**Input** \_\_\_\_\_  
**A:** 4 to 20mA DC                   **3:** 0 to 1V DC  
**B:** 2 to 10mA DC                   **4:** 0 to 10V DC  
**C:** 1 to 5mA DC                   **5:** 0 to 5V DC  
**D:** 0 to 20mA DC                   **6:** 1 to 5V DC  
**E:** 4 to 20mA DC\*1               **0:** Other DC voltage signals  
**H:** 10 to 50mA DC  
**Z:** Other DC current signals

\*1: Shunt resistor 50Ω

**Output 1** \_\_\_\_\_  
**1:** TTL level  
**2:** Open collector  
**5:** Photo MOS relay

**Output 2** \_\_\_\_\_  
**No code:** None  
**The codes are the same as for Output 1.**

**Options** \_\_\_\_\_  
**No code:** None  
**/T:** Pulse Hold Function provided.  
**/H:** Polyurethane conformal coating  
**/X:** Others (Special order)  
 \* For non-standard options, ask MTT for availability.


**SPECIFICATIONS**
**POWER SECTION**

<b>Power Requirements</b>	100 to 240V AC: 85 to 264V AC (47 to 63Hz) 24V DC: 24V DC±10% 100 to 240V DC: 85 to 264V DC		
<b>Power Sensitivity</b>	Better than ±0.1% of span for each power supply range.		
<b>Power Line Fuse</b>	160mA fuse is installed (standard).		
<b>Power Consumption</b>			
Power	100-240V AC	24V DC	100-240V DC
Single Output	3.5VA max	1.0W max	3.6W max
Dual Output	4.0VA max	1.2W max	4.8W max

**INPUT SECTION**

<b>Input Resistance</b>	With or without power: 1MΩ min.	
Voltage Input (DC)	4 to 20mA (std.)	250Ω
Current Input (DC)	2 to 10mA	250Ω
	1 to 5mA	100Ω
	0 to 20mA	250Ω
	10 to 50mA	10Ω
<b>Allowable Input Voltage</b>	30V DC max., continuous. (Standard Model for a span up to 10V)	
<b>Current Input Model</b>	40mA DC max., continuous. (Standard for 4 to 20mA)	
<b>Ranges Available</b>	Current Signal	Voltage Signal
Input Range (DC)	-100 to 100V	-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**

<b>Zero Adjustment</b>	Approx. ±5% of span. (Adjustable by the front-accessible trimmer.)
<b>Span Adjustment</b>	Approx. ±5% of span. (Adjustable by the front-accessible trimmer.)

**ORDERING INFORMATION**

To place an order, please use the ordering code format as shown above. Also specify an output frequency range\*.

(e.g.) MS3729-A-611 (0 to 4.3kHz)

\* Note that the output frequency range should be specified between 0-0.001Hz and 0-5kHz (30Hz max. for the photo MOS relay).

**Other Ordering Examples:**

For an input code of "0": MS3729-A-011 (0 to 4.3kHz / Input: 0.2 to 1V)

For an option code of "T": MS3729-A-611/T (0 to 2Hz / 200ms)

Note 1: For the option code "T", specify a pulse hold time between 200μs and 500ms.

Note 2: If you wish to include multiple options in your order, specify the option codes in series (e.g. /TX).

<b>Ranges Available</b>	Output frequency range between 0-0.001Hz and 0-5kHz Note: When the photo MOS relay is selected, the range should be between 0-0.001Hz and 0-30Hz.
<b>Maximum Output Load</b>	TTL level: Maximum output 10mA at 3.5V
<b>Maximum Rating</b>	
Open Collector	Maximum rating: 30V, 100mA (Resistive load)
Photo MOS Relay	Maximum load voltage: 400V (Peak AC) Maximum continuous load current: 0.15A (Peak AC) Peak load current: 0.5A @ 100ms (1 shot) DC Maximum output power dissipation: 360mW ON resistance: 16Ω max. Off-state leakage current: 1μA max.

**Maximum Output Frequency**  
<With Pulse Hold Function>  
When a pulse hold time is specified, the maximum possible output frequency is determined by the following equation:  
$$\text{Hz} = 1 / (T \times 1.2 + 10\mu\text{s}^*)$$
  
\* 10μs: Output pulse Lo level for TTL or voltage pulse output, or output pulse ON for open collector output  
(Example) When a pulse hold time of 200ms is set, the output frequency is:  
$$1 / (0.2 \times 1.2 + 0.0001) = 4.166 \text{ Hz}$$

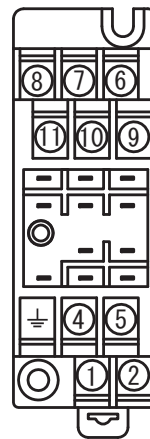
<b>Duty Ratio without Pulse</b>	40 to 60%
<b>Hold Function</b>	

<b>● PERFORMANCE</b>	
<b>Accuracy Rating</b>	Better than ±0.1% of span (at 25°C±5°C).
<b>Pulse Hold Time Accuracy</b>	Better than ±20% of a user-specified value.
<b>Temperature Effect</b>	Better than ±0.2% of span per 10°C change in ambient.
<b>Response Time</b>	
Output Frequency	0 to 90% with a step input at 100%
0.5Hz	3.1s max.
5Hz	310ms max.
50Hz	65ms max.
500Hz ≤	35ms max.
<b>Isolation</b>	4-way isolation between input, output 1, output 2, and power.
<b>Insulation Resistance</b>	100MΩ min. (@ 500V DC) between input, output 1, output 2, power, and ground.
<b>Dielectric Strength</b>	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)
<b>Surge Withstand Capability</b>	Tested as per ANSI/IEEE C37.90.1-1989.
<b>Operating Environment</b>	Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing)
<b>Storage Temperature</b>	-10 to 60°C

<b>● PHYSICAL</b>	
<b>Installation</b>	Wall/DIN rail mounting
<b>Wiring</b>	M3.5 screw terminal connection (with a power terminal block cover & drop-proof screws)
<b>Screwing Torque</b>	0.8 to 1.0 [Nm] * Recommended
<b>External Dimensions</b>	W29 × H86 × D125 mm (including the mounting screw and socket)
<b>Weight</b>	Main unit: 120g max. Socket: 80g max.

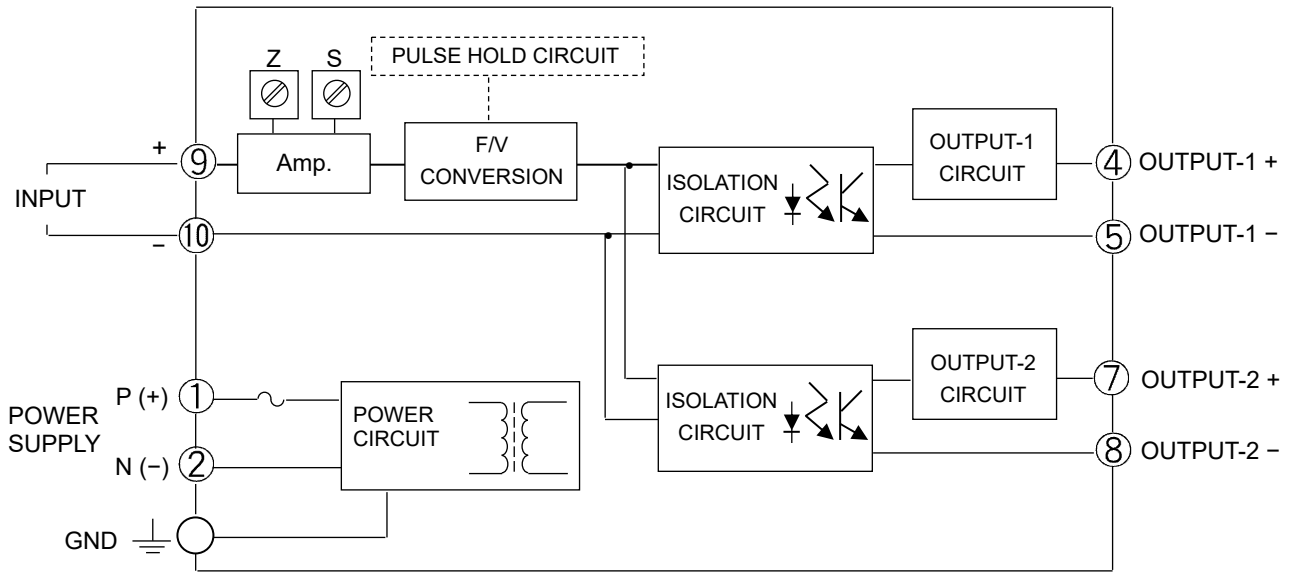
<b>● MATERIAL</b>	
<b>Housing</b>	ABS resin (UL 94V-0)
<b>Terminal Block</b>	PBT resin (UL 94V-0)
<b>Terminal Block Cover</b>	PC resin (UL 94V-2)
<b>DIN Rail Stopper</b>	PP resin (UL 94HB)
<b>Screw Terminal</b>	Nickel-plated steel
<b>Contacts Material and Finish</b>	Brass with 0.2μm gold plating
<b>Printed Circuit Board</b>	Glass fabric, epoxy resin (FR-4: UL 94V-0)

**TERMINAL ASSIGNMENTS**



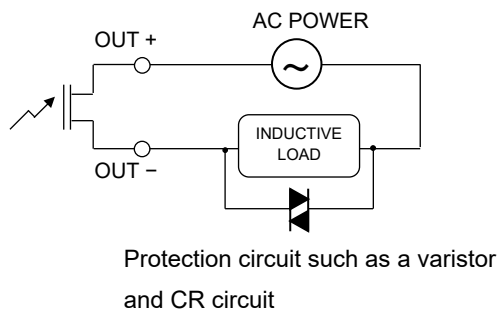
①	P (+)	POWER
②	N (-)	
⊥	GND	
④	+ OUTPUT 1	
⑤	- OUTPUT 1	
⑥	N.C.	
⑦	+ OUTPUT 2	
⑧	- OUTPUT 2	
⑨	+ INPUT	
⑩	- INPUT	
⑪	N.C.	

**BLOCK DIAGRAM**



Note: When an inductive load, such as an electric motor, is connected to the photo MOS relay output, a relay contact protection circuit must be connected across the load.

Example of AC power connection:



Example of DC power connection:

