LG ORIFICE PLATE

Summary

The LG type flow measurement flow element is the most widely used flow measurement instrument. It has the advantages of simple structure, easy installation, stable performance, and high accuracy. It can be used for liquid, vapor and gas flow measurement in modern industry. The LG type flow measurement flow element produced by our company adopting advanced calculation methods and precise processing methods has a wide range of varieties (in line with GB/T2624-2006, ISO5167-1-2003, BS1042-1989, American Mechanical Engineering Association standards, etc.), With complete specifications, it is widely used in petroleum, chemical, electric power, light industry, water supply, gas transmission and other fields.

Operating Principle

In the pipeline filled with single-phase continuous fluid, install a flow element (such as an orifice). When the fluid passes through the orifice of the flow element, the vapor forms a local contraction, the flow velocity increases, the kinetic energy increases, and the static pressure decreases. There is a static pressure difference between the front and back of the flow element, that is, ΔP = P1-P2. If the area of the orifice is F, the mass flow of the fluid is qm, the volume flow is qv, and the density is ρ, according to the principle of flow continuity and Bernoulli equation can derive the relationship between pressure difference and fluid flow:

$$q_m = \alpha F \sqrt{\Delta P \rho} \quad 或 \quad q_v = \alpha F \sqrt{\Delta P / \rho}$$

In the formula, α is the flow coefficient. It can be seen from the above relationship that if the orifice area and fluid density are constant, the flow rate is proportional to the square root of the pressure difference, that is, as long as the pressure difference is measured, the flow rate can be calculated. The flow element measures the fluid flow rate based on this principle.

Technical Parameters

- Nominal diameter: DN50~DN1000
- Nominal pressure: 0~42.0MPa
- Aperture ratio: $0.1 \leqslant \beta \leqslant 0.75$
- Range ratio: 1: 10
- Accuracy: ±1%
- Temperature: $-196\,^{\circ}C \leqslant T \leqslant +650\,^{\circ}C$

Model Selection Table

1. Model

LG □ □ — □ □ □

- Serial Number
- Flow Element Code- Table 1
- Tap Method Code- Table 2
- Nominal Diameter Code- Table 3
- Nominal Pressure Code- Table 4
- Straight Pipe Section Code- Table 5

Table 1 Flow Element Code and Meaning

Code	Meaning	Code	Meaning
Y	Standard Orifice	I	Eccentric Orifice
Q	1/4 Round Orifice	S	Segmental Orifice
X	Small Diameter Orifice		
T	Conical Inlet Orifice		

Table 2 Tap Method and Meaning

Code	F	H	Z	D	T
Meaning	Flange Tap	Corner Ring Tap	Drilling Tap	Diameter Tap	Special Tap

Table 3 Nominal Diameter Code and Meaning

Code		01	016	02	026	03	04	05	06	08	10
DN	mm	10	15	20	25	32	40	50	65	80	100
	in		1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4

Code		12	15	20	25	30	35	40	45	50	60
DN	mm	125	150	200	250	300	350	400	450	500	600
	in	5	6	8	10	12	14	16	18	20	24

Code		70	80	90	100	105	110	115	120	125	130
DN	mm	700	800	900	1000	1050	1100	1150	1200	1250	1300
	in	28	32	36	40	42	44	46	48	50	52

Table 4 Nominal Pressure Code and Meaning

Code		01	02	03	04	05	06	10	11	15	16
PN	MPa	1.6	2.0	2.5	4.0	5.0	6.3	10.0	11.0	15.0	16.0
	Class		150			300			600	900	

Code		26	42								
PN	MPa	26.0	42.0								
	Class	1500	2500								

Table 5 Straight Pipe Section Code and Meaning

Code		A	B	C	D	E	F
Unit	Flow Element	Flow Element, Mounting Flange	Flow Element, Mounting Flange, Upstream and downstream straight pipe section	Flow Element, Mounting Flange, Upstream and downstream straight pipe section, Upstream and downstream connection flange	Flow Element, Mounting Flange, Upstream and downstream straight pipe section, Upstream connection flange	Flow Element, Mounting Flange, Upstream and downstream straight pipe section, Downstream connection flange	Welding Structure

2. Executive Standard

2.1 Flow Element Executive Standard

Code	Meaning	Standard Code
Y	Standard Orifice	GB/T2624—2006（ISO5167—1—2003）
Q	1/4 Round Orifice	BS1042-1989
T	Conical Inlet Orifice	BS1042-1989
I	Eccentric Orifice	ASME
S	Segmental Orifice	ASME

For example, DN50 CL300 flange tap standard orifice model is LGYF-0505A.

2.2 Flange and Gasket Executive Standard

Flange and gasket standards can be selected from HG/T20592～20614-09 (European system) or HG/T20615～20635-09 (American system) or other standards.

Order Requirements

1. When ordering flow element, please fill in the flow element specification table (Refer to the table below)

			Flow Element Order Parameters Table					Project No.	
								Document No.	
								Page No.	
Data							Calculation		
Operating Conditions	Medium Name						Flow Element Type		
	Process Temperature ℃						Tap Method		
	Operation Pressure MPa						Instrument Scale		
							Instrument Differential Pressure kPa		
	Flow	Liquid kg/h	Max				Limitation of Min Flow		
		Vapor kg/h	Normal				Reynolds number(normal flow) Re		
		Gas Nm^3/h	Min				Area of Expansion Correction Coefficient Fa		
							Expansion Coefficient ε		
							Flow Coefficient α		
							Uncertainty %		
							Permanent Pressure Loss Pa		
	Operating Density kg/m^3						Diameter Ratio β t		
	Dynamic Viscosity mPa·s						Flow Element Hole Diameter or Round Height mm		
	Kinematic Viscosity mm^2/s						1/4 Arc Radius Or Eccentricity mm		
	Relative Humidity (φ) %								
	Compression Factor (Z)						Flow Element Standard		
	Isentropic Index (cp/cv)								
	Allowable Pressure Loss Pa						Specification		
							Model		
Pipe	Nominal Diameter(DN)						Nominal Diameter(DN)		
	Pipeline No.						Nominal Pressure(PN) MPa		
	Outer Diameter/Inner Diameter						Flange Standard		
	Material						Flange Inner Diameter mm		
							Structure Length mm		
							Tap Dimension mm		
							Tap Position		
						Material	Flow Element		
							Flange		
							Bolt		
							Nut		
							Gasket		
Note									

2. Our company can provide users with the following services

2.1 Provide a complete set of the above-mentioned various specifications of flow element

2.2 Provide flow element calculation for users, including:

1) Knowing the aperture diameter d20 of the flow element and the meter scale flow rate, under the new working conditions, find the new upper limit of the differential pressure Hmax of instrument;

2) Knowing the aperture diameter d20 of the flow element, the upper limit Hmax of the instrument differential pressure and the scale flow rate of the original design instrument, under the new working conditions, find the new scale flow rate of instrument.

2.3 According to user requirements or drawings to manufacture the flow element.