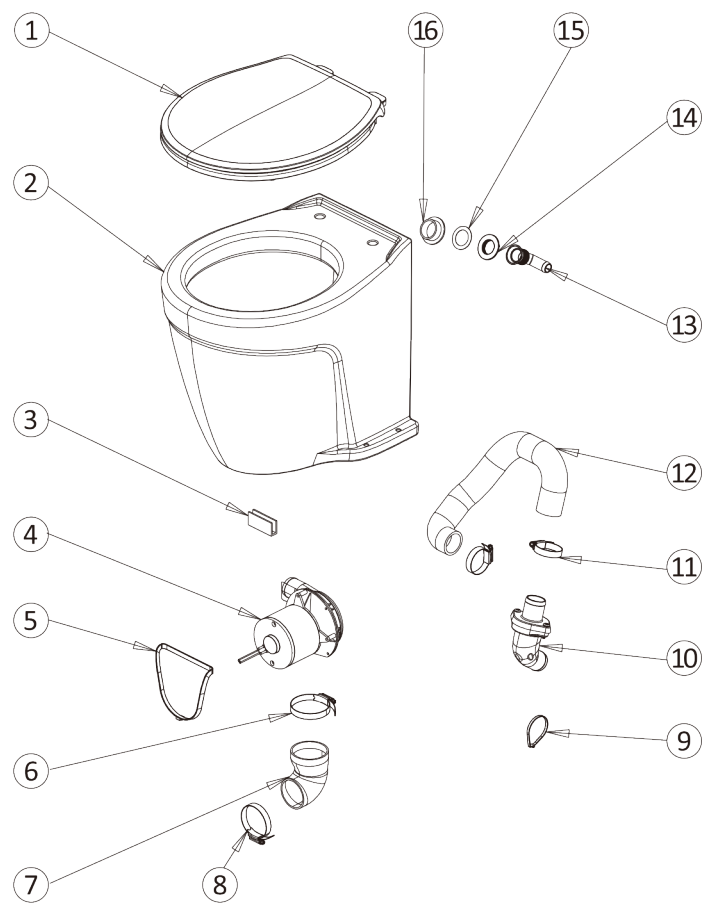


EXPLODED VIEW



SEAFLO®

Deluxe Flush Electric Toilets Instruction Manual



Fresh Water		Sea Water	
<input type="checkbox"/> SFMTE1-05 12V		<input type="checkbox"/> SFMTE1-06 12V	
<input type="checkbox"/> SFMTE2-05 24V		<input type="checkbox"/> SFMTE2-06 24V	

1	Toilet lid assembly	9	Support Strap 2
2	17" Bowl	10	Non - Return Valve Assembly
3	U-shaped pad	11	Hose Clip 3
4	Sewage Pump Assembly	12	Shaped sewage pipe
5	Support Strap 1	13	Inlet elbow
6	Hose Clip 1	14	screw nut
7	L-shaped sewage pipe	15	Stainless Steel Gasket
8	Hose Clip 2	16	Shaped Washer

SEAFLO Deluxe Flush Electric Toilets feature low noise levels, so sleeping guests will not be disturbed when the toilet is used. There are options of either flushing with fresh water from the boat's own supply or with salt, river or lake water from outside the boat. All plumbing and wiring easily concealed.

FEATURES

- Virtually silent operation for undisturbed sleep
- Non-clogging large bore flush pump macerates waste
- All plumbing and wiring easily concealed
- Uses less than 1.0 amp/hour per day
- User selectable choice of "one touch" flush cycles for minimal water usage - a "Quick Flush" uses less than 1 quart (1 litre)
- Space saving stylish design
- Regular household size seat
- Fresh or raw water rinse models
- Ignition Protection

Model	SFMTE1-05	SFMTE2-05	SFMTE1-06	SFMTE2-06
Color	White			
Features	Built In Macerator			
Max Draw	20A at 12V	10A at 24V	20A at 12V	10A at 24V
Rinse Water Variant	Fresh		Raw	
Diameter	Inlet 3/4" Hose Barb		Outlet 1 1/2" Hose Barb	
Type	Electric Impeller			
Material	Ceramic bowl, soft close seat			
Box Dimension (L * W * H)	570X450X515 mm			

RINSE OPTIONS

FRESH WATER

It is supplied with a combined solenoid valve and siphon breaker assembly for connection to any existing pressurized water system capable of delivering 2.9 US gpm (11 lpm) or more. The siphon breaker ensures there is no backflow from the toilet into the water system. The siphon breaker ensures there is no backflow from the toilet into the water system.

RAW WATER

It is supplied with a remote mounted self-priming pump to bring in sea, river or lake rinse water. Complete with strainer.

APPLICATIONS

You may install SEAFLO Deluxe Flush Toilet electrically operated marine toilets in both power and sailing craft, either above or below the waterline, for use on sea, river, lake or canal.

Your installation may discharge the waste either overboard (provided that your national and local regulations allow this), or into a treatment system or into an on-board holding tank (U.S.C.G. Marine Sanitation Devices Type I, II and III)



CAUTION! Seaflo electrical toilets are designed specifically for marine use. Consult seaflo for advice about possible non-marine application.

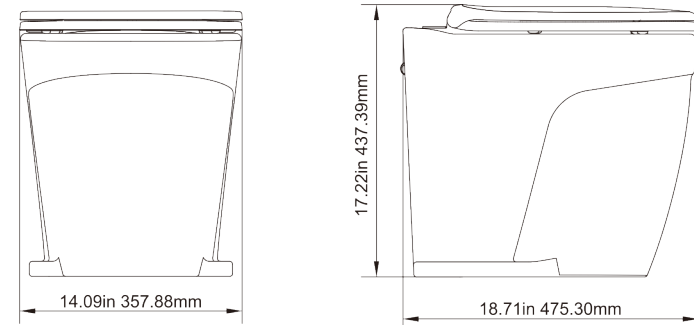
SPECIFICATIONS

PARTS	DESCRIBE
Bowl, seat and cover	Hygienic white glazed vitreous china bowl for ease of cleaning. Luxury plastic seat.
Flush pump	Internally mounted, high speed, non-clogging, centrifugal, waste macerating pump driven by powerful 240 watt, 12 or 24 Vdc, permanent magnet motor with ball bearings and robust ceramic seal, discharges up to 6ft (1.8m) above the base of the toilet.
Either Solenoid Valve	SEAFLO solenoid valve and syphon breaker assembly for connection to any existing pressurised water system capable of delivering 2.9gpm (11 lpm) or more. The syphon breaker ensures that there is no backflow from the toilet into the water system.
Rinse pump	Self-priming up to 1.8m (6ft), dry running, diaphragm water pump driven by 12 or 24 V dc, permanent magnet, ball bearing motor.
Control Panel	Three-way control panel allows the operator to select a normal flush and drain cycle, or to lower or raise the water level.

PORTS

PARTS	PORTS
Raw Water Rinse pump inlet & outlet, and Toilet Rinse inlet cover	3/4" (19mm) hose tails
Fresh Water Rinse solenoid valve inlet	choice of 1/2" (13mm) hose tail or 1/2" (13mm) male thread.
Flush pump discharge	1 1/2" (38mm) hose tail

DIMENSIONAL DRAWING



INSTALLATION INSTRUCTIONS

Your toilet is just one part of a system. Correct installation of the whole system is essential if you want the toilet to perform properly, operate reliably and safely, and give satisfactory length of life.

- The seat and lid is delivered boxed and unfitted for its protection.
- Key numbers, e.g. ('Key 31') are references to the exploded view diagram on the back page.

LOCATION

- Select a location that will give sufficient clearance all round and above the bowl.
- The mounting surface must be flat, rigid and strong enough to support a man's weight and should be at least 2" (50mm) wider and 2" (50mm) deeper than the base of the toilet.
- You will need sufficient clearance below the mounting surface to be able to secure the mounting bolts, and to be able to remove them for maintenance.
- Offer up the seat and lid to the bowl. They should be able to swing up and over, so that they will not fall forward when the craft heels or pitches. When they are swung over they must be supported so that the hinges are not strained. Remove the seat and lid and put them aside until the installation is complete.

MOUNTING

You will need:

- 4 x 1¼" (6mm) diameter stainless steel bolts of length to suit the thickness of the mounting surface.
- 4 stainless steel nuts, preferably self-locking. If you do not use self-locking nuts you will need some nut-locking compound.
- 4 plastic and 4 stainless steel 1¼" (6mm) washers.
- A tube of white silicone sealant.
- Offer up the toilet in the selected position and, using the holes in the base as a guide, mark the positions for the 4 bolt holes on the mounting surface. Remove the toilet and drill 4 vertical holes of 5/16" (8mm) diameter through the mounting surface.

Now complete all of the rest of the installation before you secure the bowl.

THROUGH HULL FITTINGS

You will need:

- ¾" 19mm bore seacock for the Rinse pump and, if you are discharging the waste over board, a 1½" 38mm bore seacock for the waste outlet.
- Follow the seacock manufacturer's own instructions concerning materials and methods of installation.
- Ensure the inlet seacock is positioned where it will be below the waterline at all times when the craft is underway, and also ensure that any other outlet seacock is both aft of, and higher than, the inlet seacock.



HAZARD RISK: Through Hull fittings. FOLLOW THESE INSTRUCTIONS!

If the installation of the toilet results in it being connected to any through-hull fitting that may possibly be below the waterline at any time, whether when the craft is at rest, underway and heeling or rolling or pitching, you must install the toilet in accordance with these installation instructions. If you do not, water may flood in, causing the craft to sink, which may result in loss of life.



HAZARD RISK: ACCIDENTAL DAMAGE.

USE SEACOCKS!

If the toilet is connected to any through-hull fittings and if the toilet or pipework is damaged, water may flood in causing the craft to sink, which may result in loss of life. Therefore, if you are making connections between the toilet and any through-hull fittings that may possibly be below the waterline at any time, full bore seacocks must be fitted to those hull fittings, to allow them to be shut off.

The seacocks must also be positioned where they are easily accessible to all users of the toilet. If, for any reason, it is not possible to do this, then secondary bore marine quality valves must be fitted to the hoses where they are easily accessible.



CAUTION! Use lever operated, full bore marine seacocks and valves. The use of screw-down gate valves is not recommended.

PIPEWORK - SELECTION OF CORRECT METHOD

You must select the correct method for the inlet pipework from 2 options and for the outlet pipework from 4 options, according to whether the toilet is above or below the waterline, and to whether it discharges the waste overboard or into an on-board holding tank.



HAZARD RISK: BOWL RIM BELOW WATERLINE.

USE VENTED LOOPS!

If the toilet is connected to any through-hull fittings, and if the rim of the bowl falls below the waterline, water may flood in causing the craft to sink, which may result in loss of life.

Therefore, if the rim of the toilet is less than 8" (20cm) above the waterline when the craft is at rest, or if there is any possibility that the rim of the bowl may be below the waterline at any time, a ventilated anti-syphon loop must be fitted in any pipework connected to a through-hull fitting, irrespective of whether inlet or outlet.

SPECIAL NOTE 1: The smaller bore inlet pipework is more hazardous than the larger outlet pipework. Unless there is a ventilated anti-syphon loop in the inlet pipework, water will flow into the bowl whenever both the inlet seacock is open and the rim of the bowl is below the actual waterline.

SPECIAL NOTE 2: Making a loop in the hose without fitting a vent may be just as hazardous as no loop at all, because water may syphon over a loop. It is the vent that actually prevents the syphon.



HAZARD RISK: PIPEWORK BECOMES LOOSE.

USE HOSE CLIPS!

If the toilet is connected to any through-hull fittings and if the pipework becomes disconnected, either from a through-hull fitting or seacock, or from the toilet or any secondary valve, water may flood in and cause the craft to sink, which may result in loss of life.

Therefore the ends of all flexible hoses fitted directly or indirectly between the toilet and any through-hull fitting that may possibly be below the waterline at any time, must be secured to the hose tails to which they are connected, using two stainless steel worm-drive hose clips.

PIPEWORK - GENERAL INSTRUCTIONS FOR ALL OPTIONS

You will need:

- Spiral reinforced smooth bore flexible hoses for both the ¾" 19mm inlet and the 1½" (38mm) outlet pipework.
- Two stainless steel worm-drive hose clips for every hose tail connection.
- Secure the hose runs so that the hoses cannot move and chafe, and so that they do not exert any leverage on the hose tail fittings to which they are connected, as this may cause adjacent joints to leak.

- Avoid sharp bends in the hoses as this may cause them to become kinked.
- Keep all pipework runs as straight and as short as possible, avoiding rising and falling over obstructions which creates airlocks.
- If it is difficult to fit the hose onto the hose tails of the toilet or seacocks, lubricate it with water, or soften the hose by dipping the end in hot water.



CAUTION! Do not apply flame to the hose. Do not apply flame or heat to the plastic hose tails on the toilet, rinse pump or solenoid valve. Do not use oils, greases or synthetic lubricants. Do not apply sealing compounds to any hose connections. Do not over tighten hose clips. Any of these actions may result in cracking or breakage of the plastic parts.

- Secure the ends of all hoses to the hose tails with two stainless steel worm-drive hose clips, ensuring that all inlet connections are airtight and that all the outlet connections are water tight.

FRESH WATER RINSE PIPEWORK

You will need:

- A 'T' piece that fits your boat's pressurised



CAUTION! Turn off power to the water pressure system pump, and open cold water taps to de-pressurise the system.

- Install a 'T' fitting in the pressurised cold water pipework near to the toilet to provide a 1/2" (13mm) feed to the Solenoid Valve.



CAUTION! If you ever connect your water system to unregulated USA City Water supplies, you must fit or use a pressure regulator to prevent risk of flooding.

- Mount the solenoid valve and syphon valve assembly in a dry position, on a Vertical surface, with the outlet port facing down, as close to the rinse intake elbow as possible and at least 8" (20cm) above the rinse intake elbow.
- Install suitable pipework between the 't' fitting and the 1/2" (13mm) inlet port on the solenoid valve.
- Run 3/4" (19mm) hose by the most direct route from the 3/4" (19mm) outlet port on the solenoid valve to the rinse intake elbow.

RAW WATER RINSE PIPEWORK - 2 OPTIONS

- Install the Raw Water Rinse pump in a dry position close to the toilet where it will not be more than 6ft (2m) above the heeled waterline at any time.
- Fit the strainer supplied to the inlet of the rinse pump.
- For more detail refer to the separate Data Sheet supplied with the rinse pump

Option 1: Toilet below the heeled waterline

- You must fit a 3/4" (19mm) vented loop fitting.
- Run 3/4" (19mm) hose by the most direct route from the inlet seacock to the inlet of the strainer fitted to the rinse pump.



CAUTION! Do not position the ventilated anti-syphon loop between the inlet seacock and the rinse pump, because it may prevent the rinse pump from priming.

- Arrange a length of 3/4" (19mm) hose between the rinse pump outlet and the rinse intake elbow, to form an anti-syphon loop whose highest point is at least 20cm (8") above the highest possible waterline, and fit the 3/4" (19mm) vented loop at the highest point.

Option 2: Toilet always above the heeled waterline

- Run 3/4" (19mm) hose by the most direct route from the inlet seacock to the inlet of the strainer fitted to the rinse pump.
- Run 3/4" (19mm) hose by the most direct route from the outlet of the rinse pump to the rinse intake elbow.

DISCHARGE PIPEWORK - 4 OPTIONS

Option 1: Toilet below the waterline and discharging overboard.

You must fit a 1 1/2" (38mm) vented loop fitting.

- Run 1 1/2" (38mm) outlet hose from the non-return valve assembly to form a loop which is at least 8" (20cm) above the highest possible waterline, and fit the 1 1/2" (38mm) Vented Loop at the highest point.

Option 2: Toilet always above the heeled waterline and discharging overboard.

- Run 1 1/2" (38mm) outlet hose from the non-return valve assembly down to the outlet seacock by the most direct route.

Option 3: Toilet discharging into holding tank AND top of holding tank above non-return valve at any time.

You must fit a 1 1/2" (38mm) vented loop fitting.

- If there is any possibility that the discharge non-return valve assembly may be below the top of the tank at any time, a ventilated anti-syphon loop must be fitted in the outlet pipework to ensure that the contents of the tank do not syphon out through the bowl.
- Arrange the outlet hose to form a loop which is at least 8" (20cm) above the highest possible level that the top of the tank may reach, and fit the vented loop at that highest point.

Option 4: Toilet discharging into holding tank, AND non-return valve always above the top of holding tank.

- Run the outlet hose by the most direct route from the non-return valve assembly down to the holding tank inlet.

CONTROLS AND ELECTRICS

You must :

- Keep the total length of both the positive and negative wires to a minimum, selecting your wire size from the Electrical Specifications table below.



CAUTION! Inadequate wire size will result in voltage drop, and will reduce performance.

Make all joints with appropriately rated marine grade terminal blocks and crimp connectors.

Use marine grade multi-strand copper wire.

Support all wires approximately every 18" (45cm) with plastic cable clips.

You must fit the correct size of fuseholder or circuit breaker, selected from the electrical specifications table. If you connect the control box directly to the battery, fit your fuseholder or circuit breaker within 7" (17cm) of the battery.



CAUTION! Remove fuse, or turn circuit breaker off, whilst installing Controls and Electrics.

ELECTRICAL SPECIFICATIONS

Voltage	Amp Draw	Fuse/Breaker	Wire size mm ² (AWG) per metre (foot) of length*			
			0-4m (0-13ft)	4-6m (13-20ft)	6-12m (20-40ft)	12-18m (40-60ft)
12V DC	20	25 amp	4 mm ² (#10)	6 mm ² (#8)	8 mm ² (#6)	19 mm ² (#4)
24V DC	10	15 amp	2.5 mm ² (#16)	4 mm ² (#14)	6 mm ² (#10)	8 mm ² (#10)

* Wire length is the total distance from the battery to the Flush pump and back to the battery

SECURING THE BOWL AND FITTING THE SEAT AND LID

- Apply a bead of white silicone sealant to the base of the toilet.
- Bolt down the toilet, using plastic washers next to the china, with stainless steel washers between the plastic washers and the bolt heads. Tighten the fastenings securely. If you are not using self-locking nuts, use nutlocking compound.
- Fit the seat and lid using the adjustable fastenings supplied with it.

TESTING

- Ensure that the battery is fully charged, and that the circuits are live.
- Open both seacocks.
- Refer to the next section - OPERATING INSTRUCTIONS.
- To prime the Solenoid Valve or Rinse pump on first installation, operate the 'Quick Flush' function several times until water flows into the toilet bowl. Thereafter they are automatically switched by the Control Panel.

SAFETY

Ensure that this instruction manual reaches the owner, skipper or operator of the craft as it contains essential safety information.

ON COMPLETION - CLOSE BOTH SEACOCKS

OPERATING INSTRUCTIONS

The toilet is one of the most used pieces of equipment on your boat. Correct operation of the toilet is essential for the safety and comfort of your crew and craft.

- Open inlet and outlet seacock (and secondary valves if fitted)
- Use good quality hard or soft household toilet paper, but do not use more than necessary.
- Do not put anything in the toilet unless you have eaten it first, except toilet paper.



HAZARD RISK: Accidental Damage. SHUT SEACOCKS!

If the toilet is connected to any through-hull fittings that are below the waterline at any time, and if the toilet or pipework is damaged, water may flood in, causing the craft to sink, which may result in loss of life.



Therefore after every usage, both seacocks (or secondary valves) must be shut. Whenever your craft is unattended, even if for only a short period of time, both seacocks (even if secondary valves are fitted) must be shut.

- Ensure that all users understand how to operate the toilet systems correctly and safely, including seacocks and secondary valves.
- Take special care to instruct children, the elderly and visitors.

CLEANING

- To clean the bowl, use any liquid or cream ceramic cleaner.



CAUTION: Do NOT use aggressive chemical agents such as Acetone or Bleach because the plastic parts may crack and the enamel coating on the seat and lid may blister.

- To clean the rest of the toilet, including the seat and lid, use a non-abrasive liquid cleaner. Polish with a dry cloth only.



CAUTION: Do not use abrasive pads on any part of the toilet and do not use cream cleaners except for the bowl.

- To disinfect the toilet, use a liquid disinfectant diluted in accordance with the manufacturers instructions. You may apply it to all parts of the toilet using a sponge or soft brush as necessary.



CAUTION: Do not use thick liquid toilet cleansers or neat bleach. They may damage the valves, gaskets, seals and the enamel coating of the seat and lid.

SERVICING INSTRUCTIONS

SEAFLO Deluxe Flush Electric Toilets do not normally require maintenance during the season, provided that they are winterised in the autumn.

- Regularly check all fastenings for tightness and leaks.



HAZARD RISK: Leaks. REPAIR LEAKS IMMEDIATELY!

If the toilet is connected to any through-hull fittings and, if the toilet or the pipework develops a minor leak, it can suddenly become a major leak that allows water to flood in, causing the craft to sink, which may result in loss of life. Therefore, if any leak develops you must repair it immediately.

SOLENOID VALVE

The Solenoid Valve is maintenance free.

RINSE PUMP

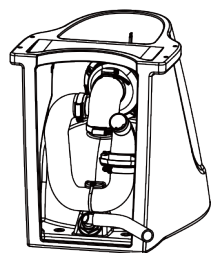
Please refer to the data sheet provided for the SEAFLO 43T series rinse pump.

CERAMIC SHAFT SEAL

In the unlikely event that water begins to drip from the shaft of the flush pump motor, the ceramic Seal is worn and must be replaced.

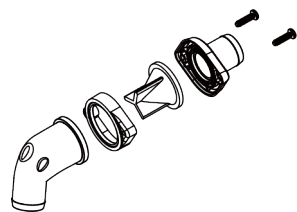
SERVICING - FLUSH PUMP

1



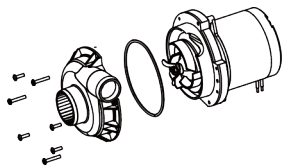
Place the toilet upside down, loosen the three clamps with a screwdriver in turn, and cut off two nylon ties. Take out the sewage joint assembly, the special-shaped sewage pipe, the sewage pump and the L-shaped sewage pipe in turn, and disconnect the flush pump wire.

2



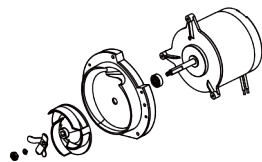
Use a screwdriver to take out the two screws of the sewage joint assembly to check whether the check valve is damaged or aged.

3



Use a screwdriver to take out the 7 screws of the flush pump, and take out the pump cover and O-ring. Check whether the O-ring is damaged or aged, and clean the parts inside the flush pump.

4



Unscrew the nut and remove the nut, spring washer, blade, impeller and pump base in turn. Take out the oil seal in the pump seat with a tool and check whether the oil seal is damaged or aged.

FIT NEW SHAFT SEAL

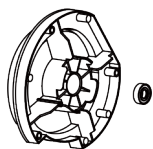
You must:

- Have perfectly clean and dry fingers when you handle the ceramic seal, or wear surgical gloves.



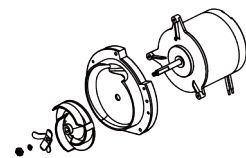
CAUTION! Do NOT allow anything at all to touch or fall onto the mating faces of the new ceramic seal!

1



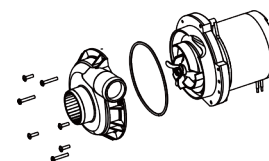
The spring side of the oil seal faces the pump seat, press the oil seal into the groove of the pump seat with a tool, and apply grease.

2



Install the pump seat, impeller, blade and spring washer on the motor in turn, and lock the nut.

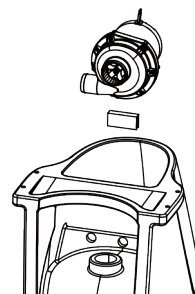
3



Fit the O-ring on the pump seat, cover the pump cover, and lock it with screws.

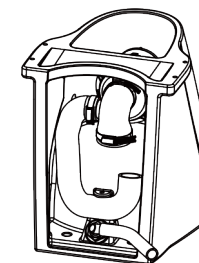
INSTALLATION NEW FLUSH PUMP

1



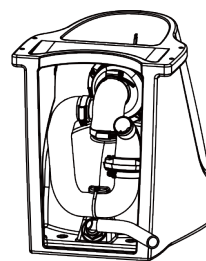
Install the U-shaped pad and new flush pump on the toilet basin, and fix it with nylon cable ties.

2



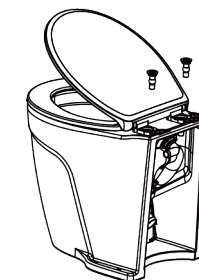
The flush pump is installed with L-shaped sewage pipes and special-shaped sewage pipes, and fastened with clamps.

3



The special-shaped sewage pipe is assembled with the sewage joint assembly and fixed with a clamp and a nylon cable tie.

4



Install the toilet cover according to the cover assembly method, and connect the power.

ELECTRICAL CONNECTIONS

Carefully inspect all electrical connections, even if they are protected. Remove any corrosion on the terminals or in the cables, and remake any loose or weak connections, because these cause voltage drop when under load, which directly reduces both Rinse and Flush pump performance. Protect all electrical connections against moisture.

SERVICING & WINTERISATION - PREPARATION

SEAFLO Deluxe Flush Electric Toilets are designed to be user serviceable and no special skills are required.

- Flush the toilet in accordance with the operating instructions and ensure that all waste has left the discharge pipework and that the bowl is empty.
- Close both seacocks (even if secondary valves are fitted)
- Switch off power or remove fuse.
- Be ready to mop up any water that may come out of the system.

SERVICING - WINTERISATION

Drain the complete system, both as protection against frost damage and to discourage the growth in the pipework of bacteria that cause unpleasant smells.

- Loosen hose clips and disconnect the hose ends from both the seacock hose tails. Ensure that all water is drained from the toilet system.



CAUTION: The use of anti-freeze is not recommended, as it is impossible to ensure that it penetrates the complete toilet system. If, for any reason, anti-freeze is used it must be glycol based.



HAZARD RISK: Seacocks opened by mistake.

ATTACH WARNING NOTICE!

If you leave the toilet disassembled and, if the seacocks are opened when the craft is afloat, water will flood in and may cause the craft to sink, which may result in the loss of life. Therefore, you must attach a warning notice to the seacocks and, if possible wire the seacocks shut. Whenever your craft is unattended, even if for only a short period of time, both seacocks (even if secondary valves are fitted) must be shut.

If you are not leaving the toilet disassembled:

- Reconnect all hose ends and secure them with their hose clips.
- Replace the non-return valve assembly.
- Fasten down the seat and lid to prevent use and attach a warning notice.

HOSES

The Solenoid Valve is maintenance free.

- Examine all hoses throughout their length for chafe, kinks and splits under hose clips. Check all hose clips for corrosion and replace worn or damaged parts.



CAUTION: Do not apply flame to the hose. Do not apply flame or heat to the plastic hose tails on the toilet, rinse pump or solenoid valve. Do not use oils, greases or synthetic lubricants. Do not apply sealing compounds to any hose connections. Do not over tighten hose clips. Any of these actions may result in cracking or breakage of the plastic parts.

- Reconnect all loose hose ends and secure them with their hose clips.

SERVICING - TESTING

- Open inlet and outlet seacocks (and secondary valves if fitted).
- Switch on power of replace fuse.
- Use touch pad controller as described on page 2, to check all functions, and then inspect for leaks.

ON COMPLETION - CLOSE BOTH SEACOCKS

TROUBLESHOOTING

BOWL FILLS WHEN NOT IN USE

- Shut seacocks
- Fit vented loops

WASTE WATER RE-APPEARS IN BOWL

- Check non-return valve assembly

BOWL DOES NOT EMPTY

- Open outlet seacock
- Check non-return valve assembly, discharge hose or outlet seacock for blockage.
- Remove pump and check for blockage

WATER DOES NOT COME IN

- Open Inlet seacock
- Check Inlet hose connections are airtight
- Check electrical connections to solenoid valve or rinse pump