

# D6F-A7D/-AB71D

MEMS Flow Sensor

## Digital Compensation for High Accuracy

- Temperature compensation and linear compensation produce high accuracy ( $\pm 3\%$  RD (25% to 100% FS)).
- Compact models for 10 to 70 L/min.
- Reduced piping work with quick-fastening feature.

RoHS Compliant



Refer to the *Common Precautions for the D6F Series* on page 40.



Digital

**NEW**

## Ordering Information

### MEMS Flow Sensor

Joint	Applicable fluid	Flow rate range	Model
Quick joint P10	Air	0 to 10 L/min	<b>D6F-10A7D-000-0</b>
		0 to 20 L/min	<b>D6F-20A7D-000-0</b>
		0 to 50 L/min	<b>D6F-50A7D-000-0</b>
Quick joint P14		0 to 70 L/min	<b>D6F-70AB71D-000-0</b>

### Accessories (Sold separately)

Type	Model
Cable	<b>D6F-CABLE3</b>
Quick fastener (for P10)	<b>D6F-FASTENER-P10</b>
Pipe fittings (for P10)	<b>D6F-PLG1</b>

Note: Refer to *Accessories for the D6F Series* on page 39.

## Connections

**D6F-10A7D-000-0**

**D6F-20A7D-000-0**

**D6F-50A7D-000-0**

**D6F-70AB71D-000-0**

Pin No. 1: Vcc  
2: SDA  
3: SCL  
4: GND

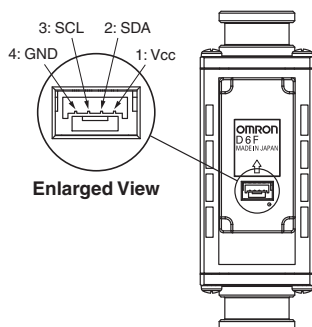
Connector BM04B-GHS (made by J.S.T. Mfg. Co.)

Use the following connectors for connections to the D6F:

Housing GHR-04V-S (made by J.S.T. Mfg. Co.)

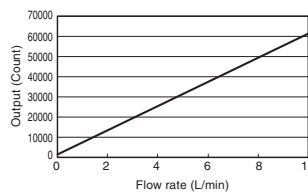
Terminals SSSL-002T-P0.2 (made by J.S.T. Mfg. Co.)

Wires AWG26 to AWG30

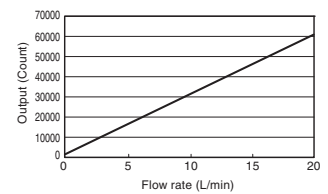


## Output Characteristics

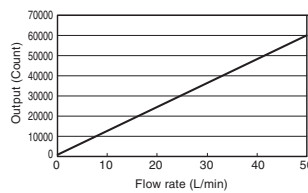
**D6F-10A7D-000-0**



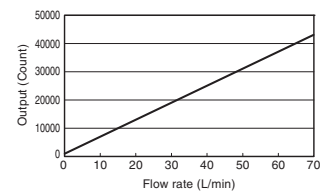
**D6F-20A7D-000-0**



**D6F-50A7D-000-0**



**D6F-70AB71D-000-0**



**D6F-10A7D-000-0**

Flow rate L/min (normal)	0	2	4	6	8	10
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power-supply voltage  $3.3 \pm 0.1$  VDC, ambient temperature  $25 \pm 5^\circ\text{C}$  and ambient humidity 35 to 75%RH.

Flow rate = (Output value - 1,024)/60,000 x 10

**D6F-20A7D-000-0**

Flow rate L/min (normal)	0	4	8	12	16	20
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power-supply voltage  $3.3 \pm 0.1$  VDC, ambient temperature  $25 \pm 5^\circ\text{C}$  and ambient humidity 35 to 75%RH.

Flow rate = (Output value - 1,024)/60,000 x 20

**D6F-50A7D-000-0**

Flow rate L/min (normal)	0	10	20	30	40	50
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	37024 (90A0)	49024 (BF80)	61024 (EE60)

Measurement conditions: Power-supply voltage  $3.3 \pm 0.1$  VDC, ambient temperature  $25 \pm 5^\circ\text{C}$  and ambient humidity 35 to 75%RH.

Flow rate = (Output value - 1,024)/60,000 x 50

**D6F-70AB71D-000-0**

Flow rate L/min (normal)	0	20	40	60	70
Output (HEX)	1024 (0400)	13024 (32E0)	25024 (61C0)	37024 (90A0)	43024 (A810)

Measurement conditions: Power-supply voltage  $3.3 \pm 0.1$  VDC, ambient temperature  $25 \pm 5^\circ\text{C}$  and ambient humidity 35 to 75%RH.

Flow rate = (Output value - 1,024)/60,000 x 100

## Characteristics/Performance

Model	D6F-10A7D-000-0	D6F-20A7D-000-0	D6F-50A7D-000-0	D6F-70AB71D-000-0
Flow Range (See note 1.)	0 to 10L/min	0 to 20 L/min	0 to 50 L/min	0 to 70 L/min
Calibration Gas (See note 2.)	Air			
Flow Port Type	Quick joint P10			Quick joint P14
Electrical Connection	Four-pin connector			
Power Supply	3.0 to 3.6 VDC			
Current Consumption	10 mA max. with no load, Vcc = 3.3 VDC, GND = 0 VDC, 25°C			
Resolution	15 bit			
Accuracy (See note 3.)	±5%RD (10%F.S. ≤ Flow rate < 25%F.S.) ±3%RD (25%F.S. ≤ Flow rate ≤ 100%F.S.)			±5%RD (10L/min ≤ Flow rate < 20L/min) ±3%RD (20L/min ≤ Flow rate ≤ 70L/min)
Response time	90 ms max.			
Repeatability (See note 4.)	0.3 %RD	0.3%RD	0.5%RD	1.3%RD
Interface (See note 5.)	I2C			
Case	PPS			
Degree of Protection	IEC IP40 (Excluding tubing sections.)			
Withstand Pressure	100 kPa			
Pressure Drop (See note 4.)	0.034 kPa	0.083 kPa	0.28 kPa	0.57 kPa
Operating Temperature (See note 6.)	-10 to +60°C			
Operating Humidity (See note 6.)	35 to 85%RH			
Storage Temperature (See note 6.)	-30 to +80°C			
Storage Humidity (See note 6.)	35 to 85%RH			
Insulation Resistance	Between sensor outer cover and lead terminals: 20 MΩ min. (at 500 VDC)			
Dielectric Strength	Between sensor outer cover and lead terminals: 500 VAC, 50/60 Hz min. for 1 min (leakage current: 1 mA max.)			
Weight	57.3 g			64.4 g

Note: 1. Volumetric flow rate at 0°C, 101.3 kPa.

Note: 2. Dry gas (must not contain large particles, e.g., dust, oil, or mist.)

Note: 3. -10 ≤ Operating Temperature ≤ 60°C

Note: 4. Reference (typical)

Note: 5. Refer to the D6F-□□□□D-000-□ Application Notes for details.

Note: 6. With no condensation or icing.

Note: 7. The following custom options are available.

Ask your OMRON representative for details.

- Temperature measurement
- Address settings (up to four addresses)
- Fault detection
- Threshold setting

## Communication

Serial Interface	I2C
Master/Slave	Slave / Address: HEX : 0x6C BIN : 110_1100 (7bit)
Speed mode	Fast Mode 400kHz
Signal	
SCL	Serial Clock
SDA	Data Signal

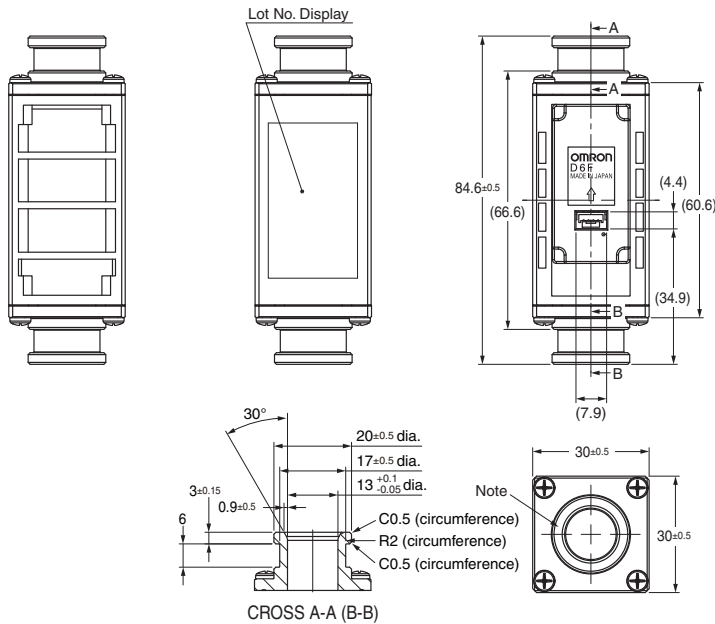
## Dimensions (Unit: mm)

### MEMS Flow Sensors

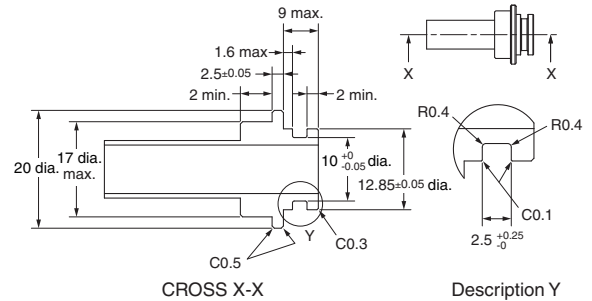
D6F-10A7D-000-0

D6F-20A7D-000-0

D6F-50A7D-000-0



### Recommended Quick joint male P10 type

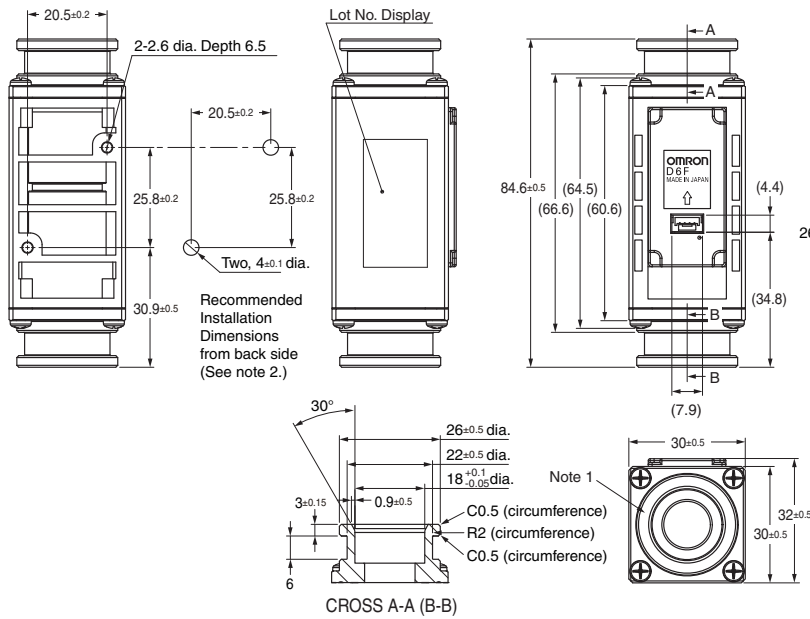


If using a Rc3/8 converter joint, the following is recommended.  
 REGAL JOINT CO., LTD <http://www.rgl.co.jp/>  
 Converter male joint (Rc3/8-Quick male joint): Adapter Rc3/8-QJM10  
 O ring: O ring P10 fluororubber (material)

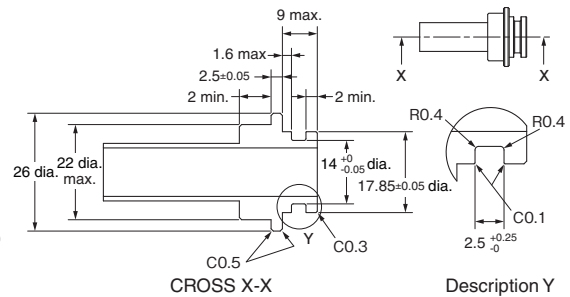
Note 1. Note . The Port type of pipe fitting based on "Quick Joint P10 Type".  
 \* P10 shows the name of an O-ring prescribed by JIS B 2401.  
 \* The port of O-ring ditch is based on P10 of JIS B 2406.  
 \* Please obtain a male joint separately.

Note 2. Use the following connectors to connect to the Sensor.  
 Connector :GHR-04V-S (JST)  
 Terminals :SSHL-002T-P0.2 (JST)  
 Wires :AWG26 to AWG30  
 Circuit numbers :1.Vcc, 2.SDA, 3.SCL, 4.GND

### D6F-70AB71D-000-0



### Recommended Quick joint male P14 type



If using a Rc3/8 converter joint, the following is recommended.  
 REGAL JOINT CO., LTD <http://www.rgl.co.jp/>  
 Converter male joint (Rc3/8-Quick male joint): Adapter Rc3/8-QJM14  
 O ring: O ring P14 fluororubber (material)

Note 1. The Port type of pipe fitting based on "Quick Joint P14 Type".  
 \* P14 shows the name of an O-ring prescribed by JIS B 2401.  
 \* The port of O-ring ditch is based on P14 of JIS B 2406.  
 \* Please obtain a male joint separately.

Note 2. To mount the Sensor with 2.6-dia. holes, use P-type self-tapping screws with a nominal diameter of 3 mm and tighten them to a torque of 1.2 N·m max. The screw threads must engage for 5.5 mm min.

Note 3. Use the following connectors to connect to the Sensor.  
 Connector :GHR-04V-S (JST)  
 Terminals :SSHL-002T-P0.2 (JST)  
 Wires :AWG26 to AWG30  
 Circuit numbers :1.Vcc, 2.SDA, 3.SCL, 4.GND