LG ORIFICE PLATE

Summary

The LG type flow measurement flow element is the oldest and 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:

$$q_m = \alpha F \sqrt{\Delta p \rho} \text{ or } Qv = \alpha F \sqrt{\Delta p / \rho}$$

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.

Model Selection Table

1. Model

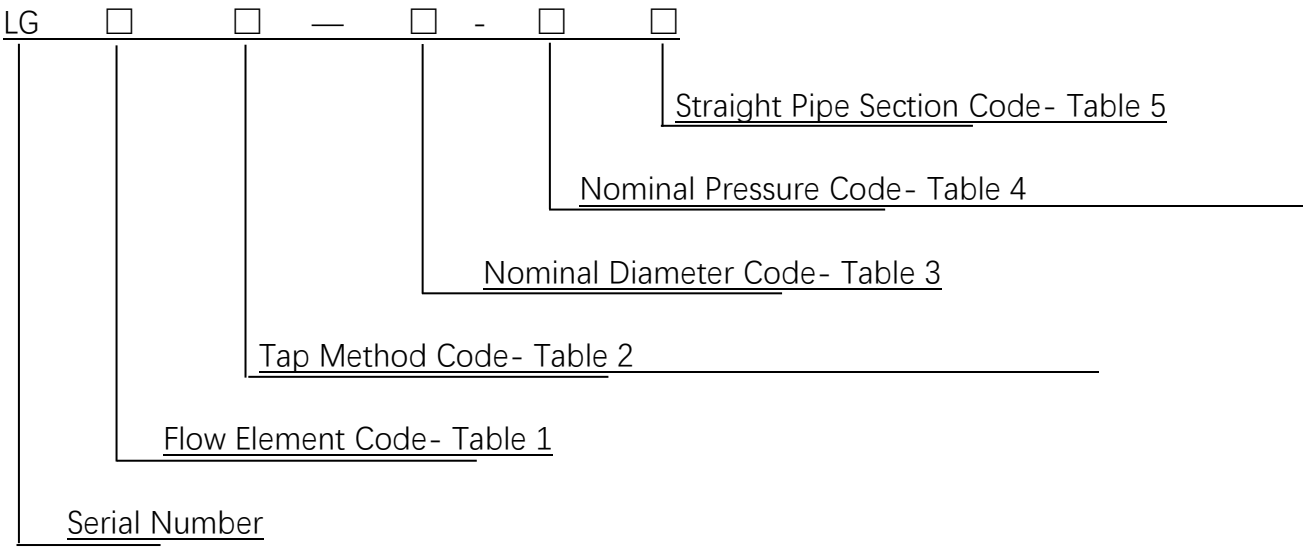

Table 1 Flow Element Code and Meaning

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		1	2/11	3/12	4/13	5/14	6/15	7/16	8/17	9/18	10/19
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		20/51	21/52	22/53	23/54	24/55	25/56	26/57	27/58	28/59	30/61
DN	mm	125	150	200	250	300	350	400	450	500	600
	in	5	6	8	10	12	14	16	18	20	24
Code		32/63	34/65	36/67	38/69	40/71	42/73				
DN	mm	700	800	900	1000	1100	1200				
	in	28	32	36	40	44	48				

Table 4 Nominal Pressure Code and Meaning

Code		3	4	5	6	7	8	9	10	11	12
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		13	14	15/16							
PN	MPa	25.0	26.0	42.0							
	Class		1500	2500							

Table 5 Straight Pipe Section Code and Meaning

Code		A	B	C	D	E	F
Meaning	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-7-7A.

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 Vapor kg/h Gas Nm3/h	Max		Limitation of Min Flow		
			Normal		Reynolds number(normal flow) Re		
			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 βt		
	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		
Pipe	Nominal Diameter(DN)				Model		
	Pipeline No.				Nominal Diameter(DN)		
	Outer Diameter/Inner Diameter				Nominal Pressure(PN) MPa		
	Material				Flange Standard		
					Flange Inner Diameter mm		
					Structure Length mm		
					Tap Dimension mm		
					Tap Position		
					Material	Flow Element	
						Flange	
						Bolt	
						Nut	
						Gasket	
Notes							

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.