



## MSVKC SERIES

### Sealless Non-Metallic Vertical Pumps

### Installation and Maintenance Instructions

Pat. No. 5,708,313

## ASSEMBLY

### PUMPS WITH MOTORS

1. No assembly required. Simply unpack the pump and motor and examine for any signs of shipping damage. If damage is detected, save the packaging and notify the carrier immediately.
2. Check and verify the locking rings (item 11) on the column are securely snapped in place and did not loosen during shipment.
3. To install the pump into the system, follow the installation instructions provided.

### PUMPS WITHOUT MOTORS (56C FRAME)

1. Unpack the pump and any supplied accessories and examine for shipping damage. If any damage is detected, save the packaging and notify the carrier immediately.
2. Create a hole if required for the discharge piping in the optional mounting plate (item 10) at the desired location.
3. Prepare to install the pump onto the motor by carefully placing the motor on the fan cover on a clean, level, and suitable work surface.
4. Slide the supplied coupling half (metal half of item 29) onto the pump shaft with the splined side facing the pump. Adjust the coupling half so that the motor shaft is recessed 7/32" below the top of the coupling. Insert the motor shaft key in the slot and align one of the setscrews with the key and tighten both setscrews with a 1/8" Allen wrench to 70 in.-lbs.
5. Install the coupling insert (internally splined plastic ring) onto the coupling half on the motor shaft. Carefully slide the motor adapter (item 9) onto the motor making sure the pump shaft coupling half matches up with the plastic insert and seats properly. Make sure the rabbet (step) on the motor is firmly seated into the motor adapter.

**⚠ CAUTION: Pump assembly may be top heavy.**

6. Rotate the pump and the mounting plate to the desired orientation. Align the holes in the mounting plate and the motor adapter with the holes in the motor face. Secure the mounting plate and motor adapter to the motor using the correct bolts and washers (items 6,7, and 8) from the hardware package.
7. Check and verify the locking rings are securely snapped in place and did not loosen during shipping. Rotate the motor fan to check for binding or rubbing inside the pump.
8. Install the pump into the system according to the installation instructions provided.

### PUMPS WITHOUT MOTORS METRIC FRAME

1. Unpack the pump and any supplied accessories and examine for damage. If any damage is detected, save the packaging and notify the carrier immediately.

2. Create a hole if required for the discharge piping in the optional mounting plate (item 10) at the desired location.
3. Prepare to assemble the pump onto the motor by placing the motor on the fan cover on a clean, level suitable work surface.
4. Slide the supplied coupling half (metal half of item 29) onto the motor shaft with the splined side facing the pump. For 63 & 71 frame motors, adjust the coupling half so that the motor shaft is recessed 7/16" below the top of the coupling.

For 80 frame motors set the coupling flush with the end of the motor shaft. For 63 & 80, align the setscrews with the flat or the key slot on the motor shaft and tighten both set screws with a 1/8" Allen wrench to 7.9 N-m. For 71 frame motors, align set screws 90° from key slot and tighten.

5. Install the metric motor adapter (item 2) onto the motor. To aid in correct installation there is the letter "A" molded on one side and the letter "B" molded on the other side of the metric motor adapter. For 71 frame motors, mount the "A" side facing the motor with the correct hardware (items 3, 4, and 5). For 63 and 80 frame motors, mount the "B" side facing the motor with the correct hardware (items 3, 4, & 5). The metric motor adapter must be positioned so that the adapter seats onto the motor rabbet.

**⚠ CAUTION: Improper positioning of the metric motor adapter can cause premature coupling failure or cause the pump shaft to bottom out before the pump is properly installed onto the motor adapter.**

6. Install the coupling insert (internally splined plastic ring) onto the motor coupling half. Carefully place the motor adapter (item 9) onto the metric motor adapter making sure the pump shaft coupling matches up to the coupling insert and that it seats completely.

**⚠ CAUTION: Pump assembly may be top heavy.**

Rotate the pump and the mounting plate to the desired orientation, aligning the bolt holes in the mounting plate and the motor adapter to the holes in the metric motor adapter. Using the correct hardware (items 6, 7, & 8), fasten the pump to the motor/metric motor adapter.

7. Check and verify the locking rings are securely snapped into place and did not loosen during the assembly process. Rotate the motor fan to check for binding or rubbing inside the pump.
8. Install the pump into the system according to the installation instructions provided.

## INSTALLATION

The VKC Series is a versatile pump designed to be operated in a variety of mounting configurations. The pump can be mounted either inside or outside of a tank or sump. See Figure 1.

**Note:** Drawings for illustration only. Pumps need to be properly supported when installed.

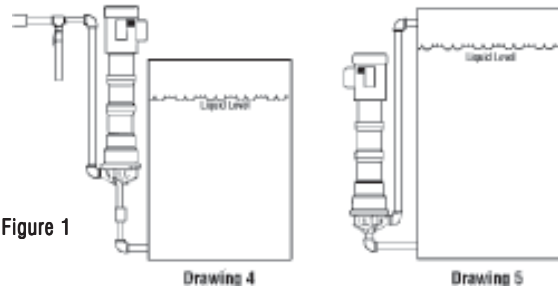
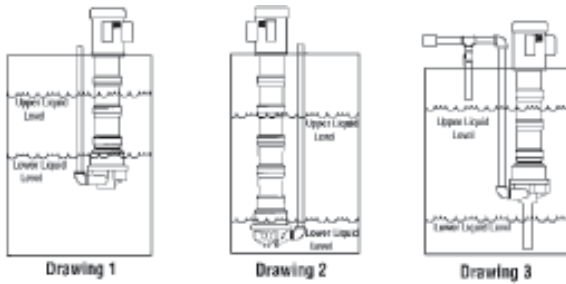


Figure 1

**Drawing 1** shows drawing of pump mounted inside a tank with suction off the bottom of the tank and level fluctuating from near top of pump column to close to the bottom of the pump.

**Drawing 2** shows drawing of pump suction near tank bottom and level fluctuating between the top and bottom of the tank.

**Drawing 3** shows drawing of pump with suction extension and the level fluctuating between startup level and low level.

**Drawing 4** shows drawing of pump mounted outside the tank.

**Drawing 5** shows drawing of pump mounted outside the tank with the motor below the liquid level.

## MOUNTING

A mounting plate is recommended for in-tank installations. Use a hole saw to cut holes in desired location for piping if required.

Support and securely fasten the mounting plate on all four sides if possible or on two sides if mounted in a corner. Drill holes in the mounting plate at the desired location for bolting to the tank.

A drip cover may be installed on top of the motor if desired.

Mount pump in desired configuration. Securely fasten mounting plate if used. Motor feet may also be used for mounting.

## PIPING

1. Support piping near the pump to eliminate any strain on the pump casings. Do not use suction or discharge piping to support the pump.
2. Do not overtighten the piping on the discharge on initial installation (i.e., down to the o-ring). Damage to the discharge can occur. The o-ring is used only when there is wear and the plastic threads are loose.
3. Do not place the pump suction directly on the bottom of the tank. Keep the pump suction at least one pipe diameter off the bottom.
4. A suction extension tube of up to nine feet in length can be added.
5. To minimize head loss from friction:
  - a. Increase pipe size by 1 diameter.
  - b. Use minimal number of pipe bends.
6. If a check valve is installed in the discharge piping, an air bleed must be installed in the discharge line to prevent air lock. This allows air trapped in the pump internals to be removed on initial startup. See drawings 3 and 4 in Figure 1.

7. Maintain a flooded suction. Use a foot valve if necessary.
8. Ensure that the piping does not leak and suction is not prone to clogging. Use a strainer if necessary on the suction.
9. If flexible hose is preferred, use reinforced hose rated for the proper temperature and pressure. This helps avoid collapse or kinks.
10. Install valves a minimum of 10 pipe diameters from the pump.

**⚠ CAUTION:** To stop the pump if prime is lost, use one of the following: (1) pressure switch on the discharge or (2) motor minder to monitor motor current.

## ELECTRICAL

Install motor according to NEC requirements and local electrical codes. Motor should have an overload protection circuit.

**Important.** To verify the correct motor rotation:

1. Install the pump into the system.
2. Fully open suction and discharge valves.
3. Allow fluid to flow into the pump. Do not allow the pump to run dry (PTFE & ceramic bushings can not be allowed to run dry without damage to pump components).
4. Jog the motor (allow it to run for one to two seconds) and observe rotation of the motor fan. Refer to directional arrow on the pump.

**Note:** A pump running backwards will pump but at a greatly reduced flow and pressure.

## OPERATION

1. Completely open the discharge valve. On pumps equipped with a discharge check valve, open air bleed valve on initial startup.
2. Start the pump and check liquid flow. If there is no flow, see the Troubleshooting section.
3. Adjust the flow rate and pressure by regulating the discharge valve.

## MAINTENANCE

### DISASSEMBLY

1. Disconnect the power and remove the wiring.
2. Close the discharge valve and disconnect the piping.
3. Remove the mounting bolts and pull the pump from the tank. Securely anchor or clamp the motor to a workbench in a horizontal position.
4. Gently tap the locking ring (item 11 closest to pump end) toward the motor until it is loose. Mark a matching line on the barrier/column housing adapter (item 16) and the 2nd stage impeller housing (item 20) as a discharge orientation reference during re-assembly. Using a strap wrench on the barrier/column housing adapter (item 16), turn it counterclockwise and remove it from the pump column. When it is unthreaded, pull it straight off to expose the drive magnet assembly (item 14).
5. Place the pump end / barrier column housing adapter on a clean work surface with the suction pointing straight up. Remove the six screws and washers (items 25A,B, & C) from the impeller housing.
6. Using a thin bladed screwdriver, gently separate the 1st stage housing (item 24) from the diffuser (item 22). Remove the 1st stage impeller housing (item 24) being careful to pull straight off so as not to damage the ceramic front spindle support. Remove the housing o-ring (item 17). Holding down on the outside of the diffuser assembly (item 22) with one hand, gently

pull the 1st stage impeller/impeller drive shaft assembly (items 19 & 23) from the pump.

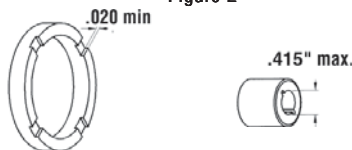
7. Remove the diffuser assembly (item 22) and the diffuser o-ring (item 21) from the top of the 2nd stage impeller housing (item 20). Remove the 2nd stage impeller housing (item 20), the housing o-ring (item 17), and the 2nd stage impeller assembly (items 18 & 19) from the barrier/column-housing adapter (item 16).
8. If further disassembly is required, place a 9/16-inch wrench on the flat area of the pump shaft (item 13) on the motor side of the drive magnet assembly (item 14).  
Holding the pump shaft with the wrench, remove the locking nut (item 15) by turning it clockwise (left hand thread). After the nut is removed, unthread the drive magnet assembly (item 14).
9. If the pump is longer than 12 inches, you remove each of the column extensions (item 30) by doing the following. Loosen the two set screws on the shaft bearing (item 31), gently tap the locking ring (item 11) toward the motor, and use the strap wrench to unthread the section.
10. When you are down to the motor adapter (item 9), mark a matching line on the adapter flange, mounting plate (item 10), and the motor to be referenced during reassembly. Loosen the setscrews on the shaft bearing (item 31). Remove the 4 motor adapter bolts and washers (items 6, 7, & 8), the mounting plate (item 10), the motor adapter (item 9), and the metric motor adapter (item 2) if required. If motor is to be replaced, remove the coupling insert and coupling half (part of item 29).

**⚠ CAUTION: Keep the drive magnet assembly and the impeller drives away from metal chips or particles**

## EXAMINATION/REPLACEMENT OF PARTS

1. Inspect the bushings (items 18A) in both the impeller drive (item 18) and the impeller drive shaft (item 23). See figure 2. If bushing in impeller drive (item 18) requires replacement, grip the impeller assembly (items 18 & 19) with the bushing side up, and gently tap the impeller (item 19) off the impeller drive (item 18). Insert a 1/16-inch punch into the balance hole (inner circle of four holes) on top of the impeller drive (item 18) and gently tap out the bushing. The punch may need to be moved to a second hole to complete the removal. Install the new bushing by gently pressing it in until it bottoms out (use a block of wood and a mallet if necessary). If the bushing in the impeller drive shaft is worn or cracked, the complete impeller drive shaft with bushing (item 23) needs to be replaced.
2. Inspect both thrust rings (item 19A) for wear. See figure 2. If replacement is necessary pull the old ring out, align the flat on the new ring and the seating area and press into place.

Figure 2



3. Inspect both ceramic housing thrust rings and both the barrier ceramic post and the 1st stage impeller housing ceramic support post for cracks, chips, scoring, or excessive wear. Replace as required.
4. Check for loose magnets on the drive hub (item 14) or rubbed areas on the barrier/column housing adapter (item 16) or impeller assemblies. Contact your distributor or FTI Technical Service if a problem is found.

5. Inspect the bearing (s) for damage and replace if necessary. To remove the bearing, unscrew the four retaining screws (item 32) and press the bearing out (note: the top of the bearing where the set screws are faces away from the motor). Installation of the new bearing requires pressing it into the section with the set screws/collar facing away from the motor, and replacing the retaining screws.
6. Examine all the plastic parts for damage or wear. Replace as needed.
7. Examine all of the o-rings for nicks or chemical attack and replace as needed.
8. If the motor requires replacement, loosen the set screws and remove the coupling half (part of item 29) from the motor shaft.

## REASSEMBLY

1. If the motor was replaced-  
Slide the coupling half (half of #29) on to the motor shaft with the splines facing away from the motor. On 56C motors, set coupling half so that motor shaft is recessed 7/32".  
For 63 and 71 frame motors, set coupling half so that motor shaft is recessed 7/16", and on 80 frame motors set coupling half so that it is flush with the motor shaft.
2. On 56C, 63, & 80 frame motors, align one set screw with flat or key slot on motor shaft and tighten both set screws with a 1/8" Allen wrench to 70 in.-lbs. (7.9 N-m). For 71 frame motors, align both set screws 90 degrees from motor flat or key slot and tighten as instructed above.
3. If the shaft was replaced, slide the second coupling half onto the pump shaft (the end with the milled flat) with the splined side facing away from the threaded end of the shaft. For 56C motor frames, set the coupling with the pump shaft recessed 7/32". For 63 and 71 motor frames, set it with the pump shaft recessed 7/16". For 80 frame, the pump shaft should be recessed 1/4". When coupling half is set correctly, align set screw with the flat on the pump shaft, and tighten both set screws with 1/8" allen wrench to 70 in.-lbs. (7.9 N-m).
4. Place the motor gently on the fan cover for reassembly. For metric frame pumps, install the metric motor adapter flange (item 2) onto the motor with the correct hardware (items 3, 4, & 5). One side of the adapter fits 63 & 80 frame motors (side B) and the other side fits the 71 frame motors (side A). The letters A & B are molded onto the adapter. For 71 frame motors the "A" must face the motor, and for 63 & 80 frame motors the "B" must face the motor. The metric motor adapter must be oriented so that the adapter seats completely onto the motor rabbet. Make sure your orientation marks are aligned (step 10 of disassembly instructions).

**⚠ CAUTION: Improper orientation of the metric motor adapter can cause premature coupling failure or cause the pump shaft to bottom out on the motor shaft before**

5. Install the coupling insert (center plastic part of item 29) onto the coupling half on the motor. Now insert the pump shaft with coupling half into the coupling insert until it is completely seated.
6. Locating the pump shaft through the bearing in the motor adapter section (item 9) carefully slide the motor adapter (item 9) down the shaft until it is fully seated on the (56C) motor rabbet or (63, 71, 80 frame) on the metric motor adapter. If a mounting plate (item 10) is being used, gently slide it over the pump shaft and the motor adapter section (item 9).
7. Rotate the mounting plate and the motor adapter to the desired orientation (marked before disassembly), and align the holes

through the mounting plate, motor adapter and into the motor (metric motor adapter if used). Secure the mounting plate and the adapter to the motor (item 1)/metric adapter (item 2) using the correct hardware (items 6, 7, & 8 for 56C or item 33 for metric).

8. Tap down gently with a rubber mallet on the top of the pump shaft to ensure complete coupling engagement. Tighten both bearing set screws onto the pump shaft using a 3/32" Allen wrench. Replace if needed and lubricate the two motor adapter/column extensions o-rings (item 12) with a chemically compatible thread lubricant.
9. For 12" pumps, go to step 10. For 18" or longer pumps, slide the lock ring (item 11) past the corresponding flats toward the motor. Make sure to place the smaller inside diameter side of the lock ring toward the motor. Use a chemically compatible thread lubricant to lubricate the external plastic threads on the motor adapter (item 9) and the internal plastic threads on the column extension (item 30). Gently slide the column extension with bearing onto the pump shaft. Install if needed and lubricate the two column extension o-rings (item 12). Repeat step 9 for each column extension to be installed.
10. Thread the left hand threaded drive magnet assembly (item 14) onto the pump shaft until it is 4" +/- 1/64" as measured from the top of the drive magnet assembly as shown in Figure 3. **A 9/16" wrench can be used on the milled flats below the threads to hold the pump shaft during this step.** Apply a small amount of Loctite Thread Locker 262 to the left-hand threaded 5/8-18 hex jam nut (item 15) and thread onto the pump shaft. Tighten to 50 ft. lbs. Recheck the drive setting dimension after the nut is tightened.

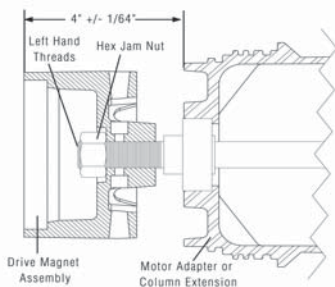


Figure 3

11. Place the barrier/housing adapter on a clean surface with the white ceramic post facing up. Place the impeller drive assembly (items 18 and 19) onto the ceramic post. Install and lubricate (with a chemically compatible lubricant) the housing o-ring (item 17).
12. Noting the reference marks made during disassembly on the impeller housing and the barrier column assembly, align the bolt hole tabs and snap the housing in place (bolt hole alignment is critical).
13. Install and lubricate the diffuser o-ring (item 21). Install the diffuser assembly (item 22) being careful not to dislodge the o-ring and to keep the bolt hole alignment straight.
14. If the impeller drive shaft (item 23) was replaced, reassemble it onto the impeller assembly (item 19) by matching the three tabs on the end of the drive shaft with the three recessed slots in the impeller assembly and pressing together.
15. Looking through the hole in the center of the diffuser assembly, note the orientation of the square recess in the top of the first stage impeller drive (item 18). Insert the square end of the drive shaft through the hole in the diffuser and into the square recess in the impeller drive. Press gently but firmly to seat the drive shaft.

16. Install and lubricate the housing o-ring (item 17) onto the diffuser (item 22). Lower the first stage impeller housing (item 24) straight down onto the pump with the ceramic front spindle support sliding into the bushing (item 18A) on top of the first stage impeller assembly. Orient the housing with the direction arrow on top (same as discharge direction), the drain boss on the bottom, and with the mounting holes aligned. Install the mounting bolts and hardware (items 25A, B & C) making sure not to dislodge the housing o-ring (item 17) or the diffuser o-ring (item 21). Hand tighten the mounting bolts to pull the pump together using the pattern shown in Figure 4.

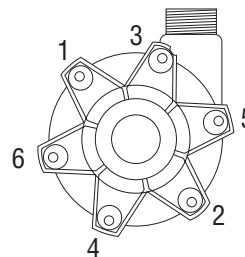


Figure 4

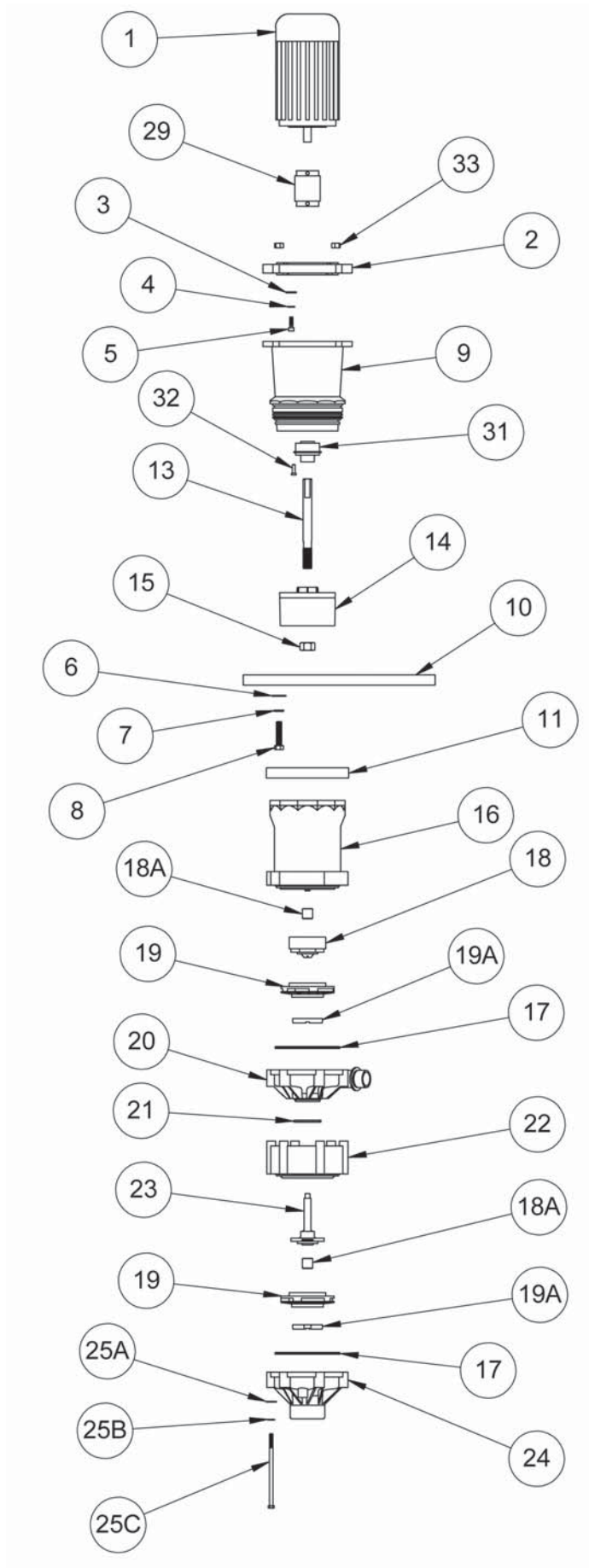
**NOTE: It is not recommended to reuse plastic screws. Always use thread lubricant when installing plastic screws.**

17. After the housing is secure, insert a screw driver into the suction and push down on the front of the first stage impeller assembly to completely seat the drive shaft (item 23) into the 2nd stage impeller (item 18). Push firmly on all three areas separated by the front spindle support in the suction.
- ⚠ CAUTION: Do not press on the gray thrust ring.**
18. Slide the lock ring (item 11) over the drive magnet assembly and past the corresponding flats on the column extension (motor adapter if 12" pump) making sure the smaller inside diameter side is toward the motor. Lubricate the external threads on the column extension (motor adapter on 12" models), the o-rings, and the internal threads on the barrier column section. Gripping the assembled pump end firmly, slide it down over the drive hub until the threads touch, and screw the pump end onto the column section. Use a strap wrench to tighten until there is no gap between the sections and the flats are parallel. Pull the lock ring up. Match with corresponding flats and snap into place.
- ⚠ CAUTION: Do not allow your fingers to get between the drive hub and the barrier column section during assembly.**
19. Rotate the motor fan and listen/feel for drive hub rubbing (re-check drive hub setting) or the first stage impeller (item 19) rubbing on the housing (recheck step 17).
  20. Reinstall the pump into the system according to the installation instructions.

## GENERAL NOTES

1. Do not pump liquids containing metal fines.
2. If magnets decouple, stop the pump immediately. The rare earth magnets used in this pump are more resistant to demagnetization, but operating the pump with the magnets decoupled will eventually weaken the magnets.
3. Plastic pumps will expand and contract with temperature so periodically check and hand tighten screws.
4. Use a chemically compatible thread lubricant on threads of column sections.

(General Notes continued on page 8.)



**MSVKC PARTS LIST**

| Item | Qty. | Description                                 | Frame | Part Number   |           |
|------|------|---|-------|---------------|-----------|
|      |      |   |       | Polypropylene | PVDF      |
| 1    | 1    | Motor                                       | 56C   | As Listed     |           |
| 2    | 1    | Metric motor adapter                        | All   | M101947       |           |
| 3    | 4    | ¼" flat washer                              | All   | J100128       |           |
| 4    | 4    | ¼" lock washer                              | All   | J100115       |           |
| 5    | 1    | Socket head cap screw                       | 71/80 | J103228       |           |
| 6    |      | 3/8" flat washer SSTL                       | All   | J100128       |           |
| 7    |      | 3/8" lock washer SSTL                       | All   | J100115       |           |
| 8    | 4    | Motor mounting bolts w/ mounting plate      | 56C   | J103161       |           |
|      |      | Motor mounting bolts without mounting plate | 56C   | J100114       |           |
|      |      | Motor mounting bolts w/mounting plate       | 71/80 | J103227       |           |
|      |      | Motor mounting bolts without mounting plate | 71/80 | J103207       |           |
| 9    | 1    | Motor adapter                               | All   | M101981-1     | M101981-2 |
| 10   | 1    | Mounting plate                              | All   | J103132-5     |           |
|      |      | PVC   |       | J103132-6     |           |
|      |      | CPVC  |       |               |           |
| 11   | 1    | Lock ring                                   | All   | M101984-1     | M101984-2 |
| 12   | 1    | Motor adapter/column extension o-ring       | All   | J103306       |           |
|      |      | Viton                                       |       | J103308       |           |
|      |      | EPDM  |       |               |           |
| 13   | 1    | Shaft                                       |       |               |           |
|      |      | 18"   | 56C   | M102119-9     |           |
|      |      | 18"   | 80    | M102119-19    |           |
|      |      | 18"   | 71    | M102119-10    |           |
|      |      | 24"   | 56C   | M102119-1     |           |
|      |      | 24"   | 80    | M102119-20    |           |
|      |      | 24"   | 71    | M102119-5     |           |
|      |      | 30"   | 56C   | M102119-2     |           |
|      |      | 30"   | 80    | M102119-21    |           |
|      |      | 30"   | 71    | M102119-6     |           |
|      |      | 36"   | 56C   | M102119-3     |           |
|      |      | 36"   | 80    | M102119-22    |           |
|      |      | 36"   | 71    | M102119-7     |           |
|      |      | 42"   | 56C   | M102119-4     |           |
|      |      | 42"   | 80    | M102119-23    |           |
|      |      | 42"   | 71    | M102119-8     |           |
|      |      | 48"   | 56C   | M102119-11    |           |
|      |      | 48"   | 80    | M102119-24    |           |
|      |      | 48"   | 71    | M102119-15    |           |
|      |      | 54"   | 56C   | M102119-12    |           |
| 54"  | 80   | M102119-25                                  |       |               |           |
| 54"  | 71   | M102119-16                                  |       |               |           |
| 60"  | 56C  | M102119-13                                  |       |               |           |
| 60"  | 80   | M102119-26                                  |       |               |           |
| 60"  | 71   | M102119-17                                  |       |               |           |
| 66"  | 56C  | M102119-14                                  |       |               |           |
| 66"  | 80   | M102119-27                                  |       |               |           |
| 66"  | 71   | M102119-18                                  |       |               |           |
| 14   | 1    | Drive magnet assembly                       | All   | A101989-20    |           |
| 15   | 1    | Jam nut                                     | All   | J103515       |           |
| 16   | 1    | Barrier/column housing adapter              | All   | A101271-1     | A101271-2 |
| 17   | 1    | Impeller housing o-ring                     | All   | J102389       |           |
|      |      | Viton                                       |       | J102585       |           |
| 18   | 1    | Impeller drive with carbon bushing          | All   | A103269-1     | A103269-4 |
|      |      | Impeller drive with PTFE bushing            |       | A103269-2     | A103269-5 |
|      |      | Impeller drive with ceramic bushing         |       | A103269-3     | A103269-6 |

| MSVKC PARTS LIST |      |   |           |               |            |
|------------------|------|---|-----------|---------------|------------|
| Item             | Qty. | Description   | Frame     | Part Number   |            |
|                  |      |   |           | Polypropylene | PVDF       |
| 18A              | 2    | Impeller bushing  | All       | J102387       |            |
|                  |      | Carbon  |           | J102790       |            |
|                  |      | Teflon  |           | J103617       |            |
| 19               | 2    | Impeller with thrust ring   | All       | A101983-17    | A101983-18 |
|                  |      | 3.00"   |           | A101983-15    | A101983-16 |
|                  |      | 3.19"   |           | A101983-2     | A101983-5  |
|                  |      | 3.50"   |           | A101983-3     | A101983-6  |
| 19A              | 1    | Thrust ring – PTFE  | All       | J103893       |            |
|                  |      | 3.00"/3.19"   |           | J101606       |            |
| 20               | 1    | Impeller housing 2 <sup>nd</sup> stage – NPT                          | All       | A103205-1     | A103205-2  |
|                  |      | Impeller housing 2 <sup>nd</sup> stage w/Viton discharge o-ring – BSP |           | A103271-1     | A103271-2  |
|                  |      | Impeller housing 2 <sup>nd</sup> stage w/EPDM discharge o-ring – BSP  |           | A103271-3     | A103271-4  |
| 21               | 1    | Diffuser o-ring – Viton   | All       | J102447       |            |
|                  |      | Diffuser o-ring – EPDM  |           | J102446       |            |
| 22               | 1    | Diffuser assembly   | All       | A103242-1     | A103242-2  |
| 23               | 1    | Impeller drive shaft – carbon bushing                                 |           | A103270-1     | A103270-4  |
|                  |      | Impeller drive shaft – PTFE bushing                                   |           | A103270-2     | A103270-5  |
|                  |      | Impeller drive shaft – ceramic bushing                                | A103270-3 | A103270-6     |            |
| 24               | 1    | Impeller housing – 1 <sup>st</sup> stage                              | All       | A103195-1     |            |
|                  |      | NPT   |           | A103195-2     |            |
|                  |      | BSP   |           | A103195-3     |            |
| 25A              | 6    | 5/16 flat washer  | All       | J103845       |            |
|                  |      | Titanium  |           | J103846       |            |
| 25B              | 6    | 5/16 lock washer  | All       | J103847       |            |
|                  |      | Titanium  |           | J103848       |            |
| 25C              | 6    | C/S hex hd 5/16-18 x 5-1/4" lg.                                       | All       | J103872       |            |
|                  |      | Titanium  |           | J103925       |            |
|                  |      | Hastelloy   |           | J103926       |            |
| 26               | 1    | Hex reducer bushing – 1-1/2" x 1"                                     | All       | J103160       |            |
| 27               | 1    | Elbow – 90° x 1-1/2"  | All       | J103165       |            |
| 28               | 1    | Discharge pipe  | All       | M101965-1     | M101965-2  |
|                  |      | 18"   |           | M101965-7     | M101965-8  |
|                  |      | 24"   |           | M101965-3     | M101965-4  |
|                  |      | 30"   |           | M101965-9     | M101965-10 |
|                  |      | 36"   |           | M101965-5     | M101965-6  |
|                  |      | 42"   |           | M101965-11    | M101965-12 |
|                  |      | 48"   |           | M101965-13    | M101965-14 |
|                  |      | 54"   |           | M101965-15    | M101965-16 |
|                  |      | 60"   |           | M101965-17    | M101965-18 |
| 29               | 1    | Coupling  | 56C       | A102485       |            |
|                  |      |   | 71        | A102487       |            |
|                  |      |   | 80        | A102488       |            |
| 30               |      | Column extension  | All       | M101982-1     | M101982-2  |
| 31               |      | Shaft bearing   | All       | J103157       |            |
| 32               |      | Bearing retaining screw   | All       | J103175       |            |
| 33               |      | 3/8-16 hex nut (for metric motor adapter)                             | All       | J100135       |            |

\*May be two different size impellers. See below. Check model number or serial number of label to determine impeller combinations.  
Example: MSKCPCVN15C. The underline positin indicates impeller combination.

1 = 3.88 + 3.88

2 = 3.5 + 3.88

3 = 3.5 + 3.5

4 = 3.19 + 3.5

5 = 3.0 + 3.5

5. The setting of the drive magnet dimension is critical. Failure to properly set the dimension may result in decoupling or damage to pump components.
6. An information sticker is attached to the motor adapter section or the mounting plate. The first line is the model number, and the second line is the serial number. See Figure 5.



Figure 5

7. The pump will contain various numbers of shaft bearings (item 28) based on the length of the pump as follows:
 

|          |   |                    |
|----------|---|--------------------|
| 18" pump | = | (1) shaft bearings |
| 24" pump | = | (2) shaft bearings |
| 30" pump | = | (3) shaft bearings |
| 36" pump | = | (4) shaft bearings |
| 42" pump | = | (5) shaft bearings |
| 48" pump | = | (6) shaft bearings |
| 54" pump | = | (7) shaft bearings |
| 60" pump | = | (8) shaft bearings |
8. Due to the hermetically sealed design, the pump will displace liquid as follows:
  - 18" pump = approximately 1-1/4 gallons (4.73 liters)
  - Add approximately 1 quart (.95 liter) per column section.
  - E.G. 24" pump = 1-1/2 gallons (5.68 liters)
9. 18" pumps do not have column extensions.
10. Largest diameter impeller is always closest to motor.

## TROUBLESHOOTING

### NO DISCHARGE

- Pump not primed.
- Air lock in pump.
- Discharge head too high.
- Closed valve.
- Viscosity or specific gravity too high (magnets uncoupled).

### INSUFFICIENT DISCHARGE

- Discharge head higher than anticipated.
- Clogged suction line, foot valve or crimp in hose.
- Foot valve too small.
- Foot valve or suction opening not submerged enough.
- Incorrect pump rotation

### INSUFFICIENT PRESSURE

- Air or gasses in liquid.
- Impeller diameter too small.
- Discharge head higher than anticipated.
- Incorrect pump rotation.

### LOSS OF PRIME

- Leaking discharge line.
- Suction lift too high or insufficient NPSHA. Should be 2 feet

above NPSHR.

- Foreign matter in impeller.
- Leaking valve.
- Malfunctioning level sensor or control.

### EXCESSIVE POWER CONSUMPTION

- System head lower than rating. Pumps too much liquid. Specific gravity or viscosity of liquid being pumped is too high or higher than defined in application.
- Binding pump parts.

### VIBRATION/NOISE

- Excess bearing wear.
- Drive magnet uncoupled.
- Loose magnet.
- Pump cavitating.
- Motor or piping not properly secured.
- Foreign object in impeller.
- Set screws on motor shaft coupling loose.
- Drive magnet assembly may not be properly set or secured.

### WARRANTY

Finish Thompson, Inc (manufacturer) warrants this product to be free of defects in materials and workmanship for a period of 180 days from date of purchase by original purchaser. If a warranted defect, which is determined by manufacturer's inspection, occurs within this period, it will be repaired or replaced at the manufacturer's option, provided (1) the product is submitted with proof of purchase date and (2) transportation charges are prepaid to the manufacturer. Liability under this warranty is expressly limited to repairing or replacing the product or parts thereof and is in lieu of any other warranties, either expressed or implied. This warranty does apply only to normal wear of the product or components. This warranty does not apply to products or parts broken due to, in whole or in part, accident, overload, abuse, chemical attack, tampering, or alteration. The manufacturer accepts no responsibility for product damage or personal injuries sustained when the product is modified in any way. If this warranty does not apply, the purchaser shall bear all cost for labor, material and transportation.

Manufacturer shall not be liable for incidental or consequential damages including, but not limited to process down time, transportation costs, costs associated with replacement or substitution products, labor costs, product installation or removal costs, or loss of profit. In any and all events, manufacturer's liability shall not exceed the purchase price of the product and/or accessories.

**Call our toll free Technical Service Hot Line, 1-800-888-3743, if you have any questions regarding product operation or repair.**

### ORDERING SPARE PARTS

Spare parts can be ordered from your local distributor. Always refer to pump model number to avoid error.



**FINISH THOMPSON INC.**

921 Greengarden Road • Erie, PA 16501-1591 U.S.A.  
Ph 814-455-4478 • Fax 814-455-8518  
Email [fti@finishthompson.com](mailto:fti@finishthompson.com) • [www.finishthompson.com](http://www.finishthompson.com)

Toll Free Service 1-800-888-3743  
Part Number J104101, Rev 1  
Literature ID No. FT02-852B, 3-4-04

