

## Space-saving Plug-in Signal Conditioners F-UNIT

### LOW FREQUENCY TRANSMITTER

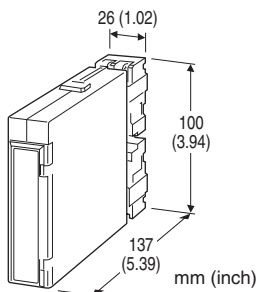
(50 Hz minimum)

#### Functions & Features

- Converting the output from a pulse-type transducer into a standard process signal
- Excitation
- High-density mounting

#### Typical Applications

- Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
- Proximity switches



## MODEL: FSP-[1][2]-[3]

### ORDERING INFORMATION

- Code number: FSP-[1][2]-[3]
- Specify a code from below for each [1] through [3] (e.g. FSP-2A-L)
- Frequency range (e.g. 0 - 10 kHz)
- Special output range (For codes Z & 0)

#### [1] INPUT

- 1: Dry contact
- 2: Voltage pulse

#### [2] 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 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 kΩ min.)
- 5: 0 - 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

### [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

**Overrange output:** 0 to 120 % at 1 - 5 V

**Zero adjustment:** -5 to +5 % (front)

**Span adjustment:** 95 to 105 % (front)

**Input pulse sensing:** DC coupled; detecting pulse rise

**Low-end cutout:** 2 to 5 %

### INPUT SPECIFICATIONS

**Excitation:** 12 V DC @30 mA; shortcircuit protection

**Frequency range:** 0 - 50 Hz through 10 kHz

**Pulse width (time) requirement:** Duty ratio 20 - 80 % at 100 % input

■ **Dry Contact:** Mechanical contact or open collector

**Pulse width time requirement:** 20 μsec. min. for ON and OFF

**Sensing:** Approx. 12 V DC @3 mA

**ON/OFF level:** ≤ 200 Ω / 0.6 V for ON, ≥ 100 kΩ / 6 V for OFF

■ **Voltage Pulse**

**Maximum frequency:** 10 kHz

**Pulse width time requirement:** 10 μsec. min. for high and low levels

**Waveforms:** Square or sine

**Hi/Lo level:** 2 - 50 V for high level; ≤1 V for low level

**Input impedance:** 10 kΩ min.



## 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:** 0 – 12 V DC

**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 1 mA max.; at  $\geq 0.5$  V

## INSTALLATION

**Power input**

•**AC:** Approx. 5.5 VA

•**DC:** 24 V approx. 85 mA

110 V approx. 25 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:** 200 g (0.44 lbs)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.1$  % (output 10 – 100 %)

**Temp. coefficient:**  $\pm 0.015$  %/°C ( $\pm 0.008$  %/°F)

**Response time:** (0 – 90%)

Approx. 1.8 sec. with 0 – 50 Hz

Approx. 0.7 sec. with 0 – 100 Hz

Approx. 0.5 sec. with 0 – 500 Hz

Approx. 0.5 sec. with 0 – 10 kHz

**Ripple:** 0.2 %p-p max. with input  $\geq 10$  %

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

**Insulation resistance:**  $\geq 100$  M $\Omega$  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:**

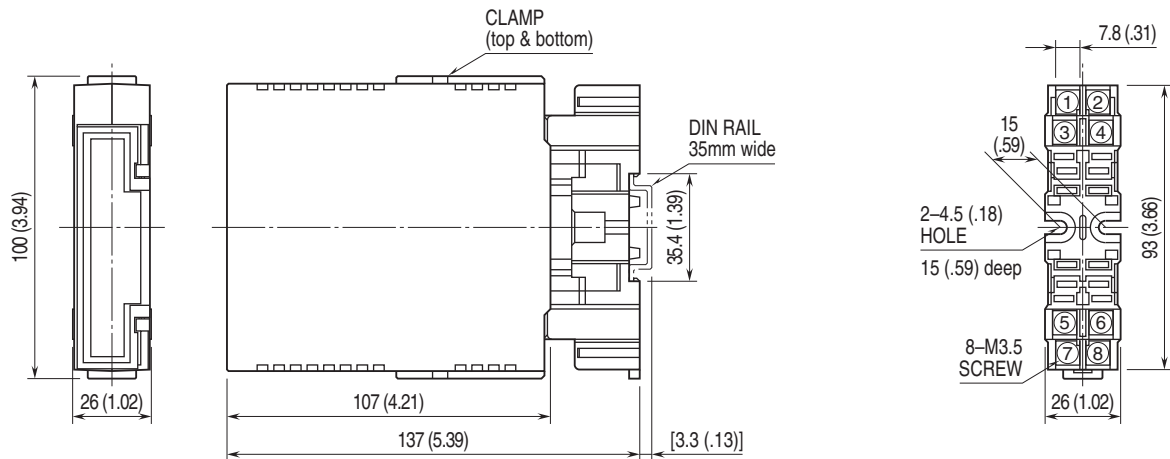
1000 V AC @ 1 minute (input to output)

2000 V AC @ 1 minute (input or output or power to ground)

1500 V AC @ 1 minute (I/O to power)

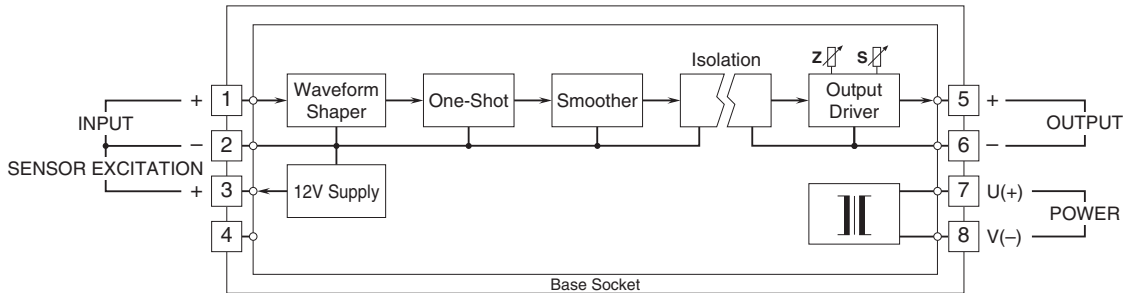


**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)**



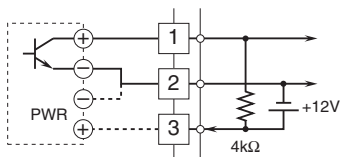
•When mounting, no extra space is needed between units.

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**

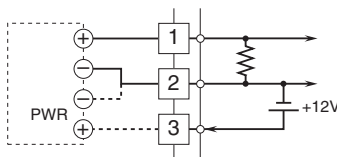


**Input Connection Examples**

■ **Dry Contact**



■ **Voltage Pulse**



Specifications are subject to change without notice.

