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.

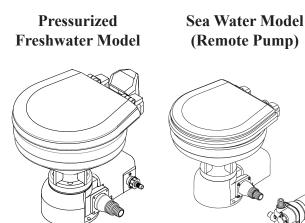
WARNING: HAZARD OF SHOCK OR FIRE



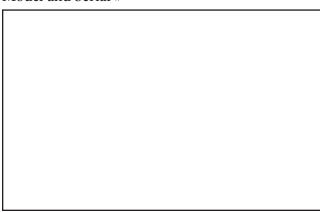
Always use recommended fuse, circuit breaker and wire size. Motors used with this product are "Ignition Protected". They are not however, explosion-proof as defined in 46CFR 110.15-65(e), Subchapter J-Electrical Engineering. **DO NOT** run continuously for more than 30 seconds.

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.



Model and Serial



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.

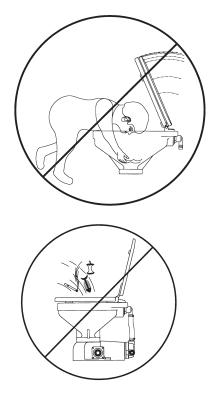
Cleaning Instructions

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

- \checkmark For leaks at toilet and hose connections
- ✓ Hose clamps
- ✓ Condition of hoses
- ✓ Seacocks
- \checkmark 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.

CONTROL SWITCH 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

- 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.

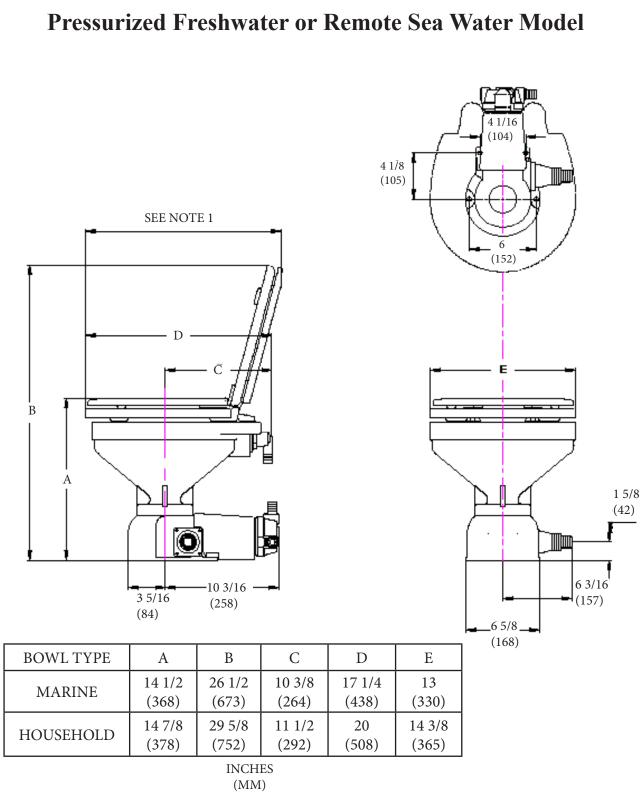
SYSTEM START-UP

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.



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 DIMENTIONS 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.		
	Distance from power source to remote intake pump MUST be included when	AWG	16
2.	determining total distance.Same wire size MUST be used for lower base and remote intake pump.	mm ²	1.5
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.		Feet
5.	For 120/240 VAC units use 12VDC specifications from transformer to unit.		Mete

CONVERSIONS

Wire - AWG to mm ²								
G	16	14	12	10	8	6	4	2
n²	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	only	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

	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					

Parts Included

All Complete Toilets Toilet Bowl Seat and Cover Lower Base Assembly Motor Cover 1 1/2 (38mm) 90° Discharge fitting Adapter, 1" FPT x Barb Control

Sea Water Model

Intake Pump

3/4" Hose Barb - straight fitting (2)3/4" Hose Barb - 90° fittingPlug 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.

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) for seawater models or 1/2" (13mm) for freshwater models, reinforced intake hose.
- Hose clamps (two for each connection below waterline).
- Wire.
- Terminals.
- Fuse/circuit breaker.

Mounting Toilet

Mounting surface must be flat and solid.

- 1. Install seat on toilet (FIG 1).
- 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 (FIG 2).**
- 4. Mark location of toilet base mounting holes on mounting surface (FIG 1).
- 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 (FIG 3).

- 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.

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

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

Mounting In-Line Strainer (Seawater Models Only)

Make sure strainer bowl is tight.

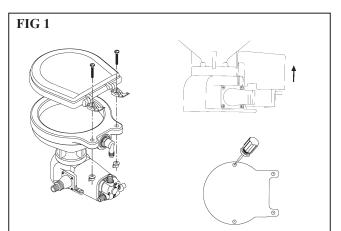
- 1. Locate strainer where it will be accessible.
- 2. Mark and drill mounting holes.
- NOTE: Hole size will depend on type of bolts/screws used (1/4" [6mm] size bolts/screws are recommended).
- 3. Install fittings provided (PLA14) on strainer's inlet and outlet ports.

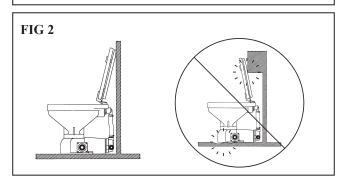
NOTE: Use thread sealant.

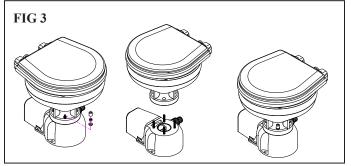
4. Mount strainer. Hoses must be installed according to flow marking on strainer top.

Mounting Remote Intake Pump (Remote Pump Models Only)

- 1. Remote intake pump must be mounted on a flat solid surface in an area that is dry and well ventilated.
- 2. Mark and drill mounting holes.
- NOTE: Hole size will depend on type of bolts/screws used 1/4" [6mm] size bolts/screws are recommended).
- 3. Mount pump. Do not over tighten bolts.







INSTALLATION

PLUMBING WARNING: HAZARD OF FLOODING

FIG 4

Toilets mounted at or below the waterline, at greatest angle of heel, and connected to a Seacock/Thru Hull Fitting(s) MUST have VENTED LOOPS installed in toilet discharge plumbing and between raw water intake pump and toilet bowl.

Install vented loops per manufacturer's instructions. 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.

Discharge Fittings

The SeaEra QC has a straight discharge fitting installed. A $1 \frac{1}{2}$ (38mm) 90° fitting is also provided. Also provided is a 1" hose adapter for the 90° fitting.

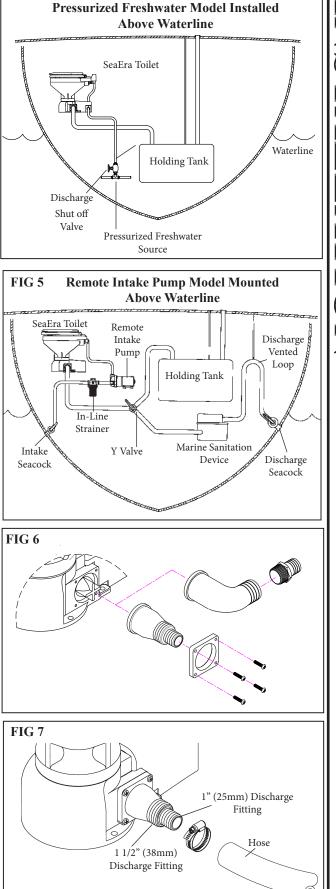
To change the discharge fitting (FIG 6):

- 1. Remove four screws securing fitting to base.
- 2. Remove flange adapter from the straight fitting and install it on the 90° fitting.
- 3. Install 90° fitting to base. Be certain the joker valve is properly in place.
- 4. If 1" (25mm) discharge hose will be used, install the 1" hose adapter into the 90° fitting. Use non hardening thread sealant.

IMPORTANT: Do not overtighten!

Discharge Lines

- Connect quality sanitation hose 1" (25mm), Raritan part# SFH1, or 1 1/2" (38mm) I.D., Raritan part# SFH to discharge fitting on toilet (FIG 7).
- 2. Run hose to appropriate device (i.e.: treatment system, holding tank, etc.).



Intake Lines

Pressurized Freshwater Models

- Install a shut off valve in intake line before water solenoid valve.
- 2. Connect hose from shut off valve to inlet port of water solenoid valve (FIG 8).
- **NOTE:** To avoid malfunction of water solenoid due to debris in water, installation of Freshwater Strainer (190601) is recommended.

Remote Sea Water Models (FIG 9)

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 (FIG 10). **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!

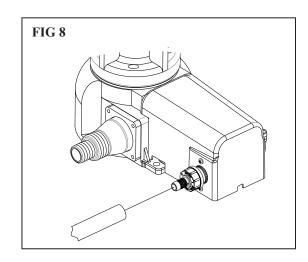
- 5. Slide fitting clips back to closed position.
- 6. Connect hose from seacock to inlet port of optional In-Line Strainer if installed. Use hose clamp provided.
- 7. Connect hose from outlet port of In-Line Strainer to inlet port of intake pump. Use hose clamp provided.

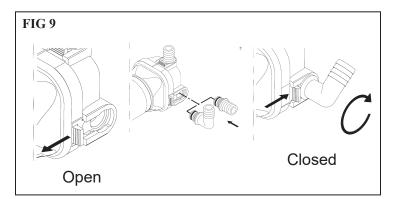
IMPORTANT: Double clamp all below waterline hose connections!

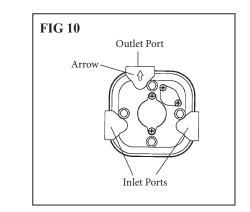
8. Connect hose from outlet port of intake pump to bowl elbow located on back of toilet bowl.

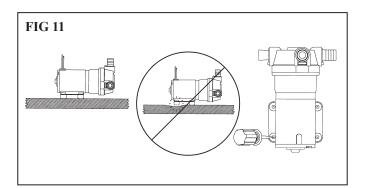
Mounting Remote Pump (FIG 11):

- 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.



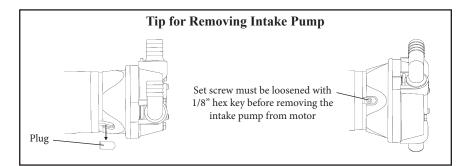






WARNING: H	AZARD	OF ELECTRIC SHOCK - Before	beginning any work on the SeaEra, be sure that all			
-		he unit has been turned off.				
		RD OF FLOODING - Make sure seacocks are in the CLOSED or OFF position before ng on toilet.				
			able causes and colutions to problems although not			
		ible cause and solution is provided.	able causes and solutions to problems although not			
Any questions reg	garding se		ould be directed to our Technical Support Department al number available before calling.			
PROBLEM	1	POSSIBLE CAUSE	SOLUTION			
1. Poor pumpout, e	especially	1A. Clogged discharge line.				
solids.		 Plumbing restrictions, bends and ells C. Clogged vents. 	1A. Be sure discharge seacock is open. Clear line, remove clog.1B. Replumb to eliminate bends and ells.			
		1D. Mineral buildup in hoses and fitting:	5. 1C. Clean holding tank vent and vented loop vents			
		1E. Low voltage.	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), check condi-			
			tion of batteries and wire sizes. Check terminals and wire connections for corrosion (heat at terminals and			
			junctions indicates a bad or corroded connection).			
		2A. Toilet not level.	2A. Raise rear of toilet; check with level.			
	r no water	2B. Restriction in intake line.	2B. Be sure seacock is open. Clear line-remove clog.			
flow).		2C. Pump sucking air.	2C. Check all connections from intake thru-hull to intake pump to be sure no air leaks are present.			
		2D. Low voltage.	2D. See 1E, above.			
2 Faul a la ma fura ma ta	1.4	2E. Clogged strainer.	2E. Remove or clear debris from strainer.			
3. Foul odors from to	illet area.	3A. "Marine life" lodged in rim of bowl.	3A. Remove and flush bowl with pressure hose to remove all material. Install strainer or KO2 kit in intake line to avoid recurrence.			
		3B. Permeated discharge hose.	3B. Replace hose with Raritan sanitation hose (#SFH).			
		3C. Sewage remaining in discharge line.	3C. Flush longer; replace hose if permeated; reroute hose making a shorter run or downward slope if possible.			
4. Bowl fills while un	derway.	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	n under	5A. Leaking bowl gasket.	5A. Tighten (4) bowl mounting nuts (#1226B).			
unit.		5B. Leak at shaft seal.	5B. Check seal and motor shaft.			
		5C. Leak from seal plate area.	5C. Check seal plate o-ring.			
6. Erratic operation	/sluggish		6A. Return motor to factory for servicing or replacement.			
running.		6B. Motor bearings damaged by seal leal	7 8 1			
		6C. Low or inconsistent voltage.	6C. See 1E above.			

TROUBLESHOOTING



SeaEra QC model 162 PARTS LIST

Item	Part#	1
1		Marine-size Bowl
1	1244W	Household-style Bowl
2	1236AW	Bowl Spud Assembly
3	1236E	Bowl Elbow (sea water only)
4	221361	Sealing Washer
5	1234	Bowl Gasket
6	VCAP	White Vinyl Cap
7	1226B	1/4-20 Hex Nut (4)
8	RNI	Shoulder Washer
9	CH38	1/4-20 X2 Threaded stud
10	161105	Base
11	C254	Joker Valve
12	161130	Discharge Fitting
13	1222D	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
21A	F237	Washer- D Shape
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)
29	PLA34	Adapter: 1" MPT xHS
41	162420	Fitting Clip (3)
43	162425	Fitting O-Ring (4)
45	162405	3/4" Hose Barb - 90° Fitting
47	162415	
50	162410	3/4" Hose Barb - Straight Fitting
51	190601	Inline Fresh Water Strainer (Optional)
		-

163000 Inline Strainer (Optional)

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Additional Parts Included with REMOTE MODELS

Item	Part#	Description
27	161135	Motor Cover
62	1660*A	Intake Motor
	166000	Remote Intake Pump, 12V DC
	166100	Remote Intake Pump, 24V DC
64	162000W	Diaphragm Pump Assy.
	(Includes	162420, 162425)

Additional Parts Included with Freshwater models

Item	Part#	Description
70	161145	Motor cover
71	221351	Water Solenoid 12 Volts
71	221352	Water Solenoid 24 Volts
72	PLH-50P	Hose, white 1/2", 1 FT.
73	PLE90-50	N 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.
84	1238SC	Slow Close Marine-size Seat and Cover
84	1245SC	Slow Close Household-style Seat and Cover

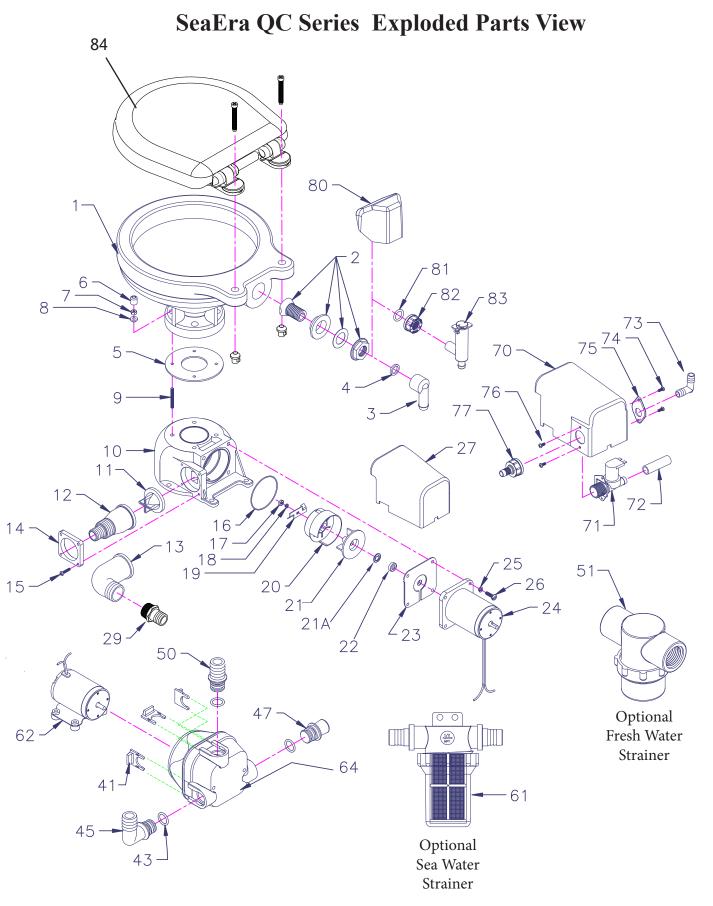
DISCHARGE ASSEMBLY

Item	Part#	Description
16-24	162012W	Discharge Assembly w/o intake pump 12V
16-24	162024W	Discharge Assembly w/o intake pump 24V

Repair Kits

DIAPUMPRK	Diaphragm Pump Repair Kit
SEADISRK	SeaEra Discharge Repair Kit

* Specify DC Voltage (12, 24)



EXPLODED PARTS

L365v0320jlc

LIMITED WARRANTY

Raritan Engineering Company warrants to the original purchaser that this product is free of defects in materials or workmanship for a period of two years from the product's date of purchase. Should this product prove defective by reason of improper workmanship and/or materials within the warranty period, Raritan shall, at its sole option, repair or replace the product.

- 1. TO OBTAIN WARRANTY SERVICE, Consumer must deliver the product prepaid, together with a detailed description of the problem, to Raritan at 530 Orange St., Millville, N.J. 08332. When requesting warranty service, purchaser must present a sales slip or other document which establishes proof of purchase. THE RETURN OF THE OWNER REGISTRATION CARD IS NOT A CONDITION PRECEDENT OF WARRANTY COVERAGE. However, please complete and return the owner Registration Card so that Raritan can contact you should a question of safety arise which could affect you.
- 2. THIS WARRANTY DOES NOT COVER defects caused by modifications, alterations, repairs or service of this product by anyone other than Raritan; defects in materials or workmanship supplied by others in the process of installation of this product; defects caused by installation of this product other than in accordance with the manufacturer's recommended installation instructions or standard industry procedures; physical abuse to, or misuse of, this product. This warranty also does not cover damages to equipment caused by fire, flood, external water, excessive corrosion or Act of God.
- 3. ANY EXPRESS WARRANTY NOT PROVIDED HEREIN, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH BUT FOR THIS PROVISION MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, IS HEREBY EXCLUDED AND DISCLAIMED. ALL IMPLIED WAR-RANTIES SUCH AS THOSE OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, IF APPLICABLE, AS WELL AS ANY IMPLIED WARRANTIES WHICH MIGHT ARISE BY IMPLICATION OF LAW, ARE EXPRESSLY LIMITED TO A TERM OF ONE YEAR. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG A LIMITED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.
- 4. UNDER NO CIRCUMSTANCES SHALL RARITAN BE LIABLE TO PURCHASER OR ANY OTHER PERSONS FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT, OR OTHERWISE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.
- 5. No other person or entity is authorized to make any express warranty, promise or affirmation of fact or to assume any other liability on behalf of Raritan in connection with its products except as specifically set forth in this warranty.
- 6. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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