Parto Sahand Ara

FWM
WEDGE METER

Flow Wedge Meter

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Flow Wedge Meter :FWM

General Description

A Wedge Flow Meter is preferably applied in difficult-to-meter line fluids, like air entrained liquids, particular entrained liquids, high viscous liquids or slurry liquids, which are abrasive or fibrous. It is also applicable for clean liquids, gas/air and steam. It consists of a measurement pipe with pressure taps in front and behind the flow element,a wedge restriction being welded into the measurement pipe from the top side. The pressure is being measured in front of the wedge (high or dynamic pressure side) and behind the wedge (static or low pressure side). By determining the difference of these two measurements, which is called the differential pressure, the volume flow of the fluid can be calculated, as all other characteristics of the measuring points are constant.As the wedge has the profile of an isosceles triangle, the form is the same from both sides. So the measurement is possible in both directions.

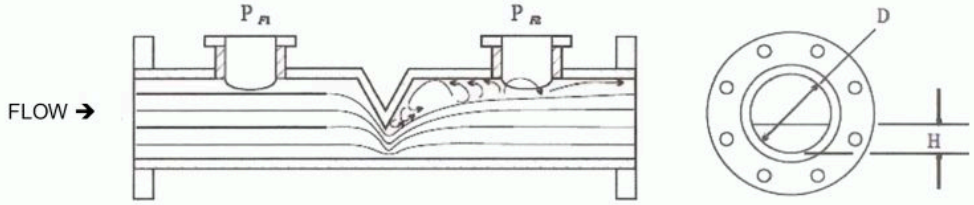
Main Features

Simple principle of operation allows functionality on any fluid.

- Long life without maintenance.
- Low permanent pressure loss.
- Different H/D (opening) ratios
- Minimal upstream and downstream requirements.
- Sizes ½" to 48".
- Bidirectional measurement possible.

Measuring Principle

The line fluid is forced downward similar to a segmental orifice plate, but is guided along a slopping "wedge" shape rather than a sharp edge. The pressure taps are located upstream and downstream of the wedge and in all cases are equipped with sealed sensors. The differential pressure produced by the device is a function of the wedge segment opening (H) and the diameter of the body, D.



Measuring Principle

The equivalent beta ratio is:

$$\beta_{wedge} = \frac{D}{D} = \left(\frac{1}{\pi} \left\{ arc\cos\left[1 - \frac{2H}{D}\right] - 2\left[1 - \frac{2H}{D}\right]\left(\frac{H}{D} - \left[\frac{H}{D}\right]^2\right)^{1/2} \right\} \right)^{1/2}$$

Discharge coefficients are as follows for the line sizes indicated:

Line size:	Discharge coefficient:
0,5"	$C = 0{,}7883 + 0{,}107\left(1 - \beta^2{}_{wedge}\right)$
1…1,5"	$C = 0{,}6143 + 0{,}718\left(1 - \beta^2{}_{wedge}\right)$
1,5…24"	$C = 0{,}5433 + 0{,}2453\left(1 - \beta^2{}_{wedge}\right)$

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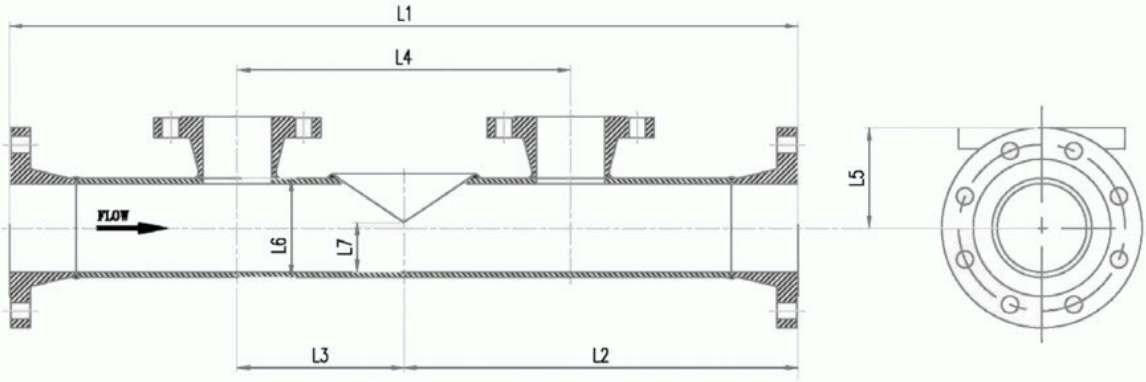
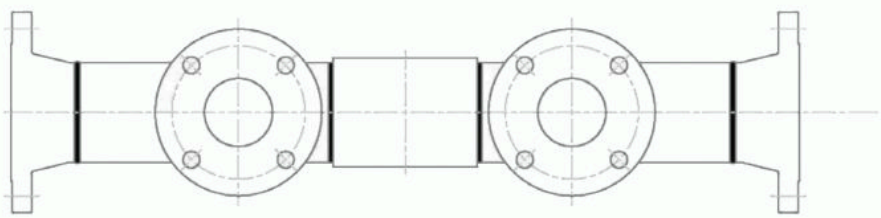
Dimensions

Table of standard dimensions:

Line size		L1		L2		L3		L4		L5		L6		L7	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
50	2	700	28	350	14	116	4.63	232	9.26	180	7.19	50	2	tba	tba
75	3	850	34	425	17	190	7.56	380	15.12	195	7.75	75	3	tba	tba
100	4	900	36	150	18	190	7.50	380	15.00	210	8.25	100	4	tba	tba
150	6	1000	40	500	20	225	9.00	450	18.00	235	9.31	150	6	tba	tba
200	8	1050	42	525	21	260	10.25	520	20.50	260	10.31	200	8	tba	tba
250	10	1125	45	565	22.5	295	11.75	590	23.50	285	11.38	250	10	tba	tba
300	12	1175	47	590	23.5	335	13.25	665	26.50	310	12.38	300	12	tba	tba
350	14	1225	49	615	24.5	350	14.00	700	28.00	325	13.00	350	14	tba	tba
400	16	1225	49	615	24.5	385	15.25	765	30.50	350	14.00	400	16	tba	tba
450	18	1300	52	650	26	420	16.75	840	33.50	375	15.00	450	18	tba	tba
500	20	1400	56	700	28	465	18.50	925	37.00	400	16.00	500	20	tba	tba
600	24	1550	62	775	31	525	21	1050	42.00	450	18.00	600	24	tba	tba





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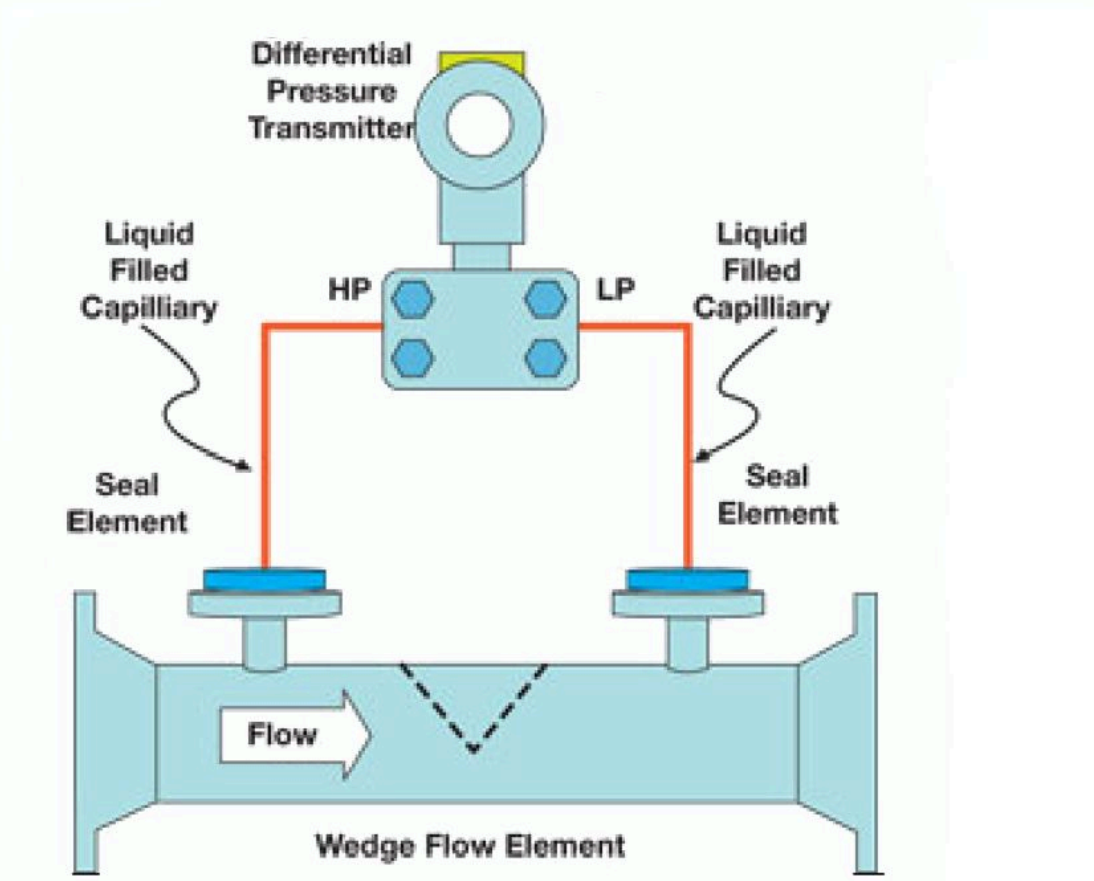
The mass flow rate equation for incompressible flow is:

$$Q_M = N_{MG} \frac{Cd^2}{\sqrt{1-(d/D)^4}} \sqrt{F_P G_F} \sqrt{H_W}$$

N_{MG} = dimensional constant
H_W = differential inches of water
G_F = specific gravity
F_P = thermal expansion factor

The calculations for compressible flow are similar but must take account to temperature and adiabatic expansion and compressibility factors.



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Order Code

FWM Configuration		
1	**Nominal size**	
	015	1/2" DN15
	025	1" DN25
	040	1 1/2" DN40
	050	2" DN50
	080	3" DN80
	100	4" DN100
	*	Other - please specify
2	**Nominal Pressure Rating DIN**	
	C1	Class 150
	C2	Class 300
	C3	Class 600
	P1	PN 10
	P2	PN 16
	P3	PN 40
	P4	PN 64
	*	Other - please specify
3	**Sealing Face**	
	RF	RF
	RJ	RTJ
	FF	FF
	*	Other - please specify
4	**Material**	
	S	316L SS (1.4435)
	*	Other - please specify
5	**Dimensions in mm (L)**	
	***	***?
6	**Pipe Size (ID)**	
	***	***?
7	**Pipe Size (WT)**	
	***	***?

Additional order details _____

FWM - [ ][ ][ ][ ][ ][ ][ ]
1 2 3 4 5 6 7

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