

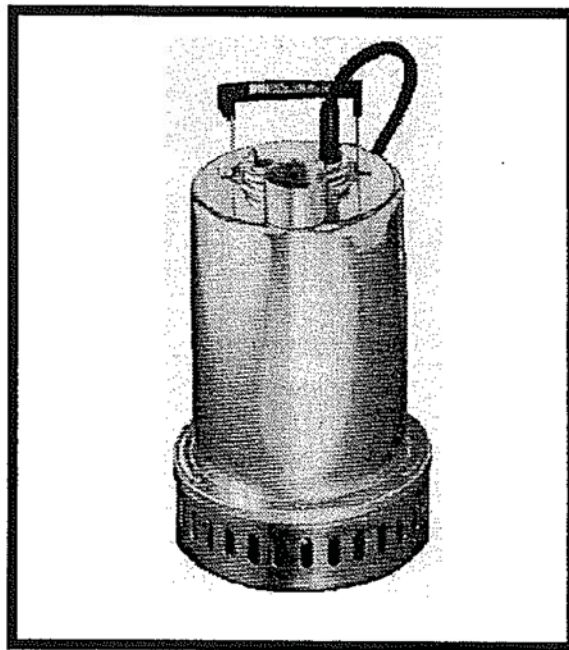


INSTALLATION AND OPERATION MANUAL

SUBMERSIBLE STAINLESS STEEL PUMPS

FLO-DRAINER

TYPE: PD & PDZ



** PAS ENCORE DISPONIBLE EN FRANÇAIS **

IMPORTANT: *Read all instruction in this manual before operating pump.
FLO FAB reserves the right to change this product without prior written notice.
FLO FAB is not responsible for losses, injury, or death resulting from a failure to observe
these safety precautions, misuse or abuse of pumps or equipment.*



SUBMERSIBLE STAINLESS STEEL PUMPS FLO-DRAINER, TYPE PD & PDZ

Specifications:

	<i>Standard</i>	<i>Optional</i>
Discharge Size	1/3 HP - 1-1/4" 1/2 HP thru 1-1/2 HP - 1-1/2"	
HP Range	1/3, 1/2, 3/4, 1 & 1-1/2HP	
Performance Range		
Capacity	2.7 to 88 GPM	
Head	9.3 to 62 feet	
Maximum Temperature	122 Deg F / 50 Deg C	
Solids	3/8" spherical	
Speed	3600 RPM	
Materials		
Casing	304 Stainless Steel	
Impeller	304 Stainless Steel *	
Shaft	303 Stainless Steel	
Motor Frame	304 Stainless Steel	
Fasteners	304 Stainless Steel	
Shaft Seal (Double) **		
Material - Upper Side	NBR Fitted Carbon / Ceramic	
Lower Side	Viton Fitted Silicon Carbide / Silicon Carbide 1/2, 3/4, 1 & 1-1/2 HP	
Impeller Type	Semi-Open	
Bearing	Sealed Ball Bearing	
Motor	Air Filled insulation Class F, 2 Pole, Rated Continuous Duty, Permanent Split Capacitor	575V available on request
Single Phase	115 V Single Phase	
Three Phase	208/230V, 460V Three Phase	
Motor Protection ***	Built in Motor Protection w/Auto Reset - Single Phase	
Power Cord - 1/3, 1/2, 3/4 HP Single Phase	UL/CSA SJTOW-A with ECS No. 250 cap plug with grounding pin. 10 ft. length - rated 15 Amp 125 V - NEMA-5-15P	
- 1, 1-1/2 HP Three Phase	UL/CSA STOW-A Water Resistant, stripped-end jacket removed 2" & conductor stripped 5/8" - 20 ft. length	

* Except model PDZ3 - Impeller/Diffuser material is Thermo Plastic-Noryl GFN3.

** PDZ3 and PD3 1/3 HP Shaft Seal is non-mechanical double oil seal (rubber).

*** Three phase models require user to provide motor protection.

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Motor Specification:

Output (HP)	Phase	Rating			Locked Rotor Current A	Insulation Class	Overload Protection	Cable				Performance Data at Rating Point		Resistance @ 20 DegC OHMS	Symbols Auto / Manual	
		Voltage V	Current A	Speed RPM				Type	No. of Cond.	Gauge		Length Ft.	EFF %			Power Factor %
										2 mm	AWG (Approx)					
1/3	Single	115	4	3340	10	F	Built-in Auto Reset	SJTOW -A	3	1.25	#16	10	67	96	4/10.6	SA/SM
	Single	115	9	3430	36		---	STOW -A	3	1.25	#16	10	66.5	93	.98/2.6	SA/SM
1/2	Three	208/230	3/3.1	3420/3450	17/19		---	---	4	1.25	#16	20	72.5/72.5	80/74	5/5	SM
		460	1.55	3440	9.5		---	---	4	1.25	#16	20	72.5	70	21.5	SM
3/4	Single	115	12.2	3440	48		Built-in Auto Reset	SJTOW -A	3	1.25	#16	10	66.5	96	0.75/2.3	SA/SM
	Three	208/230	3.9/3.8	3360/3420	22/24		---	---	4	1.25	#16	20	72/73	85/79	4.1/4.1	SM
---		460	2	3440	12		---	---	4	1.25	#16	20	75.5	75	16	SM
1	three	208/230	4.8/4.8	3320/3450	28/31		---	---	4	1.25	#16	20	75/76	80/75	3.2/3.2	SM
		460	2.5	3460	17		---	---	4	1.25	#16	20	75.5	75	11	SM
1-1/2	three	208/230	5.4/5.3	3380/3420	28/31		---	---	4	1.25	#16	20	74.5/76	85/80	3.2/3.2	SM
		460	2.7	3430	17		---	---	4	1.25	#16	20	76	80	11	SM

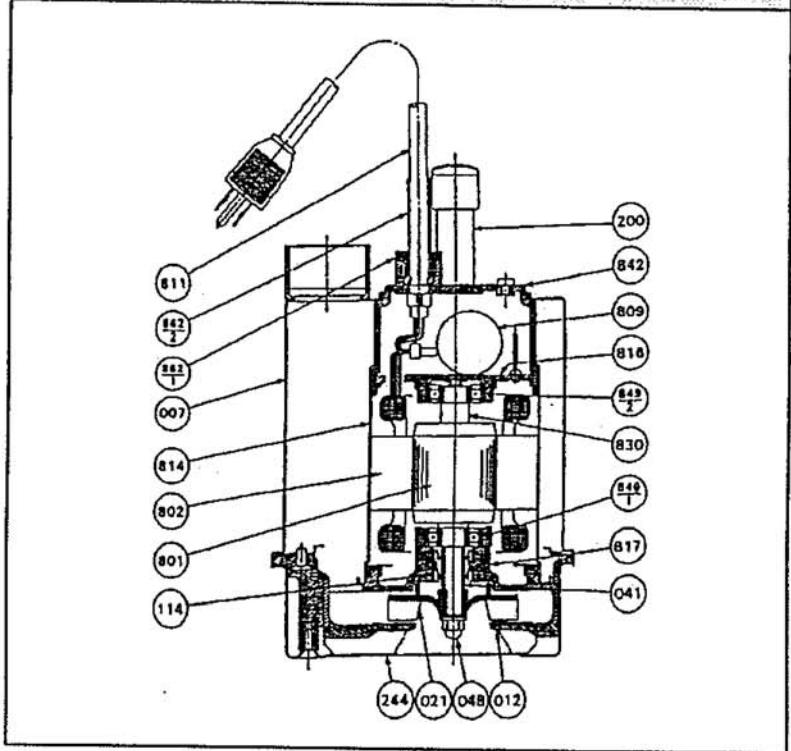
575 Volts available on request



MARCH 3 1997
5-X-045-E5

SUBMERSIBLE STAINLESS STEEL PUMPS FLO-DRAINER, TYPE PD & PDZ

Sectional View, PDZ, 1/3 HP, Single Phase



Part No.	Part Name	Material	ASTM, AISI Code	Qty.
007	Outer Casing	304 Stainless	AISI 304	1
012	Suction Cover	Noryl G.F.3		1
021	Impeller	Noryl G.F.2		1
041	Sleeve	304 Stainless / Ceramic		1
048	Impeller Nut	304 Stainless	AISI 304	1
*114	Oil Seal	NBR		2
200	Lifting Hanger	304 Stainless	AISI 304	1
244	Strainer	304 Stainless	AISI 304	1
801	Rotor			1
802	Stator			1
809	Capacitor			1
811	Submersible Cable			1
814	Motor Frame	304 Stainless	AISI 304	1
816	Bracket	Aluminium		1
817	Bracket	Noryl G.F.3		1
830	Shaft	303 Stainless	AISI 303	1
842	Motor Cover	Moplen		1
*849-1	Ball Bearing			1
*849-2	Ball Bearing			1
862 -1	Cable Connector	Nylon 66 G.F.3.		1
862 -2	Cable Boot	NBR		1

• Recommended spare parts

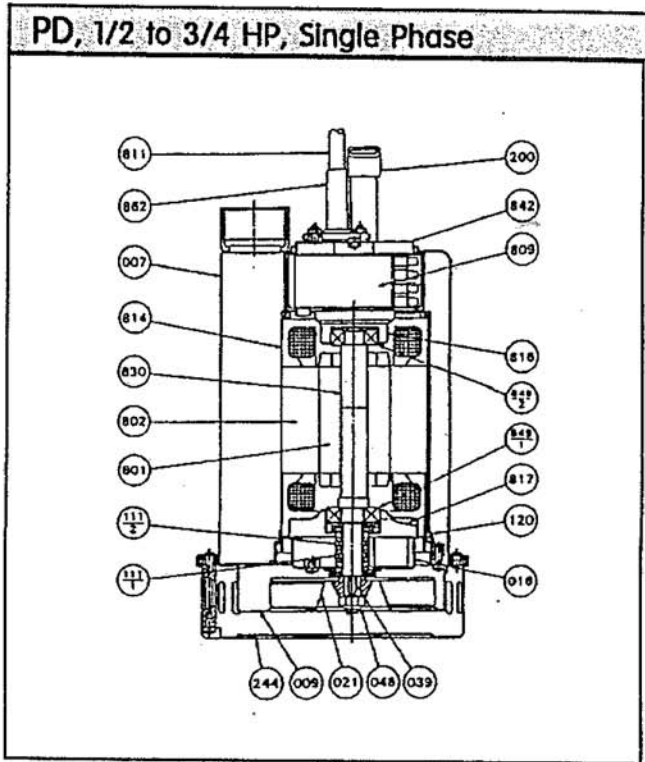
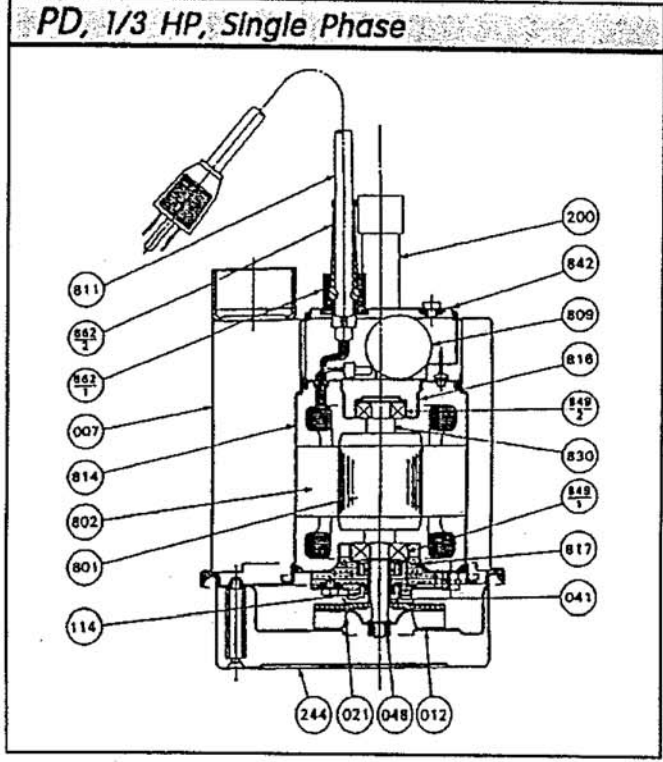
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MARCH 3 1997
5-X-045-E6

SUBMERSIBLE STAINLESS STEEL PUMPS FLO-DRAINER, TYPE PD & PDZ

Sectional View



Part No.	Part Name	Material	ASTM, AISI Code	Qty.
007	Outer Casing	304 Stainless	AISI 304	1
012	Suction Cover	304 Stainless	AISI 304	1
021	Impeller	304 Stainless	AISI 304	1
041	Sleeve	304 Stainless / Ceramic		1
048	Impeller Nut	304 Stainless	AISI 304	1
*114	Oil Seal	NBR		2
200	Lifting Hanger	304 Stainless	AISI 304	1
244	Strainer	304 Stainless	AISI 304	1
801	Rotor			1
802	Stator			1
809	Capacitor			1
811	Submersible Cable			1
814	Motor Frame	304 Stainless	AISI 304	1
816	Bracket	304 Stainless	AISI 304	1
817	Bracket	304 Stainless	AISI 304	1
830	Shaft	303 Stainless	AISI 303	1
842	Motor Cover	304 Stainless	AISI 304	1
*849-1	Ball Bearing			1
*849-2	Ball Bearing			1
862 -1	Cable Connector	Plated Brass		1
862 -2	Cable Boot	NBR		1

Part No.	Part Name	Material	ASTM, AISI Code	Qty.
007	Outer Casing	304 Stainless	AISI 304	1
009	Inner Casing	304 Stainless	AISI 304	1
016	Seal Cover	304 Stainless	AISI 304	1
021	Impeller	304 Stainless	AISI 304	1
039	Key	304 Stainless	AISI 304	1
048	Impeller Nut	304 Stainless	AISI 304	1
*111-1	Mechanical Seal			1
*111-2	Mechanical Seal			1
120	Connection Band	304 Stainless	AISI 304	1
200	Lifting Hanger	304 Stainless	AISI 304	1
244	Strainer	304 Stainless	AISI 304	1
801	Rotor			1
802	Stator			1
809	Capacitor			1
811	Submersible Cable			1
814	Motor Frame	304 Stainless	AISI 304	1
816	Bracket	304 Stainless	AISI 304	1
817	Bracket	304 Stainless	AISI 304	1
830	Shaft	303 Stainless	AISI 303	1
842	Motor Cover	304 Stainless	AISI 304	1
*849-1	Ball Bearing			1
*849-2	Ball Bearing			1
862	Cable Boot	NBR		1

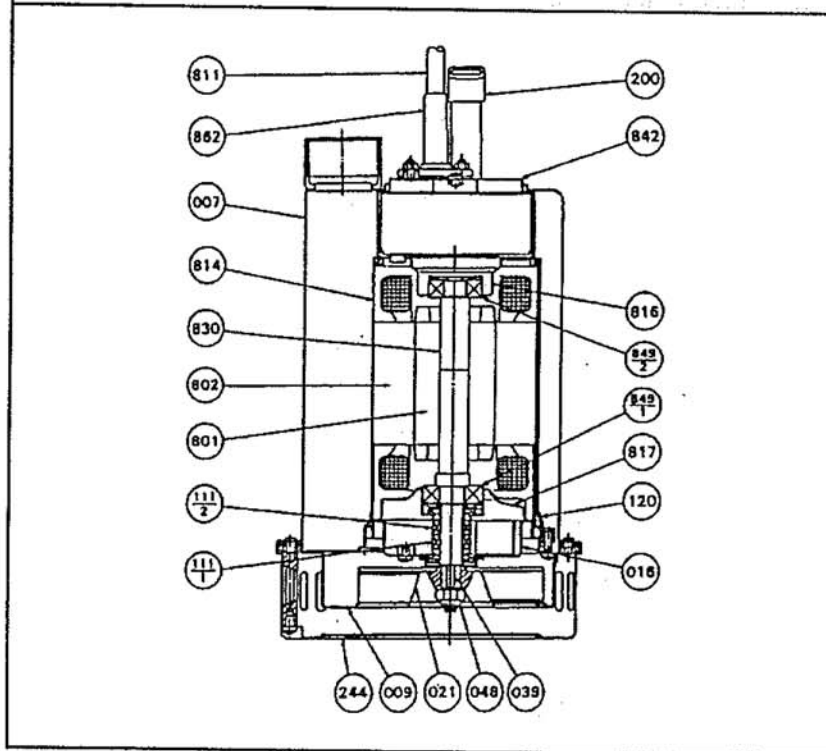
* Recommended spare parts



MARCH 3 1997
5-X-045-E7

SUBMERSIBLE STAINLESS STEEL PUMPS FLO-DRAINER, TYPE PD & PDZ

Sectional View, PD, 1 to 1-1/2 HP, Three Phase



Part No.	Part Name	Material	ASTM, AISI Code	Qty.
007	Outer Casing	304 Stainless	AISI 304	1
009	Inner Casing	304 Stainless	AISI 304	1
016	Seal Cover	304 Stainless	AISI 304	1
021	Impeller	304 Stainless	AISI 304	1
039	Key	304 Stainless	AISI 304	1
048	Impeller Nut	304 Stainless	AISI 304	1
*111-1	Mechanical Seal			1
*111-2	Mechanical Seal			1
120	Connection Band	304 Stainless	AISI 304	1
200	Lifting Hanger	304 Stainless	AISI 304	1
244	Strainer	304 Stainless	AISI 304	1
801	Rotor			1
802	Stator			1
811	Submersible Cable			1
814	Motor Frame	304 Stainless	AISI 304	1
816	Bracket	304 Stainless	AISI 304	1
817	Bracket	304 Stainless	AISI 304	1
830	Shaft	303 Stainless	AISI 303	1
842	Motor Cover	304 Stainless	AISI 304	1
*849-1	Ball Bearing			1
*849-2	Ball Bearing			1
862	Cable Boot	NBR		1

* Recommended spare parts

FLO-STEEL / FLO-DRAINER WARRANTY

Flo Fab warrants its Flo-Steel and Flo-Drainer products to be free of defective material and workmanship under normal use and service for a period of 12 months from date of sale to the end-user or 18 months from the original date of shipment from Flo Fab, whichever comes first. This warranty applies only to products which are used in accordance with all instructions as to installation, maintenance and operation as outlined in the documentation provided by Flo Fab.

Before returning any product or part for warranty consideration, the claimant must first contact the Flo Fab distributor that furnished the product, describe the claim, provide product identification numbers and proof of purchase. Upon receipt of all necessary information, the distributor shall submit the claim to Flo Fab for consideration and subsequent instructions.

Flo Fab liability for any damage or loss caused by a product which fails due to defective materials or workmanship, at any time, shall be limited (at Flo Fab option) to the replacement or repair of the defective product, as originally furnished by Flo Fab. Flo Fab shall not be liable for any loss, damage or expenses directly or indirectly related to the use of its products or from any other cause or for consequential damages (including, without limitation, loss of time, inconvenience, loss of product and loss of production). It is expressly understood that Flo

Fab is not responsible for damage or injury caused to other products, machinery, buildings, property or persons by reason of the installation and/or use of its products. This warranty does not obligate Flo Fab to bear any costs associated with inspection, removal, installation, transportation or any other expenses related to a warranty claim without written authorization by Flo Fab.

This warranty will be void if, in the judgment of Flo Fab, any product or component has been (a) tampered with, disassembled, repaired or altered by any party other than a Flo Fab authorized service depot; and/or (b) subjected to misapplication, misuse, neglect, abuse or accident; and/or (c) used to pump materials for which it was not designed to handle, which may attack or harm the materials used in construction of the product or which may otherwise harm or impair the proper operation of the product.

THIS IS A FLO FAB SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. No distributor or any other party are authorized to assume any liability or obligation on behalf of Flo Fab beyond that which is specified herein.



GENERAL APPLICATION INFORMATION

Basin Sump and Installation

If your basement does not currently have a sump installed, it would be necessary to check local plumbing codes as to the acceptable type of sump that may be used. Materials commonly specified are: clay tile, fiberglass, steel, concrete and polyethylene. It may be necessary to cut a hole in the basement floor and excavate for the sump. Plumbing and electrical contractors could advise you on proper installations of drain tiles, sump, pump and electrical service. FLO FAB recommends that a solid sump base be provided. The sump is fed by drain tile placed around the outside and/or inside basement walls at the footings. In applications where a gravel base must be used, to relieve hydraulic pressure under the basement floor, be sure to provide a permanent and solid base for the pump (bricks or a steel plate). A sump cover capable of supporting 200 pounds should be employed to contain odors and for obvious safety reasons.

Electrical Installation

Electrical service for any sump pump installation must be grounded and separately fused or breakered directly from the entrance box with a single grounding type receptacle at the pump. The receptacle should not be less than four feet above the basement floor for safety reasons. You should never touch a sump pump or discharge piping while the pump is connected to electrical power and water is present. The pump should be disconnected from the electrical source before handling in all cases.

Discharge Piping Installation

To assure the maximum performance from your sump pump, the discharge pipe size and piping fittings should not be smaller than the discharge port of the pump. Smaller pipe will add to friction losses and reduce the capacity of the pump. Normally accepted materials are galvanized pipe, rigid plastic pipe or acceptable flexible pipe or hose. A piece of flexible hose between the pump discharge and the discharge piping will provide for ease in alignment, reduce vibration and noise, and will act as a union when it is necessary to remove the pump. Where the discharge pipe is long, a check valve is often employed to prevent the water from flowing back into the sump when the pump turns off. If the discharge is directed into a sanitary sewer, a suitable anti-siphon device or a free flow check valve should be inserted in the line to prevent backflow into the pit. Sump pumps are not designed to handle raw sewage. Do not attempt to adapt one for this type of application. A sewage ejector pump especially designed to handle solids must be used.

Pump Installation

When the sump, electrical and discharge plumbing installation is complete and ready for the pump, clean all solid debris from the pit. Complete the plumbing

connection to the pump and then plug the pump into the electrical outlet. A few extra minutes to test the sump pump installation are now in order. Fill the sump with water, note the turn on and turn off level of the pump, and the pumping cycle. This will allow you to calculate the approximate discharge flow of the pump system. If everything is operating properly, install the sump cover.

Pump Selection

The pump should be of sufficient capacity and head to satisfy anticipated use requirements. Capacity is determined by a fixture unit value if effluent is drained to sump basin. Your local Wholesaler can assist you in fixture unit values.

Basement perimeter water intrusion varies by area and region. Typically a 1/3 H.P. OR 1/2 H.P. DRAINAGE PUMP WILL EVACUATE MOST HOME SUMP PITS.

Commercial and industrial drainage applications require that calculations of pumping volume and pumping head be performed to determine the proper size pump is applied.

NOTE: Pumping volume may vary seasonally due to rainfall and area run-off.

Basin and Cover

The basin should not be less than 18 inches in diameter and 24 inches deep.

Larger diameters are advisable in instances of increased pump capacity requirements as shown below:

Required Pump Capacity	Minimum Basin Diameter
up to 35 GPM	18"
over 35 GPM	24"
over 60 GPM	30"
over 100 GPM	36"
over 150 GPM	48"

The basin should be located such that all water flows into the basin due to gravity. Outdoor installations should be at a sufficient depth to ensure protection from freezing.

Maintenance Tips

- **Every three or four months:** 1) Clean the pump screen or inlet opening. If your sump collects the discharge from an automatic washing machine, cleaning will be required more often. (Before removing the pump be sure to disconnect the unit from electrical power; and reconnect after completion of cleaning); 2) Pour enough water into the sump to cycle the pump and assure its proper functioning.
- **Annually:** Remove and clean the pump. Clean the sump pit also.

SAFETY INFORMATION AND INTRODUCTION



⚠ WARNING

**Before handling this pump,
always disconnect the power first.**

This pump should only be serviced by a qualified person or a factory trained person.

⚠ CAUTION

This instruction manual includes necessary items for installation, operation and maintenance. Read this manual carefully to ensure correct installation, operation and maintenance.

Be sure to keep this instruction manual on hand for future reference.

Design of this FLOFAB pump is based on superior engineering and long experience. To prevent trouble and provide satisfactory operation and long life, it is important to understand the FLOFAB pump thoroughly by careful study of this manual. If any questions arise regarding this manual, please direct them to FLOFAB.

SPECIFICATIONS

⚠ CAUTION

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

Check the nameplate for your pump's head (HEAD), discharge volume (CAPACITY), speed (SPEED), motor voltage and current. Other specifications are noted in the chart below.

MANUAL OPERATION

ITEM NO.	MODEL	DISCHARGE DIAMETER INCHES	MOTOR OUTPUT (HP)	MOTOR PHASE	VOLTAGE	WEIGHT LBS.
PDZ3	PDZ3-1151	1-1/4	1/3	1	115	11
PD3	PD3-1151	1-1/4	1/3	1	115	11
PD5	PD5-1151	1-1/2	1/2	1	115	27
PD5*	PD5-2303	1-1/2	1/2	3	230	27
PD5*	PD5-4603	1-1/2	1/2	3	460	27
PD7	PD7-1151	1-1/2	3/4	1	115	28
PD7*	PD7-2303	1-1/2	3/4	3	230	28
PD7*	PD7-4603	1-1/2	3/4	3	460	28
PD10*	PD10-2303	1-1/2	1	3	230	31
PD10*	PD10-4603	1-1/2	1	3	460	31
PD15*	PD15-2303	1-1/2	1-1/2	3	230	31
PD15*	PD15-4603	1-1/2	1-1/2	3	460	31

*20 FT. POWER CORD

MATERIALS NEEDED

- PVC or ABS pipe cement (read manufacturer's instructions carefully)
- PVC or ABS pipe, PVC adaptor;
--1-1/4" for PDZ3 & PD3
--1-1/2" for PD5, PD7, PD10, & PD15
- In line check valve
- Sump basin 18" or larger diameter plastic, fiberglass or concrete.
(See page 2 for minimum diameter basin size by pump capacity.)
- Optional: gate valve
(see installation drawing on page 6)

TOOLS NEEDED

- Screwdriver
- Pipe wrench
- Adjustable wrench (medium-large)
- Hacksaw with 24-tooth blade for cutting plastic pipe
- Knife or round file for smoothing inside of all plastic pipe connections

INSTALLATION INSTRUCTIONS

Step 1—Inspection: Your pump has been carefully packaged to prevent damage during shipping. However, occasional damage does occur due to rough handling. Carefully inspect the pump for damage that could cause it to fail.

Step 2: Attach desired length of PVC or ABS charge pipe to pump outlet, using PVC adapter (1 1/4" pipe and adapter for PDZ3 & PD3, 1-1/2" for PD5, PD7, PD10, PD15).

Step 3: Clear sump basin of any water, debris or sediment.

Step 4: Lower pump into basin.

Step 5: Attach in line check valve to discharge pipe 12" to 18" above pump discharge with arrow pointing away from the pump (with the flow). Connect other end of check valve securely to drain pipe and tighten clamps.

Note: Do not put check valve directly into pump discharge opening.

Step 6: Drill a 1/8" relief hole in the discharge pipe 5" above pipe connection to pump.

Step 7: Plug in pump and fill sump basin with water to test unit. Pump should turn on at 13" to 14" water level. Allow pump to go through several ON-OFF cycles to assure satisfactory operation.

Note: If pump does not operate properly, see the troubleshooting checklist on page 11 .

Septic Tank Installation

The *FLO-DRAINER* pumps can be used to pump septic tank effluent, but must be installed as follows:

- Install pump in separate compartment at the discharge side of the septic tank. **Never install pump in main tank where sludge collects.**
- Use with a junction box.

WARNING: Sump basin must be vented in accordance with local plumbing codes. These pumps are not designed for and **CAN NOT** be installed in locations classified as hazardous in accordance with local codes.

ELECTRICAL INFORMATION

- Pumps are 115 V, 60 Hz and are grounded to prevent electrical shock.

WARNING: Risk of electric shock—this pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

- Use a separate 15 amp circuit breaker or 15 amp fuse block with the pump.
- **Do not** use an extension cord with the pump.
- **Do not** cut off the ground pin or use an adapter fitting.
- **Do not** work on the pump or switch until any or all power cords are unplugged.

IMPORTANT INSTRUCTIONS BEFORE INSTALLATION

Failure to follow these instructions may cause serious bodily injury and/or property damage.

1. Before installing or servicing your pump, BE CERTAIN pump power source is disconnected.
2. Installation and electrical wiring must adhere to Prov. and local codes and must be complete before priming pump. Check appropriate community agencies, or contact local electrical and pump professionals.
3. **CALL AN ELECTRICIAN WHEN IN DOUBT.** Pump should be connected to a separate 15 amp circuit breaker or 15 amp fuse block. Plugging into existing outlets may cause low voltage at motor, causing blown fuses, tripping of motor overload, or burned out motor.
4. Do not connect pump to a power supply until permanently grounded. For maximum safety, ground pump to a circuit equipped with a fault interrupter device.
5. Voltage of power supply must match the voltage of the pump.
6. Before installing pump, clear sump basin of any water, debris, or sediment. **WARNING: Sump basin must be vented in accordance with local plumbing codes. FLO FAB FLO-DRAINER are not designed for and CANNOT be installed in locations classified as hazardous in the National Electric Code, ANSI/NFPA 70.**
7. The sump basin should be between 18" and 24" in diameter and made of plastic, fiberglass, or concrete.
8. The following may cause severe damage to pump and will void warranty:
 - Using an extension cord.
 - Cutting off the ground pin or using an adapted fitting.
 - Working on pump or switch while plugged in.
 - Removing motor housing, unscrewing impeller, or otherwise removing impeller seal.

PIPING

Plastic PVC pipe is shown in the illustrations, but galvanized steel or copper pipe may be used if desired. All piping must be clean and free of all foreign matter to prevent clogging. Use thread compound on all threaded joints unless specified otherwise.

SUBMERSIBLE SUMP PUMP INSTALLATION

Refer to the installation illustration on the following page for the following instructions. Be certain sump basin is clean and all power to pump is shut off. If pump fails to operate properly after installation, refer to the troubleshooting checklist on page 11 or contact FLO FAB .

General Materials Needed

- One can PVC cement (read instructions carefully)
- One can thread compound (read instructions carefully)
- One male PVC adapter: 1/4" for 1/3 HP; 1/2" for 1/2, 3/4, 1 & 1 1/2 horsepower models.
- Enough rigid PVC pipe and couplings to reach from bottom of sump basin to discharge: 1/4" for 1/3 HP; 1/2" for 1/2, 3/4, 1 & 1 1/2 horsepower models.
- One Check Valve.

Tools Needed for all pump installations

Pipe wrench, slot screwdriver, 24-tooth hacksaw, knife or round file.

- STEP 1** Thread male PVC adaptor into pump discharge opening.
- STEP 2** Cement a 15" piece of PVC pipe to adaptor. Use appropriate diameter piping. Drill a 1/8" relief hole in the pipe 5" above pump connection. This hole prevents pump from air-locking.
- STEP 3** Clamp Check Valve to top of 15" PVC pipe with water flow arrow pointing away from pump.
- STEP 4** Lower pump into basin. Clamp needed PVC discharge pipe and fittings to open end of Check Valve.
- STEP 5** Plug in pump and fill sump basin with water. Pump should turn on at 13" to 14" water level. Perform several ON-OFF cycles to assure satisfactory operation.

Flo-DRAINER is a versatile pump and may be used in portable or temporary applications where hose or discharge tubing can be applied.

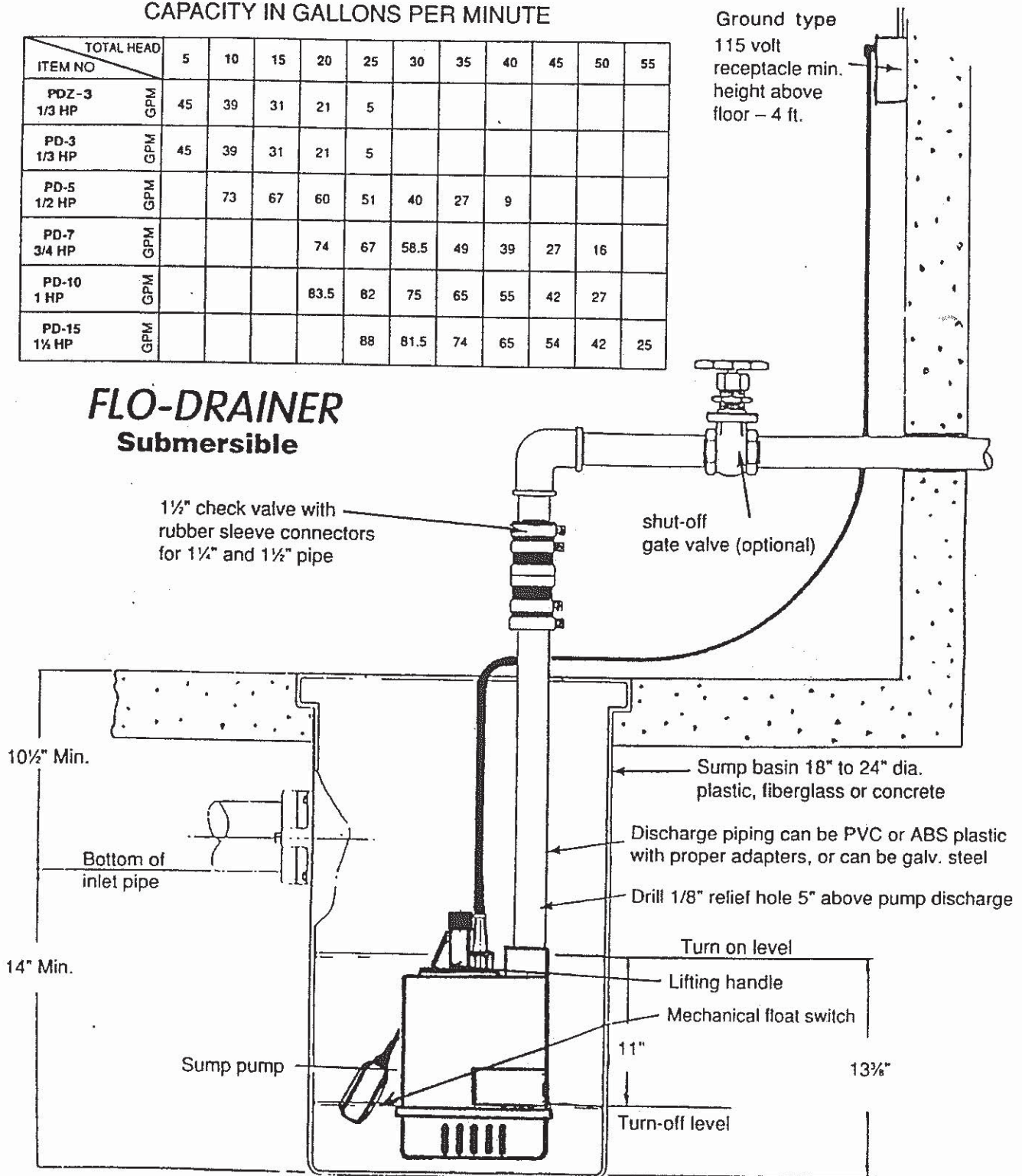
PD FLO-DRAINER

PERFORMANCE TABLE
CAPACITY IN GALLONS PER MINUTE

TOTAL HEAD		5	10	15	20	25	30	35	40	45	50	55
ITEM NO												
PDZ-3	GPM	45	39	31	21	5						
1/3 HP												
PD-3	GPM	45	39	31	21	5						
1/3 HP												
PD-5	GPM		73	67	60	51	40	27	9			
1/2 HP												
PD-7	GPM				74	67	58.5	49	39	27	16	
3/4 HP												
PD-10	GPM				83.5	82	75	65	55	42	27	
1 HP												
PD-15	GPM					88	81.5	74	65	54	42	25
1 1/2 HP												

Ground type
115 volt
receptacle min.
height above
floor - 4 ft.

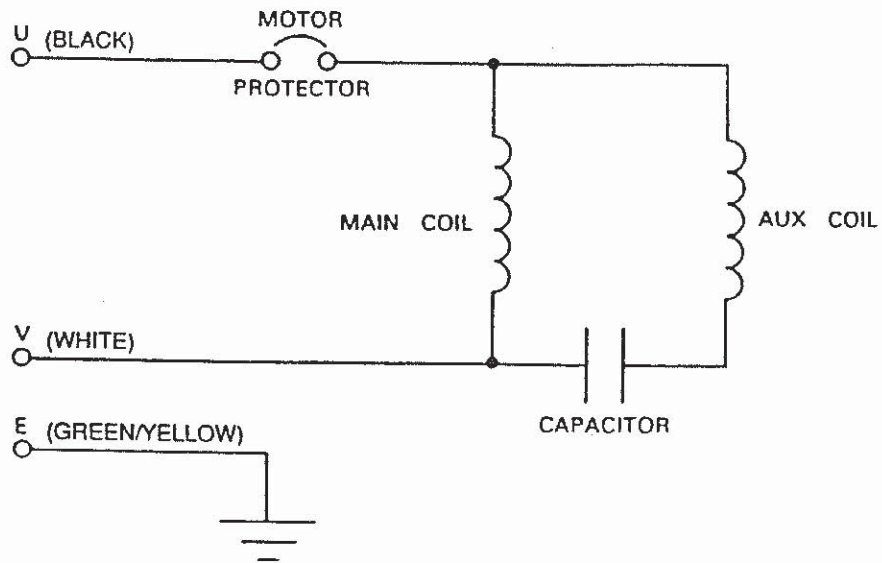
FLO-DRAINER Submersible



MOTOR WIRING DIAGRAM

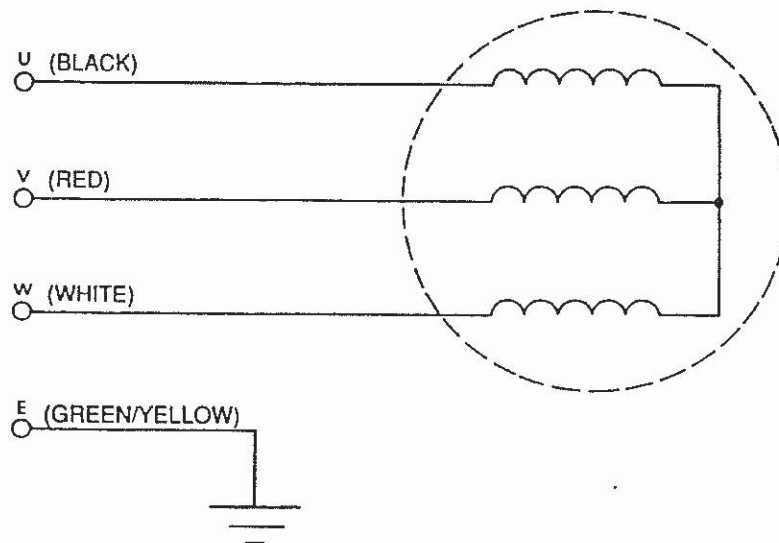
■ Manual Operation Type (Single Phase)

- Output 1/3 to 3/4 HP



■ Manual Operation Type (Three Phase)

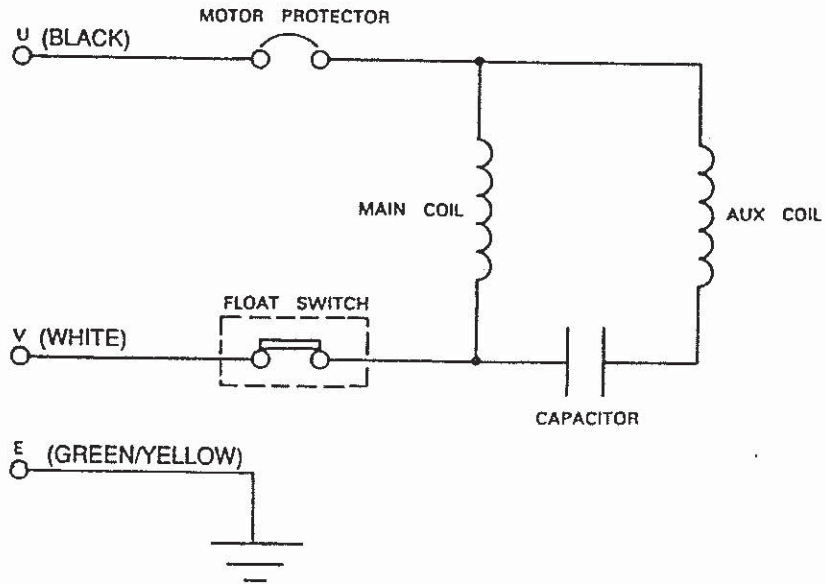
- Output 1/2 to 1½ HP



MOTOR WIRING DIAGRAM

■ Automatic Operation Type (Single Phase)

- Output 1/3 to 3/4 HP



FLO-DRAINER

Electrical Wiring: 3 Phase



▲ WARNING

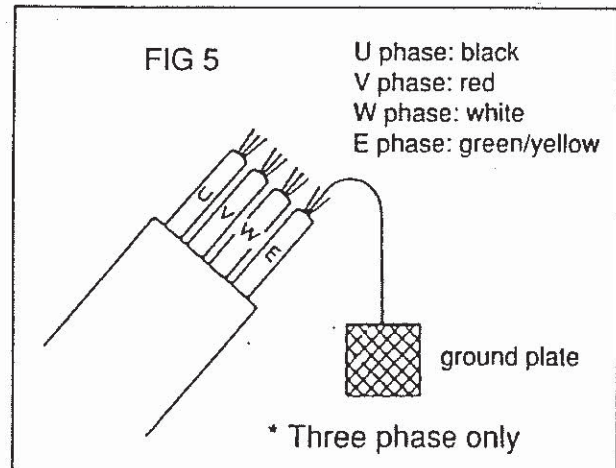
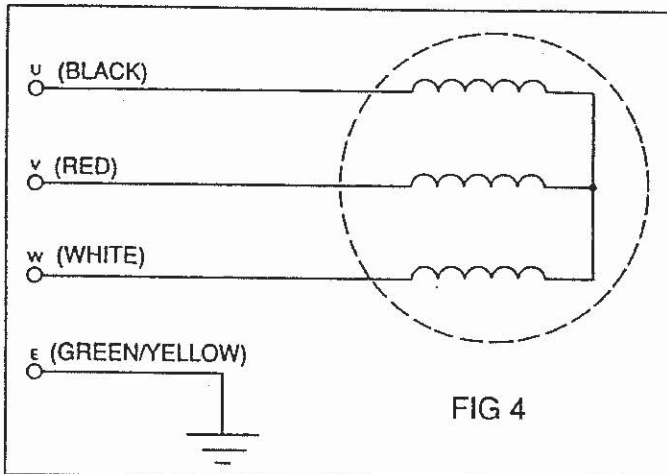
Check that the power is locked off and disconnected before working on pump. All electric work should be performed by a qualified electrician and all national and local electrical codes must be observed.

(1) Wiring

- Wire as indicated for the appropriate start system as shown in Fig. 4
- Loose connections will stop the pump. Make sure all electrical connections are secure.

MOTOR WIRING DIAGRAM

• Output 1/2 to 1½ HP



(2) Cable

- Never let the end of the cable contact water.
- If the cable is extended, do not immerse the splice in water.
- Fasten the cable to the discharge piping with tape or vinyl strips.
- Install the cable so that it will not overheat. Overheating is caused by coiling the cable and exposing it to direct sunlight.

(3) Grounding

As shown in Fig. 5 ground the green/yellow wire (label E). Under no circumstances should the green/yellow wire be connected to the power supply.

(4) Use short circuit breakers to prevent danger of electrical shock.

OPERATION

1. Before starting the pump:

- After completing installation, measure the insulation resistance again as described in INSTALLATION.
- Check water level.

If the pump is operated continuously for an extended period of time in a dry condition or at the lowest water level, the motor protector will be activated in single phase units.

Constant repetition of this action will shorten pump service life. Do not start the pump again in such a situation until after the motor has completely cooled.

TROUBLESHOOTING CHECKLIST (CAUTION: SHUT OFF POWER TO PUMP)

PROBLEM	POSSIBLE CAUSES
Pump does not run or hums.	<ul style="list-style-type: none"> • Line circuit breaker is off, or fuse is blown or loose. • Water level in sump has not reached turn-on level as indicated in installation drawing. • Pump cord is not making contact in receptacle. • Float is stuck. It should operate freely in basin. • If all of the above are OK, then the motor winding may be open.
Pump runs but does not deliver water.	<ul style="list-style-type: none"> • Check valve is installed backwards. Arrow on valve should point in direction of flow. • Discharge shut-off valve (if used) may be closed. • Pump is air-locked. Start and stop several times by plugging and unplugging cord. Check for clogged vent hole in pump case. • Impeller or volute openings are fully or partially clogged. Remove pump and clean. • Inlet holes in pump base are clogged. Remove pump and clean the openings. • Vertical pumping distance is too high. Reduce distance or resize pump.
Pump runs and pumps out sump, but does not stop.	<ul style="list-style-type: none"> • Float is stuck in up position. Be sure float operates freely in basin. • Defective float switch.
Pump runs but delivers only a small amount of water.	<ul style="list-style-type: none"> • Pump is air-locked. Start and stop several times by plugging and unplugging cord. Check for clogged vent hole in pump case. • Vertical pumping distance is too high. Reduce distance or resize pump. • Inlet holes in pump base are clogged. Remove pump and clean the openings. • Impeller or volute openings is fully or partially clogged. Remove pump and clean. • Pump impeller is partially clogged with tar or paint, causing motor to run slow and overload. Remove pump and clean.
Fuse blows or circuit breaker trips when pump starts.	<ul style="list-style-type: none"> • Pump impeller is partially clogged with tar or paint, causing motor to run slow and overload. Remove pump and clean. • Motor stator may be defective. • Fuse size or circuit breaker may be too small. Must be 15 amps. • Impeller or volute openings are fully or partially clogged. Remove pump and clean.
Motor runs for a short time, then stops.	<ul style="list-style-type: none"> • Inlet holes in pump base are clogged. Remove pump and clean the openings. • Pump impeller is partially clogged with tar or paint, causing motor to run slow and overload. Remove pump and clean. • Motor stator may be defective. • Impeller or volute openings are fully or partially clogged. Remove pump and clean.

MAINTENANCE AND SERVICE

WARNING: Pump warranty becomes void if you remove motor housing, unscrew impeller, or otherwise remove impeller seal.

If pump does not operate properly, follow the steps shown under Troubleshooting.

For any work on pump or switch, always unplug power cord(s). Do not just turn off circuit breaker or unscrew fuse.

Cleaning float

If pump becomes inoperative because of trash accumulation on the float, remove pump from sump and clean float switch.

Wipe all water and dirt from the pump and float switch.

Be sure float switch operates freely after cleaning.

Cleaning impeller and volute case

Remove screws that hold lower base to housing. **CAUTION:** Do not remove motor housing or unscrew impeller. Use screwdriver to pry base from housing. Pry in several places.

Be sure impeller turns freely after cleaning. Clean out holes in the pump base and wash thoroughly before replacing.

DISASSEMBLY AND ASSEMBLY

1. Disassembly

When disassembling pump, have a piece of cardboard or wooden board ready to place the different parts on as you work. Do not pile parts on top of each other. They should be laid out neatly in rows. The "O" ring and gasket can not be used again once they are removed. Have replacement parts ready.

Disassemble in the following order, referring to the sectional view.

Be sure to cut off power source before beginning disassembly.

- (1) Loosen casing bolts and remove casing.
- (2) Loosen bolt at end of pump shaft and lift impeller off shaft.
- (3) Remove pump shaft key and mechanical seal.
- (4) Loosen inner casing bolts and remove inner casing.
Note 1: Drain the lubricant oil into a container.
- (5) Remove the mechanical seal from the main shaft.

Note 2: Be careful not to cut your fingers on the shaft key groove when pulling out the mechanical seal.

Note 3: Be careful not to scratch or bend the pump shaft during disassembly.

2. Assembly

Re-assemble in reverse order of disassembly.

Be careful of the following points.

- (1) During re-assembly, rotate the impeller by hand and check for smooth rotation.
- (2) Replace the O-ring.
- (3) Replace all parts that are damaged.
- (4) Tighten bolts evenly.

Please obtain "O" rings, gland packings and other parts from pump dealer. The table of dimensions is given in "Maintenance."

* All specifications subject to change without notice.

In this catalog, the particulars in { } are in accordance with the International System of Units (SI) and given for reference only.

DISTRIBUTED BY



1A1 MODEL Cartridge Filter Housing



The 1A1 MODEL Cartridge Filter Housing is an all-metal, two-piece housing, featuring centerpost-type construction. The 1 A1 Model has a maximum operating temperature and pressure of 125 psig at 200°F. The 1A1 Model Cartridge Filter Housing has flow rates to up to 6 Gallons Per Minute (GPM).

APPLICABLE FILTER CARTRIDGES

Micro-Klean-III (Series U30)

Betapure-

DESIGN FEATURES

- All-metal, two-piece construction.
- Head and Sump Durable die-cast aluminum
- Mounting pads drilled to accept self-tapping screws provided with the optional mounting bracket.
- Centerpost-type design for easy cartridge changeout.

Options

- Mounting bracket; order separately.

STANDARD MODEL SPECIFICATIONS

Table 1 gives specifications for the 1A1 Model. Note that Maximum Operating Pressure is the rating for the housing only. Actual filter operating temperature depends on temperature capability of the filter cartridge used in the housing.

Operating Data	1A1 Model
Maximum Operating Pressure and Temperature	125 psi @ 200°F
Flow Rate (GPM)	See Table 2.
Materials of Construction	
Head and Sump	Die-Cast Aluminum
Centerpost	Stainless Steel
Head Gasket	Buna N & Cork
Cap-Nut Gasket	Fiber
Connection Sizes	3/8" NPTF
Cartridge Requirements	The model uses one filter cartridge. See "Cartridge Requirements" for more information.

TABLE 1 - SPECIFICATIONS

CARTRIDGE REQUIREMENTS

The 1A1 Model Cartridge Filter Housing uses one Micro-Klean III Cartridge or one Betapure Cartridge Filter.

FLOW RATES

Table 2 gives maximum flow rates in Gallons Per Minute (GPM) for the 1A1 Model Cartridge Filter Housings. Do not use Table 2 for filter sizing. Use the table as a guide only in establishing the housing flow rates. When you know the flow rate for a selected cartridge, then use the table to determine whether or not the housing is within the recommended flow rate. Remember to consider the amount of contaminant to be removed when selecting a filter.

Housing Model	Inlet / Outlet	FLOW (GPM)					
		Water	80 SSU	150 SSU	300 SSU	600 SSU	1000 SSU
1A1	3/8" NPTF	6	5	4.5	4	3.5	3

TABLE 2 - RECOMMENDED FLOW RATES

HS.1A1.0692
REPLACES
HS.1A1.0590

BENEFITS

- Long Service Life
- Quick and Easy Cartridge Change-out
- Reduced Down Time for Filter Change-out
- Reduced Labor Cost
- Uses Standard Filters
- Economical
- Easily Mounted to Wall or Support Structure



STANDARD MODEL DIMENSIONS

Table 3 gives dimensions in inches and shipping weight in pounds for the 1A1 Model Cartridge Filter Housing. These should be used for rough plumbing and approximate size definition. Note that figure 1 defines a length or width by a letter symbol in the top row. The square where the row and column meet is the selected dimension.

Model	A	B	C	D	Shipping Weight
1A1	6 3/16"	4 15/16"	3 1/2"	2 3/4"	3 lbs

TABLE 3. - 1A1 HOUSING DIMENSIONS

1A1 MODEL ORDERING GUIDE

Plant Code 01 Product Code 020

Model	Catalog Number	Mounting Bracket Kit*
1A1	44109-01	35581-05

* Order Separately

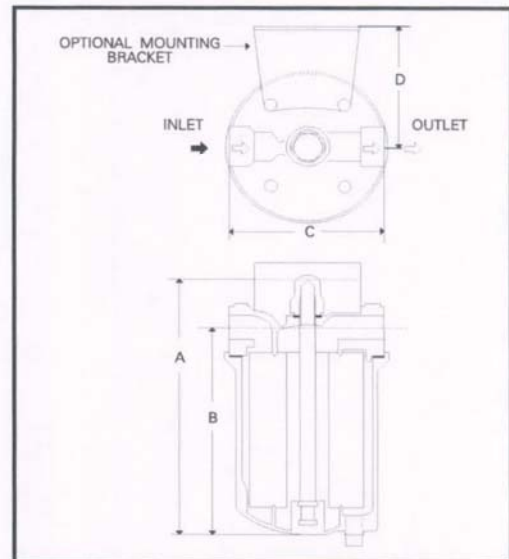


FIGURE 1. - 1A1 MODEL FILTER HOUSING

WARRANTY

Seller warrants its equipment against defects in workmanship and material for a period of 12 months from date of shipment from the factory under normal use and service and otherwise when such equipment is used in accordance with instructions furnished by Seller and for purposes disclosed in writing at the time of purchase, if any. Any unauthorized alteration or modification of the equipment by Buyer will void this warranty. Seller's liability under this warranty shall be limited to the replacement or repair, F.O.B., point of

manufacture, of any defective equipment or part which, having been returned to the factory, transportation charges prepaid, has been inspected and determined by Seller to be defective. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER. Under no circumstances shall Seller be liable to Buyer or any third party for any loss of profits or

