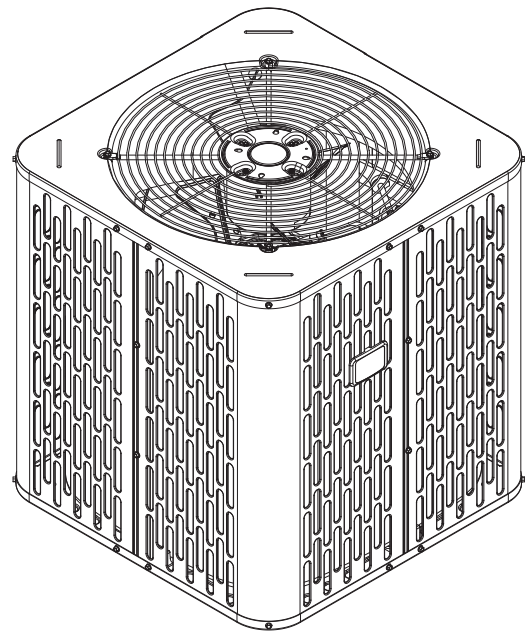


Installation, Operation, and Maintenance

Condensing Units

N5AC5018A
N5AC5024A
N5AC5030A
N5AC5036A
N5AC5042A
N5AC5048A
N5AC5060A



*Note: Graphics in this document are for representation only.
Actual model may differ in appearance.*

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE

Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

⚠ WARNING

Cancer and Reproductive Harm!

This product can expose you to chemicals, including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury or property damage.

This unit is not to be used 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.

Do not allow children to play or climb on the unit or to clean or maintain the unit without supervision.

⚠ WARNING

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⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- To be repaired only by trained service personnel.
- Do not puncture refrigerant tubing.
- Dispose of properly in accordance with federal or local regulations.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury and/or property damage. Only qualified personnel with adequate electrical and mechanical experience must repair the unit. The manufacturer or seller is not responsible for any interpretation or resulting liability.

⚠ WARNING

System Charge!

Failure to follow instructions below could result in abrupt release of system charge and could result in serious injury or property damage.

When opening the suction and liquid line service valve, turn the valve stem counterclockwise only until the stem contacts the rolled edge. Do not apply torque.

⚠ WARNING

Ventilation Required!

Failure to follow instructions below could result in death or serious injury or property damage.

Confirm the area is adequately ventilated before breaking into the system or conducting any hot work.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury and equipment or property damage.

- Do not pierce or burn.
- Be cautious that refrigerants may be odorless.

⚠ WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

⚠ CAUTION

Brazed Joints!

Failure to follow instructions below could result in minor to moderate injury or equipment damage.

When using existing refrigerant lines, verify all joints are brazed and not soldered.

⚠ CAUTION

Hot Surface!

Failure to follow instructions below could result in minor to severe burns.

Do not touch top of compressor. It may be hot.

⚠ CAUTION

Unit Contains R-454B Refrigerant!

Failure to use proper service tools may result in equipment damage or personal injury.

Use only R-454B refrigerant and approved compressor oil.

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Revision History

Updated figures in the Wiring Diagram chapter.

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Pre-Installation

General

⚠ WARNING

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Unit Contains R-454B Refrigerant!

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Failure to follow instructions below could result in abrupt release of system charge and could result in serious injury or property damage. When opening the suction and liquid line service valve, turn the valve stem counterclockwise only until the stem contacts the rolled edge. Do not apply torque.

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Ventilation Required!

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Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury. When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

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Hot Surface!

Failure to follow instructions below could result in minor to severe burns. Do not touch top of compressor. It may be hot.

⚠ WARNING

Cancer and Reproductive Harm!

This product can expose you to chemicals, including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING**Ventilation Required!**

Failure to follow instructions below could result in death or serious injury or property damage. Confirm the area is adequately ventilated before breaking into the system or conducting any hot work.

Note: The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacture's split systems are AHRI rated only with TXV/EEV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.

Operating Range**Table 1. Operating range**

Mode	Model	Operating Range
Cooling	1.5 – 5 Ton	55°F – 120°F
Heating	1.5 – 5 Ton	0°F – 66°F

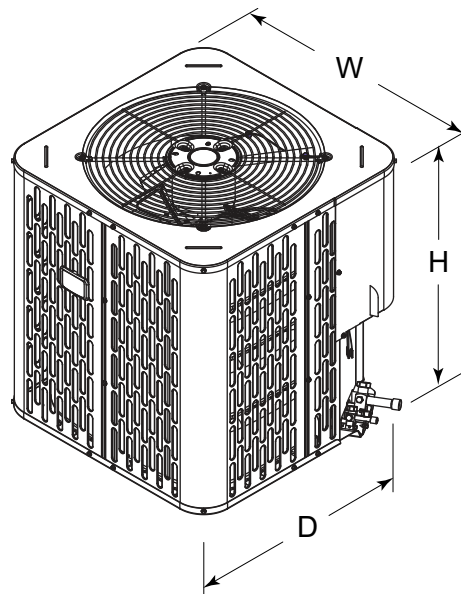
Unit Location Considerations**Unit Dimensions and Weight****Table 2. Unit dimensions and weight**

Models	H x D x W (in.)	Weight (lb) ^(a)
N5AC5018A	37 x 30 x 30	184
N5AC5024A	33 x 30 x 30	161
N5AC5030A	37 x 30 x 30	184
N5AC5036A	33 x 30 x 30	161
N5AC5042A	37 x 34 x 34	212
N5AC5048A	45 x 34 x 34	252
N5AC5060A	45 x 34 x 34	252

^(a) Weight values are estimated uncrated.

When mounting the outdoor unit, confirm the roof structure will support the weight of the unit.

Properly selected isolation is recommended to alleviate sound or vibration transmission to the building structure.

Figure 1. Unit dimensions**Refrigerant Piping Limits**

- The maximum total length of refrigerant lines from outdoor to indoor unit should not exceed 150 feet (including lift).
- The maximum vertical change should not exceed 50 feet.
- Service valve connection diameters are shown in "Line Considerations," p. 9.

Note: For other line lengths, see the *Refrigerant Piping Manual for Small Split Cooling and Heat Pump Systems — Application Guide, (SS-APG006*-EN)* or *Refrigerant Piping Software Program*.

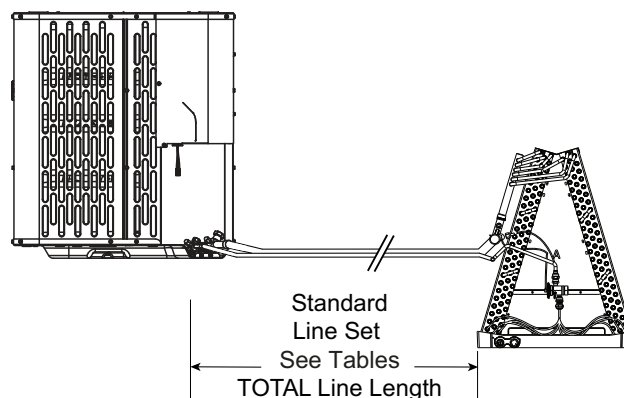
Figure 2. Refrigerant total line length limit

Figure 3. Refrigerant piping vertical change limit

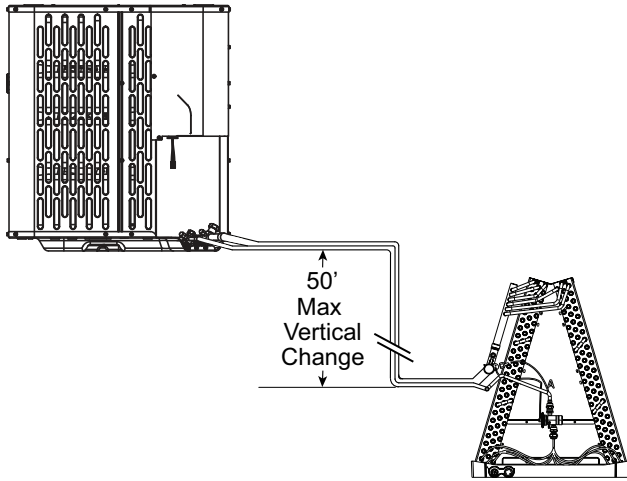
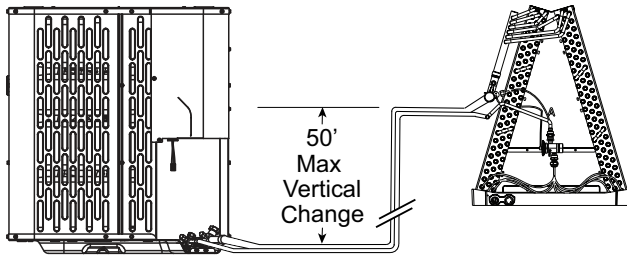


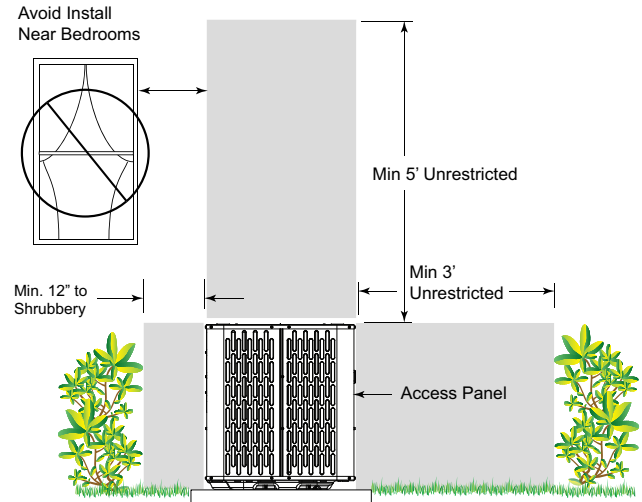
Figure 4. Refrigerant piping vertical change limit



Suggested Locations for Best Reliability

- Confirm the top discharge area is unrestricted for at least five feet above the unit.
- Three feet clearance must be provided in front of the control box (access panels) and any other side requiring service.
- Avoid installing the unit in areas where operating noise may disturb occupants, such as sleeping quarters or living-area windows. Confirm the installation location with the building owner before proceeding.
- Avoid installing the unit near windows where condensation or defrost vapor may create a nuisance for occupants.
- Position the outdoor unit a minimum of 12 inches from any wall or surrounding shrubbery to ensure adequate airflow.
- Place the outdoor unit far enough from any structure to prevent excess roof runoff or icicles from falling directly onto it.

Figure 5. Suggested locations for best reliability



Unit Preparation

Prepare the Unit for Installation

Inspect the unit for damage and promptly report any damage to the carrier.

Setting the Unit

Pad Installation

When installing the unit on a support pad, such as a concrete slab, consider the following:

- The pad should be at least 1-inch larger than the unit on all sides.
- The pad must be separate from any structure.
- The pad must be level.
- The pad should be high enough above grade to allow for drainage.
- The pad location must comply with national, state, and local codes.

For other applications refer to application guide.

Refrigeration

Line Considerations

Table 3. Refrigerant line and service valve connection sizes

Model	Rated Line Sizes (in.)		Service Valve Connection Sizes (in.)	
	Vapor Line	Liquid Line	Vapor Line Connection	Liquid Line Connection
N5AC5018A	3/4	5/16	3/4	5/16
N5AC5024A	3/4	5/16	3/4	5/16
N5AC5030A	3/4	5/16	3/4	5/16
N5AC5036A	3/4	5/16	3/4	5/16
N5AC5042A	7/8	5/16	7/8	5/16
N5AC5048A	7/8	5/16	7/8	5/16
N5AC5060A	1-1/8	5/16	7/8	5/16

Table 4. Alternate refrigerant line and service valve connection sizes

Model	Alternate Line Sizes (in.)		Service Valve Connection Sizes (in.)	
	Vapor Line	Liquid Line	Vapor Line Connection	Liquid Line Connection
N5AC5018A	5/8	3/8	3/4	5/16
N5AC5024A	5/8	3/8	3/4	5/16
N5AC5030A	5/8	3/8	3/4	5/16
N5AC5036A	5/8	3/8	3/4	5/16
N5AC5042A	3/4	3/8	7/8	5/16
N5AC5048A	3/4	3/8	7/8	5/16
N5AC5060A	7/8	3/8	7/8	5/16

Factory Charge

The outdoor condensing units are factory charged with the system charge required for the outdoor condensing unit, fifteen (15) ft. of tested connecting line, and the nominal rated indoor evaporative coil match. Always verify proper system charge via subcooling (TXV/EEV) or superheat (fixed orifice) per the unit nameplate.

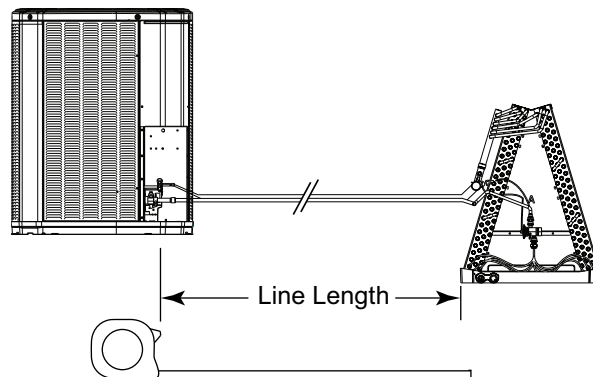
Required Line Length

Determine required line length and lift.

Total line length = _____ ft.

Total vertical change (lift) = _____ ft.

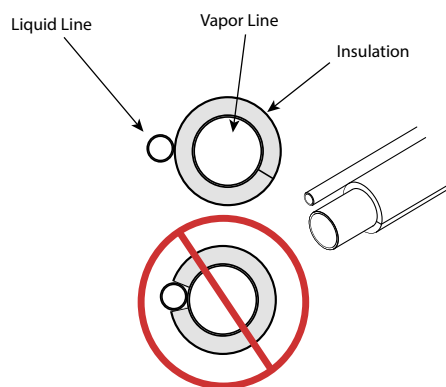
Figure 6. Required refrigerant line length



Line Insulation

Important: The vapor line must always be insulated. Do not allow the liquid line and vapor line to come in direct (metal-to-metal) contact.

Figure 7. Refrigerant line insulation



Line Routing

Important: Take precautions to prevent noise within the building structure due to vibration transmission from the refrigerant lines.

Comply with national, state, and local codes when isolating line sets from joists, rafters, walls, or other structural elements.

For example:

- Use isolation hangers when securing refrigerant lines to floor joists or other structural framing.
- Use isolation hangers when routing refrigerant lines through stud spaces or enclosed ceilings.
- Insulate and isolate refrigerant lines where they pass through walls or sills.
- Isolate the lines from all ductwork.
- Minimize the number of 90° turns.

Secure the vapor line from joists using isolators every 8 feet. Secure the liquid line directly to the vapor line using tape, wire, or other appropriate method every 8 feet.

Figure 8. Isolation from joist/rafter

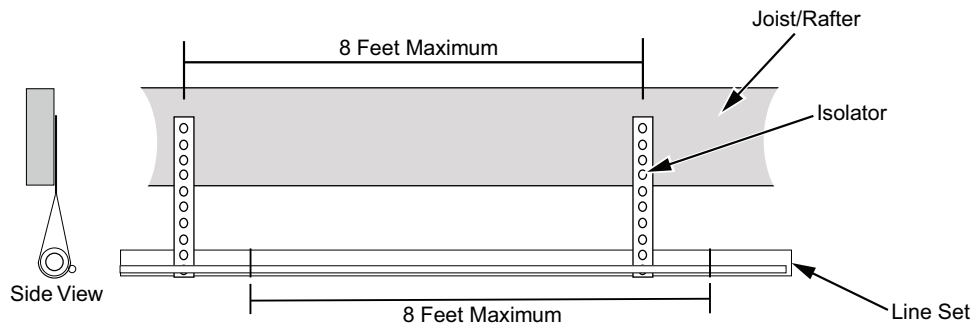


Figure 9. Isolation in wall spaces

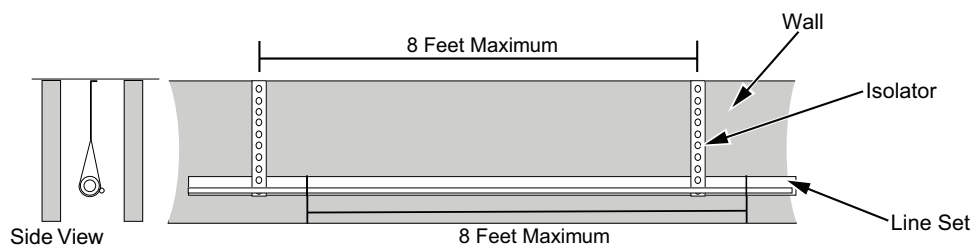


Figure 10. Isolation through wall

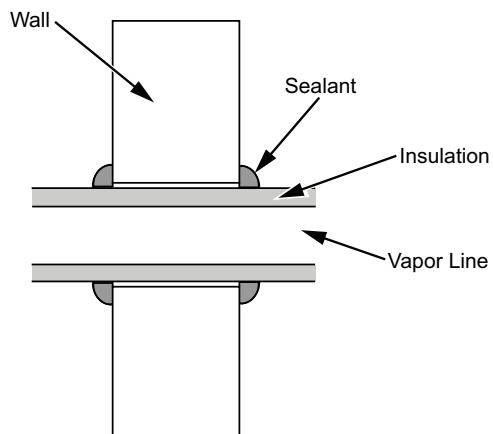
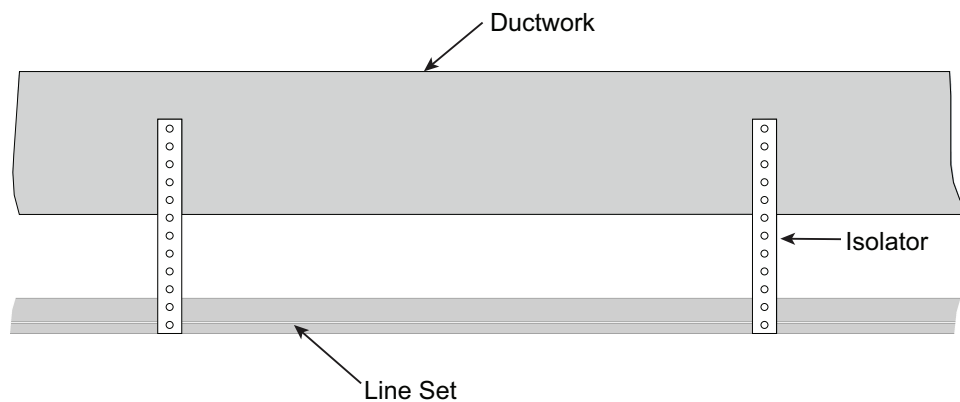


Figure 11. Incorrect lineset installation



Important: Do not hang linesets from ductwork.

Line Brazing

1. Remove caps or plugs. Use a deburring tool to deburr the pipe ends. Clean both internal and external surfaces of the tubing using an emery cloth.
2. Remove the pressure tap cap and valve cores from both service valves.
3. Purge the refrigerant lines and indoor coil with dry nitrogen.

Note: A2L equipment shall have red marked service ports and pipes through which refrigerant is serviced.

4. Wrap a wet rag around the valve body to avoid heat damage and continue the dry nitrogen purge.
 - a. Braze the refrigerant lines to the service valves.
 - b. For units shipped with a field-installed external drier, check liquid line filter driers directional flow arrow to confirm correct direction of refrigeration flow (away from outdoor unit and toward evaporator coil) as illustrated. Braze the filter drier to the liquid line.
 - c. Continue the dry nitrogen purge. Do not remove the wet rag until all brazing is completed.

Important: Remove the wet rag before stopping the dry nitrogen purge.

Notes:

- Install the drier into the liquid line.
 - Precautions should be taken to avoid heat damage to the basepan during brazing. It is recommended to keep the flame directly off the basepan.
5. Replace the pressure tap valve cores and plastic tabs after the service valves have cooled.

Figure 12. Removal of caps or plugs from pipe ends

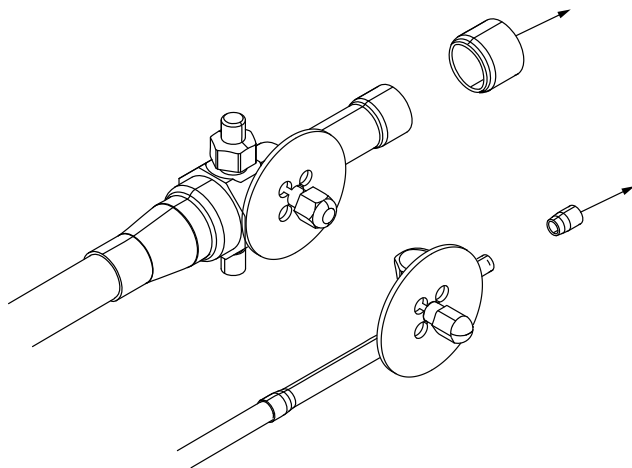


Figure 13. Removal of pressure cap and valve cores from service valves

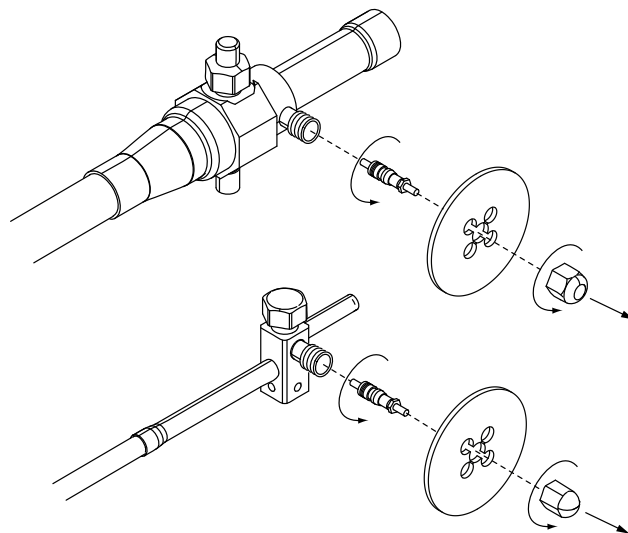


Figure 14. Purging of refrigerant lines

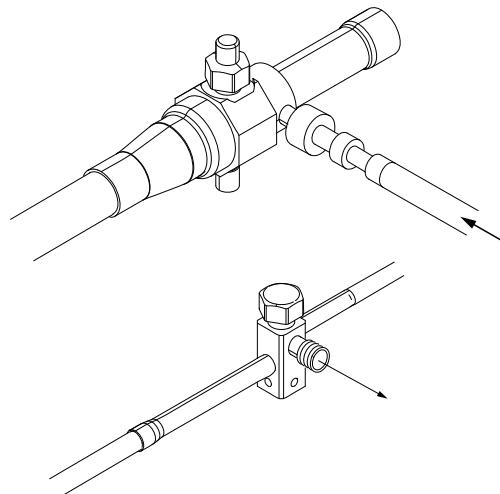


Figure 15. Wrapping of wet rag

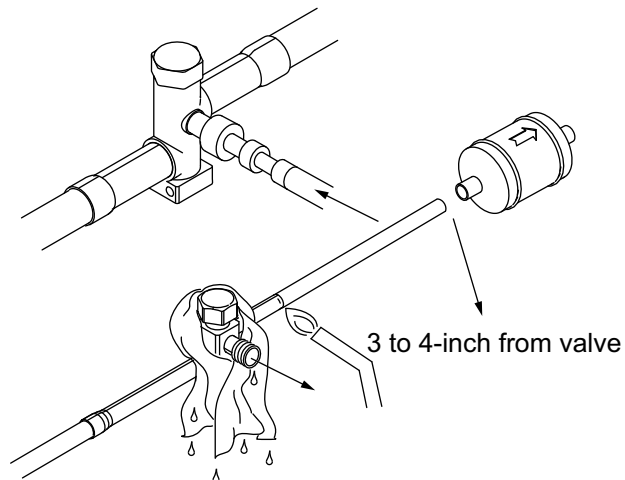
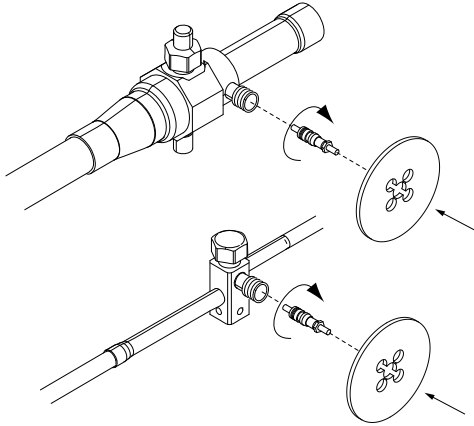


Figure 16. Re-installation of pressure valve cores and plastic tabs



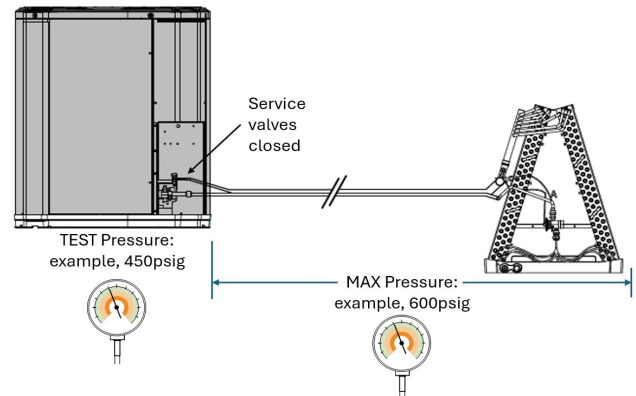
Line Leak Check

After completing field piping for split system, pressure-test the field pipework with nitrogen, then perform a vacuum test prior to refrigerant charging.

Important Considerations

- Do not use any ignition sources when searching for or detecting refrigerant leaks.
- The following leak detection methods are acceptable for all refrigerant systems:
 - Electronic leak detectors calibrated for R-454B (with a sensitivity of 5 grams/year).
 - Bubble method.
- Do not test the outdoor unit above 450 psig during service or component replacement. Test the indoor unit and linesets to the maximum pressure listed on the outdoor or indoor unit nameplate. Close the service valves when pressure-testing the evaporator coil and linesets to separate the outdoor unit from the indoor unit.

Figure 17. Refrigerant line leak check



Final Pressure Check

1. Use the service valve to isolate the outdoor unit from the evaporator coil and linesets.
2. Pressurize the evaporator coil and linesets to the max pressure listed on the outdoor or indoor unit nameplate for a minimum of 60 minutes.

Do not add additional refrigerant or test gas after reaching the evaporator coil specified pressure.

3. Verify the system maintains full pressure with no loss.
4. Complete the pressure test and proceed with the evacuation procedure.

Preliminary Pressure Check (Optional)

1. Use dry nitrogen to pressurize the refrigerant lines and evaporator coil to 150 psig.
2. Check each brazed location for leaks using a soapy solution or bubble test.
3. Remove pressure and repair any leaks before continuing.

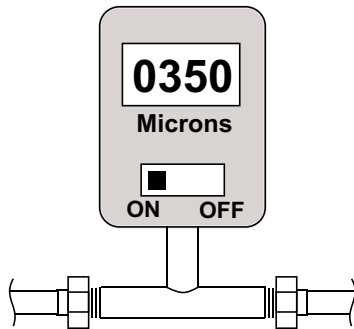
Evacuation and Servicing

Evacuate the Refrigerant Lines and Indoor Coil

Important: Do not open the service valves until the refrigerant lines and indoor coil leak check and evacuation are complete.

1. Evacuate until the micron gauge reads no higher than 350 microns, then close the valve to the vacuum pump.

Figure 18. Observe micron gauge reading



2. Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one minute.

Figure 19. Stopwatch



3. Once evacuation is complete, clear the vacuum pump and micron gauge, then close the valve on the manifold gauge set.

Servicing

- If repairs are required after the system is charged, safely remove or isolate the refrigerant and purge the section needing repair with nitrogen or oxygen-free nitrogen before opening the circuit.
- The refrigerant charge shall be recovered into the correctly marked recovery cylinders.
- Keep the vacuum pump outlet away from potential ignition sources, and make sure ventilation is available.

- Before recharging the system, pressure-test it with the appropriate purging gas. After charging and before commissioning, perform a leak test. Conduct a follow-up leak test before leaving the site.
- Use only appropriate refrigerant recovery cylinders. Have enough cylinders available to hold the full system charge. Use only cylinders designated and labeled for the recovered refrigerant. Cylinders must include a pressure-relief valve and associated shut-off valves in good working order.
- Have a set of calibrated weighing scales available and in good working order. Use hoses with leak-free disconnect couplings, and keep them in good condition. Confirm that any associated electrical components are sealed.
- Return the recovered refrigerant to the refrigerant supplier in the correct recovery cylinder. Do not mix refrigerants.
- If compressors or compressor oils are removed, evacuate them to an acceptable level to confirm that no A2L refrigerant remains in the lubricant.

Service Valves

Open the Gas Service Valve First

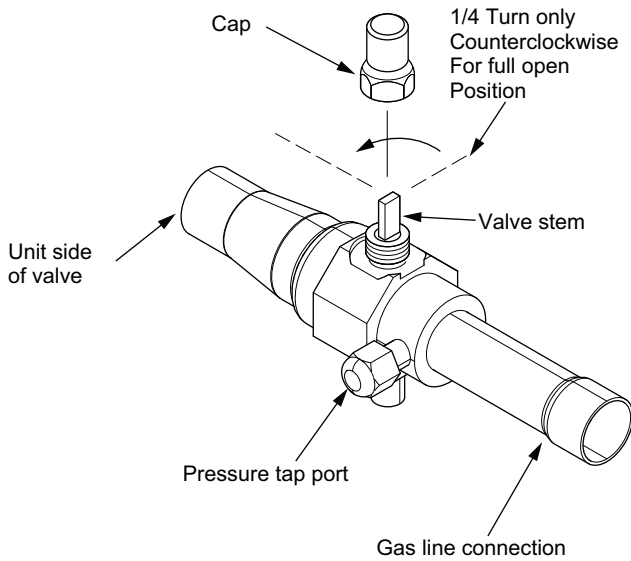
Important: Complete the leak check and evacuation must before opening the service valves.

Note: Do not vent refrigerant gases into the atmosphere.

1. Remove the valve stem cap.
2. Using an adjustable wrench, turn the valve stem 1/4 turn counterclockwise to the fully open position.
3. Replace the valve stem cap to prevent leaks. Finger-tighten plus an additional 1/6 turn.

Note: Service valves may be ball or angle style.

Figure 20. Gas service valve



Open the Liquid Service Valve Second

⚠ WARNING

System Charge!

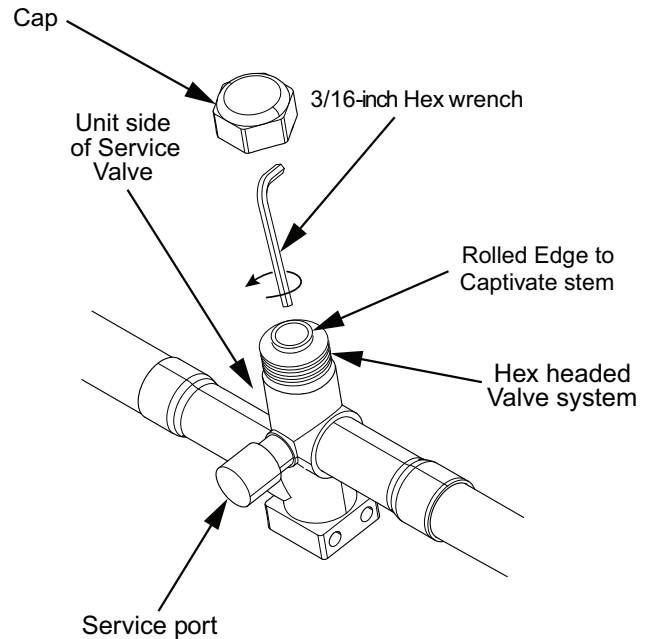
Failure to follow instructions below could result in abrupt release of system charge and could result in serious injury or property damage.

When opening the suction and liquid line service valve, turn the valve stem counterclockwise only until the stem contacts the rolled edge. Do not apply torque.

Important: Leak check and evacuation must be completed before opening the service valves.

1. Remove the service valve cap.
2. Fully insert a 3/16-inch hex wrench into the stem and back out counterclockwise until the valve stem just touches the rolled edge (approximately five turns).
3. Replace the valve cap to prevent leaks. Finger-tighten plus an additional 1/6 turn.

Figure 21. Liquid service valve



Electrical

Low Voltage

Maximum Wire Length

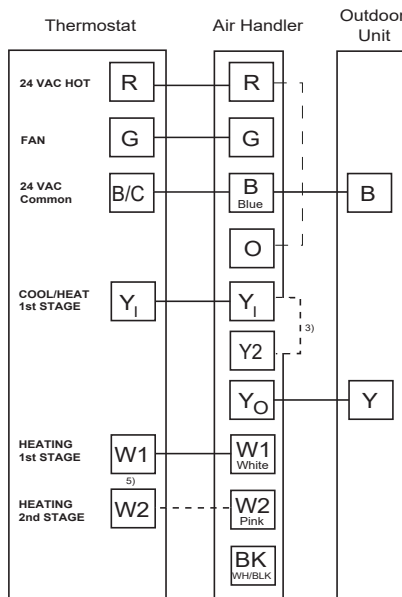
The following table defines the maximum total length of low voltage wiring from the outdoor unit, to the indoor unit, and to the thermostat.

Table 5. Low voltage maximum wire length

24 Volts	
Wire Size	Maximum Wire Length (ft.)
18 AWG	150
16 AWG	225
14 AWG	300

Connection Diagrams

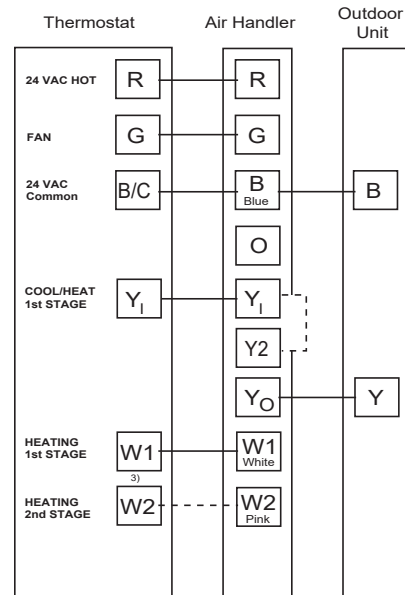
Figure 22. AC with A5AH6



Note: Units with pigtails require wirenuts for connections.

1. Cap all unused wires.
2. When BK is used:
 - a. Do not connect Y₂ at the air handler.
 - b. Cut the jumper between R and BK on the control board. See indoor wiring schematic for details.
3. In AC systems, for multiple stages of electric heat, jumper W1 and W2 together if comfort control has only one stage of heat.

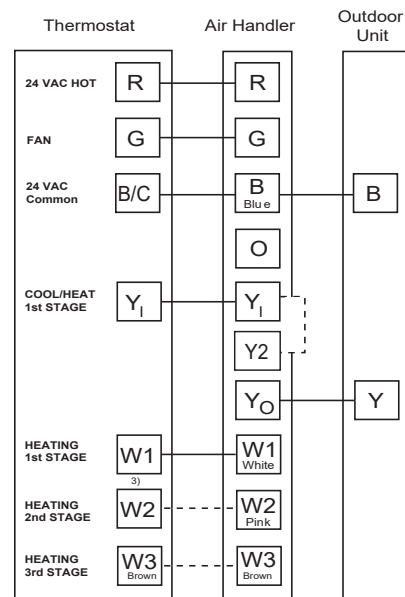
Figure 23. AC with A5AH4



Note: Units with pigtails require wirenuts for connections.

1. Cap all unused wires.
2. In AC systems, for multiple stages of electric heat, jumper W1 and W2 together if comfort control has only one stage of heat.

Figure 24. AC with ATAM4

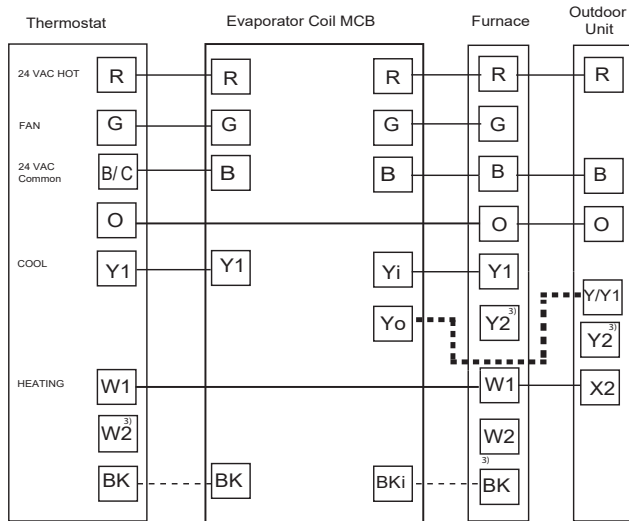


Note: Units with pigtails require wirenuts for connections.

1. Cap all unused wires.

- In AC systems, for multiple stages of electric heat, jumper W1 and W2 together if comfort control has only one stage of heat.

Figure 25. AC with furnace



Mitigation Board Guidelines

- The approved ID/OD combination provides sufficient safe ventilation in case of a leak.
- All systems require mitigation boards so an altitude adjustment factor may be required.
- The mitigation control board needs to be included in an A2L System.

High Voltage

Power Supply

⚠ WARNING

Live Electrical Components!

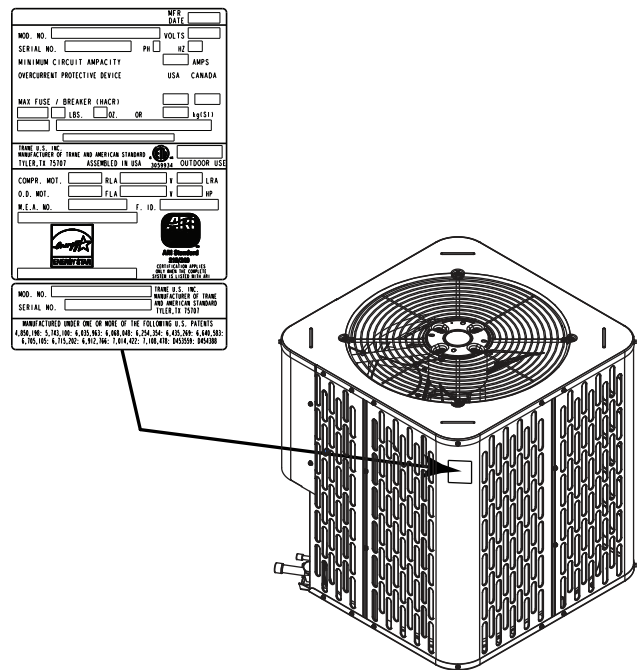
Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

- Use a high-voltage power supply to match the equipment nameplate.

- Install power wiring per national, state, and local codes.
- Follow the unit wiring diagram on the inside of the control box cover and the IOM document included with the unit.

Figure 26. Nameplate location



System Start-Up

1. Confirm that all steps from Refrigerant Line Brazing through Electrical – Low Voltage Mitigation Board Guidelines are complete.
2. Turn on the disconnect(s) to power the indoor and outdoor units.
3. If the compressor crankcase heater accessory is used and the outdoor ambient is below 70°F, wait one hour before starting the unit.
4. Set the system thermostat to ON.

System Charge Adjustment

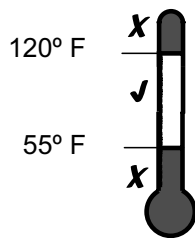
For systems using an indoor piston metering device, refer to the superheat charging method and chart. For systems using a TXV or EEV indoor metering device, refer to the subcool charging method and charts.

Temperature Measurements

Check the outdoor temperatures.

Use subcooling in cooling mode as the only recommended charging method when the outdoor ambient temperature is above 55°F.

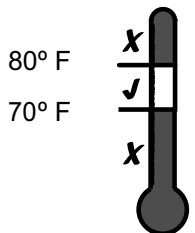
Figure 27. Outdoor temperature



Note: For Superheat (In Cooling Mode), refer to [Table 10, p. 21](#).

For best results, maintain the indoor temperature between 70°F to 80°F.

Figure 28. Indoor temperature



Note: Return in the spring or summer to accurately charge the system in cooling mode when the outdoor ambient temperature is above 55°F.

Subcooling Charging in Cooling (Above 55°F Outdoor Temperature)

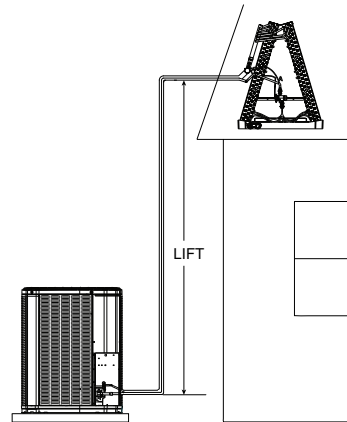
1. Use the refrigerant line total length and lift measurements from “[Line Insulation](#),” p. 9.

Total line length = _____ ft.

Vertical change (lift) = _____ ft.

Note: Use this method when matched with a TXV or EEV indoor unit.

Figure 29. Refrigerant line total length and lift



2. Determine the final subcooling value using the total line length and lift measured in [Step 1](#). and the tables below.

Table 6. Maximum line length and rise (models 018A – 036A)

018A, 024A, 030A, and 036A			
Vapor Line	Liquid Line	Length	Lift
5/8	5/16	150	50
3/4	5/16	150	50
5/8	3/8	150	50
3/4	3/8	150	50
Note:			
Ratings/Primary			
Alternate Lineset			

Table 7. Maximum line length and rise (models 042A and 048A)

042A and 048A			
Vapor Line	Liquid Line	Length	Lift
3/4	5/16	150	50
7/8	5/16	150	50
3/4	3/8	150	50
7/8	3/8	150	50
Note:			
Ratings/Primary			
Alternate Lineset			

Table 8. Maximum line length and rise (model 060A)

060A			
Vapor Line	Liquid Line	Liquid Line	Lift
7/8	5/16	150	50
1-1/8	5/16	75	50
7/8	3/8	150	50
1-1/8	3/8	75	50
Note:			
Ratings/Primary			
Alternate Lineset			

Table 9. R-454B refrigerant charging chart

Liquid Temp (°F)	Design Subcooling (°F)						
	8	9	10	11	12	13	14
	Liquid Gauge Pressure (PSI)						
55	170	172	175	178	181	184	187
60	184	187	190	194	197	200	203
65	200	203	206	210	213	217	220
70	217	220	223	227	230	234	238
75	234	238	241	245	249	252	256
80	252	256	260	264	268	272	276
85	272	276	280	284	288	292	297
90	292	297	301	305	309	314	318
95	314	318	323	327	332	336	341
100	336	341	346	351	355	360	365
105	360	365	370	375	380	385	390
110	385	390	396	401	406	412	417
115	412	417	422	428	433	439	445
120	439	445	450	456	462	468	474
125	468	474	480	486	492	498	504

Figure 30. Subcool charging corrections – 018A, 024A, 030A, 036A

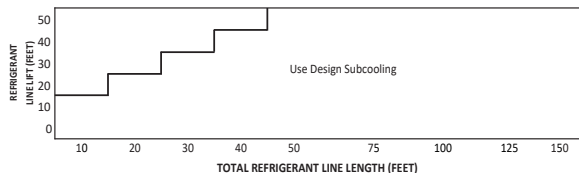


Figure 31. Subcool charging corrections – 042A, 048A

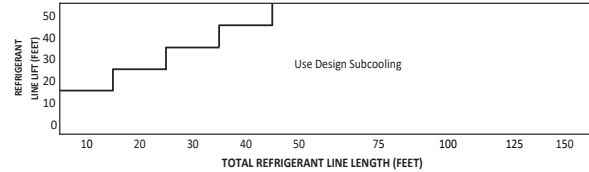
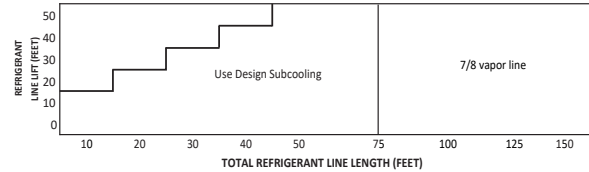


Figure 32. Subcool charging corrections – 048A, 060A



Design subcooling value = _____ °F

(from nameplate or Service Facts)

Subcooling correction = _____ °F

Final subcooling value = _____ °F

Charging the Unit

1. Attain proper gauge pressure: Use the standard R-454B subcool charging chart to adjust the refrigerant level until the correct gauge pressure is reached.

Note: Use bubble point, per the included chart, for calculating subcooling.

Add refrigerant if the liquid gauge pressure is lower than the chart value.

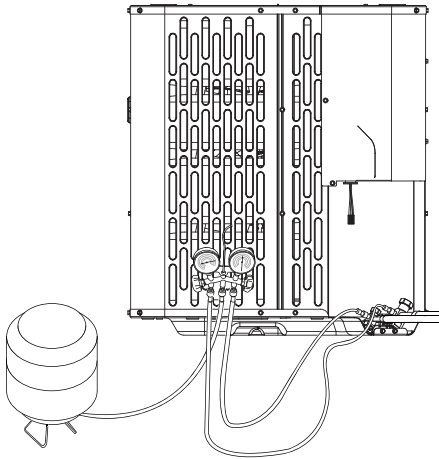
- a. Connect gauges to refrigerant bottle and unit as illustrated.
- b. Purge all hoses.
- c. Place the refrigerant bottle on a scale, then open the bottle.
- d. Stop adding refrigerant when the liquid line refrigerant and liquid gauge pressure match the charging chart.

Notes:

- Recover refrigerant if the liquid gauge pressure is higher than the chart value.
- Prevent cross-contamination between refrigerants when using charging equipment.
- Keep cylinders in the proper position as instructed, and confirm that the refrigeration system is earthed before charging with refrigerant.

System Charge Adjustment

Figure 33. Charging the unit



2. Stabilize the system.
 - a. Wait 20 minutes for the system condition to stabilize between adjustments.

Figure 34. Stopwatch



Note: When the liquid line temperature and gauge pressure approximately match the chart, the system is properly charged.

- b. Remove the gauges.
 - c. Replace the service port caps to help prevent leaks. Finger-tighten, then turn an additional 1/6 turn.
3. Record system information for reference. After charging is complete, record the system pressures and temperatures.

Outdoor model number = _____

Measured suction line temperature = _____ °F

Measured outdoor ambient = _____ °F

Liquid gauge pressure = _____ PSIG

Measured indoor ambient = _____ °F

Suction gauge pressure = _____ PSIG

Measured liquid line temperature = _____ °F

4. Complete the **Total System Charge** charge rating label below and label located on the outside of the unit with a permanent marker.
 - a. Charge added at factory = _____ lb/oz
 - b. Charge added at install = _____ lb/oz
 - c. Total system charge (a + b) = _____ lb/oz

Table 10. Fixed orifice superheat charging table

	Indoor Wet Bulb Temp (°F)																													
Outdoor Dry Bulb Temper- ature (°F)		50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
	55	7	9	10	11	12	14	15	17	18	20	21	23	24	26	27	29	30	—	—	—	—	—	—	—	—	—	—	—	—
	60	5	7	8	9	10	12	13	15	16	18	19	21	22	24	25	27	28	30	31	—	—	—	—	—	—	—	—	—	—
	65	—	—	4	6	8	10	11	13	14	16	17	18	19	21	22	24	25	27	28	27	31	—	—	—	—	—	—	—	—
	70	—	—	—	—	5	7	8	10	11	13	14	16	17	18	19	21	22	24	25	27	28	30	31	—	—	—	—	—	—
	75	—	—	—	—	—	—	5	6	7	9	10	12	14	16	18	19	21	22	24	26	28	29	31	32	—	—	—	—	—
	80	—	—	—	—	—	—	—	—	4	6	7	9	10	11	12	14	16	18	19	21	23	25	26	28	29	31	33	—	—
	85	—	—	—	—	—	—	—	—	—	—	4	6	7	9	10	13	14	16	18	20	21	23	24	26	28	29	30	31	32
	90	—	—	—	—	—	—	—	—	—	—	—	—	4	6	8	10	11	13	14	16	18	20	22	24	25	27	28	30	31
	95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	6	8	10	13	14	16	18	20	22	23	25	26	28	29
	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	8	10	12	13	16	18	20	21	23	25	27	29
	105	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	6	7	9	11	13	15	18	20	22	24	26	28
	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	7	9	11	13	16	18	21	23	26	28	
115	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	9	12	14	16	19	21	24	26	

- Measure the return-air wet-bulb temperature at the unit just before the coil using a digital psychrometer.
- Measure the outdoor dry-bulb temperature.
 - Use these temperatures to determine target superheat from the charging table. Do not charge the system if the conditions fall outside the table.
 - To decrease total superheat, add refrigerant.
 - To increase total superheat, remove refrigerant.
- After any refrigerant or airflow change, allow the system to operate for 10 to 15 minutes before determining final superheat.

Weigh-in Method for Calculating Charge

Use the weigh-in method in the following situations:

- During initial installation when replacing the system charge.
- When power is not available at the equipment site.
- When indoor or outdoor temperatures are outside the range required to verify charge using the subcooling method.

To calculate the charge:

- Measure the distance in feet between the outdoor unit and the indoor unit, and record it on Line 1. Include the

full line length from the service valve to the IDU, minus 15 ft.

Line length (ft) = _____

- Enter the charge multiplier: 0.47 oz/ft for 3/8-inch tubing or 0.30 oz/ft for 5/16-inch tubing.
- Multiply the total refrigerant tubing length from Line 1 by the value in Step 2. Record the result on Line 3 of the worksheet.

Step 1 x Step 2 = _____

- Record this value as the amount of refrigerant to weigh in before opening the service valves.

Refrigerant = _____

- Complete the **Total System Charge** rating label below and the label on the outside of the unit using a permanent marker.

Complete the **Total System Charge** chart after final charging is complete.

a. Charge added at factory = _____ lb/oz

b. Charge added at install = _____ lb/oz

c. Total system charge (a + b) = _____ lb/oz

- Return to the site for adjustment.

Important: Return in spring or summer to accurately charge the system in cooling mode when the outdoor ambient is above 55°F.

Operational and Checkout Procedures

The final phase of installation is completing the unit operational and checkout procedures. For proper performance, operate the unit and make any required charge adjustments.

1. Inspect factory tubing for any shifting during shipment.
2. Adjust the tubing to prevent tube-to-tube contact during operation.
3. Confirm all wiring connections are tight and secure.

After installation is complete, check the following:

- ☐ Leak-check the refrigerant lines.
- ☐ Properly insulate the suction lines and fittings.
- ☐ Secure and isolate all refrigerant lines.
- ☐ Seal all passages through masonry. If mortar is used, prevent it from contacting the copper tubing.
- ☐ Verify that all electrical connections are tight.
- ☐ Observe the outdoor fan during operation for clearance and smooth operation.
- ☐ Verify that the indoor coil drain line drains freely by pouring water into the drain pan.
- ☐ Verify that supply registers and return grilles are open and unobstructed.
- ☐ Verify that a return air filter is installed.
- ☐ Verify that the correct airflow setting is used for the indoor blower motor.
- ☐ Confirm safe operation by operating the complete system in each mode.
- ☐ Confirm that the refrigerant leak detection system is operational.
- ☐ Confirm that the refrigerant quantity is marked on the outdoor unit.

Refrigeration Circuits

Figure 35. 018, 030, and 042 models

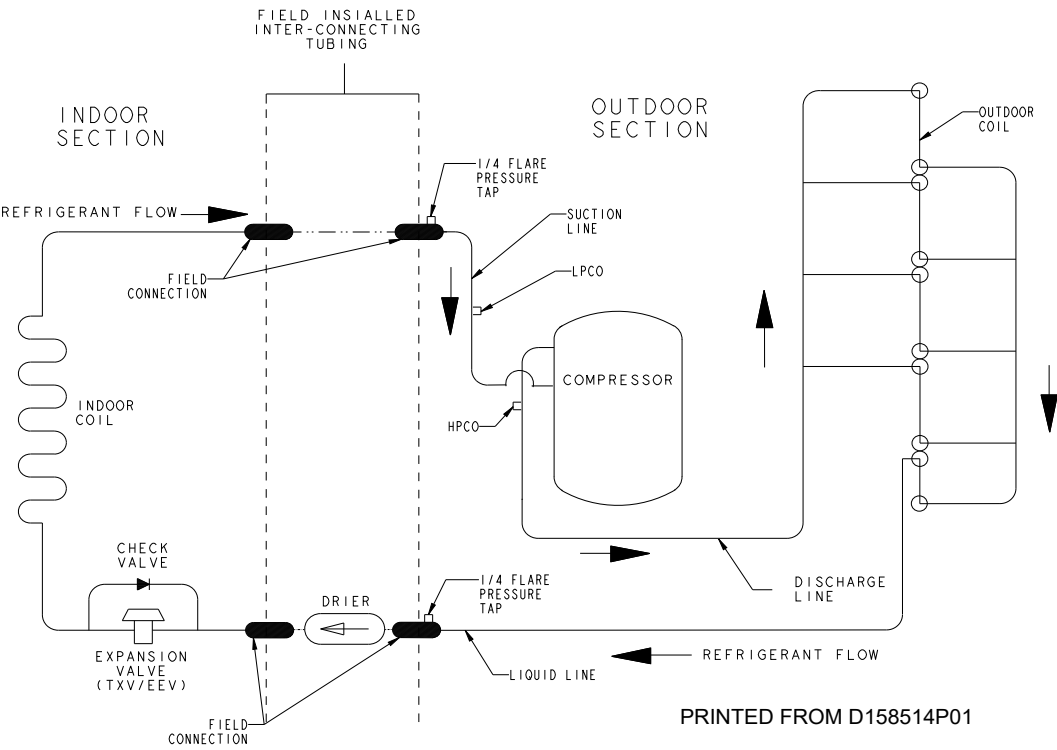


Figure 36. 024 and 036 models

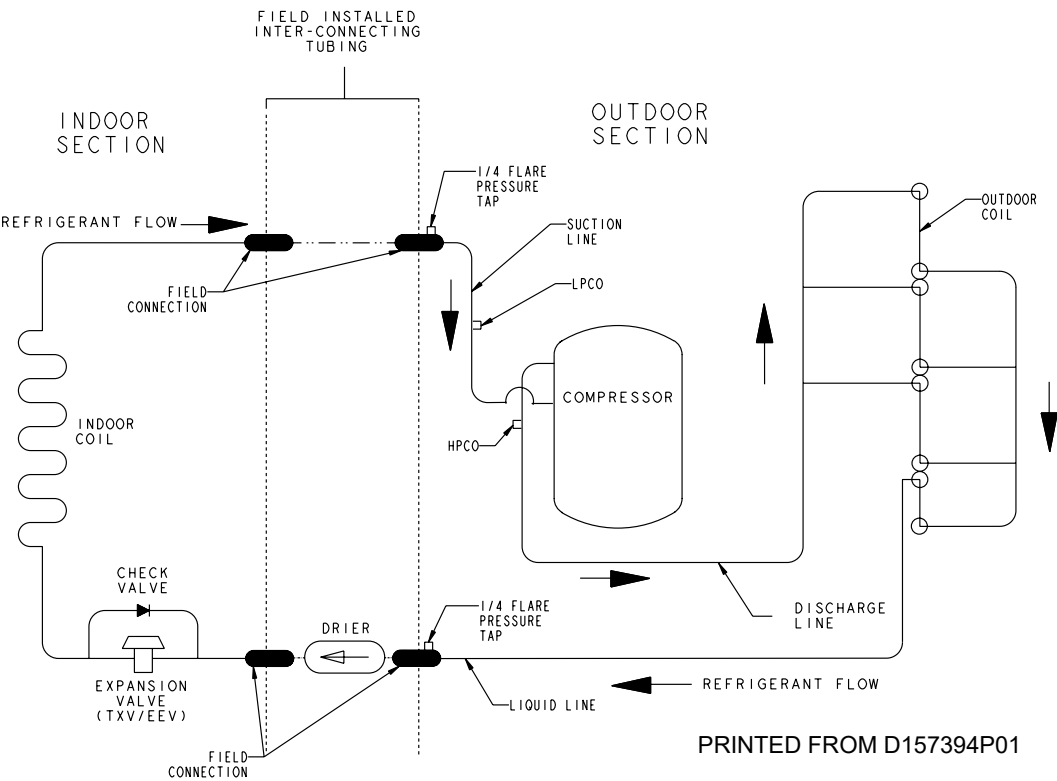
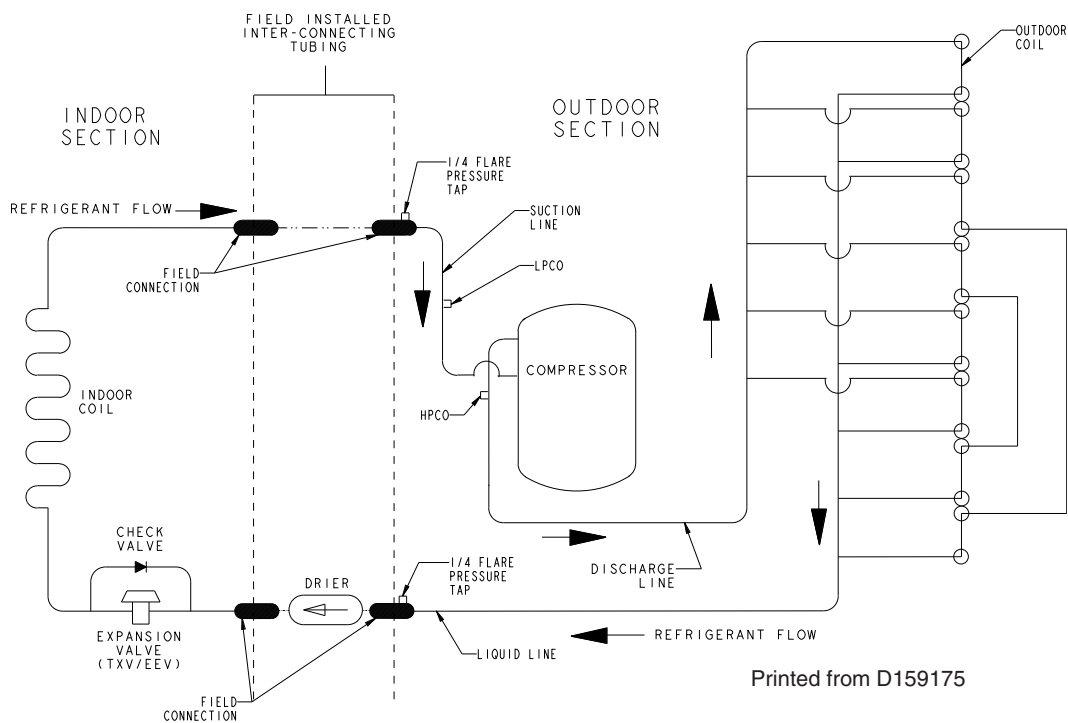


Figure 37. 048 and 060 models



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Wiring Diagrams

Figure 38. Models – 018, 024, 030, and 036

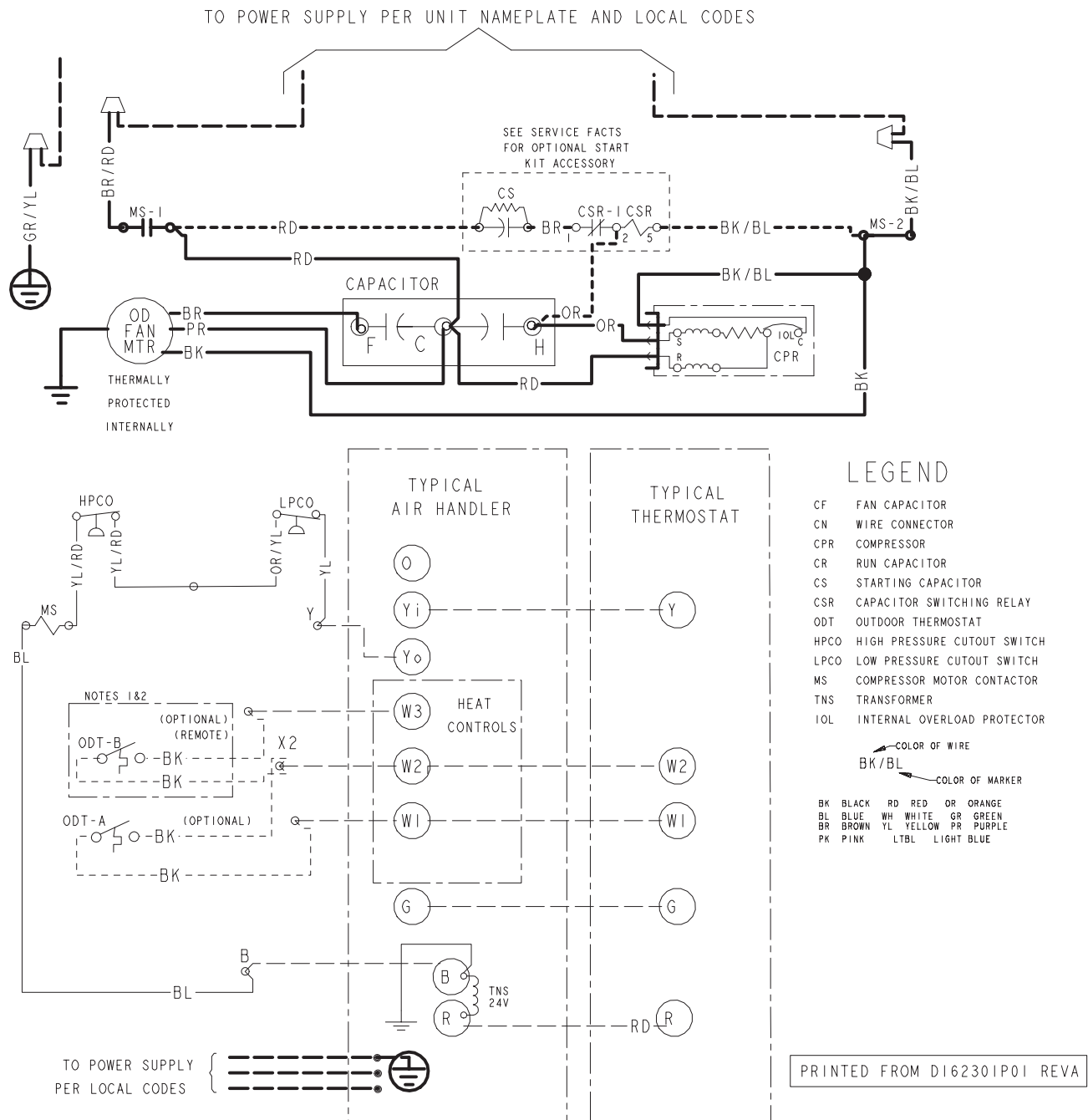


Figure 39. Models – 018, 024, 030, and 036

NOTES:

1. IF ODT-B IS NOT USED, ADD JUMPER BETWEEN W2 & W3 AT AIR HANDLER. IF USED, ODT-B MUST BE MOUNTED REMOTE OF CONTROL BOX IN AN APPROVED WEATHER PROOF ENCLOSURE.
2. IF ODT-A IS NOT USED, ADD JUMPER BETWEEN W1 & W2 AT AIR HANDLER.
3. LOW VOLTAGE (24 V) FIELD WIRING MUST BE 18 AWG MINIMUM.
4. USE COPPER CONDUCTORS ONLY!
5. FIELD GROUND MUST BE ATTACHED TO THE GROUND LUG ON THE RUNTRU AND AMERISTAR UNITS.
6. GROUND CONNECTION FOR TRANE/ AMERICAN STANDARD ONLY.

LEGEND

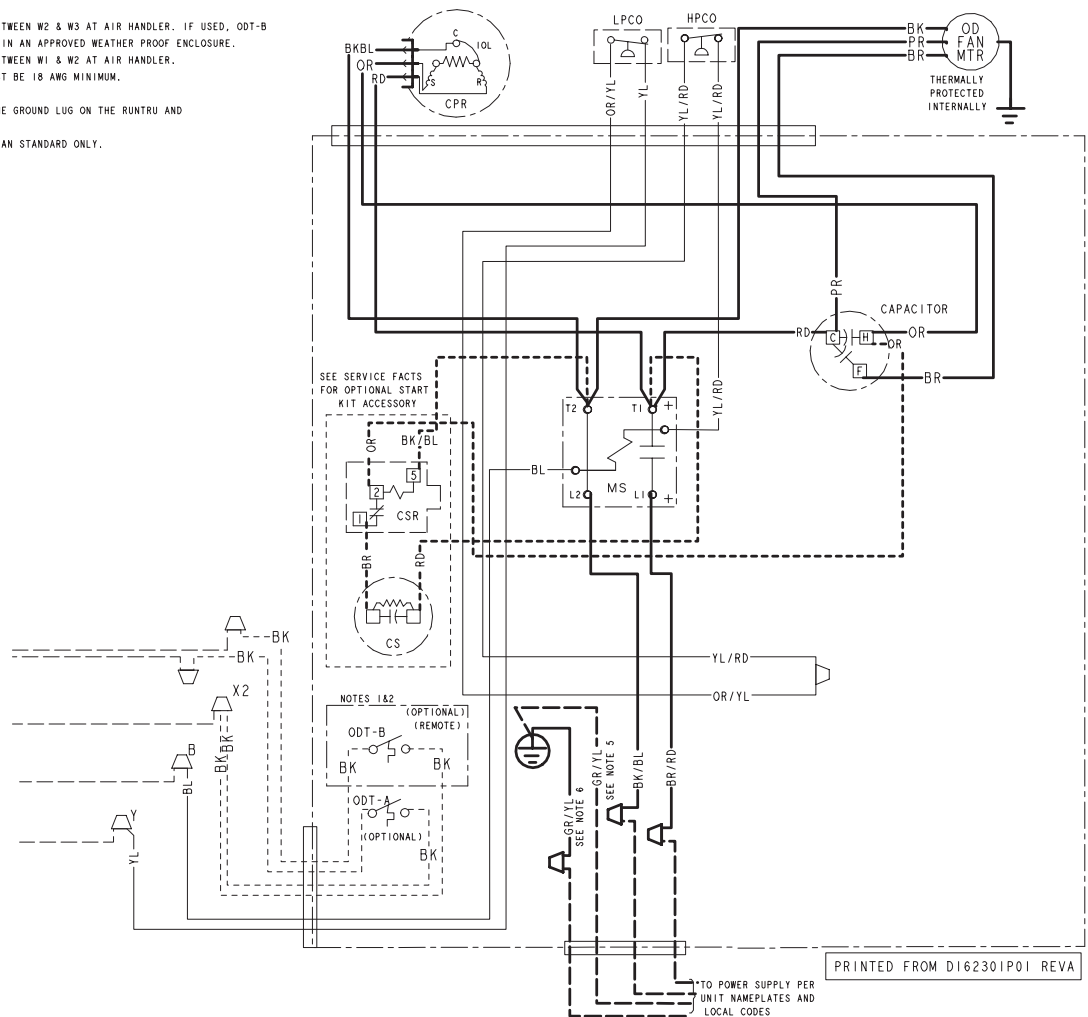
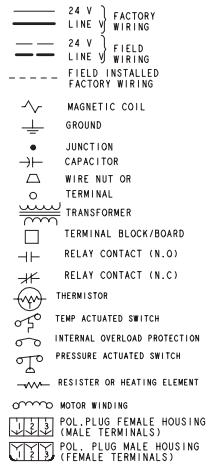
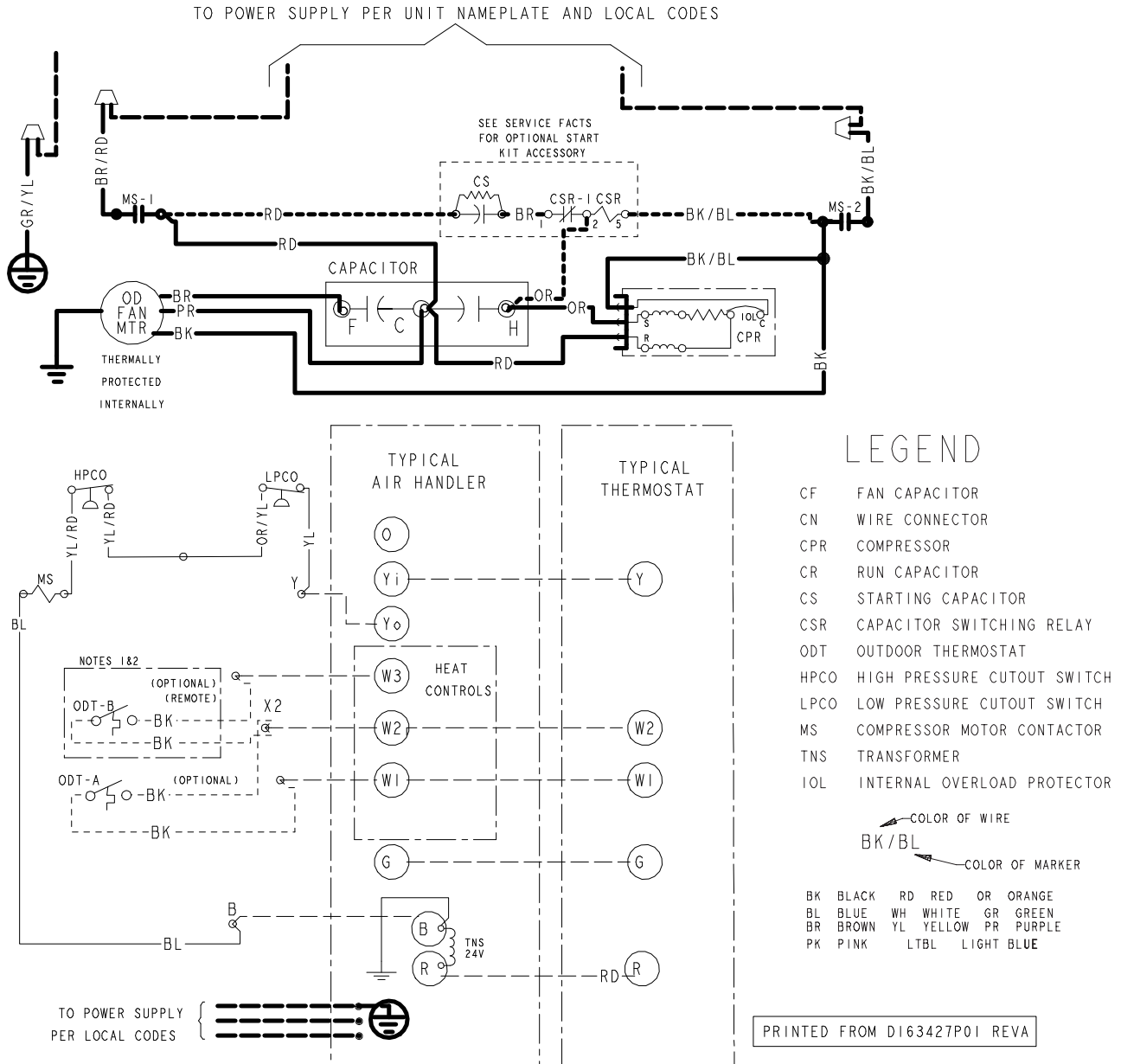


Figure 40. Models – 042, 048, and 060

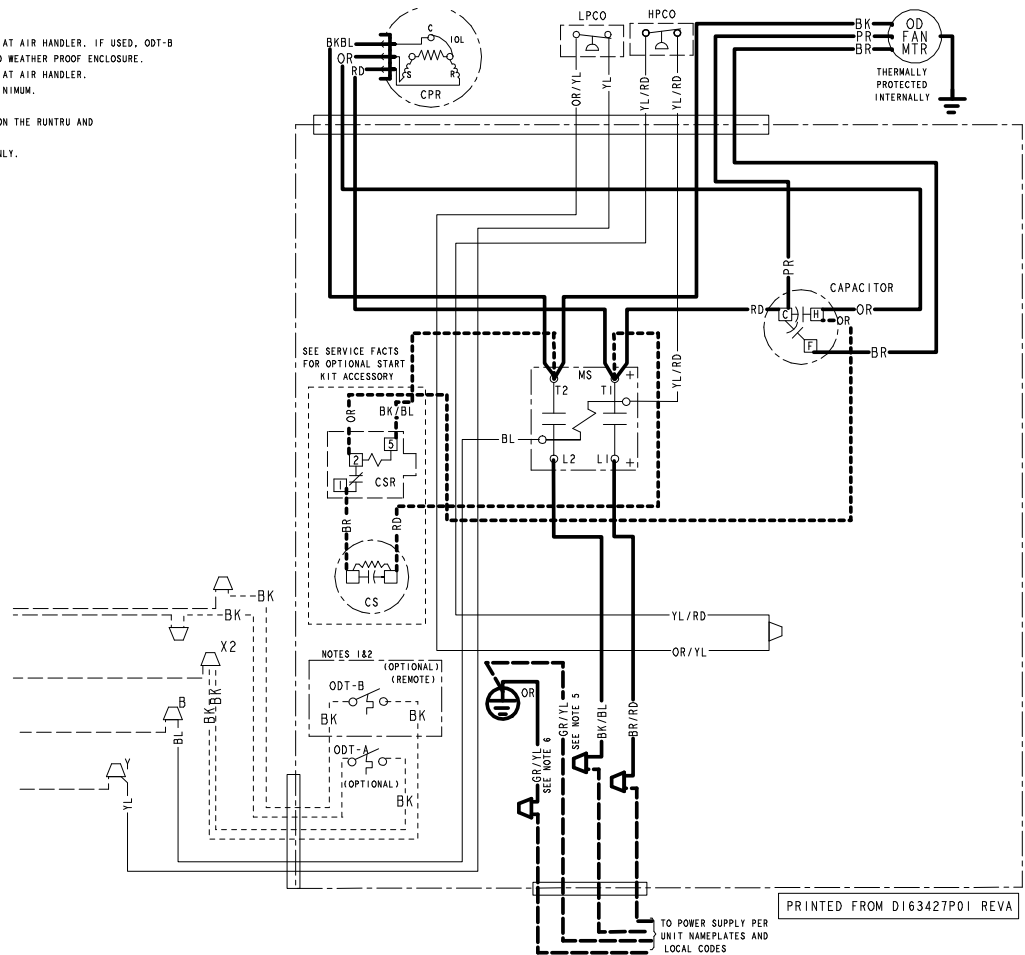
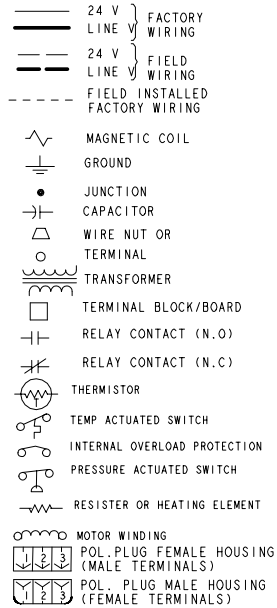


Wiring Diagrams

Figure 41. Models – 042, 048, and 060

- NOTES:
1. IF ODT-B IS NOT USED, ADD JUMPER BETWEEN W2 & W3 AT AIR HANDLER. IF USED, ODT-B MUST BE MOUNTED REMOTE OF CONTROL BOX IN AN APPROVED WEATHER PROOF ENCLOSURE.
 2. IF ODT-A IS NOT USED, ADD JUMPER BETWEEN W1 & W2 AT AIR HANDLER.
 3. LOW VOLTAGE (24 V) FIELD WIRING MUST BE 18 AWG MINIMUM.
 4. USE COPPER CONDUCTORS ONLY!
 5. FIELD GROUND MUST BE ATTACHED TO THE GROUND LUG ON THE RUNTRU AND AMERISTAR UNITS.
 6. GROUND CONNECTION FOR TRANE / AMERICAN STANDARD ONLY.

LEGEND



Pressure Curves

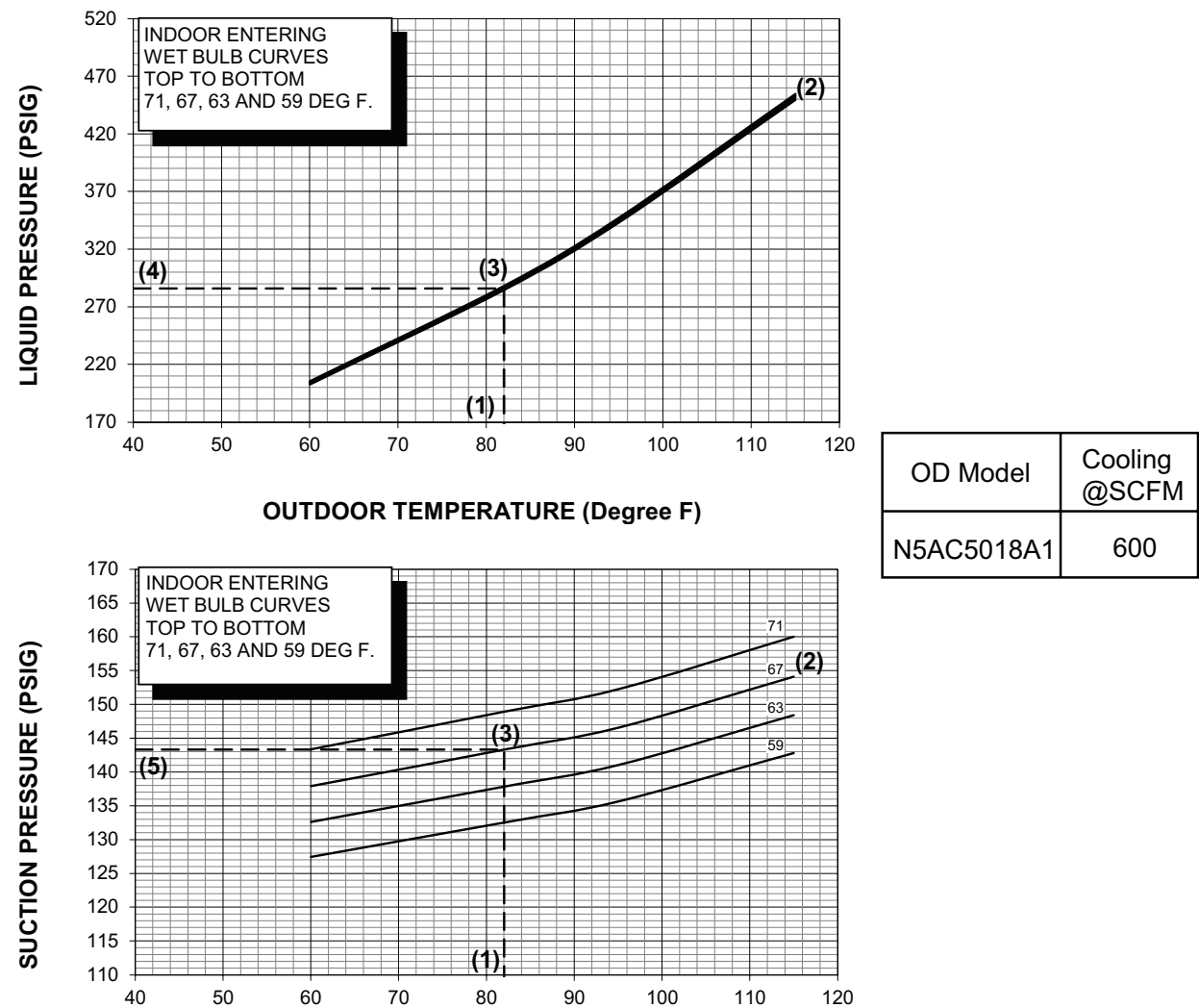
Check cooling performance when the outdoor temperature is above 65°F.

1. Set indoor airflow to the correct CFM and allow pressures to stabilize.
2. Measure the indoor wet-bulb temperature, outdoor temperature, liquid and suction pressures.

On the plots:

1. Locate the outdoor temperature.
2. Locate the indoor wet-bulb temperature.
3. Find the intersection of the outdoor temperature and indoor wet-bulb lines.
4. Read the liquid or suction pressure from the left column.

Figure 42. Model N5AC5018A1



Pressure Curves

Figure 43. Models N5AC5024A1, N5AC5030A1, N5AC5036A1, N5AC5042A1, and N5AC5048A1

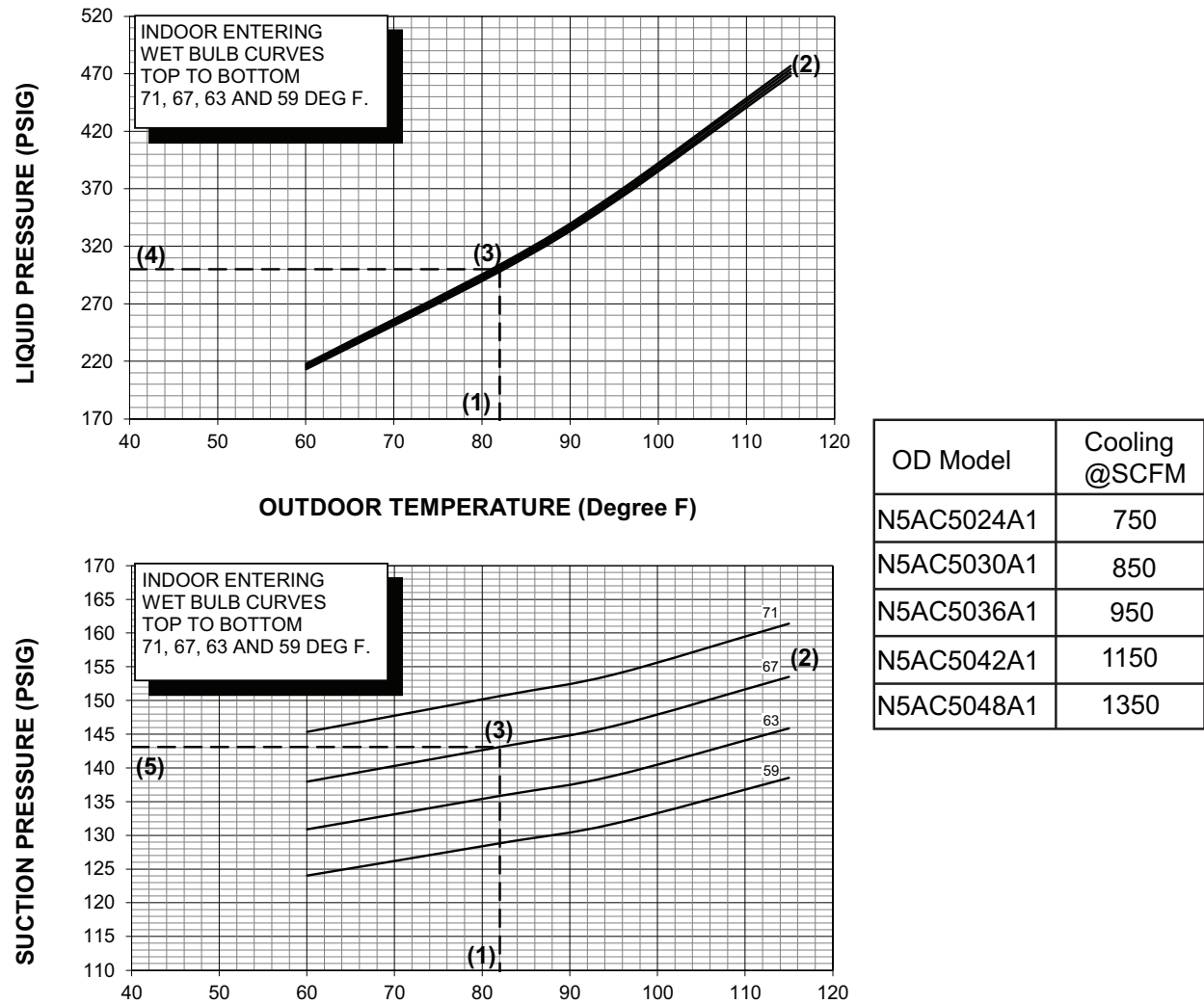
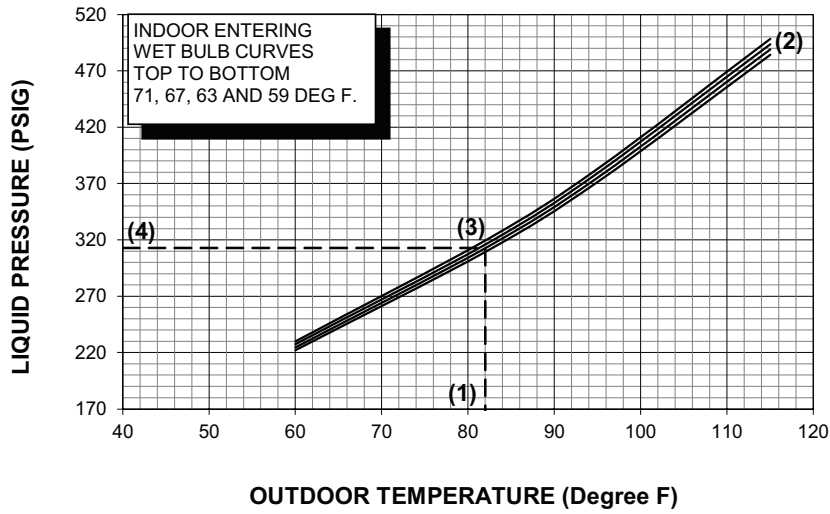
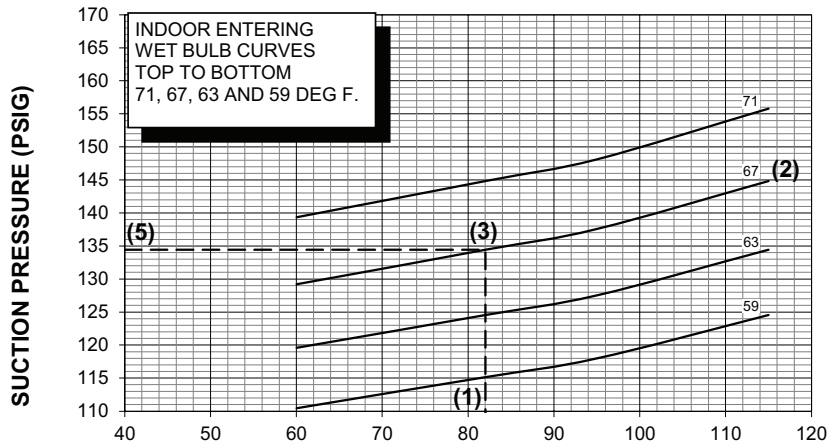


Figure 44. Model N5AC5060A1



OD Model	Cooling @SCFM
N5AC5060A1	1450



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