



WELCOME TO VOGELSANG FACTORY TRAINING

Best Practices for Installation of VX Rotary Lobe Pumps

Storage

If you are not installing your new pump right away, there are steps you must take to ensure the pump remains in working condition when it comes time for startup.



Short Term Storage

1. Flush pump with clean water (or water glycol mix), empty and allow it to dry.
2. Lightly grease bare metal surfaces and shafts.
3. Store the pump assembly in horizontal position in a dry area.
4. Temperature must not go below 23° F and the relative humidity not less than 60%.
5. No direct exposure to sunlight or UV light.
6. No aggressive, corrosive substances (contaminated air, ozone, gases, solvents, acids, alkalis, salts, radioactivity etc.) in the immediate vicinity.
7. No constant vibration or oscillation.

Long Term Storage

1. Flush pump with clean water (or water glycol mix), empty and allow it to dry.
2. Store the unit in a low humidity environment, allowing excess moisture to evaporate
3. Open the cover plate of pump and spray a long-term preservative (e.g. SHELL ENSIS) on all bright pump internals and the inside of the cover plate.
4. Rotate the pump manually (at least two revolutions) to ensure complete and even coating of the surfaces in contact every 30 days.
5. After rotation spray again all bright pump internals with the long-term preservative.
6. Close the pump cover plate.
7. Seal pump connectors carefully with metallic full face blind flanges and gaskets.
8. Spray the long-term preservative on all exposed metallic parts of the complete unit.
9. Fill the pump gear box nearly full with the proper gear oil. Consider thermal expansion.
10. Fill the drive gear box nearly full with the proper gear oil. Consider thermal expansion.

Recommissioning

1. Remove long-term rust preservative.
2. Drain the gear oil of the pump gear box to the rated oil level according to the O&M manual.
3. Drain the gear oil of the drive gear box to the rated oil level according to the O&M manual.
4. Check the seals and gaskets properly; if any changes regarding shape, color, hardness or sealing effect are detected, they must be replaced.

Preparing for Installation

Follow all best practices for safety when working on Vogelsang Equipment.





Lockout & Tagout



1. Read & understand O&M Manual before servicing this pump.
2. Turn power OFF at main panel.
3. Perform Lockout Tagout procedure.
4. Test lockout: press RUN button on panel.
5. Close ALL valves to isolate pump.
6. Loosen lower front cover bolts first to relieve pressure in the wet-end.
7. Depressurize buffer chamber only if you are servicing lobes or seals.

Important:

1. Follow all Lockout & Tagout procedure before any work is performed on the pump.
2. This sticker (or one similar on older models) came with your pump. Make sure your pump is ready to be serviced by performing steps 1-7.
3. Be sure to depressurize the pump before any work is performed.

Over Pressurization



Risk of injury from bursting components and liquid spraying out under high pressure.

- The maximum operating pressure must not be exceeded at any time.
- Observe and implement the recommendations in for installation in pipelines.
- Protect the pump assembly against excess pressure. For example, the following safety devices can be used:
 - current limiter on the motor
 - pressure relief valve
 - cut-off with a pressure switch
 - overload coupling



Run Dry



Even though our pumps are allowed to run dry from time to time, a brand new pump may develop friction during the break-in period. Friction could lead to heat and should be avoided.

- Avoid pump dry running during startup. Prevent the pump from running dry using, for example:
 - temperature monitor
 - level gauge
 - flow rate gauge



Moving the Pump



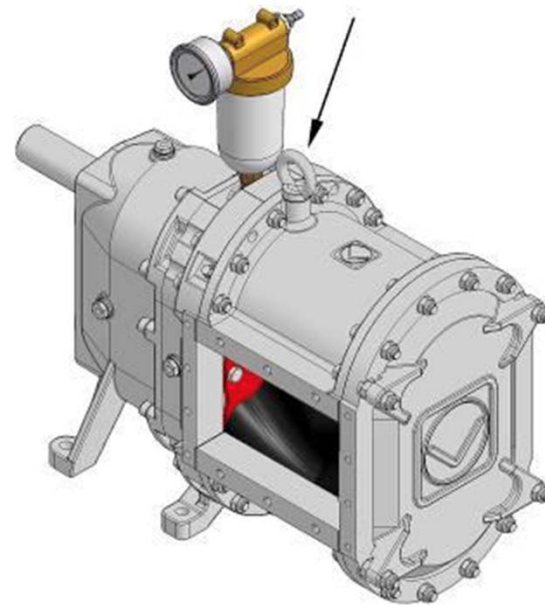
Depending on the chosen configuration, assemblies may be moved in a variety of ways.

- Always follow basic safety practices when moving heavy equipment.
- All assemblies come with factory installed lifting points and should not be removed or relocated.

Moving a Bare Shaft Q Pump

Simply lift a Q-Series pump by the lifting ring located in the center.

Removing the Oil Bottle is a best practice when moving the pump but is not always necessary for short moves.

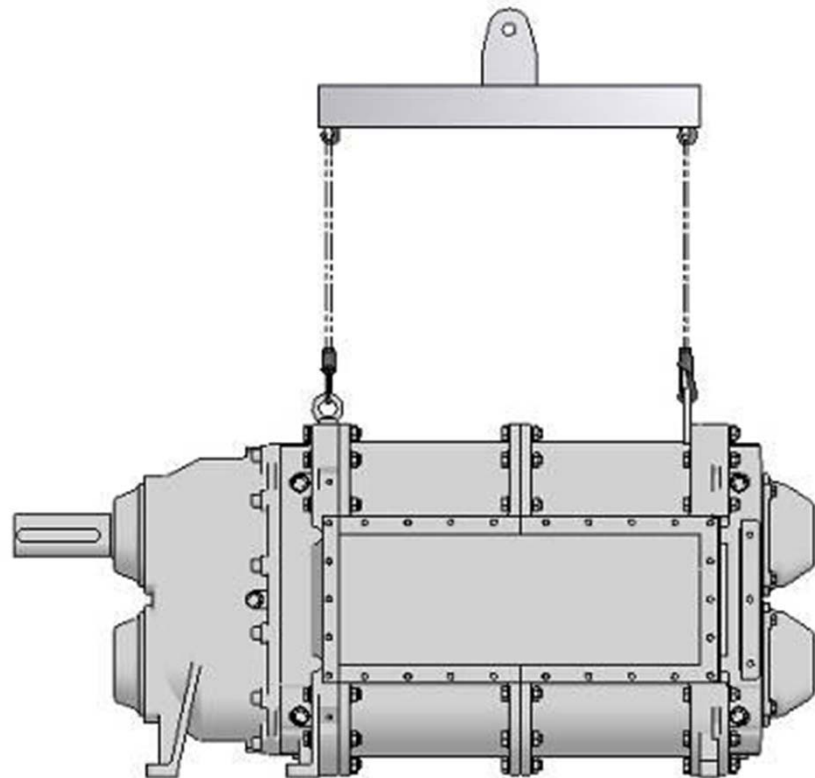




Moving a Bare Shaft QD Pump

Larger QD-Series pumps will have two lifting points. One is the same as the Q-Series and the other will be located on the outboard end of the pump. The fitting at the outboard end may be a ring or a tab depending on pump model.

Removing the Oil Bottle is a best practice when moving the pump but is not always necessary for short moves.

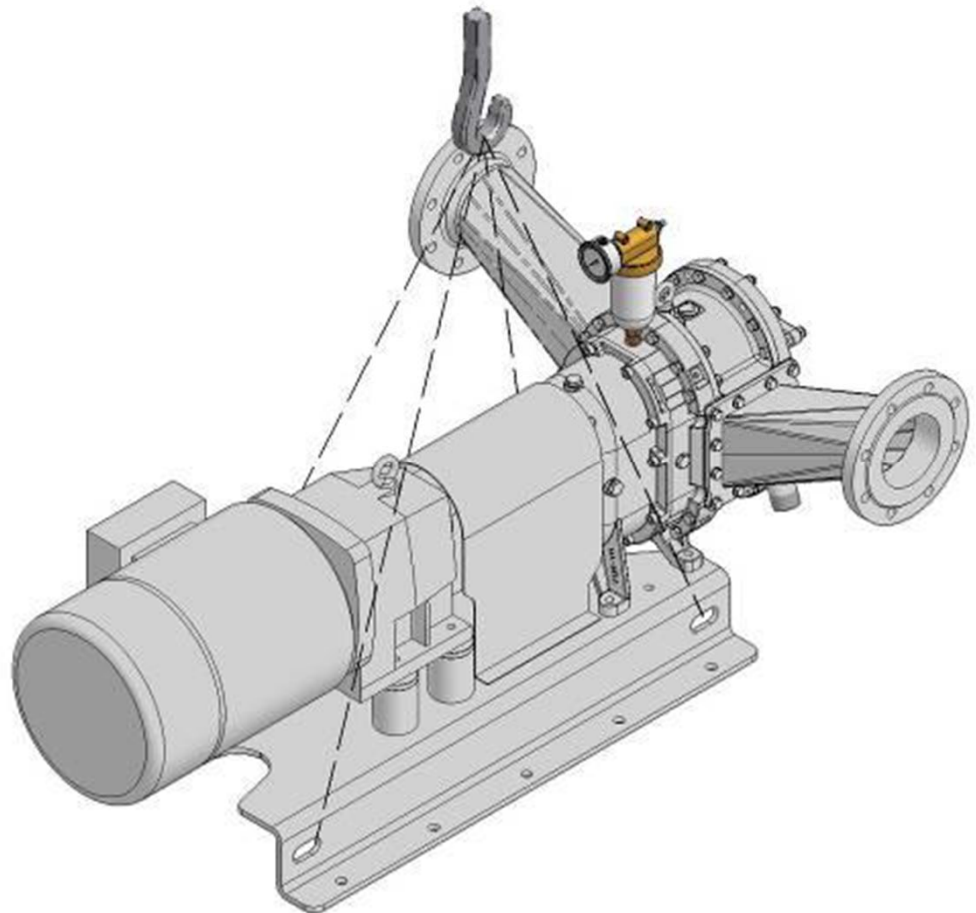


Moving an Inline Assembly

Moving a complete assembly will require a bridle to be composed of four cables or chains connected to the four slots located in the channel base.

Do not use the lifting rings to move a completed assembly. They are only rated to move the individual component they are attached to.

Removing the Oil Bottle is a best practice when moving the pump but is not always necessary for short moves.

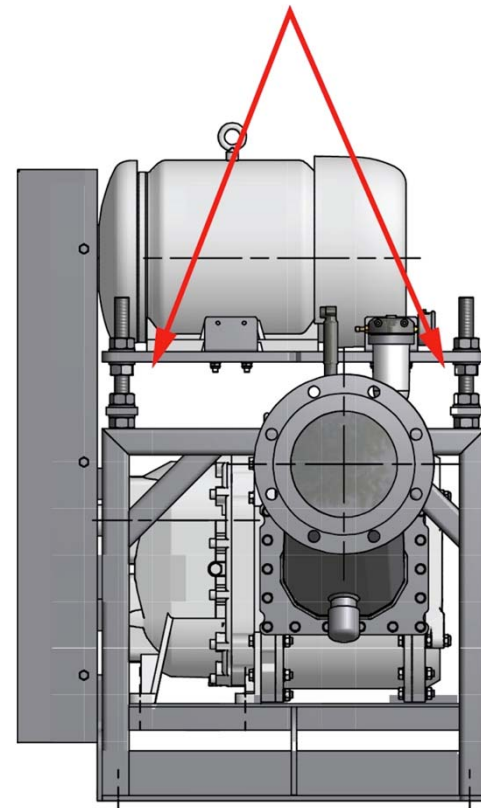




Moving a Belt Drive Piggy Back Assembly

Moving a complete assembly will require straps to be threaded under the motor mounting plate. Make sure your straps are rated for the weight of the complete assembly.

Do not use the lifting ring on top of the motor! It is only rated to lift the motor itself.



Installation

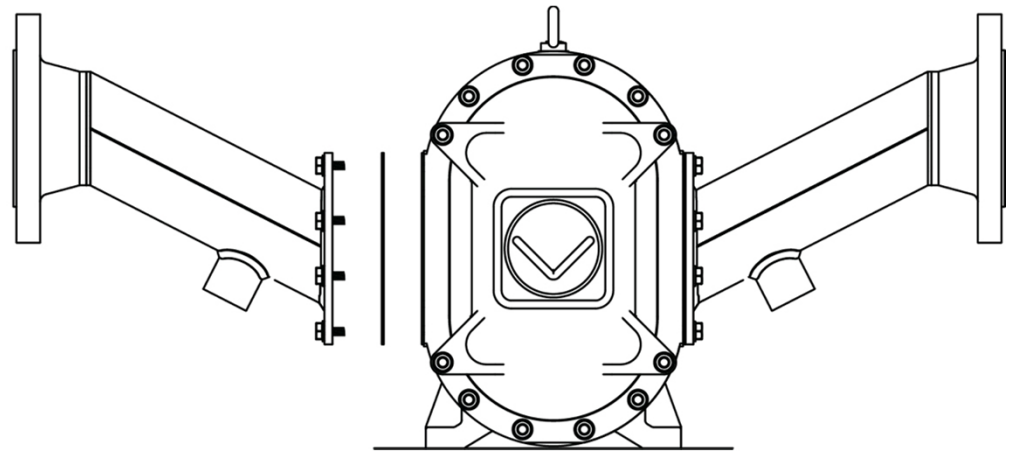


Mounting Flanges

Most pumps come complete with a set of flanges. The flanges will be mounted to the skid to prevent damage during shipping.

All hardware will be included such as hex bolts, washers and flange gaskets.

Simply insert the gasket between the pump and flange. Then thread each bolt in and secure.



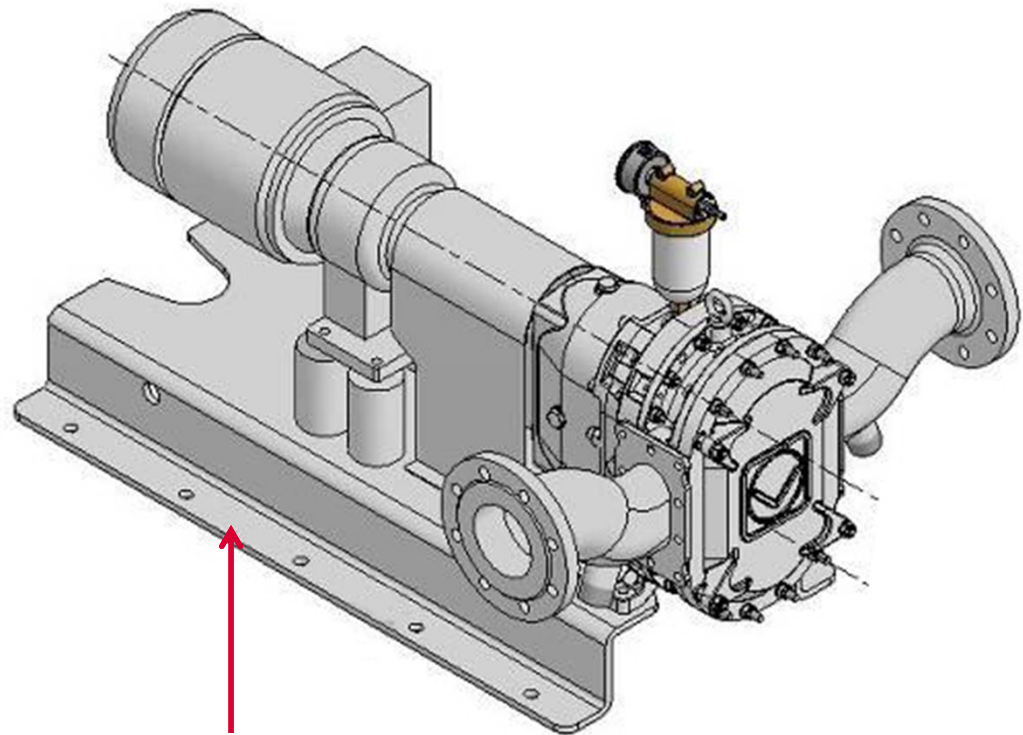
All piping must be supported. The flanges and pump are not designed to support connected piping!

Optional Grouting

Our customers sometimes prefer to bolt inline assemblies to the pad and then apply grout above the flange to secure the pump and prevent any vibration.

Our pumps are pulsation-free which means grouting is not a requirement but is an acceptable installation method.

It is recommended that only the flanges at the bottom of the base be grouted. This will ensure accessibility to underside of the base for maintenance purposes.



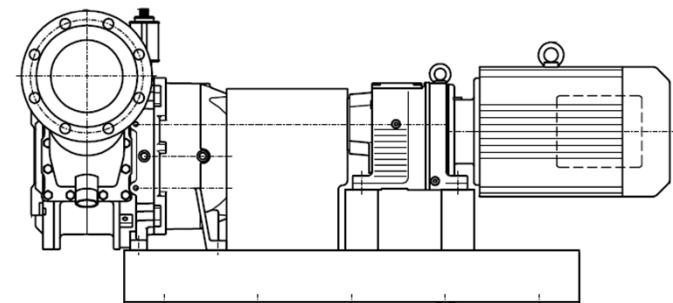
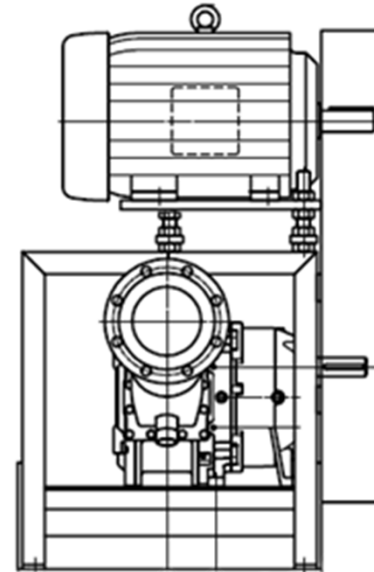
**Grout along edges
over flange**



Coupling Alignment

Vogelsang offers two basic assemblies for most applications. The belt drive configuration must be aligned by verifying that both sheaves are aligned using a straight edge.

Inline assemblies use a three part coupling device that must also be aligned to avoid any vibration or unnecessary wear.

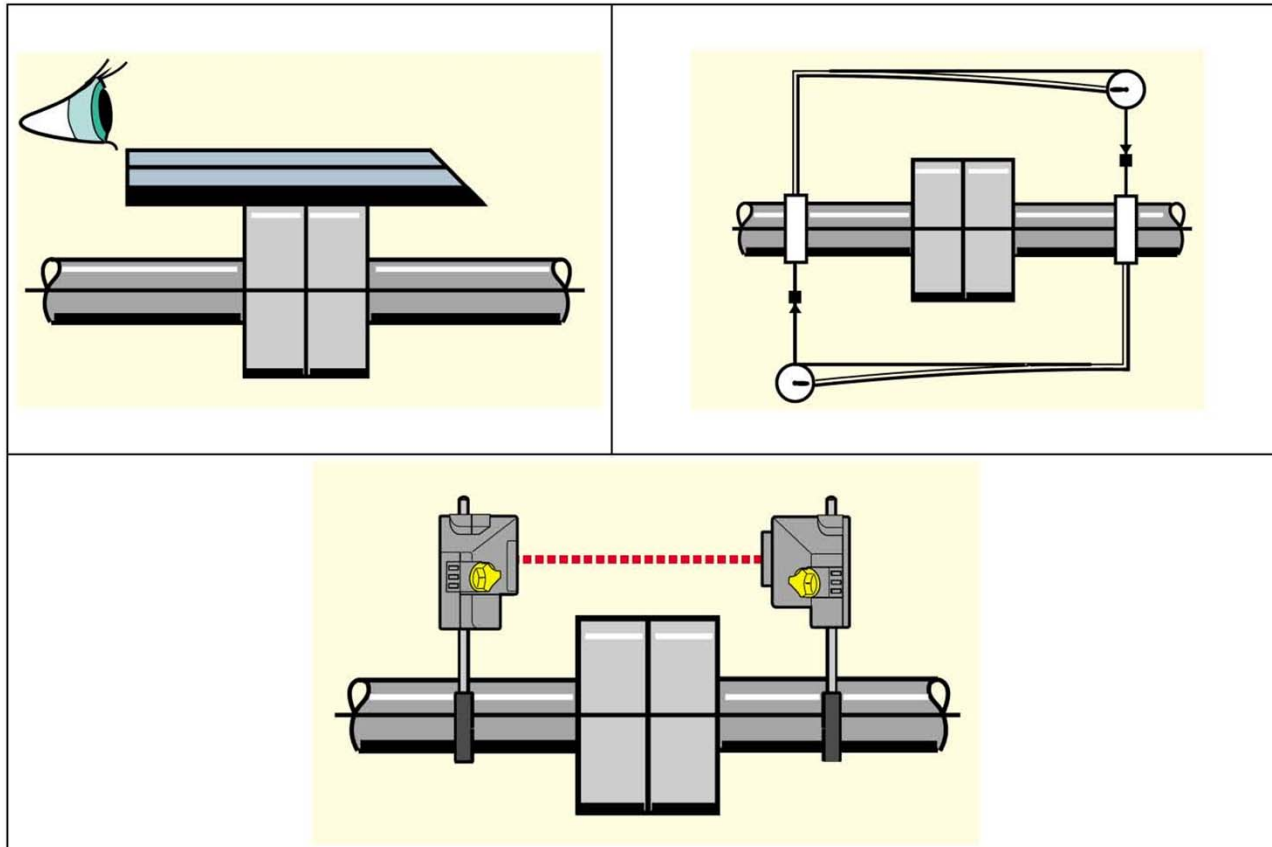




Coupling Alignment for Inline Assemblies

The alignment of the coupling must be periodically checked. If there is vibration during operation, alignment is sometimes the cause.

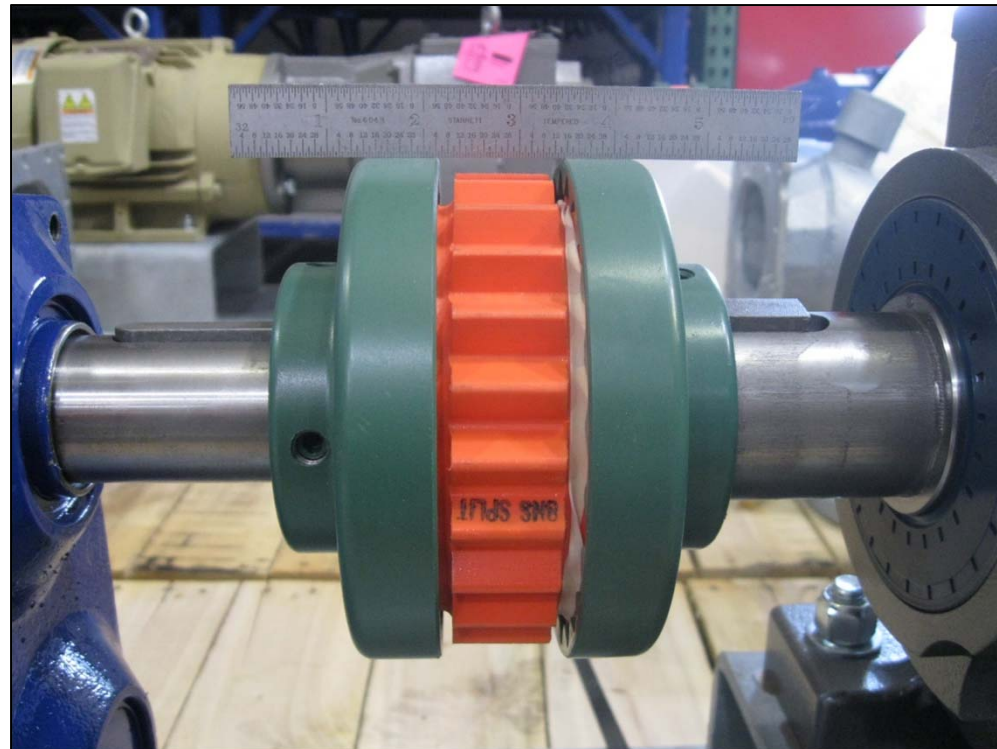
Alignment can be verified by using a straight edge or other devices.



Surflex Coupling Alignment

Check parallel alignment by placing a straight edge across the two flanges and measuring the maximum offset at various points around the periphery without rotating the coupling.

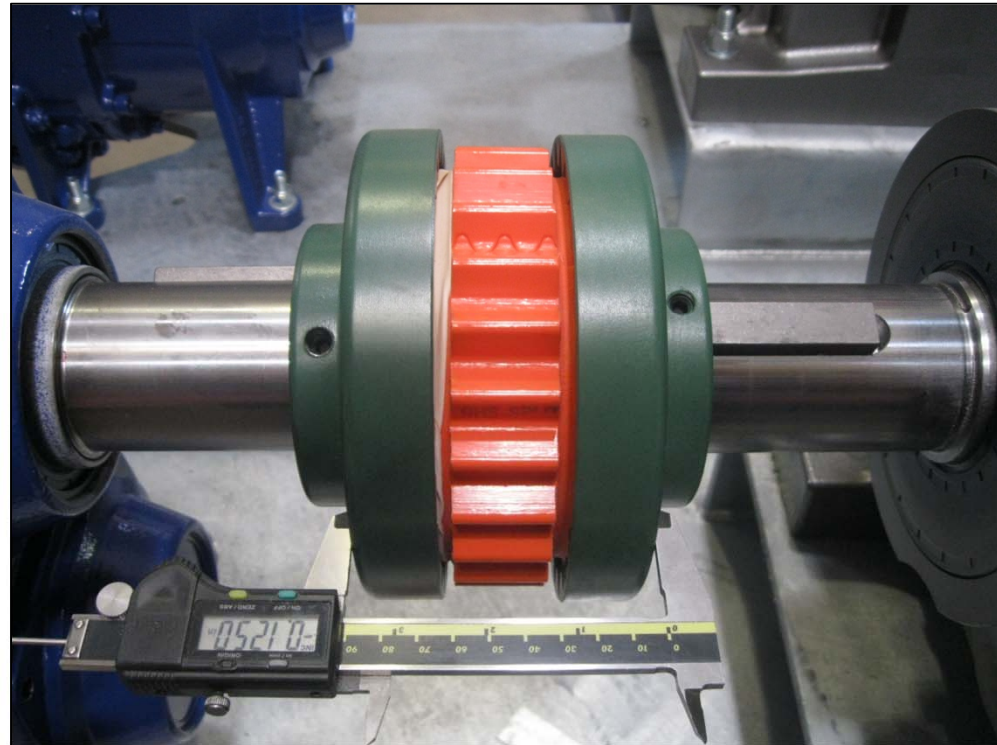
Parallel Alignment



Surflex Coupling Alignment

Check the angular alignment with a micrometer or caliper. Measure from the outside of one flange to outside of the other at intervals around the periphery of the coupling. Don't rotate the coupling.

Angular Alignment



Surflex Coupling Alignment Tolerances

(Dimensions in inches)

Sleeve Size	Maximum RPM	Types JE, JN, JES, JNS, E & N			Type H & HS		
		Parallel	Angular	Y	Parallel	Angular	Y
3	9200	.010	.035	1.188	...	...	...
4	7600	.010	.043	1.500	...	...	...
5	7600	.015	.056	1.938	...	...	...
6	6000	.015	.070	2.375	.010	.016	2.375
7	5250	.020	.081	2.563	.012	.020	2.563
8	4500	.020	.094	2.938	.015	.025	2.938
9	3750	.025	.109	3.500	.017	.028	3.500
10	3600	.025	.128	4.063	.020	.032	4.063
11	3600	.032	.151	4.875	.022	.037	4.875
12	2800	.032	.175	4.688	.025	.042	5.688
13	2400	.040	.195	6.688	.030	.050	6.625
14	2200	.045	.242	7.750	.035	.060	7.750
16	1500	.062	.330	10.250	...	...	...

Note: Values shown above apply if the actual torque

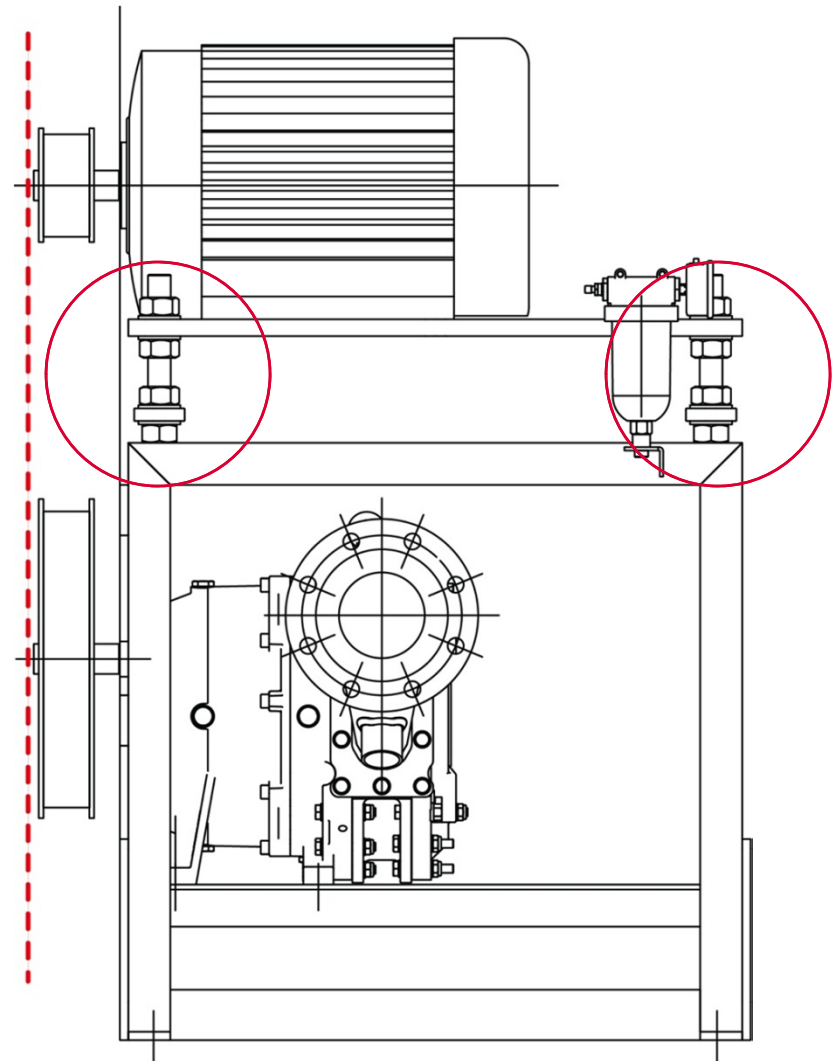


V-Belt Drive Alignment

Aligning the V-Belt or Piggy Back configuration requires that the sheaves are in line with each other.

Once the pump is mounted, the orientation of the motor is controlled via four mounting bolts as shown.

Using a straight edge, align the top sheave to the bottom sheave by adding or removing turns. Once the sheaves are aligned, belt tension is added by tightening each nut equally until the proper belt tension is achieved.



Pressurizing the Pump



What is the Pressurized Oil Bottle?

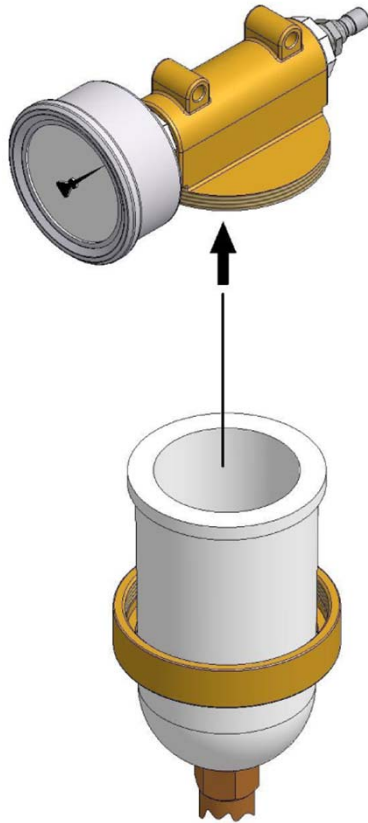


Vogelsang applies positive pressure inside the buffer chamber. The pressure is achieved via a semi-opaque bottle where air is pumped inside the bottle creating pressure on the oil inside the bottle and buffer chamber.

The reason for this is to:

- Maintain equilibrium at the seal face.
- Buffer pressure spikes/changes.
- Assure longer seal life span.
- Test seals after rebuild or maintenance.

What is the Pressurized Oil Bottle?



The oil bottle consists of:

1. Metal Cap with integrated Pressure Gauge
2. Threaded Ring to hold the cap to the bottle.
3. A Plastic Bottle with integrated threaded fitting on the bottom for mounting to the pump.

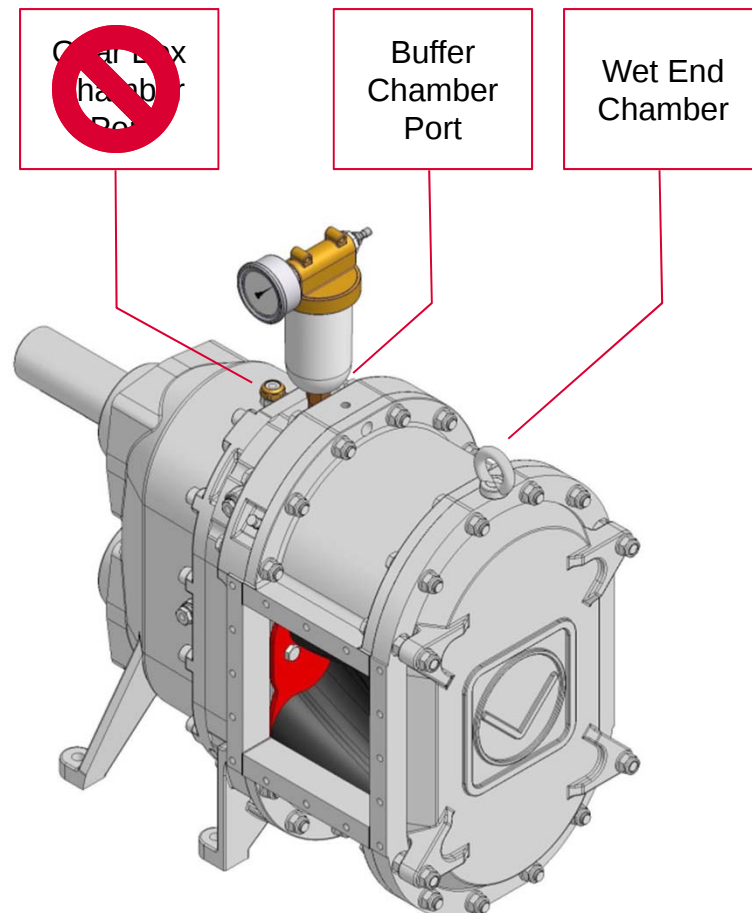


Where is the Pressurized Oil Bottle Located?

The pressurized oil bottle must be connected to the Buffer Chamber Port.

Not the Gear Box Chamber Port.

As shown on this **VX Q Pump**, the Buffer Chamber port is the closest to wet end of the pump.



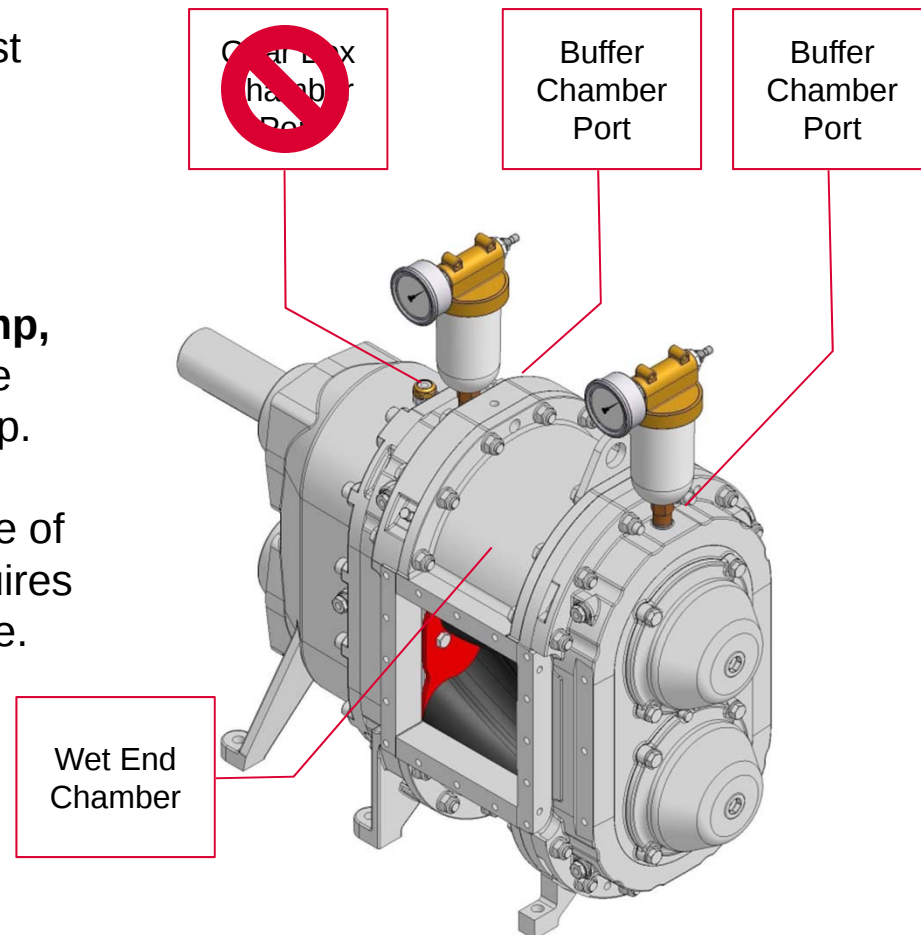


Where is the Pressurized Oil Bottle Located?

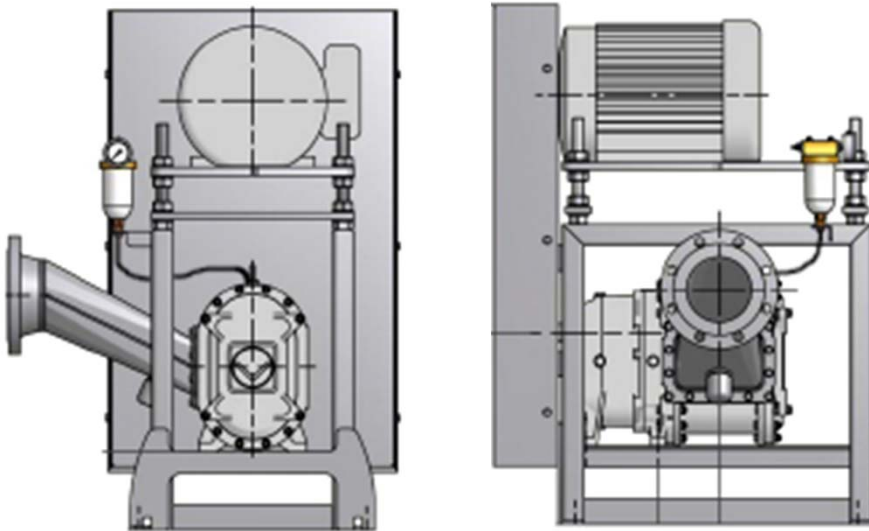
The pressurized oil bottle must be connected to the Buffer Chamber Port.

Not the Gear Box Chamber Port.

As shown on this **VX QD Pump**, the Buffer Chamber port is the closest to wet end of the pump. There is also a second Buffer Chamber on the outboard side of the wet end as well. This requires a second pressurized oil bottle.



Where is the Pressurized Oil Bottle Located?



On piggy-back assemblies or installations where the top of the pump is obstructed, the bottle is threaded to an external mount and connected to the pump via a high pressure hose.



Section 4. Pressurizing the Pump

Adding pressure to the buffer chamber and QD Door buffer for QD pump models.

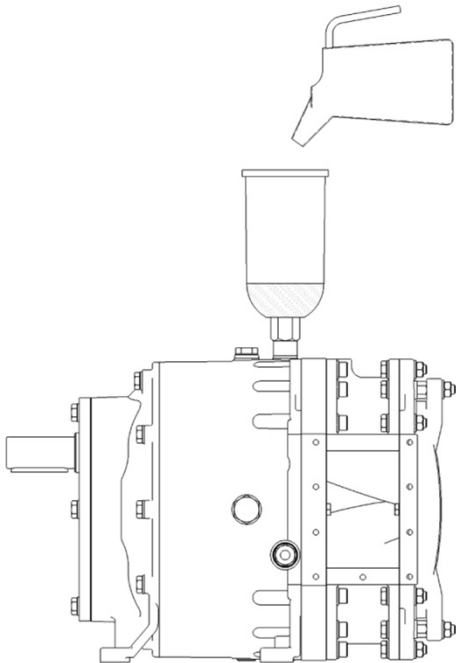
1.Fill the Buffer Chamber completely using a factory recommended oil.

2.Attached the Pressurized Oil bottle to the buffer chamber or assemble the hose and bottle assembly for piggy back installations.

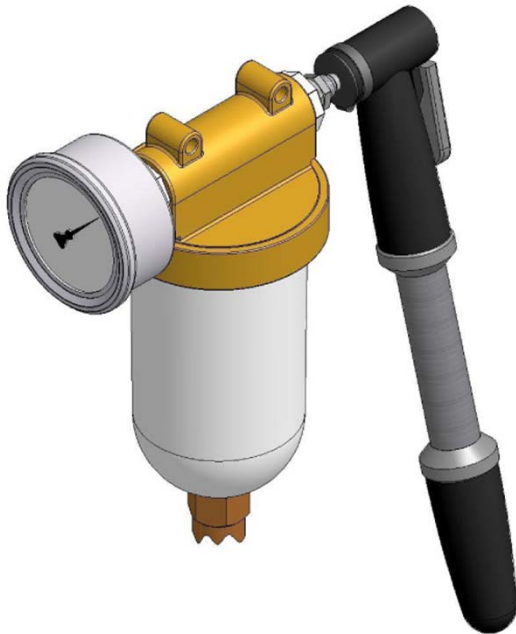
3.Remove the Bottle Cap.

4.Fill the Pressurized Oil Bottle approximately $\frac{1}{4}$ full with oil.

5.Replace the Cap and hand tighten.



Determining the Correct Pressure



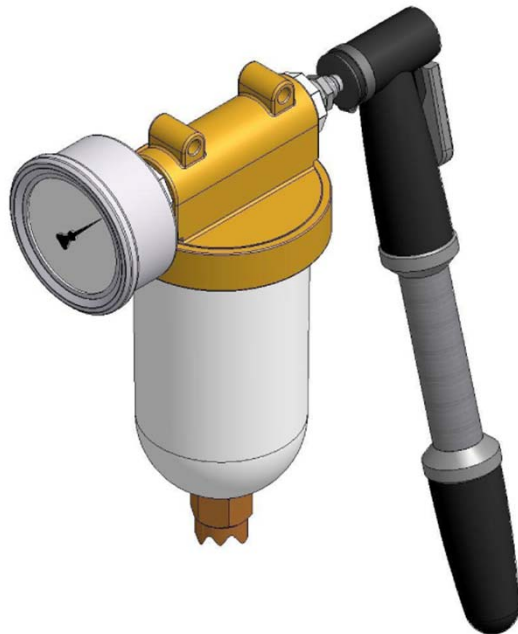
The proper pressure to be set varies. The pressure in the buffer chamber is determined by your normal suction and discharge pressure.

A simple formula is used to determine the pressure. You need to know your suction and discharge pressure.

To pump air into the bottle, simply attach the hand pump to the nipple on the opposite side of the gauge.

**Never pressurize the
Oil Bottle past 72psi.**

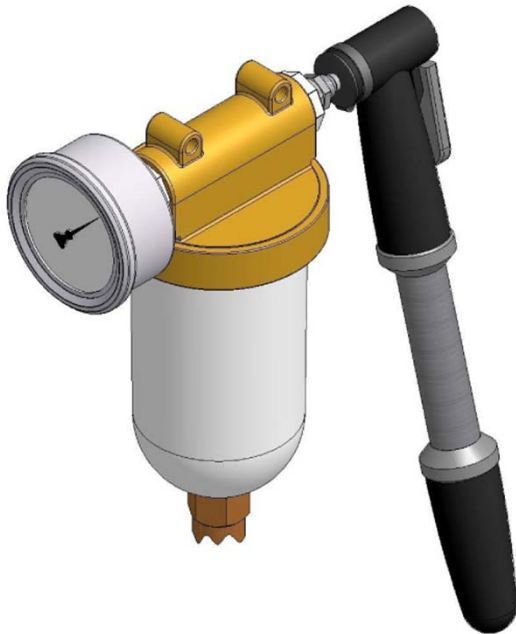
Determining the Correct Pressure



Formula:

Step	Suction Pressure	Plus	Discharge Pressure	Equals	Operating Pressure
a		+		=	
	Operating Pressure	Divided by		Equals	½ Differential Pressure
b		÷	2	=	
	½ Differential Pressure	Plus	PSI	Equals	Gauge Pressure
c		+	7psi	=	

Troubleshooting



1. If the oil level drops during operation or at idle, then it is likely that the pressure in the buffer chamber is too high. Add oil to $\frac{1}{4}$ full and reduce the pressure in increments of 7psi until the level stabilizes.
2. If the oil level rises during operation or at idle, then it is likely that the pressure in the buffer chamber is too low. Increase the pressure in increments of 7psi until the level stabilizes. **Do not pressurize past 72 psi.**
3. A rise or drop in oil level may also indicate a problem with the mechanical seal.
4. Contamination of oil in the Bottle is indicative of a mechanical seal failure.

Factory Recommended Oils



Acceptable Oils that match

Exxon Mobil Spartan EP220:

- Exxon Mobile Mobilgear 600 XP220
- Lubrication Engineers' 1605
Duolec Vari-Purpose Gear Lubricant
- NAPA SAE 80W-90 GL5 Gear Oil
- Shell Spirax 80W-90 Gear Oil
- Chevron's RPM Universal GL
SAE 80W-90 API GL-5 Gear Oil

Factory Data Card

Each pump ships with a data card mounted to the pump.

This document shows the designed operating conditions for that particular pump.

On the reverse side it also shows where to set the pressure on the oil bottle.

DO NOT REMOVE THIS CARD FROM PUMP

Please have the Serial Number of this pump ready when you call for service.



Model: VX186-130H4Q

Assembly Serial #: 11-05027

Vogelsang Work Order #: 5766, Sales Order #: 3961400
Customer PO #: 00404432-FonDuLac WWTP

Owner Information:
J.F. Ahern Co - Brian Horejs
c/o Fond Du Lac Biogas
700 Doty Street
Fond Du Lac, WI 54935

Distributor Information:
J.F. Ahern Co.
855 Morris St.
Fond Du Lac, WI 54936
(920) 921-9020

Manufacturer Information:
Vogelsang
7966 State Route 44
Ravenna, OH 44266
(330) 296-3820

Pump Information

Pump Model: VX186-130H4Q	Lobe Design: HiFlo®	Left Flange: 316 Stainless Steel, 90° Bend
Equipment Tag #: HSWRP-75-01	Lobe Mat.: NBR	Right Flange: 316 Stainless Steel, Straight
Construction: 316 Stainless Steel	Lobe Tips: 4	Oil Bottle Type: Standard Pressurized Oil Bottle
Housing Seg. Type: 316 Stainless Steel (SS)	Mechanical Seal: Cartridge Single - Block	
Ti Cast	Ring SS316 TC/SIC	
Wear Plate Mat.: 316 Stainless Steel	O-Ring Mat.: NBR	
	Lip Seal Mat.: NBR	

Motor & Drive Information

Drive Type: In-Line with TC	Motor: Baldor Electric Company	HP: 20.0
Gearbox + TC Motor	Motor Part #: IDVSM2334T	Voltage: 230/460
Base Plate Type: In-Line	Motor Family: Inverter Duty	RPM: 1800
Gearbox Ratio: 5.25	Motor Mounting: C-Face Footed	Frequency: 60 Hz
Gearbox Output: 342.86rpm	Standard Motor: STD	Efficiency: 93.00%
Gear Box: NORD Gear Corp	Frame Size: 256TC	
Gear Box Frame: 250TC	Enclosure: TEFC	
Belt Guard Type: No Belt Guard	Insulation Class: F	
Coupling: TB Woods 9HS		

Performance Information

This pump was configured to perform under the below operating conditions.

Fluid Type: Other Medium, not on the list	NPSH Required: 9.15', 3.97 psi	Suction Pressure: 0.0 psi
Flow Rate Required: 400 US gpm	pH: 7.0	Discharge Pressure: 30.0 psi
Solids Content: High Strength Waste	Max. Temp.: 100°F	Suction Lift: 0'
Solids by Weight: 9%	Running Time: 24 hrs. per day	Flooded Suction: 10'

See Reverse Side for Preventative Maintenance & Lubrication Equivalency Guide.

Startup

Direction of flow, Startup Checklist

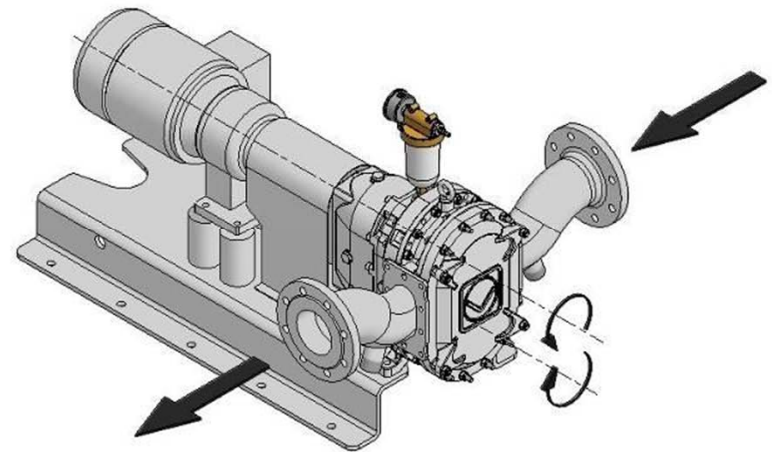
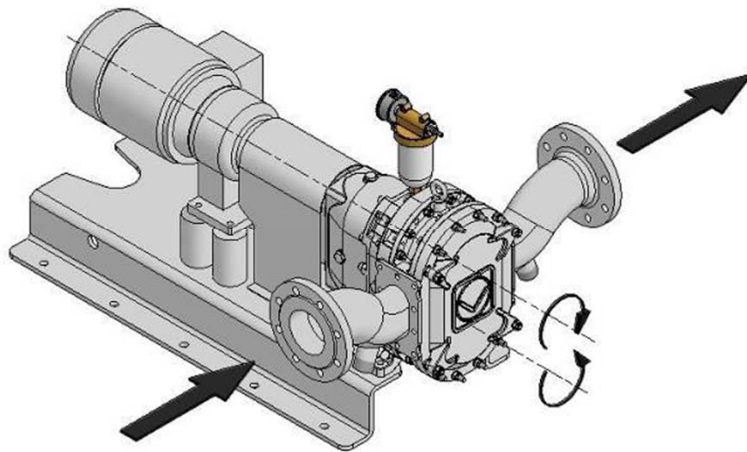


Motor Driven Pumps

Most pumps are configured with a single shaft electric motor as the drive unit for VX Series Pumps.

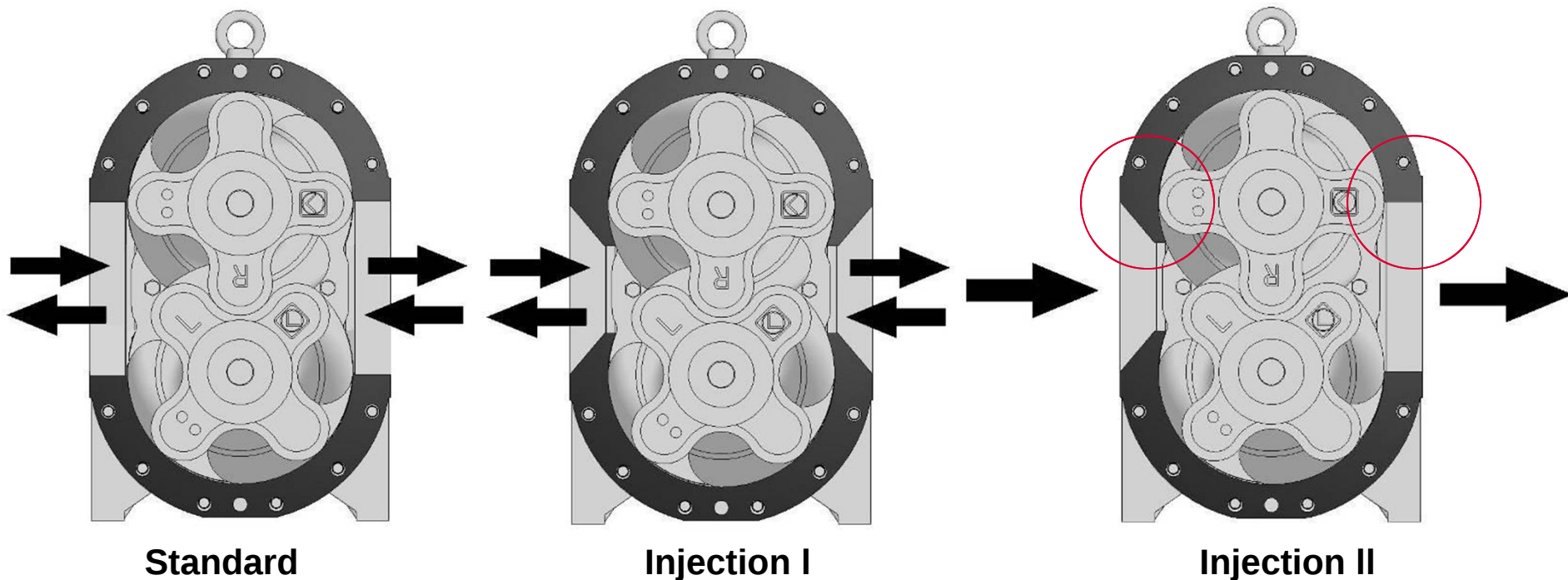
The rotation of the shaft determines the direction of flow.

The wiring configuration and/or VFD setting will determine which way the shaft will spin.



Direction of Flow

Rotary Lobe Pumps are all reversible by design. Most Vogelsang pumps can easily be reversed on the fly. If your pump has standard or injection housings, the pump can run in either direction. However, our injection II housing is asymmetrical and should be run in the direction that the pump was configured for.





Direction of Flow

The flow direction is initially determined by the way the motor is wired. Refer to the wiring diagram on the motor for instructions on which way to wire the motor.



Control Panels

Operating parameters are set by a certified controls representative per the motor specification.

All panels must be set to constant torque.



Shown with Optional Line and Load Reactors



Startup Checklist

Vogelsang requires a completed checklist to be filled out and submitted back to us. The warranty on the product does not initiate until we receive the startup form back.

This form confirms to us that the product we installed properly. This form can be downloaded at:

www.vogelsangusa.com/startup.pdf

Start-Up Report & Checklist



Scheduled Date: _____ S/N: _____

CUSTOMER INFORMATION

End-User Contact Name: _____ VSO#: _____

End User Company: _____ Phone: _____

End-User City: _____ State: _____ Fax: _____

Distributor Salesperson: _____ Phone: _____

Distributor Company: _____ Fax: _____

UNIT TYPE	Pump	Rota-Cut	CONSTRUCTION	Iron	Stainless Steel	Tungsten Carbide (Flamed on Coating)
			LOBE MATERIAL	NBR	EPDM	PUR FKM SBR

UNIT INFORMATION

Equipment Number: _____ Mounted on: _____ Channel Base _____ V-Belt Construction _____

Unit Serial Number: _____ Unit Model Number: _____

Flange Connections: Suction: _____ Gooseneck _____ 90° Elbow _____ Straight _____ Other: _____

Discharge: _____ Gooseneck _____ 90° Elbow _____ Straight _____ Other: _____

MOTOR INFORMATION

Motor Manufacturer: _____ Model: _____ Serial Number: _____

HP: _____ RPM: _____ Gear Ratio: _____ Voltage: _____ Ø: _____ S.F.: _____ Enclosure: _____

Nameplate Amps: _____ Actual Amps: _____ Is there a VFD installed for this unit? Yes No

If so what is the Make & Model: _____

FLUID & DESIGN INFORMATION

Fluid Type: _____ Solids by weight (%): _____ Hours Running per day: _____

Capacity in (USGPM): Design: _____ Actual: _____ Flooded Suction: _____ ft

Pressure (PSI): Design: _____ Actual: _____ Suction Lift: _____ ft.

Other Information: _____

Pipe size: Suction Pipe _____ inches Discharge Pipe _____ inches

COMMENTS

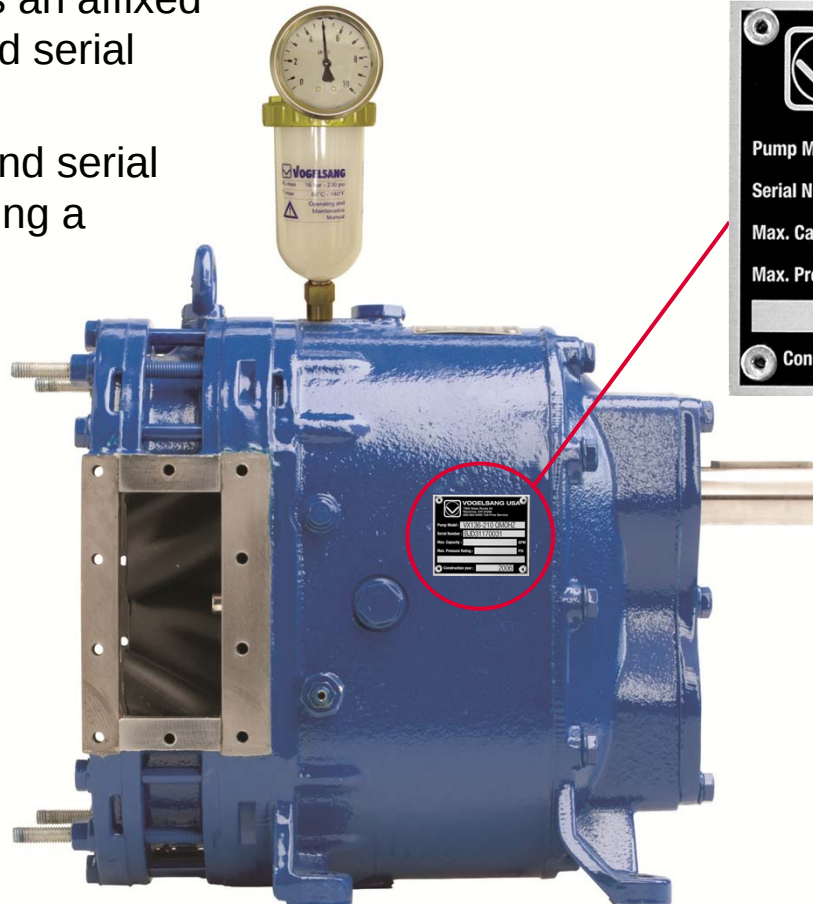
7966 State Route 44 • Ravenna, OH 44266 • (800) 984-9400 Toll-Free • (330) 296-4113 Fax

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Pump Identification

Each Vogelsang product has an affixed tag that shows the model and serial number.

- Always have the model and serial number ready when making a service call.
- This will ensure that you get the right parts in the proper material for your pump.



 VOGELSANG USA 7966 State Route 44 Ravenna, OH 44266 800-984-9400 Toll-Free Service	
Pump Model :	VX136-210 QMOHZ
Serial Number :	BJD31170031
Max. Capacity :	_____ GPM
Max. Pressure Rating :	_____ PSI
Construction year :	2006

Troubleshooting

- [Troubleshooting Matrix](#)
- [Service Web Page](#)
- Contact Service at
(330) 510-1557,
(330) 296-3820 x226 or
service@vogelsangusa.com.
- Download this presentation at:
www.vogelsangusa.com/pumpinstall.pdf

