

# Installer's Guide

## Air Conditioner/Heat Pumps 4A7Z0/4A6Z0 with AccuLink™ and Charge Assist™

ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

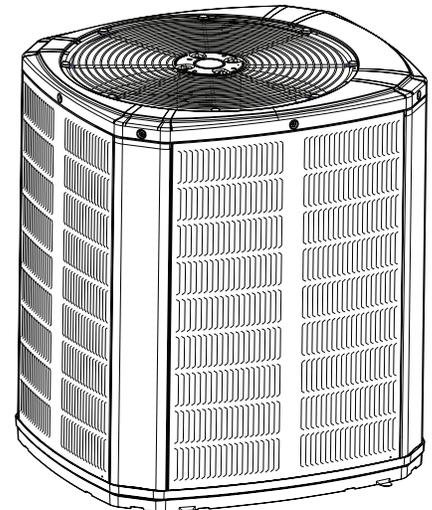
**IMPORTANT** — This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

**NOTE:** The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacture's split systems are A.H.R.I. 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.

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## Section 1. Safety

### WARNING

This information is intended for use by individuals possessing adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacture or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

### WARNING

These units use R-410A refrigerant which operates at 50 to 70% higher pressures than R-22. Use only R-410A approved service equipment. Refrigerant cylinders are painted a "Rose" color to indicate the type of refrigerant and may contain a "dip" tube to allow for charging of liquid refrigerant into the system. All R-410A systems use a POE oil that readily absorbs moisture from the atmosphere. To limit this "hygroscopic" action, the system should remain sealed whenever possible. If a system has been open to the atmosphere for more than 4 hours, the compressor oil must be replaced. Never break a vacuum with air and always change the driers when opening the system for component replacement. For specific handling concerns with R-410A and POE oil, reference Retrofit Bulletin SS-APG006-EN and APP-APG012-EN.

### WARNING

**UNIT CONTAINS R-410A REFRIGERANT!**  
R-410A operating pressures exceed the limit of R-22. Proper service equipment is required. Failure to use proper service tools may result in equipment damage or personal injury.

#### **SERVICE**

USE ONLY R-410A REFRIGERANT AND APPROVED POE COMPRESSOR OIL.

### WARNING

Extreme caution should be exercised when opening the Liquid Line Service Valve. Turn counterclockwise until the valve stem just touches the rolled edge. No torque is required. Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and /or property damage.

### WARNING

#### **LIVE ELECTRICAL COMPONENTS!**

During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

### CAUTION

If using existing refrigerant lines make certain that all joints are brazed, not soldered.

### CAUTION

Scroll compressor dome temperatures may be hot. Do not touch the top of compressor; it may cause minor to severe burning.

**NOTE:** It is recommended to install manufacturer approved matched indoor and outdoor systems.

**NOTE:** All approved split systems are AHRI rated with only TXV/EEV indoor systems.

**NOTE:** The benefits of installing approved indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.

## Section 2. Unit Location Considerations

### 2.1 Unit Dimensions and Weight

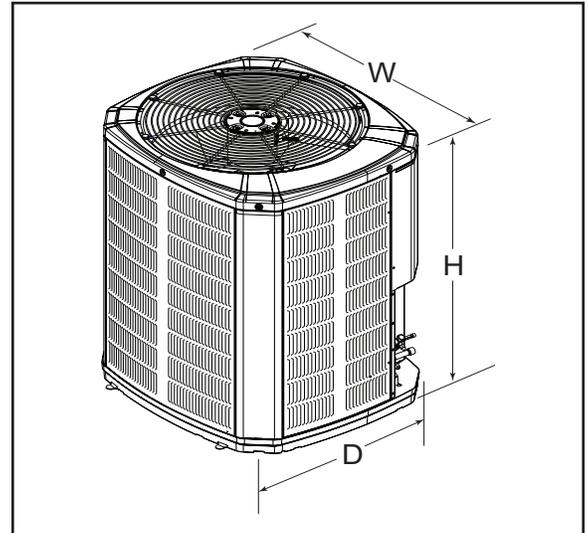
Table 2.1

Unit Dimensions and Weight		
Models	H x D x W (in)	Weight* (lb)
4A7Z0024A	45 x 34 x 37	325
4A7Z0036B	45 x 34 x 37	325
4A7Z0048A/B	45 x 34 x 37	410
4A7Z0060A	45 x 34 x 37	410
4A6Z0024A	45 x 34 x 37	330
4A6Z0036B	45 x 34 x 37	335
4A6Z0048A/B	45 x 34 x 37	420
4A6Z0060A	45 x 34 x 37	420

\* Weight values are estimated (uncrated).

When mounting the outdoor unit on a roof, be sure the roof will support the unit's weight.

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

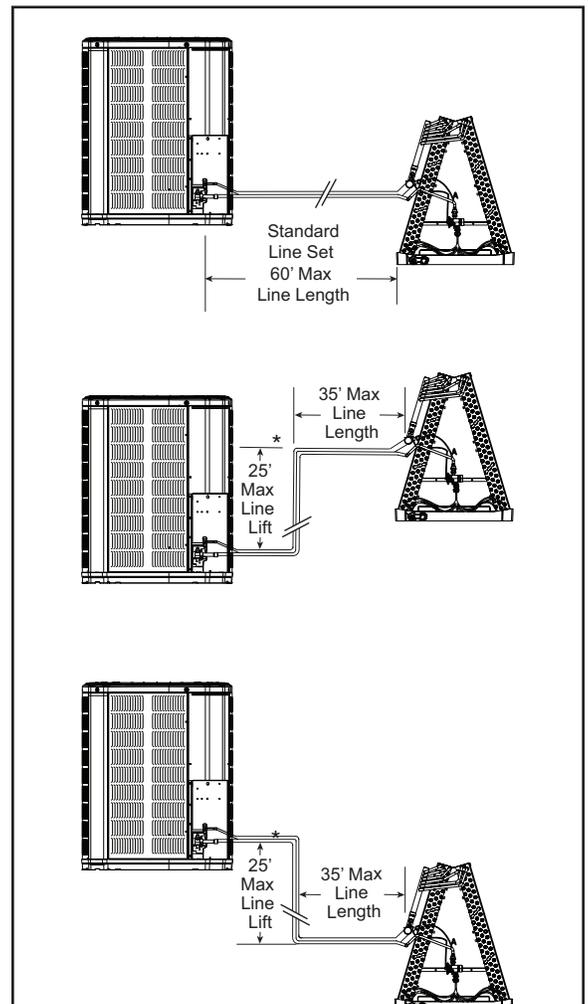


### 2.2 Refrigerant Piping Limits

1. The maximum length of refrigerant lines from outdoor to indoor unit should NOT exceed sixty (60) feet.
2. The maximum vertical change should not exceed twenty five (25) feet\*.
3. Service valve connection diameters are shown in Table 5.1.

**NOTE:** For line lengths greater than sixty (60) feet, Refer to Refrigerant Piping Application Guide, SS-APG006-EN or Refrigerant Piping Software Program, 32-3312-03 (or latest revision).

\* Restricted to maximum vertical change of 25 ft.



## 2.3 Suggested Locations for Best Reliability

Ensure the top discharge area is unrestricted for at least five (5) feet above the unit.

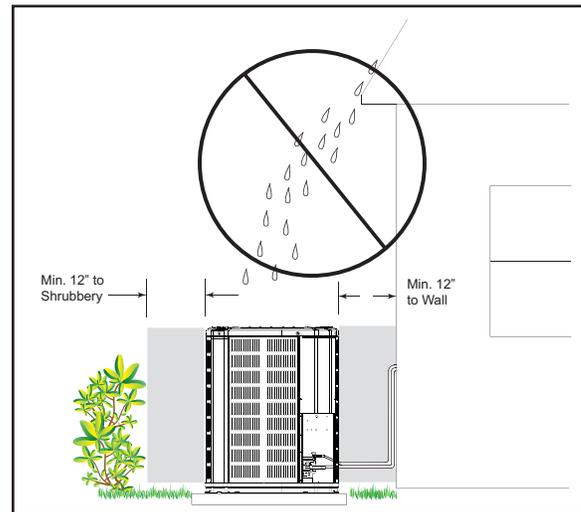
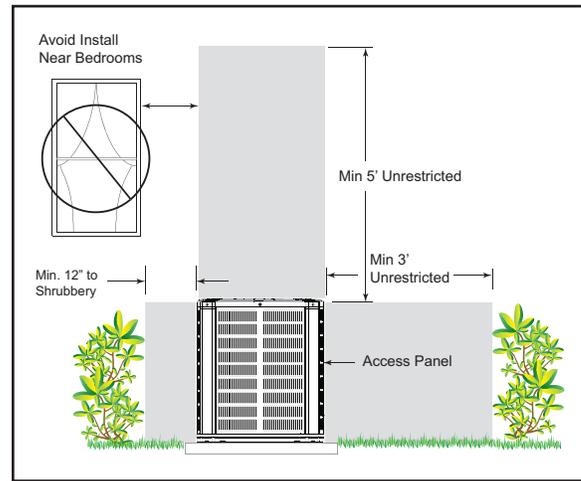
Three (3) feet clearance must be provided in front of the control box (access panels) and any other side requiring service.

Do not locate close to bedrooms as operational sounds may be objectionable.

Avoid locations such as near windows where condensation and freezing defrost vapor can annoy a customer.

Position the outdoor unit a minimum of 12" from any wall or surrounding shrubbery to ensure adequate airflow.

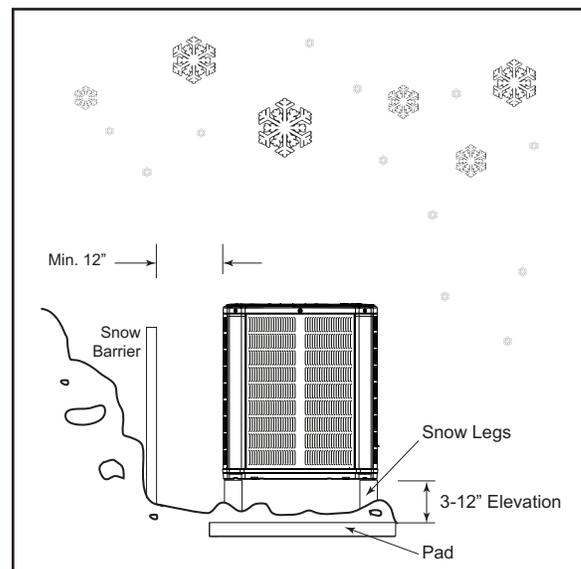
Outdoor unit location must be far enough away from any structure to prevent excess roof runoff water or icicles from falling directly on the unit.



## 2.4 Cold Climate Considerations (Heat Pump only)

**NOTE:** It is recommended that these precautions be taken for units being installed in areas where snow accumulation and prolonged below freezing temperatures occur.

- Units should be elevated 3-12 inches above the pad or rooftop, depending on local weather. This additional height will allow drainage of snow and ice melted during defrost cycle prior to its refreezing. Ensure that drain holes in unit base pan are not obstructed preventing draining of defrost water.
- If possible, avoid locations that are likely to accumulate snow drifts. If not possible, a snow drift barrier should be installed around the unit to prevent a build-up of snow on the sides of the unit.



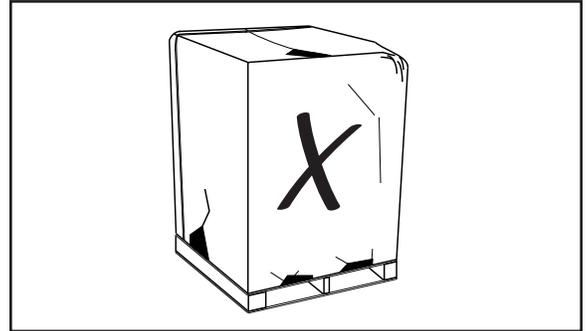
## 2.5 Coastal Considerations

If installed within one mile of salt water, including seacoasts and inland waterways, models without factory supplied Seacoast Salt Shields require the addition of BAYSEAC001 (Seacoast Kit) at installation time.

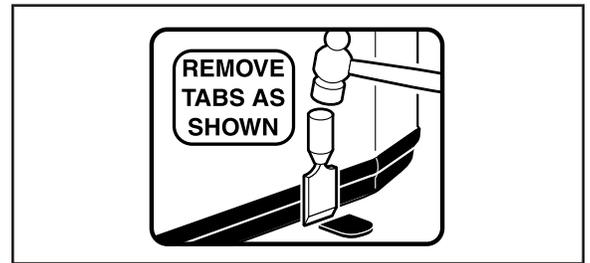
## Section 3. Unit Preparation

### 3.1 Prepare The Unit For Installation

**STEP 1** - Check for damage and report promptly to the carrier any damage found to the unit.



**STEP 2** - To remove the unit from the pallet, remove tabs by cutting with a sharp tool.

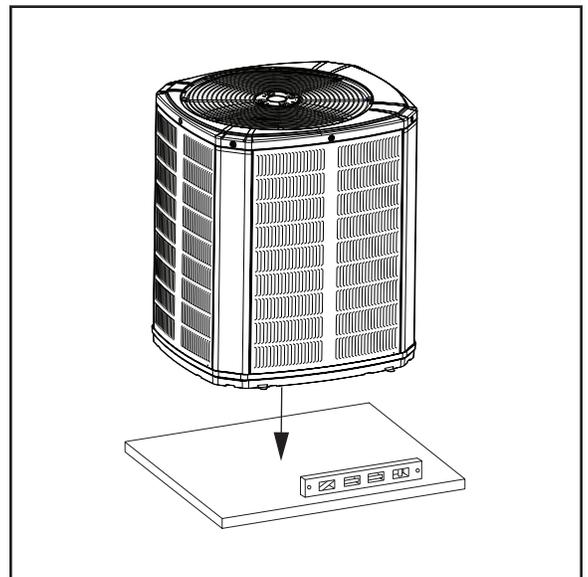


## Section 4. Setting the Unit

### 4.1 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" 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.



## Section 5. Refrigerant Line Considerations

### 5.1 Refrigerant Line and Service Valve Connection Sizes

Table 5.1

Model	Line Sizes		Service Valve Connection Sizes	
	Vapor Line	Liquid Line	Vapor Line Connection	Liquid Line Connection
4A7Z0024A	3/4	3/8	5/8	3/8
4A7Z0036B	3/4	3/8	3/4	3/8
4A7Z0048A/B	7/8	3/8	7/8	3/8
4A7Z0060A	7/8	3/8	7/8	3/8
4A6Z0024A	5/8	3/8	5/8	3/8
4A6Z0036B	3/4	3/8	3/4	3/8
4A6Z0048A/B	3/4	3/8	3/4	3/8
4A6Z0060A	3/4	3/8	3/4	3/8

### 5.2 Factory Charge

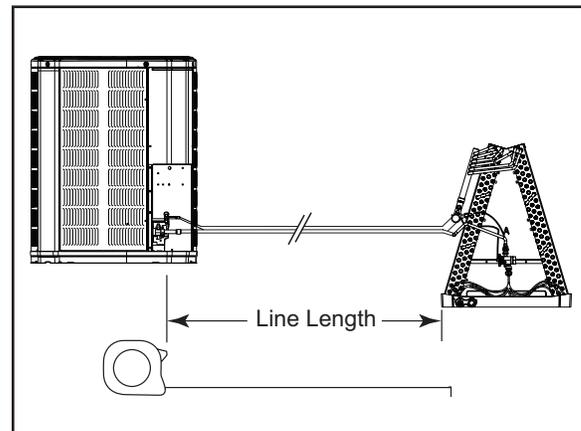
American Standard Heating & Air Conditioning outdoor condensing units are factory charged with the system charge required for the outdoor condensing unit, fifteen (15) feet of tested connecting line, and the smallest indoor evaporative coil match. See unit nameplate. **If connecting line length exceeds fifteen (15) feet and/or a larger indoor evaporative coil is installed, then final refrigerant charge adjustment is necessary.** Use Charge Assist™ or the Manual Charging procedure found in the outdoor unit Service Facts. Charge level can always be verified with the Refrigerant Charging Chart found in the Service Facts.

### 5.3 Required Refrigerant Line Length

Determine required line length and lift. You will need this later in STEP 2 of Section 14.

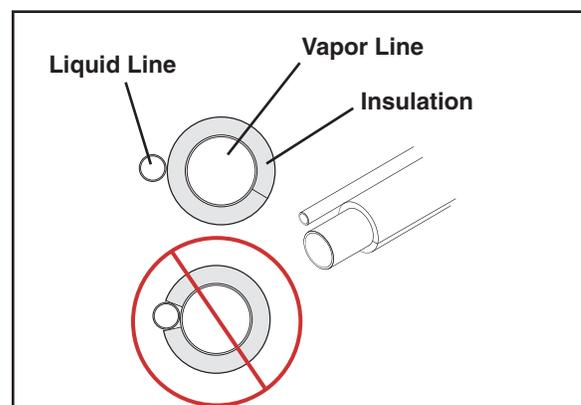
Total Line Length = \_\_\_\_\_ Ft.

Total Vertical Change (lift) = \_\_\_\_\_ Ft.



### 5.4 Refrigerant 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.



## 5.5 Reuse Existing Refrigerant Lines

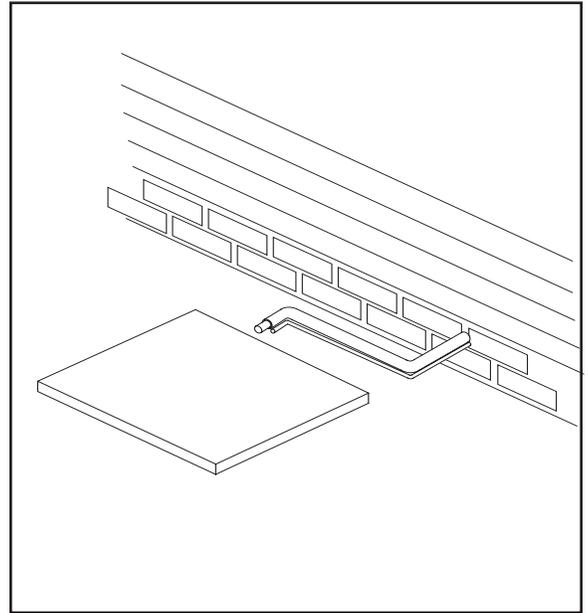
### ⚠ CAUTION

If using existing refrigerant lines make certain that all joints are brazed, not soldered.

For retrofit applications, where the existing indoor evaporator coil and/or refrigerant lines will be used, the following precautions should be taken:

- Ensure that the indoor evaporator coil and refrigerant lines are the correct size.
- Ensure that the refrigerant lines are free of leaks, acid, and oil.

**Important:** For more information see publication number SS-APG006-EN.



## Section 6. Refrigerant Line Routing

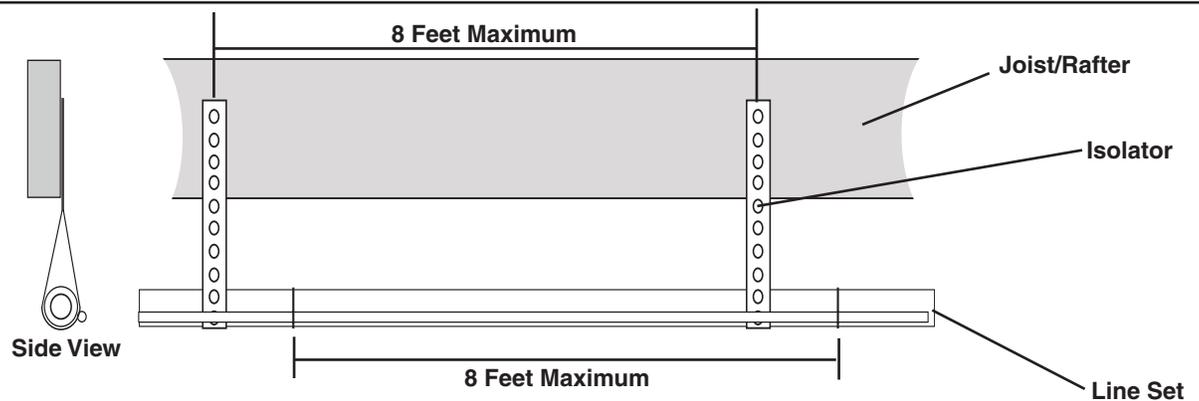
### 6.1 Precautions

**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.

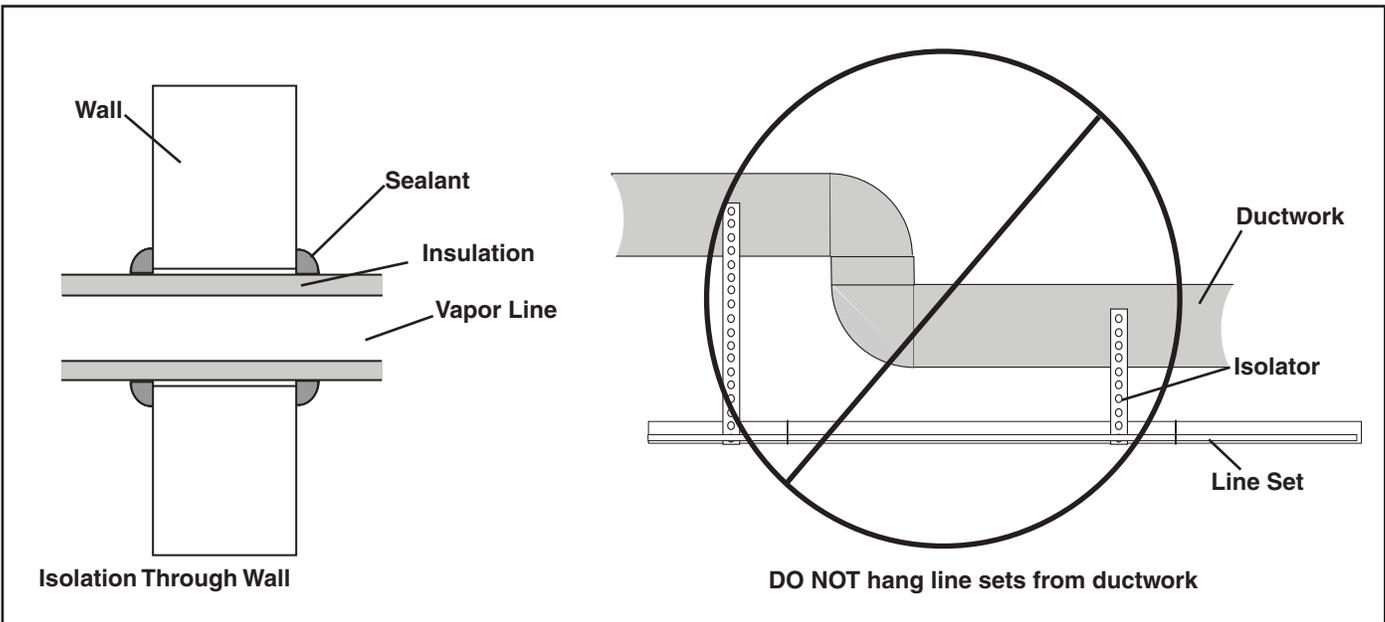
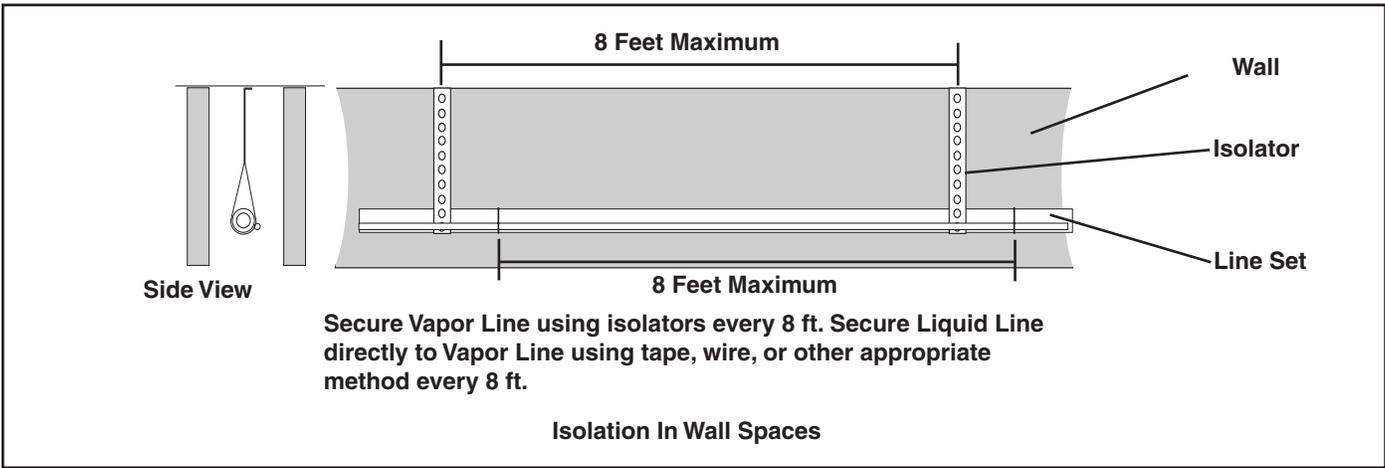
For Example:

- When the refrigerant lines have to be fastened to floor joists or other framing in a structure, use isolation type hangers.
- Isolation hangers should also be used when refrigerant lines are run in stud spaces or enclosed ceilings.
- Where the refrigerant lines run through a wall or sill, they should be insulated and isolated.
- Isolate the lines from all ductwork.
- Minimize the number of 90° turns.



Secure Vapor line from joists using isolators every 8 ft. Secure Liquid Line directly to Vapor line using tape, wire, or other appropriate method every 8 ft.

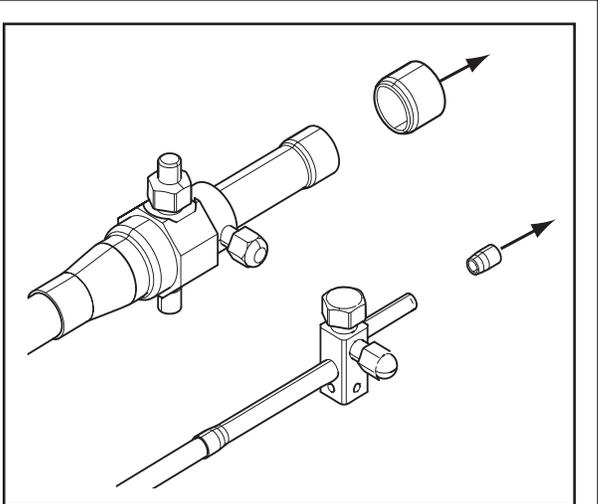
Isolation From Joist/Rafter



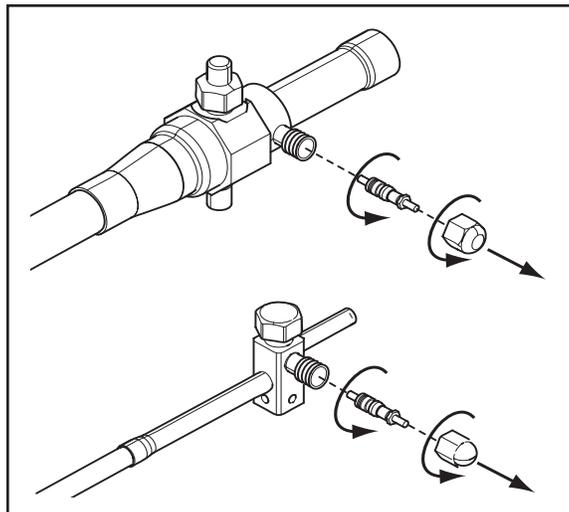
## Section 7. Refrigerant Line Brazing

### 7.1 Braze The Refrigerant Lines

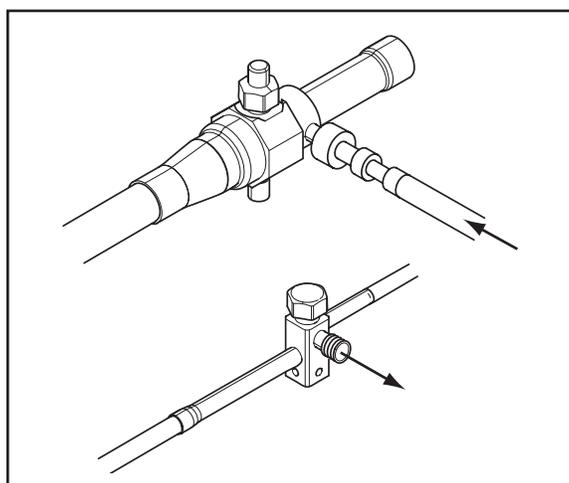
**STEP 1** - Remove caps or plugs. Use a deburring tool to debur the pipe ends. Clean both internal and external surfaces of the tubing using an emery cloth.



**STEP 2** - Remove the pressure tap cap and valve cores from both service valves.



**STEP 3** - Purge the refrigerant lines and indoor coil with dry nitrogen.



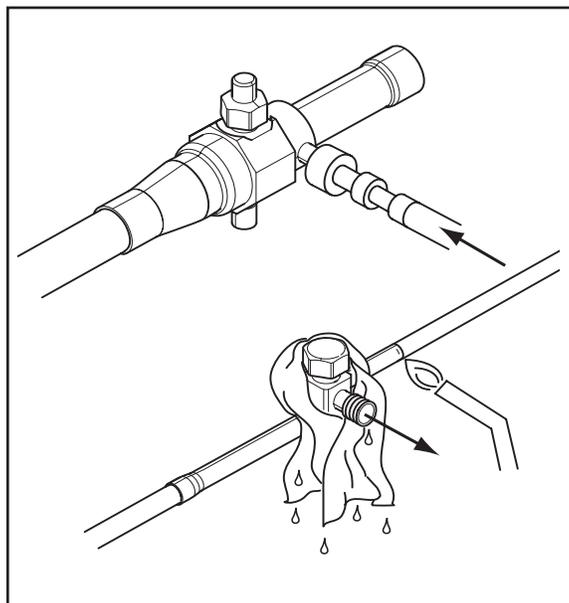
**STEP 4** - Wrap a wet rag around the valve body to avoid heat damage and continue the dry nitrogen purge.

Braze the refrigerant lines to the service valves.

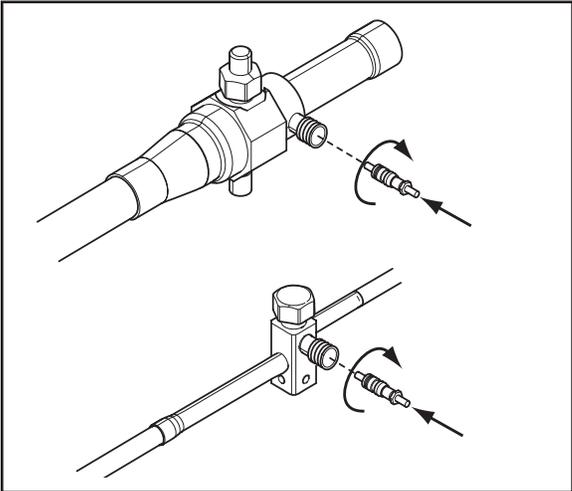
Continue the dry nitrogen purge. Do not remove the wet rag until all brazing is completed.

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

**NOTE:** Precautions should be taken to avoid heat damage to basepan during brazing. It is recommended to keep the flame directly off of the basepan.



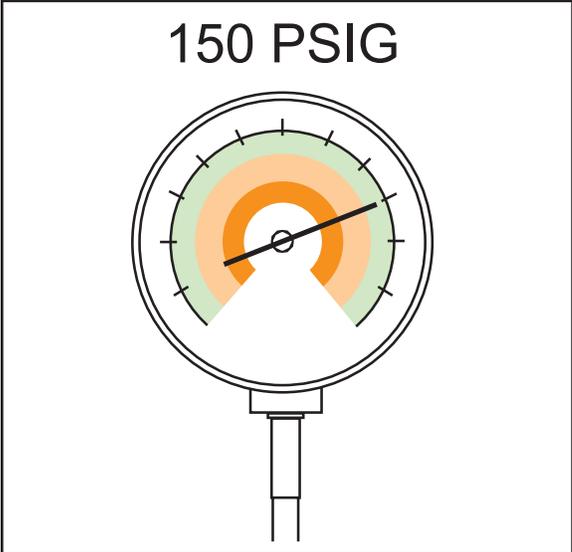
**STEP 5** - Replace the pressure tap valve cores after the service valves have cooled.



## Section 8. Refrigerant Line Leak Check

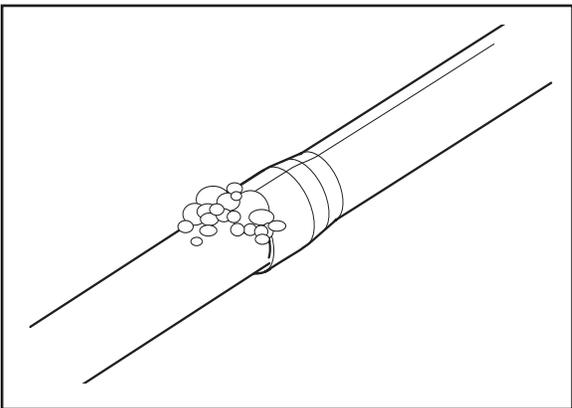
### 8.1 Check For Leaks

**STEP 1** - Pressurize the refrigerant lines and evaporator coil to 150 PSIG using dry nitrogen.



**STEP 2** - Check for leaks by using a soapy solution or bubbles at each brazed location.

Remove nitrogen pressure and repair any leaks before continuing.

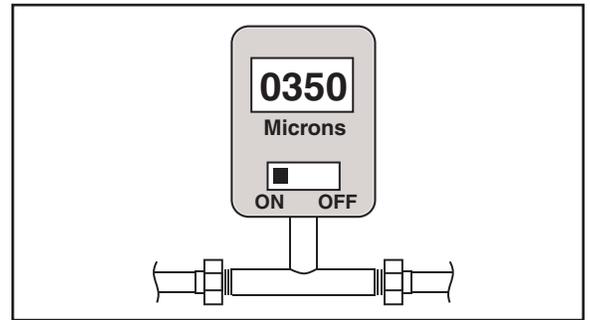


## Section 9. Evacuation

### 9.1 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.

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



**STEP 2** - Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute.

Once evacuation is complete blank off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.



## Section 10. Service Valves

### 10.1 Open the Gas Service Valve

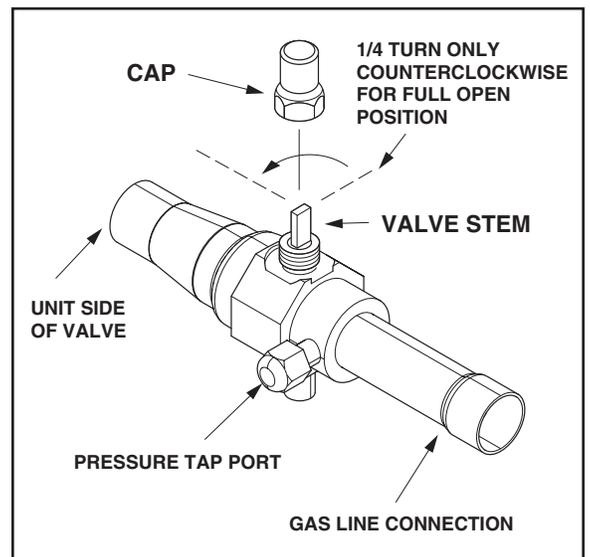
**Important:** Leak check and evacuation must be completed before opening the service valves.

**NOTE:** Do not vent refrigerant gases into the atmosphere

**STEP 1** - Remove valve stem cap.

**STEP 2** - Using an adjustable wrench, turn valve stem 1/4 turn counterclockwise to the fully open position.

**STEP 3** - Replace the valve stem cap to prevent leaks. Tighten finger tight plus an additional 1/6 turn.



## 10.1 Open the Liquid Service Valve

### **⚠ WARNING**

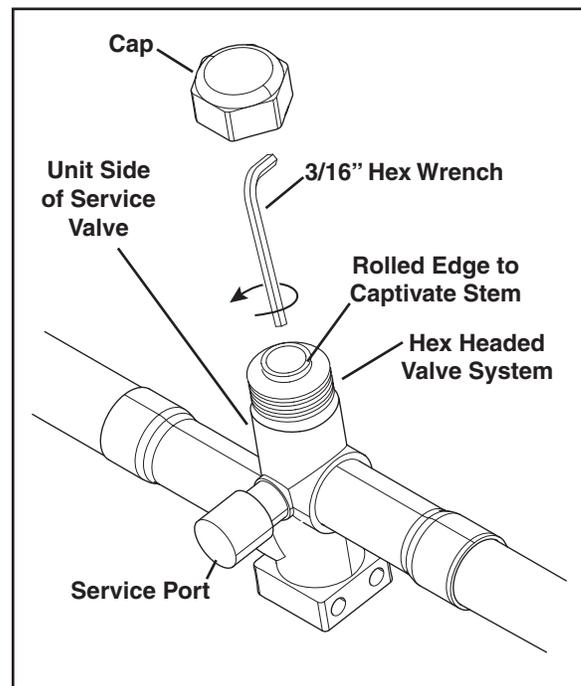
Extreme caution should be exercised when opening the Liquid Line Service Valve. Turn counterclockwise until the valve stem just touches the rolled edge. No torque is required. Failure to follow this warning will result in abrupt release of system charge and may result in personal injury and /or property damage.

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

**STEP 1** - Remove service valve cap.

**STEP 2** - Fully insert 3/16" hex wrench into the stem and back out counterclockwise until valve stem just touches the rolled edge (approximately five (5) turns.)

**STEP 3** - Replace the valve cap to prevent leaks. Tighten finger tight plus an additional 1/6 turn.



## Section 11. Electrical - Low Voltage

### 11.1 Low Voltage Maximum Wire Length

Table 11.1 defines the maximum total length of low voltage wiring from the outdoor unit, to the indoor unit, and to the thermostat.

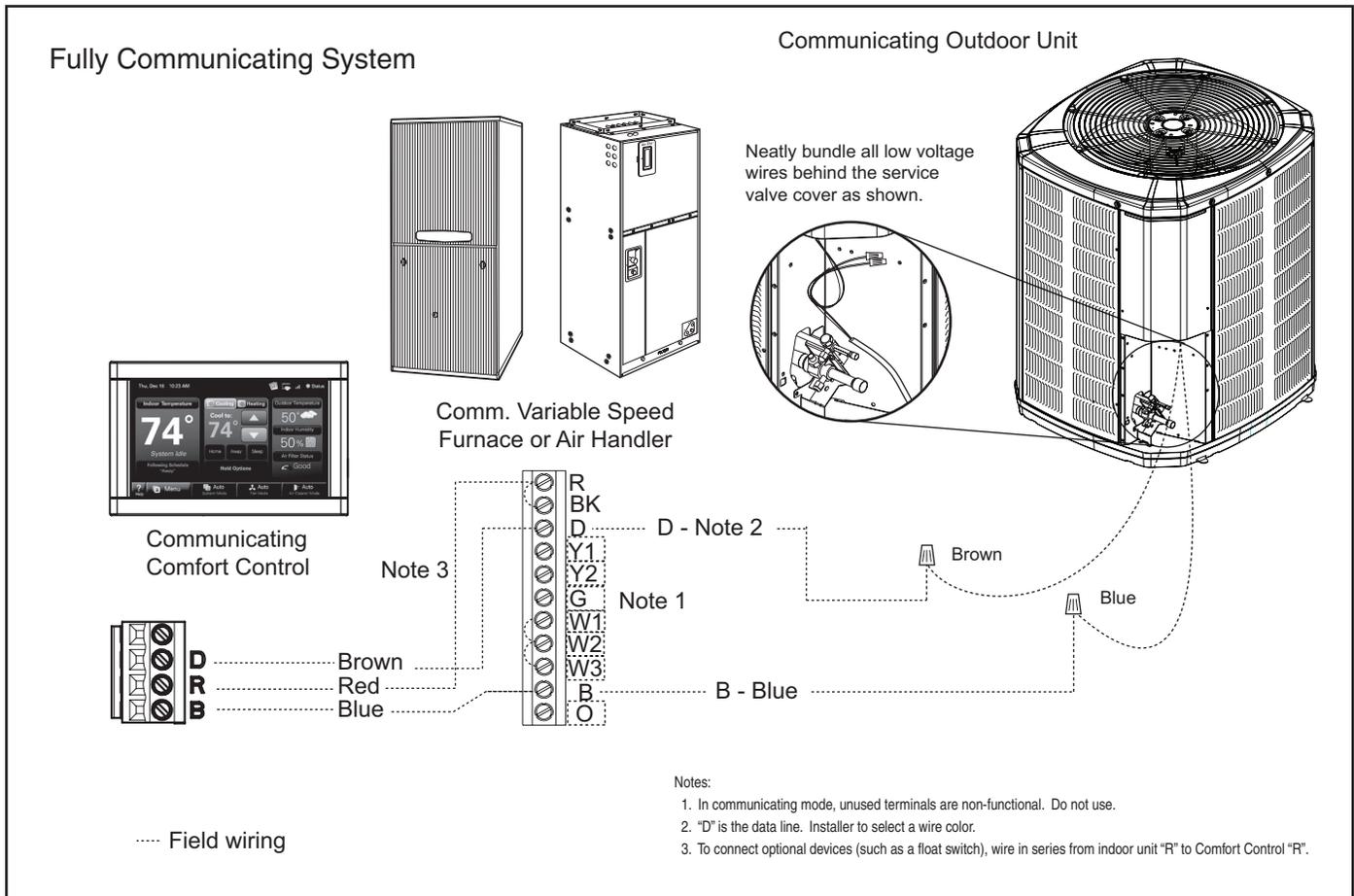
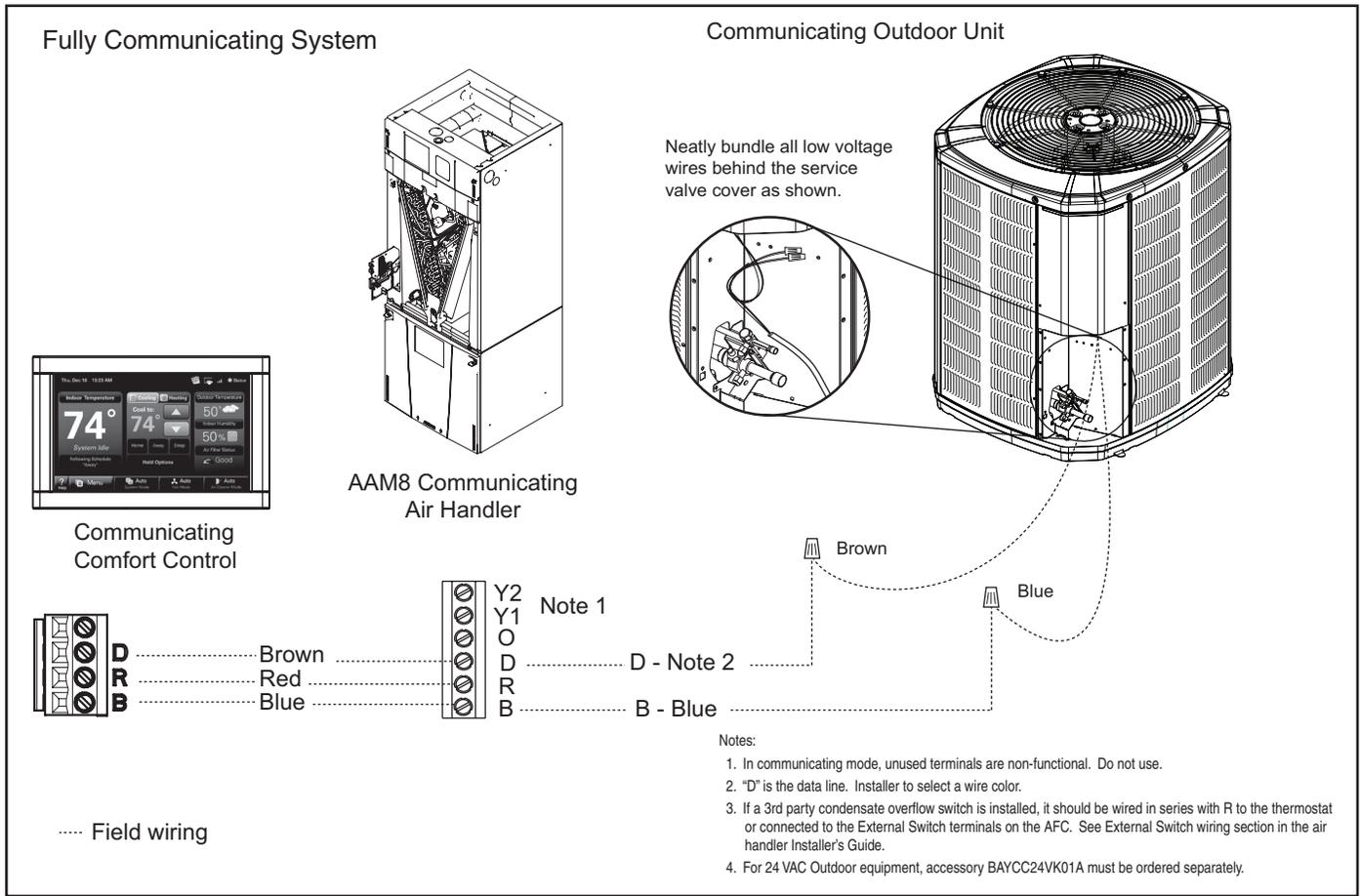
**NOTE:** The use of color coded low voltage wire is recommended to simplify connections between the outdoor unit, the control, and the indoor unit.

**NOTE:** The maximum total cable length for the entire comfort control communicating system is 500 ft. 18 AWG.

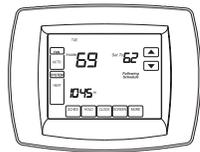
**Table 11.1**

AccuLink™ Control Wiring	
WIRE SIZE	MAX. WIRE LENGTH
18 AWG	250 Ft.
24 VOLTS	
WIRE SIZE	MAX. WIRE LENGTH
18 AWG	150 Ft.
16 AWG	225 Ft.
14 AWG	300 Ft.

## 11.2 Low Voltage Hook-up Diagrams

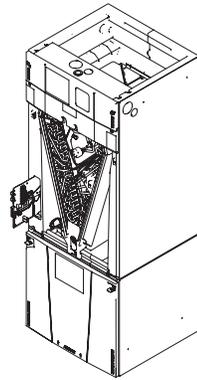


# AAM7 Air Handler with 24 Volt Control Hook-up Diagram



Comfort Control

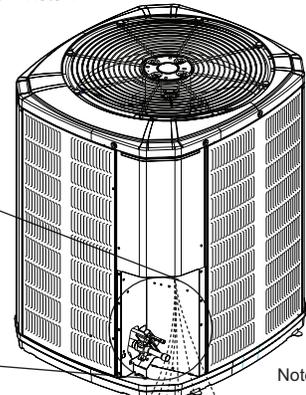
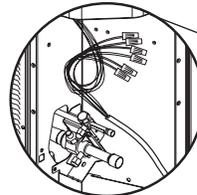
24 Volt



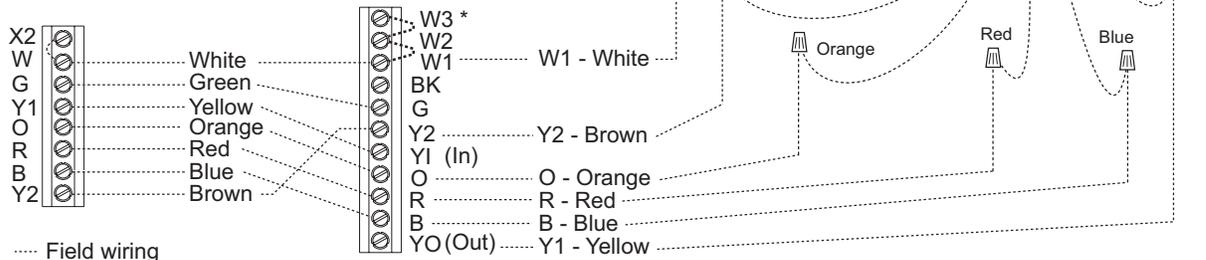
AAM7 Air Handler

# Air Conditioner or Heat Pump - Note 4

Neatly bundle all low voltage wires behind the service valve cover as shown.



Note 5

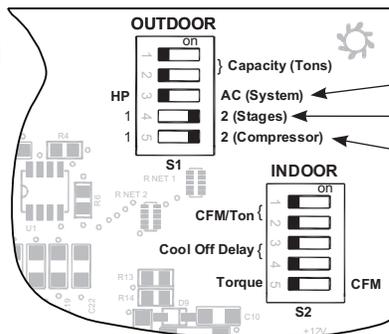


Note:

- \* For multiple stages of electric heat, jumper W1, W2, and W3 together if comfort control has only one stage of heat.
- Y1 and YO connections must be made as shown for freeze protection and internally mounted condensate overflow circuits to work properly.
- If a 3rd party condensate overflow switch is installed, it should be wired in series between YO and Y to the outdoor unit.
- Air conditioner models do not use the Black (X2) or Orange wires from the outdoor unit.
- For non-communicating applications, use 24 volt harness accessory BAYACHP024A.

# AAM7 Air Handler with 24 Volt Control Hook-up Diagram (Continued)

Control Board



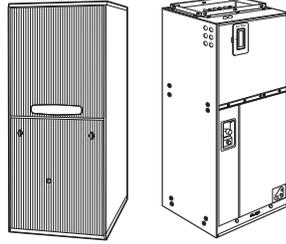
Must configure to "OFF" for heat pump.

Must configure to "ON" for 20 SEER (2 stages)

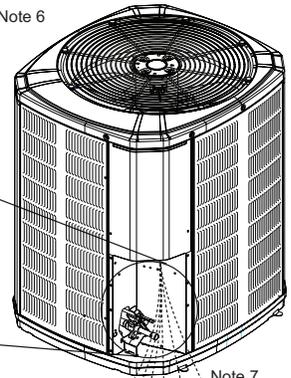
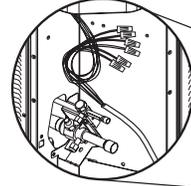
Must configure to "ON" for 20 SEER (2 compressors)

Communicating Indoor Unit  
with 24 Volt Control  
Hook-up Diagram

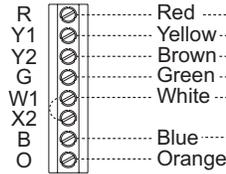
Air Conditioner or  
Heat Pump - Note 6



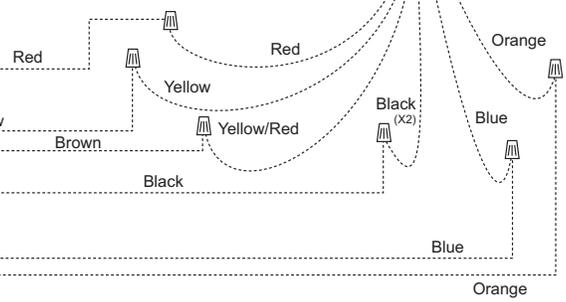
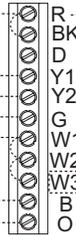
Neatly bundle all low voltage wires behind the service valve cover as shown.



Comfort Control



Comm. Variable Speed  
Furnace or Air Handler - Note 1



Notes:

1. See User Interface setup menu for 24 VAC control mode and cooling CFM options.
2. First stage CFM for 4A7Z0 and 4A6Z0 equals 50%.
3. For furnace+heat pump applications, comfort control must be dual fuel capable or use accessory TAYPLUS103A.
4. W3 terminal may not be present on indoor unit.
5. Comfort Control may not have W2 or W3 terminals.
6. Air conditioner models do not use Black (X2) or Orange wires from the outdoor unit.
7. For non-communicating applications, use 24 volt harness accessory BAYACHP024A.

### 11.3 Defrost Control (Heat Pump only)

The demand defrost control measures heat pump outdoor ambient temperature with a sensor located outside the outdoor coil. A second sensor located on the outdoor coil is used to measure the coil temperature. The difference between the ambient and the colder coil temperature is the difference or delta-T measurement. This delta-T measurement is representative of the operating state and relative capacity of the heat pump system. By measuring the change in delta-T, we can determine the need for defrost. The coil sensor also serves to sense outdoor coil temperature for termination of the defrost cycle.

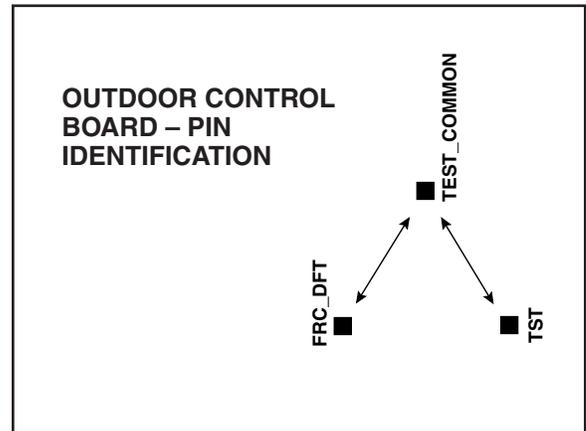
#### FAULT IDENTIFICATION

A fault condition is indicated by the fault LED on the control board inside the heat pump control box.

In normal operation, the status LED will flash once each second. If the light is flashing more than once per second or not at all, refer to the Service Facts for that unit.

#### PIN IDENTIFICATION

1. TEST\_COMMON (Shorting any of the other pins to this pin causes the function of the other pin to be executed. Leaving this pin open results in the normal mode of operation.)
2. TST = Test (Shorting TEST\_COMMON to this pin speeds up all defrost board timings.)
3. FRC\_DFT = Forced Defrost (Short TEST\_COMMON to this pin for two [2] seconds to initiate a forced defrost. Remove the short after defrost initiates.)



#### DEFROST CONTROL CHECKOUT

Normal operation requires:

- a. Status LED on board flashing 1 time/second.
- b. 12 VDC between D & B in communicating mode.
- c. 24 VAC between R & B in 24V mode.
- d. Defrost initiation when FRC\_DFT pin is shorted to TEST\_COMMON pin.

If a defrost control problem is suspected, refer to the service information in control box.

## Section 12. Electrical - High Voltage

### 12.1 High Voltage Power Supply

#### **⚠ WARNING**

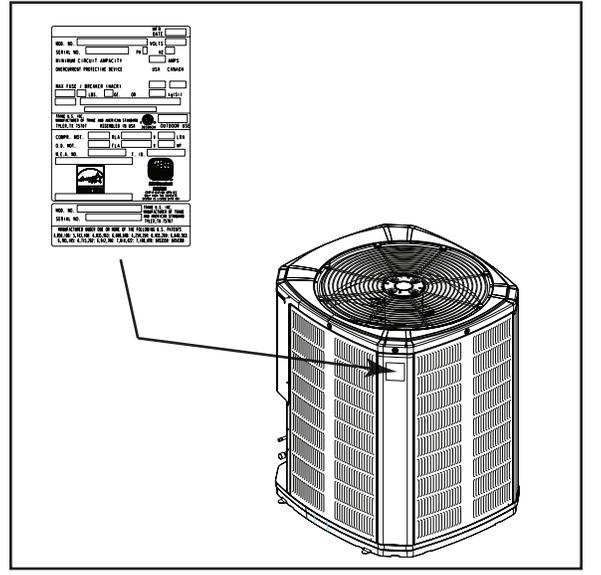
##### **LIVE ELECTRICAL COMPONENTS!**

During installation, testing, servicing, and troubleshooting of this product, it may be necessary to work with live electrical components. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

The high voltage power supply must agree with the equipment nameplate.

Power wiring must comply with national, state, and local codes.

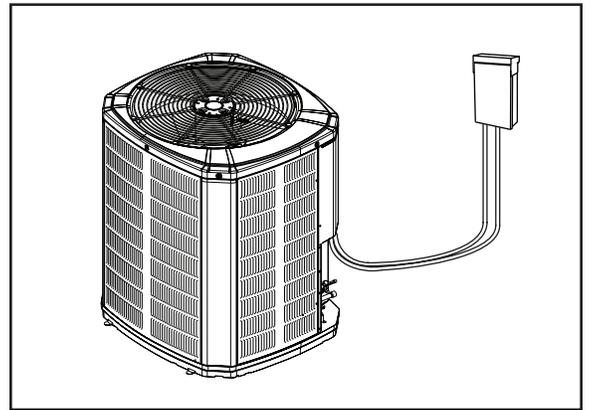
Follow instructions on unit wiring diagram located on the inside of the control box cover and in the Service Facts document included with the unit.



### 12.2 High Voltage Disconnect Switch

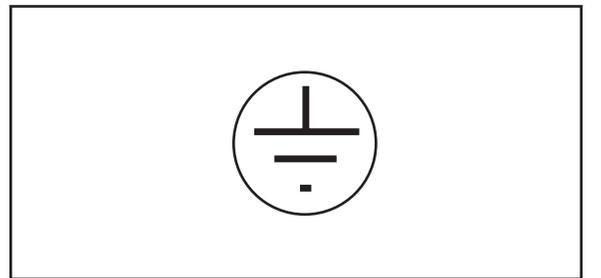
Install a separate disconnect switch at the outdoor unit.

For high voltage connections, flexible electrical conduit is recommended whenever vibration transmission may create a noise problem within the structure.



### 12.3 High Voltage Ground

Ground the outdoor unit per national, state, and local code requirements.

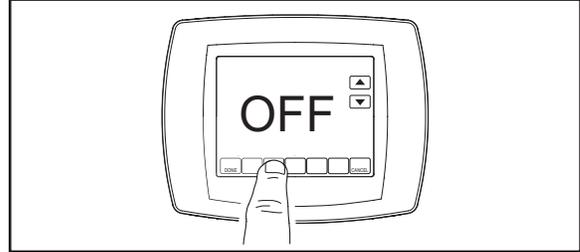


## Section 13. Start Up

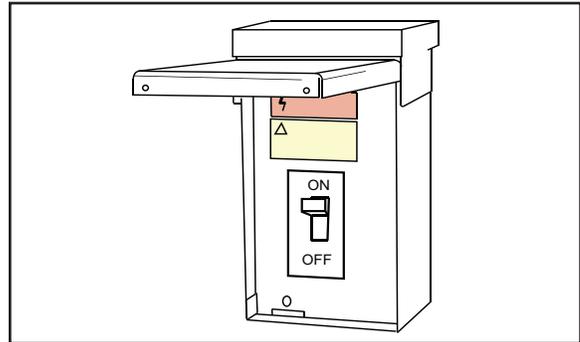
### 13.1 System Start Up

**STEP 1** - Ensure Sections 7 through 12 have been completed.

**STEP 2** - Set System Thermostat to OFF.



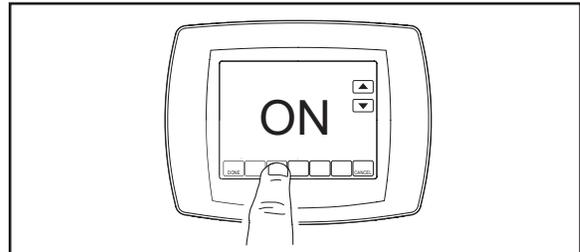
**STEP 3** - Turn on disconnect(s) to apply power to the indoor and outdoor units.



**STEP 4** - Wait one (1) hour before starting the unit if compressor crankcase heater accessory is used and the Outdoor Ambient is below 70°F.



**STEP 5** - Set system thermostat to ON.



# Section 14. System Charge Adjustment

## 14.1 Temperature Measurements

**STEP 1** - Check the outdoor temperatures.

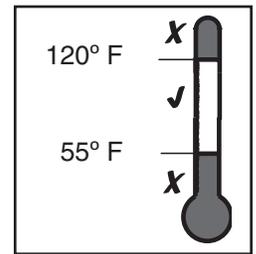
Subcooling (in cooling mode) is the only recommended method of charging above 55° F ambient outdoor temperature. See Section 14.2.

For outdoor temperatures below 55° F, follow the Superheat charging instructions (in heating mode). See Section 14.6.

**NOTE:** It is important to return in the spring or summer to accurately charge the system in the cooling mode with outdoor ambient temperature **below 55°F**.

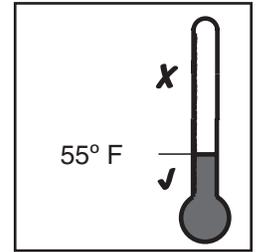
For best results the indoor temperature should be kept between 70° F to 80° F.

See Section 14.2 for Outdoor Temperatures Above 55° F

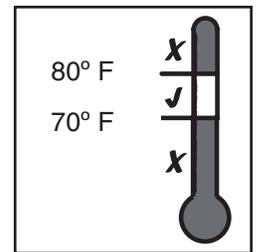


Outdoor Temp 1

See Section 14.6 for Outdoor Temperatures Below 55° F



Outdoor Temp 2



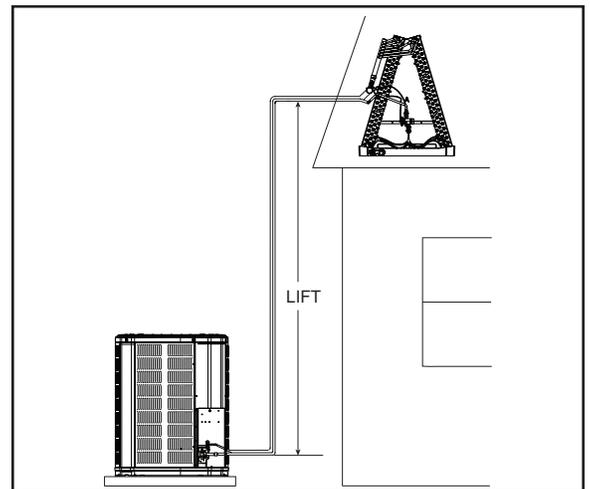
Indoor Temp

## 14.2 Subcooling Charging in Cooling (Above 55° F Outdoor Temp.)

**STEP 1** - Use the refrigerant line total length and lift measurements from Section 5.3.

Total Line Length = \_\_\_\_\_ Ft.

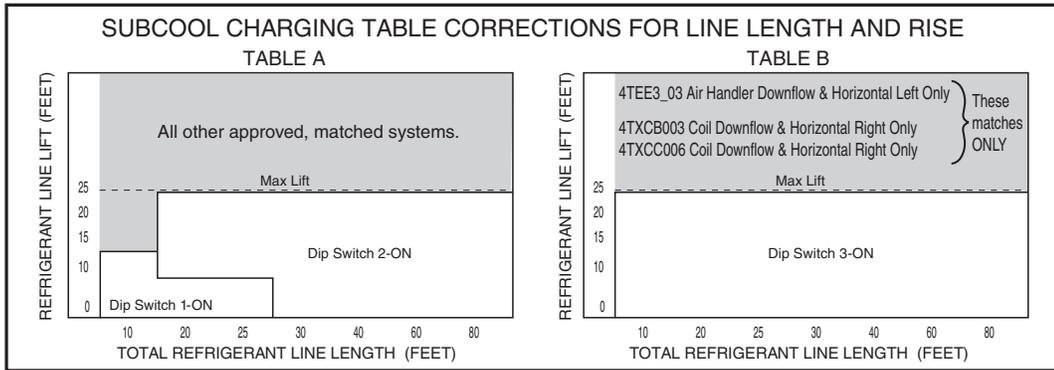
Vertical Change (Lift) = \_\_\_\_\_ Ft.



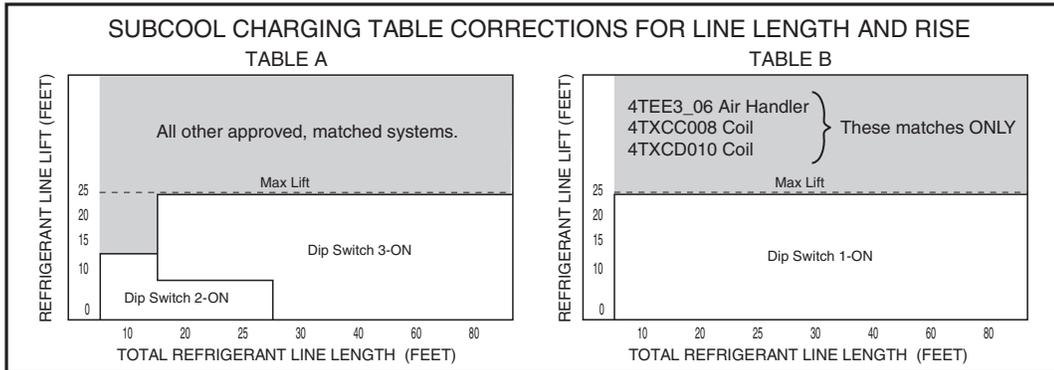
**STEP 2** - Using the total Line Length and Lift measured in STEP 1 and the subcool charging table corrections below, determine the Dip Switch position for your model.

### SUBCOOL CHARGING TABLE CORRECTIONS

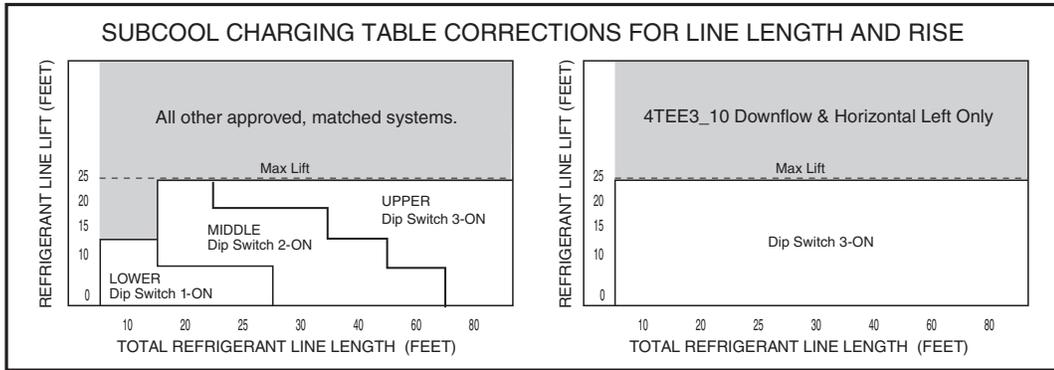
**2-TON HP MODEL ONLY**



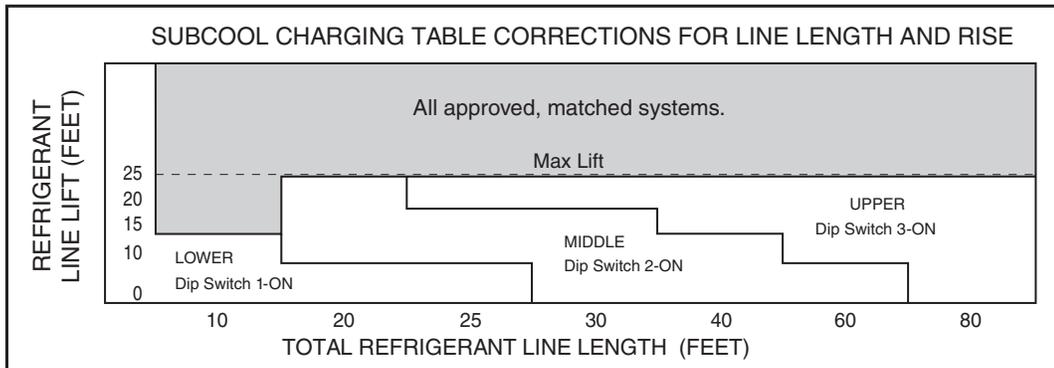
**4-TON HP MODEL ONLY**



**5-TON HP MODELS ONLY**



**ALL AC MODELS  
AND  
3-TON HP MODELS**



Dip Switch setting from Subcool Charging Table Corrections = \_\_\_\_\_

Set Dip Switch on the Charge Assist™ control board.

### 14.3 Determine the charge adjustment procedure

Final refrigerant charge adjustment is necessary. Choose the appropriate method below.

- Charge Assist™ procedure in Section 14.4
- Manual charging procedure in Section 14.5

### 14.4 Charge Assist™ Procedure

**NOTE:** Outdoor Temperature (ODT) must be between 55°F and 120°F. See Section 14.1

**IMPORTANT:** Be sure to set Dip Switches on the Outdoor Control Board for Line Length and Lift before entering Charge Assist™ Mode. See Section 14.2

**STEP 1** - To enter Charge Assist™ Mode, press the MODE button for at least one (1) second. The on-board LEDs will indicate if the system is capable of continuing. For a detailed description of on-board LEDs and their function, see the Service Facts.

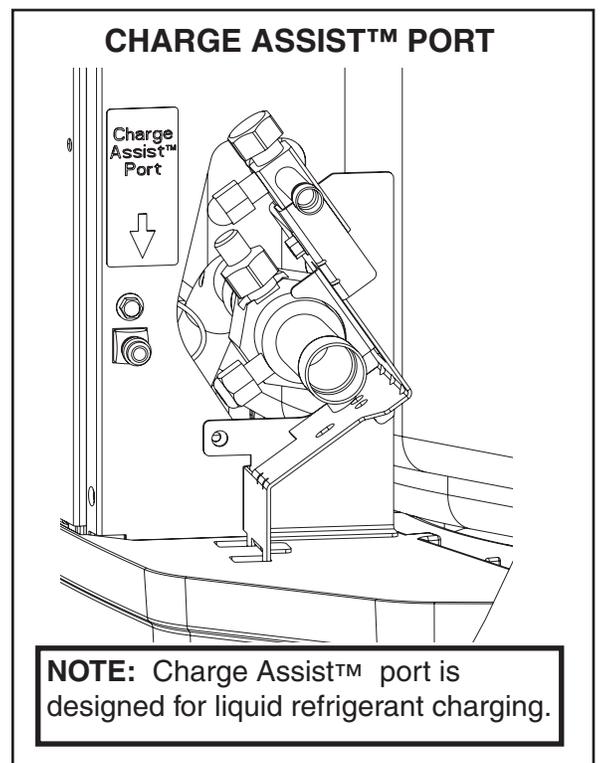
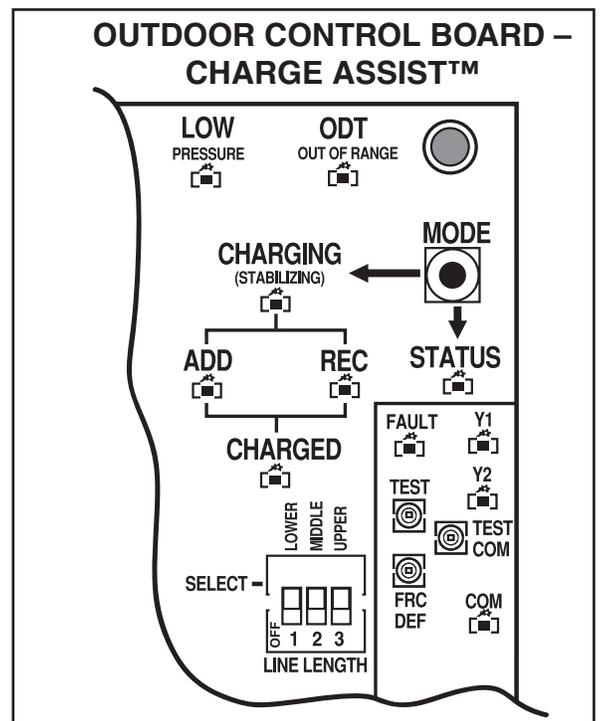
The system will take approximately 12-20 minutes to stabilize before the charge can be checked by Charge Assist™. Once the system is stabilized, watch to see which LED turns on next. If the system charge is correct, the “CHARGED” LED will turn on and remain on for one (1) hour. Once charged, the system will exit Charge Assist™ and control will return to the Comfort Control.

**STEP 2** - If the system charge is low, the “ADD” LED will turn on and stay on up to one (1) hour or until enough refrigerant is added to reach the required system charge level and turn on the “CHARGED” LED.

When the “ADD” LED is on, the charging solenoid output will be active. This feature works to automatically control refrigerant flow with BAYCAKT001.

**STEP 3** - If the system charge is high, the “REC” LED will turn on and the unit will exit Charge Assist™. You must recover refrigerant from the system before re-entering Charge Assist™.

For instructions on the Charge Assist™ tool BAYCAKT001, see the Installer’s Guide 18-HH15D1-\* (the position of the \* denotes the latest revision number).



### 14.5 Manual Charging Procedure in Cooling between 55°F and 120°F OD Ambient

**NOTE:** Outdoor Temperature (ODT) must be between 55°F and 120°F. See Section 14.1

**IMPORTANT:** Be sure to set Dip Switches on the Outdoor Control Board for Line Length and Lift. Use the corresponding charge chart and dip switch column in Section 14.2 to determine desired liquid pressure when using the manual charging procedure.

**STEP 1** - Stabilize the system by operating for a minimum of 20 minutes.

At startup, or whenever charge is removed or added, the system must be operated for a minimum of 20 minutes to stabilize before accurate measurements can be made.

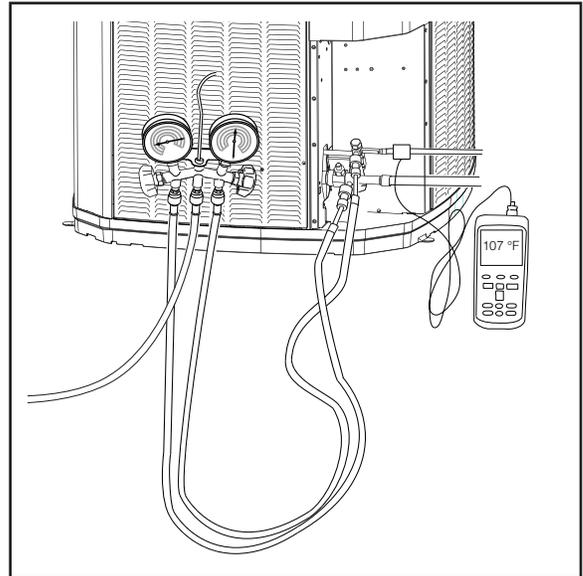


**STEP 2** - Measure the liquid line temperature and pressure at the outdoor unit's service valve.

Measured Liquid Line Temp = \_\_\_\_\_ ° F

Liquid Gage Pressure = \_\_\_\_\_ PSIG

Dip Switch setting from 14.2 Step 2 \_\_\_\_\_



Use the liquid line temperature and liquid line gage pressure from Step 2, along with the Dip Switch setting column, to determine the proper Liquid Gage Pressure.

**STEP 3** - Find the appropriate refrigerant charging chart on the following page for your system type and tonnage.

**STEP 4** - Locate your liquid line temperature in the left column of the table and the intersecting liquid line gage pressure under the DIPSWITCH selection column.

**Example:**

- A 3 ton AC is installed with line length of 30 feet and a line lift of 15 feet.
- The Dip Switch setting is 2-ON.
- The measured liquid line temperature is 85°F and the Liquid Gage Pressure is 299 PSIG.

299 PSIG is shown as the intersection of the Dip Switch ON column and the 85°F Liquid Temperature row.

<b>3 TON AC R410A REFRIGERANT CHARGING CHART</b>			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	186	186	190
60	202	202	206
65	219	219	222
70	237	237	240
75	256	256	260
80	277	277	280
85	299	299	302
90	322	322	325
95	346	346	350
100	371	371	375
105	397	397	402
110	425	425	430
115	454	454	460
120	484	484	491
125	515	515	523

\* Data is based on 10.5° of subcooling at a 95° ambient  
PRINTED FROM D155861P02 REV 2

**Example**

2 Ton AC

2 TON AC R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	191	196	197
60	205	210	212
65	221	226	227
70	237	243	244
75	255	261	263
80	274	281	283
85	295	302	305
90	316	325	328
95	339	349	352
100	364	374	378
105	390	401	406
110	417	430	435
115	445	460	465
120	475	491	497
125	505	524	530

\* Data is based on 10.1° of subcooling at a 95° ambient  
 PRINTED FROM D156402P01 REV 0

2 Ton HP

2 TON HP R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	SEE TABLE A *	SEE TABLE A	SEE TABLE B **
55	192	199	210
60	206	213	227
65	221	229	245
70	238	246	264
75	256	264	284
80	275	284	306
85	295	305	329
90	316	327	354
95	339	350	380
100	363	374	407
105	388	400	435
110	415	427	465
115	443	456	497
120	471	485	529
125	502	516	563

\* Data is based on 9.5° of subcooling at a 95° ambient  
 \*\* Data is based on 18.0° of subcooling at a 95° ambient  
 PRINTED FROM D156403P01 REV 0

3 Ton AC

3 TON AC R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON **	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	186	186	190
60	202	202	206
65	219	219	222
70	237	237	240
75	256	256	260
80	277	277	280
85	299	299	302
90	322	322	325
95	346	346	350
100	371	371	375
105	397	397	402
110	425	425	430
115	454	454	460
120	484	484	491
125	515	515	523

\* Data is based on 10.5° of subcooling at a 95° ambient  
 \*\* With AM7 or AM8: Dip switch 1 = 11° of subcooling at 95° ambient  
 PRINTED FROM D156402P02 REV 0

3 Ton HP

3 TON HP R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON **	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	194	195	199
60	208	210	215
65	224	227	232
70	242	246	250
75	260	265	270
80	280	286	291
85	301	308	313
90	324	331	337
95	348	356	362
100	373	382	388
105	399	409	416
110	427	438	445
115	456	467	475
120	486	498	507
125	517	531	540

\* Data is based on 11.5° of subcooling at a 95° ambient  
 \*\* With AM7 or AM8: Dip switch 1 = 10° of subcooling at 95° ambient  
 PRINTED FROM D156403P02 REV 0

4 Ton AC

4 TON AC R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON **	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	200	203	208
60	217	221	225
65	235	239	243
70	254	258	263
75	274	279	284
80	295	301	306
85	318	323	329
90	341	347	354
95	366	372	379
100	392	398	406
105	418	426	434
110	446	454	464
115	475	483	495
120	506	514	526
125	537	545	560

\* Data is based on 15.0° of subcooling at a 95° ambient  
 \*\* With AM7 or AM8: Dip Switch 1 = 13° subcooling at a 95° ambient  
 PRINTED FROM D156402P03 REV 0

4 Ton HP

4 TON HP R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON ***	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	SEE TABLE B **	SEE TABLE A *	SEE TABLE A
55	202	204	206
60	217	220	223
65	234	238	240
70	251	256	259
75	270	277	280
80	290	298	301
85	312	321	325
90	334	345	349
95	358	370	375
100	383	397	403
105	409	425	432
110	436	454	462
115	465	485	494
120	494	516	527
125	525	550	562

\* Data is based on 15.9° of subcooling at a 95° ambient  
 \*\* Data is based on 13.5° of subcooling at a 95° ambient  
 \*\*\* With AM7 or AM8: Dip switch 1 = 13° of subcooling at 95° ambient  
 PRINTED FROM D156403P03 REV 0

5 Ton AC

5 TON AC R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER
55	191	197	201
60	207	213	218
65	224	231	236
70	242	249	255
75	261	268	275
80	281	289	296
85	302	310	318
90	324	333	342
95	347	356	366
100	372	381	392
105	397	407	418
110	423	434	446
115	451	462	474
120	479	491	504
125	509	521	535

\* Data is based on 11.2° of subcooling at a 95° ambient  
 PRINTED FROM D156402P04 REV 0

5 Ton HP

5 TON HP R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON ***	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER & 4TEE3.10 DOWNFLOW & HORIZ. LEFT **
55	208	208	210
60	225	225	227
65	242	242	245
70	260	260	264
75	280	280	284
80	300	300	305
85	322	322	327
90	345	345	350
95	369	369	374
100	394	394	400
105	420	420	426
110	447	447	454
115	476	476	483
120	505	505	513
125	536	536	544

\* Data is based on 14.8° of subcooling at a 95° ambient  
 \*\* Data is based on 16.7° of subcooling at a 95° ambient  
 \*\*\* With \*AM7 or \*AM8: Dip switch 1 = 12° of subcooling at a 95° ambient  
 PRINTED FROM D156403P04 REV 0

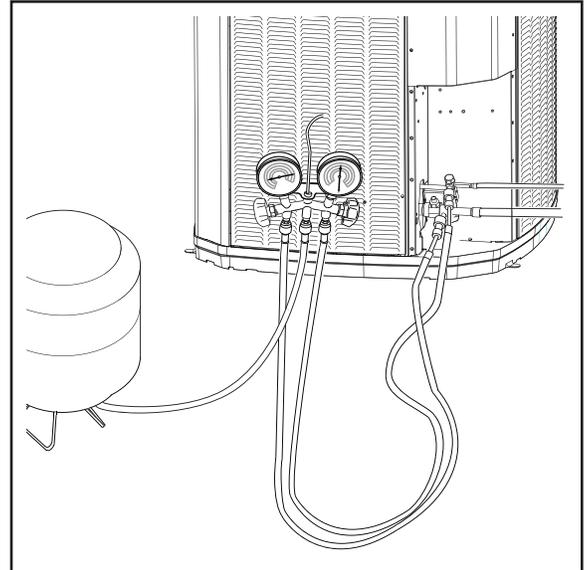
Note: See page 20 for subcool charging correction tables A and B

**STEP 5** - Adjust refrigerant level to attain proper gage pressure.

**Add refrigerant** if the Liquid Gage Pressure is lower than the chart value.

1. Connect gages to refrigerant bottle and unit as illustrated.
2. Purge all hoses.
3. Open bottle.
4. Stop adding refrigerant when liquid line temperature and Liquid Gage Pressure matches the charging chart.

**Recover refrigerant** if the Liquid Gage Pressure is higher than the chart value.



**STEP 6** - Stabilize the system.

1. Wait 20 minutes for the system condition to stabilize between adjustments.

**NOTE:** When the Liquid Line Temperature and Gage Pressure approximately match the chart, the system is properly charged.

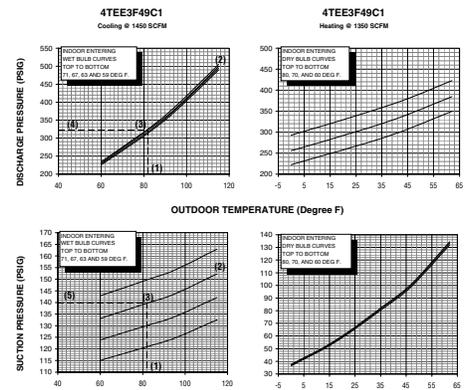
2. Remove gages.
3. Replace service port caps to prevent leaks. Tighten finger tight plus an additional 1/6 turn.



**STEP 7** - Verify typical performance.

Refer to System Pressure Curves in the Service Facts to verify typical performance.

(Example only - see Service Facts)



**STEP 8** - Record System Information for reference.

Record system pressures and temperatures after charging is complete.

Outdoor model number = \_\_\_\_\_

Measured Suction Line Temp = \_\_\_\_\_ ° F

Measured Outdoor Ambient = \_\_\_\_\_ ° F

Liquid Gage Pressure = \_\_\_\_\_ PSIG

Measured Indoor Ambient = \_\_\_\_\_ ° F

Suction Gage Pressure = \_\_\_\_\_ PSIG

Measured Liquid Line Temp = \_\_\_\_\_ ° F

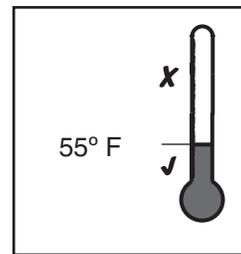
Dip Switch Selection = \_\_\_\_\_

**14.6 Subcooling Charging Below 55° F Outdoor Temp. (In Heating Only)**

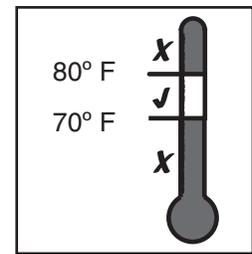
**STEP 1** - Check the outdoor temperature. If the ODT is less than 55° F, follow these charging instructions for the heating mode of operation. For temperatures above 55° F, see Section 14.1.

**NOTE:** It is important to return in the spring or summer to accurately charge the system in the cooling mode with outdoor ambient **above 55°F**.

For best results the indoor temperature should be kept between 70° F and 80° F. See the Indoor Temp illustration. Add system heat if needed.



Outdoor Temp

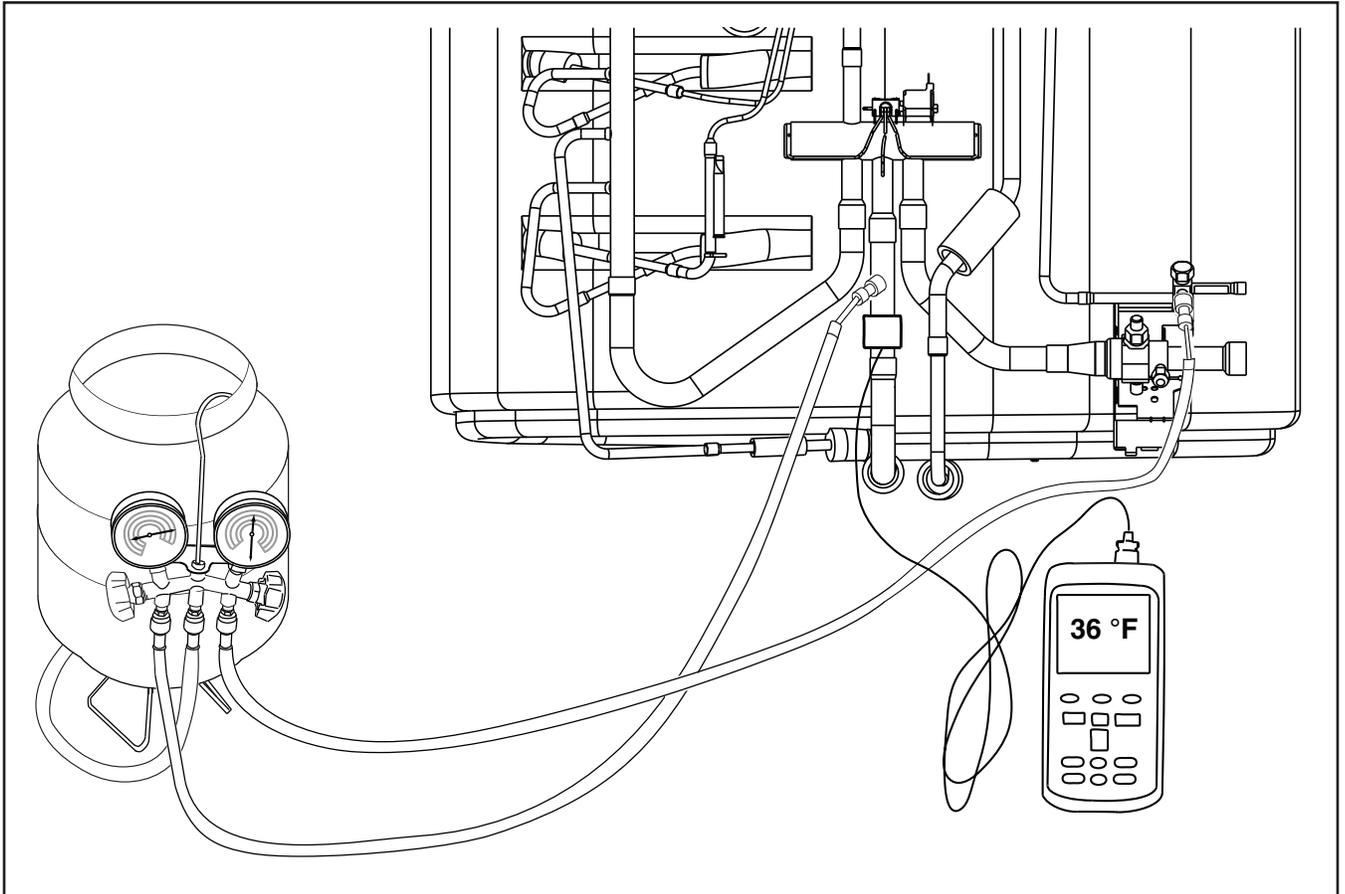


Indoor Temp

**STEP 2** - Stabilize the system by operating in the heating mode for a minimum of 20 minutes.

**Important:** Whenever charge is added or removed, the system must run for a minimum of 20 minutes before accurate measurements can be made.





**STEP 3** - Measure the suction line pressure and temperature at the “true” suction line and record the values below.

**NOTE:** the side service panel will need to be removed to gain access to this area.

Attach temperature probe and the gage as shown. Ensure the probe is securely attached and well insulated.

Measured  
Suction Line Temperature = \_\_\_\_\_ ° F

Measured  
Suction Line Pressure = \_\_\_\_\_ ° F

Compare these values to the 15 degree super-heat chart in Table 13.2.

**STEP 4** - Use the measured values from Step 3 to determine a target superheat of 15 degrees.

**Example:** Assume a suction pressure of 81 PSIG and a suction temperature of 36° F.

When the suction temperature is in line with the suction gage pressure, the target superheat value will be 15 degrees. (Example values highlighted in Table 13.2)

Table 13.2

15 degree Superheat Chart	
Suction Line Temp	Suction Gage Pressure
10	42
12	44
14	47
16	50
18	52
20	55
22	58
24	61
26	64
28	67
30	70
32	74
34	77
36	81
38	84
40	88
42	92
44	96
46	100
48	104
50	108
52	112
54	117
56	121
58	126
60	131
62	136
64	141
70	157

**STEP 5** - Adjust refrigerant level to attain 15 degrees of superheat.

**Add refrigerant** if the suction line temperature is above the value that is in line with the measured suction gage pressure.

1. Connect gages as shown in Step 3.
2. Purge all hoses.
3. Open bottle.
4. Stop adding refrigerant when the suction line temperature is in line with the measured suction line pressure in Table 13.2.

**Recover refrigerant** if the suction line temperature is lower than the temperature that is in line with the system's suction pressure.

**STEP 6** - Stabilization and completion.

1. Wait 20 minutes for the system condition to stabilize between adjustments.

**NOTE:** When the suction temperature is in line with the suction gage pressure, the target superheat value will be 15 degrees.

2. Remove gages.
3. Replace service port caps to prevent leaks. Tighten finger tight plus an additional 1/6 turn.

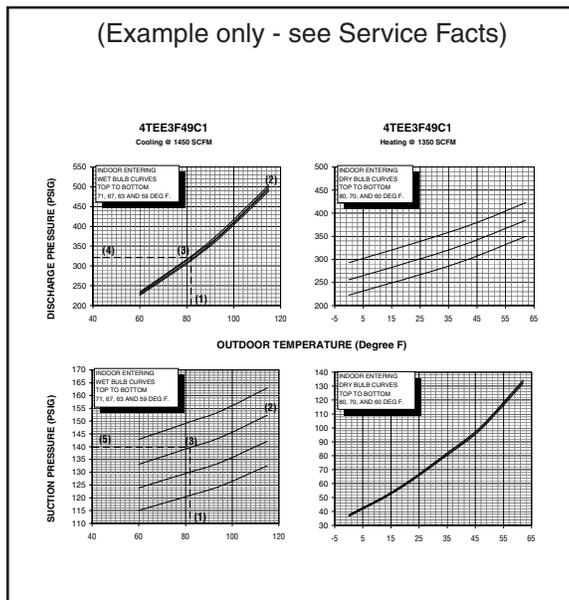


**STEP 7** - Target 10–15 degrees of subcooling using Section 14.1 as a guide.

**NOTE:** It is important to return in the spring or summer to accurately charge the system in the cooling mode with outdoor ambient **above 55°F**.

**STEP 8** - Verify typical performance.

Refer to System Pressure Curves in the Service Facts to verify typical performance.



## Section 15. Checkout Procedures and Troubleshooting

### 15.1 Operational And Checkout Procedures

Final phases of this installation are the unit Operational and Checkout Procedures. To obtain proper performance, all units must be operated and charge adjustments made.

**Important:** Perform a final unit inspection to be sure that factory tubing has not shifted during shipment. Adjust tubing if necessary so tubes do not rub against each other when the unit runs. Also be sure that wiring connections are tight and properly secured.

Electric heaters, if used, are to be installed in the air handling device according to the instructions accompanying the air handler and the heaters.

**IMPORTANT:** See Limited Warranty information in Use and Care Manual.

#### CHECKOUT PROCEDURE

After installation has been completed, it is recommended that the entire system be checked against the following list:

1. Leak check refrigerant lines. .... [ ]
2. Properly insulate suction lines and fittings..... [ ]
3. Properly secure and isolate all refrigerant lines..... [ ]
4. Seal passages through masonry.  
If mortar is used, prevent mortar from coming  
into direct contact with copper tubing. .... [ ]
5. Verify that all electrical connections are tight..... [ ]
6. Observe outdoor fan during on cycle for clearance  
and smooth operation..... [ ]
7. Be sure that indoor coil drain line drains freely. Pour water  
into drain pan..... [ ]
8. Be sure that supply registers and return grilles are open  
and unobstructed..... [ ]
9. Be sure that a return air filter is installed..... [ ]
10. Be sure that the correct airflow setting is used.  
(Indoor blower motor) ..... [ ]
11. Operate complete system in each mode to  
ensure safe operation..... [ ]

# 15.2 Troubleshooting

SYSTEM FAULTS	WHAT TO CHECK MODE HIGH VOLTAGE WIRING COMPRESSOR IOL RUN CAPACITOR START CAPACITOR CONTACTOR RELAY CONTACTOR CONTACTS LOW VOLTAGE WIRING CONTROL TRANSFORMER THERMOSTAT CONTACTOR COIL LOW VOLTAGE FUSE STUCK COMPRESSOR INEFFICIENT COMP. REF. UNDERCHARGE REF. OVERCHARGE EXCESSIVE EVAP. LOAD NONCONDENSABLES RES. O.D. AIRFLOW O.D. AIR RECIRCULATION TXV/EEV STUCK OPEN REF. CIR. RESTRICTIONS RES. I.D. AIRFLOW SUPERHEAT SOV LEAKING SOV COIL DEFECTIVE *DEFROST RELAY DEF. DEFROST CONTROL DEF.																			
	C	H																		
<b>REFRIGERANT CIRCUIT</b>																				
Head Pressure Too High	C																		P	P
	H																		P	S
Head Pressure Too Low	C									S	P								S	S
	H									S	P								S	S
Suction Pressure Too High	C									S	P	P							S	P
	H									S									S	P
Suction Pressure Too Low	C										P								S	P
	H										P								S	S
Liquid Refrig. Floodback (TXV/EEV)	C																		P	
	H																			P
Liquid Refrig. Floodback (Cap. Tube)	C										P			S	S		S	P		
	H										P			S	S		S			S
I.D. Coil Frosting	C										P			S	S					
	H																			
Compressor Runs Inadequate or No Cooling/Htg	C									S	P		S	S				S	P	S
	H									S	P		S					S	P	S
<b>ELECTRICAL</b>																				
Compressor & O.D. Fan Won't Start	C	P	P						S	P	S	P	P							
	H	P	P						S	P	S	P	P							
Compressor Will Not Start But O.D. Fan Runs	C		P	S	P	S	S	S											P	
	H		P	S	P	S	S	S											P	
O.D. Fan Won't Start	C		P		P			S												
	H		P		P			S												
Compressor Hums But Won't Start	C				P	S	S	S											P	
	H				P	S	S	S											P	
Compressor Cycles on IOL	C		P	S	P	S	S	S						P	S	P	P	S	S	S
	H		P	S	P	S	S	S						P	S	P	P	S	S	S
I.D. Blower Won't Start	C	P	P						S	P	S		S							
	H	P	P						S	P	S		S							
<b>DEFROST</b>																				
Unit Won't Initiate Defrost	C																			
	H																		P	P
Defrost Terminates on Time	C																			
	H																			P
Unit Icing Up	C																			
	H																		P	P

C - Cooling    H - Heating    P - Primary Causes    S - Secondary Causes    \* - 3 Phase Only



*American Standard*  
HEATING & AIR CONDITIONING

6200 Troup Highway  
Tyler, TX 75707  
www.americanstandardair.com

The manufacturer has a policy of continuous product and product data improvement and it reserves the right to change design and specifications without notice. Representative-only illustrations included in this document.