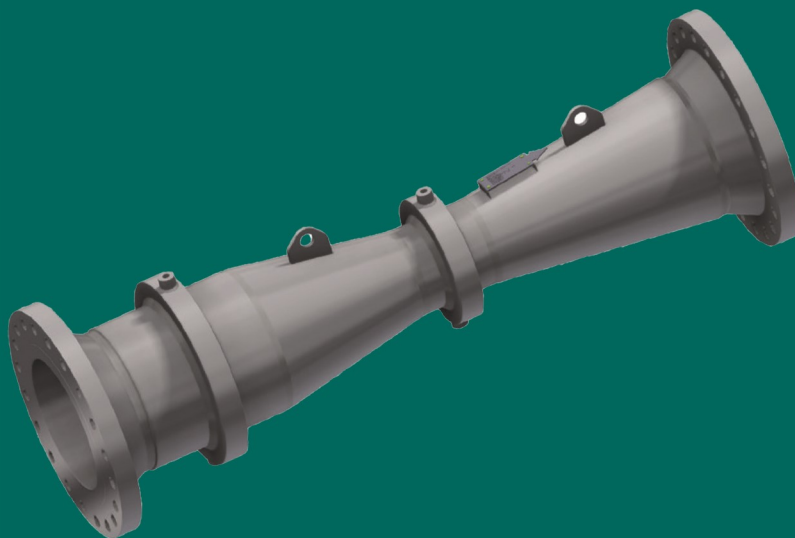




# FLOW MEASURING WITH VENTURI





## Introductions

The Venturi flowmeter is based on a classical Venturi tube, an engineered primary flow element for a most efficient and accurate differential pressure (DP) flow measurement. Thanks to its design, it has an excellent resistance to wear and doesn't require any maintenance. The service life of the Venturi element is usually equal to the one of the entire plant. It is therefore often the ideal choice in live steam applications of power plants, wet gas flow measurement in natural gas production or CO<sub>2</sub> injection, flow measurement of hydrocarbons and LNG as well as in gas-to-liquid processes and refineries.

## Applications

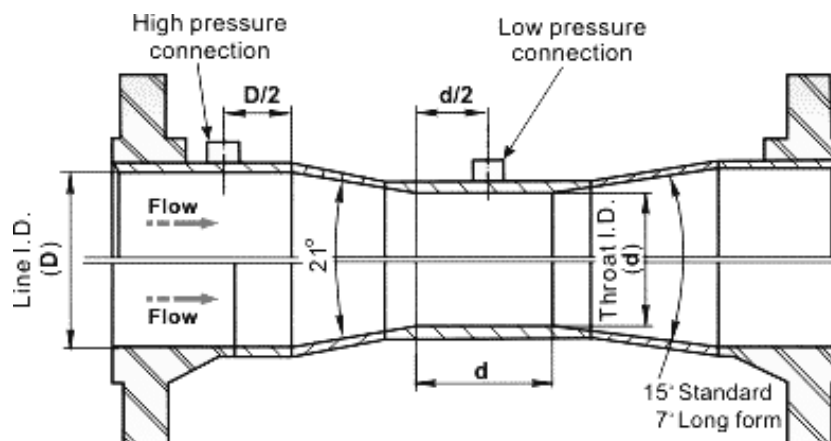
Comparing with orifices and flow nozzles, the Venturi tube generally is of a little more complicated structure, requires more material and costs and tends to be larger in size. However, Venturi tubes offer advantages including an extremely low pressure loss, a higher durability and a lower chance of catching a sludge media and sediment than other throttle elements. The Venturi tube is mostly used for measurements of flow wherever a minimal loss of pressure is important.

Manufactured by bar stock or welded plate for big size and very high wall thickness.

Venturi Meter can also be manufactured by Conical divergent angle of  $7^\circ \pm 1$  for low loss Venturi and Conical divergent angle of  $15^\circ \pm 1$  for Classical Venturi

All types can be supplied Truncated or not Truncated

The ARAMAK Venturi flowmeter covers big diameters, round and rectangular pipes and ducts.





## Specification

### Fluids :

Liquids, gases and saturated steam

### Line sizes :

3" to 80" (DN 50 to DN 2000)

### Tube Type

Machine (2" to 6")

Welded (8" to 80")

### Instrument tapping adaptor

- Threaded G or NPT
- Flanged DN25 (1 in.) to DN 80 (3 in.) to ANSI 150RF, 300RF or NP10/16, NP25/40

### Tapping No.

1 or 2

Ring type with 1 tapping

### Construction materials

316 stainless steel

304 Stainless Steel

Carbone Steel

### End Connection

- Butt-welds
- Flanged connection is available on request as welding-neck or slip-on-type according to ASME or PN

### Output signal

- Two-wire, 4 to 20 mA, selected for square-root output
- Low flow cut-off facility
- Optional Profibus PA, Foundation Fieldbus or Modbus communications

### Accuracy Uncalibrated

±1% of actual flow

### Flow range

10:1

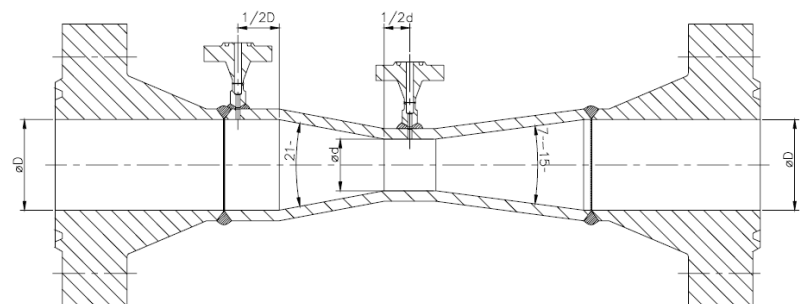
### Maximum pressure

100 Bar @ 45 °C

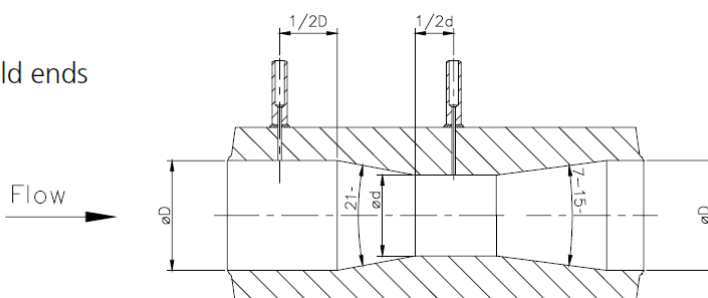
### Humidity

Relative humidity: up to 100 %

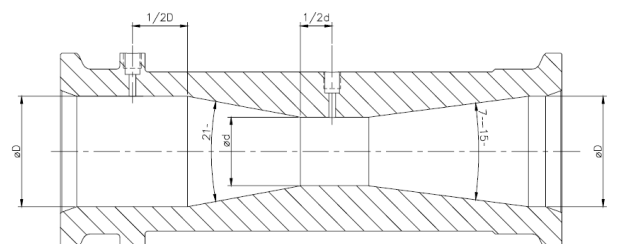
Flanged



Weld ends



Clamp connection





## Compensation

Alongside differential pressure  $\Delta p$ , pressure  $p$  and temperature  $T$  are test variable of flow  $q$ . If there are no strong fluctuations in pressure and temperature, then the accuracy of the differential pressure signal is fully sufficient for the majority of measuring points. There is then no need for any Compensation.

With some applications, particularly in the gas and steam sectors, a special compensation is required. A change in pressure and/or temperature leads to a change in density. If this is not taken into account, total accuracy may be reduced.

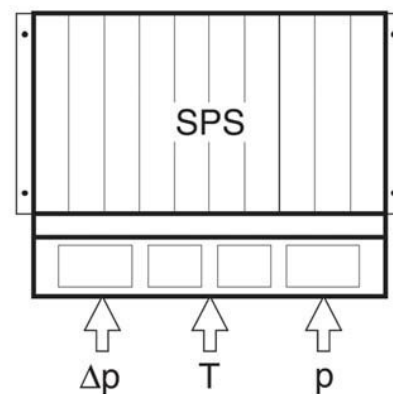
The following parameters are required for compensation:

- Gases: compensation of  $P$  and  $T$
- Saturated steam: either  $P$  or  $T$  are compensated
- Superheated steam: compensation of  $P$  and  $T$
- Liquids: compensation of  $T$  (very rare)

Both on the process side and on the system side, there are two possibilities for implementing compensation (large differences

in price and effort).

The process variables are fed into the (available) PLC or Flow Computer. The flow equations are programmed there. With this solution the investment costs are low, but the commissioning costs are increased.





# Ordering Information

VET-	XXX	XXXX	XX	XX	XX	XX	XXX	XXX	XX	XX	XX	XXX
<b>Design</b>												
welded type , weld end	WW											
Welded type , Flanged end	WF											
Machined type , weld end	MW											
Machined type , flnged end	MF											
<b>Pipe Size</b>												
..... (mm, inside Diameter)		XXXX										
<b>Body Material</b>												
316 / 316L stainless			I1									
310 stainless steel			I2									
304 stainless steel			I3									
Carbone Steel			I4									
Other			P5									
<b>Pipe thickness</b>												
..... (mm, Pipe Thickness)				XXX								
<b>Connection Rating</b>												
ANSI Class 150				A1								
ANSI Class 300				A2								
ANSI Class 600				A3								
ANSI Class 900				A4								
ANSI Class 1500				A5								
PN 10				P1								
PN 16				P2								
PN 25				P3								
PN 40				P4								
PN 63				P5								
PN 100				P6								
PN 160				P7								
<b>Body Material</b>												
PVC				I0								
Polyamide				I1								
316 / 316L stainless				I2								
304 stainless steel				I3								
Carbone Steel				I4								
Other				P5								
<b>Instrument Connection</b>												
1/2" Male , NPT								10				
1/2" Female, NPT								11				
1/2" Male, G								12				
1/2" Female, G								13				
Flanged 1/2" 150#								14				
Flanged 1" 150#								15				
Flanged 1 1/2" 150#								16				
Flanged 2" 150#								17				



## Ordering Information

Flanged 3" 150#		18					
Other		O1					
<b>RTD Sensor</b>							
Not Applicable			0				
Included			1				
<b>Transmitter</b>							
Not Applicable			0				
4~20 mA with Display, 24VDC Loop			10				
4~20 mA without Display, 24VDC Loop			11				
4~20 mA HART with Display, 24VDC Loop			20				
4~20 mA HART without Display, 24VDC Loop			21				
Other			30				
<b>Mounting</b>							
Horizontal				H			
Vertical				V			
<b>Certification</b>							
Material certificates						C0	
Material NACE MR0175						C1	
Material NACE MR0103						C2	
100% dimensional check						C3	
Hardness survey						C4	
Impact testing @ -196 °C (-320.8 °F)						C5	
Others						C6	
<b>Added requirements</b>							
Manufactured to customer drawing							DW
Special device							SP
Isolating Gate Valve 1/2" Carbon Steel							GV1
Isolating Gate Valve 1/2" Stainless Steel 304							GV2
Isolating Gate Valve 1/2" Stainless Steel 316							GV3
Isolating Ball Valve 1/2" Stainless Steel 304							BV1
Isolating Ball Valve 1/2" Stainless Steel 316							BV2
Isolating Niddle Valve 1/2" Stainless Steel 304							NV1
Seal pot							SP
5-way Valve Manifold							MF
Compress Fitting 1/2" to tube							CF
Others							OT



## Contact us

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