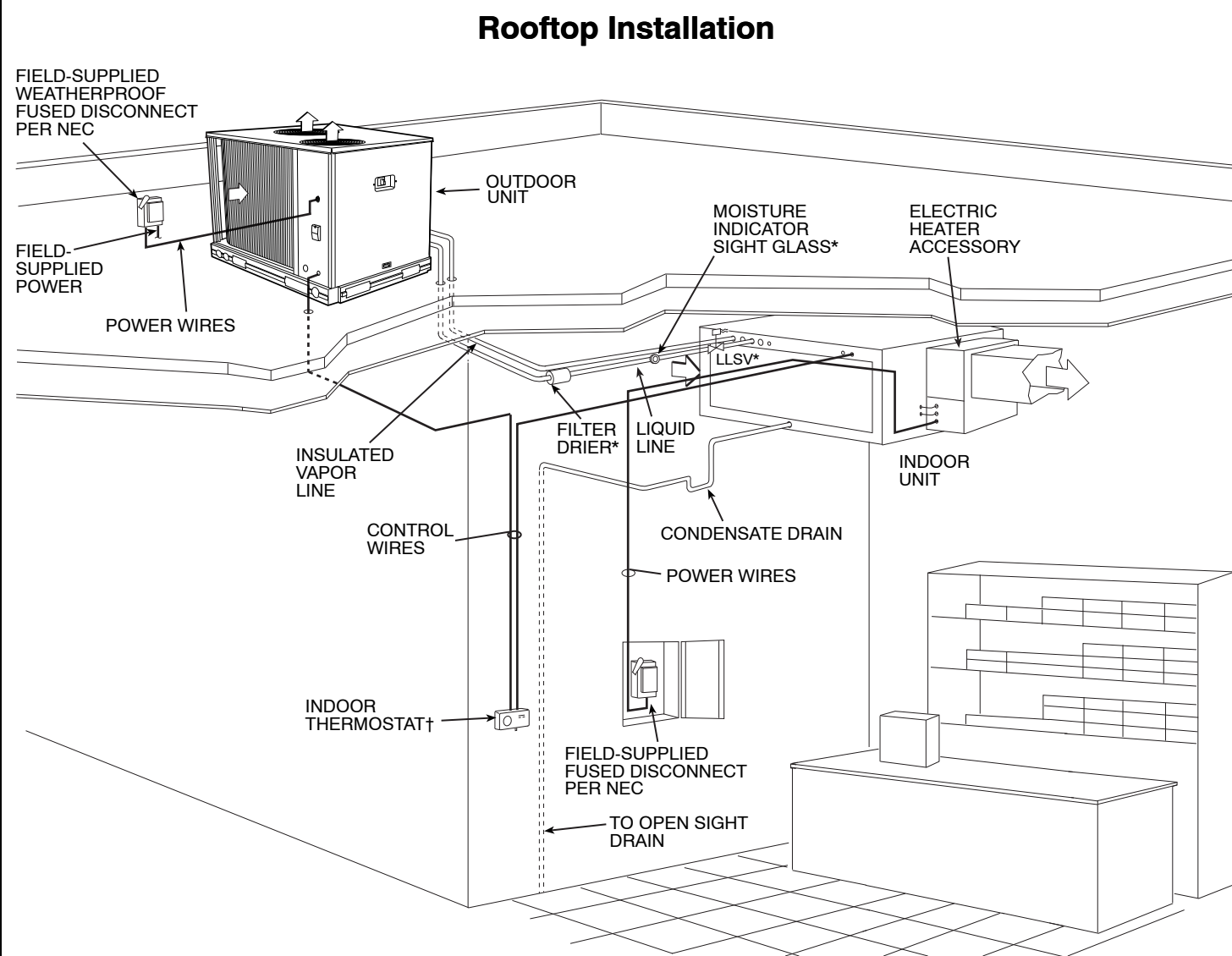


# Commercial Split System Installation Chart

6 to 12<sup>1</sup>/<sub>2</sub> Ton Condensing Units  
6, 7<sup>1</sup>/<sub>2</sub> and 10 Ton Heat Pump Units

See Installation, Start-Up and Service Manual for detailed instructions and safety precautions.

## TYPICAL PIPING AND WIRING



**LEGEND**  
LLSV — Liquid Line Solenoid Valve  
NEC — National Electrical Code  
TXV — Thermostatic Expansion Valve

\* Field supplied. See Refrigerant Specialties table in "3) Install Refrigerant Piping" section, opposite.

† Accessory Item.

**NOTES:**

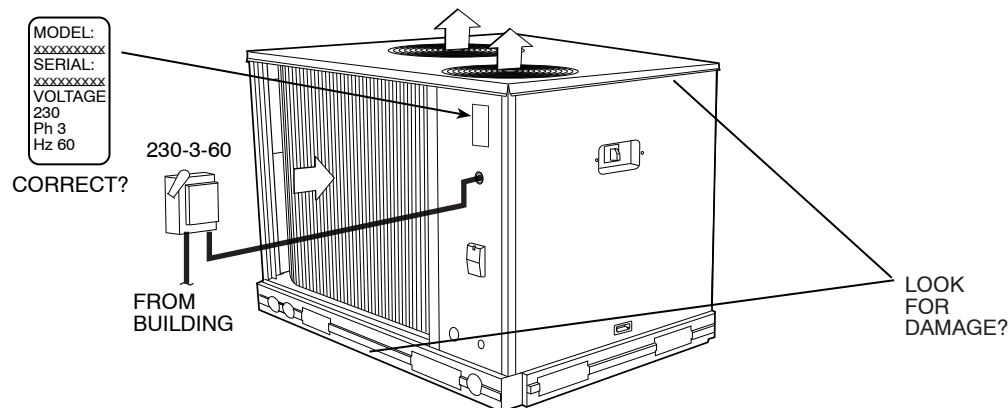
- All piping must follow standard refrigerant piping techniques. Refer to Product System Design Manual for details.
- All wiring must comply with the applicable local and national codes.
- Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include details for, a specific installation.
- Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.
- Internal factory-supplied TXVs not shown.

## SAFETY CONSIDERATIONS

- Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location.
- Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.
- Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.
- When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.
- Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

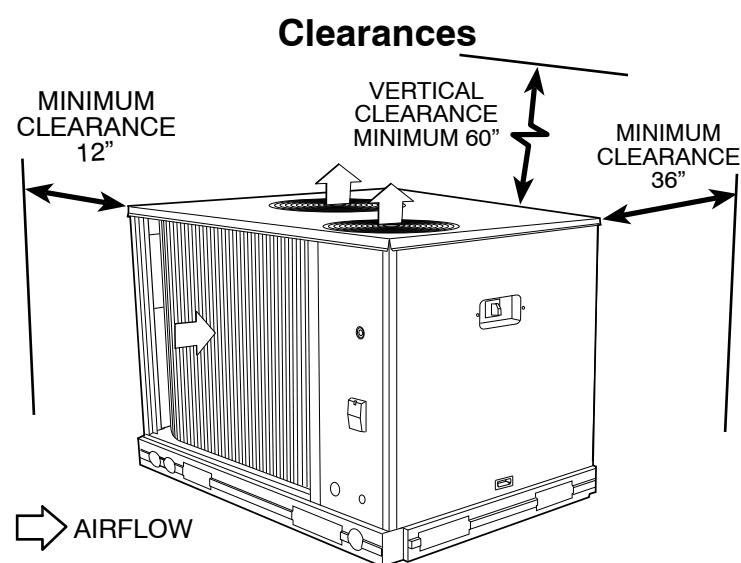
## 1. INSPECT UNIT

- Verify that power supply matches unit requirements.
- Inspect for damage.



## 2. INSTALL OUTDOOR UNIT

- Select a location that meets the requirements and limitations of the refrigerant piping recommendations shown in next section, "3. Install Refrigerant Piping."
- Maintain adequate clearance for airflow and service access.
- Unit may be mounted on a field-supplied pad or support rails.



## 3. INSTALL REFRIGERANT PIPING

- Select suction (S) and liquid (L) line size from the table below.
- Select refrigerant specialties.
- Maximum linear line length is 100 ft. Contact applications engineering for details on lengths over 100 ft.
- Do not bury refrigerant piping underground.

**REFRIGERANT PIPING SIZES - CONDENSING UNITS**

UNIT	LINEAR LENGTH OF PIPING — FT							
	0-25		25-50		50-75		75-100	
	Line Size (in. OD)							
	L	S	L	S	L	S	L	S
6 Ton (Single Circuit - 1 Stage)	3/8	7/8 or 1 1/8	3/8 or 1/2	7/8 or 1 1/8	1/2	1 1/8	1/2 or 5/8	1 1/8
7 1/2 Ton (Single Circuit - 1 Stage)	1/2	7/8 or 1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8
7 1/2 Ton (Single Circuit - 2 Stage)	1/2	7/8	1/2 or 5/8	7/8 or 1 1/8	1/2 or 5/8	7/8 or 1 1/8	1/2 or 5/8	1 1/8
10 Ton (Single Circuit - 1 Stage)	1/2	1 3/8	1/2	1 3/8	1/2 or 5/8	1 3/8	1/2 or 5/8	1 3/8
10 Ton Dual Compressor (Two Circuit - 2 Stage)	(2) 3/8	(2) 7/8	(2) 3/8	(2) 7/8	(2) 3/8 or 1/2	(2) 1 1/8	(2) 3/8 or 1/2	(2) 1 1/8
12 1/2 Ton (Single Circuit - 1 Stage)	1/2	1 1/8	1/2 or 5/8	1 1/8	1/2 or 5/8	1 3/8	1/2 or 3/4	1 3/8
12 1/2 Ton Dual Compressor (Two Circuit - 2 Stage)	(2) 3/8	(2) 7/8	(2) 3/8	(2) 7/8	(2) 3/8 or 1/2	(2) 1 1/8	(2) 3/8 or 1/2	(2) 1 1/8

**LEGEND**  
L — Liquid Line  
S — Suction Line

- NOTES:**
- Pipe sizes are based on a 2°F loss for liquid and suction lines.
  - Pipe sizes are based on the maximum linear length, shown for each column, plus a 50% allowance for fittings.
  - Charge units with R-410A in accordance with unit installation instructions.

**REFRIGERANT PIPING SIZES - HEAT PUMP UNITS**

UNIT	LINEAR LENGTH OF PIPING — FT							
	0-25		25-50		50-75		75-100	
	Line Size (in. OD)							
	L	S	L	S	L	S	L	S
6 Ton (Single Circuit - 1 Stage)	3/8	7/8	3/8	7/8	3/8 or 1/2	1 1/8	3/8 or 1/2	1 1/8
7 1/2 Ton (Single Circuit - 1 Stage)	1/2	7/8 or 1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8
7 1/2 Ton (Single Circuit - 2 Stage)	1/2	7/8 or 1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8
10 Ton (Single Circuit - 1 Stage)	1/2	7/8 or 1 1/8	1/2	1 1/8	1/2	1 1/8	1/2 or 5/8	1 1/8 or 1 3/8

**CONDENSING UNIT REFRIGERANT SPECIALTIES PART NUMBERS**

LIQUID LINE SIZE (in. OD)	LIQUID LINE SOLENOID VALVE	SOLENOID COIL	SIGHT GLASS	FILTER DRIER
3/8	EF680033	EF680037	KM680008	KH43LG091*
1/2	EF680035	EF680037	KM680004	KH43LG085*
5/8	EF680036	EF680037	KM680005	KH43LG087*

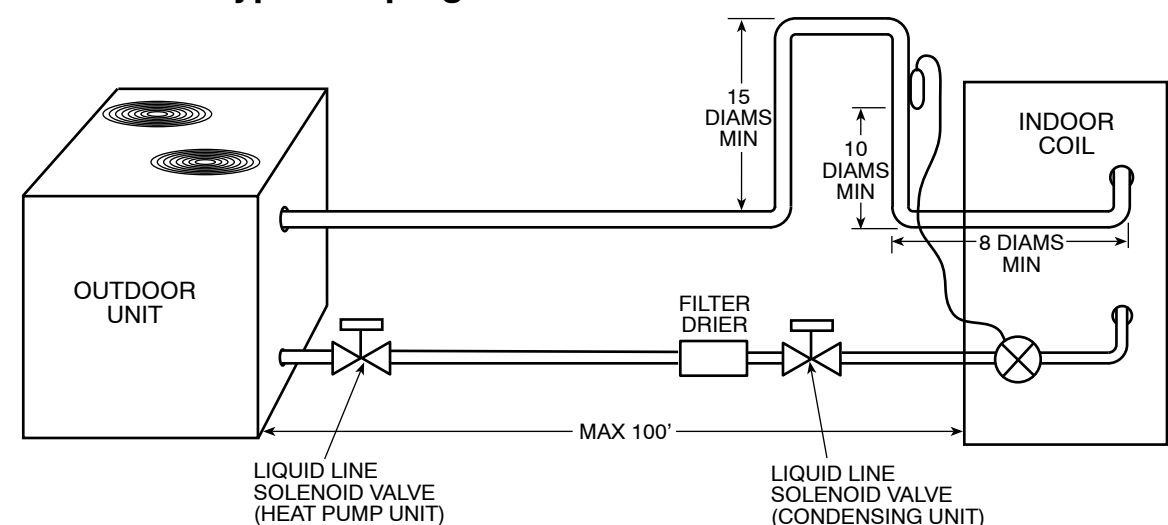
\*Bushings required.

**HEAT PUMP UNIT REFRIGERANT SPECIALTIES PART NUMBERS**

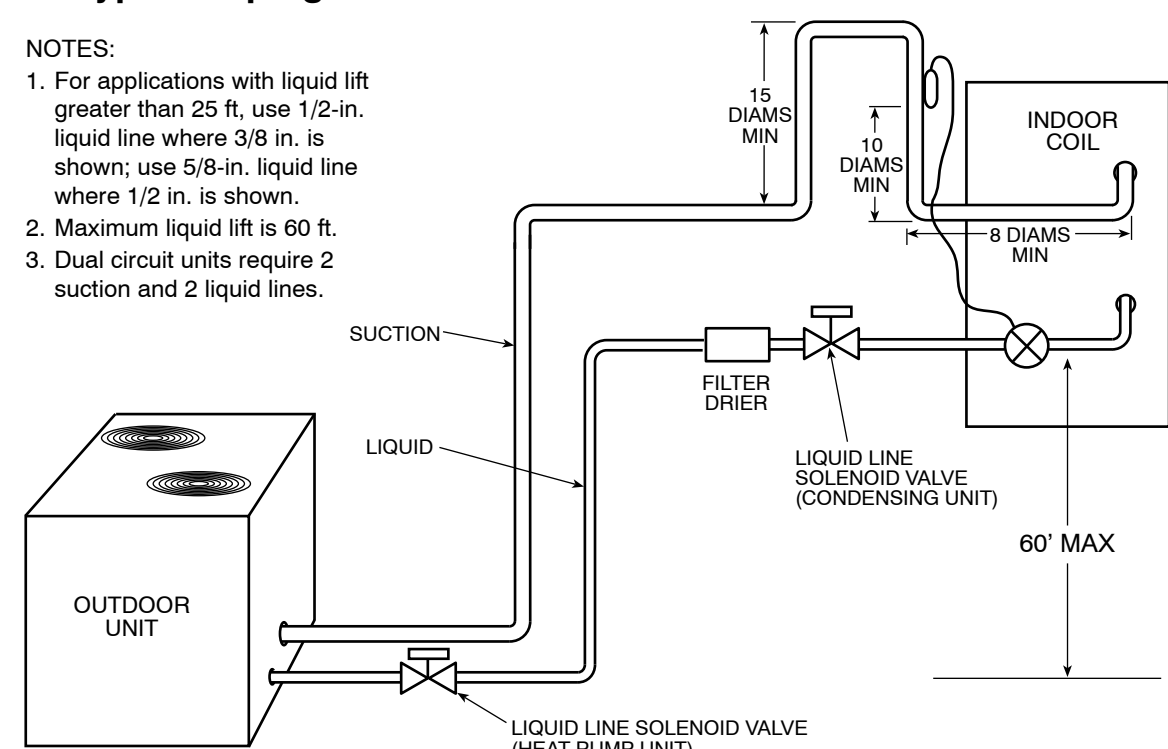
LIQUID LINE SIZE (in. OD)	LIQUID LINE SOLENOID VALVE	SOLENOID COIL	SIGHT GLASS	FILTER DRIER
3/8	EF680033 plus EF680039 biflow kit*	EF680037	KM680008	KH43LG088
1/2	EF680035 plus EF680039 biflow kit*	EF680037	KM680004	KH43LG089
5/8	EF680036 plus EF680039 biflow kit*	EF680037	KM680005	KH43LG090

\*Bushings required.

**Typical Piping for Units on the Same Level**



**Typical Piping When Indoor Unit is Above the Outdoor Unit**



**NOTES:**

- For applications with liquid lift greater than 25 ft, use 1/2-in. liquid line where 3/8 in. is shown; use 5/8-in. liquid line where 1/2 in. is shown.
- Maximum liquid lift is 60 ft.
- Dual circuit units require 2 suction and 2 liquid lines.

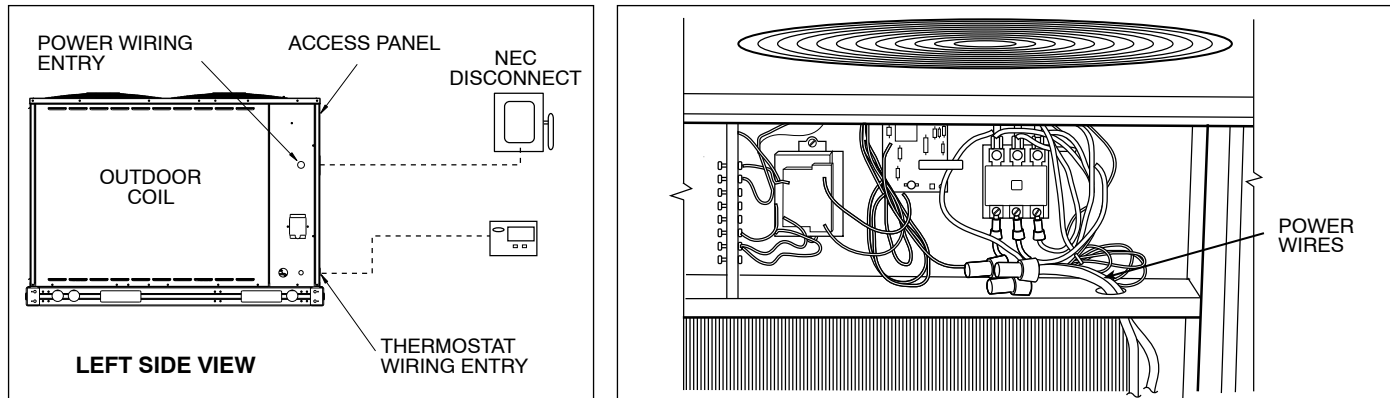
## 4. MAKE ELECTRICAL CONNECTIONS

### ⚠ WARNING

Before installing or servicing system, always turn off main power to system and install lockout tag on disconnect. There may be more than one disconnect switch. Electrical shock can cause personal injury.

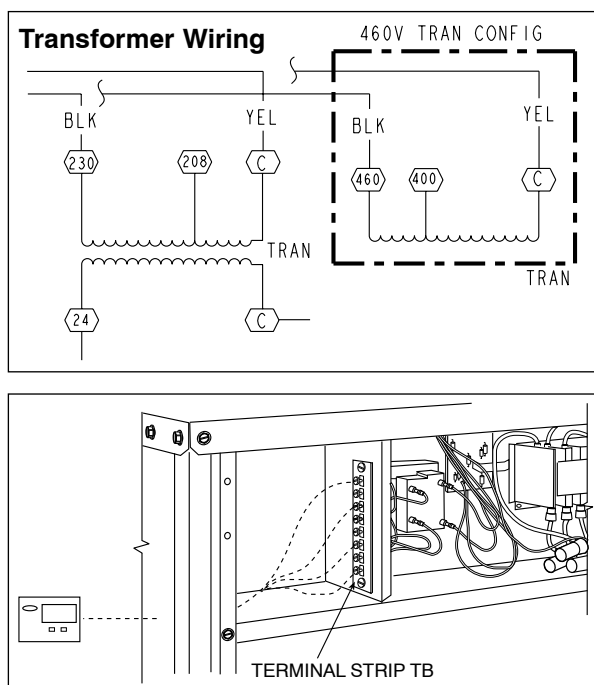
### POWER WIRING

- 1 - Verify that power is off, locked out and tagged off.
- 2 - Route power wiring from disconnect through opening in unit end panel and connect in unit control box as shown on the unit label diagram.

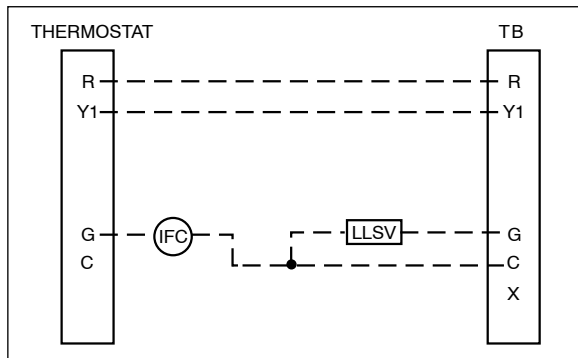


### CONTROL WIRING

- 1 - Verify that power is off, locked out and tagged off.
- 2 - Transformer wiring: If supply voltage is 208 v or 400 v, move the black wire to the appropriate terminal.
- 3 - Make connections from thermostat to terminal strip (TB) in the outdoor unit.

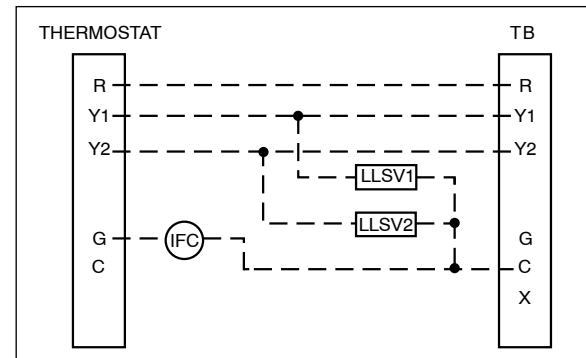


### Single Compressor/1 Stage Condensing Unit



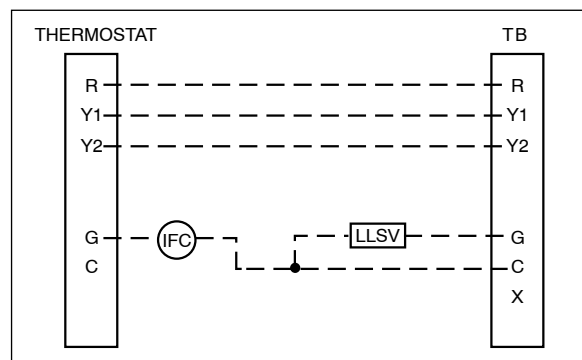
**LEGEND**  
IFC — Indoor Fan Contactor  
LLSV — Liquid Line Solenoid Valve  
TB — Terminal Board

### Dual Compressor/2 Stage Condensing Unit



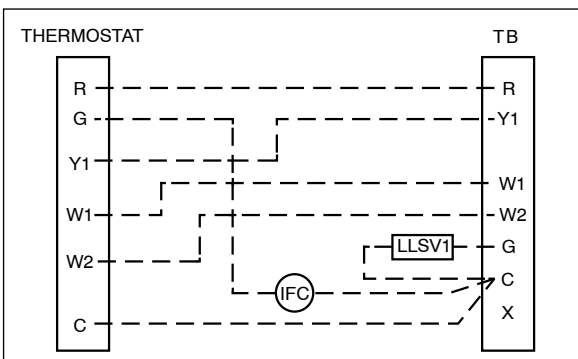
**LEGEND**  
IFC — Indoor Fan Contactor  
LLSV1 — Liquid Line Solenoid Valve Circuit No. 1  
LLSV2 — Liquid Line Solenoid Valve Circuit No. 2  
TB — Terminal Board

### Single Compressor/2 Stage Condensing Unit



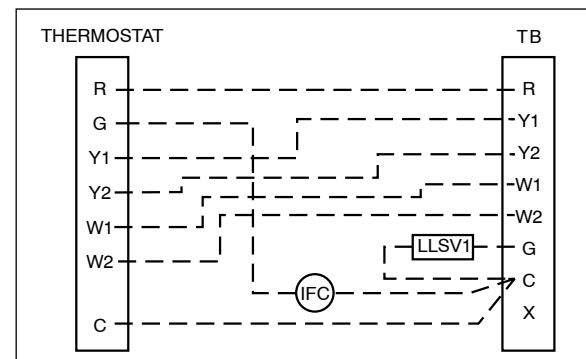
**LEGEND**  
IFC — Indoor Fan Contactor  
LLSV — Liquid Line Solenoid Valve  
TB — Terminal Board

### Heat Pump, Single Compressor/1 Stage Unit



**LEGEND**  
IFC — Indoor Fan Contactor  
LLSV — Liquid Line Solenoid Valve  
TB — Terminal Board

### Heat Pump, Single Compressor/2 Stage Unit



**LEGEND**  
IFC — Indoor Fan Contactor  
LLSV — Liquid Line Solenoid Valve  
TB — Terminal Board

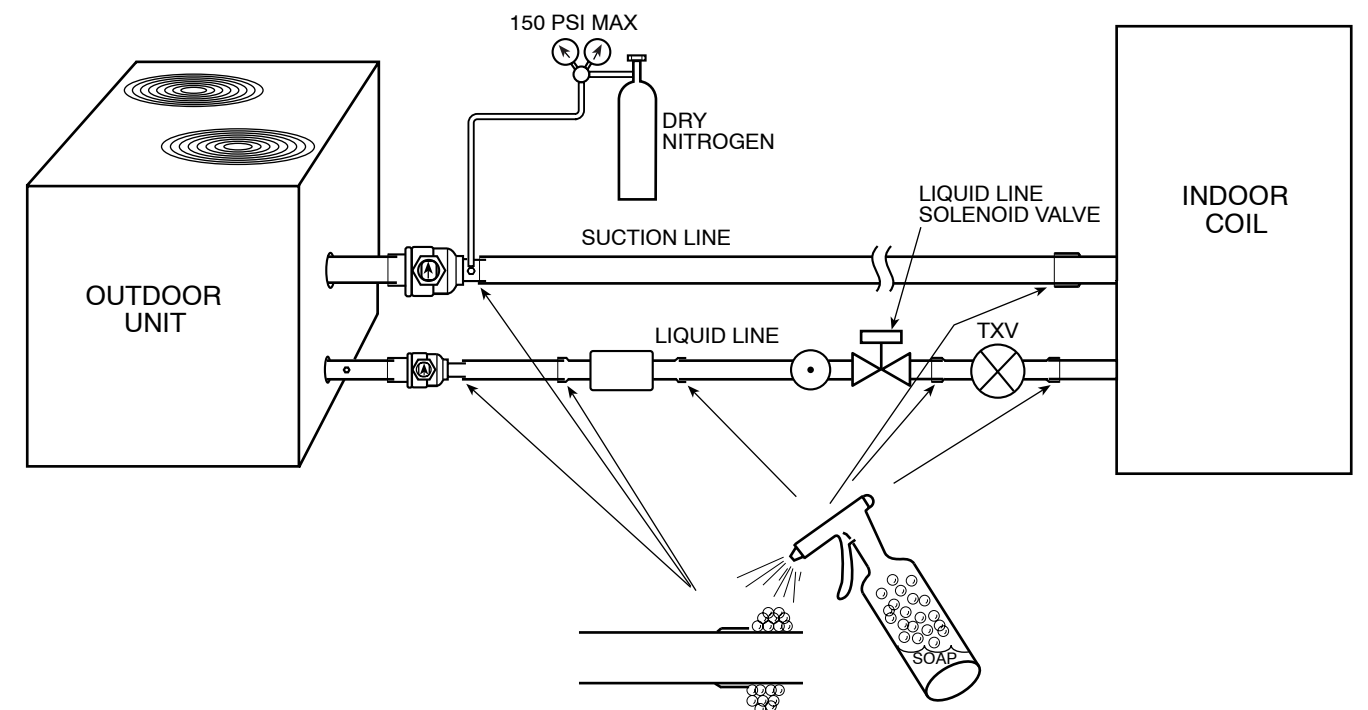
## PRE START-UP TIPS

- Read Installation, Start-Up, and Service manual.
- Use start-up checklist.
- Check all wiring connections.
- Open service valves.
- Turn on power for indoor and outdoor sections.
- Energize crankcase heater for 24 hours prior to start-up.
- Make sure compressor(s) can move freely on mounting snubbers or springs.

## 5. UNIT PRE-START

### LEAK TEST

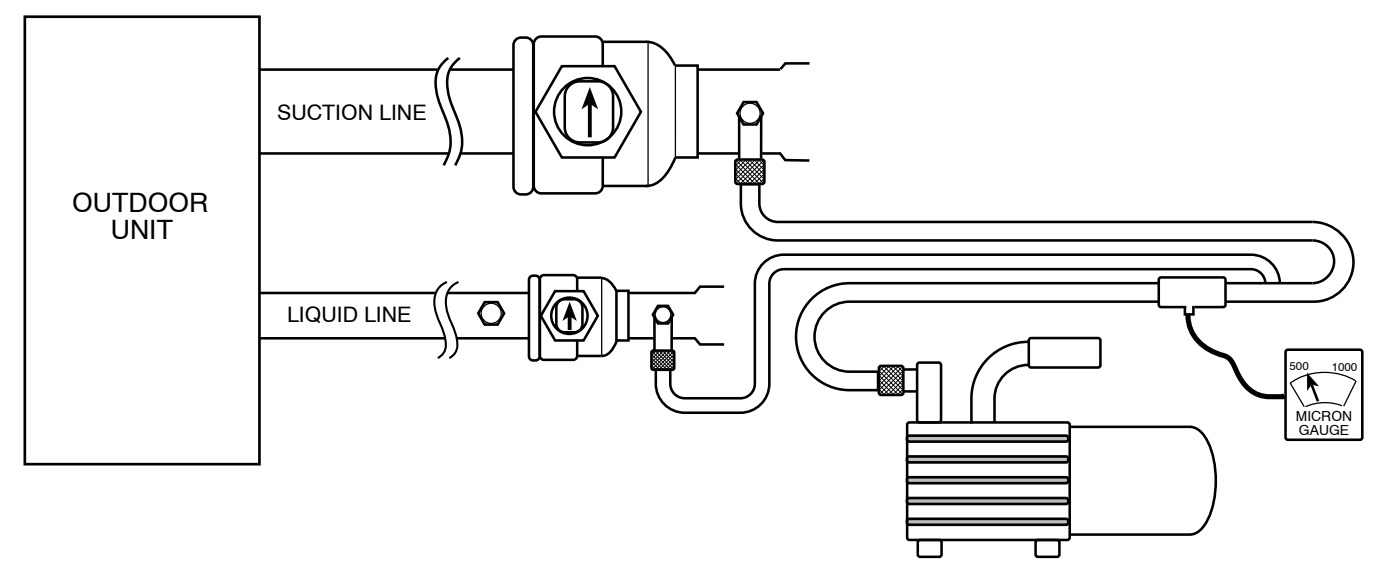
- 1 - Pressurize refrigerant piping; do not exceed 150 psi.
- 2 - Check for leaks.



### EVACUATION

#### ⚠ CAUTION

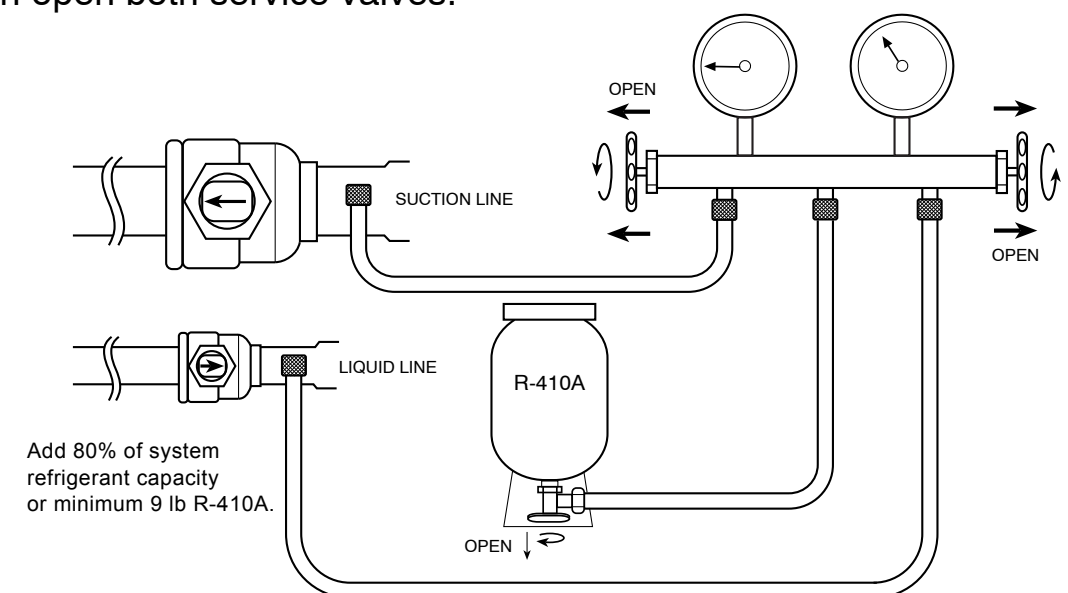
Outdoor unit contains a partial factory charge of R-410A, review rating plate for exact charge amount. Opening liquid line ball valve prior to charging will release holding charge.



EVACUATE TO A MINIMUM OF 500 MICRONS.

### INITIAL CHARGING – UNIT OFF

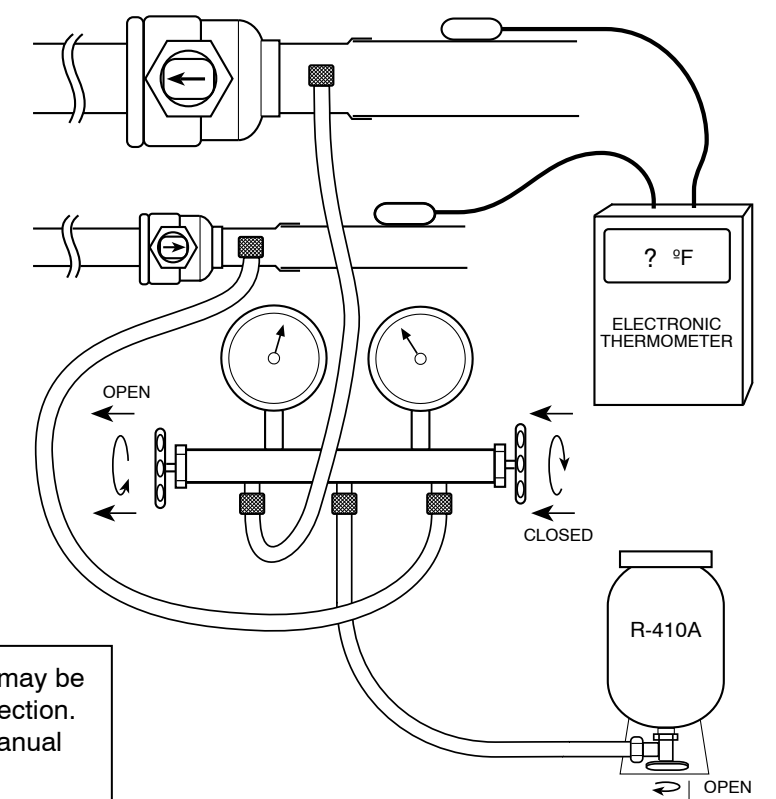
- 1 - After evacuating the system, fill the liquid line with R-410A (tank upside down). Then open both service valves.



Add 80% of system refrigerant capacity or minimum 9 lb R-410A.

### TRIM CHARGE LEVEL

- 1 - After system has been started and allowed to stabilize, adjust refrigerant level, if required, based on the Cooling Charging Chart found on unit and in Installation Instructions.
- 2 - Check superheat at the compressor; superheat should be 8 to 12°F.



**IMPORTANT:** Units with Copeland compressors may be equipped with Advanced Scroll Temperature Protection. Refer to the Installation, Start-Up, and Service manual for additional information.

