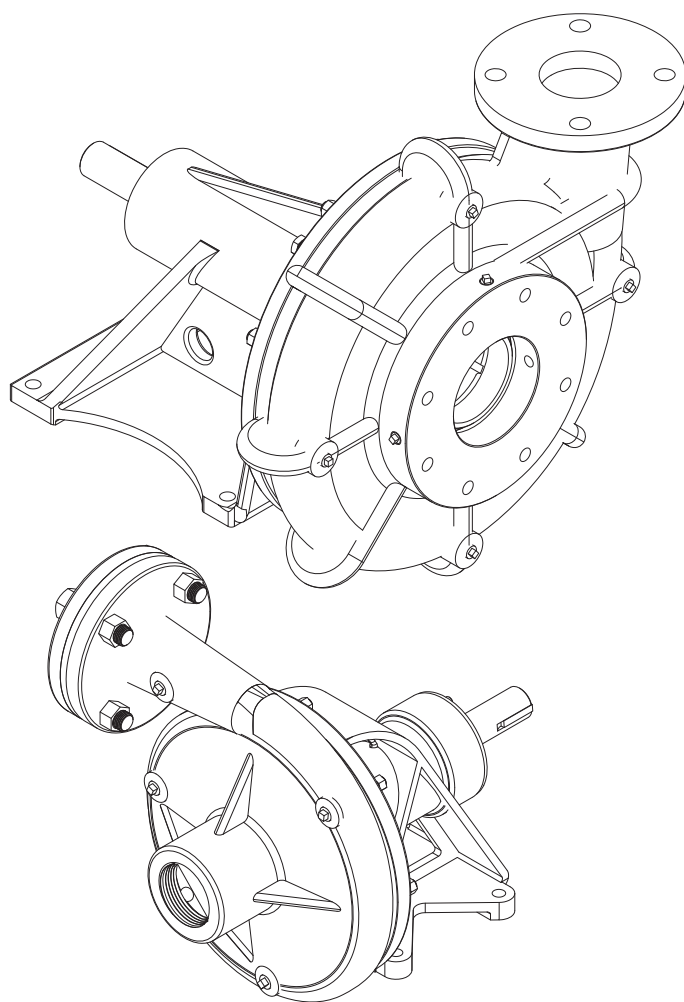


INSTALLATION, SERVICE & PARTS MANUAL



***Series: PF2020HCU
PF4030HCU***

***Frame Mounted
End Suction Pumps***



Power-Flo Pumps & Systems

a Power-Flo Technologies company

General Safety Information

Before installation, read the following instructions carefully. Failure to follow instruction and Safety information could cause serious bodily injury, death and/or property damage. Each Power-Flo pump is individually factory tested to insure proper performance. Closely following these instructions will eliminate potential operating problems, assuring years of trouble-free service.

⚠ DANGER "Danger" indicates an imminently hazardous situation which, if not avoided, **WILL result in death or serious injury.**

⚠ WARNING "Warning" indicates an imminently hazardous situation which, if not avoided, **MAY result in death or serious injury.**

⚠ CAUTION "Caution" indicates a potentially hazardous situation which, if not avoided, **MAY result in minor or moderate injury.**

IMPORTANT - Power-Flo Pumps and Systems is not responsible for losses, injury or death resulting from failure to observe these safety precautions, misuse, abuse or misapplication of pumps or equipment.

ALL RETURNED PRODUCTS MUST BE CLEANED, SANITIZED, OR DECONTAMINATED PRIOR TO SHIPMENT, TO INSURE EMPLOYEES WILL NOT BE EXPOSED TO HEALTH HAZARDS IN HANDLING SAID MATERIAL. ALL APPLICABLE LAWS AND REGULATIONS SHALL APPLY.

⚠ WARNING Installation, wiring, and junction connections must be in accordance with the National Electric Code and all applicable state and local codes. Requirements may vary depending on usage and location.

® Power-Flo is a registered trademark of Power-Flo Technologies Inc.
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⚠ WARNING Installation and servicing is to be conducted by qualified personnel only.

⚠ DANGER Keep clear of suction and discharge openings. **Do not** insert fingers in pump with power connected.

⚠ WARNING Always wear eye protection when working on pumps. Do not wear loose clothing that may become entangled in moving parts

⚠ DANGER Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing.

⚠ DANGER This pump is **not** intended for use in swimming pools or water installations where human contact with pumped fluid.

⚠ DANGER Risk of electric shock. To reduce risk of electric shock, always disconnect pump from power source before handling. **Lock out power & tag.**

⚠ WARNING **Do not** use these pumps in water over 180°F. **Do not** exceed manufactures recommended maximum performance, as this could cause the motor to overheat.

⚠ DANGER Operation against a closed discharge valve will cause premature bearing and seal failure. Heat build up on self-priming and end suction pumps may cause dangerous pressures. A high temperature switch or pressure relief valve is recommended to be installed in pump case.

⚠ WARNING Carefully read instruction manuals supplied with motor or engine before operating or servicing.

⚠ DANGER **DO NOT** pump hazardous material.

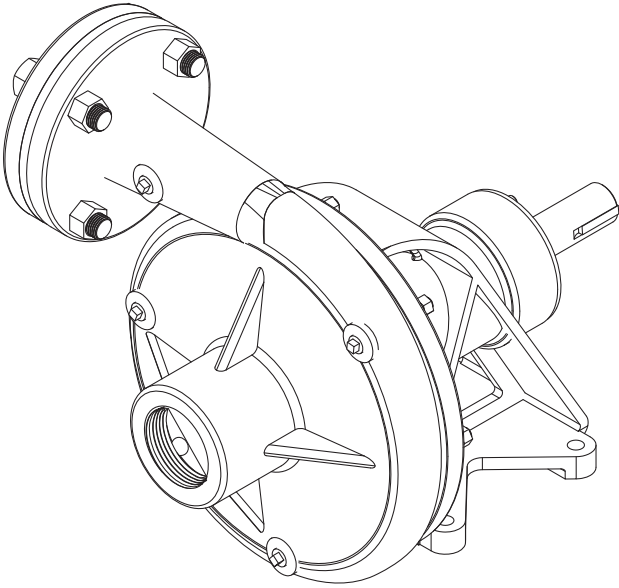
⚠ WARNING Pumps constructed with or fitted with bronze/brass may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications.

⚠ WARNING:
CANCER AND REPRODUCTIVE HARM-
WWW.P65WARNINGS.CA.GOV

IMPORTANT!
Prior to installation, record Model Number, MFG Date, and/or serial number, from pump name plate for future reference.

Model:
Serial:
MFG Date:

Specifications

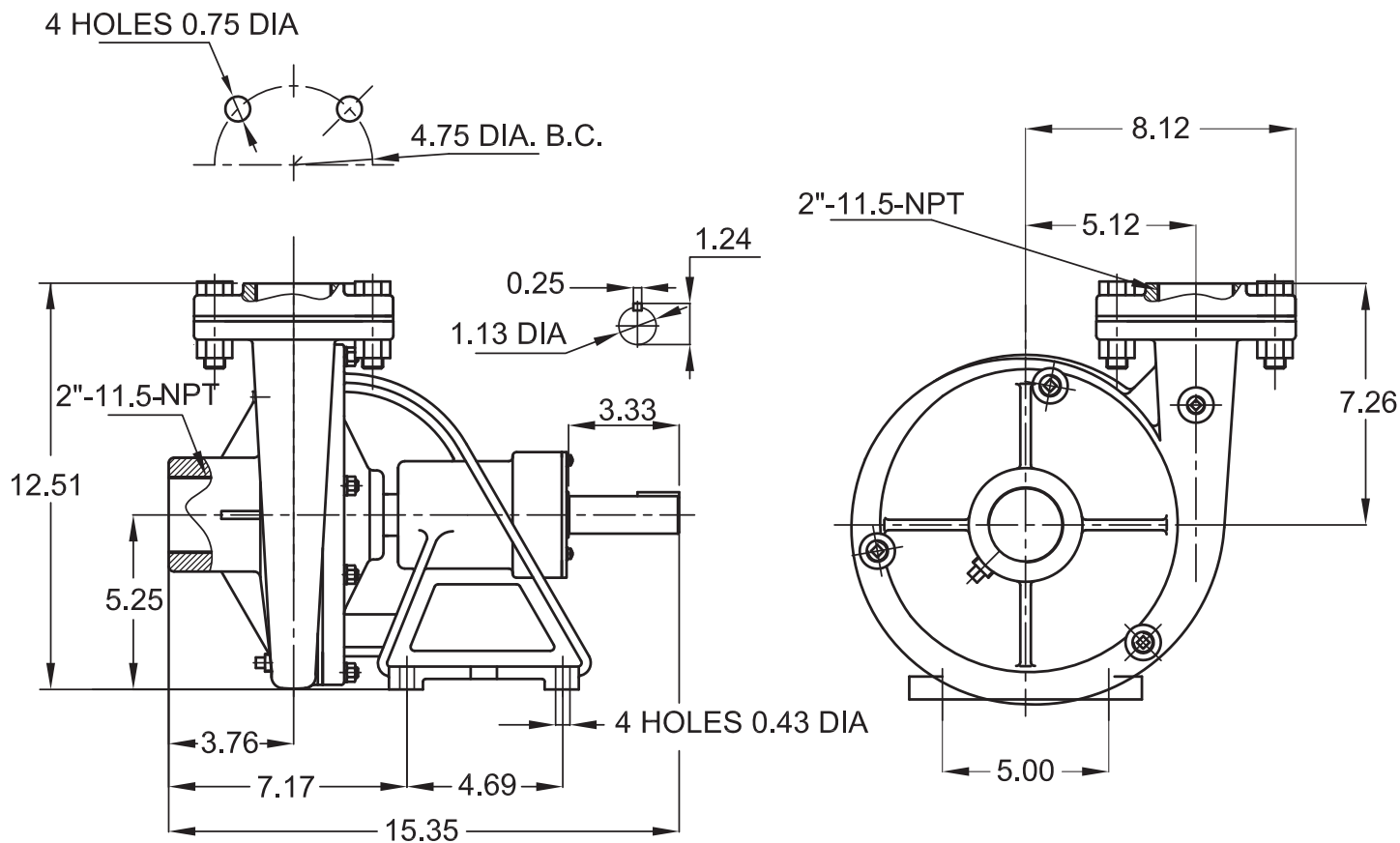
**Series: PF2020HCU**

2" x 2"
Universal Drive, End
Suction Centrifugal Pumps

SUCTION/ DISCHARGE	2" NPT Suction, 2" 125 lb Flange Discharge. Discharge can be placed in 8 different locations depending on piping requirements.
LIQUID TEMPERATURE	180°F Continuous
BODY	Cast Iron ASTM, Class 30, with Air Vent, Vacuum Pressure and Drain Plugs
PAINT	Air dry enamel
PEDESTAL	Cast Iron, Class 30
WEAR RING	Teflon "U" Cup
SHAFT	Steel
IMPELLER	Enclosed Type, Dynamically Balanced, ISO G6.3 Material: 81-3-7-9 Bronze
SHAFT SLEEVE	Bronze with O-ring
SEAL	Single Mechanical, Self Lubrication <i>Material:</i> Rotating Faces - Tungsten Stationary Faces - Tungsten Elastomer - NBR Hardware -304 Series Stainless
BEARING- PUMP END	Single Row, Ball Pre-Greased at Factory Load- Radial & Thrust
BEARING- DRIVE END	Double Row, Ball, Pre-Greased at Factory Load- Radial & Thrust
HARDWARE	Steel
WEIGHT	74 lbs.



Dimensions

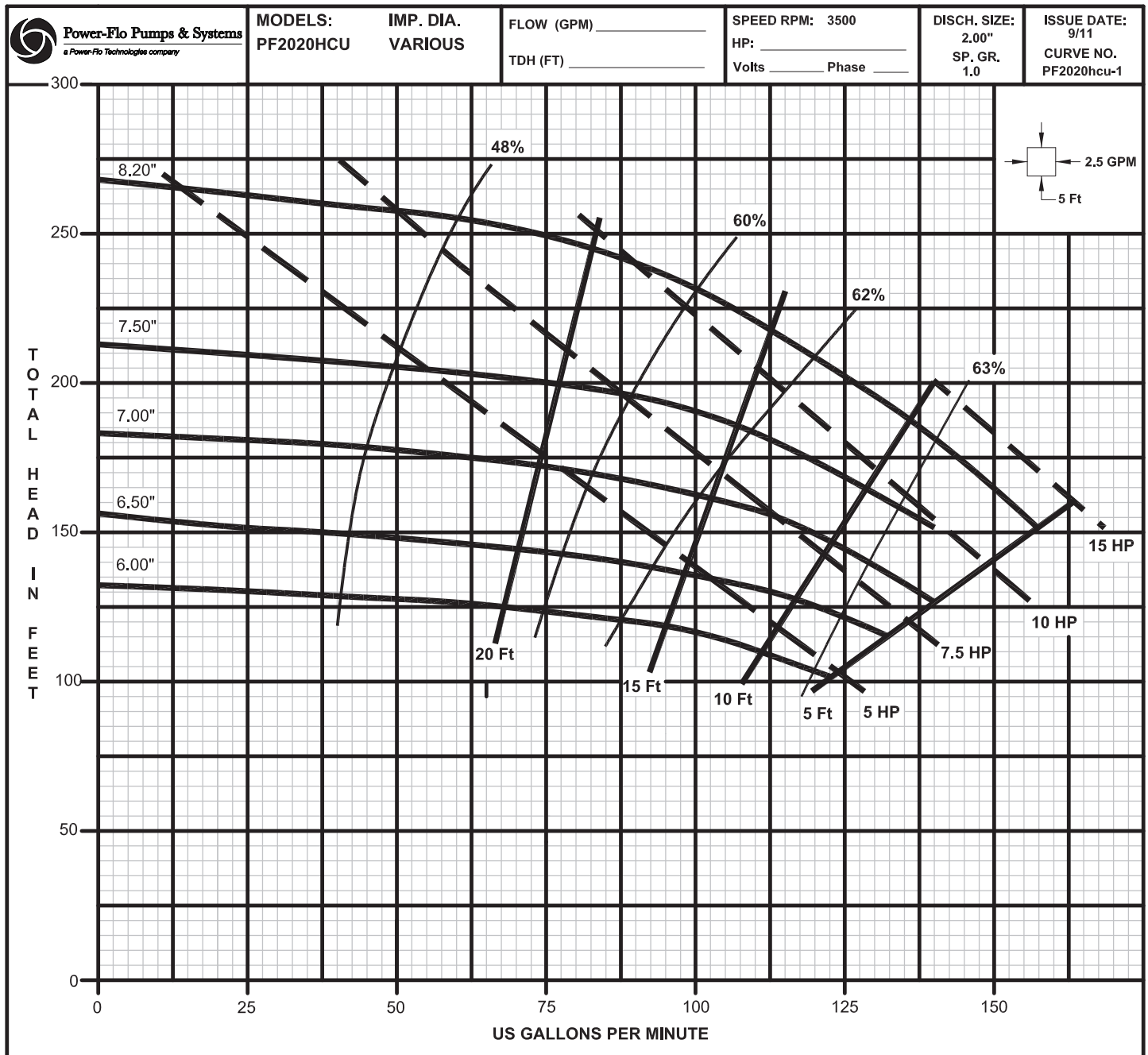


Model	Weight	
PF2020HCU	74 lbs	

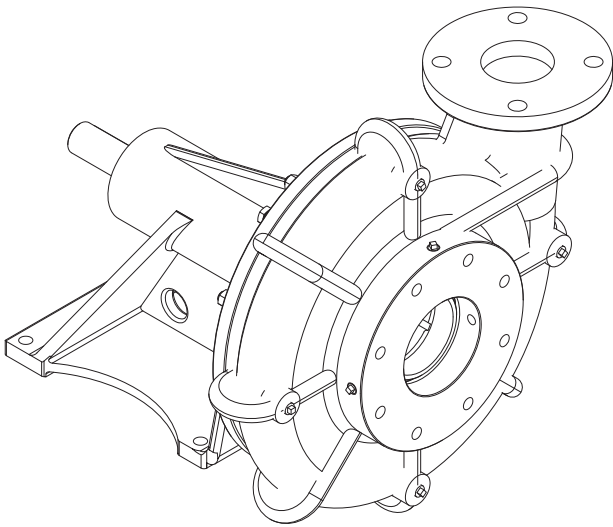
Not for pumping flammable liquids or hazardous materials that is not compatible with pump materials.



Performance



Specifications

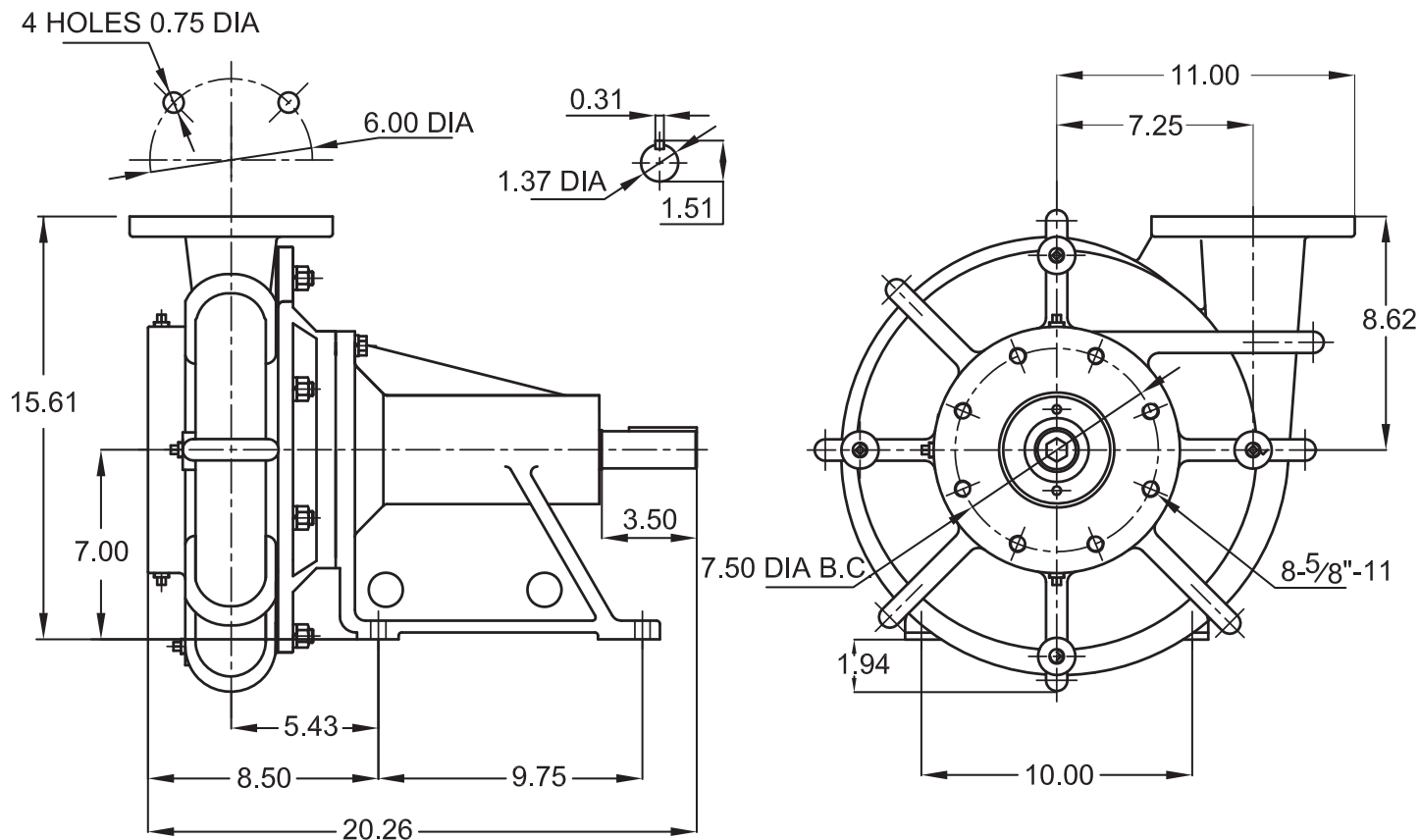
**Series: PF4030HCU**

4" x 3"
Universal Drive, End
Suction Centrifugal Pumps

SUCTION/ DISCHARGE	4" NPT Suction, 3" 125 lb Flange Discharge. Discharge can be placed in 8 different locations depending on piping requirements.
LIQUID TEMPERATURE	180°F Continuous
BODY	Cast Iron ASTM, Class 30, with Air Vent, Vacuum Pressure and Drain Plugs
PAINT	Air dry enamel
PEDESTAL	Cast Iron, Class 30
WEAR RING	Bronze
SHAFT	Steel
IMPELLER	Enclosed Type, Dynamically Balanced, ISO G6.3 Material: 81-3-7-9 Bronze
SHAFT SLEEVE	Bronze with O-ring
SEAL	Single Mechanical, Self Lubrication <i>Material:</i> Rotating Faces - Tungsten Stationary Faces - Tungsten Elastomer - NBR Hardware -304 Series Stainless
BEARING- PUMP END	Single Row, Ball Pre-Greased at Factory Load- Radial & Thrust
BEARING- DRIVE END	Double Row, Ball, Pre-Greased at Factory Load- Radial & Thrust
HARDWARE	Steel
WEIGHT	254 lbs.



Dimensions

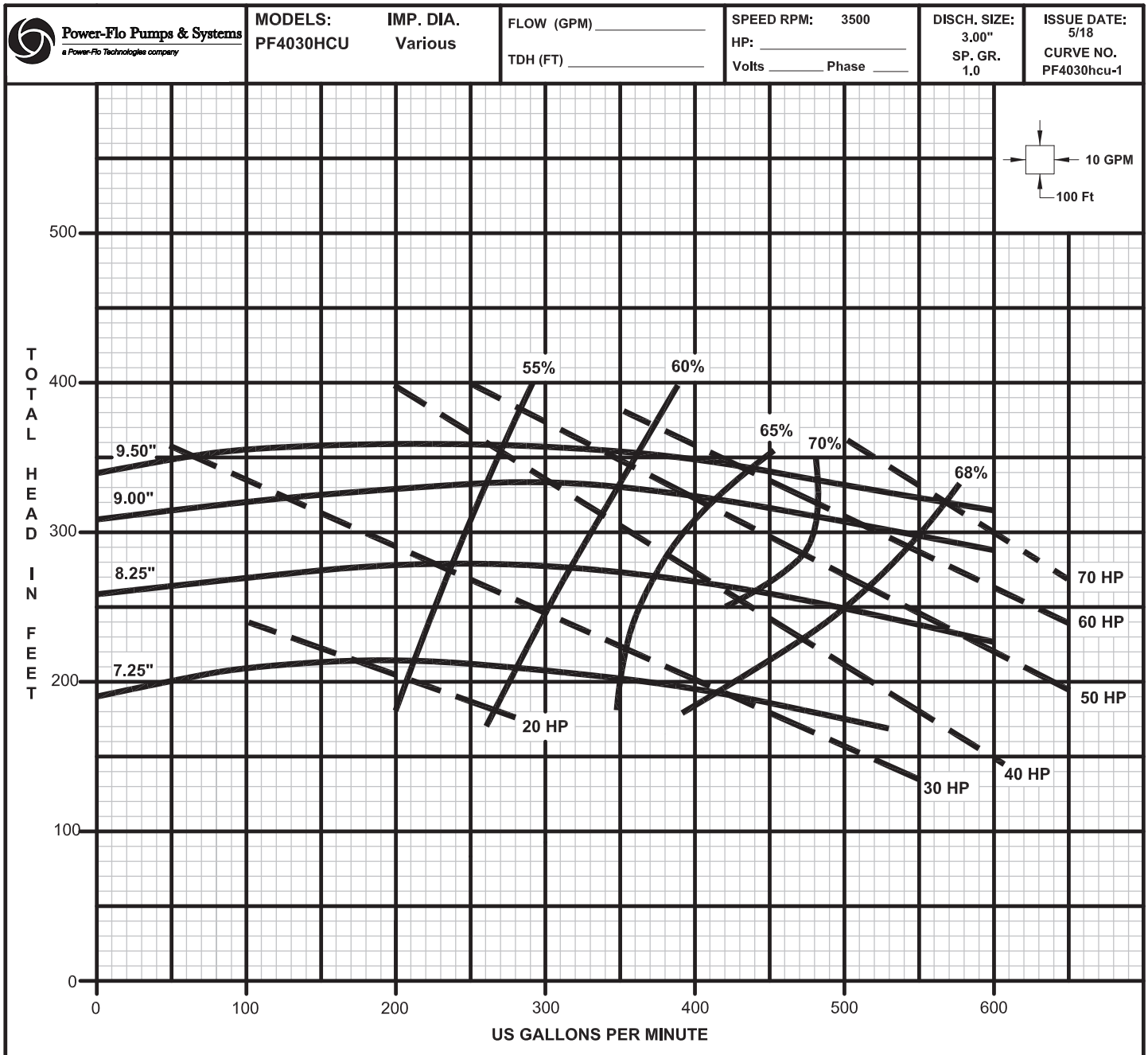


Model	Weight	
PF4030HCU	254 lbs	

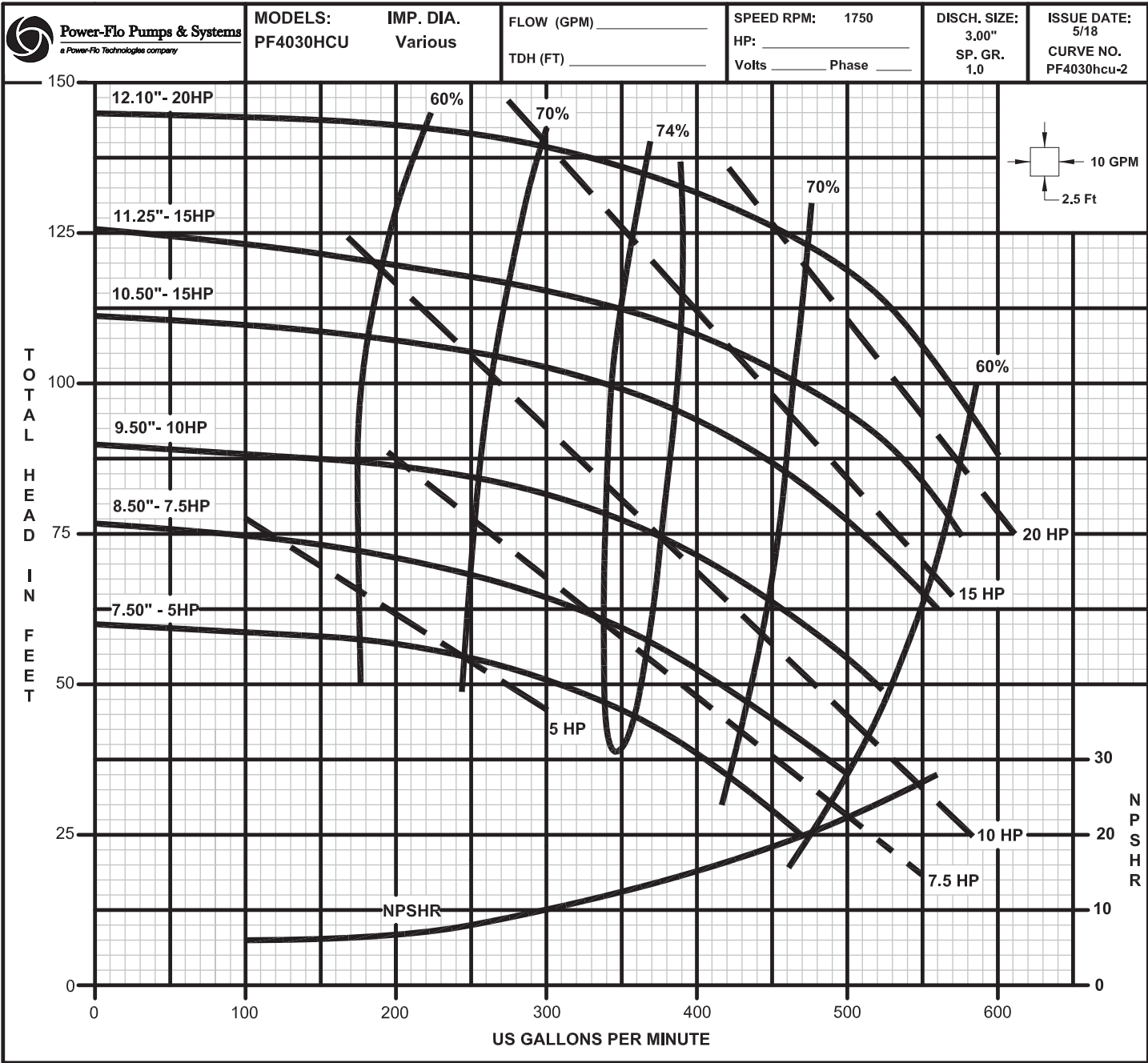
Not for pumping flammable liquids or hazardous materials that is not compatible with pump materials.



Performance



Performance



Receiving, Installation & Service

Receiving Inspection

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

Storage

Any product that is stored for a period longer than six (6) months from the date of purchase should be bench tested prior to installation. A bench test consists of, checking the impeller to assure it is free turning and a run test to assure the motor (and switch if provided) operate properly. Do not pump out of liquid.

Location

Locate pump as near as possible to the liquid being pumped.

PF2020HCU - Do Not place pump more than 15 feet above the surface of the liquid supply.

PF4030HCU - Do Not place pump more than 25 feet above the surface of the liquid supply.

Be sure pump is level. Mount pump on a firmly so not to move due to vibration.

Units should be permanently grouted onto a cement foundation. The pumps should be level to provide correct operating conditions. The flexible coupling should be realigned after grouting to eliminate excessive wear on the coupling.

Controls

Be sure the electrical specification of the control selected properly match the electrical specifications of the motor.

Motor Connection

All wiring of motor and control, overload protection and grounding should be in accordance with the National Electrical Code, State and Local codes. Make motor connection per label located on motor or motor manufactures manual.

Rotation

Pump rotation should agree with the direction on the rotation plate. If rotation on 3 phase is incorrect, interchange any two incoming wire leads. Rotation is "clockwise" when looking from the motor end.

The impeller on the PF2020HCU is threaded on the shaft and it is necessary to slide one half of the coupling back when checking rotation in order to eliminate the possibility of unscrewing the impeller and damaging the pump.

Suction



CAUTION! - Pump should not be operated without a suction strainer to prevent foreign matter from being drawn into impeller. The strainer should be cleaned regularly.

The use of pipe the same size as the port size is highly recommended. Using a smaller pipe line can cause internal damage. Make sure all lines have air-tight joints. The smallest air leak in the suction line may prevent the pump from priming. All horizontal suction lines should slope up to the pump to avoid trapped air pockets. If hose is used, it should be of reinforced type to prevent collapsing under suction.

Discharge

Connect discharge hose or pipe to the discharge port. Make sure all lines are air-tight joints.

Driver

Refer to Engine or Motor Manufacture's Instructions.

Lubrication

The shaft seal and impeller are lubricated by the liquid being pumped and needs no other lubrication. The bearings have been factory packed with lubricant and should be good for 5,000 hours or one year, then repacked.

Priming

Prime pump by completely filling volute and suction line with liquid. Allow air to escape by loosening pipe plug (4) in top of volute (1). Make sure all the air is out of the suction line and volute, or pump will not prime properly. A foot valve is required for priming or flooded suction. In freezing weather prime pump with warm water.



DO NOT operate pump without priming first. Operating dry will damage seal.

Starting

To start pump, apply power to motor or engine per the Motor or Engine manufacture's instructions.

Shutdown

Disconnect electric power or stopping engine to shut down. It is recommended to drain and flush pump if pump has been operating in freezing weather.

Service

Turn off and lock out power before servicing pump.

Impeller

For PF2020HCU - Remove hex nuts (8) and lockwashers (7) then remove volute (1) and o-ring (5) from bearing pedestal (13). If impeller (2) needs replacement, unscrew from shaft. The impeller has right hand threads, so to break loose use a block of wood against a vane and strike with hammer.



Impeller - Cont.

Examine u-cup (3), o-ring (5) and replace if required.

To reassemble, handle impeller carefully as not to damage the machined sealing surface of the inlet hub. This surface, if damaged will destroy the u-cup. Be sure spring of shaft seal (9) is in place before reassembling the impeller.

For PF4030HCU - Remove hex nuts (8) and lockwashers (7) and remove volute (1) from seal plate (27). Remove impeller (2) by holding shaft and remove screw (30), washer (29), impeller (2) and wear ring (3). Impeller screw (30) threads are right-hand and to loosen, turn counter-clockwise. Replace impeller, oring or wear ring if required.

Shaft Seal

Remove seal's (9) spring, and rotating member from shaft sleeve (11). If any seal part shows wear or damage replace entire seal assembly.

On PF2020HCU - If stationary member needs replaced, press stationary out of pedestal (13).

On PF4030HCU - If stationary member, remove capscrews (26), lockwashers (25) and pull seal plate (27) from pedestal (13). Press old stationary member from seal plate (27).



Handle all seal parts with care. Do Not damage lapped faces.

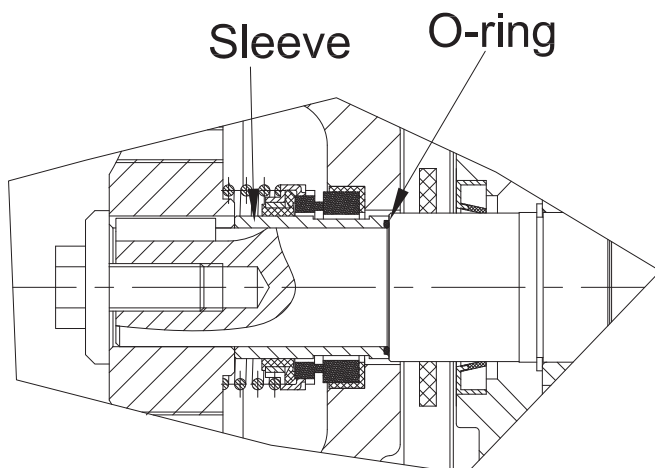
PF2020HCU - To reassemble, lightly oil and replace shaft sleeve (11), o-ring (31) and stationary member of seal (9). Press stationary member over shaft sleeve and into pedestal (13). Lightly oil inner surface of rotating member's bellows and with lapped surface facing pedestal, slide rotating member onto shaft sleeve (11) until lapped faces of stationary and rotating member are together. Make certain driving lugs in retainer are mated in carbon washer. Place spring on shaft sleeve and place on rotating member making sure it is seated on metal retainer and not cocked or resting on bellows tail.

PF4030HCU - Replace seal plate (27) onto pedestal (13). Lightly oil and replace shaft sleeve (11), o-ring (31) and stationary member of seal (9). Press stationary member over shaft sleeve and into seal plate (27). Lightly oil inner surface of rotating member's bellows and with lapped surface facing pedestal, slide rotating member onto shaft sleeve (11) until lapped faces of stationary and rotating member are together. Make certain driving lugs in retainer are mated in carbon washer. Place spring on shaft sleeve and place on rotating member making sure it is seated on metal retainer and not cocked or resting on bellows tail.

Shaft and Bearing

Remove capscrews (16), lockwashers (15) and pull bearing cap (14) from pedestal (13). Tap on drive end of shaft with block of wood and a hammer to drive the shaft and bearings from pedestal. Press bearings (12) and (17) from shaft (19) if they need repacked. If bearings need repacked, use a Lithium grease such as B.P. ENERGERASE LS2 or equal.

Reassemble pump in reverse order.



A design change was made to add the o-ring and revised the shaft sleeve. This affects pumps from May 2006 to August 2013. These new parts will be supplied in future kits.



Repair Parts

For Repair Part Please supply: Model Number and MFG Date as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

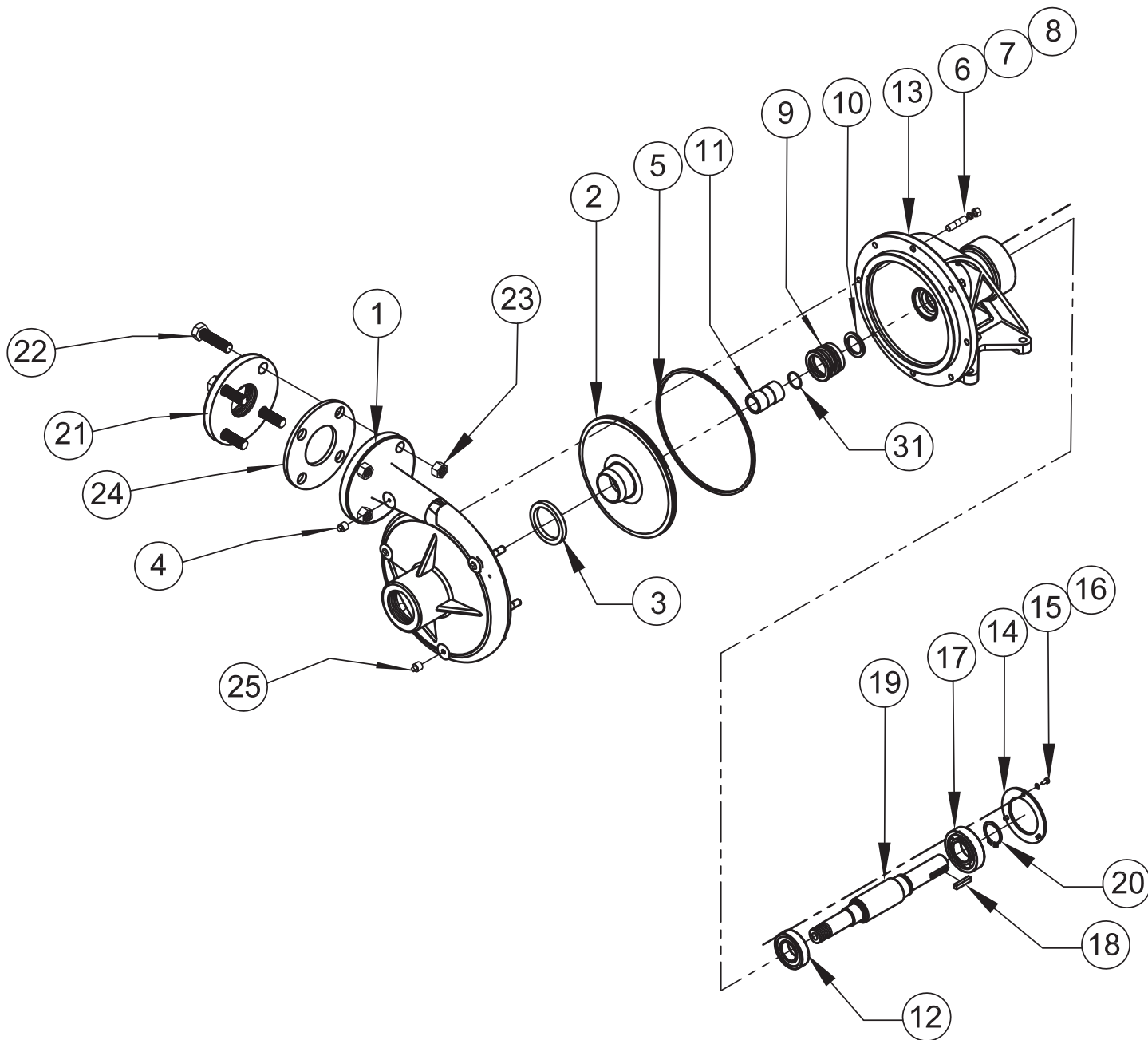


Figure 1



For Repair Part Please supply: Model Number and MFG Date as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

Repair Parts

ITEM		QTY	DESCRIPTION	PART NO
1		1	Volute	PF022026
2	☆	1	Impeller, 8.20" Dia, Bronze	PFBRZ2020HCUIMP
3	◇	1	Wear Ring, Teflon	PF021858
4		2	Pipe plug, .25" NPT	◆
5	◇	1	Square ring, Φ215.2x204.8x4.4, NBR	PF021297
6		8	Stud, 5/16-18 x 1.75" Lg	◆
7		8	Lockwasher, 5/16	◆
8		8	Hex nut, 5/16-18	◆
9	◇	1	Shaft seal, Tungsten/Tungsten-NBR-304	PF019146-T
10	◇	1	Slinger, Φ41.5x30.5x3 mm, NBR	PF005163
11	◇	1	Shaft sleeve (Revised Aug 2013), MCR1.25", Bronze	PF018071-2
12	☆	1	Bearing, inner - 6206ZZ	PF019846
13		1	Pedestal	PF029084
14		1	Bearing cap	PF019845
15		3	Lockwasher, #10	PF002618
16		3	Machine screw, #10-32 x .50" Lg	◆
17	☆	1	Bearing, outer - 6207ZZ	PF019847
18	◇	1	Shaft key, Steel	PF021092
19	☆	1	Shaft	PF021038
20		1	Retaining ring	PF019851
21		1	Suction flange	----
22		4	Stud	◆
23		4	Hex nut	◆
24	◇	1	Gasket, Rubber, Φ152xΦ69x3.5mm	PF2020GSK
25		3	Pipe plug, .375" NPT	◆
31	◇	1	O-ring NBR - (Shaft sleeve) - 25.4mm x 1.8mm	PF018384
Repair Kits				
◇	Gasket & Seal Kit - Includes: 3, 5, 9, 10, 11, 18, 24, 31			PF2020SEAL-KIT

◆ = Acquire standard hardware locally.

◇ = Seal/Gasket Kit

☆ = Supplied as individual items



Repair Parts

For Repair Part Please supply: Model Number and MFG Date as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

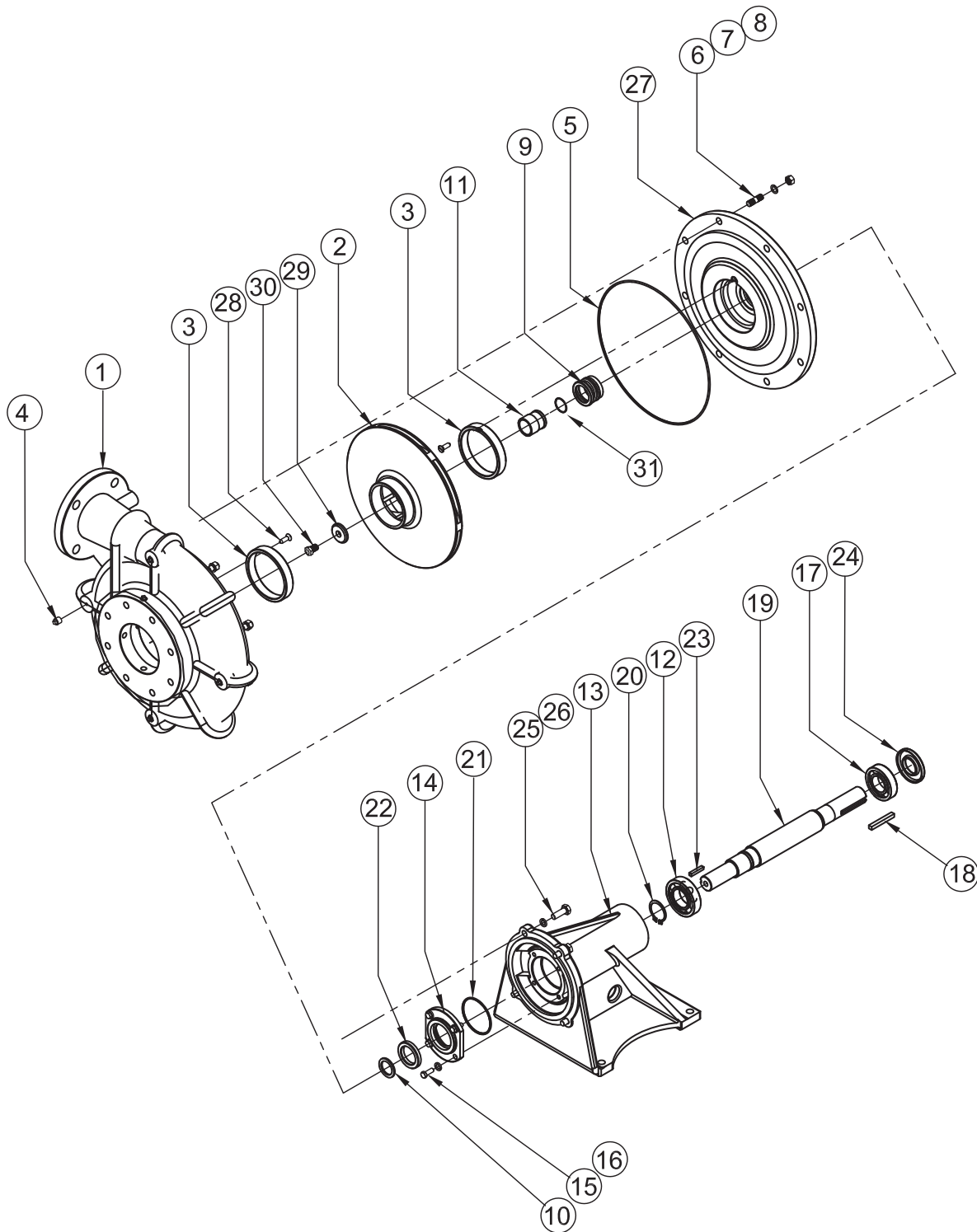


Figure 2



PF4030HCU**Self-Priming Frame Mounted Pumps**

For Repair Part Please supply: Model Number and MFG Date as shown on Name Plate, and Part Description and Part Number as shown on Parts List.

Repair Parts

ITEM		QTY	DESCRIPTION	PART NO
1		1	Volute	PF059452
2	○	1	Impeller, 12.10" Dia, Bronze	PFBRZ4030HCUIMP
3	○	2	Wear ring, Bronze	PF030645-1
4		8	Pipe plug, .25" NPT	◆
5	◇	1	O-ring, NBR, Ø307x5.3mm	PF059321
6		8	Stud, 1/2-13 X 2.00" Lg	◆
7		8	Lockwasher, 1/2	◆
8		8	Hex nut, 1/2-13	◆
9	◇	1	Shaft seal, Tungsten/Tungsted-NBR-304	PF031000
10	◇	1	Slinger, NBR, Ø63.5xØ38.1x4.5mm	PF029915
11	◇	1	Shaft sleeve, Bronze (Revised Aug 2013)	PF030652
12	☆	1	Bearing, Inner, 6207, 72mm	PF052098
13		1	Pedestal	PF052279
14		1	Bearing cap	PF030651
15		4	Lockwasher, 5/16	◆
16		4	Hex hd screw 5/16-18 x .87" Lg	◆
17	☆	1	Bearing, outer, 6208, 80mm	PF028998
18	◇	1	Shaft key, 5/16" sq x 2.50" Lg, Steel	PF052317
19	☆	1	Shaft, 420 Stainless	PF052277
20		1	Retaining ring	PF030650
21	◇	1	O-ring, NBR, Ø80x2.65mm	PF026997
22	◇	1	Oil Lipseal, TC, Ø72xØ35x9.5mm	PF024997
23		1	Key, Steel, 1/4" sq x 1.00" Lg	PF031388
24	◇	1	Oil Lipseal, TC, Ø57.15x38.1x8	PF052097
25		4	Lockwasher, 7/16	◆
26		4	Hex hd screw, 7/16-14 x 1.25" Lg	◆
27		1	Seal plate	PF052094
28	○	2	Hex hd screw, Stainless, 5/16-18 x .50" Lg	◆
29	○	1	Impeller Washer, Stainless	PF030657
30	○	1	Hex hd screw, Stainless, 1/2-13 x 1.25" Lg	◆
31	◇	1	O-ring, NBR - (Shaft Sleeve) - 31.5mm x 1.8mm	PF018385
Repair Kits				
◇	Gasket & Seal Kit - Includes: 5, 9, 10, 11, 18, 21, 22, 24, 31			PF4030SEAL-KIT
○	Impeller & Wear Ring Kit - Includes: 2, 3, 28, 29, 30			PF4030IMP-KIT

◆ = Acquire standard hardware locally.

◇ = Seal/Gasket Kit

○ = Impeller & Wear Ring Kit

☆ = Supplied as individual items

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Notes:

[illegible]

Trouble Shooting Chart



Risk of electric shock. Always disconnect the pump from the power source before handling inspections or repairs.

Symptom	Possible Cause(s)	Corrective Action
Little or no discharge and will not prime	1. Pump body not filled with water 2. Total head too high 3. Suction head higher than pump designed for 4. Impeller partially or completely plugged 5. Leak in suction line 6. Foot-valve too small 7. Impeller damaged 8. Foot-valve or suction line not submerged deep enough in water, pulling air 9. Insufficient inlet pressure or suction head 10. Suction piping too small 11. Body gasket leaking 12. Suction or discharge line valves closed 13. Piping damaged 14. Clogged strainer or foot-valve 15. Incorrect engine speed	1. Fill pump body with water. 2. Shorten suction head 3. Lower suction head, install foot-valve and prime 4. Disassemble pump and clean out impeller 5. Repair or replace suction line 6. Match foot-valve size to piping or install one larger size foot-valve 7. Disassemble pump and replace impeller 8. Submerge lower in water 9. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line partially closed. 10. Increase pipe size to pump inlet size or larger 11. Replace 12. Open 13. Clean or replace 14. Clean or replace 15. Increase speed
Loss of suction after satisfactory operation	1. Air leak in suction line 2. When pump was last turned off, water siphoned out of pump body 3. Suction head higher than pump designed for 4. Insufficient inlet pressure or suction head 5. Clogged foot-valve, strainer or pump 6. Defective wearplate	1. Repaire or replace suction line 2. Refill (reprime) pump body before restarting 3. Lower suction head, install foot-valve and prime 4. Increase inlet pressure by adding more water to tank or increasing back pressure by turning gate valve on discharge line to partially closed. 5. Unclog or replace 6. Replace
Pump overloads driver	1. Total head lower than pump rating, unit delivering too much water 2. Specific gravity and viscosity of liquid being pumped different than the pump rating 3. Speed to high	1. Increase back pressure by turning gate valve on discharge line to partially closed position that will not overload motor. 2. Consult factory 3. Check and correct speed
Pump vibrates and/or makes excessive noise	1. Mounting plate or foundation not rigid enough 2. Foreign material in pump causing unbalance 3. Impeller bent 4. Cavitation present 5. Piping not supported to relieve any strain on pump assembly	1. Reinforce 2. Disassemble pump and remove 3. Replace impeller 4. Check suction line for proper size and check valve in suction line if completely open, remove any sharp bends before pump and shorten suction line 5. Make necessary adjustments
Pump runs but no fluid	1. Air leak in suction piping 2. Pump located too far from fluid source 3. Gate valve closed 4. Clogged strainer 5. Fouled foot-valve 6. Discharge height too great 7. Fouled impeller 8. Faulty mechanical seal	1. Replace 2. Replace 3. Open 4. Clean or Replace 5. Clean or Replace 6. Lower the height 7. Clean or Replace 8. Replace
Pump leaks at shaft	1. Worn mechanical seal 2. Seal not installed properly	1. Replace 2. Follow service instructions for installing seal

NOTE: Power-Flo Pumps & Systems assumes no responsibility for damage or injury due to disassembly in the field. Disassembly of the pumps or supplied accessories other than at Power-Flo Pumps & Systems or its authorized service centers, automatically voids warranty.



LIMITED WARRANTY

Manufacturer warrants, to the immediate purchaser and subsequent initial owner during the warranty period, every new pump to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of eighteen (18) months from date of manufacture or twelve (12) months from date of installation (which ever comes first). Failure due to wear due to excessive abrasives is not covered. The initial owner is the purchaser who first uses the pump after its initial installation, or for non-permanent installation, the first owner who uses the pump. The date of installation shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump. Product will be repaired, replaced or remanufactured at Manufacturer's option. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement. This warranty does not apply to and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all pumping applications. The warranty set out in the paragraph above is in lieu of all other warranties expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products. Contact Manufacturer at: 1-877-24PUMPS or www.powerflopumps.com, Attention: Customer Service Department, to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

MANUFACTURER EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

