Rack-mounted DCS Signal Conditioners 18-RACK

2-input MATH FUNCTION MODULE

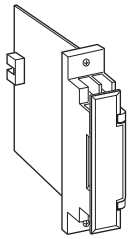
(field-programmable)

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
- 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 of [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

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

OUTPUT 1

Voltage

6: 1 – 5 V DC (Load resistance 2000 Ω min.)

OUTPUT 2

Voltage

6: 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

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

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

Downloadable at M-System's 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: 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

Current consumption: 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 lb)

PERFORMANCE in percentage of span

Accuracy: Input accuracy + output accuracy

Input accuracy: ±0.2 % (gain ≤ 1)

[±0.2 % × gain] with gain > 1

Output accuracy: ±0.2 %

Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)

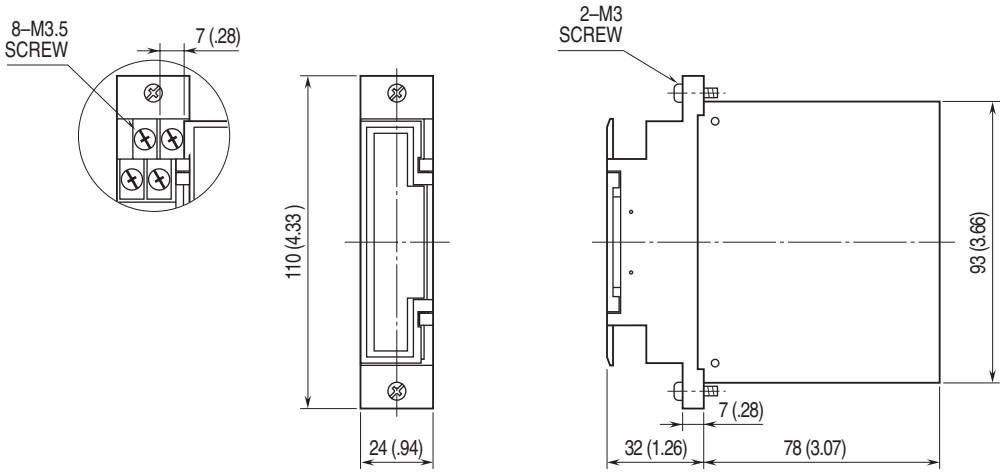
Response time: ≤ 1.2 sec. (0 – 90 %)

Line voltage effect: ±0.1 % over voltage range

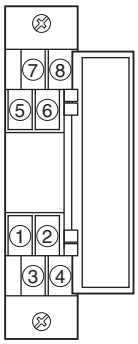
Insulation resistance: ≥ 100 MΩ with 500 V DC

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)

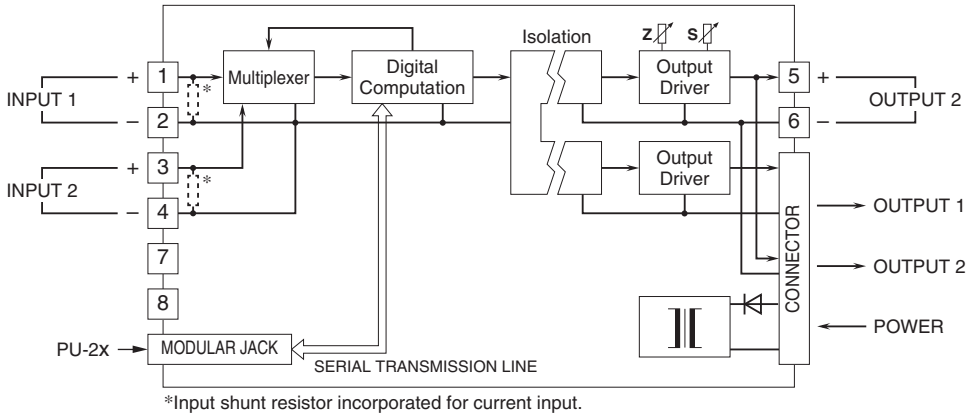
EXTERNAL DIMENSIONS unit: mm (inch)



TERMINAL ASSIGNMENTS



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Input shunt resistor incorporated for current input.

⚠ Specifications are subject to change without notice.