Technical Data for BASIS 2 Mass Flow Meters and Controllers

100 SCCM full scale through 20 SLPM full scale models

Standard specifications. Consult Alicat for available options.

### ACCURACY READINGS

| Fluids | Mass flow accuracy<sup>1</sup> | He, H<sub>2</sub> | Ar | CO<sub>2</sub>, N<sub>2</sub> | Full scale range
|--------|-------------------------------|-----------------|----|----------------|-----------------
| Air, N<sub>2</sub>, O<sub>2</sub>, CH<sub>4</sub> | 1.5% reading or 0.2% full scale<sup>2</sup> | 1.8% full scale | 1.5% reading or 0.5% full scale<sup>2</sup> | 100 SCCM – 2 SLPM: 1.5% reading or 0.5% full scale<sup>2</sup> | 5 – 20 SLPM: 2.0% reading or 1.0% full scale<sup>2</sup>

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1. Stated accuracy is after tare, under equilibrium conditions, includes repeatability and linearity.
2. Whichever is greater.

### SENSOR AND CONTROL PERFORMANCE

<table>
<thead>
<tr>
<th>Performance</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow repeatability (2σ)</td>
<td>± 0.25% reading or ± 0.05% of full scale</td>
</tr>
<tr>
<td>Control and measurement range</td>
<td>0.1% – 100% of full scale (1,000:1 turndown ratio)</td>
</tr>
<tr>
<td>Temperature sensitivity</td>
<td>Mass flow zero and span shift: 0.05% of reading per °C from calibration conditions</td>
</tr>
<tr>
<td>Temperature accuracy</td>
<td>± 1.5 °C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 – 50°C (ambient and gas)</td>
</tr>
<tr>
<td>Operating pressure range&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Meters: 0 – 145 PSIG&lt;br&gt;Controllers: 100 SCCM – 5 SLPM: 0 – 145 PSIG&lt;br&gt;10 SLPM: 0 – 100 PSIG&lt;br&gt;20 SLPM: 0 – 60 PSIG</td>
</tr>
<tr>
<td>Valve function&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Normally closed</td>
</tr>
<tr>
<td>Totalizer volume uncertainty</td>
<td>± 0.6% of reading in additional uncertainty</td>
</tr>
<tr>
<td>Typical control response time&lt;sup&gt;4&lt;/sup&gt;</td>
<td>As fast as 100 ms (T63), flow rate dependent, user-adjustable</td>
</tr>
<tr>
<td>Typical indication response time&lt;sup&gt;4&lt;/sup&gt;</td>
<td>&lt; 6 ms, flow rate dependent</td>
</tr>
</tbody>
</table>

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3. Custom valve options are available to increase operating pressure range on 10 SLPM and 20 SLPM models.
4. Applies to controllers only.

### MECHANICAL

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetted materials</td>
<td>300-series stainless steel, brass, aluminum, FKM, NBR, FR4, SiO&lt;sub&gt;2&lt;/sub&gt;/SiN&lt;sub&gt;x&lt;/sub&gt;/Si, Ablebond 84-3J, PBT UL 94V-0, tin, copper</td>
</tr>
<tr>
<td>Maximum pressure</td>
<td>Damage possible above 175 PSIG</td>
</tr>
<tr>
<td>Relative humidity range</td>
<td>95% non-condensing</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP40</td>
</tr>
<tr>
<td>Mounting orientation sensitivity</td>
<td>Calibrated in horizontal mounting orientation</td>
</tr>
<tr>
<td>Mounting holes</td>
<td>2× M3×0.5 threaded, ‡ 0.236” [6 mm]</td>
</tr>
</tbody>
</table>

### POWER AND COMMUNICATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital input and output options</td>
<td>RS-232 or RS-485</td>
</tr>
<tr>
<td>Digital data update rate</td>
<td>62.5 Hz at 19200 baud</td>
</tr>
<tr>
<td>Analog input and output</td>
<td>0-5Vdc or 4-20mA</td>
</tr>
<tr>
<td>Analog update rate</td>
<td>400 Hz</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>6-pin JST GH</td>
</tr>
<tr>
<td>Power requirements&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Controller: 12–24 Vdc, 210 mA&lt;br&gt;Meter: 12–24 Vdc, 12 mA</td>
</tr>
</tbody>
</table>

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5. Add 40 mA to power requirements if equipped with 4-20 mA analog output.

### FEATURES

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>STP reference conditions</td>
<td>0°C, 20°C, 25°C, 70°F and 1 atm available, user-configurable</td>
</tr>
<tr>
<td>Gas selection</td>
<td>9 user-selectable gases stored internally. Compatibility: Air, N&lt;sub&gt;2&lt;/sub&gt;, O&lt;sub&gt;2&lt;/sub&gt;, CH&lt;sub&gt;4&lt;/sub&gt;, Ar, CO&lt;sub&gt;2&lt;/sub&gt;, N&lt;sub&gt;2&lt;/sub&gt;O, He, H&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>Valve overrides</td>
<td>Hold, exhaust</td>
</tr>
<tr>
<td>Status LED</td>
<td>Power, serial activity, error</td>
</tr>
</tbody>
</table>

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### RANGE-SPECIFIC TECHNICAL DATA

<table>
<thead>
<tr>
<th>Full scale flow</th>
<th>Pressure drop with air at full scale venting to atmosphere</th>
<th>Process connections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controller</td>
<td>Meter</td>
</tr>
<tr>
<td>100 SCCM</td>
<td>15.0 mbar</td>
<td>0.2 mbar</td>
</tr>
<tr>
<td>200 SCCM</td>
<td>45.0 mbar</td>
<td>0.5 mbar</td>
</tr>
<tr>
<td>500 SCCM</td>
<td>6.0 mbar</td>
<td>1.5 mbar</td>
</tr>
<tr>
<td>1 SLPM</td>
<td>26.0 mbar</td>
<td>3.0 mbar</td>
</tr>
<tr>
<td>2 SLPM</td>
<td>80.0 mbar</td>
<td>10.0 mbar</td>
</tr>
<tr>
<td>5 SLPM</td>
<td>140.0 mbar</td>
<td>14.0 mbar</td>
</tr>
<tr>
<td>10 SLPM</td>
<td>450.0 mbar</td>
<td>35.0 mbar</td>
</tr>
<tr>
<td>20 SLPM</td>
<td>850.0 mbar</td>
<td>85.0 mbar</td>
</tr>
</tbody>
</table>

### DIMENSIONS

<table>
<thead>
<tr>
<th>Full-scale flow</th>
<th>Depth</th>
<th>Width</th>
<th>Height</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 SCCM – 2 SLPM</td>
<td>0.88”</td>
<td>2.70”</td>
<td>1.55”</td>
<td>0.45”</td>
<td>0.44”</td>
<td>0.27”</td>
<td>0.73”</td>
<td>0.27”</td>
<td>2.43”</td>
<td>0.23”</td>
</tr>
<tr>
<td>22.23mm</td>
<td>68.6 mm</td>
<td>39.4 mm</td>
<td>11.4 mm</td>
<td>11.1 mm</td>
<td>6.8 mm</td>
<td>18.6 mm</td>
<td>6.8 mm</td>
<td>61.8 mm</td>
<td>5.7 mm</td>
<td>≈ 116 g</td>
</tr>
<tr>
<td>5 – 20 SLPM</td>
<td>1.00”</td>
<td>3.31”</td>
<td>1.83”</td>
<td>0.58”</td>
<td>0.50”</td>
<td>0.47”</td>
<td>0.85”</td>
<td>0.47”</td>
<td>2.85”</td>
<td>0.52”</td>
</tr>
<tr>
<td>25.4 mm</td>
<td>84.0 mm</td>
<td>46.5 mm</td>
<td>14.8 mm</td>
<td>12.7 mm</td>
<td>12.0 mm</td>
<td>21.7 mm</td>
<td>12.0 mm</td>
<td>72.4 mm</td>
<td>13.1 mm</td>
<td>≈ 171 g</td>
</tr>
</tbody>
</table>

**Representative Examples**

[Images of BASIS 2 mass flow meters and controllers for 100 SCCM - 2 SLPM and 5 SLPM - 20 SLPM]