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installation instructions

593C

ELECTRIC
AIR CONDITIONER

Cancels: New

II 593C-18-1

8/1/91

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**I. CHECK EQUIPMENT AND JOBSITE****A. Unpack Unit**

Move to final location. Remove carton taking care not to damage unit.

B. Inspect Equipment

File claim with shipping company, prior to installation, if shipment is damaged or incomplete. Locate unit rating plate on unit corner panel. It contains information needed to properly install unit. Check rating plate to be sure unit matches job specifications.

II. 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 Figure 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-inch (762mm) clearance to service end of unit and 48 inches (1219mm) above unit. For proper

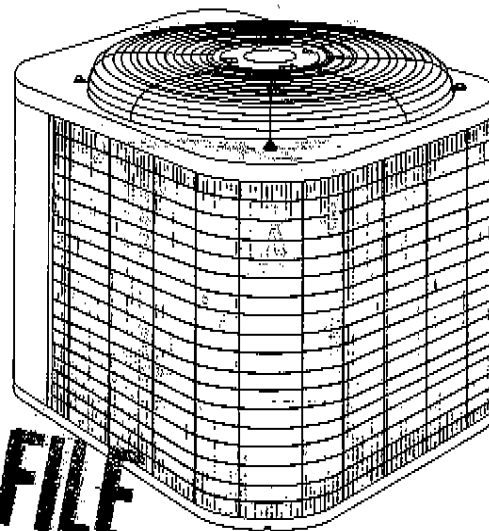


Figure 1—Model 593C

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

On rooftop applications, locate unit at least 6 inches (152mm) above roof surface. Where possible, place unit above a load-bearing wall.

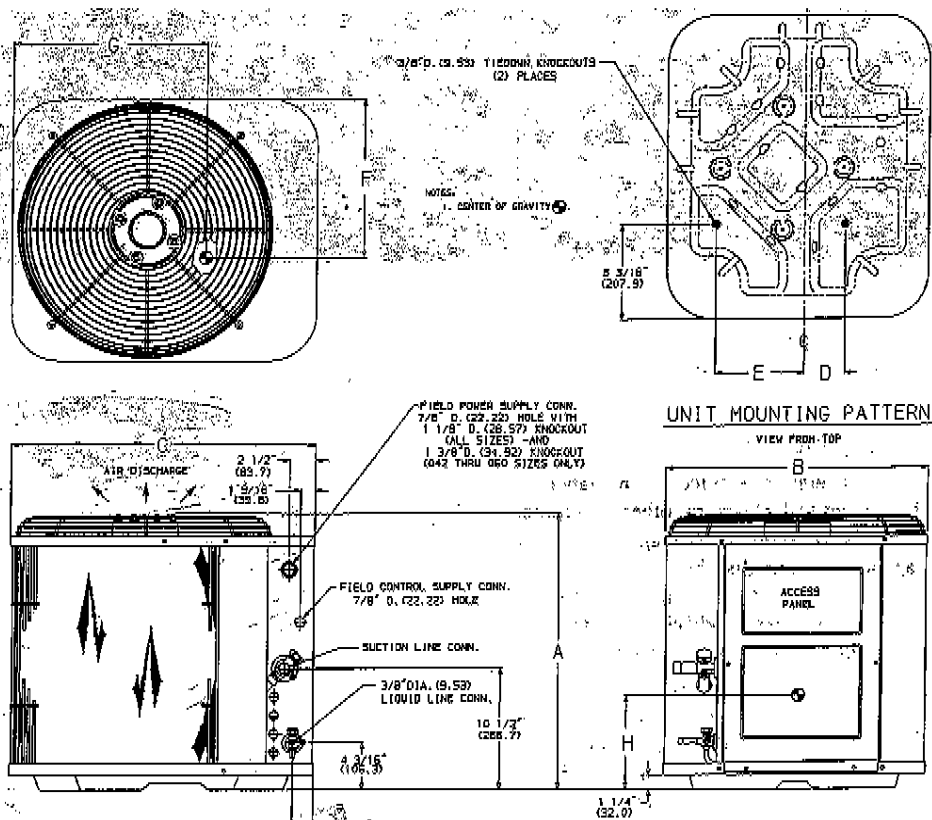
Arrange supporting members to adequately support unit and minimize transmission of vibration to building. Consult local codes governing rooftop applications.

III. REPLACE INDOOR CHECK-FLO-RATER™ PISTON (IF REQUIRED)

Check indoor coil piston to see if it matches the required piston shown on unit rating plate. (See Figure 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: DO NOT BURY MORE THAN 36 INCHES (914mm) OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-inch (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 shutdown, causing refrigerant slugging and possible compressor damage at start-up.



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MODEL 593C	A		B		C		D		E		F		G		H	
	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)	In.	(mm)
018,024	23 13/16	604.8	22 1/2	571.5	26 3/16	665.1	4 1/8	104.7	7 1/8	180.9	12 1/2	317.5	15 1/2	393.7	10 1/2	266.7
030	27 13/16	706.4	22 1/2	571.5	26 3/16	665.1	4 1/8	104.7	7 1/8	180.9	12 1/2	317.5	15 1/2	393.7	11 1/2	292.1
036	33 13/16	858.4	22 1/2	571.5	26 3/16	665.1	4 1/8	104.7	7 1/8	180.9	12 1/2	317.5	15 1/2	393.7	13	330.2
042	27 13/16	706.4	30	762.0	33	838.2	5 1/8	128.5	9 11/16	246.0	16 1/2	419.1	20 3/8	517.5	12 5/16	312.7
048	33 13/16	858.4	30	762.0	33	838.2	5 1/8	128.5	9 11/16	246.0	16 1/2	419.1	20 3/8	517.5	13 1/2	342.9
060	39 13/16	1011.2	30	762.0	33	838.2	5 1/8	128.5	9 11/16	246.0	16 1/2	419.1	20 3/8	517.5	15	381.0

Figure 2—Unit Reference Drawing.

IV. 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 I. For tubing requirements beyond 50 feet (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.

A. 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 feet (7.62m) of field-supplied or factory-accessory tubing. Check refrigerant charge for maximum efficiency. (See Section IX—Checking Charge.)

TABLE I—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	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: Tube diameters are for lengths up to 50 feet. For tubing lengths greater than 50 feet, consult Long-Line Application Guideline.

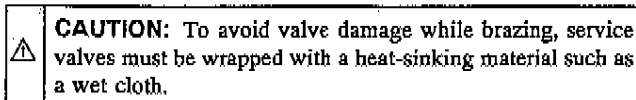
Use only 3/8-inch diameter liquid tube on cap-tube indoor coil systems.

B. Refrigerant Tubing

Connect tubing to fittings on outdoor unit vapor- and liquid-service valves. (See Figure 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.



C. 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.

V. 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.

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 (3 phase) 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, 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.

A. 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 Figure 2.) Size wires per NEC but not smaller than minimum wire size shown on Product Data Sheet.

B. Connect Ground and Power Wires

Connect ground wire to ground connection in control box for safety. Connect power wiring to contactor as shown in Figure 3.

C. Connect Control Wiring

Route 24-v control wires through control wiring grommet and connect to brown & blue pigtails supplied in unit splice box. (See Figure 4.)

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

VI. COMPRESSOR CRANKCASE HEAT

A crankcase heater is required if the refrigerant tubing is longer than 50 feet (15.24m), except in scroll compressor applications.

VII. INSTALL ELECTRICAL ACCESSORIES

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

A. Fan Delay Relay

Fan coils are equipped with a Fan Delay Relay (FDR) for the blower. The fan-delay switch is in the low-voltage control circuit. When thermostat is satisfied, compressor is turned off and blower runs for 90 seconds to remove residual cooling from indoor coil. The blower delay feature provides improved performance.

See your local distributor or dealer for specific component information.

DISCONNECT PER N. E. C. AND/ OR LOCAL CODES

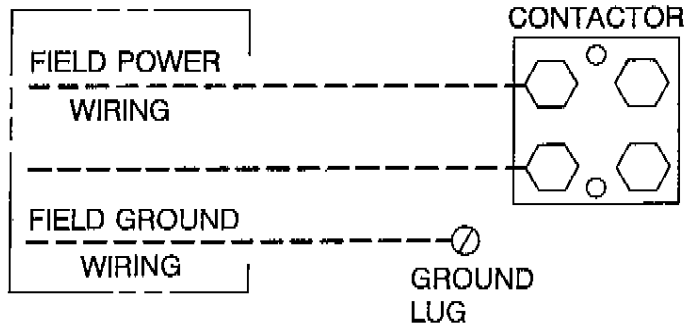


Figure 3—Line-Power Connections

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VIII. START-UP

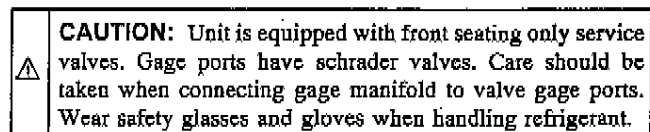
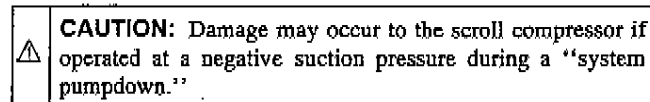
1. When equipped with a crankcase heater, energize crankcase heater a minimum of 24 hours before starting unit. To energize heater only, set thermostat at OFF position and close electrical disconnect to outdoor unit.
2. Fully backseat (open) liquid- and vapor-tube service valves.
3. Unit is shipped with valve stem(s) frontseated, and caps installed. Replace stem caps after system is opened to refrigerant flow (backseated). Replace caps finger tight and tighten additional 1/2 turn (20-ft lb torque) with wrench.
4. Close electrical disconnects to energize system.
5. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
6. Set room thermostat at COOL and fan switch at FAN or AUTO, as desired. Operate unit for 15 minutes. Check system refrigerant charge. (See Section IX.)

NOTE: For three phase scroll compressor equipment only, check compressor motor rotation at unit start up. If compressor motor runs backward, the compressor makes excessive noise, has substantially reduced current draw or discharge and suction pressures remain equalized. Shut off unit at disconnect switch and interchange the two field wiring leads at the unit contactor.

Turn on disconnect switch, restart unit and check for proper compressor motor rotation, normal compressor noise, normal current draw, suction pressure drops and discharge pressure rises from equalization.

IX. CHECKING CHARGE

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



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

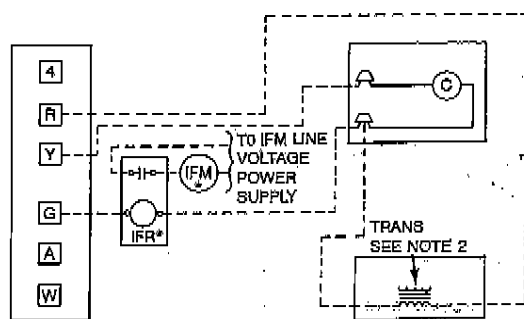
CAUTION: Compressor damage may occur if system is overcharged.

CARE AND MAINTENANCE

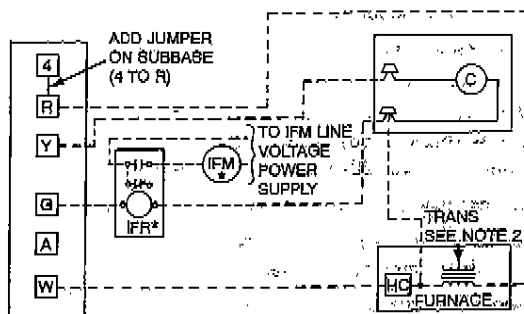
For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your servicing contractor or User's Manual for the proper frequency of maintenance. Frequency of maintenance may vary depending upon geographic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

1. LEAVE USER'S MANUAL WITH HOMEOWNER

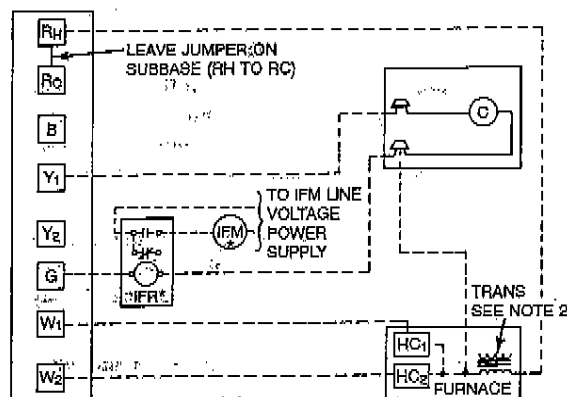
Explain system operation and maintenance procedures outlined in User's Manual.



ARRANGEMENT A—(COOLING ONLY)



ARRANGEMENT B—ONE TRANSFORMER
(COOLING AND ONE-STAGE HEATING)



ARRANGEMENT C—ONE TRANSFORMER
(COOLING AND TWO-STAGE HEATING)

*IFR AND IFM ARE LOCATED IN FURNACE ON HEATING-COOLING APPLICATIONS. IF ACCESSORY IFR IS REQUIRED FOR COOLING-ONLY APPLICATIONS, LOCATE (IFR) IN FAN COIL.

C — CONTACTOR
HC — HEATING CONTROL
IFM — INDOOR FAN MOTOR
IFR — INDOOR FAN RELAY
TRANS — TRANSFORMER

— FIELD SPICE

--- FIELD WIRING

— FACTORY WIRING

NOTES: 1. REFER TO UNIT WIRING LABEL FOR WIRE COLORS: C TO G AND C TO Y CONNECTIONS.
2. N.E.C. CLASS 2, 24V CIRCUIT, MIN. 40VA REQUIRED; 60VA REQUIRED FOR 050 AND 080 SIZE UNITS OR UNITS INSTALLED WITH LIQUID LINE SOLENOID VALVE.

Figure 4—Control Circuit Connections—24-Volt

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