

*AQUA LOGIC'S* **MULTI-TEMP® and TITAN Series chiller and heat pumps**  
**MT- 1 thru MT- 8 and HP- 1 thru HP- 5**

**INSTALLATION & OPERATING INSTRUCTIONS**

Effective 1-2016

Thank you for purchasing an Aqua logic chiller and or heat pump. It has been designed and built to provide years of reliable, trouble-free service. It provides a precise water temperature control up to +/- 1.0°F (0.7°C) accuracy and features a continuous LCD display of the current fluid temperature.



**BEFORE INSTALLING THE CHILLER**  
**READ BOTH WARRANTY AND INSTALLATION INSTRUCTIONS.**

## Important: Unpacking your chiller or heat pump

This chiller was properly packed and accepted by the transportation company for shipment. It is the responsibility of the transportation company to deliver it to you in perfect condition.

### APPARENT DAMAGE OR LOSS

If, upon delivery, the shipping container or equipment indicates DAMAGE IN TRANSIT, such damaged goods should not be accepted until the transportation company's agent has noted on the freight bill, which he will give you, the nature and extent of the damage. If any part of this shipment is LOST IN TRANSIT, have the shortage noted on the freight bill by the agent.

### CONCEALED DAMAGE

If, when this equipment is unpacked, shipping damage is discovered which was not apparent upon delivery, notify the transportation company IMMEDIATELY to inspect the damaged equipment. The inspector is REQUIRED to provide you with a DAMAGE INSPECTION report.

THIS INSPECTION MUST BE REQUESTED WITHIN FIFTEEN (15) DAYS OF DELIVERY. DO NOT MOVE DAMAGED SHIPMENTS FROM POINT OF DELIVERY. RETAIN ALL CONTAINERS AND PACKING FOR INSPECTION.

Protect yourself. File your claim immediately with the transportation company! Remember, Aqua logic Inc. is not responsible for any damage after the carrier accepts a shipment. Claim for FULL VALUE REIMBURSEMENT should be made by you against the transportation company. Replacement of the damaged equipment should be requested by the purchaser as a new order.

## WARNING!!!

**THIS DEVICE USES HIGH VOLTAGE ELECTRICAL POWER FOR OPERATION.  
SAFETY PRECAUTIONS MUST BE OBSERVED.  
CAREFULLY READ AND OBSERVE THE FOLLOWING TO AVOID ELECTRICAL SHOCK  
OR SEVERE DAMAGE TO THE EQUIPMENT.**

- We recommend, as with all electrical equipment used in or around water, that you connect your electrical equipment to a ground-fault interrupt (GFI) protection circuit.
- **ALWAYS** turn the power off for the equipment at the source (circuit breaker) if there is any electrical problem, the electrical equipment or controller has been submerged in water.
- **ALWAYS** make sure that the electrical circuit you connect your electrical equipment to is rated at least 20% higher than the maximum current rating on the equipment.
- **ALWAYS** make sure that you operate the equipment at the correct voltage.
- Do **NOT** attempt to turn off the power at the chiller or controller if a problem occurs. Disconnect unit at the main power panel.

Do **NOT** attempt to repair equipment. Call Aqua Logic for instructions.

## Very Important!

1. Allow only qualified licensed personnel to supply electric power to chiller or heat pump. Installation must be done in accordance with local and national electrical code. Multi-Temp Chillers and Titan heat pumps need a fusible disconnect installed within five feet. The chiller or heat pump needs a dedicated power supply. **Do not** share the power feed to with any other peripheral devices such as pumps, ultraviolet light sterilizers, or filters. Interlock device prevents the chiller from energizing without the pump being on.
2. Double check electrical specifications on unit's electrical access cover plate making sure of voltage, amperage, phase, and cps before energizing. (**Do not** remove any covers with electrical power on.)
3. Some control packages include condenser fan cycling, and timed switches that delay certain functions on initial start-up. Consult Aqua Logic Inc. for exact details before attempting servicing.
4. **Fluid must flow through the chiller or heat pump at all times.** See specification sheet for minimum and maximum flow rates. Flow rates less than specification may result in evaporator freeze up and cracking PVC plastic evaporator shells. Aqua Logic Inc. does not warranty evaporator shells operating under low flow conditions.
5. Incoming water pressure to the inlet of the evaporator must not exceed 40 psi. Pressures over 40 psi may cause damage to the evaporator shells not covered under warranty.

## Installation Instructions:

Installation must proceed in accordance with national building and electrical codes by qualified technicians only.

The chiller or heat pump you have purchased uses Trane condensing units. Consult specification labels on condensing unit for particular details concerning electronic parts, electrical wiring, voltages, amperage, cps, and refrigerant type. These labels are on the backs of covers that require removal to view.

1. Place the chiller or heat pump in a well ventilated area with the condenser fins pointing toward prevailing winds, or source of fresh air intake. Ambient air temperature must never exceed 110° sustained.
2. Aqua Logic Inc. recommends the chiller be mounted outdoors with a protective cover. Outdoor covers must be built allowing ample air flow on five sides.
3. If the chiller is to be located in a building, we recommend providing a source of fresh air such as a hole in an outside wall the size of the condenser fins. Position heat pump within 4' of the air source. Duct and seal condenser fins to outside air if possible.
4. If the chiller must be inside a building without access to outside air, locate unit at least 3' from any single wall and 4' to 6' from any adjacent wall. Locate in such a way as to prevent air recycling. Recycled air may not provide condenser with adequate heat exchange.

5. The evaporator located under the condensing unit, has 2" PVC slip connections on both inlet and outlet. Make sure that inlet and outlet flow is followed if designated.

## Safety Precautions

1. Always wear safety eye wear and work gloves when installing equipment.
2. Never assume electrical power is disconnected. Disconnect and check with meter.
3. Keep hands out of fan areas when power is connected to equipment.
4. R-410a escaping into the air can cause frost-bite burns.
5. R-410a is toxic when burned.

## Very Important!

1. Before making power available to the chiller, check to see if all fan blades can spin freely. Shipping may have caused fan blades to not turn freely. If this is the case, do not apply power until repaired!
2. Fluid must flow through the chiller or heat pump at all times. See specifications sheet for minimum and maximum flow rates. Flow rates under specifications may result in evaporator freeze up and cracking PVC plastic evaporator shells.
3. Double check specifications on condensing unit making sure of voltage, amperage, phase, and hertz before energizing.
4. Some control packages include condenser fan cycling, and timed switches that delay certain functions on initial start-up. Please consult Aqua Logic Inc. if necessary for exact details of your particular unit.

## Initial Start-up: Read all of the instructions before energizing unit.

**Caution:** It's important to allow the oil in the compressor(s) to warm-up at least 8 hours before starting up the unit. If the ambient air temperature is below 60°F, apply power to the unit and set controller so the compressor(s) do not energize or by-pass the heat exchanger water supply so the flow switch will not activate the unit.

Adjust temperature set point to desired water temperature. When the thermostat calls for cooling, a delay timer will start the system after 3 minutes. The chiller will pull the water temperature down to the set point, and shut the unit down. When the water temperature

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rises above the differential setting, the chiller will repeat the delay cycle and cool down to temperature set point.

## Very Important!

1. Target fluid temperature is limited to a range of 40° F to 80° F on all standard MultiTemp Chillers. Without special factory installed equipment, possible damage to the unit can occur when attempting to access fluid temperatures outside this range. Aqua Logic, Inc.'s warranty does not apply to application temperatures under 40°F or above 80° F without special factory modifications.
2. Water going to the chiller should be protected by filters to keep debris from collecting in the evaporator shells. Clogged shells lead to heat exchange problems and will void the warranty.
3. Improperly installed or out of adjustment rapid sand filters or fluidized beds can put sand into the stream of water flowing into the chiller. This condition is similar to “sand blasting” and may abrade holes in plumbing lines or the titanium coils. Conditions like these would void the Aqua Logic, Inc. warranty.

### **40° F to 80° F Fluid Temperature Applications**

Wetted parts contain titanium, PVC plastic, rubber, and polymer. These materials are non-reactive with fresh and salt water. You must consult with Aqua Logic, Inc. if any other fluids are to be pumped through the chiller.

If humid or wet conditions exist where chiller is to be located, care must be taken to prevent water from getting on electrical components. Fins on condensing unit are made from aluminum and are subject to rapid corrosion, especially near sea water. Fins are thin to aid in heat exchange. Bent fins reduce efficiency and just brushing up against them can bend them over. Heat pumps should be located away from high traffic areas.

The chiller operates by virtue of a thermostat that senses water temperature inside the probe well. When the temperature set point is satisfied, the supply of refrigerant to the evaporator is stopped. This initiates a pump down, and the compressor shuts off. When the thermostat calls for cooling, the supply of refrigerant is re-established to the evaporator, but the system has a time delay of approximately 3 or 5 minutes before the compressor goes on again.

## Chiller Control Set-up

Step	Enunciator	Description	Display
1	F or C	Fahrenheit or Celsius	<b>F</b>
2	S1 (Blinking)	Setpoint Temperature	S1 <b>77</b>
3	DIF (Blinking)	Differential Temperature	DIF <b>1</b>
4	C1 or H1	Cooling or Heating Mode	<b>C1</b>



### 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** enunciator 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.)

- 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 set point temperature. The LCD will display the current set point temperature and the set point enunciator will be blinking on and off 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.
- Press the **SET** key again to access the differential. The LCD will display the current differential and the **DIF** enunciator will be blinking on and off 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 access the heating mode. The LCD will display the current mode, **C1** for chiller mode and **H1** is for heater mode. Press the **SET** key once more and programming is complete. Controller **MUST** in the **C1** mode for correct operation.

**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.

## Heat Pump Control Set-up

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



### 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 setpoint 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 setpoint temperature. The LCD will display the current setpoint temperature and the **S1** annunciator will be blinking to indicate that the control is in the setpoint mode. Press either the up ↑ key to increase or down ↓ key to decrease the setpoint 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 setpoint temperature. The LCD will display the current chill setpoint temperature and the **S2** annunciator will be blinking to indicate that the control is in the setpoint mode. Then press either the up ↑ key to increase or down ↓ key to decrease the setpoint 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.

## Chiller / Heat Pump Maintenance

### Heat Exchanger Cleaning:

The heat exchanger should be cleaned approximately every 12 months or as needed to allow proper performance. On some models this process may be done without removal of the heat exchanger shell. (i.e., water flushing system)

**WARNING:**

When using bleach and acid special care should be observed. Always wear hand, eye and body protection. Use rubber gloves.

**DO NOT** pour acid or bleach into the water. **DO** pour water into acid or bleach solution.  
**DO NOT** perform acid and bleach flushing at the same time. The gas generated by the mixture is poisonous and can result in serious injury or death.

### To remove organic deposits from titanium tube bundle without removing the shell:

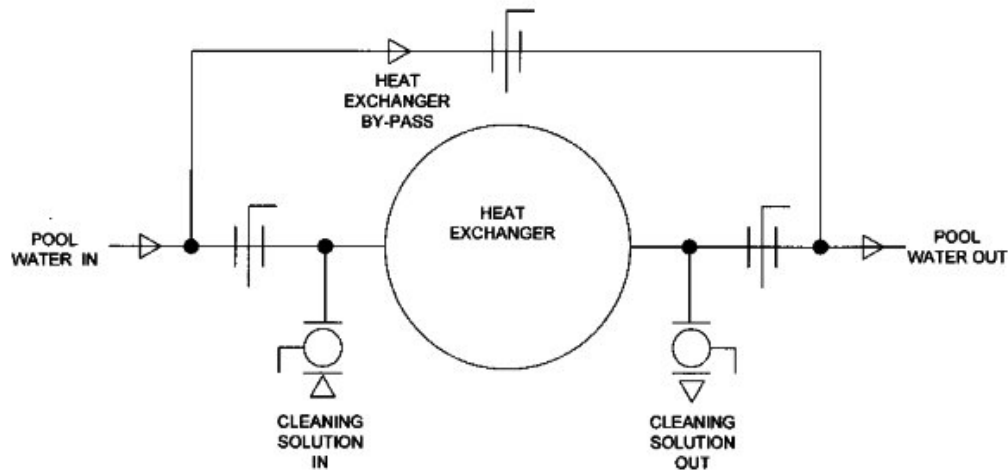
1. Isolate the heat exchanger. (see drawing next page)
2. Mix 1 part bleach to 3 parts distilled water in 20 gallon tank or larger container.
3. Circulate via pump the solution through heat exchanger for approximately one to two hours or as needed.
4. Thoroughly rinse heat exchanger with clean water.

### To remove mineral deposits from titanium tube bundle:

Use the same steps as above, but use muriatic acid instead of bleach. Be sure to follow the muriatic acid manufacturer's instructions for use and safety.



## Heat exchanger by-pass plumbing



### Condensing unit maintenance:

The condensing unit should be cleaned approximately every 12 months or as needed to allow proper performance.

**Note:** If located near the ocean, every 6 months a fresh water wash down of the condenser fins should be done to prolong the life of the chiller or heat pump.

1. Clean and inspect the condenser coil for dirt and debris built-up. (If dirty, use compressed air or a pressure washer to clean)
2. Visually inspect connecting refrigerant lines and coils for evidence of oil leaks. (If there is oil residue you may have a refrigerant leak. Call your local HVAC tech)
3. Check wiring for loose connections.

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## CHILLER AND HEAT PUMP PACKAGES LIMITED WARRANTY TERMS

(PLEASE READ CAREFULLY):

Effective 3 / 2015

### Limited Warranty

Aqua Logic, Inc. packaged water chiller and heat pumps have a **one (1) year** parts and **90 day** labor warranty. Heat exchanger (evaporator) has a **one (1) year** parts only warranty.

**An extended condensing unit only five year parts and labor warranty is available for an additional charge. This must be added at the time of purchase.**

The limited warranty covers only the parts and labor based upon Aqua Logic service cost and Aqua Logic is not liable for field repair work without prior written or verbal agreement with 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 include the following:

- Damage caused by freezing, inadequate or no water flow.
- Damage caused by improper installation or maintenance by user or their agent.
- Damage caused due to misapplication of the 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.
- Damage caused by a contractor in the field with poor installation technique ie., incorrect plumbing size between other equipment.

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

- Provide user-replaceable parts to restore the unit to proper operation.
- Provide a Repair Authorization (RA) number with a specified dollar limit for a qualified technician to provide a field repair.
- Provide a Return Authorization (RA) number to return the unit with prepaid freight in wood crate that fully protects the unit from damage to: Aqua Logic, Inc., 9558 Camino Ruiz, San Diego, CA 92126
- 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

## **Chiller / Heat Pump Start-up**

Job Name			
Date			
Model No.			
Serial No.			
Unit Run Volts / phase			
Unit Run Amps			
Water flow rate (GPM)			
Incoming Water Temp (°F)			
Freon Suction (PSI)			
Freon Liquid (PSI)			
Superheat °F			

### **Start-up procedure:**

**Caution:** It's important to allow the oil in the compressor(s) to warm-up at least 8 hours before starting up the unit. If the ambient air temperature is below 60°F, apply power to the unit and set controller so the compressor(s) do not energize or by-pass the heat exchanger water supply so the flow switch will not activate the unit.

1. Remove the cover of the unit. (If applicable)
2. Attach refrigeration suction and liquid hoses and an Amp / Volt meter to the unit.
3. Turn on water pump to heat exchanger. Note: (Make sure water flow rate is within published rate of the chiller.)
4. Adjust the controller below the indicated water temperature to turn on the unit. (After 2-5 minutes the compressor should activate.)
5. Once the compressor(s) are running for approximately 15 minutes, record the information that's listed above.
6. For Heat Pumps, cycle the unit from chilling to heating to make sure the reversing valve is functioning.

Comments:
