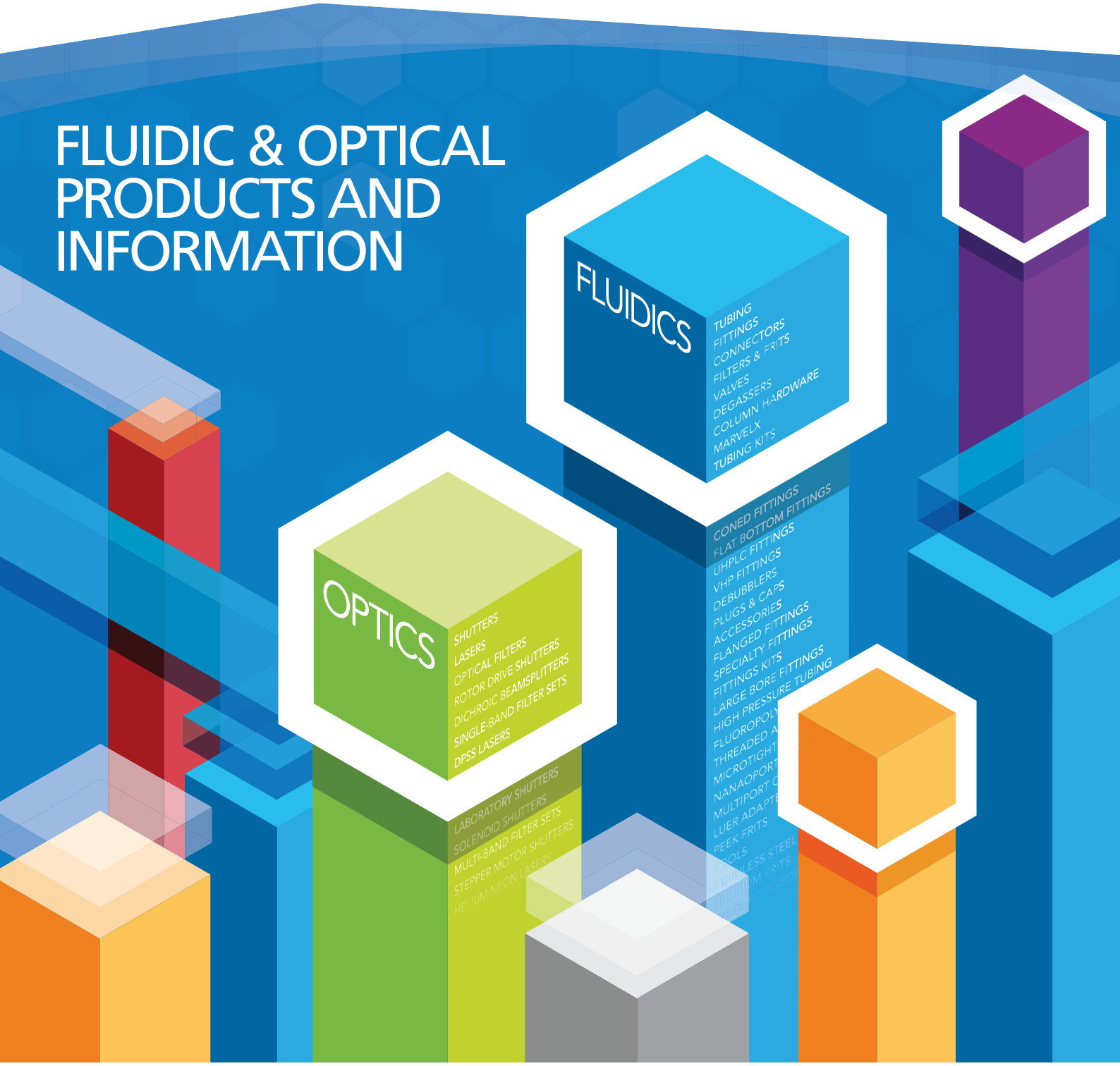
POSTNOVA

FLUIDIC & OPTICAL PRODUCTS AND INFORMATION



IDEX HEALTH & SCIENCE

Intelligent Solutions for Life™

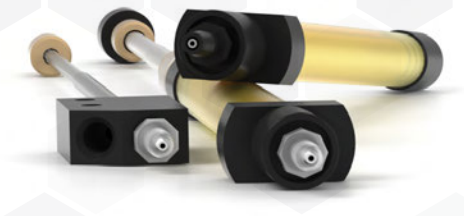
Fluidics | Optics | Consumables | Assemblies

www.postnova.com

Degassers

Degassers improve fluidic instrument precision and reliability by removing dissolved gases from fluids before they outgas and form problem causing bubbles. Three main types of bubble removing products are available. AF based degassers offer the widest range of chemical compatibility and are used to eliminate retention shifts and baseline fluctuations. Silicone based degassers offer the highest flow rate capabilities for water based systems such as diagnostic and life science instrumentation to improve dispense accuracy and reliability. Poridex based products provide rapid bubble remove for locations where bubble introduction cannot be avoided.

FLUIDICS



Debubblers

APPLICATION NOTE

- Liquid handling
- IVD
- HPLC/UHPLC
- O_2 and CO_2 removal

In medical analyzers, bubbles interfere with critical volumetric reagent dispenses and cause sample failures, wasting time and money. Because bubbles adhere to nearly every part of a dispensing system, high velocity or induced turbulent flow is often used to displace and discharge bubbles from the flow stream and into a waste area. These alternative processes waste reagents and are time consuming, unpredictable, and may additionally require designing the system to recognize bubbles are present. Regardless of how the systems are designed, aqueous systems will always be subject to the laws of physics that cause out-gassing during changes in fluid temperature, pressure, or chemicals mixture. In fluid applications like these, debubblers are the optimal solution to capture and remove formed bubbles to prevent sample dispense inaccuracies, and degassing is ideal to prevent downstream bubble formation from recurring.

Remove Bubbles, Dissolved Gas, or Both!

Dissolved gases and bubbles in system liquids cause dispense volume anomalies in many instruments, negatively affecting both dispense precision and analytical accuracy. Now you have a choice of components for actively removing bubbles with or without also removing dissolved system gases. Online Vacuum Degassing offers operating convenience, high efficiency and low operating costs compared to other common degassing technologies.

Debubbler/Degasser

Combines Vacuum Degassing with Active Bubble Removal

- Improves instrument performance — reduces downtime due to bubble formation.
- Fewer false positives due to reduction of partial reagent dispenses.
- Easily integrates into any pump, degassing tray, or stand-alone degassing application.
- Designed for use with water based solutions with no surfactants. Active degassers are recommended for other solutions.

Active Debubbler

Remove Bubbles in Fluid Stream Before or After the Pump

- Improves instrument performance — reduces downtime due to bubble formation.
- Fewer false positives due to reduction of partial reagent dispenses.
- Easily integrates into any pump, degassing tray, or stand-alone degassing application.

Transfer-Line Degasser

Removes Dissolved Gases During Fluid Transfer

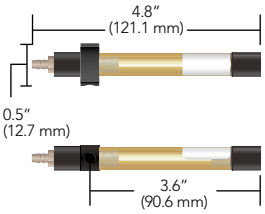
- Eliminates baseline fluctuations for improved detector sensitivity.
- Coaxial design reduces number of connections, improves reliability.
- Single lumen design increases degassing reliability.

BENEFITS

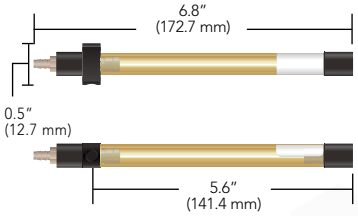
	ACTIVE DEBUBBLER	DEBUBBLER/ DEGASSER	TRANSFER-LINE DEGASSER
Perfect for applications that require dissolved gas like oxygen for reaction kinetics	✓		
Improves dispense precision by capturing and removing bubbles	✓	✓	
Eliminates false positives and reduces reagent waste by improving instrument performance	✓	✓	
Easily integrates into fluidic path	✓	✓	✓
Creates stable instrument performance across system and environmental fluctuations	✓	✓	✓
Prevents the formation of bubbles downstream of the degasser		✓	✓
Eliminates fluctuations for improved detector sensitivity and accuracy by preventing bubble formation		✓	✓
Improves fluidic system reliability because coaxial design reduces the number of connections			✓
Flexible design can be implemented as transfer line in new instruments or existing instruments that don't have space available			✓
Minimizes fluidic system internal volumes to reduce reagent cost			✓

Debubblers (Cont.)

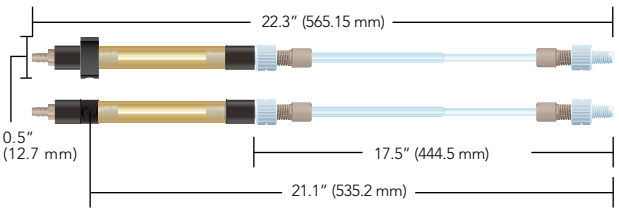
Overall Dimensions *Please note: These drawings are not actual size.*



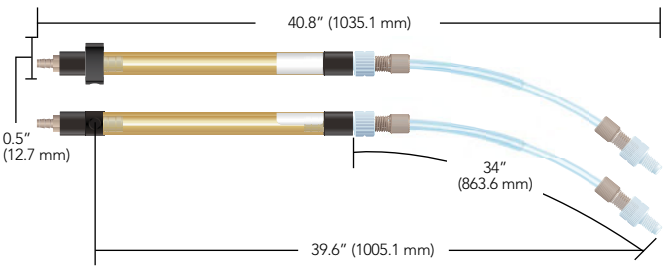
9000-1540
Active Debubbler, 2.5 mL



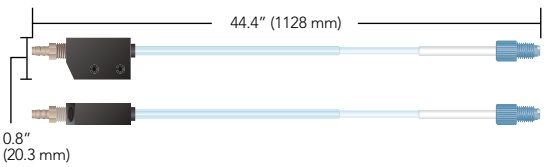
9000-1541
Active Debubbler, 5 mL



9000-1544
Debubbler / Degasser, 2.5 mL



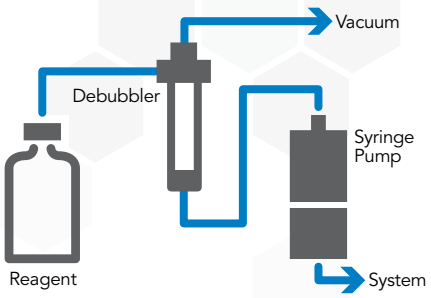
9000-1545
Debubbler/Degasser, 5 mL



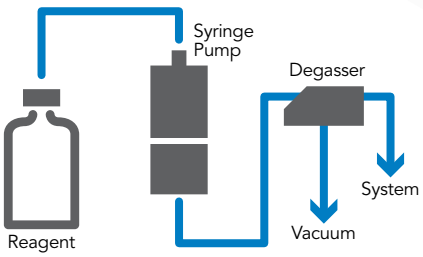
9000-1549
Transfer-Line Debubbler, 1.1 meter

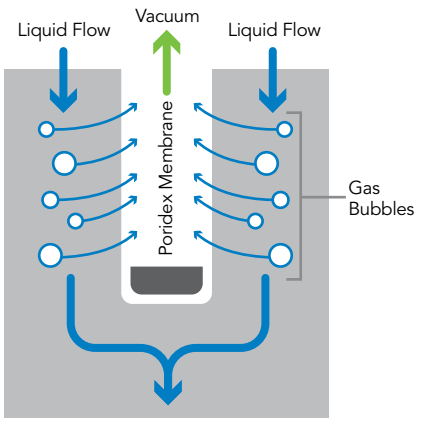
IMPLEMENTATIONS

Typical Debubbler Implementation



Transfer-Line Degasser Implementation





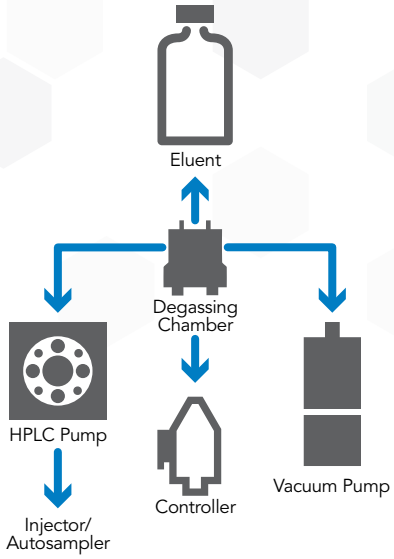
Gas bubbles are actively removed from a flowing liquid stream by vacuum via the PORIDEX membrane.

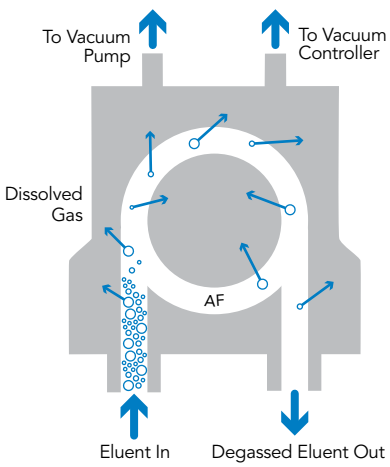
SPECIFICATIONS (ALL PLATFORMS)

	ACTIVE DEBUBBLERS	DEGASSER/DEBUBBLERS	200 KPA (30 PSI) @ 25 °C
Bubble Removal (volume of air removed/min @ 10 mL/min H_2O)	Up to 30 cc	Up to 30 cc	N/A
Degassing Efficiency† @ 1 mL/min H_2O	N/A	2.5 mL size: 36% O_2 removal, 5.0 mL size: 55% O_2 removal	< 4 ppm dissolved O_2 at 5 mL/min
Membrane Material	PORIDEX®	PORIDEX	PORIDEX
Wetted Materials	PORIDEX, Polyolefin, FEP, ETFE, Ultem®	PORIDEX, Polyolefin, FEP, ETFE, Ultem	PORIDEX, Polyolefin, FEP, ETFE
Solvent Compatibility	Solutions > 50% aqueous. Not compatible with detergent concentrations > 0.05%.	Solutions > 50% aqueous. Not compatible with detergent concentrations > 0.05%.	Solutions > 50% aqueous. Not compatible with detergent concentrations > 0.05%.
Standard Bubble Trap Volume	2.5 / 5.0 mL	2.5 / 5.0 mL	N/A
Transfer-Line Volume	N/A	2.5 / 5.0 mL	< 4 mL
Max. Operating Pressure	200 kPa (30 psi) @ 25 °C	200 kPa (30 psi) @ 25 °C	200 kPa (30 psi) @ 25 °C
Max. Operating Temperature	40 °C	40 °C	40 °C
Recommended Vacuum Level	Minimum 16 kPa absolute	Minimum 16 kPa absolute	Minimum 16 kPa absolute
Liquid Connection	1/4-28 fitting system	1/4-28 fitting system	1/4-28 fitting system
Vacuum Connection	Tubing vacuum port(s) for 1/8" (3 mm) ID elastomeric tubing	Tubing vacuum port(s) for 1/8" (3 mm) ID elastomeric tubing	Tubing vacuum port(s) for 1/8" (3 mm) ID elastomeric tubing
Pressure Drop	0.8 mm Hg / mL / min (assumes laminar flow and viscosity of 1 cP)	0.8 mm Hg / mL / min (assumes laminar flow and viscosity of 1 cP)	0.8 mm Hg / mL / min (assumes laminar flow and viscosity of 1 cP)

† *Debubbling / degassing efficiency can be optimized based on flow rate, fluid to be degassed, and gas to be removed.*

TYPICAL DEGASSER IMPLEMENTATION





Dissolved gases are actively removed from a flowing liquid stream by vacuum via the IDEX Health & Science AF® membrane.

APPLICATION NOTE

Why Degas Your Mobile Phase?

Dissolved air in HPLC mobile phases can result in flow rate instability and baseline disturbance.

Flow rate instability: Non-degassed mobile phase can outgas in the pump head, causing bubbles to be formed and trapped inside the head or check valves. These bubbles can cause flow disturbances and pressure fluctuations, resulting in flow rate instability.

Baseline disturbance: As the mobile phase passes through the column, it experiences a large pressure drop. Non-degassed mobile phase can outgas due to this pressure differential, causing air bubbles to form. Air bubbles passing through or lodging in the flow cell cause detection disturbances, exhibited as baseline noise.

Why Use a Degassing System?

Helium sparging is a common means of degassing HPLC solvents. This method has its drawbacks, however. Helium tanks are expensive and bulky, and solvent backup and contamination are concerns. In addition, helium sparging can change the composition of a premixed mobile phase over time, due to the difference in the evaporation rates of mobile phase components.

In contrast, the IDEX Health & Science Degassing System has none of these drawbacks, and it is extremely fast and efficient at removing dissolved gases — more efficient than helium sparging or PTFE-based degassing systems.

Tubing Connections

We recommend ETFE tubing (page 27) be used to limit regassing of mobile phase between the degasser and your pump. ETFE is recommended because of its superior impermeability to gases (compared to PTFE, FEP, and PFA tubing). Applicable flangeless fittings for 1/8" OD tubing are found on page 45.

GPC and HFIP Applications

Standard degassing chambers, with PEEK bulkhead unions, are not recommended for GPC applications or for use with HFIP (hexafluoroisopropanol). Special GPC "hardened" versions are available. Please contact us for more information.

NOTE

Degassing tubing is flexible and therefore can be coiled to shorten the overall length or used to transfer the fluid within an instrument to the next desired location.

Debubblers

Part No.	Description	Standard Bubble Trap Size	Transfer Line Length	Internal Volume	Max Bubble Capacity	Qty.
DEBUBBLER SERIES – AVAILABLE STANDARD CONFIGURATION						
9000-1540	2.5 mL Active Debubbler	2.5 mL	—	2.5 mL	2.5 mL	ea.
9000-1541	5 mL Active Debubbler	5 mL	—	5 mL	5 mL	ea.
9000-1544	2.5 mL Debubbler/Degasser	2.5 mL	17.5" (444.5 mm)	2.5 mL in transfer line + 2.5 mL in bubble trap	2.5 mL	ea.
9000-1545	5 mL Debubbler/Degasser	5 mL	34" (863.6 mm)	5 mL in transfer line + 5 mL in bubble trap	5 mL	ea.
9000-1549	1.1 m Transfer-Line Degasser	—	1.1 m (43")	4 mL	N/A	ea.

Full Stand Alone Degassing Systems

- Analytical and Prep scale models
- Ultra-high degassing efficiency
- Low volume, easy to prime
- Patented control eliminates baseline fluctuations
- Inert flow path
- 5+ year lifetime

Our Stand-Alone MINI and Prep-Scale HPLC vacuum degassing systems are high-efficiency, in-line modules that remove dissolved gases from the mobile phase. Their unique design assures reliable continuous operation and the highest level of performance available without the need for helium sparging. Up to five solvent lines may be degassed simultaneously by one unit.

ZHCR® Control with Built-in Test Diagnostics

- Microcontroller self-test vacuum sensor validation on power-up
- Continuous vacuum system monitoring to ensure optimum operational conditions are maintained
- Vacuum system fault detection and shutdown function indicators

AF / ZHCR Degassing Technology

Flow-through vacuum degassing chamber with a single amorphous perfluorinated copolymer (IDEX Health & Science AF®) degassing membrane, enabling degassing efficiency 50 times that of PTFE.

The ZHCR (Zero Hysteresis / Constant Run) vacuum pump employs a patented closed-loop, micro-stepping rpm control strategy permitting the pump to run with continuously variable speed, providing quick pull-down at high rpm, and then sustaining a consistent vacuum level at low rpm.

Fluctuations in detector baseline due to changes in vacuum level are eliminated by not having to repeatedly stop and start a single-speed pump. This also greatly reduces wear and noise.

The brushless motor enables quiet operation and is appropriate for environments where solvent vapors may be present.

SPECIFICATIONS

STAND-ALONE DEGASSING MODULES	
Maximum Number of Degassing Channels	5
Degassing Efficiency† @ 1 mL / min MeOH	> 70% O_2 Removal
Membrane Material	IDEX Health & Science AF
Other Wetted Materials	PEEK, PPS(GF), PTFE(GF), FEP
Solvent Compatibility	Not compatible with fluorinated solvents. Special version available for GPC solvents.
Flow Path ID[1]	1.14 mm (0.045")
Internal Volume	480 µL (standard)
Maximum Pressure (@ 25 °C)	0.5 MPa (70 psi)
Pressure Drop	0.18 kPa/mL/min

† Degassing efficiency can be optimized based on flow rate, fluid to be degassed, and gas to be removed.
[1] Standard ID; other sizes available.

NOTE

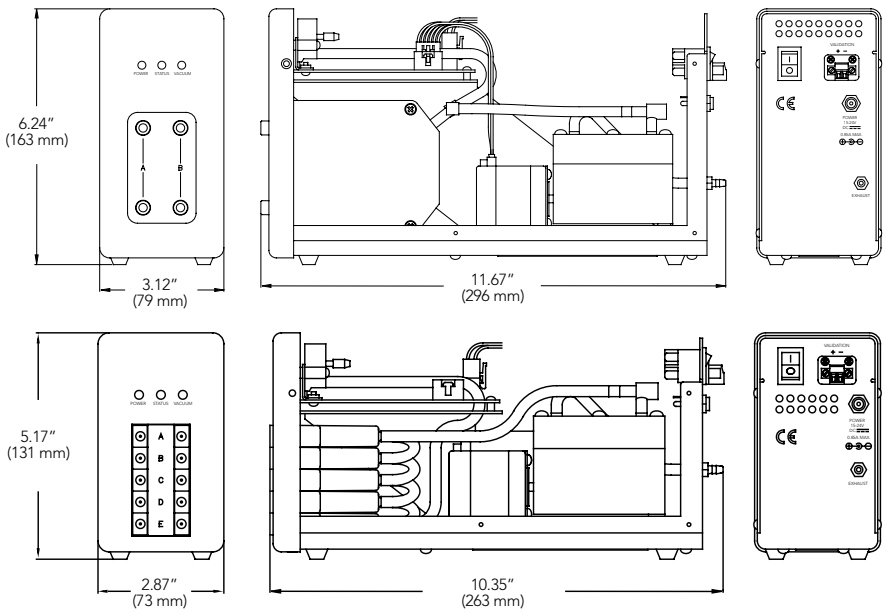
Power Requirement

Input Power required with AC Adapter (included): 100 to 240 V AC (±10%), 1A, 50 to 60 Hz (±3 Hz). Four interchangeable wall sockets are supplied with the AC Adapter: North America/Japan, U.K., Continental Europe, Australia.

CE Certification

This product has been certified under the following CE testing standards: EN61326-1; EN55011; EN61300-3-2; EN61300-3-3, & EN61010-1.

Overall Dimensions



Full Stand Alone Degassing Systems

Part No.	Number of Channels	Channel Volume	Max HPLC Gradient Flow Capability	Pressure Drop[E]	Degassing Flow Path ID	Qty.
STAND ALONE MINI VACUUM DEGASSING SYSTEMS — AVAILABLE CONFIGURATIONS[A]						
0001-6500	2	480 µL	2.0 mL/min[C]	0.18 kPa/mL/min	0.045″ (1.14 mm)	ea.
0001-6501	4	480 µL	2.0 mL/min[C]	0.18 kPa/mL/min	0.045″ (1.14 mm)	ea.
STAND ALONE PREP SCALE VACUUM DEGASSING SYSTEMS — AVAILABLE CONFIGURATIONS[A, B]						
0001-6482	2	8.4 mL	20 mL/min[D]	0.04 kPa/mL/min	0.065″ (1.65 mm)	ea.
0001-6484	2	13.8 mL	40 mL/min[D]	0.06 kPa/mL/min	0.065″ (1.65 mm)	ea.

A. Custom configurations are available. Consult us for your own OEM solution to your specific application.
B. The standard prep scale chambers are not recommended for GPC applications or for use with HFIP (hexafluoroisopropanol).
C. The flow rates given are for a gradient mixture of 50/50 MeOH/H_2O, with a typical low pressure gradient mixing valve. Higher flow rates are possible with high pressure mixing.
D. The flow rates given are for a gradient mixture of 60/40 MeOH/H_2O, with a typical low pressure gradient mixing valve. Higher flow rates are possible with high pressure mixing.
E. Estimated tubing pressure per unit change in flow assuming laminar flow with a viscosity of 1.0 cP

Contacts

Worldwide Locations and Offices

EMEAI

Postnova Analytics GmbH
Max-Planck-Strasse 14
86899 Landsberg, GERMANY
Tel: +49 8191 985 688-0
Fax: +49 8191 985 688-99
info@postnova.com
www.postnova.com

UNITED KINGDOM

Postnova Analytics UK Ltd.
Unit 64, Malvern Hills Science Park,
Malvern, Worcestershire
WR14 3SZ, UK
Tel: +44 1684 585167
info.uk@postnova.com
www.postnova.com

NORTH AMERICA

Postnova Analytics Inc.
230 South, 500 East, Suite 110
Salt Lake City, UT 84102, USA
Tel: +1 801 5212-004
Fax: +1 801 5212-884
info.us@postnova.com
www.postnova.com

SCANDINAVIA

Postnova Northern Europe
P.O Box 44
01721 Vantaa, FINLAND
Tel: +358 9 854 551-0
Fax: +358 9 854 551-51
norlab@norlab.fi
www.norlab.fi