Signal / Meter-FDM06-X

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eyc

FDM06-X
Thermal Mass Diff. Pressure Signal Processor

0.5 m/s
99999999 m³
RELAY ON

Compatible with Multiple Throttling Devices	
	Pitot Tube
	Averaging Flow Tube
	Annubar Tube
	Venturi Tube
	Orifice Plate
	V-Cone
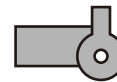
| Features |

- **Thermal mass differential pressure principle**:
  High accuracy ±1.5% F.S., without the need for temperature or pressure compensation
- **Turndown ratio 100:1 with high sensitivity design**:
  Superior to conventional differential pressure sensors in detecting subtle airflow variations
- **On-site K-factor correction**:
  Simple calculation allows input of the corresponding K-factor to align measurements with true values
- **Real-time display & system integration**:
  Capable of showing flow velocity/flow rate, and with eyc-tech DPM03 / DPM04 enables full-range linearization and totalizing flow calculation
- **Versatile outputs**:
  Supports Analog / Relay / RS-485, making system integration flexible and convenient
- **Easy installation**:
  Ferrule fittings for flexible or rigid tubing.
- **High compatibility**:
  Applicable to a wide range of differential pressure elements (Pitot tube, averaging tube, Annubar, Venturi, orifice plate, V-cone, etc.)

| Applications |

Industrial compressed air & energy management: Zonal consumption monitoring, leakage detection, energy metering
Process gases & supply control: Flow billing, mixing ratio monitoring, high-pressure/high-velocity flow monitoring
HVAC & cleanroom: Duct flow monitoring, laminar flow, positive/negative pressure, environmental control
Biotech & pharmaceutical: Aseptic area and gas supply stability monitoring
Environmental monitoring & ESG: Emission measurement, CO_2 equivalent conversion, ESG energy statistics

Signal / Meter-FDM06-X

| Specification |

Input

Sensor type	Hot-wire sensor
Turndown ratio	100：1
Measuring range	Max. 60 m/s

Output

Output signal	4 ... 20 mA / 0 ... 10 V / Relay / RS-485
Signal connection	3-wire
Warm-up time	60 sec
Response time	t90≦6 sec
Load resistance	Current output：≦500 Ω
	Voltage output：≧10 KΩ

Communication

Communication methods & protocol	RS-485 Modbus RTU
RS-485 baud rate	9600、19200、38400、57600、115200 bps

Accuracy

Accuracy	60 m/s：±(1.5% F.S.)
Temp. influence	0.2% / °C
Uncertainty of factory calibration	±1%

*The measurement range is defined at the standard condition(1013 mbar, 20°C).
*mv = measured value
*Accuracy based on tests with a 300 mm averaging Pitot tube.

Environmental

Medium	Non-corrosion gas / Air
Operating Temp. / Humidi.	0 ... 50°C / 20 ... 90%RH (Non-condensing)
Storage Temp.	-20 ... +60°C
Body operating pressure	16 bar

Electrical

Power supply	DC 24 V ±10%
Current consumption	24 V：110 mA
Relay capacity	Max. current：6 A
	Max. voltage：DC 24 V (DC 36 V Max)
Electrical connection	M12 8P connector

Installation

Installation	Ferrule fittings：1/4"(Rigid), Ø6(Flexible)

Display

Display readout	0 ... 99999999 (Cumulative flow : 8-digit)
	0 ... 99999 (Instantaneous flow : 5-digit)
Decimal point	Button
Sampling time	1 cycle/sec
Unit	m/s、ft/s、L/min、m³/min、m³/h、mL、L
	m³、ft³、inch³、gal、uk gal
Response time adjustment range	0.5 ... 300 sec

Certification

Certification	CE

Protection

IP rating	IP65
Electrical protection	■ Reverse polarity ■ Over-voltag

Material

Housing	Aluminum alloy

| Diagram |
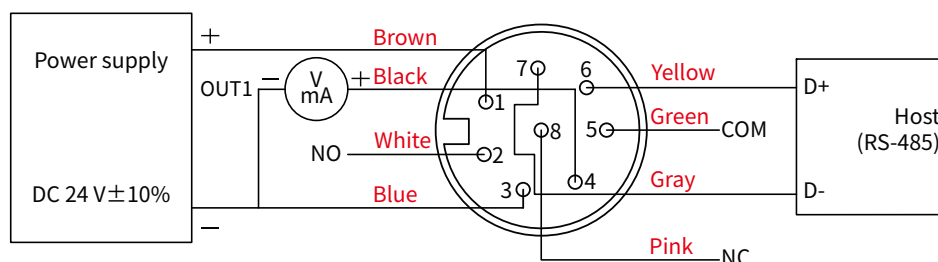
*Please make sure the product and the device which connect with RS-485 are on common ground, avoid damaged product.

| Wind Tunnel Calibration System |

The wind tunnel calibration system provides a stable and standardized environment for calibration, is not affected by external factors, and has an automated detection system to greatly improve calibration accuracy and reliability. It follows the operating standards of ISO/IEC 17025 and a calibration report can be purchased separately.

| Measurement Principle |

■ Hot-wire type differential pressure measurement

The FDM06-X adopts a hot-wire type differential pressure sensor combined with a Venturi tube. It calculates the flow rate by measuring the differential pressure at two points in the Venturi tube. Hot-wire type differential pressure measurement technology calculates the pressure difference by measuring the air flow rate. When there is a pressure difference between two measurement points, air flows from the high-pressure side to the low-pressure side through a channel inside the transmitter. The channel contains a heating element and two temperature sensors. By comparing the heating and temperature changes, the air flow rate can be precisely measured, which in turn allows the calculation of the pressure difference. This technology can detect extremely low air flow rates, making it possible to precisely measure small pressure differences. Additionally, hot-wire type measurement technology has the characteristic of low zero-point drift, meaning the transmitter can maintain a stable initial zero point even after prolonged use, ensuring measurement precision and reliability.

Flow

T$_1$ Heater T$_2$
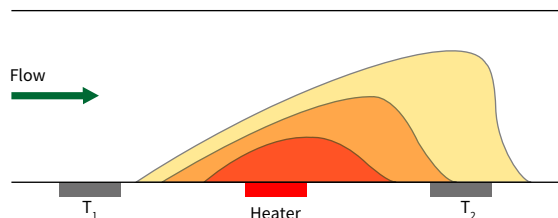
■ Formula

$$P = A + B \cdot V^n$$

P : Heating power

A : Power loss with no flow

V : Velocity

B : Fluid velocity

n : Velocity exponent
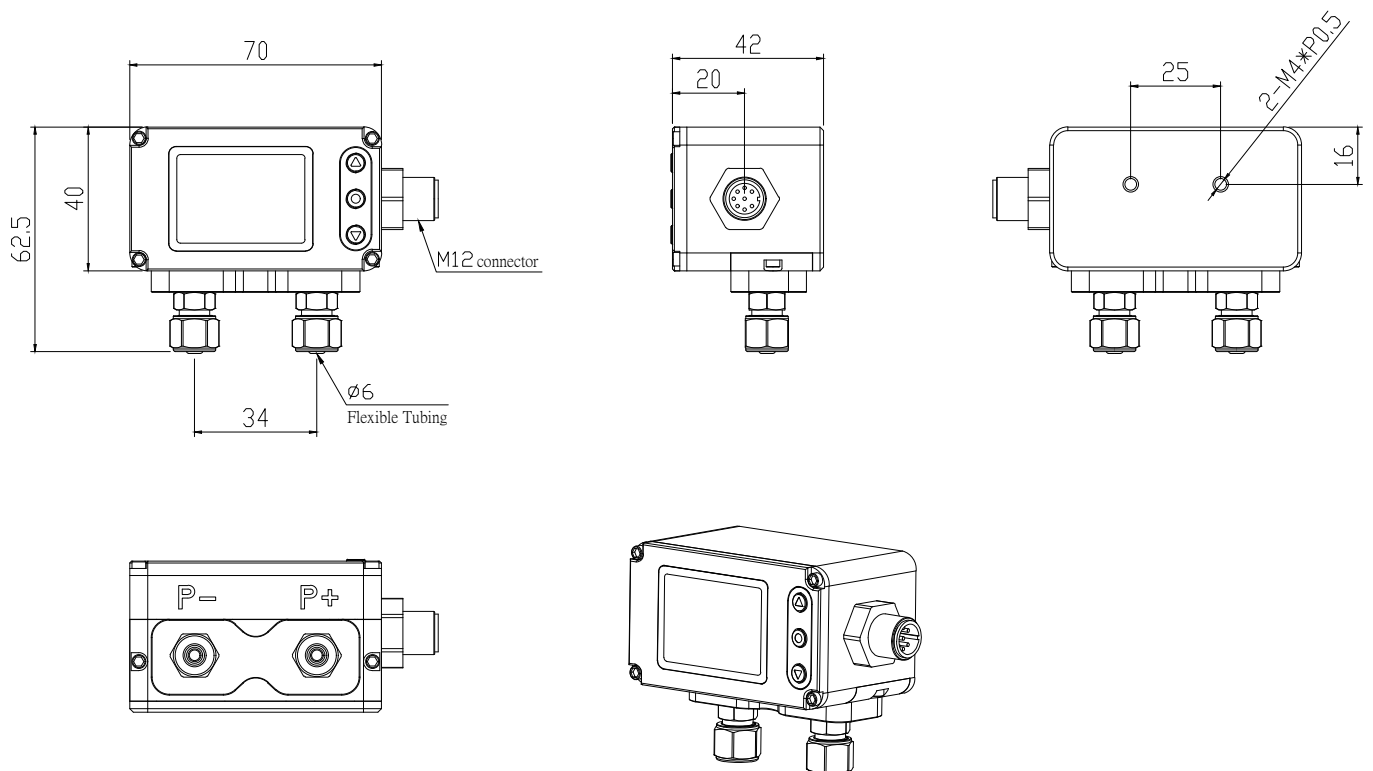
| Optional Combination |

FDM06-X
Thermal Mass Diff. Pressure
Signal Processor

DPM03
Multifunction
Signal Display Monitor

Full-Range Linearization

PLC / SCAD

DPM04
Flow Totalizer

Flow Totalizing

ESG
Carbon emissions calculation
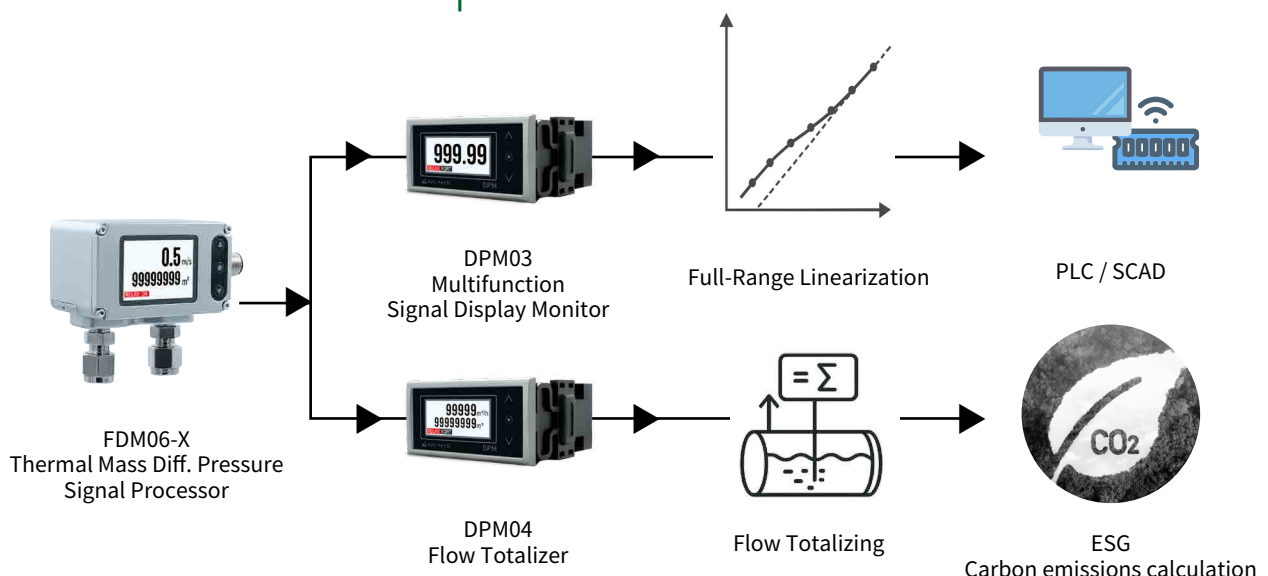
| Dimension | Unit : mm

■ Rigid tubing type

70

40

67

M12 connector

34

1/4″
SUS304 rigid tubing

42

20

25

2-M4*P0.5

16

P−   P+

■ Flexible tubing type

70

40

62.5

M12 connector

34

Ø6
Flexible Tubing

42

20

25

2-M4*P0.5

16

P−   P+
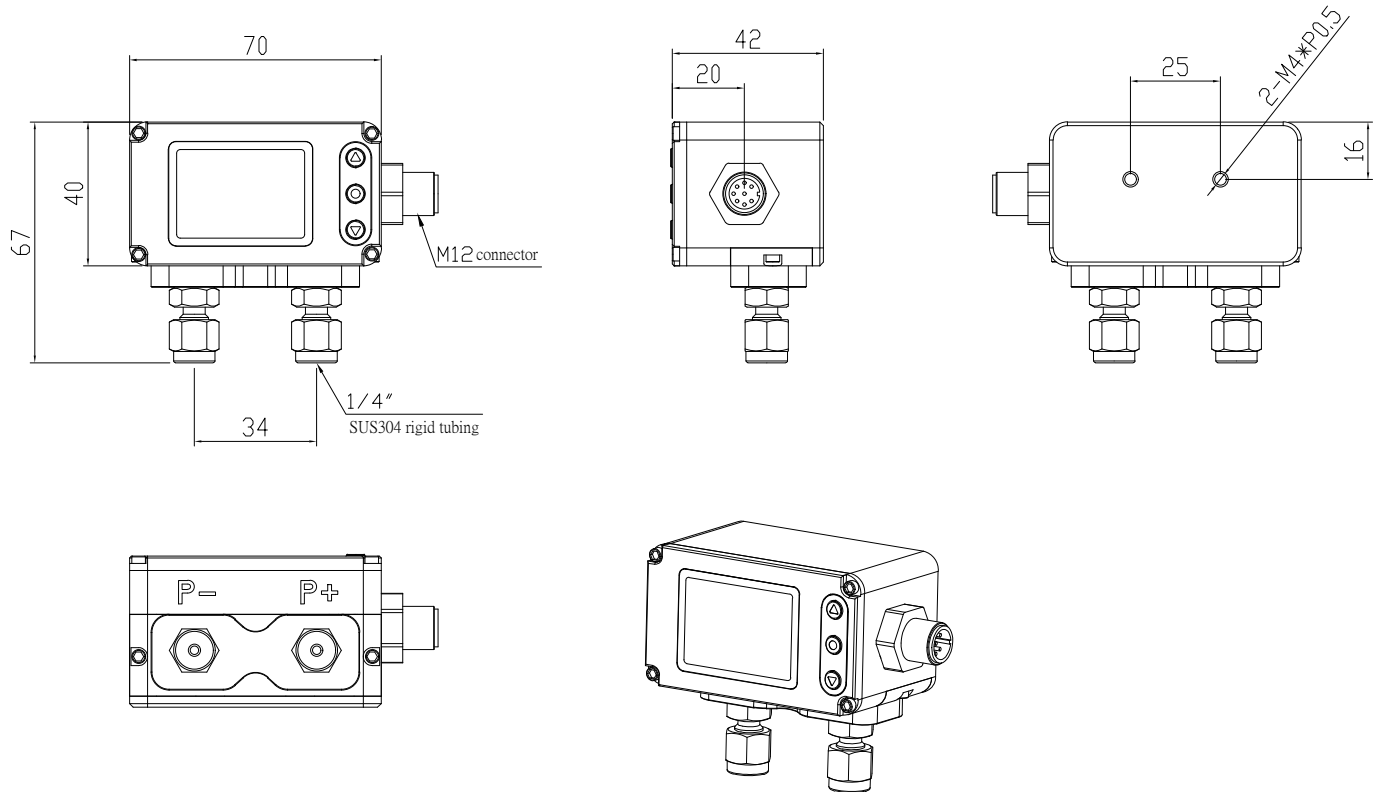
| Ordering Guide |

Connection

FDM06 — $\boxed{X}$

X：Various differential pressure elements

*Default : 4 … 20 mA + RS-485 + Relay, displaying flow velocity and flow rate

| K-factor Calculation Method |

*The K-factor is mainly used to correct the difference between theoretical formulas and actual flow conditions.

*Multi-point segmented K-factor compensation can be applied with eyc-tech DPM03/04.

■ Velocity correction (Pitot tube, averaging tube, Annubar)　　■ Flow correction (Venturi tube, orifice plate, V-cone)

$$K_V = \frac{V_{\text{True (Max)}}}{V_{\text{FM06-X measured}}}$$

K_V = velocity correction factor

V = velocity

$$K_Q = \frac{Q_{\text{True (Max)}}}{Q_{\text{FM06-X measured}}}$$

K_Q = flow correction factor

Q = flow

| Additional Option Test Report | For more detailed information please contact us.

■ILAC / TAF

YUDEN-TECH CO.,LTD. Calibration Laboratory - (ILAC / TAF) Test report.
(TAF accreditation : 3032, complying with ISO / IEC 17025) TAF has mutual recognition arrangement with ILAC MRA

Project	Measurand level or range
Air velocity transmitter	0.2 m/s … 60 m/s

■ISO 9001

Project	Measurand level or range
Air velocity / Air volume	Air velocity : $\leqq$ 120 m/s
	Air volume : 0.5 m³/h … 1000 m³/h