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Flow series two

Flow series one

SMART
Multi-variable Flow Transmitter
Specification

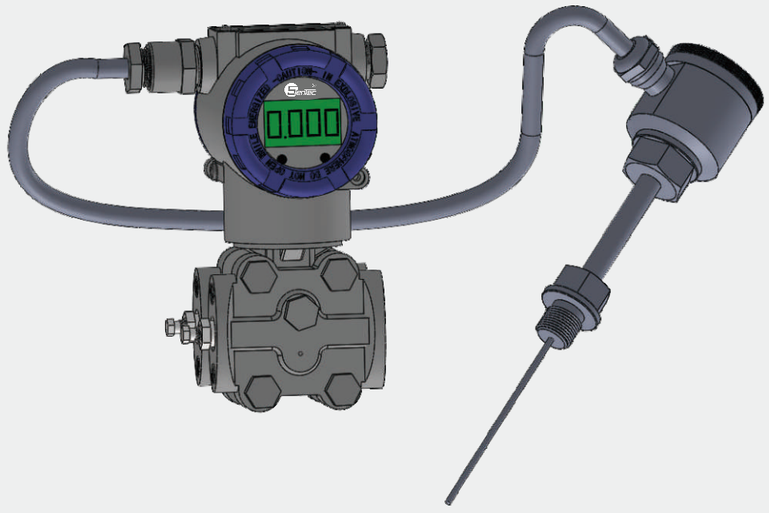
FMD3151MV

Multi-parameter flow transmitter

Product Introduction

The FMD3151MV series multi-parameter flow transmitter is used for the measurement of the full range of differential pressure, pressure/absolute pressure, temperature and flow in the industrial process, with analog (4~20mADC+hart) or digital (RS-485) output signals.At the same time, it accurately measures the differential pressure, static pressure and the process temperature of the medium through a four-wire RTD. According to these dynamic media conditions, the CPU electronic components calculate the compensated mass flow.

The differential pressure range of FMD3151MV series multi-parameter transmitter is 50Pa~10MPa (0.5mbar~100bar), and the maximum working pressure is 0.6MPa, 2MPa, 10MPa or 40MPa respectively. For high temperature, high corrosion and viscous media, various flange connection types can be provided to meet the needs of different complex industrial sites.



FMD3151MV series multi-parameter flow transmitter structure form

Main Specifications

Differential pressure sensor: 0.1 level (0.075% optional)

Absolute pressure sensor: 0.1 level

Process temperature measurement: (RTD): ±0.5℃

Flow calculation accuracy: 0.05 level

Stability: ±0.2% of the maximum measuring range/12 months

Temperature influence: The zero temperature error is ±0.1%/10°C of the maximum range
The total temperature error including zero point and range is ±0.15%/10℃ of the maximum range

Power influence: less than 0.005%/V of the output range.

Vibration influence: On any axis, the frequency is 200Hz, and the error is ±0.05%/g of the maximum range.

Load influence: As long as the voltage of the input transmitter is higher than 12V, there is no load influence in the load working area.

Influence of installation position: The maximum zero error of not more than 0.25kPa can be produced, and this error can be eliminated by calibration, and it has no effect on the range; The rotation of the measuring body relative to the flange has no effect.

Technical performance

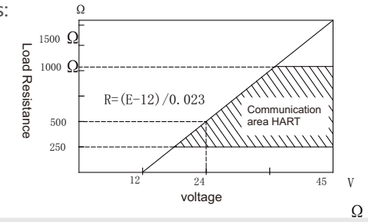
Use object: liquid, gas or steam

Measuring range: see selection specification table

Output signal: 4～20mA dc. output, superimposed with HART protocol digital signal (two-wire system) or Rs485

Power supply: external power supply 24V dc., power supply range 12V～45V

Load characteristics:



Installation in hazardous locations: Flameproof ExdIIBT5Gb;
Intrinsically safe ExiaIICT6Ga;

Temperature range: Process temperature measurement: (RTD) -200～550℃ The ambient temperature of the meter body; the electronic circuit board works at -40～85℃; sensitive components work at -40～104℃; storage temperature -40～85℃; with digital display -25～65℃ (normal operation); 40～85℃ (no damage);

Relative humidity: 0～95% (no condensation)

Overpressure limit: Adding 0 (absolute pressure) to 40MPa will not damage the transmitter; the normal working pressure is 3.43kPa (absolute pressure) to the upper limit of the range.

Volume change: less than 0.16cm3

Damping: The time constant is adjustable between 0.2～32.0s.

Start-up time: 3s, without preheating.

Selection specification table

FMD3151MV series multi-parameter flow transmitter

model	Transmitter type
FMD3151MV	Multi-parameter flow transmitter

Codename	Differential pressure range
2	0-0.1~3.5kPa
3	0-0.7~7kPa
4	0-4.0~40kPa
5	0-20~200kPa
6	0-70~700kPa
7	0-210~2100kPa
8	0-700~7000kPa

Codename	Absolute measuring range
A	0-200kPa a
B	0-2000kPa a
C	0-10000kPa a
D	0-40000kPa a

Codename	Output type
SF	Analog 4~20mADC+hart signal
F	RS485

Codename	Connection type
S0	Threaded connection
S2	Two remote transmission type connections (see 1199 remote transmission selection)

Codename	Structural material			
	Flange (joint)	Relief valve	Diaphragm material	Filling medium
22	316SST	316SST	316L SST	硅油
23	316SST	316SST	H-C276	硅油
24	316SST	316SST	MON	硅油
25	316SST	316SST	钽	硅油
XX	Special request materials			

Codename	Shell material	Electrical interface thread
A	Low copper aluminum alloy	M20*1.5
B	Low copper aluminum alloy	1/2NPT-14
C	stainless steel	M20*1.5
D	stainless steel	1/2NPT-14

Codename	Induction method
L1	1/4NPT-18 internal thread
L2	1/2NPT-14 internal thread
L3	M20*1.5 external thread
LX	Special connection thread

Codename	Optional
M4	LCD multi-function digital display meter
B1	Tube bending bracket
B2	Panel-mounted curved bracket
B3	Tube bending bracket
Da	Flameproof ExdIIBT5Gb
Fa	Intrinsically safe ExiaIICT6Ga

SMART
Flow Meter
Specification

DOUBLE RANGE DIFFERENTIAL PRESSURE FLOWMETER

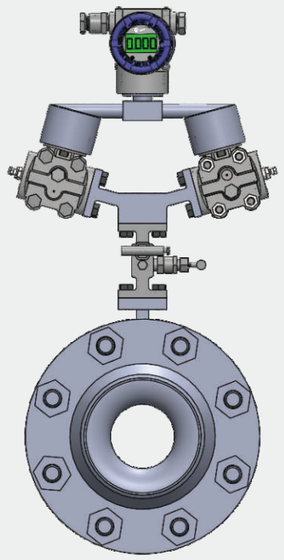
FMD-SL dual-range differential pressure flowmeter

Product Introduction

The standard throttling differential pressure flowmeter has been widely used in industrial production because of its features such as no moving parts, good shock resistance, strong anti-interference ability, and convenient use and verification. use and verification.

The range ratio of the standard throttling differential pressure flowmeter is about 1:3~1:4. When the range ratio is expanded, it is difficult to guarantee the measurement accuracy. With the development of modern industry and the increase of user process requirements, the range ratio is required It is 1:10 or even higher, especially when the flowmeter is used for measurement and trade settlement, which requires higher accuracy and wider range ratio. Our company develops a dual-range differential pressure flowmeter according to user requirements. ,
From theory to practice, it solves the problems that have plagued users for a long time.

Dual range flow meters usually use two differential pressure sensors with high range and low range. The upper limit of the differential pressure of the low range is 17.32% FS of the upper range. The dual range differential pressure flowmeter is widely used in petroleum, chemical industry, metallurgy, electric power, etc. industry.



FMD-SL dual-range differential pressure flowmeter structure

Main Specifications

Nominal diameter: 50 mm ≤DN≤1200mm If DN>1200 mm, real flow calibration is required.

Aperture ratio β: 0.10≤β≤0.75

Reynolds number range: when 0.10≤β≤0.56, 5000≤ReD
When 0.56≤β≤0.75, 10000≤ReD

Nominal pressure: PN≤16MPa

Accuracy: 1.0 grade, 1.5 grade

Uses and characteristics

Dual-range differential pressure flowmeter, for a throttling device, because a low-range differential pressure sensor and a high-range differential pressure sensor are introduced and the output can be seamlessly connected a differential pressure flowmeter can be changed. Two differential pressure flowmeters are formed in the high and low range, which greatly improves the flow measurement accuracy of the low range.

Single-range differential pressure flowmeter, after introducing the outflow coefficient C nonlinear compensation and expansion coefficient nonlinear compensation, and equipped with high-precision differential pressure transmitter, the range ratio can reach 1:10, and the dual-range orifice plate The flowmeter range ratio can reach 1:65 which greatly improves the system accuracy of the low range.

The integrated structure eliminates the distortion of differential pressure signal transmission and ensures the accuracy of the system.

Excellent stability, reliability and anti-vibration ability.

Adaptability to high temperature, high pressure, low static pressure, low flow rate and low density fluids.

It is convenient to change the range.

As long as it is designed, manufactured, installed and used in accordance with the standard, the specified accuracy can be obtained without real-flow calibration.

Selection specification table

Specification table for selection of dual-range differential pressure flowmeter

model	Flowmeter type
FMD-SL	Dual-range differential pressure flowmeter

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Throttle type
XX	Choosing a throttle

Codename	Connection method
1	Pipeline flange connection
2	Wafer flange connection

Codename	Flange material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-25	1 inch	DN25
-32	1.25 inch	DN32
-40	1.5 inch	DN40
...	...	...
-300	12 inches	DN300

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1.0MPa
16	X	1.6MPa
20	2.0MPa（150LB）	X
...	.....	.....

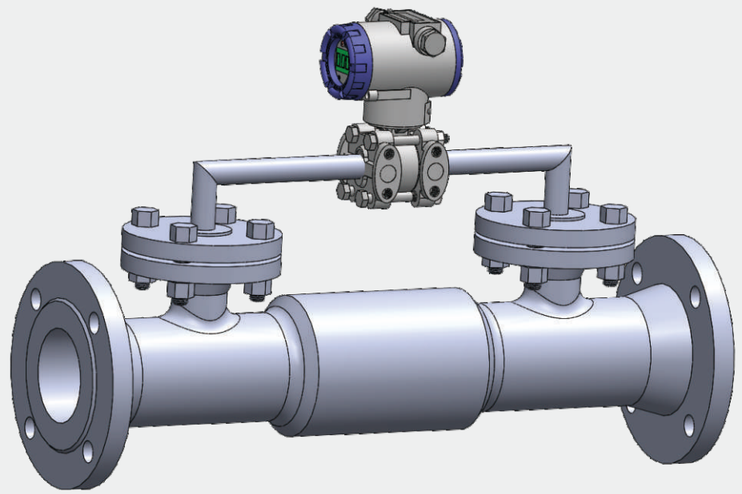
WEDGE FLOW METER

FMD-XX Wedge Flowmeter

Product Introduction

The V-cone flowmeter is a new type of throttling device that integrates the advantages of the classic venturi tube and the annular orifice. It uses the throttling effect produced by the V-shaped cone in the flow field to measure the flow rate, which is different from other throttling flowmeters. , It changes the throttling layout, from the central hole throttling to the annular throttling, the trailing edge of the cone produces small vortex, the negative pressure side output is stable, the fluctuation is small, and the stability is good. Its theoretical basis is based on the conservation of energy in the closed pipe The law of Bernoulli equation and flow continuity equation, in the case of steady flow the flow rate in the pipeline is proportional to the square root of the pressure difference. The V-cone flowmeter has good stability, high accuracy, good repeatability, and wide range ratio. The installation pipe section has low requirements and low pressure loss. It can measure fluids containing solid particles, low-pressure fluids high-humidity gases and various dirty fluids.

The wedge flowmeter is a flow meter that uses a V-shaped throttling element for flow measurement. Its sleek top angle faces downwards, which facilitates the smooth passage of liquids containing suspended particles or viscous liquids without stagnant flow upstream of the throttle. The wedge flowmeter can be used for flow measurement of viscous liquids, and the viscosity can be as high as 500mPaS, used for flow measurement of slurry, ore slurry, sandy crude oil, sewage, heavy oil, residual oil and other solid suspensions and low Reynolds number and other liquid media. It can also be used for the flow of gas and steam media. This product is used for various gases, especially suitable for the flow measurement of dirty gas and natural gas.



Wedge flowmeter structure

Main Specifications

Nominal diameter: 10mm≤DN≤1000mm

Reynolds number range: Red as low as 3[illegible]0, as high as 10

Nominal pressure: PN≤25MPa

Working temperature: t≤350℃

Accuracy grade: 0.5 grade, 1 grade

Uses and characteristics

The use of a "V"-shaped throttle can eliminate the stagnant area and prevent the system from clogging.

The Reynolds number has a wide range of applications. When the Reynolds number is 500, the square relationship between the differential pressure and the flow rate is still maintained.

The differential pressure transmitter can output an electrical signal of 4-20mA, which is convenient to be equipped with various instruments.

Easy to install, use and maintain.

The measurement accuracy is high, and the extended uncertainty of flow calibration: ±0.5%～±0.2% (water school or oil school).

Long-term stability is good, and it is praised as a zero failure rate instrument by users.

One-time meter is split type, and the measuring range can be expanded by replacing the wedge (middle)

Variety of styles: common type: the range ratio is in the range of 1:5, and the nonlinear error of the flow coefficient is ≤±1%.

High-performance type: The extended uncertainty of flow calibration within the range of 1:30 is ±0.5% to ±0.2%.

Selection specification table

FMD Wedge Flowmeter Selection Specification Table

model	Flowmeter type
FMD-XX	Wedge flowmeter

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-25	1 inch	DN25
-32	1.25 inch	DN32
-40	1.5 inch	DN40
...	...	...
-300	12 inches	DN300

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1.0MPa
16	X	1.6MPa
20	2.0MPa（150LB）	X
...	.....	.....

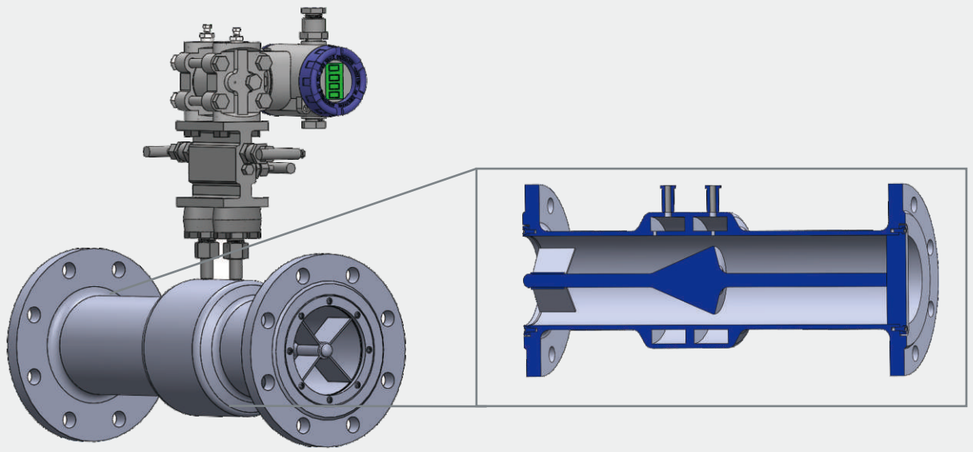
SMART
Flow Meter
Specification

V-CONE FLOW METER

FMD-NT-V Cone Flowmeter

Product Introduction

The V-cone flowmeter is a new type of throttling device that integrates the advantages of the classic venturi tube and the annular orifice. It uses the throttling effect produced by the V-shaped cone in the flow field to measure the flow rate which is different from other throttling flowmeters. , It changes the throttling layout, from the central hole throttling to the annular throttling, the trailing edge of the cone produces small vortex, the negative pressure side output is stable the fluctuation is small, and the stability is good. Its theoretical basis is based on the conservation of energy in the closed pipe The law of Bernoulli equation and flow continuity equation, in the case of steady flow, the flow rate in the pipeline is proportional to the square root of the pressure difference. The V-cone flowmeter has good stability, high accuracy, good repeatability, and wide range ratio. The installation pipe section has low requirements and low pressure loss. It can measure fluids containing solid particles, low-pressure fluids, high-humidity gases and various dirty fluids.



V-cone flowmeter structure

Main Specifications

Nominal pressure: PN≤6.3MPa

Reynolds number range: 8×7103≤Red≤10

Nominal passage: 15mm≤DN≤3000mm

Accuracy grade: 0.5 grade, 1 grade

Repeatability: ≤0.1%

Length of straight pipe section: 1~3D for front straight pipe, 3~5D for rear straight pipe

The pressure loss is small, only 1/3~1/5 of the orifice plate

The measuring range can reach 1:10, with special means, the measuring range ratio can reach 1:65.

Selection specification table

V-cone flowmeter selection specification table

model	Flowmeter type
FMD-NT	V cone flowmeter

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	structure type
1	Split structure
2	Integrated structure

Codename	Flange material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2 inch	DN50
-65	2.5 inch	DN65
-80	3 inches	DN80
...	...	...
-3000	120 inches	DN3000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1.0MPa
16	X	1.6MPa
20	2.0MPa（150LB）	X
...	.....	.....

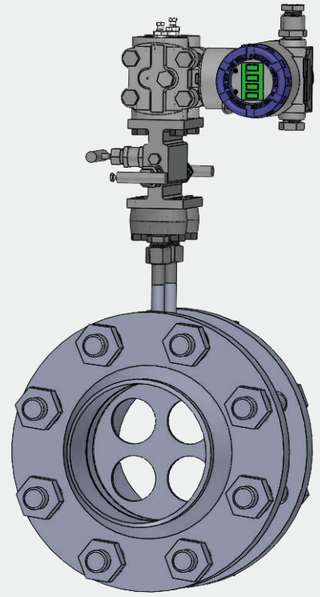
SMART
Flow Meter
Specification

ERFORATED ORIFICE PLATE FLOW METER

FMD-PH Porous Balance Flowmeter

Product Introduction

In the industrial field, when the fluid is transported in the pipeline, it often flows through various valves, elbows, tees reducers and other flow obstruction parts. When the fluid passes through these flow obstruction parts, various disturbances will occur, which will affect the normal operation. Measurement brings certain additional errors in the field installation of the flowmeter, especially the traditional differential pressure flowmeter. The new generation of porous balanced flow sensor cleverly integrates rectification and measurement, and has an obvious stable flow. The role of the field can minimize the additional error and make the actual use accuracy close to the theoretical calculation accuracy. It is a new generation of differential pressure flowmeter with broad application prospects. It can be widely used in natural gas, chemical industry, petroleum, steel, and power generation. , Papermaking, printing and dyeing, pharmaceutical and other industries.



Porous balanced flowmeter structure

Main Specifications

Nominal passage: 10m≤DN≤1000 mm

Accuracy grade: ±0.5%, ±1.0%

Repeatability: ≤0.1%

Turndown ratio: 1:10 or 1:30

Installation requirements for straight pipes: 2D before 2D and 2D afterwards

Medium operating pressure: ≤25MPa

Permanent pressure loss (Pa): ≤0.31ρV2 (ρ bulk density kg/m 3 V average flow rate m/s)

Measurable bidirectional flow

Uses and characteristics

High measurement accuracy: Since the porous balanced flow sensor is actually a flow rectifier, it can effectively eliminate eddies and improve velocity distribution distortion, making the flow field approximate to an ideal state.

Wide range ratio: Because the large diameter and small flow measurement is a difficult problem for most flow sensors and the porous balanced flow sensor has a porous structure, choosing a suitable equivalent diameter ratio can focus on the main measurement lower limit flow while taking into account the upper limit flow, making the routine The measuring flow range ratio is 1:10, and the range can be extended to 1:30

Straight pipe section requires low requirements: a certain length of straight pipe section is mainly used to ensure that the fluid flows in it smoothly, and the porous balanced flow sensor itself is a flow regulator, so it can be almost directly connected to valves, tees, and bends. After the first-class baffle, it does not affect the flow measurement.

Low permanent pressure loss: The flow sensor installed in the pipeline will inevitably produce pressure loss due to its blocking effect. The porous structure in the porous balanced flow sensor can disperse resistance, effectively reducing the formation of eddy currents and turbulent friction , To reduce the permanent pressure loss, so as to achieve the effect of throttling.

Selection specification table

Porous Balanced Flowmeter Specification Sheet

model	Flowmeter type
FMD-PH	Annular orifice

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2 inch	DN50
-65	2.5 inch	DN65
-80	3 inches	DN80
...	...	...
-1000	40 inches	DN1000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	X	.....
320	2.0MPa (150LB)	32MPa
...	.....	.....

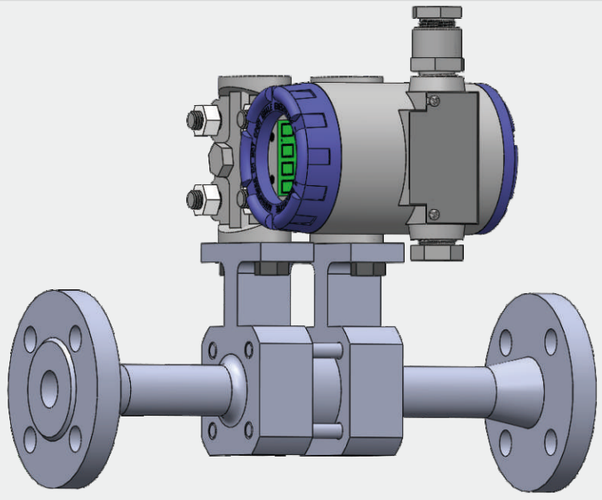
SMART
Flow Meter
Specification

BUILT IN ORIFICE PLATE FLOW METER

FMD-NC Built-in Orifice Flowmeter

Product Introduction

The integrated orifice flowmeter is a high-range ratio differential pressure flow device composed of a standard orifice plate and an intelligent multi-parameter differential pressure transmitter (or a differential pressure transmitter, a temperature transmitter, and a pressure transmitter). It measures the flow of gas, steam, liquid and natural gas, and is widely used in process control and measurement in the fields of petroleum, chemical industry, metallurgy, electric power heating, and water supply.
The standard throttling device is only suitable for flow measurement with a pipe diameter of 50mm and above. The pipe diameter is too small, and the following problems exist:
1. Different types of throttling devices have different lower Reynolds numbers. Reynolds numbeber104 is the limit that can be used. If the Reynolds number is too small, the outflow coefficient will change significantly with the change of the Reynolds number, which will increase the uncertainty. , The flowmeter has no accuracy at all.
2. It is difficult to carry out similar processing according to the shape specified in the standard and the strength of the orifice plate cannot be guaranteed.
3. When the flow rate is low to a certain value, the differential pressure is too small, because the differential pressure is proportional to the square of the flow rate, when the flow rate is low to a certain value, the differential pressure becomes smaller, so Can't tell. In view of the above situation, our company has developed a built-in orifice flowmeter based on market demand, which can be widely used for fluid measurement with small diameters and low flow rates.



Built-in orifice flowmeter structure

Main Specifications

Nominal diameter: 10mm≤DN≤50mm

Nominal pressure: PN≤32MPa

Throttle aperture ratio β: 0.2≤β≤0.75

Turndown ratio: 1:10, 1:30

Horizontal installation

Uses and characteristics

The positive and negative directions are completely symmetrical, ensuring the excellent performance of two-way flow measurement.

The sharp edge design effectively controls the separation point of the surface layer, so that the position of the separation point does not change with the Reynolds number and achieves excellent linearity.

Precise design and precise pressure-taking holes ensure the accuracy and stability of the average pressure.

The online plug-in structure can be installed continuously.

Selection specification table

Built-in orifice flow meter specification sheet

model	Flowmeter type
FMD-NC	Built-in orifice flowmeter

Codename	Connection method
1	Pipeline flange connection
2	Connect with transmitter

Codename	Flange material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
- 10	0.4 inch	DN10
...	.....	.....
- 50	2 inches	DN50

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	X	.....
320	2.0MPa（150LB）	32MPa
...	.....	.....

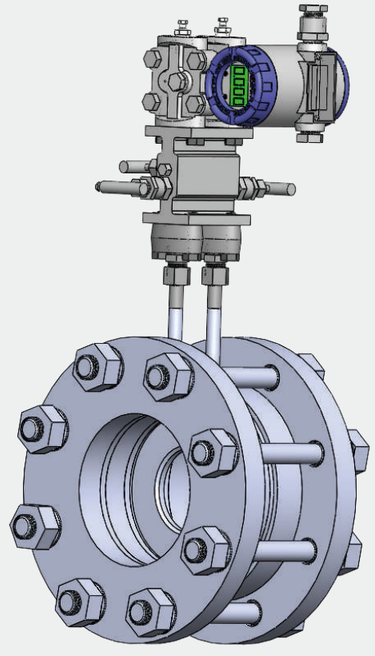
SMART
Flow Meter
Specification

INTEGRATED ORIFICE PLATE FLOW METER

FMD-YT Integrated Throttle Flowmeter

Product Introduction

The integrated orifice flowmeter is a high-range ratio differential pressure flow device composed of a standard orifice plate and an intelligent multi-parameter differential pressure transmitter (or a differential pressure transmitter, a temperature transmitter, and a pressure transmitter). It measures the flow of gas, steam, liquid and natural gas, and is widely used in process control and measurement in the fields of petroleum, chemical industry metallurgy, electric power, heating, and water supply.



Integrated orifice flowmeter structure

Main Specifications

Nominal diameter: 15mm≤DN≤1200mm

Nominal pressure: PN≤16MPa

Working temperature: -50℃≤t≤550℃

Turndown ratio: 1:5, 1:10, 1:65

Accuracy: 0.5 level, 1 level

Uses and characteristics

The use of a "V"-shaped throttle can eliminate the stagnant area and prevent the system from clogging.

The Reynolds number has a wide range of applications. When the Reynolds number is 500, the square relationship between the differential pressure and the flow rate is still maintained.

The differential pressure transmitter can output an electrical signal of 4-20mA, which is convenient to be equipped with various instruments.

Easy to install, use and maintain.

The measurement accuracy is high, and the extended uncertainty of flow calibration: ±0.5%～±0.2% (water school or oil school).

Long-term stability is good, and it is praised as a zero failure rate instrument by users.

Selection specification table

Integral orifice flowmeter selection specification table

model	Flowmeter type
FMD-BKYT	Integrated orifice

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	With front and rear straight pipe sections, butt welded connection

Codename	medium
C	Carbon steel
S	stainless steel
O	other

Codename	Pressure taking method
A	Corner connection
F	Flange pressure
D	D-D/2 take pressure

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2 inches	DN50
-65	2.5 inch	DN65
-80	3 inches	DN80
...	...	...
-1200	42 inches	DN1200

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	X	...
160	2.0MPa（150LB）	16MPa
...	.....	.....

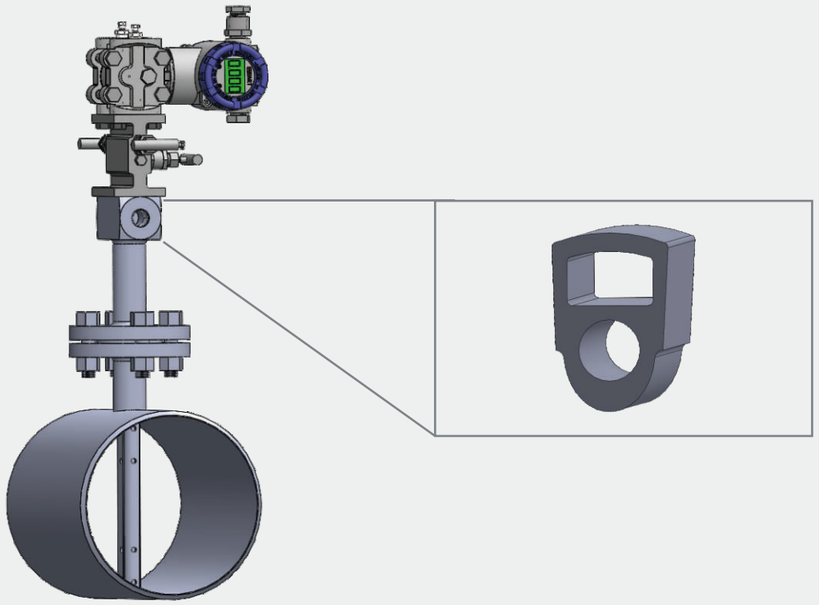
SMART
Bar Flow Sensor
Specification

FMD-W BAR FLOW SENSOR

Average velocity tube (FMD-W bar)

Product Introduction

The FMD-W bar flow sensor is a high-precision flow meter based on the pitot tube speed measurement principle, using the principle of aerodynamics, and supplemented by wind tunnel experiments. It is a differential pressure type, rate average flow sensor, which measures the flow rate through the difference between the average total pressure and static pressure of the sensor in the fluid (that is, the pressure difference between the high and low ends). It is used to measure liquid, gas and steam. Flow rate, especially suitable for the measurement of large pipe diameter, widely used in metallurgy, electric power, environmental protection and other industries.



Structure of uniform velocity tube (FMD-W bar)

Main Specifications

Nominal pressure: PN≤32MPa

Temperature range: -180℃~650℃

Nominal pass: DN10—DN6000

Accuracy level: 1.0

Repeatability: ≤0.1%

Uses and characteristics

The measuring profile designed according to the principle of aerodynamics, after a special process can make the generated fluid traction and vortex shedding force very small.

Take the static pressure hole on the side. The static pressure generated is before the fixed separation point of the fluid and the sensor, which is a completely stable non-pulsating signal.

Dustproof: The static pressure hole is taken on both sides of the sensor, which is extremely insensitive to foreign matter and dust in the medium. It is an ideal flow sensor.

FMD-W Barco realizes continuous online installation and maintenance.

FMD-W can realize the integrated installation of differential pressure, pressure and temperature, reducing the accessory error caused by differential pressure pipeline.

There are no movable parts in the structure, which can ensure the long life of the sensor, and can ensure long-term stability and no precision drift.

Energy saving: due to the extremely low pressure loss produced, the energy consumption is greatly reduced. Compared with other flow meters, the operating cost is extremely low.

FMD-W bar flow sensor has many special materials to choose from to meet the needs of corrosive ultra-high temperature and ultra-high pressure.

Selection specification table

Uniform speed tube (FMD-W bar) specification table

model	Flowmeter type
FMD-BW	W-type uniform velocity flow sensor

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Sensor type
P	normal type
Q	Ball valve type
ZX	Online plug-in type
TH	Spring lock type

Codename	Sensor structure
FT	Split structure
YT	Integrated structure

Codename	Installation method
1	Single-ended fixation
2	Double-ended fixation

Codename	Connection method
1	Threaded connection
2	Flange connection
3	Direct welding connection (for high temperature and high pressure)

Codename	Pressure Level
1	≦1.6MPa
2	≦2.5MPa
3	≦4.0MPa
...	...
5	≦25MPa

Codename	caliber
-25	25mm
-50	50mm
-80	80mm
-100	100mm
...	...
-6000	6000mm

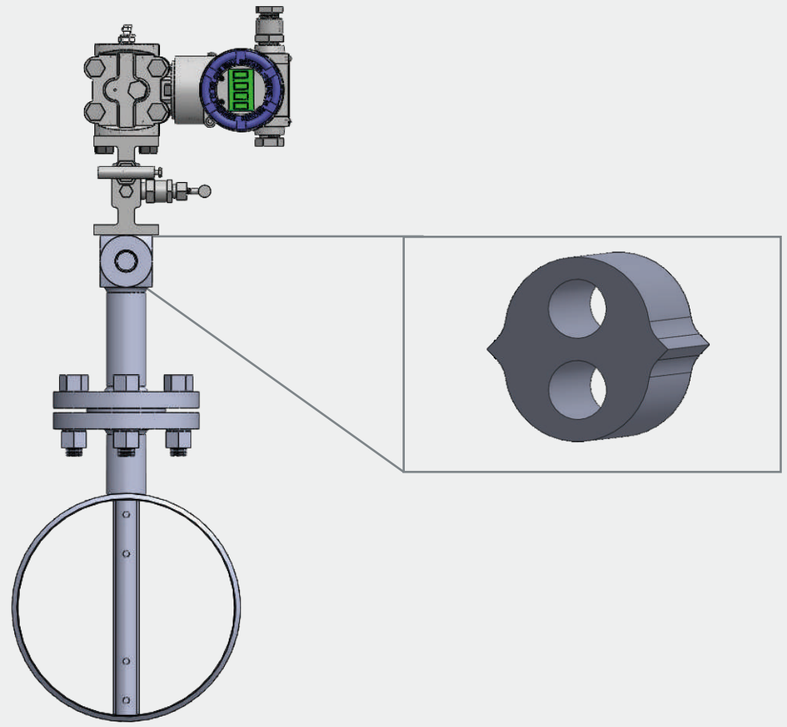
SMART
Bar Flow Sensor
Specification

SMART-D BAR FLOW SENSOR

Average velocity tube (FMD-D bar)

Product Introduction

The FMD-D bar flowmeter is a flowmeter designed and manufactured according to the principle of PITOT tube for measuring fluids (gas, steam, liquid, etc.). It uses the differential pressure generated by the fluid through the flow sensor to measure the flow.



Structure of uniform velocity tube (FMD-D bar)

Main Specifications

Nominal pressure: PN≤32MPa

Temperature range: -180℃~860℃

Nominal pass: DN10—DN6000

Accuracy grade: 0.5 (liquid), 1.0 (steam)

Repeatability: ≤0.1%

Uses and characteristics

The positive and negative directions are completely symmetrical, ensuring the excellent performance of two-way flow measurement.

The sharp edge design effectively controls the separation point of the surface layer, so that the position of the separation point does not change with the Reynolds number and achieves excellent linearity.

Precise design and precise pressure-taking holes ensure the accuracy and stability of the average pressure.

The online plug-in structure can be installed continuously.

The integrated structure of differential pressure, pressure and temperature can be realized, and the accessory error caused by the differential pressure pipeline can be reduced.

Shorter upstream and downstream pipe sections are required.

Very low permanent pressure loss.

Lower installation costs.

The choice of a variety of materials can meet the requirements of corrosion resistance, ultra-high pressure and ultra-high temperature.

Selection specification table

Specification table for selection of uniform velocity tube (FMD-D bar)

model	Flowmeter type
FMD-BD	D-type uniform velocity flow sensor

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Sensor type
P	normal type
Q	Ball valve type
ZX	Online plug-in type

Codename	Sensor structure
FT	Split structure
YT	Integrated structure

Codename	Installation method
1	Single-ended fixation
2	Double-ended fixation

Codename	Connection method
1	Threaded connection
2	Flange connection
3	Direct welding connection (for high temperature and high pressure)

Codename	Pressure Level
1	≦1.6MPa
2	≦2.5MPa
3	≦4.0MPa
...	...
5	≦25MPa

Codename	caliber
-25	25mm
-50	50mm
-80	80mm
-100	100mm
...	...
-5000	5000mm

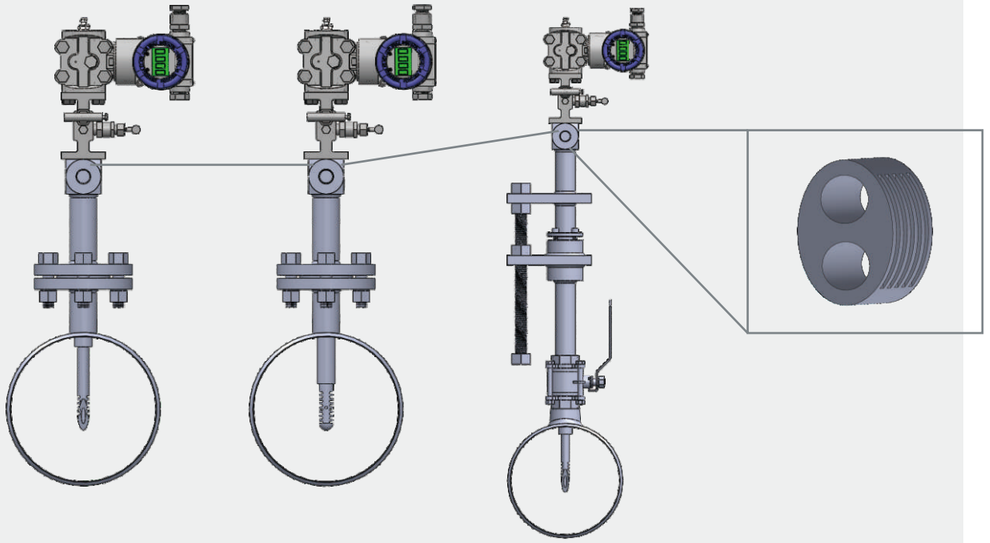
SMART
Bar Flow Sensor
Specification

SMART-B BAR FLOW SENSOR

Average velocity tube (FMD-B bar)

Product Introduction

The FMD-B bar flowmeter works according to the pitot tube principle. According to Bernoulli's principle, the dynamic pressure is equal to the difference between the total pressure and the static pressure. The differential pressure measured by the FMD-B bar is the dynamic pressure head, which can reflect the pipeline The flow rate of the medium fluid can be calculated, and the flow rate of gas, liquid and steam can be measured. It is widely used in various industries.



Structure of uniform velocity tube (FMD-B bar)

Main Specifications

Nominal pressure: PN≤4.0MPa

Temperature range: -180℃~860℃

Nominal pass: DN10—DN6000

Accuracy grade: 1.0 (liquid), 1.5 (steam)

Repeatability: ≤0.1%

Uses and characteristics

It adopts a special structure and has the function of self-correction of incoming flow direction.

The positive and negative directions are completely symmetrical, ensuring the special performance of two-way flow measurement.

There are two types of structure, which can measure clean fluid and dusty fluid respectively.

The online plug-in structure can be installed continuously.

The integrated structure of differential pressure, pressure and temperature can be realized, and the accessory error caused by the differential pressure pipeline can be reduced.

Very low permanent pressure loss.

Lower installation costs.

The choice of a variety of materials can meet the requirements of corrosion resistance, high pressure and high temperature.

Selection specification table

Uniform velocity tube (FMD-B bar) specification table

model	Flowmeter type
FMD-BB	B-type uniform velocity flow sensor

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Sensor type
P	normal type
Q	Ball valve type
ZX	Online plug-in type

Codename	Sensor structure
FT	Split structure
YT	Integrated structure

Codename	Installation method
1	Single-ended fixation
2	Double-ended fixation

Codename	Connection method
1	Threaded connection
2	Flange connection
3	Direct welding connection (for high temperature and high pressure)

Codename	Pressure Level
1	≦1.6MPa
2	≦2.5MPa
3	≦4.0MPa
...	...
5	≦25MPa

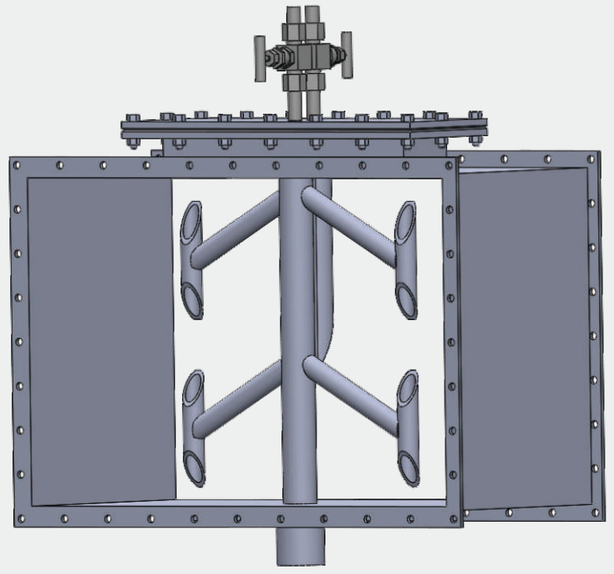
Codename	caliber
-25	25mm
-50	50mm
-80	80mm
-100	100mm
...	...
-6000	6000mm

MULTI POINT MATRIX FLOW METER

FMD-JZ multi-point matrix flow measurement device

Product Introduction

In the installation place of large-caliber gas flow meters in industrial sites, it is a common phenomenon that the straight pipe section length is not enough due to the limited space. At this time, the swirling flow and velocity distribution in the pipeline are severely distorted, and the meter coefficient of the flowmeter has a large deviation. Polygon, etc.) The flow velocity distribution in the pipeline is more complicated, and the large and small pipelines are not similar, which brings great trouble to the flow measurement. The multi-point matrix flow measurement device produced by our company divides the entire pipeline section into N equal areas. The unit, the flow sensor is equipped with a total pressure hole, the position of the total pressure hole is exactly at the center of each unit area, the measured total pressure reflects the flow velocity of each unit area, and the total pressure at each point is averaged in the flow sensor , And the static position on the axis of the sensor's back flow directionThe static pressure measured at the pressure detection port leads to the flow sensor to form a differential pressure output. The differential pressure square root has a linear relationship with the flow rate.



Multi-point matrix flow measurement device structure form

Main Specifications

Nominal diameter: 10mm≤DN≤1000mm

Reynolds number range: Red as low as 300, as high as 10

Nominal pressure: PN≤25MPa

Working temperature: t≤350℃

Accuracy grade: 0.5 grade, 1 grade

Uses and characteristics

This type of flow sensor has two structures, one is suitable for clean fluids, and the other is suitable for dusty fluids.

Simple structure and light weight.

The manufacturing cost of large-caliber instruments is low, and the larger the caliber, the more prominent the advantages.

It is easy to install and can be made into an online continuous flow structure, which is convenient for maintenance, replacement or regular inspection.

There are many types of flow probes, which can be selected according to the object of use, so the applicable fluid types and working conditions are very wide.

The calibration of the flowmeter is simple, generally only the measuring probe needs to be calibrated and there is no need for the caliber of the calibration device to correspond to the caliber of the flowmeter. The calibration device is of small and medium caliber, and the calibration cost is low, which solves the problem of large caliber flowmeter calibration.

A flow probe of one specification can be used for pipelines of various calibers, which can reduce the number of spare meters for users, and provide design, manufacturing, ordering, and

It is convenient to use on site.

Selection specification table

Multi-point matrix flow measurement device

model	Flowmeter type
FMD-JZ	Multi-point matrix measuring device

Codename	Media type
J	Clean gas
HC	Dusty gas

Codename	Connection method
1	Flange connection
2	Direct welding
3	Online plug-in
4	Special customized structure

Codename	Pipe material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
- 300	12 inches	DN300
- 350	12.5 inch	DN350
...	...	.....
- 6000	240 inch	DN6000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
...	.....	.....

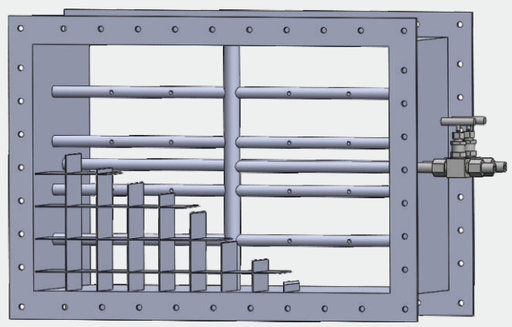
SMART
Gaseous Fluid Flow Meter
Specification

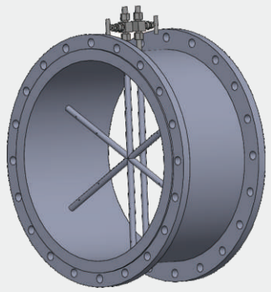
CROSS SECTION FLOW METER

FMD-HJ cross section air volume measuring device

Product Introduction

The cross-sectional air volume measuring device is a new type of flowmeter developed based on the principle of the velocity area method. The velocity area method divides the measuring velocity section into many small cells. Assuming that the velocity of each cell area is Vi, the total flow is equal to the sum of the flow through all the small cell areas. When the unit area is divided more, the measured flow rate is more accurate, and the cross-sectional air flow measuring device is developed based on this principle.





Cross-sectional air volume measuring device structure

Main Specifications

Nominal diameter: round pipe: 200mm≤DN≤6000mm
Rectangular tube: 200×200mm≤DN≤6000×6000mm

公称压力：PN≤0.6MPa

Medium temperature: t≤400℃ (﹥400℃, please specify when ordering)

Reynolds number range: Red ﹥ 2.5×10

Accuracy level: 1.0, 1.5, 2.0
Repeatability: 0.5% Stability: ±10Pa

No straight pipe section is needed, as long as there is an installation position of about 250mm

The pressure loss is small, the outflow coefficient is stable, no calibration is required

Blowing device can be installed to realize manual or automatic blowing

Process connector: G1/2, M20×1.5

working principle

There are multiple wind speed detection rods built in the cross-sectional wind measuring device. There are pairs of pressure measuring holes on the front flow direction of the detection rod to measure the average total pressure P0 of the fluid. The other group of detection rods is used to detect the back flow direction or The hydrostatic pressure P on the downstream pipe wall uses the differencce P between the average total pressure and the static pressure to express the flow rate.Because the flow velocity distribution in the pipeline is not uniform, for accurate measurement the cross section of the entire duct is divided into multiple unit areas, and there are multiple pairs of total pressure holes on the detection rod, so that they are exactly in the area of each unit. Measure the total pressure, which reflects the size of the flow velocity in the area of each unit, and the total pressure of each point and the average static pressure of each point are respectively led out of the flow sensor in the detection rod to form a differential pressurureP output
The relationship between △P and flow Qv is determined by the following formula:

$$Qv=\varepsilon\times(\pi/4)\times D2\times\{(2\times\Delta P)/\rho\}0.5$$

Among them: Qv: flow value in the duct C: outflow coefficient
ε: Expansion coefficient of fluid D: Diameter of throttle
ΔP: differential pressure valueρ： Density of fluid working condition

Selection specification table

Specification table of cross-section air flow measuring device

model	Flowmeter type
FMD-HJ	Cross-section air volume measuring device
Codename	**Pipe section shape**
Y	Round shape
F	Square
Codename	**Connection method**
1	Flange connection
2	Butt welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

代号	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-200	60 inches	DN200
-250	65 inches	DN250
-300	70 inches	DN300
...	...	...
-4000	800 inch	DN4000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
...	X	...
64	X	6.4MPa
...	.....	.....

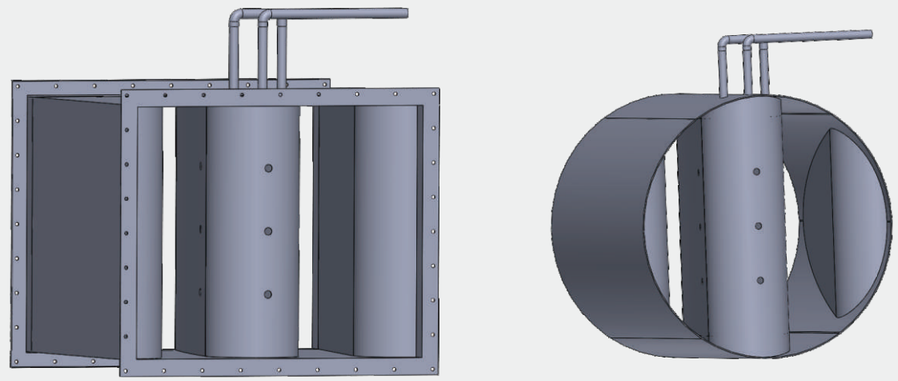
SMART
Gaseous Fluid Flow Meter
Specification

AIRFOIL-SHAPED FLOW METER

Wing-type wind measuring device

Product Introduction

The FMD wing-type wind measuring device is a special device used to measure the air volume of the boiler. It can be directly installed on the inlet of the blower and the hot and cold air ducts between the blower and the burner. The wing-type wind measuring device is suitable for conditions such as large air, large cross-sectional area of the air duct, low flow rate, short length of straight pipe section, etc., with large differential pressure signal, small pressure loss, stable performance, and simple structure. Features such as easy maintenance.



Wing-type wind measuring device structure

Main Specifications

Nominal diameter: circular pipe: 500mm≤DN≤5000mm

Rectangular tube 500mm×500≤DN≤5000×5000mm

Nominal pressure: PN≤0.6Mpa

Medium temperature: t≤400℃

Reynolds number range: Red > 2.5×10⁵

Accuracy level: level 1, level 1.5, level 2

working principle

There are multiple wind speed detection rods built in the cross-sectional wind measuring device. There are pairs of pressure measuring holes on the front flow direction of the detection rod to measure the average total pressure P0 of the fluid. The other group of detection rods is used to detect the back flow direction or The hydrostatic pressure P on the downstream pipe wall uses the differencce P between the average total pressure and the static pressure to express the flow rate.Because the flow velocity distribution in the pipeline is not uniform, for accurate measurement, the cross section of the entire duct is divided into multiple unit areas, and there are multiple pairs of total pressure holes on the detection rod, so that they are exactly in the area of each unit. Measure the total pressure, which reflects the flow velocity in the area of each unit, and the total pressure at each point and the average static pressure at each point are respectively led out of the flow sensor in the detection rod to form a differential pressureP output
The relationship between △P and flow Qv is determined by the following formula:

Selection specification table

Wing-type wind measuring device specification sheet

model	Flowmeter type
FMD	Wing type wind measuring device

Codename	Pipe section shape
Y	Round shape
F	Square

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-500	20 inches	DN500
-600	30 inches	DN600
-700	35 inches	DN700
...	.....	...
-5000	200 inches	DN5000

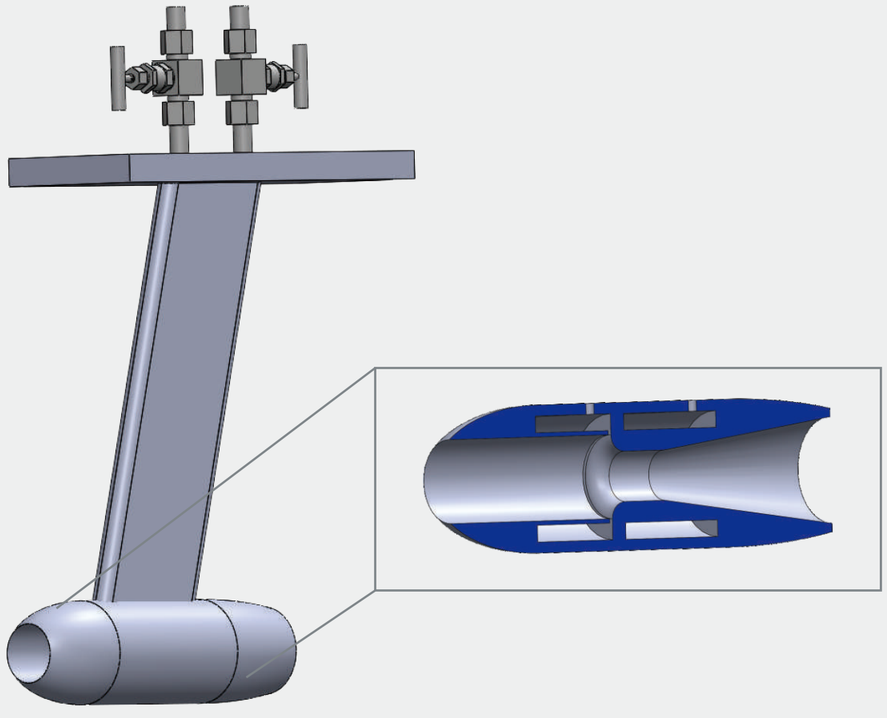
Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
...	.....	.....
10	X	1MPa
...	.....	.....

SMART
Gaseous Fluid Flow Meter
Specification

VENTURI TUBE OF PLUG-IN TYPE FLOW METER
Plug-in venturi

Product Introduction

The plug-in venturi tube is a more convenient flow measurement device produced for industrial enterprises with extra large diameter and large flow accurate measurement. It can successfully replace annubar and other large diameter plug-in flow measuring instruments, mainly used in petroleum , Chemical industry, metallurgy, electric power industry.



Plug-in venturi structure

Main Specifications

Nominal diameter: round pipe: 500mm≤DN≤15000mm
Rectangular pipe: 500mm×500mm≤DN≦15000×15000mm

Nominal pressure: PN≤2.5MPa

Medium temperature: t≤600℃ (when greater than 600℃, please specify when ordering)

Stability: ±10Pa

Turndown ratio: 1:5, 1:10, 1:30

Uses and characteristics

The flow resistance is small, and the pressure loss is small.

Large differential pressure and high precision.

The measurement range is wide and can be designed according to the user's use conditions and requirements.

It is easy to install, just insert the hole-opening device directly on the measurement official road and fix it.

A purge device can be installed, and it can be cleaned directly during use.

Selection specification table

Specification table of plug-in venturi

model	Flowmeter type
FMD-CR	Plug-in venturi

Codename	Pipe section shape
Y	Round shape
F	Square

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-500	20 inches	DN500
-600	30 inches	DN600
-700	40 inches	DN700
...	...	...
-4000	100 inches	DN4000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
...	X	.....
25	X	2.5MPa
...	.....	.....

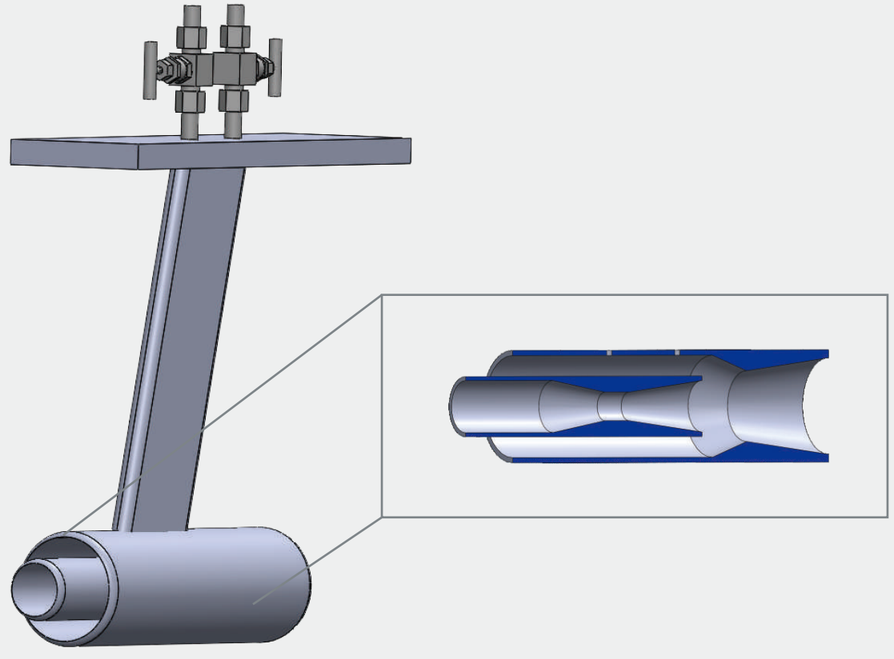
SMART
Gaseous Fluid Flow Meter
Specification

MULTI THROAT OF PLUG-IN TYPE FLOW METER

FMD-DH plug-in multi-throat measuring device

Product Introduction

The plug-in multi-throat runo ffmeasurement device adopts the principles of aerodynamics and aviation jet engine inlet design technology, and introduces the accurate correction function of the change of the inlet flow beam area and the average velocity point of the multi-throat runo ffsensor to solve the problem of large pipes. Accurate measurement of radial air flow or water flow. It is especially suitable for the measurement of primary and secondary air volume in thermal power plants.



The structure of the plug-in multi-throat diameter measuring device

Main Specifications

Working pressure: -10kpa ~ 3.5mpa (air: -10 ~ 200kpa, water: 0-3.5mpa)

Working temperature: -40c ~ 400c (water: 5 ~ 90℃)

Measurement accuracy: ±1%

Turndown ratio: 1:5, 1:10

Installation opening size: length: 280 ~ 360, width: 80 ~ 150

Scope of application: pipes with diameters above 400mm.

Applicable media: water, air, steam, gas and other media.

Uses and characteristics

The plug-in multi-throat diameter flow measurement device can be divided into two types: double-throat diameter and multi-throat diameter according to different on-site process conditions. Double throat diameter is suitable for the occasions with long straight pipe section and stable flow field. Multiple throats are suitable for occasions with short straight pipe sections and unstable flow field.

The pressure loss is small. Because the device is a single-point measuring element, the resistance loss is almost negligible for pipe diameters greater than φ400mm. The energy saving effect is remarkable.

The requirements for straight pipe sections are low. Under normal circumstances, the length of the front straight pipe section is 0.7-1.5d, and the length of the rear straight pipe section is 0.5-1d.

The anti-blocking purge device can be used for online purge and maintenance.

The differential pressure value is large. Due to the unique structure of this product, it can still have a large differential pressure value (all above kpa) even at a small flow rate.

The signal is stable and reliable, and there is no pulsation differential pressure signal. Due to the "multi-throat" structure the measured medium has a "rectification" process in each throttling section, which eliminates the influence of eddy currents to the greatest extent.

The product has a long service life. The product adopts 316 or 1crl8ni9ti material, and the fluid measuring surface is subjected to abrasion resistance treatment, and the service life can reach 20 to 30 years.

It is small in size and easy to install. You only need to open a hole in the pipe for installation, and the installation flange is randomly distributed.

Selection specification table

Specification table of plug-in multi-throat measuring device

model	Flowmeter type
FMD-DH	Porous balance throttling device

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection pipeline type
2	Flange connection wafer type
3	Direct welding
4	Special customized structure

Codename	Pipe material
C	Carbon steel
S	stainless steel
O	stainless steel

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
- 50	20 inches	DN50
- 65	35 inches	DN65
- 80	50 inches	DN80
...	.....	.....
- 3000	120 inches	DN3000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
400	X	40MPa
...	.....	.....

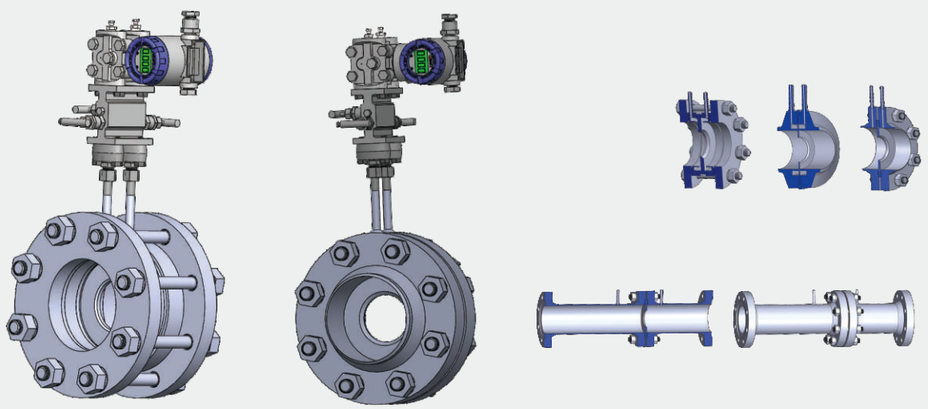
SMART
Orifice Plate Flow Meter
Specification

STANDARD ORIFICE PLATE FLOW METER

FMD-BK standard orifice plate

Product Introduction

The FMD-BK standard orifice plate can be used to measure the flow of liquid, gas, and steam in the pipeline. The FMD-BK standard orifice plate is designed and manufactured according to the national standard GB/T2624-2006 (equivalent to ISO 5167-2003), and is verified in accordance with the national standard JJG640-2016. The standard orifice plate can adopt three pressure methods: corner connection pressure (including ring chamber pressure), flange pressure and D-D/2Q pressure. The standard orifice plate designed, manufactured and calibrated in accordance with the national standard does not require real flow calibration. It has high accuracy, simple structure and low manufacturing cost. It is the most widely used flow meter in fluid measurement, but it has the disadvantage of large pressure loss and a wide range of standard orifice plates. Used in petroleum, chemical, metallurgy, electric power nuclear energy and other industries.



Standard orifice structure

Main Specifications

Nominal diameter: 50 mm ≤DN≤1000mm, if DN>1000 mm, real flow calibration is required

Aperture ratio β: 0.20≤β≤0.75

Reynolds number range: when 0.20≤β≤0.45, 5000≤ReD
When 0.45≤β≤0.75, 10000≤ReD

Nominal pressure: PN≤16MPa

Turndown ratio: 1:5, 1:10, 1:65

Installation requirements

During installation, ensure that the center of the orifice plate, the axis of the flange, the axis of the pipe, the axis of the pipe and the gasket are concentric, and the degree of misalignment shall not exceed 0.002D/β

The high and low pressure directions of the orifice plate, and the upstream and downstream pressure-taking flanges should be consistent with the flow direction of the medium. The position of the pressure-taking hole can be determined according to the different medium and the installation of the transmitter (refer to the FMD-BK manual).

When the standard orifice plate is connected to the pipe, the non-perpendicularity between the end face of the weld and the pipe axis shall not be greater than 1°. After welding, the internal weld should be processed to make it smooth and free of weld scars and weld slag.

Before welding the pressure-taking flange and the pipeline, the pressure-taking air on the official road should be drilled. Its diameter is the same as the pressure-taking hole on the pressure-taking flange. During welding, the pressure-taking hole on the pressure-taking flange is the same as the pressure-taking hole on the pipeline. Align the pressure holes.

Optional with up and down straight pipe sections.

D-D/2 pressure taking is supplied as a complete set, and the flange connection can be directly installed.

Selection specification table

Standard orifice plate specification table

model	Flowmeter type
FMD-BK	Standard orifice

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	With front and rear straight pipe sections, butt-welded connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Pressure taking method
A	Corner connection
F	Flange pressure
D	D-D/2 take pressure

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	4.0 inch	DN80
...	...	...
-1000	30 inches	DN1000

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
160	X	16MPa
...	.....	.....

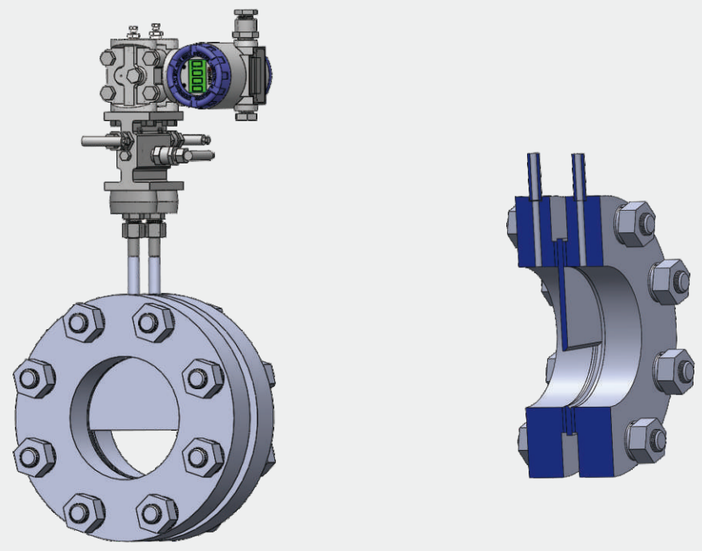
SMART
Orifice Plate Flow Meter
Specification

FRAGMENTARY ORIFICE PLATEFLOW METER

FMD-YQ round hole plate

Product Introduction

The hole of the FMD-YQ round hole plate is a part of the circle (the round hole part). The diameter of this circle is 98% of the pipe diameter. The center of the arc part of the hole should be accurately aligned to make it concentric with the pipe. This can ensure that the opening will not be covered by the pipe and gaskets at both ends or due to the eccentricity of the pipe. The relationship between the diameter ratio β (β=m, m=opening area/pipe area) of the round hole plate and the relative height of the hole h=a/D (a is the round hole height) is: the round hole plate is suitable for The measurement of the dirty medium of wet gas can avoid the siltation of the dirty material before and after the orifice plate.



Round hole plate structure

Main Specifications

Nominal diameter: 100≦DN≦1800mm

Aperture ratio: 0.3≦ β ≦0.8

Nominal pressure: PN≦6.4Mpa

Turndown ratio: 1:5, 1:10

Installation requirements

The round-notch orifice plate is only suitable for installation on horizontal or inclined pipes. It cannot be used on vertical pipes. When the measured fluid contains solid particles, the gap should be at the bottom. If there is gas in the liquid, the gap should be placed Above.

Before welding the pressure-taking pipe, the pressure-taking hole on the pipe should be opened. Its diameter should be the same as the pressure-taking hole on the pressure-taking flange. The pressure-taking hole on the pressure -taking flange should be aligned with the pressure-taking hole on the pipe. quasi.

Other requirements are the same as the standard orifice plate.

Selection specification table

Round hole plate specification table

model	Flowmeter type
FMD-YQ	Round hole plate

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection pipeline type
2	Flange connection wafer type
3	Direct welding
4	Special customized structure

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
- 50	2.0 inch	DN50
- 65	2.5 inch	DN65
- 80	4.0 inch	DN80
...	.....	.....
- 1800	72 inches	DN1800

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
100	X	10MPa
...	.....	.....

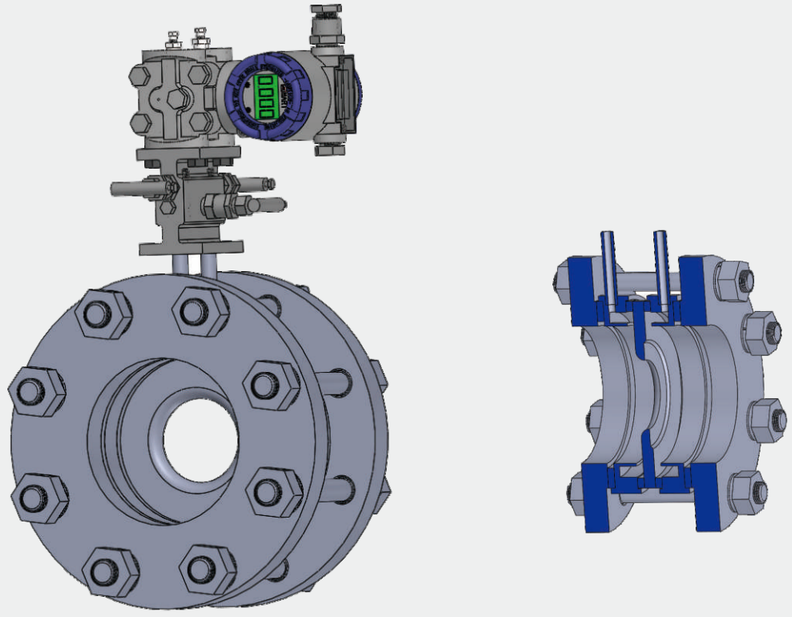
SMART
Orifice Plate Flow Meter
Specification

A QUARTER CIRCLE ORIFICE PLATE FLOW METER

FMD-1/4 round orifice plate

Product Introduction

No matter which kind of standard throttling device, it stipulates the applicable range of pipe diameter, Reynolds number, orifice aperture ratio. It cannot be used for flow measurement outside this range. In industrial production, there are often small pipe diameters, low flow rates, and high flow rates. For fluids with viscosity, a 1/4 round orifice plate must be used for such working conditions.



1/4 round orifice structure

Main Specifications

1. Throttle aperture ratio: $0.245 \leq \beta \leq 0.6$

$0.046 \leqq C\beta^{2}(1-\beta)^{-0.5} \leqq 0.326$

$ReDmin \leqq ReD \leqq 10^{6}\beta, ReDmin = 1000\beta + 9.4 \times 10^{6}(\beta - 0.24)^{8}$

$d \geq 15mm, D \leqq 500mm$。

Line pressure: PN≦10Mpa.

Working temperature: -50~545℃

Uses and characteristics

It is applicable to the regulation that the pipe diameter and Reynolds number are smaller than the standard throttling device, and its outflow coefficient is almost a constant value.

The measurement requirements, pressure taking method and installation method are close to the standard throttling device.

A large number of experiments have been carried out at home and abroad, and there are a large number of databases to check. Design calculations can refer to standard throttling devices.

There are mature data for structure form, thickness of orifice plate, and arc surface of entrance contraction.

Selection specification table

1/4 round orifice plate specification table

model	Flowmeter type
FMD-1/4	1/4 round orifice plate

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection pipeline type
2	Flange connection wafer type
3	Direct welding
4	Special customized structure

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	Flange standard
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
- 50	2.0 inch	DN50
- 65	2.5 inch	DN65
- 80	4.0 inch	DN80
...	...	.....
- 500	20 inches	DN500

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
100	X	10MPa
...	.....	.....

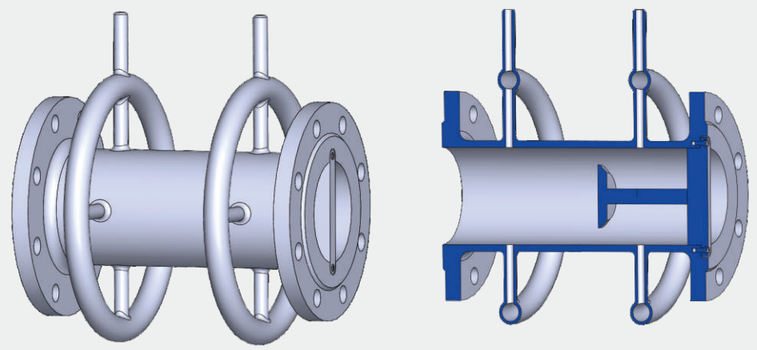
SMART
Orifice Plate Flow Meter
Specification

RING ORIFICE PLATE FLOW METER

FMD-HX ring orifice plate

Product Introduction

The basic principle of the annular orifice plate is basically the same as that of the standard orifice plate, but the structure is quite different. The ring-shaped orifice plate itself has a section of measuring tube, and a coaxial circular plate is fixed in the middle of the measuring tube. The circular plate is fixed on the pipe by a support frame. It is suitable for the measurement of various fluid media (gas, steam, liquid), such as saturation Steam, superheated steam, compressed air, various gas, waste gas, cooling water, heavy oil, residual oil, fuel oil, condensate, various chemical solutions, etc. The ring-shaped orifice plate has the characteristics of simple, firm and convenient installation and use of the standard orifice plate. At the same time, it does not require a long straight pipe section and has the advantage of working under harsh pipeline conditions.



Annular orifice structure

Main Specifications

Nominal diameter: 50 mm ≤DN≤1800mm

Reynolds number range: $5*10^3$≤ReD≤10^8

Nominal pressure: PN≤/6.4Mpa

Working temperature: -196～530℃

Turndown ratio: 1:5, 1:10, 1:65

Uses and characteristics

Suitable for measuring dirty media such as steam, gas and cooling water. The special structure of the ring-shaped orifice plate with "circumferential circulation and intermediate barrier" allows impurities to flow unimpeded and the condensate formed by steam when steam is stopped to flow away in time, thereby improving work reliability and measurement accuracy.

Suitable for flow measurement of high temperature and high pressure fluid. When the annular orifice is measuring high -temperature fluid, the periphery of the flow-measuring plate is in a free state, and the temperature expansion only changes the outline size, does not change the sharpness and shape of the edge, so it does not change the outflow coefficient and does not affect the measurement accuracy; when measuring high-pressure fluids, the flow measurement The plate is inside the pipe and has nothing to do with the level of static pressure, which reduces the processing cost.

It is more reliable and accurate in measurement than round orifice plates and eccentric orifice plates. The annular orifice is used to measure the fluid flow, and it is not easy to block the pressure tapping hole. Because of the simple geometry, it can be precisely processed and assembled, and the measurement accuracy is easily improved.

The pressure equalizing ring structure is adopted to reduce the source of measurement error.

Using a differential pressure transmitter with a remote transmission capsule, it can measure the flow of dirty media such as residual oil and heavy oil.

Selection specification table

Annular orifice plate specification table

model	Flowmeter type
FMD-HX	Annular orifice

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	4.0 inch	DN80
...	.....	...
-1800	72 inches	DN1800

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
64	X	6.4MPa
...	.....	.....

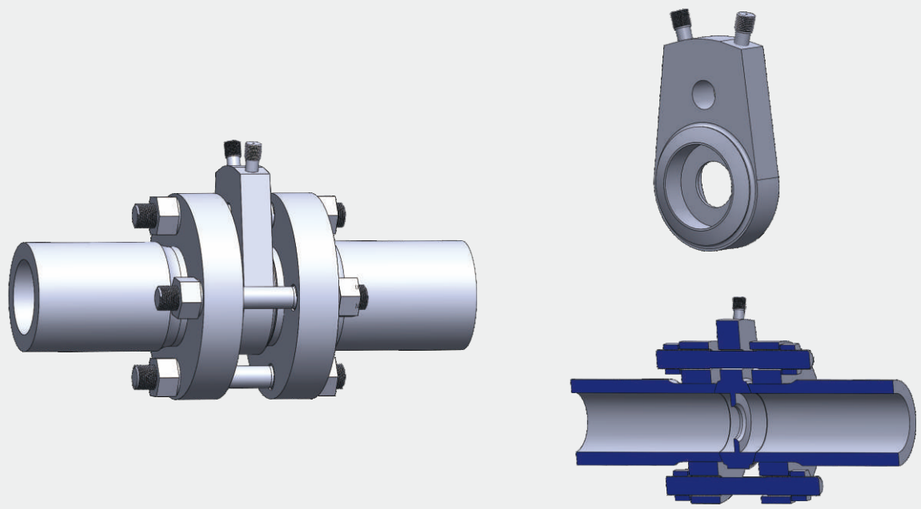
SMART
Spray Nozzle Flow Meter
Specification

HIGH PRESSURE LENS ORIFICE

FMD-TJ High Pressure Lens Orifice Plate

Product Introduction

The SMT high-pressure lens aperture plate is designed and manufactured according to the national standard GB/T2624-2006, and is verified according to the national standard JJG640-94. It does not require real-flow calibration. It has a wide application range, reasonable structure and stable performance. It is especially suitable for high-pressure places. However, the pressure loss is relatively large, and the straight pipe section is required to be long. Generally used in high-pressure places in chemical and oil refinery companies
.



FMD-TJ high-pressure lens orifice structure

Main Specifications

Nominal diameter: 10mm≤DN≤300mm

Nominal pressure: PN≤31.4MPa

Throttle aperture ratio β: 0.1≤β≤0.75

Turndown ratio: 1:10, 1:30

Uses and characteristics

Suitable for various working conditions such as high temperature, high pressure and ultra-low temperature.

It can be applied to various high voltage occasions such as chemical industry and thermoelectricity.

The applicable medium range is wide, and the flow measurement of various liquids, gases and steam can be carried out.

Geometry verification can be put into use without the high cost of real flow calibration.

Selection specification table

High-pressure lens aperture plate specification table

model	Flowmeter type
FMD-TJ	Standard nozzle

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-25	2.0吋	DN25
-32	2.5吋	DN32
-40	4.0吋	DN40
...	.....	.....
-300	20吋	DN300

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
100	X	10MPa
160	X	16MPa
200	X	20MPa
...	.....	.....
314	X	31.4MPa
...	.....	.....

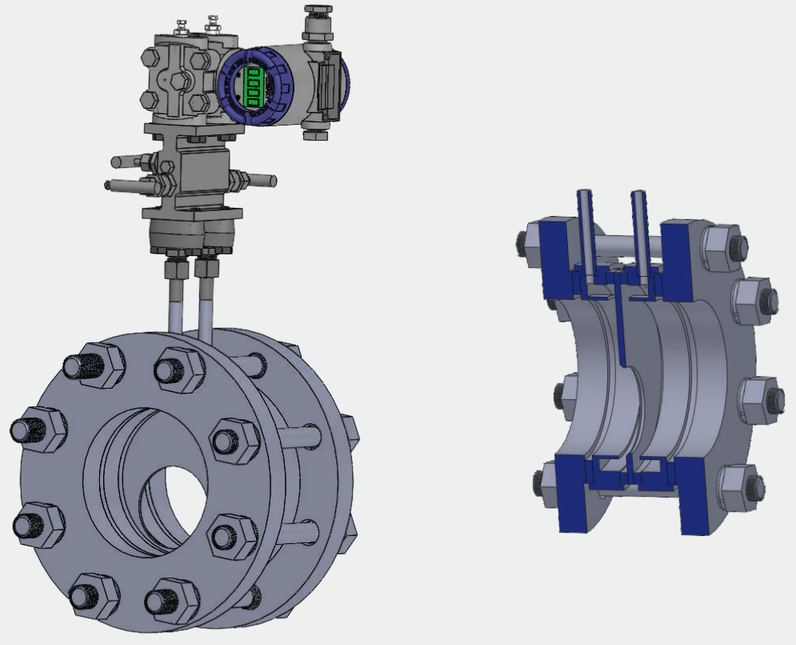
SMART
Spray Nozzle Flow Meter
Specification

ECCENTRIC ORIFICE PLATE

FMD-PX eccentric orifice plate

Product Introduction

Compared with the standard orifice plate, under the condition of dirty and dirty flow, it is easy to form dirty and dirty sludge before and after the orifice plate. It will change the effective area of the pipe before and after the throttling piece, and make the measurement deviation. For this situation, in order to make the dirty The flow is easy to pass and will not stay before and after the throttle. The eccentric orifice is used to measure the dirty flow.



FMD-PX eccentric orifice structure

Main Specifications

Nominal pressure: ≤32MPa

Nominal diameter: 100~1000mm

Opening diameter ratio: 0.46≤β≤0.84

Use restriction conditions: 0.136≤Cβ2(1-β4)0.5≤0.423
2×105β2≤ReD≦106β

Uses and characteristics

Take pressure method: corner joint take pressure.

Can measure dirty media.

Simple structure.

It is only suitable for installation on horizontal or inclined pipelines, not for vertical pipelines.

Selection specification table

Round hole plate specification table

model	Flowmeter type
FMD-CJ	Round hole plate

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection pipeline type
2	Flange connection wafer type
3	Direct welding
4	Special customized structure

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

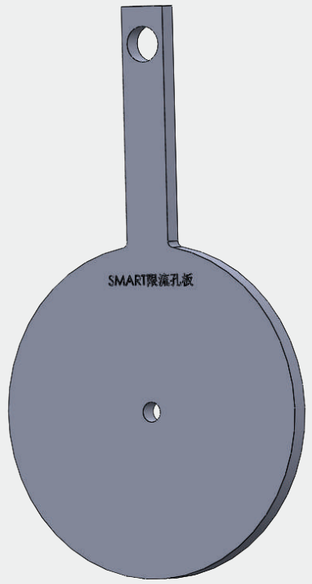
Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....

SMART
Orifice Plate Flow Meter
Specification

FLOW-LIMITING ORIFICE PLATE
Restrictor orifice

Product Introduction

In many industrial field process devices, where it is necessary to limit the flow rate and reduce the pressure, most of them use a regulating loop to achieve. The flow rate of the fluid in some pipelines is only required to be limited to certain specified ranges without adjustment. The accuracy requirements are not high, and it can be replaced by a restrictor orifice. The restrictor orifice is designed and manufactured according to GB2624, HG/T-20507 and other standards.



Flow-limiting orifice structure

Main Specifications

Nominal pressure: PN≦25MPa

Temperature range: -196~650℃

Nominal diameter: DN10~DN1000

Uses and characteristics

1. Occasions where process materials need to be depressurized.

When a large pressure drop is required upstream and downstream of the pipeline valve, in order to reduce the erosion of the fluid to the valve.

Where the fluid needs small flow and continuous fluid, such as the flushing pipeline of the pump the bypass pipeline of the hot standby pump, the analysis sampling pipe, etc.

Places where the pressure needs to be reduced to reduce noise or wear, such as venting systems.

Selection specification table

Limiting orifice plate specification table

model	Flowmeter type
FMD-XL	Restrictor orifice

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Pipeline flange connection
2	Wafer flange connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	2.5 inch	DN80
...	...	...
-1000	30 inches	DN1000

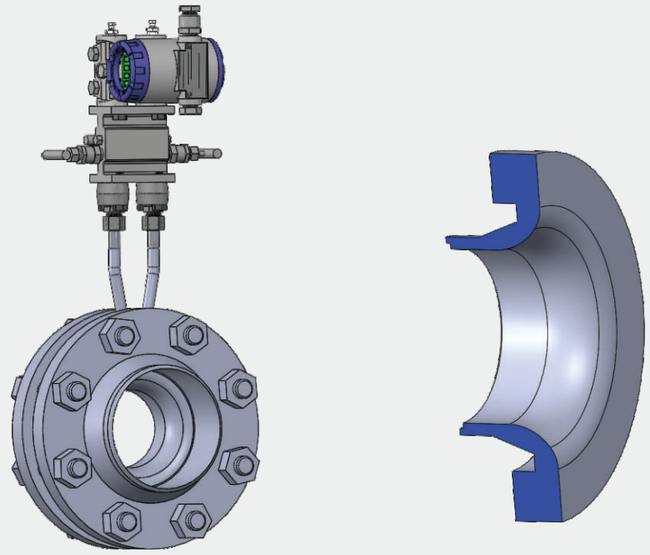
Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
100	X	10MPa
...	.....	.....

SMART
Spray Nozzle Flow Meter
Specification

STANDARD SPRAY NOZZLE FLOW METER
Standard nozzle

Product Introduction

The standard nozzle is also called ISA1932 nozzle. It has the characteristics of high temperature and pressure resistance, impact resistance, long service life, large measurement range, high measurement accuracy, etc. It is suitable for high temperature and high pressure steam in power plants, heating network pipelines, and fluid flow measurement with high flow velocity. The standard nozzle is designed and manufactured according to the national GB/T2624, and certified according to the national standard JJG-94, without real flow calibration.



Standard nozzle structure

Main Specifications

Nominal diameter: 50mm≤DN≤500mm

Nominal pressure: PN≤25MPa

Reynolds number range: when 0.30≤β≤0.44, 70000≤ReD≤107

0.44≤β≤0.8时，20000≤ReD≤107

Aperture ratio: 0.30≤β≤0.80

Turndown ratio: 1:5, 1:10, 1:65

Uses and characteristics

Suitable for measuring dirty media such as steam, gas and cooling water. The special structure of the ring-shaped orifice plate with "circumferential circulation and intermediate barrier" allows impurities to flow unimpeded and the condensate formed by steam when steam is stopped to flow away in time, thereby improving work reliability and measurement accuracy.

Suitable for flow measurement of high temperature and high pressure fluid. When the annular orifice is measuring high -temperature fluid, the periphery of the flow-measuring plate is in a free state, and the temperature expansion only changes the outline size, does not change the sharpness and shape of the edge, so it does not change the outflow coefficient and does not affect the measurement accuracy; when measuring high-pressure fluids, the flow measurement The plate is inside the pipe and has nothing to do with the level of static pressure, which reduces the processing cost.

Selection specification table

Standard nozzle specification table

model	Flowmeter type
FMD-BP	Standard nozzle

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	4.0 inch	DN80
...	.....	...
-500	20 inches	DN500

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
320	X	32MPa
...	.....	.....

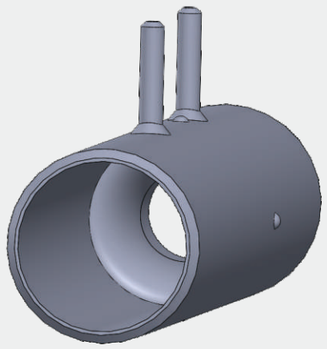
SMART
Spray Nozzle Flow Meter
Specification

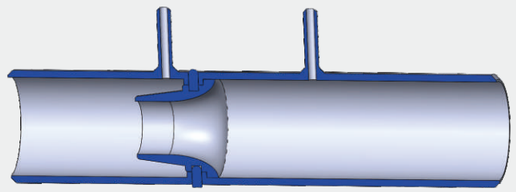
LONG NECK SPRAY NOZZLE FLOW METER

Long neck nozzle

Product Introduction

The long-diameter nozzle has the characteristics of high temperature and pressure resistance, impact resistance, long service life, large measurement range, high measurement accuracy, etc. It is suitable for high temperature, high pressure steam, heating network pipelines, and fluid flow measurement of high flow velocity in power plants. The long-neck nozzle is designed and manufactured according to the national standard GB/T2624-93, and is verified according to the national standard JJG640-94, without the need for real-flow calibration.





The long-diameter nozzle is composed of an inlet constriction A, a cylindrical throat B, and a downstream end plane C. The pressure taking method is D-D/2.
There are two types of long diameter nozzles: high ratio nozzle 0.25≤β≤0.80, low ratio nozzle 0.20≤β≤0.50
When the β value is between 0.25 and 0.5, any type of long-diameter nozzle can be used. The specific structure is shown in the figure below:

Long-neck nozzle structure

Main Specifications

Nominal diameter: 50mm≤DN≤630mm

Nominal pressure: PN≤32MPa

Reynolds number range: 10000≤ReD≤10

Aperture ratio: 0.20≤β≤0.80

Turndown ratio: 1:5, 1:10, 1:65

Uses and characteristics

During installation, ensure that the center of the orifice plate, the axis of the flange, the axis of the pipe, the axis of the pipe and the gasket are concentric, and the degree of misalignment shall not exceed 0.002D/β

The high and low pressure directions of the orifice plate, and the upstream and downstream pressure-taking flanges should be consistent with the flow direction of the medium. The position of the pressure-taking hole can be determined according to the different medium and the installation of the transmitter (refer to the FMD-BK manual).

When the standard orifice plate is connected to the pipe, the non-perpendicularity between the end face of the weld and the pipe axis shall not be greater than 1°. After welding, the internal weld should be processed to make it smooth and free of weld scars and weld slag.

Selection specification table

Long neck nozzle specification table

model	Flowmeter type
FMD-CJ	Long neck nozzle

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Direct welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	4.0 inch	DN80
...	...	...
-600	24 inches	DN500

Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
320	X	32MPa
...	.....	.....

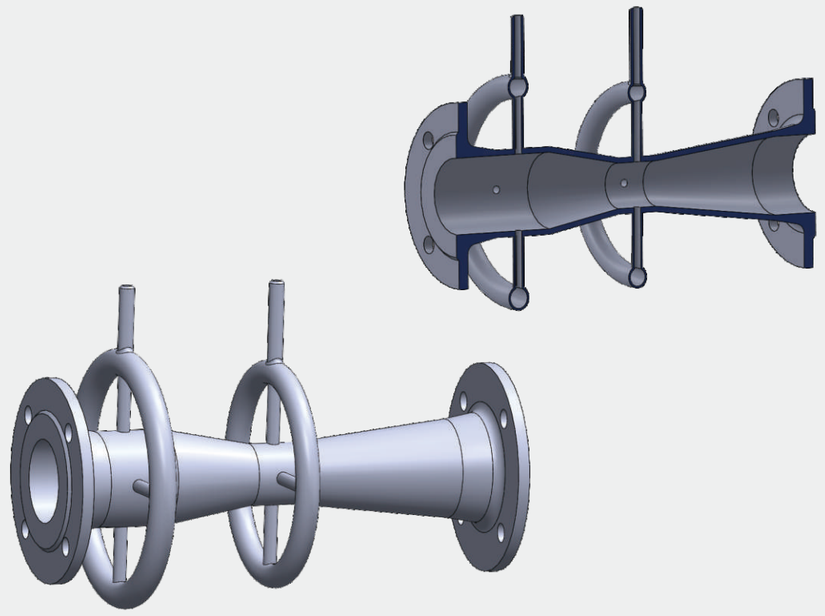
SMART
Standard Venturi Tube Flow Meter
Specification

STANDARD VENTURI TUBE FLOW METER

FMD-JD Classic Venturi

Product Introduction

The classic venturi tube is designed and manufactured according to the national standard GB/T2624-93, and tested according to the national standard JJG640-94. In the standard throttling device, it requiresThe upstream and downstream straight pipe sections are the shortest, the permanent pressure loss is the smallest, the performance is stable, and the maintenance is convenient. Because of its accurate calculation and low energy consumption, it has been widely used in petroleum, chemical, electric power, and metallurgical industries.



Classic Venturi tube structure

Main Specifications

Nominal diameter: 50mm≤DN≤1200mm, calibration is required if it exceeds 1200mm

Rough casting shrinkage section: 100mm≤DN≤800mm

Mechanical processing shrinkage section: 50mm≤DN≤250mm

Shrinkage section of thick welded iron plate: 200mm≤DN≤1200mm

Throttle aperture ratio β: 0.3≤ β ≤0.75

Rough casting shrinkage section: 0.3≤ β ≤0.75

Mechanical processing shrinkage section: 0.4≤ β ≤0.75

Shrinkage section of thick welded iron plate: 0.4≤ β ≤0.7

Reynolds number range: $2\times10^{5}\leq ReD\leq2\times10^{6}$

Rough casting shrinkage section: $2\times10^{5}\leq ReD\leq1\times10^{6}$

Mechanical processing shrinkage section: $2\times10^{5}\leq ReD\leq1\times10^{6}$

Shrinkage section of rough welded iron plate: $2\times10^{5}\leq ReD\leq2\times10^{6}$

Turndown ratio: 1:5, 1:10, 1:65

Uses and characteristics

Suitable for measuring dirty media such as steam, gas and cooling water. The special structure of the ring-shaped orifice plate with "circumferential circulation and intermediate barrier" allows impurities to flow unimpeded and the condensate formed by steam when steam is stopped to flow away in time, thereby improving work reliability and measurement accuracy.

Suitable for flow measurement of high temperature and high pressure fluid. When the annular orifice is measuring high -temperature fluid, the periphery of the flow-measuring plate is in a free state, and the temperature expansion only changes the shape and size, does not change the sharpness and shape of the edge, so it does not change the outflow coefficient and does not affect the measurement accuracy; when measuring high-pressure fluid, due to flow measurement The plate is inside the pipe and has nothing to do with the level of static pressure, which reduces the processing cost.

Selection specification table

Classic Venturi Specification Table

model	Flowmeter type
FMD-JD	Classic Venturi

Codename	Media type
Y	liquid
Q	gas
Z	steam

Codename	Connection method
1	Flange connection
2	Butt welding connection

Codename	Flange or pipe section material
C	Carbon steel
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-50	2.0 inch	DN50
-65	2.5 inch	DN65
-80	4.0 inch	DN80
...	.....	...
-1200	34 inch	DN1200

Codename	Contraction section form
C	Rough casting shrinkage section
E	Mechanical processing shrinkage section
S	Shrinkage section of rough welded iron plate

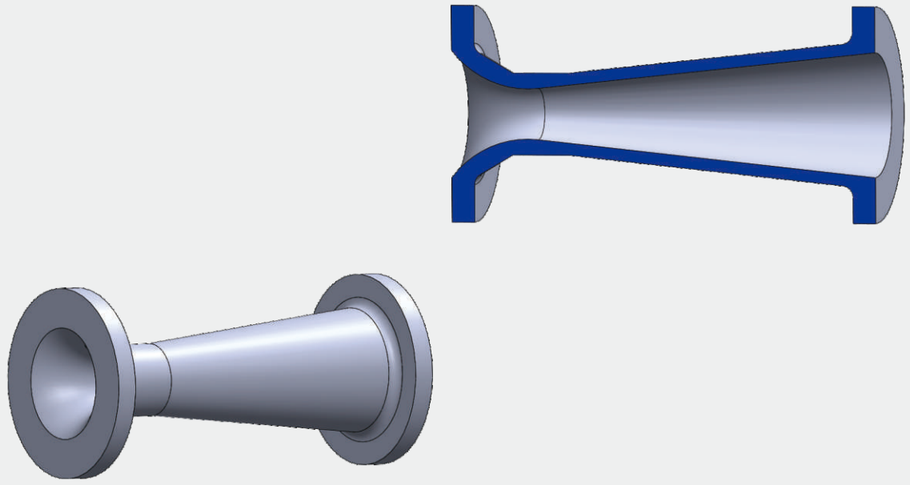
Codename	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
160	X	16MPa
...	.....	.....

CRITICAL FLOW VENTURI TUBE FLOW METER

FMD-LJ Critical Flow Venturi Nozzle

Product Introduction

Critical flow venturi nozzles, also known as sonic nozzles and critical flow nozzles, are mainly used for the transmission of gas flow standards, gas flow measurement and flow system maximum flow limitation. The principle is that when gas flows through the critical flow nozzle, when the gas flow is in the sub- The velocity of sound, the gas flow velocity at the throat of the Venturi nozzle will increase with the increase of the pressure difference between upstream and downstream. When the pressure difference between the upstream and downstream reaches a certain value, the velocity at the throat of the Venturi nozzle reaches the maximum flow rate-the local speed of sound, that is At this time, if the absolute stagnation pressure of the nozzle inlet is kept unchanged, no matter how to reduce the nozzle outlet pressure, the flow velocity will remain the same, that is, the flow velocity is no longer affected by the pressure. At this time, the venturi The inner nozzle is called the critical flow venturi nozzle.



Critical flow venturi nozzle structure

Main Specifications

Nominal pressure: PN≦25MPa

Temperature range: -196~650℃

Nominal diameter: DN10~DN1000

Temperature range: -196~650℃

Nominal diameter: DN10~DN1000

Uses and characteristics

Transmission of gas flow.

Calibration of gas flow.

Engine flow performance calibration.

Flow test of vehicle emission system.

Flow performance test of positive displacement compressor.

Calibration of valve flow performance.

Limitation of pipeline fluid flow.

Selection specification table

Critical flow venturi nozzle specification table

model	Flowmeter type
FMD-LJ	Critical flow venturi nozzle

Codename	Connection method
1	Flange connection
2	Threaded connection
3	other methods

Codename	Flange or pipe material
S	stainless steel
O	other

Codename	Flange standard
A	ANSI American Standard (Hg20615)
D	DIN European standard (Hg20592)

Codename	Nominal diameter	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
-10	3.8 inch	DN10
...	.....	....
-300	12 inches	DN300

代号	Pressure Level	
	ANSI American Standard (Hg20615)	DIN European standard (Hg20592)
025	X	0.25MPa
06	X	0.6MPa
10	X	1MPa
...	.....	.....
320	X	32MPa
...	.....	.....