Space-saving Plug-in Signal Conditioners F-UNIT

2-input MATH FUNCTION MODULE

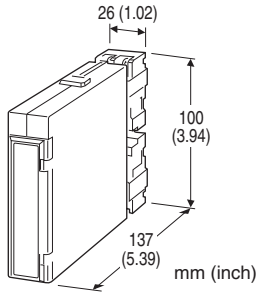
(field-programmable)

Functions & Features

- Providing temp. or pressure compensation for a gas flow, and other arithmetic operations
- Microprocessor based
- Equation and parameters selectable on site via hand-held programmer PU-2x
- Loop testing
- High-density mounting

Typical Applications

- Various flowmeters
- Adding two flows
- Ratio calculation
- Calculating average temperature



MODEL: FJF-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: FJF-[1][2]-[3][4]

Specify a code from below for each [1] through [4] (e.g. FJF-6A-K/3)

Use Ordering Information Sheet (No. ESU-1980). Default setting will be used if not otherwise specified.

[1] INPUT

Current

A: 4 – 20 mA DC (Input resistance 100 Ω)

Voltage

6: 1 – 5 V DC (Input resistance 1 MΩ min.)

[2] OUTPUT

Current

A: 4 – 20 mA DC (Load resistance 600 Ω max.)

Voltage

6: 1 – 5 V DC (Load resistance 500 Ω min.)

[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.)

[4] OPTIONS

Equation (Refer to the EQUATION table)

/1: Temperature compensation for DP flowmeter (ideal gas)
/2: Pressure compensation for DP flowmeter (ideal gas)
/3: Addition/subtraction
/4: Multiplication
/5: Division

EQUATION

Equation parameters

X_0: output (%)
X_1 to X_2: input (%)
K_0 to K_2: gain ±29.999
A_0 to A_2: bias (%) ±299.99 %

EQUATION

/1: Temperature compensation for DP flowmeter (ideal gas)

$$X_0 = \frac{K_1 X_1}{\sqrt{K_2 X_2 + A_2}}$$

where X_0 : compensated flow (linear characteristic)
X_1 : uncompensated flow (square root extraction available)
X_2 : temperature

/2: Pressure compensation for DP flowmeter (ideal gas)

$$X_0 = K_1 X_1 \sqrt{K_2 X_2 + A_2}$$

where X_0 : compensated flow (linear characteristic)
X_1 : uncompensated flow (square root extraction available)
X_2 : pressure

/3: Addition/subtraction

$$X_0 = K_0 \{K_1 (X_1 + A_1) + K_2 (X_2 + A_2)\} + A_0$$

/4: Multiplication

$$X_0 = K_0 (K_1 X_1 + A_1) (K_2 X_2 + A_2) + A_0$$

/5:Division

$$X_0 = \frac{K_0 (K_1 X_1 + A_1)}{(K_2 X_2 + A_2)} + A_0$$

RELATED PRODUCTS

- JX configurator connection kit (model: JXCON)
- Programming Unit (model: PU-2x)

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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 (non-isolated between inputs)
Overrange input: Approx. -25 to +125 %
Overrange output: Approx. -10 to +120 % at 1 – 5 V
Adjustments: Programming Unit (model: PU-2x); equation and parameters, square root extraction, zero and span, etc. (Refer to the users manual of JXCON for the adjustments configurable with JXCON.)

INPUT SPECIFICATIONS

■ **DC Current**: Input resistor incorporated

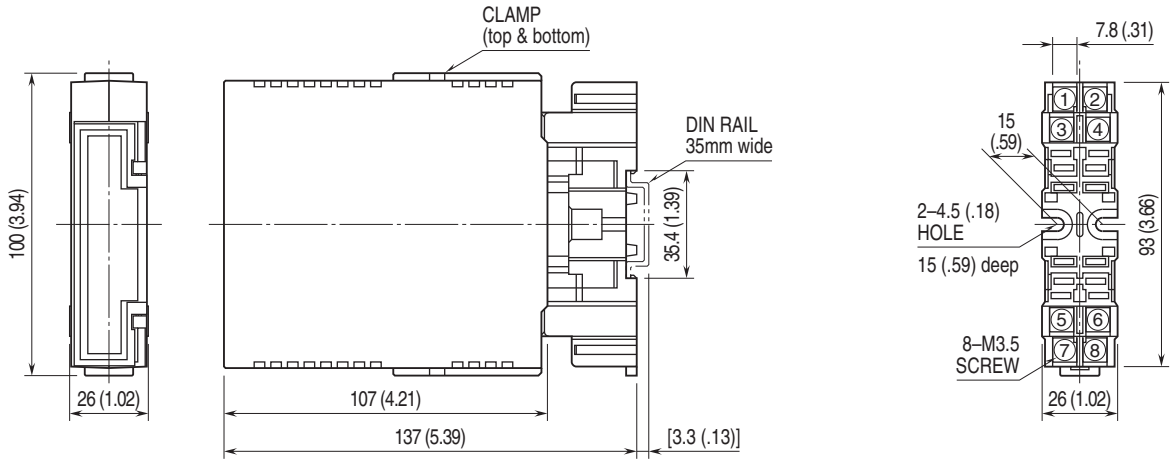
INSTALLATION

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: 220 g (0.49 lbs)

PERFORMANCE in percentage of span

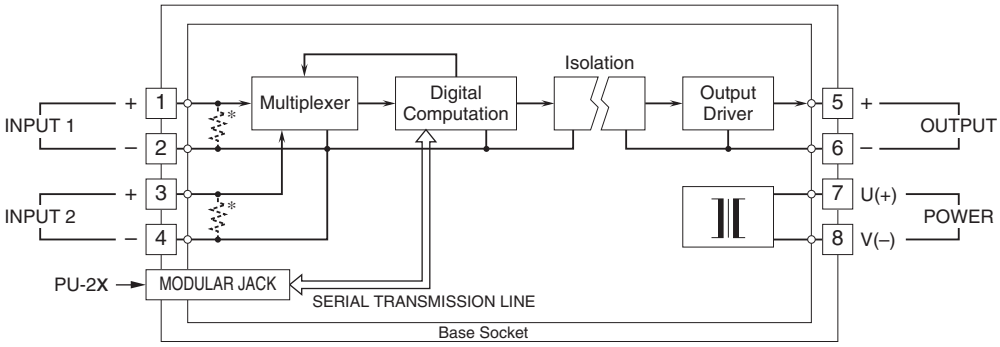
Input accuracy: ±0.2 %
Output accuracy: ±0.2 %
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time: ≤ 0.8 sec. (0 – 90 %)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength
Power input code R:
1000 V AC @ 1 minute (input to output)
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)

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 current inputs.

⚠ Specifications are subject to change without notice.

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