



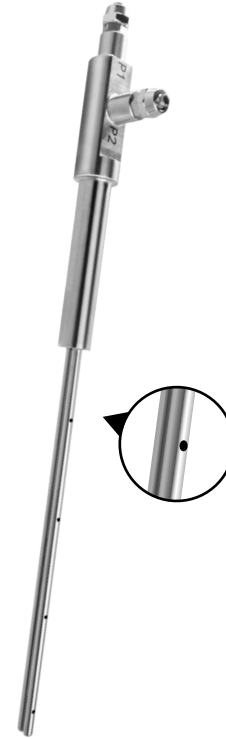
PHD330

Industrial Differential Pressure Transmitter

Differential Pressure-PHD330

www.eyc-tech.com

eyc-tech PHD330
Industrial Differential Pressure Transmitter



Match with
eyc-tech AFMT Average Flow Measuring Tube
(Pitot tube)

| Features |

- Uses piezoresistive differential pressure sensor
- No flow through, pressure ports are not interconnected
- Differential pressure measurement range of $\pm 50 \dots \pm 10,000$ Pa
- Aluminum alloy housing, IP65 protection rating
- Includes square root function for converting measurement into air velocity and airflow, and simultaneous display on the screen
- Provides analog output with RS-485 communication function
- DIP switch to adjust range and square root function

| Introduction |

The eyc-tech PHD330 industrial differential pressure transmitter uses a piezoresistive differential pressure sensor with a wide measurement range and multiple options. Its robust aluminum alloy housing effectively resists external environmental influences, ensuring stable and reliable measurements, making it particularly suitable for use in industrial environments.

| Applications |

Exhaust air treatment / Differential pressure monitoring / Airflow monitoring / Air handling unit flow

Specification

Measurement

Measuring element	Piezoresistive diff. pressure sensor, no flow-through
Measuring range	$\pm 50 \dots \pm 10000 \text{ pa}$

Output

Output	4 ... 20 mA / 0 ... 10 V / RS-485
Signal connection	3-wire
Load resistance	Current output : $\leq 500 \Omega$ Voltage output : $\geq 10 \text{ K}\Omega$
Response time	$t_{63} \leq 2 \text{ ms}$
Display type	LCD Module with back light, double line character
Display range	V=Air velocity (at 25°C) Q=Air quantity (with eyc-tech AFMT)
Digit height	5.56 mm

Accuracy

Accuracy	$\pm 1.0\% \text{ F.S. } \pm 5\% \text{ M.V}$
Temperature influence	$\pm 1.75\%$

Environment

Measuring medium	Air
Operating temperature	-20 ... +80°C(Non-display) 0 ... +50°C(Display)
Operating humidity	0 ... 95%RH(Non-condensing)
Storage temperature	-20 ... +80°C

Electrical

Power supply	DC 24 V $\pm 10\%$ & AC 24 V $\pm 10\%$
Current consumption	DC 24 V : $\leq 45 \text{ mA(Display) } / \leq 40 \text{ mA(Non-display)}$ AC 24 V : $\leq 95 \text{ mA(Display) } / \leq 90 \text{ mA(Non-display)}$
Overvoltage protection	$\leq \text{DC } 40 \text{ V}$
Electrical connection	M12 connector <i>*with 2 m cable</i>

Installation

Installation	Wall type
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Protection

IP rating	IP65
Electrical protection	■ Over-voltage ■ Reverse polarity ■ Short circuit
Pressure resistance	$\pm 50 \dots \pm 500 \text{ pa} : 0.25 \text{ bar}$ $\pm 1000 \dots \pm 10000 \text{ pa} : 0.5 \text{ bar}$
Burst pressure	$\pm 50 \dots \pm 2500 \text{ pa} : 0.75 \text{ bar}$ $\pm 5000 \dots \pm 10000 \text{ pa} : 1.25 \text{ bar}$

Certification

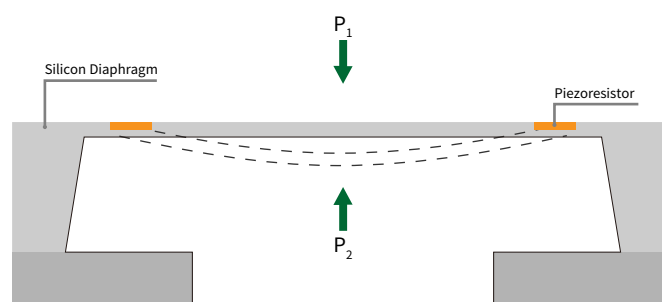
Certification	CE
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Material

Housing	Aluminum alloy
Weight	Display : 497 g ; Non-display : 478 g

Piezoresistive Differential Pressure Principle

The working principle of a piezoresistive differential pressure transmitter is based on the piezoresistive effect, a phenomenon where the electrical resistance of a material changes when subjected to stress. The main structure of the sensing element includes a diaphragm made of silicon material and piezoresistive elements integrated on the diaphragm. When there is a pressure difference on the two sides of the sensing element, the diaphragm deforms due to the pressure difference. This deformation causes the piezoresistive elements to change their shape, resulting in a change in their electrical resistance. The amount of resistance change is proportional to the pressure difference between the two sides, and after signal processing, an electrical signal proportional to the pressure difference is obtained.



| with the eyc-tech Pitot Tube Principle |

eyc-tech PHD330 Industrial Differential Pressure Transmitter is built on the structure of piezoresistive differential pressure flow measurement, with eyc-tech AFMT Average Flow Measuring Tube(Pitot tube), based on the flow continuity formula (the law of conservation of mass) and the Bernoulli formula (the law of conservation of energy), the wind speed calculation formula is deduced to achieve an effective and accurate measurement.

■ Flow rate formula

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

■ Flow formula

$$q_v = K \varepsilon A \sqrt{\frac{2}{\rho} \Delta P}$$

$$q_m = q_v \times \rho$$

V = Velocity of the liquid(m/s)

ΔP = Difference between total pressure and static pressure
(Dynamic pressure)(Pa)

ρ = Flow density(kg/m³)

K = Flow coefficient

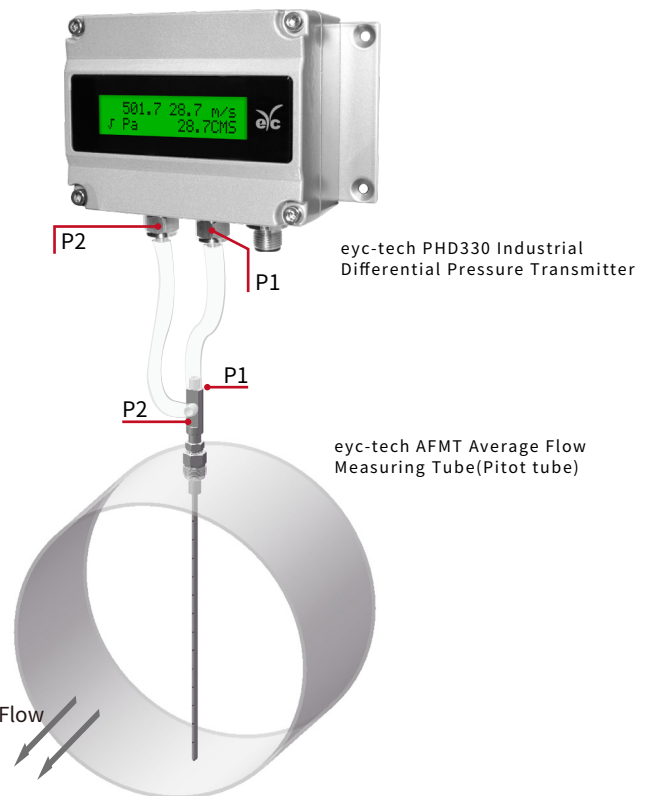
q_v = Volume flow of liquid(m³/s)

q_m = Mass flow of liquid(kg/s)

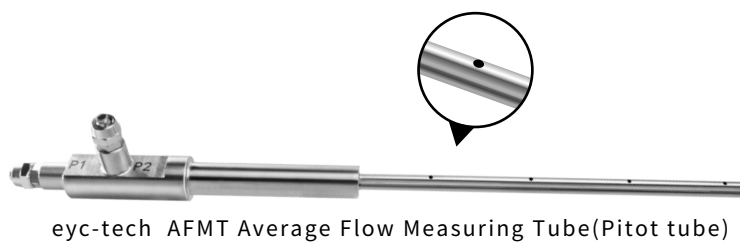
K = Flow coefficient of average flow measuring

ε = Inflation coefficient of liquid going thru measuring tube during operation

A = Cross-sectional area of duct during operation(m²)



Note : The opening direction of holes on probe should be parallel to flow direction

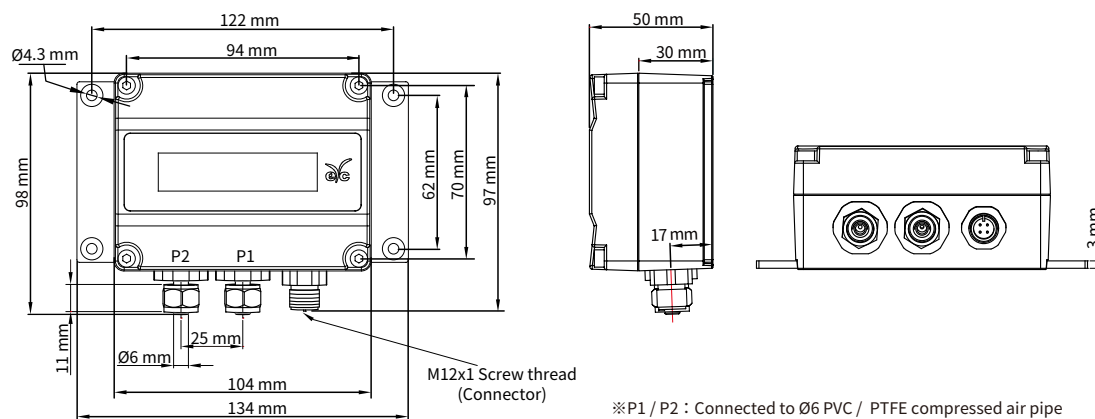


eyc-tech AFMT Average Flow Measuring Tube(Pitot tube)

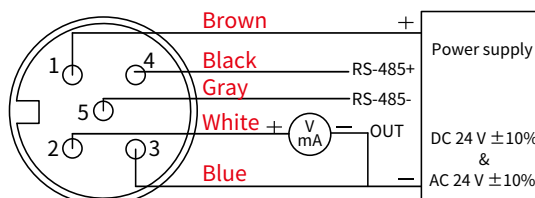
| Pressure Unit Conversion Table |

Unit	Pa	mbar	hPa	kPa	mmWS	inH ₂ O	mmHg
Range	±50 / 100	0.5 / 1	0.5 / 1	0.05 / 0.1	5 / 10	0.2 / 0.4	0.375 / 0.75
	±300 / 500	3 / 5	3 / 5	0.3 / 0.5	30 / 50	1.2 / 2	2.25 / 3.75
	±1000 / 1600 / 2500	10 / 16 / 25	10 / 16 / 25	1 / 1.6 / 2.5	100 / 160 / 250	4 / 6.4 / 10	7.5 / 12 / 18.75
	±5000 / 7500 / 10000	50 / 75 / 100	50 / 75 / 100	5 / 7.5 / 10	500 / 750 / 1000	20 / 30 / 40	37.5 / 56.25 / 75

| Dimension |



| Connection Diagram |



5P M12 Connector+RS-485

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

| Ordering Guide |

PHD	Installation	Range	Output	Electrical connection	Optional
	330	20	1	M	D1
	330 : Wall	10 : $\pm 50 / 100$ pa 20 : $\pm 300 / 500$ pa 30 : $\pm 1000 / 1600 / 2500$ pa 40 : $\pm 5000 / 7500 / 10000$ pa	1 : 4 ... 20 mA 6 : 0 ... 10 V	M : M12x1 connector *with 2m cable	D1 : Display (LCD) 1 : Non-display

| Additional Option Test Report |

For more detailed information please contact us.

ISO 9001

Project	Measurand level or range
Pressure	Differential pressure : 0 ... 500 Pa / 0 ... 1000 Pa / 0 ... 10000 Pa