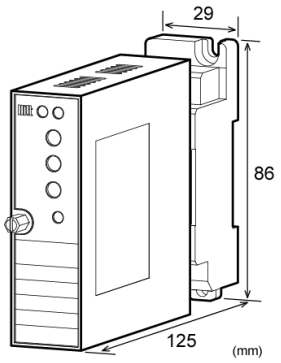
Product Specification Sheet Model: MS3781

Slim Plug-In Accumulator with Isolated Dual Output

DESCRIPTION

The MS3781 is a slim, plug-in accumulator that converts DC current or voltage signals into pulse train signals. The unit provides an isolated dual output.



ORDERING CODE

MS3781 - □ - □ □ 7

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

* 1: Shunt resistor 50Ω

Output 1

1: TTL level
2: Open collector

Output 2

Relay contacts (Form A contacts)

Options

No code: None
/S: Accumulation rate of 1 to 999 p/h
/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 above.
(e.g.) MS3781-A-627

Notes:
1. When you specify an accumulation rate, the product will be subjected to shipping inspection with the specified accumulation rate and then shipped with the accumulation rate set to it.
   If you specify an accumulation rate of less than 100 p/h, the product will be shipped with its accumulation rate set to your specified rate, but the shipping inspection will be performed with an accumulation rate of 100 p/h.
   If no accumulation rate is specified, the product will go through shipping inspection with the accumulation rate of 100 p/h and be shipped with the rate set to 0.
2. If not specified, the dropout level will be 5% of input span.
3. The accumulation rate and dropout level should be specified as shown in the example below.
   (Example) Accumulation rate: 200 p/h
   Dropout level: 1%

Continued:

Other Ordering Examples:
For an input code of "Z": MS3781-A-Z27 (Input: 8 to 20mA)
For an input code of "0": MS3781-A-017 (Input: 0 to 8V)

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 Indicator LED	Green LED is ON when the power supply is on.

Power Consumption

Power	100-240V AC	24V DC	100-240V DC
	5.0VA max	1.5W max	2.5W max

INPUT SECTION

Input Resistance

Voltage Input (DC)	With or without power: 1MΩ min.	
Current Input (DC)	4 to 20mA (std.)	250Ω
	2 to 10mA	250Ω
	1 to 5 mA	100Ω
	0 to 20mA	250Ω
	10 to 50mA	10Ω

Allowable Input Voltage

Voltage Input Model	30V DC max., continuous. (Standard for a span up to 10V)
Current Input Model	40mA DC max., continuous. (Standard for 4 to 20mA)

Ranges Available

	Current Signal	Voltage Signal
Input Range (DC)	-100 to 100mA	-10 to 10V
Input Span (DC)	100μA*1 to 200mA	200mV*2 to 20V
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 20V, 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

Maximum Output Load	TTL level: Maximum output 10mA at 3.5V
Maximum Rating	Open collector: 40V DC, 50mA
Pulse Width	125ms±20%
Output Indicator LED	Green LED is ON while pulses are output.
Relay Contacts	
Rated Load	125V AC 0.5A, 30V DC 2A (Resistive load) 125V AC 0.3A, 30V DC 1A (Inductive load)
Maximum Contact Voltage	250V AC, 220V DC
Maximum Contact Current	2A (Resistive load) 1A (Inductive load)
Electrical Life	500×10^3 cycles min. (Frequency at rated load: 1,800 cycles/h)
Mechanical Life	100×10^6 cycles min. (Frequency: 36,000 cycles/h)

●PERFORMANCE

Accuracy Rating	Better than ±0.5% of span (at 25°C±5°C).
Temperature Effect	Better than ±0.2% of span per 10°C change in ambient.
Response Time	Time to the first pulse with a 0 to 100% step input = (50ms + Pulse interval*) s max. * Pulse interval: 60 p/h setting: 60s 10 p/h setting: 360s
Accumulation Rate	Standard: 10 to 9990 p/h (in steps of 10 p/h) Option: 1 to 999 p/h (in steps of 1 p/h) (Adjustable by the front-accessible rotary switches.)
Dropout Level	0 to 20%* (Specify when ordering) * It can be specified in steps of 1%.
Accuracy	Better than ±0.5% of span.
Hysteresis	1% of span, max.
Response Time during Dropout	150ms max. (with a 1% set value, 100 to 0% step input) Note: If an input value is lower than or equal to the dropout level, the output will be 0 p/h and the red LED on the front panel will turn on. The accumulation is suspended during dropout and resumed upon return to normal operation.
Isolation	Isolation between input, output, and power.
Insulation Resistance	100MΩ min. (@ 500V DC) between input, output, power, and ground.
Dielectric Strength	Input / Output / [Power, Ground]: 2000V AC for 1 minute (Cutoff current: 0.5mA) Power / Ground: 2000V AC for 1 minute (Cutoff current: 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

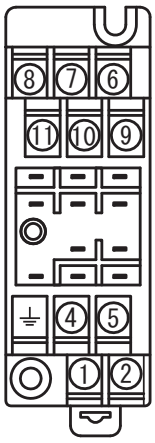
●PHYSICAL

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

●MATERIAL

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)

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