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U Series



LZYN Series Mass Flowmeter (hereafter we call LZYN) is designed according to the Coriolis Principle. It can be widely used for the process detecting and custody transfer...

Description

- Introduction
- Specification
- Function
- Outline Dimension
- Model Selection

1. General

LZYN Series Mass Flowmeter (hereafter we call LZYN) is designed according to the Coriolis Principle. It can be widely used for the process detecting and custody transfer/fiscal unit in many industries such as petroleum, petrochemical industry, pharmacy, paper making, food and energy, and so on. As a fairly advanced kind of flow measurement instrument, it has been paid attention by the circle of measurement and accepted by many customers home and abroad.



LZYN-300



LZYN-150

2. Principle

LZYN is designed according to the principle of Coriolis force. Under the alternating current effect, the magnet and coil installed on the measuring tube will make two parallel measuring tubes vibrate according to some fixed frequency. Once there is flow passing through the pipes, Coriolis force will give rise to deflection (phase shift) on the vibration of two pipes and the deflection of vibration is directly proportional to the mass flow of fluid. Pick up them and the mass flowrate could be calculated.

The vibration frequency of measuring tube is determined by the total mass of measuring tube and inner fluid. When the fluid density changes, the vibration frequency of measuring tube will be also changing, as a result, the fluid density can be calculated.

The temperature transducer installed in the pipeline can pick up the fluid temperature on time under the coordination of measuring circuit.

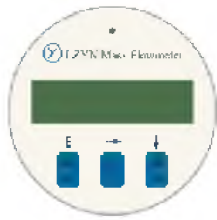
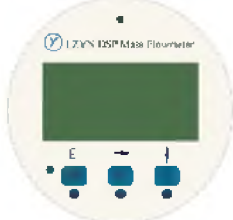
3. Feature

3. 1 Digital transmitter Feature

Comparing with traditional analog circuit and analog transmitter, digital circuit and digital transmitter has the following obvious merits:

- 3.1 Enable to measure directly mass flow rate of fluid in the pipeline without changing any parameters, which avoids the some measurement error of intermediate links. Its mass flowrate can be high accuracy and good repeatability within bigger range of turndown ratio.
 - 3.2 Fluid measured can be more extensive, such as the steady uniform flow of common viscosity fluid, the high viscosity fluid, non-Newtonian fluid, slurry containing some solid components and the liquid containing some trace of gas.
 - 3.3 Due to the small vibration, measuring tube of the LZYN can be regard as non-moving parts, which will reduce the maintenance of flowmeter, enhance the stability and lifetime.
 - 3.4 Besides the mass flow measurement, the density and temperature and even consistency can also be picked up and output.
- G Type Coriolis Transmitter & D Type Coriolis Transmitter
- G type coriolis transmitter is an analog transmitter, which adopts traditional method to do the sampling and signal analysing. D type coriolis transmitter utilizes DSP technology which greatly improves the methods of sampling, signal filtering, and signal analyzing for better performance on accuracy and turndown. It especially enhances the accuracy under low flow rate. It can be used for gas medium.

Difference between G Type Analog transmitter and D Type DSP transmitter

Comparison	G Type Analog transmitter	D Type DSP transmitter
Principle	1. Traditional sampling, process and reaction; Low turndown.	1. Higher sampling; 2. Shorter response time and quicker reaction; 3. Digital filtering. 4. Higher accuracy and bigger turndown ratio
Display	LCD	OLED
Screen	Small	Big and leave space for future updating
Display Panel		
Model Code	G	D
In conclusion, DSP transmitter is much advanced than Analog transmitter from principle, design and application, However, to keep the consistency on operation, we did not change menus until now.		

4.1. Specification of Sensor and Flow Range for Liquid Table 1

DN (mm)	40~200			
Structure	Integrate Type (-50~+125)°C Separate Type (-50~+200)°C Non-explosion-proof (-50~+300)°C。			
Sensor	U-Series			
Transmitter	Digital Type General Type			
Explosion-proof	General Type Explosion-proof			
Power supply	24VDC 220VAC			
Output Interface	RS485			
Nominal Pressure (Mpa)	1.6	2.5	4.0	6.4
Signal output	Pulse output (4-20)mA			
Accuracy	±0.1%	±0.2%	±0.5%	

U-Series sensor with general transmitter Table 2

DN (mm)	Max. Flow Range (t/h)	Normal Flow Range for Accuracy 0.1% (t/h)	Normal Flow Range for Accuracy 0.2% & 0.5% (t/h)	Stability of Zero Point (t/h)
DN40	0.6~30.0	6.0~30.0	3.0~30.0	0.0030
DN50	1.0~50.0	10.0~50.0	5.0~50.0	0.0050
DN80	2.4~120	24.0~120	12~120	0.0120
DN100	4.0~200	40.0~200	20~200	0.0200
DN150	10.0~500	100~500	50~500	0.0500
DN200	20.0~1000	200~1000	100~1000	0.1000

Table 3

DN (mm)	Max.Flow Range (t/h)	Normal Flow Range for Accuracy 0.1% (t/h)	Normal Flow Range for Accuracy 0.2% & 0.5% (t/h)	Stability of Zero Point (t/h)
DN 40	0.6~30.0	2.0~30.0	1.5~30.0	0.0030
DN 50	1.0~50.0	3.5~50.0	2.5~50.0	0.0050
DN 80	2.4~120	6.0~120	6.0~120	0.0120
DN 100	4.0~200	15~200	10~200	0.0200
DN 150	10.0~500	35~500	25~500	0.0500
DN 200	20.0~1000	70~1000	50~1000	0.1000

4.2. Accuracy

Table 4

0.1%	0.2%	0.5%
$\pm 0.1\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \times 100\% \right)$	$\pm 0.2\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \times 100\% \right)$	$\pm 0.5\% \pm \left(\frac{\text{Stability of Zero Point}}{\text{Instantaneous Flow}} \times 100\% \right)$
Accuracy is calculated based on the water measurement under the condition of +20℃~25℃ and 0.1M Pa~0.2M Pa.		

4.3. Repeatability

Table 5

Accuracy	0.1%	0.2%	0.5%
Repeatability	±0.05%	±0.1%	±0.25%
Accuracy is calculated based on the water measurement under the condition of +20℃~25℃ and 0.1M Pa~0.2M Pa.			

4.4. Measurement of Density

Table 6

Density Range	(0.2~2.0) g/cm ³
Basic Error	±0.002g/cm ³ (Affected by the sensor)
Repeatability	0.001g/cm ³

4.5. Measurement of Temperature

Table 7

Temperature Range	(-50~+125) ℃	Integrated Type
	(-50~+200) ℃	Separate Type
	(-50~+350) ℃	High Temperature Separate Type
Basic Error	≤ ±1.0℃	

Table8

Output Range	4~20mA
Resolving Power	0.000244mA
Basic Error	0.2% F.S
Temperature Impact	±0.005% F.S/°C
External resistor should be 250~600 Ω	

5.2 Frequency Output

Active Frequency Output can be configured to denote the mass flow or volume flow.

Table9

Output Range	0~10kHz
Resolving Power	0.152Hz
Basic Error	±0.075%
Temperature Impact	±0.001% F.S/°C
Max. capability of outrange is 12kHz	

5.3 Low Flow Cutoff

When the flow value measured is lower than the value of Low Flow Cutoff, the LZYN will output zero flow and the totaliser will stop to accumulate. The value of Low Flow Cutoff is usually sets to be 1% of the maximum flowrate.

5.4 Ambient Limitation

5.4.1 Ambient vibration

Table10

Frequency Range	(10~2000) Hz
Acceleration amplitude value	2g
Circulation time	50 times

5.4.2 Ambient temperature

Table11

Working Temperature	(-20~+55) °C
Storage Temperature	(-20~+70) °C

5.4.3 Ambient humidity

Table12

Working Humidity	<90%	+25℃ No condensation
Storage Humidity	<95%	

5.4.4 Enclosure Grade: IP65

6.1 Micro-bend Shape Outline Dimension (Drawing1 and Table13)

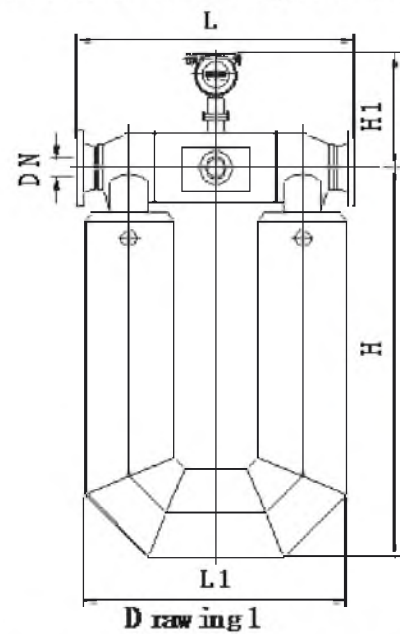


Table 13

Model LZYNU-Series	DN (mm)	L (mm)	L1 (mm)	H (mm)	H1 (mm)
040	40	520	470	660	280
050	50	558	550	750	290
080	80	780	710	1040	320
100	100	920	860	1290	350
150	150	1100	1050	1600	380
200	200	1380	1160	1740	420

6.2 Common Shape Outline Dimension (Drawing2 and Table14)

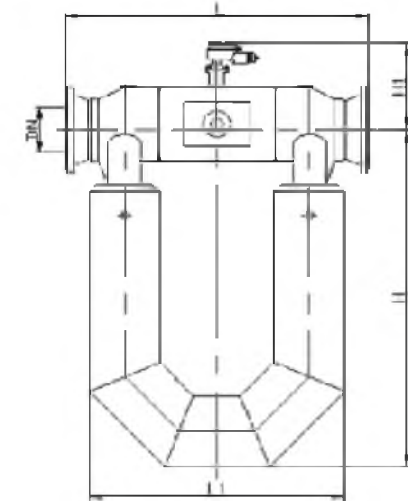


Table 14

Model LZYNU-Series	DN (mm)	L (mm)	L1 (mm)	H (mm)	H1 (mm)
040	40	520	470	660	182
050	50	558	550	750	198
080	80	780	710	1040	227
100	100	920	860	1290	290
150	150	1100	1050	1600	280
200	200	1380	1160	1740	335

LSZ -Electronic Meterhead
LSZ -Stainless steel (-20℃ ~ +80℃)
LSZ -Stainless steel high temp. type (+80℃ ~ +150℃)
LSZ -Stainless steel high temp. type (+150℃ ~ +250℃)

Table15

Drawing 2	Model	Explosion-proof Grade
Integrate Type	LZYN-010~200	Exdib IIC T4~T6 (IIC just includes H ₂)
Separate Type	LZYN-010~080	Ex ib IIC T3~T6 (IIC just includes H ₂)
	LZYN-100~200	Exdib IIC T3~T6 (IIC just includes H ₂)

LZY N — $\square\square\square\square\square\square\square\square\square\square\square$
 0 1 2 3 4 5 6 7 8 9 10 11

Note:

0—LZY N Series Mass Flow meter

1—Nom inal Size (mm)

2—Structure: 1—Integrate Type 2—Separate Type

3—Sensor: P—General Type C—Explosion-proof Type 0 details shown in the following)

4—Transmitter: A—General Type B—Explosion-proof Type Exd [ib] II CT6
 (II C just includes H₂)

5—Medium : Q—Gas Y—Liquid

6—Power Supply: 1—24V DC 2—220V AC

7—Output Interface: S—RS485 (MODBUS) N—No

8—Nom inal Pressure (MPa): 1—1.6 2—2.5 3—4.0 4—6.4

9—Rated Working Temperature Range (°C): 1—50~+125 2—50~+200 3—50~+350

10—Signal Output: F—Pulse Output I—(4~20)m A

11—Accuracy: A—0.1% B—0.2% C—0.5%

Forexample: LZY N—080 2 C B Y I S 2 2 IB

Meaning: LZY N Series Mass Flow meter, DN 80mm, Separate Type, Sensor of Exdib II

CT3~T6 (II C just includes H₂), Transmitter of Exd [ib] II CT6 (II C just includes H₂),

Liquid, 24V DC, RS485 Interface, 2.5MPa, -50~+200°C, 4~20mA Output, 0.2%

Type		1	2	3	4	5	6	7	8	9	Note
		DN (mm)	Structure	Transmitter	Electric Resistance	Power Supply	Output Interface	PN	Output Signal	Accuracy	
LZY N—											Mass Flow meter
	1 1/2"	040									DN 40mm
	2"	050									DN 50mm
	3"	080									DN 80mm
	4"	100									DN 100mm
	6"	150									DN 150mm
	8"	200									DN 200mm
			1								Integrate Type (Anti-explosion)
			2								Separate Type (Anti-explosion)
			3								Separate Type High Temperature
				G							General Type
				D							Digital Type
					A						General Type
					B						Explosion-proof Type (Table 15)
						1					24V DC
						2					220V AC
							S				RS485
							N				None
								1.6			PN 1.6MPa
								2.5			PN 2.5MPa
								4.0			PN 4.0MPa
								6.4			PN 6.4MPa
									F		Pulse Output
									I		(4~20)m A
										0.1	0.1%
										0.2	0.2%
										0.5	0.5%

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