

## Super-mini Signal Conditioners Mini-M Series

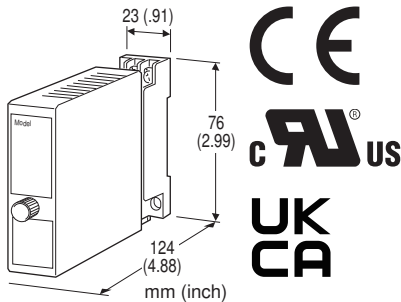
### PULSE ISOLATOR

#### Functions & Features

- Galvanically isolates pulse rate signals
- Input frequency = output frequency
- Various outputs (open collector, voltage pulses and dry contact AC/DC switch)

#### Typical Applications

- Isolating field pulse signals in order to reduce noises
- Changing e.g. dry contact signal to e.g. 5 V signals



### MODEL: M2PP-[1][2][3]-[4][5]

#### ORDERING INFORMATION

- Code number: M2PP-[1][2][3]-[4][5]
- Specify a code from below for each of [1] through [5].  
(e.g. M2PP-33N-M2/CE/Q)
- Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] INPUT

- 1: Mechanical contact (max. 30 Hz)
- 2: Open collector (max. 10 kHz)
- 3: Voltage pulse (max. 10 kHz)
- 9: Clamp-on pulse sensor CLSP  
(‘/UL’ is not selectable for ‘Standards & Approvals’ code.)

#### [2] OUTPUT

- 1: Low frequency open collector (max. 30 Hz)
- 2: High frequency open collector (max. 10 kHz)
- 3: 5 V pulse (max. 10 kHz)
- 4: 12 V pulse (max. 10 kHz)
- 5: 24 V pulse (max. 10 kHz)
- 7: Dry contact AC/DC switch (max. frequency 30 Hz)  
(‘/UL’ is not selectable for ‘Standards & Approvals’ code.)

#### [3] OUTPUT LOGIC

- N: The same as the input
- R: Inverted

#### [4] POWER INPUT

##### AC Power

**M:** 85 – 264 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)

(Select ‘/N’ for ‘Standards & Approvals’ code.)

**M2:** 100 – 240 V AC (Operational voltage range 85 – 264 V, 47 – 66 Hz)

(‘/UL’ is not selectable for ‘Standards & Approvals’ code.)

##### DC Power

**R:** 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

**R2:** 11 – 27 V DC

(Operational voltage range 11 – 27 V, ripple 10 %p-p max.)

(Select ‘/N’ for ‘Standards & Approvals’ code.)

**P:** 110 V DC

(Operational voltage range 85 – 150 V, ripple 10 %p-p max.)

(‘/UL’ is not selectable for ‘Standards & Approvals’ code.)

#### [5] OPTIONS (multiple selections)

Standards & Approvals (must be specified)

/N: Without CE, UKCA or UL

/CE: CE marking

/UK: CE, UKCA marking

/UL: UL approval, CE marking

Other Options

blank: none

/Q: Option other than the above (specify the specification)

#### SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating (UL not available)

/C04: Polyolefin coating (UL not available)

TERMINAL SCREW MATERIAL

/S01: Stainless steel (UL not available)

#### RELATED PRODUCTS

- Clamp-on pulse sensor (model: CLSP)

**GENERAL SPECIFICATIONS**

**Construction:** Plug-in  
**Connection:** M3 screw terminals (torque 0.8 N·m)  
**Screw terminal:** Chromated steel (standard) or stainless steel  
**Housing material:** Flame-resistant resin (black)  
**Isolation:** Input to output to power  
**Frequency range:** Input and output are the same.  
**Chattering protection:** Filter provided for mechanical contact input  
**Input pulse sensing:** DC coupled

**INPUT SPECIFICATIONS**

**Excitation:** 12 V DC @30 mA; shortcircuit protection

■ **Open Collector**  
**Maximum frequency:** 10 kHz  
**Pulse width time requirement:** 10 µsec. min. for ON and OFF  
**Sensing:** Approx. 12 V DC @3 mA  
**ON/OFF level:** ≤ 600 Ω / 1.8 V for ON, ≥ 100 kΩ / 3.5 V for OFF

■ **Mechanical Contact**  
**Maximum frequency:** 30 Hz  
**Pulse width time requirement:** 10 msec. min. for ON and OFF  
**Sensing:** Approx. 12 V DC @3 mA  
**ON/OFF level:** ≤ 200 Ω / 0.6 V for ON, ≥ 100 kΩ / 2.5 V for OFF

■ **Voltage Pulse**  
**Maximum frequency:** 10 kHz  
**Pulse width time requirement:** 10 µsec. min. for high and low levels  
**Waveforms:** Square or sine  
**Hi/Lo level:** 2 - 50 V DC for high level; ≤1 V DC for low level  
**Input impedance:** 10 kΩ min.

■ **Clamp-on Pulse Sensor CLSP**  
**Maximum frequency:** 50 000 pulses/hour  
**ON/OFF level:** ≤ 400 Ω / 1.3 V for ON, ≥ 200 kΩ / 12 V for OFF

**OUTPUT SPECIFICATIONS**

■ **Low Frequency Open Collector:**  
50 V DC @100 mA (resistive load)  
**Maximum frequency:** 30 Hz  
**Timer:** Limits ≥ 75 msec. within 75 ±25 msec.  
ON time for output logic non-inverted  
OFF time for output logic inverted  
**Saturation voltage:** 0.5 V DC

■ **High Frequency Open Collector:**  
50 V DC @100 mA (resistive load)  
**Maximum frequency:** 10 kHz  
**Saturation voltage:** 0.5 V DC

■ **Voltage Pulse**  
**Maximum frequency:** 10 kHz  
**High level:** Rating (5, 12 or 24 V) ±10 %  
**Low level:** ≤ 0.5V  
**Load resistance:**  
≥ 250 Ω for 5 V  
≥ 600 Ω for 12 V  
≥ 1200 Ω for 24 V

■ **Dry Contact AC/DC Switch**  
132 V AC @200 mA (cos φ = 1)  
30 V DC @200 mA (resistive load)  
**Maximum frequency:** 30 Hz  
**Timer:** Limits within 75 ±25 msec.  
for wider than 75 msec. pulses  
ON time for output logic non-inverted  
OFF time for output logic inverted  
**Saturation voltage:** 3 V DC

**INSTALLATION****Power Consumption**

• **AC:**  
Approx. 3 VA at 100 V  
Approx. 4 VA at 200 V  
Approx. 5 VA at 264 V

• **DC:** Approx. 3 W

**Operating temperature:** -5 to +55°C (23 to 131°F)  
**Operating humidity:** 30 to 90 %RH (non-condensing)  
**Mounting:** Surface or DIN rail  
**Weight:** 150 g (0.33 lb)

**PERFORMANCE**

**Insulation resistance:** ≥ 100 MΩ with 500 V DC  
**Dielectric strength:** 2000 V AC @1 minute (input to output to power to ground)

**STANDARDS & APPROVALS**

**EU conformity:**  
EMC Directive  
EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Measurement Category II (output)

Installation Category II (power)

Pollution Degree 2

Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

RoHS Directive

**UK conformity (UKCA):**

The UK legislations and designated standards are equivalent to the applicable EU directives.

(Refer to our website for more information about the legislations and designated standards.)

**Approval:**

UL/C-UL nonincendive Class I, Division 2,

























Groups A, B, C, and D

(ANSI/ISA-12.12.01, CAN/CSA-C22.2 No.213)

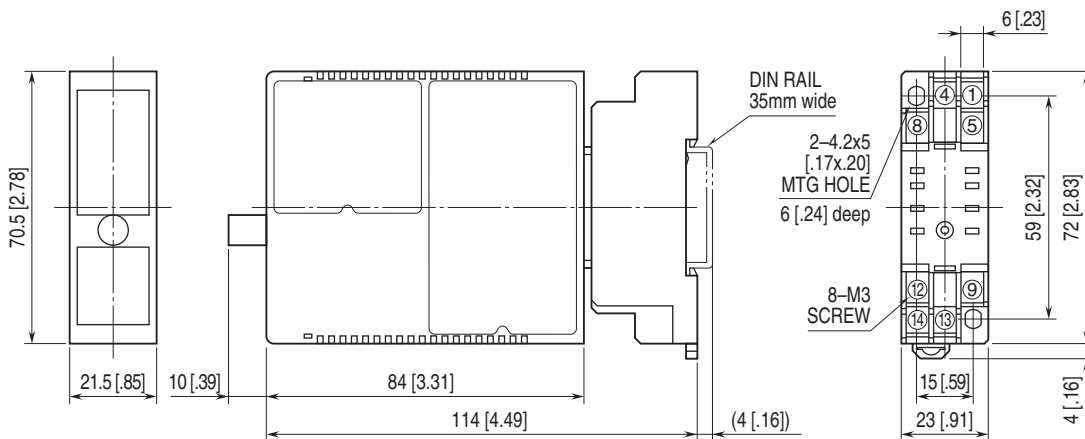
UL/C-UL general safety requirements

(UL 61010-1, CAN/CSA-C22.2 No.61010-1)

**OUTPUT LOGIC**

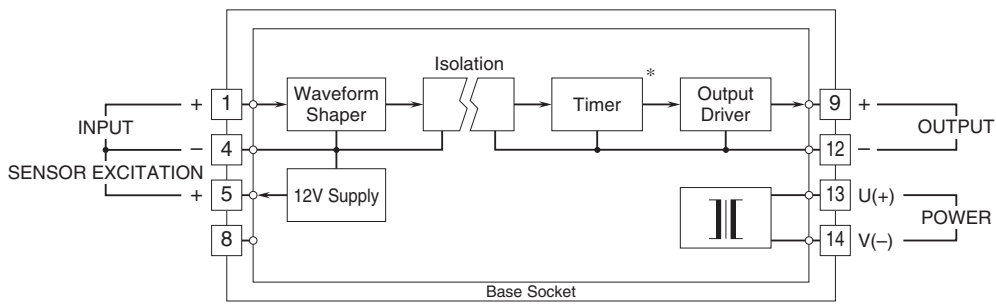
INPUT TYPE	PULSE LOGIC	INPUT	VOLTAGE PULSE OUTPUT	OPEN COLLECTOR DRY CONTACT AC/DC SWITCH
Voltage Pulse	Non Inverted	H  L 	H  L 	OFF  ON 
	Inverted	H  L 	H  L 	OFF  ON 
Mechanical Contact Open Collector Clamp-on Pulse Sensor CLSP	Non Inverted	OFF  ON 	H  L 	OFF  ON 
	Inverted	OFF  ON 	H  L 	OFF  ON 

**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]**



• When mounting, no extra space is needed between units.

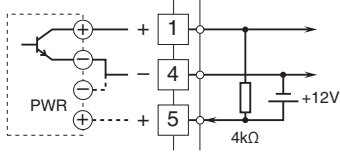
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



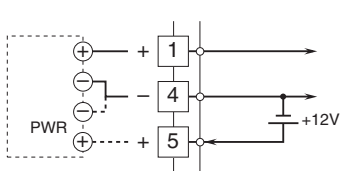
\* Low freq. open collector and dry contact AC/DC switch output only.

### Input Connection Examples

#### ■ Mechanical Contact, Open Collector or Clamp-on Pulse Sensor CLSP

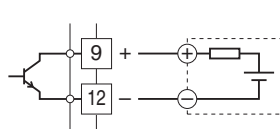


#### ■ Voltage Pulse

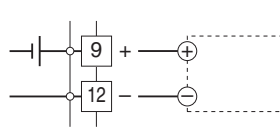


### Output Connection Examples

#### ■ Open Collector

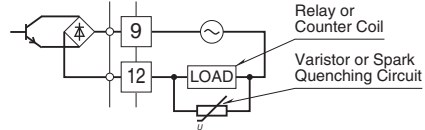


#### ■ Voltage Pulse

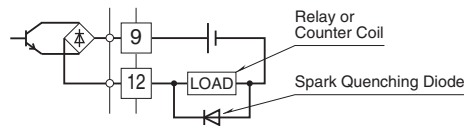


#### ■ Dry Contact AC/DC Switch

##### • AC Powered



##### • DC Powered



Specifications are subject to change without notice.