

Base
VAC



Established in 1986

www.basevacdental.com

BaseVac Dental

Introduction to BaseVac

The creation of vacuum is a predictable science. Understanding how it works in an application is fundamental to our business, and it is also our strength. At BaseVac, we know that making vacuum work in dentistry means following a path of predictable science. Manufactured in Canada, BaseVac is built on 36 years of industrial vacuum pump technology.



About Us

Canadian-Based Manufacturer

BaseVac Dental is operated under R.E Morrison Equipment Inc., based out of Mississauga, Ontario. Our products are proudly made in Canada.

Independent & Family-Owned

Our independent company has been family-owned and operated for over 35 years.

Experts in Production Air Technology

Our vacuum pumps, blowers and integrated air systems are trusted by Canada's largest automotive, food & beverage, pharma & woodworking manufacturers.



Health
Canada

Santé
Canada

Class II
Medical
Device



ISO 13485:2016
MDSAP
CERTIFIED



Our Compressor Lineup

100% Dry - No Oil, No Water



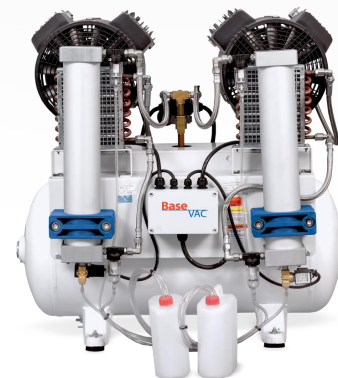
S -SERIES

Oil-Free Compressors
1-4 Users



SILENT -SERIES

Oil-Free Compressors
1-4 Users



D -SERIES

Oil-Free Compressors
6-8 Users



CAD-CAM-SERIES

Milling Compressors
(custom solutions
for any system)

Our Dry-Vacuum Lineup

100% Dry - No Oil, No Water



HD-SERIES

Modular Vacuum
2-16 Users



M-VAC SERIES

Compact Vacuum
1-3 Users



SUR-SERIES

Surgical Vacuum
5-25 Surgical Outlets



T - CUSTOM SERIES

Large & Custom Vacuum
16-400+ Users

The Power of Going Dry

Conventional, non-recycling liquid-ring vacuum systems use approx. **200,000** gallons of water per year. Municipalities charge businesses in-line with their total water consumption (annual volume of water withdrawn per annum), so the cost of using a water-based vacuum can significantly add up over years of use.

Estimated Water Costs: Liquid-Ring Dental Vacuums

- └ After 1 Year: 200,000+ Gallons used, approx. \$3,700 (CDN)
- └ After 5 Years: 1,000,000+ Gallons used, approx. \$18,500 (CDN)
- └ After 10 Years: 2,000,000+ Gallons used, approx. \$37,000 (CDN)

All BaseVac Dental Systems are 100% Dry - No Oil, No Water



Based off of Commercial Water Rates, City of Toronto, 2021

https://www.midmark.com/docs/default-source/product-literature/dental/007-10052-00-mechanicals-brochure.pdf?sfvrsn=47ba44d8_3

What is a Wet-Vacuum?

Conventional liquid-ring vacuum systems use the flow of water to create pressure within the vacuum pump. As the impeller rotates, a liquid ring is created along the casing. The void created in the center holds gas drawn in through the inlet port of the pump. As the gas travels around the pocket of air in the center, it is compressed. This compressed air is then fed back out through the discharge port.

Wet-Vacuum Systems:

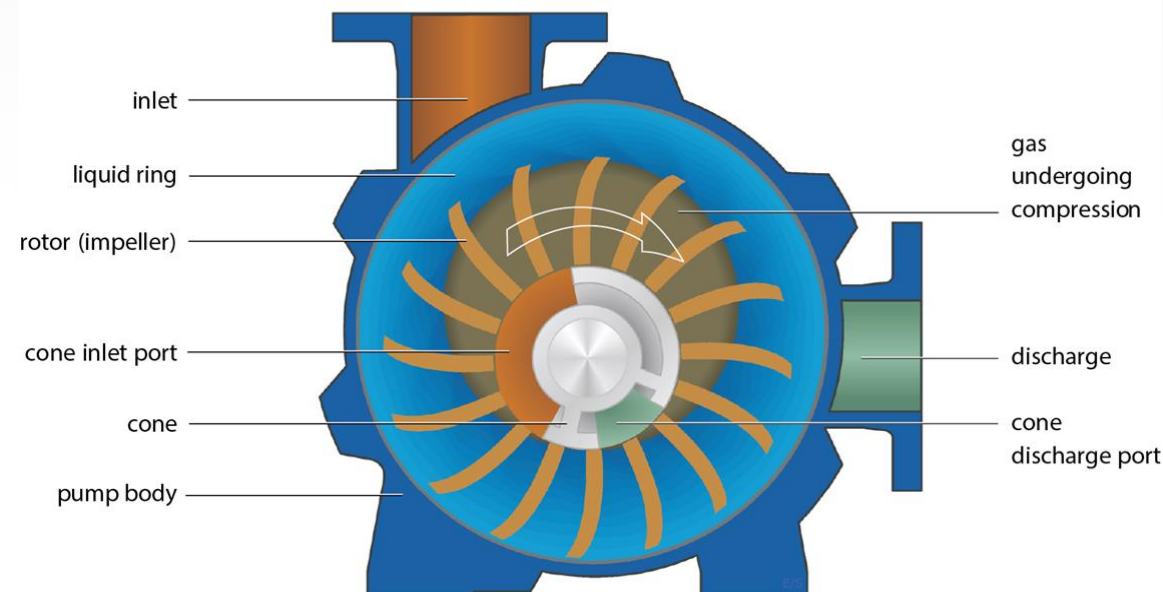
RAMVAC Barracuda



Air Techniques VacStar



Midmark ClassicSeries



What is a Dry-Vacuum?

Conventional dry vacuum systems use the flow of air to create pressure within the Vacuum Pump

High Flow Dry-Vacuums:

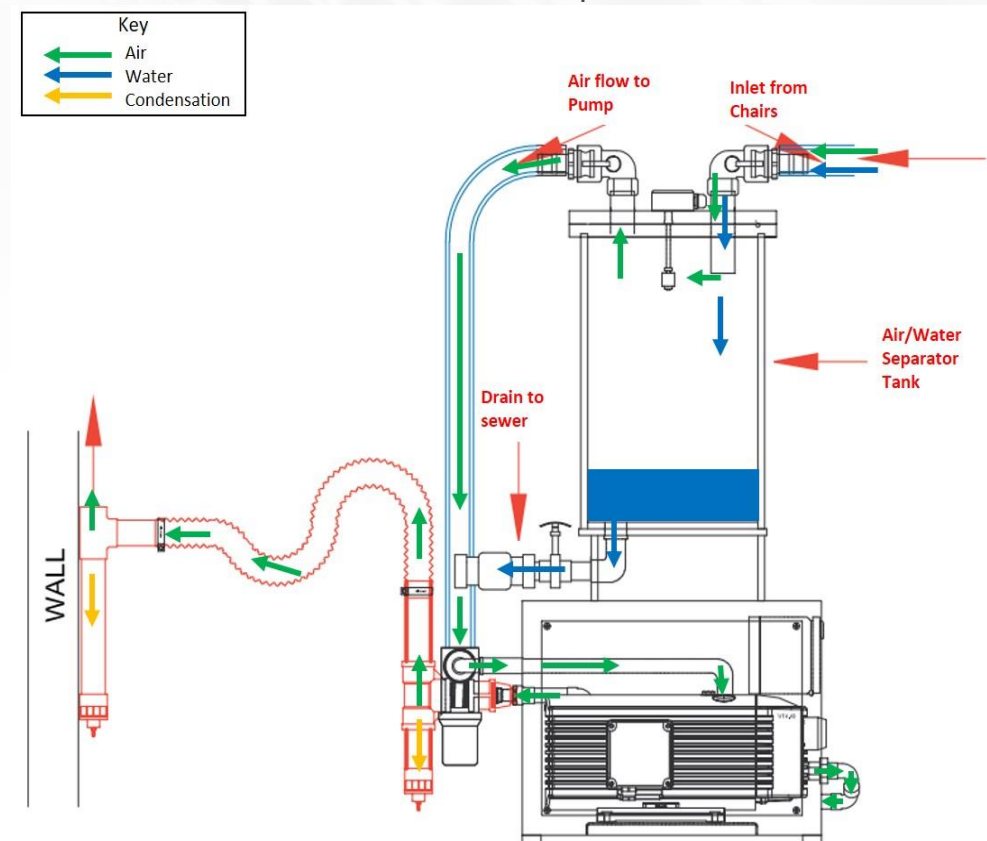
High Flow Dry-Vacuums rely on turbines that produce large air flows at vacuum levels between 7"-10" Hg

High Flow Dry-Vacuums require larger diameter piping to optimize air flow

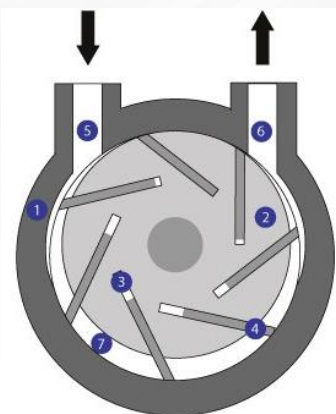
Low Flow Dry-Vacuums

Low Flow Dry-Vacuums rely on rotary vanes or rotary claws to create powerful levels of suction (15" Hg to 25" Hg)

Some Low Flow Dry-Vacuums can be adapted to all piping Systems (1/2" to 4")

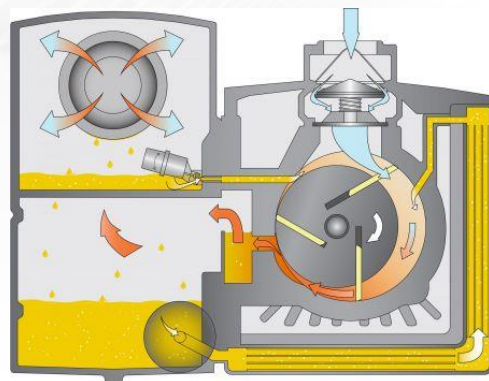


Different Types of Dry Vacuums



ROTARY VANE

- Direct drive
- Oil-free
- Minimum Maintenance
- Generates up to 25" of Hg
- Average suction 15" of Hg
- Can utilize existing lines and overhead plumbing (as small as 1/2")



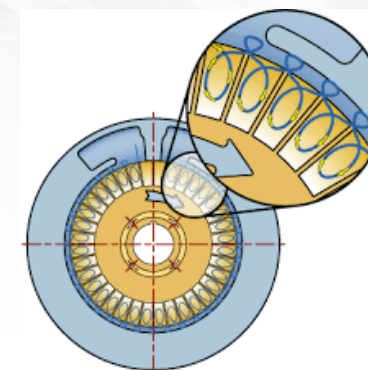
OIL-LUBRICATED ROTARY VANE

- Belt driven
- Annual oil change and maintenance
- Generates up to 12" of Hg
- Average suction is 6-8" of Hg
- Requires 2" vacuum lines



ROTARY CLAW

- Belt driven
- Oil-free
- Generates up to 18" of Hg
- Averages 12" of Hg
- Can utilize existing lines and overhead plumbing



REGENERATIVE BLOWER

- Direct Drive
- Generates up to 12" of Hg
- Average suction is 6-8" of Hg
- Requires 2" vacuum lines

Oil-Free Rotary Vane Pump: Why Do We Use It?

The Basics

- Low Cost of Ownership (Minimal and economical Maintenance)
- Easily Upgradable - Can grow with the vacuum demand of the clinic
- Small Footprint
- Easily Repairable - Available Factory Rebuilt motors/ Commonly found local parts/ Easily Troubleshoot
- Works on vacuum lines as small as 1/2"
- Works well with overhead installations
- Generates up to 25" of Hg, raising the average level of suction to 10-15"Hg

Best Applications

- Solutions for difficult applications
- Converting from Wet to Dry Vacuum
- Growing/expanding clinics
- Large custom systems
- Multi-specialty dental practices



Installation Case Study and Testimonials

Overhead Plumbing

Pulling water overhead, with just retained vacuum



[Click here for the video](#)

Hawley Lane Dental - 3HD4.40P



Hawley Lane Dental is a clinic that originally had a Mojave V5 running a 3-chair clinic with blow grade plumbing. When the clinic wanted to expand to 9-chairs, they only had one option for plumbing as the Landlord would not allow the to break up the concrete floors, the clinic needed overhead plumbing.

For added redundancy, we installed a 3HD4.40P, with the clinic mostly using 1-2 motors each day. For the overhead plumbing we used a 1/2" riser that ends in a "candy cane" reverse p-trap, terminating into a 1 1/4" trunk line.

Overhead Plumbing Video -

Upgraded!



Dr. Klimaj owns the building, kicking out tenants and expanding his clinic as the clinic's customer base grew. Benco tried many different vacuum systems in this space, nothing was able to provide the vacuum required by the clinic. Tricia Aponte and Ron LaGasse installed a 3HD4.40P, triple 2HP vacuum, giving the clinic redundancy in their motors and more than enough power to supply their clinic's demand.

The AWS tank remained in the current mechanical room, while the vacuums were installed in another mechanical room space. The two were connected by a 2" vacuum line from the pumps to supply vacuum to the AWS tank.

Dr. Daniel - 1HD4.40P vacuum + S2.0 Compressor

Upgraded!



Dr. Daniel was considering between either an AT mechanical room, or one by Dansereau Health Products. We were able to explain that both AT and Dansereau generate high air flow, but low suction due to the nature of a regenerative blower. Dr. Daniel has the plan to provide specialty dentistry and surgical procedures at her clinic. BaseVac and Benco were able to show Dr. Daniel that the power of a BaseVac is the only system that would allow a multi-specialty clinic to function as required for those delicate procedures.

Upgraded!



Dr. Fromzel had a dual 1HP wet-ring pump in her basement. The basement is below grade, which means she had to have two 50-gallon sump-pumps to pump the fluids up to grade each day. The clinic had a growing concern about the potential disaster if the sump pumps were to fail.

To resolve this concern, we installed our AWS tank in a closet, above grade in the clinic, and the vacuum in the basement, where the wet-pump use to be located.

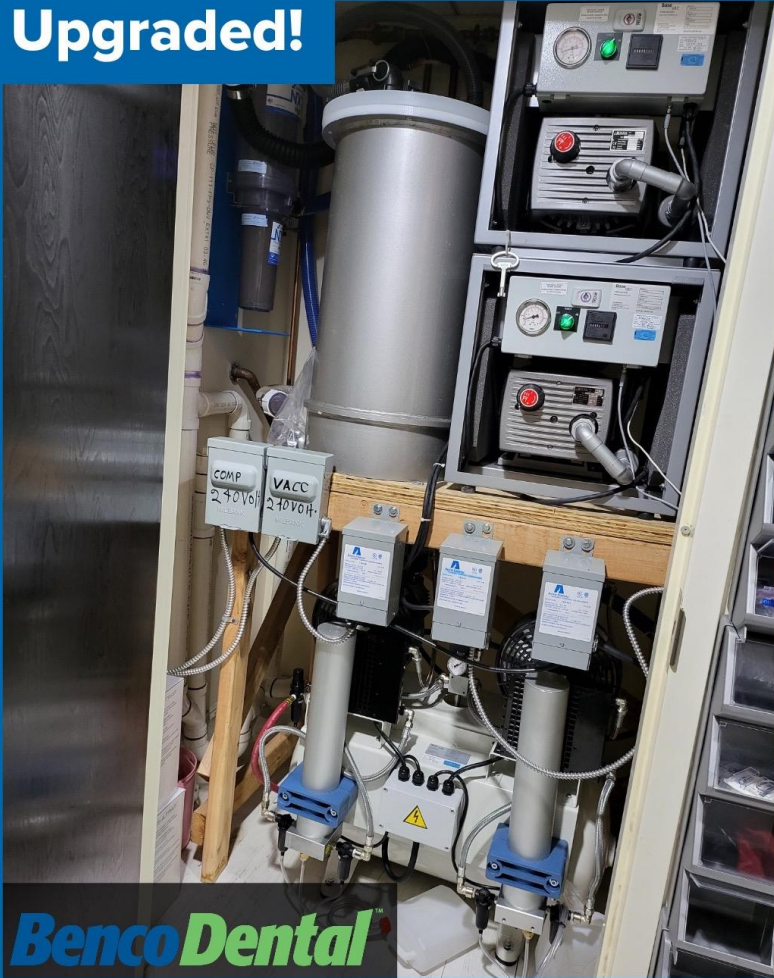


Dr. Anna Fromzel
Stamford Family Dental

"BaseVac offered a unique design that gave me a very flexible and scalable solution specifically for my practice. Their unique design gave me a solution to my unique application. Now thanks to their team, our suction is stronger, more consistent, and more efficient than it has ever been before."

Reston Family Dental - 2HD4.40P Vacuum + D1.5 Compressor

Upgraded!



Dr. Miamee had a BaseVac installed in his most recent 7-chair practice. Over 4-years of flawless service he noticed his first clinic, with a dual headed wet-vacuum had massive water consumption costs.

Dr. Miamee had Benco upgrade is whole mechanical room to match his BaseVac office. Now both of Dr. Miamee's clinics are powered by BaseVac.

"The four years of faultless service of powerful vacuum and air we received from our BaseVac system is the reason BaseVac is the only equipment I trust in my mechanical room."



Dr. Ali Miamee
Reston Family Dental

Base
VAC



Established in 1986

www.basevacdental.com

BaseVac Dental

Service and Troubleshooting

The creation of vacuum is a predictable science. Understanding how it works in an application is fundamental to our business, and it is also our strength. At BaseVac, we know that making vacuum work in dentistry means following a path of predictable science. Manufactured in Canada, BaseVac is built on 36 years of industrial vacuum pump technology.





HD-Series Vacuums

Upgrades and Innovation

Upgrades: New Frame & Motor

Our upgraded frame design streamlines the service and installation process. On the interior, our new **Republic Motors** significantly reduce capacitor and motor failures.

Removable Side Panels

Removeable Side Panels provide easier access to the pump, and make it easier to lift the system



Republic Motor

- ❖ Moved to Republic in late 2018
- ❖ Republic motor supports 208-253 V
- ❖ 2 Capacitors - 1 start, 1 run for longer life.

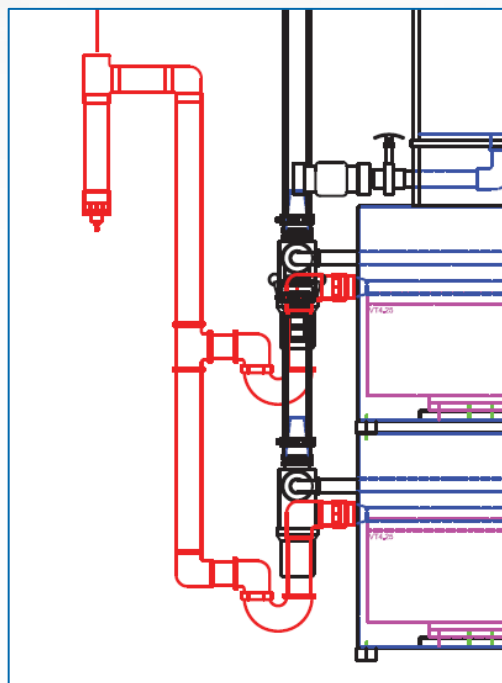


Upgrades: New Exhaust Design

Our upgraded exhaust design improves system performance and longevity by reducing the impacts of condensation

Previous Design

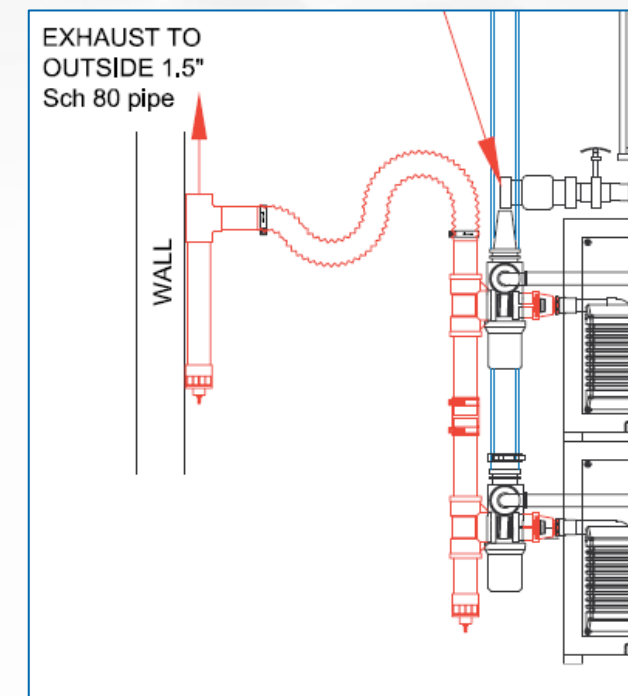
Single drip leg design allowed condensation to enter pumps - especially the bottom pump - leading to premature failure.



Upgraded Design

Second drip leg on the exhaust manifold virtually eliminates the chance of failures from condensation.

Flex hose reduces vibration and noise and makes installation easier.



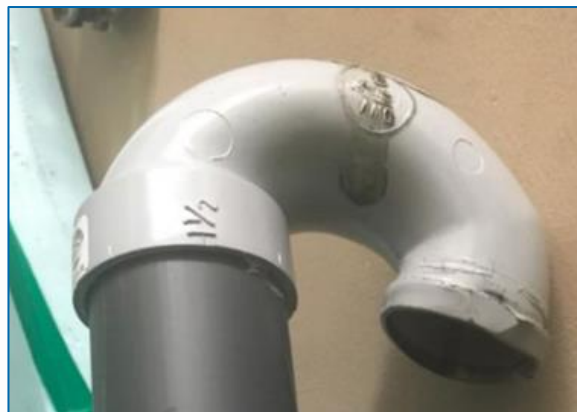
Upgrades: New Exhaust Components

Our upgraded exhaust components are significantly more heat resistant, ensuring better system performance

Original

PVC connection to Blow Off Valve

No silencer



Upgraded

Steel connection to Blow Off Valve

Mix of metal exhaust components & schedule 80 PVC

Silencer reduces noise, dissipates heat, prevents water incursion and filters carbon dust from exhaust.



Upgrades: Air/Water Separator Components

Our upgraded Air/Water Separator components are more cost effective, improve ease of installation, and are cleaner

Original

Each AWS tank shipped with high-level float switches to match the original number of pumps.

i.e. a 1HD4.40P included a single sensor tank.

The whole tank lid has to be replaced to add pumps.

Upgraded

1HD systems now ship with dual high-level float switches.

When a clinic adds a 2nd pump, simply plug it in and connect the plumbing.



Upgrades: Inlet Filters

Our upgraded inlet filters help our vacuum systems maintain better suction

Original

Sintered plastic element clogs quickly - within 8-10 months.

Must be replaced - not cleanable.

Reduced flow to clinic when clogged.



Upgraded

Stainless steel element offers the same quality of pump protection with longer filter life.

Can be easily cleaned with soap & water (dishwasher friendly).

Compatible with original filter housings.



Upgrades: Electrical Disconnects

Our upgraded disconnects improve the speed of the electrical installation process

Original

Required electrician or installer to manually connect each terminal for all low voltage components.



Upgraded

Quick disconnects make connections to all low voltage accessories quick and easy.

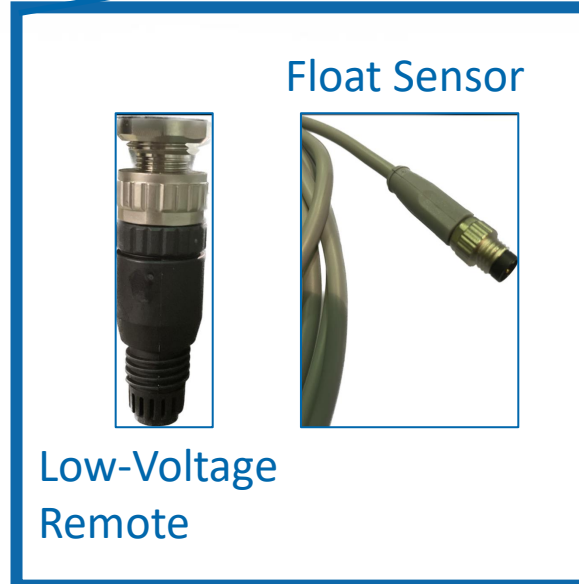


Quick Electrical Disconnects

Makes electrical installation faster & easier.

Upgraded

Quick disconnects make connections to all low voltage accessories quick and easy. These are located on the bottom right of the HD-Series control panel.

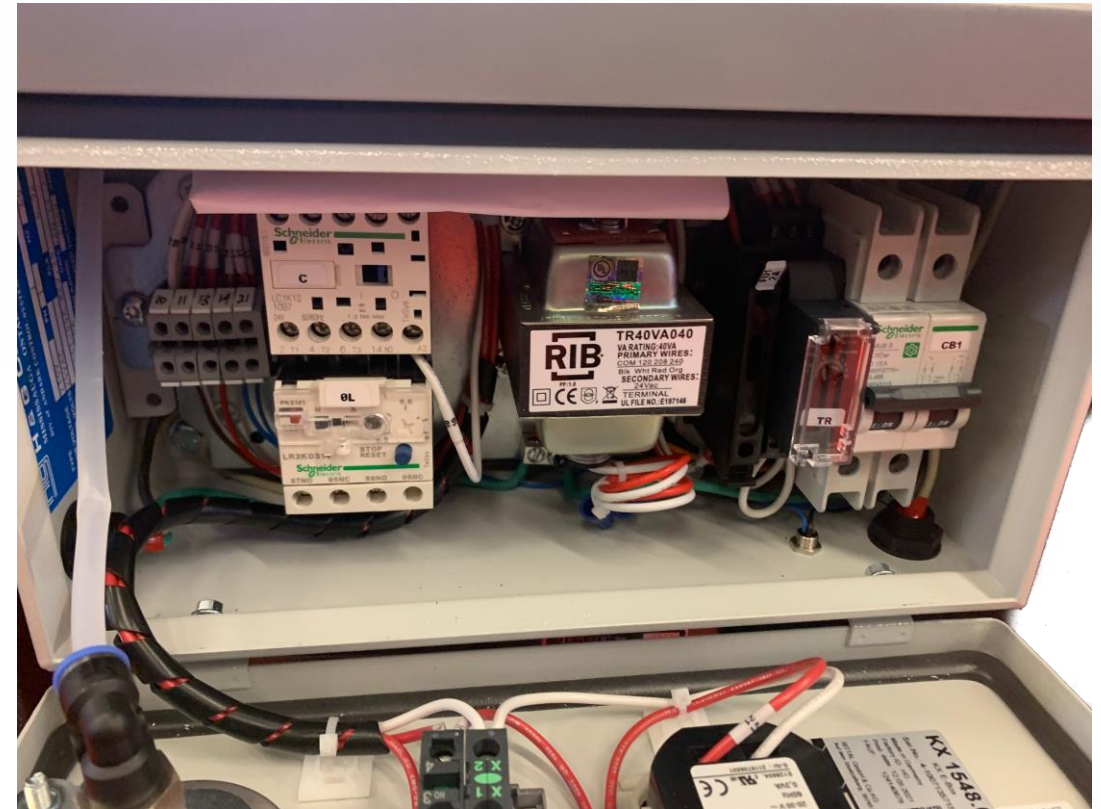


Simple and Robust Control Panel

Less downtime, easier to troubleshoot and get replacement parts.

If the control panel has a failure, the power to the panel can be easily bypassed straight to the motor, keeping the clinic running. All the components of the control panel can be purchased at a local electrical store.

[Click Here to see the Control Panel Overview.](#)



Upgrades: Vanes

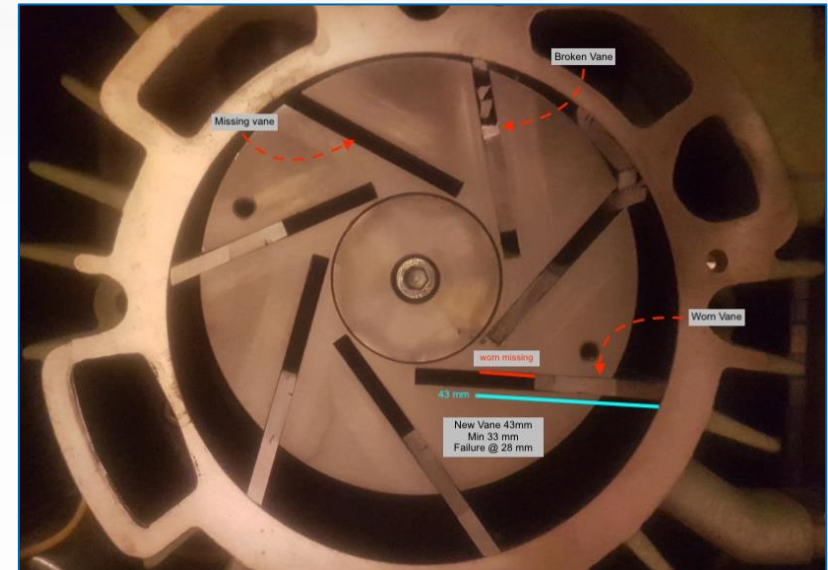
Our upgraded vanes prevent premature failure (under 3000 hours)

Issues:

- ❖ Tried a new vane supplier from approximately September 2018 - December 2018.
- ❖ The vanes passed our internal testing but sometimes failed prematurely in the field.
- ❖ The vanes are found in pumps rebuilt in this time and were supplied in parts orders during this time.

Resolution:

We changed to a new OEM-alternative vane in January 2019 and premature failures have completely stopped. Expected life of new vanes is 5,000-8,000 hours.



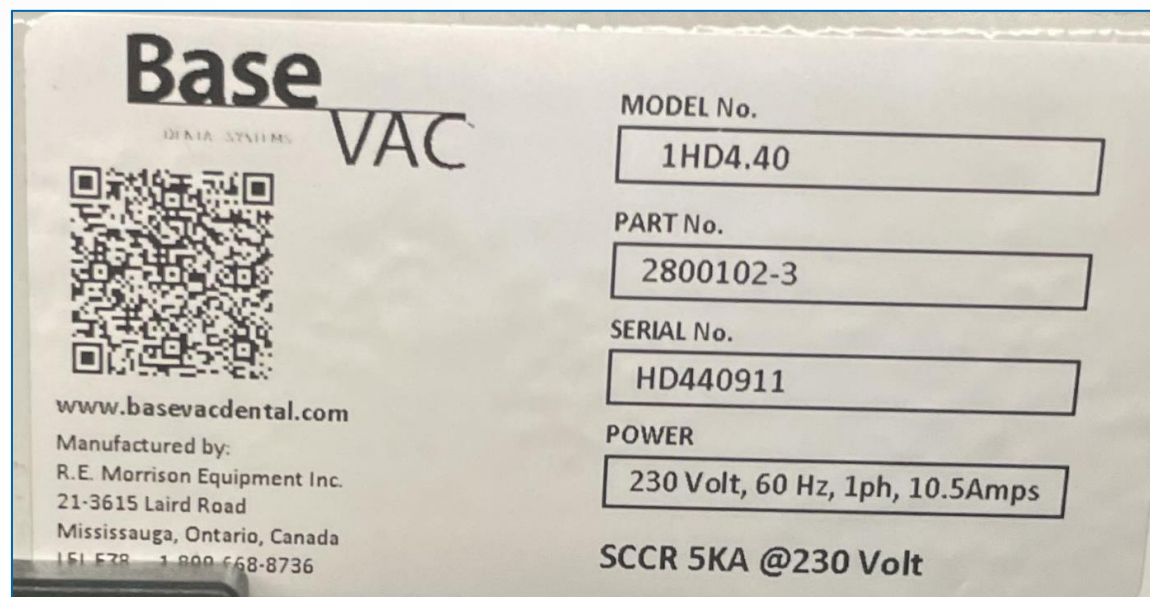


HD-Series Vacuums

Installation Guide

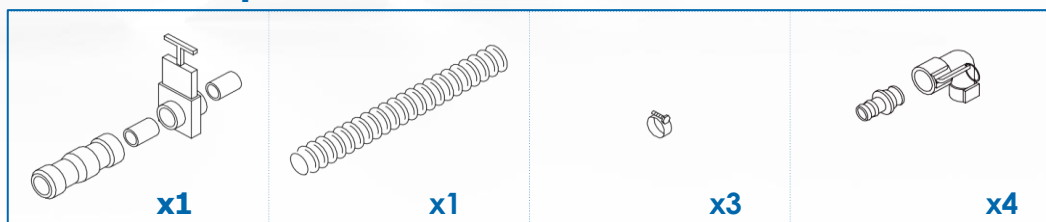
Installation: Unboxing and System ID

- QR Code
- Packages & Instructions



Installation: Parts Identification

Air Water Separator

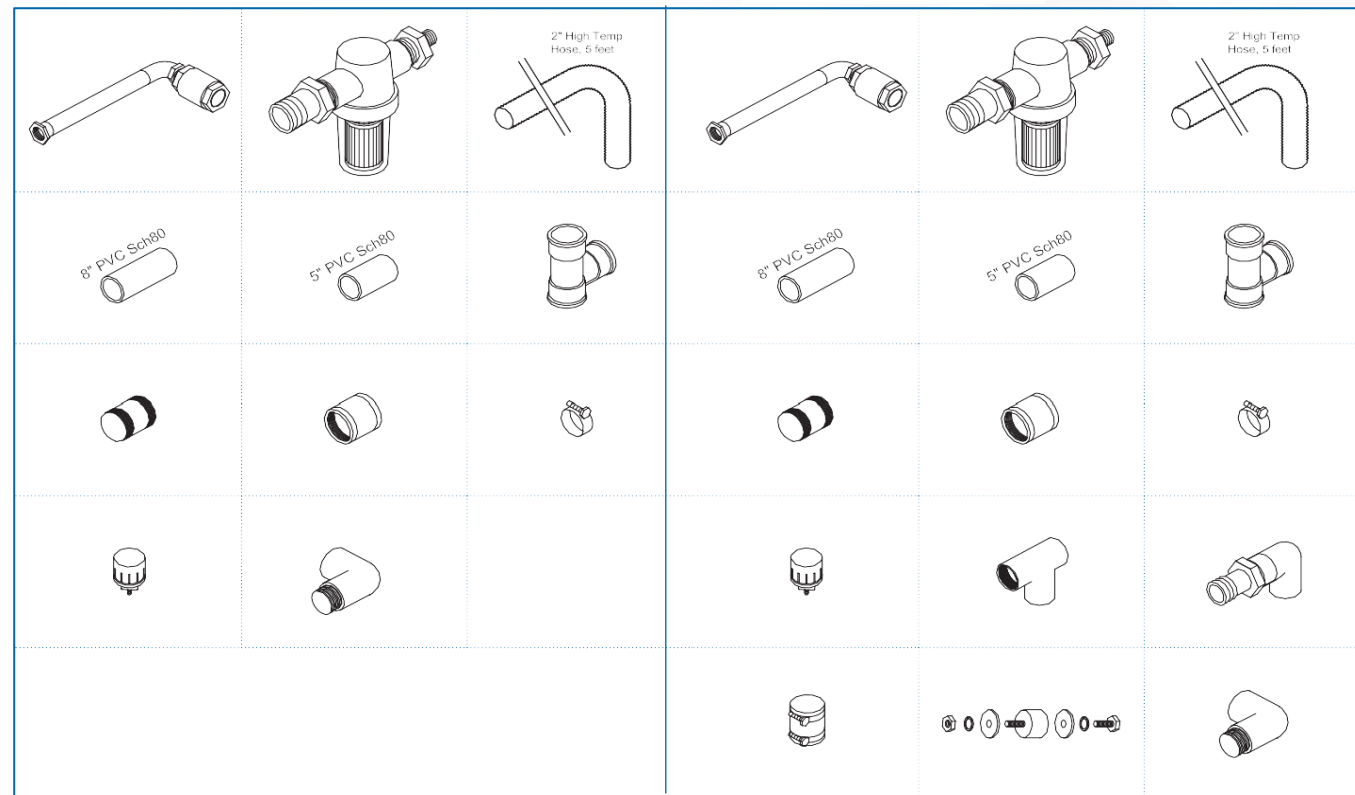


All of these parts are required!

If you have parts left over, you have a problem.

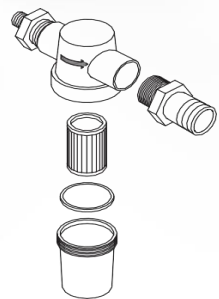
1HD Series 1HD4.16 / 1HD4.25 / 1HD4.40

2HD Series 2HD4.25 / 2HD4.40

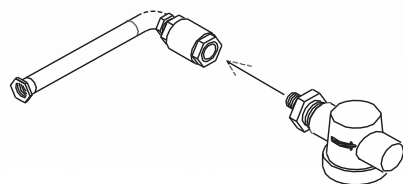


Installation: Inlet Piping Assembly

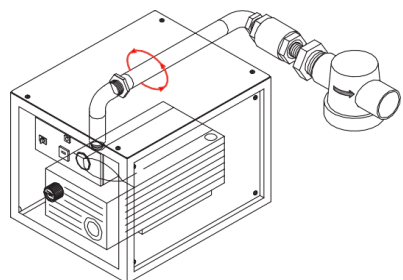
1. Remove clear housing filter, gasket and hose barb from the filter assembly



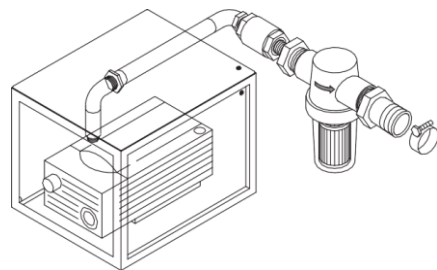
2. Assemble filter top to check valve and inlet assembly



3. Assemble completed unit from Step 2 to pump piping



4. Assemble filter housing and hose barb

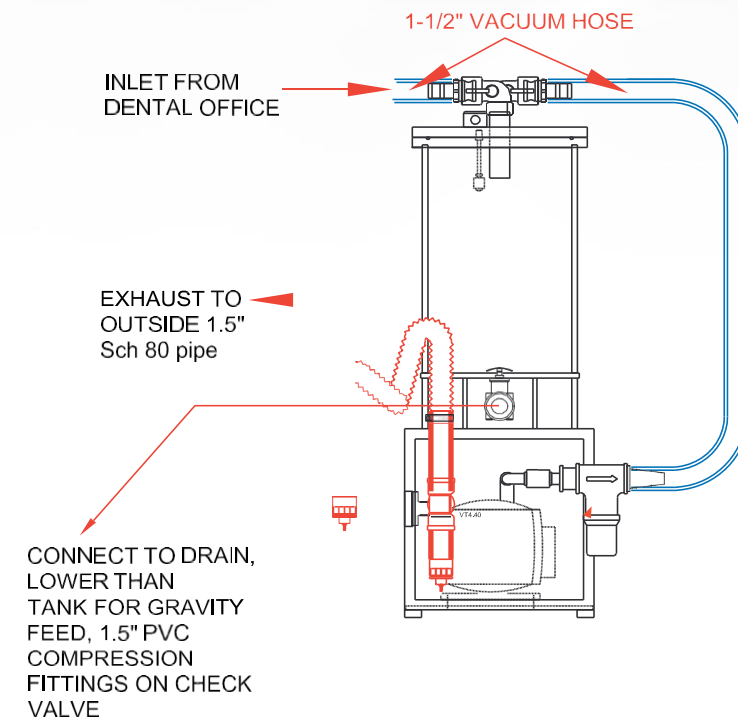


5. Use the vacuum hose to connect the inlet assembly to the Vacuum Pump connection on the tank as shown. Use clamps to fasten hose to the hose barbs.

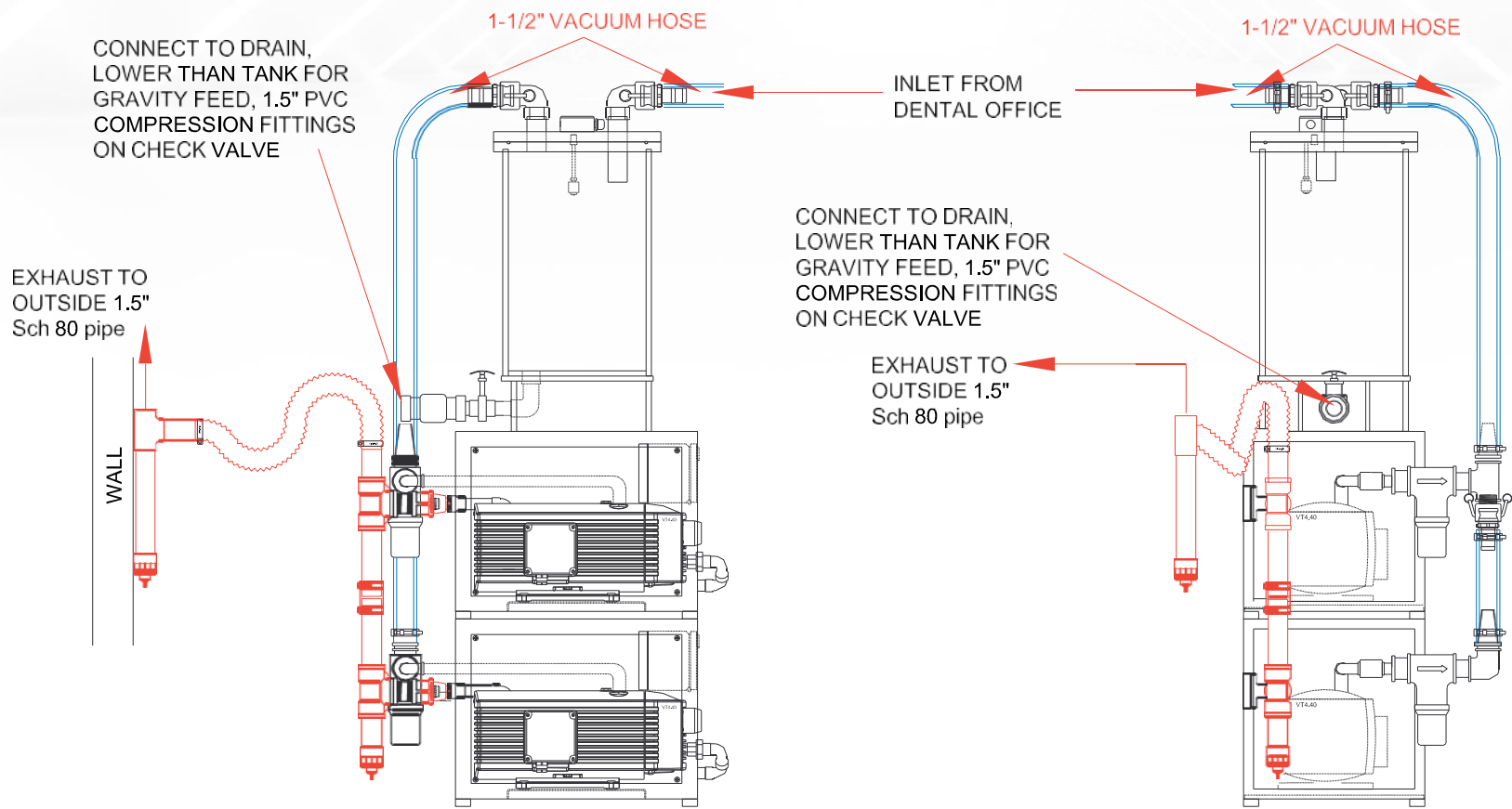
Note

The directional arrow on the filter housing is pointing away from the pump even though the direction of flow is opposite. This is done intentionally so if any liquid were to enter this line it would hit the baffle on the inside of the filter housing and disperse into the filter.

It is important that the filter remains upright for proper operation.



Installation: Exhaust Piping Assembly



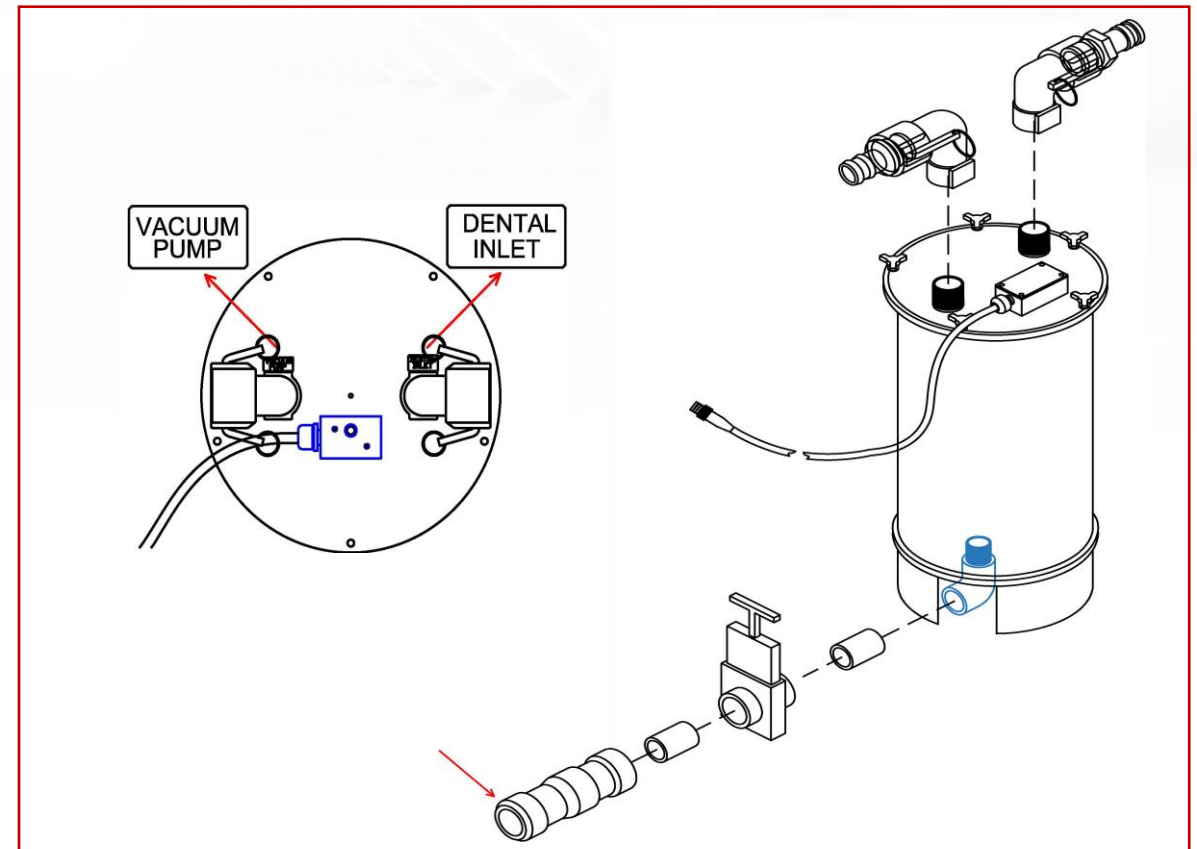
Installation: Tank Connections

1. Thread on the Dental Inlet Connection fitting to the Dental Inlet and the Vacuum Pump Connection fitting to the Vacuum pump Inlet as labelled on the top of the tank.

2. Connect the tank drain outlet hardware to the drain connection located at the bottom of the tank. Make sure that the gravity check valve flap is hanging down. The check valve has a 1.5" PVC compression fitting for connection to a drain (drain piping is not supplied). These fittings should be fastened with PVC glue

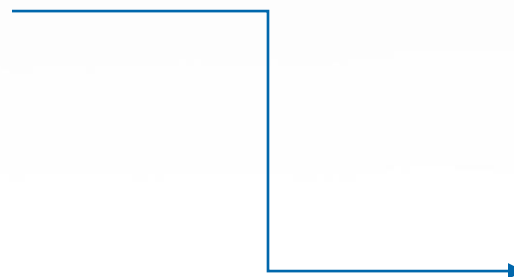
NOTE:

All connection hardware except for the drain piping is included



Installation: Example

Where do you see room for improvement within this BaseVac Setup?



Installation: Example

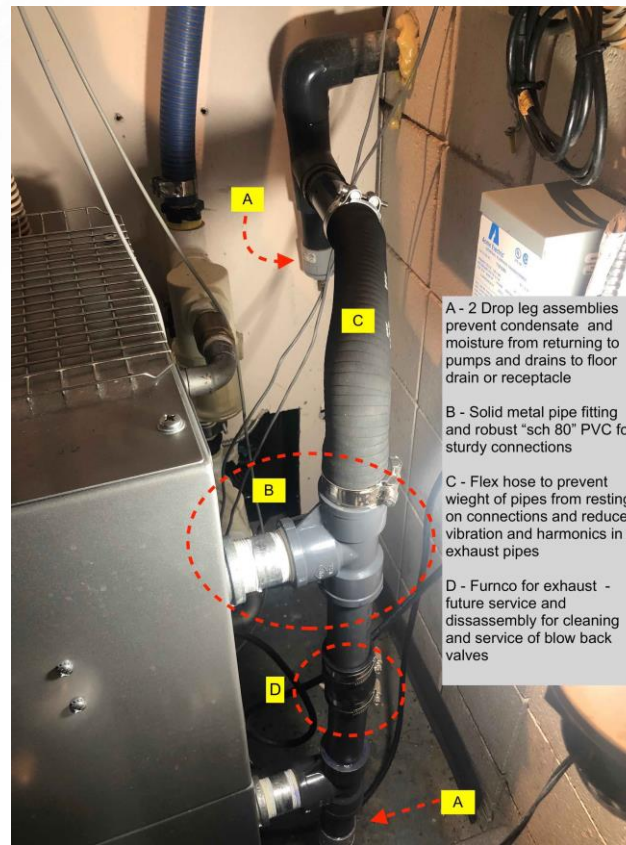
P-Trap traps moisture & heat



**“hard pipe”
connection to
drip leg.**

**No condensation
drain / drip leg.**

Installation: Upgrade Examples



A - 2 Drop leg assemblies prevent condensate and moisture from returning to pumps and drains to floor drain or receptacle

B - Solid metal pipe fitting and robust "sch 80" PVC for sturdy connections

C - Flex hose to prevent weight of pipes from resting on connections and reduce vibration and harmonics in exhaust pipes

D - Furnco for exhaust - future service and disassembly for cleaning and service of blow back valves



HD-Series Vacuums

Preventative Maintenance & Troubleshooting

HD-Series Vacuums: Preventative Maintenance

Monthly:

- Check inlet filter on vacuums. Clean if dirty.
- Check drain valve on AWS. Clean if dirty.

6 Months:

- Confirm all motors are operational.
- If stopped or making un-usual sounds, see troubleshooting guide.

12 Months (3000 Hrs)

- Replace internal filter.
- Clean inlet and exhaust assembly.
- Check vane wear and replace if necessary.
- Open and check drip leg nipples. Clean if necessary.
- Ensure motor is operating within these ranges:
 - Voltage: 208V - 253V
 - Full Load Amp: 4.25= 6.9A and 4.40= 10.5A



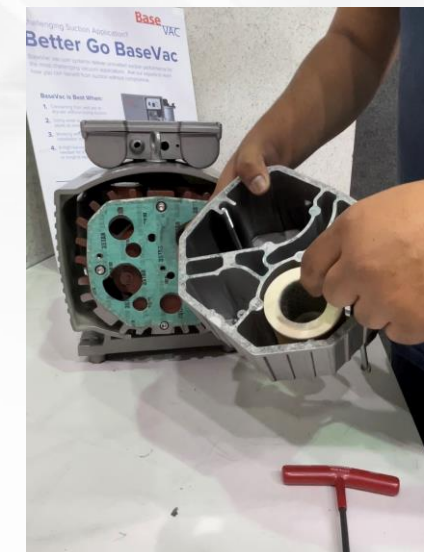
HD-Series Vacuums: A Note About Vanes

Under normal operation, vanes can 5,000-8,000 running hours.

Measure and inspect vanes at each annual service and follow the table below for guidance:

- 43 mm - New
- 33 mm - Order Replacements
- 28 mm - Replace

Chipped or cracked vanes should be replaced immediately. Follow the BaseVac Vane Replacement Guide for more details.



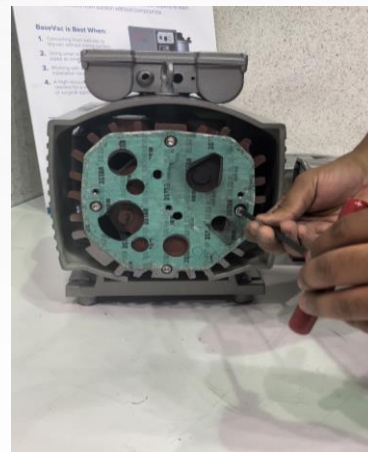
HD-Series Vacuums: Replacing Vanes



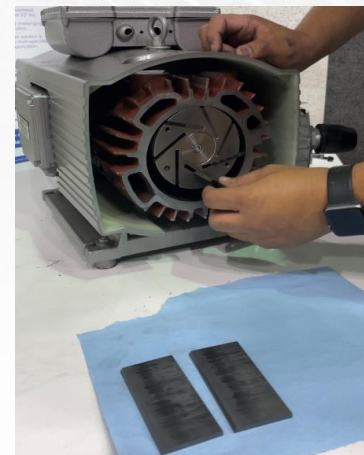
Remove plastic pump cover and filter housing



Remove inlet filter inside the housing and discard



Remove end shield to gain access to the pump housing



Extract broken vanes from the housing and the rotor vane slots



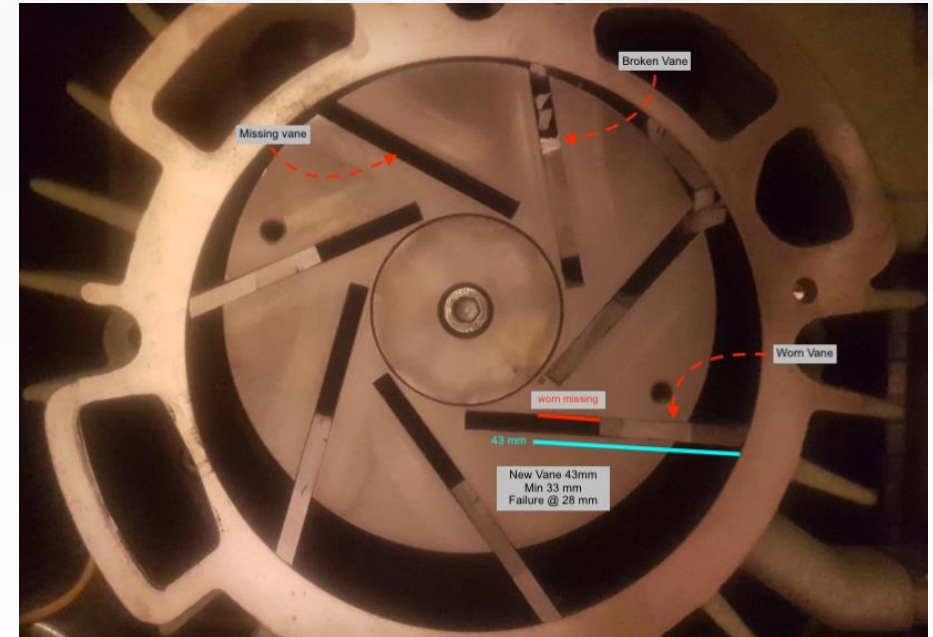
Using compressed air, blow out the filter housing, pump housing, and rotor vane slots

[Click here](#) to watch the motor overview

HD-Series Vacuums: Broken Vane Pieces

1. Remove as many vane parts as possible.
2. Use T-Handle or allen key to rotate rotor to loosen jammed vane bits. Rotate back and forth.
3. Use multi-tool to scrape vane dust out of the bottom of the slots on the rotor.
4. Fold fine sandpaper or emery cloth over top of multi-tool and fully insert into the vane slot. Push against back of cylinder to clean debris of endshield.
5. Blow cylinder out with compressed air or brake cleaner to remove all dust.

NOTE: Do not use oil or lubricant to remove vane pieces.
Oily residue will impact system performance



HD-Series Vacuums: Pump Lifespan

- ❖ Use capacitor tester to test capacitor. Use provided evaluation table to understand capacitor life.
- ❖ Use multimeter to test amperage of each motor. Compare against provided evaluation table. If amps are above the expected range, this indicates a problem with the system which will eventually lead to failure.

Contact our service team any time for support.



HD-Series Vacuums: Troubleshooting

Pump will not start	Electrical -Main fuse failure	Activate remote switch, nothing happens	- Check main fuse or breaker, reset or replace
	Electrical -Breaker OK, pump still will not start	Activate Pump panel switch to ON, nothing happens	- Check and reset overload in pump control panel.
	Mechanical -Vaness worn or broken	Pump keeps tripping breaker when turned on	If hour meter shows 6000 to 7000, vanes may have broken and need to be replaced, follow vane replacement guide.
	Pump internals have been flooded or seized with rust.	Pump keeps tripping; vanes are OK. Pump rusted inside	Remove vanes (see vane replacement guide). Use sand paper to remove visible rust. Using an Allen key, free the rotor with centre shaft bolt. Clean and replace vanes.

HD-Series Vacuums: Troubleshooting

<p>Pump room is excessively hot</p>	<p>Exhaust piping</p>	<p>The pump room heats up during the day.</p>	<ul style="list-style-type: none"> -Look for and correct leaks, crack or separation in exhaust or piping -Remove outside obstructions, example bird nest, garbage receptacle -Improve room ventilation - fresh air and exhaust -Remove side panels (newer units)
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HD-Series Vacuums: Troubleshooting

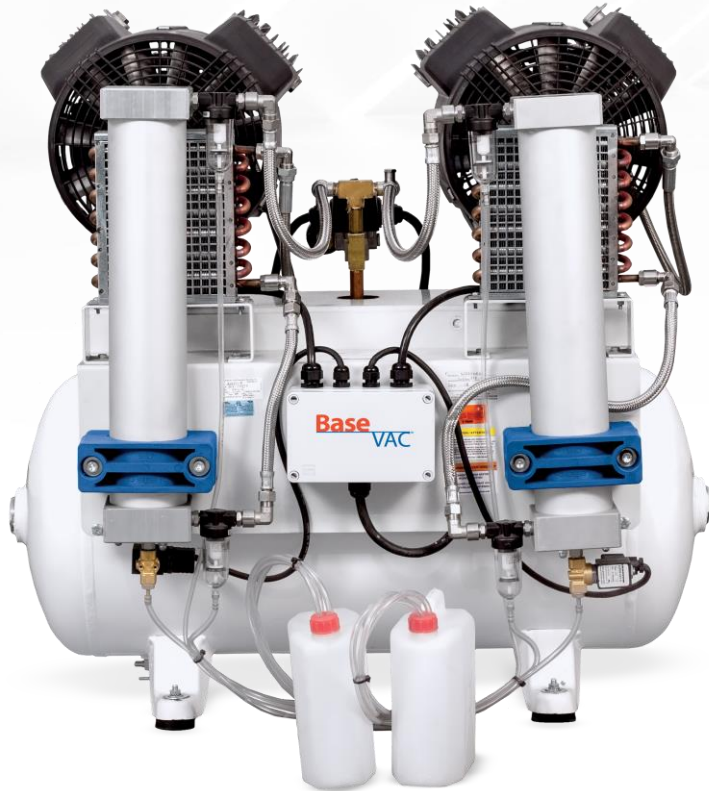
Low or Poor Vacuum	Clogging of filters and separators	Gradual drop in suction	-Clean all air filters in the line -Inspect amalgam separator to insure it is not full -Clean air-water separator
	Air Water separator full, float blocking inlet	Low or no vacuum	Turn pump off, wait 4 minutes for tank to drain and make sure drain valve is open (handle up)
	Pump problem	Sudden drop in suction, vanes noise sounds different	-Inspect the pump for broken vanes using vane replacement guide -Insure vacuum regulating valve is turned all the way in

HD-Series Vacuums: Troubleshooting

Liquid leaking from front of pump	Air water separator malfunction	Pump continues to run water leaks from pump exhaust and filter cover. Pump in-line "white" filter bowl full.	<ul style="list-style-type: none"> -Inspect float switch in air water separator, clean and or replace -If using remote drain pump, check fuse -Remote drain pump -Check for drain obstructions <p>Important: Correct problem and drain water from pump by following steps in vane replacement guide. Dry the pump with rags. Reassemble pump and immediately run the pump for minimum of 4 hours until it is dry.</p>
	Condensation in exhaust line	Water is leaking from front of pump but inline "white" filter is dry.	<ul style="list-style-type: none"> -Inspect and drain drop leg condensate traps on exhaust piping -Insure exhaust piping slopes away from pump exhaust port -Review exhaust piping guidelines

HD-Series Vacuums: Troubleshooting

Noise in Exhaust Piping	Vibration from Pump transferred to piping	The resonating sound changes with pump load.	<ul style="list-style-type: none"> -Check for rigid mounting connections and remove them. -Replace a section of rigid pipe with flex hose. -Install exhaust silencer
		The vibration sound never changes.	<ul style="list-style-type: none"> -Inspect pump to insure it is installed level with no brackets connected from the pump frame to wall or floor -Insure nothing is leaning against the pump or exhaust piping



S & D Series Compressors

Preventative Maintenance and Troubleshooting

S & D Series Compressors: Videos

Maintenance

S & D Series Compressor
Care & Maintenance

Base
VAC



<https://youtu.be/yJOnIX8Fu4A>

Troubleshooting

S & D Series Compressor
Troubleshooting

Base
VAC



<https://youtu.be/fjotxrXRm-U>

S & D Series Compressors: Preventative Maintenance

Weekly – Dental Team

1



Drain through the drain plug the dew contained in the tank and empty the tank.

2



Empty condensation collector.

Monthly – Dental Team

1



Disassemble the air intake filter and clean it by blowing in compressed air.

2



Check the compressor efficiency: possible connector slackening, pressure hoses wear, screw tightening, electric circuit efficiency, etc. Ensure all motor heads are operating.

Yearly – Service Technician

1



Replace the air intake filter. Contact us at **1.800.668.8736** or by emailing **sales at sales@basevacdental.com** to order replacement filters.

2



Check and clean out the purge valve on each desiccant tower. Replace silica desiccant pellets every 5-6 years. Contact us at **1.800.668.8736** or by emailing sales at **sales@basevacdental.com** to order replacement silica membrane dryers.

3



Replace Moisture Trap Filter. Contact us at **1.800.668.8736** or by emailing sales at **sales@basevacdental.com** to order replacement moisture trap filters.

S & D Series Compressors: Major Maintenance

The video reviews removing the head off the compressor for a gasket replacement. You can also follow this process to replace the anti-friction piston cuffs.



[Click here to view the video](#)



Anti-Friction Piston Cuff replacement

- 1) Use an adjustable wrench to remove the compressor fitting off the head outlet. **(0:06 into the video)**
- 2) Use a ½" wrench to remove the nuts holding the head. Two nuts for a 2HP compressor, four nuts for a 1.5HP compressor. **(0:15 into the video)**
- 3) Remove the head from the motor. **(0:40 into the video)**
- 4) **At 0:45** in the video, you will see the components for the anti-friction compressor cuff. The kit replaces the wide cuff at the bottom of the piston, the thin cuff at the top, and the red O-ring under the thin top cuff.
- 5) **At 3:26** in the video, you will see how to reattach the head back on the piston.

Gasket Replacement

- 1) Follow the video up to **0:50** to review how to remove the head (same as instructions above).
- 2) Place the head on a flat service to work on.
- 3) Use a 10mm socket to remove the four bolts that hold the head together. Be mindful of the orientation you take apart the head. They have to be assembled in a specific order. *Helpful hint: set the head down as you see in the video to ensure you duplicate the orientation of the head exactly*
- 4) Follow the video to replace the gasket and reassemble the head **(0:50 -3:20)**
- 5) **At 3:26** in the video, you will see how to reattach the head back on the piston and mount it back on the compressor.