

## Fewer controllers, better control:

fully configurable mass flow controllers and meters for bioprocessing

- Control via local display, analog, serial, or industrial communications
- Lock screen to protect process parameters
- Valve drive % for redundancy in preventative maintenance
- Change control & management processes for GMP environments
- USP Class VI certified elastomers & 316L stainless steel flow body; various materials options for sensor and valve per ASME BPE-2016
- Oxygen cleaning available
- ATEX Class 1 Div 2 available; IP66, IP67 & IS certifications coming soon
- Lifetime warranty on all devices



Bio-Series and MC-Series mass flow meters and controllers share hardware & software cores and are both fully configurable. Bio-Series devices come preconfigured for bioprocessing.

### Standard range specifications

- Accuracy:** Greater of  $\pm 0.6\%$  of reading or  $\pm 0.1\%$  of full scale
- High accuracy:** Greater of  $\pm 0.5\%$  of reading or  $\pm 0.1\%$  of full scale
- 2 $\sigma$  repeatability:**  $\pm (0.1\% \text{ of reading} + 0.02\% \text{ of full scale})$
- Control range:** 0.01–100% of full scale, with control on PID loop or flow setpoint
- Warmup time:** < 1 second
- Response time:** 50 milliseconds

### Standard full flow ranges

|          |          |          |           |
|----------|----------|----------|-----------|
| 0.5 SCCM | 50 SCCM  | 5 SLPM   | 500 SLPM  |
| 1 SCCM   | 100 SCCM | 10 SLPM  | 1000 SLPM |
| 2 SCCM   | 200 SCCM | 20 SLPM  | 2000 SLPM |
| 5 SCCM   | 500 SCCM | 50 SLPM  | 3000 SLPM |
| 10 SCCM  | 1 SLPM   | 100 SLPM | 5000 SLPM |
| 20 SCCM  | 2 SLPM   | 250 SLPM |           |

# Bio-Series Gas Control for Upstream Processing

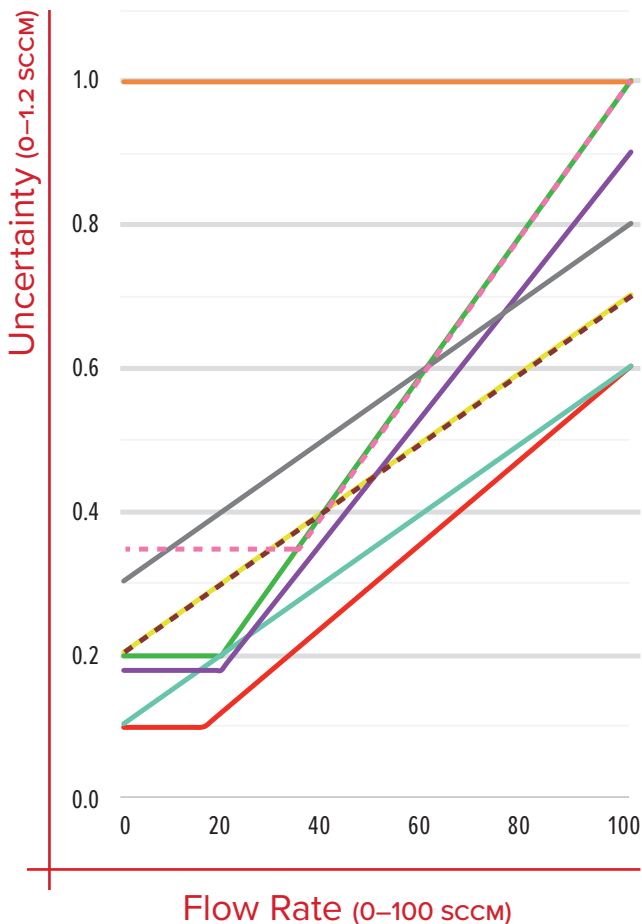
MASS FLOW CONTROL AND MONITORING FOR BIOREACTORS & FERMENTERS

## Minimal spares inventory for full system coverage:

Switch between air, O<sub>2</sub>, CO<sub>2</sub> & N<sub>2</sub> without requiring recalibration and with repeatable control to 0.01% of full scale.

Alicat mass flow controllers can be tuned from 50–125% of body size and read to 28% above tuned range. Alicat controllers outperform competitor products in accuracy and repeatability at high turndown and in temperature and pressure insensitivity. *Data from published specs as of April 2021.*

- ALICAT MC Series
- AALBORG DPC 17
- AXETRIS MFC 21xx -A
- BRONKHORST EL-FLOW Prestige
- BROOKS SLAMF
- - - BROOKS GF40
- - - MKS MF1
- SIERRA SmartTrak 100
- VOEGTLIN Red-Y High Performance



## Additional Uncertainty in Flow Measurement (% at 100 SCCM)

