

PRESSURE TRANSMITTER

To convert the pressure measurement into an output signal

OPERATING PRINCIPLE

A differential pressure sensor is a device that accurately measures a differential pressure ($\Delta P = \text{upstream pressure} - \text{downstream pressure}$) and converts it into a 4-20 mA output signal. The flow is calculated with the following formula:

$$q_m = k \sqrt{2 \Delta P \rho}$$

q_m mass flow in kg/s
 k constant
 ΔP differential pressure in bar
 ρ density of the fluid in kg/m³



Differential pressure transmitter

The density ρ of an incompressible fluid is constant at a given temperature (liquids can be considered as incompressible). The density ρ of a compressible fluid (gas) varies according to its pressure and its temperature. Thus, the choice of transmitter will be as follows:

| LIQUID | GAS | |
|-----------------------------------|-----------------------------------|--|
| CONSTANT TEMPERATURE | CONSTANT TEMPERATURE AND PRESSURE | VARIABLE TEMPERATURE AND PRESSURE |
| DIFFERENTIAL PRESSURE TRANSMITTER | | MULTIVARIABLE TRANSMITTER allows to correct* the pressure and temperature variations of the gas when coupled to a temperature sensor |

*This correction can also be obtained with a differential pressure transmitter, a temperature sensor, a pressure transmitter and a calculator

The pressure transmitter can be placed in a closed insulating or temperature controlled housing. In a critical environment (temperature, humidity, etc.), the housing protects instrumentation accessories.



Instrumentation case with differential pressure transmitters and calculator

The housing is also available in a simple sun protection version to protect the accessories from direct sunlight.



Sun protection for transmitter

Special case of assembly with 2 transmitters: rangeability⁽¹⁾ increased from 1/6 to 1/36. Thus, the measurement uncertainty remains low over a range from 2 % to 100 % of the max flow rate.

⁽¹⁾ For more details, see «Technical information» section on page 80.