

## Dual Output Super-mini Signal Conditioners Pico-M Series

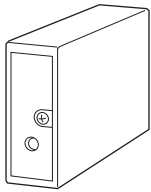
Max. 50 kHz for AC voltage pulse input

### PULSE ISOLATOR

(built-in excitation, CE)

#### Functions & Features

- Amplifying, waveshaping a pulse rate input and providing two galvanically isolated pulse signals
- Space-saving, easy-to-maintain, multi-channel installation base



### [4] OUTPUT PULSE WIDTH

- 1: Equal to the input
  - 2: One-shot output (std. pulse width 50 ms)
- Specify when optional pulse width is required.

### POWER INPUT

#### DC Power

R: 24 V DC

(Operational voltage range 24 V  $\pm$ 10 %, ripple 10 %p-p max.)

### [5] OPTIONS

blank: none

/Q: With options (specify the specification)

## MODEL: M8PP1-[1][2][3][4]-R[5]

### ORDERING INFORMATION

- Code number: M8PP1-[1][2][3][4]-R[5]  
Specify a code from below for each [1] through [5].  
(e.g. M8PP1-B7A1A12-R/Q)

- Input frequency (e.g. 0 - 1000 Hz)
- Output pulse width (e.g. 75 msec.)

Use Ordering In-formation Sheet (No. ESU-5484) for Input Codes B:DC voltage pulse or E: AC voltage pulse, or for non-standard output pulse width.

- Specify the specification for option code /Q  
(e.g. /C01 )

### [1] INPUT

- A: Dry contact
- B: DC voltage pulse (Specify sensitivity)
- C: 5 V pulse (sensitivity 2 V)
- D: 12 V/24 V pulse (sensitivity 5 V)
- E: AC voltage pulse (Specify sensitivity)
- H: Two-wire current pulse

### [2] EXCITATION

- 0: None
- 4: 12 V DC / 30 mA
- 7: 24 V DC / 30 mA

### [3] OUTPUT 1 / OUTPUT 2

- A1A1: Open collector / open collector (max. 100 kHz)
- A2A2: Open collector / open collector (max. 10 Hz)
- M1M1: 5 V pulse / 5 V pulse (max. 100 kHz)
- M2M2: 5 V pulse / 5 V pulse (max. 10 Hz)

### SPECIFICATIONS OF OPTION: Q

**COATING (For the detail, refer to M-System's web site.)**

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

### RELATED PRODUCTS

- Installation Base or Single Mount Base Socket (model: M8BSx)

This unit must be mounted on dedicated base or socket except Model M8BS2 base.

### GENERAL SPECIFICATIONS

**Construction:** Plug-in

**Mounting screw:** M3 screw (torque 0.3 N·m)

**Housing material:** Flame-resistant resin (black)

**Power supply:** Via the Installation Base terminals  
(model: M8BSx)

**Isolation:** Input to output 1 to output 2 to power

**Polarity switch:** Inverting output pulse logic

(factory setting: non-inverted)

**Input pulse sensing:** DC coupled (AC coupled for AC voltage pulse)

### INPUT SPECIFICATIONS

**Excitation:** 12 V DC  $\pm$ 2 V @30 mA

24 V DC  $\pm$ 4 V @30 mA

shortcircuit protection; approx.  $\leq$  5 mA at shortcircuit

**Caution:** With a current exceeding 30 mA, the pulse isolator stops feeding the sensor excitation, until the sensor is removed and connected again.

**Pulse width time requirement**

**No pulse width adj. for output:** 2  $\mu$ sec. min.



(10 msec. min. for 0 - 10 Hz)

**One-shot:** 1 msec. min.

■ **Dry Contact**

**Max. frequency:** 100 kHz

**Sensing:** Approx. 12 V DC @3 mA

**ON/OFF level:**  $\geq 4 \text{ k}\Omega/6 \text{ V}$  at OFF

$\leq 1.3 \text{ k}\Omega/4 \text{ V}$  at ON

■ **DC Voltage Pulse:** Specify detecting level, amplitude and DC offset.

**Max. frequency:** 100 kHz

**Waveform:** Square or sine

**Input impedance:** 30 k $\Omega$  min.

**Input amplitude:** 2 - 50 V p-p

**Detecting level:** 2 - 10 V;  $0.6 \text{ V} \leq V_H - V_L \leq 1.3 \text{ V}$

**Max. voltage between input terminals:** 50 V

• **5 V, 12 V, 24 V Pulse**

**Max. frequency:** 100 kHz

**Waveform:** Square or sine

**Input impedance:** 30 k $\Omega$  min.

**Detecting H level**

**5 V pulse:**  $\geq 3 \text{ V}$

**12 V, 24 V pulse:**  $\geq 6 \text{ V}$

**Detecting L level**

**5 V pulse:**  $\leq 1 \text{ V}$

**12 V, 24 V pulse:**  $\leq 4 \text{ V}$

■ **AC Voltage Pulse:** Specify amplitude and frequency.

**Max. frequency:** 50 kHz

**Min. frequency:** 1 Hz

**Waveform:** Sine

**Input impedance:** 10 k $\Omega$  min.

**Input amplitude:** 0.1 - 100 V p-p

**Max. voltage between input terminals:** 50 V

■ **Two-wire Current Pulse**

**Max. frequency:** 100 kHz

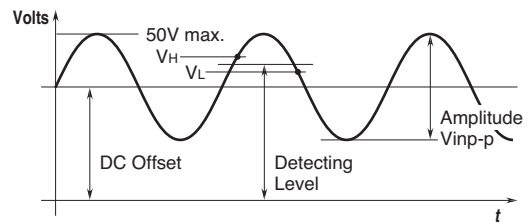
**Input resistance:** Receiving resistor 250  $\Omega$

**Input range:** 0 - 25 mA

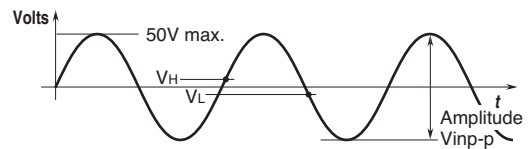
**Detecting level:**  $\leq 4 \text{ mA}$  for Lo,  $\geq 12 \text{ mA}$  for Hi

■ **Pulse**

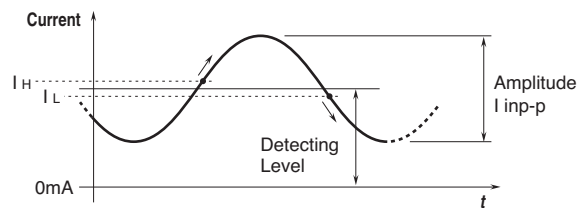
• **DC Voltage Pulse**



• **AC Voltage Pulse**



• **Two-wire Current Pulse**



## OUTPUT SPECIFICATIONS

**Max. frequency:** 100 kHz

■ **Open Collector:** 50 V DC @50 mA

**Saturation voltage:** 0.5 V DC

■ **5 V Pulse**

**Hi level:**  $5 \text{ V} \pm 10 \%$

**Lo level:**  $\leq 0.5 \text{ V}$

**Load resistance:** 1000  $\Omega$  min.

## OUTPUT PULSE WIDTH

• **One-shot Output:** Constant pulse width

Output Frequency (Hz) =  $500 \div$  Output Pulse Width (msec.)

**Pulse width:** 1 - 500 msec. (standard 50 msec.  $\pm 20 \%$ )

## INSTALLATION

**Current consumption:** Approx. 90 mA

**Operating temperature:** 0 to 55°C (32 to 131°F)

**Operating humidity:** 30 to 95 %RH (non-condensing)

**Mounting:** Installation Base (model: M8BSx)

**Weight:** 70 g (2.5 oz)



## PERFORMANCE

**Insulation resistance:**  $\geq 100 \text{ M}\Omega$  with 500 V DC

**Dielectric strength:**

1500 V AC @1 minute (input to output 1 or output 2 or power to ground)

500 V AC @1 minute (output 1 to output 2 to power)

**SWC test:** ANSI/IEEE-C37.90.1-1989

## STANDARDS & APPROVALS

**CE conformity:**

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007/A1: 2011

EMS EN 61000-6-2: 2005

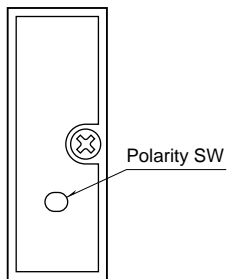
## FRONT VIEW

- **Polarity SW**

Used to select output pulse logic.

Push in the switch to invert the output logic.

Push back for non-inverted output.



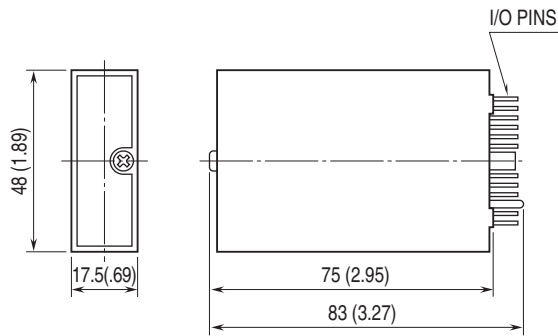
## OUTPUT LOGIC

INPUT TYPE	PULSE LOGIC	INPUT	VOLTAGE PULSE OUTPUT	OPEN COLLECTOR
Voltage Pulse Input 2-wire Current Pulse Input [ON current (H)] [OFF current (L)]	Non Inverted	H L	H L	OFF ON
	Inverted	H L	H L	OFF ON
Dry Contact Input	Non Inverted	OFF ON	H L	OFF ON
	Inverted	OFF ON	H L	OFF ON

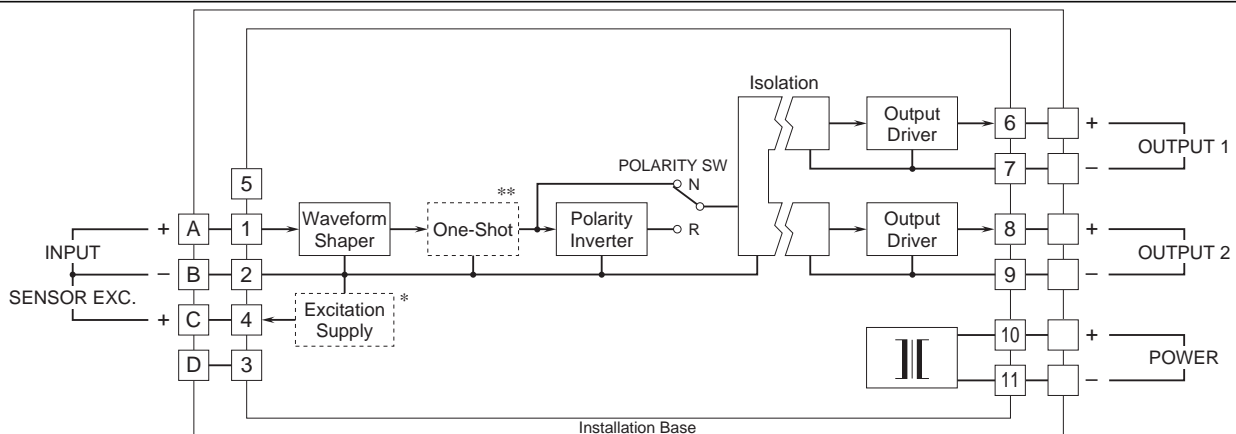
The pulse width in one-shot means the bold lined section of a pulse waveform.



## DIMENSIONS unit: mm (inch)



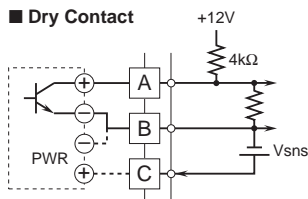
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



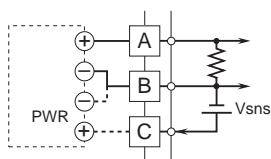
\* Provided only when the sensor excitation option is selected.  
 \*\* Provided only when the one-shot output option is selected.

### Input Connection Examples

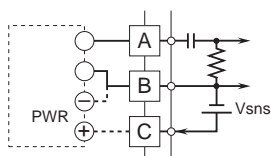
#### ■ Dry Contact



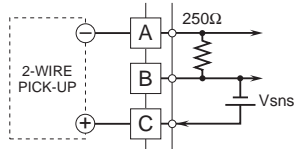
#### ■ DC Voltage Pulse



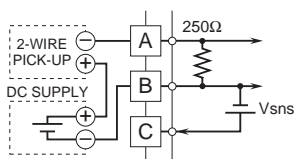
#### ■ AC Voltage Pulse



#### ■ 2-Wire Current Pulse • Built-in Excitation

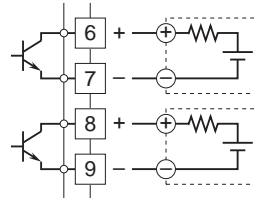


#### • External DC Supply

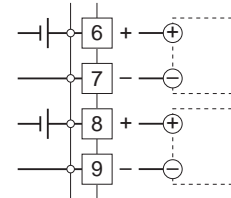


### Output Connection Examples

#### ■ Open Collector



#### ■ Voltage Pulse



Specifications are subject to change without notice.