

Dual Output Plug-in Signal Conditioners W-UNIT

6: 1 - 5 V DC (Input resistance 1 M Ω min.)

2-input MATH FUNCTION MODULE

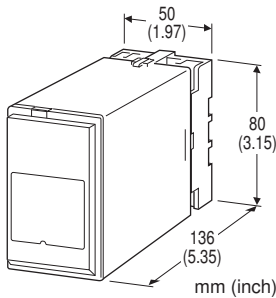
(field-programmable)

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
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

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



MODEL: WJF-[1][2][3]-[4][5]

ORDERING INFORMATION

- Code number: WJF-[1][2][3]-[4][5]
- Specify a code from below for each [1] through [5].
(e.g. WJF-6AA-B/3/Q)
- Special output ranges (For codes Z & 0)
 - 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)
- Note: If one of the outputs should be a current range, specify it for the Output 1 to allow a greater load.

[1] INPUT

Current

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

Voltage

[2] OUTPUT 1

Current

- A: 4 - 20 mA DC (Load resistance 600 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1200 Ω max.)
- C: 1 - 5 mA DC (Load resistance 2400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 600 Ω max.)
- E: 0 - 16 mA DC (Load resistance 750 Ω max.)
- F: 0 - 10 mA DC (Load resistance 1200 Ω max.)
- G: 0 - 1 mA DC (Load resistance 12 k Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Load resistance 10 k Ω min.)
- 2: 0 - 100 mV DC (Load resistance 100 k Ω min.)
- 3: 0 - 1 V DC (Load resistance 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 k Ω min.)
- 5: 0 - 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 10 k Ω min.)
- 5W: -5 - +5 V DC (Load resistance 5000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

[3] OUTPUT 2

Current

- A: 4 - 20 mA DC (Load resistance 350 Ω max.)
- B: 2 - 10 mA DC (Load resistance 700 Ω max.)
- C: 1 - 5 mA DC (Load resistance 1400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 350 Ω max.)
- E: 0 - 16 mA DC (Load resistance 430 Ω max.)
- F: 0 - 10 mA DC (Load resistance 700 Ω max.)
- G: 0 - 1 mA DC (Load resistance 7000 Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

Same range availability as Output 1

[4] POWER INPUT

AC Power

- B: 100 V AC
- C: 110 V AC
- D: 115 V AC
- F: 120 V AC
- G: 200 V AC
- H: 220 V AC
- J: 240 V AC

DC Power

- S: 12 V DC
- R: 24 V DC
- V: 48 V DC



[5] 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 M-System's web site.)**

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

EQUATION**Equation parameters**X₀: output (%)X₁ to X₂: input (%)K₀ to K₂: gain ±29.999A₀ to A₂: 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 X₀: compensated flow (linear characteristic)X₁: uncompensated flow (square root extraction available)X₂: temperature

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

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

where X₀: compensated flow (linear characteristic)X₁: uncompensated flow (square root extraction available)X₂: 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

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

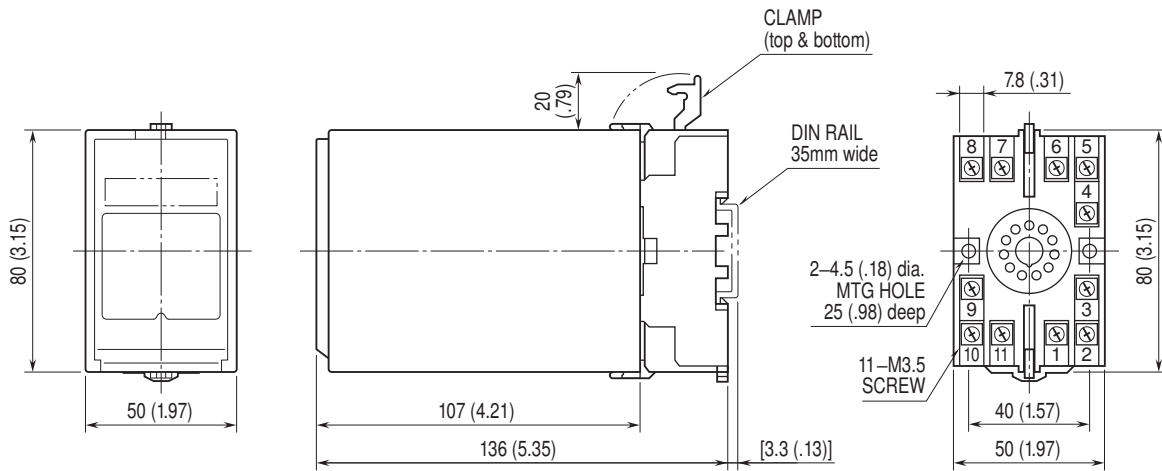
RELATED PRODUCTS

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

GENERAL SPECIFICATIONS**Construction:** Plug-in**Connection:** M3.5 screw terminals**Screw terminal:** Chromated steel (standard) or stainless steel**Housing material:** Flame-resistant resin (black)**Isolation:** Input to output 1 to output 2 to power (non-isolated between inputs)**Overrange input:** Approx. -25 to +125 %**Overrange output:** Approx. -10 to +120 % at 1 - 5 V**Zero adjustment:** -5 to +5 % (front)**Span adjustment:** 95 to 105 % (front)**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**OUTPUT SPECIFICATIONS**■ **DC Current:** 0 - 20 mA DC**Minimum span:** 1 mA**Offset:** Max. 1.5 times span**Load resistance:** Output drive 12 V max. for Output 1; 7 V max. for Output 2■ **DC Voltage:** -10 - +10 V DC**Minimum span:** 5 mV**Offset:** Max. 1.5 times span**Load resistance:** Output drive 1 mA max.; at ≥ 0.5 V**INSTALLATION****Power input**• **AC:** Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 3.5 VA• **DC:** Operational voltage range: rating ±10 % ripple 10 %p-p max., approx. 2.6 W (110 mA at 24 V)**Operating temperature:** -5 to +55°C (23 to 131°F)**Operating humidity:** 30 to 90 %RH (non-condensing)**Mounting:** Surface or DIN rail**Weight:** 400 g (0.88 lb)**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:** 2000 V AC @1 minute

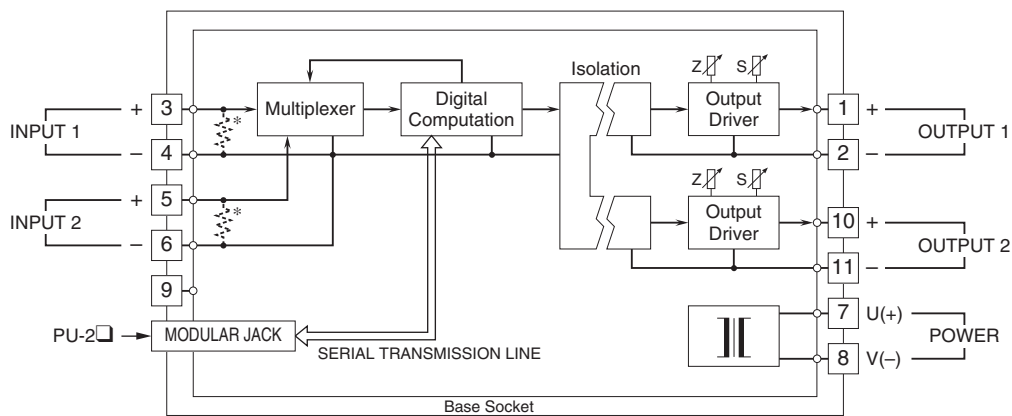
(input to output to power to ground)
 1000 V AC @ 1 minute (output 1 to output 2)

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.