STLU Vortex Flow Meter

Main Features

- 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.
- Option with built-in temperature and pressure and temperature compensation
- By lots of wave analysis of vortex flow transducer for a long time, Silver 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.
- 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.
- Simple & fixed structure, no moving parts, high reliability, convenient maintenance.
- Wide measuring range, turndown ratio can reach 10:1 in Reynolds Number 2×10~ 7× 10. 4 6
- Detecting element not contact with the measured fluids directly, stable performance and long service life.
- 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.
- Output pulse signal and current signal directly proportional to flowrate, and have RS-485, Hart, ModBus communication for convenient computer networking.
- 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.
- Low pressure loss, just 1/4 ~ 1/2 of orifice plate.
- 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.
- Wide application, can measure flowrate of steam, gas, liquid etc

Product Pictures

No display
Wafer connection
No compensation
Pulse frequency output
Economical vortex meter

Digital display
Wafer connection
No compensation
4-20mA or pulse
Hart orModbus option

Digital display
Wafer connection
Temp or pres.compensation
4-20mA or pulse
Hart orModbus option

Digital display
Flange connection
No compensation
4-20mA or pulse
Hart orModbus option

Digital display
Flange connection
Temp & pres.compensation
4-20mA or pulse
Hart orModbus option

Digital display
Thread connection
No compensation
4-20mA or pulse
Hart orModbus option

Digital display
Tri-clamp connection
No compensation
4-20mA or pulse
Hart orModbus option

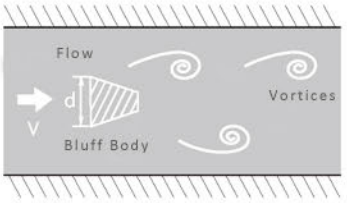
Digital display
Insertion
No compensation
4-20mA or pulse
Hart orModbus option

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:

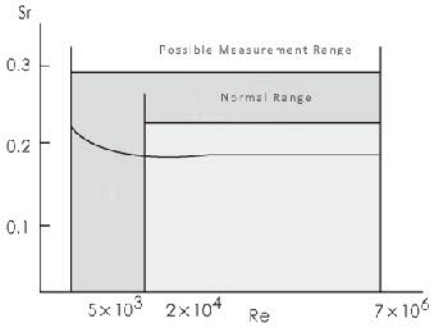
f=Sr .v/d

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



Technical Parameters

Table 1

Vortex Flow meter Main Technical Parameters			
Fluids		Gas, steam	Liquid
Accuracy		±1.5%	± 1.0%
Repeatability		±0.5%	±0.33%
Reynolds Number		2×10^4~7×10^6	
Media Temp.	Standard	-40° C~+250° C	
	Extension	-40° C~+300° C or higher	
Turn Down Ratio		1:6~1:30	
Size		DN25~DN300 in line type，250-1000 insertion type	
Pressure		1.6Mpa/2.5Mpa/4.0Mpa and others	
Velocity		5m/s ~70m/s	0.5 m/s~7m/s
Wet Parts Material		304 SST/316 SST	
Flange Material		Carbon steel/304 SST/316 SST	
Bolt Material		Carbon steel/304 SST	

Detector Material	316 SST
Connecting Rod	304 SST
Radiator	Aluminum alloy
Mounting	Wafer/Flange/Thread/Tri-clamp
Protection Level	IP65 /IP67
Power supply	24VDC(18VDC~30VDC)/Battery
Signal Output	(4-20)mA/ pulse
Communication	Hart/Modbus
Electrical connection	2-M20×1.5
Explosive Proof	Exd IIBT4/Exia IICT3-T6
Construction	Compact/Remote
Environment Temp.	With LCD:-10 ~60° C/ Without LCD: -20 ~60° C
Relative Humidity	5% ~90%

Model Selection

Table 2

Mark					
STLU	Silver Automation Instruments Vortex Flow meter				
Code	Working Principle				
VFN	Intelligent Karman Vortices Flowmeter				
Code	Process Connection				
1	Flanged(DN50~DN300)				
2	Wafer type (DN15~DN300)				
3	Fixed Inserted				
4	Adjustable Inserted (without Ball Valve)				
5	Adjustable Inserted (with Ball Valve)				
6	Tri-clamp				
7	Thread (please specify thread standard)				
Code	Measured Fluid				
2	Liquid				
3	Gas				
4	Steam				
Code	Nominal Diameter				
015	15mm	05	50mm	15	150mm
020	20mm	06	65mm	20	200mm
02	25mm	08	80mm	25	250mm

03	32mm	10	100mm	30	300mm
04	40mm	12	125mm	Others	Inserted ≥250mm

Code	Indicator
D	With Digital Indicator
N	No Indicator (3 wire, pulse frequency output)

Code	Power Supply
1	24V DC
2	3.6V Lithium Battery

Code	Output Signal
0	No output
1	Pulse Output
2	Two Wire :4~20mA DC
4	Hart Protocol
5	RS-485 (Modbus)

Code	Fluid Temperature
1	Standard -40~250° C(-40~120° C for inserted)
3	High Temperature Type :+100~+300° C
2	Specify

Code	Pressure Rating				
Code	Standard	Code	Standard	Code	Standard
G0	GB 1.0Mpa	D0	DIN PN10	A1	ANSI Class 150
G1	GB 1.6Mpa	D1	DIN PN16	A2	ANSI Class 300
G2	GB 2.5 Mpa	D2	DIN PN25	A3	ANSI Class 600
G3	GB 4.0 Mpa	D3	DIN PN40	S	Special

Code	Explosion Proof
N	Non
d	Flameproof
i	Intrinsically Safe

Code	Flow Meter Construction
0	Compact display

Code	Protection Level
0	IP65
1	IP67

Code	Compensation
B0	Non compensation

BT	Built-in temperature compensation
BP	Built-in pressure compensation
BPT	Built-in temperature and pressure compensation
EPT	External temp & pressure compensation (RTD, pressure transmitter and flow totalizer)
EP	External pressure compensation (pressure transmitter and flow totalizer)
ET	External Temperature compensation (pressure transmitter and flow totalizer)
Code	Wet Parts material
M0	Standard 304 SST
M1	Stainless steel 316
M2	Others

Dimensions

(unit :mm)

➘ **Wafer Connection, No compensation**

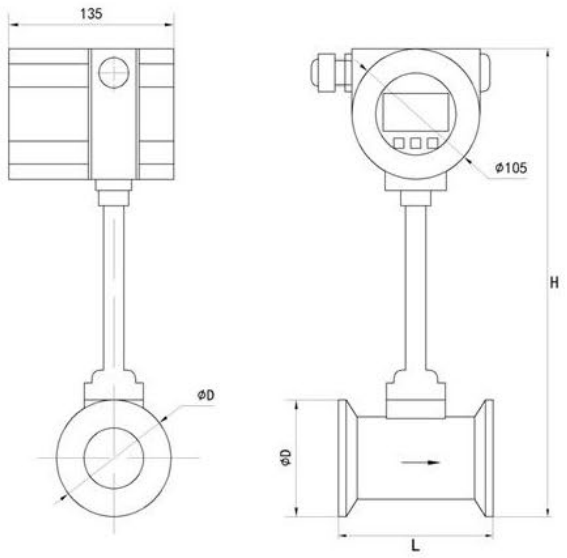


Table 3

DN	L	D	H	
			< 80℃	< 300℃
15	70	54	320	440
20	70	54	320	440
25	70	54	320	440
32	85	69	320	440
40	85	79	325	445
50	85	89	335	455
65	85	104	350	470
80	90	119	365	485
100	90	139	385	500
125	95	168	415	530
150	100	194	440	555
200	102	248	495	610
250	115	300	545	665
300	130	350	595	710

➘ Wafer Connection, compensation type

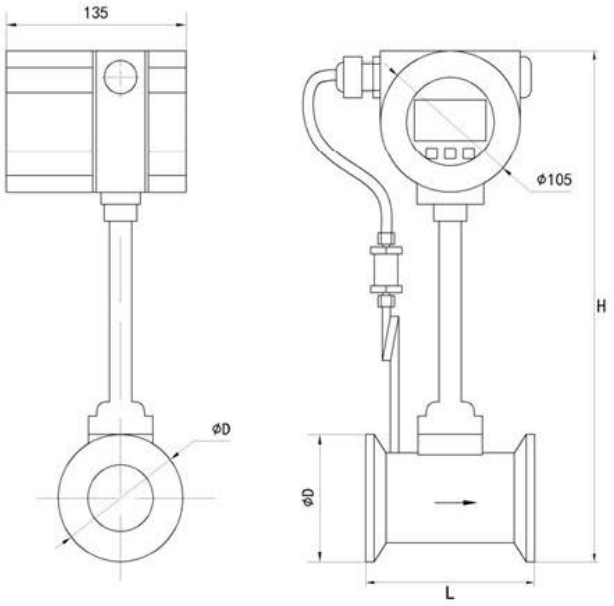


Table 4

DN	L	D	H
15	90	54	440
20	90	54	440
25	90	54	440
32	85	69	440
40	85	79	445
50	85	89	455
65	85	104	470
80	90	119	485
100	90	139	500
125	95	168	530
150	100	194	555
200	102	248	610
250	115	300	665
300	130	350	710

➘ Flange connection

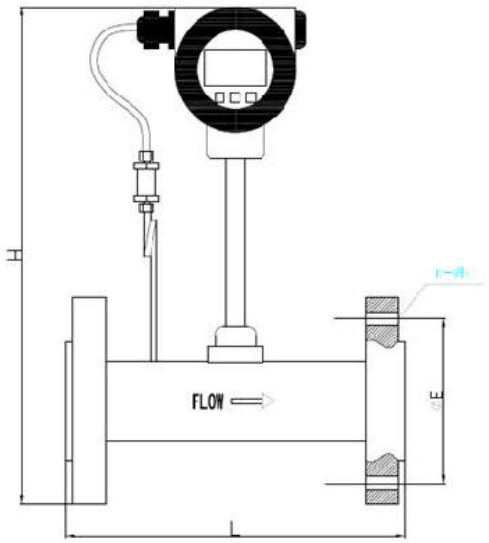


Table 5

DN	L	∅E	n-∅h	H	
				< 80 ℃	< 300 ℃
15	160	65	4-14	320	440
20	160	75	4-14	325	445
25	160	85	4-14	335	450
32	180	100	4-18	350	465
40	180	110	4-18	360	475
50	180	125	4-18	370	490
65	180	145	4-18	390	510
80	180	160	8-18	405	525
100	200	180	8-18	425	545
125	200	210	8-18	450	570
150	200	240	8-22	485	600
200	200	295	12-22	535	650
250	200	355	12-26	595	710
300	200	410	12-26	645	760

➘ Thread Connection

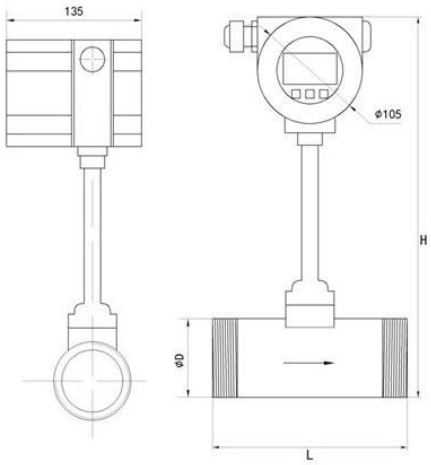
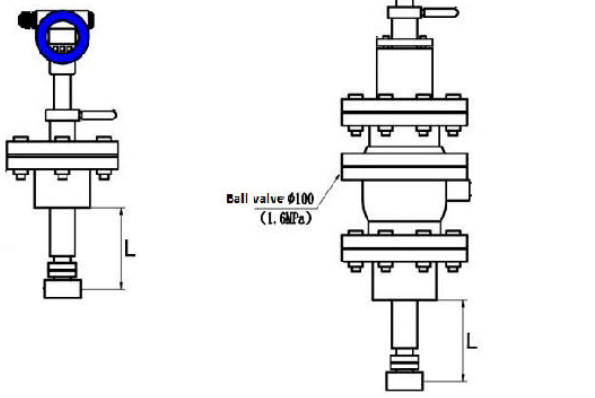


Table 6

DN	L	D	H		Thread
			< 80℃	< 300℃	
15	130	54	320	440	R1/2
20	130	54	320	440	R3/4
25	160	34	300	415	R1
32	160	41	305	420	R1 1/4
40	160	49	315	430	R1 1/2
50	160	59	325	440	R2
65	160	77	340	460	R2 1/2

➘ Insertion



No Ball valve　　With Ball valve

Table 7

Size	L (mm)
DN250	125
DN300	150
DN400	200
DN500	250
DN600	300
DN800	400

Flow Range

Table 8

Size (mm)	Liquid		Gas/steam	
	Flow Range (m3/h)	Output Frequency (Hz)	Flow Range (m3/h)	Output Frequency (Hz)
20	1~10	40~396	5.5~50	218~1982
25	1.6~16	32~325	8.5~70	172~1420
40	2.5~25	13~130	22~220	115~1147
50	3.5~35	9~93	36~320	96~854
65	6.5~68	8~82	50~480	61~583
80	10~100	6~65	70~640	45~417
100	15~150	5~50	130~1100	43~367
125	27~275	5~47	200~1700	33~290
150	40~400	4~40	280~2240	27~221
200	80~800	3~33	580~4960	24~207
250	120~1200	3~26	970~8000	20~171
300	180~1800	2~22	1380~11000	17~136
(400)	180～3000	5.6～87	2750～27000	85～880
(500)	300～4500	5.6～88	4300～43000	85～880
(600)	450～6500	5.7～89	6100～61000	85～880
(800)	750～10000	5.7～88	11000～110000	85～880
(1000)	1200～1700	5.8～88	17000～170000	85～880
Note: DN400~DN1000 is insertion type				