



- **Defender 520**
Enhanced Volumetric Primary Flow Standard
- **Defender 510**
Volumetric Primary Flow Standard



Bios

Driving a Higher Standard
in Flow MeasurementSM



Bios meets the highest quality assurance standards for gas flow measurement uncertainty, including industry-leading ISO 17025, ANSI Z-540 and NIST 150 laboratory accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology (NIST).

Bios Defender 500 Series

The Defender 500 Series delivers everything you love about Bios DryCal® Technology in a new line of true primary standards engineered for the occupational health and safety industry.

Turn the Defender on. Connect it to your pump. Take measurements. It's that simple.

Instantly calibrate your air samplers using Quick Start – there's no preparation involved, no messy soap bubble solutions. Or, set your Defender to take hands-free continuous measurements while you quickly set the flow rate on your pumps. Defender's many user-selectable options makes customizing your calibrations easy, giving you exactly what you need, in the format you prefer.

Enhance Your Audit Trail with the Defender 520

Protecting lives is important work. If an enhanced audit trail is what you need to get the job done right, the Defender 520 "three-in-one" primary standard gives it to you – automatically and without the need for additional instrumentation. While you calibrate your pumps, Defender 520 simultaneously records the temperature and pressure conditions of the calibration process – convenient, and defensible.

Optimizer Software Suite

Take the calibration process one step further and use Defender's Windows-based Bios Optimizer 110 software (included). Bios Optimizer 110 establishes communication with your Defender, downloads calibration data in real time, displays and graphs it on your PC's screen and stores it to a text file – no configuration necessary. Even better, upgrade to Bios Optimizer 120 for the ultimate audit trail – a comprehensive pump database, complete with pump profiles, printable pre- and post-calibration reports, search features and more.



Defender 520

Enhanced Volumetric Primary Flow Standard

Defender 510

Volumetric Primary Flow Standard

With Proven DryCal® Technology.






Engineered for the occupational health and safety industry.

Flexible Ways of Working

Calibrate pumps under suction when sampling through a filter or sorbent tube, or take measurements under positive pressure when calibrating pumps to fill gas sample bags for collecting gas and vapor samples. Take measurements one at a time, or take continuous measurements using the hands-free Continuous and Burst modes including user-selectable group averaging from 1 to 100 measurements. To track pump stability over time, set the time between measurements from 1 to 60 minutes and log your readings into your PC over a typical run period. Or, decide how to view your data — select your preferred measurement units, and use the handy zoom feature (Defender 520 only) to display the size and detail that's right for you.

Flow Ranges	Low (L) 5 mL – 500 mL/min Medium (M) 50 mL – 5,000 mL/min High (H) 300 mL – 30,000 mL/min
Accuracy	1% Volumetric
Size	Small enough to fit easily in your hand; slim enough to slide into a briefcase or tote
Weight	29 oz / 820 g
Dimensions (H x W x D)	5.5 x 6 x 3 in / 140 x 150 x 75 mm

User-Selectable Measurement Units	
Volumetric Flow	mL/min L/min cc/min cf/min
Pressure (Defender 520 only)	mmHg PSI kPa
Temperature (Defender 520 only)	°C °F

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Reliable
 15 years of Proven DryCal® Technology
- 
Accurate
 Backed by ISO 17025; NVLAP accredited
- 
Portable
 Lightweight and impact-resistant
- 
Simple
 Quick Start operation and
 no messy soap solutions
- 
Streamlined
 Bios Optimizer software transfers
 calibration data directly to any Windows-
 based PC using built-in serial port

Defender 500 Series Specifications	
Approximate Time per Reading:	1-15 seconds
Gas Compatibility:	Use with non-corrosive, non-condensing, non-combustible gases, less than 70% humidity
Flow Modes:	Suction or Pressure
Measurement Cell Style:	Integrated
Temperature and Pressure Sensors:	In the flow stream Press.: 3.5 mmHg (typical), 7.0 mm (max); Temp.: 0.8° C (typical), 1.3° C (max)
Reading Styles:	Single (manual), Continuous or Burst, with averaging function user-selectable from 1 to 100 measurements
AC Adapter/Charger:	12V DC, >250ma, 2.5 mm, center positive
Battery System:	6V rechargeable, sealed lead-acid, 6-8 hrs typical operation
Battery Operational Time (5 cycles/min):	3 hrs backlight on, 8 hrs backlight off
Pressure and Suction Fittings:	¼" ID Hose Barb
Warranty:	1 year; battery 6 months
Storage Temperature:	0-70° C
Ambient Humidity:	0-70%, non-condensing
Operating Pressure (Absolute):	15 PSI
Display:	Backlit graphical LCD
Data Port (for use with Optimizer software):	Serial (RS-232)
Data Cable (for use with Optimizer software):	1 meter (Defender Data Port to PC serial port)
Protective Case:	Soft side or Pelican case available
RoHS- and CE-compliant	

Backed by ISO 17025 and our Proven DryCal® Technology, the Defender 500 Series makes it easier than ever to satisfy ISO, TQM or occupational health and safety management systems and comply with critical international standards, such as ISO 9001 or OHSAS 18001.



The Bios facility in Butler, N.J., (pictured above) is the only NVLAP accredited ISO 17025 laboratory serving the occupational health and safety industry. With the lowest gas flow measurement uncertainties of any commercial laboratory, Bios provides you with the legal protections and peace of mind valued in today's litigious business environment.



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