

Vortex flowmeter

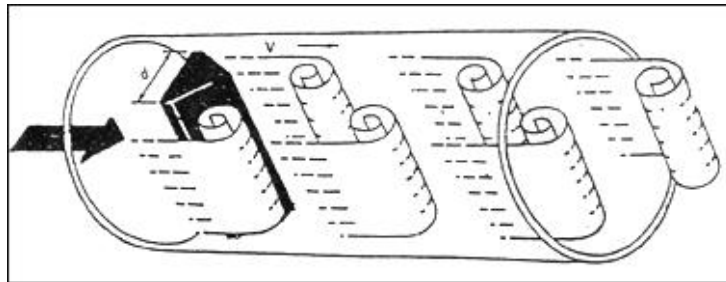


product description

HBLUGB type vortex flow meter is widely used in petroleum, chemical, metallurgy, thermal, textile, paper and other industries for superheated steam, saturated steam, compressed air and general gases (oxygen, nitrogen, hydrogen, natural gas, gas, etc.), water and liquid (Such as: water, gasoline, alcohol, benzene, etc.) measurement and control.

working principle

If a non-streamline vortex generator (blocking fluid) is set in the fluid, two rows of regular vortices are alternately generated from both sides of the vortex generator. This kind of vortex is called Kaman vortex street, as shown in Fig. 1.



图(一)

The vortex array is arranged asymmetrically downstream of the vortex generator. Suppose the frequency of the vortex is f , the average velocity of the incoming flow of the measured medium is V , the width of the vortex generating body's facing surface is d , and the diameter of the surface is D . According to the Kaman vortex principle, there is the following relationship:

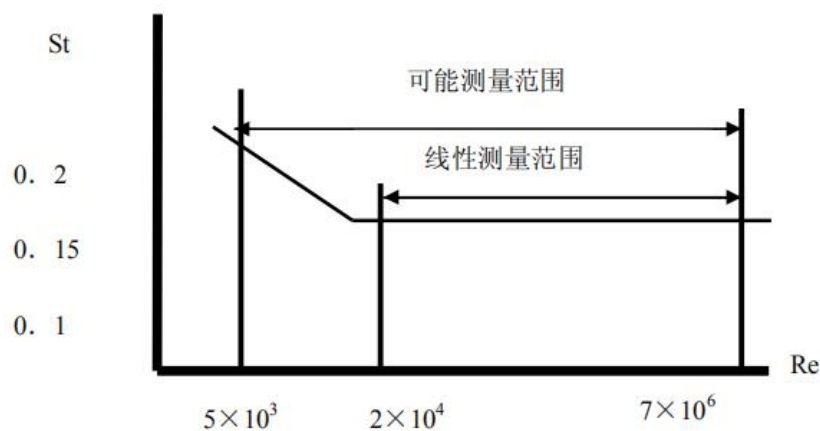
$f = StV/d$ formula (1) In the formula:

f -Carmen vortex frequency generated on the side of the generator

St -Strohal number (dimensionless number)

V – average fluid velocity

d -The width of the vortex generator, which shows that the instantaneous flow rate can be calculated by measuring the separation frequency of the Karman vortex. Among them, the Strouhal number (St) is a dimensionless unknown



number, and the figure (2) shows the relationship between the Strouhal number (St) and the Reynolds number (Re). In the straight part of $St = 0.17$ in the curve table, the release frequency of the vortex is proportional to the flow velocity, which is the measurement range of the vortex flow sensor. only

To detect the frequency f , the flow velocity of the fluid in the tube can be obtained, and the volume flow can be obtained from the flow velocity V . The ratio of the measured pulse number to the volume is called

Instrument constant (K), see equation (2)

$K=N/Q$ ($1/m^3$) Formula (2)

In the formula: K = instrument constant ($1/m^3$).

N = number of pulses

Q = volume flow (m^3)

Features

- ❖ Simple and firm structure, no moving parts, high reliability, very reliable for long-term operation.
- ❖ Simple installation and convenient maintenance.
- ❖ The detection sensor does not directly contact the measured medium, with stable performance and long service life.
- ❖ The output is a pulse signal proportional to the flow rate, no zero drift, and high accuracy.
- ❖ Wide measuring range, up to 1:10 range ratio.
- ❖ The pressure loss is small, the operating cost is low, and it is more energy-saving.
- ❖ Within a certain Reynolds number range, the output signal frequency is not affected by the fluid physical properties and composition changes. The meter coefficient is only related to the shape and size of the vortex generator. No compensation is required when measuring the fluid volume flow, and it is generally not necessary after changing accessories. Recalibrate the meter coefficient.
- ❖ Wide range of application, the flow of steam, gas and liquid can be measured.
- ❖ The inner diameter of the vortex flow sensor is 25-300mm (full tube)
- ❖ Plug-in vortex flow sensor application inner diameter range is 350-1200mm (plug-in)
- ❖ The accuracy of measuring liquid with full tube is 1%
- ❖ The accuracy of measuring steam and gas is 1.5%
- ❖ The accuracy of the liquid measurement is 2%
- ❖ The accuracy of measuring steam and gas is 2.5%]
- ❖ The measured medium temperature is $-20\sim 150^{\circ}\text{C}$, $-40\sim 250^{\circ}\text{C}$, $+100\sim 350^{\circ}\text{C}$ (tube only). The output signal is three-wire voltage pulse, three-wire system 4-20mA, two-wire system 4-20mA。

Products



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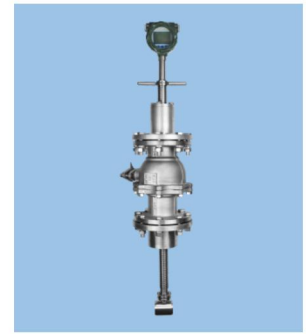
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① HBLUGB/S type flange card connection vortex flowmeter

② HBLUGB/S type flange connection vortex flowmeter

③ HBLUGB/S simple plug-in vortex flowmeter

④ HBLUGB/S split vortex flowmeter

⑤ HBLUGB/B flange connection vortex flowmeter

⑥ HBLUGB/B type flange card connection vortex flowmeter

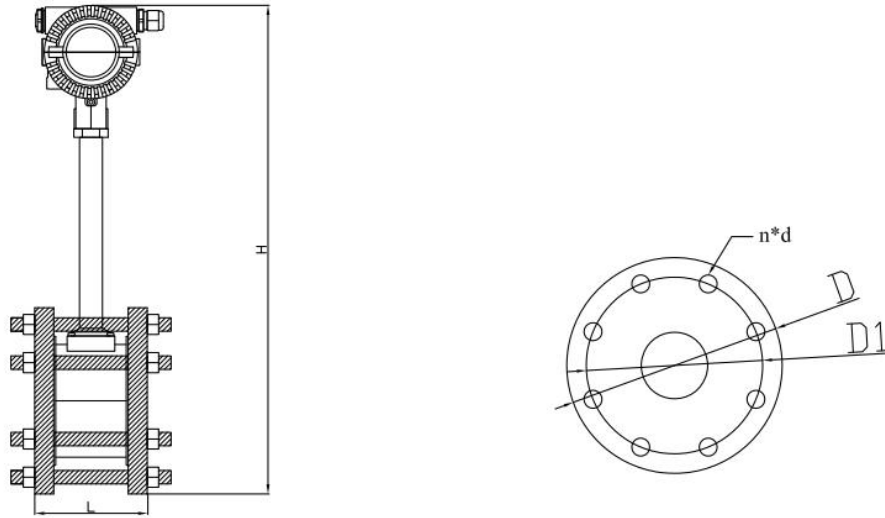
⑦ HBLUGB/B simple plug-in vortex flowmeter

⑧ HBLUGB/B type flange ball valve vortex flowmeter

Technical parameter

Nominal diameter (mm)	25,40,50,65,80,100,125,150,200,250,300, (300~1000Plug-in)
Nominal pressure (MPa)	DN25-DN200 4.0 (> 4.0Agreement Supply) , DN250-DN300 1.6 (> 1.6Agreement Supply)
Medium temperature (°C)	Piezoelectric: -40~260, -40~320; Capacitive: -40~300, -40~400, -40~450 (order agreement)
Body material	1Cr18Ni9Ti, (Other material agreement supply)
Allow vibration acceleration	Piezoelectric: 0.2g Capacitive: 1.0~2.0g
Accuracy	±1%R, ±1.5%R, ±1FS; plug-in type: ±2.5%R, ±2.5%FS
Extent	1:6~1:30
Supply voltage	Sensor: +12V DC, +24V DC; Transmitter: +12V DC, +24V DC; battery-powered type: 3.6V battery
output signal	Square wave pulse (excluding battery-powered type): high level ≥5V, low level ≤1V; current: 4~20mA
Pressure loss coefficient	Comply with JB/T9249 standard $C_d \leq 2.4$
Explosion-proof mark	Intrinsically safe type: Exd II ia CT2-T5 Flameproof type: Exd II CT2-T5
Protection class	Common type IP65 diving IP68
Environmental conditions	Temperature -20°C~55°C, relative humidity 5%~90%, atmospheric pressure 86~106kPa
Applicable medium	Gas, liquid, steam
Transmission distance	Three-wire pulse output type: ≤300m, two-wire standard current output type (4~20mA): load resistance ≤750Ω

Flange mounting dimensions

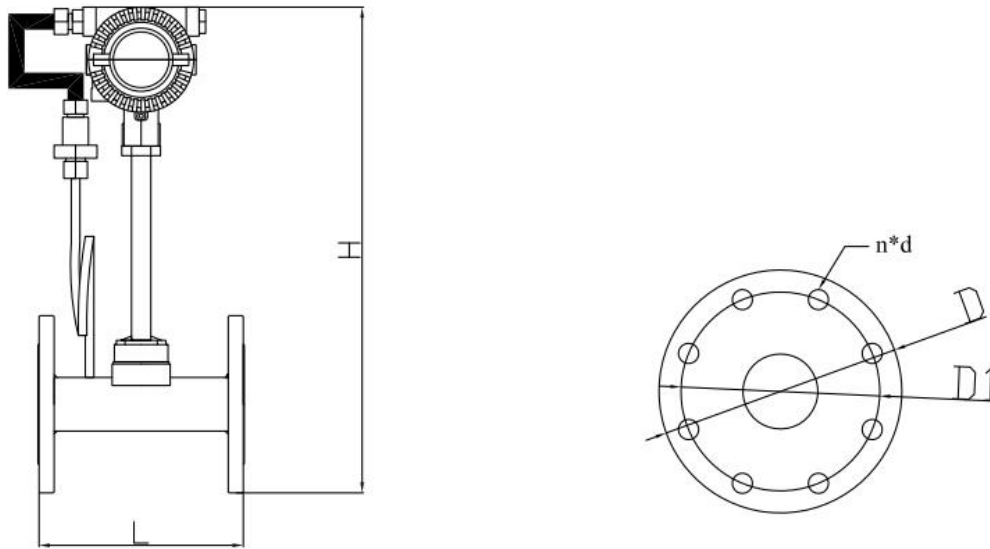


The flange standard of this table is

size (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300
L (mm)	95	95	95	114	114	117	117	117	136	151	170	190	205	220
H (mm)	460	460	460	480	490	500	515	530	550	570	600	650	710	760
D (mm)	125	125	125	145	145	160	180	195	215	245	280	335	405	460
D1 (mm)	100	100	100	120	120	125	145	160	180	210	240	295	355	410
N (pce)	4	4	4	4	4	4	4	8	8	8	8	12	12	12
d (mm)	14	14	14	14	14	18	18	18	18	18	22	22	26	26

HGT20592 PN16, other flange standards can be customized, please inform before ordering.

Temperature and pressure compensation size chart



size (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300
L (mm)	180	180	180	180	180	180	200	200	200	220	220	220	350	300
H (mm)	416	423	431	448	456	470	488	501	525	552	584	636	696	749
D (mm)	95	105	115	140	150	165	185	200	220	250	285	340	405	460
D1 (mm)	65	75	85	100	110	125	145	160	180	210	240	295	355	410
N (mm)	4	4	4	4	4	4	8	8	8	8	8	12	12	12
d (mm)	14	14	14	18	18	18	18	18	18	18	22	22	26	26

The flange standard of this table is HGT20592 PN16, other flange standards can be customized, please inform before ordering.

Flow range table

口径 (mm)		15	20	25	32	40	50	65	80	100	125	150	200	250	300
liquid (m ³ /h)	Minimum flow (Flow velocity 1m/s)	0.6	1.2	2	3	5	8	12	20	32	50	60	120	200	240
	Maximum flow (Flow velocity 5m/s)	3	6	10	16	25	40	60	100	160	250	300	600	1000	1200
	Alternative flow (Flow velocity 10m/s)	6	12	20	30	50	80	120	200	300	500	600	1200	2000	2500
gas (m ³ /h)	Minimum flow (Flow velocity 5m/s)	3	6	10	16	25	40	60	100	160	250	300	600	1000	1200
	Maximum flow (Flow velocity 50m/s)	30	60	100	160	250	400	600	1000	1600	2500	3000	6000	10000	12000
	Alternative flow (Flow velocity 70m/s)	40	80	120	200	300	500	800	1200	2000	3000	4000	8000	12000	16000

Note: The normal flow range is the minimum and maximum flow, and the alternative flow is the maximum flow provided by the customer during model selection

LUGB Vortex Flowmeter Selection Table

Model											Explanation		
HBLUGB	□	/□	/□	/□	/□	/□	/□	/□	/□	/□			
Nominal diameter	15~3000												DN15~DN3000mm
Instrument type	A												Intelligent temperature and pressure compensation type, 24V DC, 4~20mA
	B												Intelligent temperature compensation type, 24V DC, 4~20mA
	C												Intelligent pressure compensation type, 24V DC, 4~20mA
													Intelligent field display type, 24V DC, 4~20mA
	N												Transmitter type, 24VDC, pulse output /4~20mA
Accuracy class	10												1.0 level
	15												1.5 level
Material			S										304SS
			L										316L
Explosion-proof grade				N									Non-explosion-proof
				E									Explosion-proof type (Ex d ia ia Ga q IIC T6 Gb)
Pressure Level					N								conventional
					H()								High pressure customization
Communication protocol								1					None
								2					RS485/Moudbus protocol
								3					Hart Agreement
Measuring medium									1				liquid
									2				General gas
									3				Saturated Vapor
									4				superheated steam
Rated temperature										1			Below 150°C
										2			Below 250°C
										3			Below 350°C
Connection method											1		Flange mounting
											2		Flange connection
											3		Simple plug-in
											4		Ball valve plug-in
											5		Other customization (clamp/thread)
Power supply											1		3.6V lithium battery
											2		24V DC



Survive by quality, seek development by integrity

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