



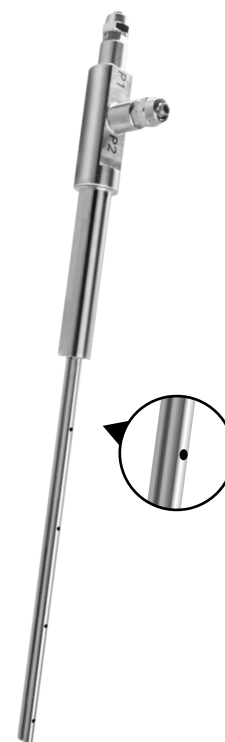
PHM33

Industrial Differential Pressure Transmitter

Differential Pressure-PHM33

www.eyc-tech.com

eYc PHM33  
Industrial Grade Differential Pressure Transmitter



Match with  
eYc AFMT Average Flow Measuring Tube  
(Pitot tube)

## | Features |

- Option RS-485 communication interface, Modbus RTU protocol
- Physical switch : mbar / Pa / hPa / kPa / mmH<sub>2</sub>O / mmWS / inH<sub>2</sub>O / mmHg
- Square root function

## | Introduction |

The eYc PHM33 differential pressure transmitter is designed on the MEMS hot wire anemometer architecture, which has very good zero point stability and small differential pressure detection capability, high pressure resistance. The transmitter uses the pressure difference to pass a very small amount of gas through the air flow channel of the sensor body. Combined with the integrated circuit to convert into a differential pressure signal.

## | Applications |

Exhaust emission / Environmental engineering / Air duct / Filter /  
Monitor differential pressure and environment air flow

## | Specification |

### Input

Input type	Thermal differential pressure module
Measuring range	0 ... 250 pa

### Output

Output	0 ... 20 mA / 4 ... 20 mA / 0 ... 1 V
	0 ... 5 V / 1 ... 5 V / 2 ... 10 V / 0 ... 10 V
Signal connection	3-wire
ModBus	RS-485
Load resistance(Current output)	4 ... 20 mA < 500 Ω / 0 ... 10 V ≥ 10 KΩ
Response time(t 63)	≤ 2 ms
Display type	LCD Module with back light, double line character
Display range(As unit is Pa)	V=Air velocity(at 25°C) Q=Air quantity(with eYc AFMT)
Height of character	5.56 mm

### Environment

Medium	Air
Environment temperature	-20 ... +80°C(Non-display) 0 ... +50°C(Display)
Environment humidity	97%RH(Non-condensing)
Storage temperature	-40 ... +80°C

### Accuracy(at 25°C)

Accuracy	±0.5% of F.S.
Temperature influence	±1.75%(-20°C ... 80°C)
Temperature compensation	0 ... +70°C

### Electrical

Power supply	DC 8 ... 35 V / AC 12 ... 30 V
Current consumption	DC 8 V : ≤ 120 mA(Display) ≤ 100 mA(Non-display)
	DC 24 V : ≤ 45 mA(Display) ≤ 40 mA(Non-display)
	AC 12 V : ≤ 140 mA(Display) ≤ 120 mA(Non-display)
	AC 24 V : ≤ 90 mA(Display) ≤ 80 mA(Non-display)
Overvoltage protection	≤ DC 40 V
Electrical connection	M12 connector

### Installation

Installation	Wall
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### Protection

IP rating	IP65(Cable) ; IP67(M12)
Electrical protection	■ Polarity protection ■ Over-voltage ■ Short circuit
Pressure resistance	2 bar
Burst pressure	5 bar

### Certification

Certification	CE
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### Material

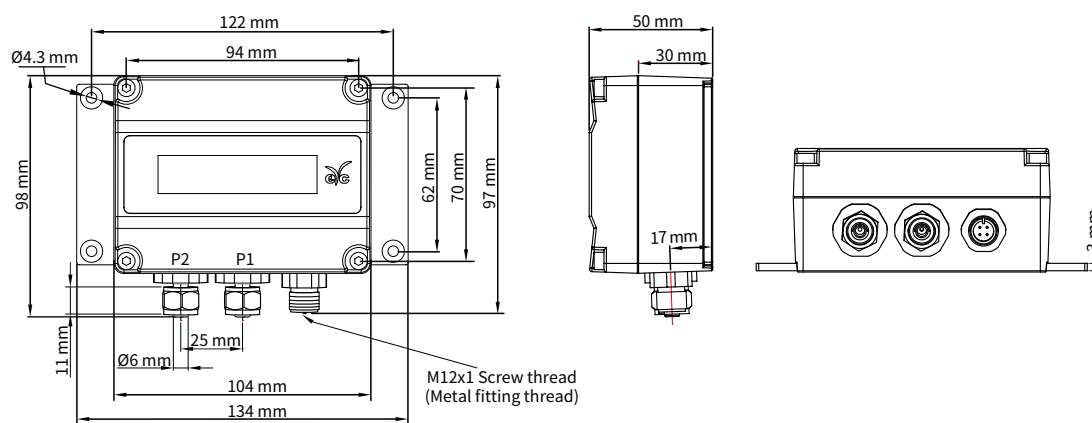
Housing	Aluminum alloy
Weight	Display : 497 g ; Non-display : 478 g

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

## | Pressure Unit Conversion Table |

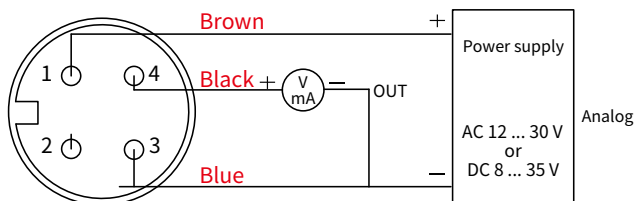
Unit	Pa	mbar	hPa	kPa	mmWS	inH <sub>2</sub> O	mmHg
Range	50 / 100 / 250	0.5 / 1 / 2.5	0.5 / 1 / 2.5	0.05 / 0.1 / 0.25	5 / 10 / 25	0.2 / 0.4 / 1	0.375 / 0.75 / 1.875

## | Dimension |

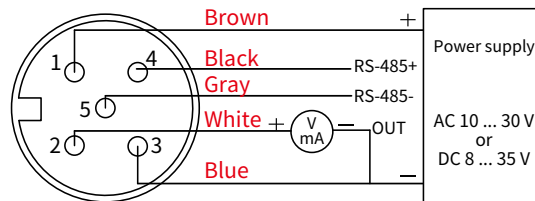


\*P1 / P2 : Connected to Ø6 PVC / PTFE compressed air pipe

## | Connection Diagram |



4P M12 Connector + Analog



5P M12 Connector+RS-485

## | Theory |

eYc PHM33 Industrial Grade Differential Pressure Transmitter is built on the structure of thermal mass flow measurement, with eYc 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

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

$$q_m = q_v \times \rho$$

V = Velocity of the liquid(m/s)

$\Delta P$  = Difference between total pressure and static pressure  
(Dynamic pressure)(Pa)

$\rho$  = Flow density(kg/m<sup>3</sup>)

K = Flow coefficient

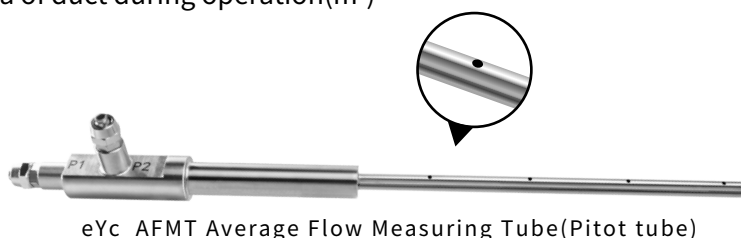
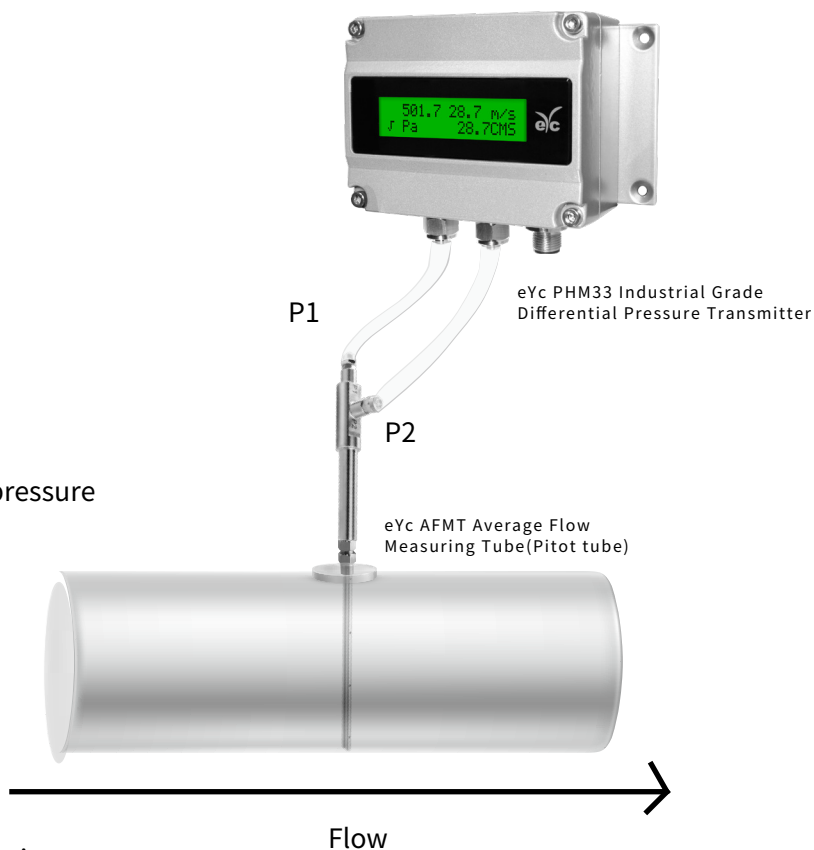
$q_v$  = Volume flow of liquid(m<sup>3</sup>/s)

$q_m$  = Mass flow of liquid(kg/s)

K = Flow coefficient of average flow measuring

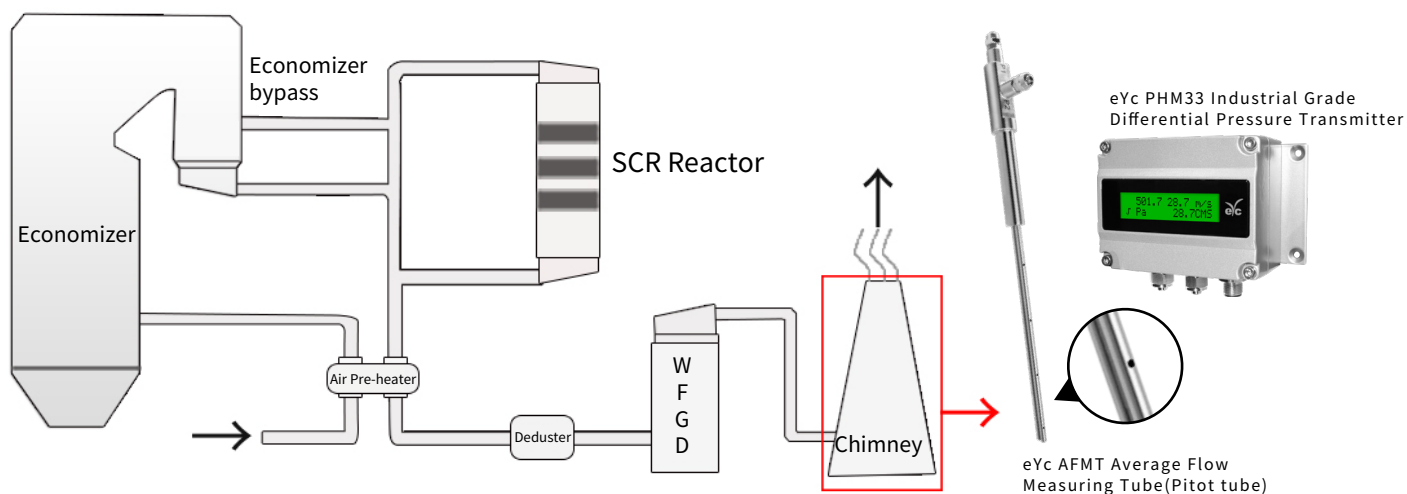
$\epsilon$  = Inflation coefficient of liquid going thru measuring tube during operation

A = Cross-sectional area of duct during operation(m<sup>2</sup>)



## | Installation |

Varnished wire waste gas treatment product installation drawing



## | Ordering Guide |

PHM **33** — **10** — **1** — **M** — **D**

Installation: 33 : Wall

Range: 10 : 50 / 100 / 250 pa

Output: 1 : 4 ... 20 mA  
2 : 0 ... 20 mA  
4 : 2 ... 10 V  
5 : 1 ... 5 V  
6 : 0 ... 10 V  
7 : 0 ... 5 V  
8 : 0 ... 1 V

Electrical connection: M : M12x1 metal connector(with 2m cable)

Optional: D : Display  
1 : RS-485

## | 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