

# SHURflo

## MARINE POTABLE WATER PUMP

### Installation and Operation Manual

SHURflo's Marine Duty Potable Water Pumps were developed to endure the harsh marine environment. The patented Tri-a-fram® design delivers smooth, consistent flow at all ranges of operation, while drawing low current. The balanced diaphragm design incorporates precision ball bearings for long life. Each motor is equipped with an integral thermal breaker and all are U/L Marine listed. All Marine duty pumps have sealed switches and are finished with a baked-on polyurethane coating to inhibit corrosion. Marine duty potable water pumps are enclosed to prevent incidental moisture from entering; however, they are not intended for environments where splashed water is present. When installed correctly, Marine Duty Potable Water Pumps provide years of quiet operation.

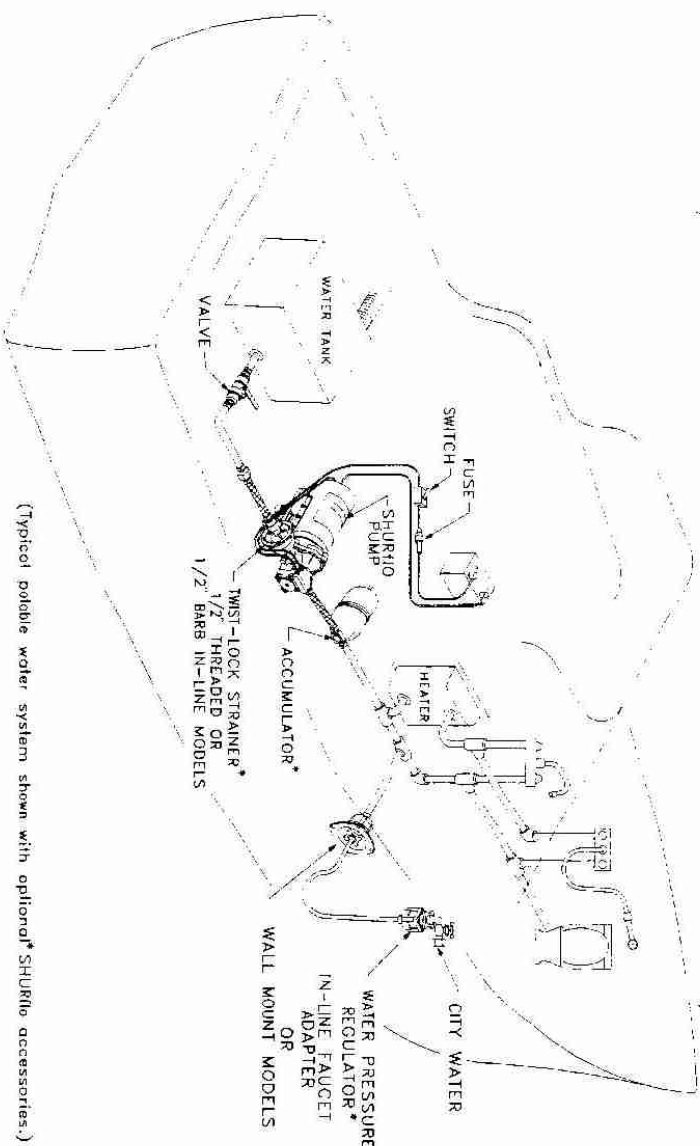
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### GENERAL INFORMATION

SHURflo realizes that in many instances our pump is being installed as a replacement pump within an existing system. The following guidelines should be considered to achieve optimum pump operation.

#### Mounting

- The pump can be at the same level or below the water tank. It may be positioned above the water tank if needed, as it is capable of a 6 ft. [1.8m] vertical prime. Horizontal inlet tubing will allow priming to 30 ft. [9m].
- Consider a *dry* location that allows easy access if maintenance is required. The pump should not be located in an area of less than one cubic foot unless adequate ventilation is provided. Excessive heat may trigger the integral thermal breaker and interrupt operation. When the temperature drops the breaker will automatically reset and start operation.



(Typical potable water system shown with optional\* SHURflo accessories.)

- The pump may be mounted in any position. If mounting the pump vertically, the pump head should be in the down position so that water will not enter the motor.

- Use #8 stainless steel hardware to fasten the pump. Choose a *solid* surface (thick plywood) that will not amplify pump operation. The mounting feet are intended to isolate the pump from the mounting surface; over tightening, flattening, or use of oversized screws will reduce the ability to isolate vibration/noise.

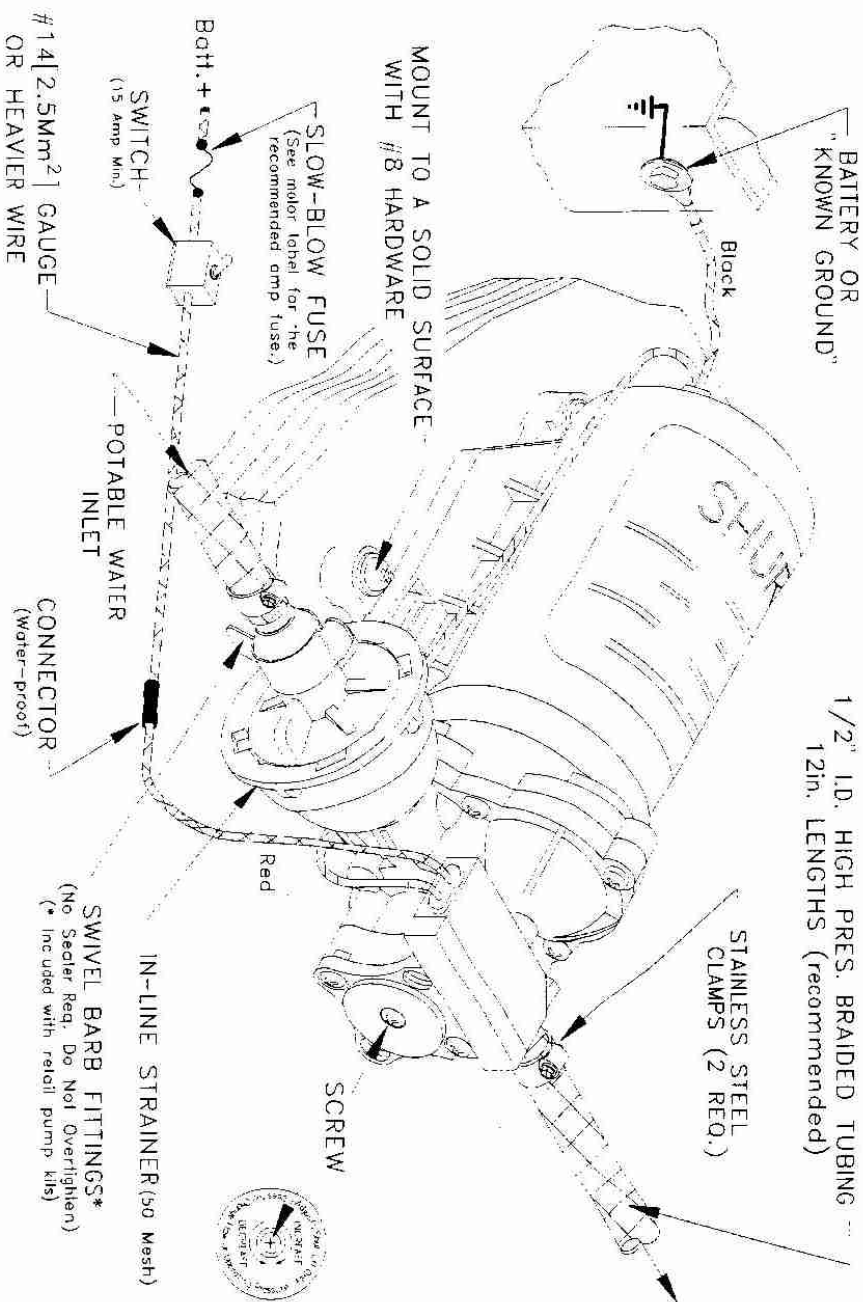
#### Electrical

- The pump should be on a dedicated (individual) circuit protected by the specified "slow blow" fuse indicated on the motor label.
- A U/L approved marine duty (ignition protected) switch rated at or above 15 amps is recommended, and must interrupt current flow on the positive (+ red) lead.
- The pump must be grounded to a "known ground" (battery). The ground wire must be the same size (gauge/mm<sup>2</sup>) as the positive wire.

- Wire size (gauge/mm<sup>2</sup>) is based on the distance from the power source to the pump. Recommended size wire is #14 gauge [2.5mm<sup>2</sup>]. For lengths of 20-50ft. [6-15M] use #12 gauge [4 mm<sup>2</sup>].
- The total current draw on the circuit *must not* exceed 15 amps. If the pump is used in conjunction with other components, overload current protection (fuse or circuit breaker) and wire size must be for the total amp requirement of all devices on the circuit.

## Plumbing

- SHURflo recommends at least 1ft. [3M] of ½" [13mm] I.D. flexible high pressure tubing to both ports. Ideally the pump's ports/strainer *should not* be connected to plastic or rigid pipe. The pump's normal oscillation may transmit through rigid plumbing causing noise, and possibly loosen or crack components.
- Installation of a 50 mesh strainer is recommended to prevent foreign debris from entering the pump. The SHURflo In-Line Strainer (shown) has a twist-lock feature allowing simple cleaning when plumbed with flexible tubing.



- SHURflo swivel barb fittings provide easy removal if maintenance or access is required. The fittings are designed with a "taper-seal", creating a water tight connection when *hand-tightened*. Always secure barb tubing connections with properly sized stainless steel clamps to prevent leaks. *Never* use Teflon tape or sealing compounds on threads. Sealer may enter the pump causing a failure. *Failure due to foreign debris is not covered under warranty.*
- Rapid cycling may be caused by excessive back pressure created by one or more of the following within a plumbing system:
  - ✓ Water filters and purifiers not on separate feed lines.
  - ✓ Flow restrictors in faucets and shower heads.
  - ✓ Small I.D. lines. Pipe/tubing should be at least ½" [13mm] I.D. for main lines.
  - ✓ Restrictive fittings and connections (elbows, "T's", feeder lines to faucets, etc.)

## ADJUSTMENT OF SWITCH SHUT-OFF

Restrictions in a plumbing system may cause the pump to rapid cycle (ON/OFF within 2 sec.) during low flow demands. Cycling should be minimized to prevent pulsating flow, and to achieve maximum pump life.

To determine if adjustment is necessary, turn a faucet ON to lower than average flow of water. The pump should cycle, but its "OFF time" must be 2 sec. or longer. If the cycling is correct, leave well enough alone. If the pump is cycling rapidly, increase the setting by turning the screw clockwise (1½ turn MAX.) until the pump operates for 1 sec. with at least 2 sec. "OFF time". If cycling cannot be minimized consider removing plumbing restrictions or simply install a SHURflo Accumulator.

## TROUBLESHOOTING

Vibration induced by sea conditions or transporting can cause plumbing or pump hardware to loosen. Check for system components that are loose. Many symptoms can be resolved by simply tightening the hardware. Check the following items along with other particulars of your system.

### PUMP WILL NOT START/ BLOWS CIRCUIT:

- ✓ Electrical connections, fuse or breaker, main switch, and ground connection.
- ✓ Is the motor hot? Thermal breaker may have triggered, it will reset when cool.
- ✓ Is voltage present at the switch?
- ✓ Charging System for correct voltage ( $\pm 10\%$ ) and good ground.
- ✓ For an open or grounded circuit, or motor, or improperly sized wire.
- ✓ For seized or locked diaphragm assembly (water frozen?).

### WILL NOT PRIME/SPUTTER: (No discharge/Motor runs)

- ✓ Is the strainer clogged with debris?
- ✓ Is there water in the tank, or has air collected in the hot water heater?
- ✓ Is the inlet tubing/plumbing sucking in air at plumbing connections (vacuum leak)?
- ✓ Is inlet/outlet plumbing severely restricted or kinked?
- ✓ Proper voltage with the pump operating ( $\pm 10\%$ ).
- ✓ For debris in pump inlet/outlet valves or swollen/dry valves.
- ✓ Pump housing for cracks or loose drive assembly screws.

### PUMP WILL NOT SHUT-OFF / RUNS WHEN FAUCET IS CLOSED:

- ✓ Output side (pressure) plumbing for leaks, and inspect for leaky valves or toilet.
- ✓ For air trapped in outlet side (water heater) or pump head.
- ✓ For correct voltage to pump ( $\pm 10\%$ ).
- ✓ For loose drive assembly or pump head screws.
- ✓ Are the valves or internal check valve held open by debris or is rubber swollen?
- ✓ Pressure switch operation/adjustment incorrect, refer to shut-off adjustment for switch.

### NOISY OR ROUGH OPERATION:

- ✓ For plumbing which may have vibrated loose.
- ✓ Is the pump plumbed with rigid pipe causing noise to transmit?
- ✓ Does the mounting surface multiply noise (flexible)?
- ✓ For mounting feet that are loose or are compressed too tight.
- ✓ For loose pump head to motor screws.(3 long screws)
- ✓ The motor with pump head removed. Is noise from motor or pump head?

### RAPID CYCLING:

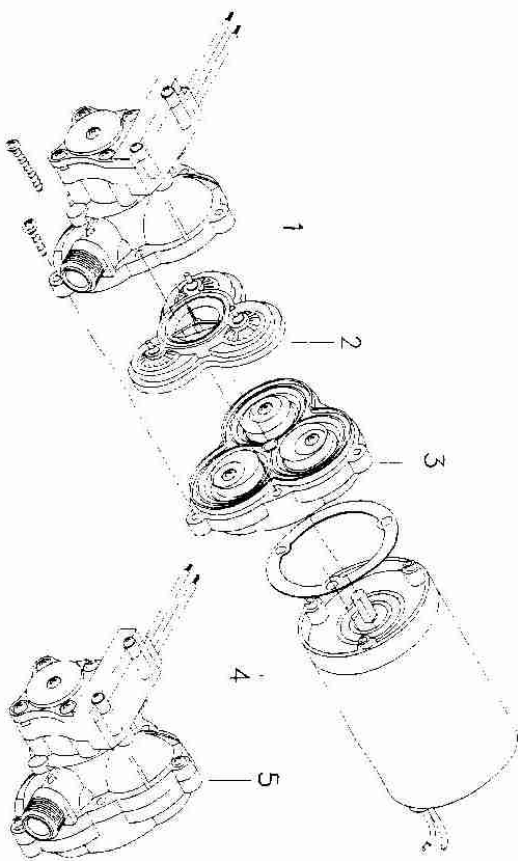
- ✓ Pressure switch shut-off adjustment.
- ✓ Water filter/purifier should be on separate feed line.
- ✓ For restrictive plumbing, flow restrictors in faucets/shower heads.

### LEAKS FROM PUMP HEAD OR SWITCH:

- ✓ For loose screws at switch or pump head.
- ✓ Switch diaphragm ruptured or pinched.
- ✓ For punctured diaphragm if water is present in the drive assembly.

## SERVICE KITS

To insure the correct service kit, order by the complete model number, date of manufacture and name plate data. Part kits come with complete repair instructions. Pump illustrations may not be representative of all SHURflo potable water pump models and are only for depiction of the various parts kit assemblies.



1	Switch / Check valve and Upper Housing Kit (Replaces all previous switch designs)
2	Valve plate assembly
3	Diaphragm / Drive assembly w/gsk.
4	Motor
5	Complete Pump Head assembly (includes parts 1, 2, 3) (Replaces all previous switch designs)

## CE CONFORMITY (Europe)

SHURflo pump models with the **CE** mark printed on the motor label conform with the EU EMC directive 89/336/EEC as specified in EN 55014 (1993) and meet the essential health and safety requirements. These models are intended solely for battery operation and comply with RFI power limits. Conducted emissions limits are not applicable on these models, since they are not intended for applications in which the pump is directly or indirectly connected to the power main.

## SANTIZING

Potable water systems require periodic maintenance to deliver a consistent flow of fresh water. Depending on use and the environment the system is subject to, sanitizing is recommended prior to storing and before using the water system after a period of storage. Systems with new components, or ones that have been subjected to contamination, should also be disinfected as follows:

1. Use one of the following methods to determine the amount of *common household bleach* needed to sanitize the tank.
  - A) Multiply "gallons of tank capacity" by 0.13; the result is the ounces (oz.) of bleach needed to sanitize the tank.
  - B) Multiply "liters of tank capacity" by 1.0; the result is the milliliters of bleach needed to sanitize the tank.
2. Mix into solution the proper amount of bleach within a container of water.
3. Pour the solution (water/bleach) into the tank and fill the tank with potable water.
4. Open *all* faucets (HOT & COLD) allowing the water to run until the distinct odor of chlorine is detected.

## LIMITED WARRANTY

SHURflo warrants its Marine Duty Potable Water Pumps to be free from material and workmanship defects under normal use and service for a period of one (1) of year from the date of manufacture or one (1) year of use with proof of purchase, not to exceed (2) two years in any event.

The limited warranty will not apply to pumps that were improperly installed, misapplied, or are incompatible with components not manufactured by SHURflo. Pump failure due to foreign debris is not covered under the terms of this limited warranty. SHURflo will not warrant any pump that is physically damaged, or altered outside the SHURflo factory.

Warranty claims may be resolved by an authorized dealer service center, or by a SHURflo service center. Returns are to be shipped with charges pre-paid. Package all returns carefully. SHURflo will not be responsible for freight damage incurred during shipping to a service center.

SHURflo's obligation under this warranty policy is limited to the repair or replacement of the pump. Pumps found not defective (under the terms of this limited warranty) are subject to charges to be paid by the returnee for the testing and packaging of "tested good" units. Warranty returns will be shipped on a freight allowed basis. SHURflo reserves the right to choose the method of transportation.

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5. The standard solution must have four (4) hours of contact time to disinfect completely. Doubling the solution concentration allows for contact time of one (1) hour.
6. When the contact time is completed, drain the tank. Refill with potable water and purge the plumbing of all sanitizing solution.

**NOTE:** The sanitizing procedure outlined above is in conformance with the approved procedures U.S. Public Health Service.

## WINTERIZING

If water is allowed to freeze in the system, serious damage to the plumbing and the pump may occur. Failures of this type will void the warranty. The best guarantee against damage is to completely drain the water system.

**NOTE:** When used per the manufacturers recommendations *non-toxic antifreeze for potable water* is safe for use with SHURflo pumps. Refer to the coach manufacturer and other equipment manufacturers for their specific winterizing & instructions.

**CAUTION: Do not use Automotive Antifreeze to winterize** potable water systems. Such solutions are highly toxic. Ingestion may cause serious injury or death.

To properly drain the system perform the following:

1. Drain the water tank. If the tank doesn't have a drain valve, open all faucets allowing the pump to operate (15 min. ON / 15 min. OFF) until the tank is empty.
2. Open all the faucets (including the lowest valve or drain in the plumbing) and allow the pump to purge the water from the plumbing, then turn the pump OFF.
3. Using a pan to catch the remaining water, remove the plumbing at the pump's inlet/outlet ports. Turn the pump ON, allowing it to operate until the water is expelled. Turn OFF power to the pump once the plumbing is emptied. *Do not* reconnect pump plumbing. Make a note at tank filler as a reminder: "Plumbing is Disconnected".
4. All faucets must be left open to guard against any damage.

SHURflo is not responsible nor will it reimburse for labor necessary to remove and reinstall a pump, if found defective.

This limited warranty is in lieu of all other warranties, expressed or implied, and no other person is authorized to give any other warranty or assume obligation or liability on SHURflo's behalf. SHURflo shall not be liable for any labor, damage or other expense, nor shall SHURflo be liable for any indirect, incidental or consequential damages of any kind incurred by the use or sale of any defective product or part. This limited warranty covers products distributed within the United States of America. Other world market areas should consult with the distributor for any deviation from this document.



SHURflo reserves the right to update specifications, prices, or make substitutions.

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## POTABLE WATER STRAINER 170-06X

### Installation and Maintenance Instructions

The SHURflo strainer prevents damage to the pump by trapping small particles and debris. The strainer uses a #50 mesh screen to trap foreign debris and particulates larger than .02 in. [.3mm]. The strainer is designed for installation directly to the SHURflo pump (inlet side). The threaded configuration (-061) is designed for use with SHURflo taper-seal swivel fittings, which work in conjunction with the pumps threaded ports. The strainer can be installed in any convenient, visible, easy to inspect location between the water supply (tank) and the pump. The strainer's transparent material allows for quick visual inspection for determining if the stainless steel screen should be cleaned. When correctly installed, no tools are required to open, hand disassembly is quick and simple due to the twist-lock feature.

**CAUTION:** The 170 Strainer series *is not* approved for marine raw water applications. Only the SHURflo 252 series strainer is approved for marine raw water/below water line applications. The 252 series is designed with screen capacity and durability necessary for the rigors of raw water use.

### INSTALLATION

1. Close the valve or drain water source (tank) as necessary. OPEN a faucet to relieve pressure within the line, then switch OFF power to the pump. This procedure will purge most of the water in the inlet (suction) water line, however use a pan or bucket to collect any remaining water.

**NOTE:** Other electrical components in the vicinity should be switched OFF to prevent electrical shock.

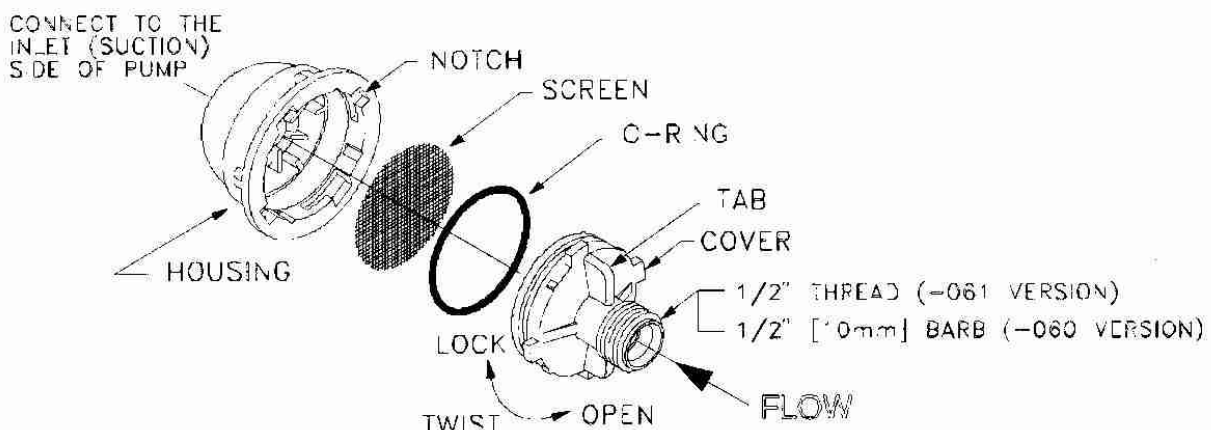
2. When installed directly to the inlet (suction) side of a SHURflo pump (male threads) or other plastic fitting, **hand-tighten until snug** (max. torque 3 ft/Lb. [1.4 Kg]).

**NOTE:** Do not use any thread sealer or Teflon tape on pump threads.

3. The inlet of the strainer should be plumbed with flexible tubing approved for potable water use. The use of flexible tubing allows convenient disassembly for cleaning and reduces noise transmission during pump operation. Securely clamp all tubing connections with stainless steel clamps.

**CAUTION:** Impact or vibrations transmitted through rigid (plastic/metal) pipe could cause the strainer to crack.

4. Check that the cover is in the locked (clockwise) position. Open the water source valve and switch ON any power turned off previously. Open the faucet and allow the pump to operate, purging the system of any trapped air. Inspect strainer and connections for leaks.



## **STRAINER CLEANING**

1. Close the valve or drain water source (tank) as necessary. OPEN a faucet to relieve pressure within the line, then switch OFF power to the pump. This procedure will purge most of the water in the inlet (suction) water line, however use pan or bucket to collect any remaining water.

**NOTE:** Other electrical components in the vicinity should be switched OFF to prevent electrical shock.

2. Support the housing while turning the cover "ears" counterclockwise, until the tabs align in the notches. Carefully wiggle the cover out of the housing to overcome the seal of the O-ring.
3. The strainer screen can be removed to aid in cleaning.
4. Reinstall the screen in the housing. Apply petroleum jelly to the O-ring to assure a positive seal.
5. Align the locking tabs of the cover in the notches of the housing. Push together then turn clockwise until in the "locked" position.
6. Open the water source valve and switch ON any power turned off previously. Open the faucet and allow the pump to operate. Inspect strainer and connections for leaks.

## **LIMITED WARRANTY**

SHURflo warrants its 170 series Strainers to be free from defects in materials and workmanship (under normal use and service) for a period of one year from the date of manufacture or one (1) year of use with proof of purchase. In no case will the terms of this warranty extend beyond two (2) years of manufactured date.

This limited warranty will not apply to any SHURflo product that is improperly installed, misapplied, or incompatible with components not manufactured by SHURflo. SHURflo will not warrant any product which is modified or damaged outside the SHURflo factory.

SHURflo's obligation under this warranty policy is limited to replacing or repairing (whichever it deems advisable) any such product or part which is returned to SHURflo's factory with transportation charges prepaid and which, upon SHURflo's inspection is found defective under the terms of this warranty.

Refer to SHURflo Service Bulletin #1047 for complete details of this limited warranty.



★ ISO Certified Facility



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