WARRANTY

Pumping units assembled by Summit Pump, Inc., Green Bay, WI are guaranteed to be free from defects in material and workmanship for one year from date of shipment from factory in Green Bay, WI. The obligation under this Warranty, statutory or otherwise, is limited to replacement or repair at Green Bay, WI, of such part as shall appear to us upon inspection at such point, to have been defective in material or workmanship.

This Warranty does not obligate Summit Pump, Inc. to bear the cost of labor or transportation charges in connection with replacement or repair of defective parts; nor shall it apply to a pump upon which repairs or alterations have been made unless authorized by Summit Pump, Inc. In addition, a return goods authorization number must be obtained from Summit Pump, Inc. before any part is shipped back to Summit Pump, Inc.

No warranty is made in respect to engines, motors, or trade accessories, such being subject to warranties of their respective manufacturers.

No express implied or statutory warranty, other than herein set forth is made or authorized to be made by Summit Pump, Inc.

In no event shall Summit Pump, Inc. be liable for consequential damages or contingent liabilities arising out of the failure of any Summit Pump, Inc. pump or parts thereof to operate properly.

SUMMIT PUMP, INC.
Green Bay, WI

LIABILITY

Summit Pump, Inc. shall not be liable for personal physical injury, damage or delays caused by failure to follow the instructions and procedures for installation, operation and maintenance contained in this manual.

The equipment is not for use in or with any nuclear facility or fire sprinkler system. Buyer accepts the responsibility for insuring that the equipment is not used in violation and Buyer shall indemnify and hold Seller harmless from any and all liability (including such liability resulting from seller’s negligence) arising out of said improper use.

COPYRIGHT

This Installation, Operation, and Maintenance Manual contains proprietary information, which is protected by copyright. No part of this Installation, Operation, and Maintenance Manual may be photocopied or reproduced without prior written consent from Summit Pump.

The information contained herein is for informational use only and is subject to change without notice. Summit Pump assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

© 2014 by Summit Pump. All rights reserved.
1. INTRODUCTION

This installation, operation, and maintenance manual is designed to help you achieve the best performance and longest life from your Summit Pump.

This pump is a close coupled / frame-mounted, closed impeller, centrifugal model with end suction / top discharge. The pump is designed for handling water, non-corrosives (cast iron/bronze fitted), and mild corrosives (316 stainless steel).

If there are any questions regarding the pump or its application, which are not covered in this manual or in other literature accompanying this unit, please contact your Summit Pump distributor.

For information or technical assistance on the power source, contact the power source manufacturer’s local dealer or representative.

SAFETY

The following message types are used in this manual to alert maintenance personnel to procedures that require special attention for the protection and safety of both equipment and personnel:

<table>
<thead>
<tr>
<th>WARNING!</th>
<th>Failure to comply with the warnings in this manual could result in personal injury or death.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTION!</td>
<td>Failure to comply with the cautions in this manual could result in destruction of or damage to equipment.</td>
</tr>
<tr>
<td>NOTE:</td>
<td>Identifies a condition or procedure which is essential to proper equipment operation.</td>
</tr>
</tbody>
</table>
2. RECEIPT AND STORAGE

RECEIVING THE PUMP

<table>
<thead>
<tr>
<th>WARNING!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to properly lift and move pump could result in serious personal injury.</td>
</tr>
</tbody>
</table>

Immediately upon arrival, carefully inspect the pump for evidence of damage during transit. Immediately report any damage to your Summit Pump Distributor.

STORING THE PUMP

Store the pump in a clean dry place. **Do not remove piping connection covers.** Rotate the pump shaft by hand **at least once per week** to maintain a protective film of oil or grease on the bearings. If you anticipate long-term storage, special treatment is available for purchase from Summit Pump, Inc.
3. INSTALLATION

LOCATION

When choosing a location for the pump, select an area that provides easy access for inspection and maintenance. Locate the pump as close as possible to the source, which will provide NPSH (Net Positive Suction Head) equal to or greater than that required by the pump at any capacity over its expected operating range.

FOUNDATION

Use a foundation that is sufficient enough to support all points of the pump base-plate. Level and grout the base-plate per standard construction practices (see ANSI/HI 1.4.2-1997).

PIPING CONNECTION – SUCTION / DISCHARGE

All piping must be independently supported and accurately aligned to the pump suction and discharge connections.

WARNING!

Lock out driver power before beginning to work on pump.

CAUTION!

Never use force to align piping to the pump suction and discharge.

The suction piping should be equal to, but never less than, the suction nozzle size. If larger, use an eccentric reducer mounted with flat side on top. If suction line is suction lift, the pipe must be free of air leaks. It must be one diameter larger than the pump suction nozzle. The end must be two pipe diameters below the liquid surface. If a foot valve is used, it must be 1.5 times the area of the suction pipe. Elbows must be a minimum of ten diameters from the suction flange.

CAUTION!

Never operate pump with discharge valve closed.

The discharge piping should include isolation and check valves. The check valve prevents the pump from rotating backward. Place the check valve between the pump and isolation valve. The isolation valve is used for priming, starting, and shutting down the system. If you use pipe diameter increasers, place them between the pump and the check valve.
ALIGNMENT – FRAME MOUNTED

The alignment at the pump and drive shaft is one of the most important considerations in the pump installation.

**WARNING!**

Lock out pump driver. Failure to do so could result in serious personal injury.

- **TO ALIGN THE PUMP**
  1. Use flexible spacer couplings to achieve proper alignment.
  2. Check and adjust the parallel and angular alignment to within .005 inches prior to connecting the coupling halves.
  3. Jog the motor to check rotation. Its arrow should match up with the arrow on the pump.
  4. Install a coupling guard when the pump is aligned.

**STUFFING BOX**

Mechanical seals are standard.

**CAUTION!**

Pumps are limited to 150°F maximum pumpage.

**Mechanical Seals**

Mechanical seals are standard in the close coupled and frame mounted pumps. The seal is mounted at the factory and needs no further adjustment for operating conditions.
4. OPERATION

LUBRICATION

The close coupled pumps require only grease lubrication per motor manufacture instructions. Frame mounted pumps are grease lubricated.

Good lubrication practice includes:

- Keep lubricant clean in storage and application devices.
- Clean lubricant/grease fitting before re-lubricating.
- Use proper amount of grease. (Too much is just as bad as too little.)
- Use correct grade for operating conditions, use NLG1 grade 2 lithium base or synthetic of equal grade.
- Grease may include:

<table>
<thead>
<tr>
<th>Table 4-1 Acceptable Greases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobil</td>
</tr>
<tr>
<td>Mobil Synthetic</td>
</tr>
<tr>
<td>Citgo</td>
</tr>
<tr>
<td>Citgo</td>
</tr>
<tr>
<td>Keystone</td>
</tr>
</tbody>
</table>
5. MAINTENANCE AND REPAIR

**WARNING!**
WEAR EYE PROTECTION. Failure to do so can result in serious personal injury.

**DISASSEMBLY PROCEDURES**
(See APPENDIX D for cross-section of corresponding model.)

- **TO DISASSEMBLE YOUR PUMP**
  1. Lock out pump motor power supply at the motor starter.
  2. Close off discharge, suction, and sealing fluid (if used).
  3. Drain casing and flush, if needed.

**WARNING!**
Pump parts are heavy. Use proper lifting methods to avoid personal injury.

4. Place lifting sling around pump frame if removing pump. Disconnect drive coupling, suction, discharge and any seal tubing. If pump is close coupled, disconnect wiring from motor. Lift entire component onto transport cart for trip to shop.

5. Secure pump or pump and motor to bench to disassemble.

6. Remove casing bolts (170) holding casing to adapter (71). Pull casing (1) and gasket (73A) away from adapter (71) over impeller (2). Set casing and gasket aside for inspection.

7. Loosen impeller screw (26). Remove impeller screw (26) and washer (24A), hold shaft with suitable tool.

8. Remove impeller (2) from shaft (6)

9. Remove mechanical seal parts (80A, B, C, & D) from shaft sleeve (14).

10. Loosen and remove adapter to frame / motor bolts. Slide adapter away from frame/motor.

11. Remove floating seat (65A) from adapter and set aside with other seal parts for inspection.

12. Slide sleeve (14), sleeve O-ring (130) and deflector (40) from shaft.
Frame Mounted Pumps
13. Loosen and remove bearing cover bolts (170C), and slide bearing cover (37) off shaft. Remove outboard seal (49) from cover (37).
14. Slide shaft assembly, shaft inboard (16) and outboard (18) bearings from bearing frame (19).
15. Remove inboard seal (51) from bearing frame (19)
16. Holding shaft assembly secure, loosen outboard bearing lock nut (22) and remove.
17. Remove inboard bearing (16) and outboard bearing (18). Use an arbor press or bearing puller to facilitate.
18. Inspect all parts for cracks, erosion, pitting, rusting, grooves worn into shaft and / or sleeve. Replace all worn or otherwise damaged parts.
19. If pump is iron, inspect casing rings and replace as necessary.

ASSEMBLY PROCEDURES
■ TO ASSEMBLE YOUR PUMP
1. Clean adapter (71) and frame/motor (19).
2. Install new grease fittings into frame (19) and bearing cover (37).
3. If using a frame assembly, install inboard bearing (16) onto shaft (6). Heat bearings for ease of installation. Install thrust outboard (118) on shaft. Install bearing so shields are toward shaft ends. Tighten bearing locknut (22) on shaft, outboard end. Set aside for inspection.
4. Install bearing cover seal (49) in outboard bearing cover (37).
5. Apply a thin coat of lubricant to the inside of the bearing frame housing (outboard and inboard).
6. Slide shaft assembly into the frame from the outboard end until the snap ring on outboard bearing (18) contacts the frame (19).
7. Slide bearing cap over the shaft end, install 4 ½” x ¾” bolts (170C), and tighten.
8. Slide inboard grease seal (51) over impeller end of shaft into place. Slide deflector (40) into position. Slide sleeve (14) on shaft.
9. Assemble mechanical seal, lubricate O-ring (54B) groove in stationary seat (65A), and seat cavity in adapter (71) with molykote DC No.55 or synthetic lube. Install stationary seat in adapter with lapped surface toward casing side of adapter.

Close Coupled
10. Slide adapter (71) over the end of the motor shaft. Align the holes in the adapter with motor holes. Install adapter to motor bolts and tighten.

Frame Mounted
11. Slide adapter (71) over end of pump shaft (6). Align holes in adapter with bearing frame (19) holes. Install adapter to frame bolts and tighten.
12. Lubricate shaft sleeve (14) bore, and bore of rotating assembly (80A). Slide sleeve onto shaft (6). Slide the rotating assembly and rotating sealing washer (not shown) (80D) onto the shaft sleeve. The lapped surface should be facing toward
the stationary seat or motor end of the assembly. Install the spring (80B). (It is closest to the impeller.) (Note: The spring retainer (80A) is used on some models – not shown.)

13. Install impeller key (32), making sure that the key goes into the notch on the shaft sleeve (14). Slide impeller (2) on, guiding the seal spring onto the impeller shoulder or into the spring retainer (80A).

14. Tighten impeller screw (26), with impeller washer (24A) in place. Rotate assembly to ensure there is no binding and that assembly turns freely.

15. Install new casing gasket (73A). Slide casing (1) over impeller. Align adapter holes with casing holes to put discharge outlet in its proper orientation. Install adapter to casing bolts (170) and tighten. Check all drain plugs (35) to ensure all are in place and tight.

16. If close coupled, reinstall or take to spares storage.

17. If frame mounted, install coupling key (46) and tape in place. Reinstall or take to spares storage.
6. PUMP CROSS SECTION AND PARTS LIST

CC AND FRAME MOUNTED PARTS ASSEMBLY

Cross Section

Parts List

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Item #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Casing</td>
<td>37</td>
<td>Bearing Cover, Outboard</td>
</tr>
<tr>
<td>2</td>
<td>Impeller</td>
<td>40</td>
<td>Deflector</td>
</tr>
<tr>
<td>6</td>
<td>Shaft</td>
<td>46</td>
<td>Key Coupling</td>
</tr>
<tr>
<td>7</td>
<td>Casing Ring (iron pumps only)</td>
<td>49</td>
<td>Bearing Cover Seal, Outboard</td>
</tr>
<tr>
<td>13</td>
<td>Packing</td>
<td>51</td>
<td>Grease Seal Inboard</td>
</tr>
<tr>
<td>14</td>
<td>Shaft Sleeve</td>
<td>52</td>
<td>Grease Fitting</td>
</tr>
<tr>
<td>16</td>
<td>Bearing, Inboard</td>
<td>53</td>
<td>Case Support (not shown)</td>
</tr>
<tr>
<td>18</td>
<td>Bearing, Outboard</td>
<td>65</td>
<td>Mechanical Seal, Stationary Element</td>
</tr>
<tr>
<td>19</td>
<td>Frame</td>
<td>71</td>
<td>Adapter</td>
</tr>
<tr>
<td>22</td>
<td>Lock Bearing Nut</td>
<td>73A</td>
<td>Casing Gasket</td>
</tr>
<tr>
<td>24A</td>
<td>Impeller Washer</td>
<td>80</td>
<td>Mechanical Seal, Rotating Element</td>
</tr>
<tr>
<td>26</td>
<td>Screw Impeller</td>
<td>130</td>
<td>Shaft Sleeve O-Ring</td>
</tr>
<tr>
<td>27</td>
<td>Adapter Ring</td>
<td>170</td>
<td>Bolt, Casing</td>
</tr>
<tr>
<td>32</td>
<td>Key Impeller</td>
<td>170B</td>
<td>Bolt, Frame to Adapter (not shown)</td>
</tr>
<tr>
<td>35</td>
<td>Plug Drain</td>
<td>170C</td>
<td>Bolt, Bearing Cap</td>
</tr>
</tbody>
</table>
CC DIMENSIONAL DATA

CLOSE COUPLED PUMP DIMENSIONS

© 2019 SUMMIT PUMP, Inc
# FRAME MOUNTED DIMENSIONAL DATA

## FRAME MOUNTED PUMP DIMENSIONS IN INCHES

<table>
<thead>
<tr>
<th>Size &amp; Frame</th>
<th>Dia.</th>
<th>Ser.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>DD</th>
<th>Style P</th>
<th>Scale M</th>
<th>S</th>
<th>Ø Drw. x</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
<th>Weight (LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 x 24  F1</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F2</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F3</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F4</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F5</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F6</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F7</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F8</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F9</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F10</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F11</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
<tr>
<td>11 x 24  F12</td>
<td>1 NPT</td>
<td>2 NPT</td>
<td>S</td>
<td>5/16</td>
<td>6</td>
<td>.120</td>
<td>5</td>
<td>5/16</td>
<td>4</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>3.34</td>
<td>4.34</td>
<td>3.34</td>
</tr>
</tbody>
</table>

---

© 2019 SUMMIT PUMP, Inc
MECHANICAL SEAL ASSEMBLY

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65A</td>
<td>Stationary Seat</td>
</tr>
<tr>
<td>80A</td>
<td>Rotating Assembly</td>
</tr>
<tr>
<td>80B</td>
<td>Spring</td>
</tr>
</tbody>
</table>