

Plug-in Signal Conditioners M-UNIT

PULSE SCALER

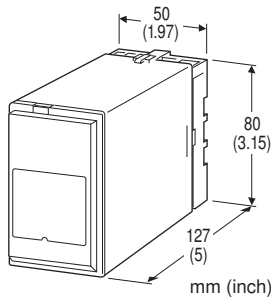
(pulse dividing; selectable range)

Functions & Features

- Galvanically isolating pulse rate signals and converting them into convenient engineering unit
- Excitation
- Scaling factor adjustable with the front switches
- Uniform output pulse
- Various outputs (relay, open collector and voltage pulses)
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

- Positive displacement flowmeters and turbine meters
- Dry contact signal produced at rotating machine



MODEL: PDU-[1][2][3][4]-[5][6]

ORDERING INFORMATION

- Code number: PDU-[1][2][3][4]-[5][6]
- Specify a code from below for each [1] through [6]. (e.g. PDU-CM1N-B/Q)
- Use Ordering Information Sheet (No. ESU-1368). Default setting (table below) will be used if not otherwise specified.
- Specify the specification for option code /Q (e.g. /C01/S01)

Factory default setting

ITEM	DEFAULT
Scaling factor	1 / (1x10 ⁰)
Output pulse width	Approx. 50% duty ratio at the max. input frequency (400 msec. max.); Limited to the range indicated in Output Pulse Width code 3 for relay output
Filter	Without; For dry contact input with frequency ≤10 Hz, the filter is automatically provided.

[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] OUTPUT

- A: Open collector (max. 100 kHz)
- M: 5 V pulse (max. 100 kHz)
- N: 12 V pulse (max. 100 kHz)
- P: 24 V pulse (max. 100 kHz)
- H: Relay contact (max. 5 Hz)
- () = Max. frequency

[3] OUTPUT PULSE WIDTH

- 1: One-shot output (5 - 200 μsec.) (Not selectable with relay contact.)
- 2: One-shot output (0.18 - 9 msec.) (Not selectable with relay contact.)
- 3: One-shot output (9 - 400 msec.)

[4] OUTPUT LOGIC

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

[5] 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

[6] 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**Input pulse sensing:** DC coupled**Sensitivity adjustment:** Single-turn screwdriver adjustment (front); 0 - ± 7 V

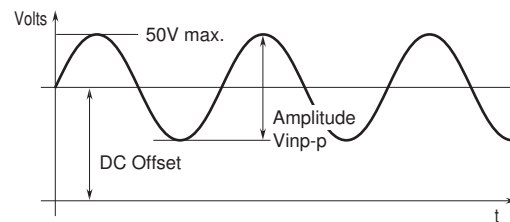
Hysteresis (deadband): Approx. 0.5 V

Input filter: Provided for 10 Hz or lower output frequency (time constant approx. 1 msec.)**Scaling factor adjustment:** 10-position rotary switches (front); $1 / (m \times 10^n)$ m = 1 - 9999, n = 0 - 6**Output pulse width adjustment:** Multi-turn screwdriver adjustment (front); 5 μ s - 400 ms**INPUT SPECIFICATIONS****Frequency range:** 0 - 100 kHz (10 Hz max. with filter)**Excitation:** 12 V DC @ 30 mA; shortcircuit protection**Pulse width time requirement:** 5 μ sec. min. (10 ms with filter)**■ Dry Contact****Sensing:** 7.5V DC @ 1mA**ON/OFF level:** ≥ 30 k Ω /5 V for OFF; ≤ 1 k Ω /1 V for ON**■ Voltage Pulse:** Specify DC offset and amplitude.**Waveform:** Square or sine**Input impedance:** 10 k Ω min.**Input amplitude:** 2 - 50 Vp-p**Offset:** 0 - ± 7 V**Max. voltage between input terminals:** ± 32 V

• 5V, 12V, 24V Pulse

Waveform: Square or sine**Input impedance:** 10 k Ω min.**Detecting level**

(Input: 5 V pulse: 12 V/24 V pulse)

 $V_H: \geq 3$ V: ≥ 6 V $V_L: \leq 1$ V: ≤ 4 V**■ Two-wire Current Pulse****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 k Ω **Saturation voltage:** 1.0 V DC**■ Voltage Pulse:****High level:** Rating (5, 12 or 24 V) ± 10 %**Low level:** ≤ 0.5 V**Maximum frequency:** 100 kHz**Load resistance:**1 k Ω min. for 5 V2.4 k Ω min. for 12 V,4.8 k Ω min. for 24 V**■ Relay Contact:**120 V AC @ 200 mA ($\cos \theta = 1$)

30 V DC @ 200 mA (resistive load)

Electrical life 3×10^5 cycles (rate 30/min.)**Maximum switching voltage:** 250 V AC or 30 V DC**Maximum switching power:** 24 VA or 6 W**Minimum load:** 5 V DC @ 10 mA**Mechanical life:** 2×10^7 cycles

For maximum relay life with inductive loads, external protection is recommended.

Maximum frequency: 5 Hz**OUTPUT PULSE WIDTH**• **One-shot Output:** Preset pulse width ± 20 %;

The pulse width is factory set to approx. 50 % duty ratio at the maximum frequency. For relay output, it is limited within the range indicated in Code 3 specification.

Adjustable pulse width: 5 μ sec. - 400 msec.**INSTALLATION****Power input**• **AC:** Operational voltage range: rating ± 10 %, 50/60 ± 2 Hz, approx. 2 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:** 350 g (0.77 lb)

PERFORMANCE

Response time:

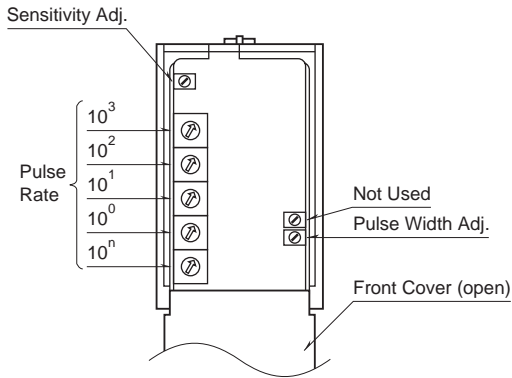
- ≤ 25 μsec. without filter
- ≤ 2 msec. with filter
- ≤ 20 msec. with relay contact pulse

Insulation resistance: ≥ 100 MΩ with 500 V DC

























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

EXTERNAL VIEW

Note: This unit is factory calibrated according to the Ordering Information Sheet.



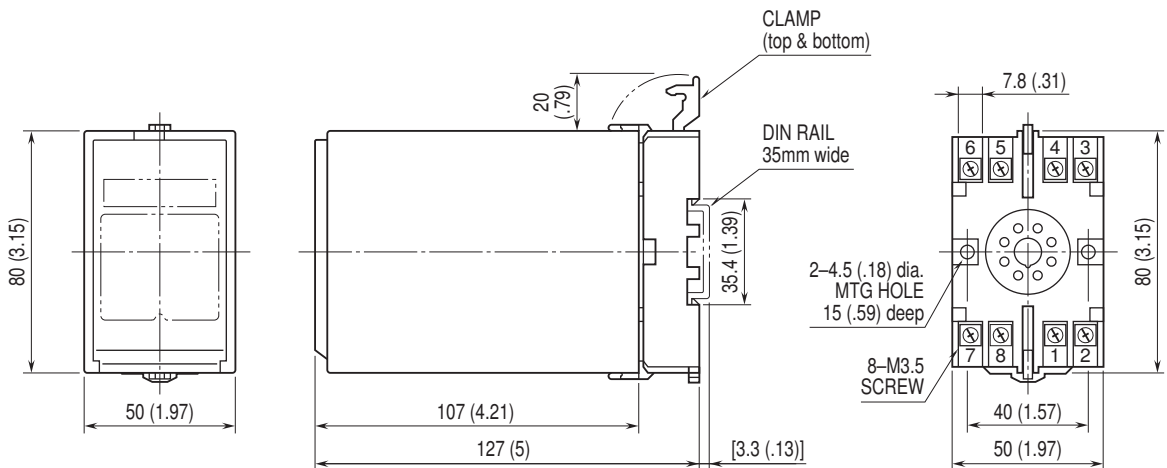
OUTPUT LOGIC

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.

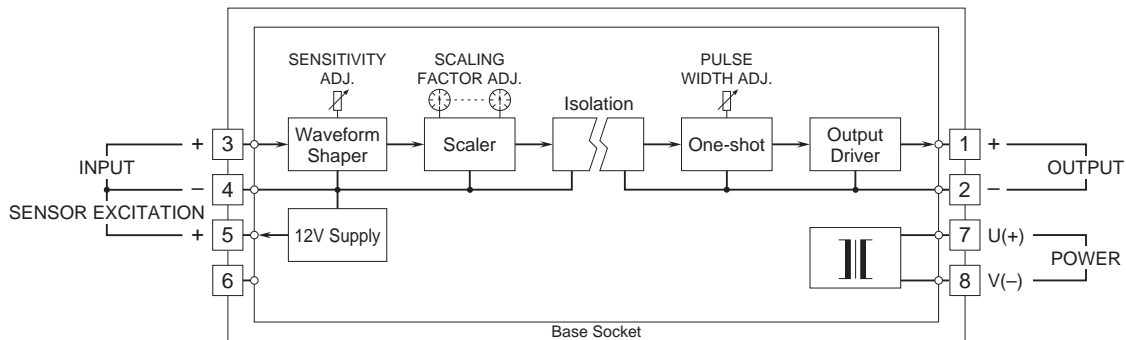


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



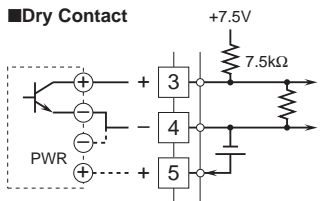
• When mounting, no extra space is needed between units.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

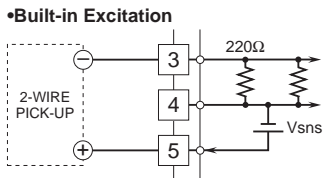


Input Connection Examples

■ Dry Contact

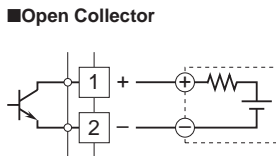


■ 2-Wire Current Pulse

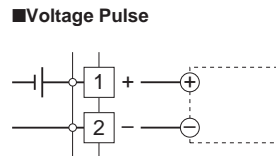


Output Connection Examples

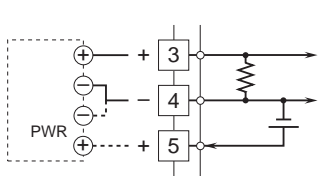
■ Open Collector



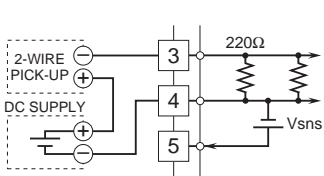
■ Voltage Pulse



■ Voltage Pulse

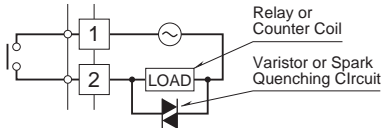


■ External DC Supply

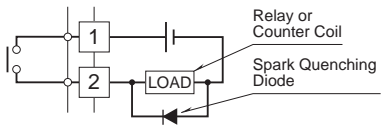


■ Relay

• AC Powered



• DC Powered



Specifications are subject to change without notice.