## Plug-in Signal Conditioners M-UNIT

## PULSE ISOLATOR

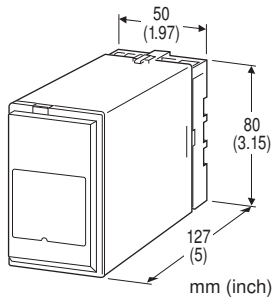
(built-in excitation)

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][7]

## ORDERING INFORMATION

- Code number: YPD-[1][2][3][4][5]-[6][7]

Specify a code from below for each of [1] through [7].
(e.g. YPD-D4A23N-B/Q)

- Frequency range (e.g. 0 – 5 Hz)
- Use Ordering Information Sheet (No. ESU-1369) for pulse width settings of DC voltage pulse input or one-shot output.
- Specify the specification for option code /Q
(e.g. /C01/S01)

## [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)
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 (≤ 30 ms; std. pulse width 5 ms)
(Specify when optional pulse width is required.)
(10 ms for relay contact pulse)
3: One-shot output (≥ 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

## [7] OPTIONS

blank: none
/Q: With options (specify the specification)

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

**COATING (For the detail, refer to M-System's web site.)**
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating
**TERMINAL SCREW MATERIAL**
/S01: Stainless steel

## GENERAL SPECIFICATIONS

**Construction**: Plug-in
**Connection**: M3.5 screw terminals
**Screw terminal**: Chromated steel (standard) or stainless steel
**Housing material**: Flame-resistant resin (black)
**Isolation**: Input to output to power
**Excitation adjustment**: 5 – 12 V DC
**Detecting level adjustments (DC voltage pulse)**: 2 – 10 V
**Input pulse sensing**: DC coupled
**Input filter**: Provided with output code A2, M2, N2, H (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 µsec. min. (10 ms for output code A2, M2, N2, H)
**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

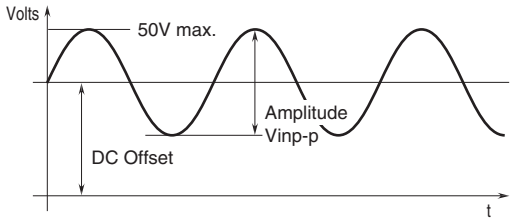
■ **Voltage Pulse:** Specify DC offset and amplitude.
**Max. frequency:** 100 kHz
**Pulse width time requirement:** 5 µsec. min. (10 ms for output code A2, M2, N2, H)
**Waveform:** Square or sine
**Input impedance:** 10 kΩ min.
**Input amplitude:** 2 – 50 Vp-p
**Sensitivity adjustment (threshold level):** 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 output code A2, M2, N2, H)
**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**:
Output code A1: 100 kHz with load resistance ≤ 1 kΩ
OUtput code A2: 10 Hz 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
**L level**: ≤ 0.5 V

■ **Relay Contact:** 120 V AC or 30 V DC @ 200 mA (resistive load)
**Maximum switching voltage**: 250 V AC or 30 V DC
**Maximum switching power**: 50 VA or 6 W
**Minimum load**: 5 V DC @ 10 mA
**Maximum frequency:** 0.5 Hz
**Relay life:**
$2 \times 10^7$ cycles (mechanical)
$7 \times 10^6$ 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

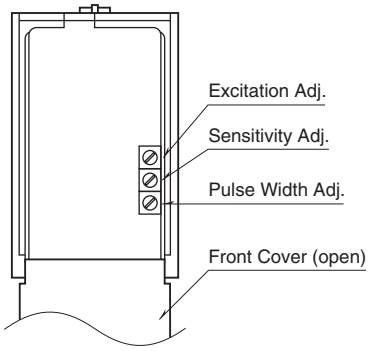
**Weight**: 400 g (0.88 lb)

## PERFORMANCE

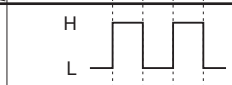
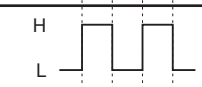
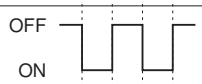
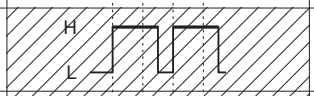
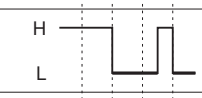
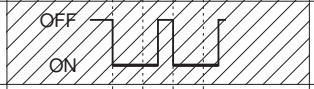
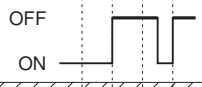
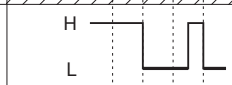
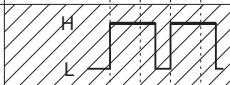
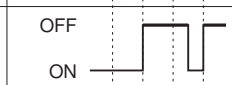
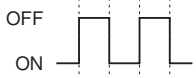
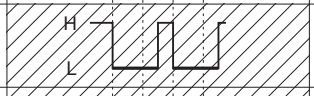
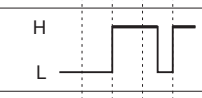
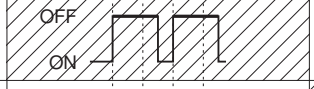
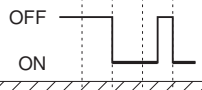
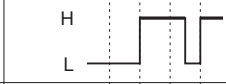
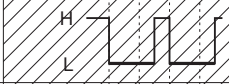
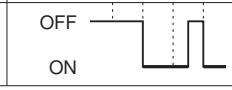
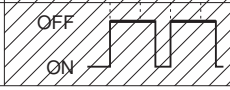
**Insulation resistance**: ≥ 100 MΩ with 500 V DC

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

## EXTERNAL VIEW



## OUTPUT LOGIC

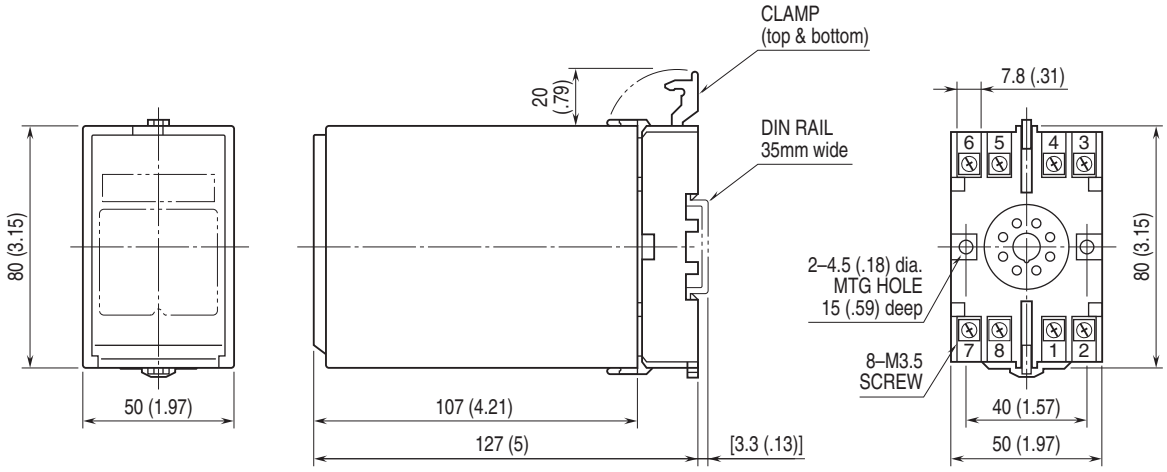
| OUTPUT WAVEFORM \ INPUT WAVEFORM | | | VOLTAGE PULSE or 2-WIRE CURRENT PULSE | DRY CONTACT |
|---|---|---|---|---|
| | | | H / L | OFF / ON |
| NON INVERTED | No pulse width conversion | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |
| | One-shot, detecting input pulse rise  | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |
| | One-shot, detecting input pulse sink  | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |
| INVERTED | No pulse width conversion | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |
| | One-shot, detecting input pulse rise  | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |
| | One-shot, detecting input pulse sink  | Voltage pulse |  |  |
| | | Open collector or relay contact |  |  |

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

Shades indicate default setting.

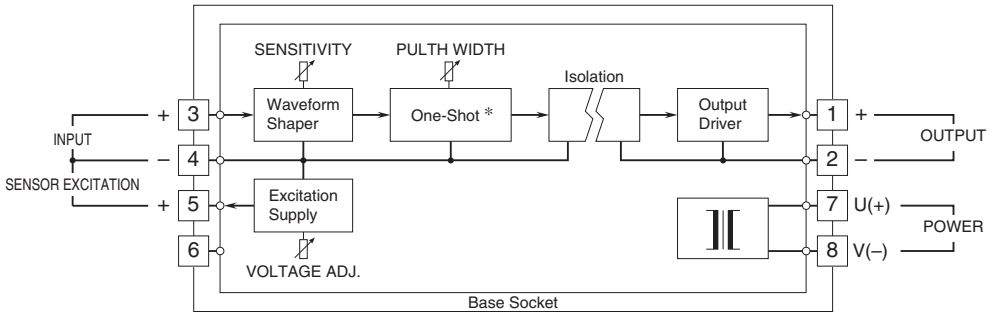
Input pulse rise/sink detected with voltage level

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)




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

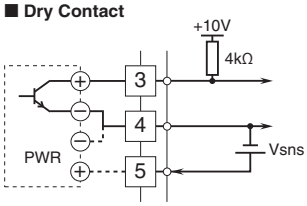
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



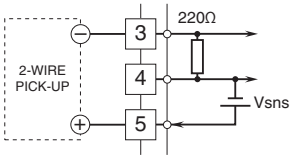

*Provided only when the one-shot output is specified.

**Input Connection Examples**

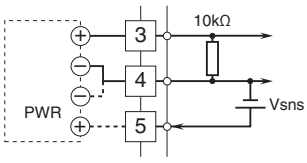
■ **Dry Contact**



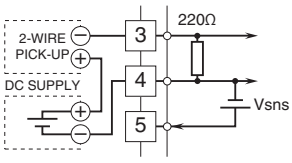

■ **2-Wire Current Pulse**
• **Built-in Excitation**




■ **Voltage Pulse**

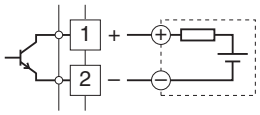



• **External DC Supply**

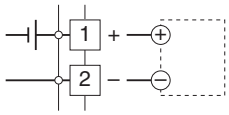



**Output Connection Examples**

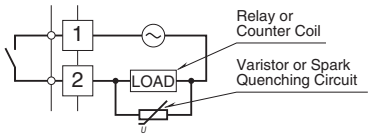
■ **Open Collector**



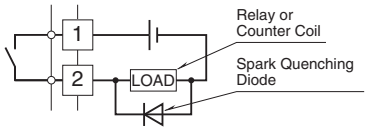
■ **Voltage Pulse**



■ **Relay Contact**
• **AC Powered**




• **DC Powered**



⚠ Specifications are subject to change without notice.