Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

MEMS Flow Sensors

# D6F series

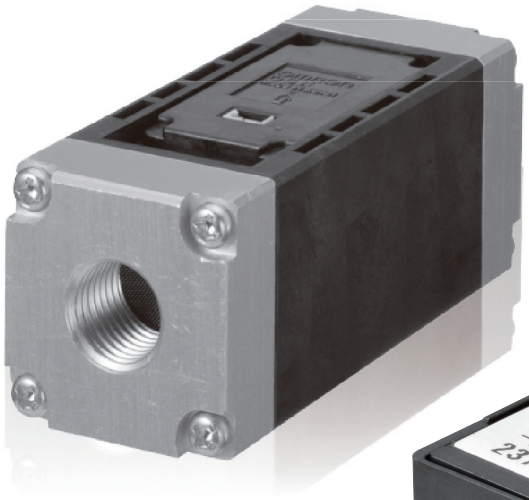
Series Catalog

## Faster and more accurate than ever before

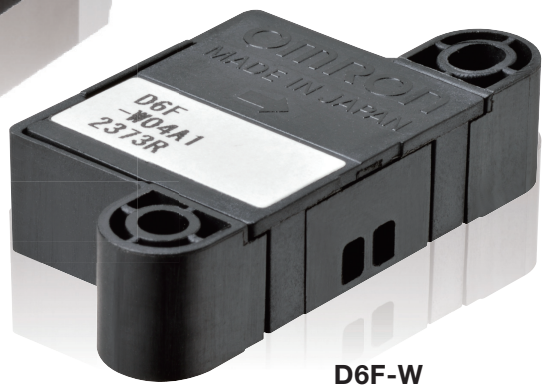
MEMS flow sensor : the ideal means for mass flow measurement

# Realizing a highly accurate flow measurement,

Omron's MEMS flow sensor accurately detects minute airflow so much as a single flap of a butterfly's wings.
A gas flow sensor capable of "measuring mass flow" independent of temperature and pressure.



D6F-A6




D6F-W

## Mass Flow Measurement

Q1 There are two balloons; each having different volumes. But these balloons have the same mass. Why is that?

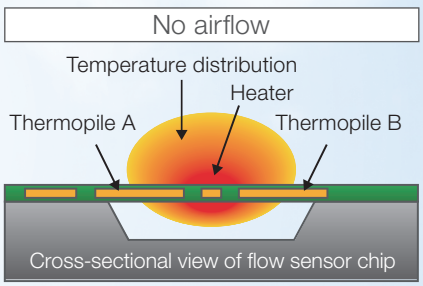
A The volume increases/decreases according to the pressure and temperature changes. The mass, on the other hand, remains constant regardless of the environmental changes. The mass flow measurement allows measurement performance that is not affected by the changes in the environment.

Q2 Why is mass flow measurement required?

A An accurate measurement of the flow is required especially for combustion control. Omron's flow sensor enables measuring the gas flow based on the mass flow measurement.

## Principles of MEMS Flow

D6F Series




During the absence of airflow, the temperature distribution around the heater is symmetrical. When there is airflow, the temperature of the upwind side cools down and the temperature of the downwind side warms up, disrupting the symmetry of the temperature distribution.

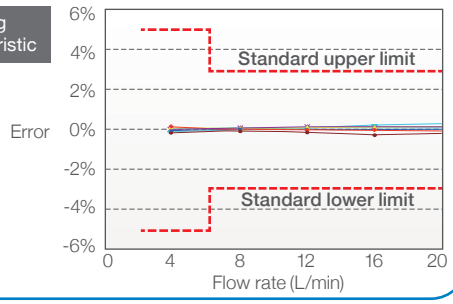
# sensing even a single flap of a butterfly's wings

## High Accuracy

### ±3RD (25-100%F.S.) is realized by linear temperature correction using ASIC technology

Ambient temperature = 25degC (Model: D6F-20A7D-000-0)

Operating characteristic



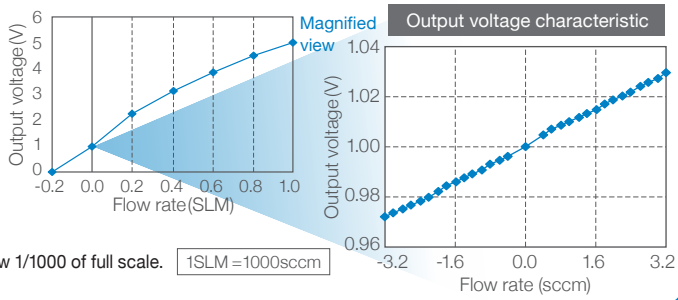

Output voltage(V)

## High Sensitivity

### Omron's unique MEMS technology allows detection of very low air velocities

Flow rate of 1L: Output corresponding to flow rate change below 1/1000 of full scale.

1SLM=1000sccm




## Compact

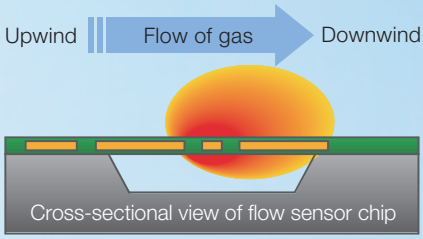
### The product size is reduced by using the world-smallest class size MEMS sensor element

Dimension of D6F-V model: 24x8x14mm.


## Sensor Measurement

Energy saving

Airflow



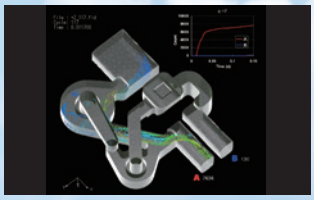

By detecting this temperature difference appearing as a difference in the electromotive forces developed by the thermopiles, it allows the mass flow rate and mass flow velocity to be measured without the influence of temperature and pressure. Since the thermopile generates the thermo-electromotive force, the power consumption is much lower than when using the resistivity method.

## Highly Resistant to Dust

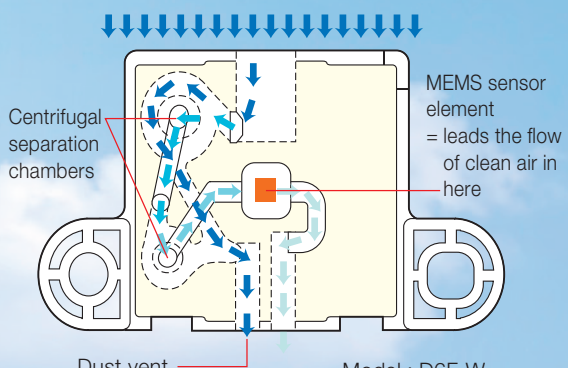
Pattent No.4534526

### Built-in Dust Segregation System (cyclonic) D6F-W/-V/-P

The sensor can be placed anywhere thanks to its dust-resistant structure. Omron's unique design of 3D flow path provides a high level of reliability by separating dust particles to reduce its effect on the sensor chip. Additionally, Omron succeeded in reducing the sensor size, allowing it to be used in wider range of applications.



External flow



# Applications

Omron flow sensors cover wide range of applications and can be used for different purposes.

## Application Examples

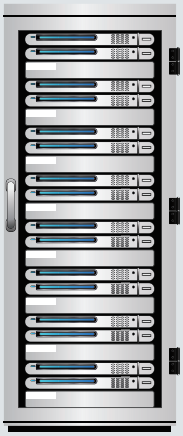
### Clogging Detection

For monitoring the flow of the cooling air to optimize the cooling efficiency and avoid malfunctions.

Flow rate
Velocity
Differential pressure

Projector

PC



Server

**Quiet, low maintenance cost**

### Combustion Control

For controlling the air/ fuel ratio by accurately measuring the mass flow rate

Flow rate
Differential pressure

Fuel cell

Water heater

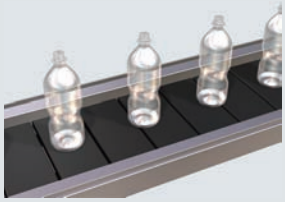
Boiler

**Optimizing combustion efficiency**

### Flow measurement

For recording the amount of air used, detecting even the smallest leaks

Flow rate
Differential pressure



Container manufacturing machine

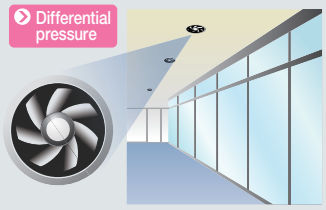
Mounting machine

**Flow visualization, real-time detection**

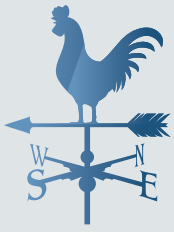
### Air volume measurement

For measuring flow rate and flow velocity of a space

Velocity
Differential pressure



Ducts




Airflow analysis (environment)

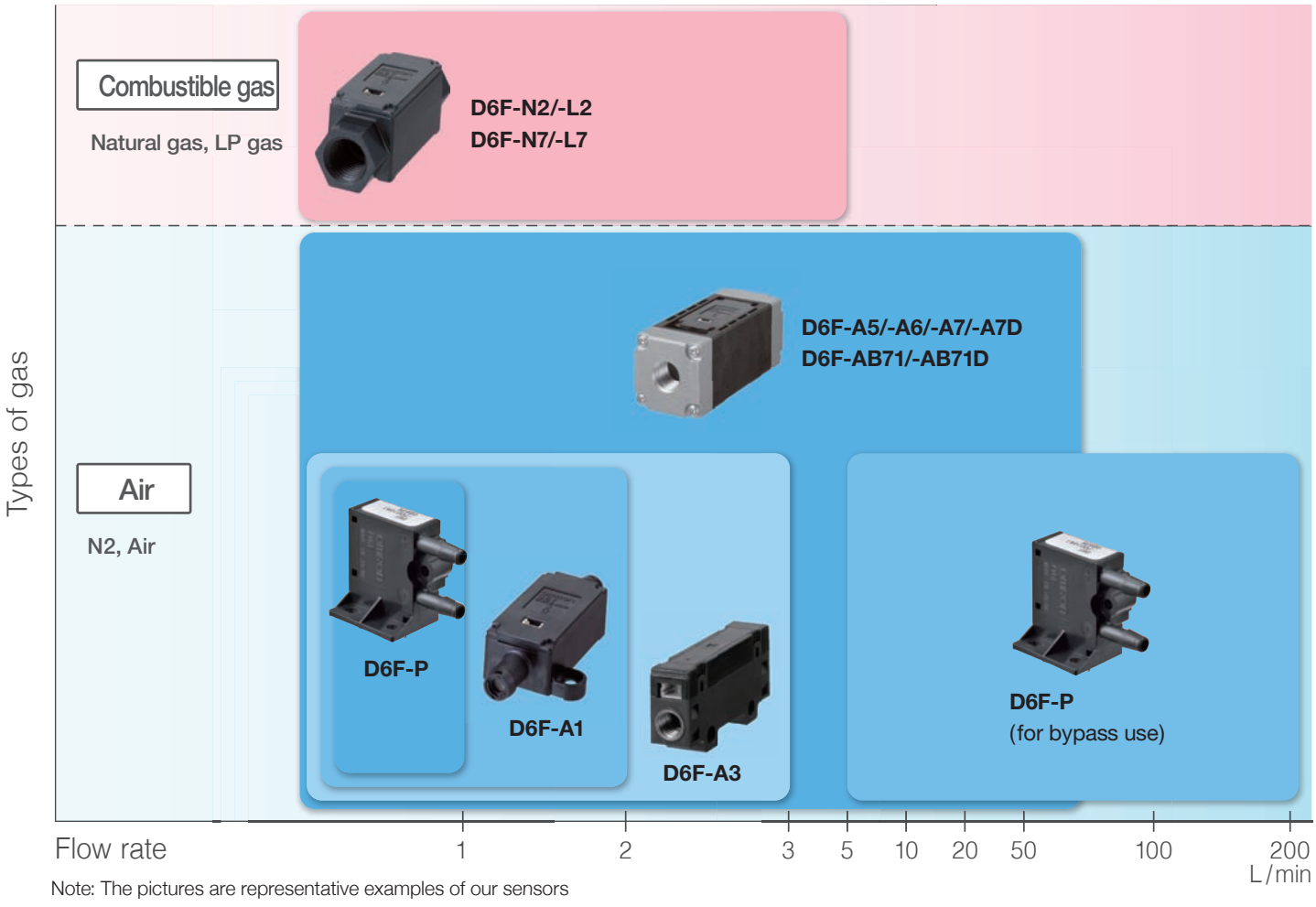
Air conditioner

**Monitoring the amount of ventilation, controlling the amount of air at the required level**

# Selection of Products

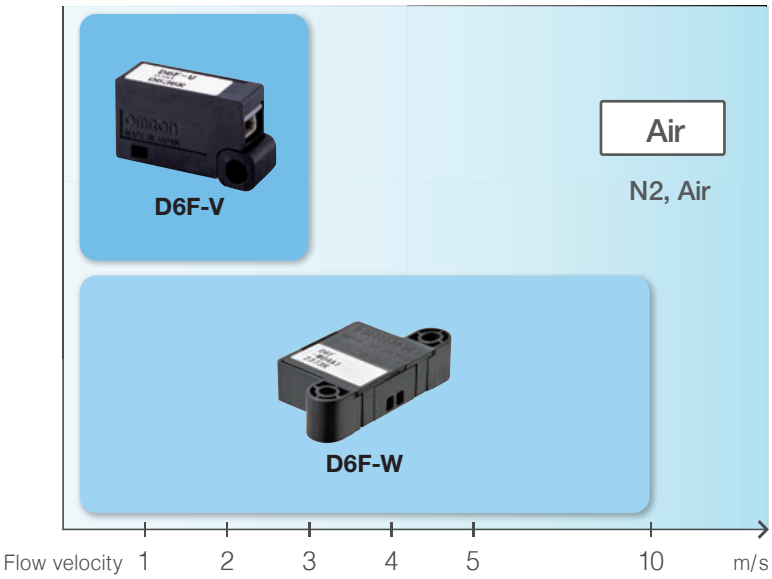
Select the most suitable sensor from many variations.

## Flow rate




Note: The pictures are representative examples of our sensors

## Flow velocity




## Differential pressure

Delivers high sensitivity even at low flow rate, low differential pressure

**MEMS differential pressure sensor**

D6F-PH

High precision

Accurate measurement

Low piping effects

High impedance to reduce the influence of piping variations

High reliability

Detect sensor anomaly

# List of D6F series

## MEMS Flow Sensor

Air | Minute flow | Analog

| Items / Applicable gas | Model | Air | | | |
|---|---|---|---|---|---|
| | | D6F-P0001A1 | D6F-01A1-110<br>D6F-P0010A□<br>D6F-P0010AM2 | D6F-02A1-110 | D6F-03A3-000 |
| Shape | |  |  |  |  |
| Flow rate range (L/mim) | 5<br>4<br>3<br>2<br>1<br>0 | 0～0.1L/min | 0～1L/min | 0～2L/min | 0～3L/min |
| Page | | 25 | 8, 25 | 8 | 12 |

Gas | Minute to middle flow | Analog

| Items / Applicable gas | Model | Natural gas (13A) | LP gas | Natural gas (13A) |
|---|---|---|---|---|
| | | D6F-01N2-000 | D6F-02L2-000<br>D6F-02L7-000 | D6F-05N2-000<br>D6F-05N7-000 |
| Shape | |  |  |  |
| Flow rate range (L/mim) | 5<br>4<br>3<br>2<br>1<br>0 | 0～1L/min | 0～2L/min | 0～5L/min |
| Page | | 10 | 10, 18 | 10, 16, 18 |

Air | Middle to high flow | Analog | Digital | Digital type only

| Items / Applicable gas | Model | Air | | | | |
|---|---|---|---|---|---|---|
| | | D6F-10A5-000<br>D6F-10A6-000<br>D6F-10A7-000<br>D6F-10A7D-000 | D6F-20A5-000<br>D6F-20A6-000<br>D6F-20A7D-000 | D6F-30A7-000<br>D6F-30AB71-000 | D6F-50A5-000<br>D6F-50A6-000<br>D6F-50A7D-000 | D6F-70AB71-000<br>D6F-70AB71D-000 |
| Shape | |  |  |  |  |  |
| Flow rate range (L/mim) | 70<br>60<br>50<br>40<br>30<br>20<br>10<br>0 | 0～10L/min | 0～20L/min | 0～30L/min | 0～50L/min | 0～70L/min |
| Page | | 14, 16, 18, 20 | 14, 16, 20 | 18, 23 | 14, 16, 20 | 20, 23 |

# MEMS 2-axis flow sensor/ MEMS flow sensor

Air | Flow velocity | Analog | Digital | Digital type only

| Items / Applicable gas / Model | Air<br>D6F-D | Air<br>D6F-W01A1 | Air<br>D6F-V03A1 | Air<br>D6F-W04A1 | Air<br>D6F-W10A1 |
|---|---|---|---|---|---|
| Shape |  |  |  |  |  |
| Flow velocity range (m/s) | -1～1m/s | 0～1m/s | 0～3m/s | 0～4m/s | 0～10m/s |
| Page | 35 | 31 | 33 | 31 | 31 |

# MEMS differential pressure sensor

Air | Differential pressure | Digital | Digital type only

| Items / Applicable gas / Model | Air<br>D6F-PH0505AD3 | Air<br>D6F-PH0025AD1 | Air<br>D6F-PH5050AD3 |
|---|---|---|---|
| Shape |  |  |  |
| Differential pressure range (Pa) | -50～50Pa | 0～250Pa | -500～500Pa |
| Page | 28 | | |

# D6F-A1

## MEMS Flow Sensor

# A Compact, High-accuracy Sensor That Measures Low Flow Rates.

Air Analog

- **High accuracy of ±3% FS.**
- **Flow rates can be measured without being affected by temperature or pressure.**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Applicable fluid | Flow rate range | Model |
|---|---|---|
| Air | 0 to 1 L/min | **D6F-01A1-110** |
| | 0 to 2 L/min | **D6F-02A1-110** |

### Accessory (included)

| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |

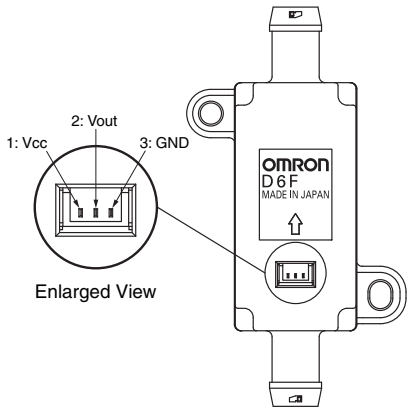
## Connections

### D6F-01A1-110
### D6F-02A1-110

Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

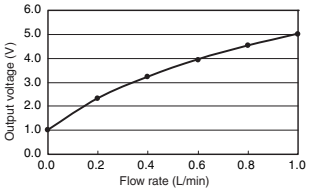
Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

Tubes Install tubes made of materials such as rubber or urethane so that they will not come out.
For urethane tubes, tubes with an outer diameter of 12 mm and an inner diameter of 8 mm are recommended.

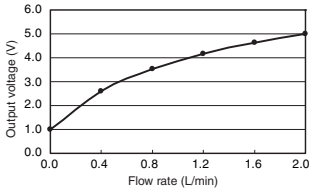



## Output Voltage Characteristics

### D6F-01A1-110




### D6F-02A1-110




### D6F-01A1-110

| Flow rate L/min (normal) | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.31 ±0.12 | 3.21 ±0.12 | 3.93 ±0.12 | 4.51 ±0.12 | 5.00 ±0.12 |

### D6F-02A1-110

| Flow rate L/min (normal) | 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.59 ±0.12 | 3.53 ±0.12 | 4.18 ±0.12 | 4.65 ±0.12 | 5.00 ±0.12 |

Measurement conditions: Power supply voltage of 12±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

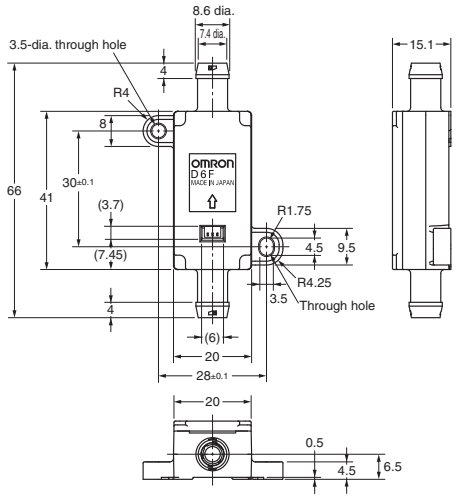
## Characteristics/Performance

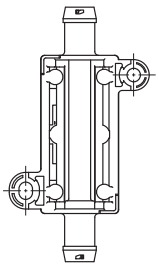
| Model | D6F-01A1-110 | D6F-02A1-110 |
|---|---|---|
| Flow Range (See note 1.) | 0 to 1 L/min | 0 to 2 L/min. |
| Calibration Gas (See note 2.) | Air | |
| Flow Port Type | Bamboo joint<br>Maximum outside diameter: 8.6 mm, Minimum outside diameter: 7.4 mm | |
| Electrical Connection | Three-pin connector | |
| Power Supply | 10.8 to 26.4 VDC | |
| Current Consumption | 15 mA max with no load, with a Vcc of 12 to 24 VDC, and at 25°C | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ) | |
| Accuracy | ±3% FS (25°C characteristic) | |
| Repeatability (See note 3.) | ±0.3% FS | |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | |
| Rated Power Supply Voltage | 26.4 VDC | |
| Rated Output Voltage | 6 VDC | |
| Case | PPS | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | |
| Withstand Pressure | 200 kPa | |
| Pressure Drop (See note 3.) | 0.42 kPa | 1.06 kPa |
| Operating Temperature (See note 4.) | −10 to 60°C | |
| Operating Humidity (See note 4.) | 35% to 85% | |
| Storage Temperature (See note 4.) | −40 to 80°C | |
| Storage Humidity (See note 4.) | 35% to 85% | |
| Temperature Characteristics | ±3% FS for 25°C characteristic at an ambient temperature of −10 to 60°C | |
| 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 | 12.8 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. Reference (typical)
Note: 4. With no condensation or icing.

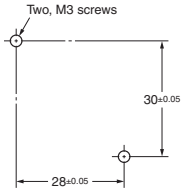
## Dimensions (Unit: mm)

**D6F-01A1-110**
**D6F-02A1-110**

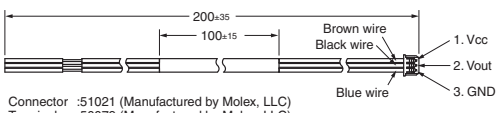


**Mounting Hole Dimensions**




**Cable (included): D6F-CABLE1**




Connector :51021 (Manufactured by Molex, LLC)
Terminal :50079 (Manufactured by Molex, LLC)
Wire :0.14SQ

# D6F-N2/-L2

## MEMS Flow Sensor

# A Compact, High-accuracy Sensor That Measures Low Flow Rates.

Gas Analog

- **High accuracy of ±3% FS.**
- **Flow rates can be measured without being affected by temperature or pressure.**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Applicable fluid | Flow rate range | Model |
|---|---|---|
| Natural gas (13A) | 0 to 1 L/min | **D6F-01N2-000** |
| | 0 to 5 L/min | **D6F-05N2-000** |
| LP gas | 0 to 2 L/min | **D6F-02L2-000** |

### Accessory (included)

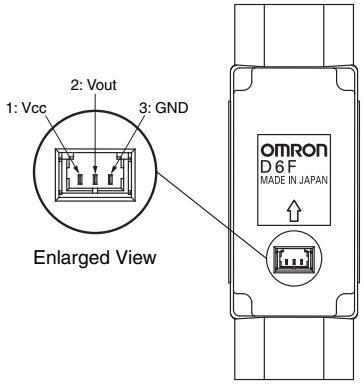
| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |

## Connections

**D6F-01N2-000**
**D6F-02N2-000**
**D6F-05N2-000**
**D6F-02L2-000**

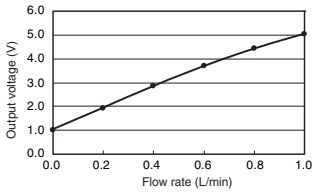
Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

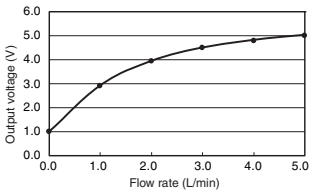



## Output Voltage Characteristics

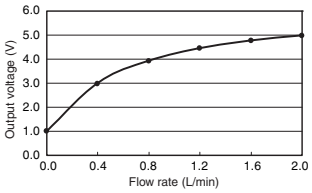
### D6F-01N2-000




### D6F-05N2-000




### D6F-02L2-000




### D6F-01N2-000

| Flow rate L/min (normal) | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.90 ±0.12 | 2.81 ±0.12 | 3.64 ±0.12 | 4.37 ±0.12 | 5.00 ±0.12 |

### D6F-05N2-000

| Flow rate L/min (normal) | 0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.91 ±0.12 | 3.92 ±0.12 | 4.47 ±0.12 | 4.79 ±0.12 | 5.00 ±0.12 |

### D6F-02L2-000

| Flow rate L/min (normal) | 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.30 | 3.02 ±0.08 | 3.95 ±0.08 | 4.47 ±0.08 | 4.79 ±0.08 | 5.00 ±0.12 |

Measurement conditions: Power supply voltage of 12±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

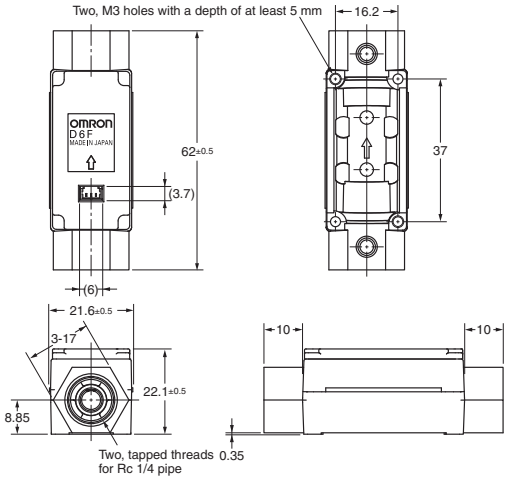
## Characteristics/Performance

| Model | D6F-01N2-000 | D6F-05N2-000 | D6F-02L2-000 |
|---|---|---|---|
| Flow Range (See note 1.) | 0 to 1 L/min | 0 to 5 L/min | 0 to 2 L/min. |
| Calibration Gas (See note 2.) | Natural gas (13A) | | Propane gas |
| Flow Port Type | Rc 1/4 thread | | |
| Electrical Connection | Three-pin connector | | |
| Power Supply | 10.8 to 26.4 VDC | | |
| Current Consumption | 15 mA max. with no load, with a Vcc of 12 to 24 VDC, and at 25°C | | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ) | | |
| Accuracy | ±3% FS (25°C characteristic) | | ±2% to ±7.5% F.S. (25°C characteristic) |
| Repeatability (See note 3.) | ±0.2% FS | | ±0.3% FS |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | | |
| Rated Power Supply Voltage | 26.4 VDC | | |
| Rated Output Voltage | 6 VDC | | |
| Case | Aluminum alloy | | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | | |
| Withstand Pressure | 200 kPa | | |
| Pressure Drop (See note 3.) | 0.017 kPa | 0.10 kPa | 0.14 kPa |
| Operating Temperature (See note 4.) | −10 to 60°C | | |
| Operating Humidity (See note 4.) | 35% to 85% | | |
| Storage Temperature (See note 4.) | −40 to 80°C | | |
| Storage Humidity (See note 4.) | 35% to 85% | | |
| Temperature Characteristics | ±3% FS for 25°C characteristic at −10 to 60°C | | ±4% FS for 25°C characteristic at −10 to 60°C |
| 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 | 35.3 g | | |

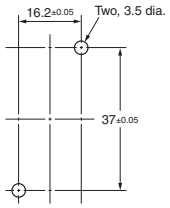
Note: 1. Volumetric flow rate at 0°C, 101.3 kPa.
Note: 2. Dry gas. (must not contain large particles, e.g., dust, oil, or mist.)
Note: 3. Reference (typical)
Note: 4. With no condensation or icing.

## Dimensions (Unit: mm)

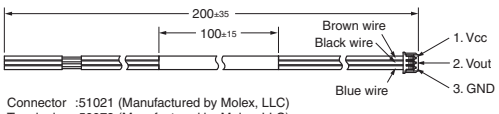
**D6F-01N2-000**
**D6F-05N2-000**
**D6F-02L2-000**




### Mounting Hole Dimensions




### Cable (included): D6F-CABLE1




Connector :51021 (Manufactured by Molex, LLC)
Terminal :50079 (Manufactured by Molex, LLC)
Wire :0.14SQ

# D6F-A3

## MEMS Flow Sensor

# High-accuracy Sensing with a Thin, Compact Body.

Air Analog

- **A thin, lightweight flow sensor.**
- **Unique flow path structure provides high precision and fast response.**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

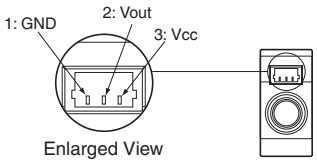
| Applicable fluid | Flow rate range | Model |
|---|---|---|
| Air | 0 to 3 L/min | **D6F-03A3-000** |

### Accessory (Sold separately)

| Type | Model |
|---|---|
| Cable | **D6F-CABLE2** |

## Connections

### D6F-03A3-000




Pin No. 1: GND
2: Vout
3: Vcc

Connector SM03B-SRSS-TB (Made by J.S.T. Mfg. Co.)

Use the following connectors made by J.S.T. Mfg. Co. for connections to the Sensor:

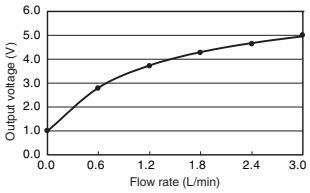
- Pressure-welded Connector
  Socket: 03SR-3S
  Wires: AWG30

Or

- Crimp Connector
  Contacts: SSH-003T-P0.2
  Housing: SHR-03V-S or SHR-03V-S-B
  Wires: AWG32 to AWG28

## Output Voltage Characteristics

### D6F-03A3-000




### D6F-03A3-000

| Flow rate L/min (normal) | 0 | 0.6 | 1.2 | 1.8 | 2.4 | 3.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.2 | 2.83 ±0.2 | 3.77 ±0.2 | 4.34 ±0.2 | 4.72 ±0.2 | 5.00 ±0.2 |

Measurement conditions: Power supply voltage of 12±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

## Characteristics/Performance

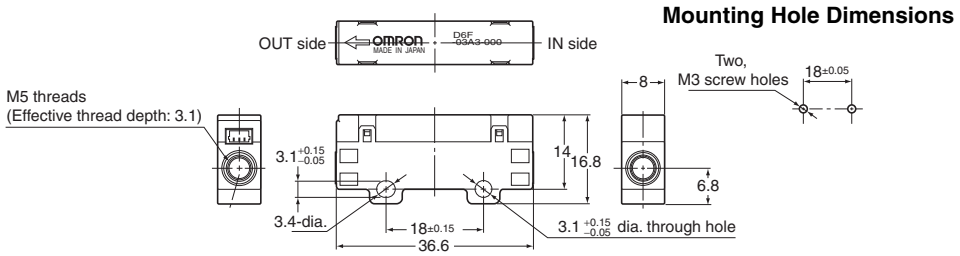
| Model | D6F-03A3-000 |
|---|---|
| Flow Range (See note 1.) | 0 to 3 L/min |
| Calibration Gas (See note 2.) | Air |
| Flow Port Type | M5 thread |
| Electrical Connection | Three-pin connector |
| Power Supply | 10.8 to 26.4 VDC |
| Current Consumption | 15 mA max. with no load, with a Vcc of 12 to 24 VDC, and at 25°C |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ) |
| Accuracy | ±5% FS (25°C characteristic) |
| Repeatability (See note 3.) | ±0.7% FS |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) |
| Rated Power Supply Voltage | 26.4 VDC |
| Rated Output Voltage | 6 VDC |
| Case | PPS |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) |
| Withstand Pressure | 200 kPa |
| Pressure Drop (See note 3.) | 0.45 kPa |
| Operating Temperature (See note 4.) | 0 to 50°C |
| Operating Humidity (See note 4.) | 35% to 85% |
| Storage Temperature (See note 4.) | −10 to 60°C |
| Storage Humidity (See note 4.) | 35% to 85% |
| Temperature Characteristics | ±5% FS for 25°C characteristic at an ambient temperature of 0 to 50°C |
| 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 | 5.3 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. Reference (typical)
Note: 4. With no condensation or icing.

## Dimensions (Unit: mm)

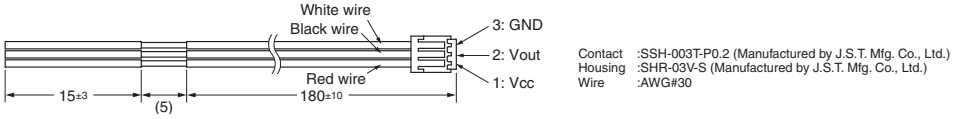
### ● MEMS Flow Sensors

**D6F-03A3-000**




### ● Cable (Sold separately)

**D6F-CABLE2**




Contact :SSH-003T-P0.2 (Manufactured by J.S.T. Mfg. Co., Ltd.)
Housing :SHR-03V-S (Manufactured by J.S.T. Mfg. Co., Ltd.)
Wire :AWG#30

# D6F-A5

## MEMS Flow Sensor

# High-accuracy Sensing with a Compact Body for Flow Rates Up to 50 L/min.

Air Analog

- **Accurately detects a mass flow rate of 10 to 50 L/min.**
- **A compact size of 30 × 78 × 30 mm (H × W × D).**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Flow Port Type | Applicable fluid | Flow rate range | Model |
|---|---|---|---|
| Manifold | Air | 0 to 10 L/min | **D6F-10A5-000** |
| | | 0 to 20 L/min | **D6F-20A5-000** |
| | | 0 to 50 L/min | **D6F-50A5-000** |

### Accessory (Sold separately)

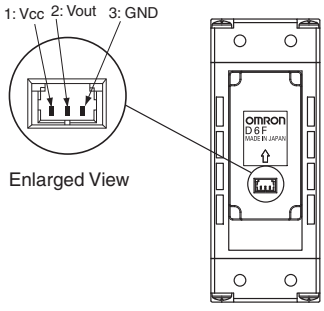
| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |

## Connections

**D6F-10A5-000**
**D6F-20A5-000**
**D6F-50A5-000**

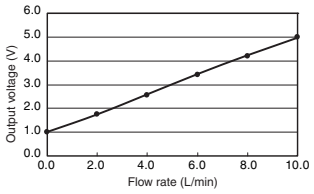
Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

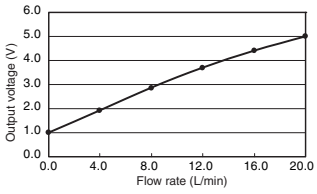



## Output Voltage Characteristics

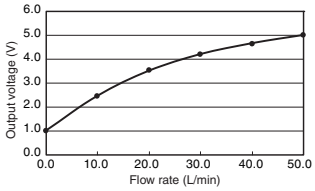
### D6F-10A5-000




### D6F-20A5-000




### D6F-50A5-000




### D6F-10A5-000

| Flow rate L/min (normal) | 0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.75 ±0.12 | 2.60 ±0.12 | 3.45 ±0.12 | 4.25 ±0.12 | 5.00 ±0.12 |

### D6F-20A5-000

| Flow rate L/min (normal) | 0 | 4.0 | 8.0 | 12.0 | 16.0 | 20.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.93 ±0.12 | 2.87 ±0.12 | 3.70 ±0.12 | 4.41 ±0.12 | 5.00 ±0.12 |

### D6F-50A5-000

| Flow rate L/min (normal) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.45 ±0.12 | 3.51 ±0.12 | 4.20 ±0.12 | 4.66 ±0.12 | 5.00 ±0.12 |

Measurement conditions: Power supply voltage of 12±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

## Characteristics/Performance

| Model | D6F-10A5-000 | D6F-20A5-000 | D6F-50A5-000 |
|---|---|---|---|
| Flow Range (See note 1.) | 0 to 10 L/min | 0 to 20 L/min | 0 to 50 L/min |
| Calibration Gas (See note 2.) | Air | | |
| Flow Port Type | Manifold | | |
| Electrical Connection | Three-pin connector | | |
| Power Supply | 10.8 to 26.4 VDC | | |
| Current Consumption | 15 mA max. with no load, with a Vcc of 12 to 24 VDC, and at 25°C | | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ) | | |
| Accuracy | ±3% FS (25°C characteristic) | | |
| Repeatability (See note 3.) | ±0.3% FS | | |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | | |
| Rated Power Supply Voltage | 26.4 VDC | | |
| Rated Output Voltage | 6 VDC | | |
| Case | PPS/aluminum alloy | | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | | |
| Withstand Pressure | 500 kPa | | |
| Pressure Drop (See note 3.) | 0.8 kPa | 2.9 kPa | 17.2 kPa |
| Operating Temperature (See note 4.) | −10 to 60°C | | |
| Operating Humidity (See note 4.) | 35% to 85% | | |
| Storage Temperature (See note 4.) | −30 to 80°C | | |
| Storage Humidity (See note 4.) | 35% to 85% | | |
| Temperature Characteristics | ±3% FS for 25°C characteristic at an ambient temperature of −10 to 60°C | | |
| 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 | 103 g | | |

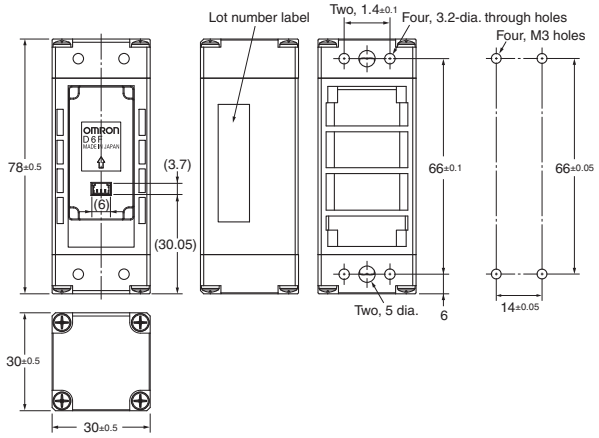
Note: 1. Volumetric flow rate at 0°C, 101.3 kPa.
Note: 2. Dry gas. (must not contain large particles, e.g., dust, oil, or mist.)
Note: 3. Reference (typical)
Note: 4. With no condensation or icing.

## Dimensions (Unit: mm)

### ● MEMS Flow Sensors

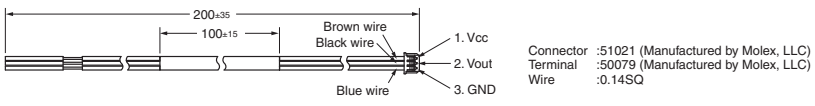
**D6F-10A5-000**
**D6F-20A5-000**
**D6F-50A5-000**

**Mounting Hole Dimensions**




### ● Cable (Sold separately)

**D6F-CABLE1**




Connector :51021 (Manufactured by Molex, LLC)
Terminal :50079 (Manufactured by Molex, LLC)
Wire :0.14SQ

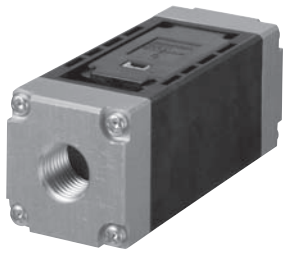
# D6F-A6

## MEMS Flow Sensor

# High-accuracy Sensing with a Compact Body for Flow Rates up to 50 L/min.

Air Gas Analog

- **Accurately measures an air mass flow rate of 10 to 50 L/min.**
- **A compact size of 30 × 78 × 30 mm (H × W × D).**



**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Flow Port Type | Applicable fluid | Flow rate range | Model |
|---|---|---|---|
| Rc 1/4 thread | Air | 0 to 10 L/min | **D6F-10A6-000** |
| | | 0 to 20 L/min | **D6F-20A6-000** |
| | | 0 to 50 L/min | **D6F-50A6-000** |
| NPT 1/8 thread | | 0 to 10 L/min | **D6F-10A61-000** |
| | | 0 to 20 L/min | **D6F-20A61-000** |
| | | 0 to 50 L/min | **D6F-50A61-000** |
| NPT 1/2 thread | | 0 to 50 L/min | **D6F-50A62-000** |

### Accessory (Sold separately)

| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |

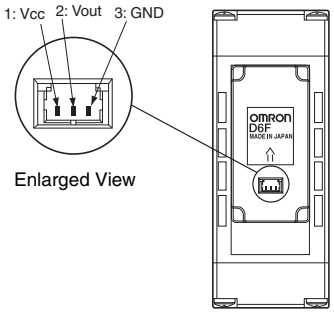
## Connections

**D6F-10A6-000**
**D6F-20A6-000**
**D6F-50A6-000**
**D6F-50A62-000**

**D6F-10A61-000**
**D6F-20A61-000**
**D6F-50A61-000**

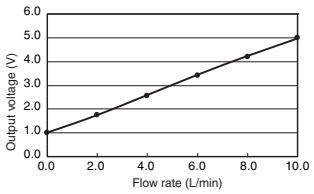
Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

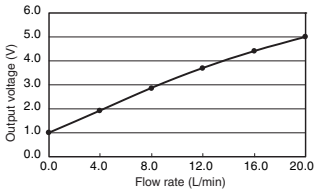



## Output Voltage Characteristics

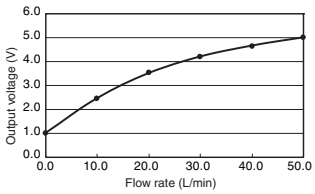
**D6F-10A6-000**
**D6F-10A61-000**




**D6F-20A6-000**
**D6F-20A61-000**




**D6F-50A6-000**
**D6F-50A61-000**
**D6F-50A62-000**




**D6F-10A6-000/D6F-10A61-000**

| Flow rate L/min (normal) | 0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.75 ±0.12 | 2.60 ±0.12 | 3.45 ±0.12 | 4.25 ±0.12 | 5.00 ±0.12 |

**D6F-20A6-000/D6F-20A61-000**

| Flow rate L/min (normal) | 0 | 4 | 8 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.93 ±0.12 | 2.87 ±0.12 | 3.70 ±0.12 | 4.41 ±0.12 | 5.00 ±0.12 |

**D6F-50A6-000/D6F-50A61-000/D6F-50A62-000**

| Flow rate L/min (normal) | 0 | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.45 ±0.12 | 3.51 ±0.12 | 4.20 ±0.12 | 4.66 ±0.12 | 5.00 ±0.12 |

Measurement conditions: Power supply voltage of 12±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

## Characteristics/Performance

| Model | D6F-10A6-000 | D6F-20A6-000 | D6F-50A6-000 | D6F-10A61-000 | D6F-20A61-000 | D6F-50A61-000 | D6F-50A62-000 |
|---|---|---|---|---|---|---|---|
| Flow Range (See note 1.) | 0 to 10 L/min | 0 to 20 L/min | 0 to 50 L/min | 0 to 10 L/min | 0 to 20 L/min | 0 to 50 L/min | 0 to 50 L/min |
| Calibration Gas (See note 2.) | Air | | | | | | |
| Flow Port Type | Rc 1/4 thread | | | NPT 1/8 thread | | | NPT 1/2 thread |
| Electrical Connection | Three-pin connector | | | | | | |
| Power Supply | 10.8 to 26.4 VDC | | | | | | |
| Current Consumption | 15 mA max. with no load, with a Vcc of 12 to 24 VDC, and at 25°C | | | | | | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10kΩ min.) | | | | | | |
| Accuracy | ±3% FS (25°C characteristic) | | | | | | |
| Repeatability (See note 3.) | ±0.3% FS | | | | | | |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | | | | | | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | | | | | | |
| Rated Power Supply Voltage | 26.4 VDC | | | | | | |
| Rated Output Voltage | 6 VDC | | | | | | |
| Case | PPS/aluminum alloy | | | | | | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | | | | | | |
| Withstand Pressure | 500 kPa | | | | | | |
| Pressure Drop (See note 3.) | 0.10 kPa | 0.28 kPa | 1.44 kPa | 0.15 kPa | 0.52 kPa | 2.31 kPa | 2.16 kPa |
| Operating Temperature (See note 4.) | −10 to 60°C | | | | | | |
| Operating Humidity (See note 4.) | 35% to 85% | | | | | | |
| Storage Temperature (See note 4.) | −30 to 80°C | | | | | | |
| Storage Humidity (See note 4.) | 35% to 85% | | | | | | |
| Temperature Characteristics | ±3% FS for 25°C characteristic at an ambient temperature of −10 to 60°C | | | | | | |
| 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 | 103 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. Reference (typical)
Note: 4. With no condensation or icing.

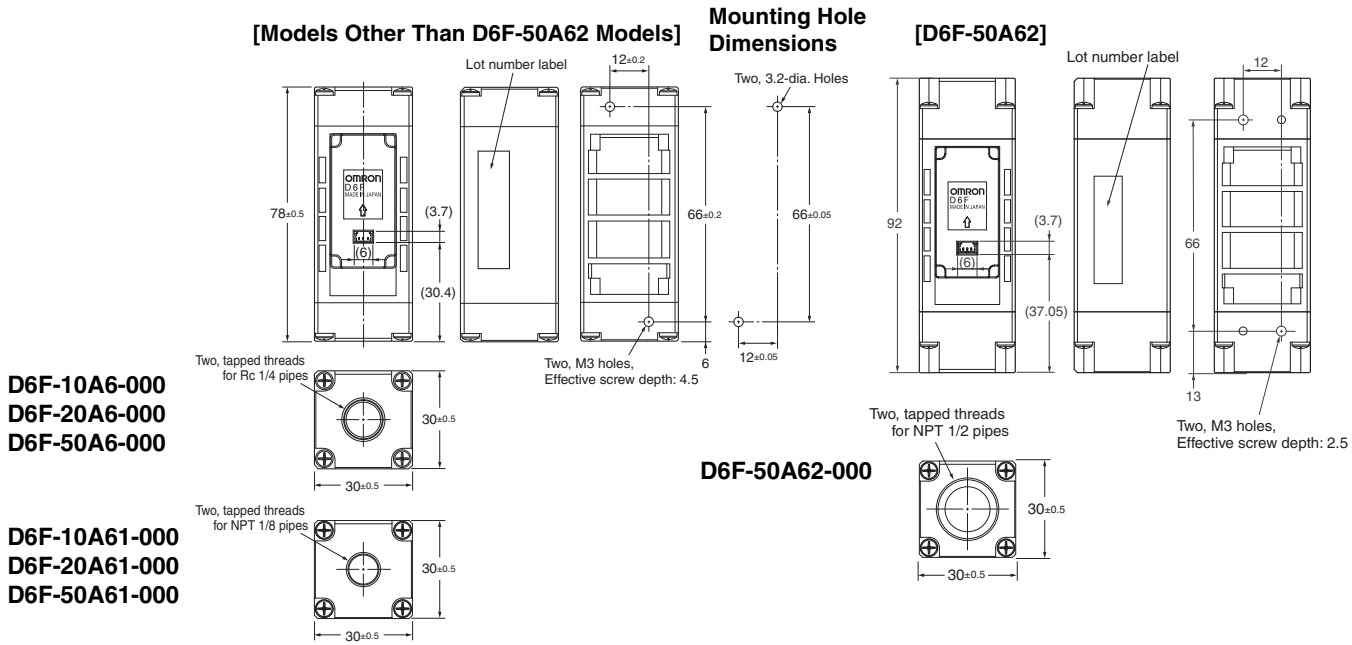
## Dimensions (Unit: mm)

### ● MEMS Flow Sensors

**[Models Other Than D6F-50A62 Models]**

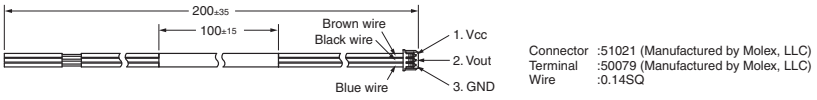
**Mounting Hole Dimensions**

**[D6F-50A62]**




### ● Cable (Sold separately)

**D6F-CABLE1**



# D6F-A7/-L7/-N7

## MEMS Flow Sensor

## Reduction of Piping time by quick joint connection

Air Gas Analog

- **Low -flow rate of natural gas and LP gas can be measured.**
- **10 L/min and 30 L/min of Air can be measured.**
- **Compact size of 30 × 84.6 × 30 mm (H × W × D).**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Flow Port Type | Applicable fluid | Flow rate range | Model |
|---|---|---|---|
| Quick joint P10 | Natural gas (13A) | 0 to 5 L/min | **D6F-05N7-000** |
| | LP gas | 0 to 2 L/min | **D6F-02L7-000** |
| | Air | 0 to 10 L/min | **D6F-10A7-000** |
| | | 0 to 30 L/min | **D6F-30A7-000** |

### Accessories (Sold separately)

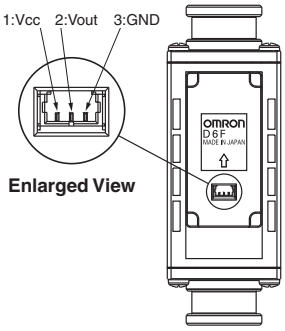
| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |
| Quick fastener | **D6F-FASTENER-P10** |

## Connections

**D6F-05N7-000 D6F-02L7-000**
**D6F-10A7-000 D6F-30A7-000**

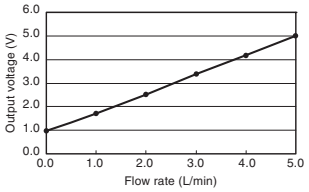
Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

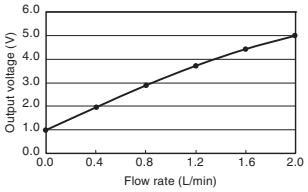



## Output Voltage Characteristics

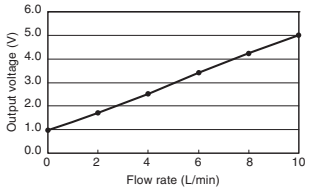
**D6F-05N7-000**



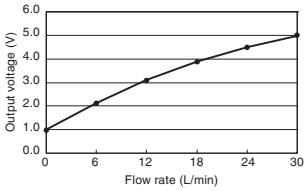

**D6F-02L7-000**




**D6F-10A7-000**




**D6F-30A7-000**




**D6F-05N7-000**

| Flow rate L/min (normal) | 0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.68 ±0.12 | 2.47 ±0.12 | 3.31 ±0.12 | 4.15 ±0.12 | 5.00 ±0.12 |

**D6F-02L7-000**

| Flow rate L/min (normal) | 0 | 0.4 | 0.8 | 1.2 | 1.6 | 2.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.96 ±0.12 | 2.89 ±0.12 | 3.72 ±0.12 | 4.43 ±0.12 | 5.00 ±0.12 |

**D6F-10A7-000**

| Flow rate L/min (normal) | 0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.75 ±0.12 | 2.60 ±0.12 | 3.45 ±0.12 | 4.25 ±0.12 | 5.00 ±0.12 |

**D6F-30A7-000**

| Flow rate L/min (normal) | 0 | 6 | 12 | 18 | 24 | 30 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 2.11 ±0.12 | 3.12 ±0.12 | 3.91 ±0.12 | 4.53 ±0.12 | 5.00 ±0.12 |

Measurement conditions: Power-supply voltage 12±0.1 VDC, ambient temperature 25±5°C and ambient humidity 35 to 75%RH.

## Characteristics/Performance

| Model | D6F-05N7-000 | D6F-02L7-000 | D6F-10A7-000 | D6F-30A7-000 |
|---|---|---|---|---|
| Flow Range (See note 1.) | 0 to 5 L/min | 0 to 2 L/min | 0 to 10 L/min | 0 to 30 L/min |
| Calibration Gas (See note 2.) | Natural gas (13A) | LP gas | Air | |
| Flow Port Type | Quick joint P10 | | | |
| Electrical Connection | Three-pin connector | | | |
| Power Supply | 10.8 to 26.4 VDC | | | |
| Current Consumption | 15 mA max. with no load and Vcc of 12 to 24 VDC, GND = 0 VDC, 25°C | | | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ min.) | | | |
| Accuracy | ±3%F.S. (25°C characteristic) | | | |
| Repeatability (See note 3.) | ±0.3%F.S. | | | |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | | | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | | | |
| Rated Power Supply Voltage | 26.4 VDC | | | |
| Rated Output Voltage | 6 VDC | | | |
| Case | PPS | | | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | | | |
| Withstand Pressure | 500 kPa | | | |
| Pressure Drop (See note 3.) | 0.06 kPa | 0.03 kPa | 0.32 kPa | 2.19 kPa |
| Operating Temperature (See note 4.) | –10 to +60°C | | | |
| Operating Humidity (See note 4.) | 35 to 85%RH | | | |
| Storage Temperature (See note 4.) | –10 to +80°C | | –30 to +80°C | |
| Storage Humidity (See note 4.) | 35 to 85%RH | | | |
| Temperature Characteristics | ±3%F.S. for 25°C characteristic at an ambient temperature of –10 to +60°C | | | |
| 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 | 72 g | | | |

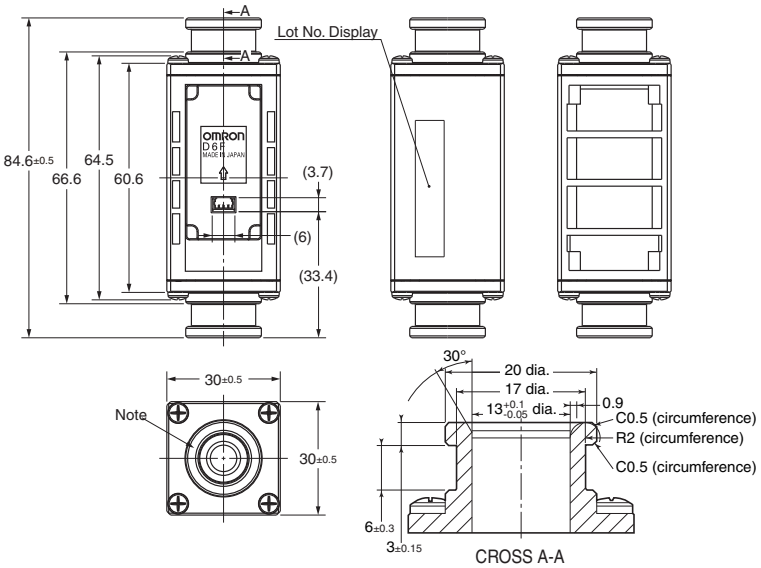
Note: 1. Volumetric flow rate at 0°C, 101.3 kPa.
Note: 2. Dry gas (must not contain large particles, e.g., dust, oil, or mist.)
Note: 3. Reference (typical)
Note: 4. With no condensation or icing.

## Dimensions (Unit: mm)

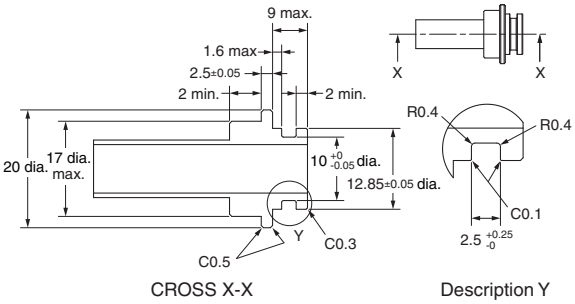
### ● MEMS Flow Sensors

**D6F-05N7-000**
**D6F-02L7-000**
**D6F-10A7-000**
**D6F-30A7-000**

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.



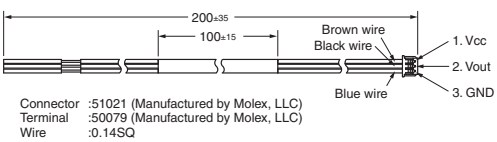

### Recommended Quick joint male P10 type




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

### ● Cable (Sold separately)

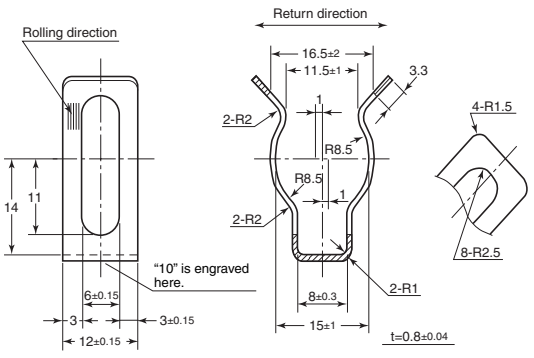
**D6F-CABLE1**




Connector :51021 (Manufactured by Molex, LLC)
Terminal :50079 (Manufactured by Molex, LLC)
Wire :0.14SQ

### ● Quick fastener (Sold separately)

**D6F-FASTENER-P10**



# D6F-A7D/-AB71D

## MEMS Flow Sensor

# Digital Compensation for High Accuracy

Air Digital

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

**RoHS Compliant**

NEW

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

## Ordering Information

### MEMS Flow Sensor

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

### Accessories (Sold separately)

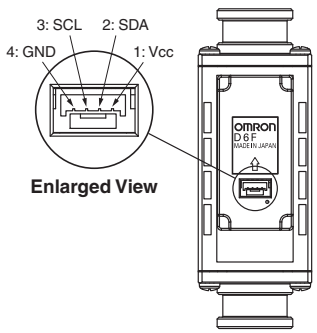
| Type | Model |
|---|---|
| Cable | **D6F-CABLE3** |
| Quick fastener | **D6F-FASTENER-P10** |

## Connections

**D6F-10A7D-000-0**
**D6F-20A7D-000-0**
**D6F-50A7D-000-0**
**D6F-70AB71D-000-0**

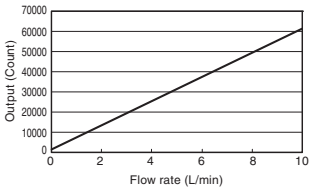
Pin No. 1: Vcc
2: SDA
3: SCL
4: GND
Connector GHR-04V-S (made by J.S.T. Mfg. Co.)

Use the following connectors for connections to the D6F:
Housing GHR-04V-S (made by J.S.T. Mfg. Co.)
Terminals SSHL-002T-P0.2 (made by J.S.T. Mfg. Co.)
Wires AWG26 to AWG30

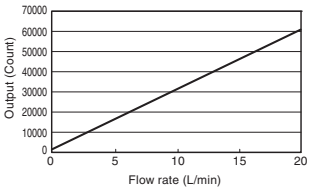



## Output Characteristics

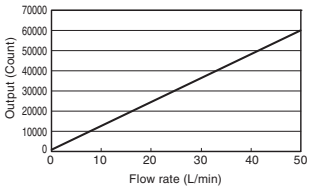
**D6F-10A7D-000-0**



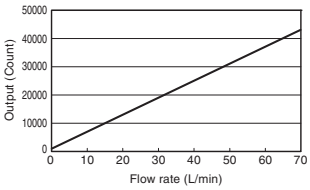

**D6F-20A7D-000-0**




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




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




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

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

Measurement conditions: Power-supply voltage 3.3±0.1 VDC, ambient temperature 25±5°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 voltage (HEX) | 1024 (0400) | 13024 (32E0) | 25024 (61C0) | 37024 (90A0) | 49024 (BF80) | 61024 (EE60) |

Measurement conditions: Power-supply voltage 3.3±0.1 VDC, ambient temperature 25±5°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 voltage (HEX) | 1024 (0400) | 13024 (32E0) | 25024 (61C0) | 37024 (90A0) | 49024 (BF80) | 61024 (EE60) |

Measurement conditions: Power-supply voltage 3.3±0.1 VDC, ambient temperature 25±5°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 voltage (HEX) | 1024 (0400) | 13024 (32E0) | 25024 (61C0) | 37024 (90A0) | 43024 (A810) |

Measurement conditions: Power-supply voltage 3.3±0.1 VDC, ambient temperature 25±5°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.)<br>±3%RD (25%F.S. ≤ Flow rate ≤ 100%F.S.) | | | ±5%RD (10L/min ≤ Flow rate < 20L/min)<br>±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 |

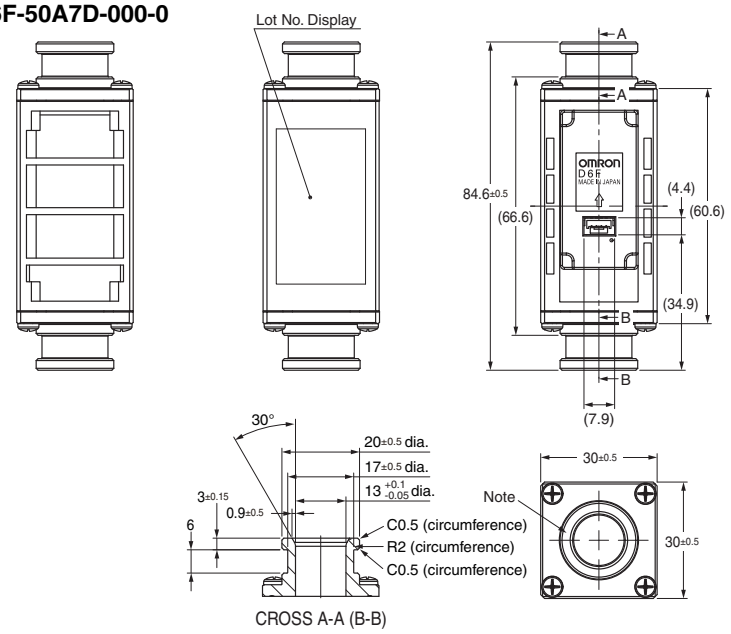
Note: 1. Volumetric flow rate at 0°C, 101.3 kPa.
Note: 2. Dry gas (must not contain large particles, e.g., dust, oil, or mist.)
Note: 3. -10 ≤ Operating Temperature ≤ 60°C
Note: 4. Reference (typical)
Note: 5. Refer to the D6F-□□□□D-000-□ Application Notes for details.
Note: 6. With no condensation or 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<br>BIN : 110_1100 (7bit) |
| Speed mode | | Fast Mode 400kHz |
| Signal | | |
| | SCL | Serial Clock |
| | SDA | Data Signal |

## Dimensions (Unit: mm)

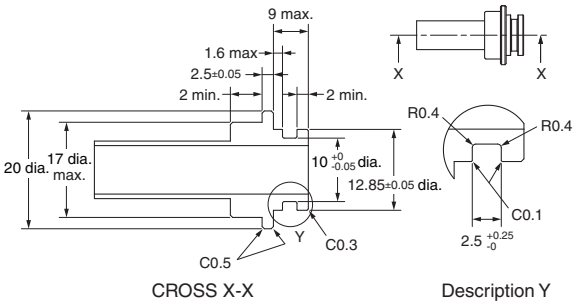
### ● MEMS Flow Sensors
**D6F-10A7D-000-0**
**D6F-20A7D-000-0**
**D6F-50A7D-000-0**




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

#### Recommended Quick joint male P10 type




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

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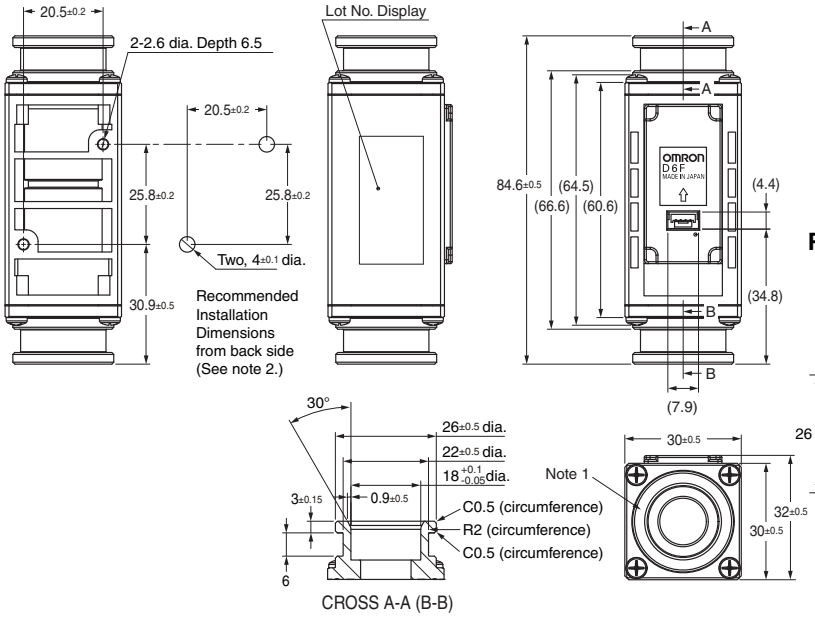
**D6F-70AB71D-000-0**

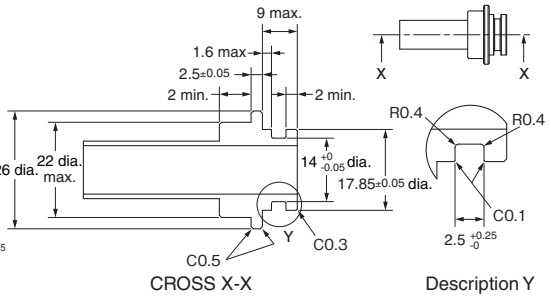



Note 1. The Port type of pipe fitting based on "Quick Joint P14 Type".
* P14 shows the name of an O-ring prescribed by JIS B 2401.
* The port of O-ring ditch is based on P14 of JIS B 2406.
* Please obtain a male joint separately.

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

#### Recommended Quick joint male P14 type




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

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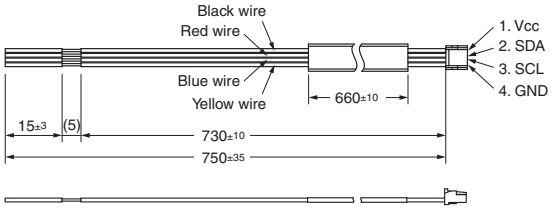
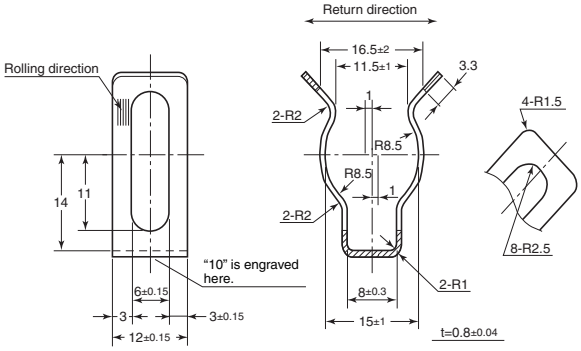
### ● Cable (Sold separately)
**D6F-CABLE3**




Contact :SSHL-002T-P0.2 (Manufactured by J.S.T. Mfg. Co., Ltd.)
Housing :GHR-04V-S (Manufactured by J.S.T. Mfg. Co., Ltd.)
Wire :AWG#28

### ● Quick fastener (Sold separately)
**D6F-FASTENER-P10**



# D6F-AB71

## MEMS Flow Sensor

# Reduction of Piping time by quick joint connection

Air Analog

- **Reduce the influence of pulsation flow by bypass flow path**
- **30 L/min and 70 L/min of Air can be measured.**
- **Compact size of 30 × 84.6 × 32 mm (H × W × D).**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

| Flow Port Type | Applicable fluid | Flow rate range | Model |
|---|---|---|---|
| Quick joint P14 | Air | 0 to 30 L/min | **D6F-30AB71-000** |
| | | 0 to 70 L/min | **D6F-70AB71-000** |

### Accessory (Sold separately)

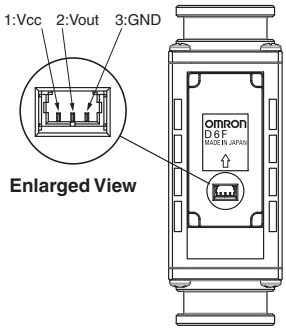
| Type | Model |
|---|---|
| Cable | **D6F-CABLE1** |

## Connections

**D6F-30AB71-000**
**D6F-70AB71-000**

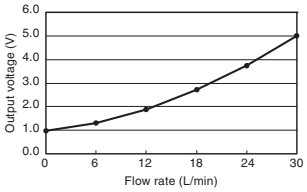
Pin No. 1: Vcc
2: Vout
3: GND
Connector 53398-03** (Made by Molex Japan)

Use the following connectors for connections to the D6F:
Housing 51021-0300 (Made by Molex Japan)
Terminals 50079 (Made by Molex Japan)
Wires AWG28 to AWG26

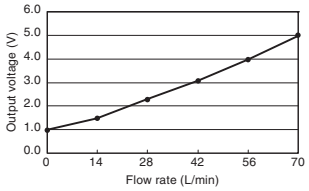



## Output Voltage Characteristics

### D6F-30AB71-000




### D6F-70AB71-000




### D6F-30AB71-000

| Flow rate L/min (normal) | 0 | 6 | 12 | 18 | 24 | 30 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.25 ±0.12 | 1.91 ±0.12 | 2.75 ±0.12 | 3.78 ±0.12 | 5.00 ±0.12 |

### D6F-70AB71-000

| Flow rate L/min (normal) | 0 | 14 | 28 | 42 | 56 | 70 |
|---|---|---|---|---|---|---|
| Output voltage V | 1.00 ±0.12 | 1.43 ±0.12 | 2.25 ±0.12 | 3.14 ±0.12 | 4.06 ±0.12 | 5.00 ±0.12 |

Measurement conditions: Power-supply voltage 12±0.1 VDC, ambient temperature 25±5°C and ambient humidity 35 to 75%RH.

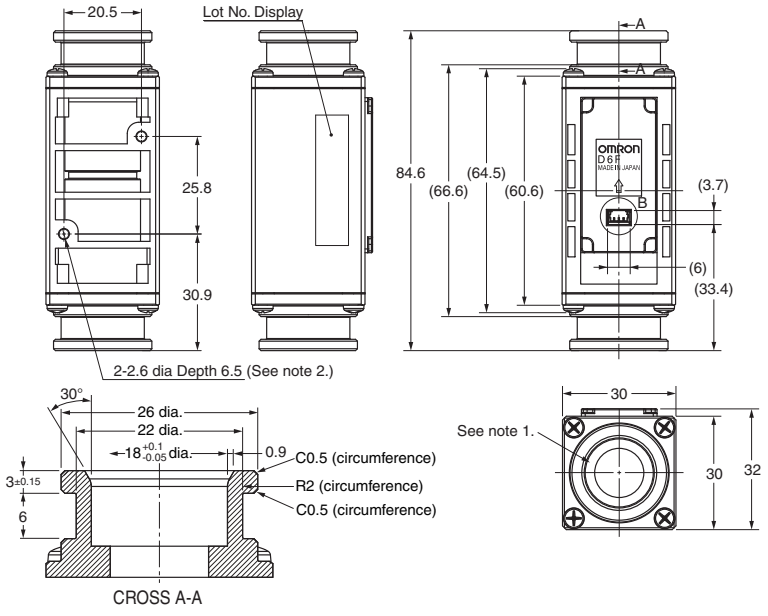
## Characteristics/Performance

| Model | D6F-30AB71-000 | D6F-70AB71-000 |
|---|---|---|
| Flow Range (See note 1.) | 0 to 30 L/min | 0 to 70 L/min |
| Calibration Gas (See note 2.) | Air | |
| Flow Port Type | Quick joint P14 | |
| Electrical Connection | Three-pin connector | |
| Power Supply | 10.8 to 26.4 VDC | |
| Current Consumption | 15 mA max. with no load and Vcc of 12 to 24 VDC, GND = 0 VDC, 25°C | |
| Output Voltage | 1 to 5 VDC (non-linear output, load resistance of 10 kΩ min.) | |
| Accuracy | ±3%F.S. (25°C characteristic) | |
| Repeatability (See note 3.) | ±0.3%F.S. | |
| Output Voltage (Max.) | 5.7 VDC (Load resistance: 10 kΩ) | |
| Output Voltage (Min.) | 0 VDC (Load resistance: 10 kΩ) | |
| Rated Power Supply Voltage | 26.4 VDC | |
| Rated Output Voltage | 6 VDC | |
| Case | PPS | |
| Degree of Protection | IEC IP40 (Excluding tubing sections.) | |
| Withstand Pressure | 100 kPa | |
| Pressure Drop (See note 3.) | 0.88 kPa | 3.49 kPa |
| Operating Temperature (See note 4.) | –10 to +60°C | |
| Operating Humidity (See note 4.) | 35 to 85%RH | |
| Storage Temperature (See note 4.) | –30 to +80°C | |
| Storage Humidity (See note 4.) | 35 to 85%RH | |
| Temperature Characteristics | ±3%F.S. for 25°C characteristic at an ambient temperature of –10 to +60°C | |
| 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 | 75 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. Reference (typical)
Note: 4. With no condensation or icing.

## Dimensions (Unit: mm)

### ● MEMS Flow Sensors
**D6F-30AB71-000**
**D6F-70AB71-000**

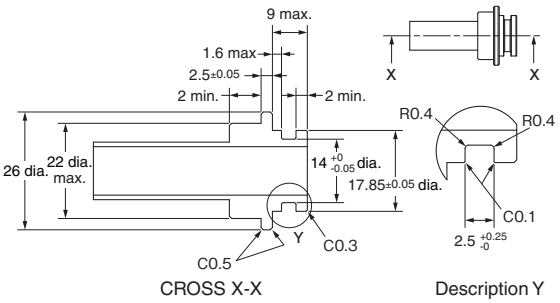



Note 1. The flow path inlet and outlet ports conform to P14-type female quick-connect joints.
(The tube inlet and outlet ports have the same shape.)
* P14 is the number of an O-ring specified in JIS B 2401.
* The O-ring groove in the male joint must conform to P14 in JIS B 2406.
* Please obtain a male 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.

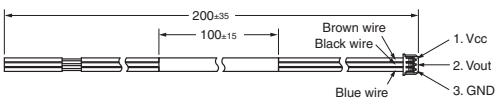
Note 3: Use the following connectors to connect to the Sensor.
Connector : GHR-04V-S (JST)
Terminals : SSHL-002T-P0.2 (JST)
Wires : AWG26 to AWG30
Circuit numbers : 1. Vcc, 2. SDA, 3. SCL, and 4. GND.

### Recommended Quick joint male P14 type




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

### ● Cable (Sold separately)
**D6F-CABLE1**



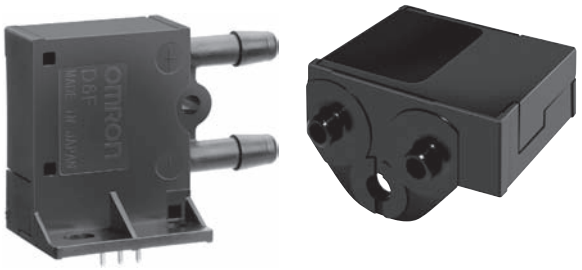

Connector :51021 (Manufactured by Molex, LLC)
Terminal :50079 (Manufactured by Molex, LLC)
Wire :0.14SQ

# D6F-P

## MEMS Flow Sensor

# A Compact, High-accuracy Flow Sensor with Superior Resistance to Environments.

Air Analog



- **Anti-dust performance is improved using the Cyclon method.**
- **A full lineup of models with different connector types: bamboo joints, lead terminals for direct mounting on-board, and manifolds.**
- **High accuracy of ±5% FS.**

**RoHS Compliant**

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

## Ordering Information

### MEMS Flow Sensor

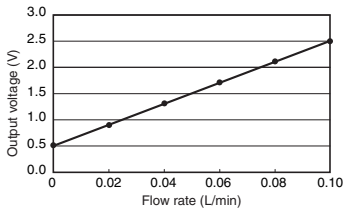
| Flow Port Type | Connection | Applicable fluid | Flow rate range | Model |
|---|---|---|---|---|
| Bamboo joint | Lead terminals | Air | 0 to 0.1 L/min | **D6F-P0001A1** |
| | Connector | | 0 to 1 L/min | **D6F-P0010A1** |
| | | | | **D6F-P0010A2** |
| Manifold | | | | **D6F-P0010AM2** |

### Accessory (Sold separately)

| Type | Model |
|---|---|
| Cable | **D6F-CABLE2** |

## Output Voltage Characteristics

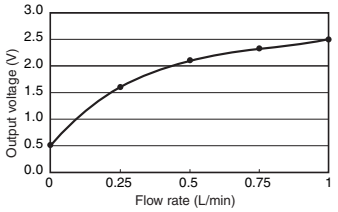
### D6F-P0001A1




| Flow rate L/min (normal) | 0 | 0.02 | 0.04 | 0.06 | 0.08 | 0.10 |
|---|---|---|---|---|---|---|
| Output voltage V | 0.50 ±0.10 | 0.90 ±0.10 | 1.30 ±0.10 | 1.70 ±0.10 | 2.10 ±0.10 | 2.50 ±0.10 |

Measurement conditions: Power supply voltage of 5.0±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.

### D6F-P0010A1/-P0010A2/-P0010AM2




| Flow rate L/min (normal) | 0 | 0.25 | 0.50 | 0.75 | 1.00 |
|---|---|---|---|---|---|
| Output voltage V | 0.50 ±0.10 | 1.60 ±0.10 | 2.10 ±0.10 | 2.31 ±0.10 | 2.50 ±0.10 |

Measurement conditions: Power supply voltage of 5.0±0.1 VDC, ambient temperature of 25±5°C, and ambient humidity of 35% to 75%.