Installation & Operating Manual

25ISB-M
9/06 Edition

WEBTROL
Quality Pumps

Vertical Series Booster

Stainless Steel Multistage Centrifugal Pump

Congratulations On Your Choice In Purchasing This Webtrol Pump

Its Quality is unsurpassed in material and workmanship and has been factory tested.
If properly installed, it will give many years of trouble free service.

Table Of Contents

Introduction

This manual was prepared to assist the installer and/or operator in understanding the proper method of installing, operating and maintaining the Vertical Series pump. We recommend that you thoroughly understand the proper installation and start-up procedures, prior to starting the pump. If these procedures are followed, you will have years of trouble-free service.

WARNING: Rules For Safe Installation And Operation

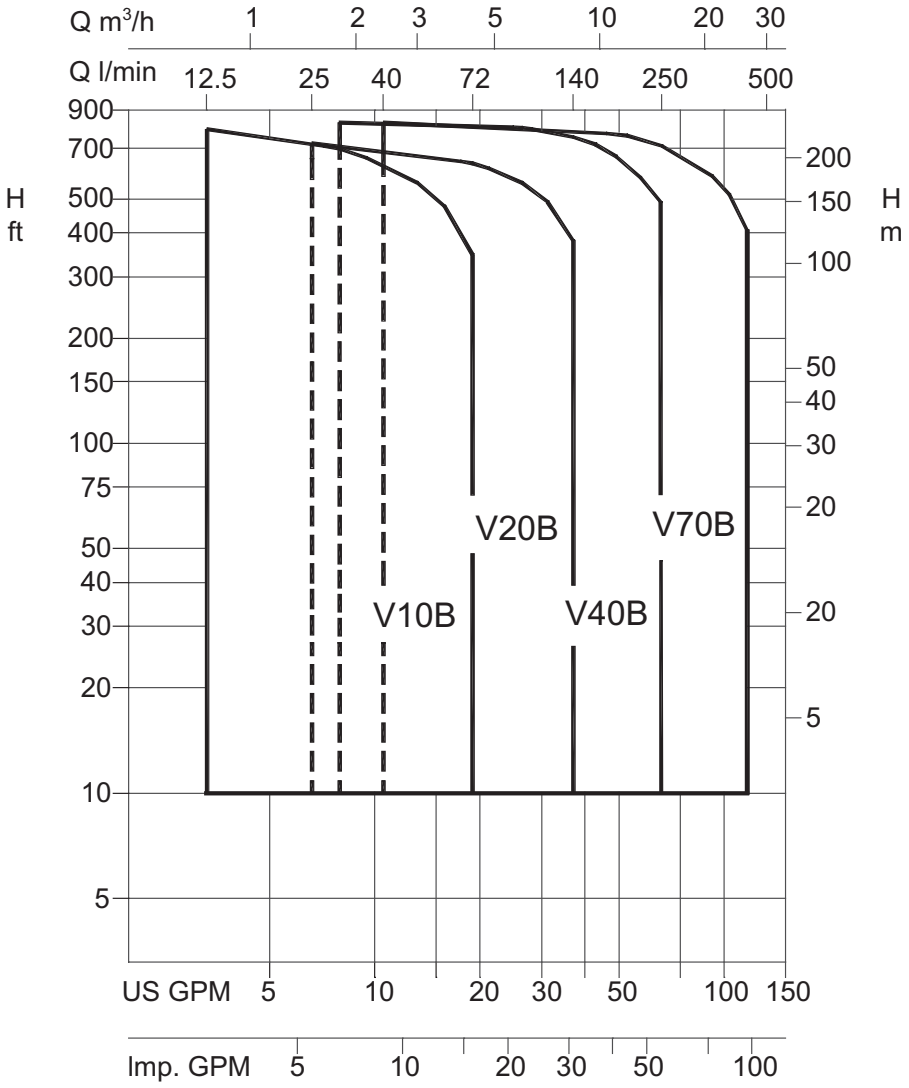
1. Read these rules and instructions carefully. Failure to follow them could cause serious bodily injury and/or property damage.
2. Check your local codes before installing.
3. For maximum safety, this product should be connected to a grounded circuit equipped with a ground fault interrupter device.
4. Before installing this product, have the electrical circuit checked by an electrician to make sure it is properly grounded.
5. Before installing or servicing your pump, BE CERTAIN pump power source is disconnected.
6. Make sure the line voltage and frequency of the electrical current supply agrees with the motor wiring. If motor is dual voltage type, BE SURE it is wired correctly for your power supply.
7. Complete pump and piping system MUST be protected against below freezing temperature. Failure to do so could cause severe damage and voids the Warranty.
8. Do not operate the pump in flammable and / or explosive atmosphere.

Caution: The V Series pumps with motor installed tend to be top heavy, care should be taken in handling and transporting to prevent damage or injury caused by the pump falling over.

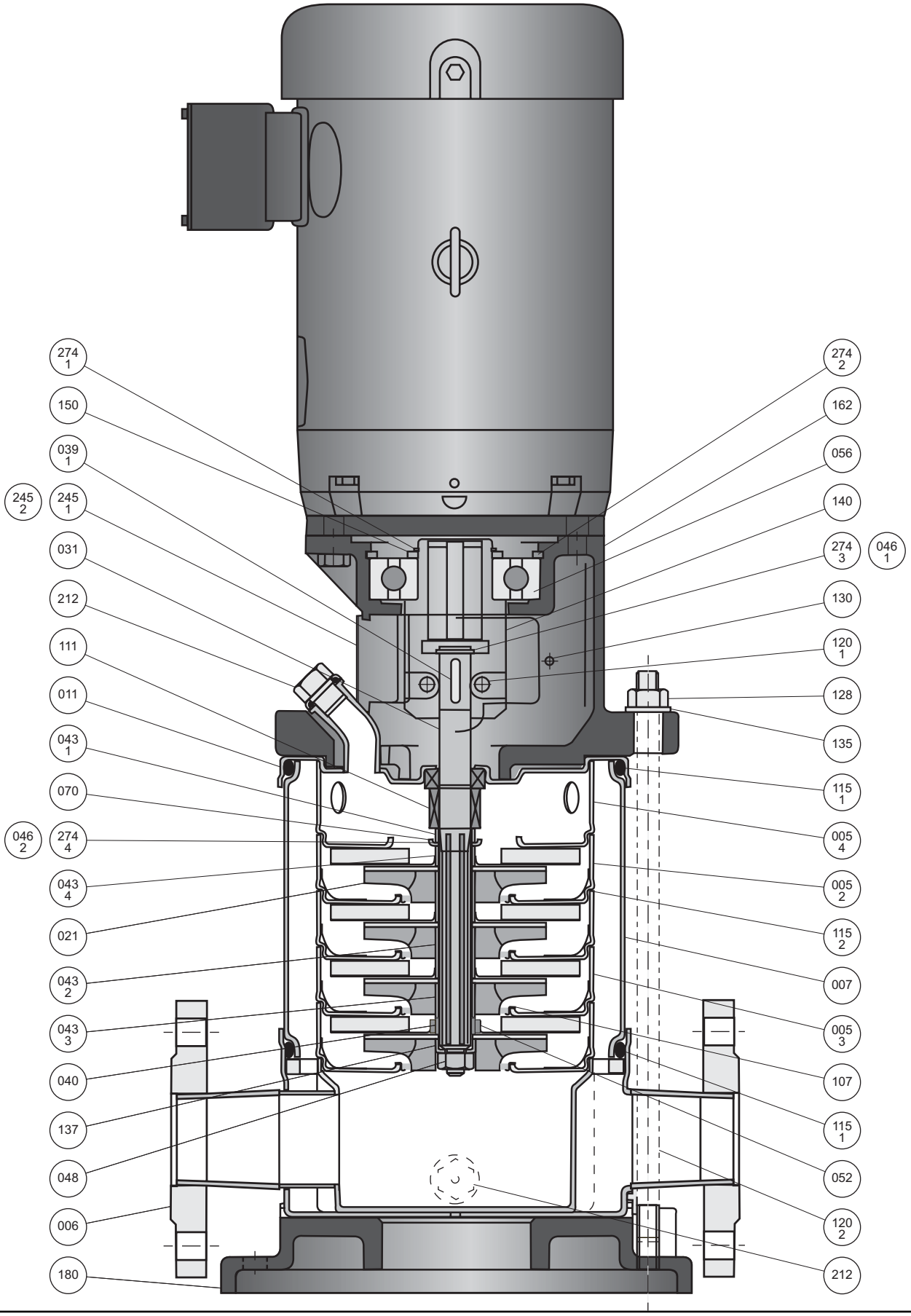
Specifications

Caution: Be careful not to exceed the given specifications in the use of your products.

Liquid Handled:	Type of Liquid	Clean Water
	Temperature	5° to +248°F (-15° to 120°C)
	Working pressure	230/360 PSI (16/25 Bar)
Construction:	Impeller	Closed Centrifugal
	Seal	Mechanical Shaft Seal
	Pump Bearing	Sealed Ball Bearing / Tungsten Carbide
	Suction/Discharge	ANSI 250 Lb. 1 1/4” - 4 / 2” - 8 bolt flange
Materials:	See Sectional View Parts List	
Motor:	NEMA C / TC Frame Speed: 60 Hz, 3450 RPM (2 Poles)	



Sectional View



Sectional View Part Names & Materials

Part No.	Part Name	Material	Part No.	Part Name	Material
005/1	Intermediate casing suction	AISI 304	107	Liner ring	AISI 304/EPDM
005/2	Intermediate casing	AISI 304	111	Mechanical seal	Sic/Carbon/FPM
005/3	Intermediate casing bearing	AISI 304	115/1	O-ring (outer casing)	Viton
005/4	Intermediate casing discharge	AISI 304	115/2	O-ring (intermediate casing)	EPDM
006	Bottom casing	AISI 304	120/1	Bolt	Carbon steel
007	Outer casing	AISI 304	120/2	Casing bolt	Steel chromate
011	Casing cover	AISI 304	128	Nut (casing bolt)	Steel chromate
021	Impeller	AISI 304	130	Screw	AISI 304
031	Shaft	AISI 304	135	Washer	Steel
039/1	Key (pump shaft)	AISI 304	137	Spacer	AISI 304
040	Bearing sleeve	Tungsten carbide	140	Coupling	Carbon steel
043/1	Shaft sleeve (mechanical seal)	AISI 304	150	Spacer	Carbon steel
043/2	Shaft sleeve (intermediate)	AISI 304	160	Base	Cast iron
043/3	Shaft sleeve (bearing)	AISI 304	162	Motor bracket	Cast iron
043/4	Shaft sleeve (last stage)	AISI 304	212	Plug 3/8-19 British Std.	AISI 304/Teflon Thread
043/5	Shaft sleeve (adjustment)	AISI 304	245/1	Coupling guard	AISI 304
046/1	Split ring (shaft end)	Carbon tool steels	245/2	Coupling guard	AISI 304
046/2	Split ring (mechanical seal)	AISI 304	274/1	C-type snap ring (coupling)	Carbon tool steels
048	U-Nut	AISI 304	274/2	C-type snap ring (bracket)	Carbon tool steels
052	Bearing	Tungsten carbide	274/3	C-type snap ring (shaft end)	Carbon tool steels
056	Ball bearing	–	274/4	C-type snap ring (mechanical seal)	AISI 304
070	Ring Holder	AISI 304			

Parts Breakdown - Per Pump

V Series Pump	107	115/2	120/1	150	247/1	274/2	274/3	274/ 4	005/2	005/3	021	040	043/2	043/3	043/4	043/5	046/1	046/2	052	056
V10B2S	2	3	4	-	-	-	1	-	-	1	2	1	-	1	-	-	-	1	1	-
V10B3S	3	4	4	-	-	-	1	-	1	1	3	1	1	1	-	-	-	1	1	-
V10B4S	4	5	4	-	-	-	1	-	2	1	4	1	2	1	-	-	-	1	1	-
V10B5S	5	6	4	-	-	-	1	-	3	1	5	1	3	1	-	-	-	1	1	-
V10B6S	6	7	4	-	-	-	1	-	4	1	6	1	4	1	-	-	-	1	1	-
V10B7S	7	8	4	-	-	-	1	-	5	1	7	1	5	1	-	-	-	1	1	-
V10B9S	9	10	2	1	1	1	1	-	7	1	9	1	7	1	-	-	-	1	1	1
V10B11S	11	12	2	1	1	1	1	-	9	1	11	1	9	1	-	-	-	1	1	1
V10B13S	13	14	2	1	1	1	-	-	10	2	13	2	10	2	-	-	1	1	2	1
V10B15S	15	16	2	1	1	1	-	-	12	2	15	2	12	2	-	-	1	1	2	1
V10B18S	18	19	2	1	1	1	-	-	15	2	18	2	15	2	-	-	1	1	2	1
V20B2S	2	3	4	-	-	-	1	-	-	1	2	1	-	1	1	1	-	1	1	-
V20B3S	3	4	4	-	-	-	1	-	1	1	3	1	1	1	1	1	-	1	1	-
V20B4S	4	5	4	-	-	-	1	-	2	1	4	1	2	1	1	1	-	1	1	-
V20B5S	5	6	2	1	1	1	1	-	3	1	5	1	3	1	1	1	-	1	1	1
V20B6S	6	7	2	1	1	1	1	-	4	1	6	1	4	1	1	1	-	1	1	1
V20B7S	7	8	2	1	1	1	1	-	5	1	7	1	5	1	1	1	-	1	1	1
V20B8S	8	9	2	1	1	1	1	-	6	1	8	1	6	1	1	1	-	1	1	1
V20B10S	10	11	2	1	1	1	-	-	8	1	10	1	8	1	1	1	1	1	1	1
V20B11S	11	12	2	1	1	1	-	-	8	2	11	2	8	2	1	1	1	1	2	1
V20B12S	12	13	2	1	1	1	-	-	9	2	12	2	9	2	1	1	1	1	2	1
V20B14S	14	15	2	1	1	1	-	-	11	2	14	2	11	2	1	1	1	1	2	1
V20B16S	16	17	2	1	1	1	-	-	13	2	16	2	13	2	1	1	1	1	2	1
V40B2S	2	3	4	-	-	-	1	1	-	1	2	1	-	1	1	-	-	-	1	-
V40B3S	3	4	4	-	-	-	1	1	1	1	3	1	1	1	1	-	-	-	1	-
V40B4S	4	5	2	1	1	1	1	1	2	1	4	1	2	1	1	-	-	-	1	1
V40B5S	5	6	2	1	1	1	1	1	3	1	5	1	3	1	1	-	-	-	1	1
V40B6S	6	7	2	1	1	1	1	1	4	1	6	1	4	1	1	-	-	-	1	1
V40B8S	8	9	2	1	1	1	1	1	6	1	8	1	6	1	1	-	-	-	1	1
V40B10S	10	11	2	1	1	1	1	1	8	1	10	1	8	1	1	-	-	-	1	1
V40B12S	12	13	2	1	1	1	1	1	9	2	12	2	9	2	1	-	-	-	2	1
V40B14S	14	15	2	1	1	1	1	1	11	2	14	2	11	2	1	-	-	-	2	1
V40B16S	16	17	2	1	1	1	1	1	13	2	16	2	13	2	1	-	-	-	2	1
V70B2S	2	3	2	1	1	1	1	1	-	1	2	1	-	1	1	-	-	-	1	1
V70B3S	3	4	2	1	1	1	1	1	1	1	3	1	1	1	1	-	-	-	1	1
V70B4S	4	5	2	1	1	1	1	1	2	1	4	1	2	1	1	-	-	-	1	1
V70B5S	5	6	2	1	1	1	1	1	3	1	5	1	3	1	1	-	-	-	1	1
V70B6S	6	7	2	1	1	1	1	1	4	1	6	1	4	1	1	-	-	-	1	1
V70B7S	7	8	2	1	1	1	1	1	5	1	7	1	5	1	1	-	-	-	1	1
V70B8S	8	9	2	1	1	1	1	1	6	1	8	1	6	1	1	-	-	-	1	1
V70B10S	10	11	2	1	1	1	1	1	7	2	10	2	7	2	1	-	-	-	2	1
V70B11S	11	12	2	1	1	1	1	1	8	2	11	2	8	2	1	-	-	-	2	1

Pump Checks

Examine the components carefully to ensure that no damage has occurred to the pump or motor during shipment. Report damage immediately to the shipping carrier or to your dealer. The Webtrol Vertical Series pump should remain in the shipping carton until it is ready to be installed. Do not drop or mishandle the pump prior to installation.

Always check the pump label against the requirement to make sure you are installing the proper pump specified for the job.

Make sure that the pump suction, marked by a sticker, is connected to the liquid source and that the discharge, similarly marked, is connected to the discharge line.

Caution: On three phase motor installations, always check for proper motor rotation prior to starting by jogging the motor. Shaft rotation must turn clockwise when viewed from back of the motor.

Make sure the motor is correctly wired, refer to instructions on motor name plate.

Make sure that the pump base is firmly secured to a solid flat surface and that the suction and discharge lines are aligned and properly supported to prevent pipe strain on the pump.

Ensure that the suction and discharge gaskets are properly installed to prevent leaks and that they do not restrict the flow to or from the pump.

Standard ANSI mating flanges should be used to connect the pump to the piping. Suction and discharge piping should be no smaller than the respective pump port sizes.

Remove the protective caps in the suction/discharge flange prior to installation.

Isolation valves should be installed on both the suction and discharge side of the pump in the event service to the pump is required.

Provide adequate space and ventilation around the pump for service and motor cooling.

Warning: Use standard plumbing practices to ensure unnecessary line losses, cavitation and prevent air lock.

Installation

Never operated the pump without water. A lack of water may cause severe damage to the internal components.

Completely prime the pump by removing the vent plug (see illustration on page 9), remove the coupling guard where necessary.

Using a funnel, fill the pump body with water until it overflows and replace plug.

Alternatively for installations with positive suction heads, close the discharge valve and remove the vent plug. Open the suction valve until liquid flows out the vent plug opening and then replace the vent plug securely and open discharge valve.

Caution: Extreme caution should be used if priming the pump in this manner in a hot water application.

Replace the coupling guards if previously removed.

Warning: Operating the pump without the coupling guards in place can cause physical injury.

It is recommended that a bleed valve be installed in the discharge line, or in a line from the vent port to the reservoir. This will allow the pressure in the pump to be relieved for service.

Installing a bleed valve is especially necessary in hot water application to prevent injury.

Pipe, valves and fittings must have a pressure rating equal to or greater than the maximum system pressure.

A bypass or pressure relief valve should be installed in the discharge line if there is any possibility the pump may operate against a closed valve in the discharge line.

Minimum flow is required for proper cooling and lubrication of the pump without which, damage and premature failure will occur.

Minimum Pumping Rate	
Model	**Minimum Flow Rate**
V10B	3.3 GPM
V20B	6.7 GPM
V40B	8 GPM
V70B	11 GPM

Operation

Make sure that the system is properly installed and primed as instructed in the installation section.

Check that the suction valve is fully open and the the discharge valve is in the open position.

Caution: Prolonged operation of the V Series pump with either valve in the closed position will cause severe damage to the pump.

Check to make sure all electric connections are correct.

Apply power to the motor.

Check motor rotation. Shaft rotation must be clockwise when viewed from back of motor. On 3 phase motors, if the rotation is not correct reverse any two leads to the starter. The rotation will now be correct.

Check that the noise, vibration, pressure, voltage and amps are at normal levels.

Warning: Webtrol Vertical Series pumps are designed for continuos and normal on/off operation.

Rapid cycling can cause high heat and loading that can cause damage to the pump or motor.

Motor Installation

Installation procedures for motors 3 HP or greater.

1. Remove the motor coupling protection guards from both sides of the pump.

2. Attach a strong sling or chains to the motor lifting lugs or eyebolts to ensure that the motor may be centered when lifted vertically.

Warning: When lifting the pump, use appropriate crane (or hoist), check position and tightness of lift system so that weight of the pump is not unbalanced.
Failure to observe this precaution can result in serious accidents.

3. Position the motor, shaft down, about 1” above the pump assembly. Check the motor for balance and alignment.

4. Ensure that the motor key has been placed firmly into the motor shaft keyway.

5. Align the motor key and keyway with the coupling keyway and slowly lower the motor into position ensuring that the key slides into the coupling keyway.

6. Prior to lowering the motor completely, rotate the motor so that the mounting holes are aligned with the corresponding holes in the pump bracket. After alignment, lower the motor onto the pump head.

7. Insert the four motor bolts with lock washers and tighten evenly using an alternating criss cross pattern. Tighten the set screws in the coupling.

8. Replace the coupling protection guards.

Installation procedures for the following pump models:
V10B2S - V10B7S, V20B2S - V20B7S, V40B2S - V40B3S

1. Make sure the motor protection guard is removed from the pump end.

2. Carefully loosen the screws on the coupling and place motor key in the motor shaft keyway.

3. Position the motor vertically over the pump with the keyways lined up on the motor shaft and coupling. Then lower the motor into place.

4. With the motor positioned over the pump and the motor shaft correctly inserted in the coupling, rotate the motor so that the mounting bolt holes line up with the corresponding holes in the motor bracket. Insert the mounting bolts with lockwashers and firmly tighten using a criss crossing pattern.

5. Using two screwdrivers, lever between the motor bracket and the coupling raise the pump shaft until it touches the motor shaft. Now, tighten the coupling set screws to secure the motor and pump shaft into position.
Note! No gap should exist between the pump and motor shafts.

6. Rotate the coupling to assure that the pump turns freely. If rubbing occurs loosen the coupling screws on the motor side and repeat step 5.

Motor Removal

1. Following general safety and electrical instructions, disconnect the power to the motor and remove power cords.

Warning: For any removal or installation procedures, always disconnect the power first.
Failure to observe this precaution can result in serious accidents.

2. Loosen and remove the four motor bolts and lockwashers.

3. Attach a strong sling or chains to the motor lifting lugs or eyebolts to ensure that the motor may be centered when lifted vertically.

4. Slowly lift the motor off the pump assembly being careful to retain the motor key. If the motor does not slide easily out of the coupling do not raise the pump into the air, dropping the pump end can cause damage. Fix the pump base to the floor or bench and lift motor again.

Disassembly Of Pump

1. Remove the motor as detailed in (Motor Removal) section.

2. Isolate the pump by closing the suction inlet and discharge valves.

3. Carefully relieve the pressure in the pump by opening the vent or drain plugs.

Caution: Extreme caution should be exercised in this operation since the pump is under system pressure at this point. Use a pressure bleed valve in hot water applications where water temperature could cause physical injury.

4. Remove the vent plug

5. Remove the coupling guards with a Phillips head screwdriver.

6. Using an Allen wrench (a T-handle is recommended) loosen and remove the pump coupling bolts and remove the lower coupling section.

7. Using 900 snap ring pliers, engage coupling snap ring and lift up to clear end of the pump shaft.

8. Loosen and remove the four tie rods.

9. Rotate the tie rods counter clockwise to loosen from pump base and remove. This will allow the solid coupling to clear the end of the shaft.

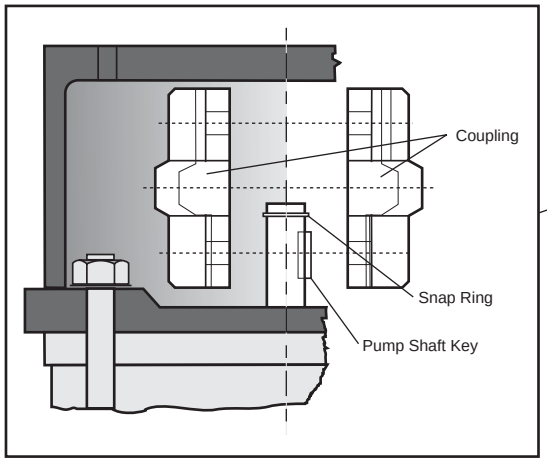
10. Gently tap the base of the motor bracket with a soft mallet to loosen the fit on the pump assembly.

11. Turn the solid coupling half so that it is aligned with the vent pipe.

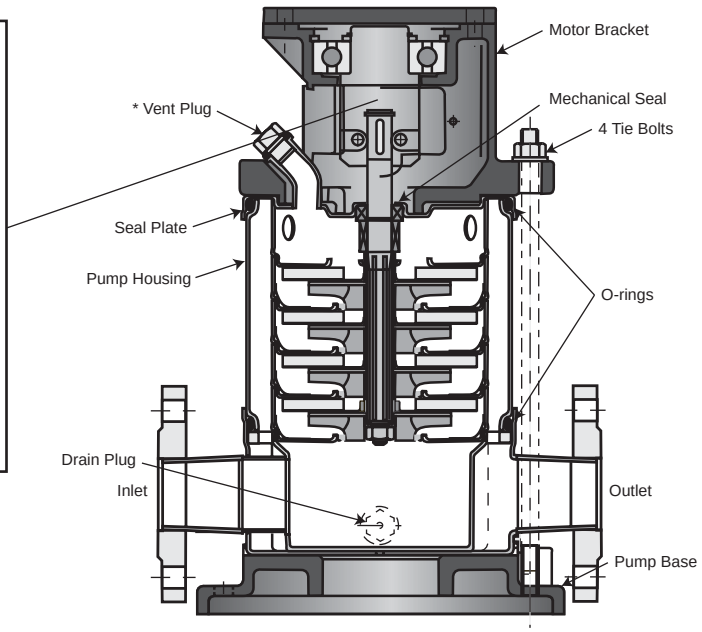
12. Lift the motor bracket off of the pump assembly by tilting the bracket towards the vent pipe and lifting.

13. Remove and retain the pump shaft key.

14. Remove the seal plate (casing cover) vertically off of the pump shaft assembly.



NOTES
* Vent Plug - The vent plug is shown rotated to the left side for this drawing, it is located on the same side as the dran plug.



Mechanical Seal Replacement

1. Complete disassembly of pump as detailed in previous section.

2. Remove the old rotating seal assembly by lifting vertically off the pump shaft. The rotating assembly is rubber boot mounted.

3. Press the old stationary seal assembly out of the seal plate from the outside of the seal plate. The stationary seat is rubber cup mounted.

4. Place the rotating seal assembly retainer onto the shaft taking care not to scratch or touch the seal face. If touching the seal face in necessary, gently wipe with a clean soft tissue.

5. Carefully place the rotating seal assembly onto the shaft using a non-metallic sleeve to push the assembly into place on the shaft, seating the rubber boot snugly.

6. Using a non-metallic sleeve, press the stationary seal assembly into the seal plate evenly, seating the rubber boot snugly.

7. Reassemble the pump as instructed in (Replacement of Pump Hydraulic Assembly) section.

Replacement Of Pump Hydraulic Assembly

1. Remove the old mechanical seal assembly, refer to “Disassembly of Pump for Mechanical Seal Replacement”.

2. Remove the pump body from the pump casing and remove the o-ring located in the pump casing.

3. Ensure that the proper replacement hydraulic (stack) assembly has been selected and provided for the applicable pump size.

4. Lift the replacement hydraulic (stack) assembly and place it onto the pump casing ensuring that it is firmly seated. Ensure that the pump shaft keyway is aligned vertically with the drain connection on the pump casing for ease of later assembly completion.

5. Using a new lower pump body o-ring, apply a light film of silicone grease to the o-ring and place it over the hydraulic assembly and into the pump casing ensuring that it is seated.

6. Place the pump body onto the entire assembly and align it with the o-ring installed into the pump casing.

7. Using new upper pump body lower o-ring, apply a light film of silicone grease to the o-ring and place it into the o-ring groove on the upper pump body ensuring that it is seated.

8. Replace the rotating mechanical seal and seal assembly. Refer to “Mechanical Seal Replacement”

9. Replace the stationary mechanical seal Assembly. Refer to “Mechanical Seal Replacement”

10. Carefully place the seal plate over the pump shaft Be sure the seal face is not damaged during assembly (cracked, scratched, or chipped) or the seal will leak. Ensure that the vent pipe is vertically aligned with the drain connection of the pump casing.

11. Install the pump shaft key into the keyway.

12. Place the motor bracket onto the pump seal cover by tilting the assembly over the vent pipe. The solid coupling half must be turned toward the vent pipe to ensure that the pump shaft hey will slide into the coupling keyway. The motor bracket should fit snugly onto the stationary seal assembly.

13. Replace four tie rods, threading them into the pump mounting base.

14. Replace the tie rod washers and nuts onto the tie rods finger tight.

15. Commence staggered tightening of the tie rod nuts to ensure even distribution of pressure and proper seating of the seal cover plate onto pump body. Tighten all nuts to fit snugly.

16. Place handle of soft mallet, or similar lever, into the pump suction so that the entire shaft may be raised slightly until the snap ring groove is above the lower lip of the pump coupling.

17. With the pump shaft assembly lifted slightly, replace the pump shaft snap ring or until seated into the groove at the end of the shaft. This will lock the pump shaft into the coupling.

18. Replace the lower coupling half and insert coupling bolts tightening them firmly. Ensure that coupling bolts are tightened evenly.

19. Replace coupling guards and fasten with coupling guard screws tightening them evenly.

20. Reinstall vent pipe plug.

21. For reassembly of motor, refer to “Motor Installation”.

Thank You For Purchasing A Vertical Series Pump

We at Webtrol are constantly working on new products to make your job easier, while making your systems more efficient, reliable and affordable.

Your opinion means a lot to us, so please let us know what you think about our Vertical Series Pump.

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