

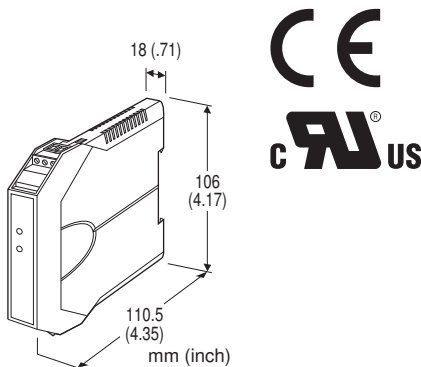
Space-saving Two-wire Signal Conditioners B3-UNIT

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



MODEL: B3FP[1]

ORDERING INFORMATION

- Code number: B3FP[1]
Specify a code from below for [1].
(e.g. B3FP/UL/Q)
- Specify the specification for option code /Q
(e.g. /C01)
- 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 (multiple selections)

- Standards & Approvals
- blank:** CE marking
- /UL: UL approval, CE marking
- Other Options
- blank:** none
- /Q: Option other than the above (specify the specification)

SPECIFICATIONS OF OPTION: Q

- COATING (For the detail, refer to our web site.)
- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber coating (UL not available)

GENERAL SPECIFICATIONS

- Construction:** Small-sized front terminal structure
- Connection:** Euro type connector terminal
(applicable wire size: 0.2 to 2.5 mm², stripped length 8 mm)
- 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 conform with EU Directive; 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

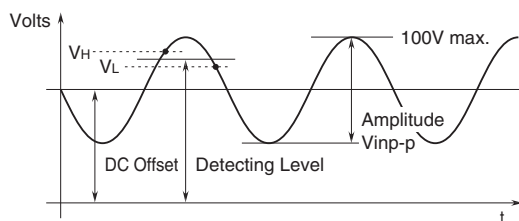
(Convert current into voltage using the receiving resistor value.)

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**



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

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

Approval:

UL/C-UL general safety requirements

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

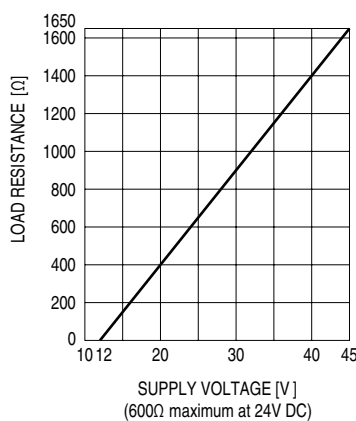
OUTPUT SPECIFICATIONS

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

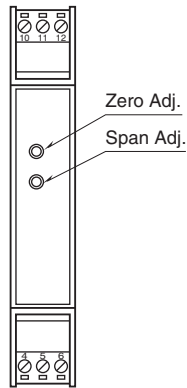
Supply voltage: 12 - 45 V DC

Operating temperature:

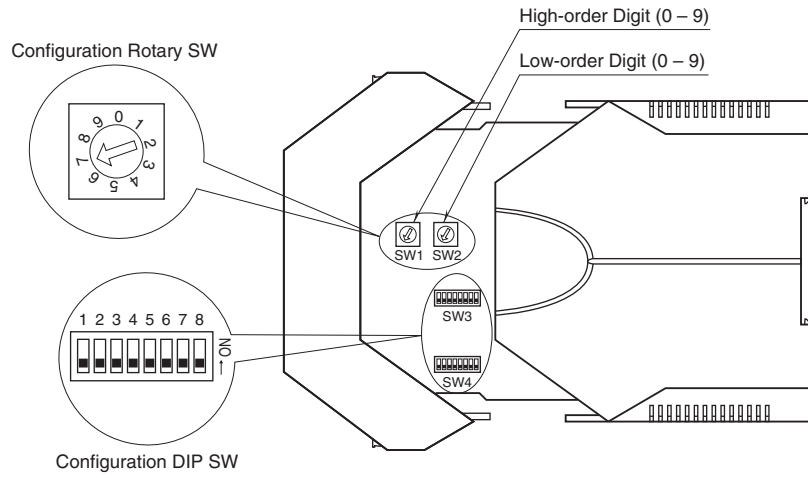
-40 to +85°C (-40 to +185°F)

EXTERNAL VIEW

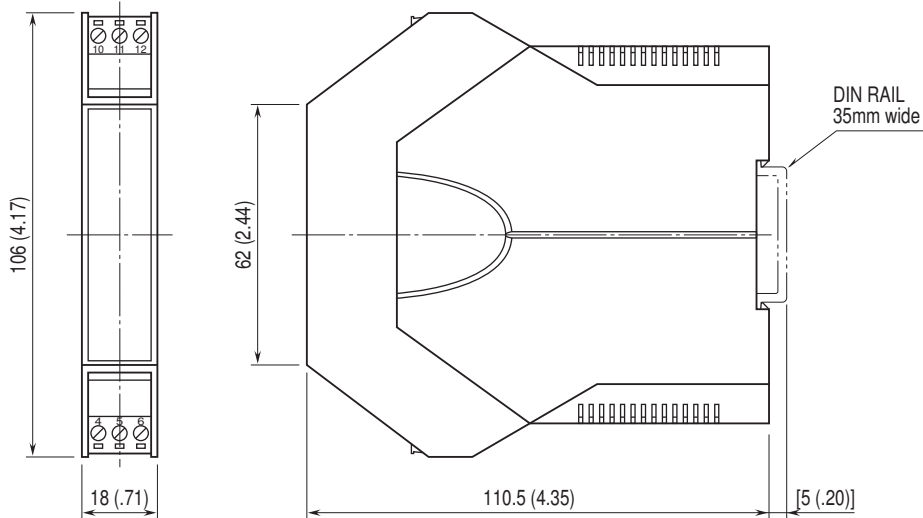
■ FRONT VIEW



■ SIDE VIEW

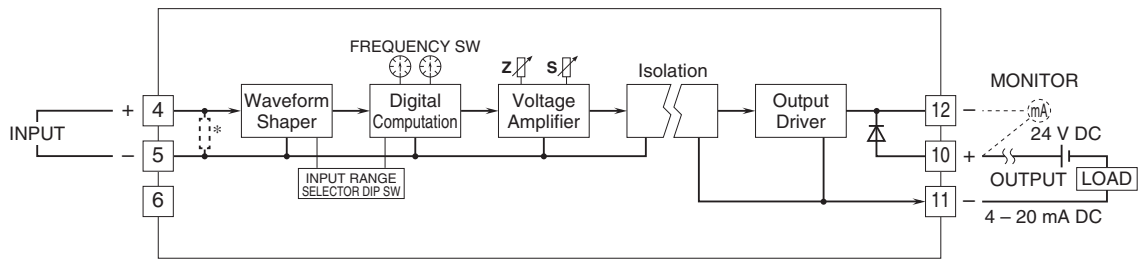


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

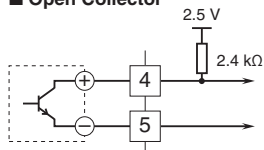
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Input shunt resistor incorporated for two-wire current pulse input.

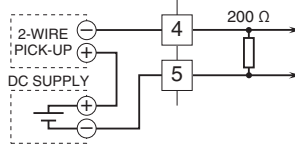
Input Connection Examples

■ **Open Collector**

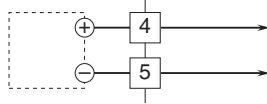


■ **Two-wire Current Pulse**

• **External DC Supply**



■ **Voltage Pulse**



Specifications are subject to change without notice.