LGY COMPACT ORIFICE PLATE FLOW METER

Summary

LGY compact orifice plate flow meter consists of a flow element, a differential pressure transmitter, a manifold, a temperature sensor and a pressure sensor, and can measure various medium such as liquid, gas, and vapor. The flow element implements the standard of GB/T2624-93 <Flow Measurement Flow Element Uses Orifice Plate, Nozzle and Venturi Tube to Measure the Flow of Fluid Filled with Circular Pipe>, adopting LG-94-01win <Flow Element Design Calculation And Management Software> design calculation, according to JJG640-1994 <Differential Pressure Flow meter Verification Regulations> and JB4730-94 <Pressure Vessel Non-destructive Test>, and verify the actual measurement accuracy through the flow standard device inspection.

Structure Form

LGY compact orifice plate flow meter has two main structure forms: one is simple integration, which is to assemble the orifice plate, manifold, and differential transmitter together. This structure is used in situations where temperature and pressure are relatively stable; the other is compensation integration. It is to assemble the orifice plate, the manifold, and the differential transmitter together, and increase the temperature and pressure compensation function. This product has high measurement accuracy and is suitable for occasions that require precise measurement.

LGY compact orifice plate flow meter has compact structure and simple installation, which can save a lot of installation work for users; assembled in the factory to ensure stable and consistent measurement accuracy, the consumption of LGY compact orifice plate flow meter has increased significantly in recent years, and the common specifications are concentrated below DN150.

Basic Parameters

Technical Parameters and Performance
Nominal Diameter: 50 ~ 600 mm, Special Design:15 ~ 50,600 ~ 1000mm,
Nominal Pressure：42.0MPa
Medium Temperature: 150℃,450℃ （Only limited to separated type）
Output：4 ~ 20mA ， 4 ~ 20mA+HART
Range Ratio: 10：1
Accuracy: ±1% (Accuracy)
Explosion Proof Type：Intrinsic Safe: ia II CT6； Explosion proof: d II BT4
IP Rating：IP66

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Model Selection Table

Serial Number	Code						Content	
LGY							Compact Orifice Plate Flow Meter	
	A						Corner Tap	
	B						Flange Tap	
	C						Other	
		—						
			4	13			DN25	1”
			5	14			DN32	1-1/4”
			6	15			DN40	1-1/2”
			7	16			DN50	2”
			8	17			DN65	2-1/2”
			9	18			DN80	3”
			10	19			DN100	4”
			20	51			DN125	5”
			21	52			DN150	6”
			22	53			DN200	8”
			23	54			DN250	10”
			24	55			DN300	12”
			25	56			DN350	14”
			26	57			DN400	16”
			27	58			DN450	18”
			28	59			DN500	20”
					—			
					3		PN16	
					4		Class150	
					5		PN25	
					6		PN40	
					7		Class300	
					8		PN63	
					9		PN100	
					10		Class600	
					11		Class900	
					12		PN160	
					13		PN250	
					14		Class1500	
					15		PN420	
					16		Class2500	
						A	With Differential Transmitter	

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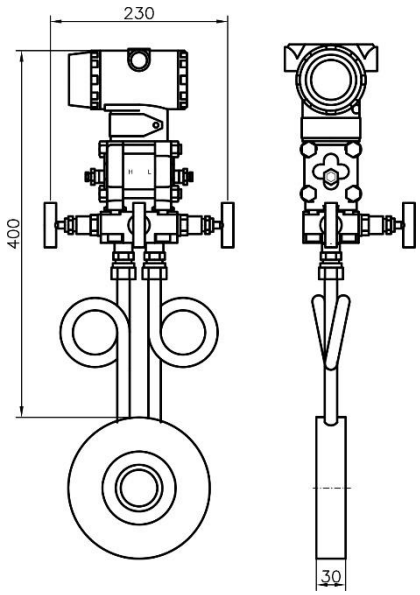
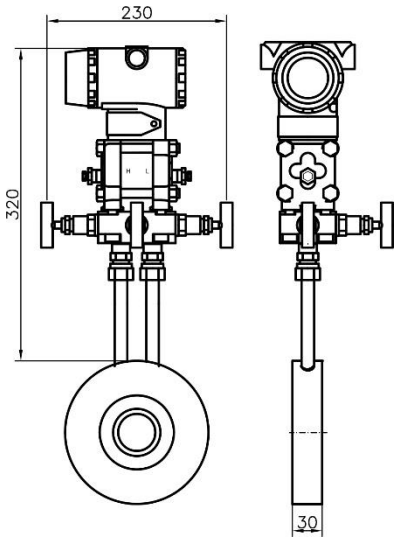
	B		With Differential Transmitter and Flow Totalizer
	C		With Temperature And Pressure Compensation Differential Pressure Transmitter
	D		Other

Outline Drawing



Temperature > 120℃



Temperature≤120℃

1. Requirements for Measuring Pipelines

1.1 The pipe for installing LGY compact orifice plate flow meter must be straight and its cross section must be round. The straightness of the pipeline can be inspected visually, and the roundness of the pipeline can be inspected according to relevant standards. The inner diameter of the pipeline within the 5D length on both sides of the downstream side of the integrated orifice must be measured on the spot and be consistent with the inner diameter of the pipeline used in the design and calculation of flow element.

1.2 The inner wall of the pipeline should be clean. If the inner diameter of the straight pipe section is inconsistent with the nominal inner diameter, please order the upstream and downstream straight pipe sections.

1.3 Straight pipe length requirements.

The length of the upstream and downstream straight pipe sections required by the compact orifice plate flow meter is shown in the following table

Diameter Ratio β	Upstream							Downstream
	Single 90°	There are two	There are	The reducer	The divergent	Full	Fully	All chokes

	elbow or tee (fluid comes from only one branch)	or more 90° elbows in the same plane	more than two 90° elbows in different planes	shrinks from D to 0.5D in the length of 1.5D-3D	tube gradually expands from 0.5D to D in the length of 1D-2D	open ball valve	open gate valve	included in this table
0.2	10(6)	14(7)	34(17)	5	16(8)	18(9)	12(6)	4(2)
0.50	14(7)	20(10)	40(20)	6(5)	18(9)	22(11)	12(6)	6(3)
0.65	22(11)	32(16)	54(27)	11(6)	25(13)	28(14)	16(8)	7(3.5)

1 All straight pipe lengths are expressed in multiples of D and should be counted from the upstream side of the primary device.

2 In line with the value outside the brackets, the additional uncertainty of the outflow coefficient is zero, and the straight pipe section is less than the value outside the brackets, but greater than the value in the brackets, an arithmetic addition of ±0.5% shall be added to the uncertainty of the outflow coefficient.

3 Straight pipe length refers to the shortest straight pipe length required between various obstructions upstream or downstream of the primary device and the primary device itself.

2. LGY Compact Orifice Plate Flow Meter Installation Requirements

2.1 Verticality Requirements

The front face of the compact orifice plate should be perpendicular to the axis of the pipeline, and its allowable deviation is ±1°.

2.2 Coaxiality Requirements

The axis of the compact orifice plate should be coaxial with the axis of the pipeline, and the coaxiality deviation

$$\frac{0.005D}{0.1+2.3\beta^4}$$

should not be greater than, when the coaxiality error exceeds the above value, it is considered that the flow element does not meet the requirements of GB/T2624-93.

2.3 When installing the compact orifice plate flow meter, make sure that the inlet and outlet directions are consistent with the marked direction, and do not install it backwards.

2.4 The gasket shall not protrude into the inside of the pipe after clamping.

2.5 The valve used to adjust the flow should preferably be installed outside the shortest straight pipe downstream of the compact orifice plate flow meter.

2.6 There shall be no sudden changes in pipe diameter at the joints of the pipe sections and fittings of compact orifice plate flow meter.

2.7 For newly installed piping systems, the compact orifice plate flow meter must be installed after piping flushing and line sweeping.

Use Requirements and Precautions

In order to ensure the measurement accuracy of LGY compact orifice plate flow meter, its use must meet the following conditions:

1. The fluid must fill the round pipe and flow continuously through the pipe;
2. The fluid must be a Newtonian fluid, homogeneous, single-phase in physics and thermodynamics, or can be considered single-phase; including gas, liquid and vapor.
3. No phase change occurs when the fluid flows through the compact orifice plate flow meter.
4. The fluid flow rate does not change with time or changes slowly.
5. Before the fluid flows through the compact orifice plate flow meter, its stream must be parallel to the axis of the pipeline, and there must be no rotating flow.
6. Compact orifice plate flow meter is not suitable for flow measurement of pulsating flow and critical flow.
7. The measured medium must be clean and free of impurities.

Common Faults and Troubleshooting Methods

Common Faults	Reason	Troubleshooting Methods
1. Differential pressure transmitter indicates no change	1. Stop valve is not opened	Open the stop valve
	2. Differential pressure pipeline is blocked	Unblock the differential pressure pipeline
	3. Differential pressure transmitter failure	Check differential pressure transmitter
2. The indication value of the differential pressure transmitter obviously deviates from the indication value of gauge	1. The installation direction of flow element is wrong	Reinstall the flow element
	2. Differential pressure transmitter failure	Check differential pressure transmitter
	3. The working condition parameters of the measured medium are inconsistent with those used when designing the flow element	Correct according to the relevant formula, it is necessary to recalculate the differential pressure value
	4. The length of the straight pipe before and after the flow element is not enough	Adjust the length of straight pipe
	5. The inner diameter of the straight pipe section is out of tolerance	Measure the inner diameter of straight pipe section and recalculate the maximum flow
	6.Throttle aperture tolerance	Measure the orifice aperture, recalculate the maximum flow
	7. Flow element is deformed	Replace flow element
	8. There are attachments on flow element	Clean and replace flow element

	9. Tap location is incorrect	Reinstall in the correct way
3. Differential pressure transmitter has no indication	1. Power is not turned on	Turn on the power
	2. The stop valve is not open	Open the stop valve
	3. Differential pressure transmitter failure	Check differential pressure transmitter
4. Medium leakage at the flow element	1. Insufficient clamping force of connector	Refasten the connection
	2. Sealing gasket failure	Replace sealing gasket
	3. Material is corroded	Replace corroded parts

Maintain

After LGY compact orifice plate flow meter is put into use, in order to ensure its measurement accuracy and reliability, it must be maintained:

1. Clean the tap signal pipeline and the differential pressure gauge regularly to remove all debris, and check and adjust the zero point of the differential pressure gauge at the same time.
2. If there is a significant difference between the displayed value of the differential pressure gauge and the measured value, a comprehensive inspection and adjustment should be carried out, and the measurement verification should be carried out if necessary.
3. The LGY compact orifice plate shall be subject to periodic measurement verification according to the measurement verification period.