Industrial Grade High Accuracy Thermo Mass Flow Transmitter

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

FTM94/95

| Features |

- IP67 Rugged aluminum alloy case, fit in variety harsh environment
- Easy to install, imported sensing element, high accuracy, long-term stability
- Switch multifunction physical quantities: m/s, ft/s, Nm³/h, Nm/s, L/min (Air velocity & volume)
- LCD Display of air velocity and Temp.

| 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 be eliminated by circuit
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 double PT probe and full metal housing design, high accuracy, suitable for a variety of pipe diameters, widely used in industrial fields.

Application:
Industrial process gas supply / Flow monitoring for consumption and drying / Compressed air consumption measurement / Building / Plant / Clean room / Hospital / Semiconductor / Electronics industry / Paper / Printing / Textile / Steel industry / Food / Chemical / Pharmaceutical / Biotechnology industry

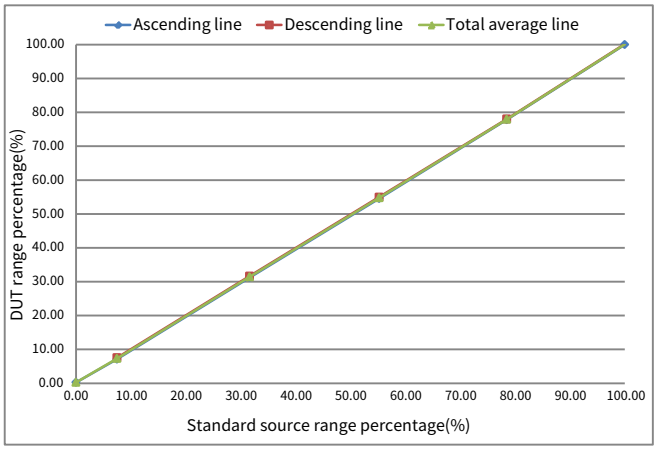
Measuring Specialist

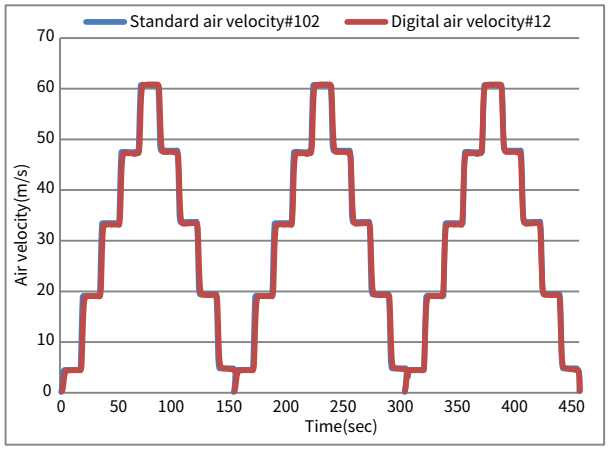
| Specification |

Item		Function & Parameter
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)
	Minimum initial value	0.15 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 (0 ... 100 HZ)	(1)0 ... 100 Hz：4 ... 20 mA (2)0 ... 100 Hz：0 ... 10 V
	Signal connection	3-wire
	Linear accuracy	±1.5%
	Accuracy test	Test environment：at 25°C
	Warm-up time	＜60 sec
	Reaction time	t90＜5 sec
	Temp. effect	0.05% / °C
	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：≧10 KΩ
Environmental	Measuring medium	Air
	Operating Temp. & Humid.	With display：-20 ... +60°C / 0 ... 95%RH(Non-condensing) Without display：-20 ... +60°C / 0 ... 95%RH(Non-condensing)
	Probe operating Temp.	0 ... 120°C(Air velocity has an error of 2 ... 3 m/s due to the increase of the working environment Temp.)Option:150°C
	Storage Temp. & Humid.	-20 ... +60°C / 0 ... 95%RH(Non-condensing)
Electrical	Probe pressure	10 bar
	Power supply	DC 24 V±10%
	Current consumption	＜0.3 A
	Overvoltage protection	DC：＜40 V
Installation	Electrical connections	M12 metal connector / terminal IP67
	Fixed seat	3/4”PT outside thread metal connector
Protection	Installation	Duct type / remote type
	IP rating	IP67(Probe)；IP65(Housing)
Certification	Electrical protection	■ Polarity protection ■ Over-voltage ■ Short-circuit
	Safety certification	CE certification
Material	Housing / probe	Aluminum alloy ； SUS304
Weight	Each / g	FTM94：720 g / FTM95：832 g

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

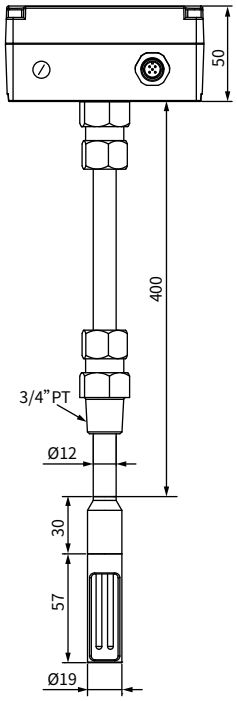
| 3-Cycle curve |



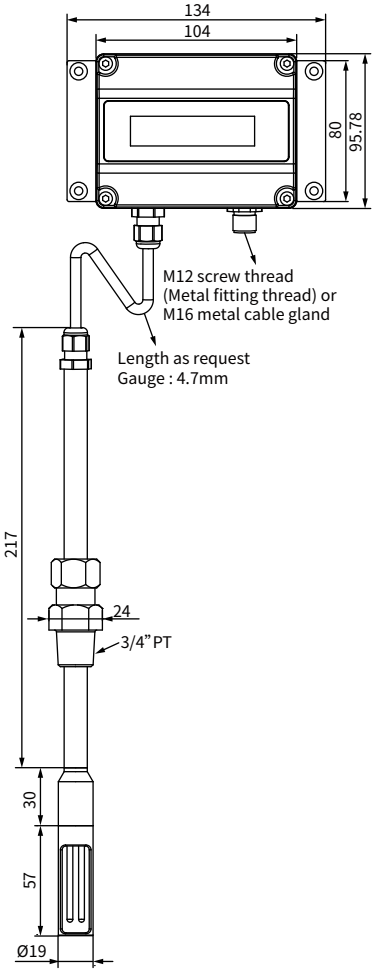


| Dimension | Unit : mm

1.FTM94(Duct)

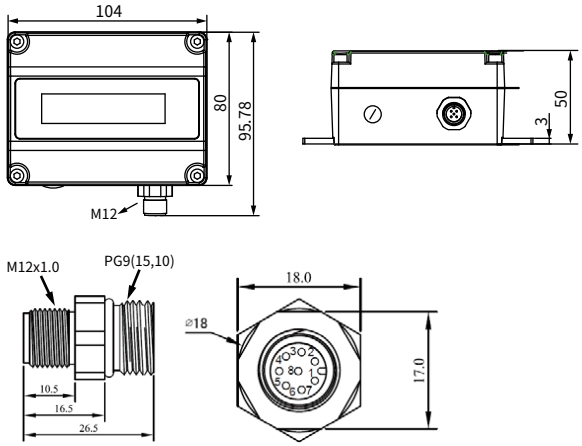


2.FTM95(Remote)

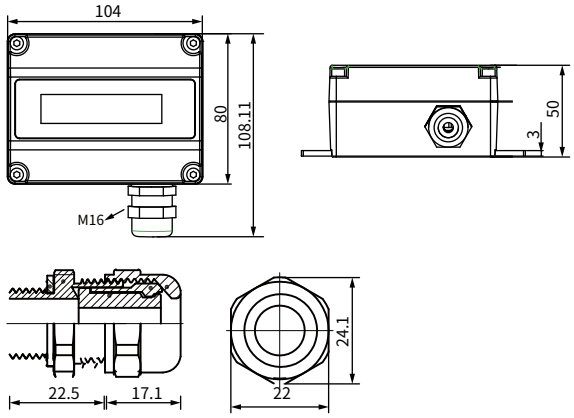


| Electrical Connector | Unit : mm

1.M type：M12-8PIN metal connector (RS-485+analog)



2.N type：M16-8PIN metal connector (RS-485+analog)



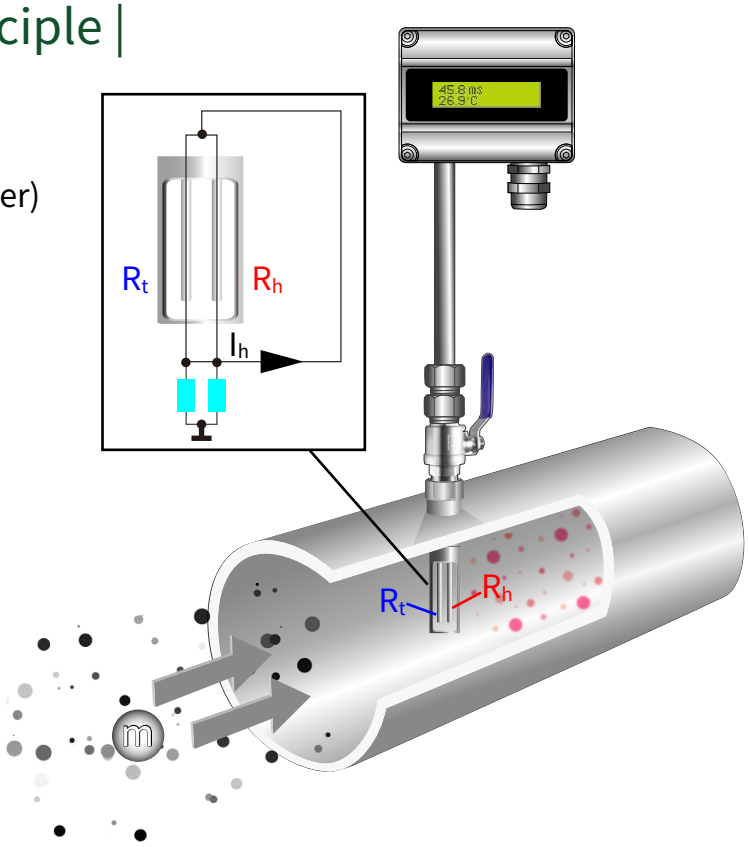
Industrial Grade High Accuracy Thermo Mass Flow Transmitter

| Hot-wire measurement principle |

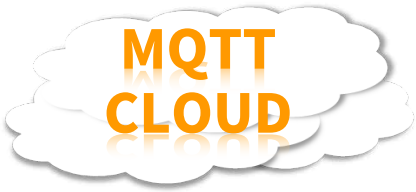
The thermal measuring principle
Abstraction of heat from a heated body by
an enveloping gas flow(Hot-film Anemometer)

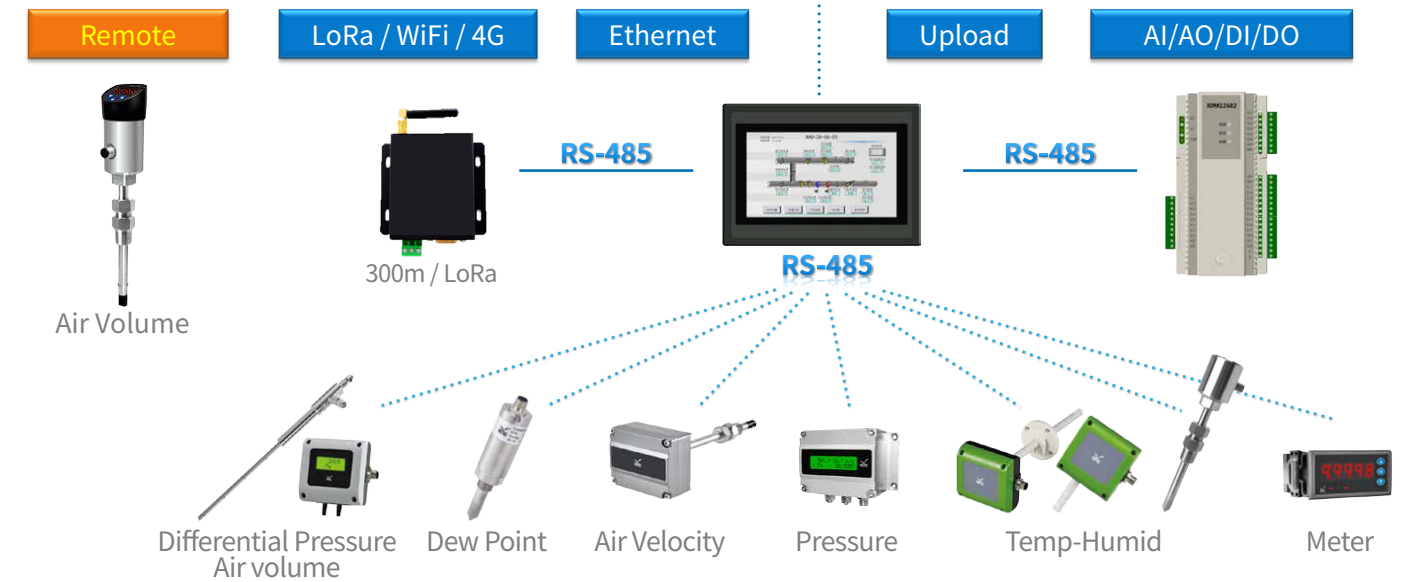
T between R_h and R_t = constant
The loss of heat depends on the number
of molecules that collide with Rh

m : Mass flow
I_h : Heating current
R_h : Platinum thin-film resistor –
electrically heated
R_t : Platinum thin-film resistor –
gas temperature



| Product application |

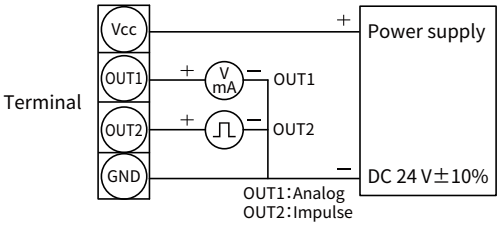


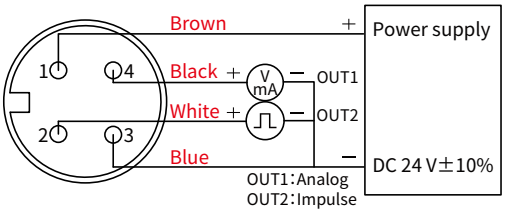


eYc AIOT Solution – System Architecture of the Smart Factory

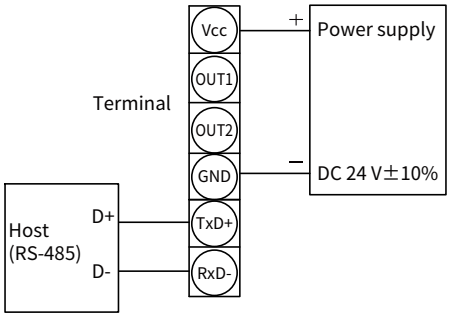
| Connection Diagram |

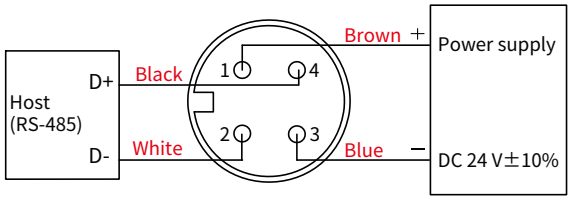
1.Analog & Impulse



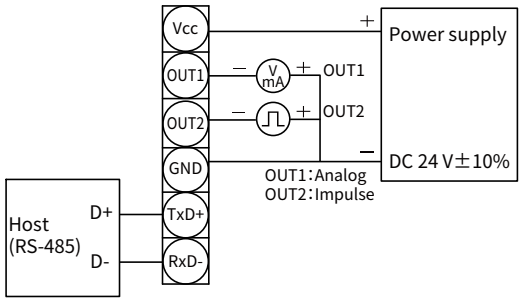


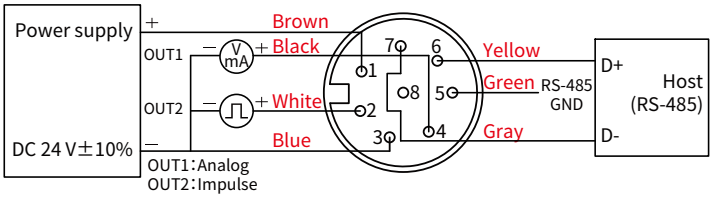
2.RS-485





3.Analog+RS-485 & Impulse





| Ordering Guide |

FTM **94** – **20** **1** **1** – **X** **D** **N**

Installation	Measuring range	Output	Modbus	Cable	Display	Option
94:Duct type	02:20 Nm/s	1:4 ... 20 mA+impulse	0:No	2:2 m cable	D:LCD display	M:M12 metal connector
95:Remote type	04:40 Nm/s	2:0 ... 10 V+impulse	1:RS-485	5:5 m cable	N:No	(with 2 m electrical cable)
	06:60 Nm/s	3:No		W:Other lengths		N:Metal cable gland
	09:90 Nm/s			X:No		W:Other request
	12:120 Nm/s					

| Additional Option (ILAC / TAF) Test Report |

Additional option:(ILAC / TAF)Test report - Standard calibration laboratory(TAF accreditation:3032, complying with ISO / IEC 17025)
TAF has mutual recognition arrangement with ILAC MRA

Project	Measurand level or range
Anemometer	0.2 ... 60 m/s(8 basic points on average or specified by customer)