

## Dual Output Plug-in Signal Conditioners W-UNIT

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

### 3-input MATH FUNCTION MODULE

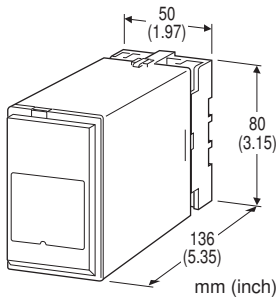
(field-programmable)

#### Functions & Features

- Providing temperature and 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 three flows
- Calculating average temperature



## MODEL: WJFK-[1][2][3]-[4][5]

### ORDERING INFORMATION

- Code number: WJFK-[1][2][3]-[4][5]

Specify a code from below for each [1] through [5].  
(e.g. WJFK-6AA-B/2/Q)

- Special output ranges (For codes Z & 0)
- Parameters

Use Ordering Information Sheet (No. ESU-1681). Default setting will be used if not otherwise specified.

(K<sub>0</sub> = 1, K<sub>1</sub> = 1, K<sub>2</sub> = 1, K<sub>3</sub> = 1, A<sub>0</sub> = 0 %, A<sub>1</sub> = 0 %, A<sub>2</sub> = 0 %, A<sub>3</sub> = 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 kΩ max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

#### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 kΩ 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 kΩ 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: Temp. & pressure compensation for DP flowmeter (ideal gas)

/2: Addition/subtraction

/3: Multiplication

/4: Multiplication/division

/5: Multiplication/division

/6: Addition/multiplication

/7: Addition/division

/8: Addition/division

/9: Addition/multiplication

/10: Addition/division

### Other Options

blank: none

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

## SPECIFICATIONS OF OPTION: Q (multiple selections)

### COATING

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

### TERMINAL SCREW MATERIAL

/S01: Stainless steel

## EQUATION

### Equation parameters

X<sub>0</sub>: output (%)

X<sub>1</sub> to X<sub>3</sub>: input (%)

K<sub>0</sub> to K<sub>3</sub>: gain ±29.999

A<sub>0</sub> to A<sub>3</sub>: bias (%) ±299.99 %

## EQUATION

/1: Temp. & pressure compensation for DP flowmeter (ideal gas)

$$X_0 = K_1 X_1 \sqrt{\frac{K_2 X_2 + A_2}{K_3 X_3 + A_3}}$$

where X<sub>0</sub> : compensated flow (linear characteristic)

X<sub>1</sub> : uncompensated flow (sq. root extraction available)

X<sub>2</sub> : pressure

X<sub>3</sub> : temperature

/2: Addition/subtraction

$$X_0 = K_0 \{K_1 (X_1 + A_1) + K_2 (X_2 + A_2) + K_3 (X_3 + A_3)\} + A_0$$

/3: Multiplication

$$X_0 = K_0 (K_1 X_1 + A_1) (K_2 X_2 + A_2) (K_3 X_3 + A_3) + A_0$$

/4: Multiplication/division

$$X_0 = \frac{K_0 (K_1 X_1 + A_1) (K_2 X_2 + A_2)}{(K_3 X_3 + A_3)} + A_0$$

/5: Multiplication/division

$$X_0 = \frac{K_0 (K_1 X_1 + A_1)}{(K_2 X_2 + A_2) (K_3 X_3 + A_3)} + A_0$$

/6: Addition/multiplication

$$X_0 = K_0 (K_1 X_1 + K_2 X_2 + A_1) (K_3 X_3 + A_3) + A_0$$

/7: Addition/division

$$X_0 = \frac{K_0 (K_1 X_1 + K_2 X_2 + A_1)}{(K_3 X_3 + A_3)} + A_0$$

/8: Addition/division

$$X_0 = \frac{K_0 (K_1 X_1 + A_1)}{(K_2 X_2 + K_3 X_3 + A_2)} + A_0$$

/9: Addition/multiplication

$$X_0 = K_0 (K_1 X_1 + A_1) + K_0 (K_2 X_2 + A_2) (K_3 X_3 + A_3) + A_0$$

/10: Addition/division

$$X_0 = K_0 (K_1 X_1 + A_1) + \frac{K_0 (K_2 X_2 + A_2)}{(K_3 X_3 + A_3)} + A_0$$

## 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  $\geq 0.5$  V

## INSTALLATION

### Power input

•**AC:** Operational voltage range: rating  $\pm 10$  %, 50/60  $\pm 2$  Hz, approx. 3.5 VA

•**DC:** Operational voltage range: rating  $\pm 10$  % 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:**  $\pm 0.2$  %

**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

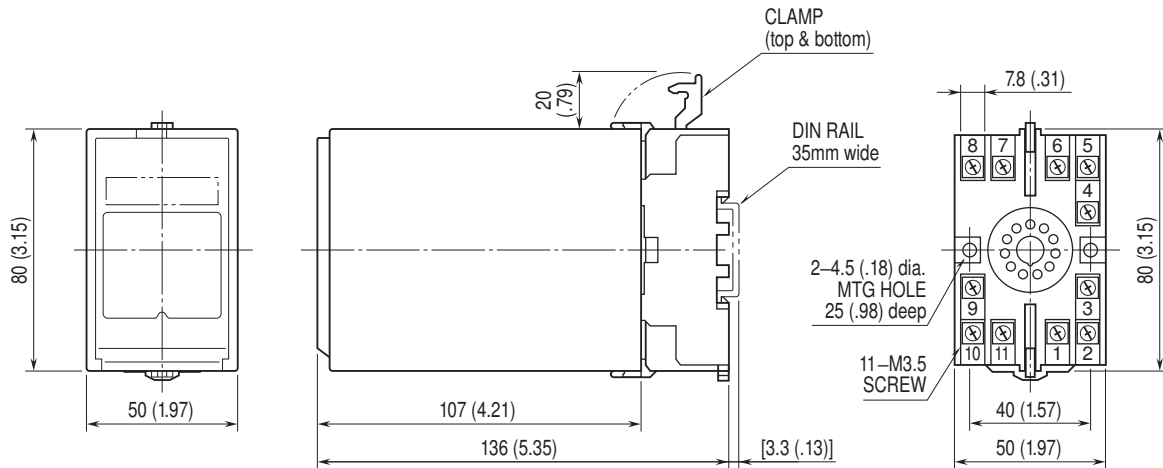
**Dielectric strength:** 2000 V AC @1 minute

(input to output to power to ground)

1000 V AC @ 1 minute (output 1 to output 2)

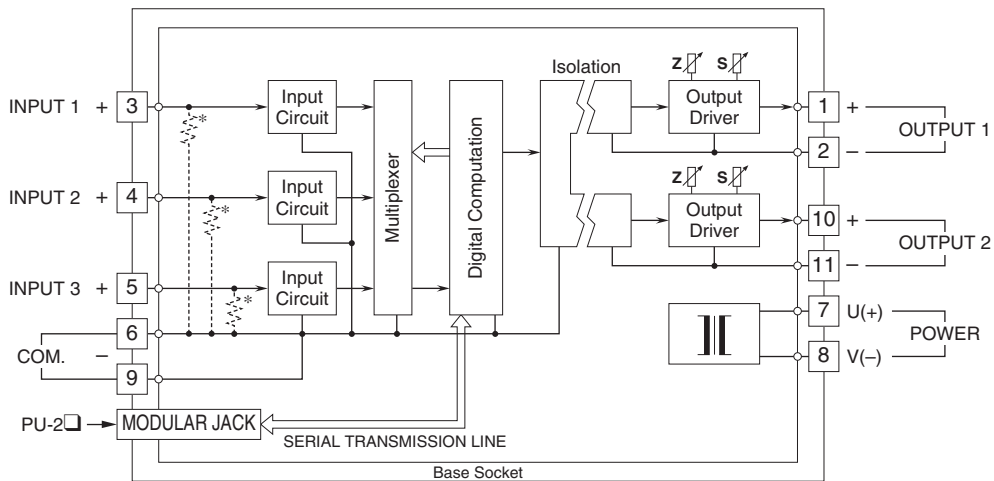


## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



• 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.