


## 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 electric codes 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 words DANGER, WARNING, and 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 which **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, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label. Electrical shock can cause personal injury or death.

### INSTALLATION

#### Step 1—Check Equipment and Job Site

**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. (762mm) clearance to service end of unit and 48 in. (1219mm) above unit.

  
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**Fig. 1—Model 38YCX**

For proper airflow, a 6-in. (152mm) clearance on 1 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 water, 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 tubing 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

### CAUTION

Accumulation of water and ice in base pan may cause equipment damage.

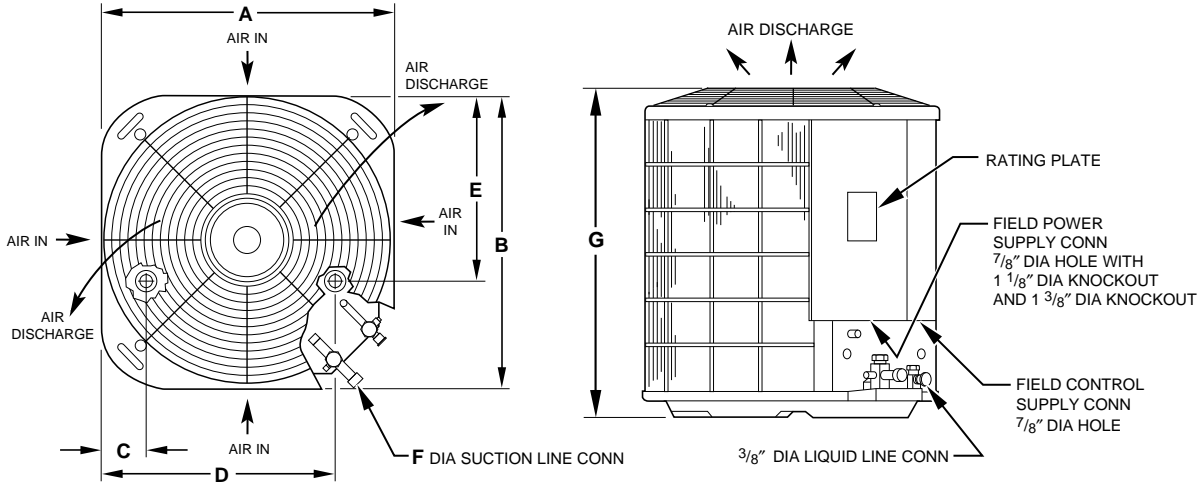
In areas where prolonged freezing temperatures are encountered, elevate unit per local climate and code requirements to provide clearance above estimated snowfall level and ensure adequate drainage of unit. (See Fig. 3.)

#### Step 4—Replace Indoor AccuRater® Piston (if required)

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

NOTES:

1. ALLOW 30" CLEARANCE TO SERVICE END OF UNIT, 48" ABOVE UNIT, 6" ON ONE SIDE, 12" ON REMAINING SIDE, AND 24" BETWEEN UNITS FOR PROPER AIRFLOW.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55° F (UNLESS LOW AMBIENT CONTROL IS USED) MAX. 125° F.
3. MAXIMUM OUTDOOR OPERATING AMBIENT IN HEATING MODE IS 66° F.
4. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.



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UNIT SIZE	A/B		C		D		E		F		G	
	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
024	22-1/2	571.5	3-11/16	93.6	18-1/8	460.4	14-3/8	365.1	5/8	15.88	33-15/16	862.0
036	30	762.0	6-1/2	165.1	23-1/2	596.9	20	508.0	3/4	19.05	39-15/16	1014.4
048	30	762.0	6-1/2	165.1	23-1/2	596.9	20	508.0	7/8	22.23	33-15/16	862.0
060	30	762.0	6-1/2	165.1	23-1/2	596.9	20	508.0	7/8	22.23	33-15/16	862.0

Fig. 2—Unit Reference Drawing

**⚠ WARNING**

Do not operate unit in the vicinity of toxic or flammable material. Failure to follow this warning can result in personal injury, fire, or death.

**⚠ CAUTION**

Remove indoor coil piston if unit is to be installed on system with a TXV metering device.

**Step 5—Make Piping Connections**

**⚠ 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 prevent compressor damage DO NOT bury more than 36 in. of refrigerant tubing. If ANY tubing is buried, provide 6 in. vertical rise at service valve.

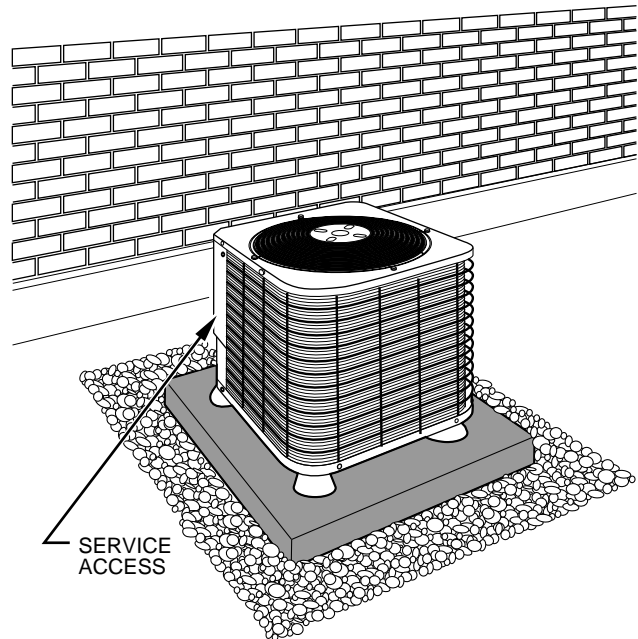


Fig. 3—Accessory Heat Pump Feet

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**Table 1—Refrigerant Connections and Recommended Liquid and Vapor Tube Diameters**

UNIT SIZE	LIQUID				VAPOR			
	Connection Dia.		Tube Dia.		Connection Dia.		Vapor Dia.	
	In.	mm	In.	mm	In.	mm	In.	mm
<b>024</b>	3/8	9.53	3/8	9.53	5/8	15.88	5/8	15.88
<b>036</b>	3/8	9.53	3/8	9.53	3/4	19.05	3/4	19.05
<b>048</b>	3/8	9.53	3/8	9.53	7/8	22.23	7/8	22.23
<b>060</b>	3/8	9.53	3/8	9.53	7/8	22.23	1-1/8	28.58

NOTES: 1. Tube diameters are for lengths up to 50 ft (15.24m). For tubing lengths greater than 50 ft (15.24m), consult Long-Line Application Guideline.  
2. Do not apply capillary tube indoor coils to these units.

**⚠ CAUTION**

To prevent damage to unit or service valves observe the following:

- Use a brazing shield.
- Wrap service valves with wet cloth or use a heat sink material.

Outdoor units may be connected to indoor section using accessory tubing package or field-supplied refrigerant grade tubing of correct size and condition. For tubing requirements beyond 50 ft (15.24m), consult Long-Line Application Guideline which is available from your local distributor.

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

**INSTALLATION RECOMMENDATIONS**

1. Locate unit away from windows.
2. Ensure that vapor and liquid tube diameters are appropriate to capacity of unit. (See Table 1.)
3. Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends.
4. Leave some slack between structure and unit to absorb vibration.
5. When passing refrigerant tubes through the wall, seal opening with RTV or other pliable silicon-based caulk. (See Fig. 4.)
6. Avoid direct tubing 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 tubing. (See Fig. 4.)
8. Ensure that tubing insulation is pliable and completely surrounds vapor tube.
9. When necessary, use hangar straps which are 1 in. (25mm) wide and conform to shape of tubing insulation. (See Fig. 4.)
10. Isolate hangar straps from insulation by using metal sleeves bent to conform to shape of insulation.

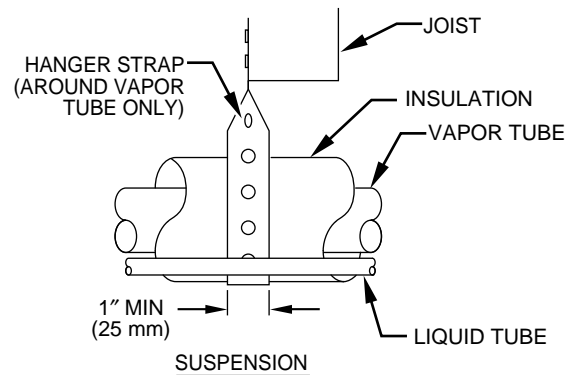
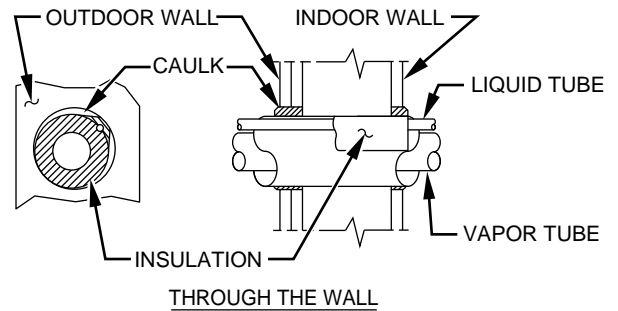
If refrigerant tubes or indoor coil is exposed to atmosphere, it must be evacuated to 500 microns to eliminate contamination and moisture in the system.

**OUTDOOR UNIT CONNECTED TO FACTORY-APPROVED INDOOR UNIT** — Outdoor unit contains correct system refrigerant charge for operation with indoor unit of same size when connected by 15 ft (4.55m) of field-supplied or factory-accessory tubing. Check refrigerant charge for maximum efficiency.

**REFRIGERANT TUBING** — Connect tubing to fittings on outdoor unit vapor and liquid service valves. (See Fig. 2 and 5.)

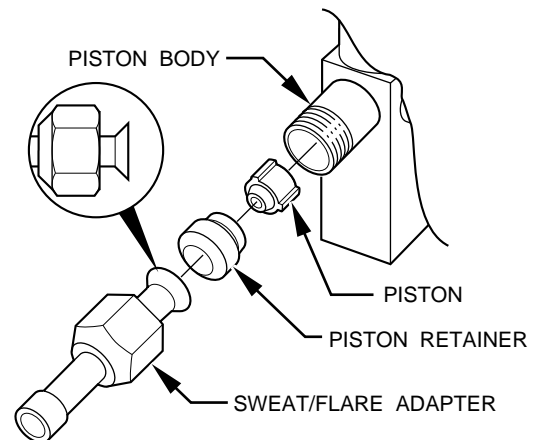
**SWEAT CONNECTION** — Use refrigerant grade tubing. Service valves are closed from factory and ready for brazing. After wrapping service valve with a wet cloth, tubing set can be brazed to service valve using either silver bearing or non-silver bearing

**NOTE:** Avoid contact between tubing and structure.



**Fig. 4—Piping Installation**

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**Fig. 5—Service Valve with Sweat Adapter Tube**

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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

### ⚠ WARNING

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

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.

**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 may fluctuate above or below permissible limits.

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

**NOTE:** Install branch circuit disconnect per local codes to handle unit starting current. Locate disconnect within sight from and readily accessible from unit per local codes.

**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 local codes but not smaller than minimum wire size shown on unit rating plate.

**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. 6.

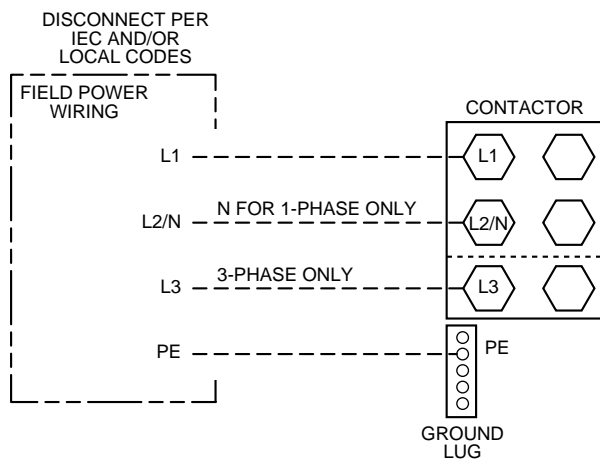


Fig. 6—Line Power Connections

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### ⚠ WARNING

The unit 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 can result in an electric shock, fire, or death.

**NOTE:** Use No. 18 AWG (American Wire Gage) color-coded, insulated (35°C minimum) wires. If thermostat is located more than 100 ft (30.5m) from unit (as measured along the control voltage wires), use No. 16 AWG color-coded wires to avoid excessive voltage drop.

**CONNECT CONTROL WIRING** — Route 24-v control wires through control wiring grommet and connect leads to control wiring terminal board. (See Fig. 7.)

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

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

**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 geographic location.

## Step 7—Compressor Crankcase Heater

When equipped with a crankcase heater, energize heater a minimum of 24 hr before starting unit. To energize heater only, set thermostat to OFF and close electrical disconnect to outdoor unit.

A crankcase heater is required if the refrigerant tubing is longer than 50 ft.

## Step 8—Install Electrical Accessories

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

## Step 9—Start-up and Check Charge

### ⚠ CAUTION

To prevent compressor damage or personal injury, observe the following:

- Do not overcharge system with refrigerant.
- Do not operate unit in a vacuum or at negative pressure.

In scroll compressor applications:

- Dome temperatures may be hot.
- In 3-phase application, incorrect phasing will cause reverse rotation, resulting in elevated noise levels, equalized pressures and reduced current draw. Correct by reversing power connection L1 and L2 on contactor.

### ⚠ CAUTION

To prevent personal injury wear safety glasses, protective clothing, and gloves when handling refrigerant and observe the following:

- Back seating service valves are not equipped with Schrader valves. Fully back seat (counter clockwise) valve stem before removing gage port cap.
- Front seating service valves are equipped with Schrader valves.

### ⚠ CAUTION

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

1. If equipped with a crankcase heater, energize a minimum of 24 hr before starting unit. To energize heater only, set thermostat OFF and close electrical disconnect to outdoor unit.
2. Fully open liquid and vapor service valves.
3. Unit is shipped with valve stem(s) front seated and caps installed. Replace stem caps after system is opened to refrigerant flow. Replace caps finger tight and tighten additional 1/6 turn using a backup wrench on valve body flats to prevent distortion of sheet metal.
4. Close electrical disconnects to energize system.
5. Set room thermostat at desired temperature.
6. Set room thermostat to HEAT or COOL and fan to ON or AUTO mode, as desired. Operate unit for 15 minutes. Check system refrigerant charge.

7. Factory charge is shown on unit rating plate. Adjust charge in cooling mode by following procedure shown in charging table. Check charge in heating mode by following procedure shown on heating check chart. Both are located on unit.

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 reversing valve, switching it to cooling position. Circuit R-Y energizes contactor, starting outdoor fan motor and compressor circuit. R-G energizes indoor unit blower relay, starting indoor blower motor on high speed.

When thermostat is satisfied, its contacts open, de-energizing contactor and blower relay. Compressor and motors 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 indoor blower relay, starting 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 supplemental electric heat and providing electrical potential to the second heater sequencer (if used). If outdoor temperature falls below the setting of the outdoor

thermostat (field-installed option), 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 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.

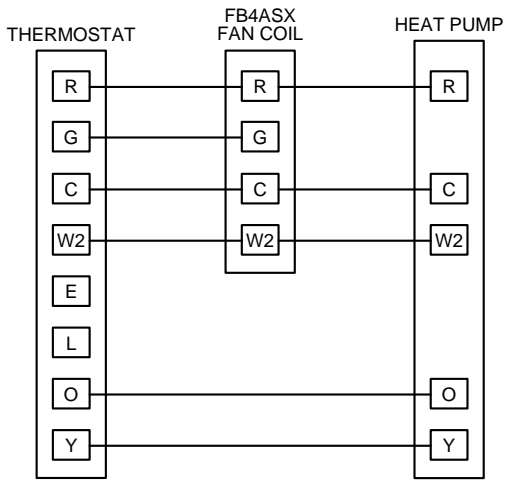
The electronic timer and defrost cycle will start only when contactor is energized and defrost thermostat is closed.

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

### **CARE AND MAINTENANCE**

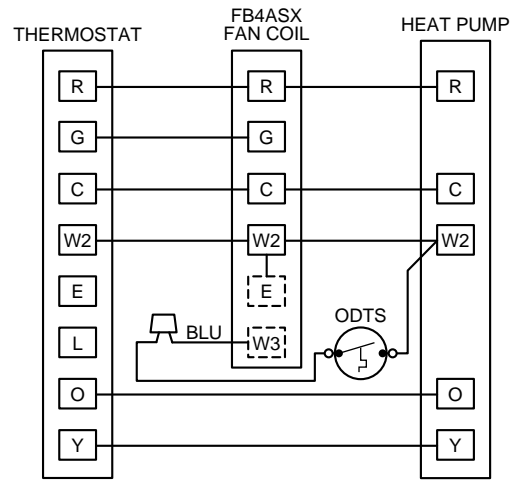
For continuing high performance and to minimize possible equipment failure, periodic maintenance must be performed on this equipment.

Leave User's Manual with owner. Explain system operation and periodic maintenance requirements outlined in manual. Frequency of maintenance may vary depending upon geographic areas, such as coastal applications.



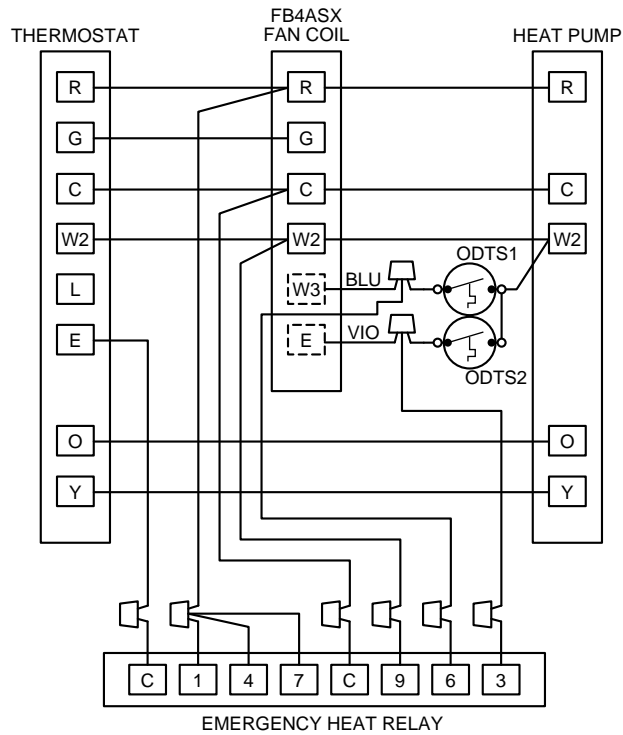
SYSTEMS WITHOUT  
OUTDOOR THERMOSTAT

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SYSTEMS WITH ONE  
OUTDOOR THERMOSTAT

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SYSTEMS WITH TWO  
OUTDOOR THERMOSTATS

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**Fig. 7—24-v Control Circuit Connections**

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