



Vortex Flow Meter

Vortex Flow meter

Measuring Principle

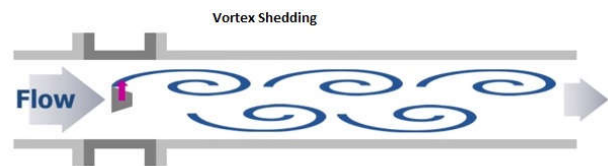
Vortex flow meter is one kind of speed type flow meter, it's based on Karman Vortex theory and adopts piezoelectric crystal to detect the burble frequency of the fluid caused by flowing through the triangular prism in the pipeline and then measure the flow of fluid. When the fluid in the pipeline passes the burble generator (Triangular Prism) ,burble will generate due to the acceleration of partial flow rate. The burble will arise alternately in two burble lines, which is called Karman Vortex. The releasing frequency of Karman Vortex depends on the size of triangle prim and flow rate of fluid , while independent of the medium feature parameter, such as the temperature ,pressure , it can be indicated by the following formulas:

$$F = sR \cdot v \cdot (1 - 1.27 \cdot d/D) \sim \text{Formula 1}$$

$$Q = 3600 \cdot F/K \sim \text{Formula 2}$$

$$M = Q \cdot p \sim \text{Formula 3}$$

- F.....The releasing frequency of Karman Vortex (unit: Hz)
- Sr.....Strouhal number (unit:dimensionless)
- V.....Medium flow rate (unit: m/s)
- d.....The width of triangle prim
- D.....Vortex meter inner diameter (unit:m)
- Q.....Instantaneous volume flow rate(m³/h)
- K.....Vortex meter coefficient (unit pulse number /m³)
- M.....Instantaneous quality flow rate (unit :kg/h)
- P.....Fluid density (unit:kg/m³)



Features:

- Integrated pressure & temperature compensation
- Wide temperature range up to highest temperature 350°C
- No moving parts, no abrasion ,non-wearing parts inside , fully welded SS304 body (SS316 Selectable .

Benefits

- 18months warranty
- Low maintenance, Reliable meter

Application

- Rotating industrial machinery lubrication
- Paper/pulp slurries
- General Industrial high-viscosity fluids
- Chemical pacing
- Petroleum ,chemical and fuel management
- High-viscosity fluids .



Specification

Diameter	DN15~DN300/mm (1/2"~12")
Accuracy	±1.5% (Standard) ; ±1.0% (Optional)
Communication	RS485/Modbus, Hard ,Profibus
Signal Output	4-20mA ,Pulse
Frequency Output	2~3000Hz
Relative Humidity	≤85%
Velocity	0.4 ~ 7.0 m/s liquid 4.0 ~ 60 m/s gas 5.0 ~ 70 m/s steam
Power Supply	12 VDC ; 24 VDC
Nominal Pressure	1.6MPa ,2.5MPa ,4.0MPa
Body Material	SS304 (Standard) , SS316 (Optional)
Level of Protection	IP65
Flange Standard	EN1092-1 PN10 ,PN16 ,PN25 ,PN 40 ANSI BS16.5 Class 150,300,600 JIS2220 10K ,20k , 40K AS4087 PN16,PN21 ,PN35

Flow Rate Table

Diameter (mm)	Liquid (m ³ /h)	Gas (m ³ /h)
15	0.8~6	6~40
20	1~8	8~50
25	1.3~15	8~100
32	3~33	14~350
40	4~44	18~450
50	6~66	30~750
65	13~140	50~1250
80	20~220	70~1750
100	36~400	100~2500
125	50~600	200~5000
150	100~1200	400~10000
200	150~1800	600~15000
250	200~2400	1000~25000
300	300~3600	
400	300~3600	
500	400~4800	
600	500~6000	

Vortex Flow Meter Type



Vortex Flow Meter
(Flange Type)



Vortex Flow Meter
(With Temperature
Pressure Compensation)



Vortex Flow Meter
(Sanitary Clamp Type)



Vortex Flow Meter
(Wafer Type)



Vortex Flow Meter
(Insertion Type)



Vortex Flow Meter
(Remote Type With
Temperature Pressure
Compensation)

Vortex Flow Meter – Saturated Steam Flow Range (kg/h)

Absolute Pressure P (Mpa)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.8	2.0	
Temperature T (Deg C)	120.2	133.5	143.62	151.84	164.96	164.96	170.41	175.36	179.68	187.96	195.04	201.37	207.11	212.37	
Density Kg/m ³	1.129	1.651	2.163	2.669	3.667	3.667	4.162	4.665	5.147	6.127	7.106	8.085	9.065	10.05	
DN20	Qmax	80	102	130	160	190	220	250	279	309	368	426	485	544	603
	Qmin	9	11	12	13	15	16	17	18	19	20	22	24	25	26
DN25	Qmax	136	198	260	320	380	440	499	559	618	735	853	970	1088	1206
	Qmin	14	17	19	21	23	25	27	28	30	33	35	37	39	42
DN40	Qmax	400	498	649	801	951	1100	1249	1397	1544	1838	2132	2426	2720	3015
	Qmin	32	38	44	48	53	57	60	64	67	73	79	84	89	94
DN50	Qmax	667	826	1080	1335	1585	1834	2081	2328	2574	3054	3553	4043	4533	5025
	Qmin	52	64	73	81	88	95	100	107	112	122	132	140	149	157
DN65	Qmax	933	1320	1730	2135	2536	2934	3330	3724	4118	4902	5685	6468	7252	8040
	Qmin	88	106	121	135	147	158	168	178	187	204	220	234	248	261
DN80	Qmax	1400	1980	2596	3240	4015	4644	5270	5896	6520	7760	9000	10240	11480	12730
	Qmin	105	127	1445	161	176	189	201	213	224	345	263	280	298	313
DN100	Qmax	2332	3300	4320	5400	6430	7320	8320	9310	10300	12260	14200	16160	19120	20100
	Qmin	175	212	242	269	293	315	336	335	374	408	439	468	496	522
DN125	Qmax	3500	4950	6490	8000	9510	11000	12500	14000	15440	18400	21300	24260	27200	30200
	Qmin	262	317	363	404	440	473	504	533	560	611	658	702	744	783
DN150	Qmax	4666	6600	8650	10680	12680	14670	16650	18620	20590	24500	28420	32340	36260	40200
	Qmin	350	423	484	538	586	631	672	711	747	815	878	936	990	1044
DN200	Qmax	9330	13200	17300	21360	25360	29340	33300	37240	41180	47000	56850	64680	72520	80400
	Qmin	610	740	848	942	1026	1104	1176	1243	1308	1427	1536	1638	1735	1827
DN250	Qmax	13997	19810	25960	32030	38040	44000	49940	55860	61760	73520	85270	97000	108780	120600
	Qmin	875	1056	1210	1345	1466	1577	1680	1776	1868	2038	2195	2340	2480	2610
DN300	Qmax	20995	29720	38930	48040	57050	66000	74900	83800	92650	110300	127900	145530	163200	180900
	Qmin	1050	1270	1453	1614	1759	1892	2016	2132	2241	2446	2634	2808	2975	3132

Superheated Steam Density & Relative Temperature and Pressure (Kg/m³)

Absolute Pressure (Mpa)	Temperature (°C)					
	150	200	250	300	350	400
0.1	0.52	0.46	0.42	0.38		
0.15	0.78	0.70	0.62	0.57	0.52	0.49
0.2	1.04	0.93	0.83	0.76	0.69	0.65
0.25	1.31	1.16	1.04	0.95	0.87	0.81
0.33	1.58	1.39	1.25	1.14	1.05	0.97
0.35	1.85	1.63	1.46	1.33	1.22	1.13
0.4	2.12	1.87	1.68	1.52	1.40	1.29
0.5		2.35	2.11	1.91	1.75	1.62
0.6		2.84	2.54	2.30	2.11	1.95
0.7		3.33	2.97	2.69	2.46	2.27
0.8		3.83	3.41	3.08	2.82	2.60
1.0		4.86	4.30	3.88	3.54	3.26
1.2		5.91	5.20	4.67	4.26	3.92
1.5		7.55	6.58	5.89	5.36	4.93
2.0			8.968	7.97	7.21	6.62
2.5			11.5	10.1	9.11	8.33
3.0			14.2	12.3	11.1	10.1
3.5			17.0	14.6	13.0	11.8
4.0				17.0	15.1	13.6

Selection Model

BT-VFM													
Connection	1									Flange			
	2									Sanitary Clamp			
	3									Inserted			
	4									Others (Pls Specified)			
Measured Medium	G									Gas			
	L									Liquid			
	S									Steam			
	O									Others (Pls Specified)			
Diameter										Three Digitals ; for example : 010 : 10mm ; 050 : 50mm			
Combination			Z							Compact Type			
			F								Remote Type		
Convertor				N						No display; 24V DC; Pulse Output			
				A								No display; 24V DC; 4-20mA Output	
				B									Local display; Lithium Battery Power; No output
				C									Local display; 24V DC Power; 4-20mA Output; Optional backup power: Lithium Battery
				C1									Local display; 24V DC Power; 4-20mA Output; Modbus RS485 Communication Optional backup power: Lithium Battery
				D									Local display; 24V DC Power; 2-wire 4-20mA Output; Pulse Output
Explosion Rating				N						BT5			
				E								Others	
Flange Standard						-DXX				DXX: D06,D10,D16, D25,D40 D06: DIN PN6; D10: DIN PN10 D16: DIN PN16; D25:DIN PN25 D40: DIN PN40			
						-AX					AX: A1 ,A3 ,A6 A1: ANSI 150#; A3: ANSI 300# A6: ANSI 600#		
						-GX					GX: G01 G02 G03 G04 GB standard G01:PN10 G02:PN16 G03:PN25 G04:PN40		
						-WF					Wafer Connection ; Mating Flange included		
Fluid Temperature							- T1			-20 ~ +70°C			
							- T2				-20 ~ +250°C		
							- T3				-20 ~ +350°C		
Additional Compensation							- N			Standard			
							- C				C/w Temperature & Pressure Compensation		

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