

VACUUBRAND® Vacuum Products

A complete range of vacuum solutions

VACUUBRAND has been a pioneer in laboratory vacuum for over 40 years, and brings convenience, performance, reliability, and economy to laboratory vacuum supply. VACUUBRAND® pump-control options also offer distinct productivity advantages compared with uncontrolled pumps, central vacuum system, and competitive vacuum products.

Being the only manufacturer that manufactures nothing but vacuum technology for laboratory applications gives VACUUBRAND a unique perspective on the market. It gives them the ability to make “no compromise” application-specific solutions, for rotary evaporators, vacuum ovens, gel dryers, biofluid aspiration and more. Why choose a VACUUBRAND® pump instead of an oil-sealed pump or a competitive oil-free pump?

- **Oil-Free and Chemically Resistant without Compromise:** VACUUBRAND® chemistry-design diaphragm pumps combine dry operation, fluoropolymer flowpaths, and distinctive engineering for excellent corrosion-resistance and low maintenance.
- **Whisper Quiet:** These are among the quietest diaphragm vacuum pumps available, operating at decibel levels comparable to a quiet conversation.
- **Lower Lifetime Cost:** The high flow rates, corrosion-resistant flow path materials, reliability (typical service intervals well in excess of 15,000 working hours) and durability of VACUUBRAND® pumps can save thousands of dollars per pump per year in operation and maintenance costs. Visit www.brandtech.com for details.
- **High Performance:** Working vacuum flow rates of VACUUBRAND® pumps are up to 100% better than competitive dry pumps for faster evaporative applications and higher productivity.

PC3001 VARIO^{PRO}

Quiet. Powerful. Low Maintenance. Unbeaten Economy.

Become a Vacuum Expert: A Short Course in Lab Vacuum

How deep of a vacuum do I need?

Vacuum pump specifications are typically stated as ultimate vacuum and flow rate. The ultimate vacuum required is task dependant. Most laboratory applications operate best in the range of 1-100mbar. For filtration, liquid aspiration and other pressure-differential (“fluid movement”) applications, 100mbar is sufficient, achieving 90% of the possible “force” i.e. potential pressure difference. An ultimate vacuum of 7mbar is effective for rotary evaporation of most solvents more volatile than water. For challenging applications like rotary evaporation of very high temperature boiling point solvents or centrifugal concentration of high boilers like DMF, a 2mbar ultimate vacuum is needed. VACUUBRAND® oil-free diaphragm pumps can do the job for all the above applications. VACUUBRAND® oil-free pumps are whisper quiet, economical and environmentally friendly, requiring no costly oil changes, or cold traps to protect the pump. A good rule of thumb is “never use an oil pump when an oil-free pump will do the job.” Freeze drying requires deeper vacuum typically referred to as “fine vacuum” in the range of 10^{-3} -1mbar. Rotary vane or hybrid pumps are required for these applications.

Control

Gauges and controllers enable you to monitor and manage your laboratory vacuum applications. Whether you simply need to monitor your application, provide on/off control, need flow rate control or require precise adaptive vacuum control, VACUUBRAND offers mercury free gauges and controllers, as well as integrated systems to meet your requirements.

What about “flow rate?”

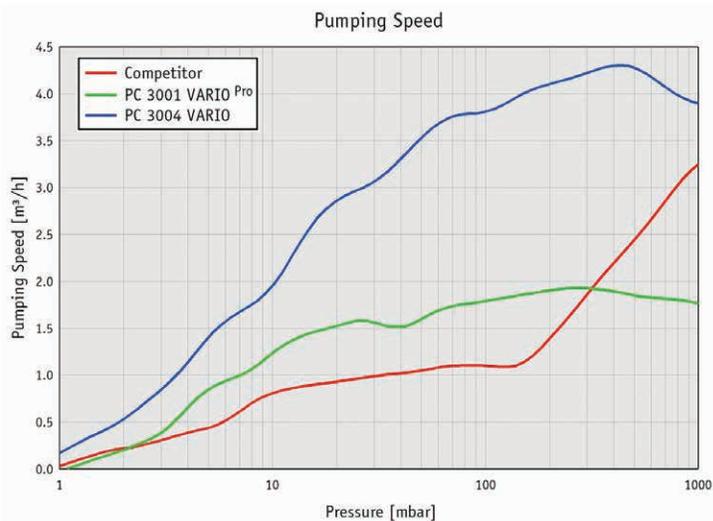
The flow rate required for an application is determined by the application, system leakage and your time requirements. The “free air capacity” (also known as displacement) specification of a vacuum pump represents its peak ability to move vapor at atmospheric pressure. It is important to note that actual flow rate decreases from the displacement specification to zero as a pump reaches its ultimate vacuum. A pump’s flow curve illustrates its working flow rate through its operating range and can be useful for the selection of the correct pump for an application (see figure to the right). If a pump can’t provide enough flow under vacuum, the application will proceed more slowly or in some cases not at all. VACUUBRAND® pumps are designed to retain more flow rate throughout their working range, and only drop off sharply close to their ultimate vacuum.

Solvent Recovery

Catchpots and condensers protect the pump and your lab atmosphere from application vapors. An inlet catchpot captures condensed vapors from the vacuum line before they degrade pump performance. The outlet condenser (cooled by external means) and catchpot provide near 100% recovery of vapors that pass harmlessly through the pump’s corrosion-resistant fluoropolymer flowpath, typically eliminating the need for a cold trap to protect the pump or environment. For more details on the economic benefits of eliminating cold traps, see page 76. Depending on the temperature of your application and the vapor pressure of your solvent, you may not even need a condenser, an outlet catchpot may be sufficient.

Corrosion Resistance

Evaporative and other corrosive applications can be very destructive to ordinary vacuum pumps. Conventional rotary vane pumps require frequent oil changes and cold traps to minimize the damaging effects of corrosive chemical vapors. VACUUBRAND® oil-free chemistry-design pumps incorporate a fully chemistry resistant fluoropolymer flow path for excellent corrosion resistance and low maintenance. For non-corrosive, non-evaporative applications, VACUUBRAND also offers a comprehensive line of high-performance Aluminum-FKM diaphragm pumps.



New & Innovative Vacuum Products



MZ1C Vacuum Pump

MZ1C

For small scale evaporative applications using volatile solvents, the new MZ1C is an excellent choice. It provides 12 millibar (9 torr) ultimate vacuum and 0.5cfm (14lpm) free air capacity in a functional, space saving package. The MZ2C provides a well-proven and extraordinarily long diaphragm life time in excess of 15,000 operating hours. It is whisper quiet with low vibration. The functional, space saving and innovative design with readily accessible top mounted power switch ensures convenient and quick operation. It features robust PTFE diaphragms and valves for optimal chemical resistance with a full fluoropolymer flowpath, for a complete chemistry-design pump. Suitable for gel dryers and small rotary evaporators when vacuum control and solvent condensation is not an issue.

CVC3000 detect

The CVC3000 *detect* vacuum controller adds performance to any stand-alone laboratory diaphragm vacuum pump – from VACUUBRAND, or any other manufacturer. Integrated with a high performance solenoid valve for ease of use, the new *detect* mode will find the first boiling point in a rotary evaporator automatically, and then provide 2-point control. Additionally, the CVC3000 *detect* allows programming of multistep programs for standardized routines. A simple jogwheel interface, and menus in fourteen different languages allow easy use by anyone in the lab. Available in a benchtop version, and a version that mounts to lab frames and ring-stands; both come with a universal power supply standard.

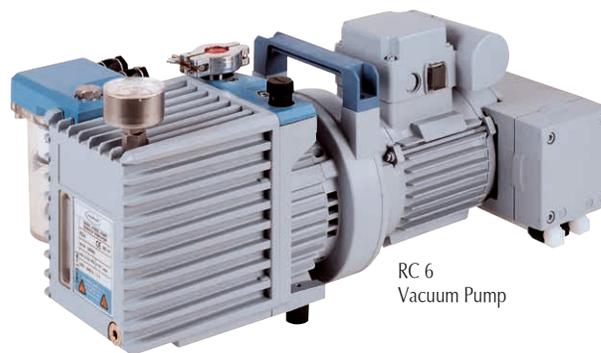


ORDERING INFORMATION

Description	Cat. No.	2014 List Price
NEW! MZ1C	724103	\$1091.00
NEW! CVC3000 <i>detect</i> benchtop version, 100-230V, 50-60Hz	2614860	3,285.00
NEW! CVC3000 <i>detect</i> support rod version, 100-230V, 50-60Hz	2614120	3,285.00
RC6 Chemistry-HYBRID pump, 120V, 50-60Hz	698563	7,375.00

RC6 chemistry-HYBRID™

The RC6 chemistry-HYBRID™ pump is a combination of a two-stage rotary vane pump and a two-stage chemistry diaphragm pump for optimized corrosion resistance. It's an excellent pump for lyophilization and other chemistry applications requiring the deeper vacuum provided by rotary vane pumps. The unique design, combining two pump types, drastically reduces oil changes and maintenance costs while ensuring peak performance. The diaphragm pump maintains the oil reservoir under vacuum in order to keep the partial pressures of solvent vapors at levels below their condensation points and to reduce largely the concentration of oxygen and corrosive gases. Therefore the RC6 chemistry-HYBRID™ pump has a much higher solvent vapor pumping capability and resistance to aggressive gases than conventional rotary vane pumps.



RC 6 Vacuum Pump

Large-scale applications

VACUUBRAND® makes a number of large vacuum pumps, in both Aluminum-FKM and fluoropolymer Chemistry-design models. An excellent choice for your scale-up processes and kilo labs. Contact BrandTech® Scientific for information.



MD 12 NT Vacuum Pump

The Essential Vacuum Pump

The Essential Oil-Free, Corrosion-Resistant Vacuum Pump

High performance VACUUBRAND® chemistry-design diaphragm pumps provide dry vacuum levels as deep as 0.6mbar, making them an excellent choice for most applications from benchtop research to pilot plant installations. Pumps without controls are well-suited to high flow applications like vacuum ovens, or for applications in which the control is provided by the vacuum application apparatus. Even operations that don't require solvent recovery or sophisticated control benefit from a pump designed with your applications in mind.

Continuous Condensate Purge

All chemistry-design multistage models feature an integrated gas ballast that permits continuous purging of condensed vapor from the pump.

Whether your vacuum application requires a simple pump or a fully integrated vacuum system with solvent recovery and electronic control, VACUUBRAND has the right pump for your lab.



MZ2C NT Vacuum Pump
7mbar, 1.4cfm

Small Footprint

Compact pumps fit easily on benchtops or under hoods.

The VACUUBRAND nameplate – the sign of a quality product

VACUUBRAND continuously works to perfect an integrated management system in all departments; conforming with ISO 9001 and ISO 14001. The standard of performance is quality, customer focus, employee involvement and environmental orientation. Each vacuum pump goes through a performance test of hours to days at the VACUUBRAND facility, measuring specifications and equipment reliability with computer-controlled measuring and test

instruments, with a fully automated final test. An interlock system prevents the manufacturing of a serialized nameplate until all test parameters are met. This ensures that every vacuum pump bearing the VACUUBRAND name is not only designed to an exceptionally high level engineering standard, but also offers extraordinary lifetime economy because of their low service costs and above-average lifetimes.

Networked Vacuum

VACUU•LAN® Mini-Network

The VACUU•LAN® Mini-Network is a great way to perform up to three applications from a single pump, increasing utility without eating up valuable lab space. It builds on VACUUBRAND's pioneering technology in vacuum local area networks for new laboratories and renovations, transferring the technology into a simple-to-install unit to add capability to existing labs. Three VACUU•LAN® vacuum ports with flow control are mounted onto a bar—each port has an integrated check valve to minimize

interference and the possibility of cross-contamination. Corrosion resistant materials are used throughout the vapor flowpath for long life in chemistry labs. The bar can be mounted to ring stands or laboratory framework with the pre-installed mounting support rods, or can be easily attached to walls. Vacuum can be supplied by any VACUUBRAND® chemistry-design pump, or even diaphragm pumps from other manufacturers.



ORDERING INFORMATION

Description	Cat. No.	2014 List Price
VACUU•LAN® Mini-Network	2614455	\$1,360.00



VACUU•LAN® Networks for New Lab Construction and Renovation

Fully-customized VACUU•LAN® vacuum local area networks can provide the vacuum for your laboratory construction or renovation project. The modular network can be integrated into laboratory furniture and fume hoods, and powered by a quiet, compact VACUUBRAND® chemistry design vacuum pump that fits under your lab bench. With a VACUU•LAN® vacuum local area network, you have high-performance vacuum (as deep as 2mbar/1.5Torr) at each bench or fume hood port, without the instability and user interference of a central vacuum system, and without the bench space required for individual pumps. Individual ports can even be configured for electronic control, for fully programmable vacuum supply directly from the network. This modular approach offers long-term flexibility; install the vacuum you need where you need it, only when you need it.

Two decades of global experience developing VACUU•LAN® laboratory vacuum local area networks, for small college labs and major research institutions, make this VACUUBRAND innovation the smart choice for your laboratory vacuum. For more information on this innovative technology, contact BrandTech® Scientific.

Vacuum Pumps with Adaptive Electronic Control



Self-regulating Electronic Control – VARIO®

VACUUBRAND® VARIO® vacuum systems offer users unsurpassed control of critical vacuum applications. A low maintenance chemistry-design pump is integrated with a variable speed motor and a mercury-free, digital controller. The system automatically finds and follows boiling curves, continuously optimizing the vacuum level without having to program presets. It's the ultimate productivity tool! VARIO® pumps are an excellent choice for reactors.

- **Faster:** Because the vacuum level is continuously optimized, evaporation times are up to 30% faster when compared to other electronically-controlled pumps.
- **Easier:** Just press "Start" and the VARIO® pump begins pumping down, and finds the first boiling point. It maintains and continually optimizes vacuum levels to vapor flow — even for mixtures!
- **Sustainable:** VARIO® technology greatly reduces energy consumption by reducing pumping speed to only what is necessary for optimal process performance. This greatly extends service intervals. No dry ice cold traps required for pump protection, and no oil changes massively reduce the carbon footprint.
- **Less "Babysitting":** The VARIO® controller automatically adjusts vacuum levels, reducing the need for manual adjustment or complex pumping programs. The pump even shuts itself off at pre-set levels or when evaporation is complete.
- **Virtually No Bumping:** The VARIO® controller automatically reduces the pumping speed as each boiling point is approached so "overpumping" is substantially reduced.
- **Less Maintenance:** Because the pump only operates enough to maintain optimum vacuum, wear is reduced, extending the service interval greatly.
- **Computer Interface:** An integrated bidirectional RS232 port allows control and monitoring of every parameter for process validation, and the execution of complex pumping programs. Use our VACUU•CONTROL™ software (PC only) for easy control and monitoring (call for details).



PC3001 VARIO^{PRO}
Vacuum System
2mbar, 1.2cfm

Low-profile outlet
condenser reduces
height requirements.



PC3001 basic Vacuum System

The PC3001 basic provides 2mbar ultimate vacuum and 34lpm with a speed control knob for manual vacuum control. This compact, quiet, energy efficient, low maintenance pumping unit can be upgraded to a PC3001 VARIO^{PRO} system with two supplemental modules. Module 1 adds an inlet catchpot to protect the pump and full VARIO® control. Module 2 adds an outlet condenser for solvent recovery. Add one or both!

More information at
www.brandtech.com.

ORDERING INFORMATION

Description	Cat. No.	2014 List Price
PC3001 basic		
100-120V/200-230V, 50-60Hz	696723	\$5,252.00
Supplemental Module 1	699921	2,391.00
Supplemental Module 2	699922	507.00

Vacuum Pumps with Manual Control

Vacuum Pumps with Manual Control

Popular VACUUBRAND® chemistry-design vacuum pumps are available with manual flow control to provide the most basic management of vacuum where electronic control is unnecessary to achieve good results.

Centrifugal concentration, gel drying, and even simple rotary evaporation applications can often be effectively managed with manual control systems.

Outlet Condenser with Catchpot

An outlet condenser is an effective way to capture vapors that pass through a chemistry diaphragm pump, helping protect the lab atmosphere and the environment. With the vapors at the outlet being at atmospheric pressure, the extremely cold temperatures required with an inlet side cold trap are not necessary. For most applications tap water is sufficient, or in line with a rotary evaporator condenser coil.



PC101 NT
Vacuum System
7mbar, 1.4cfm

Inlet Catchpot

Most VACUUBRAND® PC systems feature an “AK” inlet catchpot. This helps protect the pump from any condensation in the vacuum line, as well as particles that may be generated by the application, preserving the performance of the pump for consistent operation. VACUUBRAND® catchpots are safety coated to help protect against breakage.

Diaphragm Valve

A manually controlled PTFE diaphragm valve restricts the flow into the pump. The vacuum level is determined by the equilibrium between the vapor flow from the application balanced against the restricted flow. Using this method of control for evaporative applications is significantly quieter than less expensive bleeder valves.

Bourdon Analog Gauge

Dial (Bourdon) relative pressure gauge provides approximate vacuum levels and trend indication on the PC101 NT and PC201 NT.

Dual Application Vacuum Systems

Pumps with Dual Application Control

VACUUBRAND® dual application vacuum systems harness the power of the VACUUBRAND® oil-free pumps to increase lab efficiency and reduce the cost of vacuum generation. Operating two different applications from a single pump saves money and lab bench space.

These vacuum systems are available with manual control, electronic control, or both. Integrated check valves minimize interaction between applications.

All dual application systems include a high-performance 7mbar or 1.5mbar VACUUBRAND® NT series vacuum pump. Select a 7mbar system (MZ2C NT Synchro™, PC511 NT, or PC520 NT) for most lab applications and 1.5mbar systems (MD4C NT Synchro™, PC611 NT, PC620 NT) for larger applications or those with higher boiling point solvents.



MZ2C NT Synchro™
Vacuum System
7mbar, 1.4cfm

MZ2C NT Synchro™ (7mbar) and MD4C NT Synchro (1.5mbar)

Vacuum systems feature two manually-controlled vacuum ports. These manual controllers regulate flow, providing approximate vacuum levels suitable for less critical applications. Synchro pumps can be easily upgraded to electronic control with the purchase of the CVC3000 *detect* controller with integrated solenoid valve. See page 84.

Have more than 2 applications?

Expanding on the concept of the dual-application system, VACUUBRAND offers the VACUU•LAN® system - a modular integrated Vacuum Local Area Network for laboratories. Far more than a "small central vacuum system," VACUU•LAN® provides performance that approaches that of individual diaphragm vacuum pumps dedicated to each application, but with less bench space, noise and cost. A modular design allows for easy reconfiguration, upgrading or even relocation. VACUU•LAN® systems can be installed in new laboratories, or retrofitted into existing ones. VACUU•LAN® is also popular for lab renovations and science parks, see page 69. For more information, contact BrandTech Scientific.

Manual Control

PTFE diaphragm valve provides approximate control of vacuum levels for less demanding applications.

Electronic Control

Solenoid valve, operated by a CVC3000 controller, provides precise two-point electronic control for important applications.

PC511 NT (shown)	PC611 NT (not shown)
Vacuum System	Vacuum System
7mbar, 1.4cfm	1.5mbar, 2.2cfm



PC520 NT (7mbar) and PC620 NT (1.5mbar) systems have two electronically controlled vacuum ports for precise automated control of two applications running simultaneously.

PC520 NT
Vacuum System
7mbar, 1.4cfm

Vacuum Pumps with Two-Point Electronic Control

Pumps with Two-Point Electronic Control

Many applications that require a specific vacuum level to operate properly, such as most rotary evaporation, will benefit significantly by adding electronic control to the vacuum pump. VACUUBRAND employs a digital controller and solenoid valve to provide “two-point control.”



Controller

When mated to a VACUU•BUS™ solenoid valve, the mercury-free, digital CVC3000 controller provides two-point vacuum control. A digital readout shows actual vacuum levels, while a digitally simulated analog indicator simplifies trend and “at-a-glance” monitoring. See page 85 for more details.

Solenoid valve

The CVC3000 controller opens and closes the high performance solenoid valve to keep vacuum levels between pre-set tolerances as vapor flow from the application changes.

PC510 NT
Vacuum System
7mbar, 1.4cfm

Save money with a VACUUBRAND® system!

Because VACUUBRAND® pumps provide high flow-rates at working vacuum levels, they can provide cost savings, both initially, and over the life of the pump.

- Synchro™ Multi-tasking systems harness the power of the VACUUBRAND® pump for two applications, reducing the cost per application. See page 72 for more about dual application pumps and page 69 for VACUU•LAN® systems.
- No Cold Trap Required! VACUUBRAND® pumps require no cold trap to protect the pump in most applications; a huge cost saving in purchase and refrigerant costs.
- Productivity savings with the self-adjusting VARIO® systems free you up to perform other work with minimal pump oversight. Their continually optimized vacuum levels speed evaporation by up to 30%!

vacuum pumps at www.brandtech.com.

Find out more details on how to save money with VACUUBRAND®

VACUUBRAND® Rotary Vane Pumps

VACUUBRAND XS-Series Rotary Vane Vacuum Pumps for Fine Vacuum Applications

- **Quiet:** XS-pumps are extremely low-noise and low vibration, even compared to earlier VACUUBRAND® rotary vane models.
- **Rugged:** The XS series have been designed from the ground-up for service in chemistry labs. They provide exceptional water vapor tolerances with minimal impact on ultimate vacuum. Internal components have been redesigned to improve corrosion resistance, reduce wearing forces, enhance performance and simplify maintenance. Internal steel surfaces have even been nitrogen-plasma treated for chemical resistance and mechanical hardness.

- **Energy Efficient:** Pumps have very low power consumption, and generate low levels of waste heat compared to competitive models.
- **Great Value:** On top of all of these advantages, VACUUBRAND® XS-series rotary vane pumps are competitively priced with other popular pumps.



Big vacuum in a small package!
VACUUBRAND® RZ2.5

Extremely compact compared to popular pump models

- Compared with a belt-drive pump, the RZ2.5 takes up 1/3 of the bench space, weighs half as much, and occupies less than 1/4 the volume, despite superior flowrates.
- Compared with competitive direct drive pumps, the RZ2.5 takes up half of the space and weighs half as much.

For a detailed comparison see http://www.brandtech.com/RVpumpcompare_2011.pdf.



Don't forget...

Adding accessories to your rotary vane pump can extend the pump lifetime and make your workplace more pleasant.

- **Inlet Hose Barbs:** Match the pump to your vacuum hose. A 10mm (3/8") polypropylene hose barb is included with RZ2.5 and RZ6 pumps, inlet centering and clamping rings (and outlet, where applicable) are included with the pump.
- **Inlet Catchpot:** Collects condensates and particles from the vacuum line, before they can contaminate pump oil and can reduce pump lifetime.
- **Oil Mist Filter:** Captures up to 99% of oil-mist from the outlet of your pump, keeping your lab atmosphere and bench top clean (included with RC6).
- **Pump Oil B:** For best performance, and long life, use Pump Oil B (supplied with all new pumps). Its special high-viscosity formula is an excellent choice for VACUUBRAND® pumps.

Description	Cat. No.	2014 List Price
Accessories for your VACUUBRAND® rotary vane pump and RC6		
KF16 to 10mm (3/8") hose barb, fits RZ2.5, RZ6, and RC6 inlet, aluminum	662511	\$40.00
KF25 to 12mm (1/2") hose barb, fits RZ9 inlet and outlet, aluminum	662518	50.00
KF25 to 19mm (3/4") hose nipple, fits RZ9 inlet and outlet, aluminum	662532	55.00
Other flanges, clamping rings and centering rings available.		
Inlet catchpot for RZ2.5	698000	387.00
Inlet catchpot for RZ6 and RC6	698006	567.00
Inlet catchpot for RZ9	698007	486.00
Oil mist filter for RZ2.5	698003	538.00
Oil mist filter for RZ9	698017	664.00
Pump Oil B, 1 liter bottle	687010	50.00
Pump Oil B, 5 liter can	687011	175.00

Model	Free Air Capacity 60Hz (cfm) ¹	Ultimate vacuum w/o gas ballast	Ultimate vacuum w/ gas ballast	Flange Inlet Connection	Outlet Connection (hose barb)	Cat. No. 120V US plug	2014 List Price
RZ2.5	1.65	2 x 10 ⁻³	1 x 10 ⁻²	KF16	10mm	698123	\$2,495.00
RZ6	4.0	2 x 10 ⁻³	1 x 10 ⁻²	KF16	10mm	698133	3,427.00
RZ9	6.0	2 x 10 ⁻³	1 x 10 ⁻²	KF25	KF25	698143	4,395.00

¹ Pumping speed at 50Hz is 83% of stated value

Vacuum Pump Ordering Information

CHEMISTRY DESIGN PUMPS

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Oil-Free Chemistry Design Diaphragm Vacuum Pumps								
ME1C	No	No	100	75	0.5	14	721103	\$1,091.00
ME2C NT	No	No	< 70	< 52	1.4	38	730103	1,995.00
ME4C NT	No	No	< 70	< 52	2.6	73	731203	2,948.00
ME8C NT	No	No	< 70	< 52	4.7	133	734203	4,995.00
ME16C NT	No	No	< 70	< 52	6.8	193	741303	Inquire
MZ1C NEW!	No	No	12	9	0.5	14	724103	1,936.00
MZ2C NT	No	No	7	~ 5	1.4	38	732303	2,949.00
MZ2C NT+2AK	No	Yes**	7	~ 5	1.4	38	732503	3,851.00
MD1C	No	No	2	1.5	0.88	25	696613	3,560.00
MD1C+AK+EK	No	Yes	2	1.5	0.88	25	696633	5,651.00
MD4C NT	No	No	1.5	1.1	2.2	63	736403	6,629.00
MD12C	No	No	2	1.5	7.2	205	743303	Inquire
MV10C	No	No	9x10 ⁻¹	7x10 ⁻¹	6.36	178	744303	Inquire
Chemistry-HYBRID Vacuum Pumps								
RC6	No	No	2x10 ⁻³	1.5x10 ⁻³	4.1	115	698563	7,375.00
Oil-Free Chemistry Design Single Application Vacuum Systems								
MZ2C+AK+M+D	1 Manual	No	7	5	1.4	38	732703	4,045.00
PC101 NT	1 Manual	Yes	7	5	1.4	38	733003	4,253.00
PC510 NT	1 Electronic	Yes	7	5	1.4	38	733103	7,069.00
PC3001 basic 100-120V/200-230V, 50-60Hz	1 Manual	No	2	1.5	1.2	34	696723	5,252.00
PC201 NT	1 Manual	Yes	1.5	1.1	2.2	63	737003	7,997.00
PC610 NT	1 Electronic	Yes	1.5	1.1	2.2	63	737103	11,009.00
Oil-Free Chemistry Design Dual Application Vacuum Systems								
MZ2C NT Synchro™	2 Manual 1 Electronic +1 Manual	Yes	7	5	1.4	38	732803	4,987.00
PC511 NT	Manual	Yes	7	5	1.4	38	733203	7,669.00
PC520 NT	2 Electronic	Yes	7	5	1.4	38	733303	10,403.00
MD4C NT Synchro™	2 Manual 1 Electronic +1 Manual	Yes	1.5	1.1	2.2	63	736803	8,853.00
PC611 NT	Manual	Yes	1.5	1.1	2.2	63	737203	11,534.00
PC620 NT	2 Electronic	Yes	1.5	1.1	2.2	63	737303	14,161.00
Oil-Free Chemistry Design VARIO® Adaptive Single Application Vacuum Systems								
ME16C NT VARIO	Adaptive	No	70	53	11.4	322	741703	Inquire
MZ2C NT VARIO	Adaptive	No	7	5	1.7	47	732403	6,711.00
MD4C NT VARIO	Adaptive	No	1.5	1.1	2.7	77	736503	10,434.00
MV10C NT VARIO	Adaptive	No	6x10 ⁻¹	4.5x10 ⁻¹	5.0	143	710603	Inquire
PC3001 VARIO ^{PRO}	Adaptive	Yes	2	1.5	1.2	34	696703	8,588.00
PC3002 VARIO	Adaptive	Yes	7	5	1.7	47	733503	8,230.00
PC3003 VARIO	Adaptive	Yes	6x10 ⁻¹	4.5x10 ⁻¹	1.7	47	738403	12,310.00
PC3004 VARIO	Adaptive	Yes	1.5	1.1	2.7	77	737503	11,750.00
PC3010 NT VARIO	Adaptive	Yes	6x10 ⁻¹	4.5x10 ⁻¹	6.8	193	744803	Inquire
PC3012 NT VARIO	Adaptive	Yes	1.5	1.1	7.5	215	743803	Inquire
PC3016 NT VARIO	Adaptive	Yes	70	53	11.4	322	741803	Inquire

ROTARY VANE PUMPS

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
RZ2.5	No	No	2x10 ⁻³	1.5x10 ⁻³	1.6	47	698123	2,495.00
RZ6	No	No	2x10 ⁻³	1.5x10 ⁻³	4	113	698133	3,427.00
RZ9	No	No	2x10 ⁻³	1.5x10 ⁻³	6.0	170	698143	4,395.00
RZ16, 230V, 50-60Hz, CEE plug	No	No	2x10 ⁻³	1.5x10 ⁻³	11.2	318	698050	5,368.00

* All pumps 120V, 60Hz unless noted

**Outlet catchpot for solvent collection only

Selecting the Best Pump for Your Application

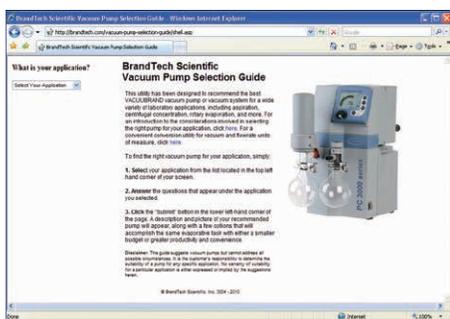
Vacuum Pump Selection Guide—Online!

Not sure which vacuum pump or system is best for your lab? Find out using the BrandTech® Scientific Vacuum Pump Selection Guide!

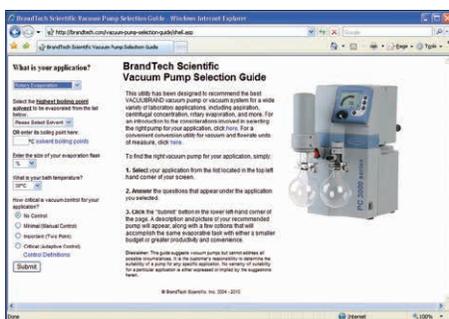
This free guide has been designed to recommend the best VACUUBRAND® vacuum pump or system for a wide variety of laboratory applications, including fluid aspiration, centrifugal concentration, rotary evaporation, and more.

Simply choose Product Selection Help located under the Support tab at www.brandtech.com to find the guide. Answer a few simple questions about your application. The software suggests the pump, controls, and solvent capture accessories that are right for your application. It even offers options for limited budgets or applications where control is critical.

It's as easy as 1,2,3...



1 Select your application from the list located in the top left hand corner of your screen.



2 Answer a few questions about your application, and click on the "Submit" button.



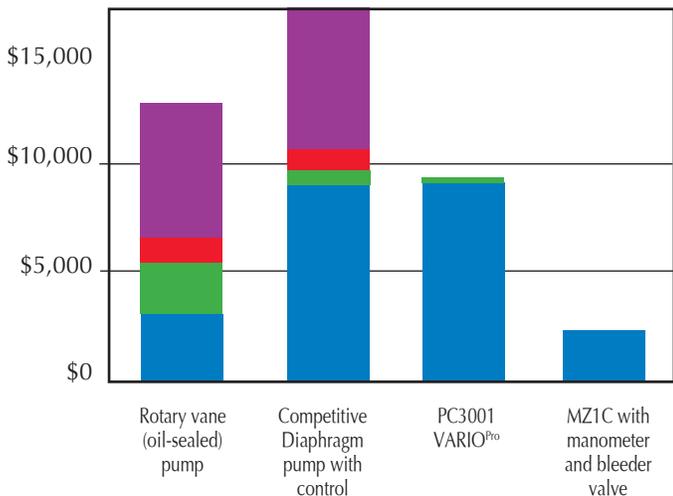
3 It's that simple! A photo and description of your recommended pump will appear on the right of your screen. The software even recommends other options with more control or lower cost.

Pump Economy and Sustainability

Where comparing the costs of vacuum pumps, it is important to include accessories that are needed and lifetime repair and maintenance costs. Rotary vane pumps require mist filters, catchpots, cold traps (including dry ice, liquid nitrogen or electricity costs) plus frequent oil changes. Competitive diaphragm

pumps have much shorter service intervals (3,000-4,000 hours) compared with VACUUBRAND® dry pumps (15,000+ hours), and competitive diaphragm pumps often recommend cold traps to enhance performance, adding substantially to operating costs and inconvenience.

5-Year Cost Comparison—Vacuum Pumps



Refrigerant: 5lb. dry ice per day, \$1/lb. for 250 days/year

Added Accessories: exhaust filter and cold trap

Maintenance: oil changes, filter replacements, service parts

Pump Purchase Cost

Vacuum for Filtration and SPE

Filtration, SPE and Aspiration

Fluid movement applications, such as filtration, fluid aspiration and solid phase extraction, typically don't require deep vacuum levels or high flow rates. For fluid aspiration, the best choice is usually an integrated solution like our *BVC control* or *professional* (see page 64).

However when using an unpowered collection system, like the *BVC Basic*, or for filtration or SPE, these types of applications are best served by the VACUUBRAND® ME1C and ME4C NT. Users seeking additional capability or users with special circumstances, however,

may want to consider the VACUUBRAND® MZ2C NT+2AK or MD1C+AK+EK pumps with integrated solvent recovery.

When choosing the pump for your filtration or solid phase extraction application, consider the following factors:

How much vacuum do I need?

Vacuum filtration and solid phase extraction typically require just enough vacuum depth to generate a pressure differential between atmospheric pressure and the receiving vessel. These applications do not usually require control unless the vacuum level is too deep and may cause filtrate boiling.

The ME1C vacuum pump is an excellent selection for most fluid movement applications. It is a simple, compact, stand alone pump with sufficient vacuum and flow to perform effective vacuum filtration or solid phase extraction and is powerful enough to support up to two simultaneous applications.

How much flow do I need?

Labs running more than three simultaneous filtration applications may require a pump with higher flow rates to maintain sufficient vacuum at all workstations.

The ME4C NT vacuum pump is an excellent pump for these circumstances. Like the ME1C, it is a simple, compact stand alone pump. However, its higher flow rate ensures better results and faster process times in large-scale filtration and solid phase extraction labs.

Do I need solvent recovery?

During normal filtration and solid phase extraction applications, solvent recovery is not typically needed. However, pumps with higher performance (MZ2C NT+2AK) and solvent recovery (MD1C+AK+EK) can support a broader range of applications. They are an excellent choice for labs seeking to support several different applications with only one pump.



ME1C Vacuum Pump
100mbar, 0.5cfm



MZ2C NT+2AK
Vacuum Pump
7mbar, 1.4cfm

ORDERING INFORMATION

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Oil-Free Diaphragm Vacuum Pumps								
ME1C	No	No	100	75	0.5	14	721103	\$1,091.00
ME2C NT	No	No	<70	<52	1.4	38	730103	1,995.00
ME4C NT	No	No	<70	<52	2.6	73	731203	2,948.00
MZ2C NT+2AK	No	Yes**	7	5	1.4	38	732503	3,851.00
MD1C+AK+EK	No	Yes	2	1.5	0.88	25	696633	5,651.00
ME4C NT+2AK 100-120V/200-230V, 50-60Hz	No	Yes**	<70	<52	2.5	73	2614080	3,851.00

Accessories

Vacuum regulation valve with manometer for ME1C	696843	336.00
Power Cord 120V, US	637655	42.00

* All pumps 120V, 60Hz unless noted

**Outlet catchpot for solvent collection only

Vacuum Oven/Gel Dryer Vacuum Solutions

Vacuum Oven Solutions

How much vacuum do I need?

Vacuum ovens typically require a pump with deeper vacuum levels than other heated applications because the evaporative effect of elevated temperature is often offset by the poor thermal transfer of the oven environment.

How much flow do I need?

Vacuum ovens also require higher vacuum pump flow rates than other lab applications due to the relatively large sample capacity of most vacuum ovens. Strictly speaking flow rate requirements are determined by solvent load, but some assumptions can be made based on oven size.

The MZ2C NT+2AK vacuum pump is an excellent selection for labs with smaller vacuum ovens (<1.0 cubic foot in capacity) and semi-dry samples. Its performance, small footprint, and integrated catchpots for solvents make it a popular choice. Evaporation of higher boiling point solvents, however, may require a more powerful pump, such as the MD1C+AK+EK.

Laboratories with larger ovens (one or more cubic feet in capacity) or with samples having a high moisture content do well with the PC201 NT. It can generate vacuum levels for evaporation of most solvents, and its high flow rate reduces process times.

Use a Cold Trap?

Using a cold trap for solvent recovery gives users greater flexibility when selecting a pump for vacuum ovens. The cold trap reduces vapor loads, and eliminates the need for solvent capture by the pump. These applications are typically best-served by a stand alone pump such as the compact, economical MD1C vacuum pump.



PC201 NT
Vacuum System,
1.5mbar, 2.2cfm

Gel Dryer Vacuum Solutions

How much vacuum do I need?

The vacuum level required for gel drying applications is usually determined by the concentration of SDS-PAGE. For standard-sized gels with SDS-PAGE concentrations up to 10%, select the MZ2C NT+2AK. It has the power to provide excellent results in most gel-drying applications and its two catchpots capture condensing vapors for clean operation.



MZ2C NT+2AK
Vacuum Pump
7mbar, 1.4cfm

For SDS-PAGE concentrations greater than 10%, choose the MD1C+AK+EK. Its integral pump achieves deeper vacuum levels for enhanced evaporative performance, and the catchpots and condenser protect the pump and the lab atmosphere without the cost and inconvenience of a cold trap.



MD1C+AK+EK
Vacuum Pump
2mbar, 0.88cfm

ORDERING INFORMATION

Model	Model Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Oil-Free Diaphragm Vacuum Pumps								
MZ2C NT+2AK	No	Yes**	7	5	1.4	38	732503	\$3,851.00
MD1C	No	No	2	1.5	0.88	25	696613	3,560.00
MD1C+AK+EK	No	Yes	2	1.5	0.88	25	696633	5,651.00
Oil-Free Single Application Vacuum Systems								
PC201 NT	1 Manual	Yes	1.5	1.1	2.2	63	737003	7,997.00

* All pumps 120V, 60Hz unless noted

**Outlet catchpot for solvent collection only

Rotary Evaporation Vacuum Solutions

Vacuum pumps provide the operational muscle for your rotary evaporator. Apart from the vacuum control, your evaporator is just rotating glassware! In fact, you can get better control of your application directly from your vacuum pump. As such VACUUBRAND offers a full range of pumps and systems with integrated control that help optimize your rotary evaporation application.

To find the vacuum pump or system that best meets your needs, answer the following questions:

Adaptive Vacuum Control

The best way to prevent bumping is with a self-regulating, hysteresis-free vacuum control. Adaptive control, an innovation exclusive to VACUUBRAND® VARIO® pumps and systems, combines an electronic controller and a speed-controlled motor. Fifteen years of proprietary software refinement allows our VARIO® pumps to automatically perform the following tasks:

- Find and follow boiling points, hysteresis-free, without programming even for solvent mixtures or changing conditions
- Evaporate up to 30 percent faster
- Shut the pump off when evaporation is completed

For most benchtop rotary evaporators, the PC3001 VARIO^{PRO} vacuum system is an excellent choice. The powerful integral pump provides a deep 2mbar ultimate vacuum – enough to evaporate DMSO at a bath temperature of 50°C!



PC3001 VARIO^{PRO}
Vacuum System
2mbar, 2.0cfm

How much vacuum do I need?

The vacuum capacity required from a pump to support a rotary evaporation application is determined by the typical application temperatures and the solvents being evaporated. Virtually all rotary evaporation applications can be accomplished with diaphragm vacuum pumps. The vacuum pump should have the ability to reach the vapor pressure of the solvent at the application temperature.

Manual Control

For applications that require only minimal control, select the economical PC101 NT vacuum system for basic evaporation and vapor capture. It includes the same 7mbar MZ2C NT pump as the PC510 NT (below) along with a stand, inlet catchpot and outlet condenser, but substitutes a manual flow-control valve and dial gauge for economy. It's an excellent choice for basic evaporation! Or support 2 evaporators with an economical, space-saving Synchro system! See pages 72, 75 & 80 for description and ordering information.



PC101 NT Vacuum System
7mbar, 1.4cfm

How much control do I need?

Rotary evaporation applications often require significant oversight and control because the heat and high surface area increase evaporation rates. This can lead to solvent “bumping” or boiling over.

Electronic Control

Some rotary evaporation applications might benefit from control, but not require the precision of adaptive control. The PC510 NT system is an excellent choice for these applications. It is a great workhorse system for evaporation of many common solvents in rotary evaporators up to 5 liters in size. The integrated MZ2C NT pump evaporates all but the highest boiling point solvents at reasonable bath temperatures, and the system includes a controller that allows preset or semi-automatic setting of vacuum level, with appropriate hysteresis adjustment. Solvent recovery is provided by an inlet catchpot and outlet condenser.

Need to run two evaporators? Consider the PC520 NT. See pages 72 & 75 for description and ordering information. They'll provide different conditions to two applications at once, saving bench space and the cost of an additional pump or system. If you anticipate needing a second electronically controlled port in the future, consider a PC511 NT or PC611NT. The second flow-controlled port adds minimal cost, but can easily be upgraded to full electronic control with the purchase of a CVC3000 *detect* (see page 84).



PC510 NT
Vacuum System
7mbar, 1.4cfm

Rotary Evaporation Vacuum Solutions

Do I need solvent recovery?

Solvent vapor that makes it past the evaporator's condenser can condense in the vacuum line. For best pump performance, an inlet catchpot "AK" can keep these condensed vapors out of the pump. Solvent vapors that pass through the pump can be captured efficiently at atmospheric pressure at the diaphragm pump outlet with an outlet condenser "EK," minimizing pollution of the laboratory environment.

Consider the MD1C+AK+EK for labs that already have a stand-alone vacuum controller, or one integrated into their evaporator. It features the same chemistry-design pump and solvent recovery as the 2mbar PC3001 VARIO^{PRO} system, but without control.

For applications that do not require either control or solvent recovery, consider a stand alone pump such as the MZ1C or MD1C. They provide superior flow rates at working vacuum to competitive pumps, with a significantly lower price and very small footprint. Integrated gas ballast provides high condensate tolerance. The MD1C is also preferred by customers who address vacuum control and solvent recovery through other methods.

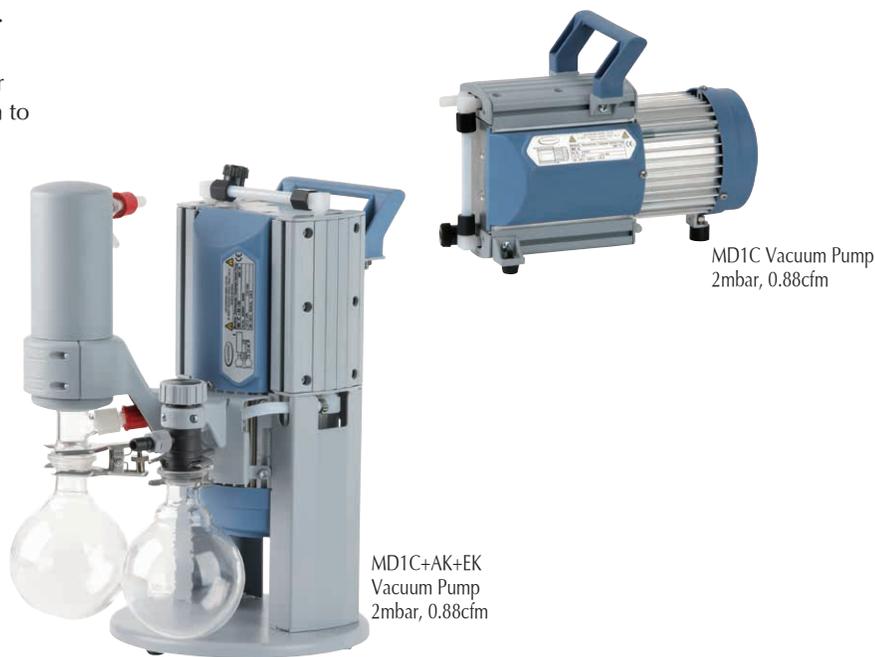
What about larger or multiple rotary evaporators?

BrandTech® and VACUUBRAND offer the most comprehensive line of chemistry-design diaphragm vacuum pumps, including models that can operate rotary evaporators up to 100 liters or larger, with or without integrated VARIO® adaptive control.

We also offer systems that will run two different evaporation applications simultaneously without interference! Still not sure? Contact BrandTech® Scientific for more information.

NOT SURE WHAT PUMP IS RIGHT FOR YOUR NEEDS?

Learn about our Vacuum Pump Selection Guide see page 76.



ORDERING INFORMATION

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Oil-Free Diaphragm Vacuum Pumps								
MZ1C	No	No	12	9	0.5	14	724103	\$1,936.00
MZ2C NT	No	No	7	5	1.4	38	732303	2,949.00
MZ2C NT + 2AK	No	Yes**	7	5	1.4	38	732503	3,851.00
MD1C	No	No	2	1.5	0.88	25	696613	3,560.00
MD1C+AK+EK	No	Yes	2	1.5	0.88	25	696633	5,651.00
MD4C NT	No	No	1.5	1.1	2.2	63	736403	6,629.00
Oil-Free Single Application Vacuum Systems								
PC101 NT	1 Manual	Yes	7	5	1.4	38	733003	4,253.00
PC510 NT	1 Electronic	Yes	7	5	1.4	38	733103	7,069.00
PC3001 basic								
100-120V/200-230V, 50-60Hz	1 Manual	No	2	1.5	1.0	28	696723	5,252.00
Oil-Free VARIO® Adaptive Single Application Vacuum Systems								
PC3001 VARIO ^{PRO}	Adaptive	Yes	2	1.5	1.0	28	696703	8,588.00
PC3002 VARIO	Adaptive	Yes	7	5	1.7	47	733503	8,230.00
PC3003 VARIO	Adaptive	Yes	6x10 ⁻¹	4.5x10 ⁻¹	1.5	42	738403	12,310.00
PC3004 VARIO	Adaptive	Yes	1.5	1.1	2.7	77	737503	11,750.00
Add Dual Application Vacuum Systems								
MZ2C +NT +AK +Synchro +EK	2 Manual	Yes	7	5	1.4	38	732803	4,987.00
PC511 NT	1 Manual, 1 Electronic	Yes	7	5	1.4	38	733203	7,669.00
PC520 NT	2 Electronic	Yes	7	5	1.4	38	733303	7,669.00

* All pumps 120V, 60Hz unless noted **Outlet catchpot for solvent collection only

Centrifugal Concentration Vacuum Solutions

The high performance and convenience of VACUUBRAND® pumps and systems makes them an excellent choice for most centrifugal concentration applications. VACUUBRAND offers a wide variety of pumps for excellent, reproducible results. When selecting the best pump for your lab, consider the following issues.

How much vacuum do I need?

Centrifugal concentration generally requires greater ultimate vacuum than other evaporative applications because it is usually performed at room temperature. Fortunately, VACUUBRAND® diaphragm pumps are available with enough power for room temperature evaporation of solvents with boiling points as high as that of DMF.

The performance demands of most tabletop concentrators are often well served with one of VACUUBRAND®'s three-stage vacuum pumps, the MD1C or MD4C NT. Both of these pumps are powerful enough to evaporate DMF. Select the MD1C for supporting smaller concentrators and the MD4C NT with its higher flow rate for larger benchtop concentrators. For more volatile solvents, a pump like an MZ2C NT would be an excellent choice.

For very high boiling point solvents at room temperature such as DMSO or ethylene glycol, rotary vane technology may be required. We suggest the unique RC6 Chemisty-HYBRID pump for deeper vacuum with maximum convenience.

Do I need solvent recovery?

Large centrifugal concentrators often come with cold traps, reducing the need for integrated solvent recovery with the pump. Concentrators without cold traps should have solvent recovery integrated with the pump to prevent pump contamination and pollution of the laboratory.

When using a small concentrator without a cold trap, choose the MD1C+AK+EK. It provides excellent flow rates at working vacuum to effectively operate a smaller concentrator without a cold trap (something not possible with competitive pumps) and captures solvent vapors itself.

Are my samples prone to bumping?

When samples often bump in a centrifugal concentrator, control may be necessary to prevent cross-contamination. Depending on the volatility, flow control—as in our PC101 NT or PC201 NT—may be sufficient. For more volatile solvents, use our VARIO® systems that adjust vacuum levels automatically.

What about larger concentrators?

VACUUBRAND® pumps are available for “mega” sized concentrators used in combinatorial chemistry and the drug discovery marketplace. Please contact BrandTech® Scientific for assistance in selecting the best pump for these applications.

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Oil-Free Diaphragm Vacuum Pumps								
MZ2C NT	No	No	7	5	1.4	38	732303	\$2,949.00
MD1C	No	No	2	1.5	0.88	25	696613	3,560.00
MD1C+AK+EK	No	Yes	2	1.5	0.88	25	696633	5,651.00
MD4C NT	No	No	1.5	1.1	2.2	63	736403	6,629.00
Chemistry-HYBRID Vacuum Pumps								
RC6	No	No	2x10 ⁻³	1.5x10 ⁻³	4.1	115	698563	7,375.00
Oil-Free Single Application Vacuum Systems								
MZ2C NT + AK + EK	1 Manual	Yes	7	5	1.4	38	732603	3,953.00
MD4C NT + AK + EK	1 Manual	Yes	1.5	1.1	2.2	63	736703	7,813.00
Oil-Free VARIO® Adaptive Single Application Vacuum Systems								
PC3001 VARIO ^{PRO}	Adaptive	Yes	2	1.5	1.2	34	696703	8,588.00
PC3004 VARIO	Adaptive	Yes	1.5	1.1	2.7	77	737503	11,750.00

* All pumps 120V, 60Hz unless noted

Freeze Drying Vacuum Solutions

Lyophilization is a demanding vacuum application that requires a deeper vacuum than can be achieved with diaphragm technology alone. It is usually best-served by the innovative VACUUBRAND® RC6 Chemistry-HYBRID™ pump.

How much vacuum do I need?

Lyophilization applications typically require vacuum levels as deep as 10^{-3} mbar. Traditionally, this requirement has been provided by oil-sealed rotary vane pumps.

To help users combat the high costs and contamination of rotary vane pumps, VACUUBRAND developed the RC6 Chemistry-HYBRID™ pump. The RC6 combines a rotary vane pump for vacuum capacity with a chemistry-design diaphragm pump that reduces condensation and continuously distills solvents from the pump oil. This design reduces oil changes and maintenance costs by up to 90 percent**.

What about larger applications?

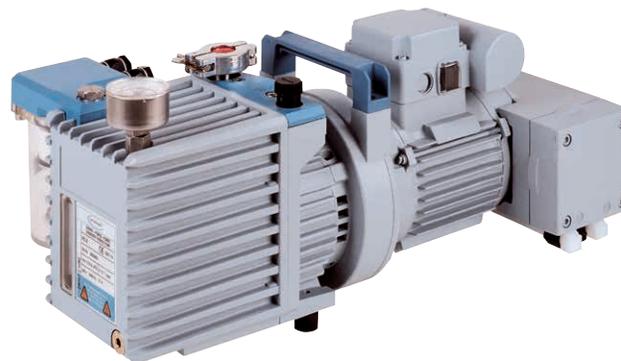
The RC6 Hybrid pump may be used with freeze dryers with condensers of six, twelve or eighteen liters. VACUUBRAND also offers a full line of rotary vane pumps with the power to easily meet the demands of larger applications and the innovative design and quality assurance of VACUUBRAND® pumps.

For applications larger than 18 liters, contact BrandTech® Scientific.

Rotary Vane options?

BrandTech® Scientific recommends that you should “never use an oil pump when an oil-free pump will do the job.” Sometimes, however, certain applications require deeper vacuum levels than oil-free pumps can provide.

When these situations arise, consider the RC6 Chemistry HYBRID™ pump or a VACUUBRAND® rotary vane vacuum pump such as the RZ2.5, RZ6, or RZ9. These pumps feature the same high performance, innovative design, and quality assurance as VACUUBRAND® oil-free vacuum pumps and systems. See page 74 for more information.



RC6 Chemistry-HYBRID™
Vacuum Pump 2×10^{-3} mbar, 4cfm

Model	Controller(s)	Solvent Recovery	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
			mbar	Torr	cfm	lpm		
Chemistry-HYBRID™ Vacuum Pumps								
RC6	No	No	2×10^{-3}	1.5×10^{-3}	4.1	115	698563	\$7,375.00
Rotary Vane Vacuum Pumps								
RZ2.5	No	No	2×10^{-3}	1.5×10^{-3}	1.6	47	698123	2,495.00
RZ6	No	No	2×10^{-3}	1.5×10^{-3}	4.0	113	698133	3,427.00
RZ9	No	No	2×10^{-3}	1.5×10^{-3}	6.0	165	698143	4,395.00

* All pumps 120V, 60Hz unless noted

** The RC6 Chemistry-HYBRID™ pump, like other oil-sealed pumps, should always be operated with a cold trap.

Aluminum-FKM Diaphragm Vacuum Pumps

VACUUBRAND® Aluminum-FKM (e.g., Viton®) vacuum pumps are intended specifically for non-corrosive, non-evaporative applications. They are excellent for laboratory and process-plant applications including gas transfer, backing turbo pumps, and vacuum filtration. All wetted parts of these pumps are made of aluminum, FKM, and polyethylene. Aluminum-FKM pumps should not be used with organic solvents, corrosives, or other vapors inconsistent with the materials of construction.

- **Eliminates Oil Changes:** These pumps utilize diaphragm vacuum technology for totally dry operation. There is no oil to change or monitor!
- **Reduces Maintenance:** Diaphragms typically withstand up to 15,000 hours of use before replacement – that’s years in most applications, minimizing downtime and service costs. When it is finally time for service, their unique design eliminates tedious, trial-and-error stroke length recalibration.
- **Improves Productivity:** These pumps feature specially engineered pump heads for high flow rates at working vacuum. Higher flow rates mean reduced process times and higher throughput.
- **Ensures Reliable Use:** All VACUUBRAND® pumps and systems must pass rigorous product testing before leaving the factory. It’s your assurance of a reliable pump.
- **ME1:** Features PTFE diaphragm and valves for enhanced corrosion resistance (not for use with acidic vapors).



ME1 Vacuum Pump
100mbar, 0.5cfm



MD12 NT VARIO
Vacuum Pump

Quiet Operation

Aluminum-FKM pumps operate very quietly, at about the same volume as a conversation.

Excellent Durability

VACUUBRAND® Aluminum-FKM pumps have service intervals in excess of 15,000 hours (that’s years in most applications). Most service can be done in the lab in a matter of minutes.

FKM Double Diaphragm

FKM double planar diaphragm for high performance and increased reliability.

Broad Product Range

Vacuum as deep as 0.5mbar with flow rates as high as 307lpm!

Model	Ultimate Vacuum		Free Air Capacity at 60Hz		Cat. No.*	2014 List Price
	mbar	Torr	cfm	lpm		
Aluminum-FKM Diaphragm Vacuum Pumps for non-corrosive applications						
ME1	100	75	0.5	14	721003	\$859.00
ME2 NT	< 80	< 60	1.3	37	730003	1,392.00
ME4 NT	70	52	2.4	67	731003	2,162.00
ME8 NT	70	52	4.6	130	734003	3,881.00
ME16 NT	70	52	10.8	307	741003	Inquire
MZ2 NT	7	5	1.3	37	732003	2,162.00
MD1 100-120V/200-230V, 50-60HZ	1.5	1.1	0.82	23	696087	2,570.00
MD4 NT	1.5	1.1	2.2	63	736005	4,079.00
MD12 NT	2	1.5	7.8	222	743003	6,108.00
MV2 NT	5x10 ⁻¹	4x10 ⁻¹	1.4	40	738003	4,610.00
MV10 NT	5x10 ⁻¹	4x10 ⁻¹	6.8	193	744003	Inquire
Accessory						
Vacuum regulation valve with manometer for ME1					696842	167.00

* All pumps 120V, 60Hz unless noted

Vacuum Gauges & Controllers

VACUUBRAND® vacuum gauges and controllers enable you to monitor and control vacuum generation for most laboratory vacuum applications. Gauges are compatible with most laboratory vacuum pumps and house vacuum, and feature both analog and digital displays. They help to rid laboratories of toxic, harmful mercury by replacing McLeod gauges and other manometers.

• **Meets the Requirements of Most Vacuum**

Applications: VACUUBRAND® vacuum gauges cover the range from atmospheric pressure to 5×10^{-9} mbar/Torr/hPa. They are easy to read and feature a digital readout and analog indicator to simplify both data recording and trend-monitoring.

- **Rugged Operation:** Gauges and controllers are manufactured without fragile springs or glass tubes and feature corrosion-resistant transducers to ensure rugged, reliable operation.
- **Displays Results in Your Units:** Vacuum gauges and controllers provide results in millibar, Torr, or hectoPascal.
- **Provides Complete Process Control:** The CVC 3000 vacuum controller, in conjunction with a VACUU•BUS® solenoid valve, provides two-point vacuum control in the range from atmospheric pressure to 1 mbar/Torr/hPa (control range can be extended to 10^{-3} mbar with external Pirani vacuum sensor). It allows easy adjustment of vacuum setpoints as well as both automatic and manual hysteresis programming.
- **NEW! Integrated Vacuum Controller:** The CVC3000 *detect* pairs our sophisticated CVC3000 vacuum controller with a permanently mounted chemistry-design solenoid valve to provide a simple one-piece solution to single-application vacuum control. Works with any vacuum source, even central vacuum; an integrated check valve helps protect your application from vacuum line instability.

Mercury-free, Digital/Analog Vacuum Instruments.



DVR2 Vacuum Gauge

Eliminate fragile glass and mercury and inaccurate, corrosion-prone dial gauges in your lab! Analog and digital display for easy monitoring of most lab applications. A transducer of corrosion-resistant ceramic for durability measures absolute pressures from atmosphere to 1 mbar/Torr/hPa with user-selectable units. Battery power with adjustable sleep timer for long battery life.

NEW! CVC3000 *detect*

The new CVC3000 *detect* combines the market leading CVC3000 vacuum controller as found on VACUUBRAND®'s PC3001 VARIO^{PRO}, and a solenoid valve, to provide advanced two-point control for any stand-alone diaphragm vacuum pump from VACUUBRAND® or competitive units. The new “*detect*” feature allows the CVC3000 to automatically



find the first boiling point with a rotary evaporator. The CVC3000 also allows the pre-programming of up to ten multi-step programs, bi-directional communication via RS232 serial port and too many other features to mention here. Available in two models – one with a benchtop stand; or one for mounting on lab frames or ring stands

NEW! CVC3000 + VSP3000 Pirani Control Packages for Fine Vacuum

These packages enable convenient two point vacuum control in the fine vacuum range down to 10^{-3} mbar. They consist of a CVC3000 vacuum controller, a VSP3000 external Pirani vacuum sensor, a VV-B 15C high performance chemistry in-line solenoid valve and all necessary small flange components. Two versions of this package are available: one with KF16 small flange connections suitable for the RZ2.5, RZ6 rotary vane pumps and our RC6 Chemistry-HYBRID™ pump; the other with KF25 small flanges suitable for our RZ9 rotary vane pumps. Either package can also be used with pumps from other manufacturers with the corresponding flange set. Control is achieved by use of an in-line solenoid valve, minimizing noise and oil-mist generation. The controller and components are completely self-configuring and automatically checked via VACUU•BUS® communication protocol.



Vacuum Gauges & Controllers

NEW!

The Versatile DCP3000 Vacuum Gauge System

The DCP3000 utilizes VACUUBRAND's innovative VACUU•BUS® plug-and-play system to integrate a variety of different vacuum sensors to measure from atmosphere to 5×10^{-9} mbar in your choice of millibar, Torr, or hectoPascal. It is available equipped with your choice of a capacitive transducer, an exclusive corrosion-resistant Pirani transducer, or a combined Pirani/Penning transducer that automatically switches between measuring technologies. The DCP3000 can monitor up to a total of four capacitive/Pirani transducer sets with automatic switching between transducers, or up to four Pirani/Penning transducers. An external vent valve can also be added. Completely mercury-free, the DCP3000 also features a switching power supply, with US, UK, Australian and European plugs.



Measuring Range*:	DVR2 Vacuum Gauge	CVC3000 and DCP3000 + VSK3000 Capacitive Transducer	DCP3000 + VSP3000 Pirani Transducer	DCP3000 + MPT100 Pirani/Penning Transducer
mbar	1-1080	0.1-1080	1×10^{-3} - 1×10^3	5×10^{-9} - 1×10^3
Torr	1-812	0.1-810	7.5×10^{-4} - 7.5×10^2	3.7×10^{-9} - 7.5×10^2
hPa	1-1080	0.1-1080	1×10^{-3} - 1×10^3	5×10^{-9} - 1×10^3
Accuracy	$< \pm 1$ mbar (0.75Torr) ± 1 digit	$< \pm 1$ mbar/Torr/hPa / ± 1 digit (after adjustment, constant temp.)	$\pm 15\%$ of indicated value in the range 0.01-100mbar/Torr/hPa	1×10^{-7} - 1×10^{-2} mbar: $\pm 25\%$; 1×10^{-2} -100 mbar: $\pm 15\%$

Model	Cat. No.	2014 List Price
DVR2 Vacuum Gauge, battery operated (9V, Lithium)	682902	\$923.00
DCP 3000 + VSK 3000 Vacuum Gauge, 100-230V, 50-60Hz	683170	1,889.00
DCP 3000 + VSP 3000 Vacuum Gauge, 100-230V, 50-60Hz	683190	1,889.00
DCP 3000 + MPT 100 Vacuum Gauge, 100-230V, 50-60Hz	683175	3,569.00
CVC 3000 Vacuum Controller, 100-230V, 50-60Hz (requires VVB6C solenoid valve below)	683160	2,356.00
CVC 3000 <i>detect</i> Vacuum Controller, support rod version 100-230V, 50-60Hz (with integrated chemistry solenoid valve) NEW!	2614120	3,285.00
CVC 3000 <i>detect</i> , Vacuum Controller, benchtop version, 100-230V, 50-60HZ (with integrated chemistry solenoid valve) NEW!	2614860	3,285.00
VVB6C VACUU•BUS® solenoid valve	674291	987.00
VVB15C KF16 High Performance VACUU•BUS® solenoid valve	674110	1,068.00
VVB15C KF25 High Performance VACUU•BUS® solenoid valve	674115	1,098.00
CVC 3000 + VSP 3000 + VVB 15C KF16 (Pirani control Package)	635983	3,369.00
CVC 3000 + VSP 3000 + VVB 15C KF25 (Pirani control Package)	635982	3,969.00
VSK 3000 VACUU•BUS® gauge head	636657	619.00
VSP 3000 VACUU•BUS® Pirani gauge head	636163	614.00
VVKWB solenoid coolant valve	674220	420.00
VBMB solenoid vent valve	674217	363.00
Liquid Level Sensor for 500mL catchpot, VACUU•BUS®	699908	587.00
VACUU•BUS® extension cable	612552	72.00
VACUU•BUS® Y cable	636656	125.00
Vacuum regulation valve with manometer for ME1C	696843	336.00
Vacuum regulation valve with manometer for ME1	696842	167.00

* Do not exceed atmospheric pressure