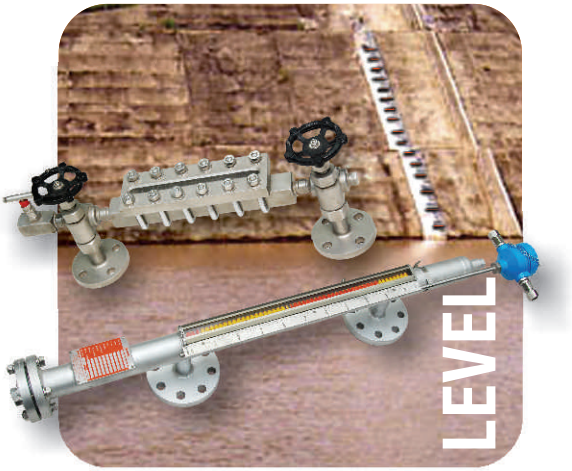
General®

RMK GROUP OF COMPANIES



Thermal INSTRUMENT INDIA PRIVATE LIMITED

MINCO (INDIA) FLOW ELEMENTS PRIVATE LIMITED

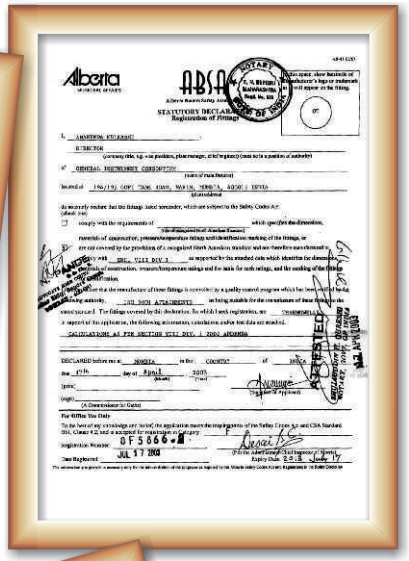
An ISO 9001 : 2008 / ISO 14001:2004 &
OHSAS 18001:2007 Certified Company

COMPREHENSIVE PRODUCT CATALOGUE

General

ATEX

ISO 9001:2008



CRN

FLUOR

GOST R

CSA

ISO-14001 HS

UL

VENTURI TUBES

www.generalinstruments.net

Venturi Tubes

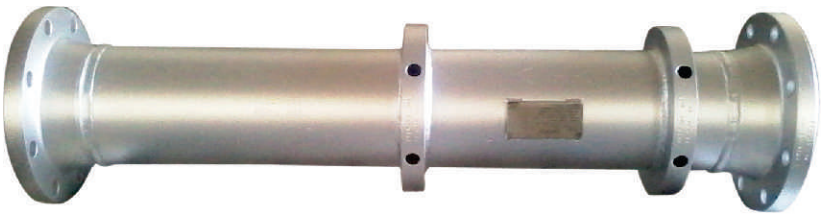
Salient features & benefits

- Can be used on slurries and dirty fluids
- Lower susceptibility to erosion
- Low permanent pressure loss
- Extended product life with no moving parts
- Vertical or horizontal installation

GENERAL Venturi Tubes serve users with accurate measurement of non-viscous fluids in clean & dirty streams. Venturi Tubes are virtually maintenance-free. Venturi tubes are manufactured in strict accordance with ASME MFC-3M, BS-1042 and ISO-5167 standards. These measurement standards provide users with +/-1.0% uncertainty of discharge coefficient. For critical measurement applications, wet calibration at reputed flow laboratories can be offered.

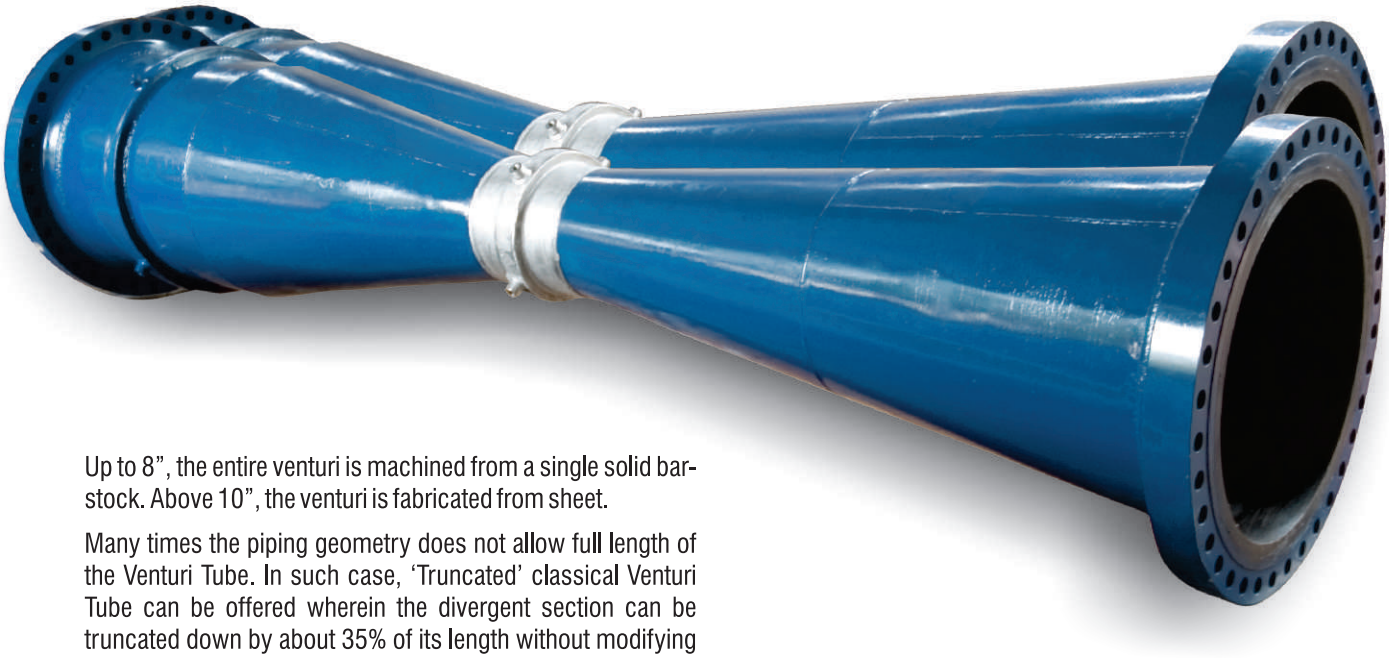
Venturi Tube is a low pressure drop metering device. It offers constant accuracy, low susceptibility to erosion, high-pressure recovery, and installation at any angle from horizontal to vertical. This measurement product performs in a wide variety of applications that include air, water, vapor, steam, gas, chemical substances, sludge and slurry applications.

The classical Venturi Tube is made up of a entrance cylinder of the same diameter as the pipe connected to a conical convergent section, a cylindrical throat, and a conical divergent section which varies in angle from 7° to 15° depends upon the pressure recovery. The high pressure taps are located on the middle of inlet section and the low pressure taps are located at the middle of the throat section. A piezometer ring is sometimes used for differential pressure measurement. This consists of several holes in the plane of the tap locations. Each set of holes is connected together in an annular slot to give an average pressure.



Machined Venturi Tubes

Venturi Tubes

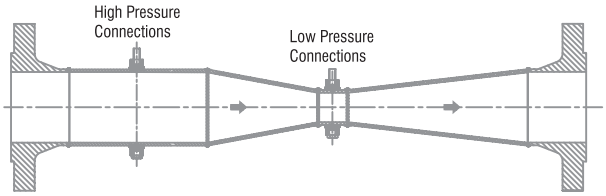


Up to 8", the entire venturi is machined from a single solid bar-stock. Above 10", the venturi is fabricated from sheet.

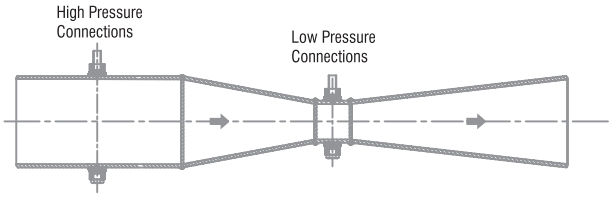
Many times the piping geometry does not allow full length of the Venturi Tube. In such case, 'Truncated' classical Venturi Tube can be offered wherein the divergent section can be truncated down by about 35% of its length without modifying the divergent angle. The outer diameter of the divergent section is less than the inside diameter 'D' of the pipe.

The throat restricts the fluid flow resulting in a pressure drop. This differential pressure relates to the flow rate by applying Bernoulli's equation. The angled inlet and outlet cones help to control the pressure recovery. These are widely used in oil and gas sectors and in piping projects.

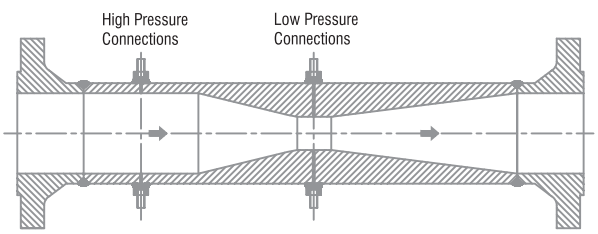
This results in lower permanent pressure loss and greater capacity than other differential meters of the same size. Permanent pressure loss is generally 5% to 20% of the differential pressure, depending on the bore size selected.



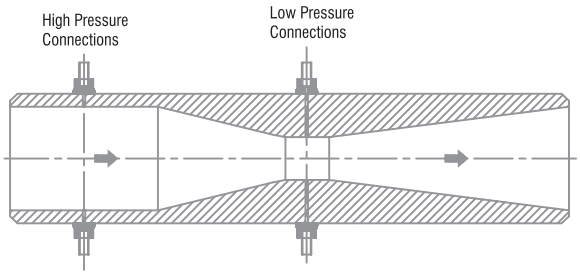
Fabricated with Flanged ends



Fabricated with Beveled ends



Machined with Flanged ends



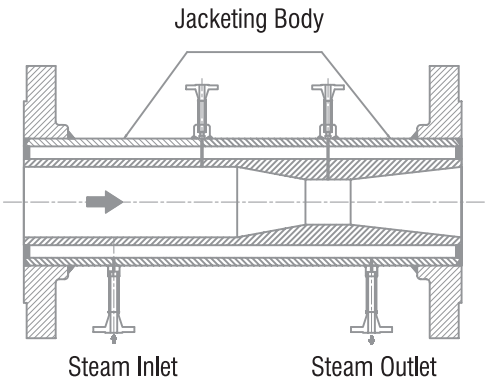
Machined with Beveled ends

Jacketed Venturi & Venturi Nozzle

Jacketed Venturi

Jacketing is mainly provided for heating applications where processes require operating temperature to be amplified. In certain scenario a steam is passed through the jacket passage and fluid inside is heated extensively.

This is mainly applicable for smaller size from 2" to 10".



Jacketed Venturi

Venturi Nozzle

The Venturi Nozzle is an attractive solution for measurements with high accuracy and low residual pressure loss requirements.

This Nozzle has the same features as the ISA 1932 Nozzle except the residual pressure loss is lower.

The profile of the Venturi Nozzle is axisymmetric. It consists of a convergent section, with a rounded profile, a cylindrical throat and a divergent section.

A venturi nozzle can be achieved as truncated alternative. The divergent portion may be truncated up to 35% of its length.

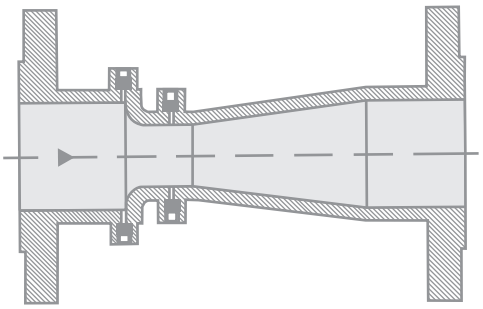
At large sizes there is the possibility to go for a sheet metal downstream cone.

The upstream tap location shall be corner taps and the throat pressure taps shall comprise at least four single pressure leading into a annular chamber.

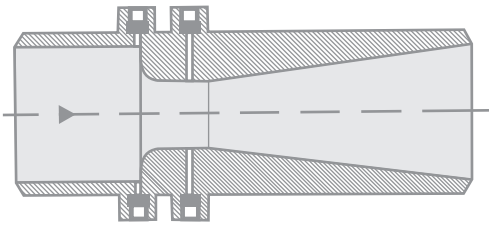
Depending on customer requirements, the typical 1/2" or 3/4" tappings have a but or socket weld, screw thread or flange connection. Tappings maybe equiped with condensate chambers and shut-off valves.

Available in wide variety of materials (SA105, SS316, F12, F22, F91, etc.)

The flow calculation is performed according to the ISO 5167- 2003.



Fabricated Venturi Nozzle



Machined Venturi Nozzle

Eccentric & Rectangular Venturi

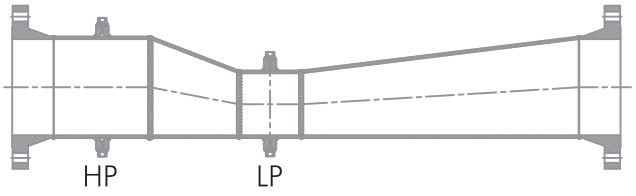
Eccentric Venturi

Eccentric venturi is one of the types of venturi used for the mixed phase (Gaseous & Liquid) of the fluid designed and manufactured as per the standard L. K. Spink. Eccentric venturi is also consists of four parts i.e. Inlet cylinder, convergent, Throat & Divergent as like classical venturi tubes. But the basic difference in the design of both is that either bottom or top side of the venturi is in the same plane.

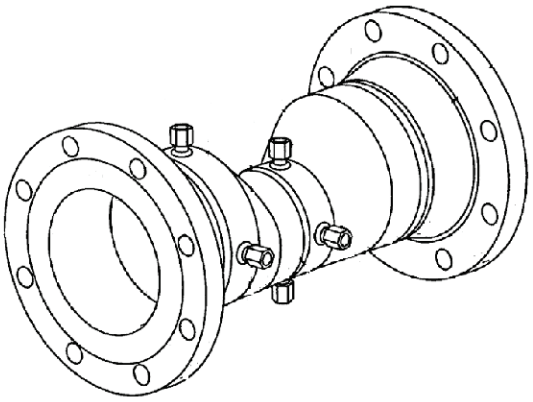
Degrees of Convergent & Divergent angles are also same as per the classical venturi tube (21° & 7° to 15° respectively).

Piezometric ring for the averaging of the readings can be provided. This is required due to the mixed phase of the gas or of the liquid.

Various materials ranging from Carbon steel to stainless steel & also Duplex Stainless steel can be provided.

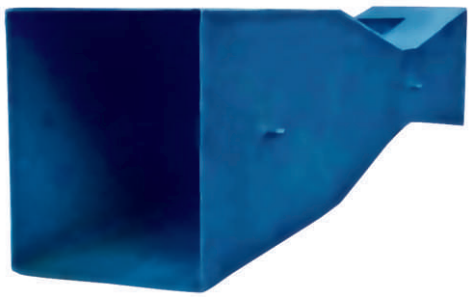


Eccentric Venturi

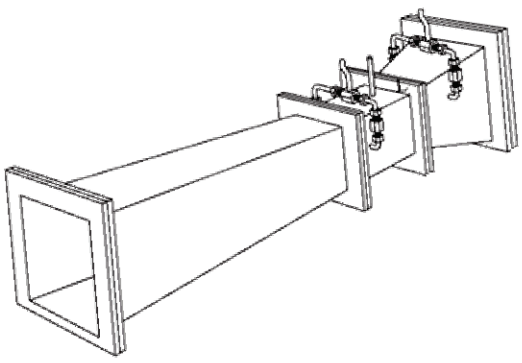


Rectangular Venturi

Rectangular venturi tubes are used in rectangular air ducts or furnaces as primary elements in flow measurement of gas according to the differential pressure principle. The rectangular venturi tube has single or double plane contraction with again same sections as Inlet Duct, Convergent cone, Throat & Divergent cone.



Rectangular Venturi



Ordering Information

Venturi Tube

SIZE

SAME AS SIZE 1" TO 104"

PIPE SCH

SAME AS SCH	5
SAME AS SCH	10
SAME AS SCH	20
SAME AS SCH	40
SAME AS SCH	60
SAME AS SCH	80
SAME AS SCH	120
SAME AS SCH	160
SPECIFY	OTHER

VENTURI MATERIAL

560	SA516 Gr.60
570	SA516 Gr.70
A62	IS2062 Gr.A
B62	IS2062 Gr.B
V6/ V6L	SS316/ 316L
V4/ V4L	SS304/ 304L
SPECIFY	OTHER

DIVERGENT ANGLE

SPECIFY	7deg TO 15deg

SPECIAL

CE	CE
RAD	RADIOGRAPHY
PWHT	PWHT
NACE	NACE
IBR	IBR
H2	H2 SERVICE
O2	O2 CLEANING
WCAL	WET CALLIBRATION

END CONNECTION

WB	BUTT WELDED
FE	FLANGED END

PROCESS CONNECTION

NP	NPT (F)
BS	BSP (F)
SW	SOCKET WELDED

PIEZOMETRIC RING

PZRQ	REQUIRED
PZNRQ	NOT REQUIRED

VENTURI TYPE

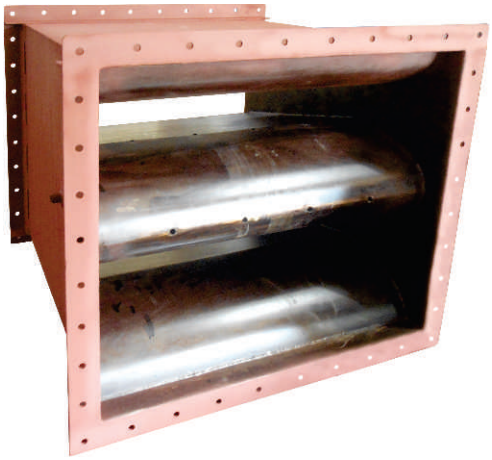
MAC	MACHINED
FAB	FABRICATED
ECC	ECCENTRIC
REC	RECTANGULAR
JAC	JACKETED

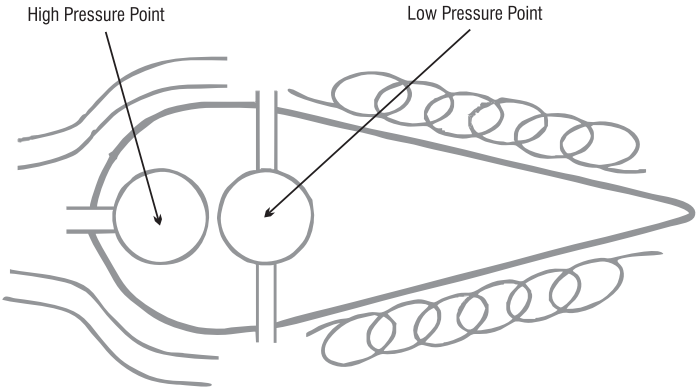
Note:
1. Other than above information customer has to provide process data as on page no. 96.
2. Default process connection size is 1/2" other than this (e.g. 3/4" or 1"), please specify.
3. If the venturi is machined then forged grade of the respective venturi material will be used.

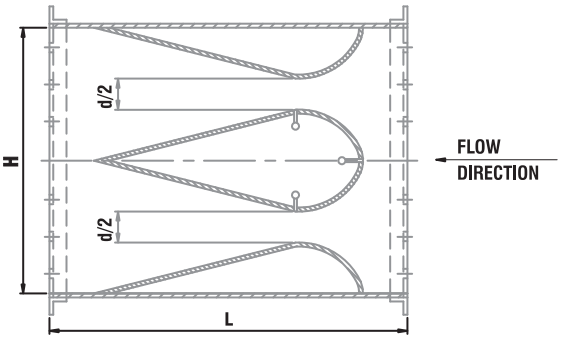
Aerofoil

Aerofoil is primary flow element use to measure air flow in rectangular duct.

An aerofoil is having the shape of the cross section of the aircraft wing, with the function of producing a controllable net aerodynamic force.

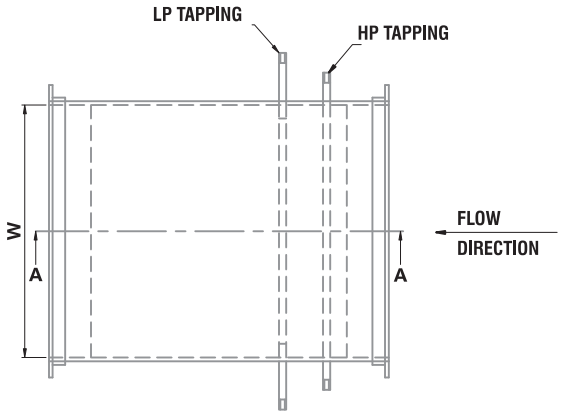






Front Sectional View

Aerofoil works on the principle of the relationship between flow velocity and the pressure fields in frictionless flow. Since the air particles follow the curved streamlines above the upper surface there must be a centripetal force across the streamlines which is accelerating the flow towards the centre of curvature. That force must be associated with a pressure gradient across the streamlines i.e. ambient atmospheric pressure at some distance from the surface grading to a lower pressure on the upper wing surface.

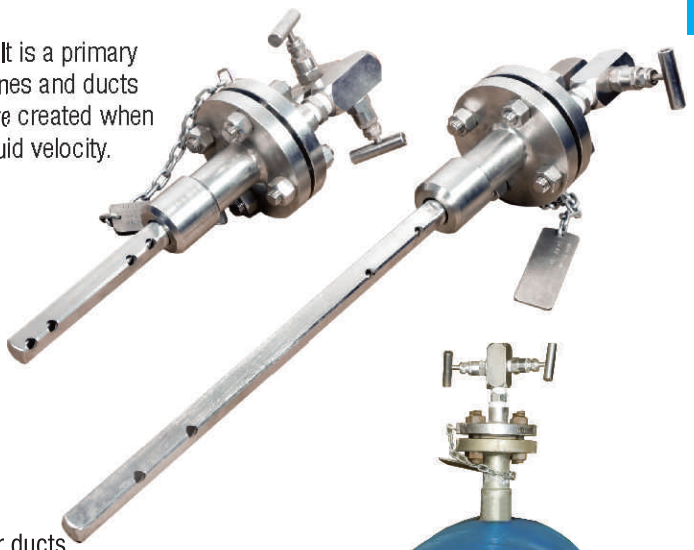


Top View

Averaging Pitot Tube

General

Averaging Pitot tube is a multiport self averaging flow meter. It is a primary element for flow measurement of gas, liquid, vapour in pipelines and ducts based on the principle of measurement of differential pressure created when an obstruction is placed in the fluid flow due to increase in fluid velocity.



Features:

- Unique profile shape enables high flow rate turn down
- Dual averaging for better accuracy
- Suitable for Liquid ,gas and steam flow measurement
- Repeatability of measurement ± 0.1 %
- Short upstream and downstream straight pipe lengths
- Long term accuracy unaffected by wear.

Averaging pitot tubes are generally used for large line sizes or ducts where other primary devices become relatively expensive.

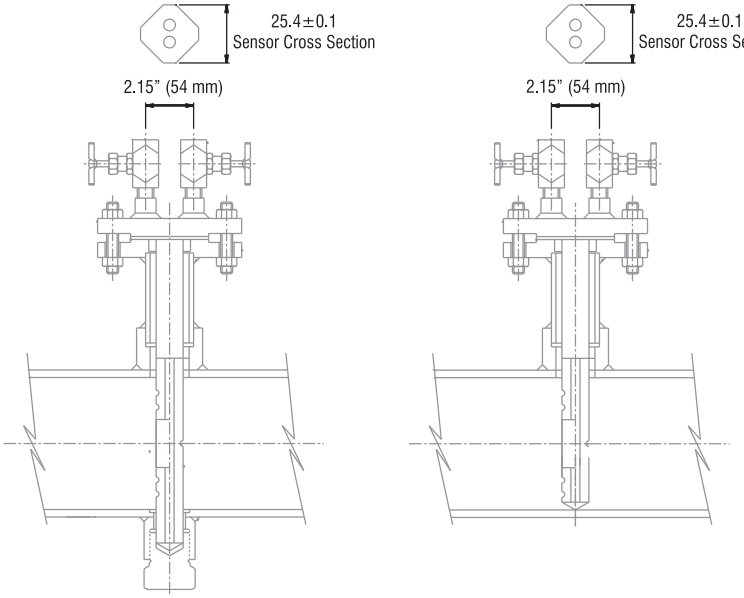
Averaging Pitot tube comprises of following components:

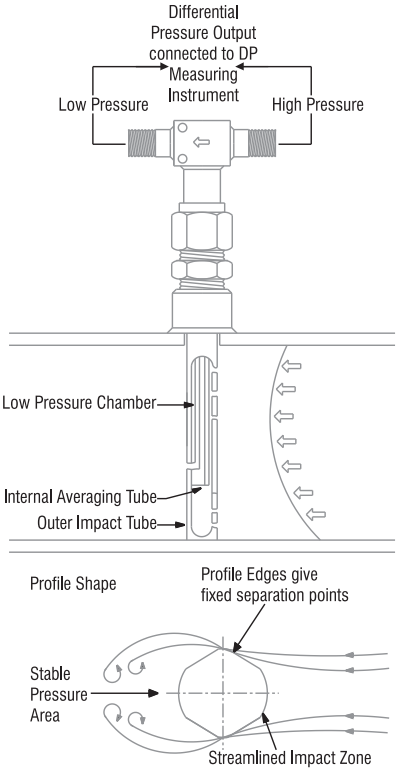
- Outer impact tube - one piece construction
- Low pressure chamber
- Internal averaging tube
- Head

The outer impact tube has a number of pressure sensing holes facing upstream which are positioned at equal annular points in accordance with a loglinear distribution.

The 'total pressures' developed at each upstream hole by the impact of the flowing medium are firstly averaged within the outer impact tube and then to a second order (and more accurately) averaged within the internal averaging tube. This pressure is represented at the head as the high pressure component of the DP output. The low pressure component is generated from a single sensing hole located on the downstream side of the outer impact tube.

Stable flow coefficient which is the result of typical diamond shape, makes it a reliable flow measuring primary flow element. Simple and inexpensive, long term accuracy within acceptable limits over wide range of flow, low permanent pressure loss & minimum operating cost makes it ideal choice of any design engineer. Retractable arrangement can be provided on request for online maintenance without stopping the flow.





Ordering Information

Averaging Pitot Tube

SIZE

SAME AS SIZE 1" TO 104"

PIPE SCH

SAME AS SCH	5
SAME AS SCH	10
SAME AS SCH	20
SAME AS SCH	40
SAME AS SCH	60
SAME AS SCH	80
SAME AS SCH	120
SPECIFY	160
	OTHER

END SUPPORT

ESRQ	REQUIRED
ESNRQ	NOT REQUIRED

ISOLATION VALVE

NDV	NEEDLE
BLV	BALL

SENSOR MATERIAL

A6/A6L	SS316/316L
A4/A4L	SS304/304L

SPECIAL

CE	CE
HS	H2S
PWHT	PWHT
NACE	NACE
IBR	IBR
H2	H2 SERVICE
O2	O2 CLEANING
WCAL	WET CALLIBRATION

PROCESS CONNECTION

NP	NPT (F)
BS	BSP (F)
SW	SOCKET WELDED

APT TYPE

RTB	RETRACTABLE
NRTB	NON RETRACTABLE

LINE MATERIAL

CS	CARBON STEEL
AS	ALLOY STEEL
SS	STAINLESS STEEL
SPECIFY	OTHER

Note:
1. Line material is required to select the respective mounting hardware material.
2. Other than above information customer has to provide process data as on page no. 96
3. Default process connection size is 1/2" other than this (e.g. 3/4" or 1"), please specify.

G-Cone

G-Cone Flow Meter is an advanced differential pressure instrument, which is ideal for use with liquid, steam or gas media in low straight length availabilities where accuracy, low maintenance and cost are important.

Now a days straight length availability is prior concern in the projects where challenges arising to build bigger projects in lower available spaces. G-Cone is the best option for low space availabilities. Where conventional flow elements such as Orifice Assemblies, Flow Nozzles & Venturi tube required straight lengths from minimum 10D (D- Pipe ID) to 44D at the same condition G-Cone is satisfactorily working with only 3D upstream straight length & 2D Downstream straight length. No flow straightner or conditioner are required for G-Cone to reduce the turbulence in the flow. Profile of Cone acts itself as a straightner thereby reducing the straight length requirement.

The G-Cone is designed for today's most challenging oil / gas production, chemical, food & beverage, plastics, pharmaceuticals, district HVAC, textile, power and water & wastewater applications.

Our designed V-Cone flow meters are as per latest edition of ISO 5167-5 2016.

Our G-Cone design suits for the both direct or remote mounting of transmitter. With almost all material ranges such as Stainless steel, Duplex & Super Duplex Stainless steel, Inconel, Hastelloy-C etc.

Specifications

Material	: 304 or 316 stainless steel, Duplex 2205, Hastelloy C-276, carbon steels; Special materials on request.
Calibration	: Minimum 20 Point Calibration.
Configurations	: Flow tube with Flange end and wafer-type
Fitting Type	: Flanged or Butt Welded
Installation Requirement	: Typically 3D upstream and 2D downstream of the cone are required.
Line Size	: 2" to 24" (As per ISO 5167) Other sizes on request.
Pressure Range	: Up to 10,000 psi
Repeatability	: ± 0.1%
Accuracy	: ± 0.5%
Turn-Down	: 10 : 1
Standard Beta Ratios	: 0.45 to 0.80, special betas available
Temperature Range	: Up to 1,600 °F (870°C)

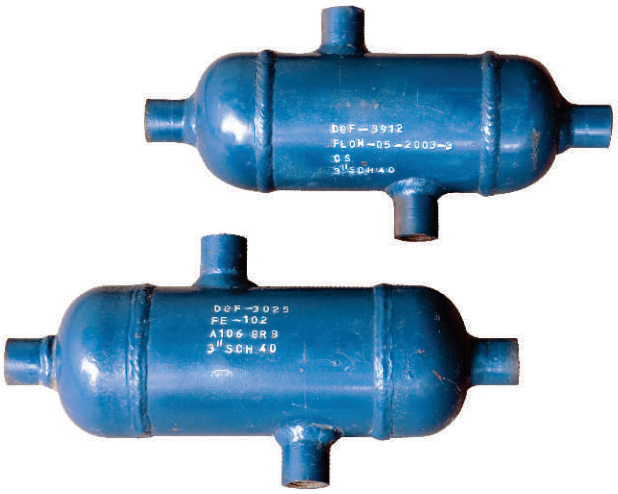
Condensate Pots

We manufacture complete range of condensate pots which requires in many process industries Condensate pots are generally used in the measurement of steam/vapor which condense to liquid state at the ambient temperature.

These are also used to cool down very high temperature liquids and to maintain a constant liquid head above the instrument. These can be installed in both horizontal & vertical position.

We manufacture these condensate pots as per customer's requirement and design in various sizes 2", 3" and 4" etc.

Condensate pots are manufactured in various grades of Carbon steel, Alloy steel & stainless steel. IBR Form IIIC certificate can be provided for condensate pots.



Conditioning Plate and Flow Straightener

Flow straighteners and conditioners are used in conjunction with flow meters. They can smooth out turbulent and transitional flows and help meters measure more accurately

These are installed on the upstream side of flow elements to remove swirl resulting from a complicated piping layout, and to restore an acceptable velocity profile.

Flow conditioners are used to produce a swirl-free, distortion-free highly repeatable velocity flow profile for use in flow meter and pump systems. These eliminates the flow distortion effects of upstream elbows, pipe size changes, valves, dampeners and more to produce a consistent flow profile for flow meters and pumps. Most all flow meter technologies require significant upstream and downstream straight-run to meet and sustain their specified accuracy. Flow conditioners or flow straighteners are used to minimize these straight run requirements.

Process Data

To help us serve you better and to maintain our high benchmarks of precision, kindly furnish the following data to us whenever there is any product enquiry:

Bore Calculation Input Data

Name of the fluid & State	
Operating temperature / Ambient temperature	
Operating Pressure (abs)	
Viscosity (cP)	
Maximum flow / Normal flow	
Differential range	
Base sp. gravity / density (only for gas)	
Operating sp. gravity / density (for gas & liquid)	
Specific heat ratio (Cp/Cv) only for gas	
Pipe size & schedule	
Pipe material	
Tap type	
Element material	

Approvals

General

General® INSTRUMENTS CONSORTIUM

(An ISO 9001 : 2008 / ISO 14001:2004 & OHSAS 18001:2007 Certified Company)

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THERMAL INSTRUMENT INDIA PRIVATE LIMITED
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Tel.: +91 2362 236 243, +91 2362 236 026
Fax: +91 2362 236018 E-mail: elements@giconindia.com

Plant II
F.A.T.I. GENERAL EQUIPMENTS PVT. LTD.
2, 3 Jawahar Co-op. Industrial Estate, Kamothe, Panvel - 410 209 INDIA
Tel.: +91 22-2743 1357 / 58 E-mail: sales@fati-india.com

Plant III
MINCO (INDIA) FLOW ELEMENTS PRIVATE LIMITED
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Email-Id: enquiry@generalinstrumentsme.com

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- ITALY
- JAPAN
- KUWAIT
- KOREA
- MALAYSIA
- NETHER LAND
- OMAN
- PHILIPPINES
- QATAR
- SINGAPORE
- SRI LANKA
- THAILAND
- U K
- USA
- VIETANAM