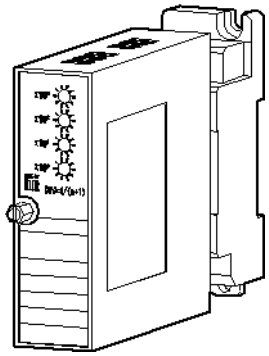
Slim Plug-In Pulse Divider with Isolated Single/Dual Output

DESCRIPTION

The MS3711A is a slim, plug-in pulse divider that accepts pulse train signals from sensors or other devices, shapes and divides these pulses, converts signal levels as necessary, and provides isolated single or dual output.



ORDERING CODE

MS3711A - □ - □ □ □

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
1: TTL level
2: Open collector
3: Voltage pulse 10V±10%
4: Voltage pulse 12V±10%

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

Note: When a combination of TTL levels or voltage pulses is selected for Outputs 1 and 2, the voltage levels for for both outputs should be the same.

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
/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.
(e.g.) MS3711A-A-O22

* With the default setting, the division ratio is 1/1.

Other Ordering Examples:
For an input code of "Y": MS3711A-A-Y22 (Input DC voltage pulse: 0 to 12V / SH=8.5V, SL=2.5V)
For an input code of "Y": MS3711A-A-Y22 (Input AC pulse: 200Vp-p / S= 2Vp-p)
For a specific division ratio: MS3711A-A-O22 (Division ratio: 1/100)
* SH=Threshold level Hi, SL=Threshold level Lo, S=Threshold level
Note 1: When a DC current pulse is selected for input, the range should be specified between 0-100μA and 0-100mA.
Note 2: If you wish to include multiple options in your order, specify the option codes in series (e.g. /AX).

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 is installed (standard).

Power Consumption

Power	100-240V AC	24V DC	100-240V DC
Single Output	5.0VA max	2.1W max	7.2W max
Dual Output	5.5VA max	2.2W max	7.2W max

●INPUT SECTION

Input Resistance

Voltage Input Model	With power:	1MΩ min. (Standard, 5V input)
	Without power:	10kΩ min.
Current Input Model	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).

Maximum Input Frequency	100kHz
Input Pulse Width	10μs min.
Duty Ratio	40 to 60% (at standard threshold voltage)
Sensor Power Supply	30mA max. (2-wire or 3-wire type)

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

●OUTPUT SECTION

Maximum Output Load

TTL Level	5mA @ 3.5V
Voltage Pulse 10V	7mA @ ±10%
Voltage Pulse 12V	7mA @ ±10%

Maximum Rating	Open collector: 30V, 50mA
Division Ratio	1/1 to 1/10000 Division ratios can be set using the four 10-position rotary switches on the front panel. Assuming that these four switches are set to a, b, c and d as shown below, a 4-digit number "n" is expressed as follows: $n = a\times10^3+b\times10^2+c\times10^1+d\times10^0$ where a, b, c and d are variables, each of which takes any of the numbers 0 to 9. Dividing 1 by (n+1) gives a division ratio.

Division Ratio	Switch Setting			
	$\times10^3$	$\times10^2$	$\times10^1$	$\times10^0$
1/n+1	a	b	c	d
1/1	0	0	0	0
1/100	0	0	9	9
1/10000	9	9	9	9

Duty Ratio	40 to 60% (Input pulse duty ratio 50%, standard threshold voltage) Note that the duty ratio will be 30 to 70% only when the division ratio is 1/3. DC voltage pulse: 0-5V/1kHz input AC voltage pulse: 5Vp-p/1kHz input Open collector: 1kHz input

Maximum Output Frequency

Voltage Pulse Output	100kHz
Open Collector Output	50kHz (Load resistance 1kΩ max.)

(For both of the above, the conditions are as follows: input pulse duty ratio 50% and standard threshold voltage)

●PERFORMANCE

Isolation	4-way isolation between input, output [Output 1/Output 2], power, and ground.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output [Output 1/Output 2], power, and ground.
Dielectric Strength	Input / Output [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)
Operating Environment	Ambient temperature: -5 to 55°C Humidity: 5 to 90% RH (non-condensing)
Storage Temperature	-10 to 60°C

●PHYSICAL

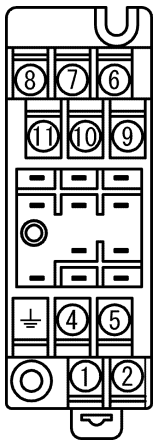
Installation	Wall/DIN rail mounting
Wiring	M3.5 screw terminal connection (with a power terminal block cover & drop-out prevention screws)
Screwing Torque	0.8 to 1.0 [Nm] * Recommended
External Dimensions	W29 × H86 × D125mm (including the mounting screw and socket)
Weight	Main unit: 120g max. Socket: 80g max.

●MATERIALS

Housing	ABS resin (UL 94V-0)
Terminal Block	PBT resin (UL 94V-0)
Terminal Block Cover	PC resin (UL 94V-2)
DIN Rail Stopper	PP resin (UL 94HB)
Screw Terminal	Nickel-plated steel
Contacts Material and Finish	Brass with 0.2μm gold plating
Printed Circuit Board	Glass fabric epoxy resin (FR-4: UL 94V-0)
Anti-Humidity Coating	HumiSeal® 1A27NS (Polyurethane)

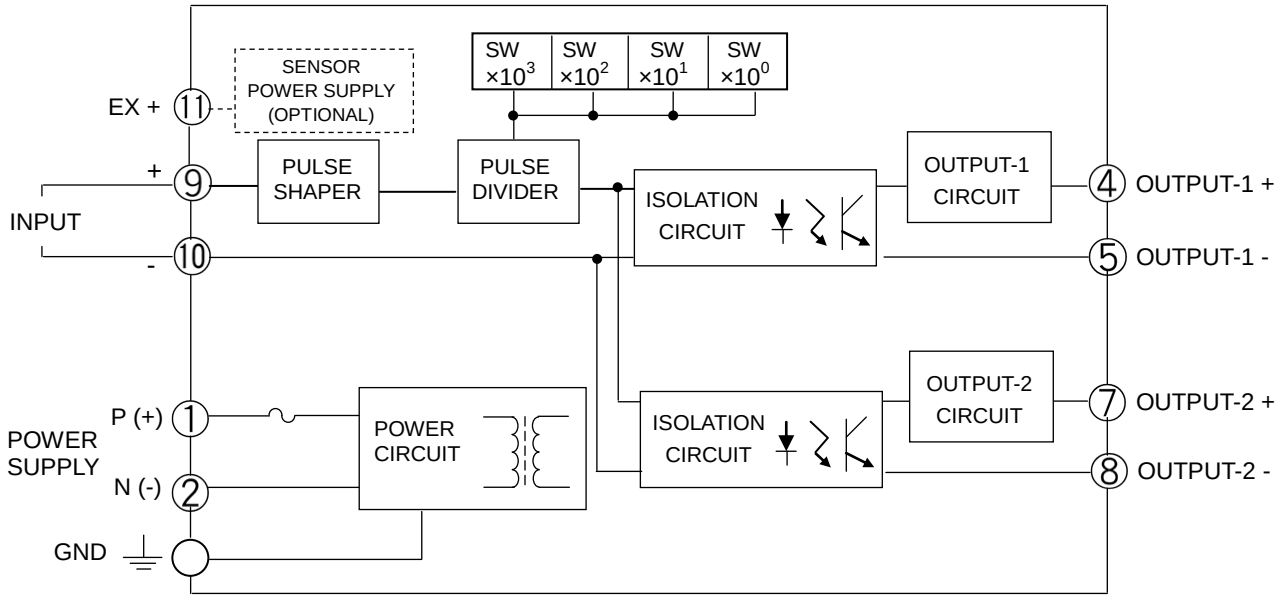
* HumiSeal® is a registered trademark of Chase Corporation.

TERMINAL ASSIGNMENT

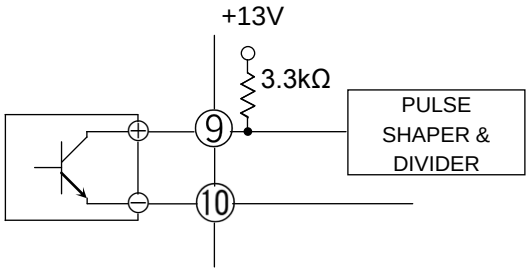


①	P (+)	POWER
②	N (-)	
⏚	GND	
④	+ OUTPUT 1	
⑤	- OUTPUT 1	
⑥	N.C.	
⑦	+ OUTPUT 2	
⑧	- OUTPUT 2	
⑨	+ INPUT	
⑩	- INPUT	
⑪	EX	

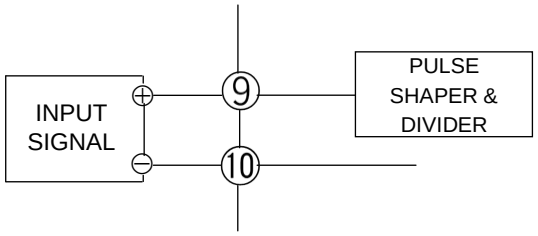
BLOCK DIAGRAM



For dry contact or open collector input:



For voltage pulse input:



When a 2-wire sensor is used:

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