

PITOT TUBE

KEY DATA

- Calculations of the Pitot tube according to ASME MFC-12M
- Measurement averaged over the entire length of the tube for better accuracy
- Recommended for gas, liquid or steam fluids
- Inside pipe diameter from 100 mm to 5 000 mm
- Reynolds number $> 1,2 \cdot 10^4$
- Repeatability of measurement : 0,1%



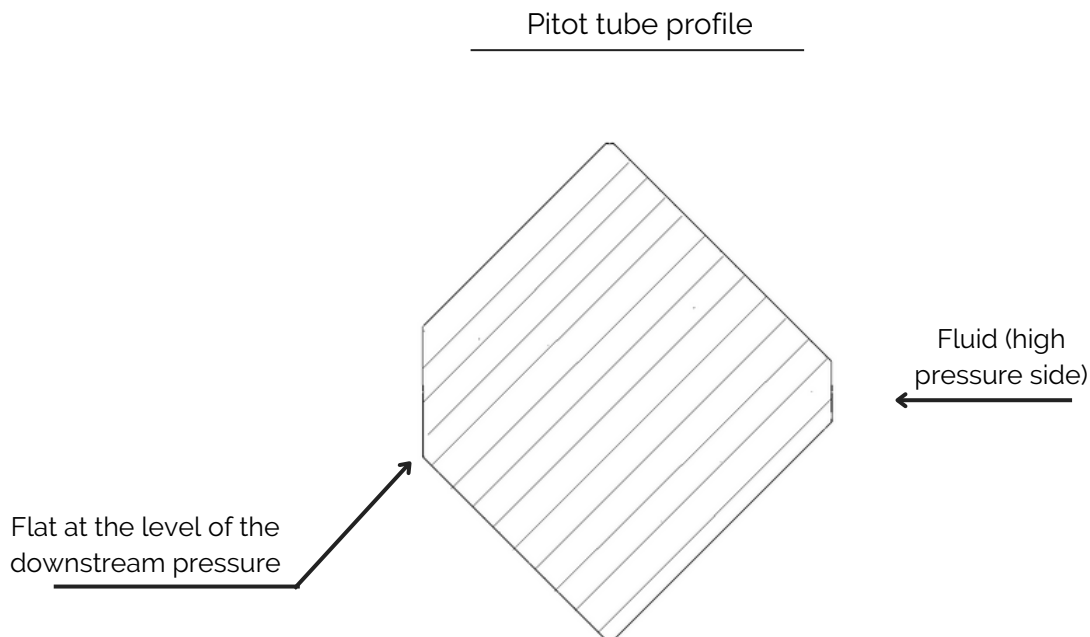
Averaged Pitot tube

➤ BENEFITS ◀

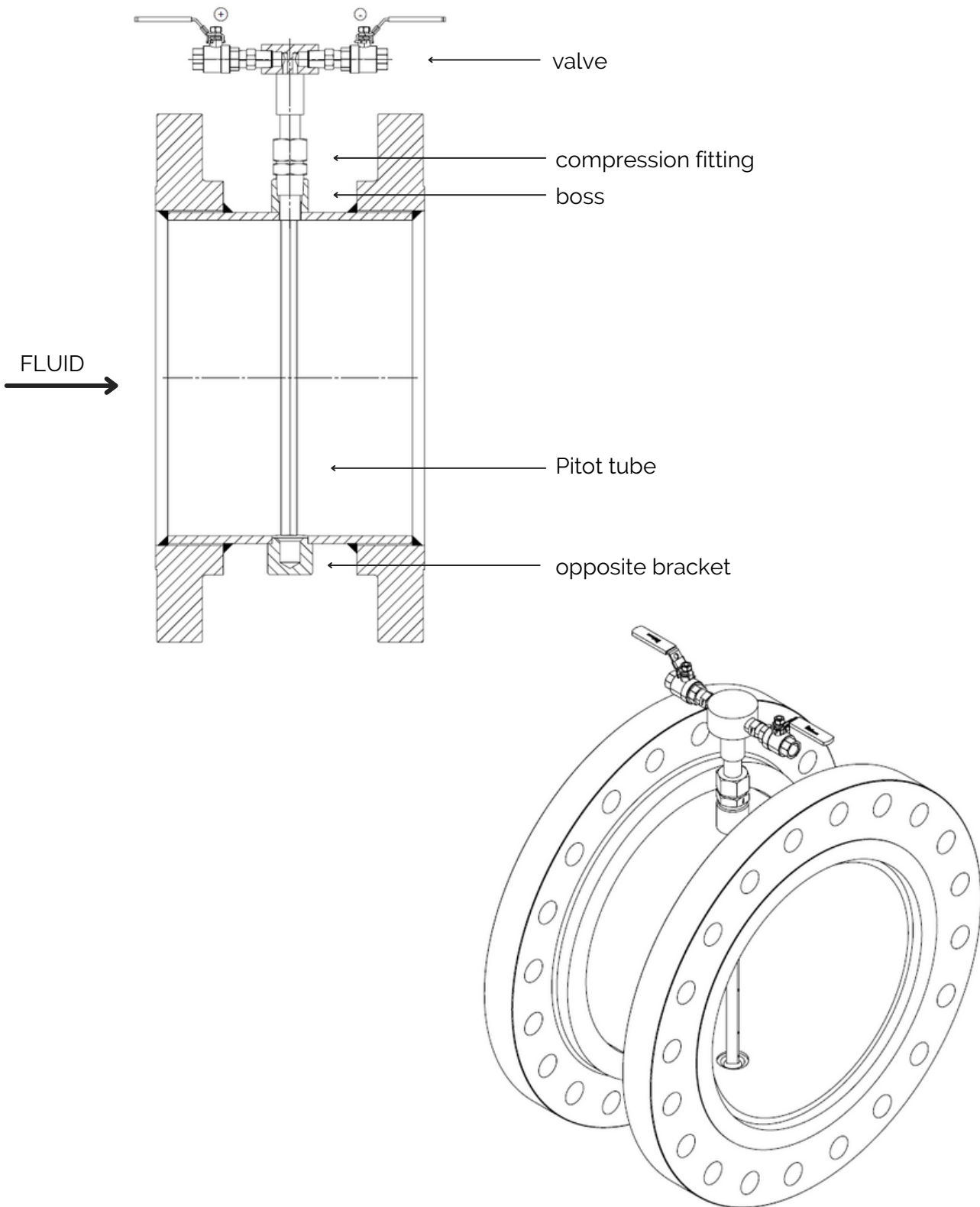
- Cost-effective measurement system : low installation cost and maintenance-free
- Standardized principle : reliability and accuracy of measurement, no need of calibration
 - Optimized sensor profile to create a stable flow
- Suitable and competitive system for large pipes up to 5 m
 - Low pressure drop when passing through the element
- Bi-directional measurement possible (only change the +/- pressure taps)

OPERATING PRINCIPLE

- The Pitot tube is an average flow measurement element; it is intended for use in pipes, ducts or chimneys. The differential pressure created through the measuring element is directly linked to the flow rate value : the Pitot tube thus constitutes a simple, removable device for the installation or reconditioning of pipes of all sizes.
- it is mounted perpendicular to the pipe with several pressure tapings on the upstream face. The fluid produces an impact pressure when hitting the tube. The Pitot tube takes an average of the different pressure taps, which allows to take into account the irregularities of the flow and to be less sensitive to the deformation of the speed profile.
- A single pressure tap is present on the downstream face. Thanks to the profile of the measuring tube at the level of this downstream pressure tap, it is possible to obtain a separation of the vortices and thus to create a stable pressure zone.
- The profile of the pitot tube has flats which allow the vortices to move away from the low pressure tap when the fluid flows. A stable pressure zone is created and allows precise flow measurement as well as wide rangeability (1:10).



PLAN



- The dimensions of the tube (section, width, etc.) are adapted according to its height to always ensure very good mechanical stability.
- A pipe end support (opposite bracket) as shown above will be provided on large pipes.



The average Pitot tube is generally used for large pipes with a low pressure fluid (low non-recoverable pressure drop). It is also suitable for bi-directional flow measurement.

STANDARDS

- ASME MFC-12M

TECHNICAL CHARACTERISTICS

- Fluid temperature ⁽¹⁾ : cryogenic to +1300°C
- Fluid type : gas, steam, monophasic liquid
- Materials : stainless steel 316L, others available on request
- Accuracy : from 1 % of the max flowrate
- Characteristics according to the standard in force :

		ASME MFC-12M
ReD	Reynolds number in the pipe	$ReD > 1,2 \cdot 10^4$
D	Inside pipe diameter ⁽²⁾	$50 \text{ mm} \leq D \leq 5\,000 \text{ mm}$
L1	Upstream straight length	$L1 \geq 7, D$ ⁽³⁾
L2	Downstream straight length	$L2 \geq 3, D$ ⁽³⁾
P	Maximum authorized pressure	$P \leq 600 \text{ bar}$
T	Maximum authorized temperature	$T \leq 1\,300 \text{ °C}$
μ	Maximum authorized viscosity	0,2 Pa.s

(1) No temperature restriction with remote-mounted transmitter, otherwise +125°C max

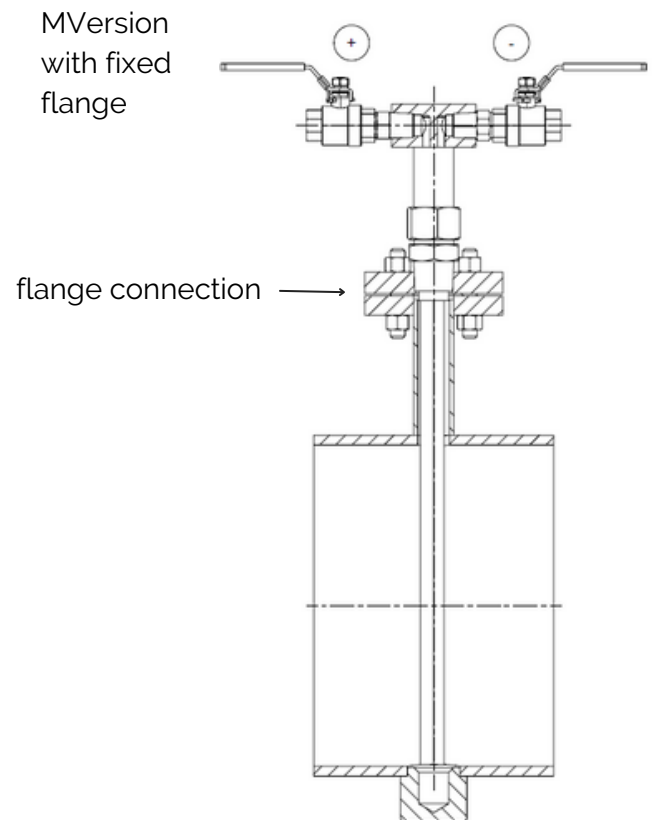
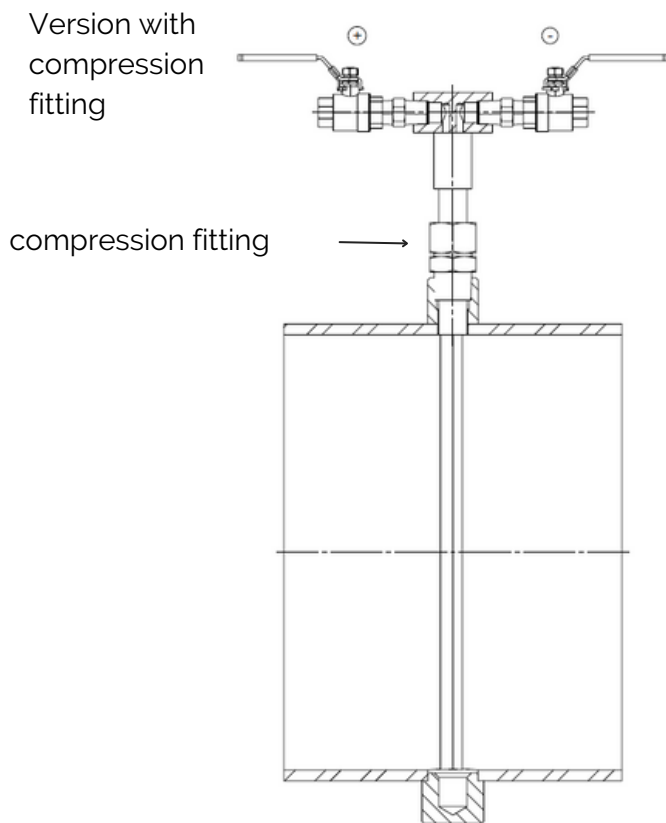
(2) For pipe sizes of 2" and smaller, measurement sections with integrated Pitot tube are available.. For dimensions greater than 5000 mm, consult us.

A tube support will be provided on the pipe opposite the insertion point to ensure the stability of the Pitot tube for large pipes.

(3) For an upstream fitting corresponding to a 90° bend. For more details, see installation instructions on user guide.

CONNECTION OF THE PITOT TUBE TO THE PIPE

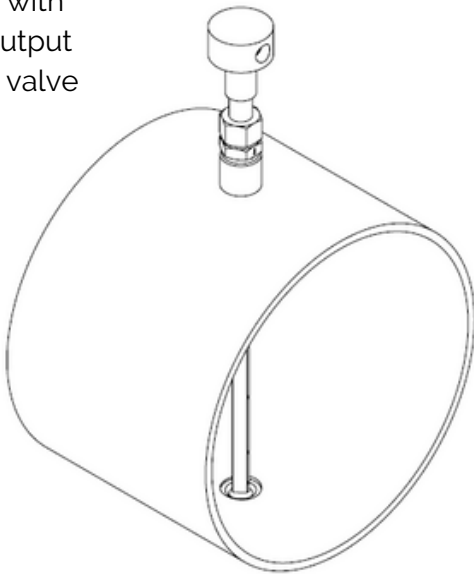
- 2 versions available :
 - with compression fitting screwed on the pipe
 - with a fixed flange



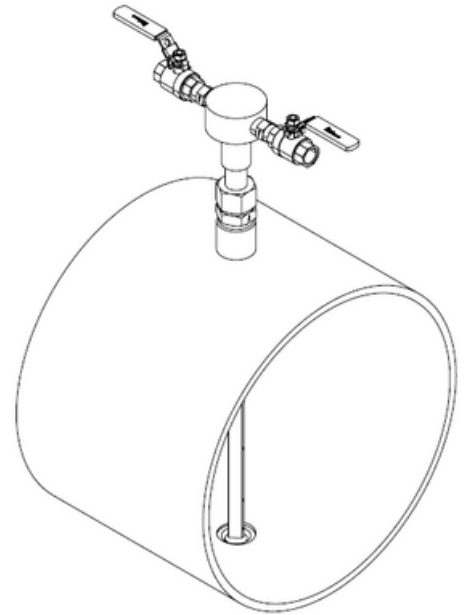
INSTRUMENTATION CONNECTION

- 3 types of connections available :
 - direct output without valve, 1/2" NPTM connection
 - with valve
 - with manifold (3-way or 5-way) for direct mounting of the differential pressure transmitter

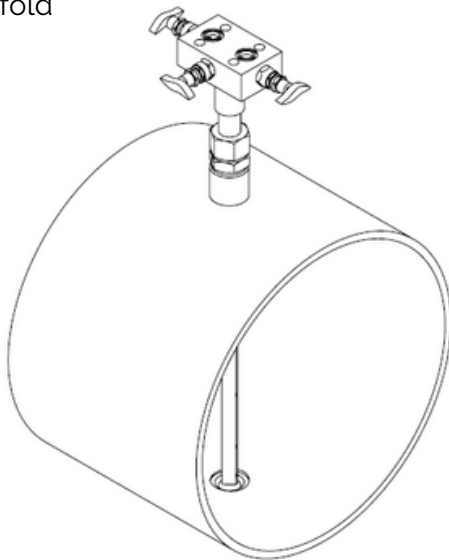
Version with direct output without valve



Version with valves on outputs



Version with manifold



- Possibility to mount the differential pressure transmitter and deliver a complete assembly ready for installation
- Possibility to mount a Pt100 temperature probe with a multivariable differential pressure transmitter to automatically compensate the effects of pressure and/or temperature variations

ACCESSORIES

For flow measurement, we offer a full range of accessories for assembly with pitot tubes.

■ Transmitter



Differential pressure transmitter, multivariable transmitter

■ Manifold



2-way / 3-way / 5-way manifold with or without direct mounting

■ Condensation pot



■ Valves



■ Fittings



■ Flow straightener or conditioner



FURTHER INFORMATION

All information on the mounting of pitot tubes (and their accessories) such as :

- pressure taps orientation
- mounting of the differential pressure transmitter
- required straight lengths

can be found on the IOM notice "User guide - Installation, operation and maintenance manual".

ITEM CODE

- Pitot tube : DPIT-DN-Material-process connection-instrumentation connection

DPIT	ND	Material	Process connection	Instrum. connection
Nominal diameter - ASME	4" to 200"	316L Others	V - compression fitting 1"NPT	V - with valves SV - 1/2" NPTM direct output, without valve MN - with manifold
OR Nominal diameter - ISO	DN50 to 5000		B - flange connection	

- Examples Pitot tubes codes :

- DPIT-12-316L-V-SV
- DPIT-150-316L-V-MN
- DPIT-3000-316L-B-MN

- As an option, for the stability of large pitot tubes, we offer tube end brackets - or opposite support. To be noted in addition to the article code.



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