

## **RLCM-400 SERIES MASS FLOW METER**

### **APPLICATION**

- Petro-chemical engineering which includes systems with chemical reactions, fluid transports, etc.,
- Grease industries which include plant oil, animal oil and other grease handling systems
- Medicine industry
- Deckle industry
- Spinning prints, dyer industry
- Energy industry
- Food processing industry includes beverages, etc.,
- Custody transfer, Process control applications



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## RLT Instrumentation (Unit of RLT Group)

### FEATURES

The RLCM-400 Series mass flow meter is a kind of new intelligence flow meter. This flow meter gathers light, machine and electricity as the integral for its operation. This kind of flowmeter can be used for quality discharge. Coriolis Mass flowmeter is more accurate for wide range of operating conditions. Accuracy of this flowmeter is independent of fluid composition, flow swirl and flow pulsations. Cost of Installation and Maintenance of Coriolis Mass flowmeter is less compared to other flowmeters.

### INTRODUCTION

Now-a-days Coriolis Mass flowmeters are widely used in Oil and Gas Industries particularly for custody transfer since its operation is more stable for flow disturbances and it contains no wearing parts. Coriolis flow meters can be used only for small line sizes and places where more pressure drop is acceptable in a system. Coriolis Mass flow meter is also used to measure the density of the medium.

### PRINCIPLE OF OPERATION

Coriolis Mass flow meter consists of Sensor and Transmitter. The conduit with one or more vibrating tubes which vibrate at their resonant frequency is used to measure the flow rate. The sensor, known as the primary element of the flowmeter is placed at both inlet and outlet ends of the tube senses the Coriolis forces on vibrating tubes and gives the mass flow rate of the process fluid. When there is no flow, the

sensing coils oscillate in proportion to the sinusoidal vibration of the tubes. During flow, Coriolis force is developed due to mass fluid flow and hence the vibration of the tubes along with the Coriolis force produces a phase shift in the sensing signal produced by the sensing coil. The phase shift is directly proportional to the mass flow rate. Also the frequency of the vibration gives the density of the fluid.

(i.e)The Coriolis force ( $F_c$ ) is therefore proportional to the moving mass ( $m$ ), speed of rotation ( $\omega$ ) and radial velocity ( $V_r$ ) in the rotation system.

$$F_c = 2 \cdot m \cdot \omega \cdot V_r$$

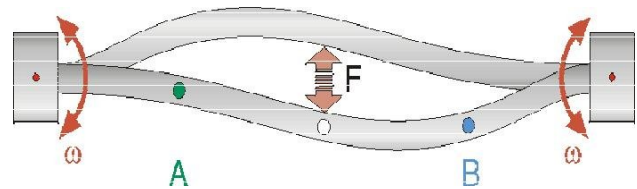


Fig 1.1: Generation of Coriolis Force

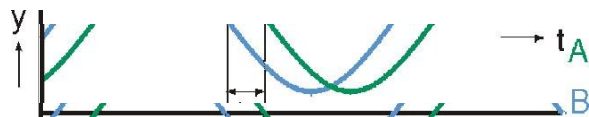


Fig 1.2: Phase Shift Difference

$\omega$	=	Angular velocity
$F_c$	=	Coriolis force
$\phi$	=	Phase shift
A, B	=	Sensors
y	=	Amplitude
t	=	Time

**RLT Instrumentation  
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**PERFORMANCE  
SPECIFICATION**

**Accuracy:**

*Flow Rate:*

$\pm 0.2\% \pm [( \text{zero stability}/\text{flow}) * 100\%]$   
Zero Stability is 0.2 %s that the  
biggest flow rate

*Density:*

Better than  $1\text{g}/\text{cm}^3$

**Repeatability:**

$\pm 0.1\% \pm [1/2(\text{zero stability}/\text{flow}) * 100\%]$

**FUNCTIONAL**

**SPECIFICATION**

**Ambient Temperature:**

-20°C~+55°C

**Medium Temperature:**

-60°C~+180°C

**Store temperature:**

-20°C~+55°C

**Degree of humidity:**

$\leq 95\%RH$

**Working pressure:**

4 MPa

**Ambient pressure:**

0.86~10.6 Bar

**Power Supply:**

220V $\pm 20\%$  AC

18 to 36V DC

**Power Consumption:**

Less than 12 watts

**Transmitting Distance:**

From sensor to display instrument  
up to 200m

**PHYSICAL  
SPECIFICATIONS**

**Protection grade:**

IP65

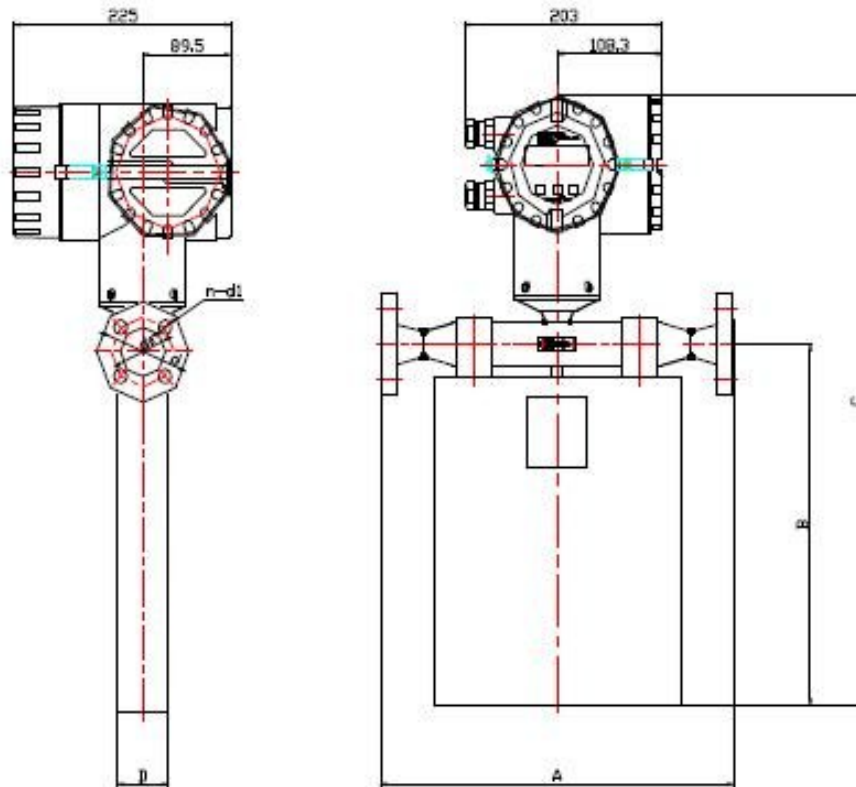
**Explosion-proof Certification:**

Exd [ib] ib IIBT5

**RLT Instrumentation  
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Type	DN (mm)	PN MPa	Max Flow Kg/min	Min Flow Kg/min	Weight (Kg)
RLCM440-01-5	15	4	70	5	10
RLCM440-02-5	25	4	260	15	20
RLCM440-03-2	32	4	260	15	20
RLCM440-04-0	40	4	260	15	20
RLCM440-05-0	50	4	1100	70	30
RLCM440-06-5	65	4	1100	70	30
RLCM440-08-0	80	4	1100	70	30
RLCM440-10-0	100	4	3600	125	60
RLCM440-12-5	125	4	3600	125	60

**DIMENSION DETAILS**



**RLT Instrumentation  
(Unit of RLT Group)**

Model	DN (mm)	Dimension			C (Hi-Temp)	D	Standard and Dimensions				
		A	B	C			Connection (FLANGED)	d	do	n-d1	Screw holt
RLCM-400	15	338	340	575	675	52	GB9119-2000	95	65	4-Φ14	M12x60
RLCM-400	25	414	470	708	858	78	GB9119-2000	115	85	4-Φ14	M12x60
RLCM-400	32	450	470	708	858	78	GB9119-2000	135	100	4-Φ18	M16x60
RLCM-400	40	450	470	708	858	78	GB9119-2000	145	110	4-Φ18	M16x60
RLCM-400	50	526	615	853	1003	112	GB9119-2000	160	125	4-Φ18	M16x60
RLCM-400	65	540	615	853	1003	112	GB9119-2000	180	145	8-Φ18	M16x70
RLCM-400	80	564	615	853	1003	112	GB9119-2000	195	160	8-Φ18	M16x70
RLCM-400	100	843	860	1098	1248	202	GB9119-2000	230	190	8-Φ22	M20x80
RLCM-400	125	843	860	1098	1248	202	GB9119-2000	270	220	8-Φ26	M24x80

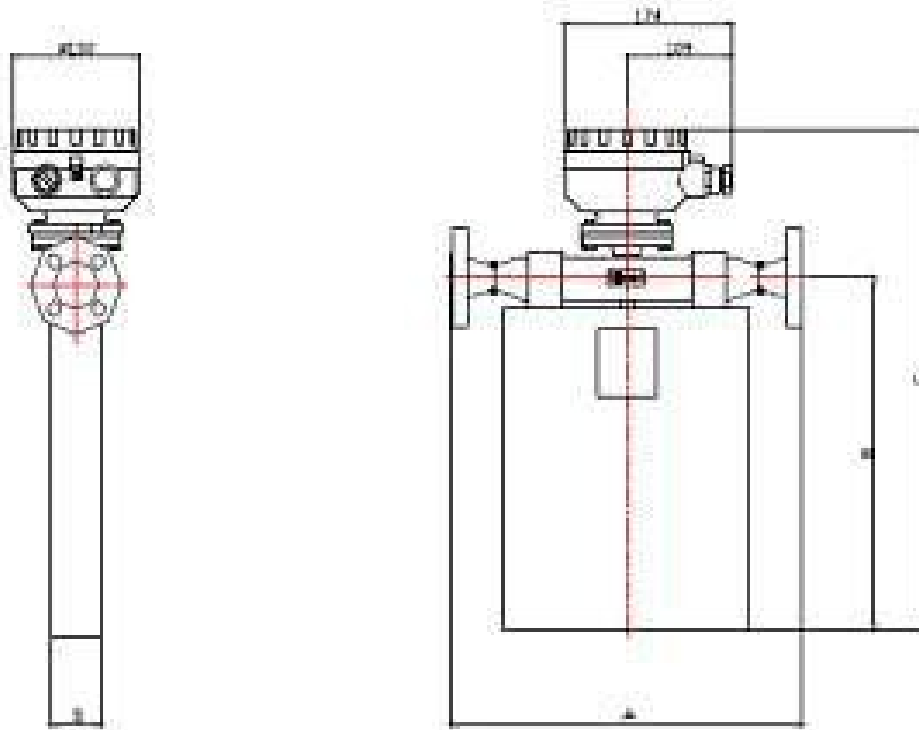


Figure three(divided body figure)

**RLT Instrumentation**  
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Model	DN (mm)	Dimension			C (Hi-Temp)	D	Standard and Dimensions				
		A	B	C			Connection (FLANGED)	d	do	n-d1	Screw holt
RLCM-400	15	338	340	486	586	52	GB9119-2000	95	65	4-Φ14	M12x60
RLCM-400	25	414	470	619	769	78	GB9119-2000	115	85	4-Φ14	M12x60
RLCM-400	32	450	470	619	769	78	GB9119-2000	135	100	4-Φ18	M16x60
RLCM-400	40	450	470	619	769	78	GB9119-2000	145	110	4-Φ18	M16x60
RLCM-400	50	526	615	764	914	112	GB9119-2000	160	125	4-Φ18	M16x60
RLCM-400	65	540	615	764	914	112	GB9119-2000	180	145	8-Φ18	M16x70
RLCM-400	80	564	615	764	914	112	GB9119-2000	195	160	8-Φ18	M16x70
RLCM-400	100	843	860	1009	1159	202	GB9119-2000	230	190	8-Φ22	M20x80
RLCM-400	125	843	860	1009	1159	202	GB9119-2000	270	220	8-Φ26	M24x80

**RLT Instrumentation**  
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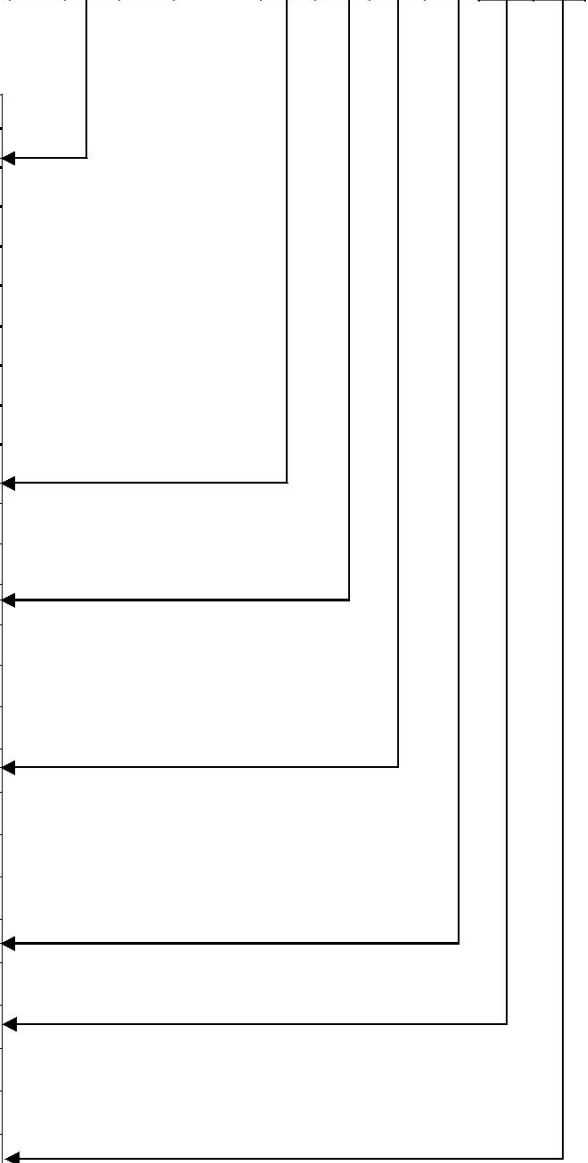
**ORDERING INFORMATION**

**RLCM-440**

A		
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B	C	D	E	D	E
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CODE	SPECIFICATION
<b>A</b>	<b>Line Size</b>
015	DN15
025	DN25
040	DN40
050	DN50
080	DN80
100	DN100
125	DN125
<b>B</b>	<b>Power Supply</b>
A	AC 85-265 V
D	DC 18- 36 V
<b>C</b>	<b>Sensor Materials</b>
1	SS 316L
2	1Cr18Ni9Ti
3	Optional from Customers
<b>D</b>	<b>Explosion Proof Certification</b>
N	None
B	Intrinsic Safety ExiI ICT4
T	Non- Explosion Proof Structure
<b>E</b>	<b>Working Pressure</b>
1	4 MPa
2	Optional From Customer
<b>F</b>	<b>Version</b>
Y	Compact
F	Remote
<b>G</b>	<b>Cable Length</b>
005	5m
010	10m
XXX	Optional From Customers(Cable Length: L=m)



Note:

1. Sensor material is the material of U type tube.
2. The divided body figure noted to link electrical cable length while ordering.
3. If customer have special request, please explain while ordering.

**RLT Instrumentation  
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Head Office



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