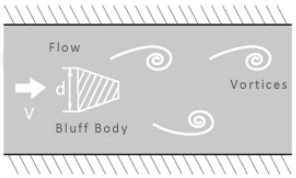
STLU Vortex Flowmeter

1. Working Principle

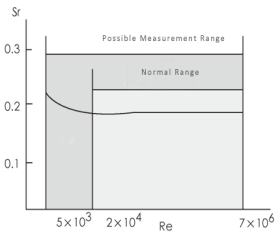
When a column body placed in flowing fluids in pipe, a series of vortices will be generated alternately on each side of the object as shown as below, these eddies known as "Karman Vortices", the frequency of the vortex shedding is related to the velocity of the fluid and the width of the body. Expressed by formula as below:

$$f=Sr\ .v/d$$

Thereinto f----fre quency of Karman Vortex shedding
Sr----Strouhal number
v----velocity
d----width of column object



Because the frequency of the vortex shedding is proportional to the velocity, it can be used to calculate the instantaneous flowrate .



Strouhal number is a very important coefficient in the Vortex Flowmeter. In the range of straight line of St≈0.17 in curve, frequency of vort ex shedding is proportional to the velocity, so as long as the frequency (f) be detected, the velocity (v) will be obtained, and volumetric flowrate will be got according to v.

For STLU Vortex Flowmeter, its frequency of the vortex shedding was detected by the stress force which exerted

2. Main Features:

1. Best of STLU Intelligent Vortex Flow Transducer is piezocrystal built in bluff body to avoid fluid turbulence caused by external type, no zero drift, and high reliability.
2. By lots of wave analysis of vortex flow transducer for a long time, Silver Company has designed the most scientific probe shape, wall thickness, height, probe rod diameter and matching piezocrystal, adopts advanced CNC to machine to ensure technical parameters of proper alignment and smooth finish etc., and with special treating process to maximatily overcome existed signal influence by intrinsic self-oscillation frequency.
3. STLU Intelligent Vortex Flow Transducer has good commonality and interchangeability. Adopt advanced CNC to machine parts such as transducer body and bluff body etc. to ensure machining accuracy to make parts (especial for bluff body) has good commonality, so that, repeatability and accuracy won't be affected by parts change and get signal with high signal noise ratio and good stability.
4. Simple & fixed structure, no moving parts, high reliability, convenient maintenance.
5. Wide measuring range, turndown ratio can reach 10:1 in Reynolds Number 2×10^{4}~ 7×10^{6}.
6. Detecting element not contact with the measured fluids directly, stable performance and long service life.
7. Detecting probe and bluff body installed independently, and high temperature resistance piezocrystal sealed in bluff body make transducer simple structure, good commonality and high stability.
8. Output pulse signal and current signal directly proportional to flowrate, and have RS-485, Hart, ModBus communication for convenient computer networking.
9. When vortex flow transducer measures liquid volumetric flow, it does not need temperature, pressure compensation. Vortex output signal is linear to velocity, that is to say, directly proportional to volumetric flowrate. When measure gas or steam, it needs temperature and pressure compensation. Compensating pressure and temperature is to get volumetric flow of gas under standard state or mass flow of steam.
10. Low pressure loss, just 1/4 ~ 1/2 of orifice plate.
11. In a specific range of Reynolds Number, flow character just refers to bluff body shape and dimension, and not affected by fluid pressure, temperature, viscosity, density and ingredients.
12. Wide application, can measure flowrate of steam, gas, liquid etc

3. Technical Parameter Table

Table 1

Installation Type	Measured Fluid	Accuracy	Repeatability
Pipe Type	Gas (incl.steam)	±1.5 % ±1.0%	0.50% 0.33%
Inserted Type	Gas Liquid	±3.0% ±2.5%	1.00% 0.83%

Measuring Range	Gas (incl.steam): 7~55 m/s (7~50 m/s for DN ⩾ 200) Liquid：0.7~5.5 m/s
Rated Pressure	GB 1.6Mpa,2.5Mpa,4.0Mpa,6.4Mpa DIN PN16,PN25,PN40 JIS 10K,20K,40K ANSI Class 150,Class 300, Class 600
Fluid Temperature	-40~+250℃（-40~+120℃ for inserted） +100~+350 ℃ （high temp）
Installation Type	Pipe Vortex Flow Transducer Inserted
Parts Name	Material
Transducer Body	304 SS
Bluff Body	304SS
Detecting Probe Connecting Rod	316SS 304SS
Radiattor	A-alloy
Gasket	High Temperature Resistance Asbestos NBR Graphite
Power Suply	24V DC 3.6V Lithium Battery (Local display) Double Power Supply (24VDC,3.6V Lithium Battery)
Output Signal	Pulse, 4~20mA, RS-485,Hart,Modbus
Electric Terminal	M20*1.5
Protection Grade	Flameproof Exd II BT3-6 Insteinsical Safe Exia II CT3-6
Body Process	SS Sand-blast for Transducer Body And Plastic Coating for Amplifier Cover
Ambient Temperature	-35~60℃ (No LCD) -5~60 ℃ (with LCD)
Relative Humidity	5~95%

4. Flow Range

Selection of measuring saturated steam mass flowrate Measuring range (t/h)

Table 2

DN(mm)	0.1Mpa		0.2Mpa		0.3Mpa		0.4Mpa		0.5Mpa		0.6Mpa		0.7Mpa		0.8Mpa	
15	5.8-38.74 kg/h		7.0-56.7 kg/h		81-74.3 kg/h		8.8-91.6kg/h		9.7-108.8 kg/h		10.4-125.9 kg/h		10.9-141.9 kg/h		11.6-159.7 kg/h	
20	10.6-68.9 kg/h		12.8-100.8 kg/h		14.7-132.0 kg/h		16.2-162.9 kg/h		17.8-193.5 kg/h		19.1-223.8 kg/h		20.2-252.3 kg/h		21.5-284.0 kg/h	
25	13.4-17.7 kg/h		16.2-157.4 kg/h		18.2-206/3 kg/h		20.5-254.5 kg/h		22.4-302.3 kg/h		25.5-394.2 kg/h		25.5-394.2 kg/h		27.1-443.8 kg/h	
32	21.8-176.5 kg/h		26.3-258.0 kg/h		29.6-338.1 kg/h		33.3-417.0 kg/h		36.2-495.1 kg/h		39.2~572.9 kg/h		25.5-394.2 kg/h		27.1-443.8 kg/h	
40	26.5-275.8 kg/h		32.0-430.1 kg/h		36.1-528.2 kg/h		40.6-651.6 kg/h		44.1-773.7 kg/h		47.7-895.3 kg/h		0.05	1.01	0.05	1.14
50	0.04	0.43	0.04	0.64	0.05	0.83	0.06	1.01	0.06	1.21	0.07	1.39	0.08	1.58	0.09	1.77
65	0.07	0.73	0.08	1.06	0.09	1.39	0.10	1.72	0.11	2.04	0.12	2.36	0.13	2.66	0.14	2.99
80	0.10	1.09	0.12	1.61	0.13	2.19	0.14	2.60	0.15	3.09	0.16	3.58	0.17	4.03	0.18	4.55
100	0.15	1.72	0.18	2.52	0.21	3.29	0.23	4.06	0.25	4.84	0.27	5.60	0.28	6.31	0.30	7.10
125	0.27	2.69	0.31	3.94	0.36	5.16	0.41	6.37	0.46	7.55	0.51	8.74	0.56	9.85	0.61	11.09
150	0.33	3.87	0.40	5.67	0.46	7.43	0.51	9.17	0.56	10.88	0.60	12.59	0.64	14.19	0.71	15.97

200	0.70	6.27	0.84	9.17	0.95	12.00	1.06	14.81	1.16	17.59	1.25	20.34	1.33	22.93	1.42	25.82
250	1.25	9.79	1.51	14.31	1.68	18.76	1.92	23.13	2.07	27.48	2.26	31.79	2.41	35.83	2.54	40.34
300	1.43	14.40	2.17	20.61	2.70	27.01	2.76	33.32	2.93	39.57	3.23	45.78	3.45	56.61	3.64	58.09

Table 3

DN(mm)	0.9Mpa		1.0 Mpa		1.1 Mpa		1.2 Mpa		1.3 Mpa		1.4 Mpa		1.5 Mpa		1.6 Mpa	
15	12.1-1766 kg/h		12.8-193.5 kg/h		13.2-210.3 kg/h		13.7-227.1 kg/h		14.3-243.8 kg/h		14.9-260.6 kg/h		15.3-2777.3 kg/h		15.8-294.1 kg/h	
20	22.6-314.0 kg/h		23.8-343.9 kg/h		24.9-373.9 kg/h		26.1-403.7 kg/h		27.3-433.6 kg/h		28.2-463.3 kg/h		29.3-490.0 kg/h		30.4-522.8 kg/h	
25	28.6-490.7 kg/h		30.0-537.3 kg/h		31.2-584.1 kg/h		32.4-630.7 kg/h		33.5-677.4 kg/h		34.8-723.9 kg/h		36-770.3 kg/h		37.2-816.9 kg/h	
32	46.5-803.9 kg/h		48.0-880.4 kg/h		50.1-957.6 kg/h		0.05	1.04	0.05	1.11	0.05	1.18	0.06	1.25	0.06	1.34
40	0.05	1.26	0.06	1.38	0.06	1.49	0.06	1.61	0.06	1.74	0.06	1.86	0.07	1.97	0.07	2.09
50	0.09	1.97	0.10	2.15	0.10	2.33	0.11	2.52	0.11	2.71	0.12	2.90	0.12	3.08	0.13	3.26
65	0.14	3.31	0.15	3.63	0.15	3.95	0.15	4.27	0.16	4.58	0.16	4.89	0.17	5.21	0.18	5.52
80	0.19	5.02	0.20	5.50	0.21	5.98	0.22	6.45	0.23	6.94	0.24	7.42	0.25	7.88	0.26	8.36
100	0.32	7.85	0.33	8.56	0.35	9.35	0.37	10.09	0.38	10.84	0.39	11.58	0.40	12.32	0.41	13.07
125	0.66	12.27	0.72	13.44	0.79	14.60	0.85	15.77	0.90	16.94	0.97	18.10	1.02	19.26	1.07	20.42
150	0.78	17.66	0.84	19.35	0.90	21.03	1.08	22.71	1.17	24.38	1.25	26.06	1.32	27.73	1.39	29.41
200	1.53	28.54	1.64	31.27	1.75	34.00	1.87	36.70	2.01	39.42	2.13	42.12	2.26	44.82	2.39	47.53
250	2.68	44.61	2.84	48.89	3.01	53.11	3.23	57.34	3.37	61.59	3.51	65.81	3.65	70.03	3.79	74.27
300	3.82	64.23	4.01	70.33	4.25	76.44	4.49	82.57	4.74	88.69	4.98	94.77	5.23	100.84	5.46	106.94

(Note: Pressure above is gauge pressure)

Table 4

Measuring Mass Flowrate of Superheated Steam			Measuring Volumetric flowrate of Gas(under operating pressure)		
DN(mm)	MIN flowrate (t/h)	Max flowrate(t/h)	DN (mm)	MIN flowrate(m^3/min)	MAX flowrate (m^3/min)
15	5.40 $2\sqrt[2]{\rho}$ kg/h	34.97ρ kg/h	15	0.088/ $\sqrt[2]{\rho}$	0.59
20	9.88 $2\sqrt[2]{\rho}$ kg/h	62.17ρ kg/h	20	0.156/ $\sqrt[2]{\rho}$	1.04
25	12.492 $\sqrt[2]{\rho}$ kg/h	97.14ρ kg/h	25	0.201/ $\sqrt[2]{\rho}$	1.61
32	20.352 $\sqrt[2]{\rho}$ kg/h	159.15ρ kg/h	32	0.328/ $\sqrt[2]{\rho}$	2.65
40	24.882 $\sqrt[2]{\rho}$ kg/h	248.69ρ kg/h	40	0.397/ $\sqrt[2]{\rho}$	4.16
50	37.102 $\sqrt[2]{\rho}$ kg/h	388.58ρ kg/h	50	0.658/ $\sqrt[2]{\rho}$	6.48
65	65.672 $\sqrt[2]{\rho}$ kg/h	656.68ρ kg/h	65	0.995/ $\sqrt[2]{\rho}$	10.94
80	99.662 $\sqrt[2]{\rho}$ kg/h	994.75ρ kg/h	80	1.51/ $\sqrt[2]{\rho}$	16.57
100	0.142 $\sqrt[2]{\rho}$	1.55ρ	100	2.36/ $\sqrt[2]{\rho}$	25.91
125	0.222 $\sqrt[2]{\rho}$	2.44ρ	125	3.68/ $\sqrt[2]{\rho}$	40.48
150	0.312 $\sqrt[2]{\rho}$	3.50ρ	150	5.27/ $\sqrt[2]{\rho}$	58.30

200	0.652 $\sqrt[2]{\rho}$	5.63 ρ	200	9.42/ $\sqrt[2]{\rho}$	94.22
250	1.052 $\sqrt[2]{\rho}$	8.83 ρ	250	14.73/ $\sqrt[2]{\rho}$	147.22
300	1.352 $\sqrt[2]{\rho}$	12.72 ρ	300	21.2/ $\sqrt[2]{\rho}$	212.00
			350	28.86/ $\sqrt[2]{\rho}$	288.44
			400	37.7/ $\sqrt[2]{\rho}$	376.78
			450	47.71/ $\sqrt[2]{\rho}$	476.89
			500	58.9/ $\sqrt[2]{\rho}$	588.78
			600	84.82/ $\sqrt[2]{\rho}$	847.78
			700	115.4/ $\sqrt[2]{\rho}$	1154.00
			800	150.8/ $\sqrt[2]{\rho}$	1507.22
			900	190.8/ $\sqrt[2]{\rho}$	1907.56
			1000	235.6/ $\sqrt[2]{\rho}$	2355.00
			1200	339.3/ $\sqrt[2]{\rho}$	3391.22

Note : ρ ---- Density of superheat steam under operating condition.(Kg/m^3)
Refer to Appendix .4

Note :
1. ρ ---- Density of superheat steam under operating condition.(Kg/m^3)
2. Formula : $\rho = \frac{(\square + 0.101325) \times 10.972 \times 10^4}{\mathbf{R} \times (\mathbf{t} + \mathbf{2}.\mathbf{3}.\mathbf{15})}$

Thereinto : ρ --Operating pressure(Gauge pressure)Mpa
t—Medium temperature ℃
R—Gas constant
Refer to Appendix . 3(Gas character and common date)
3. DN~DN300 is piped vortex flow transducer
DN300~DN1200(expendable to DN1600mm) is measuring range of inserted vortex flow transducer

Table 5

Measuring Volunmetric Flowrate of Gas(under Standard condition)			Measuring Volumetric Flowrate of Liquid		
DN (mm)	Min flowrate (Nm^3/min)	Max flowrate(Nm^3/ min)	DN(mm)	Min flowrate(m^3/h)	Max flowrate(m^3/h)
15	0.088k/	0.59k	15	12.01/ $\sqrt[2]{\rho}$	3.53
20	0.156 k/ $\sqrt[2]{\rho}$	1.04k	20	21.18/ $\sqrt[2]{\rho}$	6.22
25	0.201 k/ $\sqrt[2]{\rho}$	1.61k	25	33.2/ $\sqrt[2]{\rho}$	9.71
32	0.328 k/ $\sqrt[2]{\rho}$	2.65k	32	106.6/ $\sqrt[2]{\rho}$	15.92
40	0.397 k/ $\sqrt[2]{\rho}$	4.16k	40	133.7/ $\sqrt[2]{\rho}$	24.87
50	0.658 k/ $\sqrt[2]{\rho}$	6.48k	50	167/ $\sqrt[2]{\rho}$	38.86
65	0.995 k/ $\sqrt[2]{\rho}$	10.94k	65	226.4/ $\sqrt[2]{\rho}$	65.67
80	1.51 k/ $\sqrt[2]{\rho}$	16.57k	80	343.1/ $\sqrt[2]{\rho}$	99.47
100	2.36 k/ $\sqrt[2]{\rho}$	25.91k	100	536/ $\sqrt[2]{\rho}$	155.43
125	3.68 k/ $\sqrt[2]{\rho}$	40.48k	125	837.7/ $\sqrt[2]{\rho}$	242.88

150	5.27 k/ $\sqrt[2]{\rho}$	58.30k	150	1206.4/ $\sqrt[2]{\rho}$	349.69
200	9.42 k/ $\sqrt[2]{\rho}$	94.22k	200	2144.8/ $\sqrt[2]{\rho}$	612.72
250	14.73 k/ $\sqrt[2]{\rho}$	147.22k	250	3351.3/ $\sqrt[2]{\rho}$	971.41
300	21.2 k/ $\sqrt[2]{\rho}$	212.00k	300	4825.9/ $\sqrt[2]{\rho}$	1398.87
350	28.86 k/ $\sqrt[2]{\rho}$	288.44k	350	6568.5/ $\sqrt[2]{\rho}$	1904.02
400	37.7 k/ $\sqrt[2]{\rho}$	376.78k	400	8576.7/ $\sqrt[2]{\rho}$	2486.88
450	47.71 k/ $\sqrt[2]{\rho}$	476.89k	450	10856.8/ $\sqrt[2]{\rho}$	3147.43
500	58.9 k/ $\sqrt[2]{\rho}$	588.78k	500	13405.8/ $\sqrt[2]{\rho}$	3885.75
600	84.82 k/ $\sqrt[2]{\rho}$	847.78k	600	19303.9/ $\sqrt[2]{\rho}$	5595.48
700	115.4 k/ $\sqrt[2]{\rho}$	1154.00k	700	26274/ $\sqrt[2]{\rho}$	7616.07
800	150.8 k/ $\sqrt[2]{\rho}$	1507.22k	800	34316.2/ $\sqrt[2]{\rho}$	9947.52
900	190.8 k/ $\sqrt[2]{\rho}$	1907.56k	900	43433.7/ $\sqrt[2]{\rho}$	12589.83
1000	235.6 k/ $\sqrt[2]{\rho}$	2355.00k	1000	53623.3/ $\sqrt[2]{\rho}$	15543
1200	339.3 k/ $\sqrt[2]{\rho}$	3391.22k	1200	77215.6/ $\sqrt[2]{\rho}$	22381.92

Notes :

1 . ρ ---gas density under operating condition (Kg/m^3)

2. $k=\frac{P+0.101325}{0.101325} X \frac{293.15}{1+273.15}$

Thereinto : P -- working pressure (gauge pressure) Mpa
t--- temperature(℃)

3. Standard condition 20℃ ,0.1Mpa (absolute pressure),or under
Standard atmospheric pressure at 20℃

4. The flowrate measuring range:
DN15~500 for Piped Vortex Flow transducer
DN500~1200(expandable to 1600 mm) for Inserted Vortex Flow transducer

Notes:

1. P ----liquid density under operating condition(Kg/m^3)
Density of water under normal temperature and pressure is 1000Kg/m^3, $\sqrt[2]{\rho}$ =31.623

2. The flowrate measuring range:
DN15~500 for Piped Vortex Flow transducer
DN500~1200 (expandable to 1600mm) for Inserted Vorte)
(Flow transducer

5. Selection Table of STLU Intelligent Vortex Flow Transducer

Table 6

Item	Code	Description
Factory Mark	STLU	Silver Automation Instruments
Working Principle	V	Karman Vortices
Meter Type	F	Flowmeter
Meter Catagory	N	Standard Intelligent
Installing Type	-1	Flanged(DN50~DN300)
	2	Wafer type (DN15~DN300)
	3	Fixed Inserted
	4	Adjustable Inserted
	5	Adjustable Inserted (with Ball Valve)

Measured Fluid	2	Liquid
	3	Gas
	4	Steam
Nominal Diameter	-015	15mm
	020	20mm
	02	25mm
	03	32mm
	04	40mm
	05	50mm
	06	65mm
	08	80mm
	10	100mm
	12	125mm
	15	150mm
	20	200mm
	25	250mm
	30	300mm
	DN/10(for Inserted)	DN(DN ⩾ 250mm)
Indicator	D	With Digital Indicator
	N	No Indicator
Power Supply	-1	24V DC
	2	3.6V Lithium Battery
	3	Double Power Supply(24V DC,3.6v Lithium Battery)
Output Signal	0	No output
	1	Pulse Output
	2	Two Wire :4~20mA DC
	3	RS-485 (manufacture-defined protocol)
	4	Hart
	5	RS-485 (Modbus)
Fluid Temperature	1	Standard -40~250℃ (-40~120℃ for inserted)
	3	High Temperature Type :+100~+350℃
Rated Pressure	-G1	GB 1.6Mpa
	G2	GB 2.5 Mpa
	G3	GB 4.0 Mpa
	G4	GB 6.4 Mpa
	D1	DIN PN16
	D2	DIN PN25
	D3	DIN PN40
	J1	JIS 10K
	J2	JIS 20K
	J3	JIS 40K
	A1	ANSI Class 150
	A2	ANSI Class 300
	A3	ANSI Class 600
Explosion Proof	N	Non
	d	Flameproof
	i	Intrinsically Safe

Compensation	0	No compensation
	1	With temperature and pressure compensation
Companion Flange	0	No
	1	With

6. Dimensions

1) Wafer Type Vortex Flowmeter Dimension

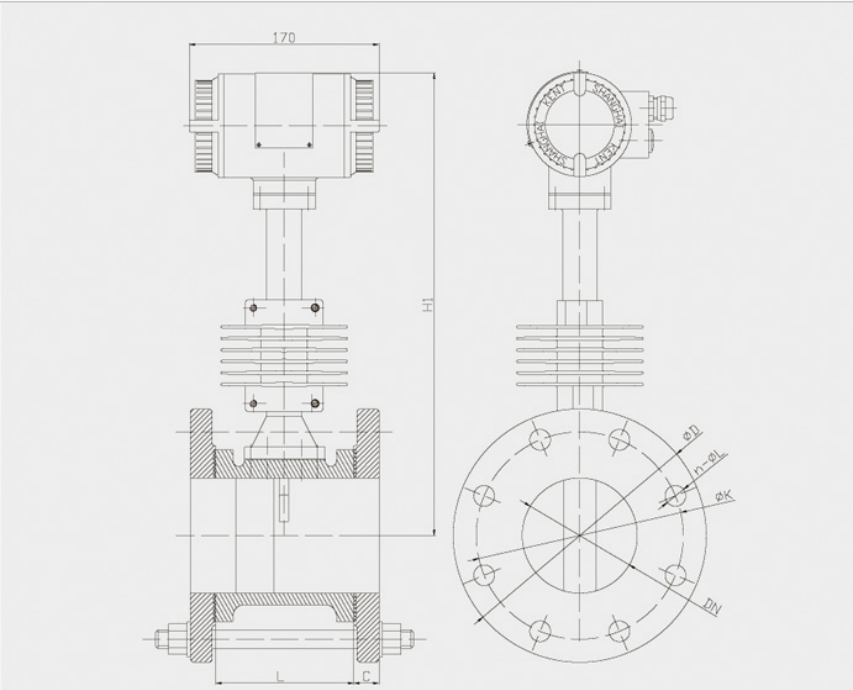


Table 7

DN	H1±2	L	ΦD	ΦK	n-ΦL	C
15	341	100	95	65	4-Φ14	14
20	343	100	105	75	4-Φ14	16
25	346	100	115	85	4-Φ14	16
32	349	100	140	100	4-Φ18	18
40	353	100	150	110	4-Φ18	18

Notes:

1. This outline drawing is high temperature type vortex flow transducer; standard type does not have cooling fin;
2. Flange dimension refers to GB/T9115.2-2000, unit is mm.

2) Wafer Type Vortex Flowmeter Dimension

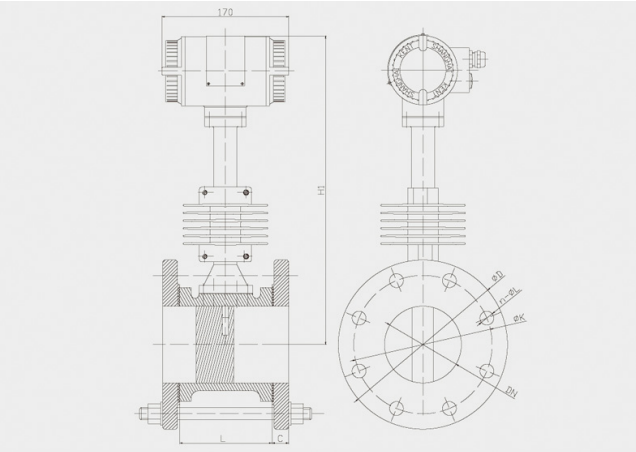


Table 8

DN	H1±2	L	1.6 Mpa				2.5 Mpa				4.0Mpa				6.4Mpa			
			ΦD	ΦK	n-ΦL	C	ΦD	ΦK	n-ΦL	C	ΦD	ΦK	n-ΦL	C	ΦD	ΦK	n-ΦL	C
50	353	100	165	125	4-Φ18	20	165	125	4-Φ18	20	165	125	4-Φ18	20	180	135	4-Φ22	26
65	359	100	185	145	4-Φ18	20	185	145	8-Φ18	22	185	145	8-Φ18	22	205	160	8-Φ22	26
80	365	100	200	160	8-Φ18	20	200	160	8-Φ18	24	200	160	8-Φ18	24	215	170	8-Φ22	28
100	374	100	200	180	8-Φ18	22	235	190	8-Φ22	26	235	190	8-Φ22	26	250	200	8-Φ26	30
125	388	100	250	210	8-Φ18	22	270	220	8-Φ26	28	270	220	8-Φ26	28	295	240	8-Φ30	34
150	401	100	285	240	8-Φ22	24	300	250	8-Φ26	30	300	250	8-Φ26	30	345	280	8-Φ33	36
200	428	125	340	295	12-Φ22	26	375	310	12-Φ26	32	375	320	12-Φ30	36	415	345	12-Φ36	42
250	454	145	405	355	12-Φ26	28	450	370	12-Φ30	35	450	385	12-Φ33	42				
300	480	160	460	410	12-Φ22	32	515	430	16-Φ30	38	515	450	16-Φ33	48				

Notes:

1. This outline drawing is high temperature vortex flow transducer; standard type does not have cooling fin;

2. Flange dimension refers to GB/T9115.2-2000, unit is mm.

3) Flange type Vortex Flowmeter Dimension (GB/T9115.2-2000)

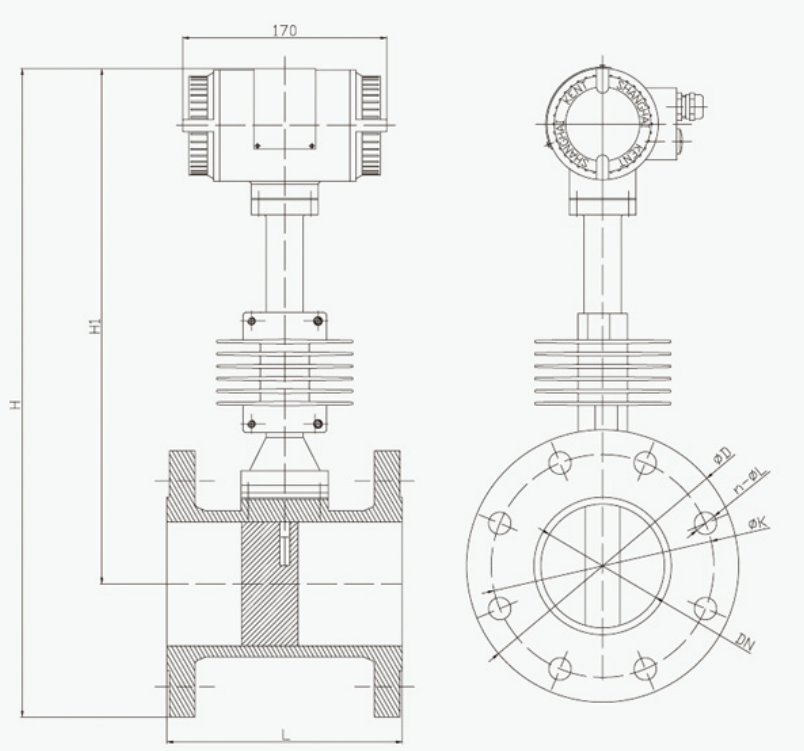


Table 9

DN	H±3				H1 ±2	1.6MPa				2.5MPa				4.0MPa				6.4MPa			
	1.6 MPa	2.5 MPa	4.0 MPa	6.4 MPa		L	ΦD	ΦK	n-ΦL	L	ΦD	ΦK	n-ΦL	L	ΦD	ΦK	n-ΦL	L	ΦD	Φk	N-ΦL
50	436	436	436		353	190	165	125	4-Φ18	190	165	125	4-Φ18	190	165	125	4-Φ18				
65	452	452	452		359	190	185	145	4-Φ18	200	185	145	8-Φ18	200	185	145	8-Φ18				
80	466	466	466		365	190	200	160	8-Φ18	210	200	160	8-Φ18	210	200	160	8-Φ18				
100	485	492	492		374	200	220	180	8-Φ18	210	235	190	8-Φ22	210	235	190	8-Φ22				
125	514	524	524		388	200	250	210	8-Φ18	220	270	220	8-Φ26	220	270	220	8-Φ26				
150	544	552	552		401	210	285	240	8-Φ18	220	300	250	8-Φ26	220	300	250	8-Φ26				
200	599	609	616		428	235	340	295	12-Φ22	235	360	310	12-Φ30	255	375	320	12-Φ30				
250	657	667	680	690	454	265	405	355	12-Φ26	265	425	370	12-Φ30	275	450	385	12-Φ33	275	470	400	12-Φ36
300	716	723	738	746	480	280	460	410	12-Φ26	280	485	430	16-Φ30	290	515	450	16-Φ33	290	530	460	16-Φ36

Notes:
1. This outline drawing is high temperature vortex flow transducer; standard type does not have cooling fin;
2. Flange dimension refers to GB/T9115.2-2000, unit is mm.

4) Flange type Vortex Flowmeter Dimension (DIN2631-2637)

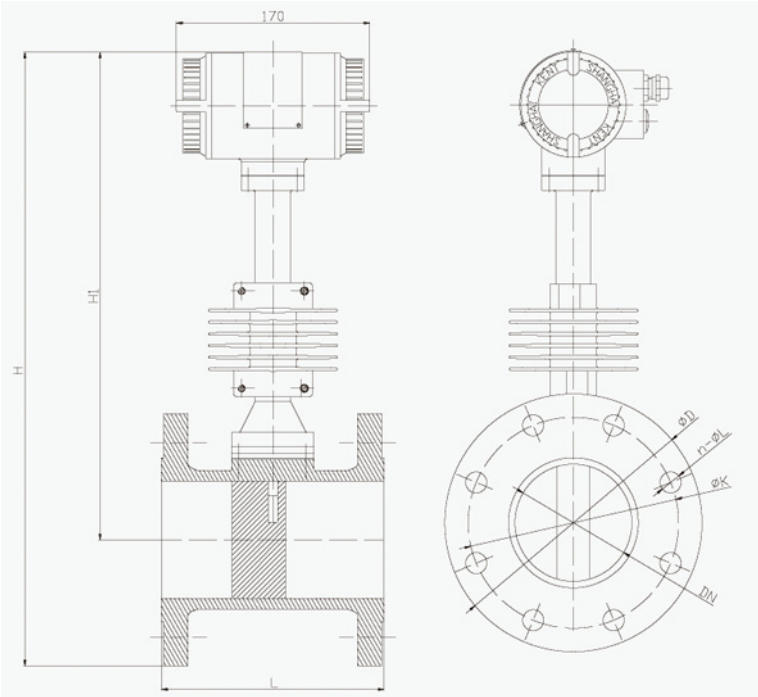


Table 10

DN	H±3			H1±2	PN16				PN25				PN40			
	PN16	PN25	PN40		L±2	ΦD	ΦK	n-ΦL	L±2	ΦD	ΦK	n-ΦL	L±2	ΦD	ΦK	n-ΦL
50	436	436	436	353	190	165	125	4-Φ18	190	165	125	4-Φ18	190	165	125	4-Φ18
65	452	452	452	359	190	185	145	4-Φ18	200	185	145	8-Φ18	200	185	145	8-Φ18
80	466	466	466	365	190	200	160	8-Φ18	210	200	160	8-Φ18	210	200	160	8-Φ18
100	485	485	492	374	200	220	180	8-Φ18	210	235	190	8-Φ22	210	235	190	8-Φ22
125	514	514	524	388	200	250	210	8-Φ18	220	270	220	8-Φ26	220	270	220	8-Φ26
150	544	544	552	401	210	285	240	8-Φ22	220	300	250	8-Φ26	220	300	250	8-Φ26
200	599	599	616	428	235	340	295	12-Φ22	235	360	310	12-Φ26	255	375	320	12-Φ30
250	657	657	680	454	265	405	355	12-Φ26	265	425	370	12-Φ30	275	450	385	12-Φ33
300	716	716	743	480	280	460	410	12-Φ26	280	485	430	16-Φ30	290	515	450	16-Φ33

Notes:
1.This outline drawing is high temperature vortex flow transducer; standard type does not have cooling fin;
2.DIN flange size refers to DIN2631-2637,unit is mm;

5). Flange type Vortex Flowmeter Dimension (JIS B2220:2004)

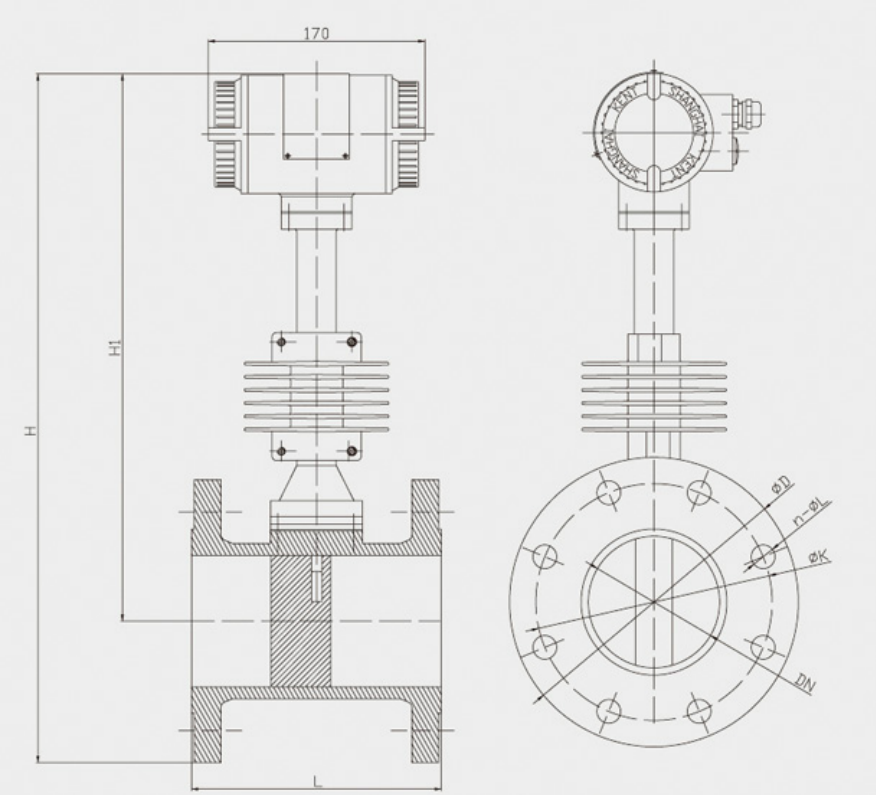


Table 11

DN	H±3			H1±2	10K				20K				40K			
	10K	20K	40K		L±2	ΦD	ΦK	n-ΦL	L±2	ΦD	ΦK	n-ΦL	L±2	ΦD	ΦK	n-ΦL
50	431	431	436	353	190	155	120	4-Φ15	190	155	120	8-Φ19	190	165	130	8-Φ19
65	447	447	460	359	190	175	140	4-Φ15	200	175	140	8-Φ19	200	200	160	8-Φ23
80	458	466	471	365	190	185	150	8-Φ15	210	200	160	8-Φ23	210	210	170	8-Φ23
100	480	487	500	374	200	210	175	8-Φ15	210	225	185	8-Φ23	210	250	205	8-Φ25
125	514	524	539	388	200	250	210	8-Φ19	220	270	225	8-Φ25	220	300	250	8-Φ27
150	542	554	579	401	210	280	240	8-Φ19	220	305	260	12-Φ25	220	355	295	12-Φ33
200	594	603	631	428	235	330	290	12-Φ19	235	350	305	12-Φ25	255	405	345	12-Φ33
250	655	670	692	454	265	400	355	12-Φ23	265	430	380	12-Φ27	275	475	410	12-Φ33
300	708	726	756	480	280	445	400	16-Φ23	280	480	430	16-Φ27	290	540	470	16-Φ39

Notes:
1.This outline drawing is high temperature vortex flow transducer;standard type does not have cooling fin;
2.JIS flange size refers to JIS B2220:2004,unit is mm.

6). Flange type Vortex Flowmeter Dimension (ANSI B16.5)

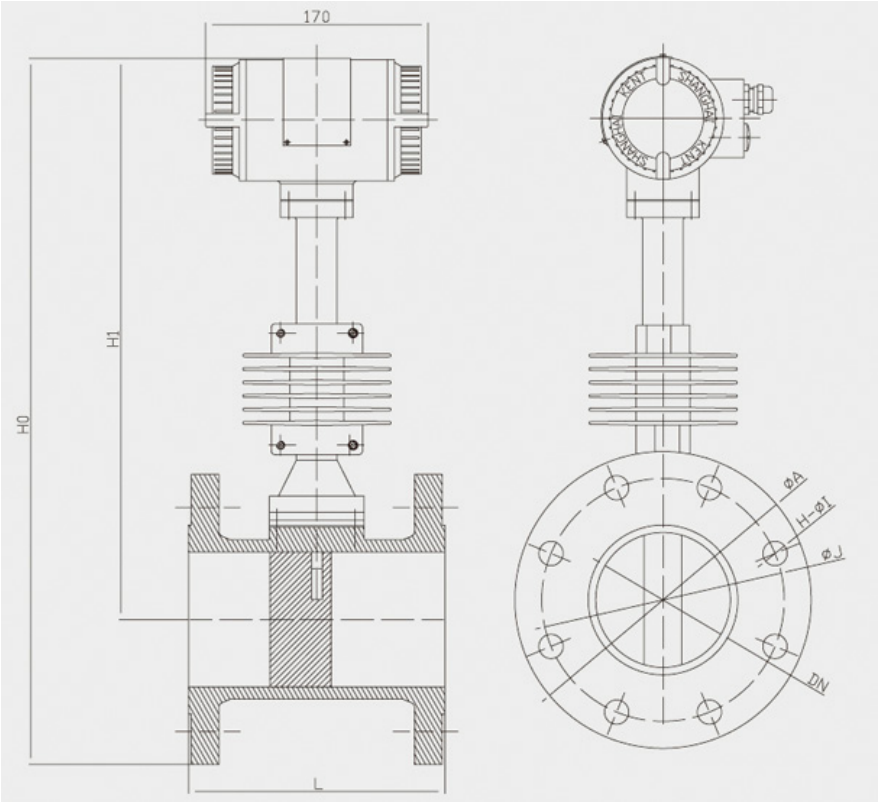
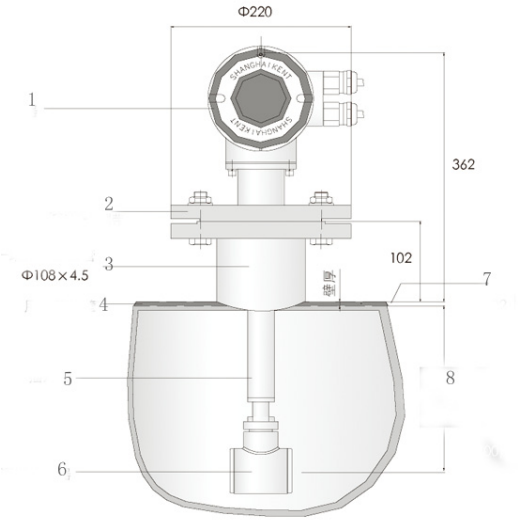


Table12

DN	HO			H1	CL150				CL300				CL600			
	CL150	CL300	CL600		L	ΦA	ΦJ	H-ΦI	L	ΦA	ΦJ	H-ΦI	L	ΦA	ΦJ	H-ΦJ
2	17.40	17.65	17.65	13.90	7.50	6.00	4.75	4-0.75	8.00	6.50	5.00	8-0.75	9.00	6.50	5.00	8-0.75
2 1/2	17.88	18.23	18.23	14.13	7.50	7.00	5.50	4-0.75	9.00	7.50	5.88	8-0.88	9.00	7.50	5.58	8-0.88
3	18.62	18.87	18.87	14.37	7.50	7.50	6.00	4-0.75	9.00	8.25	6.62	8-0.88	9.50	8.25	6.62	8-0.88
4	19.22	19.72	20.10	14.72	8.00	9.00	7.50	8-0.75	9.00	10.00	7.88	8-0.88	10.00	10.75	8.50	8-1.00
5	20.28	20.78	21.78	15.28	8.00	10.00	8.50	8-0.88	9.50	11.00	9.25	8-0.88	10.50	13.00	10.50	8-1.12
6	21.29	22.04	22.79	15.79	8.50	11.00	9.50	8-0.88	9.50	12.50	10.62	12-0.88	10.50	14.00	11.50	12-1.12
8	23.60	24.35	25.10	16.85	9.50	13.50	11.75	8-0.88	11.00	15.00	13.00	12-1.00	12.50	16.50	13.75	12-1.25
10	25.87	26.62	27.87	17.87	10.50	16.00	14.25	12-1.00	12.50	17.50	15.25	16-1.12	14.00	20.00	17.00	16-1.38
12	28.40	29.15	29.90	18.90	11.00	19.00	17.00	12-1.00	13.50	20.50	17.75	16-1.25	15.00	22.00	19.25	20-1.38

Notes:
1.This outline drawing is high temperature vortex flow transducer;standard type does not have cooling fin;
2.ANSI flange size refers to ANSI B16.5, unit is mm

6) Fixed Insertion Vortex Flowmeter Outline Dimension



Parts:

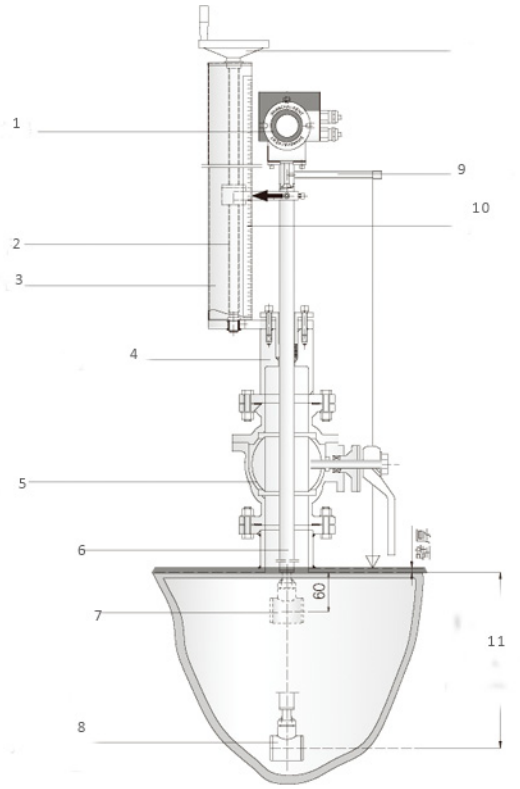
1. Converter
2. Body flange
3. short duct with flange
4. Outer wall of customer's pipe
5. Inserted rod
6. Vortex transducer
7. Customer's pipe
8. R=1/2" diameter of the pipe (DN<800)
   R=0.121 inner diameter of the pipe (DN≥800)

Table 13

DN	OD X Thickness	R	DN	OD X Thickness	R
250	273 X 11.5	125	800	820 X 10	96.8
300	325 X 12.5	150	900	920 X 10	108.9
350	377 X 13.5	175	1000	1020 X 10	121
400	426 X 13	200	1200	1220 X 10	145.2
450	478 X 14	225	1400	1420 X 10	169.4
500	529 X 14.5	250	1600	1620 X 10	193.6
600	630 X 15	300	1800	1820 X 10	217.8
700	720 X 10	350	2000	2020 X 10	242

Notes: Above information is just for reference,mm for unit

7) Adjustable Insertion Vortex Flow meter outline Diamension



Parts:

1. Converter
2. Screw rod
3. Encloser
4. Seat for inserted rod
5. Ball valve
6. Inserted rod
7. Vortex transducer
8. Vortex transducer
9. Hand handle
10. Guide rod
11. Scale
12. R=1/2" diameter of the pipe (DN<800)
    R=0.121 inner diameter of the pipe (DN≥800)

Table 14

DN	OD X Thickness	R	DN	OD X Thickness	R
250	273 X 11.5	125	800	820 X 10	96.8
300	325 X 12.5	150	900	920 X 10	108.9
350	377 X 13.5	175	1000	1020 X 10	121
400	426 X 13	200	1200	1220 X 10	145.2
450	478 X 14	225	1400	1420 X 10	169.4
500	529 X 14.5	250	1600	1620 X 10	193.6
600	630 X 15	300	1800	1820 X 10	217.8
700	720 X 10	350	2000	2020 X 10	242

Notes: Above information is just for reference,mm for unit