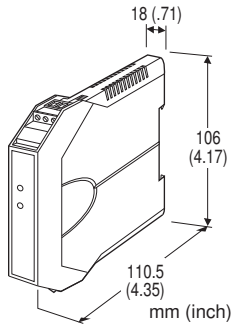
Space-saving Two-wire Signal Conditioners B3-UNIT

FREQUENCY TRANSMITTER

(field-configurable)

Functions & Features

- Converts the output from a pulse-type transducer into a 4 – 20 mA DC signal
- DIP switch configurable input range
- Monitor terminals
- High-density mounting
- CE marking
- UL approval



MODEL: B3FP[1]

ORDERING INFORMATION

- Code number: B3FP[1]

Specify a code from below for [1]
(e.g. B3FP/UL)

- Orders will be shipped with default factory settings as shown below.
- Factory default setting:
  Input type: Voltage pulse
  Frequency range: 0 – 1000 Hz
  Pulse amplitude: 5 Vp-p
  DC offset: 2.5 V
  Pulse sensing: DC coupled
  Noise filter: None
  Detecting level: High (2 V)

INPUT – Field-selectable

Open collector
Voltage pulse
Two-wire current pulse

[1] OPTIONS

Standards & Approvlas

blank: CE marking
/UL: UL approval, CE marking

GENERAL SPECIFICATIONS

Construction: Small-sized front terminal structure
Connection: Euro type connector terminal
Housing material: Flame-resistant resin (gray)
Isolation: Input to output
DIP/rotary switches: For input calibration
(Refer to the instruction manual)
Noise filter: Chattering protection filter selectable with DIP switches (time constant 1 msec.)
Pulse sensing: DC coupled or capacitor coupled selectable with DIP SW

INPUT SPECIFICATIONS

Measurable frequencies: 0 – 0.01 Hz through 100 kHz; Sine waves with frequencies lower than 0.1 Hz cannot be detected with capacitor coupling.
Pulse width time requirement: Min. 4 µsec. for both H and L levels
DC offset: Selectable within the maximum voltage for respective pulse amplitude setting.
(e.g. For the amplitude 2 Vp-p with the maximum voltage 10 V, DC offset can be as low as -9 V and as high as +9 V.)
Frequency offset: Selectable up to 50 % of the full-scale frequency.

- **Open Collector**

Sensing voltage/current: Approx. 2.5 V DC @ 1mA
Detecting levels: ≤ 750 Ω / 0.7 V for ON;
≥ 3.0 kΩ / 1.3 V for OFF

- **Voltage Pulse**

Waveform: Square or sine
Input impedance: 10 kΩ min.
Input amplitude: Min. 0.1 V p-p, max. 200 Vp-p
Max. voltage between input terminals: 100 V (Max. voltage across the input terminals: 70 V for CE conformity; 30 V rms, 42.4 V peak or 60 V DC for UL approval)
Detecting level: See the table below

- **Two-wire Current Pulse**

Input resistance: Receiving resistor 200 Ω
Input range: 0 – 25 mA
Detecting level: See the table below
(Convert current into voltage using the receiving resistor value.)

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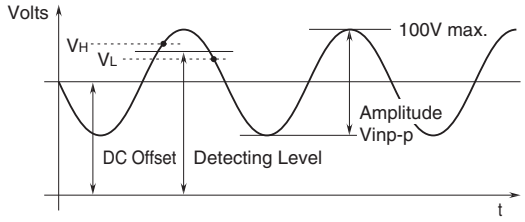
DETECTING LEVEL	PULSE AMPLITUDE		
	0.1 – 2 Vp-p	2 – 10 Vp-p	10 – 200 Vp-p
Zero-cross	0V	0V	0V
Low level	45mV	60mV	300mV
Middle level	200mV	400mV	2V
High level	1V	2V	10V
DETECTING LEVEL	DEADBAND		
Zero-cross	±15% of Amplitude, ≥45mV*		
Low level	±15% of Amplitude, ≥40mV*		
Middle level	±15% of Amplitude, ≥80mV*		
High level	±40% of Detecting Level		

*Minimum deadband required for the amplitude 0.1 – 2 Vp-p.

■ **VOLTAGE PULSE WAVEFORM**



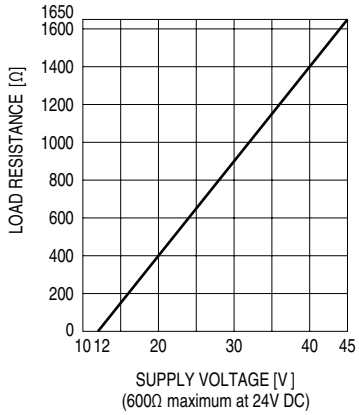
OUTPUT SPECIFICATIONS

■ **OUTPUT:** 4 – 20 mA DC

Load resistance vs. supply voltage:

Load Resistance (Ω) = (Supply Voltage (V) – 12 (V)) ÷ (0.02 (A))

(including leadwire resistance)



INSTALLATION

Supply voltage: 12 – 45 V DC

Operating temperature:

-40 to +85°C (-40 to +185°F)

Max. 55°C (131°F) for UL approval

Operating humidity: 0 to 95 %RH (non-condensing)

Mounting: DIN rail

Weight: 80 g (2.8 oz)

PERFORMANCE in percentage of span

Accuracy: ±0.1 % (±0.3 % for frequencies below 10 Hz for sine waves detected with capacitor coupling)

Temp. coefficient: ±0.02 %/°C (±0.01 %/°F)

Response time: Max. 0.5 sec. + 1 pulse cycle (0 – 90 %)

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 2000 V AC @1 minute

(input to output to ground)

STANDARDS & APPROVALS

CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

Approval:

UL/C-UL general safety requirements

(UL 61010-1, CAN/CSA-C22.2 No.1010-1)

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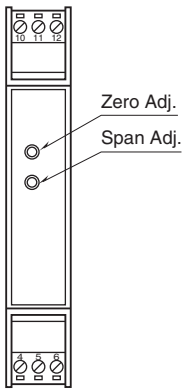
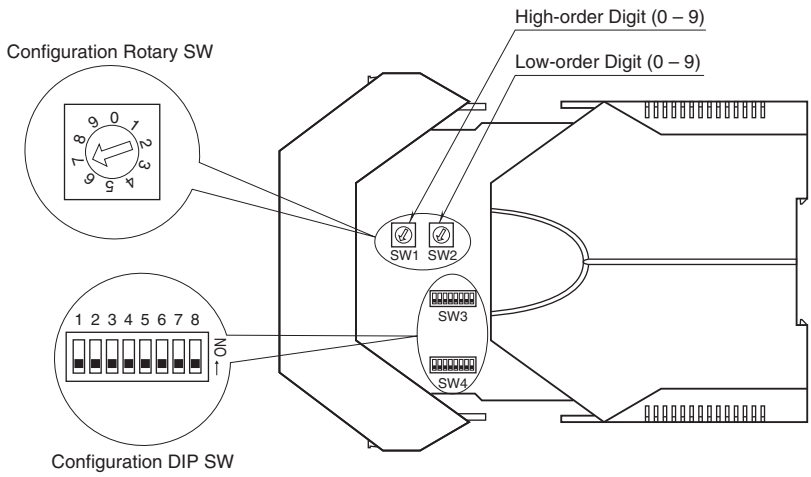
EXTERNAL VIEW

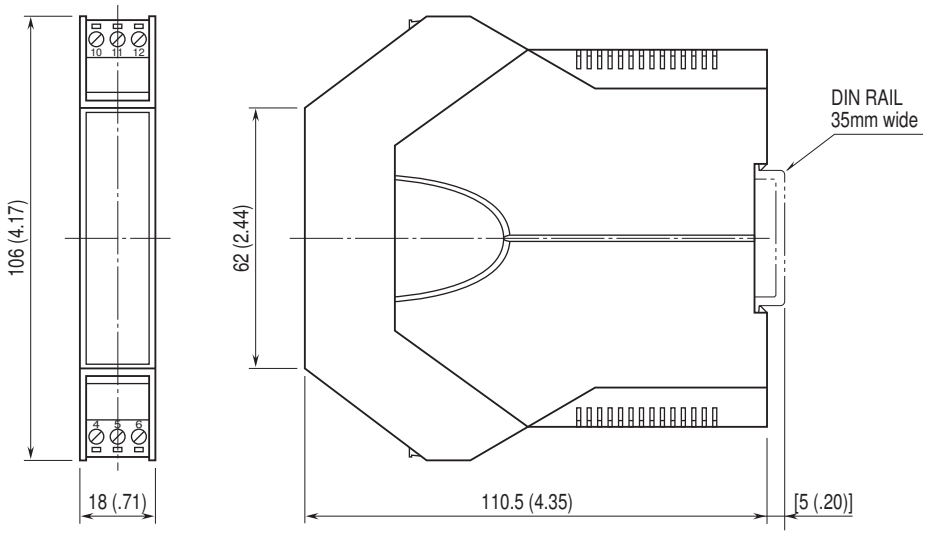
■ FRONT VIEW



■ SIDE VIEW



EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

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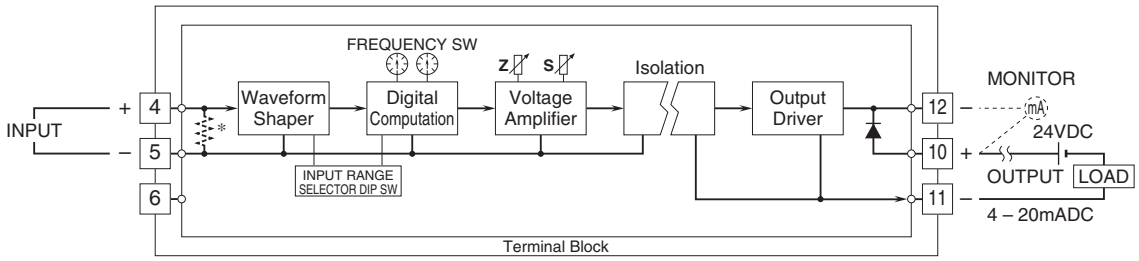
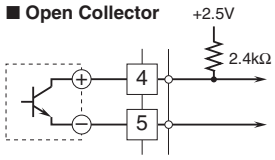
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



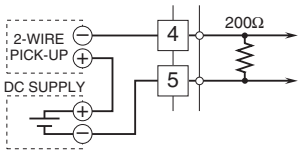
*Input shunt resistor incorporated for current input.

Input Connection Examples

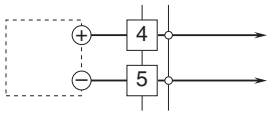
■ **Open Collector**



■ **Two-wire Current Pulse**
• **External DC Supply**



■ **Voltage Pulse**



⚠ Specifications are subject to change without notice.

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