



VES ULTRA s/L INSTALLATION MANUAL



INCLUDED COMPONENTS:

- Qty.1 ULTRA Evaporator
- Qty.1 Compressor Assembly
- Qty.1 Single Fan Condenser Assembly
- Qty.1 Condensation tube for evaporator condensation assembly 1/2" ID 12 feet

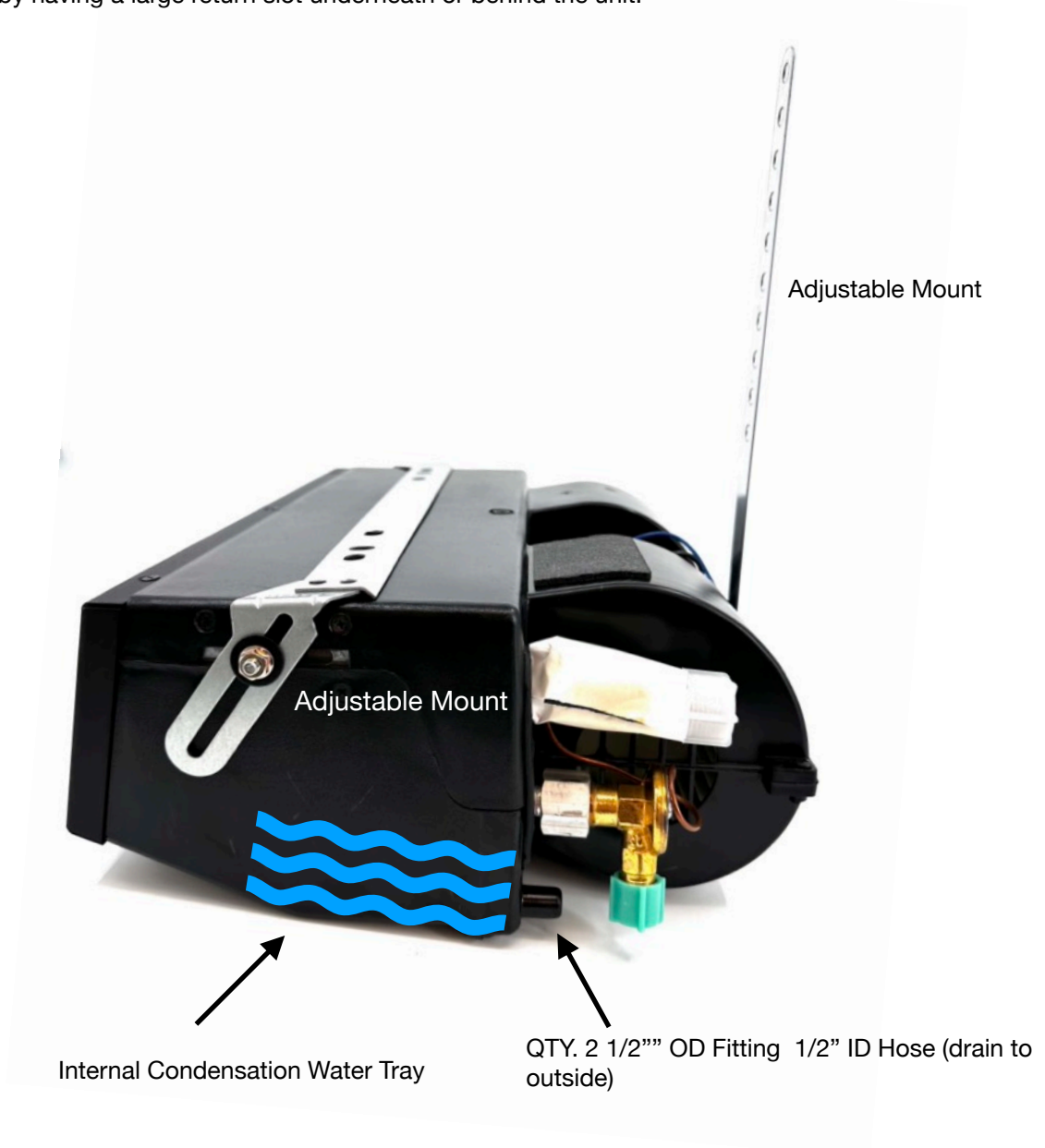
Not Included:

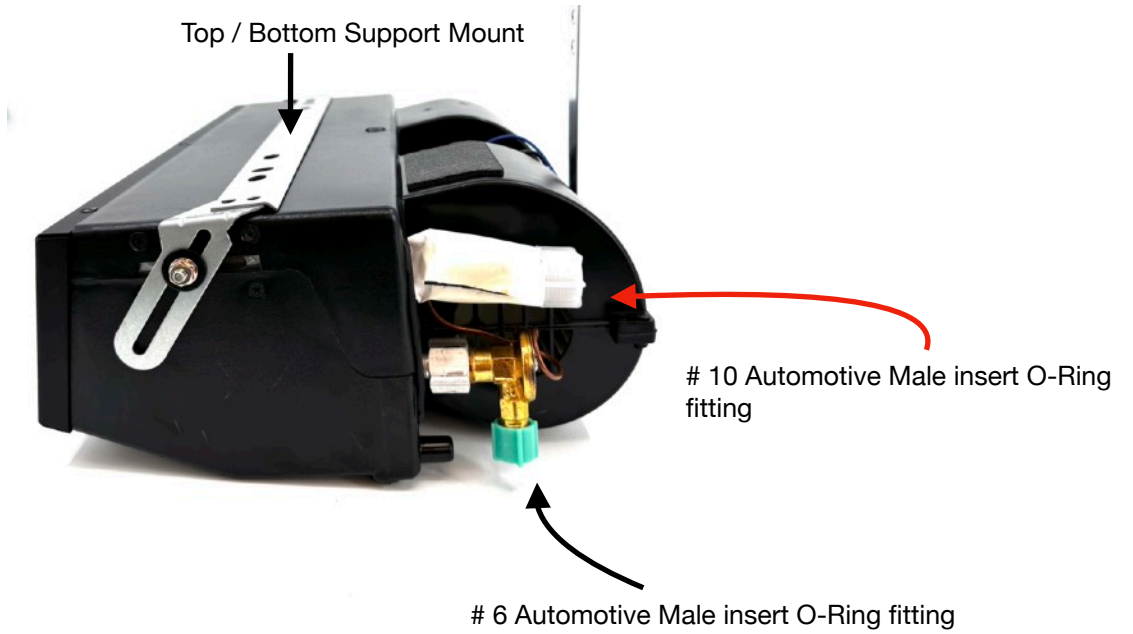
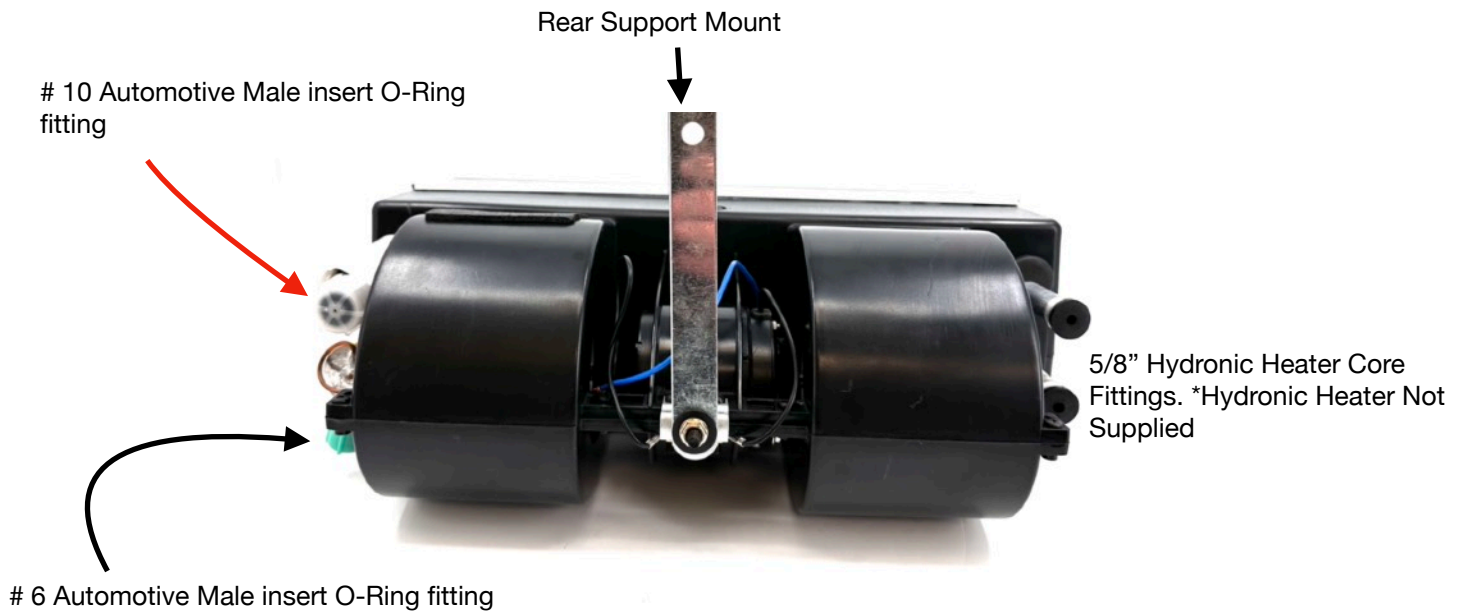
- This unit requires automotive refrigerant hoses to complete the installation process. Once all pieces are mounted the customer can fill out the hose request form and custom hose lengths can be purchased. Otherwise these hoses can be purchased with a complete hose kit shown below. The part number for this kit is VES-HK (fittings crimped on by us) or VES-HK-NC (fittings shipped loose, customer crimp).
- Qty. 1 Complete refrigerant hose kit contains:
 - Hose #1
7 feet of #8 standard barrier with Qty. 2- #8 90 degree fittings crimped on
 - Hose #2
13 feet of #6 standard barrier hose with Qty. 2- #6 90 degree fittings crimped on
 - Hose #3
2 feet of #6 standard barrier hose with Qty. 1- #6 straight fitting and Qty. 1 #6 90 degree fitting crimped on
 - Hose #4
6 feet of #10 standard barrier hose with Qty. 2- #10 90 degree fittings crimped on
- Our kit uses standard Female O-ring automotive fittings.
- Main power cable and circuit breaker/fuse. Please see Blue Sea's circuit wizard for assistance on proper sizing.
<http://circuitwizard.blueseas.com>
- Various mounting hardware to mount components
- Evacuation and charging with R134a
Components to evacuate and charge the system are available on Amazon, at Harbor Freight, or at your local auto parts store. For guidance on this, please see the customer supplied charging videos on our website under the manuals and videos tab or call us. Unit can also be charged by a certified home, commercial or automotive a/c technician. Secure a technician ahead of time and give them the attached charging sheet.
- DO NOT LIFT UNIT BY COVER AND DO NOT OPERATE UNIT WITOUT ALL LINES AND COVER IN PLACE. THE COMPRESSOR IS PRE-FILLED WITH PVE COMPRESSOR OIL. TAKE CAUTION WHEN REMOVING CAPS.

Attention: User serviceable parts inside, make sure units can be accessed for future servicing.

1. Mount Evaporator

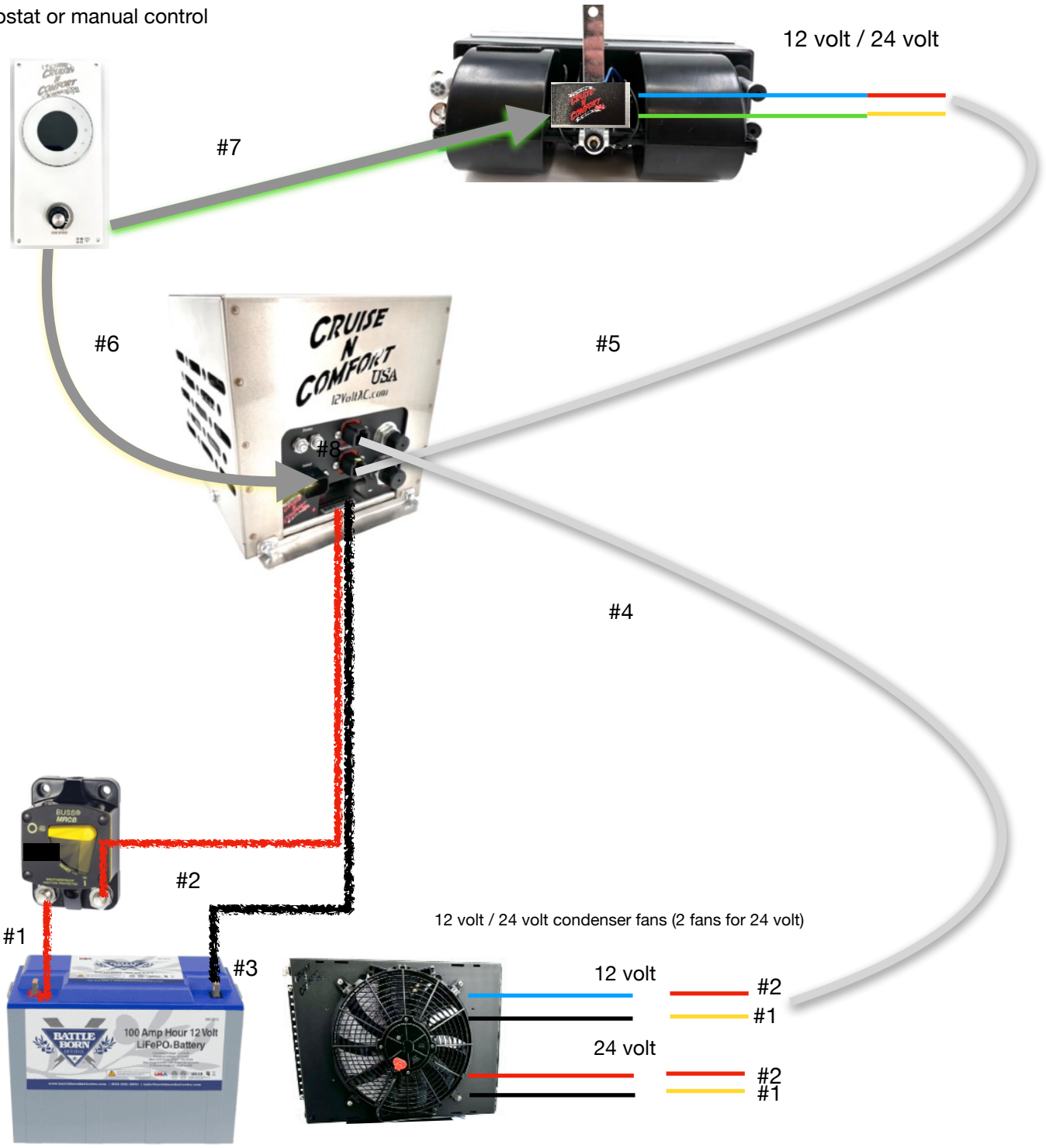
The evaporator needs to be secured to either the ceiling or inside a cabinet and needs to be mounted so that the internal condensation drain pan can drain the condensed water out of the drain tubes on the bottom. Too much of a tilt on the forward vents will not allow for proper drainage, mount as flat as possible. Make sure if this evaporator is mounted inside a cabinet that return air can enter the back of the fans. This can be achieved by having a large return slot underneath or behind the unit.





Electrical Connection Diagram 12/24 volt models

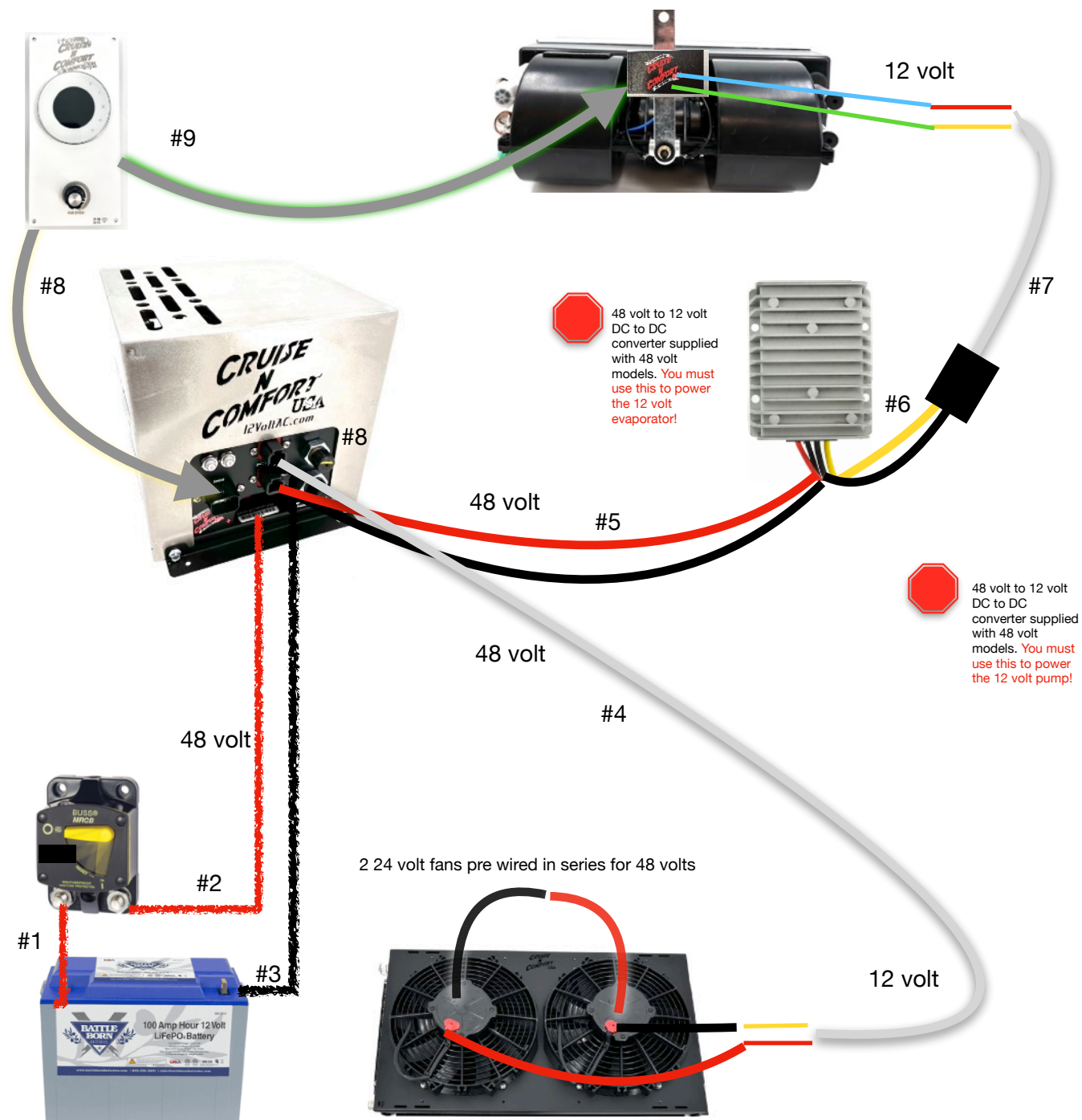
Thermostat or manual control



- #1 Power lead from Battery + to Circuit breaker / fuse
 - #2 Power lead from circuit breaker to main power connection +
 - #3 Power lead from battery- to main power terminal -
 - #4 Power connection from condenser out to condenser fans
 - #5 Power connection from evaporator out to PWM blower controller
 - #6 Plug to thermostat / manual control
 - #7 Plug to 3pin small connector on PWM blower controller
- *When connecting main power terminals inside the compressor box unit you MUST torque the power post to 11 ft lb (15.82 Nm).

Electrical Connection Diagram 48 Volt Systems

Thermostat or manual control



- #1 Power lead from Battery + to Circuit breaker / fuse
- #2 Power lead from circuit breaker to main power connection +
- #3 Power lead from battery- to main power terminal -
- #4 Power connection from condenser out to dual 24 volt fans wired in series
- #5 Power connection from evaporator out to DC to DC Red / Black input plug
- #6 Power connection 12 volt from DC to DC to evaporator cable
- #7 Power connection 12 volt from yellow/black DC to DC to evaporator red+ to blue and yellow - to green on evaporator blower PWM
- #8 Plug to thermostat / manual control
- #9 small 3 wire plug to evaporator blower PWM

*When connecting main power terminals inside the compressor box unit you MUST torque the power post to 11 ft lb (15.82 Nm).

***Main power cable and circuit breaker/fuse not included. Please see Blue Sea's circuit wizard for assistance on proper sizing for your breaker and wiring. <http://circuitwizard.blueseas.com> . This calculator will help you determine the appropriate wire size and breaker/ fuse size for your application. The current consumption for the units are listed below.**

VES 12s ULTRA 12 volts @ 38 amps

VES 24s ULTRA 24 volts @ 27 amps

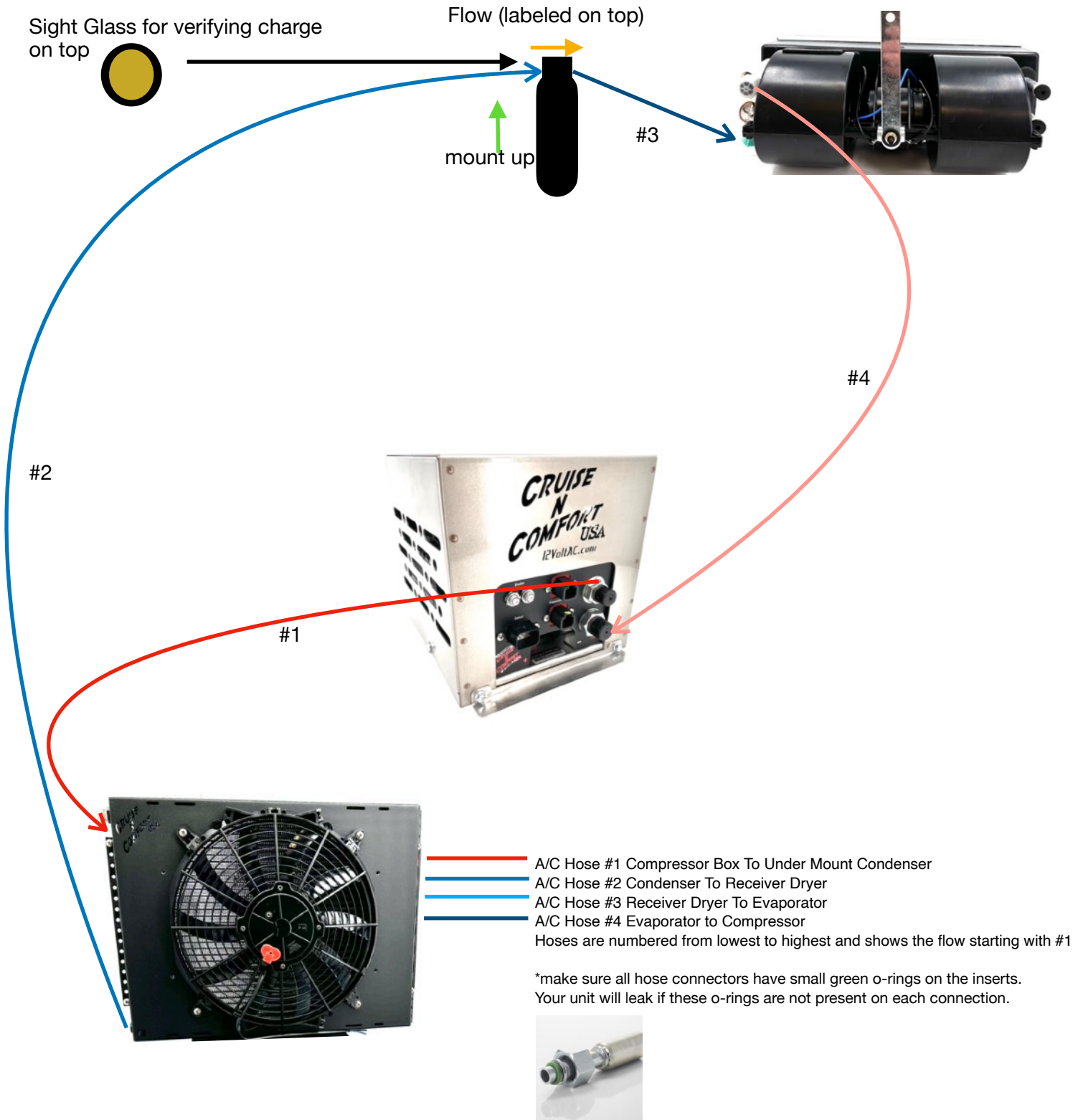
VES 12L ULTRA 12 volts @ 55 amps

VES 24L ULTRA 24 volts @ 33 amps

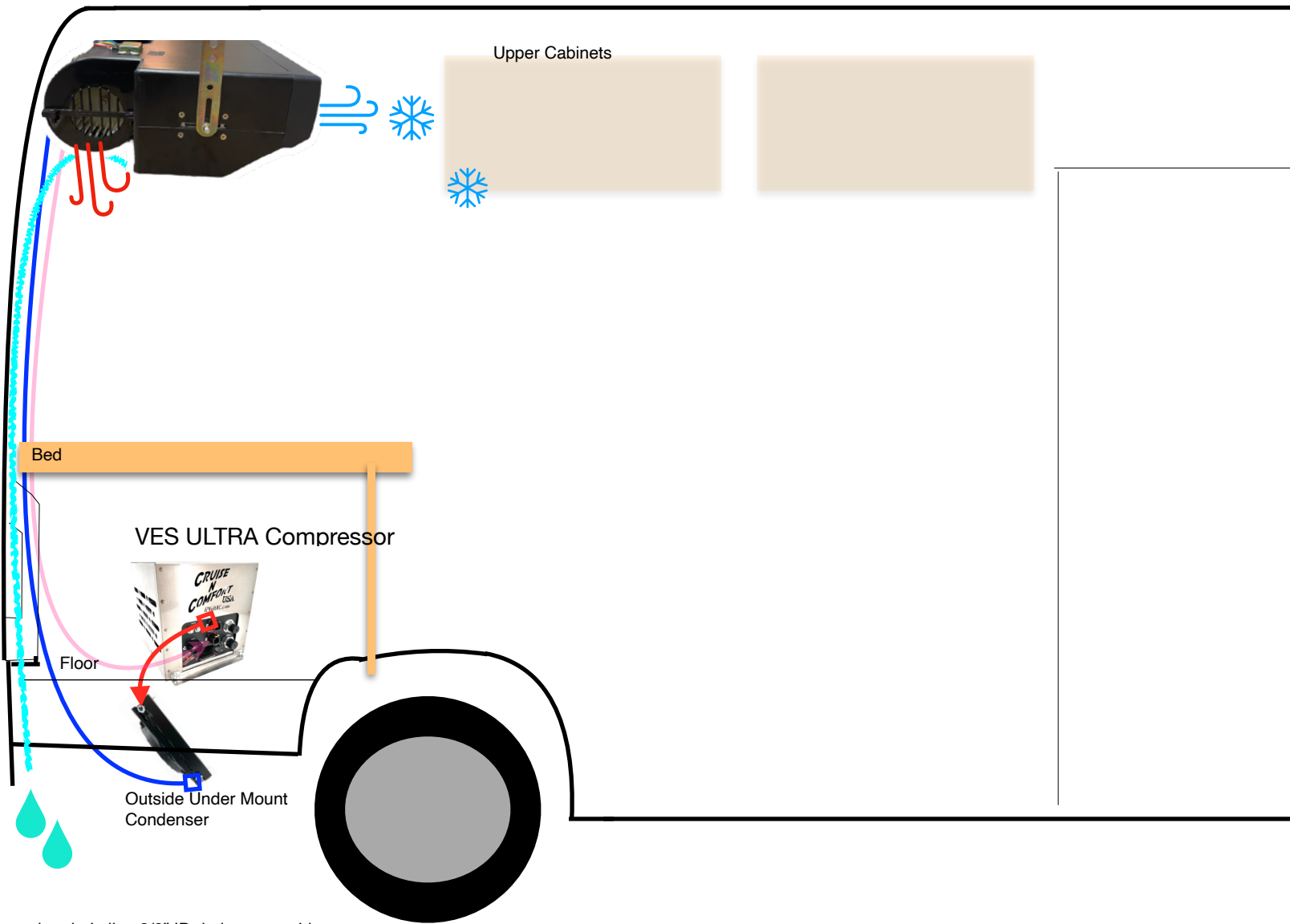
VES 48L ULTRA 48 volts @ 16 amps

When connecting power terminals inside the compressor box unit you **MUST** torque the power post to 11 ft lb (15.82 Nm).

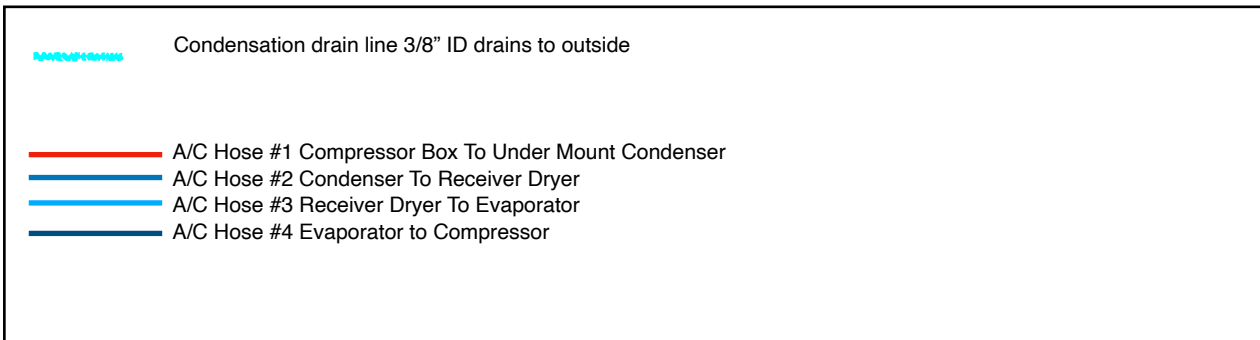
4. Refrigeration Line Connections Diagram



Evacuate and charge with R134a to 2.25 lbs when using our pre sized hose kit. Call us to help determine the fill procedure if custom lines and lengths have been made. **MAKE SURE THE TECHNICIAN DOES NOT ADD ANY OIL CHARGE TO THE SYSTEM.** If the unit is evacuated and recharged a equal amount of what was lost can be put back in using only PVE OIL. PAG oil or lines that have PAG oil in them will ruin the compressor and void your warranty.



Condensation drain line 3/8" ID drains to outside



VES Hose Order Sheet

Hose #1:

#8 13/32" I.D. , 29/32" O.D. HOSE (HIGH PRESSURE HOSE)

- FROM DISCHARGE FITTING ON COMPRESSOR TO TOP FITTING ON CONDENSER

ENDS REQUIRED: 90 DEGREE QTY.

STRAIGHT QTY.

Hose #2

#6 5/16" I.D. , 3/4" O.D. HOSE (LIQUID LINE)

- FROM LOWER CONDENSER FITTING TO RECEIVER DRIER

ENDS REQUIRED: 90 DEGREE QTY.

STRAIGHT QTY.

Hose #3

#6 5/16" I.D. , 3/4" O.D. HOSE (LIQUID LINE)

- FROM RECEIVER DRIER TO EXPANSION VALVE ON EVAPORATOR

ENDS REQUIRED: 90 DEGREE QTY.

STRAIGHT QTY.

Hose #4

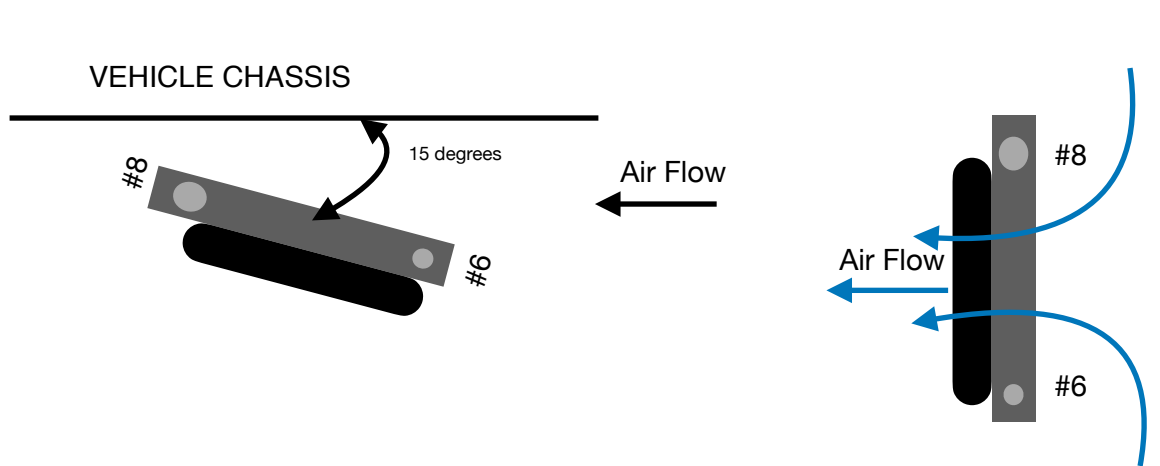
#10 1/2" I.D. , 1" O.D. HOSE (SUCTION HOSE)

- FROM EVAPORATOR TO SUCTION PORT ON THE COMPRESSOR

ENDS REQUIRED: 90 DEGREE QTY.

STRAIGHT QTY.

5" minimum to allow proper air flow



Looking at the end of the condenser, the small port should always be lower than the large port.

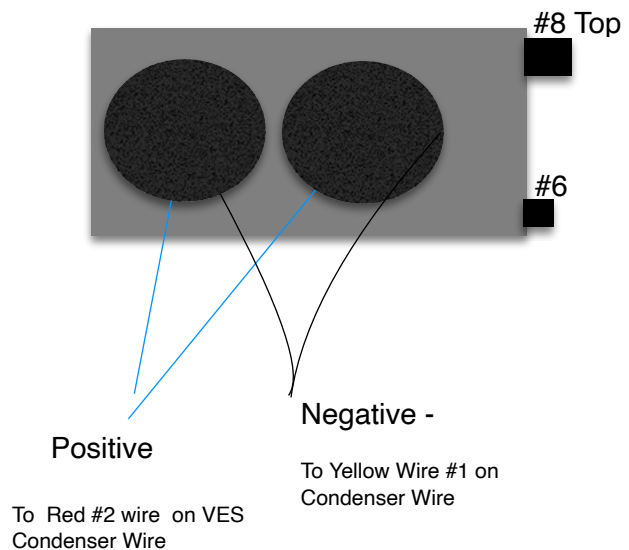
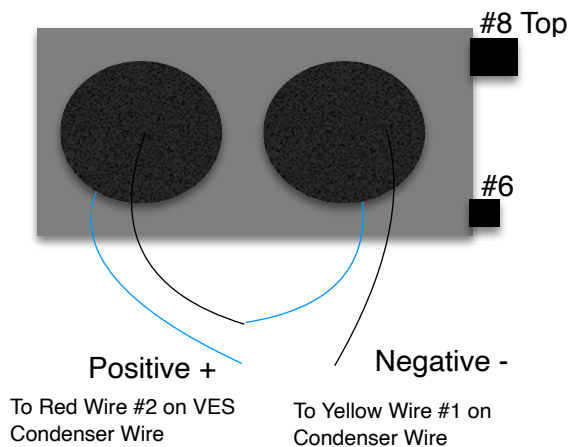
The rotation does not matter as long as there is at least 15 degrees of rotation from the horizontal plane. Condensers can be roof mounted. The refrigerant enters the condenser with the Large port and out the small port. If the large port is lower than the small it will cause the oil to not return to the compressor and back up inside the condenser.

If you need to change the side that your ports come out, unbolt the fan shroud and switch sides.

***** PLEASE NOTE WHEN EVACUATING AND CHARGING THE SYSTEM. DO NOT EVER ADD ANY PAG OIL INTO THE SYSTEM, THIS OIL IS CONDUCTIVE AND WILL CAUSE THE COMPRESSOR TO FAIL. BE SURE TO FLUSH LINES AND MAKE SURE THE REFRIGERANT YOU BUY IS R134A AND DOES NOT HAVE A OIL CHARGE!!! THE UNIT SHIPS WITH PVE OIL INSIDE THE COMPRESSOR.

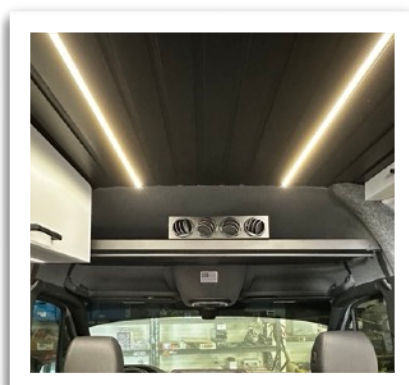
Series: This is a option to make fans run slower and quieter when in cooler climates

Parallel: This is a option to make fans run faster in warmer climates. **48 Volt units cannot be wired this way, they have 24 volt fans that are wired in series. Fan failure will result.**



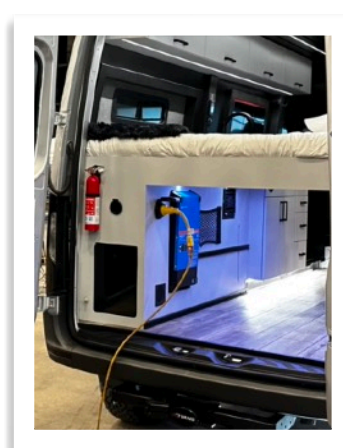
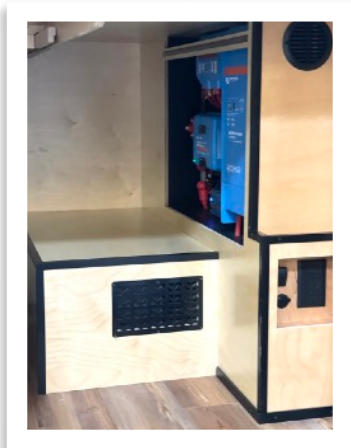
Evaporator

The evaporator can be mounted in a cabinet and opened only when running or a fascia can surround the front for a flush custom look. Installer can custom dye the front to match any interior. SEM spray dye is excellent for this. Customers submitted photos



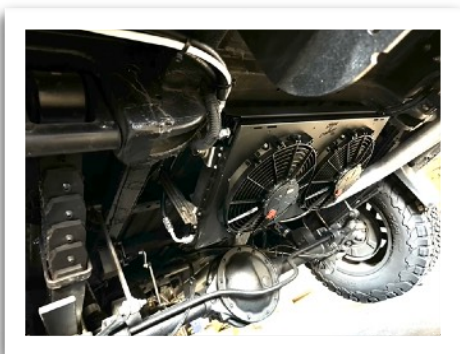
Compressor Box

The compressor box can be hidden away in an interior or exterior cabinet to reduce noise and keep out of sight. Customers submitted photos



Condenser

The IP68 rated condenser can be mounted almost flat underneath or on a roof rack. *Dual fan, condenser mounts and optional rock guard shown. Customers submitted photos



VES Series charging sheet for certified A/C technician

Take this sheet with you when having a certified air conditioning shop charge your system. This sheet is for all VES units that were shipped with our VES Standard Hose Kit. If hoses are custom you will need to adjust charge slightly and /or charged using the sight glass on top of the receiver dryer.

- Make sure the cover is removed so they can easily access the charge ports.
- Make sure the unit powers up and that the inside blower and outside fans come on.
- Make sure your batteries are full so that they can run the system for a few minutes to make sure it is operating properly.
- Make sure your ac lines are high and torqued and that each fitting has a green ring before the hose get installed. Checking the hose fittings and crimps with a soap and water solution after initial charge and while running is highly recommended to look for leaks.

Pressures will vary depending on temperatures but typical high side pressures will run around 125 PSI when it is cool out to around 175 PSI when it warmer and after the unit has been running awhile. Pressures over 200 will indicate a in operating fan, overcharge of refrigerant or inadequate air flow across condenser. Low side pressures will run about 35 when its cool to 55 when the return air into the evaporator is warmer. Run blower speed on high when charging, lower blower speed will show lower low side pressures.

1. Evacuate

- Evacuate system with machine or vacuum pump and check for leaks

2 Charge

- Charge system with 2.25 LBS. of R134a refrigerant.
- Do not use R134a synthetics or R134a with stop leak or any kind of additives.
- Do not add an oil charge, PAG or Ester oils are conductive and will void the compressor warranty. The compressor already has 355cc of PVE Electric oil inside. MAXX systems have 455cc of PVE per compressor. This is the same oil as many electric or hybrids that use PVE oil.
- If leak dye is needed please call us for a suitable solution, most leak dyes contain incompatible PAG or Ester Oil.
- If charging with small cans use Qty.3 12 oz cans of straight R134a no additives or synthetics. The back of the can will list out how many oz of R134a and how many oz of additives if it has any.

3. Run

Run system for about 10 minutes and check for leaks with a soapy solution on the hose fitting crimps and nuts.

Cruise N Comfort USA
1020 West Ranch Road Suite 102 Tempe, AZ 85284
Tel: 1(855)899-1442 Fax: 1(888)246-2832