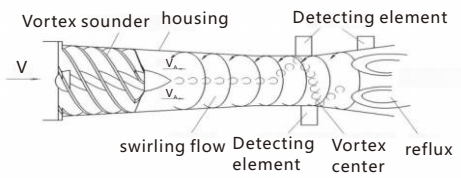
Please refer to page 5 for selection details

FV30

Precession Vortex Flowmeter

Working principle

The flow profile of the flow sensor is similar to the profile of a Venturi tube. Install a set of spiral guide vanes on the inlet side, and when the fluid enters the flow sensor, the guide vanes force the fluid to generate intense vortex flow. When the fluid enters the diffusion section, the vortex flow is subjected to reflux and begins to undergo secondary rotation, forming a gyroscopic vortex precession phenomenon. The precession frequency is directly proportional to the flow rate and is not affected by the physical properties and density of the fluid. The detection element can obtain good linearity over a wide range of flow rates by measuring the secondary rotational precession frequency of the fluid. The signal is amplified, filtered, and transformed into a pulse signal proportional to the flow rate through a preamplifier, and then sent to the microprocessor for integration processing along with temperature, pressure, and other detection signals. Finally, the measurement results (instantaneous flow rate, cumulative flow rate, and temperature, pressure data) are displayed on the LCD screen



Product mix

The precession vortex flowmeter has a compact structure, mainly composed of a shell, vortex generator, sensors (temperature, pressure, flow), rectifier, bracket, and converter.

Application

Measurement of various gas flows in industries such as petroleum, chemical, power, metallurgy, and urban gas supply

function characteristics

1. No mechanical movable parts, less prone to corrosion, stable and reliable, long service life, and long-term operation without special maintenance;2. Adopting a 16 bit computer chip with high integration, small size, good performance, and strong overall functionality;3. The intelligent flowmeter integrates the flow probe, microprocessor, pressure and temperature sensors, and adopts the built-in combination to make the structure more compact. It can directly measure the flow, pressure and temperature of the fluid, and automatically track compensation and Compressibility factor correction in real time;4. Adopting dual probe detection technology and new sensor processing technology, as well as reasonable installation methods, greatly improves signal strength, enables sensors to accurately detect signals, and suppresses interference caused by pipeline vibration;5. Adopting domestically leading intelligent seismic technology, effectively suppressing interference signals caused by vibration and pressure fluctuations;6. The Chinese dot matrix display screen is adopted, which has many display digits and is intuitive and convenient to read. It can directly display the volume flow under the working state, the volume flow under the Standard state, the total amount, and the medium pressure, temperature and other parameters;7. The converter can output frequency pulses, 4-20mA analog signals, and has an RS485 interface, which can be directly connected to a computer network, with a transmission distance of up to 1.2km;8. Multiple physical parameter alarm outputs, one of which can be selected by the user;9. Pressure and temperature signals are input by sensors, with strong interchangeability;10. The entire machine has low power consumption and can be powered by built-in batteries or external power sources.

Usage environment

Ambient temperature: -30℃ ~ +55℃
Relative humidity: 5% ~ 95%
Atmospheric pressure: 86KPa ~ 106KPa
Working conditions
Medium temperature range: -20℃ ~ +70℃
Mominal pressure: 1.6、2.5、4.0、6.3MPa

Technical Parameter

Nominal Diameter DN(MM)	Types of	Flow range (m^3/h)	Pressure rating (mpa)	Accuracy (level)	Pressure at Q maxLoss (kpa)	Shell Material
20		1.2 ~ 15	1.6	1.0	3.30	≤2.5MPa, aluminum alloy ≥4.0MPa, stainless steel
25		2.5 ~ 30	2.5		2.10	
32		4.5 ~ 60	4.0		2.90	
50	A type	6 ~ 75	6.3		4.20	
50	B type	10 ~ 150	10		3.90	
80	A type	18 ~ 200	16		5.40	
80	B type	28 ~ 400	1.6 2.5 4.0 6.3 10	1.5	3.70	1.6MPa, aluminum alloy ≥2.5MPa, stainless steel
100	A type	40 ~ 600			3.80	
100	B type	50 ~ 800			5.90	
150	A type	100 ~ 1200	1.6		7.60	
150	B type	150 ~ 2250	2.5		11.00	
200		360 ~ 3600	4.0		16.00	

Explanation: A and B are used to distinguish between different flow ranges with the same diameter

Explosion proof sign

The flowmeter is of explosion-proof type, with explosion-proof markings Exd Ⅱ BT4 and Exd Ⅱ CT4-T6 (excluding acetylene)

Wiring port

The outlet interface is M20 × 1.5 internal threads.

Electrical specifications

Common	a. Internal power supply 3.6VDC	Average current <80μA
	b. External power supply 24 ~ 28VDC(two-wire system)	Current 4 ~ 20mA
	c. External power supply 12 ~ 28VDC(three-wire system)	Current <100mA
Intelligent	a. Internal power supply 3.6VDC	Average current <400μA
	b. External power supply 24 ~ 28VDC(two-wire system)	Current 4 ~ 20mA
	c. External power supply 12 ~ 28VDC(three-wire system)	Current <100mA

Outline dimensional drawing

Nominal diameter DN(mm)	Nominal pressure (MPa)	Overall dimension		Body material		weight (KG)
		Body length L	Altitude H	Stainless steel	Aluminium alloy	
25	1.6/2.5/4.0	200	367	√	√	7
	6.3	200	378	√		10
32	1.6/2.5/4.0	230	383	√	√	9
	6.3	230	402	√		12
50	1.6/2.5/4.0	230	403	√		11
	6.3	260	421	√		14
80	1.6	330	438		√	11
	2.5/4.0	330	438	√		18
	6.3	330	446	√		21
100	1.6	410	468		√	14
	2.5/4.0	410	475	√		18
	6.3	410	483	√		33
150	1.6	585	542		√	21
	2.5/4.0	585	549	√		52
	6.3	585	572	√		72
200	1.6	700	618		√	41
	2.5	700	626	√		117
	4.0	700	634	√		127

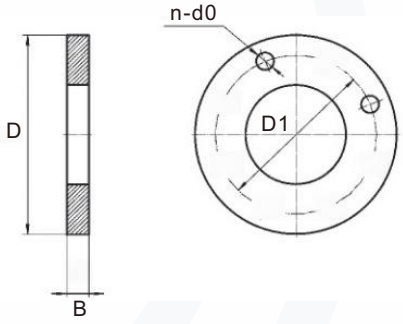
Flange connection dimensions meet the following standards

1.6~4.0MPa(DN25 ~ DN150)GB/T9113.1-2000

1.6、2.5MPa(DN200) GB/T9113.1-2000

4.0MPa(DN200) GB/T9119-2000

6.3MPa(DN25 ~ DN150) GB/T9115.2-20000



Flange connection size table

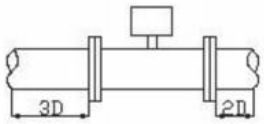
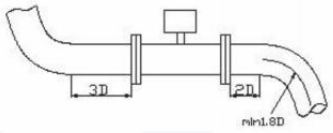
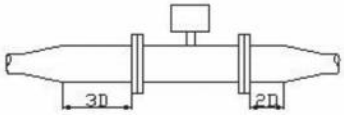
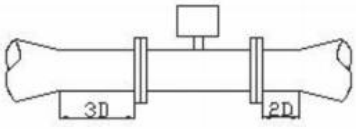
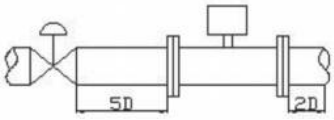
stress \ argument \ Nominal diameter		25	32	50	80	100	150	200
1.6MPa	D	Make use of 4.0MPa flange size			200	220	285	340
	D1				160	180	240	295
	n-d0				8-Ø18	8-Ø18	8-Ø22	12-Ø22
	B				20	22	24	24
2.5MPa	D	Make use of 4.0MPa flange size						360
	D1							310
	n-d0							12-Ø26
	B							30
4.0MPa	D	115	140	165	200	235	300	375
	D1	85	100	125	160	190	250	320
	n-d0	4-Ø14	4-Ø18	4-Ø18	8-Ø18	8-Ø22	8-Ø26	12-Ø30
	B	16	15	20	24	24	28	36
6.3MPa	D	14	155	180	215	250	345	
	D1	100	110	135	170	200	280	
	n-d0	4-Ø18	4-Ø22	4-Ø22	8-Ø22	8-Ø26	8-Ø33	
	B	24	24	26	28	30	36	

Selection and installation

In the selection process should grasp two principles; That is, first, to ensure production safety, and second, to ensure the use of precision. To this end, three selection parameters must be implemented, namely, the maximum, minimum and common flow rate in the near and long term (mainly used to select the nominal diameter of the instrument), the design pressure of the measured medium (mainly used to select the nominal pressure level of the instrument), and the actual working pressure (mainly used to select the pressure level of the pressure sensor of the instrument).
a. When the measured flow rate is known to be the working volume flow rate, the appropriate nominal diameter can be directly selected according to the flow range in the table.
b. When the measured flow is known to be the volume flow under standard conditions, the volume flow Qx under standard conditions should first be converted to the volume flow Qv under working conditions (according to the formula
2), and then select the corresponding nominal path according to the flow range in the technical parameter table.
c. Do not make the actual minimum flow Qmin lower than the lower flow limit of the selected nominal runoff meter.
d. When there are special requirements for flow range and nominal pressure, an agreement can be made to order.
Straight pipe section requirements

式中：$$Q_N = \frac{P_a + P}{P_N} \bullet \frac{T_N}{T} \bullet \frac{Z_N}{Z}$$

According to the working principle of the precession vortex flowmeter and the requirements of the flowmeter on the upper and downstream straight pipe sections, it is recommended to use the following figure for various upstream resistance parts The length of the front and back straight pipe sections, and keep the inner wall of the straight pipe section smooth and straight.
Q_N ——Volume flow under standard conditions(m^3/h)
Q_V ——Volume flow under working conditions(m^3/h)
P_a ——Local atmospheric pressure(KPa)
P ——The gauge pressure measured by the pressure hole of the flowmeter (KPa)
P_N ——Atmospheric pressure at standard conditions(101.325KPa)
T_x——Absolute temperature at standard state(293.15K)
T ——The absolute temperature of the fluid being measured(K)
Z_v ——Compressibility of gas under standard conditions
Z ——Compressibility of gas under working conditions
Note: Zy/Z=1 when using bell jar or negative pressure calibration, for natural gas (Zy/Z)/2=FZ is the supercompression factor.

Instructions	Graphical representation
Ensure that the length of the straight pipe section on the upstream side is at least 3D and the length of the straight pipe section on the downstream side is at least 3DAt least 2D. (D: nominal diameter of precession vortex flowmeter)	
Pipe Bending: For curved pipes, it is necessary to ensure that the length of the straight pipe section on the upstream side is at least 3D, and the downstream sideThe length of the straight pipe section should be at least 2D。	
Shrinkage tube: For shrink pipes, it is necessary to ensure that the length of the straight pipe section on the upstream side is at least 3D, and the downstream sideThe length of the straight pipe section should be at least 2D.	
expander: For expansion pipes, it is necessary to ensure that the length of the straight pipe section on the upstream side is at least 3D, and the downstream sideThe length of the straight pipe section should be at least 2D.	
Valves: If there is a valve on the upstream side, ensure that the length of the straight pipe section on the upstream side is at leastThe straight pipe section on the downstream side of 5D should have a length of at least 2D.	

FV30-Selection composition

Selection example **FV30** 1-10m³/h / G / C / U / C / N / R / V / A / C / U

(1 2 3 4 5 6 7 8 9 10 11)

1.measuring range	R()	Note measuring range	
2.Process connection	G	Flange connection	
	T( )	Other connection methods	
3.Flange connection specification	O	DN15	
	P	DN20	
	Q	DN25	
	R	DN32	
	S	DN40	
	C	DN50	
	U	DN65	
	V	DN80	
	W	DN100	
	X	DN125	
	Y	DN150	
	Z	DN200	
	I	DN250	
	A	DN300	
4.Explosion-proof form	U	Diaphragm type	
	X	Intrinsically safe explosion-proof	
	Y	Non-explosion proof	
5.Compensation form	C	Ordinary type (no temperature and pressure compensation)	
	D	Intelligent (with temperature and pressure compensation)	
6.Output signal	N	4~20mA	
	O	4 to 20mA, HART protocol signal	
	P	4-20mA, switching output	
	Q	4~20mA+RS485	
	U	4 to 20mA+MODBUS	
	V	4 to 20mA+RS485+MODBUS	
	W	4~20mA+ pulse output	
7.accuracy class	R	Level 1.0	
	S	Level 1.5	

FV30-Selection composition

Selection example **FV30** 1-10m³/h | G | C | U | C | N | R | V | A | C | U

(1 2 3 4 5 6 7 8 9 10 11)

8.Pressure grade	V	1.6MPa		
	W	2.5MPa		
	X	4.0MPa		
	Y	6.3MPa		
9.Power Supply	A	Internal 3.6V battery		
	B	DC24V+3.6V battery		
10.Shell material	C	stainless steel		
	D	aluminium alloy		
11.Liquid contact material	U	304SS		
	V	316L		
	T( )	Other materials		
12.Other options	T( )	Other options		

Instructions:

It means that the FV30 type precessional vortex flowmeter has a measuring range of 1-10m3/h, the connection process is flange connection, the flange connection specification is DN50, the explosion-proof form is flameproof, the compensation form is ordinary (no temperature and pressure compensation), the signal output is 4 ~ 20mA, the accuracy level is 1.0, the pressure level is 1.6Mpa, and the internal 3.6V battery of the power supply. The shell material is stainless steel, the liquid material is 304SS.

Product Certification

Compliance and approval; Rodwig flow meters meet key standards and certifications for process measurement technology; To ensure the highest reliability in such settings;

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