



Commercial Air Source Heat Pump Water Heater Operations and Installation Manual

⚠️ 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:

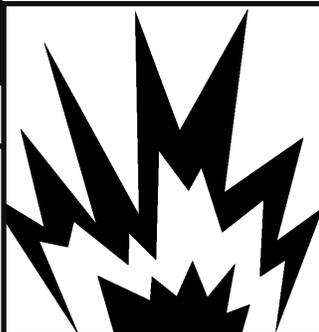
- Have been exposed to fire.
- Have been submerged in water or exposed to flooding.
- Have been exposed to extreme temperatures.
- Have significant interior or exterior damage.
- Have been running without water.

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.

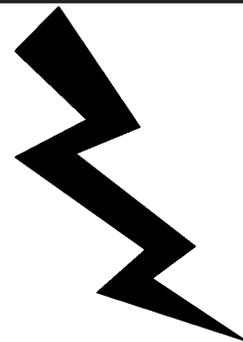
⚠️ WARNING Refrigerant!

- Unit contains R-134a refrigerant under high pressure. Refrigerant must be recovered to relive 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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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, deposits the extracted heat into sanitary water at a usable temperature. Through this cycle both hot sanitary water and cool, dehumidified air is made available.

Nyle Systems C-250 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 Geysler C-250 is air sourced, meaning heat is extracted from the surrounding air and, utilizing heat pump technology, that energy is used to heat sanitary water to the desired temperature. As a by-product of heating water, the Geysler C-250 unit will also cool and dehumidify the surrounding air. This cooler, dehumidified air can be ducted to another location for

Performance for heat pumps is expressed in terms of Coefficient of Performance (COP). In typical installations the Geysler C-250 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 typically in the range of 70% to 95%.

ABOUT THE GEYSER C-250

The Geysler C-250 has a nominal heating capacity of 250,000BTUH, generating up to 500 gallons of hot water per hour. The C-250 also has a nominal cooling capacity of 178,000BTUH. 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

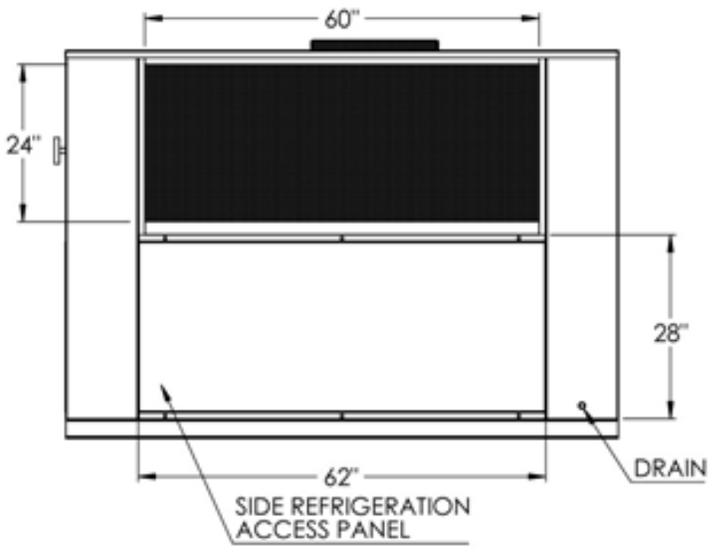
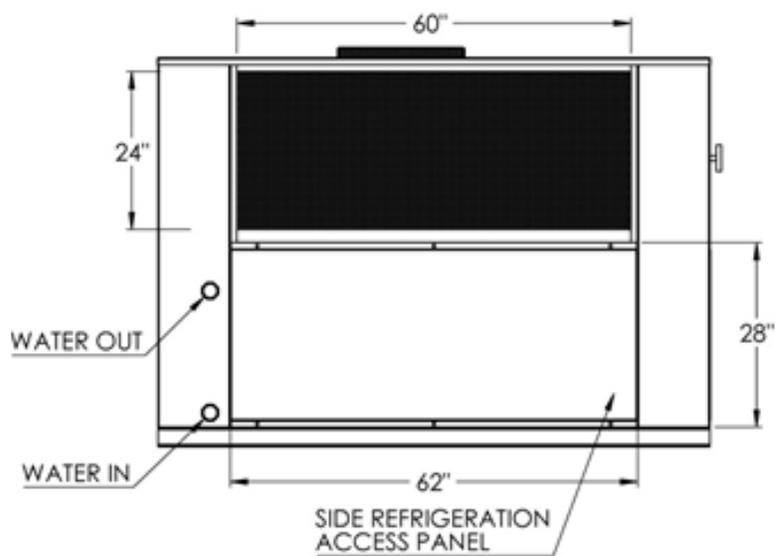
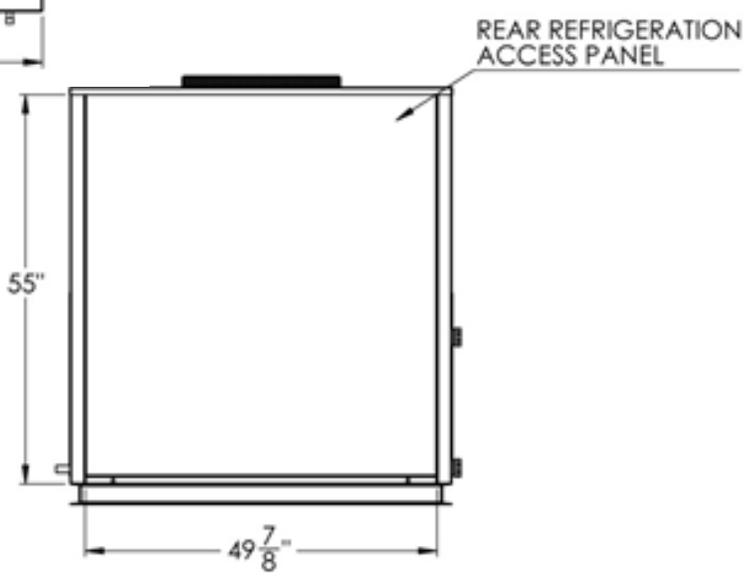
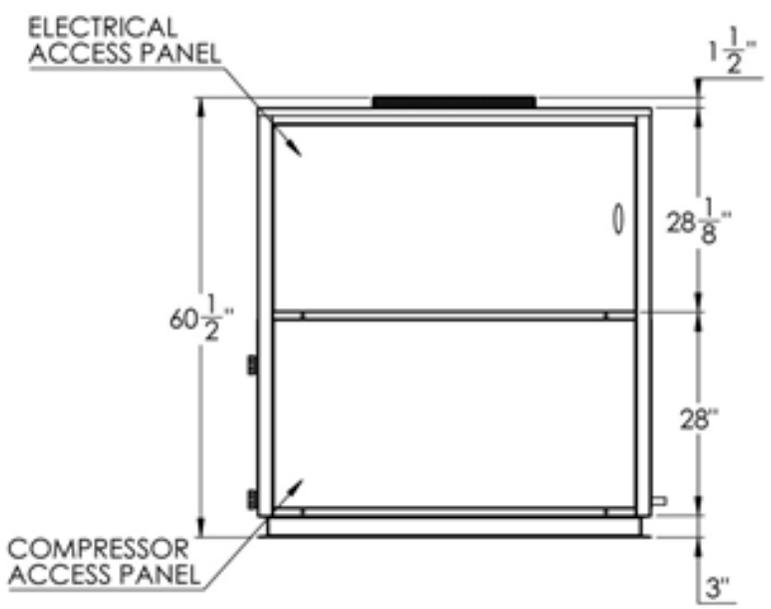
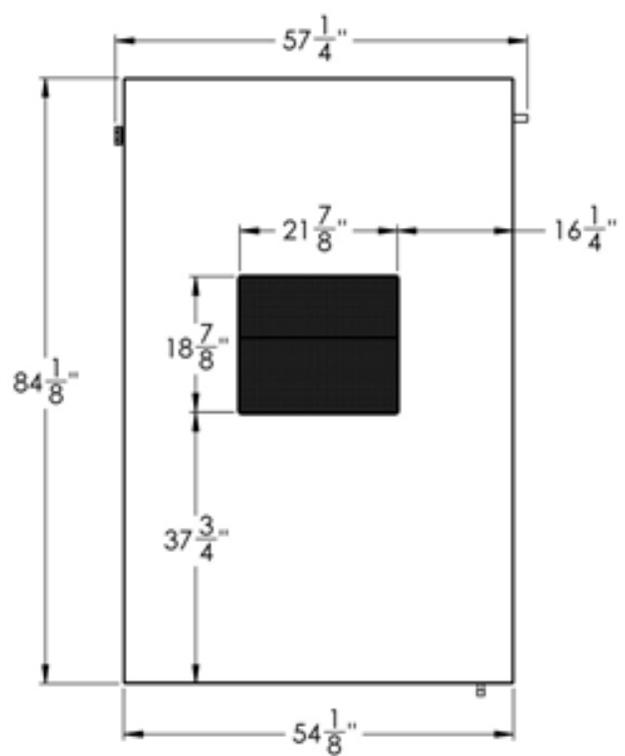
SAFETY CONSIDERATIONS

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 Geysler C-250. 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 Geysler C-250.
- ▶ 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 Geysler C-250 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.



UNIT SPECIFICATIONS

Model Number	C-250
Recovery Rate *	567 Gal/Hr
Heat Capacity *	249,800 BTUH
Power Input *	24 KW
Cooling Capacity *	178,000 BTUH
Compressor Type	Semi Hermetic
Refrigerant	R-134a
Max Water Temp.	150°F
Water Corrections	2" FNPT
Water Flow Rate Condenser **	50 Gal/Min
Condenser Pressure Drop **	7.5 PSI
Dimensions (LxWxH)	84"x 57"x 61"
Weight	1,700 LB

* Water was heated from 70° F to 130°F with 75°F entering air condition

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

CONTROLLER

The Geyser C-series comes standard with a Johnson Controls A419 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 a factory setting of 120° F with a 15° F differential. The A419 control should never be set higher than 150° F; failure to comply could void the warranty. (See Johnson Controls manual for installation instructions).



Johnson Controls A419 Controller
Model # A419GBF-1C

Changing Temperature Units

The A419 control is set at the factory to display in Fahrenheit temperature units.



To convert to Celsius units, press the Up and Down buttons simultaneously. Press them again to return to Fahrenheit units.

Notes: Make sure the Touchpad Lock jumper is in the unlocked (installed) position before adjusting the control.

Verify that the A419 control is displaying the desired temperature units (F° or C°) before establishing the setpoint value.

Setting the Setpoint

To view and adjust the temperature setpoint, follow these steps and see Function Ranges and Settings:



1. Press and hold the MENU button until the display changes to flashing SP. This will take about 2 seconds.



2. Press the MENU button again. The current setpoint is displayed.



3. Press the Up or Down button to adjust the setpoint temperature.



4. Press the MENU button to save. The display then returns to the sensor temperature.

Notes: If no entries are made for 30 seconds while programming is in progress, the control reverts to the normal temperature display.

If the **MENU** button is not pressed after changing the setpoint value, the new value is not saved and the A419 control reverts to the previously saved setpoint value.

Any saved A419 control setting values are non-volatile and remain in the control's memory during power interruptions.

Function Ranges and Settings

Function	Range	Factory Setting
SP: Setpoint	-30 to 212°F (-34 to 100°C)	30
dIF: Differential	1 to 30° (F or C)	5
ASd: Anti-short Cycle Delay	0 to 12 minutes	1
OFS: Temperature Offset	0 to 50° (F or C)	0
SF: Sensor Failure Operation	0 = output de-energized 1 = output energized	1

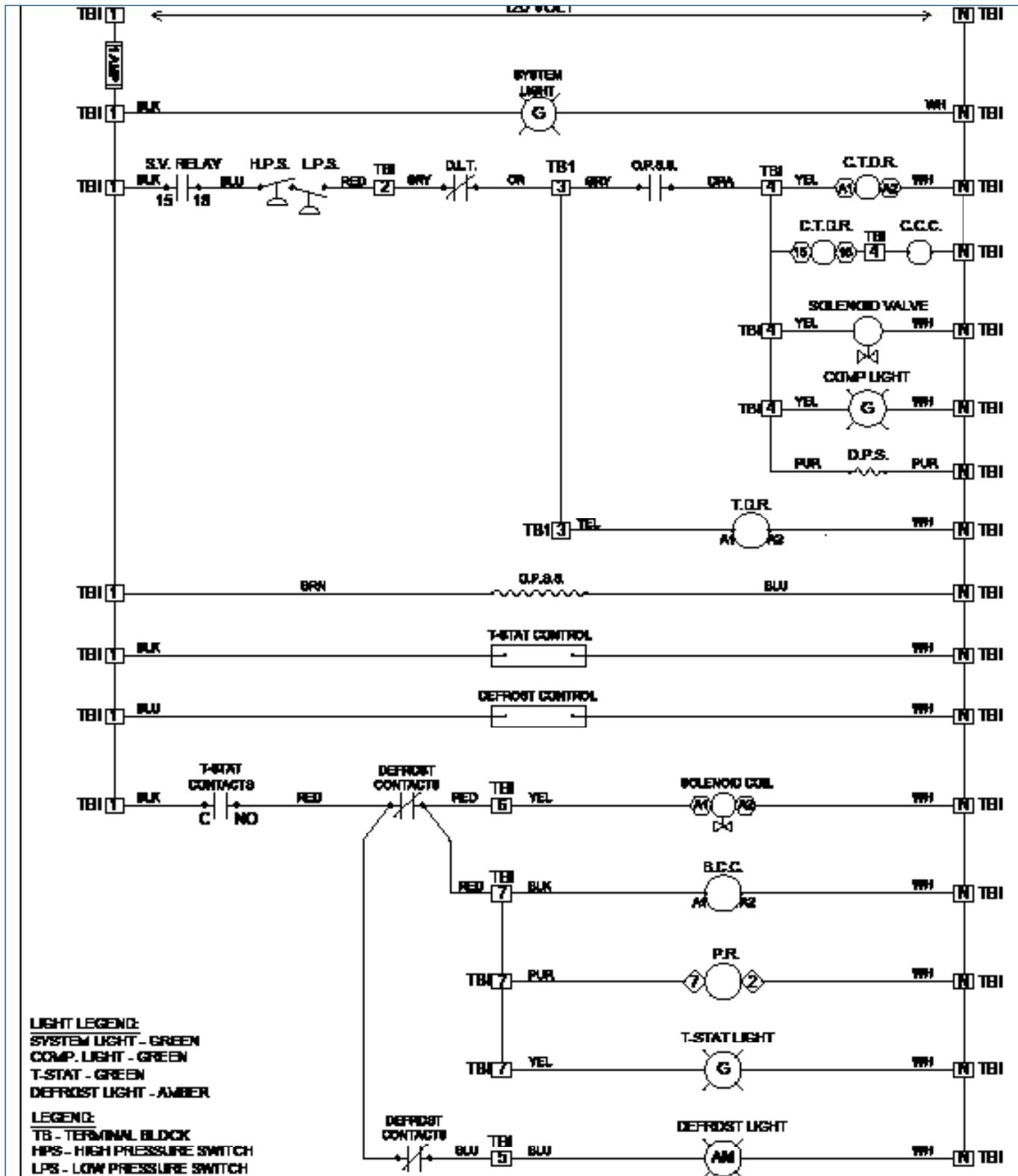
Operation at Extremes: If the combination of setpoint plus or minus the differential falls outside the temperature range (-30 to 212°F [-34° to 100°C]), the A419 control operates as follows:

Cooling/Cut-in: If the control is operating in Cooling/Cut-in mode and setpoint minus differential is less than -30°F, the control switches on at setpoint and off when the temperature drops below -30°F (-34°C).

Heating/Cut-in: If the control is operating in Heating/Cut-in mode and setpoint plus differential is greater than 212°F (100°C), the control switches on at setpoint and off when the temperature exceeds 212°F (100°C)

Cooling/Cutout: If the control is operating in Cooling/Cutout mode and setpoint plus differential is greater than 212°F (100°C), the control switches on when the temperature exceeds 212°F (100°C) and off at setpoint.

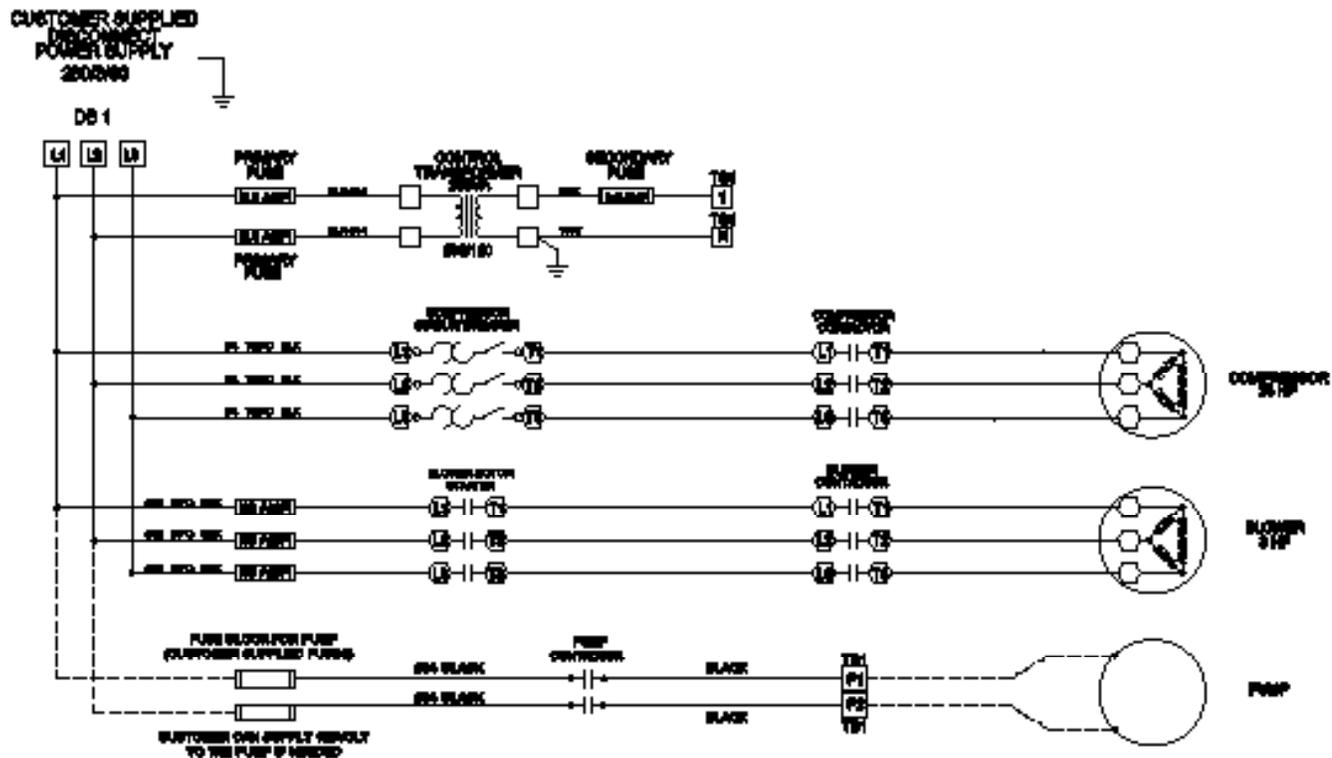
Heating/Cutout: If the control is operating in Heating/Cutout mode and setpoint minus differential is less than -30°F (-34°C), the control switches on when the temperature drops below -30°F (-34°C) and off at setpoint.



LIGHT LEGEND:
 SYSTEM LIGHT - GREEN
 COMP. LIGHT - GREEN
 T-STAT - GREEN
 DEFROST LIGHT - AMBER

LEGEND:
 TB - TERMINAL BLOCK
 HPS - HIGH PRESSURE SWITCH
 LPS - LOW PRESSURE SWITCH
 CCC - COMPRESSOR CONTACTOR COIL
 TDR - TIME DELAY RELAY FOR THE COMPRESSOR
 SOL. COIL - SOLENOID COIL
 BCC - BLOWER CONTACTOR COIL
 PR - PUMP RELAY
 OPS - OIL PRESSURE SWITCH
 OPSS - OIL PRESSURE SAFETY SWITCH
 ----- FIELD WIRING

 <small>THE QUALITY OF THE SERVICE WE PROVIDE IS OUR PRIORITY</small>	CONTROL WIRING 1-1	
	VSI C-250	
ISSUED BY AS	REV. NUMBER DWG FILE NAME	REV 1.3



 <p>IT POWERED BY THE INDUSTRY'S MOST ADVANCED TECHNOLOGY FOR RELIABILITY</p>	POWER WIRING 1-1	
	VSI C-250	
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INSTALLATION

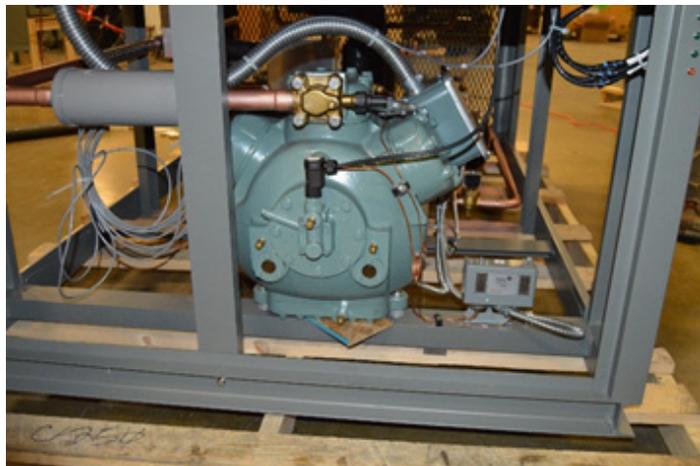
IMPORTANT: Please read this entire manual before installation. Be sure to follow all installation steps. Failure to conform to these instructions may decrease the heat pump performance and could cause severe injury or death. Only qualified, licensed persons should install the heat pump equipment and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

RECEIVING AND STORAGE

When receiving shipment at the job site, carefully inspect the shipment against the bill of lading. Please make sure that all units have been received as ordered. Inspect each unit's 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.
5. Remove shipping crate wood under compressors shown in the following photographs. This can be done by loosening the nuts on top of the spring mounts.



NOTE:

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

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.

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.



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. 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 Geysers C-250 the line size should be 2".
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 in the front of the unit. 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.

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. Check it with a volt meter.
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
3. Check for chattering or humming in the contractor 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 maybe in contact with each other, vibrations from the compressor may cause them to chatter against one another.

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.

