

Plug-in Signal Conditioners M-UNIT

FREQUENCY TRANSMITTER

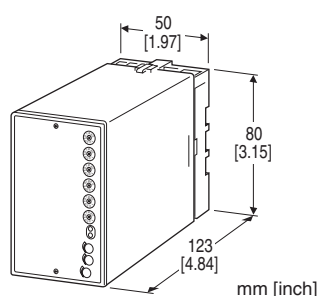
(selectable range)

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 of [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 k Ω max.)

Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

1: 0 – 10 mV DC (Load resistance 10 k Ω min.)

2: 0 – 100 mV DC (Load resistance 100 k Ω 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

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

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 - 1 MHz through 99.99 kHz
(If not specified the default value is used: 0 - 9.999 kHz)

Pulse width time requirement: 4 µsec. min.

Detecting level:

Excitation 12 V

Sensing: 12 V / 1.5 mA

ON/OFF level

ON: $\leq 0.8 \text{ k}\Omega$ / 1.0 V

OFF: $\geq 1.7 \text{ k}\Omega$ / 2.5 V

Excitation 24 V

Sensing: 24 V / 3 mA

ON/OFF level

ON: $\leq 0.35 \text{ k}\Omega$ / 1.0 V

OFF: $\geq 0.8 \text{ k}\Omega$ / 2.5 V

■ **Mechanical Contact**

Frequency range: 0 - 1 MHz 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: $\leq 0.8 \text{ k}\Omega$ / 1.0 V

OFF: $\geq 1.7 \text{ k}\Omega$ / 2.5 V

Excitation 24 V

Sensing: 24 V / 3 mA

ON/OFF level

ON: $\leq 0.35 \text{ k}\Omega$ / 1.0 V

OFF: $\geq 0.8 \text{ k}\Omega$ / 2.5 V

■ **Proximity Sensor**

Frequency range: 0 - 1 MHz through 9.999 kHz

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

Pulse width time requirement: $\geq 20 \text{ }\mu\text{sec.}$

Waveform: Square or sinusoidal

Detecting level: Input voltage $\pm 50 \text{ V}$ ($\pm 30 \text{ V}$ to conform with EU Directive)

$\leq 0 \text{ mV}$ for Lo, $\geq 150 \text{ mV}$ for Hi

Input impedance: $\geq 20 \text{ k}\Omega$

■ **Voltage Pulse**

Frequency range: 0 - 1 MHz through 99.99 kHz

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

Pulse width time requirement: $\geq 4 \text{ }\mu\text{sec.}$

Waveform: Square or sinusoidal

Detecting level: Input voltage $\pm 50 \text{ V}$ ($\pm 30 \text{ V}$ to conform with EU Directive)

$\leq 1 \text{ V DC}$ for Lo, $\geq 2 \text{ V DC}$ for Hi

Input impedance: $\geq 20 \text{ k}\Omega$

■ **Two-wire Current Pulse**

Frequency range: 0 - 1 MHz through 99.99 Hz

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

Pulse width time requirement: $\geq 10 \text{ msec.}$

Input resistance: 200 Ω

Input range: 0 - 30 mA

Detecting level: $\leq 5 \text{ mA}$ for Lo, $\geq 10 \text{ mA}$ 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 $\geq 0.5 \text{ V}$

INSTALLATION

Power input

•AC: Operational voltage range: rating $\pm 10 \%$,

50/60 ± 2 Hz, approx. 4 VA

•DC: Operational voltage range: rating ± 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: ± 0.1 %

Temp. coefficient: ± 0.01 %/°C (± 0.006 %/°F)

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

Line voltage effect: ± 0.1 % over voltage range

Insulation resistance: ≥ 100 M Ω 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

Installation Category II

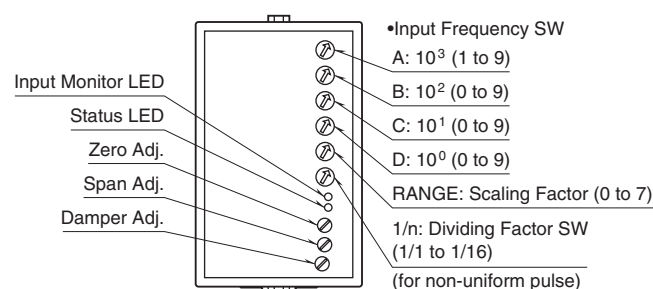
Pollution Degree 2

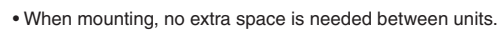
Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

RoHS Directive

EXTERNAL VIEW





SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Specifications are subject to change without notice.