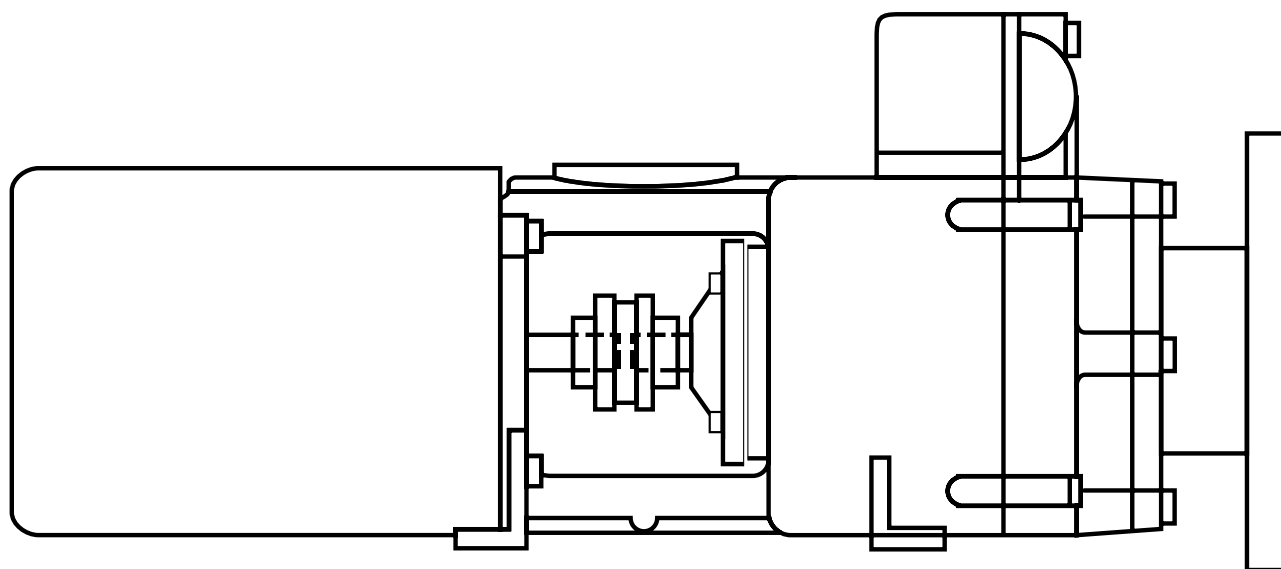




HYDROMATIC®



MODEL NPG/PG 200

NON-SUBMERSIBLE GRINDER PUMP

INSTALLATION AND SERVICE MANUAL

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

General Information

Thank you for purchasing your Hydromatic® pump. To help ensure years of trouble-free operation, please read the following manual carefully.

Before Operation:

Read the following instructions carefully. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often.

Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.

CALIFORNIA PROPOSITION 65 WARNING:

▲WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Pump Information

Pump Description:

The Hydromatic pumps covered by these instructions are non-submersible grinder pumps.

The cutter blades are on the suction side of the centrifugal pump impeller and discharge directly into the inlet of the impeller. The integral stainless steel pump-motor shaft is sealed by two mechanical seals with an oil chamber between the seals to provide lubrication for both seal faces.

A radial sleeve bearing, lubricated by the oil in the seal chamber, is located between the seals and takes the radial load from the pump impeller and cutter blades.

The ball thrust bearing is mounted in a housing sealed and filled with oil to lubricate the bearing. The ball thrust bearing is held in a movable cap so that the axial cutter and cutter ring clearance can be adjusted from the outside without the use of shims.

Application:

These pumps are designed for either home or industrial sewage discharge applications with a pH ranging from 6 to 9, specific gravities from 0.9 to 1.1, viscosities ranging from 28 to 35 S.S.U., and temperatures up to 140°F.

Codes:

All NEC & local wiring codes must be observed. Consult the local inspector before installation to avoid costly delays that can occur due to rejection after job is finished.

Installation Instructions

Location:

If pumps are installed in an existing basin or concrete sump, the piping can either be connected permanently or rails and brackets can be furnished for mounting to walls of basin. In either case, be sure that the Hydromatic check valve is used and that the pumps are not submerged in a horizontal position. The complete factory built packaged system is recommended for the most satisfactory installation and generally for the lowest cost where expensive installation labor is involved.

Electrical Connections:

Make all connections from motor to control panel to comply with local codes.

CAUTION: Be sure ground wire is connected per NEC or local code requirements. This is important for safety.

Pump Operations

Starting the Pump:

To start the pump, perform the following steps in order:

1. If motor is 3 phase, the rotation of the impeller must

first be checked. Lift pump from sump, lay it down, and quickly turn pump on and then off.

The impeller should turn counterclockwise when viewed from the suction. If rotation is wrong, turn off main breaker and interchange any two line leads to motor to correct rotation.

If the pump is piped-in permanently and inlet cannot be observed, rotation will have to be checked by pump operation described later.

If pump is single phase, no rotation check is necessary.

2. Run water into sump until pump can be tested without dry running.
 3. Open gate valve in the discharge line.
 4. Turn pump on. If pump runs and sump liquid does not pump down, stop pump and close discharge gate valve. Then vent off trapped air to discharge line, open discharge valve, and start the pump again.
- If the pump is piped in permanently, it may be necessary to break the union at pump discharge to clear air.
5. If motor is 3 phase, piped-in permanently, and still does not operate properly after venting, rotation is wrong and can be reversed by interchanging any two line leads.

CAUTION: Be sure ground wire is connected per NEC or local code requirements. This is important for safety.

Pump Maintenance

Axial Cutter Adjustment:

To maintain the proper face clearance between the axial cutter and the cutter ring, follow this procedure:

1. Close the gate valve at pump discharge.
2. Turn off circuit breaker.

CAUTION: Never work on pump unless power has been turned off and pump disconnected.

3. Remove pump from sump.
4. Referring to Figure 1, loosen jam nuts on set screws located on top of bearing housing.
5. Loosen set screws.
6. Tighten hex head capscrews until axial cutter just drags on cutter ring when radial cutter is turned by hand.
7. Back off on hex screws 1/8 turn.
8. Tighten setscrews to lift axial cutter for proper face clearance.
9. Tighten jam nuts on setscrews.
10. Again turn radial cutter by hand to determine if shaft has any drag.
11. If there is still some drag, repeat above steps and back off hex screws further.

IMPORTANT: Be sure that both hex screws are tightened or loosened the same amount and that the setscrews are tight against the motor housing. Also, remember that the

setscrews increase the clearance while the hex screws decrease the clearance.

Replacing Grinder Parts:

If necessary to replace grinder parts because of wear or to inspect for clogging, refer to Page 5.

1. Close the gate valve at pump discharge.
2. Turn off circuit breaker.

CAUTION: Never work on pump with power on or without disconnecting power cable to motor.

3. Remove pump from sump.
4. Unscrew capscrews and remove cutter ring retainer.
5. Unscrew hex head capscrews and remove volute case. Cutter ring can now be removed from volute. Keep both shims for reassembly as necessary.
6. Radial cutter and axial cutter are now exposed. If checking for clogging, these parts can now be cleaned without removing them from the shaft.

7. If necessary to replace cutters, remove capscrew, washer, and radial cutter from shaft.

Radial cutter and impeller are screwed onto shaft. The thread is right hand. Tap radial cutter with plastic hammer if necessary to loosen. Axial cutter lifts off impeller and is held from rotating by pin. Unscrew impeller from shaft in same manner as radial cutter, and remove washer.

8. Clean all parts thoroughly before proceeding with assembly. Make sure spring pin is inserted into impeller. Replace case but

do not replace grinder ring at this point.

9. Loosen hex head capscrews 1/2 turn. Replace shims and cutter ring and cutter retainer ring. Now repeat steps 4 thru 11 under Axial Cutter Adjustment. It may be necessary to loosen hex head capscrews in pump case and tap with a hammer to get proper clearance on O.D. of radial cutter.
10. Plug motor into power and operate for a few seconds only to be sure parts are not rubbing.

Replacing Seals:

1. The pipe plug drains the seal chamber. Check for water in the oil drained from seal chamber. If there is some water in this oil, the chamber must be completely drained and refilled.
2. Remove cutters, impeller and pump parts as described earlier under "Replacing Grinder Parts."
3. Remove socket head capscrew in seal plate and screw two of the screws into the tapped back-off holes to force seal plate from seal housing. Pulling this plate off will also force lower seal from shaft. Remove lower seal from seal plate.
4. Remove snap ring and pull upper seal from shaft. It may be necessary to use packing hooks to remove seal. Use a screwdriver to break the upper stationary ceramic seal ring so that it can be removed easily.

CAUTION: Do not use any old seal parts. Replace all parts with new pieces. Mixing old

parts with new parts will cause immediate seal failure.

5. When cleaning all parts before replacement, check to be sure sleeve bearing or shaft is not worn. Be sure all O-rings are in excellent condition without cuts or nicks, and replace them if not in excellent condition. Use O-ring lube to prevent cutting at assembly.
6. After all parts are replaced and before final assembly of impeller and cutters (step 8 of "Replacing Grinder Parts") refill seal chamber with oil. Do not fill completely; allow about 1/2 inch below fill plug so that there will be an air space for expansion.
7. Use only Hydromatic non-submersible oil in seal chamber. In an emergency, a high grade transformer oil can be used.

NOTE: When applying power, be sure the pump is restrained from turning by holding the pump at the motor housing, or by clamping it in a holding fixture.

CAUTION: Always keep hands away from the pump cutter area after the circuit breaker is reconnected.

Pump Troubleshooting

Below is a list of troubles and their probable causes.

No liquid delivered

1. Pump air bound
2. Discharge head too high

3. Pump or piping plugged
4. Wrong rotation
5. Speed too low

Insufficient liquid delivered

1. Discharge head too high
2. Impeller or cutters partially plugged or damaged
3. Wrong rotation
4. Incorrect diameter impeller
5. Speed too low

Insufficient discharge pressure

1. Wrong rotation
2. Air or gases in liquid
3. Impeller damages
4. Incorrect impeller diameter
5. Speed too low

Pump overloads motor

1. Wrong rotation
2. Specific gravity or viscosity of liquid too high
3. Speed too high
4. Head lower than rating, pumping too much liquid
5. Pump clogged
6. Defective bearings
7. Defective impeller

Pump is noisy

1. Defective bearings
2. No axial clearance between impeller and volute
3. No axial clearance between cutter ring and axial cutter
4. No diametral clearance between radial cutter and cutter ring

If the cause of the trouble cannot be determined and corrected as outlined above, contact your nearest factory representative.

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Parts List

ORDERING REPLACEMENT PARTS: Product improvements are made from time to time. The latest part design will be furnished as long as it is interchangeable with the old part. When ordering replacement parts, always furnish the following information: (1) pump serial number, (2) pump model and size, (3) part description, (4) part number, (5) impeller diameter (if ordering impeller), (6) quantity required, and (7) shipping instructions.

Ref. No.	Part No.	Part Description	Qty.
1	10102-003-1	Key	R 2
2	08349-025-1	Coupling Flange	R 2
3	08348-007-1	Coupling Sleeve	R 1
4	04580-001-1	Drivescrew	2
5	13425-025-1	Nameplate	1
6	00013-005-1	Socket Head Screw	2
7	00114-001-1	Hex Nut (PG)	2
	19109A013	Hex Nut (PGL)	2
	00114-006-1	Hex Nut (NPG)	2
8	09801-000-2	Bearing Cap (PG/PGL)	1
	09801-010-2	Bearing Cap (NPG)	1
9	00974-008-1	Retaining Ring	R 1
10	09802-000-1	Shaft (PG/PGL)	1
	09802-001-1	Shaft (NPG)	1
11	05404-003-5	Seal Plate Ass'y (PG/PGL)	R 1
	05404-010-5	Seal Plate Ass'y (NPG)	R 1
12	09803-010-2	Bearing Frame	1
13	05413-001-1	Gasket	S 1
14	00101-010-1	Capscrew (PG)	5
	00130051	Capscrew (PGL)	5
	00101-019-1	Capscrew (NPG)	5
15	105-014034-263	Capscrew (PG)	3
	105-014034-26	Capscrew (PGL)	3
	00517-009-1	Capscrew (NPG)	3
16	00156-025-1	Flat Washer (PG)	R S 1

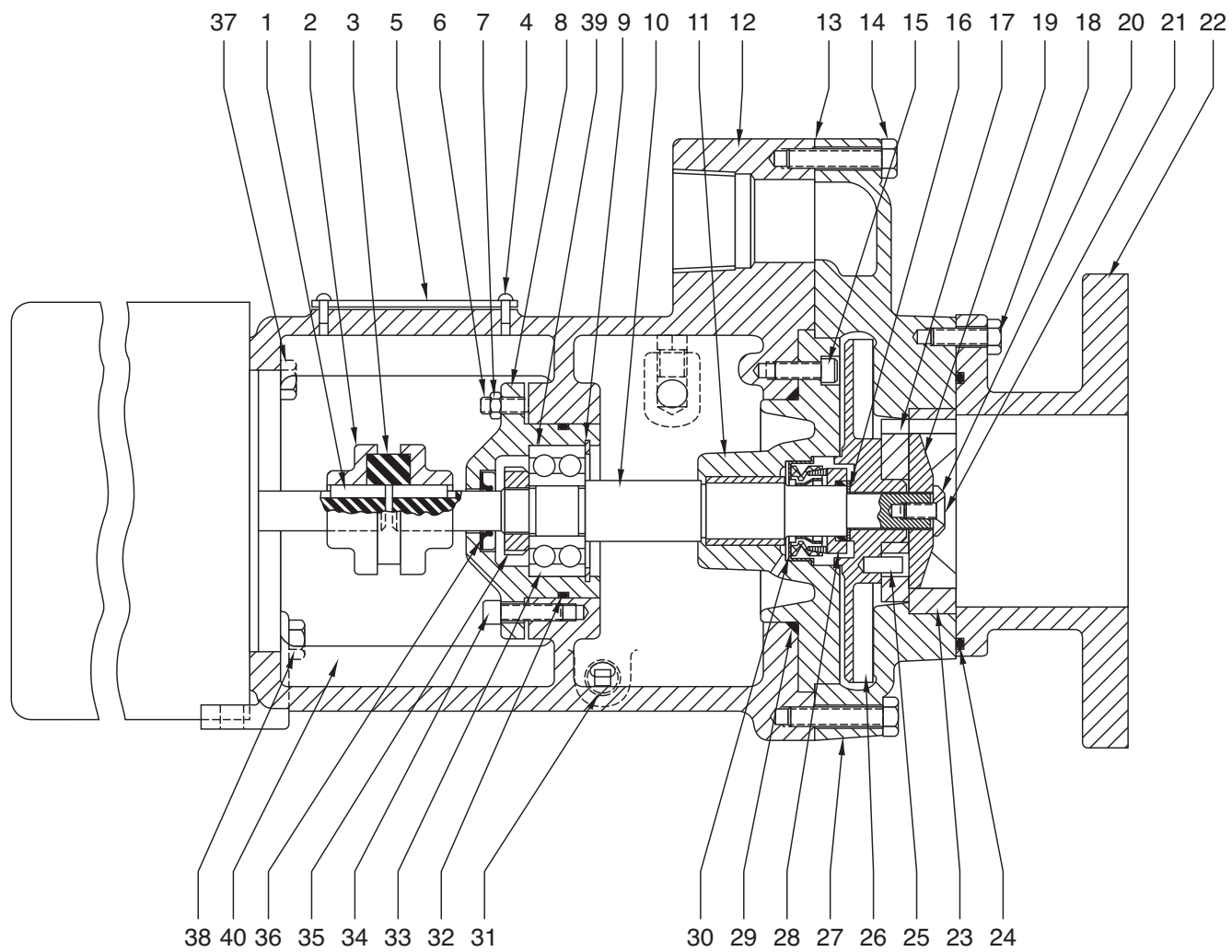
Ref. No.	Part No.	Part Description	Qty.
	1560251	Flat Washer (PGL)	R S 1
	00156-029-1	Flat Washer (NPG)	R S 1
17	05506-002-2	Axial Cutter (PG/PGL)	R 1
	05506-001-2	Axial Cutter (NPG)	R 1
18	19100A029	Hex Head Capscrew (PG/PGL)	4
	00101-023-1	Hex Head Capscrew (NPG)	4
19	05405-001-2	Radial Cutter (PG)	R 1
	05506-002-2	Radial Cutter (PGL)	R 1
	05405-002-5	Radial Cutter Ass'y (NPG)	R 1
20	05570-001-5	Washer (PG)	1
	05570-005-1	Washer (PGL)	1
	05570-003-1	Washer (NPG)	1
21	14885-000-1	Screw (PG/PGL)	1
	01130-008-1	Flat Head Screw (NPG)	1
22	10152-000-2	Suction Head (PG/PGL)	1
	10152-010-2	Suction Head (NPG)	1
23	05505-000-2	Cutter Ring (PG/PGL)	R 1
	05407-001-2	Cutter Ring (NPG)	R 1
24	00150-013-1	O-Ring	S 1
25	05419-001-1	Dowel Pin (PG/PGL)	R 1
	06420-000-1	Dowel Pin (NPG)	R 1
26	07033-002-2	Impeller (PG)	1
	06463-005-2	Impeller (PGL)	1
	07033-012-2	Impeller (NPG)	1
27	05402-002-2	Volute (PG)	1

Ref. No.	Part No.	Part Description	Qty.
	06464-000-2	Volute (PGL)	1
	05402-011-2	Volute (NPG)	1
28	04918-000-1	Seal (PG/PGL)	S 1
	04918-001-1	Seal (NPG)	S 1
29	00150-029-1	O-Ring	S 1
30	04917-000-1	Seal Head (PG/PGL)	S 1
	04917-001-1	Seal Head (NPG)	S 1
31	14981-001-1	Pipe Plug (PG/PGL)	2
	00119-008-1	Pipe Plug (NPG)	2
32	00834-018-1	O-Ring	S 1
33	07167-007-1	Ball Bearing	R 1
34	00517-007-1	Socket Head Capscrew (PG/PGL)	2
	00517-011-1	Socket Head Capscrew (NPG)	2
35	09855-001-1	Bearing Locknut	R 1
36	01090-007-1	Oil Seal	S 1
37	19101A010	Hex Head Capscrew (PG/PGL)	2
	00238-025-1	Hex Head Capscrew (NPG)	2
38	19101A017	Hex Head Capscrew (PG/PGL)	2
	00238-028-1	Hex Head Capscrew (NPG)	2
39	00628-032-1	Shim	AR
	51700-116-7	Rebuild Kit (NPG)	1
	51700-117-7	Rebuild Kit (PG/PGL)	1
	51700-063-7	Seal Kit (NPG)	1
	51700-064-7	Seal Kit (PG/PGL)	1
40	24709110000	Paraffinic Oil	0

Notes: S — Parts in Seal Kit I — Parts in Impeller Kit R — Parts in Rebuild Kit *Consult Factory

O — Amount of oil required will vary between 54 and 60 oz. depending on stator size. Fill to above motor windings.

NPG/PG 200



STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

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