



FTM94/95

Industrial High Accuracy Thermal Mass Flow Transmitter



www.rst-elektronik.com

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



| Features |

- IP67 Rugged aluminum alloy case, fit in variety harsh environments
- 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 : 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)

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

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.

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

| Applications |

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| 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
	Nm ³ /h(Flow)(Option) or m ³ (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, non-linearity and repeatability)	0 ... 40 m/s : ±(1% of mv+0.5 m/s)
	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

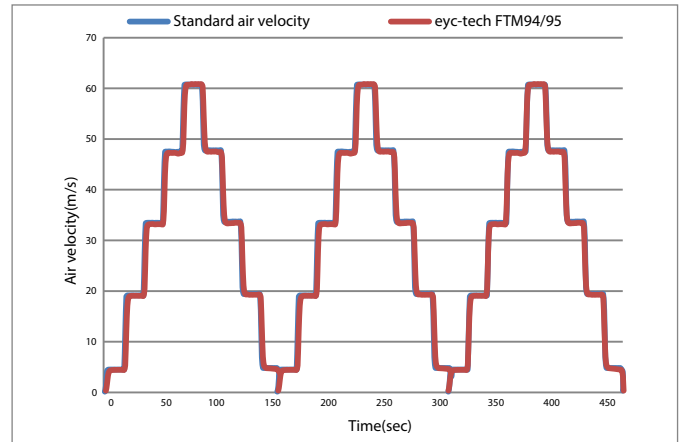
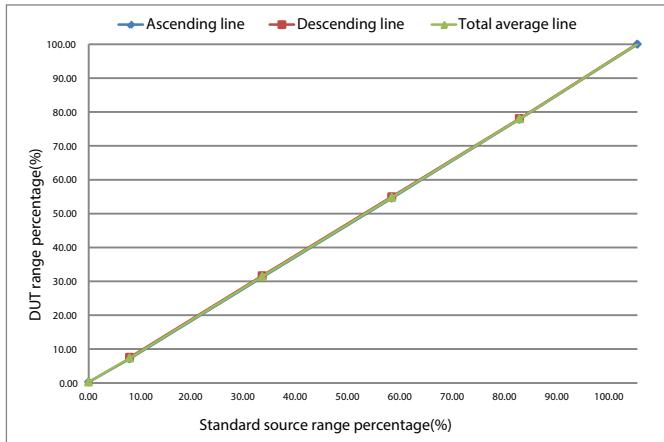
Certification

Certification	CE
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Material

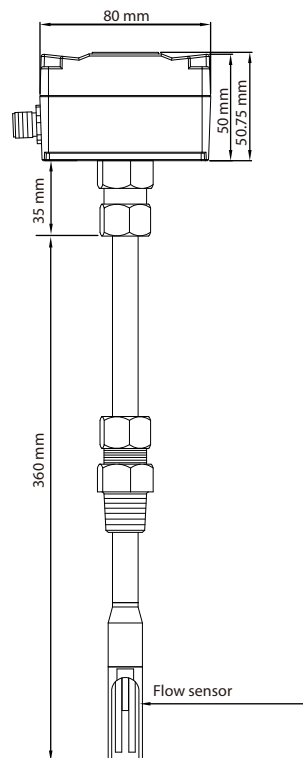
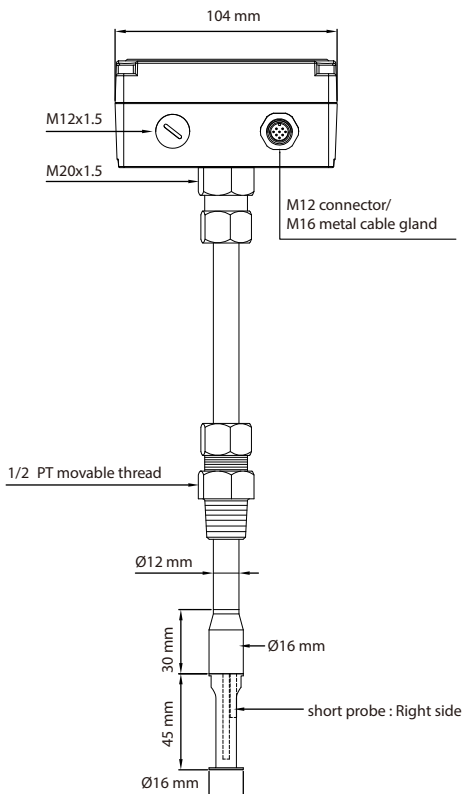
Housing	Aluminum alloy
Probe	SUS316
Remote probe cable	TEFLON (Remote FTM95)
Weight	FTM94 : 720 g
	FTM95 : 832 g

| 3-Cycle curve |

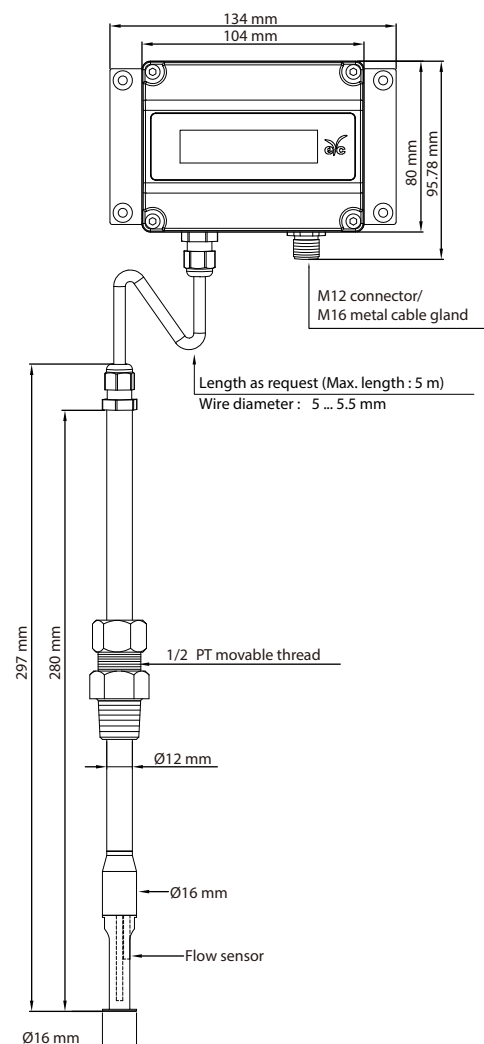


| Dimension | Unit : mm

FTM94 (Duct)

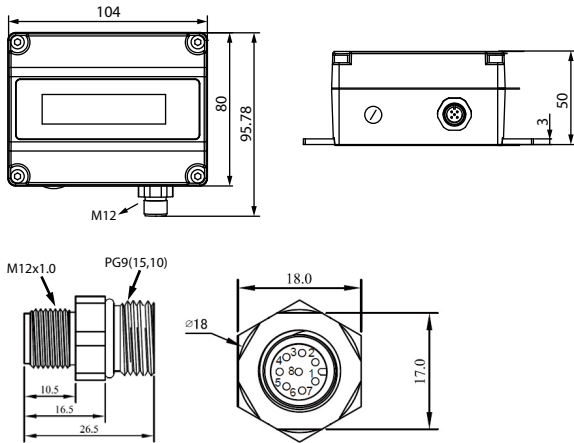


FTM95 (Remote)

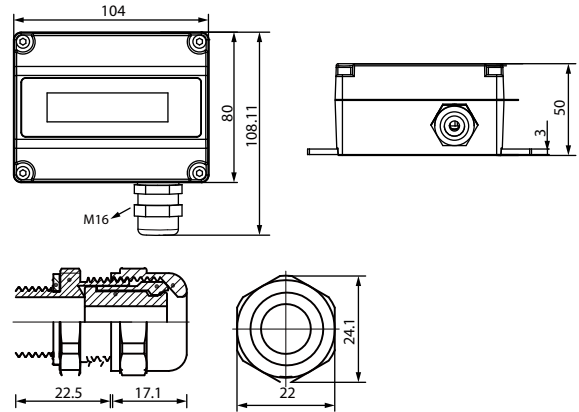


| Electrical Connector | Unit : mm

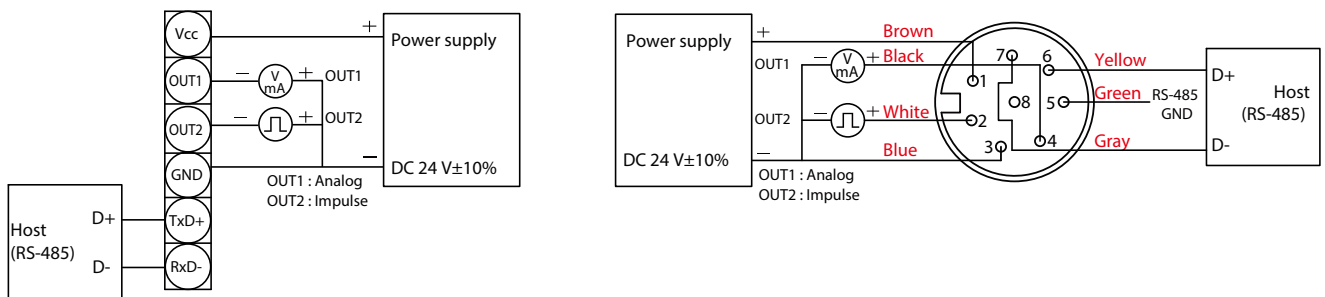
M type :
M12 connector (RS-485+analog)



N type :
M16 metal cable gland (RS-485+analog)



| Diagram | Analog+RS-485 & Impulse



*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

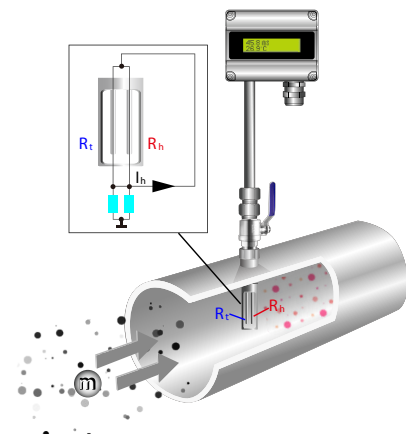
The loss of heat depends on the number of molecules that collide with R_h

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

*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 : ≤ 120 m/s
	Air volume : 0.5 m ³ /h ... 1000 m ³ /h