

## Plug-in Signal Conditioners M-UNIT

### PULSE ISOLATOR

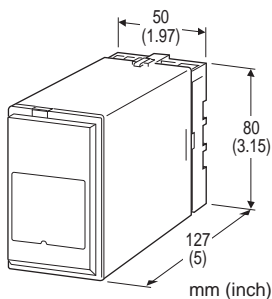
(built-in excitation)

#### Functions & Features

- Galvanically isolating pulse rate signals
- Input frequency = output frequency
- Various outputs (relay, open collector and voltage pulses)
- Excitation
- Isolation up to 2000 V AC
- High-density mounting

#### Typical Applications

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



## MODEL: YPD-[1][2][3][4][5]-[6]

### ORDERING INFORMATION

- Code number: YPD-[1][2][3][4][5]-[6]
- Specify a code from below for each [1] through [6].  
(e.g. YPD-D4A23N-B)
- Frequency range (e.g. 0 - 5 Hz)
  - Output pulse width (e.g. 75 msec.)
  - Use Ordering Information Sheet (No. ESU-1369).

#### [1] INPUT

- A:** Dry contact  
**B:** Voltage pulse (Specify sensitivity)  
**C:** 5 V pulse (sensitivity 2 V)  
**D:** 12 V/24 V pulse (sensitivity 5 V)  
**H:** Two-wire current pulse

#### [2] EXCITATION

- 1:** 5 V DC / 80 mA  
**4:** 12 V DC / 40 mA

#### [3] OUTPUT

- A1:** Open collector (max. frequency 100 kHz)  
**A2:** Open collector (max. frequency 10 Hz)  
**M1:** 5 V pulse (max. frequency 100 kHz)  
**M2:** 5 V pulse (max. frequency 10 Hz)  
**N1:** 12 V pulse (max. frequency 100 kHz)  
**N2:** 12 V pulse (max. frequency 10 Hz)  
**H:** Relay contact (max. frequency 0.5 Hz)

#### [4] OUTPUT PULSE WIDTH

- 1:** Equal to the input  
**2:** One-shot output ( $\leq 30$  ms; std. pulse width 5 ms)  
 (Specify when optional pulse width is required.)  
 (10 ms for relay contact pulse)  
**3:** One-shot output ( $\geq 30$  ms; std. pulse width 50 ms)  
 (Specify when optional pulse width is required.)

#### [5] OUTPUT LOGIC

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

#### [6] POWER INPUT

- AC Power**  
**B:** 100 V AC  
**C:** 110 V AC  
**D:** 115 V AC  
**F:** 120 V AC  
**G:** 200 V AC  
**H:** 220 V AC  
**J:** 240 V AC  
**DC Power**  
**S:** 12 V DC  
**R:** 24 V DC  
**V:** 48 V DC

### GENERAL SPECIFICATIONS

- Construction:** Plug-in  
**Connection:** M3.5 screw terminals  
**Housing material:** Flame-resistant resin (black)  
**Isolation:** Input to output to power  
**Input pulse sensing:** DC coupled  
**Input filter:** Provided for 10 Hz or lower output frequency  
 (time constant approx. 1 msec.)

### INPUT SPECIFICATIONS

- Excitation:** Shortcircuit protection; approx. 150 mA at shortcircuit
- **Dry Contact**
- Max. frequency:** 100 kHz  
**Pulse width time requirement:** 5  $\mu$ sec. min. (10 ms)

for 0 – 10 Hz or lower frequency)

**Sensing:** 10 V DC @ 2.5 mA

**ON/OFF level:**

≥ 5.5 kΩ /5.5 V for OFF

≤ 1.8 kΩ /4.5 V for ON

• **Voltage Pulse:** Specify DC offset and amplitude.

**Max. frequency:** 100 kHz

**Pulse width time requirement:** 5 μsec. min. (10 ms for 0 – 10 Hz or lower frequency)

**Waveform:** Square or sine

**Input impedance:** 10 kΩ min.

**Input amplitude:** 2 – 50 Vp-p

**Offset:** 2 – 10 V

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

• **5V, 12V, 24V Pulse**

**Waveform:** Square or sine

**Input impedance:** 10 kΩ min.

**Detecting level**

INPUT	5 V PULSE	12 V / 24 V PULSE
$V_H$	≥ 2.25 V	≥ 5.25 V
$V_L$	≤ 1.75 V	≤ 4.75 V

• **Two-wire Current Pulse**

**Max. frequency:** 100 kHz

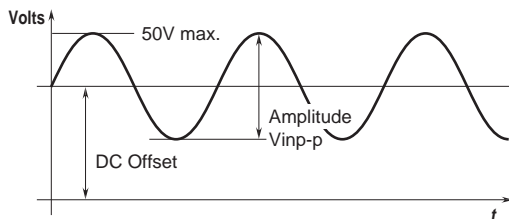
**Pulse width time requirement:** 5 μsec. min. (10 ms for 0 – 10 Hz or lower frequency)

**Input resistance:** Receiving resistor 220 Ω

**Maximum current:** ± 50 mA

**Hi/Lo level:** ≤ 5 mA for Lo, ≥ 15 mA for Hi

■ **Voltage pulse waveform**



## OUTPUT SPECIFICATIONS

• **Open Collector:** 50 V DC @ 50 mA (resistive load)

**Maximum frequency:** 100 kHz with load resistance ≤ 1 kΩ

**Saturation voltage:** 0.5 V DC

• **Voltage Pulse:** Rating (5 or 12 V) ± 10 %

**Maximum frequency:** 100 kHz

**Load resistance:** 1.5 kΩ min. for 5 V, 3 kΩ min. for 12 V

• **Relay Contact:** 120 V AC or 30 V DC @ 200 mA (resistive load)

**Maximum frequency:** 0.5 Hz

**Relay life:**

2 × 10<sup>7</sup> cycles (mechanical)

7 × 10<sup>6</sup> cycles (electrical)

## OUTPUT PULSE WIDTH

• **Equal to the Input:** No pulse width conversion

(difference between input and output within ±10 μsec.)

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

Output Frequency (Hz) = 500 / (Output Pulse Width (msec.))

**Adjustable pulse width**

**Pulse width max. 30 msec. (code 2):**

1 – 30 msec. adjustable (standard 5 msec. ±20 %) for

'Output' code other than 'H'

10 – 30 msec. adjustable (standard 10 msec. ±20 %) for

'Output' code 'H'

**Pulse width min. 30 msec. (code 3):** 30 msec. – 1 sec.

adjustable (standard 50 msec. ±20 %)

## INSTALLATION

**Power input**

• **AC:** Operational voltage range: rating ±10 %, 50/60 ± 2 Hz, approx. 2.5 VA

• **DC:** Operational voltage range: rating ±10 %, ripple 10 %p-p max., approx. 2 W (80 mA at 24 V)

**Operating temperature:** -5 to +60°C (23 to 140°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Mounting:** Surface or DIN rail

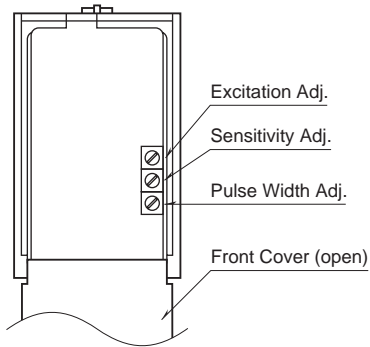
**Weight:** 400 g (0.88 lbs)

## PERFORMANCE

**Insulation resistance:** ≥ 100 MΩ with 500 V DC

**Dielectric strength:** 2000 V AC @1 minute (input to output to power to ground)

## EXTERNAL VIEW

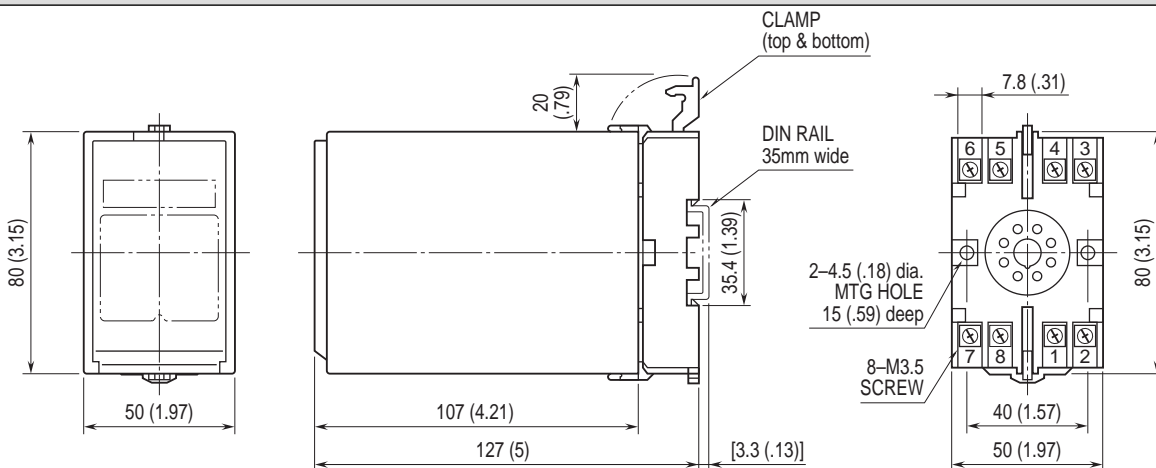


## OUTPUT LOGIC

INPUT TYPE	PULSE LOGIC	INPUT	VOLTAGE PULSE OUTPUT	OPEN COLLECTOR or RELAY CONTACT
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

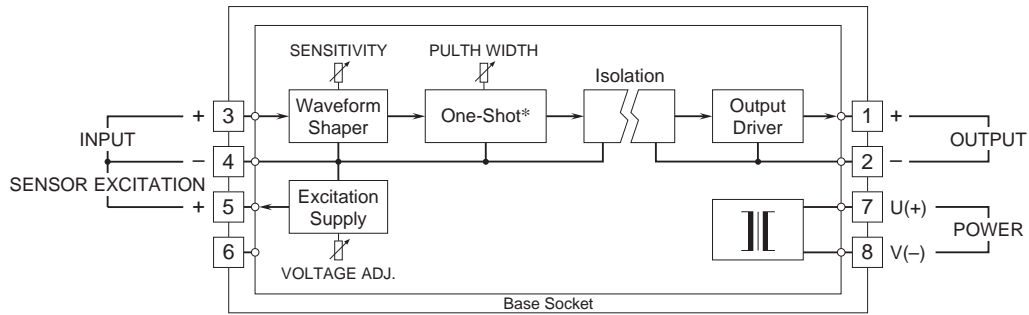
The pulse width in one-shot means the bold lined section of a pulse waveform.

## DIMENSIONS unit: mm (inch)



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

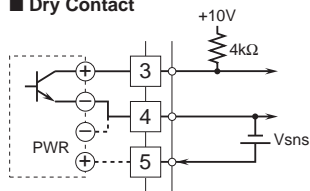
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



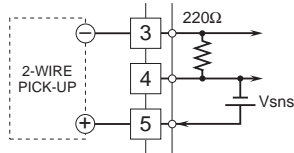
\*Provided only when the one-shot output is specified.

### Input Connection Examples

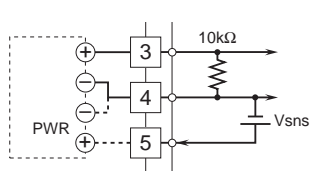
#### ■ Dry Contact



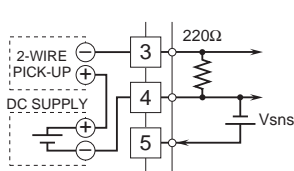
#### ■ 2-Wire Current Pulse •Built-in Excitation



#### ■ Voltage Pulse

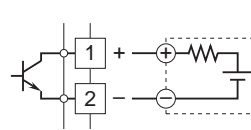


#### • External DC Supply

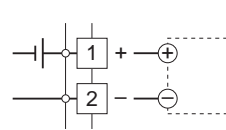


### Output Connection Examples

#### ■ Open Collector

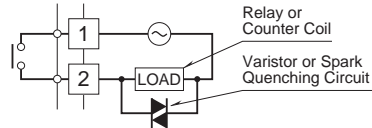


#### ■ Voltage Pulse

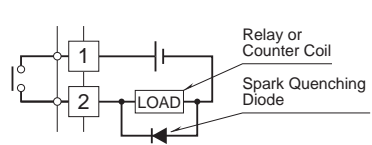


#### ■ Relay Contact

##### •AC Powered



##### •DC Powered



Specifications are subject to change without notice.