

SeaEra QC Toilet

Series QC, Model 162 (manufactured after June 2014)

OPERATION, MAINTENANCE AND INSTALLATION INSTRUCTIONS

THE FOLLOWING ARE CAUTIONARY STATEMENTS THAT MUST BE READ AND FOLLOWED DURING BOTH INSTALLATION AND OPERATION.

WARNING: *Raritan Engineering Company, Inc. recommends that a qualified person or electrician install this product. Equipment damage, injury to personnel or death could result from improper installation. Raritan Engineering Company, Inc. accepts no responsibility or liability for damage to equipment, injury or death to personnel that may result from improper installation or operation of this product.*



WARNING: HAZARD OF SHOCK OR FIRE



Always use recommended fuse, circuit breaker and wire size.

Motors used with this product are "Ignition Protected". They are not however, explosion-proof as defined in 46CFR 110.15-65(e), Subchapter J-Electrical Engineering.

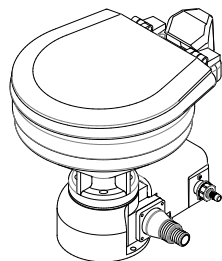
DO NOT run continuously for more than 30 seconds.

WARNING: HAZARD OF FLOODING - Always shut off seacock(s) before leaving the boat unattended.

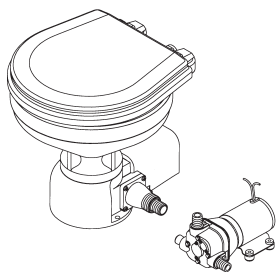


Double clamp all below waterline hose fittings and check frequently for integrity.

**Pressurized
Freshwater Model**



**Sea Water
Model(Remote Pump)**



SeaEra toilet is available in 12V or 24V DC.

Bowls are available in two models: standard and household. Fresh water model utilizes onboard freshwater, the Sea water model utilizes a remote pump installed between raw water source and bowl. Sea/Fresh models can switch between fresh and raw water source.

Three different control options are available:

1. **Smart toilet control (STC):** provides timed operation and independent control of water and discharge
2. **Multifunction control:** provides momentary operation and independent momentary control of water and discharge
3. **Push button switch:** providing only the ability to flush with no independent control of water or discharge.



IMPORTANT SAFETY INSTRUCTIONS:

WARNING: HAZARD OF FLOODING - Always shut off seacock(s) before leaving the boat unattended.

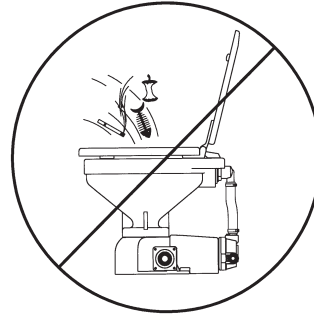
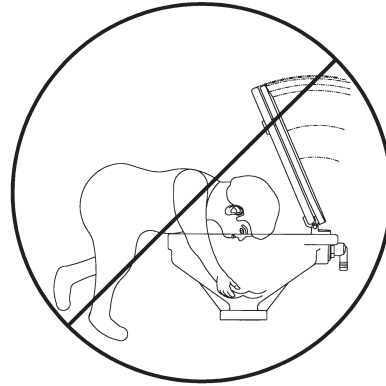


Double clamp all below waterline hose fittings and check frequently for integrity.

Toilets mounted at or below the waterline must have a vented loop installed in the discharge line. The top of the vented loop must be a minimum of 4" (10cm) above the waterline at the boats greatest angle of heel (see vented loop manufacturer's instructions). Sea Water Models must also have a vented loop installed between the intake pump and the toilet bowl. Double clamp all below waterline connections.

WARNING:

Young children should NOT be left unsupervised around toilet. Serious injury or death could occur. Children can drown in water retained in the bowl. Seat and/or lid could close and strike child. Always replace circuit breaker and fuses with same rating. Use Raritan parts to maintain ignition protection requirements.



Cleaning Instructions

IMPORTANT: Do not use cleaners that contain ammonia, ethyl acetate, phosphoric acid or concentrated chlorine bleach. These may cause damage to the toilet.

Using Raritan C.P. (part# 1PCP22) a bio-enzymatic toilet bowl cleaner will keep the bowl clean and fresh smelling.

Recommend Visual Inspection

- ✓ For leaks at toilet and hose connections
- ✓ Hose clamps
- ✓ Condition of hoses
- ✓ Seacocks
- ✓ Condition of wires and connections
- ✓ In-Line Strainer (if you have one)

- No special toilet paper is required.
- Water should appear in the bowl within ten seconds. If not, see troubleshooting section.
- Hard objects or stringy substances (paper towels, feminine hygiene products, filter cigarettes, etc.) must not be thrown into the toilet as they will cause damage.
- Always shut off seacock(s) before leaving the boat unattended.

Cleaning In-Line Strainer (Optional part# 163000) (Sea Water Models only)

Shut off intake seacock. Unscrew bowl. Remove filter. Clean bowl and filter with a clean cloth. Clean gasket and gasket contact surfaces thoroughly. Replace gasket, filter and bowl. Open seacock. Check for leaks.

OPERATION:

Refer to manual enclosed in control switch.

Winterizing:

- Improper winter lay up is a major cause of marine toilet failure.
- Use only nontoxic antifreeze.
- Flush toilet several times to clear waste from system.
- Dispose of all antifreeze in accordance with local and federal regulations.
- Winterize holding tanks, plumbing, treatment systems (MSD's), etc. Independently following manufacturer's instructions.

Pressurized Freshwater Models

Parts Required:

- 1" (25 mm.) Or 1 1/2" (38 mm.) I.D. discharge hose, approximately 3 feet (1 m.) long
- Two buckets
- Nontoxic antifreeze approximately 1 quart (1 liter)

Steps:

1. Close discharge seacock (if one exists).
2. Shut off intake water at source.
3. Turn off power to unit.
4. Disconnect and drain discharge hose.
5. Disconnect intake hoses from water solenoid and place in one of the buckets.
6. Connect short hose to toilet's discharge and place in other bucket.
7. Pour antifreeze in bowl.
8. Turn on power to unit and flush until antifreeze is removed from the bowl and water is drained from the solenoid and hose.
9. Disconnect power to toilet.
10. Reconnect intake hoses to water solenoid

Remote Intake Pump Model

Parts Required:

- 3/4" (19 mm.) I.D. intake hose approximately 3 feet (1 m.) long.
- 1" (25 mm.) or 1 1/2" (38 mm.) I.D. discharge hose approximately 3 feet (1 m.) long.
- Two buckets
- Nontoxic antifreeze approximately 1 quart (1 liter)

Steps:

1. Close the intake and discharge seacocks.
2. Turn off power to unit.
3. Disconnect and drain intake hose and discharge hose .
4. Connect short hoses to toilet's intake and discharge.
5. Place one bucket under hose connected to toilet's discharge.
6. Pour nontoxic antifreeze in other bucket.
7. Place hose connected to intake pump into bucket with antifreeze.
8. Turn on power to unit and flush toilet until antifreeze begins to be discharged from toilet.
9. Disconnect power from toilet.

RECOMMISSIONING

1. Using the buckets, hoses and approximately one gallon (3.8 liters) of clean fresh water, flush antifreeze out of the toilet (see Winterizing). Dispose of antifreeze in accordance with local and federal regulations.
2. Reconnect the intake and discharge hoses and open both seacocks and water source valve.
3. Check all connections for leaks with several test flushes.

SYSTEM START-UP

1. Open seacock(s).

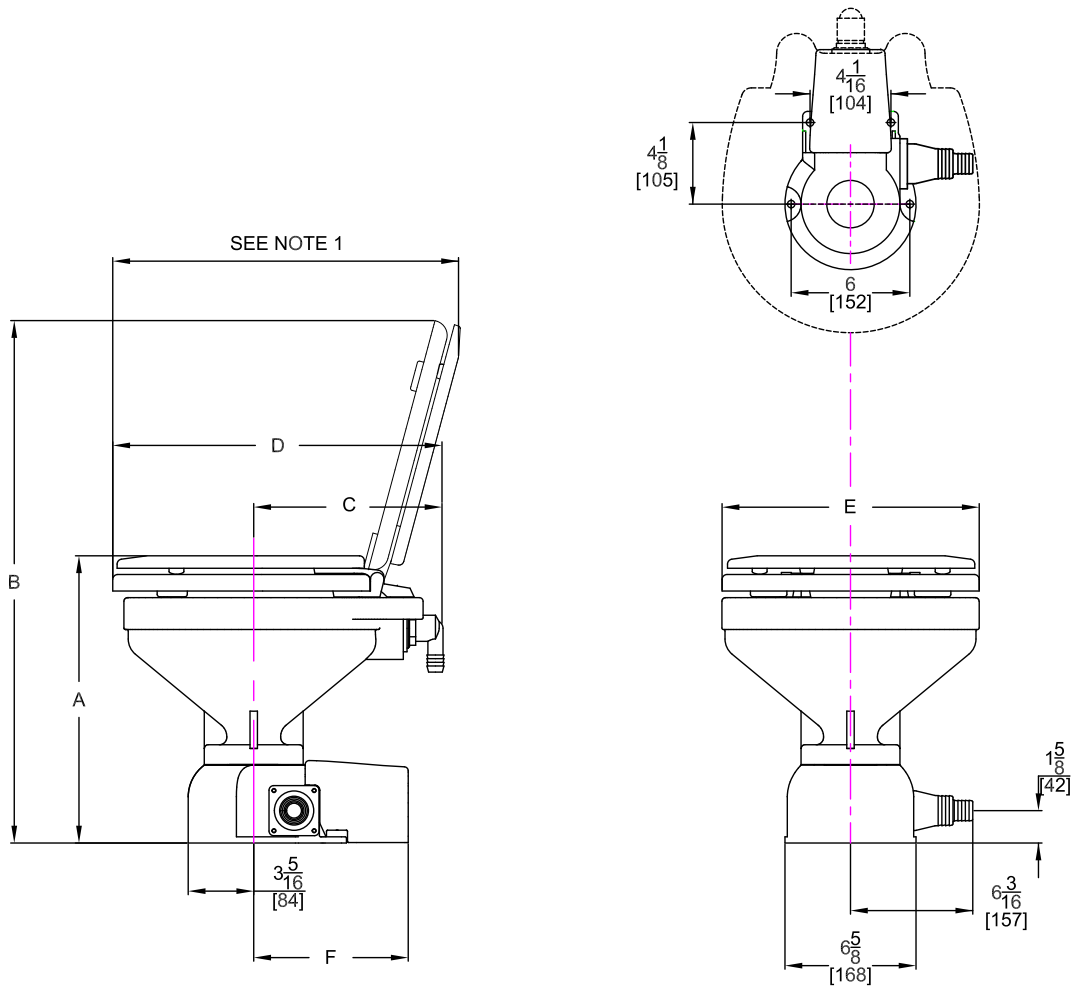
NOTE: Pressurized freshwater models; open water source valve.

2. Turn on power to toilet.
3. Flush toilet per operation instructions.
4. Check for leaks.

IMPORTANT: If toilet does not flush properly or if water does not enter the bowl within 10 seconds, refer to troubleshooting.

SPECIFICATIONS

Pressurized Freshwater or Remote Sea Water Model



BOWL TYPE	A	B	C	D	E
MARINE	14 1/2 (368)	26 1/2 (673)	10 3/8 (264)	17 1/4 (438)	13 (330)
HOUSEHOLD	14 7/8 (378)	29 5/8 (752)	11 1/2 (292)	20 (508)	14 3/8 (365)

INTAKE	F
PRESSURIZED FRESH WATER	8 7/8 (225)
REMOTE PUMP	7 13/16 (199)

INCHES
(MM)

NOTE:

1. THE SEAT WILL OPEN WITHIN THE DEPTH OF THE BOWL (D), HOWEVER, IT MAY BE DESIRABLE TO INCREASE THIS ANGLE BY ALLOWING MORE ROOM AT THE BACK OF THE BOWL FOR THE SEAT TO OPEN.
2. DIMENSIONS ARE FOR REFERENCE AS VITREOUS CHINA DIMENSIONS MAY VARY +/- 5%.

Plumbing

Maximum suction of Intake pump (Maximum height above waterline)	4 Ft. (1.2m) from Intake Pump.
Maximum height of discharge vented loop	6 Ft. (1.8m) from base of toilet.
Pressurized water source requirements	minimum flow rate of 3.5 gpm (13.25 liters) at 10psi (70 K pa) shutoff pressure of 5 psi (34.5 kPa).

NOTES: for Wiring

1.	Distances are from source to unit and back to source.
2.	Distance from power source to remote intake pump MUST be included when determining total distance. Same wire size MUST be used for lower base and remote intake pump.
3.	Recommended conductor wire minimum AWG (mm ²) for 3% voltage drop.
4.	Recommended conductor sizes are based on 105°C rated insulation. Refer to ABYC Standards for other insulation ratings.
5.	For 120/240 VAC units use 12VDC specifications from transformer to unit.

CONVERSIONS

Wire - AWG to mm²

AWG	16	14	12	10	8	6	4	2
mm ²	1.5	2.5	4.0	6.0	10.0	16.0	25.0	35.0

Feet to Meters

Feet	10	15	20	25	30	40	50
Meter	3.1	4.6	6.1	7.6	9.2	12.2	15.2

Sea Water Model - Recommended Wire and Fuse/Circuit Breaker Size

Units Voltage	Circuit Breaker/fuse size (amps)	Remote Pump and lower base Amp. draw @ nominal voltage	Remote Pump only Amp. draw @ nominal voltage	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC	25	23	10	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG
24 VDC	15	12.5	5	14 AWG	14 AWG	12 AWG	10 AWG	10 AWG

Pressurized Freshwater Model - Recommended Wire and Fuse/Circuit Breaker Size

Units Voltage	Circuit Breaker/fuse size (amps)	Amp. draw @ nominal voltage	10 feet	15 feet	20 feet	30 feet	40 feet	50 feet
12 VDC Lower Base	25	13	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG
24 VDC Lower Base	15	7.5	14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG
12, 24, and Water Solenoid Valve	3	2	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG	16 AWG

INSTALLATION

Parts Included

All Complete Toilets

Toilet Bowl
Seat and Cover
Lower Base Assembly
Motor Cover
Control

Sea Water Model

3/4" Hose Barb - straight fitting (2)
3/4" Hose Barb - 90° fitting
Plug Fitting

Tools Required

5/16" nut driver, wrench or screw driver
5/8" (16mm) drill bit, bit for drilling mounting surface, wire cutters, wire terminal crimpers, hose cutters, tape measure

Mounting Toilet

Mounting surface must be flat and solid.

1. Install seat on toilet.
2. Remove motor cover.
3. Place toilet where it will be located.
Make sure there is room to route hoses.
Make sure seat will open properly.
4. Mark location of toilet base mounting holes on mounting surface.
5. Drill holes for toilet mounting bolts/screws.

NOTE: Hole size will depend on type of bolt/screws used (5/16" [8 mm] size bolts/screws are recommended).

6. Secure toilet to surface

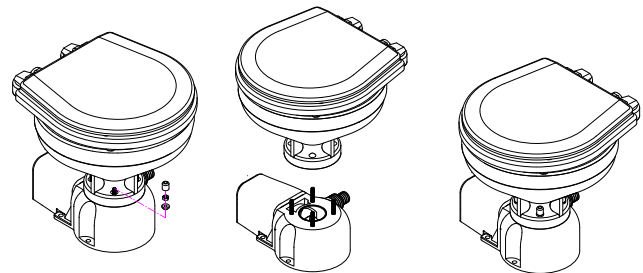
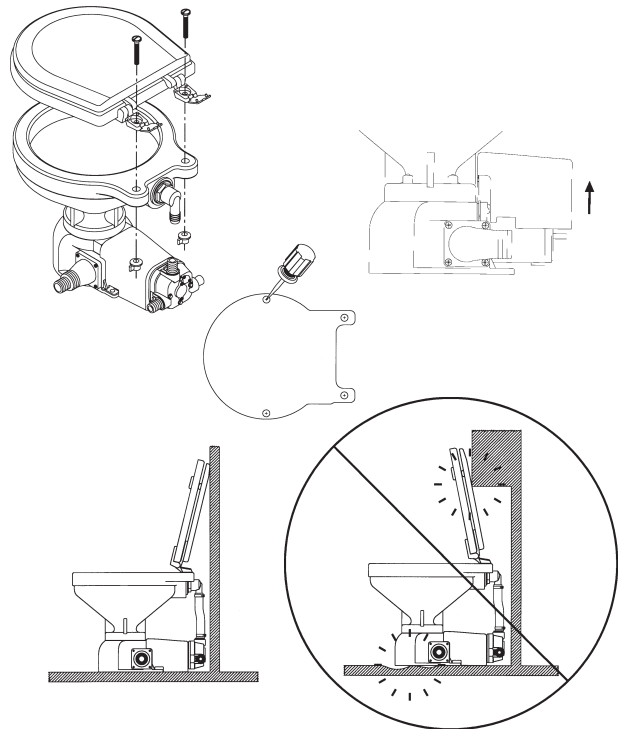
90° Rotation of Toilet Bowl

Toilet bowl can be rotated 90° on the base, for installing in confined locations.

1. Determine which direction bowl is to be mounted.
2. Remove four vinyl caps at the base of toilet bowl.
3. Remove four nuts and shoulder washers.
4. Carefully remove toilet bowl from base.
5. Rotate toilet bowl to desired position.
6. Replace four shoulder washers, nuts and vinyl caps.

Additional Parts Required

- Four stainless steel mounting bolts or lag screws (minimum 1/4" [6mm]) and washers
- 1" (25mm) or 1 1/2" (38mm) I.D. discharge hose
- 3/4" (19mm) I.D. reinforced intake hose
- 3/4" (19mm) and 1" (25mm) or 1 1/2" (38mm) hose clamps (two for each connection below waterline)
- Wire
- Terminals
- Fuse/circuit breaker



NOTE: Tighten nuts carefully and evenly. Do Not over tighten.

Install the Warning Label (L322) where it can be easily seen.

PLUMBING

WARNING: Hazard of Flooding

Toilets mounted at or below the waterline must have a vented loop installed in the discharge line. The top of the vented loop must be a minimum of 4" (10cm) above the waterline at the boat's greatest angle of heel (see vented loop manufacturer's instructions).

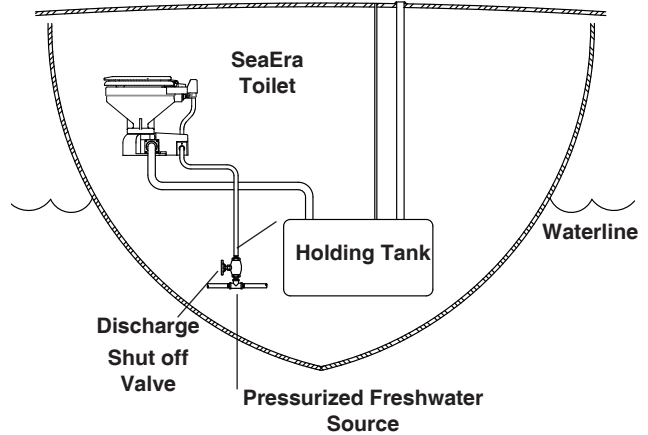
Sea Water Models must also have a vented loop installed between the intake pump and the toilet bowl.

Double clamp all below waterline connections.

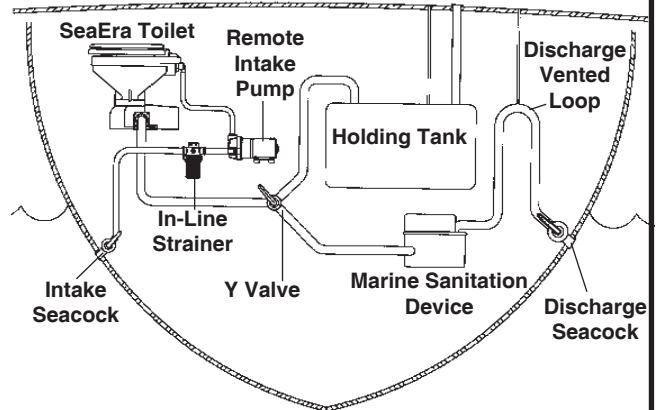
IMPORTANT

- Fittings and 90° bends should be kept to a minimum.
- Discharging untreated sewage is forbidden in all U. S. waters within the three-mile limit.
- Thru-hull fittings and seacocks must be installed where they are easily accessible.
- Use only quality reinforced hoses.
- Secure all hoses properly.

Pressurized Freshwater Model Installed Above Waterline



Remote Intake Pump Model Mounted Above Waterline



Intake Lines

Pressurized Freshwater Models

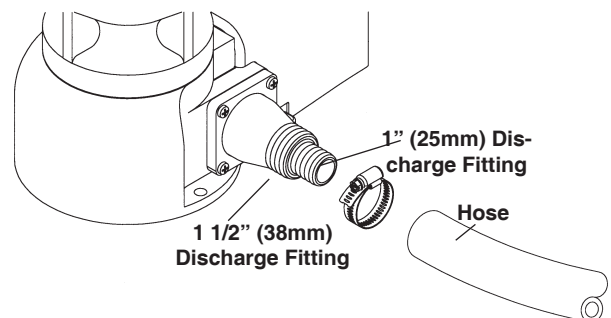
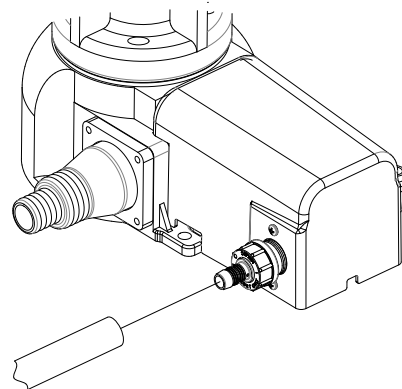
Install a shut off valve in intake line before water solenoid valve.

1. Connect hose from shut off valve to inlet port of water solenoid valve.

NOTE: To avoid malfunction of water solenoid due to debris in water, installation of Freshwater Strainer (190601) is recommended.

Discharge Lines

1. Connect quality sanitation hose 1" (25mm), Raritan part# SFH1, or 1 1/2" (38mm) I.D., Raritan part# SFH to discharge fitting on toilet.
2. Run hose to appropriate device (i.e.: treatment system, holding tank, etc.).



Remote Sea Water Models

Intake pump fittings are interchangeable to allow more flexibility during installation. Inlet ports are located on either side of intake pump. Outlet port (to toilet bowl) is at top of intake pump.

NOTE: To avoid poor pump performance installation of strainer (163000) is recommended

1. Slide fitting clips to open position.
2. Select inlet port to be used.
3. Install appropriate fittings into inlet and outlet ports.

NOTE: The 90° fitting can be rotated 360°.

4. Install the plug fitting into unused inlet port.

IMPORTANT: Be sure not to install plug fitting into outlet port! Damage to pump will occur!

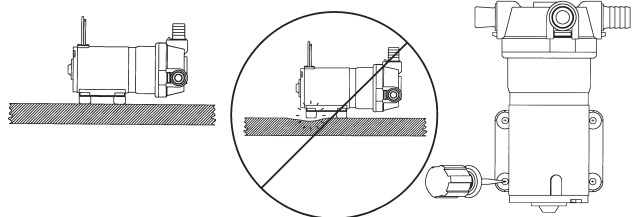
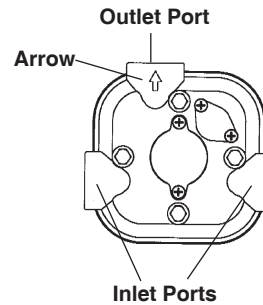
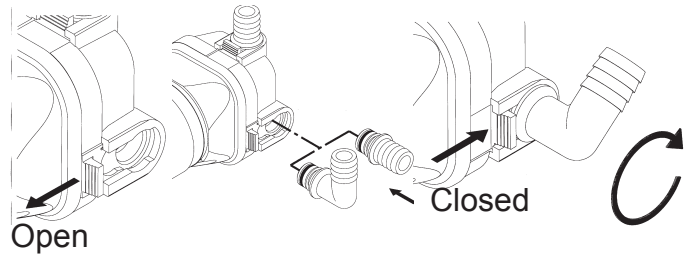
5. Slide fitting clips back to closed position.
6. Connect hose from seacock to inlet port of optional In-Line Strainer if installed. Use hose clamp provided.
7. Connect hose from outlet port of In-Line Strainer to inlet port of intake pump. Use hose clamp provided.

IMPORTANT: Double clamp all below water-line hose connections!

8. Connect hose from outlet port of intake pump to bowl elbow located on back of toilet bowl.

Mounting Remote Pump:

1. Locate remote pump between thru hull fitting and toilet bowl.
2. Locate in an area away from berth to keep noise level down.
3. Use Inline Strainer (optional) to avoid clogs.
4. Secure remote pump to the floor using four bolts through the pump base.



TROUBLESHOOTING

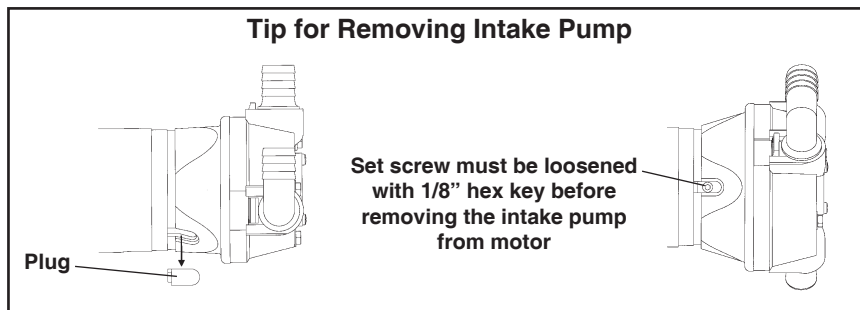
WARNING: HAZARD OF ELECTRIC SHOCK - Before beginning any work on the SeaEra, be sure that all power to the unit has been turned off.

WARNING: HAZARD OF FLOODING - Make sure seacocks are in the CLOSED or OFF position before working on toilet.

NOTE: The following information reflects the most probable causes and solutions to problems although not every possible cause and solution is provided.

Any questions regarding servicing or operation of the SeaEra should be directed to our Technical Support Department in Millville, NJ or Ft. Lauderdale, FL. Please have model and serial number available before calling.

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Poor pumpout, especially solids.	1A. Clogged discharge line. 1B. Plumbing restrictions, bends and ells. 1C. Clogged vents. 1D. Mineral buildup in hoses and fittings. 1E. Low voltage.	1A. Be sure discharge seacock is open. Clear line, remove clog. 1B. Replumb to eliminate bends and ells. 1C. Clean holding tank vent and vented loop vents 1D. Clean or replace affected parts. Replace hose if needed. 1E. Check voltage at toilet while toilet is running . If less than nominal voltage of toilet (12, 24, or 32), check condition of batteries and wire sizes. Check terminals and wire connections for corrosion (heat at terminals and junctions indicates a bad or corroded connection).
2. Poor water flow, especially at front of bowl (or no water flow).	2A. Toilet not level. 2B. Restriction in intake line. 2C. Pump sucking air. 2D. Low voltage. 2E. Clogged strainer.	2A. Raise rear of toilet; check with level. 2B. Be sure seacock is open. Clear line-remove clog. 2C. Check all connections from intake thru-hull to intake pump to be sure no air leaks are present. 2D. See 1E, above. 2E. Remove or clear debris from strainer.
3. Foul odors from toilet area.	3A. "Marine life" lodged in rim of bowl. 3B. Permeated discharge hose. 3C. Sewage remaining in discharge line.	3A. Remove and flush bowl with pressure hose to remove all material. Install strainer or KO2 kit in intake line to avoid recurrence. 3B. Replace hose with Raritan sanitation hose (#SFH). 3C. Flush longer; replace hose if permeated; reroute hose making a shorter run or downward slope if possible.
4. Bowl fills while underway.	4A. Pressure buildup at seacocks.	4A. Close intake, then discharge seacock to determine which is causing problem. If discharge, be sure the vent or vented loop is clean. If intake, there is too much pressure on seacock; contact Raritan Technical Support.
5. Water leaking from under unit.	5A. Leaking bowl gasket. 5B. Leak at shaft seal. 5C. Leak from seal plate area.	5A. Tighten (4) bowl mounting nuts (#1226B). 5B. Check seal and motor shaft. 5C. Check seal plate o-ring.
6. Erratic operation/sluggish running.	6A. Worn motor brushes. 6B. Motor bearings damaged by seal leak. 6C. Low or inconsistent voltage.	6A. Return motor to factory for servicing or replacement. 6B. Return motor to factory for servicing or replacement. 6C. See 1E above.



SeaEra model 162 PARTS LIST

Item	Part#	Description
1	1237W	Marine-size Bowl
1	1244W	Household-style Bowl
2	1236AW	Bowl Spud Assembly
3	1236E	Bowl Elbow (sea water only)
5	1234	Bowl Gasket
6	VCAP	White Vinyl Cap
7	1226B	1/4-20 Hex Nut (4)
8	RNI	Shoulder Washer
9	CH38	Water Solenoid Valve Mounting Bracket
10	161105	Base
11	C254	Joker Valve
12	161130	Discharge Fitting
13	1222AW	90° Discharge Fitting
14	161125	Discharge Mounting Flange
15	F164	Discharge Mounting Flange Fastener(4)
16	161107	Seal Plate O-Ring
17	1108A	Macerator Nut
18	M23A	Macerator Lockwasher (5)
19	161123	Macerator Blade
20	161120	Impeller/Macerator Housing
21	161115	Impeller
22	31-102	Shaft Seal
23	161110	Seal Plate
24	1610*	Discharge Motor
25	HW1	Mounting Screw Lockwasher (4)
26	F098	1/4 - 20 x 1" hex (4)
28	164000BR	Push Button Switch
41	162420	Fitting Clip (3)
43	162425	Fitting O-Ring (4)
45	162405	3/4" Hose Barb - 90° Fitting
47	162415	Plug Fitting
50	162410	3/4" Hose Barb - Straight Fitting (2)
51	190601	Inline Fresh Water Strainer (optional)
61	163000	Inline Strainer

Additional Parts Included with

REMOTE MODELS

27	161135	Motor Cover
62	1660*A	Intake Motor
	166000	Remote Intake Pump, 12V DC
	166100	Remote Intake Pump, 24V DC
	166200	Remote Intake Pump, 32V DC
64	162000W	Remote intake pump w/o motor

Additional Parts Included with

FRESHWATER MODELS

70	161145	Motor cover
71	221351*	Water solenoid
72	PLH-50P	Hose, white 1/2", 1 FT.
73	PLE90-50N	1/2" 90 deg Hose Barb Elbow
74	221366	Clips,
75	161146	Grommet plate
76	F201	Screw M4 x 10mm
77	221357	Hose adapter straight
80	168006	Vacuum break cover
81	221360	O-ring
82	25309	Nut 3/4 FNPT
83	221300	Vacuum breaker assy.

DISCHARGE ASSEMBLY

16-24	162012W	Discharge Assembly w/o intake pump 12V
16-24	162024W	Discharge Assembly w/o intake pump 24V
16-24	162032W	Discharge Assembly w/o intake pump 32V

Repair Kits

DIAPUMPRK	Diaphragm Pump Repair Kit
SEADISRK	SeaEra Discharge Repair Kit

* Specify DC Voltage (12, 24, 32)

SeaEra QC series Exploded Parts View

EXPLODED PARTS

