
**Installation and Maintenance Manual
For
Delta Star Water-cooled Marine Duty
In-Line Water Heat Pumps
(Models DSHP-4-WCMD thru DSHP-10-WCMD)**



DSHP-9-WCMD shown

Use Quick Install page for easy setup.



Thank you for selecting an Aqua Logic Water-cooled Marine Duty Delta Star Heat Pump. We have endeavored to manufacture the most reliable and efficient water Heat Pump available. Our highly trained technicians use premium quality components to assemble equipment that will operate faithfully for years. You can call us or visit us on the web for technical assistance before and after the sale. We are committed to making sure that you are satisfied with your Aqua Logic Heat Pump now—and in the future.

Please take some time to familiarize yourself with the information in this manual so that you can get the most from your Heat Pump. Don't hesitate to contact us if we can assist you further.

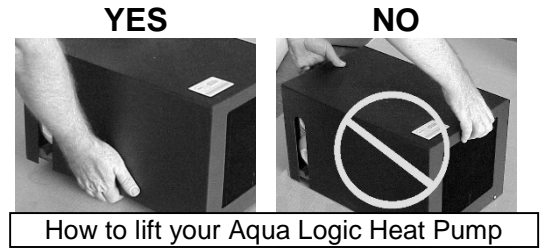
Quick Install for your Aqua Logic Delta Star Heat Pump

Unpack your Delta Star Heat Pump:

- Carefully remove the Heat Pump from the box by reaching underneath the Heat Pump and lifting it by its base. NEVER lift the Heat Pump by its cover to avoid personal injury or damage to the Heat Pump (See illustration).
- Use a Phillips head screwdriver to remove the two screws on opposite ends of the cover.

Place your Aqua Logic water Heat Pump:

- Place the water Heat Pump on a sturdy flat surface.
- Make sure that the unit is resting on its base to avoid damage.
- If you place the Heat Pump in a cabinet, allow at least ½" of space between the Heat Pump and the walls of the cabinet to avoid vibration and noise.



Delta Star Plumbing:

- Your Aqua Logic flow-through Heat Pump requires an external water pump (not supplied) for proper operation.
- The Heat Pump should be the last piece of equipment in the plumbing before the water is returned to the tank or sump (after pump and filters).
- Use male-pipe-thread (MPT) fittings of the diameter below to connect your Heat Pump to your system. Use the same or larger diameter pipe or hose for your plumbing for best water flow.
- We suggest installing unions and ball valves (not included) on the inlet and outlet of the Heat Pump for easier installation and removal of the Heat Pump from the system for maintenance or repair (if necessary).
- Be sure that the water flow through your Aqua Logic Heat Pump goes into the water inlet (bottom) and out the top to prevent potential damage (see illustration).
- If you use flexible hose to plumb your system or connect your Heat Pump, make sure that the hose is not kinked to prevent restricted flow and potential damage to your Heat Pump.
- Avoid elbows in your plumbing to minimize flow loss through your system.
- For most efficient operation, we recommend the minimum and maximum flow rates listed in the specifications sheet for each model.
- Do **NOT** operate the Heat Pump without adequate water flow.



Electrical Hookup:

- We suggest using a dedicated power circuit for best operation and longest life of the Heat Pump. The circuit must be rated to handle the maximum load of the Heat Pump.
- We highly recommend that you use a ground-fault interrupter (GFI) to avoid electrical shock. You can obtain an inline GFI from Aqua Logic, a local hardware store if the outlet in the wall does not have a GFI installed.
- Avoid using an extension cord on your Heat Pump.
- Temperature controller installation:
 - Follow the instructions included with the controller to install it.
 - Install the sensor for the controller "upstream" (ahead) of Heat Pump.
 - Plug the Heat Pump into the controller.
 - Plug the controller into the wall outlet.
 - Program or adjust the controller to your desired temperature. (see Heat Pump Controller Programming)

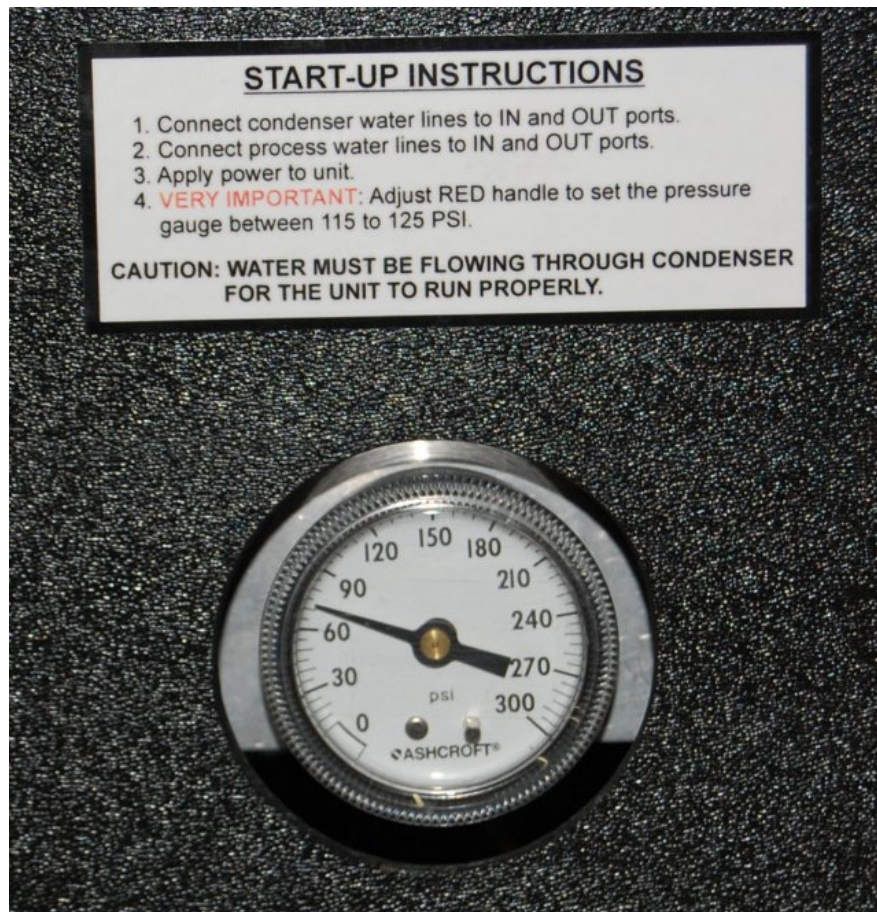
Your Aqua Logic Heat Pump is now installed and ready for operation!

HEAT PUMP SET-UP AJUSTMENTS

WARNING: DO NOT over tighten water fittings.

- Mount Heat Pump on a flat pad and away for water spray.
- Give at least 1 ft all the way around unit for servicing.
- Install evaporator water inlet and outlet.
- Install condenser water inlet and outlet.
- Test water fittings for leaks.
- Apply electrical power to the Heat Pump.
- Adjust the controller to the desired water temperature. (See "Operation and Programming")
- **Important:** Regulate condenser water until pressure on the pressure gauge reads between 115 to 125 PSIG for models DSHP-4-WCMD thru DSHP-9-WCMD and 195 to 220 PSIG for model DSHP-10-WCMD. Check after 15 minutes of run time, adjust the water flow (if needed) to the correct pressure.

Warning: This unit must have proper water flow rate both on the evaporator and the condenser to operate correctly.



HEAT PUMP 2 STAGE CONTROLLER PROGRAMMING

STEP	ANNUCIATOR	DESCRIPTION	DISPLAY
1	F or C	Fahrenheit or Celsius Scale	F
2	S1 (blinking)	Stage 1 Set point Temperature	S1 77
3	DIF1 (blinking)	Stage 1 Differential Temperature	DIF1 1
4	C1/H1	Stage 1 Heating Mode	H1
5	S2 (blinking)	Stage 2 Set point Temperature	S2 77
6	DIF2 (blinking)	Stage 2 Differential Temperature	DIF2 1
7	C2/H2	Stage 2 Cooling Mode	C2



Liquid Crystal Display (LCD)

The LCD display provides a constant readout of the sensor temperature and indicates if the output relay is energized. When the **S1** or **S2** annunciator is constantly illuminated during operation, the relay is energized. The display is also used in conjunction with the keypad to allow the user to adjust the set point temperature, differential and heating /cooling modes.

Programming Steps and Display

The control can be programmed in four simple steps using the LCD display and the three keys on the face of the control. (See photo for display and keys.)

NOTE: Stage 1 must be set for heat mode and Stage 2 for cool mode for correct operation.

- To start programming, press the **SET** key once to access the Fahrenheit/Celsius mode. The display will show the current status, either **F** for degrees Fahrenheit or **C** for degrees Celsius. Then press either the up ↑ arrow or down ↓ arrow key to toggle between the **F** or **C** designation.
- Press the **SET** key again to access the heat mode set point temperature. The LCD will display the current set point temperature and the **S1** annunciator will be blinking to indicate that the control is in the set point mode. Press either the up ↑ key to increase or down ↓ key to decrease the set point to the desired temperature.
- Press the **SET** key again to access the heat mode differential temperature. The LCD will display the current differential and the **DIF 1** annunciator will be blinking to indicate that the control is in the differential mode. Then press either up ↑ key to increase or the down ↓ key to decrease the differential to the desired setting (minimum 1°F, maximum 30°F).
- Press the **SET** key again to select heat mode. The LCD will display the current mode: **C1** or **H1**. Then press either up ↑ key to increase or the down ↓ key to select the correct Stage 1 mode. Stage 1 **MUST** be in the **H1** mode for correct operation.
- Press the **SET** key again to access the chill mode set point temperature. The LCD will display the current chill set point temperature and the **S2** annunciator will be blinking to indicate that the control is in the set point mode. Then press either the up ↑ key to increase or down ↓ key to decrease the set point to the desired temperature. **S1** and **S2** should both be set for the same temperature.
- Press the **SET** key again to access the chill mode differential temperature. The LCD will display the current differential and the **DIF 2** annunciator will be blinking to indicate that the control is in the differential mode. Then press either up ↑ key to increase or the down ↓ key to decrease the differential to the desired setting (minimum 1°F, maximum 30°F). **DIF1** and **DIF2** should both be set to the same value for best results.
- Press the **SET** key again to access the heating mode. The LCD will display the current mode: **C2** or **H2**. Stage 2 **MUST** be in the **C2** mode for correct operation.
- Press the **SET** key again to exit programming mode. Controller will display current water temperature.

Controller will automatically drop out of “program mode” and return to “operating mode” 30 seconds after last key press.

Troubleshooting Controller Error Messages:

Display Messages

- E1** - Appears when the up ↑ or down ↓ key is pressed when not in the programming mode.
To correct: If the E1 message appears even when no keys are being pressed, replace the control.
- E2** - Appears if the control settings are not properly stored in memory.
To correct: Check all settings and correct if necessary.
- EP** - Appears when the probe and or flow switch is open shorted or sensing a temperature that is out of range.
To correct: Check to see if the sensed temperature is out of range. If not, check for probe damage by comparing it to a known ambient temperature between -30°F and 220°F. Replace the probe is necessary. Also, check for proper water flow through heater. If water flow is correct, flow switch.
- EE** - Appears if the EEPROM data has been corrupted.
To correct: This condition cannot be field repaired. Replace the control.
- CL** - Appears if calibration mode has been entered.
To correct: Remove power to the control for least five seconds. Reapply power. If the **CL** message still appears, replace the control



When Disaster Strikes

You may have a lot of money invested in your aquarium at home or in the office. Or you may have valuable dollars invested in seafood for your store or restaurant. Unfortunately, equipment or electricity may fail at the most inopportune time. What can you do to minimize the risk in such an event? Based upon our years of experience in the aquatic life support industry, we recommend the following:

- Always have ALL of the electrical equipment connected to ground fault interrupt (GFI) circuits.
- Do not overload electrical circuits.
- Add the aquarium system and livestock to your homeowner's or renter's insurance policy if allowable.
- Monitor your system closely during the first few weeks of operation. Make sure that everything is working correctly. Call it a shakedown cruise.
- Check the condition of your equipment regularly. Keep it clean. You don't take your car on a long trip without first changing the oil, checking the tires, etc. Why would you ignore maintaining the equipment on your aquarium?
- Keep blue ice or bags of ice in the freezer. If you use ice to help maintain water temperature, leave the ice in the bag so that the water from the melting ice doesn't dilute the water solution in your aquarium.
- Turn off aquarium lights if the Heat Pump fails. Livestock in the wild have periods of several days when they do not get intense light. There ARE typhoons that can cover an area for days at a time. Limited use of VHO and halide lamps to avoid heat build-up in the tank is far less harmful than extremely high water temperatures.
- Put a temperature controller on the lights to shut them off and to sound off an alarm if water temperature rises more than 5°F above the Heat Pump set point.
- Keep a spare pump on hand in case your primary pump fails.
- Maintain a supply of ammonia-neutralizing chemicals such as Amquel®. You can use them to control ammonia in your system during a prolonged power outage. Be sure to follow manufacturer's dosage recommendations and compatibility with organisms in your tank.
- Stock your aquarium sparingly. Then when disaster strikes (and it usually will sooner or later), you have more time to fix the problem before you lose livestock.
- Oversize your filtration system. Water quality is the most critical element for maintaining healthy fish. On a reef tank, it is easy to invest thousands of dollars for livestock (not including how sentimental you may be attached to your livestock). Why not spend a little more up front for more life support reserve in case of a disaster?
- Have a battery-powered air pump on hand for extended power outages. It will provide aeration and move water in the absence of power.
- In most areas of the country, our electrical grid is subjected to surges, spikes, brownouts and blackouts caused by high peak usage, snowstorms, hurricanes, thunderstorms and more. A surge protector can help with the surges and spikes but they are not effective in brownouts. Furthermore, even the best surge protector can't protect against direct strikes of lightning. It takes an uninterruptible power supply (UPS) or backup generators to protect against low voltage and blackouts. And it takes a backup generator to adequately power a Heat Pump—especially a ½-HP unit needed on a 300-gallon tank.

It is very unfortunate when equipment fails. However, a prudent aquarist should have a disaster plan and follow the motto, "Be prepared."

Maintenance and Cleaning



Your Aqua Logic Heat Pump should provide years of efficient and reliable service with a minimum amount of maintenance. There is no scheduled maintenance and there are only two procedures that can be performed by the user.

Cleaning:

The condenser should be cleaned occasionally to remove accumulated organic material or minerals from the coil. To see whether the condenser needs to be cleaned, shine a flashlight through in the water inlet side of the Heat Pump.

You may also need to remove accumulated organic material or minerals from the coil (Evaporator). Organic material may be removed by using a mild chlorine bleach solution while minerals may be removed by using a dilute muriatic acid solution, Lime-A-Way® or other hard water deposit remover.

Warning:

- Do **NOT** perform both procedures at the same time since the combination of chlorine and acid may cause serious injury or death.
- Be sure to wear appropriate protective gear.
- Use extreme caution when using caustic chemicals around your system.

To remove accumulated organics (slime):

- Remove power from the Heat Pump.
- Wear protective eyewear, clothing and gloves.
- Mix a solution of 1 part unscented chlorine bleach to 4 parts water.
- Use a small pump, pail and hoses to run the solution through the heat exchanger for about 10 minutes to flush the organic materials out.
- Rinse the heat exchanger with clear unchlorinated water until you can no longer smell chlorine.
- Allow the heat exchanger to dry and then return the Heat Pump to service.

To remove accumulated minerals:

- Remove power from the Heat Pump.
- Wear protective eyewear, clothing and gloves.
- Prepare a solution according to cleaning product instructions.
- Use a small pump, pail and hoses to run the solution through the heat exchanger for about 10 minutes to flush the minerals out.
- Rinse the heat exchanger with clear unchlorinated water for at least 30 minutes.
- Allow the heat exchanger to dry and then return the Heat Pump to service.

NOTES:

If you have any questions or concerns about maintaining your Aqua Logic Heat Pump, please call us at (858) 292-4773.



Specifications

Aqua Logic Water-cooled Marine Duty Delta Star Heat Pump features:

- Non-toxic titanium heat exchanger and condenser for use in fresh and saltwater applications.
- Stainless steel stand with ABS protective cover.
- Made in the USA
- Limited 1-year warranty

Model	HP	BTU	Volts	AMP	Refrigerant	Evaporator Flow (gpm)	Condenser *Flow (gpm)	Evaporator I/O FIPT	* Condenser I/O FIPT	Dimensions (LxWxH inches)	Weight (lbs)
DSHP-4-WCMD	1/3	4050	115	7.2	R-134A	10-20	3-5	3/4"	3/4"	23 x 14 x 14	75
DSHP-5-WCMD	1/2	6000	115	9.5	R-134A	12-25	3-5	1 1/2"	1 1/2" / 3/4"	24 x 16 x 16	125
DSHP-6-WCMD	1/2	6000	230	4.8	R-134A	12-25	3-5	1 1/2"	1 1/2" / 3/4"	24 x 16 x 16	125
DSHP-7-WCMD	3/4	9500	115	13.0	R-134A	15-30	5-10	1 1/2"	1 1/2" / 3/4"	25 x 21 x 15	155
DSHP-8-WCMD	3/4	9500	230	7.0	R-134A	15-30	5-10	1 1/2"	1 1/2" / 3/4"	25 x 21 x 15	155
DSHP-9-WCMD	1	12000	230	7.2	R-134A	20-35	5-10	1 1/2"	1 1/2" / 3/4"	27 x 24 x 15	165
DSHP-10-WCMD	1.5	21000	230	10.5	R-417A	25-40	10-15	1 1/2"	1 1/2" / 3/4"	31 x 26 x 19	225

*** The condenser seawater flow rate is based on 55-60 °F entering water temperature. The condenser head pressure is maintained by metering the water flow via gate valve.**

ONE YEAR LIMITED WARRANTY

All **Aqua Logic Delta Star Water-Cooled Marine Duty Heat Pumps** are warranted against defects in parts and workmanship for a period of one (1) year from the date of original end user purchase. The limited warranty covers only parts and labor based upon Aqua Logic service cost. Aqua Logic is not liable for field repair work performed without prior written or verbal agreement and a Repair Authorization (RA) number with a fixed maximum charge.

- The warranty applies only to the original purchaser and is not transferable.
- The warranty covers only the repair or replacement of Aqua Logic products and is limited to Aqua Logic's cost of defective parts.
- Once Aqua Logic determines that the defect is due to parts or workmanship and that the product is under warranty, Aqua Logic will repair or replace the product solely at their discretion.

Our warranty does not cover the following:

- Damage caused by freezing, inadequate water flow, or no water flow.
- Damage caused by improper installation or maintenance by user or their agent.
- Damage caused due to misapplication of product.
- Damage caused by corrosion, abuse, accident, alteration or improper use.
- Damage caused by flood, fire, earthquake, tornado, or other acts of God.
- Damage caused by electrical spikes, surges, brownouts, or improper voltage or amperage.
- Damage caused by failure of any third party equipment (ie. controller, pump, etc.)
- Incidental damage to other equipment, property or livestock.
- Warranty will be voided if product labels are removed or defaced.

In the event of a defect or failure of the product please contact Aqua Logic immediately for assistance. Aqua Logic will at their discretion:

- Provide user with replaceable parts to restore their unit to proper operation.
- Provide a Repair Authorization (RA) number with a specified dollar limit so that a qualified Technician can provide a field repair.
- Provide a Return Authorization (RA) number to return the Heat Pump with original packaging to Aqua Logic, Inc., 9558 Camino Ruiz, San Diego, CA 92126 by prepaid freight. You need to include the serial number as well as proof of purchase and/or a copy of the original bill of sale along with the RA number.

COD shipments will be refused. Aqua Logic shall not be responsible for shipping damage or loss.