

# Product Information

## MASS FLOW GAUGE

DF-231BA equips highly responsive (99% response 300 ms) Mass Flow Sensor.  
Extensive flow ranges from 500mL/min to 500L/min.



### DF-231BA Mass Flow Gauge

#### ■ Features

- With Mass Flow Sensor, no need to correct temperature and pressure.
- Highly responsive sensor allows instant flow measurement.
- Multi-function indicator is ideal for various measurements.

#### ■ Application Examples

Flow test under various test pressures  
Pass/Fail judgment based on flow rate  
Flow measurement of many types of products  
Test data acquisition, Data management with PC

#### ■ Specifications

Flow Range		500 mL/min 2, 5, 20, 50, 200, 500 L/min	Number of Channels	10 channels
Measurement media		Air (*1) and specified gases (*2)	Upper/Lower limits	4 levels (HH, HI, LO, LL)
Accuracy	F.S. to 20%	±3% of rdg ±1 digit 200, 500 L/min: ±5% of rdg ±1 digit	Zero Adjustment	One-push zero-adjusting method
	20% or less	±1% of F.S. ±1 digit	Auto-Zero	Auto Zero button
Operating Temperature		0 to 50°C (Accuracy is guaranteed only for +10 to 35°C)	Display Hold	Hold button
Pressure Range		-70 kPa to 1 MPa 200, 500 L/min: -35 kPa to 1 MPa	Display Response	Digital Filter (High, Medium, Low)
Withstand Pressure		1.5 MPa	RS-232C	1200, 9600 and 19200 bps switchable
Response		Approx. 300 ms/step response to 99%	BCD Output	Open collector
Pressure Loss		Up to 2 kPa	Display Digits	3.5 digits (1999) and 4.5 digits (19999) switchable
Port Size		50 L/min or less: Rc(PT)1/4 200 L/min or more: Rc(PT)1/2	Sampling Time	250 ms and 50 ms selectable
Power Source		24 VDC ±10%, 0.3 A max AC adapter enclosed	User Span	0.001 to 9.999 (Default: 1.000)
			Dimensions	Indicator Unit: W140 × H66 × D172 Sensor: Refer to the next page.
			Panel Cutting Size	W133 x H61 mm

(\*1) Provide a filter on the upstream side of the Sensor to prevent entry of mist or contaminants

(\*2) Specified gases include argon, carbon dioxide, natural gas 13A, methane, propane and butane. The gas coefficient is specified.  
However, the accuracy is not guaranteed.

#### ■ Model

#### DF-231BA-(1)(2)-(3)

(1) Flow Range			(2) Option		(3) Power Source	
Code	Measurement Range	Display	Code	Description	Code	Description
<b>500ML</b>	0 to 500 mL/min	000 to 500	<b>F1</b>	5 V analog output	<b>VG</b>	AC adapter 100 V cable (3 m)
<b>2L</b>	0 to 2 L/min	.000 to 1.999	<b>F2</b>	10 V analog output	<b>VH</b>	AC adapter 240 V cable (2 m)
<b>5L</b>	0 to 5 L/min	0.00 to 5.00			<b>VJ</b>	AC adapter not enclosed
<b>20L</b>	0 to 20 L/min	0.00 to 19.99				
<b>50L</b>	0 to 50 L/min	00.0 to 50.0				
<b>200L</b>	0 to 200 L/min	00.0 to 199.9				
<b>500L</b>	0 to 500 L/min	000 to 500				

## ■ Related Products

### Mass Flow Sensors MF-130



MF-130 Mass Flow Sensors used for DF-231BA are available also as single products.

#### < Features >

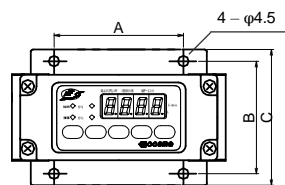
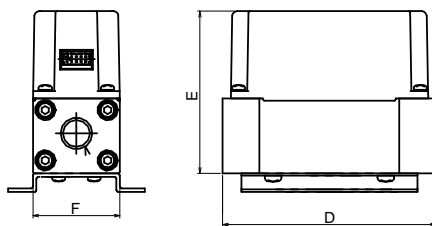
- High responsiveness: 99% response 300 ms
- Compact, robust body with full 4-digit flow indicator
- Argon, carbon dioxide, natural gas 13A, methane, propane and butane can be measured as well as air.
- Flow display can be switched from Instantaneous to Total flow rate.

#### MR-130 Range Code

Range Code	Measurement Range
500ML	0 to 500 mL/min
2L	0 to 2 L/min
5L	0 to 5 L/min
20L	0 to 20 L/min
50L	0 to 50 L/min
200L	0 to 200 L/min
500L	0 to 500 L/min

Primary Specifications	
Port Size	500ML to 50L (PT1/4) 200L to 500L (PT1/2)
Accuracy	500ML to 50L: $\pm 3\%$ of rdg 200L to 500L: $\pm 5\%$ of rdg Less than 20% of F.S.: $\pm 1\%$ of F.S.
Driving Power	12 to 24 VDC
Output Voltage	0 to 5VDC
Measurement Media	Air and Designated gases
Enclosed Cable	Standard cable (3 m)

#### Dimensions



	500ML to 50L	200L	500L
A	55	72	72
B	48	75	75
C	58	87	87
D	91	98.6	98.6
E	69.1	82.1	96.1
F	37	50	59

Mounting hole 4.5  $\phi$

Unit: mm

### Quick Flange Couplers QF-C10A



The couplers were developed for attaching/removing the sensor. The sensor can be easily attached/removed with the thumbscrew. The coupler can be sealed tightly by tightening without any tool.

#### < Features >

- Easy attachment/removal of the sensor
- The coupler can be used for both positive and negative pressures.
- Withstand pressure: From vacuum to 1 MPa
- Port size: 1/2 and 1/4 are available.
- Can be used as a substitute for union fitting.

Diameter	Model	Specifications	Applicable range of MF-130
1/4	QF-C10A-FF02	Rc1/4- Rc1/4 (Female)	--
	QF-C10A-MM02	R1/4- R1/4 (Male)	500ML to 50L
	QF-C10A-MF02	R1/4- Rc1/4 (Male-Female)	500ML to 50L
1/2	QF-C10A-FF04	Rc1/2- Rc1/2 (Female)	--
	QF-C10A-MM04	R1/2- R1/2 (Male)	200L to 500L
	QF-C10A-MF04	R1/2- Rc1/2 (Male-Female)	200L to 500L