

# Technical Data for **MWB-Series Portable** Mass Flow Meters

**10 sccm** full scale through **100 SLPM** full scale

Standard specifications. Consult Alicat for available options.

| SENSOR PERFORMANCE  |  |
|---|--|
| Mass Flow Accuracy at calibration conditions <sup>1</sup> | ±0.75% of reading or ±0.1% of full scale, whichever is greater   |
| High Accuracy Option <sup>1</sup>                         | ±0.6% of reading or ±0.1% of full scale, whichever is greater  |
| Bidirectional Option <sup>1</sup>                         | No additional uncertainties  |
| Repeatability (2σ)  | ±(0.1% of reading + 0.02% of full scale)   |
| Flow Measurement Range                                    | 0.01–100% of full scale  |
| Temperature Sensitivity                                   | Mass flow zero shift: ±0.03% of full scale per °C from tare temperature<br>Mass flow span shift: ±0.01% of reading per °C from 25°C                        |
| Pressure Sensitivity                                      | Mass flow zero shift: ±0.01% of full scale per ATM from tare pressure<br>Mass flow span shift: ±0.1% of reading per atmosphere from calibration conditions |
| Operating Temperature Range                               | -10–60°C (expanded range available)  |
| Temperature Accuracy                                      | ±0.75°C  |
| Operating Pressure Full Scale                             | 60 PSIA (additional options available)   |
| Pressure Accuracy above 1 atm                             | ±0.75% of reading  |
| Pressure Accuracy below 1 atm                             | ±0.1 PSIA  |
| Totalizer Volume Uncertainty                              | ±0.5% of reading additional uncertainty  |
| Sensor Response Time                                      | <1 ms  |
| Typical Indication Response Time <sup>2</sup>             | 127 ms (user adjustable)   |
| Typical Warm-Up Time                                      | <1 s   |

**1** Stated accuracy is after tare under equilibrium conditions.

Extreme gas behavior (especially near state boundaries) can introduce additional flow uncertainties.

**2** Indication response time includes user adjustable averaging up to 255 ms.

| MECHANICAL                 |  |
|----------------------------|--|
| Minimum Operating Pressure | 11.5 PSIA common mode pressure (lower operating pressures available)<br>Differential pressure must exceed model pressure drop, see below for details   |
| Maximum Operating Pressure | Damage possible above 76.8 PSIA common mode pressure<br>Damage possible above 10 PSID differential pressure  |
| Ingress Protection         | IP40 (consult Alicat for weatherproofing options)  |
| Humidity Range             | 0–95%, non-condensing  |
| Wetted Materials           | 302 / 303 stainless steel, Viton®, glass-reinforced polyphenylene sulfide, alumina, glass, gold, silicon, heat-cured epoxy, heat-cured silicone rubber |

| COMMUNICATIONS                    |   |
|-----------------------------------|---|
| Digital I/O Options               | Serial over Micro-USB B   |
| Digital Data Update Rate          | 40 Hz at 19200 baud   |
| Display Update Rate               | 10 Hz   |
| Battery Life (contrast dependent) | Monochrome screen: 18 hours, 14 hours backlit<br>Color TFT: 8 hours |

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| FEATURES   |  |
|--|--|
| STP Reference Conditions                                     | 25°C and 1 atm (default), user configurable  |
| NTP Reference Conditions                                     | 0°C and 1 atm (default), user configurable   |
| Monochrome LCD or Color TFT Display with integrated touchpad | Simultaneously displays mass flow, volumetric flow, temperature, and pressure  |
| Gas Select™  | 98 user selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature and pressure ranges for highest accuracy. |
| COMPOSER™  | Allows 20 user definable gas mixes. Up to 5 constituent gases per mix, down to percentages of 0.01%.   |

| RANGE SPECIFIC SPECIFICATIONS |  |  |                                |
|-------------------------------|--|--|--------------------------------|
| Full scale flow               | Pressure drop at full scale flow venting to atmosphere | Process connections <sup>3</sup>                 | Mount tap size                 |
| 10 sccm to 20 sccm            | 0.07 PSID  | M5 female thread (10-32 compatible) <sup>4</sup> | 2× 8-32 UNC 0.175 in [4.45 mm] |
| 50 sccm to 5 SLPM             | 0.07 PSID  | 1/8" NPT Female                                  | 2× 8-32 UNC 0.350 in [8.89 mm] |
| 10 SLPM                       | 0.08 PSID  | 1/4" NPT Female                                  | 2× 8-32 UNC 0.350 in [8.89 mm] |
| 20 SLPM                       | 0.25 PSID  | 1/4" NPT Female                                  | 2× 8-32 UNC 0.375 in [9.53 mm] |
| 40 SLPM                       | 0.12 PSID  | 1/2" NPT Female                                  | 4× 8-32 UNC 0.375 in [9.53 mm] |
| 50 SLPM                       | 0.14 PSID  | 3/4" NPT Female                                  | 4× 8-32 UNC 0.375 in [9.53 mm] |
| 100 SLPM                      | 0.24 PSID  | 3/4" NPT Female                                  | 4× 8-32 UNC 0.330 in [8.38 mm] |

<sup>3</sup> Consult Alicat for available process connection options, such as:

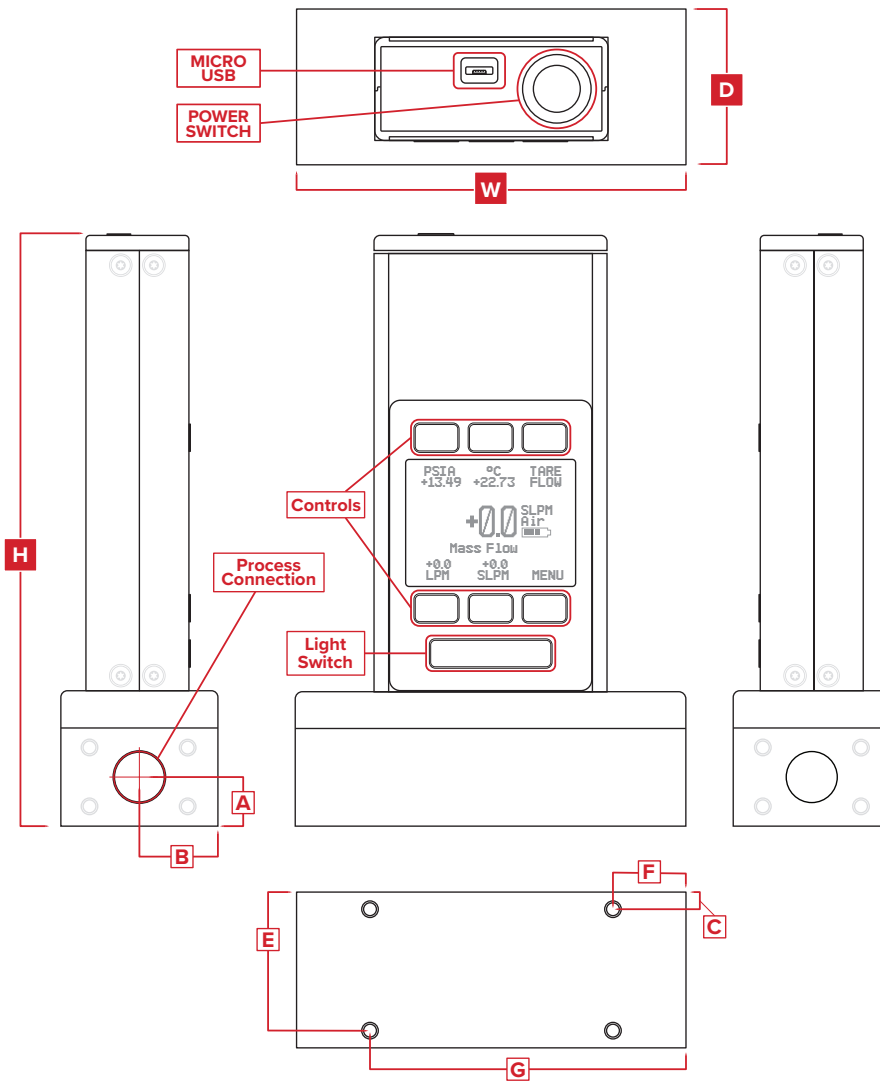
Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO, and VCR).

<sup>4</sup> Shipped with Buna-N O-Ring face seal to 1/8" female NPT fittings.

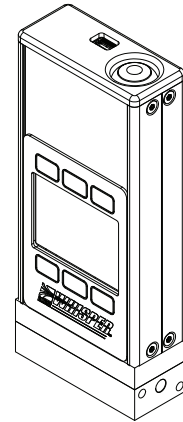
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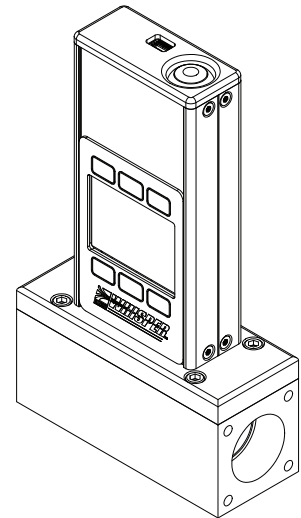
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## Representative Examples



10 SCCM



50 SLPM

## DIMENSIONS

| Full scale flow | Weight   | Height    | Width     | Depth    | A        | B        | C        | E        | F        | G        |
|-----------------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|
| 10–20 SCCM      | ≈ 1.0 lb | 5.543 in  | 2.375 in  | 1.050 in | 0.336 in | 0.525 in | 0.125 in | 0.925 in | 0.150 in | 2.225 in |
|                 | ≈ 0.5 kg | 140.79 mm | 60.33 mm  | 26.67 mm | 8.53 mm  | 13.34 mm | 3.18 mm  | 23.50 mm | 3.81 mm  | 56.52 mm |
| 50 SCCM–2 SLPM  | ≈ 1.2 lb | 5.713 in  | 2.375 in  | 1.050 in | 0.350 in | 0.525 in | 0.125 in | 0.925 in | 0.150 in | 2.225 in |
|                 | ≈ 0.5 kg | 145.11 mm | 60.33 mm  | 26.67 mm | 8.89 mm  | 13.34 mm | 3.18 mm  | 23.50 mm | 3.81 mm  | 56.52 mm |
| 5 SLPM          | ≈ 1.6 lb | 5.813 in  | 2.375 in  | 1.050 in | 0.350 in | 0.525 in | 0.125 in | 0.925 in | 0.150 in | 2.225 in |
|                 | ≈ 0.7 kg | 147.65 mm | 60.33 mm  | 26.67 mm | 8.89 mm  | 13.34 mm | 3.18 mm  | 23.50 mm | 3.81 mm  | 56.52 mm |
| 10 SLPM         | ≈ 2.6 lb | 5.853 in  | 2.625 in  | 1.050 in | 0.358 in | 0.525 in | 0.125 in | 0.925 in | 0.275 in | 2.350 in |
|                 | ≈ 1.2 kg | 148.67 mm | 66.68 mm  | 26.67 mm | 9.09 mm  | 13.34 mm | 3.18 mm  | 23.50 mm | 6.99 mm  | 59.69 mm |
| 20 SLPM         | ≈ 2.6 lb | 6.013 in  | 4.000 in  | 1.600 in | 0.500 in | 0.800 in | 0.175 in | 1.425 in | 0.750 in | 3.250 in |
|                 | ≈ 1.2 kg | 152.73 mm | 101.60 mm | 40.64 mm | 12.70 mm | 20.32 mm | 4.45 mm  | 36.20 mm | 19.05 mm | 82.55 mm |
| 40–100 SLPM     | ≈ 3.7 lb | 6.613 in  | 4.000 in  | 1.600 in | 0.800 in | 0.800 in | 0.175 in | 1.425 in | 0.750 in | 3.250 in |
|                 | ≈ 1.7 kg | 167.97 mm | 101.60 mm | 40.64 mm | 20.32 mm | 20.32 mm | 4.45 mm  | 36.20 mm | 19.05 mm | 82.55 mm |