

LG VENTURI FLOW METERS

Summary

LG type venturi standard flow element has a long history and it is a widely used flow measuring instrument, with high accuracy, stable performance, low pressure loss (generally between 5% to 20% of the differential pressure value), easy to maintain, especially in the energy-saving work condition, it has the advantages of accurate measurement and reduced energy consumption, and has broad prospects in use.



Operating Principle

In the pipeline filled with single-phase continuous fluid, install a flow element (such as a venturi). 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, $\Delta P = P_1 - P_2$. If the area of the orifice is F , the mass flow of the fluid is q_m , the volume flow is q_v , 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:

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

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~DN250 (classic venturi tube through machining shrinkage section)
DN300~DN1200 (crude welded shrinkage section of iron plate)
- Nominal pressure: 0~42.0MPa
- Aperture ratio: $0.4 \leq \beta \leq 0.75$ (classic venturi tube through machining shrinkage section)
 $0.4 \leq \beta \leq 0.7$ (crude welded shrinkage section of iron plate)
- Range ratio: 1 : 10
- Accuracy: $\pm 1\%$
- Temperature: $-196^\circ\text{C} \leq T \leq +650^\circ\text{C}$

Model Selection Table

1. Model

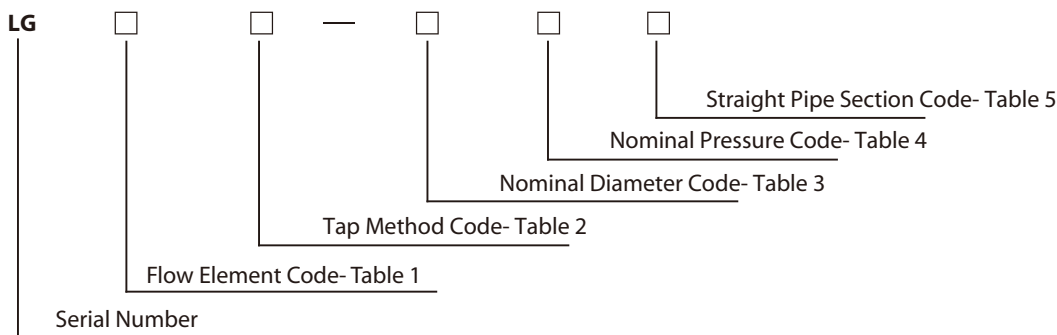


Table 1 Flow Element Code and Meaning

Code	Meaning	Caliber
J	Classic Venturi Tube Through Machining Shrinkage Section	DN50-DN250
H	Crude Welded Shrinkage Section Of Iron Plate	More than DN250

Table 2 Tap Method and Meaning

Code	Meaning
T	Tap Equalizing Ring
Z	Drilling 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
J	Classic Venturi Tube Through Machining Shrinkage Section	GB/T2624—2006 (ISO5167—1—2003)
H	Crude Welded Shrinkage Section Of Iron Plate	GB/T2624—2006 (ISO5167—1—2003)

For example, DN50 CL300 flange connection tap equalizing ring venturi tube model is LGJT-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	°C			Tap Method			
	Operation Pressure	MPa			Instrument Scale			
	Flow			Instrument Differential Pressure		kPa		
		Liquid	kg/h	Max	Limitation of Min Flow			
		Vapor	kg/h	Normal	Reynolds number(normal flow)			
		Gas	Nm ³ /h	Min	Area of Expansion Correction Coefficient		Re	
						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)				Specification				
Allowable Pressure Loss		Pa			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

- 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
- 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.