

STLU-G Series Vortex Flow Meters



- High accuracy : Liquid accuracy $\pm 0.5\sim \pm 1.5\%$, gas accuracy $\pm 0.5\sim \pm 2.5\%$,
- High temperature option max to 500°C
- High pressure constructions max to 450 bar
- Large turn down ratio, standard 8:1~20:1, max 30:1 or higher.
- Min liquid velocity can be 0.21 m/s, and gas velocity can be even lower to 1.98 m/s
- Low Pressure Loss
- On-site flow sensor replacement without stopping the flow

Overview

The new generation of isolated and seismic-resistant inductive vortex flowmeter is a world-leading milestone in the history of vortex flowmeters. The flowmeter housing adopts an integral structure, which is sturdy, without sealing parts, installation screws, or leaks, ensuring safety and reliability. It is equipped with isolation and allows for on-site sensor replacement without stopping the flow. The sensor has excellent seismic resistance, as well as high pressure and high temperature performance. The transmitter is equipped with advanced electronic signal spectrum scanning and processing circuits, further optimizing seismic resistance. It offers precise measurement, wide range, low minimum flow rate, safety, reliability, low operating costs, and minimal pressure loss. This product has a wide range of applications and has become a truly "universal flowmeter". The isolated and seismic-resistant inductive vortex flowmeter is sure to be favored by designers, specifiers, and a wide range of users.

Principle

The inductive vortex flowmeter is a volumetric flowmeter that operates based on the principle of the Karman vortex street. Inside the flowmeter housing, there is a triangular prism called the bluff body. When the fluid flows past the bluff body, low-pressure zones are formed on both sides of the bluff body, creating regular vortices alternately on each side, known as Karman vortices. As shown in Figure 1.1, the vortices are asymmetrically arranged downstream of the bluff body. The flow velocity and volumetric flow rate of the vortex flowmeter are directly proportional to the

frequency of the vortices. It is mainly used for measuring the flow of industrial pipeline fluids, such as gases and vapors. It has a small size, a wide range of measurement, high accuracy, and is almost unaffected by parameters such as fluid density, pressure, temperature, and viscosity when measuring volumetric flow rates. It has no moving mechanical parts, resulting in high reliability and low maintenance requirements. The instrument parameters can remain stable for a long time.

Given: Vortex frequency f , average fluid velocity V , bluff body width d , flowmeter inner diameter D , the relationship can be derived as follows:

$$f = St * V / [(1-1.25*d/D)*d]$$

Where:

f : Vortex frequency

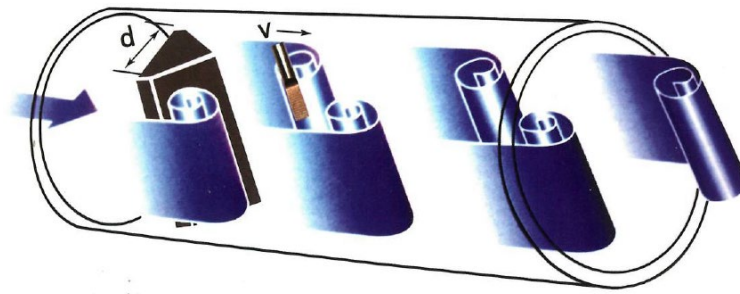
V : Fluid flow velocity

d : Width of the bluff body

D : Inner diameter of the flowmeter

St : Strouhal number

Schematic diagram of the working principle of Karman vortex flow meter



Technical Specifications

Process fluids	Liquids, Gas and Steam.				
	Saturated steam can be regarded as single-phase fluid when its dryness is greater than 85%				
Process temperature	Standard: -40~+250°C~350°C			Extended:>+350°C~500°C	
Pressure rating	Standard:≤2.5MPa~4.0Mpa			Extended:>4.0MPa~45MPa	
Accuracy	Liquid:	±0.5%	±1.0%	±1.5%	
	Gas:	±0.5%	±1.0%	±1.5%	±2.5%
Turndown	Standard:8:1~20:1			Extended:≥30:1	

Reynolds number	Standard:2x10 ⁴ ~7x10 ⁶	Extended:1x10 ⁴ ~7x10 ⁶
Flow velocity	Liquid:0.21~7.6m/s Gas/steam standard velocity range: 2~76m/s, extended <1.98m/s	
Resistance factor	Full pipe type: Cd ≤2.4	
Permitted max. vibration acceleration	0.5g-1.5g	
Straight pipe length	Upstream straight pipe length ≥ 20D Downstream straight pipe length ≥ 5D	
Pressure loss	$\Delta P=1.29 \cdot \rho \cdot V^2$ ρ :density (kg/m ³), V:velocity(m/s)	
Minimum upstream pressure (liquids)	$P_{min} \geq 2.7 \cdot \Delta P + 1.3 \cdot P_0$ P ₀ : liquid vapor pressure at operating conditions (Pa)	
Protection rating	Standard: IP65	Extended: IP68
Ex mark	Intrinsically safe type: Ex ia IIC T1~T4 Ga	
Ambient conditions	Ambient temperature	-40~+55°C non-explosion-protected areas
		-20~+55°C explosion-protected areas
	Relative humidity	non-condensing
	Atmospheric pressure	86~106kPa
Power supply	Pulse: 12VDC~+24VDC Current:+24VDC 4-20mA Battery: 3.6V	
Power	<1w	
Output signals	Frequency/pulse output: 2~3,000Hz low level ≤1V high level ≥5V	
	2 wires, 4~20mA output: For explosion-protected type, load resistance ≤300 For non-exploration-protected type, load resistance ≤500	
Display	Flow rate, volume flow, flow unit, flow percentage, etc.	
Communication protocol	HART、Modbus RTU(RS485)	
Electrical Conduit	M20*1.5 (F)	
	1/2"-14 NPT (F)	
Body & bluff body	Standard Material: 304 SS	

Model Selection

Mark					
STLU	Silver Automation Instruments Vortex Flow meter				
Code	Working Principle				
G	Isolated type 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 \geq 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				
3	High Temperature Type :+100~+350° C				
4	High Temperature Type :+350~+500° 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				
1	Remote display ,specify cable length				
Code	Protection Level				
0	IP65				
1	IP67				
2	IP68				
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				
Code	Flow Range				

S	Standard Flow Range
E	Extended Flow Range

Flow Range for inline Type vortex flow meter

(mm) Meter size	Liquid		(mm) Meter size	Gas/Steam	
	Std.flow range Unit :m3/h	Exd.flow range Unit :m3/h		Std.flow range Unit :m3/h	Exd.flow range Unit :m3/h
15	0.2-5	0.1-5	15	4-16	3-20
20	0.35-10	0.2-10	20	5-30	4-40
25	0.55-12	0.3-12	25	8-80	5-90
32	0.9-18	0.5-18	32	10-150	6-200
40	1.5-25	0.9-25	40	14-280	9-310
50	2.5-40	1.5-40	50	20-400	14-490
65	3.5-70	2.5-70	65	35-720	24-840
80	5.5-130	3.5-130	80	55-1100	36-1440
100	8.5-160	5.5-160	100	80-1600	60-2440
125	15-250	8.5-250	125	130-2600	90-3600
150	20-400	12.5-400	150	190-3800	130-5200
200	34-700	22-700	200	330-6600	220-7700
250	53-1200	35-1200	250	530-10600	350-12400
300	76-1800	50-1800	300	760-15200	500-17800
350	104-3100	69-3100	350	1035-21000	690-24000
400	135-3500	90-3500	400	1350-27000	900-31000

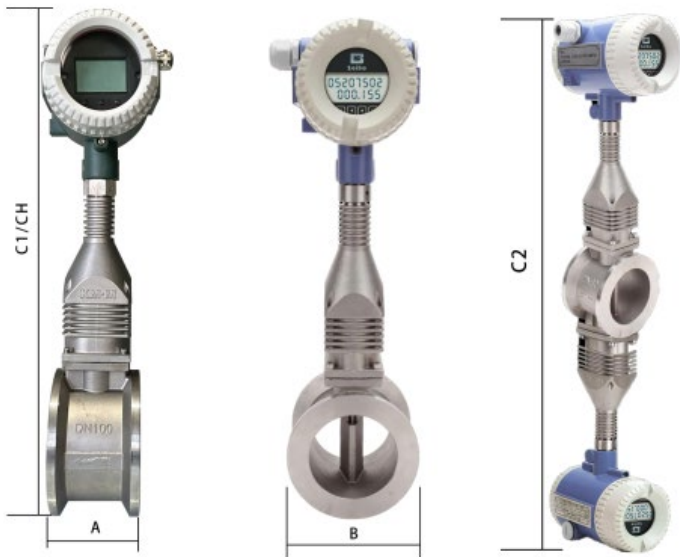
Insertion Type Vortex Flow Meter Flow Range

Meter size(DN)	Liquid		Gas		Steam	
	Std.flow range Unit :m3/h	Exd.flow range Unit :m3/h	Std.flow Range Unit :m3/h	Exd.flow Range Unit :m3/h	Std.flow Range Unit :m3/h	Exd.flow Range Unit :m3/h
200	60-1050	27-810	400-1200	320-8000	400-4200	320-8400
250	100-1550	52-1800	618-6300	550-11000	618-6300	550-11000
300	150-2100	88-2500	1000-1060	800-18000	1000-1060	800-18000

350	200-3100	121-3630	1500-15000	1100-2600 0	1500-15000	1100-26000
400	350-3500	160-4800	1800-11800	1500-3400 0	1800-18200	1500-34000
450	420-4200	200-6000	2100-21100	2000-4000 0	2100-21100	2000-40000
500	500-5200	247-7500	2500-25200	2400-1800 0	2500-25200	2400-48000
600	700-7200	360-10800	3560-35600	2500-5900 0	3560-35600	2500-59000
700	830-8400	485-14600	4850-48500	3460-6900 0	4850-48500	3460-69000
800	100-20000	640-19200	6300-63000	4500-9100 0	630-63800	4500-91000
900	1370-138000	810-24300	8020-80300	5720-1140 00	8020-80300	5720-114000
1000	1700-170000	990-29000	9900-99000	7060-1412 00	9800-99000	7060-141200
1200	2500-250000	1400-4100 00	14200-1420000	10180-241 0000	14200-1420 000	10180-24100 00
1500	3800-380000	2300-6900 00	22200-1250000	15900-375 0000	22200-1250 000	15900-37500 00

Flow Meter Dimension

Wafer Connection Dimensions



Unit :mm

Meter size	Length	Outer Diameter	Height of normal temperature		Height of high temperature
			C1	C2	
DN	A	B			CH
15	68	54	405	460	460
20	68	54	405	460	460
25	68	54	405	460	460
32	78	68	405	460	460
40	80	78	410	470	470
50	82	86	410	470	470
65	84	104	430	490	490
80	84	118	440	500	500
100	90	138	460	520	520
125	90	168	490	550	550
150	100	194	520	580	580
200	100	248	570	630	630
250	115	298	630	690	690
300	130	348	680	740	740

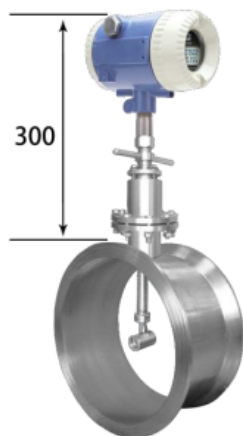
Flange Connection Dimension



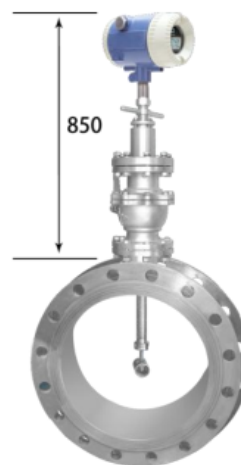
Unit :mm

Meter size	Length	Bolt hole center distance	Height of Normal temperature	Height of high temperature	Bolt	Number
DN	A	B	C1	C2	D	N
15	140	65	400	460	M12	4
20	140	75	400	460	M12	4
25	160	85	410	470	M12	4
32	160	100	430	490	M16	4
40	160	110	440	500	M16	4
50	180	125	450	510	M16	4
65	180	145	470	530	M16	4
80	180	160	490	550	M16	4
100	180	180	500	560	M16	8
125	180	210	540	600	M16	8
150	180	240	560	620	M20	8
200	220	295	630	690	M20	12
250	220	355	680	740	M24	12
300	220	410	730	790	M24	12

Insertion Type Dimension



Simple Insertion Vortex Flowmeter



Valve-controlled Insertion Vortex Flowmeter