LZYN Series Mass Flowmeter

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.

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

Comparing with the traditional flow measurement method, LZYN has 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 regards 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.

4. Main Technical Specification

4.1. Specification of Sensor and Flow Range (Just for Liquid)

Table1

DN(mm)	Max. Flow Range (kg/h)	Normal Flow Range for Accuracy 0.1% (kg/h)	Normal Flow Range for Accuracy 0.2% & 0.5% (kg/h)	Stability of Zero Point(kg/h)
10	20 ~ 1000	150 ~ 1000	80 ~ 1000	0.200
15	40 ~ 2000	300 ~ 2000	150 ~ 2000	0.400
20	80 ~ 4000	600 ~ 4000	400 ~ 4000	0.800
25	120 ~ 6000	1000 ~ 6000	600 ~ 6000	1.200
40	600 ~ 30000	5000 ~ 30000	3000 ~ 30000	6.000
50	1000 ~ 50000	8000 ~ 50000	5000 ~ 50000	10.00
80	2400 ~ 120000	20000 ~ 120000	12000 ~ 120000	24.00
100	4000 ~ 200000	30000 ~ 200000	20000 ~ 200000	40.00
150	10000 ~ 660000	80000 ~ 500000	50000 ~ 500000	100.0
200	20000 ~ 1200000	150000 ~ 1000000	80000 ~ 1000000	200.0

4.2. Accuracy

Table2

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

4.3. Repeatability

Table3

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 0.1MPa~0.2MPa.			

4.4. Measurement of Density

Table4

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

Table5

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

5. Specification of Function

5.1 Circuit Loop Output

4-20mA Current Output can be configured to denote the mass flow or volume flow.

Table6

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

5.2 Frequency Output

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

Table7

Output Range	0 ~ 10kHz
Resolving Power	0.152Hz
Basic Error	± 0.075%
Temperature Impact	± 0.001%F.S/℃
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 totali ser 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

Table8

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

5.4.2 Ambient temperature

Table9

Working Temperature	(-20 ~ +55) ℃
Storage Temperature	(-20 ~ +70) ℃

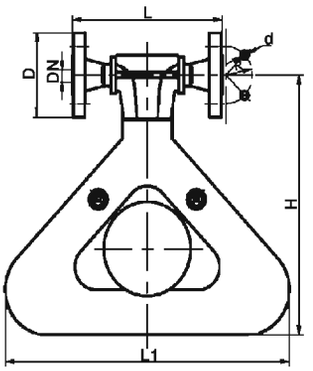
5.4.3 Ambient humidity

Table10

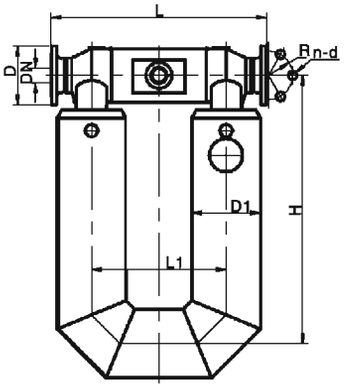
Working Humidity	<90%	+25℃ No condensation
Storage Humidity	<95%	

5.4.4 Enclosure Grade: IP65

6. Outline Dimension (Shown in the following Drawings and Table)



DN (10~25)



DN (40~200)

DN (40~200)

Table11

Model LZYN	DN	D	R	n-d (ϕ)	L1	H	L
10	10	90	30	4-14	350	290	80/150
15	15	95	32.5	4-14	350	290	180
20	20	95	32.5	4-14	350	290	180
25	25	115	42.5	4-14	530	340	200
40	40	150	55	4-18	340	580	450
50	50	165	62.5	4-18	364	650	570
80	80	200	80	8-18	520	880	850
100	100	235	95	8-22	580	1150	950
150	150	300	125	8-26	686	1416	1100
200	200	375	160	12-30			

7. Type Description

LZYN — □□□ □ □ □ □ □ □ □ □ □ □
0 1 2 3 4 5 6 7 8 9 10 11

Note:
0—LZYN Series Mass Flowmeter
1—Nominal Size(mm)
2—Structure: 1Integrate Type 2Separate Type
3—Sensor: P–General Type C–Explosion–proof Type (Details shown in the following)

Table12

Model		Explosion-proof Grade
Integrate Type	LZYN-010～200	Exdib Ⅱ CT4～T6 （Ⅱ C just includes H_2）
Separate Type	LZYN-010～080	Ex ib Ⅱ CT3～T6 （Ⅱ C just includes H_2）
	LZYN-100～2000	Exdib Ⅱ CT3～T6 （Ⅱ C just includes H_2）

4—Transmitter: A–General Type B–Explosion–proof Type Exd［ib］Ⅱ CT6
（Ⅱ C just includes H_2）
5—Medium: Q–Gas Y –Liquid
6—Power Supply: 1–24VDC 2–220VAC
7—Output Interface: S–RS485(MODBUS) N–No
8—Nominal Pressure(MPa): 1–1.6 2–2.5 3–4.0 4–6.4
9—Rated Working Temperature Range(℃):1–50～+125 2 –50～+200 3–50～+350
10—Signal Ouptut: F–Pulse Output I–(4～20)mA
11—Accuracy: A–0.1% B–0.2% C–0.5%

For example: LZYN–080 2 C B Y 1 S 2 2 I B
Meaning: LZYN Series Mass Flowmeter, DN80mm, Separate Type, Sensor of Exdib Ⅱ CT3～T6（Ⅱ C just includes H_2）, Transmitter of Exd［ib］Ⅱ CT6（Ⅱ C just includes H_2）, Liquid, 24VDC, RS485 Interface, 2.5MPa, –50～+200℃, 4～20mA Output, 0.2%