

Technical Data for **Whisper Series** Mass Flow Meters

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

Standard specifications. Consult Alicat for available options.



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| SENSOR PERFORMANCE | |
|---|--|
| Mass Flow Accuracy at calibration conditions ¹ | ±0.75% of reading or ±0.1% of full scale, whichever is greater |
| High Accuracy Option ¹ | ±0.6% of reading or ±0.1% of full scale, whichever is greater |
| Bidirectional Option ¹ | 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 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 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 ² | 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) Differential pressure must exceed model pressure drop, see below for details |
| Maximum Operating Pressure | Damage possible above 80 PSIA common mode pressure 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 | |
|---------------------------------------|---|
| Analog I/O Options | 4–20 mA, 0–5 VDC, 1–5 VDC, 0–10 VDC |
| Digital I/O Options | RS-232 Serial by default RS-485 Serial, Modbus RTU (over RS-232 or RS-485), Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, Profibus |
| Electrical Connection Options | 6 pin locking, 8 pin mini-DIN, 8 pin M12, DB-9, DB-15 |
| Power Requirements ³ | 9–24 VDC, 40 mA (12–24 VDC, 80 mA if equipped with 4–20 mA or 0–10 VDC output) |
| Digital Data Update Rate ³ | 40 Hz at 19200 baud |
| Analog Data Update Rate | 1 kHz |
| Display Update Rate | 10 Hz |
| Analog Signal Accuracy | ±0.1% of full scale additional uncertainty |

- 3** Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

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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™ | 20 user definable gas mixes. Each mix may have up to 5 gases with 0.01% precision. |

| RANGE SPECIFIC SPECIFICATIONS | | | |
|-------------------------------|--|--|--------------------------------|
| Full scale flow | Pressure drop at full scale flow venting to atmosphere | Process connections ⁴ | Mount tap size |
| 10–20 sccm | 0.07 PSID | M5 female thread (10-32 compatible) ⁵ | 2× 8-32 UNC 0.175 in [4.45 mm] |
| 50 sccm–5 SLPM | 0.07 PSID | 1/8" NPT Female | 2× 8-32 UNC 0.300 in [7.62 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 | 4× 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 0.375 in [9.53 mm] |

⁴ Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO, and VCR).

⁵ Shipped with Buna-N O-Ring face seal to 1/8" female NPT fittings.

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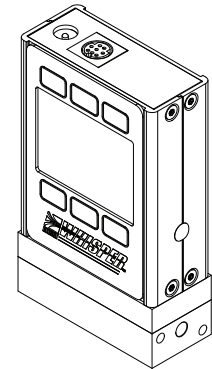
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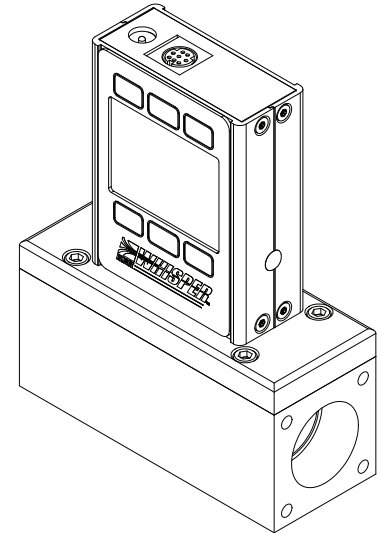


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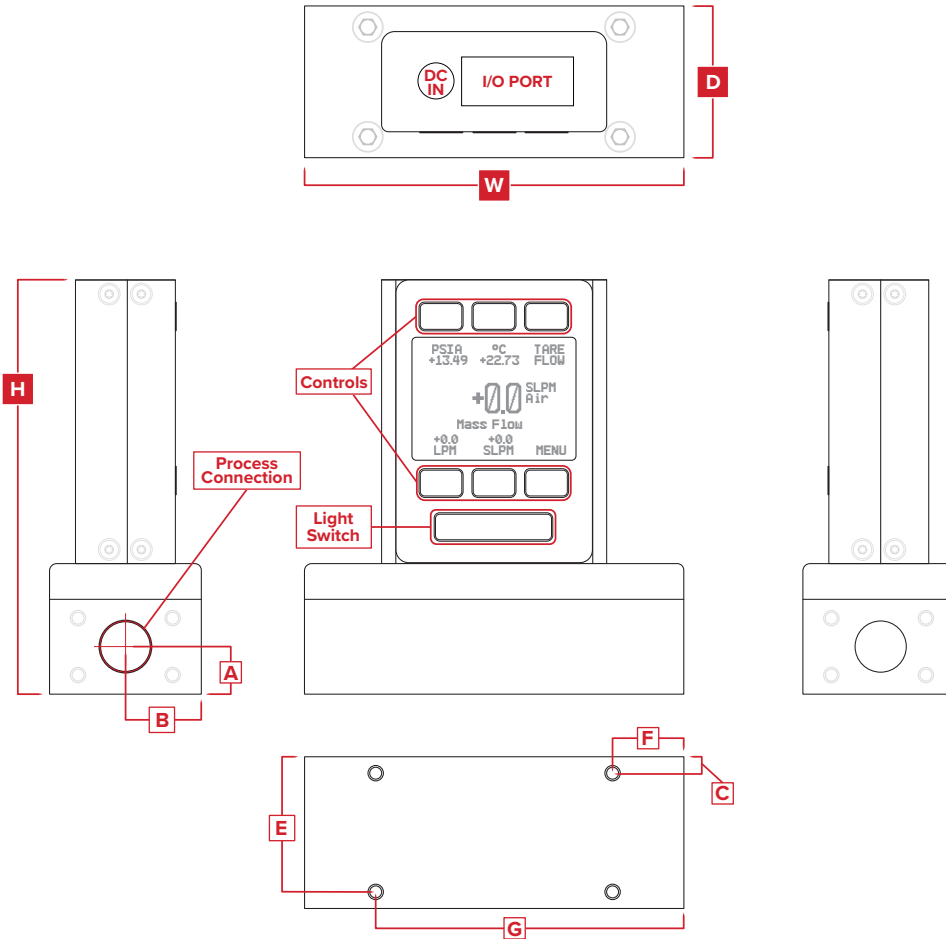
Representative Examples



10 SCCM



50 SLPM



DIMENSIONS

| Full scale flow | Weight | Height | Width | Depth | A | B | C | E | F | G |
|-----------------|----------|-----------|-----------|----------|----------|----------|----------|----------|----------|----------|
| 10–20 SCCM | ≈ 0.8 lb | 3.897 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 |
| | ≈ 0.4 kg | 98.98 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 | ≈ 1.0 lb | 4.067 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 | 103.30 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 | ≈ 1.4 lb | 4.167 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 |
| | ≈ 0.6 kg | 105.84 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 | ≈ 2.4 lb | 4.207 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 |
| | ≈ 1.1 kg | 106.86 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 | ≈ 2.4 lb | 4.367 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 |
| | ≈ 1.1 kg | 110.92 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 | ≈ 3.5 lb | 4.967 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 |
| | ≈ 1.5 kg | 126.16 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 |