

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

### 2-input MATH FUNCTION MODULE

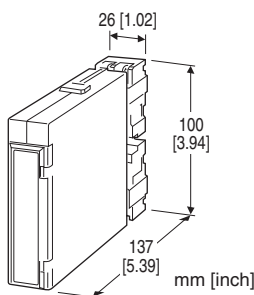
(field-programmable)

#### Functions & Features

- Providing temperature 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 of [1] through [4].  
(e.g. FJF-6A-K/3/Q)

- Parameters

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

( $K_0 = 1$ ,  $K_1 = 1$ ,  $K_2 = 1$ ,  $A_0 = 0\%$ ,  $A_1 = 0\%$ ,  $A_2 = 0\%$ )

- Specify the specification for option code /Q  
(e.g. /C01/S01)

### [1] INPUT

Current

**A:** 4 - 20 mA DC (Input resistance 100  $\Omega$ )

Voltage

**6:** 1 - 5 V DC (Input resistance 1 M $\Omega$  min.)

### [2] OUTPUT

Current

**A:** 4 - 20 mA DC (Load resistance 600  $\Omega$  max.)

Voltage

**6:** 1 - 5 V DC (Load resistance 500  $\Omega$  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  $\pm 10\%$ , ripple 10 %p-p max.)

**P:** 110 V DC

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

### [4] OPTIONS (multiple selections)

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

Other Options

**blank:** none

**/Q:** Option other than the above (specify the specification)

### SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

**/C01:** Silicone coating

**/C02:** Polyurethane coating

**/C03:** Rubber coating

TERMINAL SCREW MATERIAL

**/S01:** Stainless steel

**EQUATION****Equation parameters**

$X_0$ : output (%)

$X_1$  to  $X_2$ : input (%)

$K_0$  to  $K_2$ : gain  $\pm 29.999$

$A_0$  to  $A_2$ : bias (%)  $\pm 299.99$  %

**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**

- Programming Unit (model: PU-2x)
- PC configurator software (model: JXCON)

Downloadable at our web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual for the PC configurator for applicable cable types.

**GENERAL SPECIFICATIONS**

**Construction:** Plug-in

**Connection:** M3.5 screw terminals (torque 0.8 N·m)

**Screw terminal:** Nickel-plated steel (standard) or stainless 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 consumption**

• **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 lb)

**PERFORMANCE in percentage of span**

**Accuracy:** Input accuracy + output accuracy

**Input accuracy:**  $\pm 0.2$  % (gain  $\leq 1$ )

[ $\pm 0.2$  %  $\times$  gain] with gain  $> 1$

**Output accuracy:**  $\pm 0.2$  %

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

**Response time:**  $\leq 1.2$  sec. (0 - 90 %)

**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)

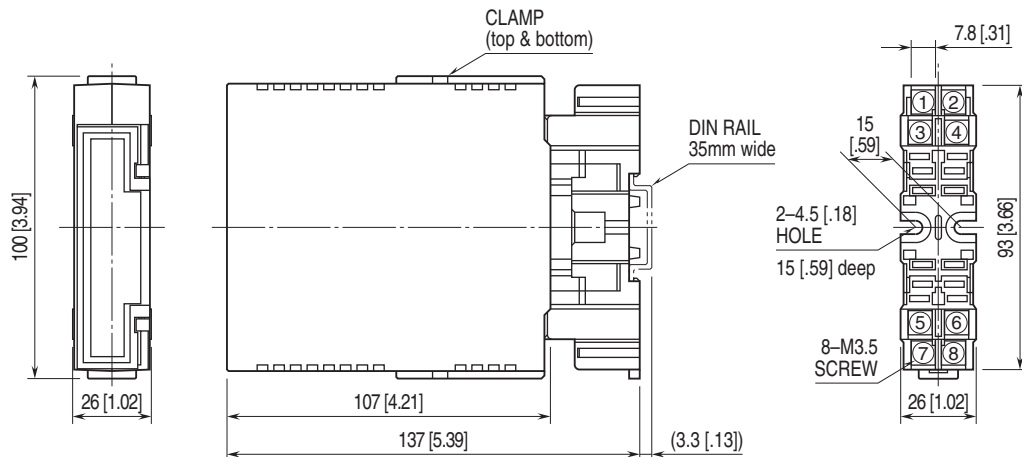
**Power input code K, L, P:**

1000 V AC @ 1 minute (input to output)

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

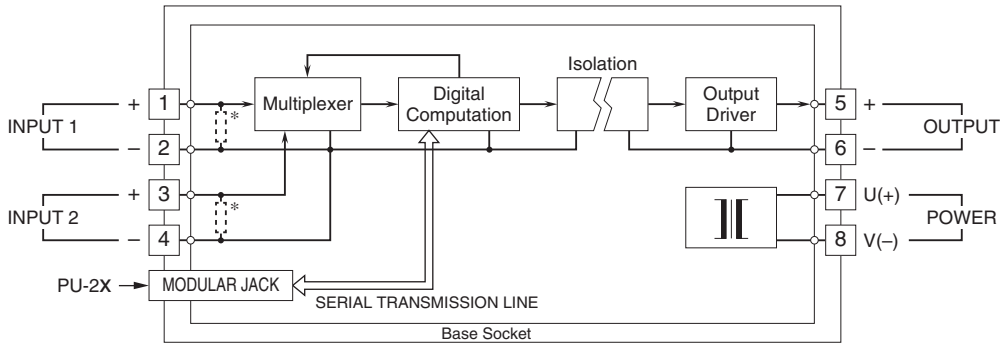
1500 V AC @ 1 minute (I/O to power)

**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS** unit: mm [inch]



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

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\*Input shunt resistor incorporated for current inputs.



Specifications are subject to change without notice.