

# 1-4-5

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## CORIOLIS MASS FLOW METER KC-7777-M (Micro bend tube type; Liquid, Gas)



## CORIOLIS MASS FLOW METER (KC-7777-M)

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### Product Features

- **Measuring diameters:** DN08, DN15, DN25, DN40, DN50, DN80, DN100
- **Instantaneous and totalized flow rate, volumetric and mass flow rate, temperature, and density display**
- **Power supply:** AC 85–265 V (50/60 Hz), DC 18–36 V
- **Output accuracy:**  $\pm 0.005\%$  F.S. (HART 4–20 mA)
- **Interface (RS-485) allows on-site adjustment in case of flow meter malfunctions**
- **Direct mass flow measurement eliminates the need for separate temperature and pressure compensation**
- **Simple on-site signal processing and calibration (precision calibration: 5–8 calibration points)**
- **Short upstream and downstream straight pipe sections (10D front end ~ 5D rear end)**
- **Excellent reproducibility and outstanding long-term stability**
- **Hygienic design with 3A certification**
- **CIP/SIP cleaning capability to ensure product quality**
- **Best price-to-performance ratio**
- **Easy adaptability to different applications**
- **Wide measurable flow rate range (100:1 turndown ratio)**
- **Fast response to flow rate changes (0.1 second)**
- **No moving parts**
- **CE, IP66, IP67**

### Application

- 0~3,000 kg/min precision measurement
- Excellent interference immunity against frequency interference
- Excellent zero stability and minimal pressure loss
- Suitable for process control of crude oil trade transfers and loading/unloading in industries such as petroleum/chemical industries, aerospace, power plants, shipyards, semiconductors, paper, power, steel, and metal

### Product Introduction

The structure consists of two parts: the sensor and the transmitter, and features ARM pure digital drive, DSP signal processing, and high oscillation frequency.

It features a high-performance microprocessor and LCD display for convenient and fast parameter setting and self-checking and self-diagnosis functions.

It boasts high stability, high shock resistance, fast response, high accuracy, low pressure loss, and multi-parameter measurement (including mass flow rate, density, temperature, and percentage).

It has a wide range of applications (it can be used to measure all types of non-Newtonian fluids, slurries, suspensions, and high-viscosity fluids).

It has low installation requirements (straight pipe requirements before and after the Coriolis mass flow meter are low). It is stable and requires minimal maintenance.

## Coriolis Mass Flowmeter (KC-7777-M)

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### Product Performance

- **Accuracy**  
Liquid, Oil : R.D 0.15 / 0.2  
Gas : R.D  $\pm 0.5\%$  ,  $\pm 1.0\%$
- **Repeatability**  
R.D 0.075%, 0.1%, 0.25%, 0.5%
- **Density Measurement**  
Density range : 0.3 ~ 3.0 g/cm<sup>3</sup>  
Accuracy :  $\pm 0.001$  g/cm<sup>3</sup>( $\pm 1$ kg/m<sup>3</sup>)
- **Response Time**  
Within 0.1 second
- **Measurement Range**  
0~3,000kg/min
- **Function**  
Flow Rate & Total, Volume, Mass, Density, Temperature Measurable

### Operating Specification

- **Fluid**  
Liquid, Oil, Liquid+Solid Mixed Mass & Volume Measurement
- **Input Power (Optional)**  
24VDC, 220VAC/24VDC self-adaption
- **Output Signal (Optional)**  
pulse+4~20mA+RS485  
pulse+4~20mA+HART
- **Pressure Drop**  
0.15 kpa
- **Fluid & Environment Temperature**  
Fluid : -50~+150 °C 옵션 : -50~+230 °C, -50~+350 °C  
-200~+150 °C, -255~+150 °C  
Environment : -20 ~ 60 °C (-4 ~ 140 °F)      Options : -40~60 °C (-40~140 °F)

## Coriolis Mass Flow Meter (KC-7777-M)

- **Pressure (limitations)**

16 Bar Std.

40, 63, 100, 160, 200, 250, 300, 350, 400, 700, 900, 1200Bar (Option)

- **Display**

Display instructions: instantaneous & integration, volume, mass measurement

Alphanumeric 2 X 16 backlight LCD

Adjustable variables via remote control switch or Smart interface software

Adjustable : Full scale : (0 ~100) %

Flow: m<sup>3</sup>/h(m<sup>3</sup>), L/h(L), mL/h(mL), kg/h(kg)

Time response 0.1 sec / Correction factor setting 0.5 ~ 5 /

Zero & Span

- **Totalizer**

Flow rate and total oxygen point (0000. / 000.0/ 00.00 / 0.000)

Seven digits (9,999,999,99.9 Count) in engineering units Reset table by Software

- **Software (Option)**

Smart interface Windows® -based Software 8MB RAM of RAM, preferred 16MB of RS-485

communication Additional features: Zero cut-off adjustment / Linearization adjustment / Save /

Load configuration / For meter validation

## Physical Specification

- **Wetted Materials**

Measuring Tube – SS 316L / HC Hastelloy, Titanium, PTFE (Option)

Body – SS 304, SS 316L

- **Cnclosure**

General type IP66 & Waterproof, dustproof, explosion-proof IP67

(Ex d ib IIc T6 Gb : Ex db ia IIc T6 Gb Ex tb IIIc T80°C Db)

- **Electrical Connection**

2 X ½" NPT , M20X1.5

- **Mounting (Selection)**

ANSI 150lb Flange, JIS 10k RF Flange

ANSI 300lb Flange, JIS 20K RF Flange (Option)

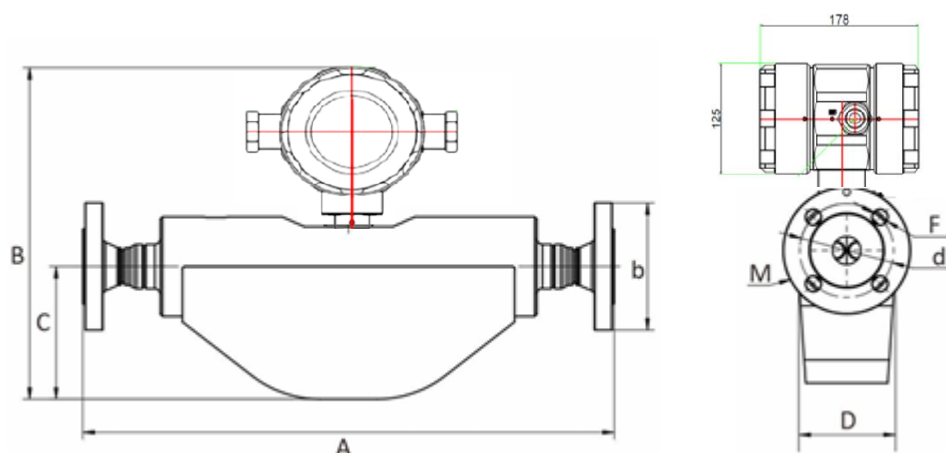
- **Certification**

CE (All Case)

[Korea Gas Safety Corporation is preparing for hydrogen explosion-proof certification.]

## Coriolis Mass Flow Meter (KC-7777-M)

### ❖ Drawing Dimension Specifications & Chart "M" (Micro bend tube) Type



Model	A	B	C	D	F	d	b	M
DN08	390	270	100	70	4-Φ14	Φ65	Φ95	DN15PN40Flange
DN15								
DN25	480	300	120	90	4-Φ14	Φ85	Φ115	DN25PN40Flange
DN40	816	401	200	125	4-Φ18	Φ110	Φ150	DN40PN40Flange
DN50					4-Φ16	Φ125	Φ165	DN50PN40Flange
DN80	954	567	300	170	4-Φ18	Φ160	Φ200	DN80PN40Flange
DN100	1111	551	292	292	4-Φ22	Φ190	Φ235	DN100PN40Flange

### ❖ Specifications by size (flow rate, temperature, pressure)      Zero stability

Size		Max. Flow Rate		Medium Temp'	Max. Working Pressure	Size		Zero stability (Kg/min)
inch	mm	Kg/min	Lb/min					
1/4"	DN08	20	44	-50~150°C	100Bar	1/4"	DN08	0.002
1/2"	DN15	60	132			1/2"	DN15	0.006
1"	DN25	200	440			1"	DN25	0.010
1-1/2"	DN40	450	992			1-1/2"	DN40	0.020
2"	DN50	650	1433			2"	DN50	0.025
3"	DN80	2000	4409		63Bar	3"	DN80	0.050
4"	DN100	3000	6613		40Bar	4"	DN100	0.100

## Coriolis Mass Flow Meter (KC-7777-M)

**The Coriolis mass flow meter realizes the following control with the current output signal:**

- |   |   |
|---|---|
| 01 – Mass flow(kg/h) Control                | 02 – Density (g/cm <sup>3</sup> ) Measuring |
| 03 – Volume flow(m <sup>3</sup> /h) Control | 04 – Temperature(°C) Measuring              |

**Application :** Batch Control / Mixed / Process Control / Filling & Dispensing / Loading & UnLoading / Measurement of commercial and process liquids and oils



Respond to customer needs with fast response speeds and achieve energy savings with  $\pm 0.1\%$  F.S. precision control, minimizing losses in industrial settings.

Upstream and downstream straight pipe conditions **(KC-7777 Micro bend tube type)**

Vertical pipe length required for measurement			
Line Condition	KC-7777 Smart- IN™		Orifice Plate(3)
	upstream(1)	downstream(2)	
90° Elbow or T-Junction	10D	5D	28D
Reduction (4:1)	10D	5D	14D
Expansion (4:1)	10D	5D	30D
After the control valve	10D	5D	32D
Two 90° elbows (same horizontal plane)	10D	5D	36D
Two 90° elbows (different horizontal planes)	10D	5D	62D

### Note:

- (1) The straight pipe diameter multiple (D) is the straight pipe required between obstructions upstream of the flow meter.
- (2) The required straight pipe length can be shortened due to field-specific calibration.
- (3) For comparison with our flow meter, this is the straight pipe required for an orifice flow meter with a diameter ratio of 0.7, as defined by ISO-5167.
- (4) For pressure effects, please contact the manufacturer.

## Order Code-Coriolis Flow Meter (KC-7777-M)

**Type** **Flange** **Conn' Spec'** **Enclosure** **Power** **Output** **Display** **Direction** **Cal1** **Cal2** **Press'** **Option**  
**KC-7777-**  -  -    - **E**   - **P**  - **V**  -   -   -   -   -    
**1** **2** **3** **4** **5** **6** **7** **8** **9** **10** **11** **12** **13** **14** **15**

Type	Code 1
Micro bend tube (Liquid) type	ML
Micro bend tube (Gas) type	MG
Agency approved, customer specified	W

Input Power	Code 8
DC 24V, 500mA	2
AC 220V or 22-245V, 60Hz	3
Agency approved, customer specified	W

Calibration <sup>2</sup> (Gas)	Code 13
70 °F(21 °C) 14.7 psig (1.103 barg)	A
32 °F(0 °C) 14.7 psig (1.103 barg)	B
Agency approved, customer specified	W

Process Connection	Code 2
Thread	T
Tri-clamp	TC
Lok Fitting	L
DIN / ANSI / JIS Flange	D / A / J
Agency approved, customer specified	W

Output Signal	Code 9
Modbus RTU / RS-485S, Pulse active	1
Profibus PA Modbus RTU / RS-485, Pulse active	
DC 4~20 mA Hart or Current Loop	2
Agency approved, customer specified	W

Calibration <sup>2</sup> (Liquid)	Code 13
64.4 °F(18 °C) 14.7 psig (1.103 barg)	A
32 °F(0 °C) 14.7 psig (1.103 barg)	B
Agency approved, customer specified	W

Connection Spec' <sup>1,3</sup>	Code 3,4,5		
Size	DIN	150lb	JIS10k
¼" (DN08)	Thread or Lok		
1/2" (DN15)	D2	F2	J2
1" (DN25)	D4	F4	J4
1-1/2" (DN40)	D6	F6	J6
2" (DN50)	D7	F7	J7
3" (DN80)	D9	F9	J9
4" (DN100)	D11	F11	J11
Agency approved, customer specified	W		

Display	Code 10
No Readout	NR
Digital Display	DD
Agency approved, customer specified	W

Pressure Limit	Code 14
16 bar	1
40 bar	2
900 bar	3
Agency approved, customer specified	W

Flow Direction	Code 11
Horizontal Left to Right or Vertical UP	1
Horizontal Right to Left or Vertical Down	2
Agency approved, customer specified	W

Option	Code 15
High Temp'(-50~+230 or -255~150°C)	ST
High Press' (max.1,200 Bar)	HP
Mat'l : HC Hastelloy, Titanium, PTFE	SM
Agency approved, customer specified	W

Enclosure <sup>5</sup>	Code 6,7
Hazardous-Area Location Enclosure	2
Remote Hazardous-Area Location Enclosure(Only with Meter)	3(Ft)
Remote Hazardous-Area Location Enclosure(Only with Junction Box)	4(Ft)
IP66 or IP67	N2
Remote IP66 with Junction Box	N4(Ft)
Agency approved, customer specified	W

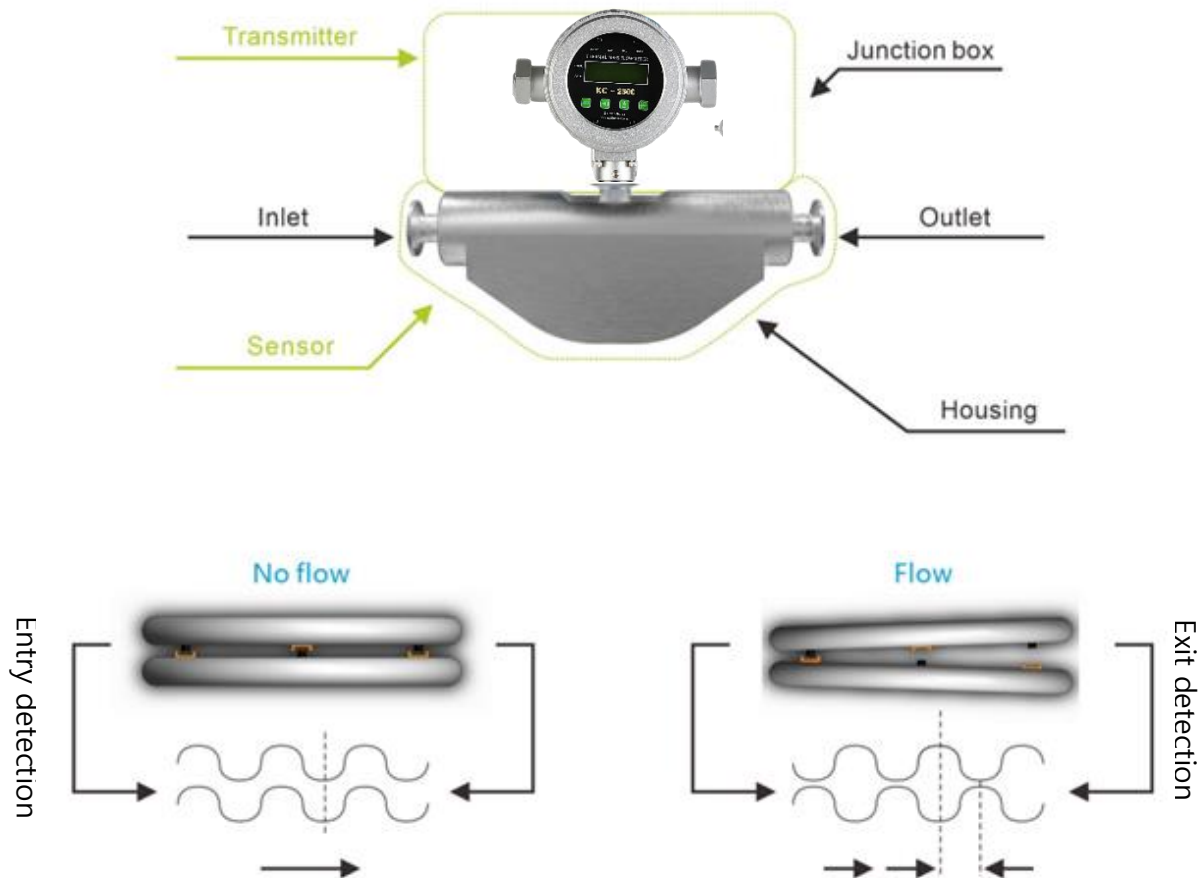
Calibration <sup>1</sup> (Gas)	Code 12
Standard Calibration	A
Air, only for 1/2" and small pipe Size	
Compressed Air, only for 2" and large pipe size	D
Customer Calibration	B
Air	
Agency approved, customer specified	W

Calibration <sup>1</sup> (Liquid)	Code 12
Standard Calibration	A
Water, only for 1/2" and small pipe Size	
Water, only for 2" and large pipe size	D
Customer Calibration	B
Water	
Agency approved, customer specified	W

## Coriolis Mass Flow Meter (KC-7777)

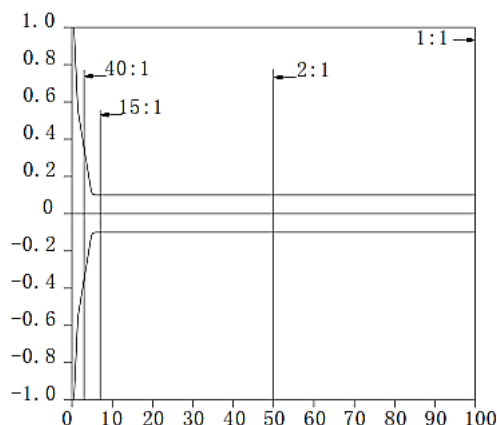
### Measurement Principle

A Coriolis mass flow meter vibrates a flowmeter tube as fluid passes through it, based on the Coriolis principle. A sensor detects and analyzes the frequency, phase difference, and temperature changes in the flowmeter tube. This allows for direct measurement of the fluid's mass flow rate, and density is calculated from the vibration frequency. Other process variables, such as mass flow rate, volume flow rate, density, and temperature, can also be obtained.

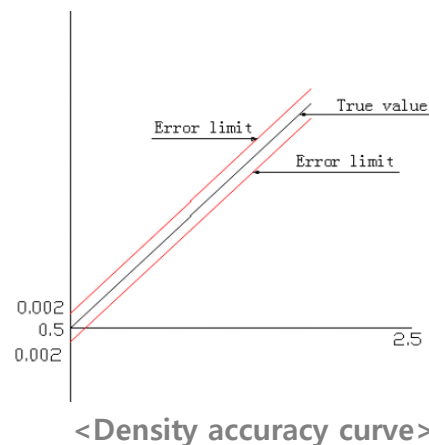


**Instantaneous Flow Accuracy:  $\pm 0.20\%$**   
Flow Rate  $\pm [(Zero\ Stability/Flow\ Rate) * 100] \%$

**Flow Rate Response Time:** Factory set to 1 second (user adjustable)



**Density measurement accuracy:**  
 $\pm 0.002\text{ g/cm}^3$  (applicable to liquids only) As shown in the graph below, the origin coordinates start at 0.5.





## Coriolis Mass Flow Meter (KC-7777)

KOLAS Standard equipment : SONIC NOZZLE(Gas)



## CORIOLIS MASS FLOW METER (Liquid)



Disclaimer:

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Related technical details are subject to change for further improvement.

## Coriolis Mass Flow Meter (KC-7777)

※ Just choose the one that suits your needs.

Application	Type		Mass Flowmeter	
			Coriolis Mass	
Object of Measurement	Liquid, Oil		○	
	Gas		○	
	Vaper		○	
	steam		○	
Application	control		○	
	Monitor		○	
	Supply		○	
Operating condition	Temperature (max)		Gas, Liquid	-50 ~ 230°C -255 ~ 155°C
	Pressure (max)		Max 1,200 Bar (120 MPa)	
	Pressure loss		Negligible	
	Range ability		Large	
Installing condition	Bore		Ø3 to Ø150	
	Straight	upstream	10D	
	Pipe length	downstream	5D	
	Piping work		Required	
	Explosion-proofing		○	
Performance	Accuracy		Liquid	±0.15~0.2% R.D
			Gas	±0.5%, 1.0% R.D
	Flow Range Velocity		Liquid, Gas	0.2 ~ 29,000 kg/min
Turndown Ratio	Up to 100:1 ~ max 1000:1 (for low frequencies)			

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**Gas, Liquid, Steam, Mixed type Mass/Volume Flow Meter  
specialized manufacturing company**

**Detailer**

*Certified in accordance with*

**KC Q ISO 9001 : 2015**

**KC Q ISO 14001 : 2015**

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