Digital Compensation for High Accuracy

• 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.

Ordering Information

MEMS Flow Sensor

Accessories (Sold separately)

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-70A7D1-000-0

Output Characteristics

D6F-10A7D-000-0
D6F-20A7D-000-0
D6F-50A7D-000-0
D6F-70A7D1-000-0

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
| | | 0 to 70 L/min | D6F-70A7D1-000-0
Quick joint P14

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

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

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

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

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
D6F-A7D/-AB71D MEMS Flow Sensor

Characteristics/Performance

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

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-AB71D-000-0 Application Notes for details.
Note: 6. With no condensation or icing.
Note: 7. The following custom options are available.
   - Temperature measurement
   - Address settings (up to four addresses)
   - Fault detection
   - Threshold setting

Communication

<table>
<thead>
<tr>
<th>Serial Interface</th>
<th>I2C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master/Slave</td>
<td>Slave / Address: HEX : 0x6C BIN : 110_1100 (7bit)</td>
</tr>
<tr>
<td>Speed mode</td>
<td>Fast Mode 400kHz</td>
</tr>
<tr>
<td>Signal</td>
<td>SCL</td>
</tr>
<tr>
<td></td>
<td>SDA</td>
</tr>
</tbody>
</table>
### 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 eigyou@rgl.co.jp
- Converter male joint (Rc3/8-Quick male joint): Adapter Rc3/8-QJM10
- O ring: O ring P10 fluororubber (material)

**Note 1.**

- * 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 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)

**Note 1.**

- * 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