



Commercial Air Source Heat Pump Water Heater Operations and Installation Manual

Version 2.2
Nyle Systems LLC © 2016

GEYSER C-25A

⚠️ WARNING

Read through entire manual before installing, operating, or servicing this unit. Failure to follow any steps or guidelines could result in personal injury, death, destruction of property or may cause the unit to become inoperable. **This manual must be kept with the unit at all times.**

PRECAUTIONS

Do not operate unit if it or any of its parts:

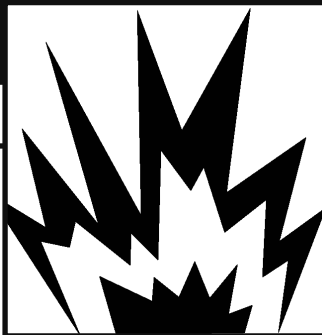
- Have been exposed to fire.
- Have been submerged in water or exposed to flooding.
- Have been exposed to extreme temperatures.
- Have significant interior or exterior damage.
- Have been running without water.

In the case of any of the above, have the unit serviced by a qualified professional before continuing operation.

⚠️ WARNING

Explosion Hazard!

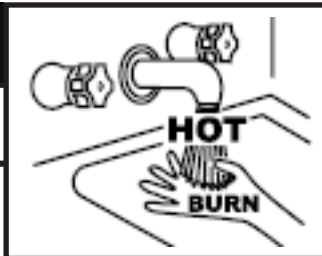
- DO NOT purge or pressurize this system with oxygen to test for leakage. Using oxygen may cause dangerous explosive reaction.
- Overheating water in the tank can cause explosion.
- Be sure to install correct temperature and pressure relief valves on storage tanks. Failure to do so may result in excessive pressure in the tank which can cause an explosion.



⚠️ WARNING

Burn Risk!

- Water temperatures over 125°F (52°C) can cause severe burns.
- Children, elderly and disabled peoples are at high risk of injury and require assistance.
- Test water for safe temperature before use.
- Water heater must have temperature limiting devices installed according to local building codes.



GROUNDING

Heat pump water heater must be grounded.

Failure to ground will result in unreliable performance or an inoperative unit.

You may chose to:

Ground by connecting unit to a grounded metal, permanent wiring system.

or

Ground by running an equipment grounding conductor with the circuit conductors and connecting those to the equipment grounding terminal or lead on the water heater.

Grounding must be in accordance with national and local electrical codes. Please contact your municipal offices for more information on building codes.

⚠️ WARNING

Refrigerant!

- Unit contains R-134a refrigerant under high pressure. Refrigerant must be recovered to relieve pressure before servicing.
- **DO NOT use unapproved refrigerants, substitutes or additives.**
- Failure to abide by these guidelines can result in death, injury and property damages.
- Contact Nyle's service department for more information on refrigerant options.

⚠️ WARNING

Electrical Shock!

- **Turn off power to unit before service.**
- Make sure wires are labeled before disconnecting.
- Test unit after reconnecting wires.
- Failure to do the above could result in death or injury.

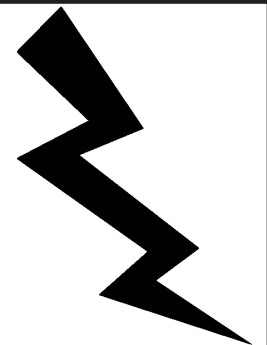


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GENERAL INFO & SAFETY

INTRODUCTION

GENERAL INFORMATION

Nyle Systems air source heat pumps offer commercial and industrial users an energy efficient means of heating water to temperatures as high as 150°F. Nyle air source heat pumps work by gathering heat from the surrounding air, and through a refrigeration cycle, depositing the extracted heat into sanitary water at a usable temperature. Through this cycle both hot sanitary water and cool, dehumidified air are made available.

Nyle Systems' C-25A air source heat pump is a single-package horizontally mounted unit with built-in digital thermostats and manual controls. This unit is built specifically for use in large scale commercial applications where a large amount of sanitary water is needed at usable temperatures.

HOW IT WORKS

The Geyser C-25A is air sourced, meaning heat is extracted from the surrounding air and, utilizing heat pump technology, is used to heat sanitary water to the desired temperature. As a by-product of heating water, the Geyser C-25A unit will also cool and dehumidify the surrounding air. This cooler, dehumidified air can be ducted to another location for conditioning of another space

Performance for heat pumps is expressed in terms of Coefficient of Performance (COP). In typical installations the Geyser C-25A unit achieves COPs ranging from 3-5, depending on source and heated water temperatures. This means it creates 3-5 units of renewable heat from the air for every 1 unit of electricity required to run the unit. This 300% to 500% efficiency offers significant savings over gas, oil, or electric water heaters with efficiencies for these technologies typically in the range of 70% to 95%.

ABOUT THE GEYSER C-25A

The Geyser C-25A has a nominal heating capacity of 25,000BTUH, generating up to 52 gallons of hot water per hour. The C-25A also has a nominal cooling capacity of 19,900 BTUH. These units can heat water efficiently up to 150°F and are ideally suited for restaurants, hotels/motels, apartment buildings, laundry facilities, health care facilities, schools, sports arenas, gyms, institutions such as prisons, military barracks, specific manufacturing plants, and more.

SAFETY INFORMATION

SAFETY CONSIDERATIONS

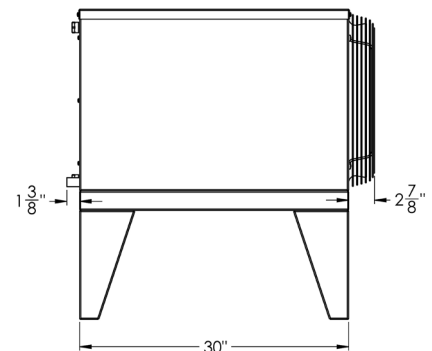
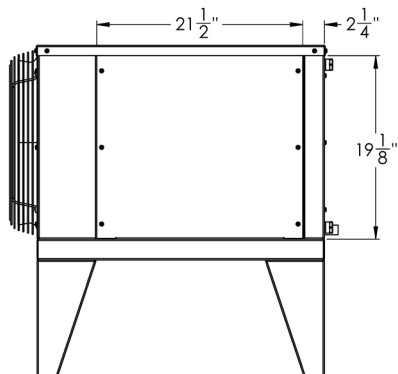
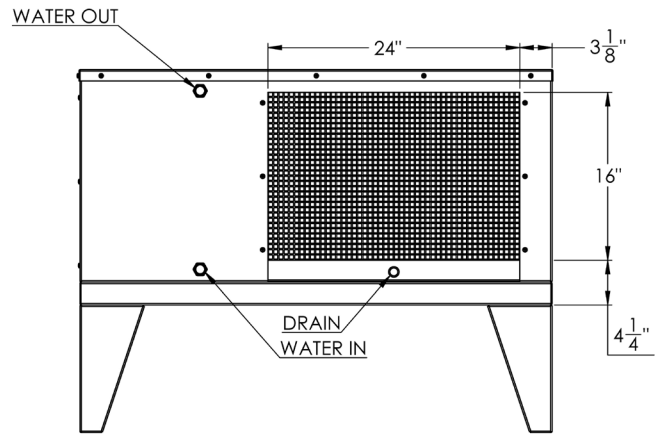
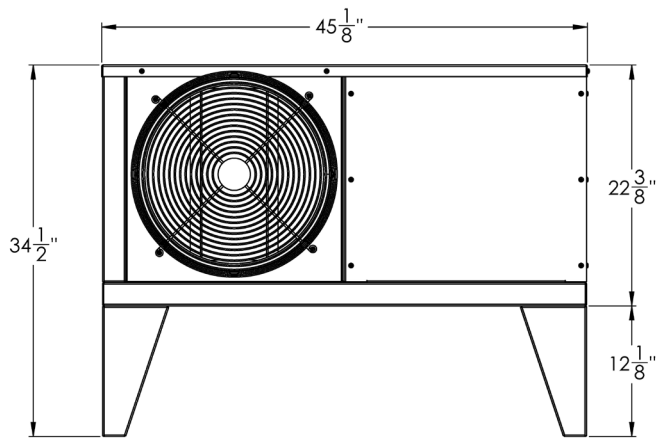
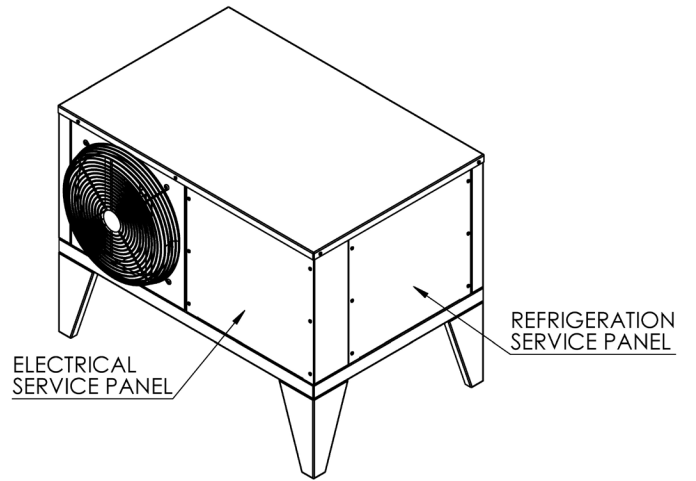
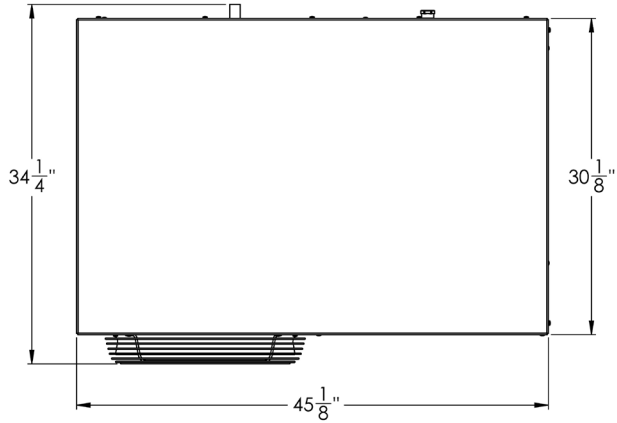
Installation and servicing of heat pump equipment can be hazardous due to system pressure and electrical components. Please note that only trained and qualified service personnel should perform installation, repairs, or service on the Geyser C-25A. When performing installation, repair, or service on the unit, observe precautions in the manual, tags, and labels attached to the unit. Follow all other safety precautions that may apply.

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other hazardous conditions which may cause personal injury or property damage. Always consult a qualified installer, service agency, or your distributor for information or assistance.

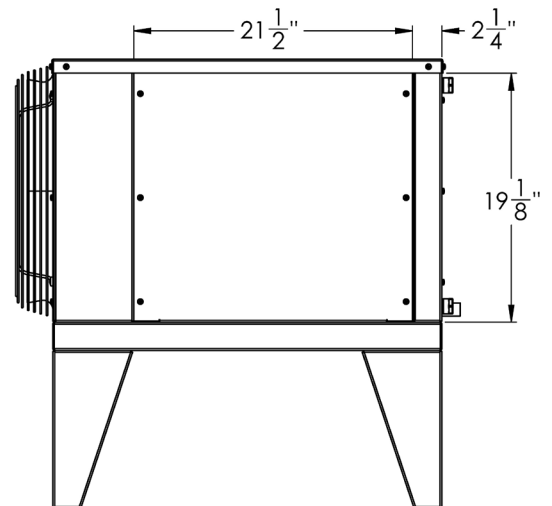
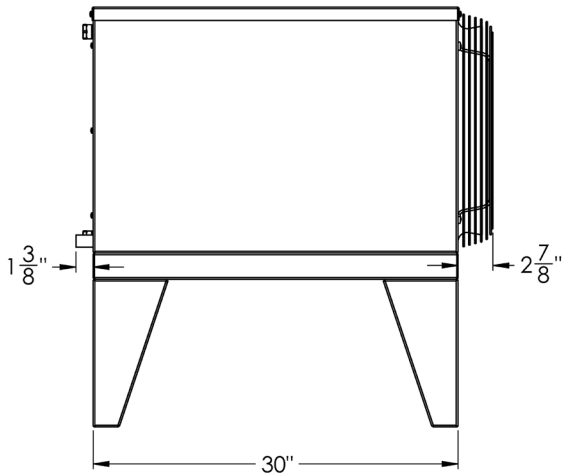
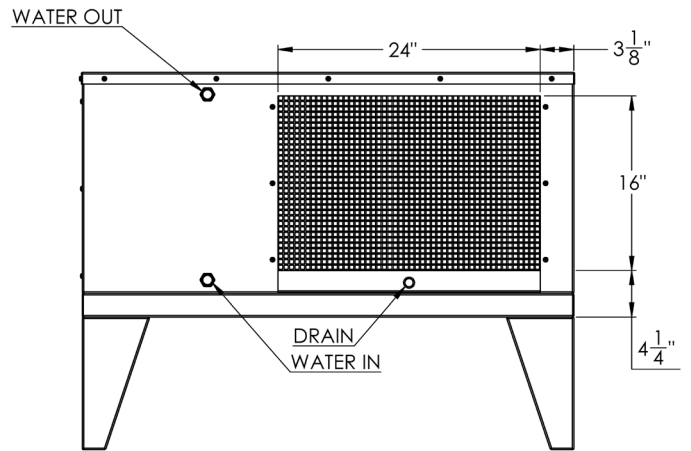
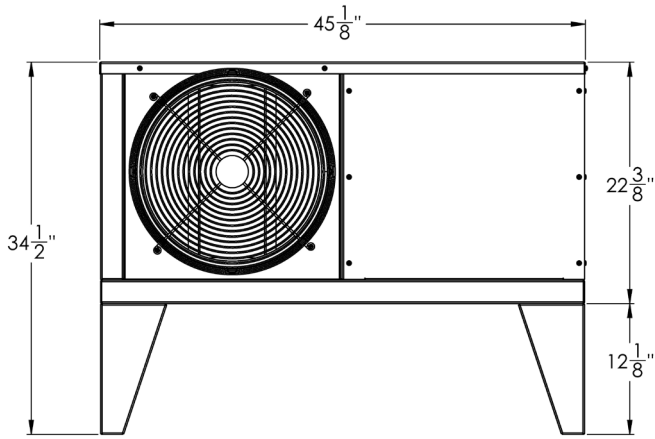
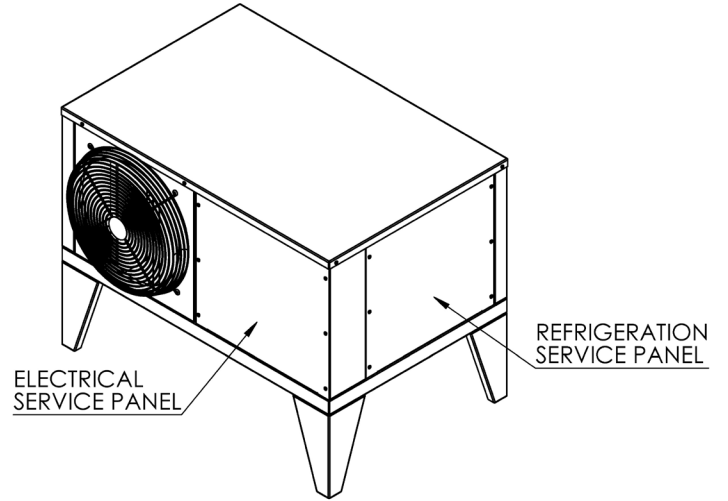
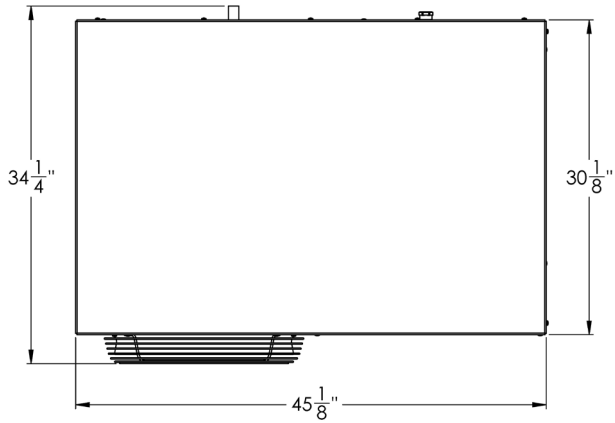
- ▶ Do not stand or sit on the unit
- ▶ Disconnect all power before opening the control panel.
- ▶ There is no need to open the control panel unless there is a malfunction internally. Only a licensed technician is to open the control panel.
- ▶ Disconnect all power before installing or servicing the Geyser C-25A.
- ▶ Ensure the power receptacle is rated for the appropriate load. See Data Sticker on the unit.
- ▶ Ensure that the electrical supply has proper overload fuse or breaker protection rated for at least the appropriate amperage. See Data Sticker on the unit.
- ▶ All lifting of the Geyser C-25A heat pump water heater should be done with a fork lift or pallet jack to prevent back injuries. Never move the unit alone.
- ▶ If the pressure relief valve on the existing water heater tank is leaking or dripping, call a licensed plumber for repair. Do not plug or remove valve as this could result in an explosion.
- ▶ Water temperature over 125°F can cause severe burns resulting in scalding.
- ▶ Follow all safety instructions provided by the manufacturer of the existing water heater.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and the National Electrical Code (NEC) for special installation requirements.

PHYSICAL DIMENSIONS



PHYSICAL DIMENSIONS



SPECIFICATIONS

UNIT SPECIFICATIONS

Model Number	C-25A-___A	C-25A-___B
Recovery Rate*	52	52
Heat Capacity*	26,100 BTUH	26,100 BTUH
Cooling Capacity*	19,900 BTUH	19,900 BTUH
Compressor Type	Scroll	Scroll
Refrigerant	R-134a	R-134a
Max Water Temp.	150°F	150°F
Water Connections	1" FNPT	1" FNPT
Water Flow Rate Condenser**	5.4	5.4
Condenser Pressure Drop (DW) **	Approx. 4.35 psi	Approx. 4.35 psi
Air Flow Rate Evaporator**	1,250 CFM	1,250 CFM
Dimensions (LxWxH)	45 1/8" x 34 1/4" x 34 1/2"	45 1/8" x 33" x 34 1/2"
Weight	300 lbs	300 lbs

* Water was heated from 70°F to 130°F with 70°F 60% RH entering air

** Based on performance with 10°F rise across condenser

CONTROLLER

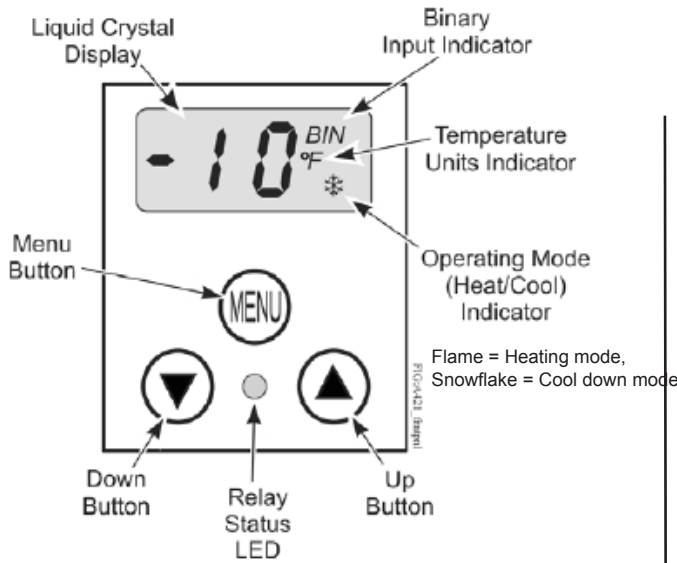
The Geyser C-series comes standard with a Johnson Controls A421 Model # A421GBF-x controller. This control is used to control the water temperature in the tank by supplying a call signal to the Heat Pump Water Heater. The control comes with some factory settings.

The A421 control should never be set higher than 150° F; failure to comply could void the warranty.



Johnson Controls A421 Controller
Model # A421GBF-x

ELECTRONIC TEMPERATURE CONTROLS



Screen Navigation

The A421 control buttons and display operate the same in both Basic and Advanced mode.

- When in Menu screens the parameters and values will flash on and off.
- Use the Arrow keys to navigate through all of the parameters and values
- To select a parameter press MENU
- To save a selected value, press MENU. This will automatically bring you to the next settable parameter
- To exit menus and return to the main screen press both arrow keys simultaneously.

Notes: If you do not press MENU to save a new value, the control reverts to the last saved value.

After 30 seconds of inactivity, while in any screen, the control reverts to the Main screen.

Saved settings remain in the control's memory during power interruptions.

Function Ranges & Settings

Some of the A421 controllers settings are preprogrammed by Nyle before shipment. These settings along with parameter ranges have been provided for your reference in the Parameter Settings table below.

Parameter Settings		
Function	Range	Factory Settings
OFF: Desired Temp Hi	-40 to 212 °F -40 to 100 °C	120°F
On: Desired Temp Low	-40 to 212 °F -40 to 100 °C	30°F
ASd: Anti-short Cycle Delay	0 - 12 Min	0 min
SF: Sensor Failure	0= Output De-energized 1= Output Energized	0
bLL: Back light Level	0 = off 1-10 = on, varying brightness	10
Advanced Parameter Settings		
Un: Temp. Units	°F and °C	°F
tSb: Temp. Setback	-50 to 50°F -30 to 30°C	0°F
So: Sensor Offset	-5 to 5°F -3 to 3°C	0°F
HtS: High Temp. Stop	-40°F -212°F -40°C - 100°C	120°F
LtS: Low Temp. Stop	-40°F -212°F (-40°C - 100°C)	40°F

Basic Mode

In this mode you can adjust the OFF, On, SF and ASd Parameters ONLY. Most adjustments that are needed to run your unit will be performed in this mode.

Basic Mode Menu:

From the main screen press MENU once. The screen will display the flashing OFF parameter indicating that you have entered the menu.

OFF: This parameter indicates your desired high temperature. When this temp is reached the unit will enter a cool down mode until the On value is reached. **WARNING: Never set above 150°F.**

ON: This parameter indicates your desired low temperature. When this temperature is reached the unit will enter heating mode until it reaches the OFF value again.

ASd: The Anti-Short Cycle Delay indicates the time required for the unit to wait before running again. **This parameter is set to 0 min because Nyle units come equipped with safety timers already in place.**

SF: Sensor Failure indicates that the temperature sensor has failed.

bLL: Black Light Level indicates the brightness of the LCD screen.

Advanced Mode

In Advanced mode you can adjust all of the basic parameters as well as; Un, Tsb, So, HtS and LtS. The main function of this mode is to add more control over your unit and to set restrictions for parameters in basic mode.

Advanced Mode Menu:

From the main screen press and hold both arrow keys simultaneously. The screen will display the flashing Un parameter to indicate that you have entered the menu.

Un: Indicates the temperature units. This can be in either Fahrenheit (°F) or Celsius (°C).

LtS: Low Temp. Stop indicates the lowest temperature that the On or OFF parameters can be set to in Basic Mode.

HtS: High Temp. Stop indicates the highest temperature that the On or OFF parameters can be set to in Basic Mode.

tSb: Temp Setback indicates the value for setting back the On and OFF temperature values. **Default to 0°F because it is not applicable to the application of this unit type.**

So: Sensor Offset allows for compensation of any difference between the displayed temperature and the temperature being read by the sensor.

Restricted Mode

Switching the Controller to Restricted Mode will prevent users from adjusting most or all of the parameter settings. The main screen will function normally.

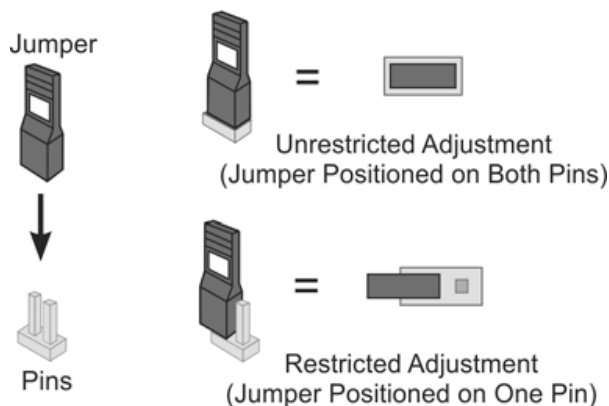
Note: The OFF parameter is the only parameter that can be accessed in Restricted Mode. So be sure that your desired parameter values are set before changing over to restricted mode.

In addition, the differential between the OFF/ON parameters is fixed in restricted mode. If the OFF parameter is adjusted the On parameter will adjust to maintain the differential.

Setting the controller to restricted mode:

- Turn power off from the controller
- Carefully remove the front panel
- Locate the jumper and carefully position it on one pin as shown in the diagram below.

The controller is now in restricted mode. Securely replace the cover before reconnecting power to the controller.



Lock out

You can format your parameters to completely restrict all user adjustment of the control when in restricted mode. To do this set the HtS value equal to the OFF value and the LtS equal to the On value. This makes the OFF/On range equal to the HtS/LtS range and thereby unadjustable in restricted mode.

RECEIVING, STORAGE & PLACEMENT

RECEIVING UNIT

IMPORTANT: Please read this entire manual before installation. Be sure to follow all installation steps. Failure to conform to these instructions may decrease the heat pump performance and could cause severe injury or death. Only qualified, licensed persons should install the heat pump equipment and electrical supply. Installation must conform to all local, state, and federal applicable codes.

RECEIVING

When receiving shipment at the job site, carefully inspect the shipment against the bill of lading. Please make sure that all unit's have been received as ordered. Inspect each units shipping crate/packaging and inspect each unit for damage. If there is a problem, notify the shipping company to make proper notation of any shortages or damage on all copies of the freight bill.

Check The Following:

1. Compare the electrical data on the unit data sticker with ordering and shipping information to verify that the correct unit has been delivered.
2. Verify that the unit is the correct model for the entering water temperature of the job.
3. Verify that the refrigerant tubing is free of kinks or dents.
4. Inspect all electrical connections. Be sure connections are clean and tight at the terminals.

NOTE:

It is the responsibility of the purchaser to file all necessary claims with the shipping company.

PLACEMENT & STORAGE

UNIT LOCATION

1. This unit is designed for indoor use.
2. Provide sufficient space for water and electrical connections.
3. Locate unit in an area that allows for easy access and removal of access panels.
4. Allow enough space for service personnel to perform maintenance. It is recommended to allow 3ft clearance on all sides. Clearance for electrical should follow all local codes and regulations.

CLEANING AND FLUSHING

1. If the heat pump is to be connected to an existing storage tank, the old tank must be drained and cleaned of sediment before the heat pump is installed.
2. Prior to start-up of any heat pump, the water circulating system must be cleaned and flushed of all dirt and debris.

STORAGE

If the equipment is not needed for immediate installation upon its arrival at the job site, it should be left in its shipping carton and stored in a clean, dry area of the building. Units must be stored in an upright position at all times. Do not remove any equipment from its shipping package until it is needed for installation.

INSTALLATION

INSTALLATION

IMPORTANT: Please read this entire manual before installation. Be sure to follow all installation steps. Failure to conform to these instructions may decrease the heat pump performance and could cause severe injury or death. Only qualified, licensed persons should install the heat pump equipment and electrical supply. Installation must conform to all local, state, and federal applicable codes.

CONNECTING WATER PIPING

All plumbing should be performed by a licensed professional, and should adhere to all local and state codes.

1. For maximum efficiency, the heat pump should have the coldest water from the hot water supply tank running through the condensing heat exchanger and the warmest possible air passing through the evaporating heat exchanger. This is done to make efficient use of the temperature difference. Therefore, the lowest connection in the hot water supply tank should be used for the condenser supply (Hot Water Inlet) to the heat pump and the condenser return (Hot Water Outlet) from the heat pump should be installed higher up on the tank, but not near the top. Installing the return at the top of the tank can cause cooler water to mix with the hottest water at the top of the tank.
2. Lines to and from the heat pump must be properly sized for the correct flow rate. Too much or too little water flow will decrease efficiency. Water tank ports must also be large enough to ensure peak water demands can be handled. For the Geyser C-25A the line size should be 1”.
3. Some municipal codes require installation of temperature and pressure relief valves on plumbing sections. Others may require dielectric plumbing fittings. Use copper or bronze fittings. All hot water pipes must be insulated.
4. All plumbing must be sized for peak water flow demands.
5. Tanks with dip tubes should be used with caution or avoided altogether, because the dip tube can restrict flow and cause heat pump malfunction.

CONNECTING WIRING

All electrical work should be performed by a licensed professional, and should adhere to all local and state codes.

The heat pump control is housed inside the electrical enclosure. Follow the name plate information located on the unit for proper voltage, phase, ampacity, breaker sizing and wire sizing. Locate a fuse disconnect as close as possible to the heat pump.

SYSTEM USAGE

BEFORE START UP

Verify the following:

- ▶ High voltage is correct and matches nameplate
- ▶ Piping is complete and the water system has been cleaned and flushed.
- ▶ Air is purged from closed loop system.
- ▶ Isolation valves are open and water control valves or loop pumps are wired.
- ▶ Service panels are in place.
- ▶ Unit controls are in “off” position.
- ▶ Locate the fan/blower direction arrows on the fan/blower guard.
- ▶ Use the arrow to check that the fan/blower and compressor is rotating in the correct direction. The compressor will always be running in the same direction as your fan/blower.
 - If your fan/blowers is rotating in the wrong direction then your compressor is also rotating backwards and needs to be corrected. To correct the rotation, change the two legs feeding the main distribution block to the unit.

MAINTENANCE & TROUBLESHOOTING

MAINTENANCE

UNIT HEAT EXCHANGER MAINTENANCE

1. Keep all air out of the water or solution.
2. Keep the system under pressure at all times. Closed loop systems must have positive static pressure.

REPLACEMENT PROCEDURES

When contacting Nyle for service or replacement parts, refer to the model number and serial number of the unit as stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and the date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

TROUBLE SHOOTING

COMPRESSOR WILL NOT RUN

1. The breaker may be open or the circuit breaker is tripped. Check electrical circuits and motor windings for shorts or grounds. Investigate for possible overloading. Replace fuse or reset circuit breakers after fault is corrected.
2. Supply voltage may be too low. Verify supply voltage matches name plate voltage listed.
3. Control system may be faulty. Check control for correct wiring and check the transformer for proper voltage.
4. Wires may be loose or broken. Replace or tighten.
5. The low pressure switch may have tripped due to one or more of the following:
 - a) Heating
 - 1) Air restricted to evaporator
 - 2) Evaporator needs cleaning
 - 3) Air temperature too cold
 - 4) Low refrigerant
 - b) Cooling
 - 1) Heated water flow too low
 - 2) Low refrigerant

6. The high pressure switch may have tripped due to one or more of the following:
 - a) Heating
 - 1) Condenser heat exchanger clogged
 - 2) Heated water flow too low
 - 3) Heated water too hot
 - b) Cooling
 - 1) Condenser heat exchanger clogged
 - 2) Heated water flow too low
 - 3) Air source too hot
7. Water temperatures are outside of their acceptable ranges.

INSUFFICIENT COOLING OR HEATING

1. Check for restriction in water flow.
2. Check refrigerant subcooling and superheat for proper refrigerant charge and expansion valve operation.

UNIT OPERATION IS NOISY

1. Check compressor for loosened mounting bolts. Make sure compressor is floating free on its isolator mounts. Check for tubing contact with the compressor or other surfaces.
2. Check screws on all panels for tightness.
3. Check for chattering or humming in the contactors or relays due to low voltage or a defective holding coil. Replace the component.
4. Check for proper installation of vibration absorbing material under the unit.
5. Check for abnormally high discharge pressures.
6. Check for any loose panels or parts that may be in contact with each other; vibrations from the compressor may cause them to chatter against one another.

SAFETY SETTINGS & WARRANTY

SAFETY SETTINGS

Safety	Factory Setting	Action
Temperature Setpoint	120°F	-
High Refrigerant Pressure Cut-out	400 psi	Shutoff
High Refrigerant Pressure Cut-in	300 psi	Restart
Low Refrigerant Pressure Cut-out	5 psi	Shutoff
Low Refrigerant Pressure Cut-in	20 psi	Restart
Defrost Temperature Setpoint (Refrigerant)	28°F	Defrost
Compressor Anti-short Cycle Delay	300 sec	-

LIMITED WARRANTY

The equipment supplied by Nyle is warranted to be free from defects in workmanship and materials for a period of one year from the date of the original installation or 15 months from the date of delivery, whichever comes first. A new or remanufactured part will be supplied by Nyle providing the defective part is first returned to Nyle for inspection. The replacement part assumes the unused portion of the warranty. The warranty does not include labor or other costs incurred for diagnosis, repairing or removing, installing or shipping the defective or replacement parts.

Nyle makes no warranty as to the fitness of the equipment for a particular use and shall not be liable for any direct, indirect or consequential damages in conjunction with this contract and/or the use of its equipment. Buyer agrees to indemnify and save harmless Nyle from any claims or demands against Nyle for injuries or damages to third parties resulting from buyer's use or ownership of the equipment.

No other warranties, expressed or implied, will be honored unless in writing by an officer of Nyle Systems.

