



These instructions must be read and understood completely before attempting installation.

SPLIT SYSTEM AIR CONDITIONER INSTALLATION / START-UP INSTRUCTIONS /HOMEOWNERS INFORMATION MANUAL

Issue 0536

TABLE OF CONTENTS

Safety Precautions	2	Electrical Connections	7
Unit Location	2	Control Wiring	7
Rooftop Installation	3	Pre-Start Procedure	7
Evaporator Piston Selection	3	Start-Up Procedure	7
Refrigeration Line Sets	3	Adjusting charge	7
Installation of Line Sets	3	System Charging	8
Service Valve Type	5	Wiring Diagram	9
Brazing Connections	5	Superheat Tables	10
Leak Check	6	HomeOwner's Information	13
Evacuating & Charging	6	Warranty	15
Opening Service Valve	6		

These units are designed for use in residential and commercial type buildings with a wide variety of Furnace/Air Handlers and Evaporator Coil combinations. Air Conditioners may only be installed with combinations listed in the Air Conditioning and Refrigeration Institute (ARI) Directory of Certified Products. Refer to www.ariprimer.net.org.

After uncrating unit, inspect thoroughly for hidden damage. If damage is found, notify the transportation company immediately and file a concealed damage claim.

⚠ WARNING

Installation, repairs and service must be made by qualified persons. Installation, repairs or service by unqualified persons may result in physical injury to occupants or service personal. Unqualified service may result in failure of operation of the equipment or inadequate operation of this equipment. Installation **MUST** conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA 70/ANSI C1-1993 or current edition and Canadian Electrical Code Part 1 CSA C22.1.

⚠ CAUTION

Improper installation, adjustment, alteration, service or maintenance will void the warranty.

NOTE

These instructions are intended as a general guide and do not supersede national, state or local codes in any way.
These instructions must be left with the property owner.

NOTE TO INSTALLING DEALER:

These instructions and warranty are to be given to the owner or prominently displayed near the indoor furnace / air handler unit.

⚠ WARNING

This product and/or the indoor unit it is matched with may contain fiberglass wool.

Disturbing the insulation during installation, maintenance, or repair will expose you to fiberglass wool dust. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

To reduce exposure to this substance or for further information, consult material safety data sheets available from your distributor.

⚠ WARNING

DISCONNECT ALL ELECTRICAL POWER BEFORE REMOVING SERVICE PANELS.

Safety Precautions

1. Always wear proper personal protection equipment.
2. Always disconnect electrical power before removing panel or servicing equipment.
3. Keep hands and clothing away from moving parts.
4. Handle refrigerant with caution, refer to proper MSDS available by request from the refrigerant supplier or distributor.
5. Use care when lifting, avoid contact with sharp edges.

Unit Location

The remote condensing unit is to be installed on a solid foundation. This foundation should extend a minimum of 2" (inches) beyond the sides of the condensing unit. To reduce the possibility of noise transmission, the foundation slab should NOT be in contact with or be an integral part of the building foundation.

The "top discharge" condenser air is taken in through the condenser coil and is discharged out the top. For quiet operation and maximum efficiency, eliminate any obstructions which might interfere with air discharge.

Zoning ordinances may govern the minimum distance the condensing unit can be installed from the property line. Check before proceeding.

Locate outdoor unit per Figure 1.

Figure 1

Slab Mounting At Ground Level

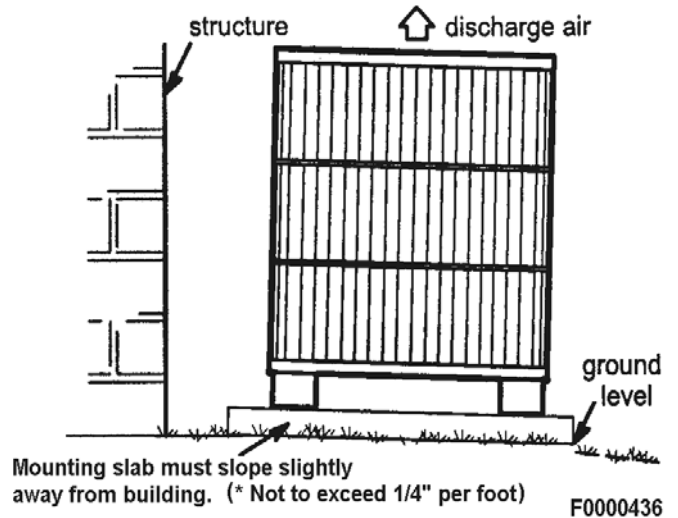
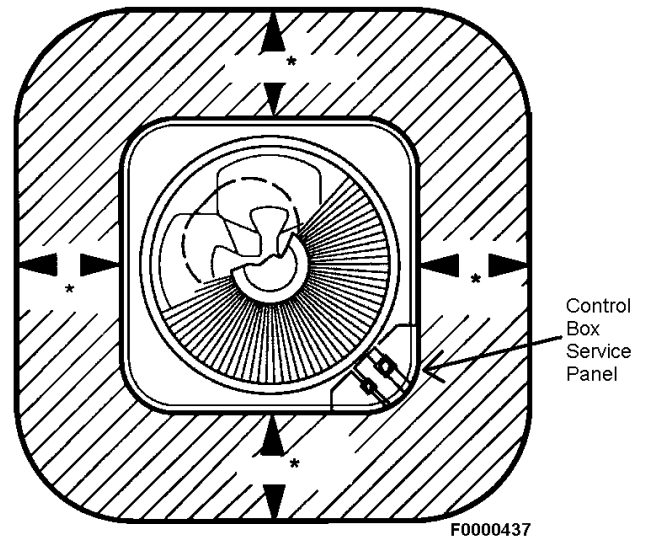


Figure 2

Installation Clearances



* NOTE - A service clearance of 30" (762 mm) must be maintained on one of the sides adjacent to the control box. Clearance to one of the other three sides must be 36" (914 mm). Clearance to one of the remaining two sides may be 12" (304 mm) and the final side may be 6" (152 mm).

NOTE - A clearance of 24" (610 mm) must be maintained between two units.

NOTE - 48" (1219 mm) clearance required on top of unit. Maximum soffit overhang is 36" (914 mm).

DO LOCATE THE UNIT:

- with proper clearances on sides and top of unit
- on a solid, level foundation or pad
- to minimize refrigerant line lengths

DO NOT LOCATE THE UNIT:

- on brick, concrete blocks or unstable surfaces
- near clothes dryer exhaust vents
- near sleeping area or near windows
- under eaves where water, snow or ice can fall directly on the unit

Roof Top Installations

If necessary to install units on a roof structure, be sure to elevate and level the units. Ensure the roof structure and anchoring method is adequate for unit location. Isolate unit and tubing from building structure. Consult local codes regarding rooftop mounting.

Evaporator Piston Selection

The condensing unit must be matched to an approved evaporator. Refer to Table 1 or unit rating plate for proper size piston. If the evaporator coil does not have a piston already installed or if the piston installed is not the one indicated, a replacement piston is required. See the evaporator coil (indoor unit) instructions for details of changing the piston.

The evaporator coil may also use a thermal expansion valve (TXV) in place of a piston. Contact distributor for correct piston or TXV part/part number.

NOTE: The proper piston or thermostatic expansion valve MUST be installed in the indoor coil prior to installation of refrigerant lines.

Table 1

13 SEER A/C Piston Sizes	
Tonnage	Piston Size
1.5	55
2	67
2.5	71
3	78
3.5	82
4	90
5	101

Refrigeration Line Sets

Fully annealed refrigeration lines must be used when installing the system. Use only refrigeration grade copper pipe. Refer to **Table 2** for piping size requirements. Split systems may be installed with up to 50 feet of line set (no more than 20 feet vertical) without special consideration. For other lengths, refer to tables 3, 4 and 5.

Table 2

Line Set Sizes		
Unit Size	Liquid Line	Vapor Line
18	3/8"	3/4"
24	3/8"	3/4"
30	3/8"	3/4"
36	3/8"	3/4"
42	3/8"	7/8"
48	3/8"	7/8"
60	3/8"	1-1/8" **

* 7/8" permissible, resulting in 3-4% capacity reduction

It is important that no tubing be cut or seals broken until you are ready to actually make connections to the evaporator and to the condenser section. DO NOT remove rubber plugs or copper caps from the tube ends until ready to make connections at evaporator and condenser. Under no circumstance leave the lines open to atmosphere for any period of time, if so unit requires additional evacuation to remove moisture.

Be *extra careful* with sharp bends. Tubing can "kink" very easily, and if this occurs, the entire tube length will have to be replaced. *Extra care* at this time will eliminate future service problems.

It is recommended that vertical suction risers not be up-sized. Proper oil return to the compressor should be maintained with suction gas velocity.

Table 3

Liquid Line Size for A/C				
Unit Size	Approved Liquid Line Diameters up to:			
	25 ft.	50 ft.	100 ft.	150 ft.
18	3/8"	3/8"	3/8"	3/8"
24	3/8"	3/8"	3/8"	3/8"
30	3/8"	3/8"	3/8"	3/8"
36	3/8"	3/8"	3/8"	3/8" 1/2"
42	3/8"	3/8"	3/8" 1/2**	3/8" 1/2**
48	3/8"	3/8"	3/8"	1/2"
60	3/8"	3/8"	3/8"	1/2"

Table 4

Vapor Line Sizes for Outdoor Section Below Indoor Section			
Nominal Unit Size	Line Set Length up to . . .		
	50 ft.	100 ft.	150 ft.
18	3/4"	3/4"	3/4"
24	3/4"	3/4"	3/4"
30	3/4"	3/4"	7/8"
36	3/4"	7/8"	7/8"
42	7/8"	7/8"	7/8"
48	7/8"	1-1/8"	1-1/8"
60	1-1/8"	1-1/8"	1-1/8"

Table 5

Vapor Line Sizes for Outdoor Section Above Indoor Section			
Nominal Unit Size	Line Set Length up to		
	50 ft.	100 ft.	150 ft.
18	3/4"	3/4"	3/4"
24	3/4"	3/4"	3/4"
30	3/4"	3/4"	7/8"
36	3/4"	3/4"	7/8"
42	7/8"	7/8"	7/8"
48	7/8"	7/8"	1-1/8"
60	1-1/8"	1-1/8"	1-1/8"

Installation Of Line Sets

DO NOT fasten liquid or suction lines in direct contact with the floor or ceiling joist. Use an insulated or suspension type of hanger. Keep both lines separate, and always insulate the suction line. Long liquid line runs (30 feet or more) in an attic will require insulation. Route refrigeration line sets to minimize length.

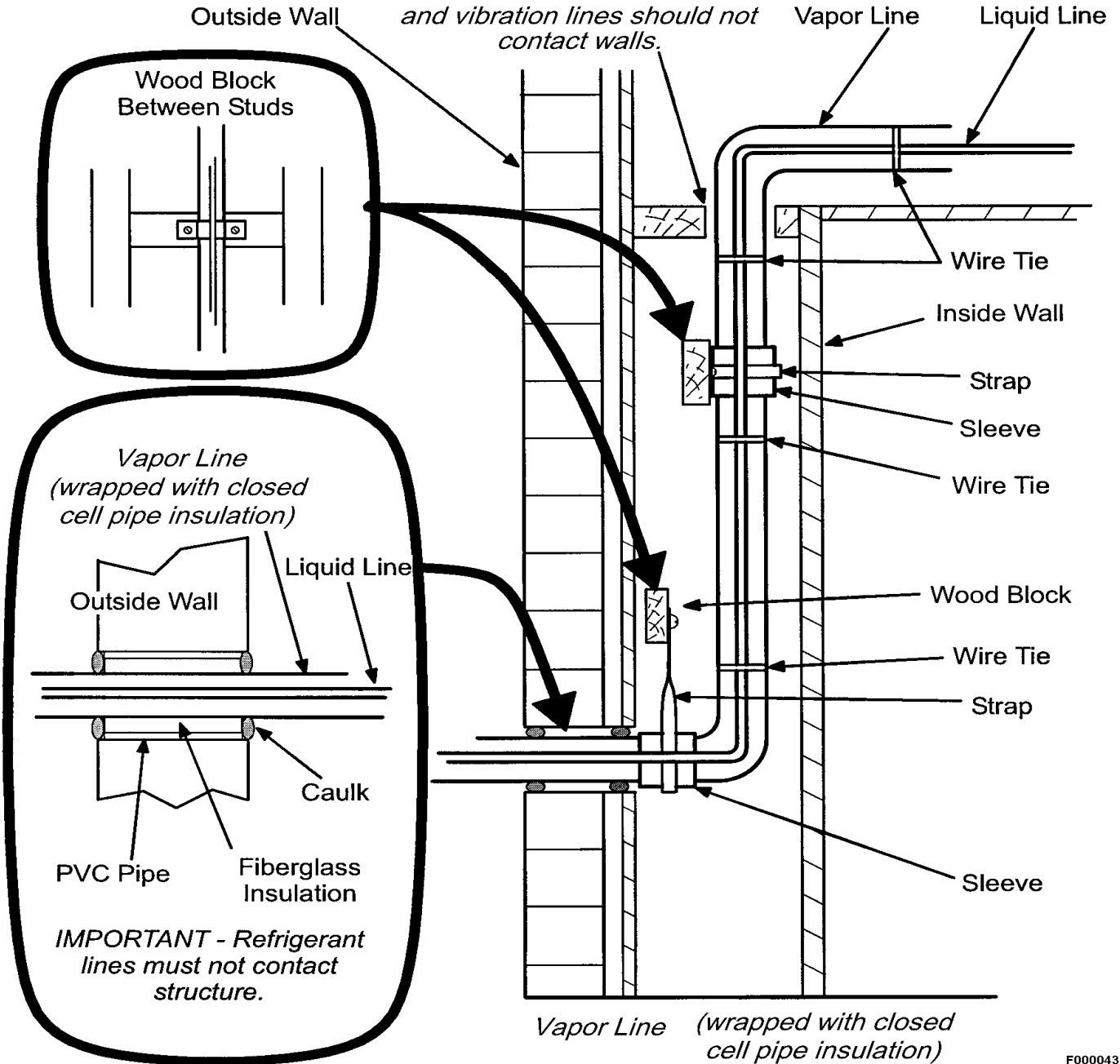
DO NOT let refrigerant lines come in direct contact with foundation. When running refrigerant lines through the foundation or wall, openings should allow for a sound and vibration absorbing material to be placed or installed between tubing and foundation. Any gap between foundation or wall and refrigerant lines should be filled with a vibration damping material.

Figure 3

Refrigerant Line Sets How To Install Vertical Runs (new construction shown)

NOTE - Similar installation practices should be used if line set is to be installed on exterior of outside wall.

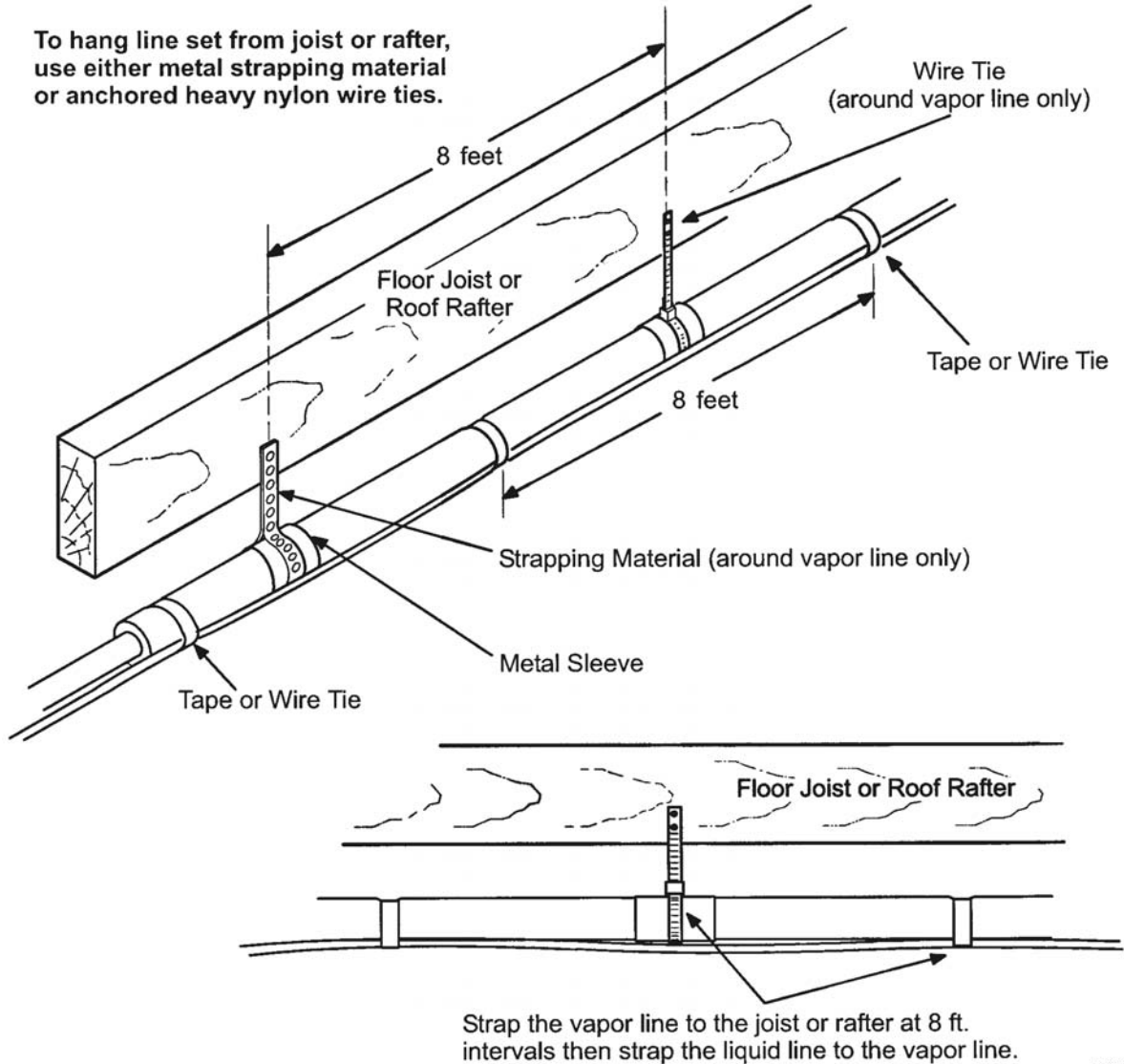
IMPORTANT - To reduce noise and vibration lines should not contact walls.



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Figure 4

Refrigerant Line Sets: Installing Horizontal Runs



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Service Valve Type

The outdoor condensing unit is supplied with sweat brass service valves with copper stubs. All service valves are positioned to seal refrigerant in the unit with gauge ports open to connecting lines. Gauge ports have Schraeder valve core installed and require use of charging hoses with depressors. DO NOT heat valve body above 250 degrees F. Service valves must be wrapped with wet rags or otherwise protected from heat during brazing. Use care to ensure no moisture enters valves or Schraeder valve cores if wet rags are used.

Brazing Connections

⚠ WARNING

FIRE HAZARD!

Refrigerant and oil mixture under pressure could ignite as it escapes and contacts brazing torch resulting in FIRE. Make sure the refrigerant charge is properly removed from both the high and low sides of the system before brazing any component or lines.

FAILURE TO DO SO COULD RESULT IN BODILY INJURY OR DEATH.

Before making sweat connections, be sure all joints are clean. Before heat is applied for brazing, dry nitrogen should be flowing through the tubing to prevent oxidation and scale formation on the inside of the tubing.

The following is the recommended method for making sweat connections at the refrigerant line connections:

1. Deburr and clean refrigerant tube end with emery cloth or steel brush.
2. Insert tubing into swage fitting connection.
3. Apply wet rags over valves or otherwise protect from heat.
3. Allow dry nitrogen to flow through refrigerant pump.
5. Braze joint, using a suitable brazing alloy for copper to copper joints.
6. Quench the joint and tubing with water using a wet rag. Leave rag on fitting body and re-wet with water to help cool area.

Leak Check

Refrigeration lines and indoor coil must be checked for leaks after brazing and before evacuation. The recommended procedure is to apply a trace amount of vapor refrigerant (approximately two ounces or 3 psig) into the line set and indoor coil, then pressurize with 150 psig of dry nitrogen. Use a refrigerant leak detector to check all joints. The system may also be checked for leaks using a halide torch or pressure and soapy solution. After completion of leak check, relieve all pressure from system before evacuation.

Evacuating And Charging Instructions

NOTE: Intentional release of CFC or HCFC refrigerant to the atmosphere violates Federal Law. It may also violate State and Local Codes. Check all Federal, State and Local Codes before proceeding.

These outdoor units are pre-charged at the factory with adequate refrigerant to handle **15 feet** of refrigerant tubing.

NOTE: DO NOT use any portion of the charge for purging or leak testing. It is mandatory that a thorough evacuation of the refrigeration lines and indoor coil be performed.

The liquid line and suction line service valves have been closed after final testing at the factory. *DO NOT disturb these valves until the lines have been leak checked and evacuated or the charge in the unit may be lost.*

1. Connect the vacuum pump to the center hose of the manifold gauge set, the low-pressure manifold gauge to the vapor service valve and the high pressure manifold gauge to the liquid service valve.

NOTE: Unnecessary switching of hoses can be avoided and complete evacuation of all lines can be achieved by also connecting a branch hose from the manifold gauge center port to a cylinder of R-22. Provide a separate shut-off valve to vacuum pump to avoid contaminating vacuum pump oil with refrigerant.

2. The valves should be kept in the "front seated" (closed) position. This will allow evacuation of the

refrigeration lines and the indoor coil, without disturbing the factory charge in the outdoor unit.

3. Follow the vacuum pump manufacturer's instructions. Allow the pump to operate until the system has been evacuated down to 300 microns. Allow the pump to continue running for an additional 15 minutes. Turn OFF the pump and leave the connections secured to the two (2) service valves. After 5 minutes, if the system fails to hold 500 microns or less, check all connections for tight fit and repeat the evacuation procedure.
4. Isolate the vacuum pump from the system by closing the shutoff valves on the gauge-set. Disconnect the vacuum pump.

Opening Service Valves

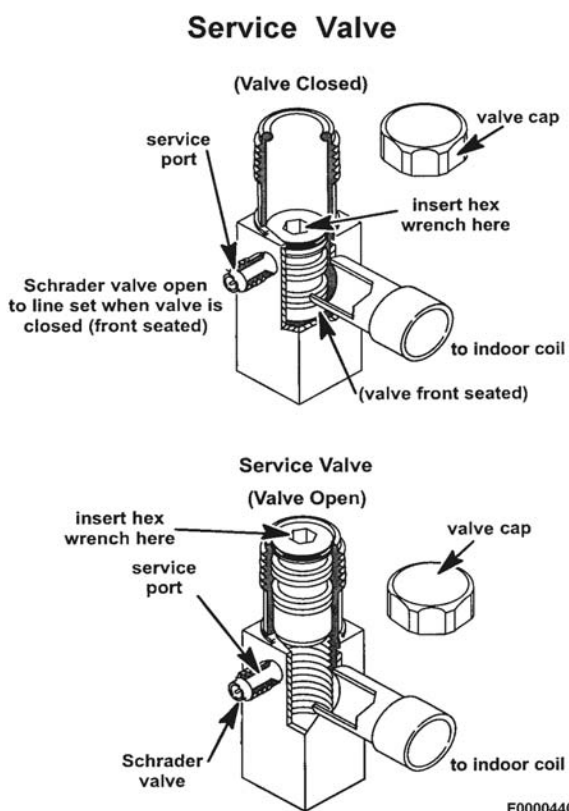
After evacuation of the connecting lines, remove the service valve cap and fully insert the hex wrench into the stem. A back-up wrench is required on the valve body to open the valve stem. Back-out counterclockwise until the valve stem just touches the coined edge.

Wrench sizes:

- 3/8 service valve: 3/16" Hex wrench
- 3/4 service valve: 5/16" Hex wrench
- 7/8 service valve: 5/16" Hex wrench

Replace service valve cap and torque to 8-11 ft-lb on 3/8" valves; 12-15 ft-lb on 3/4" valves; 15-20 ft-lb on 7/8" valves. Use backup wrench on valve body when torquing valve cap.

Figure 5



NOTE: The cap is the primary seal and must be tightened to prevent leaks.

Torque gauge port caps hand tight after adjusting charge per "Adjusting Charge" section.

Electrical Connections

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Turn OFF electric power before connecting unit, performing any maintenance or removing panels or doors.

FAILURE TO DO SO COULD RESULT IN BODILY INJURY OR DEATH.

Be sure to check all local codes to determine that the unit is installed accordance with local requirements. Consult the National Electric Code for wire size requirements. Use 60° C wire or higher. Always provide ground connections to the outdoor unit. Power supply must agree with rating on unit nameplate.

Provide line voltage power supply to unit from a properly sized disconnect switch. Route power and ground wires from disconnect switch to unit. Line voltage connections are made at the line side of the contactor in the electrical box of the condensing unit. Follow the appropriate wiring diagram attached to inside of the access door of the unit.

Proper fusing recommendations are also indicated on Unit Rating Plate. In general, the best fuse for any unit is the smallest fuse that will hold equipment on line under normal use and service without nuisance tripping breakers or blowing of fuses. Time delay fuses are required to prevent blowing due to starting current (the current in rush when equipment starts is referred to as the Locked Rotor Amps or (LRA). A fuse of this kind properly sized will give maximum equipment protection.

Control Wiring

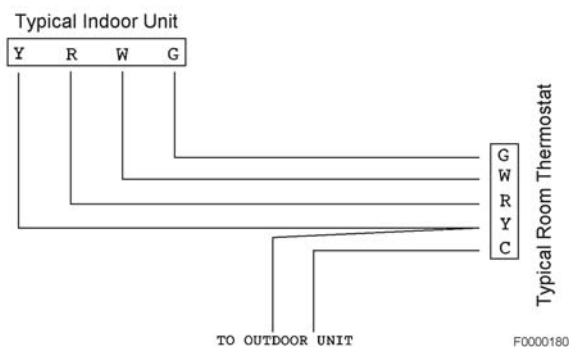
The control voltage is 24 Vac. High quality insulated 18 AWG is recommended for control wiring. For lengths longer than 150 feet, contact your local distributor for technical service.

Ensure room thermostat is properly installed per instructions shipped with room thermostat. Generally, thermostat should not be exposed to sunlight, drafts or vibration and should not be mounted on exterior walls.

Low voltage control wire connections should be made as noted on the wiring diagram on the inside cover of the outdoor unit.

Figure 6

Diagram Typical HEAT / COOL



Pre-Start Procedure

1. Check to ensure:
 - service valve caps are installed and tightened
 - voltage supply at unit agrees with nameplate rating
 - all factory and field wiring connections are tight
 - indoor fan motor is on correct speed tap
2. Close electrical disconnects to energize system.
3. Energize crankcase heater, on units so equipped, for 8 hours before operating the units.

Start-Up Procedure

1. Set thermostat selector switch to OFF.
2. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
3. Set the system switch of the thermostat on COOL and fan switch for continuous operation or AUTO, as desired. Operate unit for a minimum of 10 minutes, then check the system refrigerant charge.
4. Adjust refrigerant charge per "Adjusting Charge" section.

Adjusting Charge

All split system units are factory charged for 15 feet of connecting line set and matched evaporator coil. Refrigerant charge should initially be adjusted for line set lengths other than 15 feet. For line sets shorter than 15 feet in length, remove charge per **Table 6**. For line sets longer than 15 feet, add charge per **Table 6**. Oil charge is sufficient for all line lengths.

Table 6

Refrigeration Charge Adjustment	
Liquid Line Diameter	Oz. Per Linear Foot *
3/8"	.60
* Factory charge for series is for 15' (ft.) line sets and evaporator coil.	

Final charge adjustments should be in the cooling mode by subcooling / superheat check, only when outdoor ambient is above 60°F. If the outdoor ambient is below 60°F, adjust charge only by weight and recheck later when ambient is above 60°F.

Before final adjustment is made to the refrigerant charge, it is imperative proper indoor airflow be established. Airflow will be higher across a dry coil versus a wet coil. Blower charts are usually calculated with a **dry coil**. Recommended airflow is **350-450 CFM per ton** (12,000 Btuh) through a wet coil. Refer to indoor unit instructions for methods of determining air flow and blower performance. To determine cfm flow in the field the following calculation may be used:

Example:

(Electric Heat)

$$\frac{\text{VOLTS X AMPS X 3.414 BTUH/WATT}}{1.08 \text{ X TEMP. DIFF.}} = \text{C.F.M.}$$

(Fossil Fuel)

$$\frac{\text{BTUH OUTPUT}}{1.08 \text{ X TEMP. DIFF.}} = \text{C.F.M.}$$

NOTE: Each time charge is added to or removed from the system, allow the system to run a minimum of 10 minutes before pressure/temperature readings are re-taken and superheat calculations made.

TXV System Charging

1. Operate unit for minimum of 10 minutes (be sure variable speed systems are at 100% fan speed).
2. Measure pressure and temperature at liquid valve service port. Use a good thermistor or electronic thermometer.
3. Subtract measured temperature from saturation temperature (of measured pressure) measured to obtain subcooling. Refer to **Table 8** for saturation temperature of R-22.
4. The subcooling level should be 10-12°F subcooling.
5. If measured subcooling is:
 - more than required, slowly recover refrigerant to obtain required subcooling.
 - less than required, slowly add refrigerant to obtain required subcooling.

Piston System Charging

1. Operate unit for minimum of 10 minutes (be sure variable speed systems are at 100% fan speed).
2. Measure pressure and temperature at vapor valve service port. Use a good thermistor or electronic thermometer.
3. Subtract saturation temperature (of measured pressure) from temperature measured to obtain superheat. Refer to **Table 8** for saturation temperatures of R-22.
4. Measure outdoor dry bulb using a good thermometer and indoor wet bulb using a psychrometer.
5. Using measured temperatures, find closest outdoor dry bulb and indoor wet bulb temperatures on appropriate charging tables and locate required superheat. (Refer to pages 10 - 12.)
6. If measured superheat is:
 - more than required, slowly add refrigerant to obtain required superheat.
 - Less than required, slowly recover refrigerant to obtain required superheat.

Unit Maintenance

The unit should be inspected and cleaned on an annual basis by a qualified technician. This should include checking for adequate clearances, electrical connections, duct connections/blockages, air filters, airflow, lubrication, and operational performance of system. **Coils may require cleaning. The coil should always be cold when cleaning. Use an alkaline-based cleaner only.**

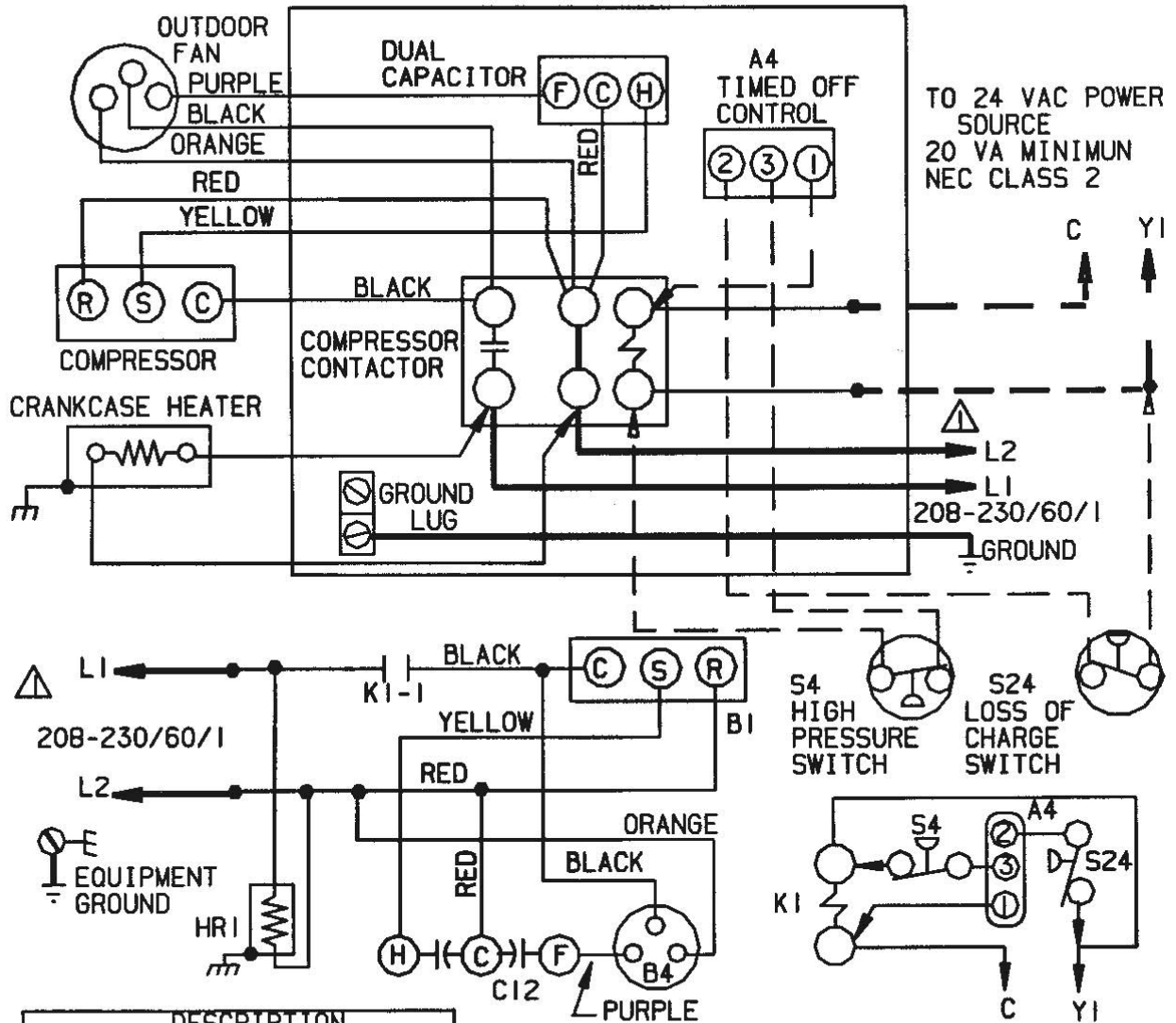
Use of acidic cleaners will damage coil materials and void manufacturers warranty.

Table 8

R-22 Saturation Temperature / Pressure Chart

Pressure (psig)	Temp. (°F)	Pressure (psig)	Temp. (°F)	Pressure (psig)	Temp. (°F)	Pressure (psig)	Temp. (°F)	Pressure (psig)	Temp. (°F)	Pressure (psig)	Temp. (°F)
19.3	-6	31.8	9	44.1	21	58.8	33	76.0	45	155.7	85
20.8	-4	32.8	10	45.3	22	60.1	34	77.6	46	168.4	90
22.4	-2	33.7	11	46.4	23	61.5	35	79.2	47	181.8	95
24.0	0	34.7	12	47.6	24	62.8	36	80.8	48	195.9	100
24.8	1	35.7	13	48.8	25	64.2	37	82.4	49	210.8	105
25.6	2	36.7	14	49.9	26	65.6	38	84.0	50	226.4	110
26.4	3	37.7	15	51.2	27	67.1	39	92.6	55	242.7	115
27.3	4	38.7	16	52.4	28	68.5	40	101.6	60	259.8	120
28.2	5	39.8	17	53.6	29	70.0	41	111.2	65	277.8	125
29.1	6	40.8	18	54.9	30	71.4	42	121.4	70	296.7	130
30.0	7	41.9	19	56.2	31	73.0	43	132.2	75	316.5	135
30.9	8	43.0	20	57.5	32	74.5	44	143.6	80	337.4	140

A/C SINGLE PHASE WIRING DIAGRAM



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C12	CAPACITOR-DUAL
HR1	HEATER-COMPRESSOR
K1, -1	CONTACTOR-COMPRESSOR
S4	SWITCH-HIGH PRESSURE
S24	SWITCH-LOSS OF CHARGE

⚠ FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

WARNING-
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

← INDICATES OPTIONAL COMPONENTS

— LINE VOLTAGE FIELD INSTALLED
- - - CLASS II VOLTAGE FIELD INSTALLED

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SUPERHEAT TABLES FOR CHARGING SYSTEMS WITH PISTON COILS

Required Superheat for 2AC13 (,L)18P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	6	4	3	--	--	--	--	--	--	--	--	--	--	--
55	8	7	5	3	--	--	--	--	--	--	--	--	--	--
57	11	9	7	6	4	2	--	--	--	--	--	--	--	--
59	13	11	10	8	7	4	3	--	--	--	--	--	--	--
61	15	14	12	10	9	7	5	3	--	--	--	--	--	--
63	17	16	14	13	11	9	7	5	3	--	--	--	--	--
65	19	18	16	15	14	11	10	7	5	3	--	--	--	--
67	21	20	18	17	16	14	12	10	7	5	3	--	--	--
69	23	22	20	19	18	16	14	12	10	7	6	4	2	--
71	25	24	22	21	20	18	17	14	12	10	8	6	4	3
73	27	26	24	23	22	20	19	17	14	12	10	9	7	5
75	29	28	26	25	24	22	21	19	17	14	13	11	9	7

Required Superheat for 2AC13(B,L)24P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	4	--	--	--	--	--	--	--	--	--	--	--	--	--
55	8	5	2	--	--	--	--	--	--	--	--	--	--	--
57	12	9	6	3	--	--	--	--	--	--	--	--	--	--
59	16	13	10	7	5	--	--	--	--	--	--	--	--	--
61	19	16	14	11	9	6	2	--	--	--	--	--	--	--
63	22	20	17	15	13	10	6	2	--	--	--	--	--	--
65	26	23	21	18	16	14	10	6	2	--	--	--	--	--
67	29	27	24	22	19	17	14	10	6	2	--	--	--	--
69	32	30	28	25	23	20	18	14	10	6	3	--	--	--
71	35	33	31	29	26	24	21	18	14	10	7	4	--	--
73	38	36	34	32	30	27	25	21	18	14	11	8	5	2
75	42	40	37	35	33	31	28	25	21	18	15	12	9	6

Required Superheat for 2AC13(B,L)30P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	4	--	--	--	--	--	--	--	--	--	--	--	--	--
55	7	4	2	--	--	--	--	--	--	--	--	--	--	--
57	10	8	6	3	--	--	--	--	--	--	--	--	--	--
59	14	11	9	7	4	--	--	--	--	--	--	--	--	--
61	16	14	12	10	7	5	2	--	--	--	--	--	--	--
63	19	17	15	13	11	8	5	2	--	--	--	--	--	--
65	22	20	18	16	14	11	9	5	2	--	--	--	--	--
67	25	23	21	19	17	15	12	9	5	2	--	--	--	--
69	28	26	24	22	20	18	15	12	9	5	3	--	--	--
71	31	29	27	25	23	21	18	15	12	9	6	4	--	--
73	33	31	30	28	26	24	21	18	15	12	10	7	5	2
75	36	34	32	30	28	26	24	21	18	15	13	10	8	5

Required Superheat for 2AC13(B,I)36p-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	4	2	--	--	--	--	--	--	--	--	--	--	--	--
55	7	5	3	--	--	--	--	--	--	--	--	--	--	--
57	9	8	6	4	2	--	--	--	--	--	--	--	--	--
59	12	10	8	6	5	2	--	--	--	--	--	--	--	--
61	15	13	11	9	7	5	3	--	--	--	--	--	--	--
63	17	15	14	12	10	8	6	3	--	--	--	--	--	--
65	19	18	16	14	13	10	8	6	3	--	--	--	--	--
67	21	20	18	17	15	13	11	8	6	3	--	--	--	--
69	24	22	20	19	17	16	14	11	8	6	4	--	--	--
71	26	24	23	21	20	18	16	14	11	8	6	4	2	--
73	28	27	25	23	22	20	19	16	14	11	9	7	5	3
75	30	29	27	26	24	23	21	19	16	14	12	10	8	6

Required Superheat for 2AC13(B,L)42P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	4	--	--	--	--	--	--	--	--	--	--	--	--	--
55	9	6	3	--	--	--	--	--	--	--	--	--	--	--
57	13	10	7	4	--	--	--	--	--	--	--	--	--	--
59	17	14	12	8	5	--	--	--	--	--	--	--	--	--
61	20	18	15	13	9	6	4	--	--	--	--	--	--	--
63	24	22	19	16	14	11	8	3	--	--	--	--	--	--
65	28	26	23	20	17	15	12	7	3	--	--	--	--	--
67	31	29	26	24	21	19	16	12	7	3	--	--	--	--
69	35	32	30	28	25	22	20	16	12	7	4	--	--	--
71	38	36	34	31	29	26	23	20	16	12	8	5	2	--
73	42	39	37	35	32	30	27	23	20	16	13	10	6	3
75	45	43	40	38	35	33	31	27	23	20	16	13	10	7

Required Superheat for 2AC13(B,L)48P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	4	--	--	--	--	--	--	--	--	--	--	--	--	--
55	8	5	--	--	--	--	--	--	--	--	--	--	--	--
57	13	10	7	3	--	--	--	--	--	--	--	--	--	--
59	17	14	11	8	4	--	--	--	--	--	--	--	--	--
61	21	18	15	12	9	5	3	--	--	--	--	--	--	--
63	25	22	19	16	14	10	7	2	--	--	--	--	--	--
65	29	26	23	20	18	15	12	7	2	--	--	--	--	--
67	33	30	27	24	22	19	16	11	7	2	--	--	--	--
69	36	34	31	28	26	23	20	16	11	7	3	--	--	--
71	40	37	35	32	30	27	24	20	16	11	8	4	--	--
73	44	41	39	36	33	31	28	24	20	16	13	9	6	2
75	47	45	42	39	37	34	32	28	24	20	17	13	10	6

Required Superheat for 2AC13(B,L)60P-1A

INDOOR WET-BULB	OUTDOOR DRY BULB TEMPERATURE													
	50	55	60	65	70	75	80	85	80	95	100	105	110	115
53	5	2	--	--	--	--	--	--	--	--	--	--	--	--
55	10	7	3	--	--	--	--	--	--	--	--	--	--	--
57	15	12	8	4	--	--	--	--	--	--	--	--	--	--
59	19	16	13	9	6	2	--	--	--	--	--	--	--	--
61	23	20	17	14	11	7	4	--	--	--	--	--	--	--
63	27	25	22	18	15	12	9	3	--	--	--	--	--	--
65	31	29	26	23	20	17	14	8	3	--	--	--	--	--
67	35	33	30	27	24	21	18	13	8	3	--	--	--	--
69	39	37	34	31	28	25	22	18	13	8	4	--	--	--
71	43	41	38	35	32	30	27	22	18	13	9	6	--	--
73	47	45	42	39	36	34	31	27	22	18	14	11	7	3
75	51	48	46	43	40	37	35	31	27	22	19	15	11	7

Home Owner's Information

⚠ WARNING

ELECTRICAL SHOCK HAZARD!

Turn OFF electric power to unit before performing any maintenance or removing panels or doors.

FAILURE TO DO SO COULD RESULT IN BODILY INJURY OR DEATH.

AIR CONDITIONING

Room Thermostat

The wall-mounted thermostat controls your air conditioner. The thermostat is available in various configurations from different manufacturers. The information below is typical for most thermostats. Ask your dealer for specific information regarding the model of thermostat installed.

For **Cooling Cycle** switch the room thermostat system lever to "Cool". The thermostat will turn the air conditioner on in the cooling mode until the selected room temperature is achieved and then shut off automatically.

Some room thermostats have a setting on the system lever marked "AUTO" which will automatically change between heating and cooling modes.

NOTE: Some heating and cooling units have a reset feature which will allow you to reset the unit at the thermostat after some abnormal condition has caused safety switches to cut the unit off. If your unit has this feature, switch the system lever to OFF and back to COOL or HEAT. If you are in doubt which model you have, please consult your Dealer.

For **Fan Control** your thermostat may have a Fan Selection Switch that allows you to run the fan continuously or cycle it automatically with the heating or cooling system. Switch the lever to ON for continuous operation and to AUTO for automatic cycling.

For maximum comfort satisfaction and continual air cleaning/filtering, constant fan operation is recommended.

On models without a Fan Selection Switch, the fan will cycle with the outdoor unit.

Important System Information

- Your system should never be operated without a clean air filter properly installed.
- Return air and supply air registers should be free from restrictions or obstructions to allow full flow of air.
- Air conditioners remove humidity from your home. Depending on the amount of moisture in the air inside your home, water will trickle from the condensate drain of the indoor cooling coil.

Regular Maintenance Requirements

Your system should be regularly inspected by a qualified service technician. These regular visits may include (among other things) checks for:

- motor operation
- ductwork air leaks
- coil & drainpan cleanliness (indoor & outdoor)
- electrical component operation & wiring check
- proper refrigerant level & refrigerant leaks
- proper airflow
- drainage of condensate
- air filter(s) performance
- blower wheel alignment, balance & cleaning primary and secondary drain line cleanliness

There are some routine maintenance procedures you can do to help keep your system operating at peak performance. Additional maintenance or service must be performed by a qualified service personal.

Air Filter

Inspect air filters at least monthly and replace or clean as required. Disposable filters should be replaced. Washable filters may be cleaned by soaking in mild detergent and rinsing with cold water. Replace filters with the arrows pointing in the direction of airflow. Dirty filters are the most common cause of poor cooling performance and compressor failures.

Indoor Coil

If the system has been operated with a clean filter in place, it should require minimal cleaning. Use a vacuum cleaner and soft brush attachment to remove any accumulation of dust from the top and underside of the finned coil surface. However, perform this maintenance only when the coil is completely dry.

If the coil cannot be cleaned by this method, call your dealer for service. It may need a detergent solution and rinsing with water for cleaning, which may require coil removal. You should not attempt this yourself.

Condensate Drain

During cooling season check at least monthly for free flow of drainage and clean if necessary.

Condenser Coils

Grass cuttings, leaves, dirt, dust, lint from clothes dryers, and fall off from trees can be drawn into coils by movement of the air. Clogged condenser coils will lower the efficiency of your unit and could cause damage to the condenser. Periodically, debris should be brushed from the condenser coils.

⚠ WARNING

SHARP OBJECT HAZARD!

Condenser coils have sharp edges. Wear adequate body protection on body extremities (e.g. gloves). Failure to follow this warning could result in bodily injury.

Use a soft bristle brush with light pressure only. DO NOT damage or bend condenser coil fins. Damaged or bent fins may affect unit operation.

Painted Surfaces

For maximum protection of the unit's finish, a good grade of automobile wax should be applied every year. In geographical areas where water has a high concentration of minerals (calcium, iron, sulfur, etc.), it is recommended that lawn sprinklers not be allowed to spray the unit. In such applications, the sprinklers should be directed away from the unit. Failure to follow this precaution may result in premature deterioration of the unit finish and metal components.

In sea coastal areas, special maintenance is required due to the corrosive atmosphere provided by the high salt concentration in ocean mists and the air. Periodic washing of all exposed surfaces and coil will add additional life to your unit. Please consult your installing dealer for proper procedures in your geographic area.

Units should be positioned to avoid contact with pet or livestock traffic.

IF YOUR SYSTEM DOES NOT WORK, BEFORE REQUESTING A SERVICE CALL:

1. Ensure thermostat is set below (cooling) or above (heating) room temperature and that the system lever is in the "COOL", "HEAT" or "AUTO" position.
2. Inspect your return air filter: If it is dirty your air conditioner may not function properly.
3. Check indoor and outdoor disconnect switches. Confirm circuit breakers are ON or that fuses have not blown. Reset breakers/replace fuses as necessary.
4. Inspect the outdoor unit for clogged condenser coils, (grass cuttings, leaves, dirt, dust or lint). Ensure that branches, twigs or other debris are not obstructing the condenser fan.

IF YOUR SYSTEM STILL DOES NOT OPERATE, CONTACT YOUR SERVICING DEALER.

Be sure to describe the problem, and have the model and serial numbers of the equipment available.

OUTDOOR EQUIPMENT LIMITED WARRANTY

(Not applicable outside the U.S.A. and Canada.)

GENERAL FIVE YEAR PART WARRANTY - The manufacturer warrants the product to be free from defects in material and workmanship under normal use and maintenance for a period of five (5) years in residential applications (one (1) year for commercial) on all components. The warranty period begins on the date of original installation whether or not actual use begins on that date. If the date of original installation cannot be verified, the warranty begins on the date of manufacture plus six (6) months. At the *Manufacturer's* sole option, a new or re-manufactured part to replace any defective part will be provided without charge for the part itself; PROVIDED the defective part is returned to our distributor through a qualified servicing dealer or contractor. The replacement part assumes the unused portion of the factory warranty. Residential application is defined as a single family or multi-family dwelling.

COVERED PARTS INCLUDE - compressor, capacitor, condenser coil, contactor, fan blade, fan motor, muffler, service valve, solenoid valve, unit mounted sensors and switches, if present.

2AC13 FIVE YEAR COMPRESSOR WARRANTY - The compressor in this is warranted to be free from defects in material and workmanship under normal use and maintenance for a period of five (5) years. The compressor will be provided without charge for the compressor itself; PROVIDED the defective compressor is returned to our distributor through a qualified servicing dealer or contractor. The replacement compressor assumes the unused portion of the factory warranty.

THIS WARRANTY DOES NOT INCLUDE LABOR OR OTHER COSTS incurred for diagnosing, repairing, removing, installing, shipping, servicing, or handling of either defective parts or replacement parts or complete unit. Other costs not covered include items such as any materials not listed above, refrigerant and refrigerant reclaiming. Such costs may be covered by a separate warranty provided by the installing dealer or contractor.

THESE WARRANTIES APPLY ONLY:

- *To products in their original installation location and become void upon re-installation.*
- *To units installed with indoor coil combinations listed in the [Air-Conditioning and Refrigeration Institute \(ARI\) Directory of Certified Unitary Equipment](http://www.ARIPrimenet.org). (www.ARIPrimenet.org.)*

EXCEPTIONS TO LIMITED WARRANTY - When the outdoor unit is installed in non-residential applications; the compressor is warranted for 1 year.

LIMITATIONS OF WARRANTIES - All implied warranties (including implied warranties of merchantability) are hereby limited in duration to the period for which the limited warranty is given. Some states do not allow limitations on how long an implied warranty lasts, so the above may not apply to you. The expressed warranties made in this warranty are exclusive and may not be altered, enlarged, or changed by any distributor, dealer, contractor or other person whatsoever.

THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR:

1. Failure to start due to voltage conditions, blown fuses, open circuit breakers or other damages due to the inadequacy or interruption of electrical service;
2. Damage as a result of floods, winds, fires, lightning, accidents, corrosive environments or other conditions beyond the control of the *Manufacturer*;
3. Damage or repairs required as a consequence of faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation;
4. Normal maintenance as outlined in the installation and servicing instructions or owner's manual including coil cleaning, filter cleaning and/or replacement and lubrication;
5. Parts not supplied or designated by the *Manufacturer*, or damages resulting from their use;
6. The *Manufacturer* products installed outside the United States of America and Canada;
7. Electricity or fuel costs or increases in electricity or fuel costs for any reason whatsoever including additional or unusual use of supplemental electric heat;
8. **ANY SPECIAL INDIRECT OR CONSEQUENTIAL PROPERTY OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER.** Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you.

This warranty gives you specific rights, and you may also have other rights that vary from state to state.

Keep this book and your sales slip together for future reference. You must provide proof of purchase or installation date for in-warranty service.

Write down the following information about your unit to better help you obtain assistance or service if you ever need it. You will need to know the complete model and serial number. You can find this information on the unit rating plate.

Dealer Name: _____

Address: _____

Phone Number: _____

Model Number: _____

Serial Number: _____

Installation Date: _____