

Plug-in Signal Conditioners M-UNIT

FREQUENCY TRANSMITTER

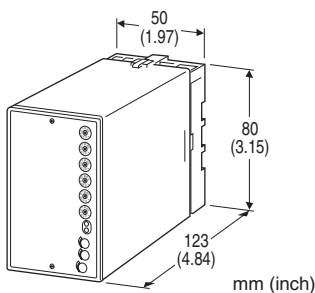
(selectable range)

Functions & Features

- Converting the output from a pulse-type transducer into a standard process signal
- Open collector, mechanical contact, proximity sensor, voltage pulse and 2-wire current pulse inputs
- Output decreases gradually with no input
- Excitation
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

- Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
- Measuring rotation speed of a machine generating dry contact signals



MODEL: MPAU-[1][2][3]-[4][5]

ORDERING INFORMATION

- Code number: MPAU-[1][2][3]-[4][5]
Specify a code from below for each [1] through [5].
(e.g. MPAU-A1LA-B/Q)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q
(e.g. /C01/S01/SET)

[1] INPUT

- A1: Open collector
- A2: Mechanical contact
- B1: Proximity sensor
- B2: Voltage pulse
- H: Two-wire current pulse

[2] EXCITATION

- L: 12 V DC / 40 mA
- M: 24 V DC / 25 mA

[3] OUTPUT

Current

- A: 4 - 20 mA DC (Load resistance 750 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1500 Ω max.)
- C: 1 - 5 mA DC (Load resistance 3000 Ω max.)
- D: 0 - 20 mA DC (Load resistance 750 Ω max.)
- E: 0 - 16 mA DC (Load resistance 900 Ω max.)
- F: 0 - 10 mA DC (Load resistance 1500 Ω max.)
- G: 0 - 1 mA DC (Load resistance 15 kΩ max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 100 Ω min.)
- 4: 0 - 10 V DC (Load resistance 1000 Ω min.)
- 5: 0 - 5 V DC (Load resistance 500 Ω min.)
- 6: 1 - 5 V DC (Load resistance 500 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 2000 Ω min.)
- 5W: -5 - +5 V DC (Load resistance 1000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

[4] 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

[5] OPTIONS

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 M-System's web site.)**

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

EX-FACTORY SETTING/SET: Preset according to the Ordering Information Sheet
(No. ESU-1690)**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**Overrange output:** Approx. 0 to 120 % at 1 - 5V**Zero adjustment:** -5 to +5 % (front)**Span adjustment:** 95 to 105 % (front)**Chattering protection:** Filter provided for mechanical contact input (time constant: 1 msec.)**Input monitor LED:** Red LED blinks according to the input.**Status indicator:** Green LED turns ON in normal operating conditions.**Input pulse sensing:** DC coupled**Frequency adjustments:** Rotary switches (front)**Non-uniform pulse compensation:** Input pulses divided and then multiplied for stabilizing the output; dividing factor adjustable with the front rotary switches (1/1 - 1/16, factory default 1/1)**Damper:** Time constant adjustable within 0 to 5 sec. (factory default 0 sec.) to provide a first order lag output**INPUT SPECIFICATIONS****Excitation:** Shortcircuit protection;12 V DC @ 40 mA (approx. 43 mA at shortcircuit)
or 24 V DC @ 25 mA (approx. 33 mA at shortcircuit)**■ Open Collector****Frequency range:** 0 - 0.001 Hz through 99.99 kHz
(If not specified the default value is used: 0 - 9.999 kHz)**Pulse width time requirement:** 4 μ sec. min.**Detecting level:****Excitation 12 V**

Sensing: 12 V / 1.5 mA

ON/OFF level

ON: ≤ 0.8 k Ω / 1.0 VOFF: ≥ 1.7 k Ω / 2.5 V**Excitation 24 V**

Sensing: 24 V / 3 mA

ON/OFF level

ON: ≤ 0.35 k Ω / 1.0 VOFF: ≥ 0.8 k Ω / 2.5 V**■ Mechanical Contact****Frequency range:** 0 - 0.001 Hz through 9.999 Hz

(If not specified the default value is used: 0 - 9.999 Hz)

Pulse width time requirement: 10 msec. min.**Detecting level:****Excitation 12 V**

Sensing: 12 V / 1.5 mA

ON/OFF level

ON: ≤ 0.8 k Ω / 1.0 VOFF: ≥ 1.7 k Ω / 2.5 V**Excitation 24 V**

Sensing: 24 V / 3 mA

ON/OFF level

ON: ≤ 0.35 k Ω / 1.0 VOFF: ≥ 0.8 k Ω / 2.5 V**■ Proximity Sensor****Frequency range:** 0 - 0.001 Hz through 9.999 kHz

(If not specified the default value is used: 0 - 9.999 kHz)

Pulse width time requirement: ≥ 20 μ sec.**Waveform:** Square or sinusoidal**Detecting level:** Input voltage ± 50 V (± 30 V with CE) ≤ 0 mV for Lo, ≥ 150 mV for Hi**Input impedance:** ≥ 20 k Ω **■ Voltage Pulse****Frequency range:** 0 - 0.001 Hz through 99.99 kHz

(If not specified the default value is used: 0 - 9.999 kHz)

Pulse width time requirement: ≥ 4 μ sec.**Waveform:** Square or sinusoidal**Detecting level:** Input voltage ± 50 V (± 30 V with CE) ≤ 1 V DC for Lo, ≥ 2 V DC for Hi**Input impedance:** ≥ 20 k Ω **■ Two-wire Current Pulse****Frequency range:** 0 - 0.001 Hz through 99.99 kHz

(If not specified the default value is used: 0 - 99.99 kHz)

Pulse width time requirement: ≥ 10 msec.**Input resistance:** 200 Ω **Input range:** 0 - 30 mA**Detecting level:** ≤ 5 mA for Lo, ≥ 10 mA for Hi**OUTPUT SPECIFICATIONS****■ DC Current:** 0 - 20 mA DC**Minimum span:** 1 mA**Offset:** Max. 1.5 times span**Load resistance:** Output drive 15 V max.**■ DC Voltage:** -10 - +12 V DC**Minimum span:** 5 mV**Offset:** Max. 1.5 times span**Load resistance:** Output drive 10 mA max.; 5 mA for negative voltage output; at ≥ 0.5 V

INSTALLATION

Power input

•AC: Operational voltage range: rating $\pm 10\%$,
50/60 ± 2 Hz, approx. 4 VA

•DC: Operational voltage range: rating $\pm 10\%$,
ripple 10% p-p max.; approx. 2.5 W (100 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 in percentage of span

Accuracy: $\pm 0.1\%$

Temp. coefficient: $\pm 0.01\%/^{\circ}\text{C}$ ($\pm 0.006\%/^{\circ}\text{F}$)

Response time: ≤ 0.5 sec. + one pulse cycle (0 - 90 %; with damper set to 0 sec.)

Line voltage effect: $\pm 0.1\%$ over voltage range

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

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

STANDARDS & APPROVALS

CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

Low Voltage Directive (2006/95/EC)

EN 61010-1: 2001

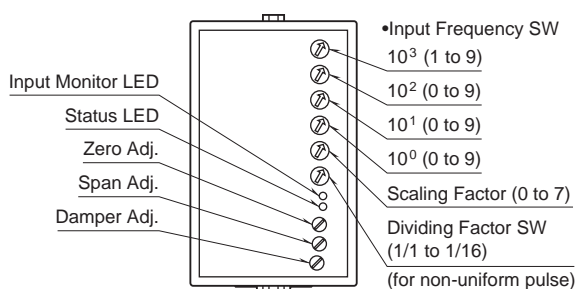
Installation Category II

Pollution Degree 2

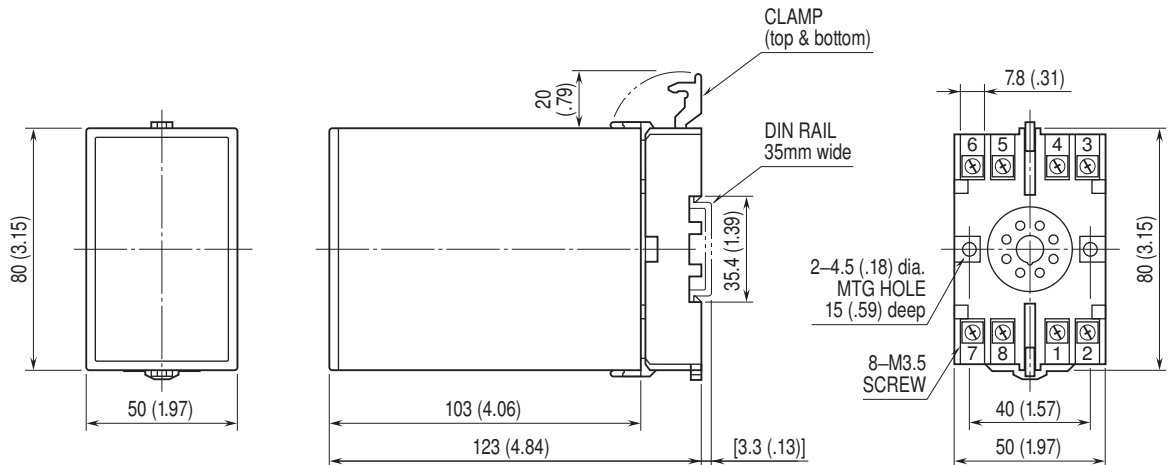
Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

EXTERNAL VIEW

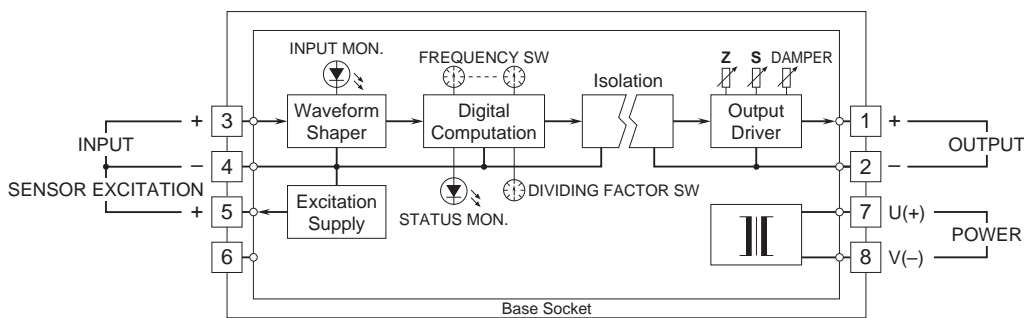


DIMENSIONS unit: mm (inch)



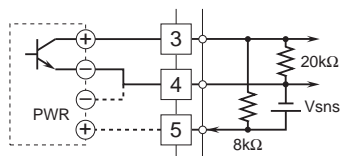
• When mounting, no extra space is needed between units.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

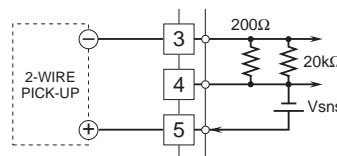


Input Connection Examples

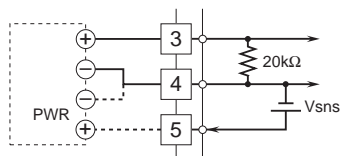
■ Open Collector or Mechanical Contact



■ 2-Wire Current Pulse



■ Voltage Pulse



Specifications are subject to change without notice.