

# LBTC Positive Displacement Rotary Vane Flow Meter

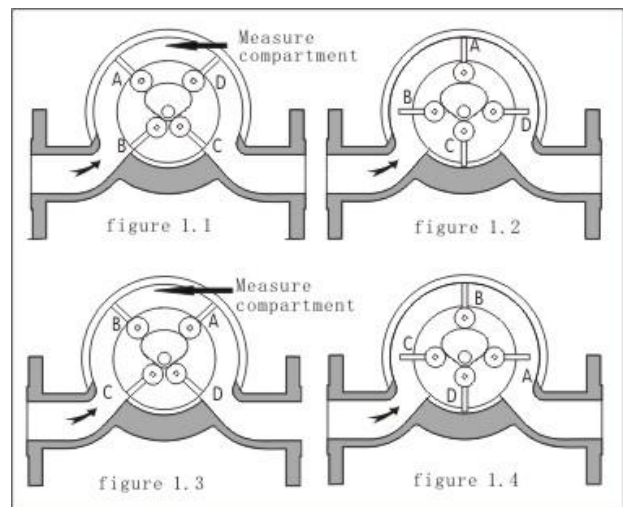
## Summary

LBTC positive displacement rotary vane flow meter belongs to positive displacement meter and is one of the most accurate measuring meters for measuring liquid of modern industry. The flow meter has stable performance and is insensitive to flow state change of upstream medium and change of medium viscosity. It has high measuring accuracy, good applicability and long life. Now it has widely used for every field such as process control of modern industry and trade settlement, etc.



## Operation Principle

There are two or three couples of rotary vanes, they slide radially along grooves in the barrel-type rotor. With the action of flowing pressurized fluid, pushing the rotary vanes and the rotor rotates around its axis. Rotary vanes continuously divide the flowing fluid into an individual volume, using drive gear and counting mechanism calculate and indicate the total delivery of the fluid. The process as follows: when the rotary vanes are at the state as figure 1.1, vane A and D stretch out from the rotor and contact the inwall of measuring chamber while vane B and C retract back completely into rotor. With the fluid entering into the meter, it pushes the vanes and the rotor rotating clockwise. When the rotor and vanes run  $1/8$  circle, the vanes stop at the position as shown in figure 1.2, vane A stretches completely, vane D begins to retract back, vane C is still in completely contraction state, while vane B begins to stretch out. When the rotor and the vanes run a  $1/4$  circle, the vanes are in the positions as shown in figure 1.3. The vane A and B both completely stretch out, the space which is composed of the two vanes, rotor, the meter case bore, the upper cover and lower cover is full of measuring fluid. When the rotor and the vanes are in the position as shown in figure 1.4, the fluid in the space begins to be released with the vane A withdrawing gradually. Meanwhile, the vane C begins to stretch out, another new exactly measuring fluid volume between the vane B and C begins to form gradually. So when four vanes rotate around the whole circle is 4 times of volume. ( the meter has three pairs vanes, 6 space volumes will be drained) it realizes fluid measurement.



# LBTC Positive Displacement Rotary Vane Flow Meter

## Main technical parameters

1. Intrinsic Error: 0.2%; 0.5%
2. Nominal Diameter (mm): 25mm; 50mm; 80mm; 100mm; 150mm; 200mm; 250mm; 300mm;
3. Nominal Pressure: 2.5MPa; 4.0MPa; 6.4MPa;
4. Flow Rate Range:

Nominal Diameter	25		50		80		100		150		200		250		300	
Intrinsic Error %	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5
Min. Flow m <sup>3</sup> /h	3	1	8	5	25	18	35	25	60	40	100	80	120	110	300	200
Max. Flow m <sup>3</sup> /h	6	8	20	35	65	80	90	115	120	150	180	240	350	550	900	1000

5. Operation Temperature: -20° C ~ +250° C; (special temperature should indicate.)
6. Fluid Viscosity: 0.6~500mPa.s ( kinematic viscosity)
7. Pressure loss: no more than 0.1MPa(such as nominal diameter is DN80)
8. Min. Indication Unit: For equipped with mechanical header, subject to the model of selected header.  
For equipped with intelligent header: 0.001m<sup>3</sup>
9. Integrated Flux: For equipped with mechanical header, subject to the model of selected header.  
For equipped with intelligent header: 99999.9999 m<sup>3</sup>
10. Coefficient of theoretical instrument: only for equipped with intelligent meter.

Nominal diameter DN	25	50	80	100	150	200	250	300
Coefficient of theoretical instrument N/L	18.868	6.993	3.657	2.357	1.634	1.483	0.841	0.563

## Main features

- ◆ The meter can be equipped with mechanical integrating instrument to realize local indication, and can be equipped with pulse signal transmitter or intelligent instrument to realize signal remote transmission;
- ◆ High precision, the highest accuracy class is 0.2;
- ◆ Rotary vanes are wear-resistant, and the vanes can operate in high pressure condition.
- ◆ The pressure loss is small. Attenuation of accuracy is low and the pressure loss is no more than 0.1Mpa. (Such as nominal diameter is DN80)
- ◆ The structure of the single housing is simple and the weight is light, The structure of double housing can not be influenced by thermal expansion and pressure, and deformation is very small.
- ◆ Installation for the meter is very convenient , no need for auxiliary equipment such as straight pipe section, rectifier, etc. The meter cannot be influenced by pipe pieces such as valves, elbow, etc.
- ◆ The meter can work very stable with no vibration and noise.
- ◆ the pressure drop is more than velocity-type flow meter, but is better than other positive displacement meter.

# LBTC Positive Displacement Rotary Vane Flow Meter

**Model Selection Table**

Model	Code				Code meaning
LBTC-					Positive displacement rotary vane flow meter
	25				Nominal diameter:DN25mm
	50				Nominal diameter:DN50mm
	80				Nominal diameter:DN80mm
	100				Nominal diameter:DN100mm
	150				Nominal diameter:DN150mm
	200				Nominal diameter:DN200mm
	250				Nominal diameter:DN250mm
	300				Nominal diameter:DN300mm
		Q			House material: nodular cast iron
		C			House material: carbon steel
		P			House material: 304
			2.5		Nominal Pressure: 2.5MPa
			4.0		Nominal Pressure: 4.0MPa
			6.3		Nominal Pressure: 6.4MPa
				JX	With mechanical counter, local indication.
				BS	With mechanical counter, remote signal transmitted with pulse transmitter
				ZN1	With intelligent instrument, local indication; remote signal transmitted with pulse transmitter.
				ZN2	With intelligent instrument, local indication with 4~20mA signal output.
				ZN3	With intelligent instrument, local indication with 4~20mA signal output and remote signal transmitted with pulse signal transmitter
				i	Intrinsically safe: ia IICT5 (for intelligent meter or pulse signal transmitter)
				d	Explosion isolation: d IIBT4 (for intelligent meter or pulse signal transmitter)
LBTC-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Example**

LBTC-50Q2.5Z1i: Positive displacement rotary vane flow meters

- ◆Nominal Diameter: 50mm;
- ◆Material of the Body Case: Nodular cast iron;
- ◆Nominal Pressure: 2.5MPa;
- ◆Equipped with intelligent instrument with local indication and remote pulse signal remitted by transmitter;
- ◆Explosion-proof type: intrinsically safe

# LBTC Positive Displacement Rotary Vane Flow Meter

## Outline and installation dimension

### 1、 Structure and dimension

For LBTC positive displacement rotary vane flow meter outline and installation dimension as figure 2、 3 and following table.

DN	PN	Outline Dimension (mm)			Flange Connection Dimension (mm)							
					Spherical cast iron flange				Carbon and Stainless Steel Flange			
mm	MPa	L	H	H1	D	D1	n-d	bolt	D	D1	n-d	bolt
25	2.5	248	360	90	115	85	4-φ14	M12	115	85	4-φ14	M12
	4.0	248	360	90	115	85	4-φ14	M12	115	85	4-φ14	M12
	6.3	320	358	89	140	100	4-φ18	M16	140	100	4-φ18	M16
50	2.5	350	427	123	165	125	4-φ19	M16	165	125	4-φ18	M16
	4.0	350	427	123	165	125	4-φ19	M16	165	125	4-φ18	M16
	6.3	460	686	184	175	135	4-φ23	M20	180	135	4-φ23	M20
80	2.5	440	427	160	200	160	8-φ19	M16	200	160	8-φ18	M16
	4.0	440	427	160	200	160	8-φ19	M16	200	160	8-φ18	M16
	6.3	460	920	260	210	170	8-φ23	M20	216	170	8-φ23	M20
100	2.5	530	528	180	235	190	8-φ23	M20	235	190	8-φ23	M20
	4.0	530	528	180	235	190	8-φ23	M20	235	190	8-φ23	M20
	6.3	622	996	319	250	200	8-φ25	M22	250	200	8-φ25	M32
150	2.5	650	596	216	300	250	8-φ28	M24	300	250	8-φ26	M24
	4.0	650	596	216	300	250	8-φ28	M24	300	250	8-φ26	M24
	6.3	640	968	360	340	280	8-φ34	M30	340	280	8-φ34	M30
200	2.5	700	800	300	360	310	12-φ28	M24	360	310	12-φ26	M24
	4.0	700	800	300	375	320	12-φ31	M27	375	320	12-φ30	M27
	6.3	900	1255	457	405	345	12-φ34	M30	405	345	12-φ34	M30
250	2.5	950	1100	540	425	370	12-φ31	M27	425	370	12-φ90	M27
	4.0	950	1100	540	450	385	12-φ34	M30	450	385	12-φ34	M30
	6.3	1040	1374	558	470	400	12-φ41	M36	470	400	12-φ41	M36
300	2.5	1000	887	455	485	430	16-φ31	M27	485	430	16-φ30	M27
	4.0	1000	887	455	515	450	16-φ34	M30	515	450	16-φ34	M30
	6.3	1150	1617	702	530	460	16-φ41	M36	530	460	16-φ41	M36

Note: nodular cast iron flange standard is GB12380.4-90~GB12380.7-90

Carbon steel or stainless steel flange PN2.5MPa executes standard of JB/T82.1-94;PN4.0MPa and PN6.3MPa execute standard of JB/T82.2-94.

# LBTC Positive Displacement Rotary Vane Flow Meter

Figure 2 Outline of positive displacement rotary vane flow meter with mechanical meter

Figure 3 Outline of positive displacement rotary vane flow meter with intelligent meter

For LBTC series positive displacement rotary vane flow meter with anchor bolt plate, please see figure 4 and the following table

Nominal Diameter DN	Structure dimension (mm)				
	D	D1	H	n-d	Bolt
25	185	160	12	3-φ14	M12
50	235	200	15	3-φ18	M16
80	305	260	18	3-φ22	M20
100	335	300	20	3-φ23	M20
150	385	350	24	3-φ23	M20
200	480	440	25	3-φ25	M22
250	725	660	28	3-φ33	M30
300	855	780	30	3-φ34	M30

Note: anchor bolt disc plate should be ordered individually

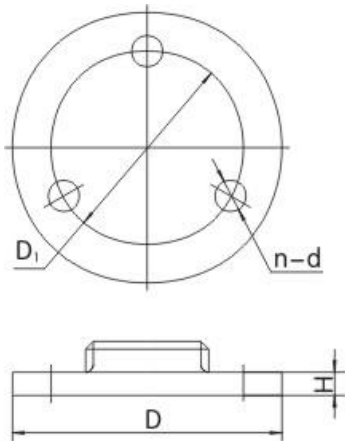
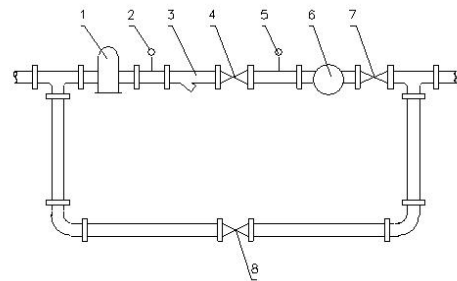


Figure 4 Structure and dimension of anchor bolt plate



1-Gas eliminator 2-pressure gauge 3- filter  
4、 7、 8- valve 5- thermometer

6- LBTC positive displacement rotary vane flow meter

Figure 5 Flow meter installation instructions

# LBTC Positive Displacement Rotary Vane Flow Meter

## 2. Installation requirements

We suggest LBTC positive displacement rotary vane flow meter should install according to installation instruction as shown in figure 5.

- 2.1 Connection pipe of LBTC positive displacement rotary vane flow meter should be the same diameter and axis as inlet and exit of flow meter, can not have projections on pipe wall. Connection pipe near flow meter can't have obvious transformation, and minimizing the impact on flow meter due to expansion and contraction of pipeline.
- 2.2 Installing flow meter on new pipe, to avoid sundries in pipe along with the fluid entering into flow meter that will cause damage, you can use short pipe instead of flow meter. After cleaning or purging the pipe, install the flow meter. Don't let scavenging air pass bulk.
- 2.3 You should take off the sealing-capping of connecting flange on flow meter before installation, if impurity and gas content in fluid is high, we suggest installing filter、 gas eliminator or LPXG before flow meter, filter mesh should be used as following ranges: flow meter of DN20-50 should use 20mesh, DN80-150 should use 15mesh, DN200-300 should use 10mesh.
- 2.4 The flow meter should be installed horizontally on main pipe ,generally the slant angle should be no more than 15° ,to make sure clearance of rotary vane of flow meter is equalizing and measurement is accurate.
- 2.5 Direction of arrow on flow meter should be the same as flow direction of fluid when installing, flow meter and straight pipe of both sides should be on coaxial line.
- 2.6 Flow throttle valve and switch valve installed on pipe work reliably. For observation and inspection conveniently, abscission of bypass pipe can use closing device which is composed of two switch valves in series, there is a small-bore leak valve on the short connecting pipe between two valves, you can inspect the cutting capacity conveniently.
- 2.7 Use strictly according to range on the nameplate of flow meter: all of max. flow, operating pressure, operating temperature, fluid viscosity can't exceed specialized range on the nameplate of flow meter.
- 2.8 When using the flow meter, you should open the valve slowly and increase the flow gradually until reaching needed flow, but can't exceed the max. flow limited by nameplate on flow meter.
- 2.9 The flow meter should be maintained periodically, main content of maintenance as follows:
  - a) Inspecting whether the flow range exceeds max. flow on the nameplate;
  - b) Observing whether there is regular noise in the housing of operating flow meter, and whether there is bigger impurity and foreign matter entering flow meter.
  - c) After the parts replacement, you need to re-calibrate.
  - d) The flow meter in normally using should be calibrated regularly according to industry stipulation.
  - e) When using mechanical integrating instrument, you should inject lubricant regularly.

## Order requirements

- ◆ Specification: more than 100m;
- ◆ Accuracy class: ◆ Brand of material contacting fluid:
- ◆ Max. Min. flow value; ◆ Other flanges standard:
- ◆ Fluid:
- ◆ Operating temperature:
- ◆ Fluid viscosity
- ◆ Please note if the transmission distance is