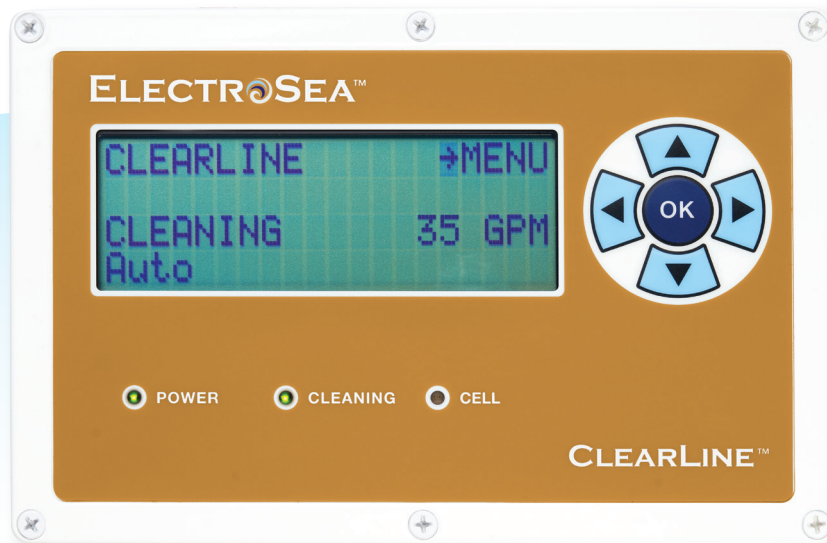


# CLEARLINE® System



## Installation Manual

## Model CL-990-X1.5



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# ELECTROSEA®

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## ELECTROSEA®

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ElectroSea was created when the owners of a sportfishing yacht invented “a better way” to prevent unwanted marine growth in their seawater lines. Solving complex technical problems is their expertise. With more than 100 issued U.S. patents and 350+ foreign patents in advanced technologies, our Executive Management Team has been developing innovative solutions for more than 50 years. With an expert team of ‘old salts’ who eat, sleep, and breathe boating, ElectroSea will improve your time on the water.

## CLEARLINE® System

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CLEARLINE is an innovative marine electrochlorination system that prevents biofouling and barnacle growth in your vessel's seawater lines. CLEARLINE keeps your air conditioners, chillers and refrigerators operating at maximum flow rates, and sea strainers clean longer. The patent pending CLEARLINE System includes CLEARLINE Control Unit which is the brain, and ClearCell® which is the heart of the system. CLEARLINE operates automatically 24x7x365 and is built for flawless and reliable performance.

### Quick Start Installation Guide, Installation Manual and Operators Manual

**The CLEARLINE System includes a detailed Quick Start Installation Guide, Installation Manual and Operators Manual. READ all manuals in their entirety before proceeding with installation.**

## CLEARLINE System

The CLEARLINE System includes the Control Unit, ClearCell, and all components listed below:

### CLEARLINE Control Unit

- (1) Control Unit
- (3) Cables
  - (1) Power Cable 20' (6.1m)
  - (1) ClearCell Cable 12' (3.7m)
  - (1) Flow Sensor Cable 12' (3.7m)
- (4) Mounting Screws #10 x 1" (2.54cm)



*Major components shown above*

### ClearCell

- (1) ClearCell
- (1) Flow Sensor
- (1) Union
- (3) Hose Connectors
- (1) Top Side Mounting Bracket
- (1) Bottom Side Mounting Bracket
- (4) Mounting Screws #12 x 1.25" (3.12cm) Round Head
- (4) Mounting Screws #12 x 1.25" (3.12cm) Flat Head
- (4) Machine Screws M5 x 12mm Round Head

### Items not included

- Optional Base Tab Bracket
- Optional Strainer Accessory Kit
- Marine Grade Seawater Hose
- Stainless Steel Hose Clamps
- PTFE Tape & Paste
- Other Fittings

## Safety Considerations

Improper installation can result in unsatisfactory performance, premature failure, damage to systems in the seawater circuit and/or to the vessel.

**WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE**

Indicates a hazardous situation which can cause damage to personal property, environment, or equipment.

## Pre-installation Descaling of Seawater Conduits

Pre-installation descaling ensures any existing barnacles, biofilm, and marine growth that have accumulated on the interior seawater lines are removed. If seawater lines are impacted with barnacles and marine growth, then ElectroSea recommends professional descaling prior to installing the CLEARLINE System. By starting with descaled and clean seawater lines, you will realize the full benefit of the CLEARLINE System. For new vessels, descaling is not necessary.

**NOTICE**

**DO NOT perform acid descaling after the CLEARLINE System has been installed. Descaling acids will damage the ClearCell canister, ClearCell Electrode and void the Warranty.**



► **Without CLEARLINE**

**Hours** - Complex multispecies microbial biofilm forms

**Days** - Secondary colonizers arrive and multiply

**Weeks** - Macroscopic communities of algae and invertebrates grow



► **With CLEARLINE**

The advanced CLEARLINE electrochlorination system continuously prevents barnacles and biofilm build-up

## Optimal Performance

**Constant Chlorinated Seawater Flow:** The CLEARLINE System should be powered ON and have seawater flowing through the ClearCell at all times. This provides the vessel’s seawater circuit with constant chlorinated seawater to prevent unwanted marine growth. Intermittent or stagnant seawater that is not continuously electrochemically treated allows growth of marine microorganisms. Barnacles have the innate ability to close themselves off and survive intermittent exposure to biocidal agents.

- DO NOT turn off seawater pumps, air conditioner, or chiller for an extended period of time.

Inspect the vessel for problem areas:

- Pre-existing biofouling in seawater lines prior to CLEARLINE installation.
- Clogged seawater strainers and intakes.
- Impacted, blocked or occluded lines from debris lodged in plumbing.
- Sporadic demand valve areas; depending on the system, valves that turn on and off can foster unwanted marine growth.

## Flow Alert

**Flow Alert:** The Flow Alert feature monitors seawater flow through the ClearCell. This feature allows the user to set a minimum flow rate threshold value and time duration. If the seawater flow rate drops below a minimum value for a period of time, then “Flow Alert” will appear on the display (no audible alert). This feature notifies the user that some part of the seawater circuit such as the intake, strainer, pump, or internal screen on the ClearCell requires cleaning or is not functioning properly. Flow rate can be set in GPM or LPM, and time duration in minutes. To set the Flow Alert value go to MENU, Flow Alert, and enter desired threshold flow rate and time duration for notification.

### NOTICE

**Flow Alert feature is default OFF from ElectroSea and must be set-up by the installer or end user.**

### NOTICE

**CLEARLINE will continue generating chlorine even after a Flow Alert occurs. Flow Alert does not prevent CLEARLINE from operating.**

If a Flow Alert occurs:

1. Check vessel’s strainers and intake grates for blockage
2. Check seawater pump operation
3. Check ClearCell Internal Screen (see Operation Manual, Pg. 8)



## Internal Screen

The ClearCell contains an internal screen to catch debris before it reaches the Flow Sensor (debris, tiny shells, or other foreign materials that pass through the vessel's main strainer). The internal screen should be cleaned periodically, and whenever debris gets caught in the screen and decreases seawater flow. See CLEARLINE Operation Manual, Pg. 8-13 for detailed instructions to clean internal screen.

### NOTICE

- **DO NOT PERFORM ACID DESCALING OF SEAWATER CIRCUIT AFTER THE CLEARLINE SYSTEM HAS BEEN INSTALLED.**
- **DESCALING ACIDS OR CLEANING CHEMICALS WILL DAMAGE THE CLEARCELL CANISTER, CLEARCELL ELECTRODE AND VOID THE WARRANTY.**
- **DO NOT TOUCH THE CLEARCELL ELECTRODE PLATES OR USE ANY TYPE OF MECHANICAL BRUSH.**
- **THE CLEARCELL ELECTRODE PLATES CONTAIN A SPECIAL METAL OXIDE COATING THAT WILL BE PERMANENTLY DAMAGED IF YOU HANDLE IT.**

### NOTICE

Low seawater flow may damage cooling system and other components that depend on this water for proper operation. It is the owner's responsibility to monitor the vessel's seawater flow and perform any maintenance on the vessel's seawater pumps, strainers, and screen in ClearCell.

**Spray screen with  
freshwater  
to remove debris**



## CELL Indicator

**CELL Indicator:** The Control Unit will display "SALINITY/CELL", % OUTPUT and illuminate the red CELL LED in various conditions. This is not an immediate cause for concern and may be temporary depending on seawater salinity level. CLEARLINE will continuously attempt to generate chlorine and automatically resume standard operation when conditions are resolved. The CELL indicator will be illuminated during installation if any of the following conditions occur:

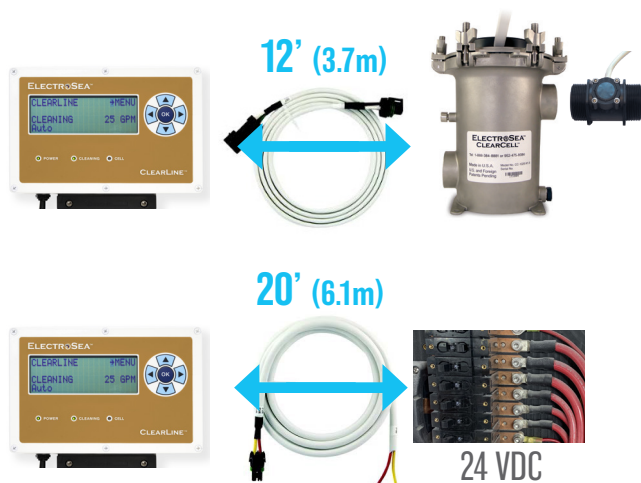
- Water salinity is below 20 parts per thousand (most common cause of CLEARLINE CELL indicator notice)
- ClearCell cable or its connectors has been compromised

See CLEARLINE Operation Manual, Pg. 7 for CELL Indicator Troubleshooting.

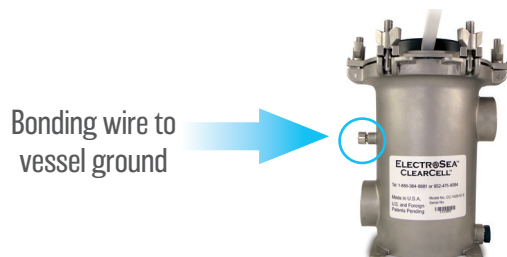


## Electrical Connection Overview

- CLEARLINE Control Unit must be located:
  - Within 12ft. (3.7m) of ClearCell
  - Within 12ft. (3.7m) of Flow Sensor
  - Within 20ft. (6.1m) of 24VDC power source



- ClearCell must be connected to vessel's bonding circuit.



**NOTICE** DO NOT cut, extend, or splice the 12' (3.7m) ClearCell cable. Longer ClearCell cables are available from ElectroSea.

**NOTICE** DO NOT connect multiple ClearCell cables together. The Extended Cables in the table below show the total cable length from the CLEARLINE Control Unit to the ClearCell.

Modification of ClearCell cable will impair CLEARLINE operation.

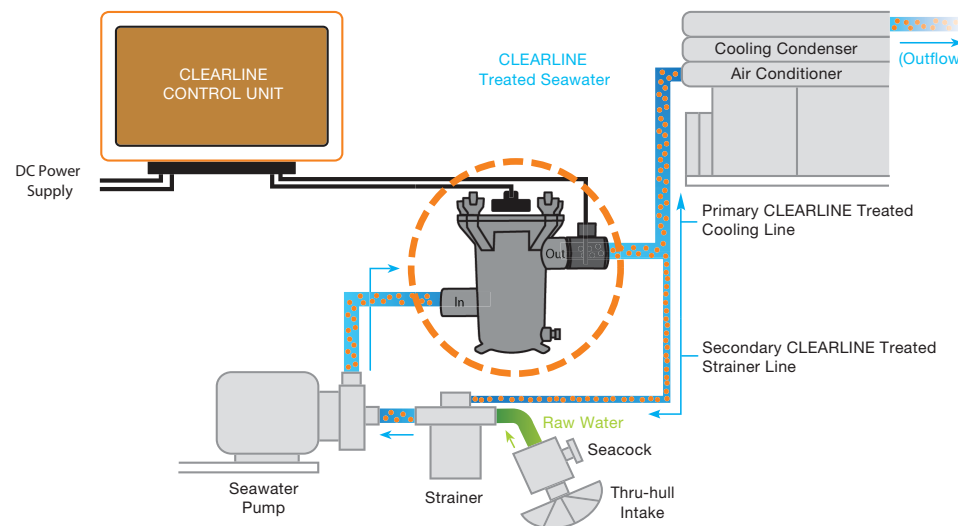
### OPTIONAL CABLE ACCESSORIES:

PART NUMBER	DESCRIPTION
CBLO1-CC-EXT-15FT	15' (4.6m) CLEARCELL Extended Cable
CBLO1-CC-EXT-20FT	20' (6.1m) CLEARCELL Extended Cable



## Seawater Connection Overview

1. Locate the vessel's seawater intake pump, strainer, and seacock shut-off valve.
2. Turn OFF ALL seacock shut-off valves in the seawater circuit at or below the water line. This includes any output seacocks to prevent back siphoning.
3. The ClearCell should be installed **after the seawater strainer and pump**, and **before** any seawater cooled equipment such as air conditioners, chillers, etc. The ClearCell should be installed at or below the water line.
4. The optional CLEARLINE treated strainer return line should be connected **after** the ClearCell Flow Sensor output and before the strainer and after the seacock.



**NOTICE** DO NOT USE DESCALING SOLUTIONS, ACIDS OR CLEANING CHEMICALS AFTER CLEARLINE HAS BEEN INSTALLED. THIS WILL DAMAGE THE CLEARLINE SYSTEM AND VOID THE WARRANTY.

**NOTICE** All ClearCell seawater plumbing connections must be performed by a qualified marine installation professional.

**WARNING** Failure to turn OFF all seacock valves in the seawater circuit could result in sinking the vessel.

**NOTICE** DO NOT decrease seawater flow below manufacturer's specifications for downstream cooling equipment.

**NOTICE** Limit the use of 90° elbows as they restrict flow and cause pressure drop.

**WARNING** Use marine grade hose and double clamp with two stainless steel clamps, reversing the clamps. Failure to properly secure seawater connections could result in sinking the vessel.

**WARNING** DO NOT exceed the ClearCell pressure specifications

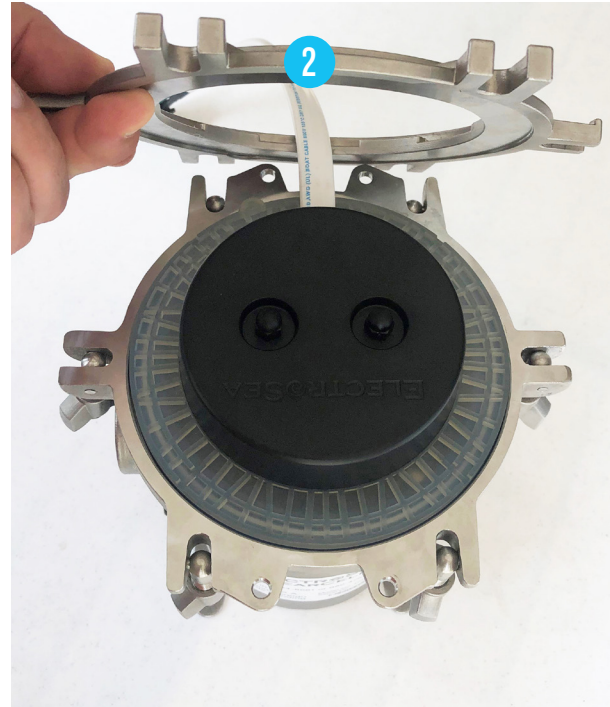
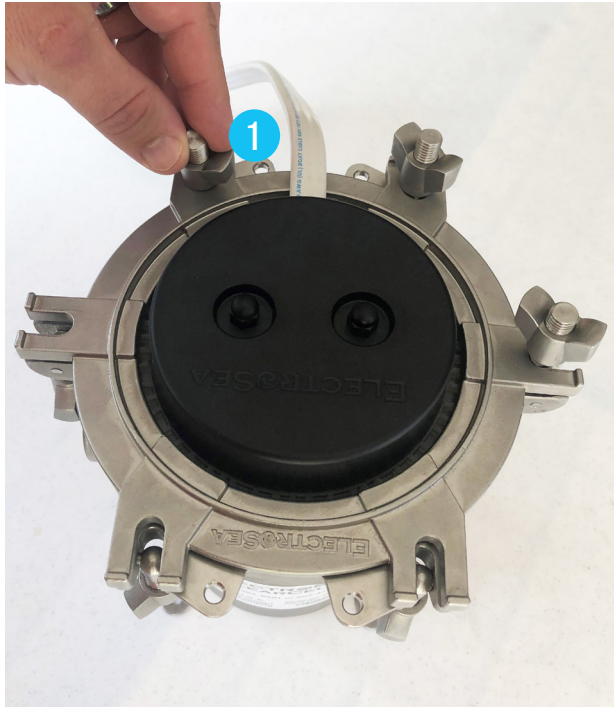
**NOTICE** The ClearCell is made of 2205 Duplex Stainless Steel for high corrosion resistance. Do not connect dissimilar metals to the ClearCell.

**NOTICE** Use only original parts supplied by ElectroSea. They are made of special titanium, stainless and other high quality materials. Use of non-factory or substitute parts will void the Warranty.

**NOTICE** CLEARLINE is not for use with engines or generators.

## ClearCell Canister Preparation

1. Unsecure the pressure ring by turning the wing nuts counterclockwise.
2. Remove the pressure ring.
3. Remove the Electrode Assembly. Lift by the black plastic cover. Do not lift or pull on the cable. Set the assembly aside in a safe location.



## ClearCell Mounting Options

1. The ClearCell canister must be installed so it is level and at or below the waterline.

### **WARNING**

Failure to mount the ClearCell level could result in the accumulation of harmful gas.

2. The ClearCell can be mounted using several different options as shown below:



**Mount  
ClearCell Level**

### **OPTION A**

#### **Base Tab Mounting**



1. Mount canister to flat interior engine room surface.
2. Insert (4) #12 round head screws into base tab to secure the ClearCell canister.

### **WARNING**

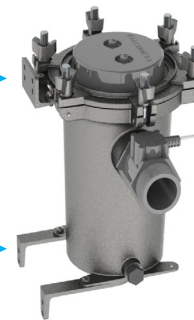
Do not screw through hull of boat.

### **OPTION B**

#### **Side Mounting**

**Top Bracket** →

**Bottom  
Bracket** →



1. Attach Top and Bottom Side mount brackets to the canister with (4) M5 machine screws.
2. Secure to stringer or other appropriate load supporting vertical surface with (4) #12 round head screws and (4) #12 flat head screws.

### **OPTION C**

#### **Base Tab Extension Bracket (Optional Mounting Accessory)**



1. Mount canister on Base Tab Extension Brackets.

PART NUMBER	DESCRIPTION
BTEB-5.5	Extension bracket that connects to mounting feet tabs on ClearCell canister

## ClearCell Canister and Flow Sensor

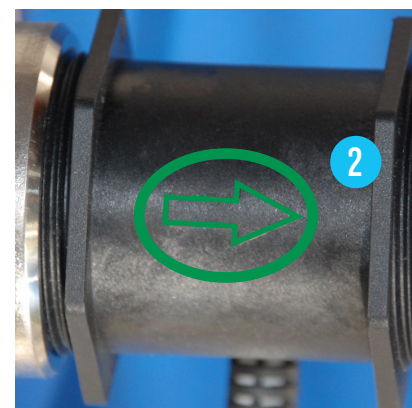
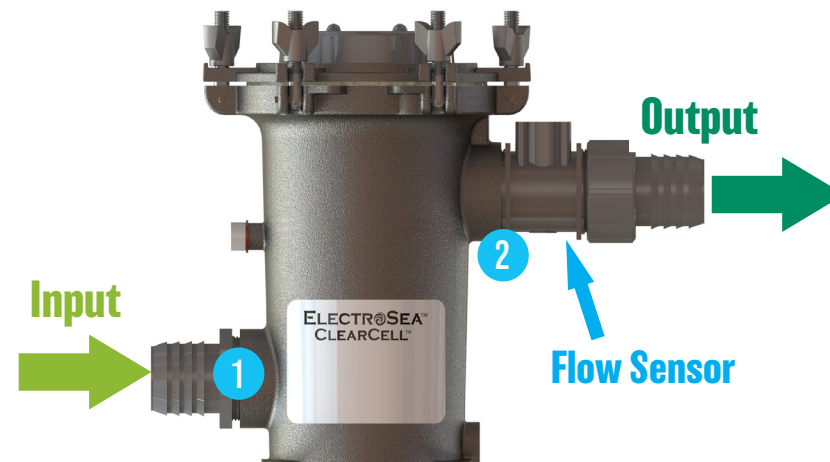
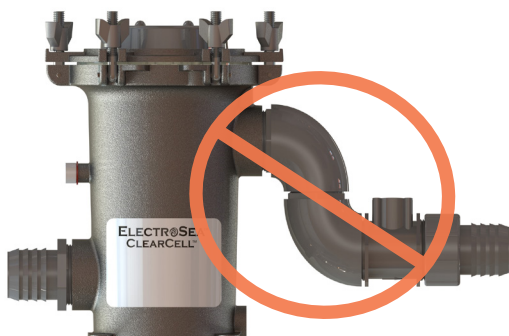
1. The ClearCell canister and Flow Sensor have directional INPUT and OUTPUT requirements. Seawater **MUST** enter at the INPUT port and flow through the ClearCell and Flow Sensor according to the marked labels.

**NOTICE** Failure to route seawater in the direction of the ClearCell and Flow Sensor INPUT and OUTPUT labels will result in improper operation of the CLEARLINE System.

2. Connect the Flow Sensor **after** the ClearCell output port. The Flow Sensor is made of glass filled nylon for superior strength, however, this makes the threads less malleable and rougher than other plastics. When sealing to this component, it is recommended that multiple turns of PTFE tape and paste are used.

- 4x turns of Hercules® MEGATAPE™ PTFE or equivalent
- Use Hercules® REAL-TUFF™ Thread Sealant or equivalent

**NOTICE** DO NOT place 90° elbows or other flow restrictive plumbing fittings **BEFORE** the Flow Sensor. This will alter the measured flow and cause improper operation of the CLEARLINE System.



**Flow Sensor must be oriented so seawater follows direction of flow arrow**



## ClearCell Canister and Flow Sensor

3. Connect the threaded female PVC hose connector to Flow Sensor output. Use PTFE tape and thread sealant.
4. Connect male PVC hose connector to threaded Union. The UNION provides quick access to the Flow Sensor as necessary. Use PTFE tape and thread sealant.
5. Add flexible hose of desired length and join hose connector on Flow Sensor output to hose connector on Union. Use two hose clamps (not included), reversing the clamps, over the flexible hose connections.

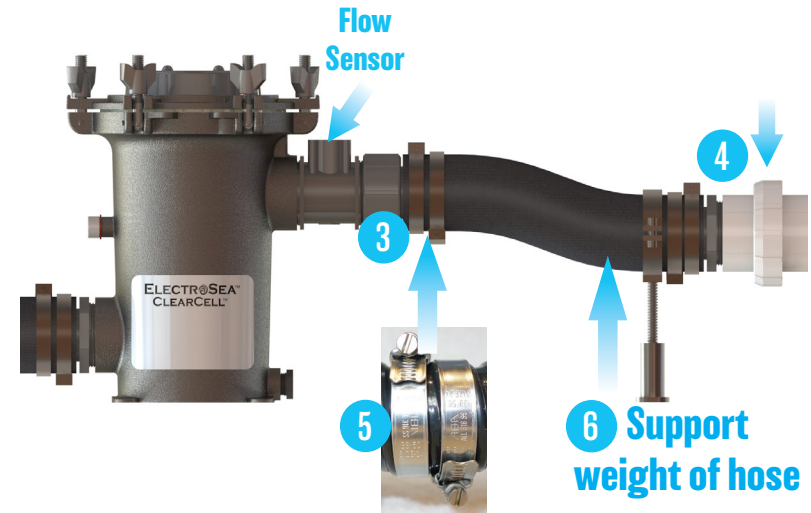
**WARNING** Failure to use hose clamps could result in a seawater leak or hose disconnection causing damage to property and/or the vessel sinking.

6. Add flexible hose hanger, hose strap or hose support bracket within 12" (0.3m) of Flow Sensor. Make sure the Flow Sensor and Union are properly supported.

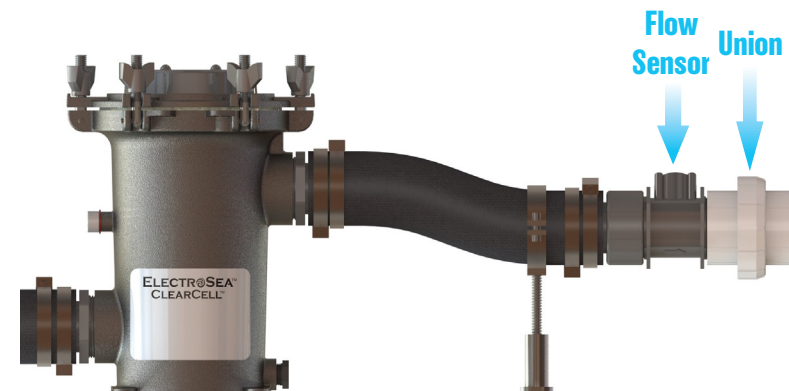
**WARNING** DO NOT let the weight of the hose or any plumbing hang unsupported on the Flow Sensor. Use hose hangers, hose straps or hose support brackets that are attached securely to a bulkhead, stringer or other solid object to relieve any force on the Flow Sensor when connected to ClearCell. Excessive force could crack the Flow Sensor and/or Union.

**NOTICE** All seawater flowing through the ClearCell must flow through the Flow Sensor. DO NOT split or divert seawater before the Flow Sensor.

### Flow Sensor connected to ClearCell



### Option with Flow Sensor connected to Union



## Optional Strainer Return Line

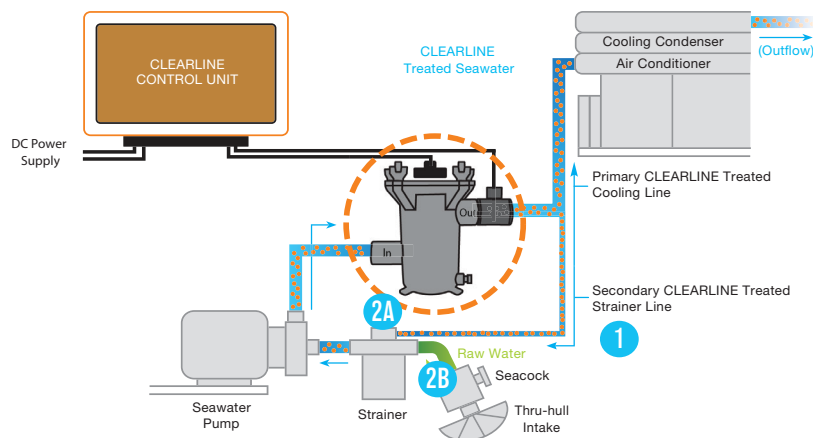
1. OPTIONAL: Add a CLEARLINE treated strainer return line with a tee-fitting and ball valve, after the ClearCell Flow Sensor that goes back to the strainer. This CLEARLINE treated strainer return line should be connected **after the ClearCell Flow Sensor output** and return to the strainer lid or after the seacock. The CLEARLINE treated return line to the strainer should be 3/8" (9.5mm) ID flexible hose and should include a ball valve to adjust return flow as necessary.

**NOTICE** DO NOT connect the return line source before the pump on the suction side.

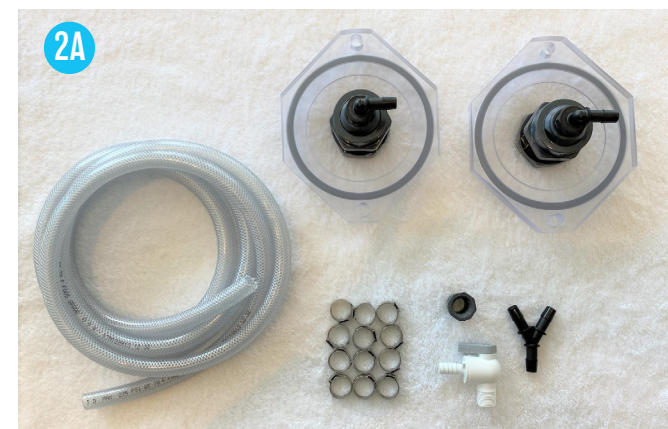
2. There are two options to install the CLEARLINE treated return line to the strainer:
  - 2A. Use CLEARLINE Strainer Accessory Kit to plumb the return line directly to the top of the strainer lid. The CLEARLINE Strainer Accessory Kit includes a custom strainer lid, ball valve, tubing, connectors and fittings.

**WARNING** DO NOT drill through the top of any strainer lid.  
The lid will crack and/or fail over time and could resulting in sinking of the vessel.

- 2B. Use the appropriate plumbing fittings to connect the return line after the seacock and before the strainer. Make sure to use a ball valve.



PART NUMBER	DESCRIPTION
DSA-1.5	Arctic Steel 1.5" (3.8cm) Dual Strainer Accessory
DSA-SP1	SCOT Pump Dual Strainer Accessory



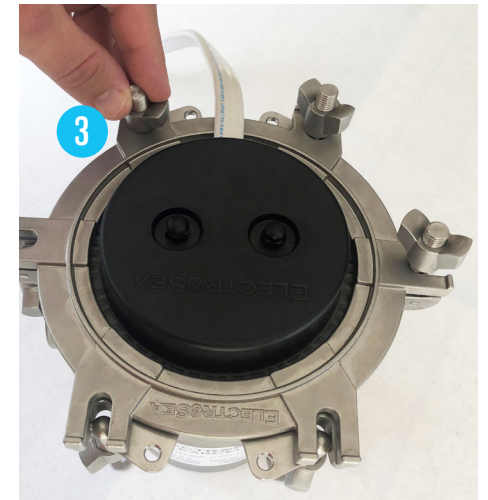
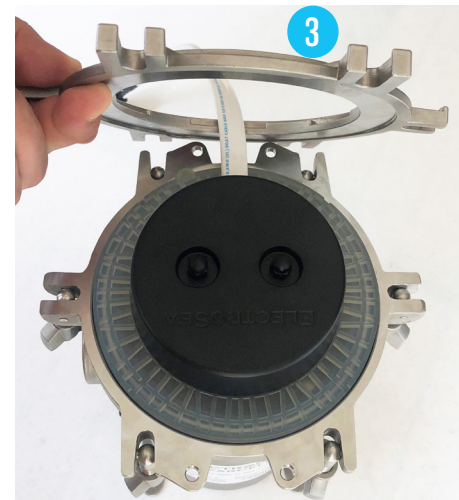
## ClearCell Reassembly

1. Ensure the gasket is in the top of the ClearCell canister.
2. The Electrode Assembly and lid are keyed and can be inserted in only one direction. The plates of the ClearCell Electrode will be parallel to the seawater input. Align the Electrode Assembly and insert it into the ClearCell canister.

**NOTICE** DO NOT touch the metal ClearCell Electrode surface with your hands or any metal tools. The ClearCell Electrode has a proprietary coating. This may damage the ClearCell Electrode and affect its performance.

**NOTICE** DO NOT use chemicals, acids, descaling solutions or zincs in the ClearCell canister or on the ClearCell Electrodes. This will damage the ClearCell Electrode and canister.

3. Add the pressure ring and tighten down the wing nuts evenly. Do not use tools to perform this tightening process. Work in a star pattern so all are evenly secure.
4. Double check all fittings, hose clamps and wing nuts are secure. Open the seacock valves and verify there are no leaks.
5. Bleed excess air from the ClearCell canister, then re-tighten wing nuts.





## CLEARLINE Control Unit Mounting and Wiring

### CLEARLINE Location and Mounting

- Mount the CLEARLINE Control Unit (1) on a bulkhead in the engine room using four #10 stainless steel Mounting Screws provided. CLEARLINE is designed for marine engine rooms with a maximum environmental temperature of 50°C (122°F). Do not mount CLEARLINE in an area that receives excessive heat.

### CLEARLINE to 24VDC Power Supply

- Power OFF the CLEARLINE Control Unit (2) before beginning the wiring process below.
- Locate an always on, 24VDC power source on the vessel. Connect the **RED (+)** and **YELLOW (-)** wires of the Power Cable to this source according to the appropriate electrical standards (i.e. ABYC). Connect the Power Cable (A) to the CLEARLINE Control Unit.

**NOTICE** Failure to Power OFF the CLEARLINE Control Unit during the wiring process could result in damage to the CLEARLINE System.

### CLEARLINE to ClearCell

- Connect the ClearCell cable (B) between the CLEARLINE Control Unit and the ClearCell.

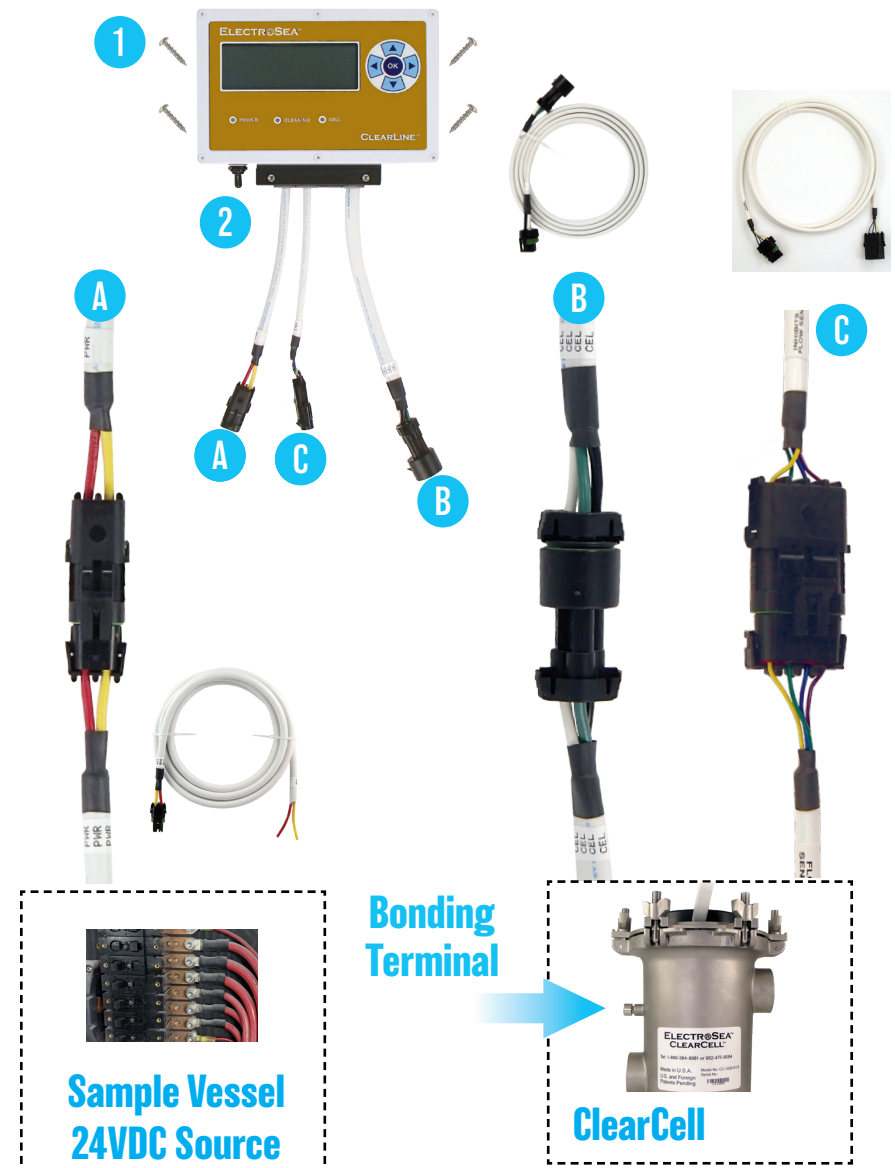
### CLEARLINE to Flow Sensor

- Connect the Flow Sensor cable (C) to the CLEARLINE Control Unit and the Flow Sensor.

### ClearCell Bonding

- Connect vessel bonding wire to ClearCell bonding terminal according to appropriate bonding standards (i.e. ABYC).

**NOTICE** Failure to bond ClearCell will void Warranty.



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## Specifications

### **CLEARLINE SYSTEM**

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<b>Power:</b>	24 VDC 7 Amp Max Peak Current
<b>Normal Operating Flow:</b>	18-50 GPM (68-189 LPM)
<b>Maximum Pressure:</b>	70 psi

### **CLEARLINE CONTROL UNIT**

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<b>Size:</b>	10.0 inches (25.4cm) - width 7.0 inches (17.8cm) - height (without cables) 3.25 inches (8.3cm) - depth
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### **CLEARCELL**

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<b>Size:</b>	10.2 inches (26cm) - height 8.4 inches (21.3cm) - diameter / width
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## ELECTROSEA, LLC

**State Law and Implied Warranties:** This warranty gives you specific legal rights, and you may also have other rights that vary from state to state. Any implied warranties that apply to you, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the Warranty Period defined below. Some states do not allow limitations on how long an implied warranty will last, so the above limitation may not apply to you.

**Limited Warranty – What is Covered:** ElectroSea, LLC (“ElectroSea”) warrants that this product (the “Product”) will be free from defects in materials and workmanship when used for its intended purposes under normal usage conditions. **As described below, there are limitations to this Limited Warranty.**

**Who is Covered:** This Limited Warranty is made only to this purchaser (the “Original Purchaser”):

1. The original end user purchaser of a Product directly from ElectroSea or an authorized ElectroSea Dealer (a “Direct Purchaser”); or
2. The original end user purchaser of a new vessel in which a new Product was installed by the manufacturer (a “Vessel Purchaser”).
3. This Limited Warranty is not transferable.

**How Long Coverage Lasts – the Warranty Period:** This Limited Warranty only applies for a two year period (the “Warranty Period”) that begins on:

1. For a Direct Purchaser, the date of the Direct Purchaser’s purchase of the Product; or
2. For a Vessel Purchaser, the date the vessel is delivered to the Vessel Purchaser by the manufacturer or one of its dealers.

**What ElectroSea will Do:** ElectroSea’s only obligation under this Limited Warranty is to, at ElectroSea’s election:

1. Repair the Product;
2. Replace the Product; or
3. Refund the original purchase price paid by the Original Purchaser for the Product.

**This is the sole and exclusive remedy available under this Limited Warranty. ElectroSea’s maximum monetary liability under this Limited Warranty is an amount equal to the purchase price paid by the Original Purchaser for the Product.**

## ELECTROSEA, LLC

**Things Not Covered:** This Limited Warranty does not cover:

1. A failure of the Product that results from (a) improper installation of the Product, (b) a failure to follow instructions for use of the Product, (c) jamming or clogging the Product with foreign matter, (d) use of chemicals or other substances not specified by ElectroSea for use in or with the Product, (e) abuse, misuse, or mishandling of the Product, (f) repair or modification of the Product by someone other than ElectroSea, or (g) damage to the Product, however caused;
2. Costs of service to remove the Product for return to ElectroSea or install a repaired or replacement Product;
3. Damage to the Product while in transit to or from ElectroSea; or
4. Damage to the vessel in which the Product is installed or any of its equipment, components, systems, fittings, air conditioners, chillers, wells, pumps, freezers, conduits or pipework.

**How to Make a Claim:** Call ElectroSea toll free at (888) 384-888. **You must make your claim during the Warranty Period and within 30 days after you first discovered the defect that is the subject of your claim.** You will need a receipt (or similar document) that shows that you are the Original Purchaser and are within the Warranty Period. You will also need the Product's serial number, the type and length of vessel on which the Product is used, and a reasonably complete description of the problem you are having. ElectroSea may require that you send the Product to ElectroSea, at your cost, for examination. If your claim is covered by this Limited Warranty, ElectroSea will pay the cost of sending the Product (as repaired) or a replacement Product to you.

**No Other Express Warranties:** This Limited Warranty is the only express warranty that applies to the Product. ElectroSea has not given anyone the right to make any warranty or promise of any kind relating to ElectroSea or the Product, so if someone other than ElectroSea makes a warranty or promise relating to ElectroSea or the Product, that warranty or promise is not binding on ElectroSea.

**Limitation of Damages:** **In no event or circumstance will ElectroSea be liable to anyone for any punitive, special, incidental, indirect or consequential damages that relate in any way to the Product, even if ElectroSea has been advised of the possibility of those damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.**

**Product Changes:** ElectroSea may change the Product, the materials used in the Product, or the manner in which the Product is made from time to time, but will not have an obligation to incorporate any of those changes into previously manufactured Products or provide notice of any of those changes to purchasers of previously manufactured Products.

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**ELECTROSEA®**



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