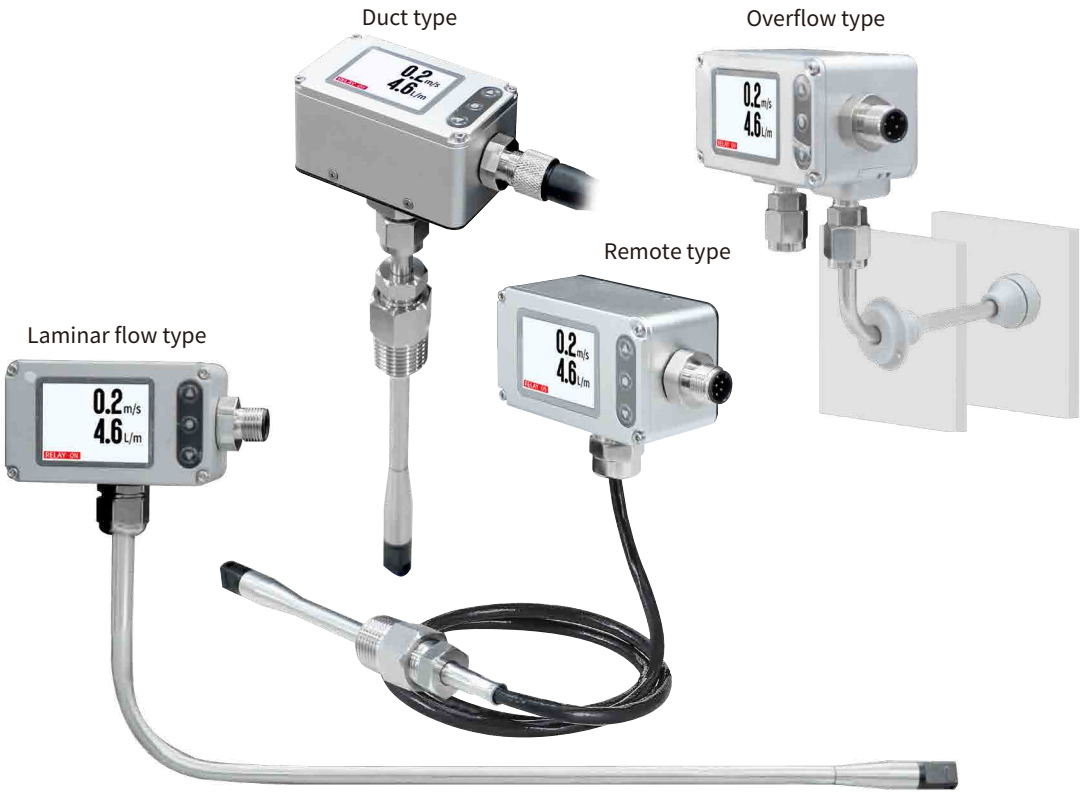
FDM06-L

Bi-directional Low Air Flow Thermal Mass Transmitter



| Features |

- Based on the hot-wire principle, featuring bi-directional measurement.
- High sensitivity for low airflow, dual temperature sensors, ideal for laminar flow / overflow.
- 2" LCD color screen with easy settings via buttons.
- The screen displays airflow and air velocity, integrated with UI settings.
- Accuracy : ±1.0% pipeline withstand pressure of 16 bar
- Multiple Outputs: Analog output / Relay / RS-485

| Applications |

Overflow Flow Monitoring (0.20 m/s) / Laminar Flow Monitoring (0.20 ... 0.50 m/s) / Semiconductor / Pharmaceutical / Food and Beverage / Laminar Flow Control / Overflow Control / Positive and Negative Pressure Control / Energy / Environmental Protection / Factory Automation / Pharmaceutical

*Recommended range : 0.00 ... 1.00 m/s for laminar and overflow monitoring.

Air flow / Air velocity-FDM06-L

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| Specification |

Input

Sensor type	Hot-wire sensor
Turndown ratio	100 : 1
Measuring range	±(0.00 ... 1.00 m/s)
	±(0.00 ... 2.00 m/s)
	±(0.00 ... 10.00 m/s)

*Deadband : 0... -0.5 m/s
*Recommended range : 0.00 ... 1.00 m/s for laminar and overflow monitoring.

Output

Output signal	4 ... 20 mA / 0 ... 10 V / Relay / RS-485
Signal connection	3-wire
Warm-up time	60 sec
Response time	t90≦ 5 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 (Including hysteresis,	0.05 ... 1.00 m/s：±(1% of mv+0.05 m/s)
non-linearity and repeatability)	0.05 ... 2.00 m/s：±(1% of mv+0.1 m/s)
	0.1 ... 10.00m/s：±(1% of mv+0.2 m/s)
Uncertainty of factory calibration	±1%
Installation angle effect	<3 % mv for α <10°
Temp. influence	0.2%/°C

*The measurement range is defined at the standard condition(1013 mbar, 20°C).
*mv = measured value

Environmental

Medium	Air
Operating Temp. & Humid.	0 ... 50°C / 20 ... 90%RH(Non-condensing)
Storage Temp.	-25 ... +60°C
Operating pressure	16 bar : Duct type ø12
	2 bar : Duct type ø8 / Remote type ø8
	none : Laminar flow type ø8 / Overflow type ø8

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	PT 1/2" movable thread

Display

Display readout	-99.99 ... +99.99 (Air velocity)
	0 ... 99999 (Air volume)
Decimal point	Button
Sampling time	1 cycle/sec
Flow unit	m/s, ft/s, L/min, m^3/min, m^3/h
Response time adjustment range	0.5 ... 300 sec

Certification

Certification	CE

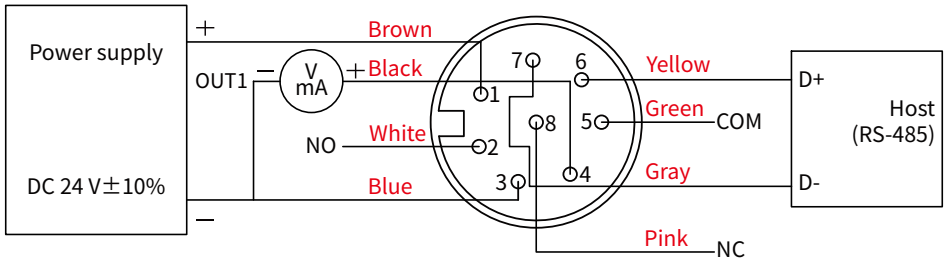
Protection

IP rating	IP65(Housing)
Electrical protection	■ Reverse polarity ■ Over-voltag

Material

Housing	Aluminum alloy / Plastic
Probe	SUS304
Probe head	PC with glass fiber
Weight	Duct type : 340 g
	Duct type ø12 : 440 g
	Remote type (2 m cable) : 450 g
	Laminar flow type : 300 g
	Overflow type : 290 g

| 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.

| Low Air Flow vs. Differential Pressure |

Using Bernoulli's equation, the conversion formula between air velocity and differential pressure can be derived. Under standard conditions (1013 mbar, 20°C), the relationship between air velocity and differential pressure is shown in the figure below.

In applications such as cleanrooms, laboratory airflow monitoring, and detection of weak airflows, the FDM06-L thermal mass flow sensor performs especially well under ultra-low velocity conditions, making it particularly suitable for airflow detection where differential pressure is difficult to identify.

Formula

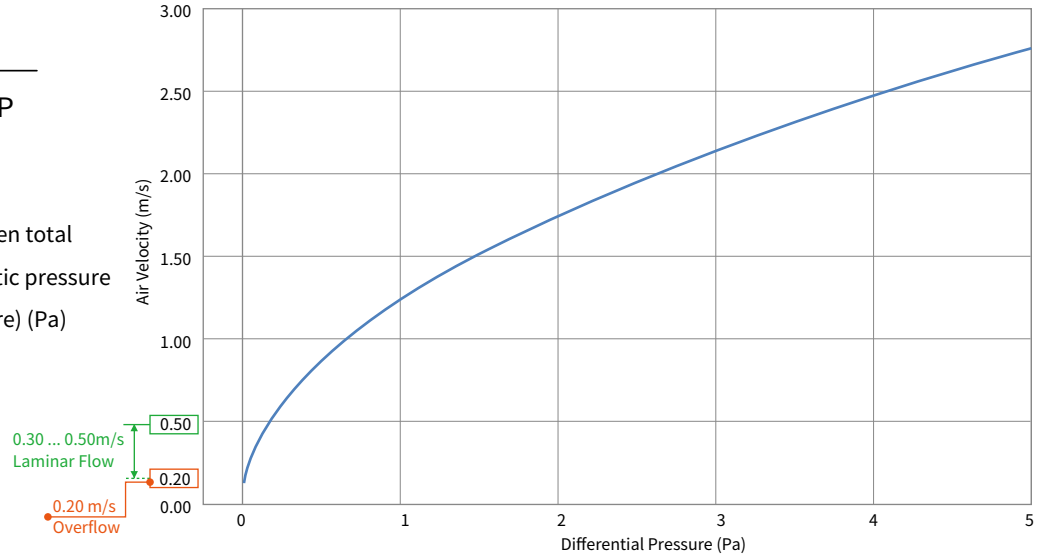
$$V = K\sqrt{\frac{2}{\rho}\Delta P}$$

V =Velocity (m/s)

Δ P =Difference between total pressure and static pressure (dynamic pressure) (Pa)

ρ =Density (kg/m³)

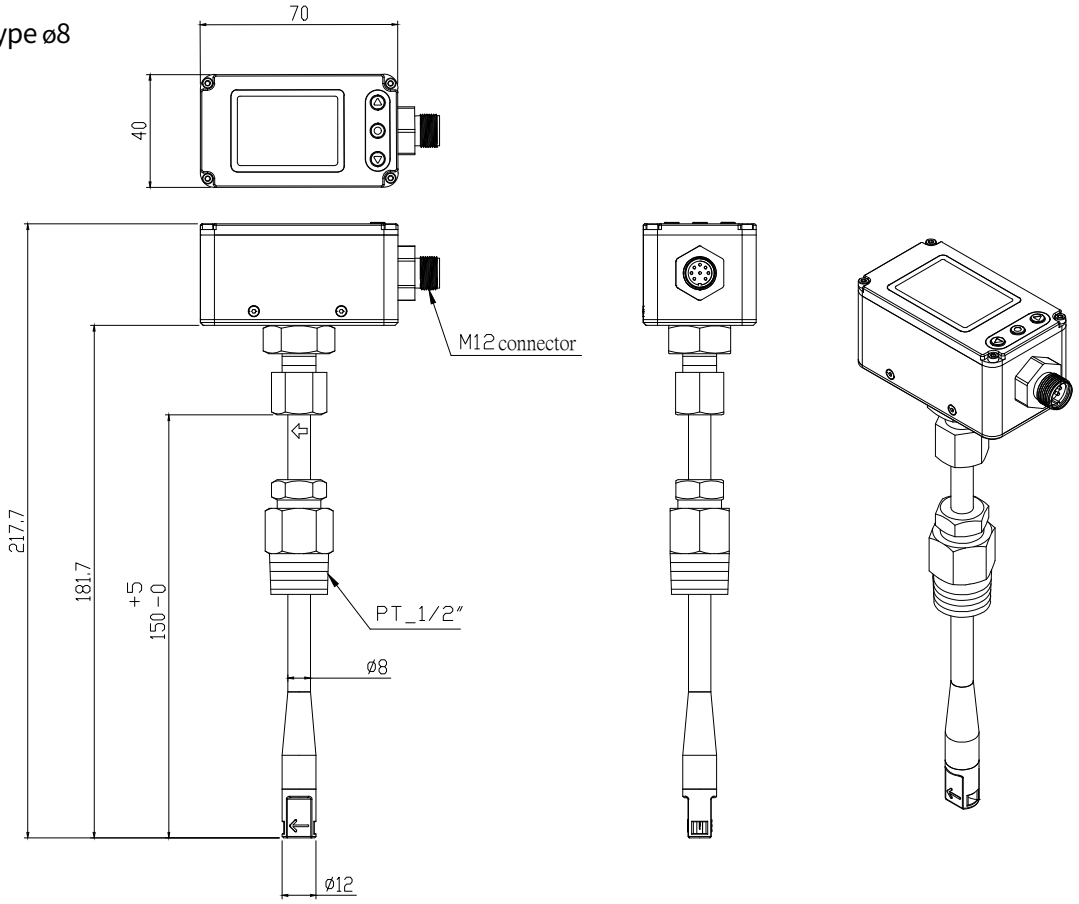
K =Coefficient



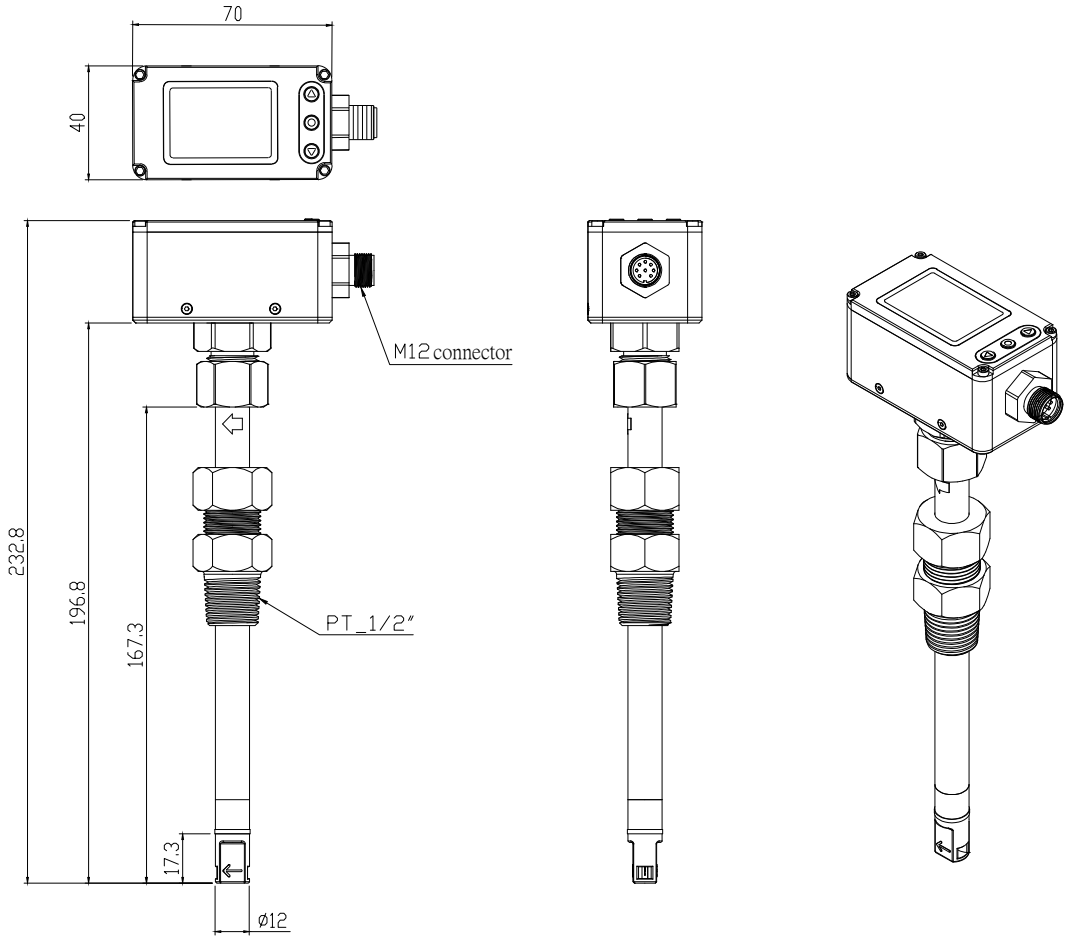
*Recommended range : 0.00 ... 1.00 m/s for laminar and overflow monitoring.

| Dimension | Unit : mm

Duct type ø8

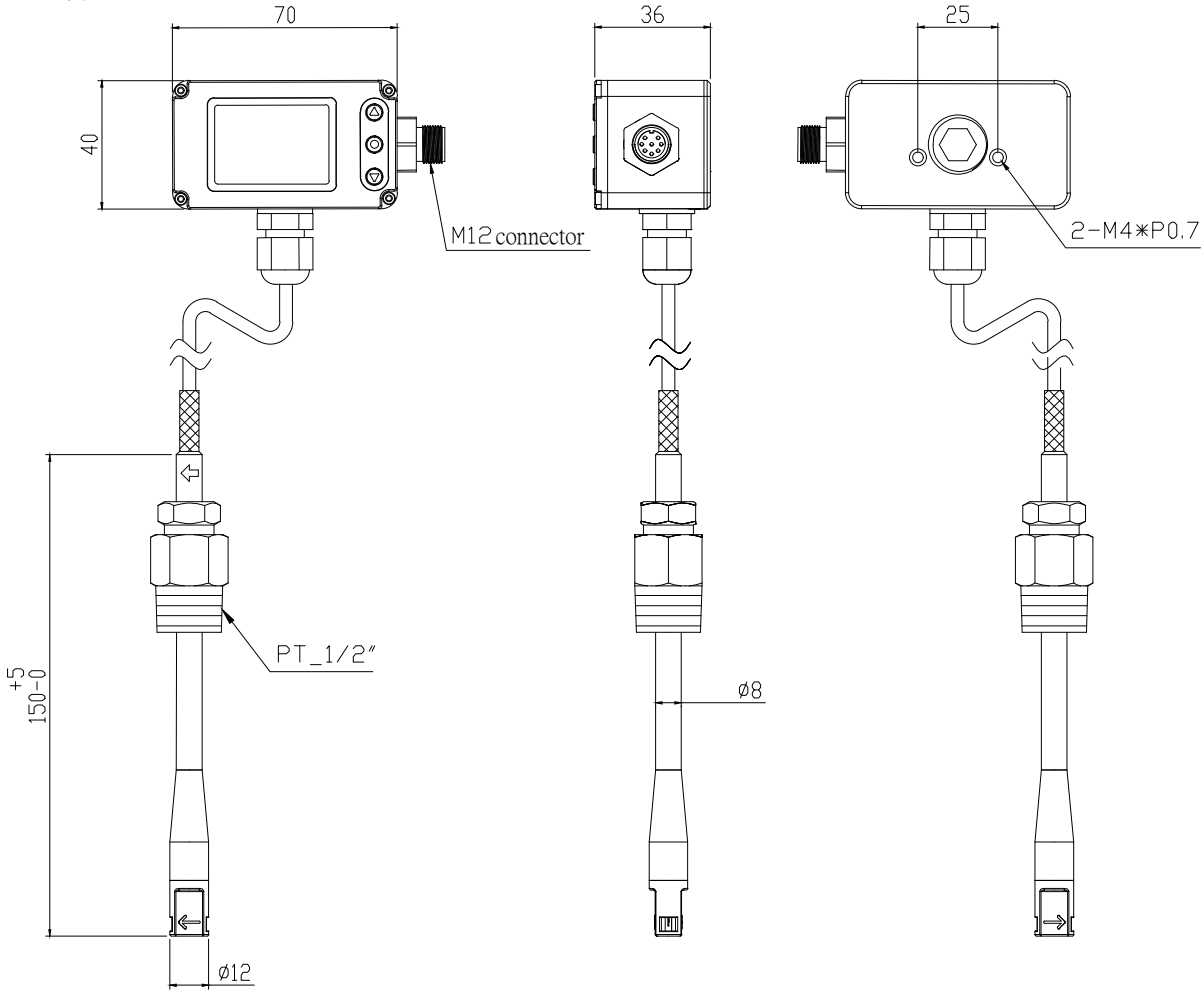


Duct type ø12

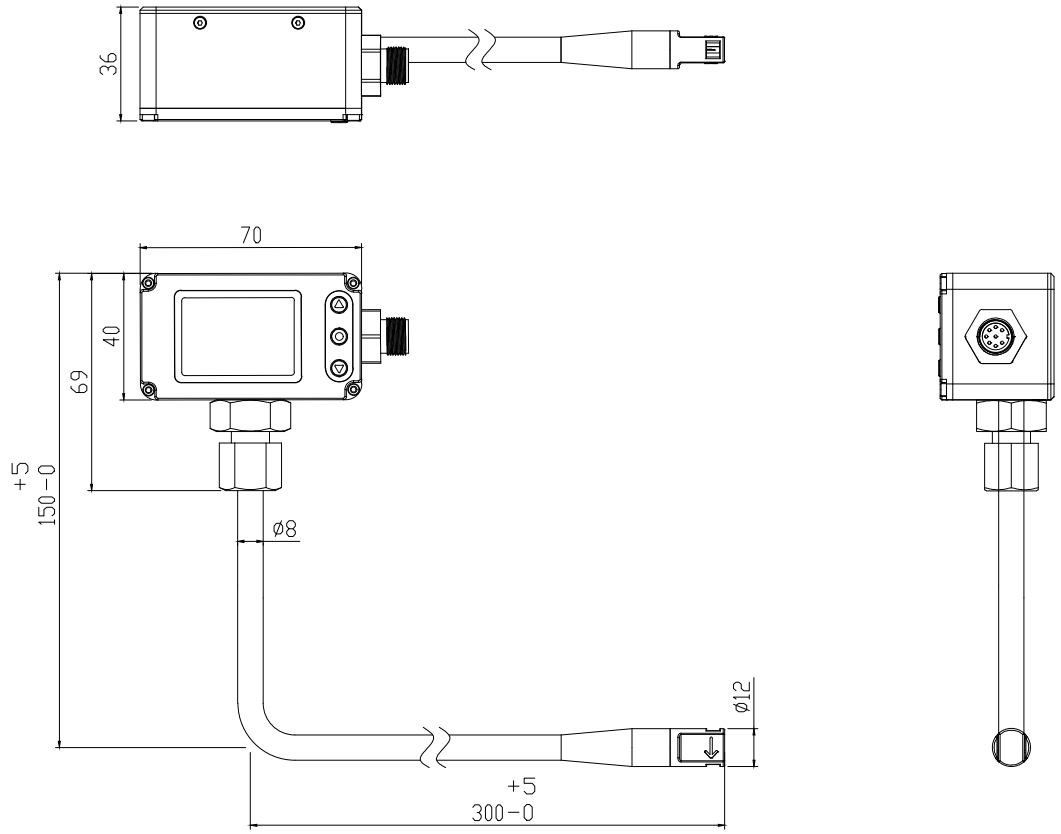


Air flow / Air velocity-FDM06-L

Remote type ø8

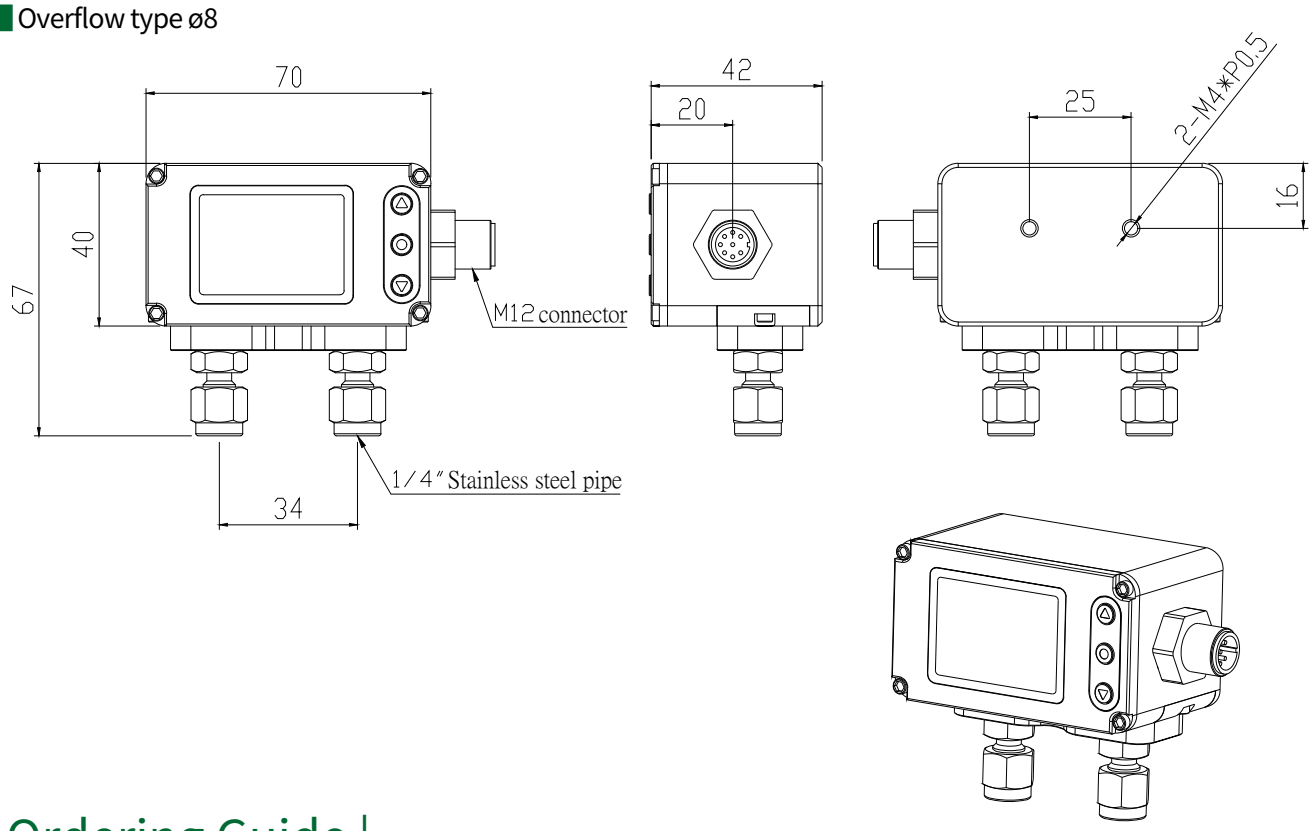


Laminar flow type ø8



Air flow / Air velocity-FDM06-L

Overflow type ø8



| Ordering Guide |

FDM06 — L (Application) — DX (Installation) — 10 (Range) — 2 (Output)

Application	Installation	Range	Output
L：Low air flow	DX：Duct type	01：±1 m/s	2：4 ... 20 mA+RS-485+Relay
	D1：Duct type ø12	02：±2 m/s	3：0 ... 10 V+RS-485+Relay
	RX：Remote type (Cable : 2 m)	10：±10 m/s	
	L1：Laminar flow type		
	L2：Overflow type (Standard : ±2 m/s)		

| 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 ：≦ 120 m/s
	Air volume : 0.5 m^3/h ... 1000 m^3/h