


## Installation and Start-Up Instructions

**NOTE:** Read the entire instruction manual before starting the installation.

### SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and the National Electrical Code (NEC) for special installation requirements.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit or in instructions and manuals, be alert to the potential for personal injury.

Understand the signal word DANGER, WARNING, or CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards that **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage.

### WARNING

Before installing or servicing system, always turn off main power to system. There may be more than 1 disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury or death.

### INSTALLATION

#### Step 1—Check Equipment and Jobsite

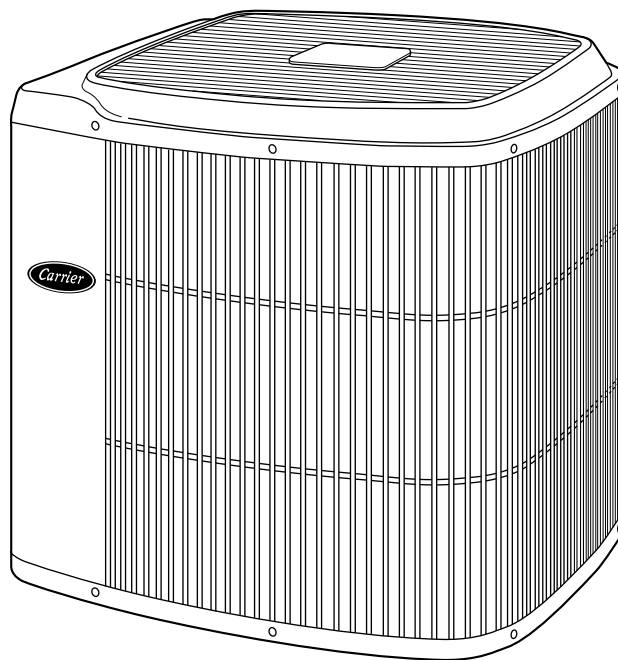
**UNPACK UNIT** — Move to final location. Remove carton taking care not to damage unit.

**INSPECT EQUIPMENT** — File claim with shipping company, prior to installation, if shipment is damaged or incomplete. Locate unit rating plate on unit corner panel. (See Fig. 2.) It contains information needed to properly install unit. Check rating plate to be sure unit matches job specifications.

#### Step 2—Install on a Solid, Level Mounting Pad

If conditions or local codes require the unit be attached to pad, tiedown bolts should be used and fastened through knockouts provided in unit base pan. Refer to unit mounting pattern in Fig. 2 to determine base pan size and knockout hole location.

When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping, and service. Allow 30-in. clearance to service end of unit and 48 in. above unit. For proper airflow, a 6-in.



A92446

**Fig. 1—Model 38TRA**

clearance on 1 side of unit and 12 in. on all remaining sides must be maintained. Maintain a distance of 24 in. between air conditioners. Position so snow, ice, and water from roof or eaves cannot fall directly on unit.

On rooftop applications, locate unit at least 6 in. above roof surface. Where possible, place unit above a load-bearing wall.

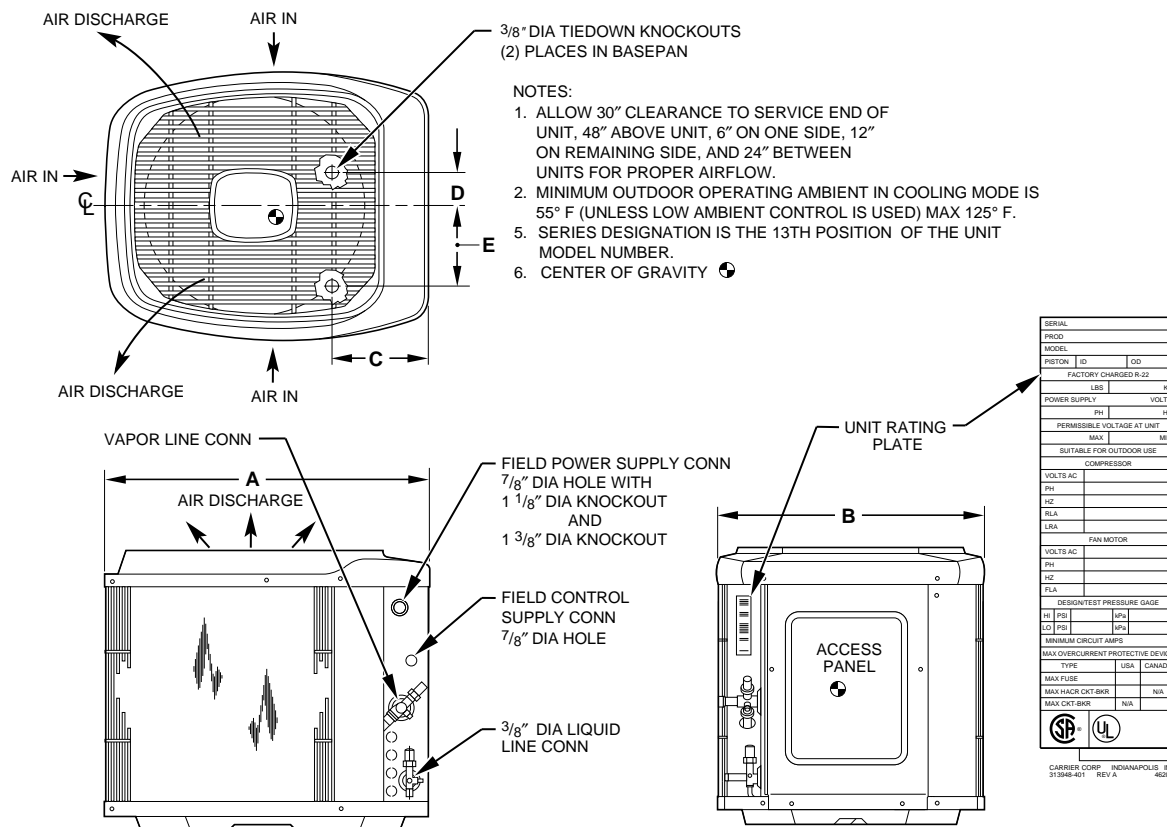
Arrange supporting members to adequately support unit and minimize transmission of vibration to building. Consult local codes governing rooftop applications.

#### Step 3—Replace Indoor AccuRater® Piston, If Required

Check indoor coil piston to see if it matches the required piston shown on unit rating plate. (See Fig. 2.) If it does not match, replace indoor coil piston with piston shipped with this unit. The piston shipped with outdoor unit is correct for any approved indoor coil combination.

### CAUTION

If unit is to be installed on system with a thermostatic expansion valve (TXV), removal of the indoor coil piston is required.



A92471

UNIT SIZE	A	B	C	D	E
	In.	In.	In.	In.	In.
018	27-1/2	22-1/2	8-3/16	2-13/16	6-15/16
024-048	34-15/16	30	8-3/16	4	9-3/4
060 (301 Series)	45	38-5/8	8-9/16	5-15/16	11-13/16
060 (311 Series)	34-15/16	30	8-3/16	4	9-3/4

Fig. 2—Unit Reference Drawing

### ⚠ CAUTION

DO NOT BURY MORE THAN 36 IN. OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-in. vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown, causing refrigerant slugging and possible compressor damage at start-up.

### Step 4—Make Piping Connections

Outdoor units may be connected to indoor sections using accessory tubing package or field-supplied refrigerant grade tubing of correct size and condition. For tubing requirements beyond 50 ft, consult Long-Line Application Guideline which is available at your local distributor.

### ⚠ CAUTION

In some cases noise in the living area has been traced to gas pulsations from improper installation of equipment.

### INSTALLATION RECOMMENDATIONS

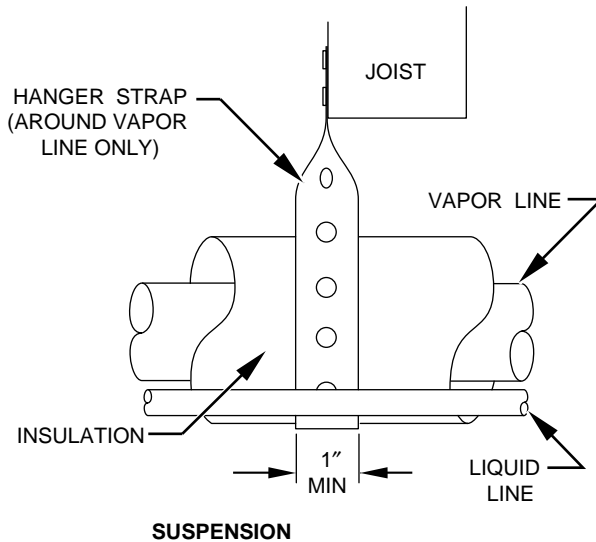
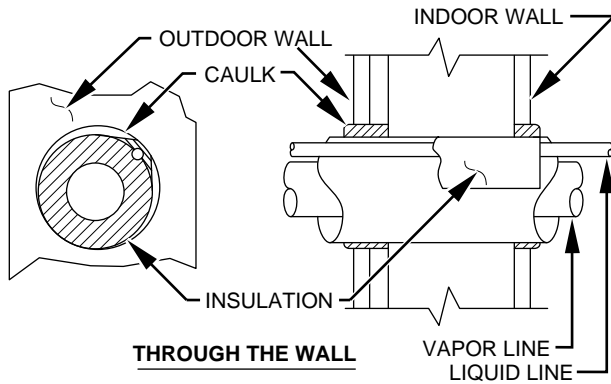
1. Locate the unit away from windows.
2. Ensure that vapor and liquid line diameters are appropriate to the capacity of the unit. (See Table 1.)

3. Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends.
4. Leave some slack between the structure and the unit to absorb vibration.
5. When passing refrigerant tubes through the wall, seal the opening with RTV or other pliable silicon-based caulk. (See Fig. 3.)
6. Avoid direct lineset contact with water pipes, ductwork, floor joists, wall studs, floors, and walls.
7. Do not suspend refrigerant tubing from joists and studs with a rigid wire or strap which comes in direct contact with the tubing. (See Fig. 3.)
8. Ensure that tubing insulation is pliable and completely surrounds the vapor line.
9. When necessary, use hanger straps which are 1 in. wide and conform to the shape of the tubing insulation. (See Fig. 3.)
10. Isolate the hanger straps from the insulation by using metal sleeves bent to conform to the shape of the insulation.

If refrigerant tubes or indoor coil is exposed to atmospheric conditions for longer than 5 minutes, it must be evacuated to 500 microns to eliminate contamination and moisture in the system.

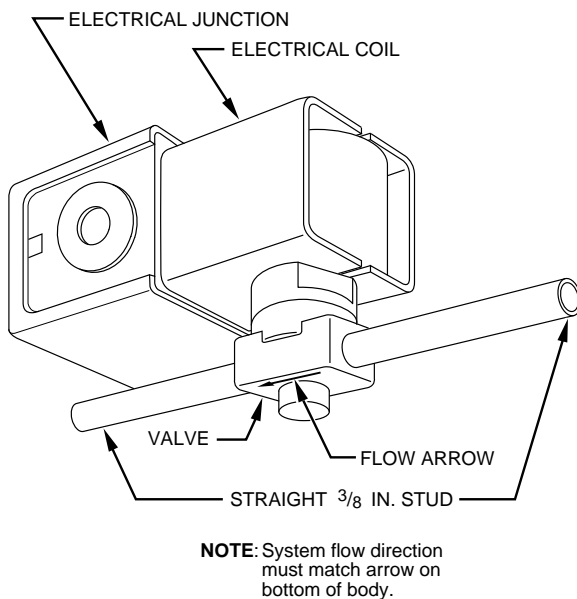
**OUTDOOR UNITS CONNECTED TO FACTORY-APPROVED INDOOR UNITS** — Outdoor unit contains correct system refrigerant charge for operation with indoor unit of the same size when

NOTE:  
AVOID CONTACT BETWEEN TUBING AND STRUCTURE



A92469

Fig. 3—Piping Installation



A87044

Fig. 4—Solenoid Valve Installation

connected by 15 ft of field-supplied or factory-accessory tubing. Check refrigerant charge for maximum efficiency. (See Step 8—Checking Charge.)

## INSTALL SOLENOID VALVE IN LIQUID TUBE

### ⚠ CAUTION

Solenoid valve must be energized during evacuation for effective evacuation.

Before making liquid tube connections, install factory-supplied solenoid valve on indoor liquid fitting. (See Fig. 4.) Be sure to use flare adapter supplied with the indoor coil when making connections.

### ⚠ CAUTION

If a field-supplied control power source is needed when adding solenoid, wiring must comply with local codes and NEC requirements.

1. Remove coil liquid connection cap and discard.
2. Mount solenoid valve on liquid tube, making sure valve flow arrow points toward indoor coil. Mount valve in any position except valve body at top and electric coil at bottom. (See Fig. 4.) The solenoid valve is to be installed a maximum of 24 in. from indoor coil.
3. Braze valve onto end of liquid tube using silver bearing or non-silver bearing brazing material. Consult local code requirements.
4. Braze flare adapter onto outlet end of the solenoid valve.
5. Wire solenoid coil into system control circuit as shown in Fig. 6.

Table 1—Refrigerant Connections and Recommended Liquid and Vapor Tube Diameters (In.)

UNIT SIZE	LIQUID		VAPOR	
	Connect Diameter	Tube Diameter	Connect Diameter	Tube Diameter
018, 024	3/8	3/8	5/8	5/8
030, 036	3/8	3/8	3/4	3/4
042, 048	3/8	3/8	7/8	7/8
060	3/8	3/8	7/8	1-1/8

Notes: 1. Tube diameters are for lengths up to 50 ft. For tubing lengths greater than 50 ft, consult Long-Line Application Guideline.

2. Do not apply capillary-tube indoor coils to these units.

REFRIGERANT TUBING — Connect tubing to fittings on outdoor unit vapor and liquid service valves. (See Fig. 2.)

### ⚠ CAUTION

A brazing shield **MUST** be used when tubing sets are being brazed to the service valves to prevent damage to the painted unit surface.

### ⚠ WARNING

Relieve pressure and recover all refrigerant before system repair or final unit disposal to avoid personal injury or death. Use all service ports and open all flow control devices, including solenoid valves.

### ⚠ CAUTION

To avoid valve damage while brazing, service valves must be wrapped with a heat-sinking material such as a wet cloth.

SWEAT CONNECTION — Use refrigerant grade tubing. Service valves are closed from factory and ready for brazing. After wrapping the service valve with a wet cloth, the tubing set can be brazed to the service valve using either silver bearing or non-silver

bearing brazing material. Consult local code requirements. Refrigerant tubing and indoor coil are now ready for leak testing. This check should include all field and factory joints.

### Step 5—Make Electrical Connections

Be sure field wiring complies with local and national fire, safety, and electrical codes, and voltage to system is within limits shown on unit rating plate. Contact local power company for correction of improper voltage. See unit rating plate for recommended circuit protection device. (See Fig. 2.)

**NOTE:** Operation of unit on improper line voltage constitutes abuse and could affect unit reliability. See unit rating plate.

**NOTE:** Use only copper wire between disconnect switch and unit.

**NOTE:** Install branch circuit disconnect per NEC of adequate size to handle unit starting current, but not larger than maximum fuse size shown on unit rating plate. Locate disconnect within sight from and readily accessible from unit, per Section 440-14 of NEC.

**ROUTE GROUND AND POWER WIRES** — Remove access panel and control box cover to gain access to unit wiring. Extend wires from disconnect through power wiring hole provided and into unit control box. (See Fig. 2.) Size wires per NEC but not smaller than minimum wire size shown in presale literature.

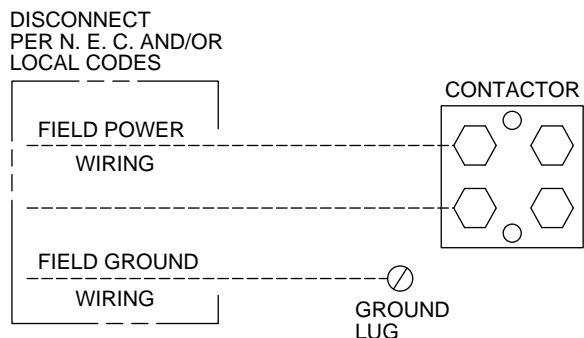
#### ⚠ WARNING

The cabinet must have an uninterrupted or unbroken ground according to NEC, ANSI/NFPA 70-1993 or local codes to minimize personal injury if an electrical fault should occur. This may consist of electrical wire or conduit approved for electrical ground when installed in accordance with existing electrical codes. Failure to follow this warning could result in an electrical shock, fire, or death.

#### ⚠ WARNING

To avoid personal injury or death, do not supply power to unit with compressor terminal box cover removed.

**CONNECT GROUND AND POWER WIRES** — Connect ground wire to ground connection in control box for safety. Connect power wiring to contactor as shown in Fig. 5.



A91056

Fig. 5—Line Power Connections

**CONNECT CONTROL WIRING** — Route 24-v control wires through control wiring grommet and connect to brown and blue pigtailed supplied in unit splice box. (See Fig. 6.)

Use No. 18 AWG color-coded, insulated (35° C minimum) wire. If thermostat is located more than 100 ft from unit (as measured along the control voltage wires), use No. 16 AWG color-coded wire to avoid excessive voltage drop.

Use furnace transformer, fan coil transformer, or accessory transformer for control power, 24-v/40va minimum.

**NOTE:** Use of available 24-v accessories may exceed the minimum 40-v power requirement. Determine total transformer loading and increase the transformer capacity or split the load with an accessory transformer as required.

### Step 6—Install Electrical Accessories

Refer to the individual instructions packaged with the kits or accessories when installing.

### Step 7—Start-up

1. Fully back seat (open) liquid and vapor service valves.
2. Unit is shipped with valve stem(s) front seated and caps installed. Replace stem caps after system is opened to refrigerant flow (back seated). Replace caps finger tight and tighten additional 1/6 turn with wrench.
3. Close electrical disconnects to energize system.
4. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
5. Set room thermostat at COOL and fan switch at FAN or AUTO, as desired. Operate unit for 15 minutes. Check system refrigerant charge. (See Step 8—Checking Charge.)

### Step 8—Checking Charge

Factory charge is shown on unit rating plate. (See Fig. 2.)

#### ⚠ CAUTION

Do not disable low-pressure switch during a condenser pump down. Compressor damage may occur if run at a negative suction pressure.

#### ⚠ CAUTION

Compressor damage may occur if system is overcharged.

#### ⚠ WARNING

Service valve gage ports are not equipped with Schrader valves. To prevent personal injury, make sure valves are fully back seated before removing gage port caps. Wear safety glasses and gloves when handling refrigerant.

Adjust charge by following procedure shown on the superheat charging tables located on unit information plate.

#### ⚠ CAUTION

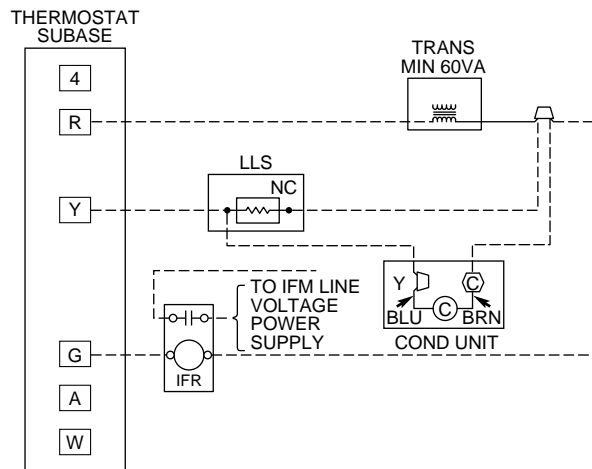
Do not vent refrigerant to atmosphere. Recover during system repair or final unit disposal.

### CARE AND MAINTENANCE

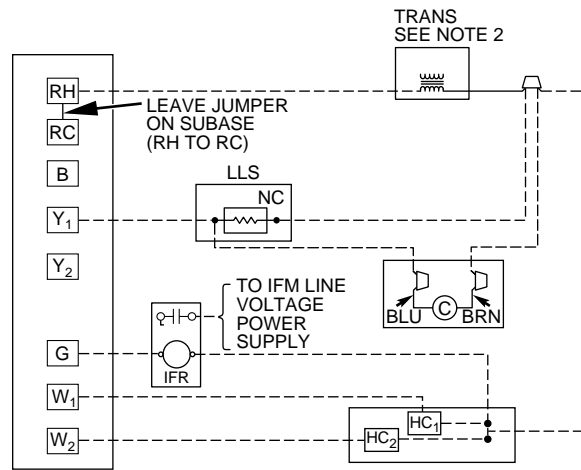
For continuing high performance and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your servicing contractor or User's Manual for the proper frequency of maintenance. Frequency of maintenance may vary depending upon geographic areas, such as coastal applications.

### Step 1—Leave User's Manual With Homeowner

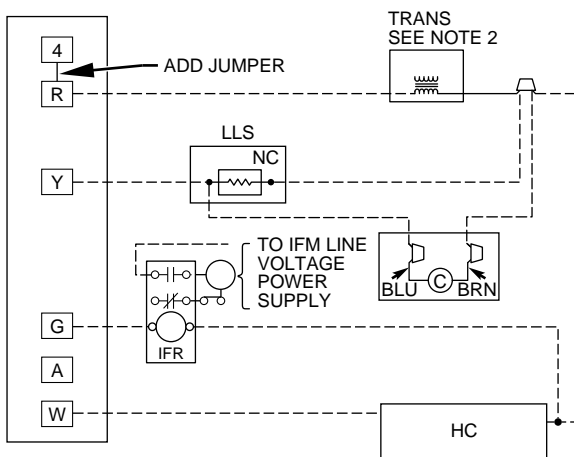
Explain system operation and maintenance procedures outlined in User's Manual.



ARRANGEMENT A—COOLING ONLY



ARRANGEMENT C—1 TRANSFORMER;  
COOLING AND 2-STAGE HEATING



ARRANGEMENT B — 1 TRANSFORMER;  
COOLING AND 1-STAGE HEATING

- NOTES:** 1. REFER TO UNIT LABEL WIRING DIAGRAM FOR WIRE COLORS. IFR, IFM AND LLS ARE LOCATED INDOORS ON HEATING-COOLING APPLICATIONS. IF ACCESSORY IFR IS REQUIRED FOR COOLING-ONLY APPLICATIONS, LOCATE IFR IN FAN COIL.
2. N.E.C. CLASS 2, 24V CIRCUIT, MIN 40VA REQUIRED.

C — CONTACTOR  
HC — HEATING CONTROL  
IFM — INDOOR FAN MOTOR  
LLS — LIQUID LINE SOLENOID VALVE  
NC — NORMALLY CLOSED  
TRANS — TRANSFORMER

**Fig. 6—24-V Control Circuit Connector**

A93199

