



38YR Heat Pumps—Outdoor Section

Installation and Start-Up Instructions

NOTE: Read the entire instruction before starting the installation.

SAFETY CONSIDERATION

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.

It is important to 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 one 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, tie-down 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. (762mm) clearance to service end of unit and 48 in. (1219mm) above unit.

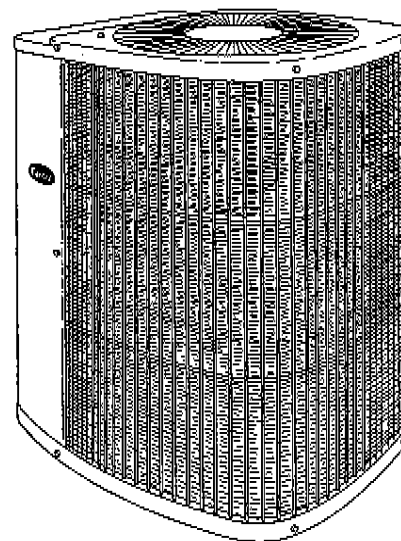


Fig. 1—Model 38YR

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For proper airflow, a 6-in. (52mm) clearance on one side of unit and 12 in. (305mm) on all remaining sides must be maintained. Maintain a distance of 24 in. (610mm) between units. Position so snow or ice from roof or eaves cannot fall directly on unit.

On rooftop applications, locate unit at least 6 in. (152mm) above roof surface. Place unit above a load-bearing wall and isolate unit and piping set from structure.

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

Step 3—Elevate Unit

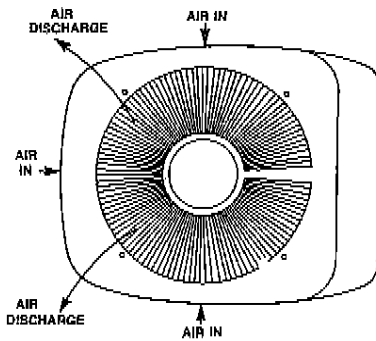
For proper drainage the heat pump must be raised off the mounting surface. Fig. 3 shows unit with accessory heat pump feet installed. Use accessory heat pump snow rack in areas where prolonged subfreezing temperatures or heavy snow occur. Refer to separate installation instructions packaged with the accessories.

Step 4—Thermostatic Expansion Valve (TXV) Usage

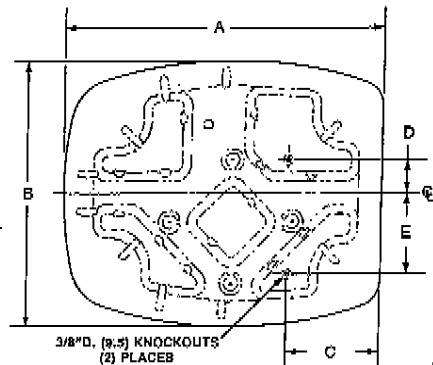
This unit must be installed with a TXV (hard shut-off) as provided in kit form inside the outdoor section to be installed on the indoor unit.

For installation, consult the TXV Installation Instructions furnished with the TXV kit.

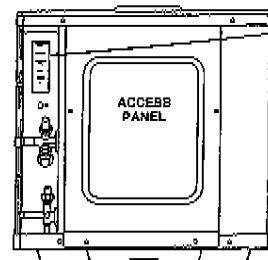
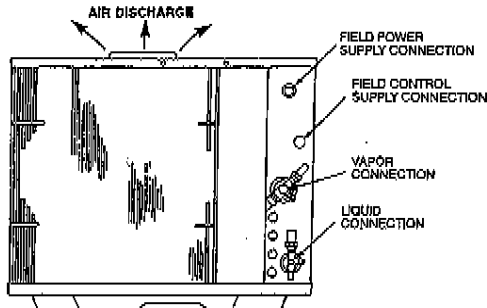
Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.



- NOTES:**
1. ALLOW 3" (76.2) CLEARANCE TO SERVICE END OF UNIT, 4" (101.6) ABOVE UNIT, & (15") ON ONE SIDE, 13" (330) ON REMAINING SIDE, & (25") (610) BETWEEN UNITS FOR PROPER AIRFLOW.
 2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 58F (13.9C), (UNLESS LOW AMBIENT CONTROL IS USED), MAXIMUM 125F (51.7C).
 3. MAXIMUM OUTDOOR OPERATING AMBIENT IN HEATING MODE IS 68F (18.9C).
 4. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS
 5. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.



UNIT MOUNTING PATTERN
VIEW FROM TOP



DATE	
MO	
MACHINE	
PRODUCT NO.	
FIGURE NO.	00
FACTORY CHARGED 0-27	
LINE	
POWER SUPPLY	WPS
PA	W2
POWERSOURCE VOLTAGE 41 UNIT	
NAME	
SOFTWARE NON INVENTION V20	
COMPANY CODE	
VOLUME SET	
PH	
PC	
SLA	
LWA	
FAX NUMBER	
VOL 18 JC	
PH	
PC	
SLA	
CURRENT TEST PROTECTIVE GAGE	
IN TEST	W2
IN TEST	W2
UNIVERSAL CIRCUIT NAME	
MAX OVERCURRENT PROTECTIVE DELAY	
TYPE	USA
MAX FUSE	USA
MAX WIRE OUT-DOWN	USA
MAX CYCLES	USA
 	
CARRIER CODE 2400000000 000 0	
INVENTION NO. 0000000000 0000000000	

UNIT SIZE	A		B		C		D		E	
	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)
018—048	34-15/16	886.7	30	762.0	8-3/16	207.3	4	101.3	9-3/4	247.2
060	45	1143.0	38-5/8	979.9	8-9/16	216.8	5-15/16	150.8	11-13/16	299.3

Fig. 2—Unit Reference Drawing

⚠ CAUTION

DO NOT BURY MORE THAN 36 IN. (914mm) OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-in. (152mm) 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 shut-down, causing refrigerant slugging and possible compressor damage at start-up.

Step 5—Make Piping Connections

Outdoor units may be connected to indoor sections using accessory tubing package or field-supplied tubing of refrigerant grade, correct size, and condition. The liquid- and vapor-tube diameters can be determined by using Table 1. For tubing requirements beyond 50 ft (15.24m), consult Long-Line Application Guideline available from your local distributor.

If either refrigerant tubing or indoor coil is exposed to atmospheric conditions for longer than 5 minutes, it must be evacuated to 1000 microns to eliminate contamination and moisture in the system.

Run refrigerant tubes as directly as possible, avoiding unnecessary turns and bends. Suspend refrigerant tubes so they do not damage insulation on vapor tube and do not transmit vibration to structure.

Also, when passing refrigerant tubes through wall, seal opening so vibration is not transmitted to structure. Leave some slack in refrigerant tubes between structure and unit to absorb vibration.

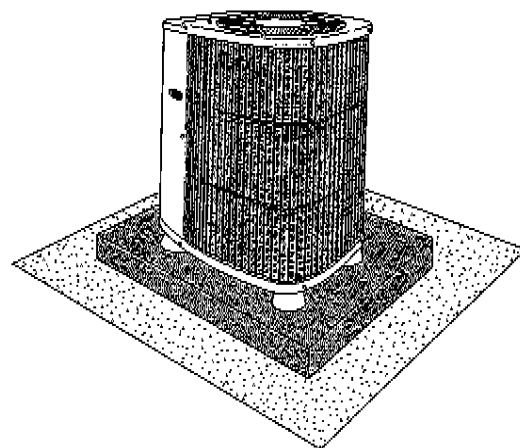


Fig. 3—Accessory Heat Pump Feet

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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 connected by 25 ft (7.62m) of field-supplied or factory accessory tubing. Check refrigerant charge for maximum efficiency. (See Step 9 — Checking Charge.)

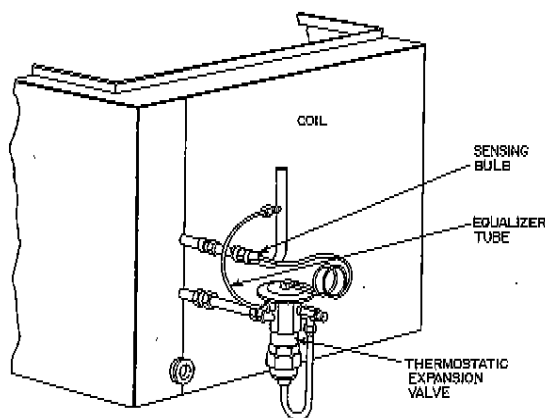


Fig. 4—Typical TXV Installation

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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	3/8	3/8	5/8	5/8
024, 030	3/8	3/8	3/4	3/4
036, 042	3/8	3/8	7/8	7/8
048, 060	3/8	3/8	7/8	1-1/8

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

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.

⚠ 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 6—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.

⚠ WARNING

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

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect unit reliability. See unit rating plate. Do not

install unit in system where voltage or phase imbalance may fluctuate above or below permissible limits.

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

NOTE: Install branch circuit disconnect per NEC of adequate size to handle unit starting current. 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.)

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.

CONNECT CONTROL WIRING — Route 24-volt control wires through control wiring grommet and connect leads to control wiring terminal board. (See Fig. 6.)

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

Use furnace or fan coil transformer as 24-volt (40 va minimum) supply for system or use accessory transformer.

NOTE: The defrost timer is factory set for 90-minute cycles. The timer can be field-set for 30- and 50-minute cycles depending on defrost conditions in your geographical location.

DISCONNECT

PER N.E.C AND/ OR

LOCAL CODES

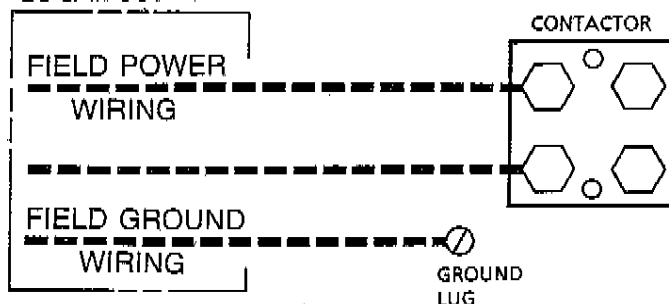


Fig. 5—Line-Power Connections

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Step 7—Install Electrical Accessories

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

⚠ CAUTION

Damage may occur to the scroll compressor if operated at a negative suction pressure during a "system pumpdown."

Step 8—Start-Up

1. Fully back seat (open) liquid- and vapor-tube 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 1/12 turn (20-ft lb torque) using a backup wrench on valve body flats to prevent distortion of sheet metal.
3. Close electrical disconnects to energize system.
4. Set room thermostat at desired temperature.
5. Set room thermostat at HEAT or COOL and fan switch at ON or AUTO, as desired. Operate unit for 15 minutes. Check system refrigerant charge. (See Step 9.)

SEQUENCE OF OPERATION — With power supplied to indoor and outdoor units, transformer is energized.

Cooling

On a "call for cooling," the thermostat "makes" circuits R-O, R-Y, and R-G. Circuit R-O energizes the reversing valve, switching it to cooling position. Circuit R-Y energizes the contactor, starting outdoor fan motor and compressor circuit. R-G energizes the indoor unit blower relay, starting the indoor blower motor on high speed.

When the thermostat is satisfied, its contacts open, deenergizing the contactor and blower relay. Compressor and motors should stop.

Heating

On a "call for heating," the thermostat "makes" circuits R-Y and R-G. Circuit R-Y energizes contactor, starting outdoor fan motor and compressor. Circuit R-G energizes the indoor blower relay, starting the blower motor on high speed.

Should the temperature continue to fall, R-W2 is made through the second-stage room thermostat bulb. Circuit R-W2 energizes a sequencer, bringing on the first bank of supplemental electric heat and providing electrical potential to the second heater sequencer (if used). If the outdoor temperature falls below the setting of the outdoor thermostat, (field-installed option) the contacts close to complete the circuit and bring on the second bank of supplemental electric heat.

When the thermostat is satisfied, its contacts open, de-energizing the contactor and sequencer. All heaters and motors should stop.

Defrost

The defrost control is a time/temperature control which includes a field-selectable (quick connects located at board edge) time period between defrost cycles (30, 50, and 90 minutes), factory set at 90 minutes.

The electronic timer and the defrost cycle will start only when the contactor is energized and the defrost thermostat is closed.

The defrost mode is identical to the cooling mode except that the outdoor fan motor stops and a second-stage heat is turned on to continue warming the conditioned space.

Step 9—Checking Charge

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

▲ WARNING

Service valve gage ports are not equipped with Schrader valves. To prevent personal injury, make sure gage manifold is connected to the valve gage ports before moving valves off fully back seated position. Wear safety glasses and gloves when handling refrigerant.

▲ CAUTION

Compressor damage may occur if system is overcharged.

Adjust charge in cooling mode by following procedure shown on the "subcooling charging tables" located on unit information plate. Check charge in heating by following procedure shown on "heating check chart" located on unit information plate.

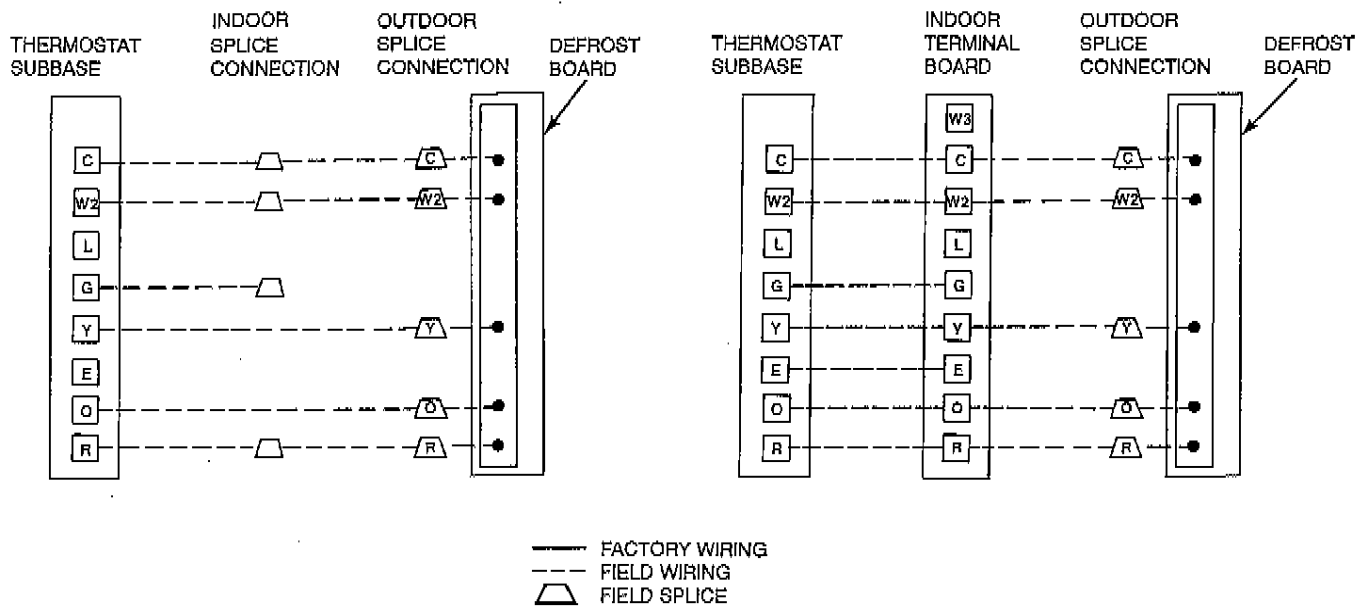
CARE AND MAINTENANCE

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.

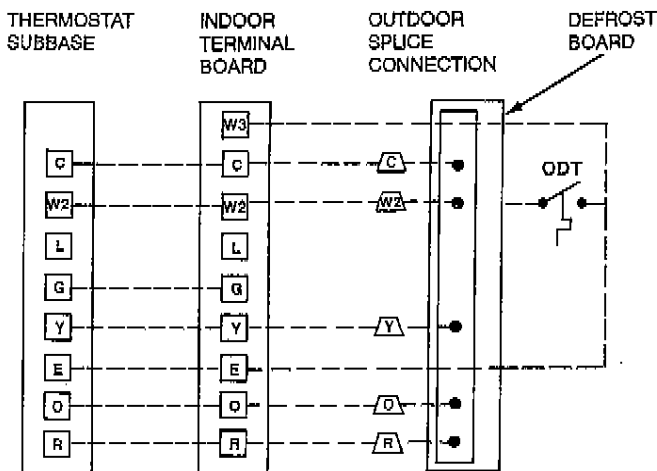
SYSTEMS WITHOUT OUTDOOR THERMOSTATS



USED WITH FD3A, FF1A, 40DQ, 40RC FAN COILS

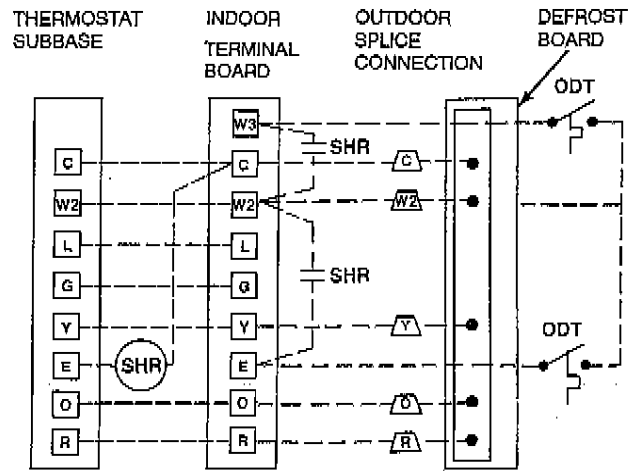
USED WITH FB4A, FB5A, 40YA, 40YR FAN COILS

SYSTEMS WITH ONE OUTDOOR THERMOSTAT



USED WITH FB4A, FB5A, 40YA, 40YR FAN COILS

SYSTEMS WITH TWO OUTDOOR THERMOSTATS



USED WITH FB4A, FB5A, 40YA, 40YR FAN COILS

REMOVE BREAK-OFF JUMPERS ON INDOOR FAN COIL CIRCUIT BOARD WHEN INSTALLING OUTDOOR THERMOSTATS

Fig. 6—Typical Circuit Connections

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