



ALPHA 9-15 SERIES CHILLERS INSTALLATION & OPERATION

INSTALLATION

A. UNIT PLACEMENT

1. The Alpha series chillers should be lifted into place by picking up on all four corners of the unit baseplate simultaneously. The unit should never be lifted by any of the components on top of the baseplate. The four corners are the only areas designed to support the unit.

2. The chiller unit can be mounted in almost any area of the boat. Because the unit is water cooled, high ambient temperatures such as those found in an engine room do not adversely affect the unit. The unit should not be mounted in an area where seawater, salt air spray, bilge water or internal leakage could splash on the unit in any way.

B. SERVICE ACCESSIBILITY

The most important consideration to remember when installing the Alpha series chiller is that there must be service accessibility to all components after the unit is installed.

All piping (both chillwater and seawater) connections to and from the Alpha series unit should be easily removable for maintenance or repair. The chillwater inlet and outlet should have a flexible hose connection right at the inlet and outlet FPT fittings. This flexible connection should be 6-8" long with two hose clamps on each end of the hose. On the end of the hose, opposite the chiller, there should be a shutoff valve. This should be done for both the chillwater inlet and outlet lines. These can be used to isolate the unit during maintenance or repair. Flexible hose connections should also be installed in the seawater lines.

D. PIPING CONNECTIONS

REAR RIGHT	35%
REAR LEFT	25%
FRONT RIGHT	20%
FRONT LEFT	20%

The unit should be securely mounted on all four corners to prevent movement of the unit in the most severe conditions. It is recommended that the unit be mounted on the vibration isolators that are supplied with the chiller to prevent any unit vibration from being transferred to the structure of the yacht. The unit weight is distributed as follows:

C. SHOCK MOUNTING

The primary components on the unit that will possibly need service accessibility are the main electrical box and compressor. The compressor should be accessible from the top. There should be sufficient room to remove the compressor without moving the unit or having to move any equipment located around the unit. Access must also be provided to remove the electrical box cover from the unit and to remove and replace all electrical box internal components.

Following are the step by step instructions for starting the Alpha Series chiller. If there are any questions regarding these instructions please contact Aqua Air for clarification.

OPERATION

Wiring for the compressor power inlets, seawater pumps and relays and flow switch must be of the proper size. The amperage draw for all units is shown in the equipment specification table at the end of this document. The wire should be rated for 105 degree Celsius, 600 volt duty. Proper sized wire terminals should be used on all connections. All connections must be tight to prevent a high amperage condition from happening. All wires should be routed into the main electrical box through the plastic wire bushings and/or connectors provided in the bottom of the box.

WARNING

Failure to use the correct wire sizes, breaker sizes and wire connectors can result in equipment failure, voiding the warranty and/or injury or death to the operator.

F. WIRING

Condensation that forms on the plate chiller is collected at the bottom by the drain pan. There is a 1/2" O.D. hose connection in the bottom of the drain pan. It should be connected to a hose and drained into a suitable area.

E. DRAIN CONNECTIONS

All chiller lines connecting to the unit must be insulated with a minimum of 1/2" wall foam insulation to prevent condensation.

C. CHILLER UNIT PUMP STARTUP

1. Make sure that the seawater thru-hull valve is in the open position.
2. Check the seawater strainer to make sure that it is clean.
3. If the seawater pump has a removable plug, remove it momentarily to allow any air trapped in the pump head to escape. Running the seawater pump dry will burn up the seal and cause it to leak.

B. SEAWATER SYSTEM

1. Make sure that there is sufficient fresh water in the ship's pressurized fresh water system to fill the entire chillwater system.
2. Open the air bleeder on the highest fan coil to allow air to escape from the system while water is being introduced into the system.
3. Open the ball valve separating the ship's fresh water system from the chillwater make-up system and allow water to enter the chillwater system.
4. If there is a pressure gauge on the chillwater makeup line it should indicate between 12-15 psig when the system is filled. These are the normal operating pressures.

A. INTRODUCING FRESH WATER INTO THE CHILLWATER SYSTEM

Failure to accurately follow the startup procedure can result in equipment failure, voiding the warranty and/or injury or death to the operator.

WARNING!

The Alpha chillers are test run at the factory before shipment. The digital thermostat on each chiller is set according to the following temperatures:

SINGLE CHILLER SETTINGS

G. CHILLER SETTINGS

When the **SYSTEM** switch on the remote panel is turned on the chillwater pump will energize. It is now possible to select any or all of the units. The individual chiller units are turned on by placing the **CHILLER UNIT** switch in the **ON** position, energizing the control circuitry. The unit will now go through the thermostat countdown and then the compressor will come on. If the seawater pump has not already been energized by the another chiller it will now start pumping. Verify that the seawater pump is rotating in the proper direction and that there is a good stream of water coming out the seawater overboard discharge.

MULTIPLE CHILLER STARTUP

When the **SYSTEM** switch on the remote panel is in the **ON** position, the control circuitry for the chiller is energized. After the thermostat countdown (as described above) has been completed the chiller will energize. The chillwater pump will start as soon as the **SYSTEM** switch has been turned on. The seawater pump should start as soon as the compressor starts. Verify that the seawater pump is rotating in the proper direction and that there is a good stream of water coming out of the seawater overboard discharge.

SINGLE CHILLER STARTUP

You have a single chiller or multiple chillers. Procedures are listed below for both. One feature of the Alpha series chillers is the use of a solid state digital thermostat to control all the functions of the chiller. One of the features of the thermostat is its built-in anti-short cycle timer. Whenever power is first applied to the control circuitry of the chiller the thermostat locks the circuit out for 210 seconds (3.5 minutes). This only occurs when the chiller has been turned off at the remote panel or at the circuit breaker supplying power for the remote panel. This also prevents the chiller from immediately coming back on after a power outage.

The starting procedure that applies to your particular situation depends upon whether

E. STARTING THE CHILLER(S)

3. Continue this procedure until all the air has been purged from the system. Any air that is trapped in the chillwater loop can be heard passing through the coils or the pump head. Any air in the chillwater loop will reduce the system capacity and must be purged.
2. Starting with the lowest fan coil in the boat, progressing to the highest, begin bleeding each fan coil. On coils with schrader fittings, depress the pin inside the fitting to release the trapped air. On fan coils with the screw head type bleeder turn the screw counter-clockwise until the trapped air is released. After only water comes out turn the screw clockwise to tighten.
1. Turn on each individual room thermostat to the full cooling position. Verify that the fan coil water valve is open. A simple way to check if the valve is open is to try and move the water valve lever. If the lever moves side to side without resistance then the valve is energized and open. If you feel spring tension against the lever then it is not open.

D. BLEEDING AIR FROM THE SYSTEM

Before you begin to bleed the chillwater loop of air, it is necessary to start the chiller pump. There must always be water in the head of the chiller pump during operation. Running this pump dry will burn up the seal and cause it to leak. To turn the chiller pump on put the **SYSTEM** switch on the remote panel in the **ON** position. The amber light above the switch will come on and the pump should start. If it does not, check the fuse directly below the **SYSTEM** switch to see if it is blown. On 3 phase systems make sure that the motor is turning counter-clockwise as you are facing the front of the pump. If it is not, turn the unit off and switch any two leads of the power input wires to the chiller pump. If air is trapped in the chiller pump head remove the top brass plug and allow the air to escape. Before replacing the plug put pipe thread sealant on it and then install and tighten.

Instructions for changing the thermostat set points are in the section of this manual titled "DIGITAL THERMOSTATS 222118.9 SERIES". Turn to the third page and read section titled "PROGRAMMING STAGE CONTROL VALUES". T775A thermostats (222118 series) are used on all units.

Unit	Stage 1
Chiller 1	45F
Chiller 2	48F
Chiller 3	51F
Chiller 4	54F
Chiller 5	57F

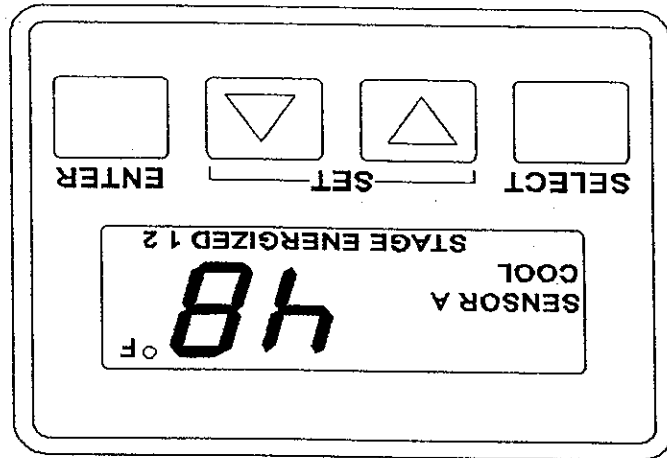
If more than one chiller is operated in parallel, the setting should be changed as shown below. The settings for chiller #1 will remain at the factory settings while the settings for chillers 2-7 will change. The freeze-up setting of 38F will not change.

MULTIPLE CHILLER SETTINGS

According to these settings the chiller will stop operation when the chillwater inlet temperature reaches 45F. The chiller will restart when the inlet temperature reaches 48F. If the chiller does not receive sufficient chillwater flow and the chillwater outlet temperature reaches 38 degrees F the chiller will shut off on stage 2. This acts as freeze-up protection.

STAGE	FUNCTION	SET POINT	DIFFERENTIAL	MODE
1	COOLING	45F	3F	COOL
2	FREEZE-UP	38F	5F	COOL

7775 THERMOSTAT DISPLAY



REMEMBER THAT THE FREEZE-UP SETTING SHOULD ALWAYS BE 38 F.

Unit Specifications

	A9D	A10D	A14D	A15D
Capacity (nom)	108,000 btuh 27,000 kcal	120,000 30,000	168,000 42,000	180,000 45,000
Nominal Tons	9	10	14	15
Weight	376 lbs 171 kg	376 lbs 171 kg	570 lbs 259 kg	570 lbs 259 kg
No. of Compressors	1	1	1	1
Length	29 in 737 mm	29 in 737 mm	29 in 737 mm	29 in 737 mm
Width	29 in 737 mm	29 in 737 mm	29 in 737 mm	29 in 737 mm
Height	26 in 660 mm	26 in 660 mm	31 in 781 mm	31 in 781 mm
Voltage *	208-240	208-240	208-240	208-240
Phase	3	3	3	3
Frequency	50-60	50-60	50-60	50-60
Amperage Draw	26	27	36	41
Chillwater Connections	2" FPT	2" FPT	2" FPT	2" FPT
Chillwater Flow	22 gpm 82 lpm	24 gpm 91 lpm	34 gpm 129 lpm	36 gpm 137 lpm
Chillwater Pump	CD100B-40-05	CD100B-40-05	CD100B-45-10	CD100B-45-10
Chillwater Pump Amp.	2	2	4	4
Seawater Connections	1-1/4" FPT	1-1/4" FPT	1-1/2" FPT	1-1/2" FPT
Seawater Flow	36 gpm 137 lpm	40 gpm 152 lpm	56 gpm 212 lpm	60 gpm 228 lpm
Seawater Pump	CD100B-40-05	CD100B-40-05	CD100B-45-10	CD100B-45-10
Seawater Pump Amp.	2	2	4	4

*Units are also available in 460/3/60 and 380/3/50 power input. Consult the factory for specific information.

ALPHA 9-15 CHILLER SPARE PARTS

	A9D	A10D	A14D	A15D
Compressor Overload	203725-01	203725-01	203730-01	203730-01
Contactors	205105-01	205105-01	205105-01	205105-01
Time Delay	217001-00	217001-00	217001-00	217001-00
Temperature Controller	222119-00	222119-00	222119-00	222119-00
Plate Chiller Assembly	CHA-10	CHA-10	CHA-15	CHA-15
Condenser Assembly	13600-A10	13600-A10	13600-A15	13600-A15
Compressor	203724-00	203725-00	203728-00	203730-00
High Pressure Switch	210909-00	210909-00	210909-00	210909-00
Low Pressure Switch	210910-00	210910-00	210910-00	210910-00
Drier/ Filter	206615-10	206615-10	206615-14	206615-14