



# FTM94/95

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, imported sensing element, high accuracy, long-term stability
- Switch multifunction physical quantities: m/s, ft/s, Nm<sup>3</sup>/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.



### Applications:

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

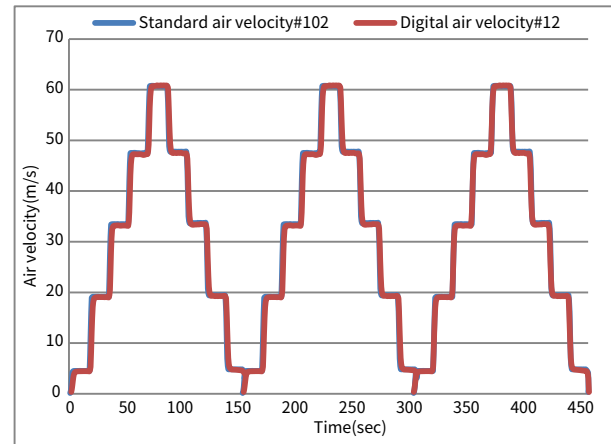
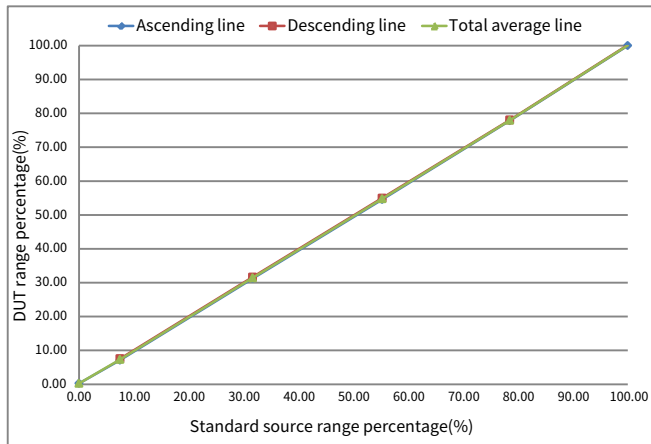


### | Specification |

| Item          |                                 | Function & Parameter                                                                                                                                |
|---------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Input         | Type                            | Pt20 / Pt300(Air velocity)·Pt1000(Temp.)                                                                                                            |
|               | Measuring range                 | 0 ... 120 Nm/s, N:Working condition<br>(Definition:20°C at 1013 hPa);Units can be converted Nm/s<br>(Flow rate) or Nm <sup>3</sup> /h(Flow)(Option) |
|               | Minimum initial value           | 0.15 Nm/s                                                                                                                                           |
| Output        | Installation angle effect       | <3% of the measured value<br>(When the installation angle<10°)                                                                                      |
|               | Signal                          | 4 ... 20 mA / 0 ... 10 V / RS-485 / Impulse                                                                                                         |
|               | Preset output                   | Out1:Air velocity;Out2:Impulse                                                                                                                      |
|               | Impulse range<br>(0 ... 100 HZ) | (1)0 ... 100 Hz:4 ... 20 mA<br>(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<br>(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)<br>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<br>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                      | 1/2"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                                                                                                                           |

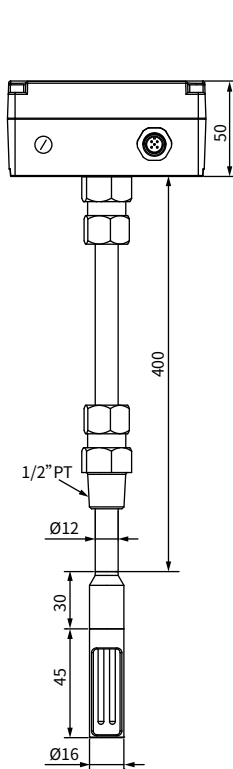
\*Please make sure the product and the device which connect with RS-485 are on common ground, avoid damaged product.

### | 3-Cycle curve |

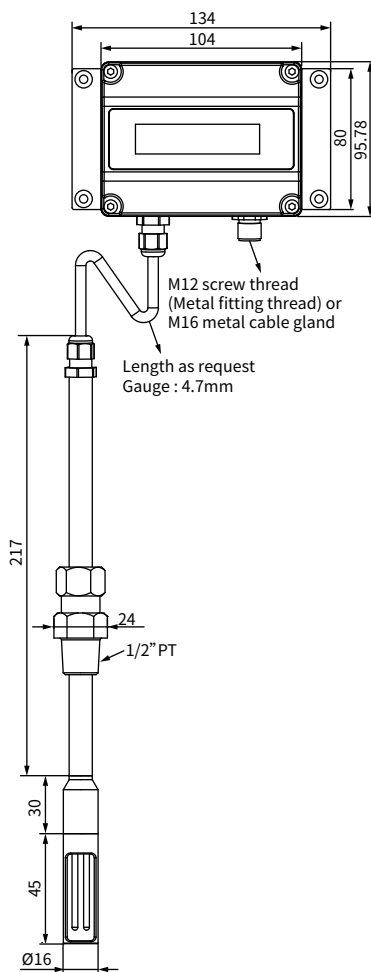


### | Dimension | Unit : mm

#### 1.FTM94(Duct)

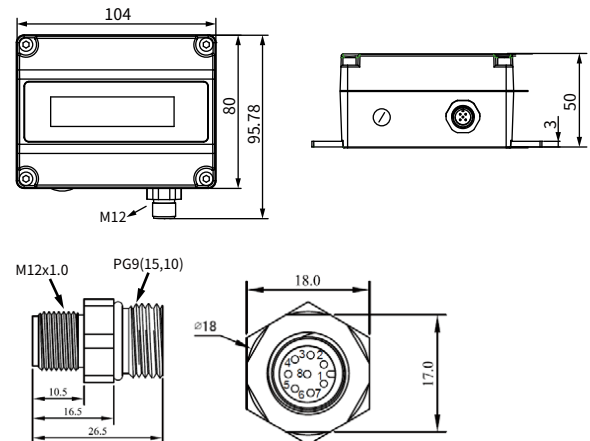


#### 2.FTM95(Remote)

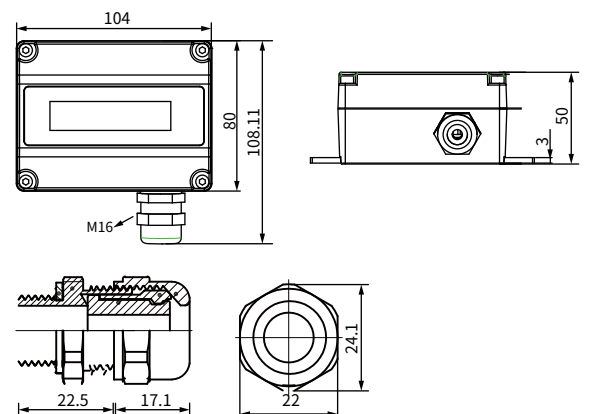


### | Electrical Connector | Unit : mm

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



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



### | 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

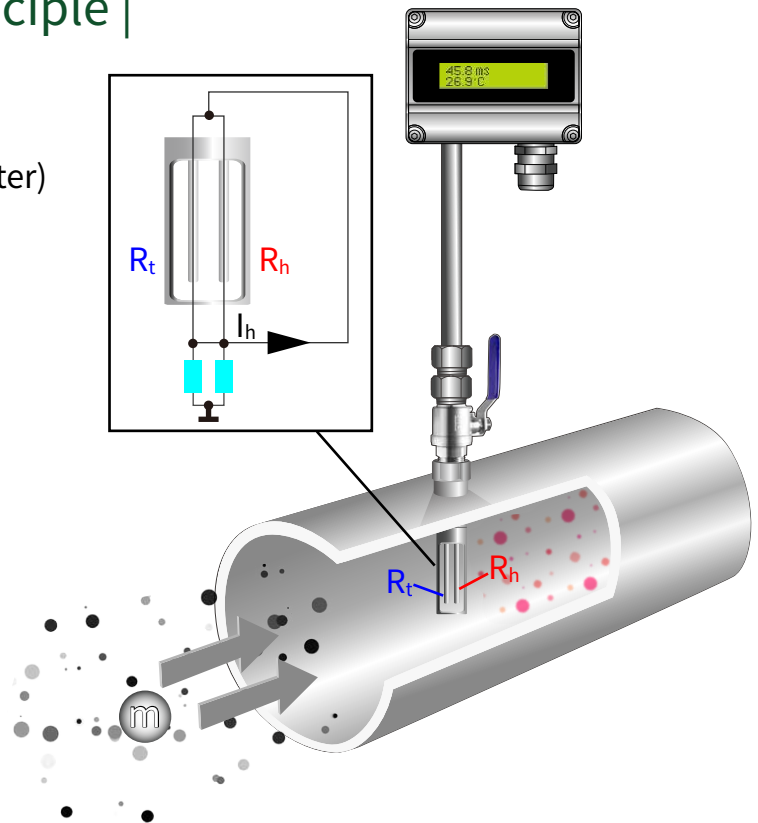
The loss of heat depends on the number of molecules that collide with  $R_h$

$m$ : Mass flow

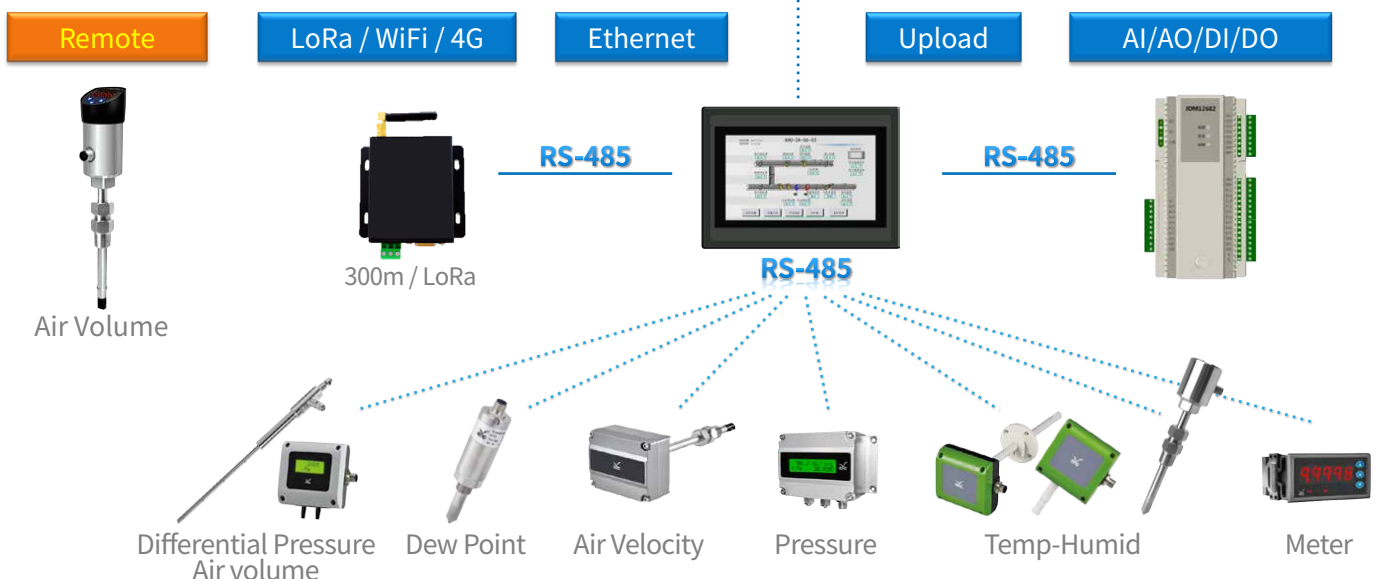
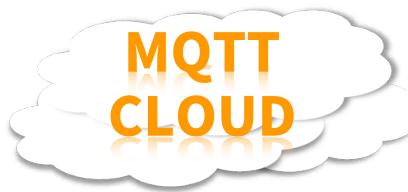
$I_h$ : Heating current

$R_h$ : Platinum thin-film resistor – electrically heated

$R_t$ : Platinum thin-film resistor – gas temperature

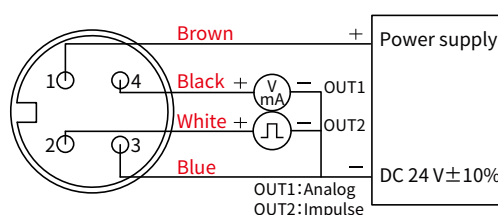
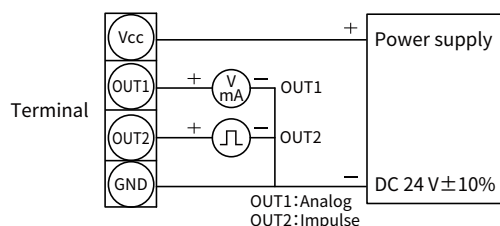


### | Product application |

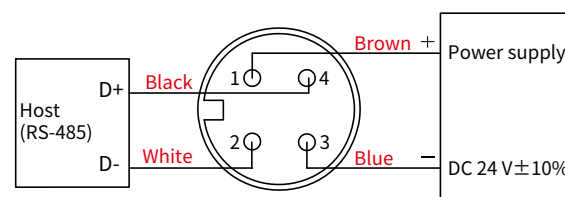
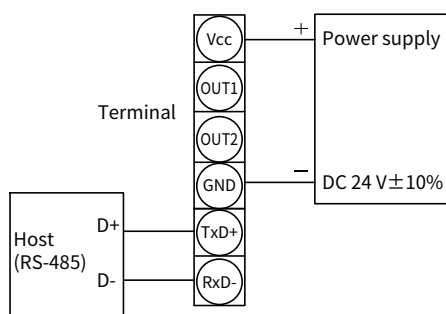


### Connection Diagram

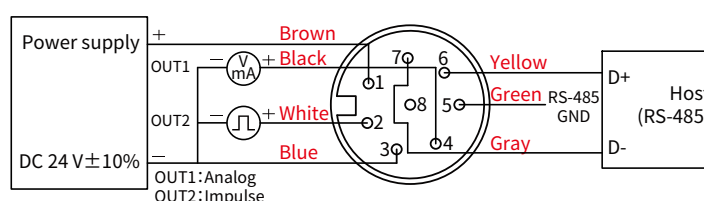
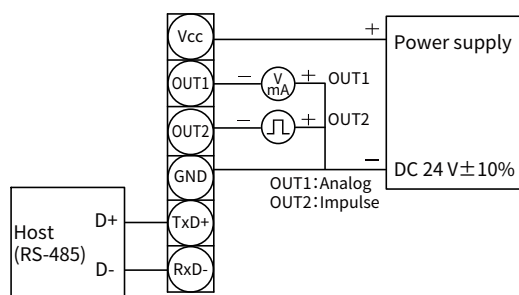
#### 1. Analog & Impulse



#### 2. RS-485



#### 3. Analog+RS-485 & Impulse



### Ordering Guide

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

### 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) |