

Space-saving Plug-in Signal Conditioners F-UNIT

3: Mercury relay contact (max. 30 Hz)

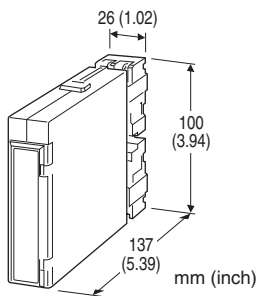
DC/FREQUENCY CONVERTER

Functions & Features

- Providing a pulse rate output in proportion to DC input signal
- High-density mounting

Typical Applications

- Totalizing applications in combination with a counter



MODEL: FAP-[1][2]-[3]

ORDERING INFORMATION

- Code number: FAP-[1][2]-[3]
- Specify a code from below for each [1] through [3] (e.g. FAP-61-L)
- Special input range (For codes Z & 0)
- Output frequency range (e.g. 0 - 500 Hz)

[1] INPUT

Current

- A: 4 - 20 mA DC (Input resistance 250 Ω)
 D: 0 - 20 mA DC (Input resistance 50 Ω)
 G: 0 - 1 mA DC (Input resistance 1000 Ω)
 H: 10 - 50 mA DC (Input resistance 100 Ω)
 Z: Specify current (See INPUT SPECIFICATIONS)
 (0 % input must be 0 mA.)

Voltage

- 3: 0 - 1 V DC (Input resistance 1 MΩ min.)
 4: 0 - 10 V DC (Input resistance 1 MΩ min.)
 5: 0 - 5 V DC (Input resistance 1 MΩ min.)
 6: 1 - 5 V DC (Input resistance 1 MΩ min.)
 0: Specify voltage (See INPUT SPECIFICATIONS)
 (0 % input must be 0 V.)

[2] OUTPUT

- 1: Open collector (max. 1 kHz)
 2: 5 V pulse (max. 1 kHz)

[3] POWER INPUT

AC Power

K: 85 - 132 V AC
 (Operational voltage range 85 - 132 V, 47 - 66 Hz)

L: 170 - 264 V AC
 (Operational voltage range 170 - 264 V, 47 - 66 Hz)

DC Power

R: 24 V DC
 (Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

P: 110 V DC
 (Operational voltage range 85 - 150 V, ripple 10 %p-p max.)

GENERAL SPECIFICATIONS

- Construction:** Plug-in
Connection: M3.5 screw terminals (torque 0.8 N·m)
Screw terminal: Nickel-plated steel
Housing material: Flame-resistant resin (black)
Isolation: Input to output to power
Zero adjustment: 0 - 5 % (front)
Span adjustment: 95 to 105 % (front)

INPUT SPECIFICATIONS

- **DC Current:**
 Shunt resistor attached to the input terminals (0.5 W)
 Specify input resistance value for code Z.
- **DC Voltage:** 0 - 300V DC
Minimum span: 1V
Input resistance: 1 MΩ min.

OUTPUT SPECIFICATIONS

- **Open Collector:** 30 V DC @100 mA (resistive load)
Frequency range: 0 - 10 pulses/hour through 1 kHz
Saturation voltage: 0.6 V DC
- **5 V Pulse**
Frequency range: 0 - 10 pulses/hour through 1 kHz
Hi level: 3.0 - 5.5 V
Lo level: ≤ 0.5 V
Load resistance: 250 Ω min.
- **Mercury Relay Contact:** 132 V AC @ 200 mA (cos φ = 1)
 30 V DC @ 200 mA (resistive load)
Frequency range: 0 - 10 pulses/hour through 30 Hz
Timer: Limits ON time 75 ±25 msec.
Relay life: ≥ 5 × 10⁸ cycles, mechanical
 ≥ 5 × 10⁷ cycles, electrical

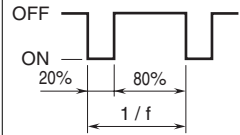


OUTPUT PULSE WIDTH

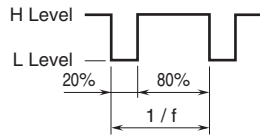
■ Frequency less than 500 Hz at 100% input

→ Duty ratio 20% (See the figure below)

• Open Collector



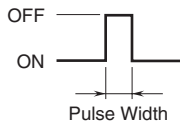
• Voltage Pulse



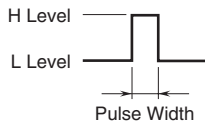
■ Frequency greater than 500 Hz at 100% input

→ See the figure and equation below.

• Open Collector



• Voltage Pulse



$$\text{Pulse Width [millisec.]} = \frac{1}{2.09 \times 100\% \text{ Frequency [kHz]}}$$

■ Mercury Relay Contact

Frequency less than 4 Hz (100%) → Pulse width time 75 ±25 ms.

Frequency greater than 4 Hz (100%) → Duty ratio 20%

INSTALLATION

Power input

- AC: Approx. 4.5 VA
- DC: 24 V approx. 70 mA
- 110 V approx. 20 mA

Operating temperature: -5 to +55°C (23 to 131°F)

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

Mounting: Surface or DIN rail; Standard Rack Mounting

Frame BX-16H available

Weight: 190 g (0.42 lbs)

PERFORMANCE in percentage of span

Accuracy: ±0.1 %

Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)

Response time: Approx. 3 sec. (0 - 90 %)

Line voltage effect: ±0.1 % over voltage range

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength

Power input code R:

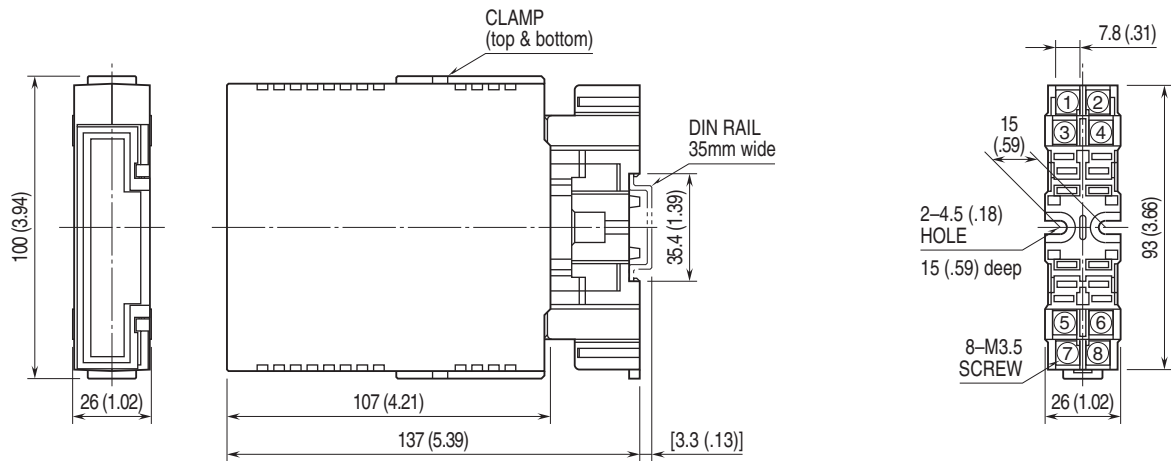
- 1000 V AC @ 1 minute (input to output)
- 2000 V AC @ 1 minute (input or output or power to ground)
- 500 V AC @ 1 minute (I/O to power)

Power input code K, L, P:

- 1000 V AC @ 1 minute (input to output)
- 2000 V AC @ 1 minute (input or output or power to ground)
- 1500 V AC @ 1 minute (I/O to power)

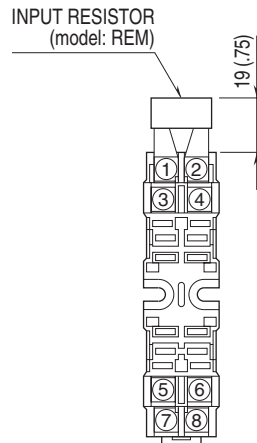


DIMENSIONS unit: mm (inch)



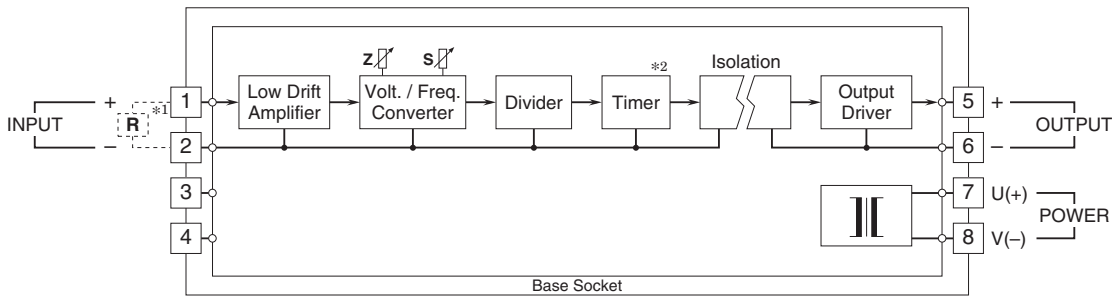
•When mounting, no extra space is needed between units.

TERMINAL ASSIGNMENTS unit: mm (inch)



Input shunt resistor attached for current input.

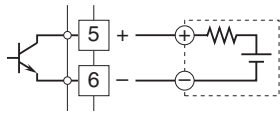
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



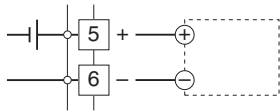
- *1. Input shunt resistor attached for current input.
- *2. Timer available for mercury relay contact option.

Output Connection Examples

■ Open Collector

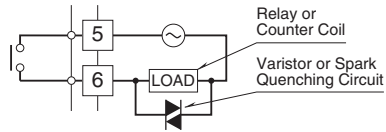


■ Voltage Pulse

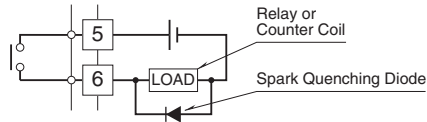


■ Relay

•AC Powered



•DC Powered



Specifications are subject to change without notice.