FTM94/95

Industrial High Accuracy Thermal Mass Flow Transmitter

Suitable for harsh environments, industrial processes flow monitoring or slightly corrosion compressed air

| Features |

- IP67 Rugged aluminum alloy case, fit in variety harsh environment
- Easy to install, high accuracy, long-term stability
- Switchable physical quantities : m/s, ft/s, Nm³/h, Nm/s, L/min, m³/min (Air velocity & volume)
- LCD Display of air velocity and temperature
- LCD Display of cumulative flow : m³, L (Option)

| Introduction |

FTM94/95 Hot wire thermal air velocity transmitter working at a constant Temp.

using King's law heat balance equation for:

$$e^2 = a' + b'v^n$$

e : Sensor voltage output(V)

a' : Zero output of constant temperature hot wire anemometer, Can use CTA circuit as temperature compensation

b' : Sensitivity of the sensor, related to the operating temperature

v : Fluid flow rate

n : 0.45 ... 0.5(Standard)

Can be calculated from the formula characteristic curve of constant Temp. hot wire anemometer, special three PT probe and full metal housing design, high accuracy, suitable for a variety of pipe diameters, widely used in industrial fields.

| Applications |

Exhaust gas removal / Dust environment / Slightly corrosive environment / Burner feeder / Biotechnology industry / Factory building air intake / Exhaust calculation

Air Velocity-FTM94/95

www.eyc-tech.com

| Specification |

Input

Input type	Pt20 / Pt300 (Air velocity) / Pt1000 (Temp.)
Measuring range	0 ... 120 Nm/s
	N : Working condition (Definition : 20°C at 1013 hPa)
	Units can be converted Nm/s (Flow rate) or
	Nm³/h(Flow)(Option) or m³(Cumulative flow)(Option)
Minimum initial value	0.1 Nm/s

Output

Installation angle effect	<3% of the measured value (When the installation angle<10°)
Signal	4 ... 20 mA / 0 ... 10 V / RS-485 / Impulse
Preset output	Out1 : Air velocity；Out2 : Impulse
Impulse range (1 ... 500 Hz)	(1)1 ... 500 Hz : 4 ... 20 mA, (2)1 ... 500 Hz : 0 ... 10 V
Signal connection	3-wire
Warm-up time	<60 sec
Reaction time	t90<5 sec
Display type	LCD Module with back light, double-row
	(Up air velocity, down temperature(Default: 0 ... 120°C))
Load resistance	Current output : ≦500 Ω, Voltage output : ≧100 KΩ

Accuracy

Accuracy (Including hysteresis,	0 ... 40 m/s : ±(1% of mv+0.5 m/s)
non-linearity and repeatability)	40 ... 60 m/s : ±(1% of mv+1 m/s)
	90 ... 120 m/s : ±(1% of mv+1.5 m/s)
Temp. influence	0.2% / °C
Repeatability	0.5%
Uncertainty of factory calibration	±1%

Electrical

Power supply	DC 24 V±10%
Current consumption	<0.3 A
Overvoltage protection	DC : <40 V
Electrical connections	M12 connector / M16 metal cable gland

Environmental

Measuring medium	Air
Operating Temp.	-20 ... +60°C
Operating Humid.	0 ... 95%RH(Non-condensing)
Probe operating Temp.	0 ... 120°C / Option:200°C
	(Increasing operating temperature
	will affect air velocity error)
Storage Temp.	-20 ... +60°C
Storage Humid.	0 ... 95%RH(Non-condensing)
Probe pressure	16 bar

Installation

Fixed seat	1/2"PT movable thread
Installation	Duct type
	Remote type

Protection

IP rating	IP67(Probe)；IP65(Housing)
Electrical protection	■ Reverse polarity
	■ Over-voltage
	■ Short-circuit

Certification

Certification	CE

Material

Housing	Aluminum alloy
Probe	SUS316
Remote probe cable	TEFLON (Remote FTM95)
Weight	FTM94 : 720 g
	FTM95 : 832 g
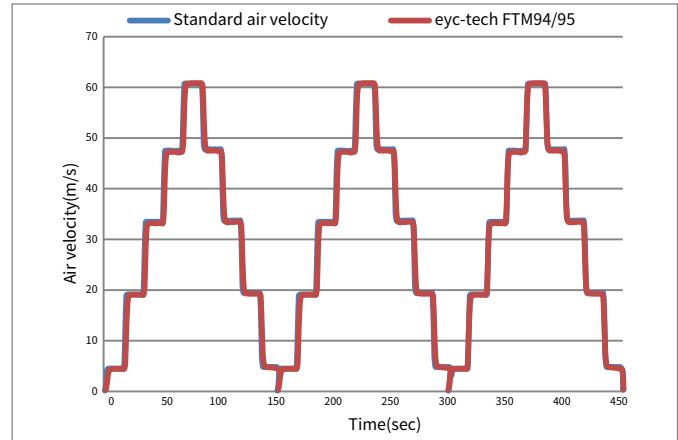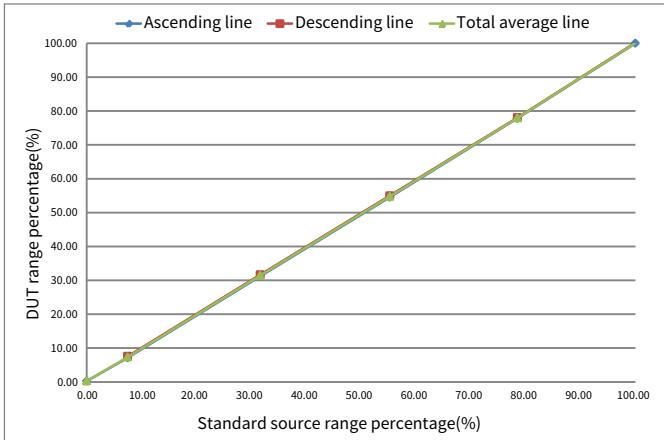
| 3-Cycle curve |

| Dimension | Unit : mm

FTM94 (Duct)

- M12x1.5
- M20x1.5
- M12 connector/ M16 metal cable gland
- 1/2"PT movable thread
- Ø12 mm
- Ø16 mm
- 30 mm
- 45 mm
- Ø16 mm
- short probe : Right side
- 104 mm
- 80 mm
- 50 mm
- 50.75 mm
- 35 mm
- 360 mm
- Flow sensor

FTM95 (Remote)

- 134 mm
- 104 mm
- 80 mm
- 95.78 mm
- M12 connector/ M16 metal cable gland
- Length as request (Max. length : 5 m) Wire diameter : Ø5 ... 5.5 mm
- 1/2"PT movable thread
- Ø12 mm
- Ø16 mm
- Flow sensor
- Ø16 mm
- 297 mm
- 280 mm
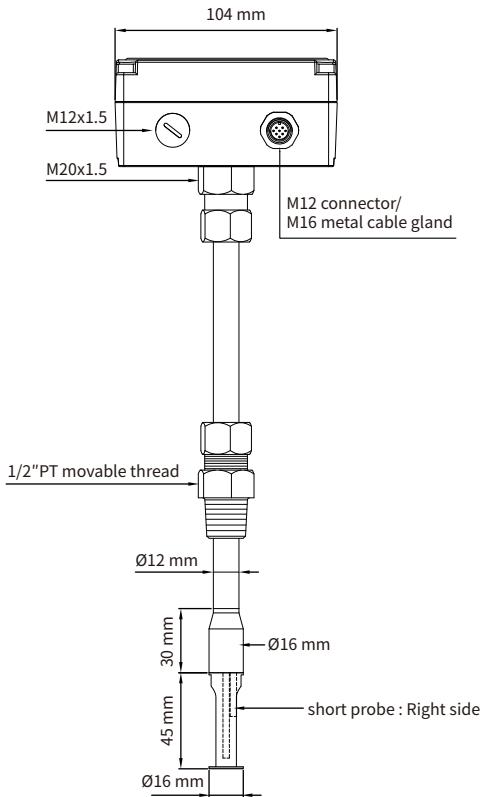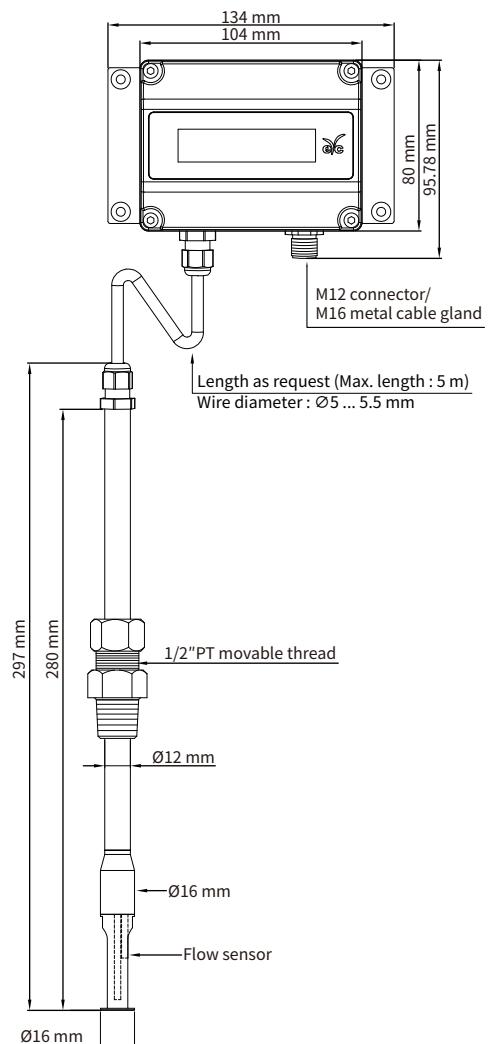
| Electrical Connector | Unit : mm

M type :
M12 connector (RS-485+analog)
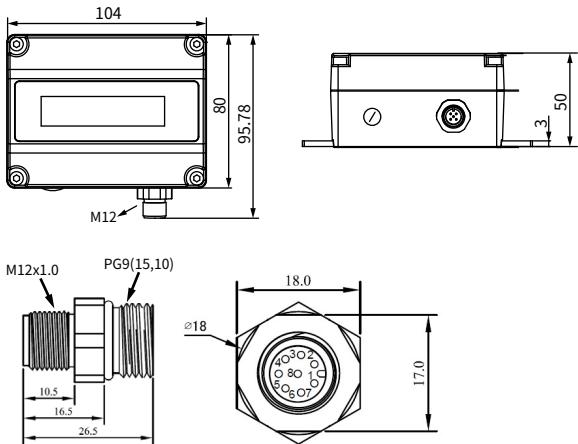
N type :
M16 metal cable gland (RS-485+analog)
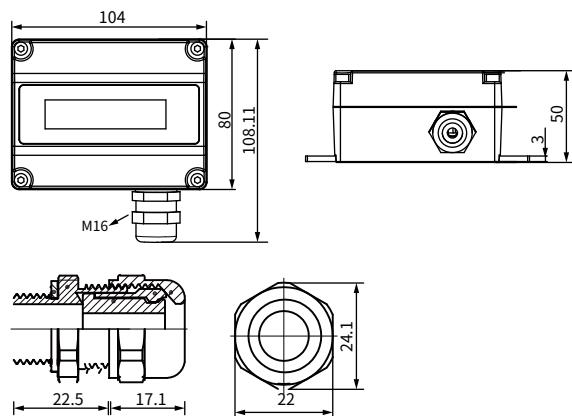
# | Diagram | Analog+RS-485 & Impulse

OUT1 : Analog
OUT2 : Impulse

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OUT2 : Impulse
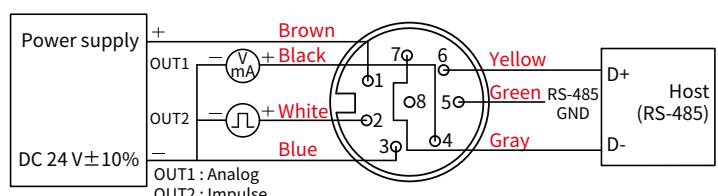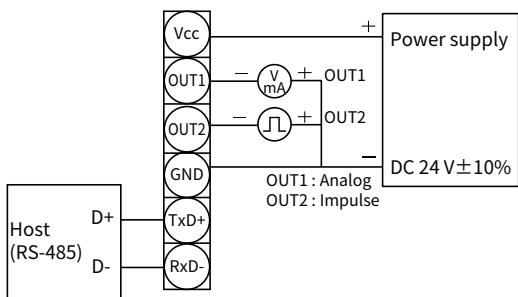
*Please make sure the product and the device which connect with RS-485 are on common ground, avoid damaged product.

| Hot-wire measurement principle |

The thermal measuring principle abstraction of heat from a heated body by an enveloping gas flow (Hot-film Anemometer)

T between R_h and R_t = constant

The loss of heat depends on the number of molecules that collide with Rh

m : Mass flow

I_h : Heating current

R_h : Platinum thin-film resistor – electrically heated

R_t : Platinum thin-film resistor – gas temperature
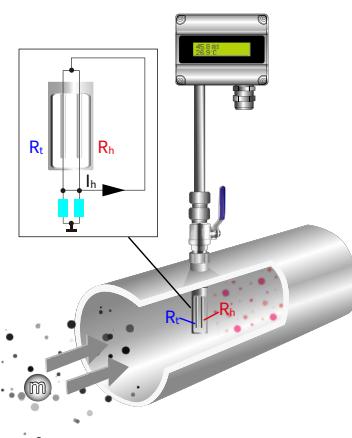
| Ordering Guide |

Installation	Measuring range	Output	Remote probe cable	Display	Option
FTM **94** —	**02**	**11** —	**X**	**D**	**N**

Installation	Measuring range	Output	Remote probe cable	Display	Option
94 : Duct type	02 : 20 Nm/s			D : LCD display	M : M12 connector with 2 m cable
95 : Remote type	04 : 40 Nm/s			N : No	N : M16 metal cable gland
	06 : 60 Nm/s		2 : 2 m cable		W : Other request / Cumulative flow
	09 : 90 Nm/s	11 : 4 ... 20 mA+impulse+RS-485	5 : 5 m cable		
	12 : 120 Nm/s	21 : 0 ... 10 V+impulse+RS-485	X : No		

*Recommended best-selling

Product ordering number	Product Specifications
FTM94-0411-XNM	Duct type, 40Nm/s, 4 ... 20mA + impulse + RS-485, M12
FTM95-1211-5DM	Remote type + display, 120Nm/s, 4 ... 20mA + impulse + RS-485, 5 m cable, M12

| 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 m^3/h ... 1000 m^3/h