

## RIF300 Vortex Flow meter

for the measurement of liquid, gas, and steam in commercial, industrial and municipal applications: for the water and waste water, chemical & petrochemical, oil & gas, power, pharmaceutical, paper, food & beverage industries.

### Vortex Flowmeter Advantages:

- Integrated pressure and temperature compensation.
- 4-20mA, pulse with HART or pulse with RS485 are selectable.
- Wide temperature range up to highest temperature 350°C
- No moving parts, no abrasion, non-wearing parts inside, fully welded SS304 body(SS316 selectable).
- Embedded sensor; 4 piezo-electric crystal encapsulated inside the sensor



Temperature & Pressure compensation

### Measuring principle:

Vortex flow meter is one kind of speed type flow meter; It 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.

Vortex flow meter is widely used in petrol, chemical industry, light industry and power heat supply and so on.

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 alternatively 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:

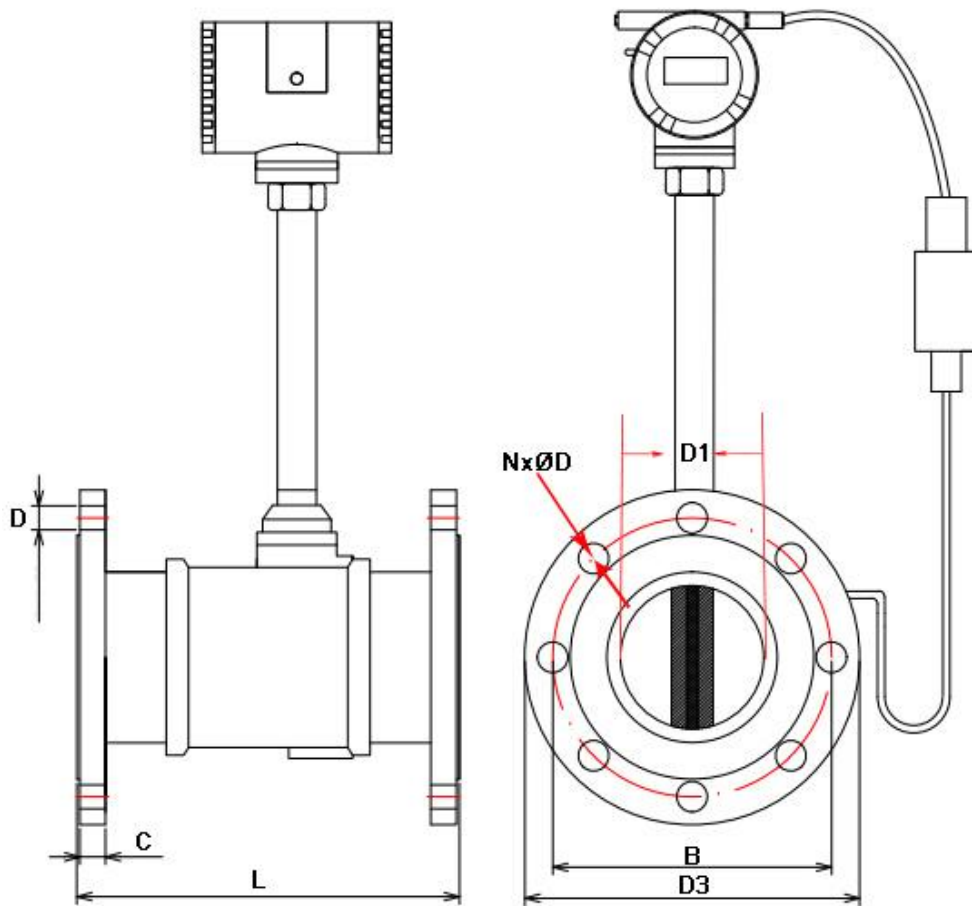
- F=  $sR \cdot v(1 - 1.27 \cdot d/D)$  formula 1  
 Q=  $3600 \cdot F/K$  formula 2  
 M=  $Q \cdot p$  formula 3  
 F: The releasing frequency of Karman vortex (unit: Hz)  
 Sr: Strouhal number (unit: dimensionless)  
 V: Medium flow rate (unit:m/s)  
 d: The width of triangle prim  
 D: Vortex meter inner diameter (unit:m)  
 Q: Instantaneous volume flow rate (m<sup>3</sup>/h)  
 K: Vortex meter coefficient (unit pulse number/m<sup>3</sup>)  
 M: Instantaneous quality flow rate (unit: kg/h)  
 P: Fluid density (unit:kg/m<sup>3</sup>)

### Measuring range of liquid & gas (Working condition)

Diameter (mm)	Flow rate liquid (mc/h)	Flow rate gas (mc/h)
15	0.8÷6	6÷40
20	1÷8	8÷50
25	1.3÷15	8÷100
32	1.5÷16	14÷350
40	3÷33	18÷450
50	4÷44	30÷750
65	6÷66	50÷1250
80	13÷140	70÷1750
100	20÷220	100÷2500
125	36÷400	200÷5000
150	50÷600	400÷10000
200	100÷1200	600÷15000
250	150÷1800	1000÷25000
300	200÷2400	-
400	300÷3600	-
500	400÷4800	-
600	500÷6000	-

Note: if client want to know the mass flow rate, they need to calculated according to density, density is depends on the different temperature and pressure.

## Flange Connection DIN16 2502 PN16



Diameter (mm)	Inner Diameter D1 (mm)	Length L (mm)	Flange Outer Diameter D3 (mm)	Central Dia of Bolts Hole B (mm)	Flange Thickness C (mm)	Bolt Hole Diameter D (mm)	Screw Q.ty N
25	25	170	115	85	16	14	4
32	32	170	140	100	16	18	4
40	40	190	150	110	16	18	4
50	50	190	165	125	18	18	4
65	65	220	185	145	18	18	4
80	80	220	200	160	20	18	8
100	100	240	220	180	20	18	8
125	125	260	250	210	22	18	8
150	150	280	285	240	22	22	8
200	200	300	340	295	24	22	12
250	250	360	405	355	26	26	12
300	300	400	460	410	28	26	12

## Vortex flowmeter-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 (°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/m³		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
20	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
25	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
40	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
50	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
65	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
80	Qmax	1400	1980	2596	3240	4015	4644	5270	5896	6520	7760	9000	10240	11480	12730
	Qmin	105	127	144	161	176	189	201	213	224	245	263	280	298	313
100	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
125	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
150	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
200	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
250	Qmax	13997	19810	25960	32030	38040	44000	49940	55860	61760	73520	85270	97000	108780	120600
	Qmin	875	1056	1210	1345	1466	1577	1680	1766	1868	2038	2195	2340	2480	210
300	Qmax	20995	29720	38930	48040	57050	66000	74900	83800	92650	110300	127900	145530	163130	180900
	Qmin	1050	1270	1453	1614	1759	1892	2016	2132	2241	2446	2634	2808	2808	3132

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

Absolute Pressure P (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			8.96	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

## RIF300 Vortex Flowmeter Model Selection

	RIF300	500	1	1	3	N	1	D	E	1
<b>Caliber (mm)</b>	DN15-DN300 Reference code, check code table 10.		XXX							
<b>Nominal Pressure</b>	1.6 MPa		1							
	2.5 MPa		2							
	4.0 MPa		3							
	Others		4							
<b>Connection</b>	Flange		1							
	Wafer		2							
	Tri-Clamp (Sanitary)		3							
	Thread		4							
	Insertion		5							
	Others		6							
<b>Medium</b>	Liquid		1							
	Common Gas		2							
	Saturated Steam		3							
	Superheated Steam		4							
	Others		5							
<b>Special Mark</b>	Normal					N				
	Standard signal output					M				
	Intrinsically safe Explosion-proof					B				
	On site display					X				
	High Temperature (350°C)					G				
	Temperature compensation					W				
	Pressure compensation					Y				
	Temperature & Pressure compensation					Z				
<b>Structure Type</b>	Compact/integral						1			
	Remote						2			
<b>Power supply</b>	DC24V							D		
	3.6V Lithium battery							E		
	Others							G		
<b>Output Signal</b>	4÷20 mA								A	
	Pulse								B	
	4÷20mA   Hart								C	
	Pulse, RS485								D	
	4÷20mA/Pulse   Hart								E	
	Others								F	
<b>Flange Standard</b>	DIN PN16									1
	DIN PN25									2
	DIN PN40									3
	ANSI 150#									A
	ANSI 300#									B
	ANSI 600#									C
	JIS 10K									D
	JIS 20K									E
	JIS 40K									F
	Others									G

Table 10

CALIBER	CODE
15	150
20	200
25	250
32	320
40	400
50	500
65	650
80	800
100	101
125	125
150	151
200	201
250	251
300	301