

## CORIOLIS MASS FLOWMETER

### Description

FKCD Series Mass Flowmeter 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.

### Operating Principle

FKCD 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 then 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



### Features

- Digital transmitter Feature Comparing with traditional analog circuit and analog transmitter, digital circuit and digital transmitter has the following obvious merits
- The DSP chip is the core of digital transmitter for FKCD. As we know, the techniques of Digital Signal Processing can greatly increase the accuracy of flowmeter and broaden turndown ratio.
- The sampling rate of digital transmitter is much higher than the traditional products, so it can provide shorter response time for the flow, quicker reaction to the flow change, higher efficiency and better accuracy for small amount tank loading/unloading system.

### Technical Specifications

#### Flow Ranges (with Analogue Transmitters)

Size (DN)	Full Range (t/h)	Normal Flow Range (t/h)		Stability of Zero point (t/h)
		±0,1 %	±0,2% and ±0,5%	
8	0.016...0.80	0.16...0.80	0.08...0.80	0.0001
10	0.02...1.0	0.2...1.0	0.10...1.00	0.0001
15	0.04...2.00	0.40...2.0	0.20...2.00	0.0002
20	0.08...4.00	0.70...3.50	0.40...4.00	0.0004
25	0.12...6.00	1.20...6.00	0.60...6.00	0.0006
40	0.6...30.00	6.0...30.00	3.0...30.00	0.003
50	1.0...50.00	10.0...50.00	5.00...50.00	0.005
80	2.40...120	24.00...120.00	12.00...120.00	0.012
100	4.00...200	40.00...200.00	20.00...200.00	0.02
150	10.00...500.00	100.00...500.00	50.00...500.00	0.05
200	20.00...1000.00	200.00...1000.00	100.00...1000.00	0.1
250	30.00...1500.00	300.00...1500.00	150.00...1500.00	0.15
300	50.00...2500.00	500.00...2500.00	250.00...2500.00	0.25

#### Conversion of Basic Error for Mass flow

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°C and 1...2 bar (g)		

## Flow Ranges (with DSP Electronics)

Size (DN)	Full Range (t/h)	Normal Flow Range (t/h)		Stability of Zero point (t/h)
		±0,1 %	±0,2% and ±0,5%	
8	0.016...0.80	0.06...0.80	0.04...0.80	0.0001
10	0.02...1.0	0.07...1.0	0.05...1.00	0.0001
15	0.04...2.00	0.20...2.0	0.10...2.00	0.0002
20	0.08...4.00	0.30...3.50	0.20...4.00	0.0004
25	0.12...6.00	0.40...6.00	0.30...6.00	0.0006
40	0.6...30.00	2.0...30.00	1.5...30.00	0.003
50	1.0...50.00	3.5...50.00	2.50...50.00	0.005
80	2.40...120	6.00...120.00	6.00...120.00	0.012
100	4.00...200	15.00...200.00	10.00...200.00	0.02
150	10.00...500.00	35.00...500.00	25.00...500.00	0.05
200	20.00...1000.00	70.00...1000.00	50.00...1000.00	0.1
250	30.00...1500.00	100.00...1500.00	75.00...1500.00	0.15
300	50.00...2500.00	175.00...2500.00	125.00...2500.00	0.25

## Repeatability

Accuracy	0.1%	0.2%	0.5%
Repeatability	±0,05%	±0,1%	±0,25%
Repeatability is calculated based on the water measurement under the condition of +20...25°C and 1...2 bar (g)			

## Density

Density Range	0.2...2 g/cm3
Basic Error	±0,002 g/cm3
Repeatability	0.001 g/cm3

## Temperature

Temperature Range	-50...150°C	Integrated Type Remote Type Remote (High Temp) Type
	-50...200°C	
	-50...350°C	
Basic Error	<±1.0	

## Outputs

### Analog

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

### Pulse

Output Range	0...10 kHz
Resolving Power	0.152 Hz
Basic Error	±0.075%
Temperature Influence	±0.001%FS/°C
Capability of Outrange is 12 kHz	

## Environment Limitation

### Vibration

Frequency Range	10...2000 Hz
Acceleration Amplitude Value	2 g

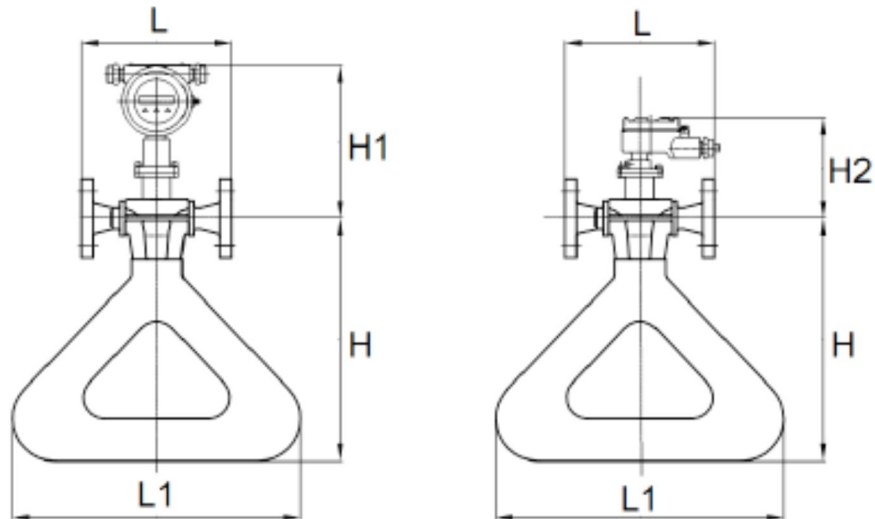
### Ambient Temperature

Working Temp.	-20...55°C
Storage Temp.	-20...70°C

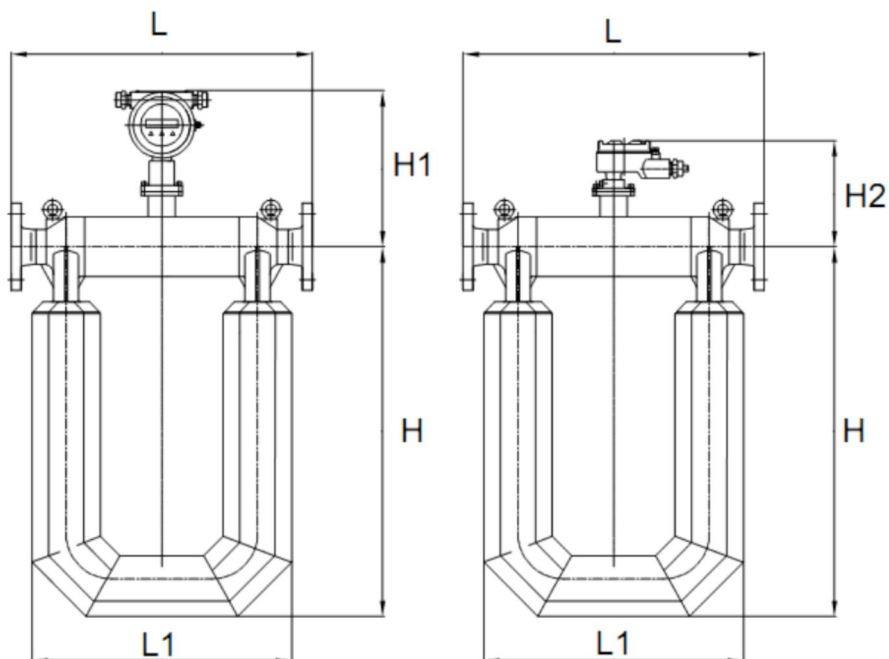
### Ambient Humidity

Working Humidity	<90%
Storage Humidity	<90%

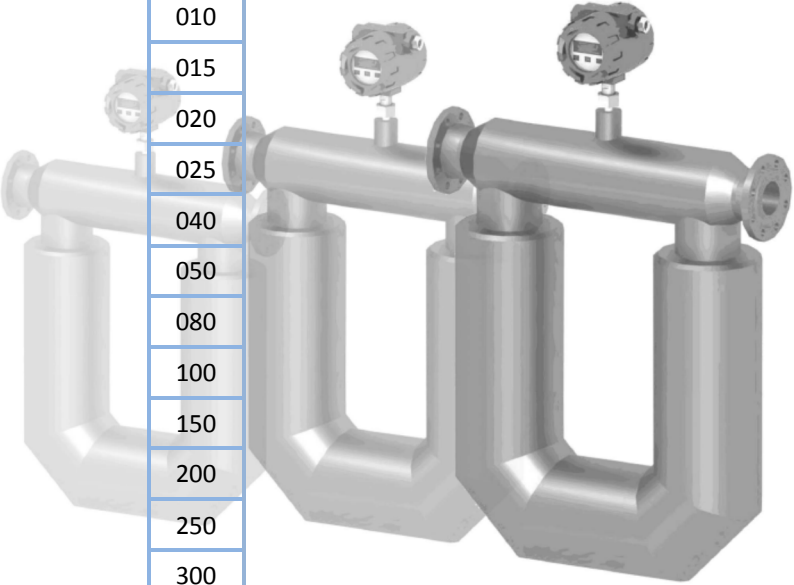
## Dimensions



DN(mm)	L(mm)	L1(mm)	H(mm)	H1(mm)	H2(mm)	Weight(kg)	
						Integral	Separate
10	180	350	290	260	168	11	14
15	180	350	290	260	168	11	14
20	200	450	400	290	198	14	17
25	200	450	400	290	198	15	18



DN(mm)	L(mm)	L1(mm)	H(mm)	H1(mm)	H2(mm)	Weight(kg)	
						Integral	Separate
40	520	470	660	280	188	30	33
50	570	550	750	290	198	35	38
80	780	710	1040	320	228	80	83
100	920	860	1290	350	258	185	188
150	1100	1050	1600	380	288	320	323
200	1365	1150	1700	420	328	625	628

Ordering										Description
FCKD.										
Line Size	008									DN08
	010									DN10
	015									DN15
	020									DN20
	025									DN25
	040									DN40
	050									DN50
	080									DN80
	100									DN100
	150									DN150
	200									DN200
	250									DN250
	300									DN300
Sutstructure	C									Integrated Type
	R									Remote Type
	H									Remote (High Temp) Type
Enclosure	P									IP67
	E									Flameproof ex ib IIC T4...T6
Accuracy	01									±0,1%
	02									±0,2%
	05									±0,5%
Supply	AC									230VAC
	DC									24VDC
Communication	M									RS485-MODBUS
	H									HART (with converter)
Output	A									Analogue 4-20 mA
	F									Pulse
Flange Rating	16									PN16
	25									PN25
	40									PN40
	64									PN64
Electronics	D									DSP
	A									Analogue

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