

Rack-mounted DCS Signal Conditioners 18-RACK

2-input MATH FUNCTION MODULE

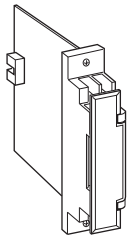
(field-programmable)

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
- Second channel output available at the front terminals and at the Standard Rack connector

Typical Applications

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



MODEL: 18JF-[1]66-R[2]

ORDERING INFORMATION

- Code number: 18JF-[1]66-R[2]

Specify a code from below for each [1] and [2]
(e.g. 18JF-666-R/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

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

OUTPUT 1

Voltage

B: 1 - 5 V DC (Load resistance 2000 Ω min.)

OUTPUT 2

Voltage

B: 1 - 5 V DC (Load resistance 2000 Ω min.)

POWER INPUT

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

[2] 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

X₀: output (%)

X₁ to X₂: input (%)

K₀ to K₂: gain ±29.999

A₀ 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: Rack-mounted; terminal access via screw terminals on the front and connector on the rear; terminal cover provided

Connection

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

Output 1: Connector



Output 2: M3.5 screw terminals (torque 0.8 N·m) and connector

Power input: Supplied from connector

Screw terminal: Nickel-plated steel

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 %

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

•DC: Approx. 60 mA

Operating temperature: -5 to +55°C (23 to 131°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Standard Rack 18BXx or 18KBXx

Weight: 150 g (0.33 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 M Ω with 500 V DC

Dielectric strength: 1500 V AC @ 1 minute

(input to output 1 or output 2 or power)

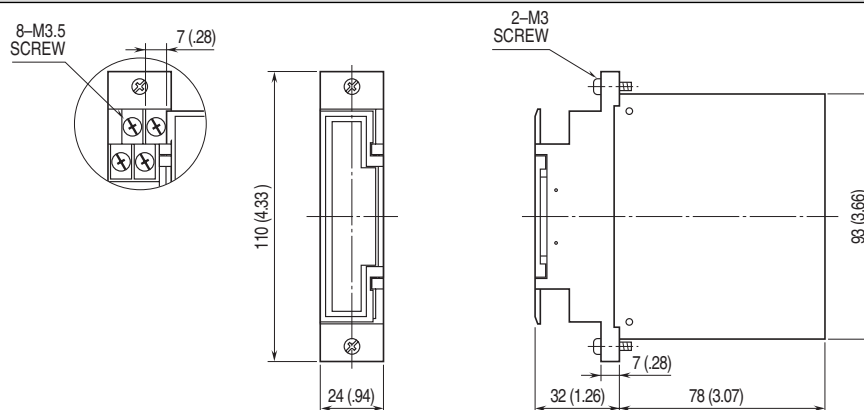
500 V AC @ 1 minute

(output 1 to output 2 to power)

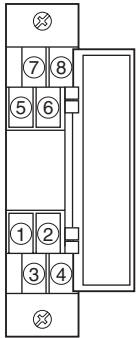
1500 V AC @ 1 minute

(input or output or power to ground)

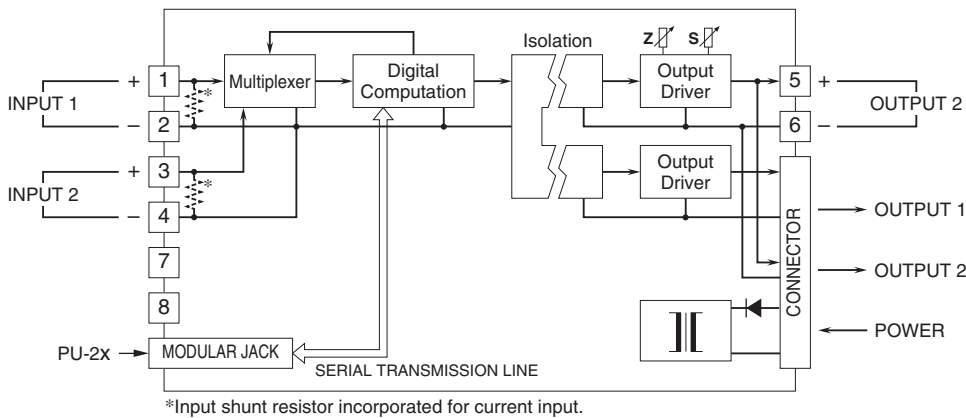
DIMENSIONS unit: mm (inch)



TERMINAL ASSIGNMENTS



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Input shunt resistor incorporated for current input.



Specifications are subject to change without notice.

