



National New Key Product Certificate for LZYN Coriolis Mass Flowmeter



Contract credit class approval certificate



CE for LZYN



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ISO 9001:2008



Brand Register Certificate



Patent Certificate



Explosion Proof Certificate

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 etc.. As a fairly advanced kind of flow measuring instrument, it has been paid attention by the circle of measurement and accepted by many customers home and abroad.



LZYN-150



LZYN-25



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 changed, 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

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:

3.1.1 The DSP chip is the core of digital transmitter for LZYN. As we know, the techniques of Digital Signal Processing can greatly increase the accuracy of flowmeter and broaden turndown ratio.

3.1.2 The sampling rate of digital transmitter is much higher than traditional products, so it provides shorter response time for the flow, quicker reaction to the flow change, higher efficiency and better accuracy for small amount tank loading/unloading system.

3.1.3 Digital Signal Processing techniques can filter and shape the flow signal better. Well-designed digital filter can remove industrial frequency electromagnetic fields, spatial electromagnetic fields and noise effect on mass flowmeter, markedly enhance stability and reliability of mass flowmeter.

3.2. Mass Flowmeter Feature

Comparing with the traditional flow measurement method, LZYN has following obvious merits:

3.2.1 Enable to directly measure mass flow rate of fluid in the pipeline without changing any parameters, which avoids some measurement error of intermediate links. Its mass flowrate can be high accuracy and good repeatability within bigger range of turndown ratio.

3.2.2 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.

3.2.3 Except for 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 for Liquid

Table 1

DN(mm)	8~300			
Structure	Integrate Type (-50~+125)℃ Separate Type (-50~+200)℃ Low temp. separated type: -150℃-+125℃			
Sensor	U-Series		Micro-bend 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	6.3 (25MPa is available for some sizes)
Signal output	Pulse output		(4-20)mA	
Accuracy	0.1%	0.2%	0.5%	
Hygienic type	Customize as customers' needs.			
Process connection	Flange(GB/DIN/ANSI...) Or Thread(customized)			



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U-Series sensor with digital transmitter

Table 3

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)
8	10~800	60~800	40~800	0.13
10	10~1000	70~1000	50~1000	0.13
15	30~3000	150~3000	100~3000	0.38
25	80~8000	400~8000	300~8000	1.00
40	320~32000	2000~32000	1500~32000	4.00
50	500~50000	3500~50000	2500~50000	6.25
80	1400~140000	6000~140000	6000~140000	17.5
100	2000~200000	15000~200000	10000~200000	25.0
150	5000~500000	35000~500000	25000~500000	62.5
200	10000~1000000	70000~1000000	50000~1000000	125
250	15000~1500000	100000~1500000	75000~1500000	188
300	25000~2500000	170000~2500000	125000~2500000	313

Microbend Series sensor with digital transmitter

Table 4

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)
8	8~800	80~800	55~800	0.13
10	10~1000	100~1000	70~1000	0.13
15	20~3000	200~3000	150~3000	0.38
25	80~8000	600~8000	400~8000	1.00
40	240~24000	2400~24000	1200~24000	4.00
50	500~50000	5000~50000	2500~50000	6.25
80	800~120000	8000~120000	5500~120000	17.5
100	1500~200000	20000~200000	10000~200000	25.0
150	5000~500000	50000~500000	25000~500000	62.5
200	10000~1000000	100000~1000000	50000~1000000	125
250	15000~1500000	150000~1500000	100000~1500000	188
300	25000~2000000	200000~2000000	100000~2000000	313

For gas

Table 5

DN (mm)	Max.Flow Range (kg/h)	Normal Flow Range for Accuracy 0.5 % (kg/h)	Stability of Zero Point (kg/h)
8	4~800	20~800	0.13
10	5~1000	25~1000	0.13
15	15~3000	75~3000	0.38
25	40~8000	200~8000	1.00
40	160~32000	800~32000	4.00
50	250~50000	1250~50000	6.25
80	700~140000	3500~140000	17.5
100	1000~200000	5000~200000	25.0
150	2500~500000	12500~500000	62.5
200	5000~1000000	25000~1000000	125
250	7500~1500000	37500~1500000	188
300	12500~2500000	62500~2500000	313

Note: The flow range for $\pm 0.2\%$ is 1/2 of $\pm 0.5\%$ which changes the min. flow rate but same to the max. flow rate



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4.2. Accuracy

Table 6

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 0.1MPa~0.2Mpa		

4.3. Repeatability

Table 7

Accuracy	0.1%	0.2%	0.5%
Repeatability	$\pm 0.05\%$	$\pm 0.1\%$	$\pm 0.25\%$
Accuracy is calculated based on the water measurement under the condition of +20℃~25℃ and 0.1MPa~0.2Mpa			

4.4. Measurement of Density

Table 8

Density Range	(0.2~3.0)g/cm ³
Basic Error	$\pm 0.002\text{g/cm}^3$ (Affected by the sensor)
Repeatability	$\pm 0.001\text{g/cm}^3$

4.5. Measurement of Temperature

Table 9

Temperature Range	Integrated Type	(-50~+125)℃
	Separate Type	(-50~+200)℃
	Low Temperature Separated Type	(-150~+125)℃
Basic Error	$\leq \pm 1.0\text{℃}$	

5. Specification of Function

5.1 Current Output

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

Table 10

Output Range	4~20mA
Basic Error	0.1%F.S
Repeatability	$\pm 0.01\%/^{\circ}\text{C}$
External resistor should be 250~600Ω	

5.2 Frequency Output

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

Table 11

Output Range	0~10kHz
Basic Error	$\pm 0.005\%$
Temperature Impact	$\pm 0.001\%/^{\circ}\text{C}$
Max.capability of outrange is 12kHz	



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5.3 RS485 Output

RS485 output adopts the RTU communication mode which is compatible with MODBUS protocol.

5.4 Ambient Limitation

5.4.1 Ambient vibration

Table12

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

5.4.2 Ambient temperature

Table13

Working Temperature	(-20 ~ +55) °C
Storage Temperature	(-40 ~ +70) °C

5.4.3 Ambient humidity

Table14

Working Humidity	< 90%	+25°C No condensation
Storage Humidity	< 95%	

5.4.4 Enclosure Grade: IP65

5.5 Power consumption

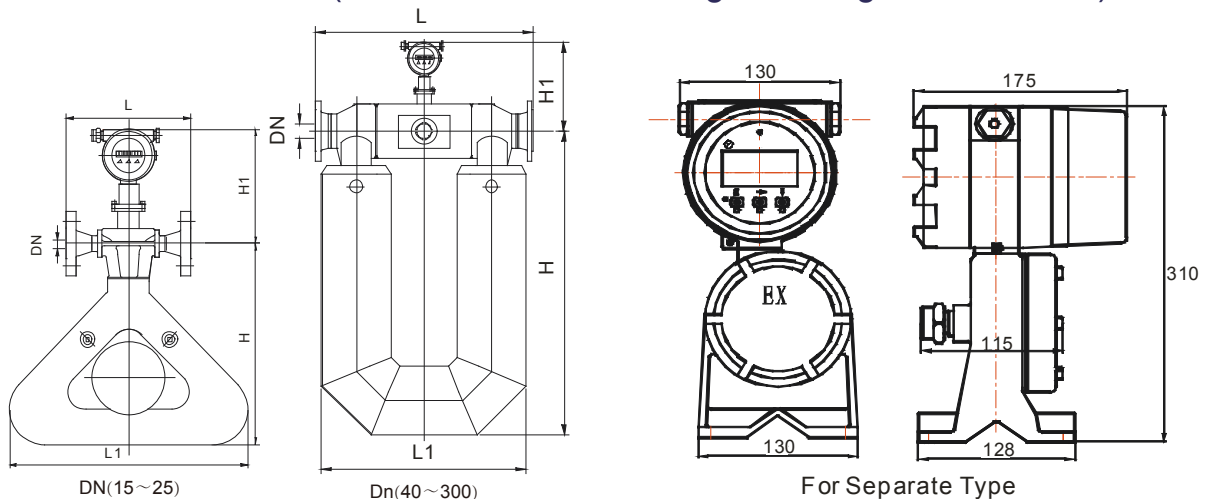
The normal power consumption of the flowmeter is 10W, while the max value is 15W.

5.6 Weight

Table15

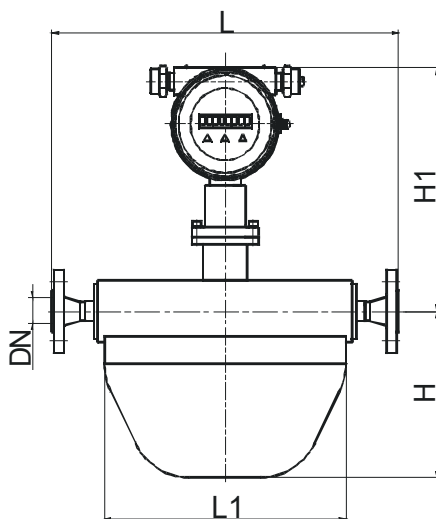
DN(mm)	15	25	40	50	80	100	150	200	250	300
Triangle type & U-type	13	17	30	40	100	190	325	536	960	3450
Micro-bend type	12	15	25	38	78	135	265	430	500	630

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



Outline dimension for triangle-type and U-type
Table16

LZYN	DN	L		ΔL (mm)	L1	H	H1	
		GB/T9115-2010 (MPa)					Integrated	Separated
		≤ 4.0	≥ 6.3					
008	8	150	170	±1.5	350	290	260	190
010	10	150	170		350	290	260	190
015	15	180	194		350	300	260	190
025	25	200	248		450	420	280	210
040	40	520	547	±2.5	470	660	280	210
050	50	558	588		550	710	290	220
080	80	780	808		710	1040	320	250
100	100	920	948		860	1140	350	280
150	150	1100	1140	±3.5	1050	1520	380	310
200	200	1364	1410		1160	1655	420	350
300	300	2070	2120		1270	3150	520	450


Outline dimension for microbend-type
Table17

LZYN	DN	L		ΔL (mm)	L1	H	H1	
		GB/T9115-2010 (MPa)					Integrated	Separated
		≤ 4.0	≥ 6.3					
008W	08	270	290	±1.5	160	130	280	210
010W	10	270	290		160	130	280	210
015W	15	400	414	±2.5	280	184	290	220
025W	25	500	536		360	250	300	230
040W	40	600	634		460	300	310	240
050W	50	800	828		640	410	320	250
080W	80	900	928	±3.5	700	490	350	280
100W	100	1130	1156		860	660	370	290
150W	150	1410	1410		1200	900	400	330
200W	200	1800	1844		1450	1170	420	350
250W	250	1850	1890		1530	1180	420	350
300W	300	2000	2050		1600	1300	460	390



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LZYN - Mass Flowmeter

Model Selection LZYN —

0 1 2 3 4 5 6 7 8 9 10

Type	1	2	3	4	5	6	7	8	9	10	Instructions
LZYN	DN	Medium	Structure	Sensor	Protection	Working voltage	Output port	Nominal pressure	Signal output	Accuracy	
	015										Coriolis Mass Flowmeter
	025										15mm
	040										25mm
	050										40mm
	080										50mm
	100										80mm
	150										100mm
	200										150mm
	250										200mm
	300										250mm
	Y										300mm
	Q										To measure liquid
			1								To measure gas
			2								Integrated -50~125 °C
			3								Separated -50~200 °C
			4								High temp. separated:-150~125 C
				U							Low temp. separated:-150~125 C
				W							U-type sensor
					A						Microbend-type sensor
					B						None
						1					Anti-explosion type
						2					DC24V
							S				AC220V
							N				RS485
								1.6			None
								2.5			1.6 MPa
								4.0			2.5 MPa
								6.4			4.0 MPa
								10			6.4 MPa
								16			10 MPa
								25			16 MPa (for DN10-25)
									F		25 Mpa (for DN15-25)
									I		Pulse output
										0.1	(4-20mA) current output
										0.2	± 0.1%
										0.5	± 0.2%
											± 0.5%
											W Hygeian
											D Customize

Example: LZYN-080Y2UB1S2.5I0.2

Means: Coriolis Mass Flowmeter, DN80, to measure liquid, separated type, U-type sensor, DC24V as the power supply, RS485 output port, nominal pressure: 2.5MPa, (4~20)mA current output, accuracy: ±0.2%.

Specification		Antiexplosion grade
Separated type	LZYN-015~080 sensor	Exib II CT3~T6
	LZYN-100~200 sensor	Exd ib II CT3~T6
	LZYN transmitter	Exd [ib] II CT6
Integrated type	LZYN-015~080 flowmeter	Exdib II CT4~T6
	LZYN-100~200 flowmeter	Exdib II CT4~T6

Field use picture of LZYN-Mass Flowmeter in CNPC and SinoPEC

