



We connect and protect

# SpectraCool Air Conditioner

N21 Model

Instruction Manual



## TABLE OF CONTENTS

Warranty And Return Policy .....	2
General Safety Instructions .....	3
Receiving The Air Conditioner .....	3
Handling And Testing The Air Conditioner .....	3
Installation Instructions.....	4
Dimension Drawings.....	5
Mounting Cutout Dimensions .....	7
Wire Diagrams And Schematics .....	8
N21 with Mechanical Thermostat, 115/230 V Wire Diagram .....	8
N21 with Mechanical Thermostat, 460 V .....	8
N21 with Mechanical Thermostat Schematic .....	9
N21 with Remote Digital Controller, 115/230 V Wire Diagram .....	10
N21 with Remote Digital Controller, 460 V Wire Diagram .....	11
Component List .....	12
Parts List .....	13
Technical Information .....	14
Design Data .....	14
Temperature Control For Mechanical Thermostat Unit .....	14
Units With Heat .....	14
General information.....	14
Example.....	14
To change the temperature setting of the thermostat.....	14
Dial ranges .....	14
Testing Thermostat Calibration .....	14
Cooling Thermostat .....	14
Heating Thermostat .....	15
Principles Of Operation.....	15
Maintenance .....	15
Compressor .....	15
Inlet air filter .....	15
How to remove, clean or install a new inlet air filter .....	16
Condenser and evaporator air movers.....	16
Refrigerant loss.....	16
Preventative Maintenance/Inspection .....	17
Trouble Shooting .....	18
F-Gas Information .....	22

**Note:** Some of the information in this manual may not apply if a special unit was ordered. If additional drawings for a special unit are necessary, they have been inserted. Contact nVent Equipment Protection if further information is required.

## WARRANTY AND RETURN POLICY

---

<https://HOFFMAN.nVent.com/en-us/cooling-warranty-registration>

<https://nVent.widen.net/s/s8xgmxhvk2/89153291>

## GENERAL SAFETY INSTRUCTIONS

---

Observe the following general safety instructions for installation and operation of this product:

- This appliance is for installation only in locations not accessible to the general public.
- This appliance is not intended for use by persons, including children, with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- This appliance should be installed in accordance with national wiring regulations.
- Follow all precautions detailed in the following sections during transportation, receiving, testing, operation and maintenance.
- This appliance is intended for altitudes up to 10,000 ft (3,048 m) from sea level. For every additional 1000 ft of elevation, the capacity of this unit is derated by 1%.

## RECEIVING THE AIR CONDITIONER

---

Inspect the air conditioner. Check for concealed damage that may have occurred during shipment. Look for dents, scratches, loose assemblies, evidence of oil, etc. Damage evident upon receipt should be noted on the freight bill. Damage should be brought to the attention of the delivering carrier — NOT to nVent Equipment Protection — within 15 days of delivery. Save the carton and packing material and request an inspection. Then file a claim with the delivering carrier.

nVent Equipment Protection cannot accept responsibility for freight damages; however, we will assist you in any way possible.

## HANDLING AND TESTING THE AIR CONDITIONER

---

If the air conditioner has been in a horizontal position, be certain it is placed in an upright, vertical or mounting position for a minimum of five (5) minutes before operating.

### CAUTION:

Do not attempt to operate the air conditioner while it is horizontal or on its side, back or front. The refrigeration compressor is filled with lubricating oil. This will cause permanent damage to the air conditioner and also voids the warranty.

TEST FOR FUNCTIONALITY **BEFORE** MOUNTING THE AIR CONDITIONER TO THE ENCLOSURE.

Refer to the nameplate for proper electrical current requirements. If cord-connected, connect the power cord to a properly grounded power supply. If permanently connected, wire the unit to a properly grounded power supply using copper conductors only. Power supply wiring should be restrained to ensure no contact with the internal fan. Minimum circuit ampacity should be at least 125% of the amperage shown in the design data section for the appropriate model. No other equipment should be connected to this circuit to prevent overloading. The air conditioner is rated for operation at 50 and 60 Hz. No action is necessary to adjust the appliance operation at the rated frequencies.

Immediately after applying power, the evaporator blower (enclosure air) should start running. Operate the air conditioner for five (5) to ten (10) minutes. No excessive noise or vibration should be evident during this run period. The condenser blower (ambient air), the evaporator blower (enclosure air), and the compressor should be running.

Condenser air temperatures should be warmer than normal room temperatures within a few minutes.

The compressor is provided with automatic reset thermal overload protection. This thermo-switch is located and mounted inside the plastic enclosure clipped to the compressor. The switch operates when the compressor overheats due to clogged or dirty inlet air filter or if ambient air temperatures exceed nameplate rating or if enclosure dissipated heat loads exceed the rated capacity of the air conditioner. The thermal overload switch will actuate and stop compressor operation. The blowers will continue to operate and the compressor will restart after it has cooled to within the thermal overload cut-in temperature setting.

## INSTALLATION INSTRUCTIONS

---

1. Inspect the air conditioner and verify correct functionality before mounting the air conditioner. See HANDLING AND TESTING THE AIR CONDITIONER on page 3.
2. Determine if the unit is to be surface or recess mounted. Using the appropriate cutout dimensions, see Mounting Cutout Dimensions on page 7 of this manual, prepare the enclosure opening for either surface or recess mounting. Select an installation location that will allow for adequate ventilation and clearance for service. Clearance between the air conditioner with or without a supplementary heater and adjacent structures (another enclosure, air conditioner, wall, or combustible surface) must be at least:
  - 24" from front
  - 2" from right side
  - 9" from left side
  - 6" from top

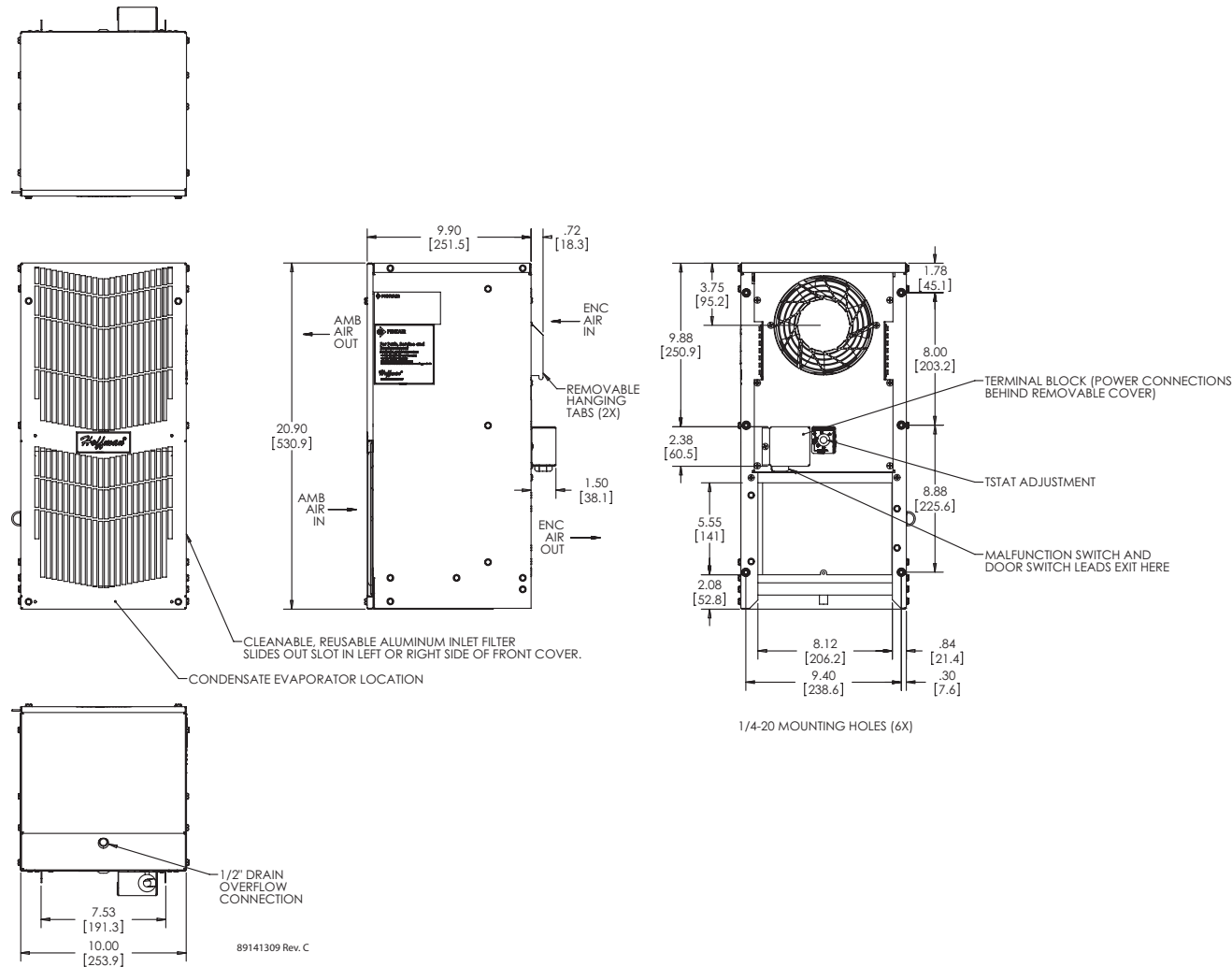
Local fire codes may have different requirements; please observe applicable regulations for the location of the air conditioner.

The distance between the air conditioner and the electronic components and other equipment installed inside the enclosure must be at least 3" to ensure adequate air circulation. At minimum clearance levels, an air baffle between the inlet and outlet may be necessary to prevent recirculation.

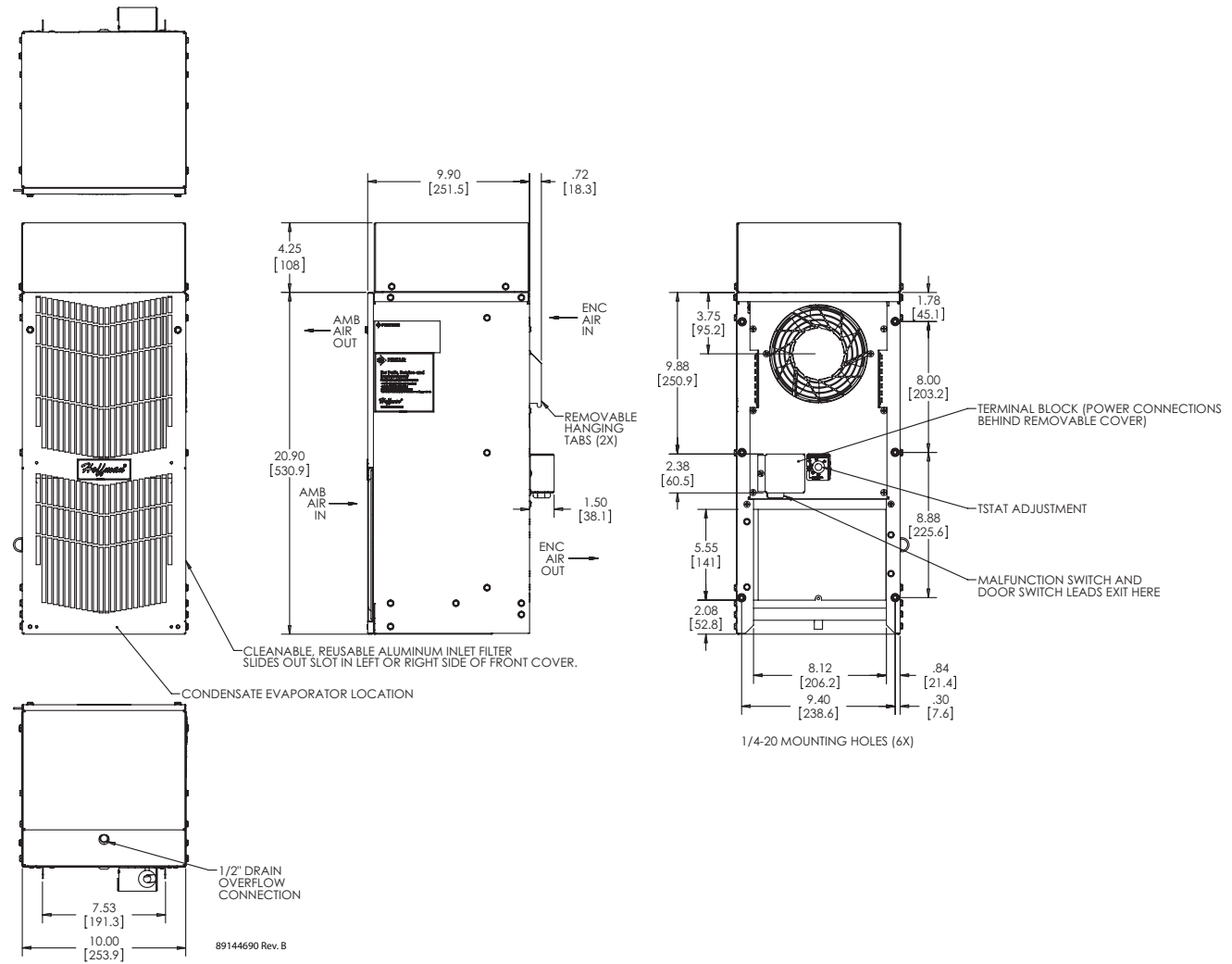
3. Using the gasket kit provided, install gaskets to air conditioner.
4. Mount air conditioner on enclosure using 1/4-20x.625 mounting bolts provided. "EZ" mount tabs can be used to hold unit on enclosure while mounting in place. Torque each bolt to 65 in./lbs. Allow unit to remain upright for a minimum of five (5) minutes before starting. Caution! Air conditioner must be in upright position during operation.
5. To avoid cross-threading mounting inserts, start bolts by hand before tightening with a wrench or ratchet driver.
6. When routing the drain tube, caution should be taken to keep it from kinking or being elevated above the exit point of the air conditioner. The drain tube must be on a continuous downward slope. A slight elevation of the tube could result in secondary trap. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN OVERFLOWING OF THE CONDENSATE DRAIN PAN.
7. Refer to top of nameplate for electrical requirements. Connect the power cord or wire the unit to a properly grounded power supply by following applicable national wiring regulations. Use of an extension cord is not recommended. If the air conditioner is wired to the power supply, the electrical circuit should be fused with a time delay fuse or HACR circuit breaker per the MOPD rating in the Design Data table- see page 14.

# DIMENSION DRAWINGS

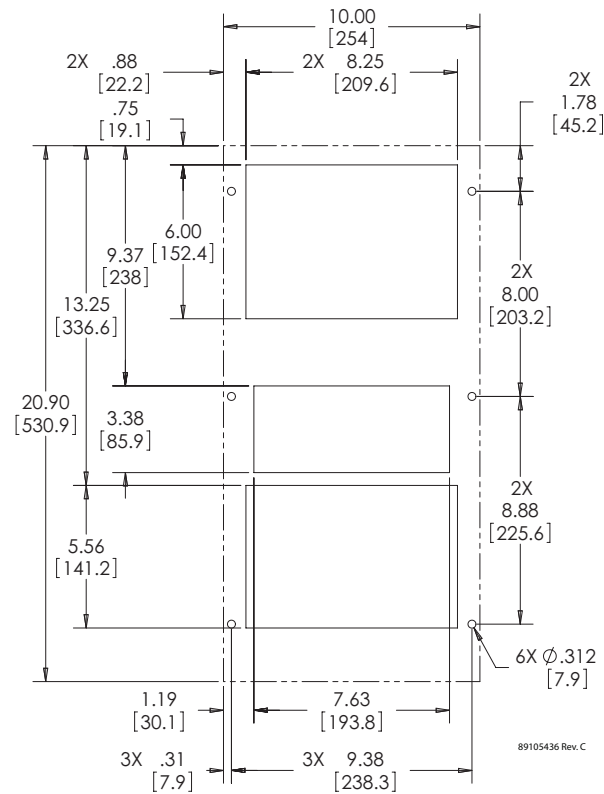
## 115/230 Volt Models



# 460 Volt Models

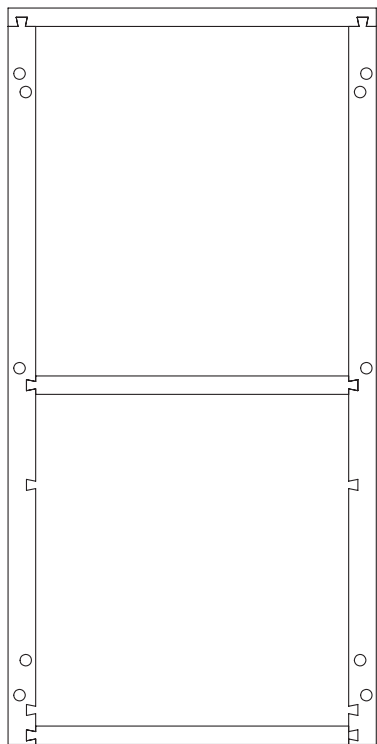


**MOUNTING CUTOUT DIMENSIONS**



Cutout Instructions  
(As viewed from outside of enclosure)

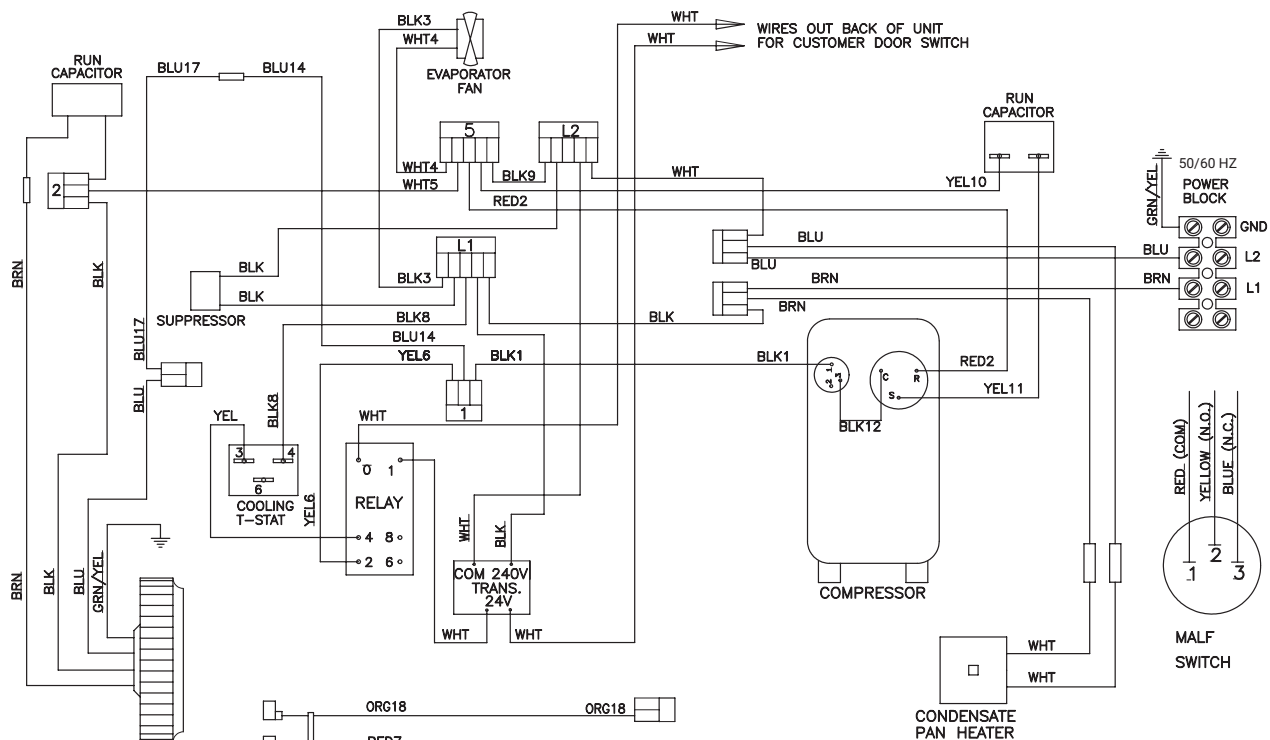
**Note:** Dashed lines represent air conditioner.



**Note:** Mounting Gasket Adheres to Air Conditioner

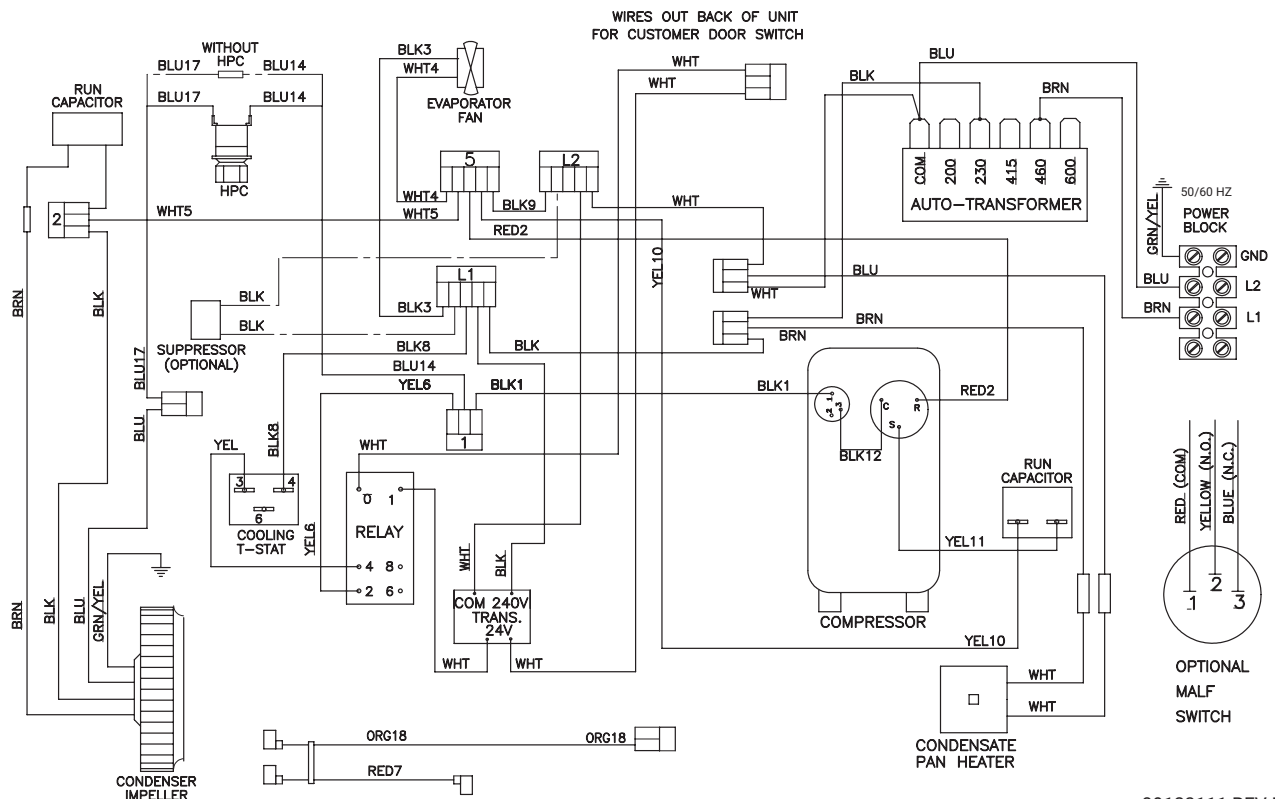
## WIRE DIAGRAMS AND SCHEMATICS

### N21 with Mechanical Thermostat, 115/230 V Wire Diagram



89114751 REV E

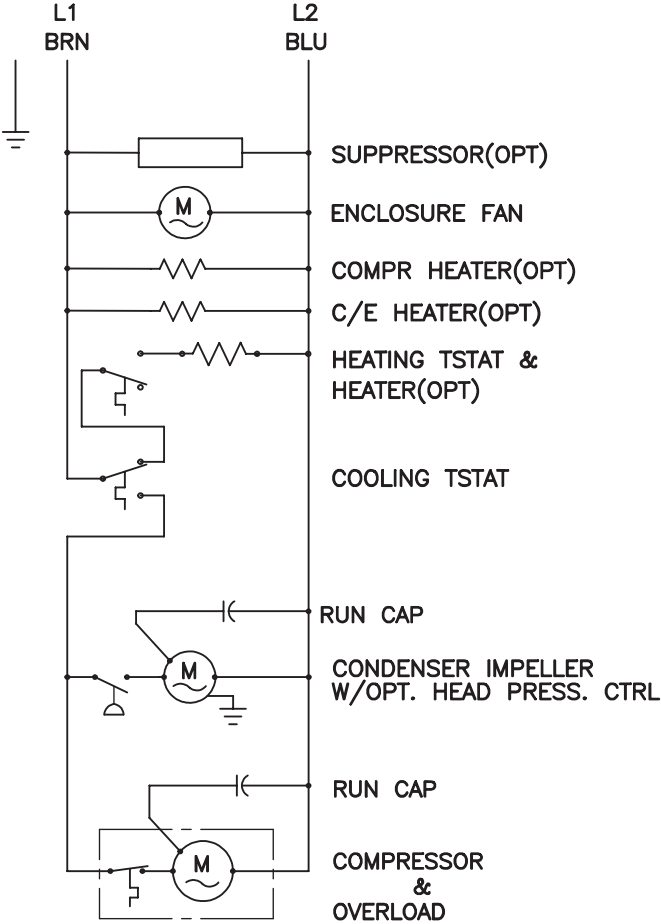
### N21 with Mechanical Thermostat, 460 V Wire Diagram



89123111 REV D



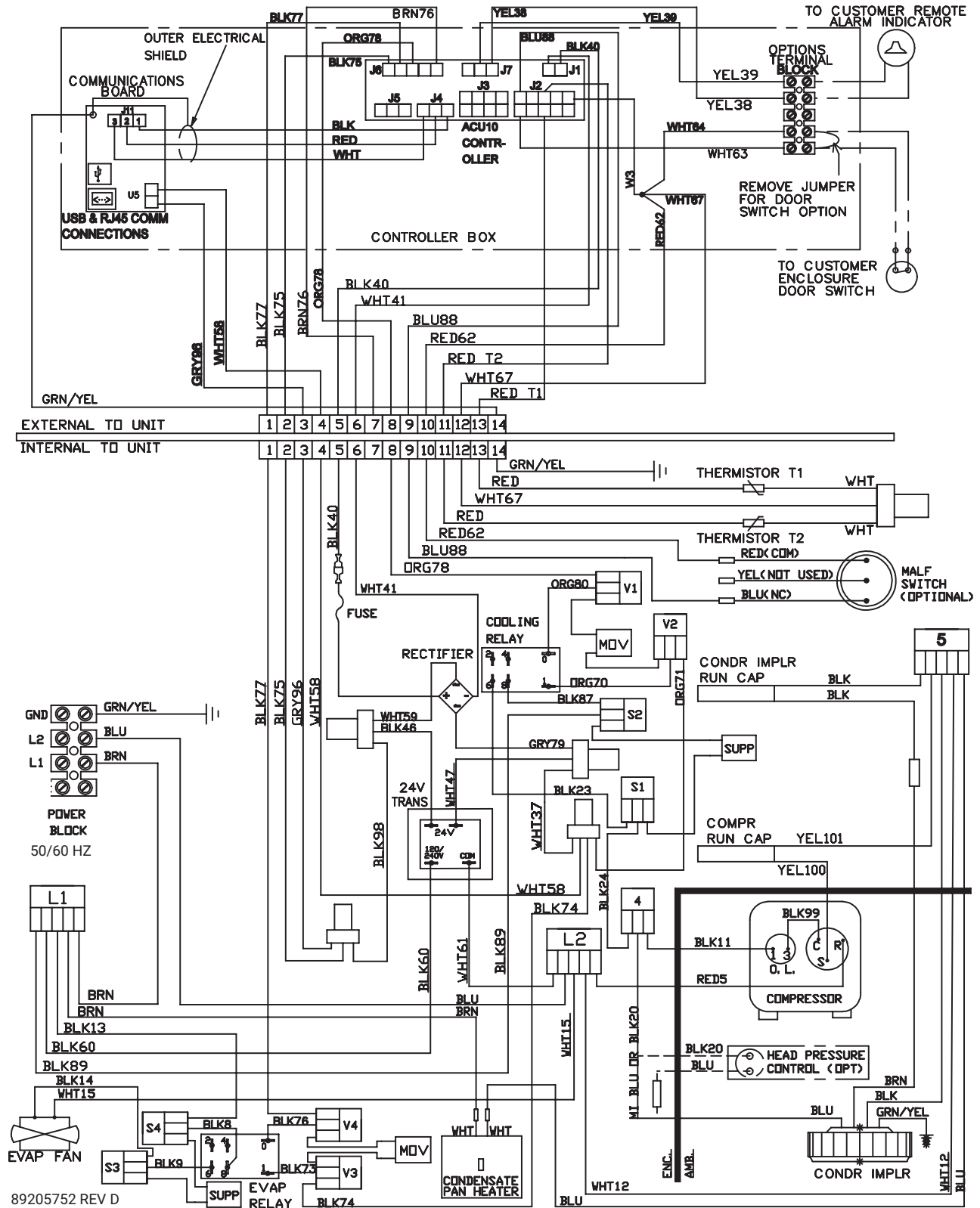
N21 with Mechanical Thermostat Schematic



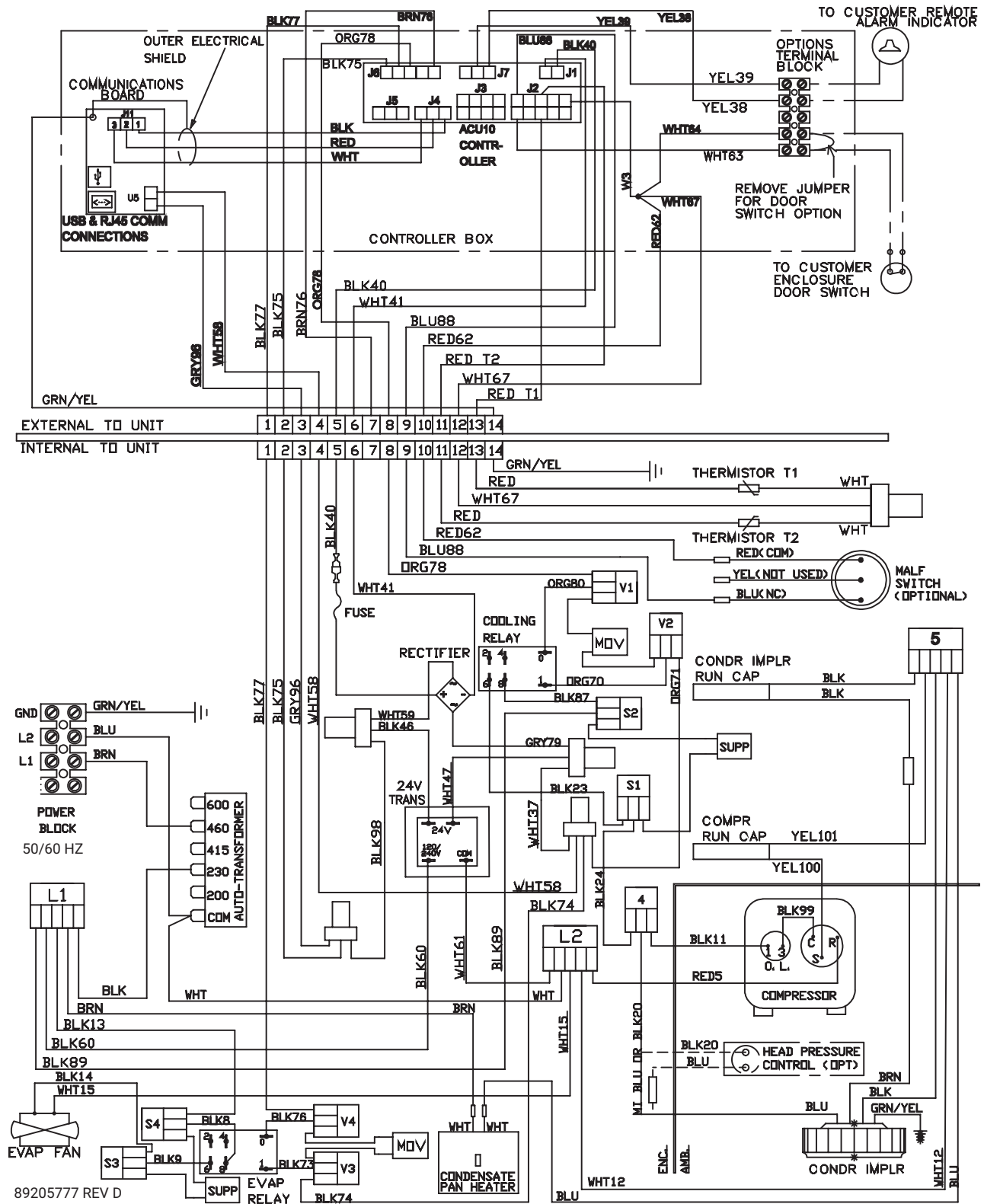
ELECTRICAL SCHEMATIC

89115115 REV B

# N21 with Remote Digital Controller, 115/230 V Wire Diagram



# N21 with Remote Digital Controller, 460 V Wire Diagram

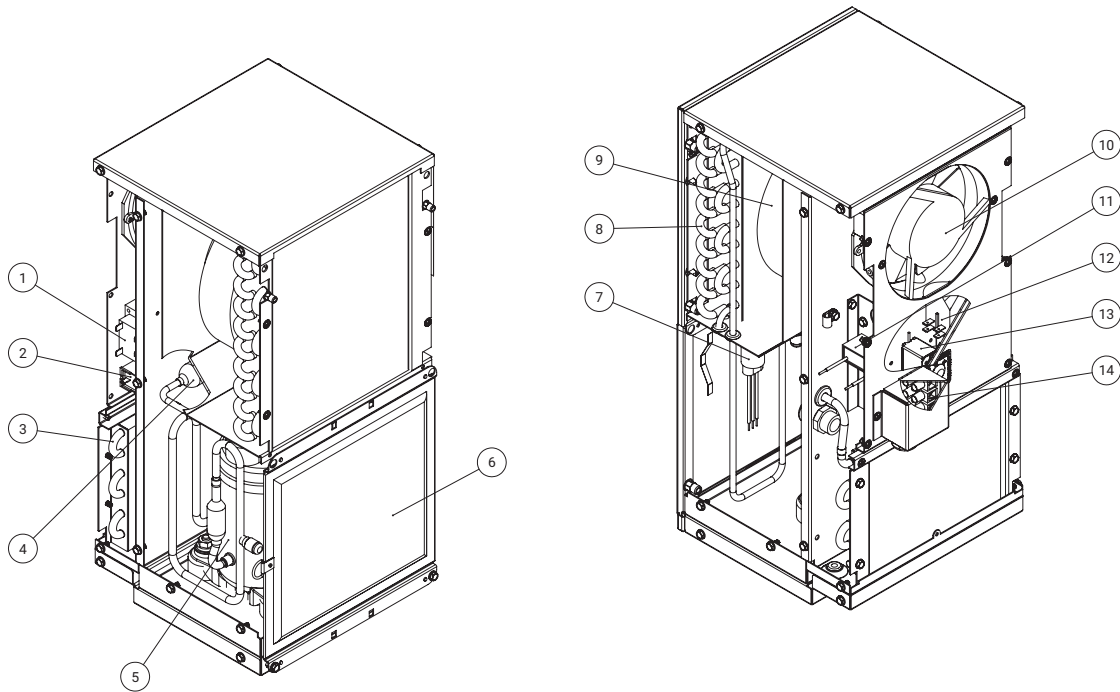


89205777 REV D

## COMPONENT LIST

Part Description	N210216GXXX 115 V 1-Phase 50/60 Hz 2000 BTU	N210226GXXX 230 V 1-Phase 50/60 Hz 2000 BTU	N210246GXXX 460 V 1-Phase 50/60 Hz 2000 BTU
Capacitor, Compressor Run	89107709SP	89106525SP	89106525SP
Capacitor, Condenser Impeller	52603215SP	52603214SP	52603214SP
C/E heater	10103041SP	10103042SP	10103042SP
Coil, Condenser, Coated (Optional)	89135056SP	89135056SP	89135056SP
Compressor	89109026SP	89108369SP	89108369SP
Fan, Evaporator	12101201SP	12101202SP	12101202SP
Impeller, Condenser	101091121SP	101091122SP	101091122SP
Remote Digital Controller (Optional)	89205060SP	89205060SP	89205060SP
Thermal Overload, Compressor	89109877SP	89109878SP	89109878SP
Transformer, Controller	10100694SP	10100693SP	10100693SP
Transformer, Input Power	N/A	N/A	101006116SP

## PARTS LIST



Part	Description	Part No.
1	Transformer, Controller	See Components List
2	Capacitor, Compressor Run	See Components List
3	Coil, Evaporator	89050853SP
4	Filter, Drier, Refrigerant	52602803SP
5	Compressor	See Components List
6	Filter, Air, Reusable	89112089SP
7	Switch, Malfunction (Optional)	89096951SP
8	Coil, Condenser	89135053SP
9	Impeller, Condenser	See Components List
10	Fan, Evaporator	See Components List
11	Capacitor, Condenser Impeller	See Components List
12	Relay	10100536SP
13	Thermostat, SPDT, 55-100°F	10106116SP
14	Terminal Block	89225280SP
15	Mounting Gasket Kit**	20100008SP

**Note:** \*\*Mounting gasket not shown

## TECHNICAL INFORMATION

### Design Data

Model	Voltage	Hz	Phase	MOPD Amps	Full Load Cooling Amps	BTU/HR @ Max Ambient Temperature	Max Ambient Temperature °F/°C	Shipping Weight lb/kg
N210216GXXX	115	50/60	1	15	7.0/7.0	2000/2175	131/55	56/25
N210226GXXX	230	50/60	1	15	3.5/3.5	2000/2175	131/55	56/25
N210246GXXX	460	50/60	1	15	1.9	2000/2175	131/55	66/30

**Note:** XXX will be replaced with a three-digit number designating all desired options. Consult the factory for specific model numbers.

### TEMPERATURE CONTROL FOR MECHANICAL THERMOSTAT UNIT

**Note:** For Remote Digital Controller Unit, see instruction manual included with Remote Digital Controller Box.

The electromechanical thermostat is factory preset to 75°F/23°C. To change the temperature setting, remove the nylon plug from the front face of the unit. Use a standard screwdriver to adjust thermostat. For cooler temperatures turn clockwise, for warmer temperatures turn counterclockwise. Setpoint differential is 6°F.

### UNITS WITH HEAT

#### General information

Air conditioners with electric heat are equipped with two thermostats that are clearly marked on the label as to which thermostat is cooling and which is heating.

The electromechanical thermostats are factory set for; cooling at 80°F/27°C, heating at 55°F/13°C unless otherwise noted on the Shop Record. The thermostats have a differential of 10°F between the on/off function of the air conditioner. The thermostat set point designates the temperature point at which the air conditioner turns off. The thermostats have a variance of  $\pm 3^\circ\text{F}$  at set points below 100°F and a variance of  $\pm 4^\circ\text{F}$  at 100°F.

#### Example

With a dial setting for cooling at 80°F, the cooling operation of the air conditioner will turn on at  $90 \pm 3^\circ\text{F}$  and turn off at  $80 \pm 3^\circ\text{F}$ .

With a dial setting for heating at 55°F, the heating operation of the air conditioner will turn on at  $55 \pm 3^\circ\text{F}$  and turn off at  $65 \pm 3^\circ\text{F}$ .

#### To change the temperature setting of the thermostat

Remove the nylon plug which covers the temperature adjustment screw. Using a standard screw driver, turn the adjustment screw clockwise for cooler settings and counter clockwise for warmer settings.

Reinstall the nylon plugs.

#### Dial ranges

The cooling thermostat dial range is from 70°F to 100°F. The heating thermostat dial range is from 55°F to 65°F.

The air conditioners are equipped with thermostat stop screws to limit the ranges. Removing the cooling stop screws for any purposes other than testing the operation of the air conditioner may cause limited cooling due to the evaporator coil icing over.

Removing the heating stop screws for any purposes other than testing the operation of the air conditioner will cause the air conditioner to have a limited differential between the heating and cooling function. This will cause the air conditioner to cycle between heating and cooling more frequently.

### Testing Thermostat Calibration

#### Cooling Thermostat

With the air conditioner plugged in and the cooling thermostat set to the lowest position, (remove stop screw), measure the temperature of the intake air on the evaporator side of the unit and note the temperature. Turn the cooling thermostat dial counter clockwise at a rate of 1°F per second until the compressor stops and note the reading on the dial. Compare the two readings, they must be within  $\pm 3^\circ\text{F}$  of each other.

## Heating Thermostat

With the air conditioner plugged in and the heating thermostat set to the lowest position, (remove stop screw), measure the temperature of the intake air on the evaporator side of the unit and note the temperature. Turn the heating thermostat dial counter clockwise at a rate of 1°F per second until the heater starts (read change in amps of unit to determine when heating starts) and note the reading on the dial. Compare the two readings, they must be within  $\pm 3^{\circ}\text{F}$  of each other.

## PRINCIPLES OF OPERATION

---

If electrical power to the air conditioner is interrupted and reapplied immediately, (within 3 to 5 seconds), the compressor may not restart due to the high back pressure of the compressor. It takes a minimum of one (1) minute after shut-down for the compressor suction and discharge pressures to equalize in order for the air conditioner to restart.

Operating the air conditioner below the minimum ambient temperature or above the maximum ambient temperatures indicated on the nameplate voids all warranties.

It is recommended that the warranty section of this manual be read in order to familiarize yourself with parameters of restricted operation.

The moisture that the enclosure air can contain is limited. If moisture flows from the drain tube continuously this can only mean that ambient air is entering the enclosure. Be aware that frequent opening of the enclosure's door admits humid air, which the air conditioner must then dehumidify.

Units with the optional malfunction switch have a normally open connection between the red & yellow wires and normally closed with the red and blue wires. During alarm the red and yellow wires will be closed and the blue and red wires will be open.

Maximum electrical ratings for the switch are 13 A for 120 VAC and 10 A for 240 VAC.

## MAINTENANCE

---

Performing preventative maintenance (PM) helps to keep your nVent HOFFMAN AC unit operating at the highest most efficient levels. Maintenance should be performed at least twice a year, more frequently when in challenging conditions, such as dusty, high humidity, high heat, oily or corrosive environments.

Product failures due to lack of maintenance may impact warranty coverage.

### Compressor

The compressor requires no maintenance. It is hermetically sealed, properly lubricated at the factory and should provide years of satisfactory operating service.

Should the refrigerant charge be lost, recharging ports (access fittings) on the suction and discharge sides of the compressor are provided for recharging and/or checking suction and discharge pressures.

Under no circumstances should the access fitting covers be loosened, removed or tampered with.

Breaking of seals on compressor access fittings during warranty period will void warranty on hermetic system.

Recharging ports are provided for the ease and convenience of reputable refrigeration repair service personnel for recharging the air conditioner.

### Inlet air filter

Proper maintenance of the inlet air filter, located behind the front cover, will assure normal operation of the air conditioner. If filter maintenance is delayed or ignored, the maximum ambient temperatures under which the unit is designed to operate will be decreased.

If the compressor's operating temperature increases above designed conditions due to a dirty or clogged filter (or plugged condenser coil), the air conditioner's compressor will stop operating due to actuation of the thermal overload cutout switch located on the compressor housing. As soon as the compressor temperature has dropped to within the switch's cut-in setting, the compressor will restart automatically. However the above condition will continue to take place until the filter has been cleaned or replaced.

It is recommended that power to the air conditioner be interrupted intentionally when abnormally high compressor operating temperature causes automatic shutdown of the unit. The above described shutdown is symptomatic of clogged or dirty filter, thus causing a reduction in cooling airflow across the surface of the compressor and condenser coil.

Do not run the air conditioner for extended periods of time with the filter removed. Particles of dust, lint, etc., can plug the fins of the condenser coil which will give the same reaction as a plugged filter. The condenser coil is not visible through the filter opening, so protect it with a filter.

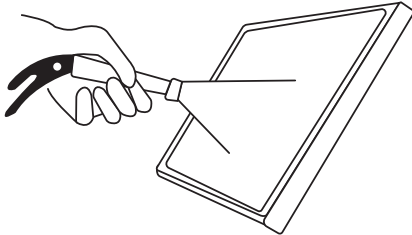
Continued operation under the above conditions can and will damage and shorten compressor life. The air conditioner is available with an easily removable inlet filter to facilitate necessary cleaning. There should be no reason to neglect this necessary maintenance.

## How to remove, clean or install a new inlet air filter

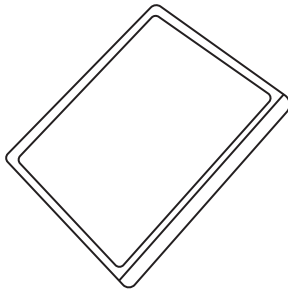
Research Products (RP) aluminum washable air filters are designed to provide excellent filtering efficiency with a high dust holding capacity and a minimum amount of resistance to air flow. Because they are constructed entirely of aluminum they are lightweight and easy to service. Optimum filter performance is maintained by recoating the filters after washing with RP Super Filter Coat adhesive. To achieve maximum performance from your air handling equipment, air filters should be cleaned on a regular basis.

The inlet air filter is located behind the front cover. To access filter, pull ring protruding from slot in side of front cover. The filter may now be cleaned or new filter installed.

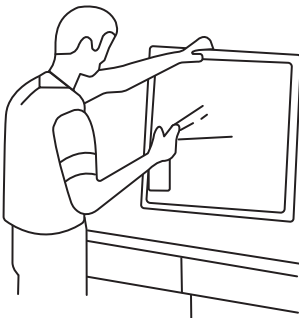
### Cleaning Instructions:



1. Flush the filter with warm water from the exhaust side to the intake side.  
**Do not use caustics.**



2. After flushing, allow filter to drain. Placing it with a corner down will assure complete drainage.



3. Recoat the filters with RP Super Filter Coat adhesive. When spraying filter do so from both sides for maximum concentration of adhesive.

## Condenser and evaporator air movers

Fan and impeller motors require no maintenance. All bearings, shafts, etc. are lubricated during manufacturing for the life of the motor.

### CAUTION:

Operation of the air conditioner in areas containing airborne caustics or chemicals can rapidly deteriorate filters, condenser coils, blowers and motors, etc. Contact nVent Equipment Protection for special recommendations.

## Refrigerant loss

Each air conditioner is thoroughly tested prior to leaving the factory to insure against refrigeration leaks. Shipping damage or microscopic leaks not found with sensitive electronic refrigerant leak detection equipment during manufacture may require repair or recharging of the system. This work should only be performed by qualified professionals, generally available through a local, reputable air conditioning repair or service company.

Refer to the data on the nameplate which specifies the type of refrigerant and the charge size in ounces.

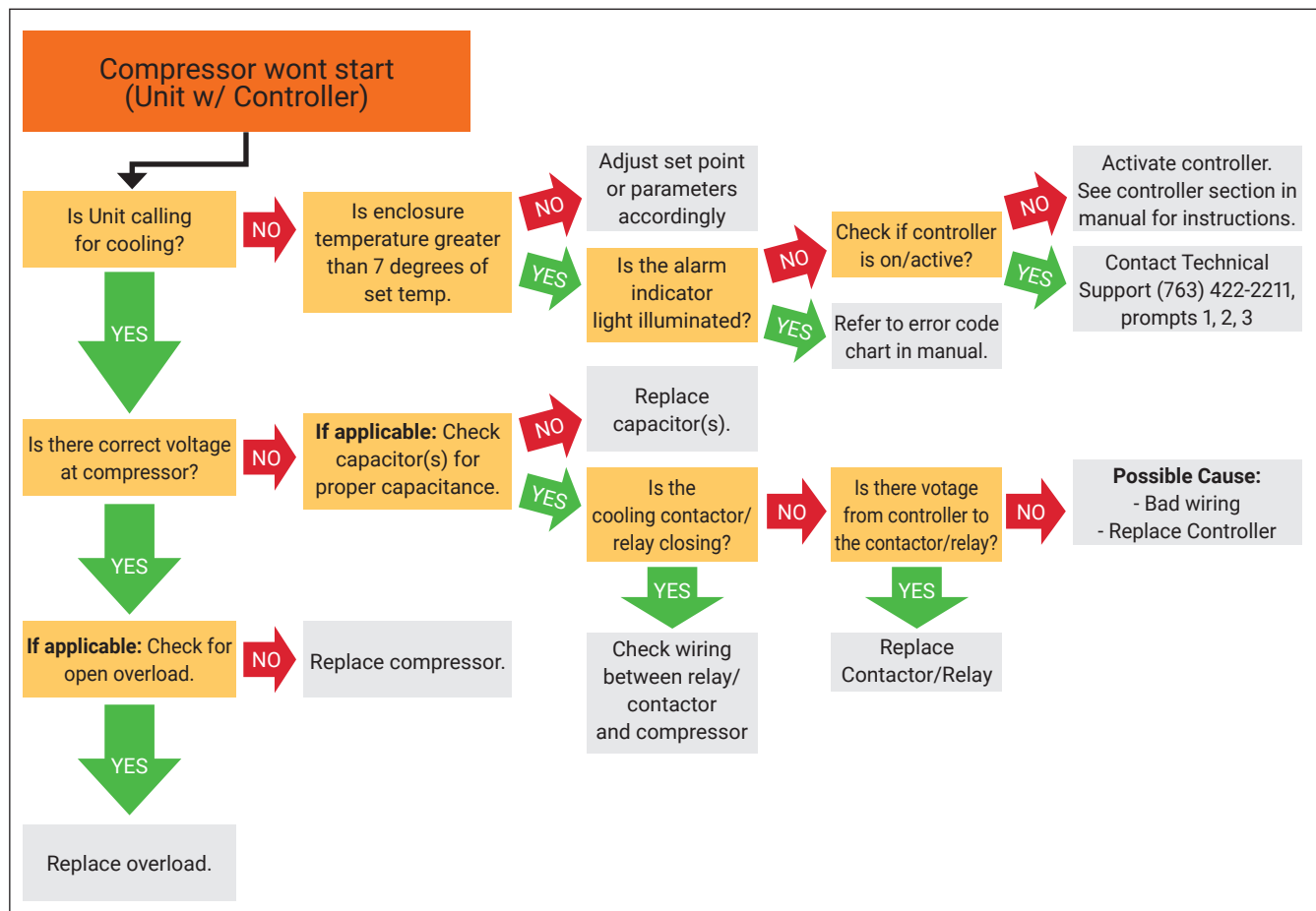
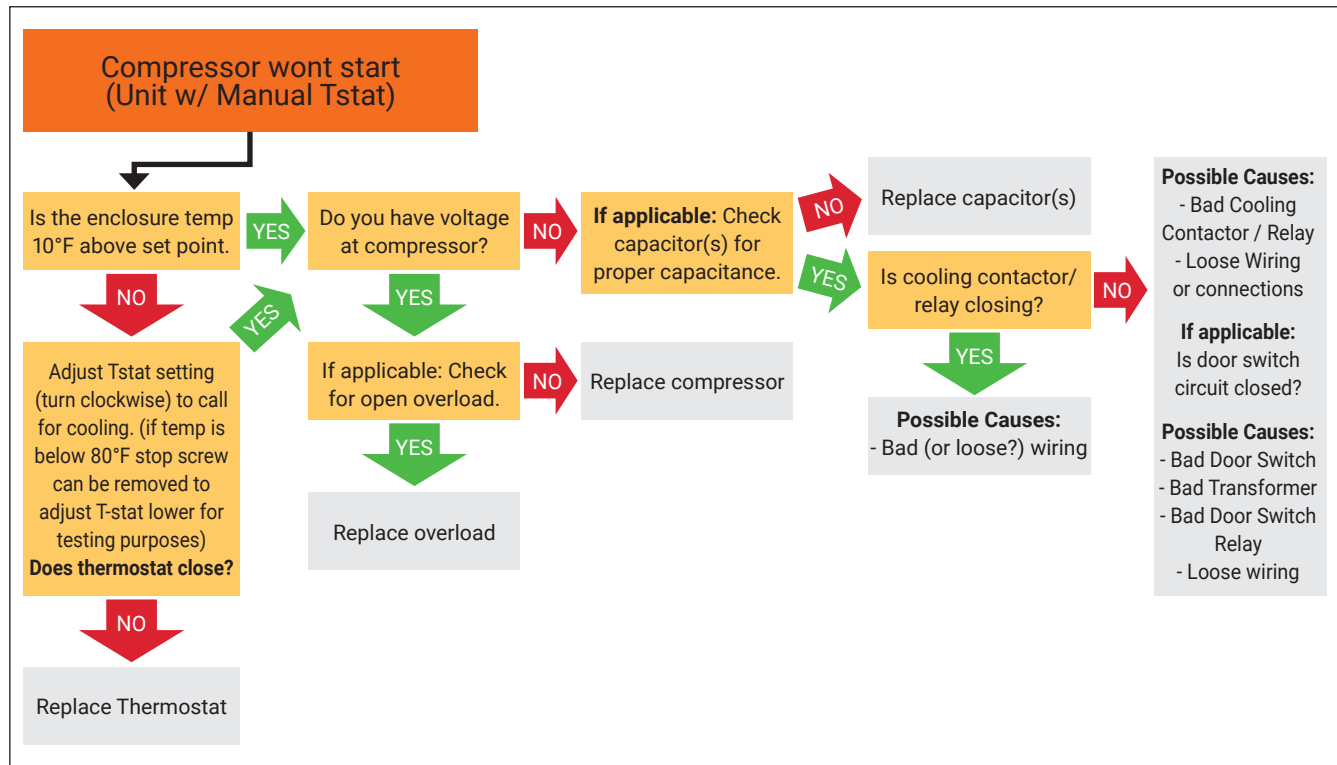
Before recharging, make sure there are no leaks and that the system has been properly evacuated into a deep vacuum.



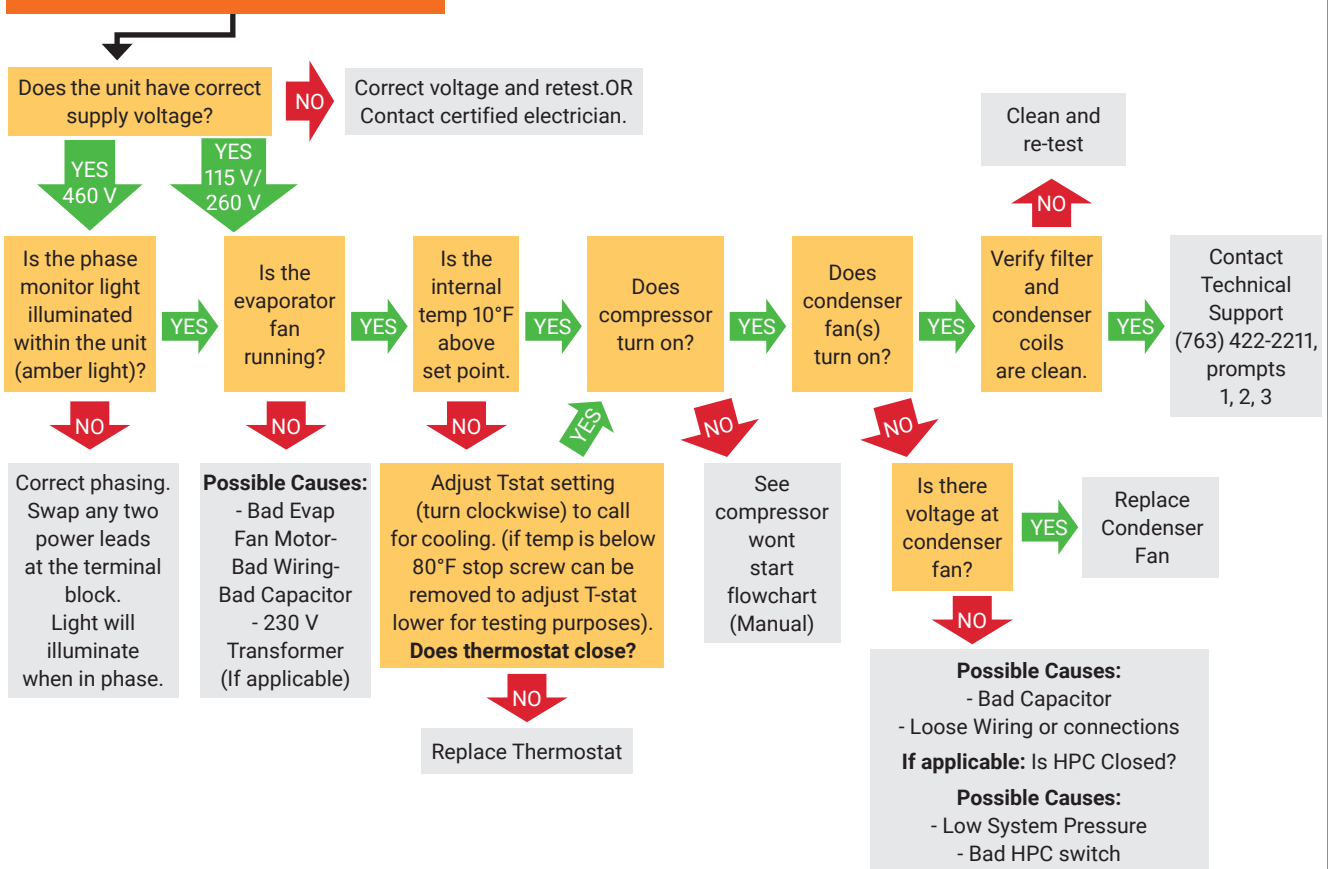
## PREVENTATIVE MAINTENANCE/INSPECTION

Maintenance/Inspection Recommendations (Perform at least 2 times per year – more frequently as required by operational environment)		Last Completed			
Check Point	Description	Date	Date	Date	Date
Operational Inspection	Run unit through all modes of operation and record temperatures, voltages, and amperes Comments:				
Visual Inspection	Visually inspect unit for damage, cleanliness, missing, loose, or broken parts Comments:				
Filter Maintenance	Inspect, clean, and replace filter as necessary Comments:				
Clean Unit	Inspect and clean coils, fans/blowers, louvers, air inlets/outlets, interior and exterior of unit as required Comments:				
Controller Cycle Sequence	Cycle the controller through all modes of operation to ensure proper cycling and temperature setpoint operation. Adjust to proper setting (Typically 80°F - 85°F) Comments:				
Air Flow and Circulation	Inspect AC unit, cabinet, and surrounding area to ensure adequate airflow to and from the unit on both the inlet and outlet air channels for the ambient and cabinet air Comments:				
Seals, Gaskets, and Leaks	Inspect and repair the seals, gaskets, and access holes around the unit and/or cabinet that show signs of leaking air and/or moisture Comments:				
Condensate and Drains	Inspect and clean the condensate pans and drains to ensure proper drainage and dissipation of moisture Comments:				
Electrical/Wiring	Inspect for loose, damaged, corroded, or chaffing wiring and connections. Tighten, insulate, or tie-up wires as required Comments:				
Options and Accessories	Check operation and functionality of optional and accessory items such as digital display/controller, door switches, alarm switches, air baffles/deflectors, etc. Comments:				
Refrigeration System	Inspect refrigeration tubing/lines for signs of leaks, rubbing, corrosion, or damage. Check the compressor for proper operation, mounting, and visible signs of exposure to high heat Comments:				
Maintenance Records	Update maintenance records on the unit and in the management system Comments:				

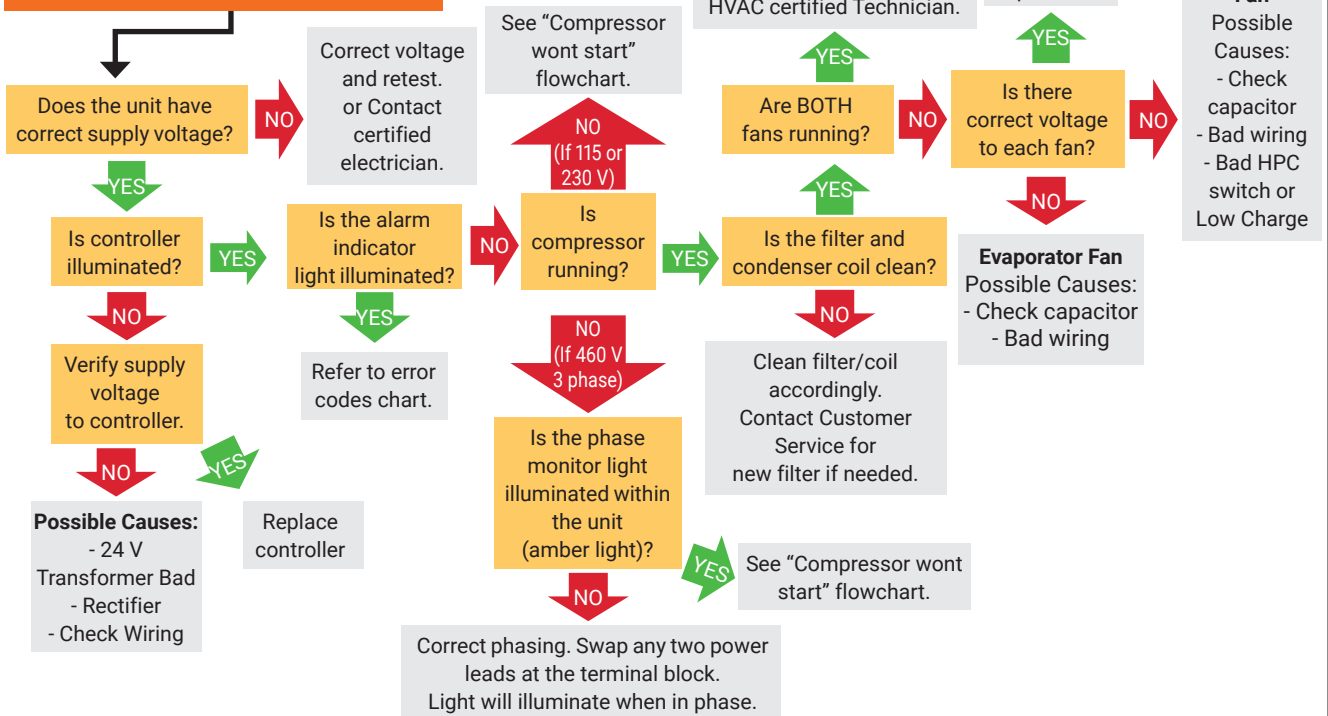
## TROUBLE SHOOTING



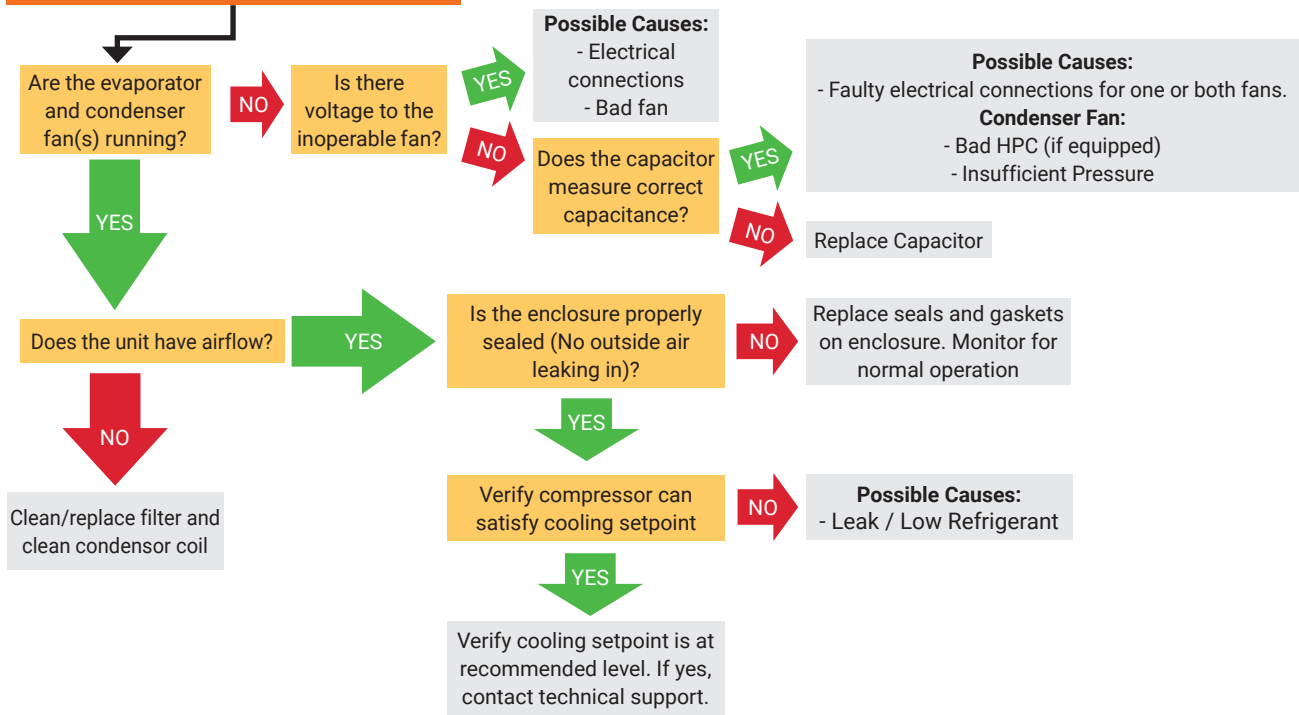
## "Unit wont Cool" w/ Manual Tstat 115 V/230 V/460 V



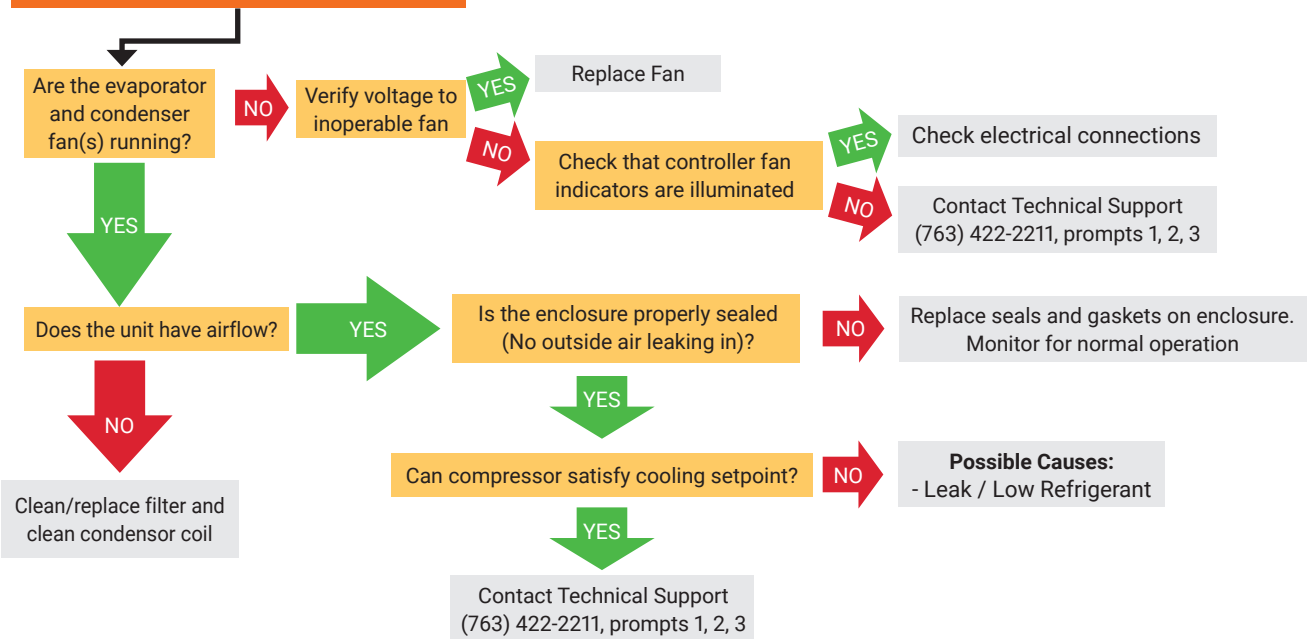
## UNIT W/ CONTROLLER "Unit wont turn on and/or cool."

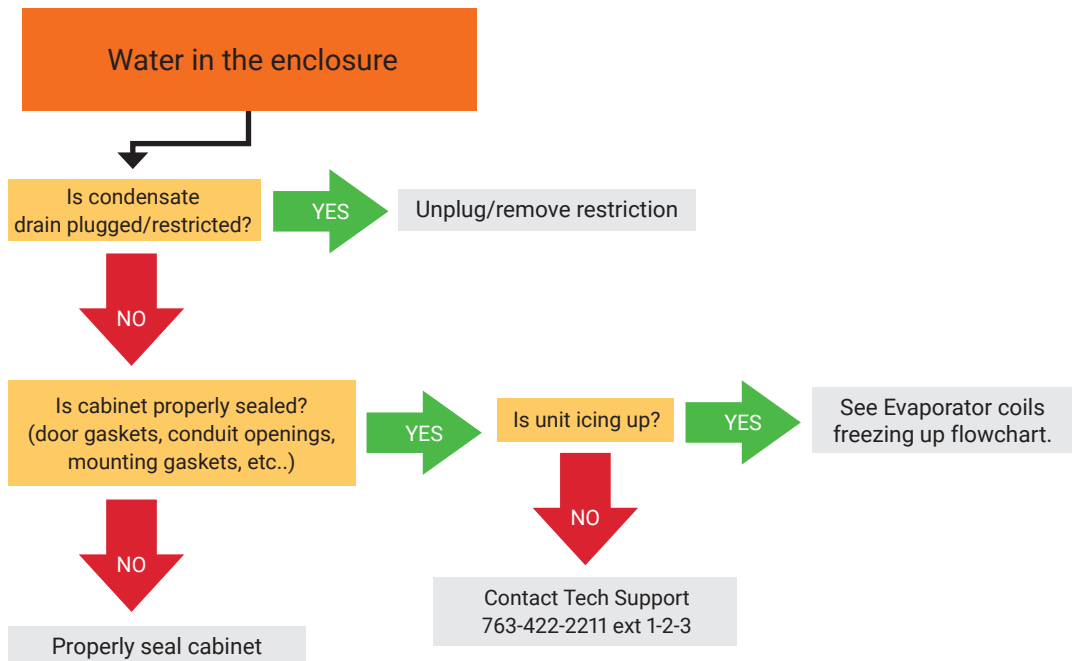
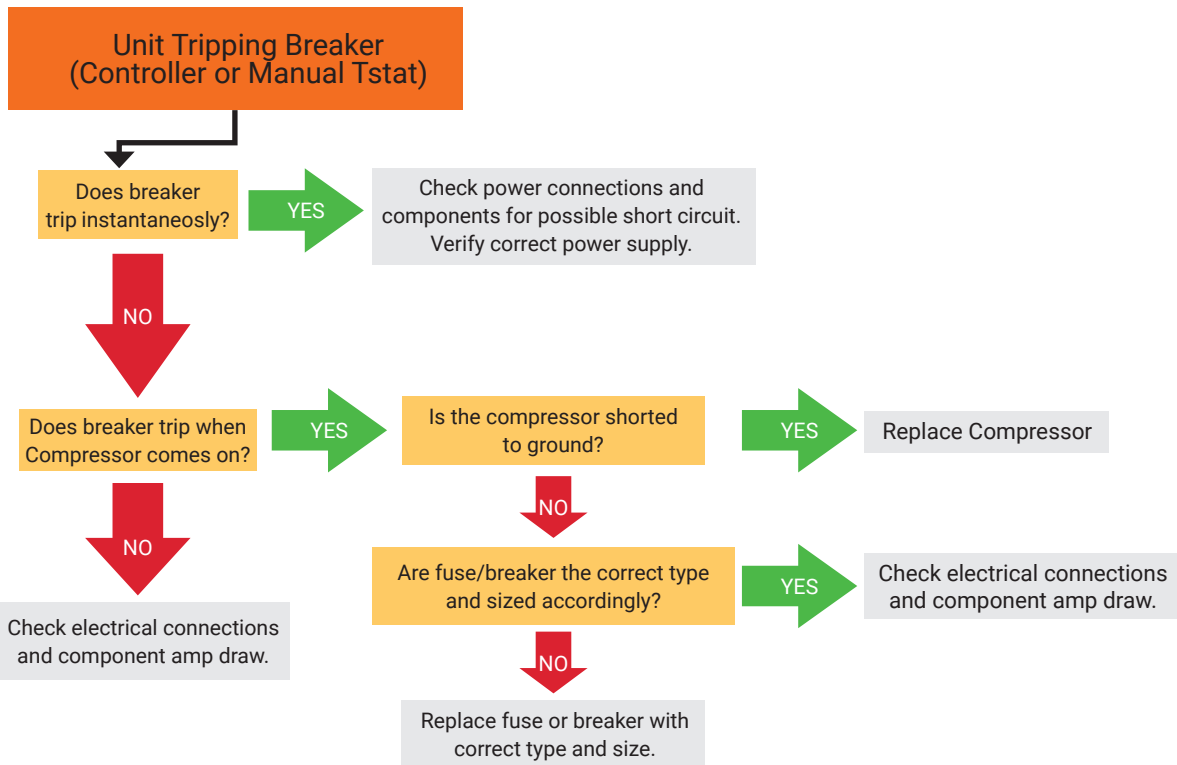


## Evaporator Coils Freezing (Unit w/ Manual Tstat)



## Evaporator Coils Freezing (unit with controller)





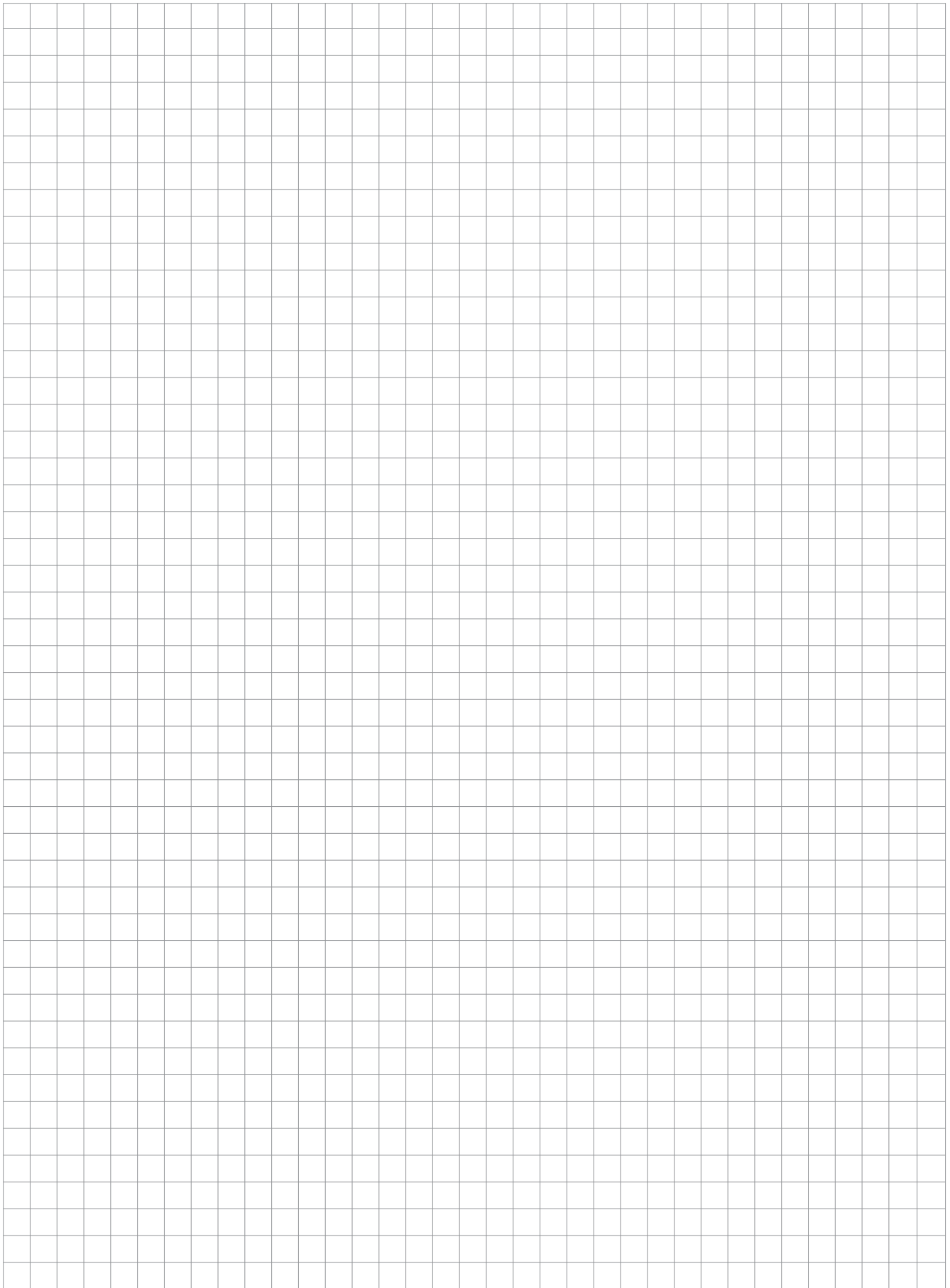
**For additional technical support:**

- Call 763-422-2211 or
- Email [cooling.service@nVent.com](mailto:cooling.service@nVent.com) or
- Download Field Service Request (FSR) from:  
<http://HOFFMAN.nVent.com/en-us/cooling-field-service-request>

**F-GAS INFORMATION**

---

	<b>N210216GXXX N210226GXXX N210246GXXX</b>
Refrigerant Kühlmittel Chłodziwo	R513A
GWP	573
Factory Charge Füllmenge durch Hersteller Opłata Fabryczna	184 Grams 184 Gramm 184 Gramów
CO <sub>2</sub> Equivalent CO <sub>2</sub> Equivalent CO <sub>2</sub> Ekwilalent	0.105 Tons 0,105 Tonnen 0,105 Tony



## **nVent**

2100 Hoffman Way  
Anoka, MN 55303 USA  
Tel +1.763.422.2211  
Fax +1.763.576.3200



Our powerful portfolio of brands:

**CADDY   ERICO   HOFFMAN   ILSCO   RAYCHEM   SCHROFF**