INSTALLATION AND MAINTENANCE INSTRUCTIONS
SCU12M Series
Split System Air Conditioner

⚠ WARNING

The equipment covered in this manual is to be installed by trained and experienced service and installation technicians. Improper installation, modification, service, or use can cause electrical shock, fire, explosion, or other conditions which may cause personal injury, death, or property damage. Use appropriate safety gear including safety glasses and gloves when installing this equipment.

⚠ WARNING

Risk of electrical shock. Disconnect all remote power supplies before installing or servicing any portion of the system. Failure to disconnect power supplies can result in property damage, personal injury, or death.

⚠ WARNING

Installation and servicing of air conditioning equipment can be hazardous due to internal refrigerant pressure and live electrical components. Only trained and qualified service personnel should install or service this equipment. Installation and service performed by unqualified persons can result in property damage, personal injury, or death.

⚠ WARNING

Sharp metal edges can cause injury. When installing the unit, use care to avoid sharp edges.

Save these instructions for future reference

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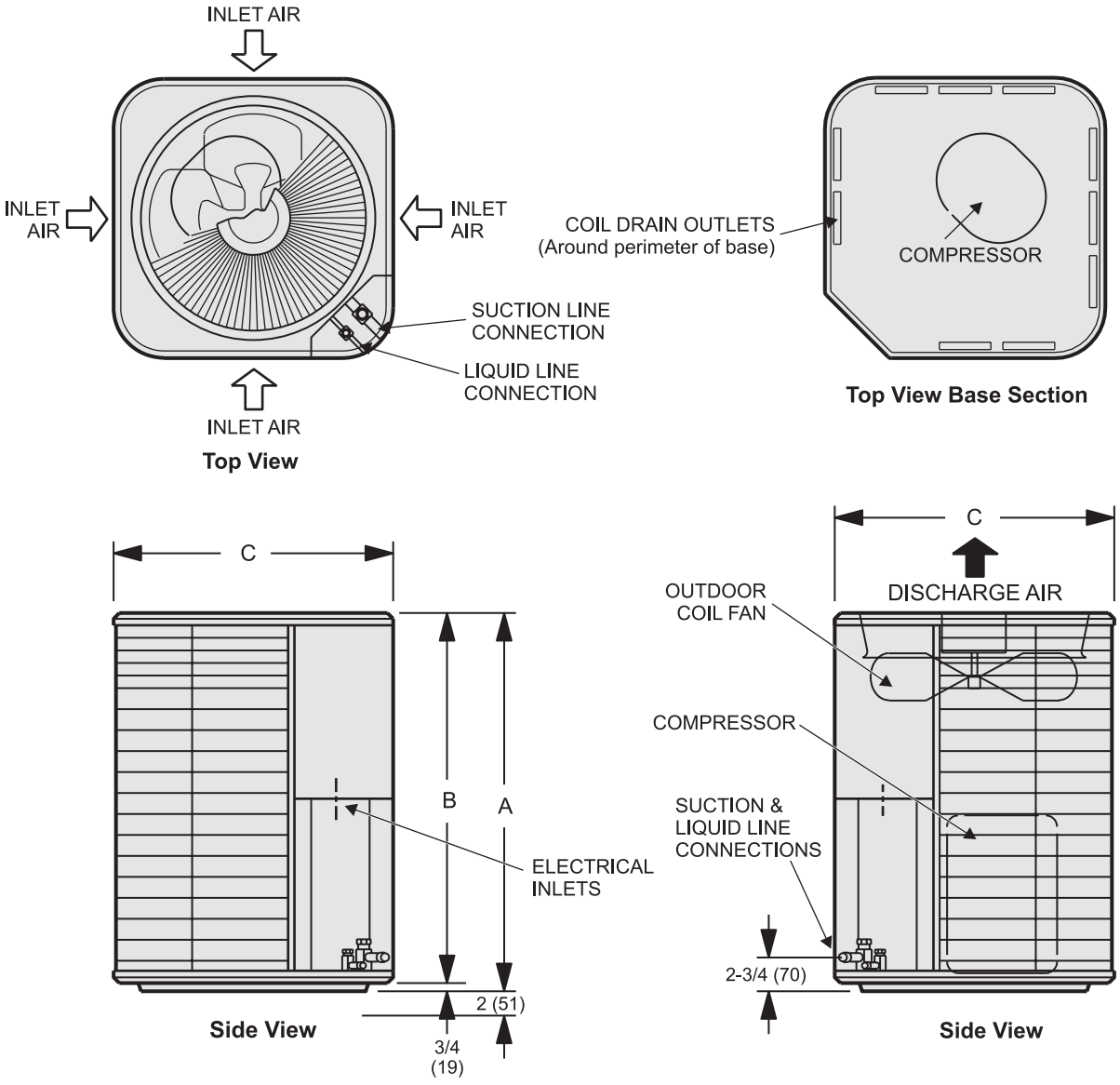
Manufactured By
A.A.C.
A Lennox International Company
421 Monroe Street
Bellevue, OH 44811

UNIT DIMENSIONS



Model Number		A	B	C
SCU12M-024	in.	25	24-1/4	24-1/4
	mm	635	616	616
SCU12M-030 SCU12M-036 SCU12M-042 SCU12M-048	in.	33	32-1/4	24-1/4
	mm	838	819	616
SCU12M-060	in.	29	28-1/4	28-1/4
	mm	737	718	718

INSTALLATION

General

Read this entire instruction manual, as well as the instructions supplied in separate equipment, before starting the installation. Observe and follow all warnings, cautions, instructional labels, and tags. Failure to comply with these instructions could result in an unsafe condition and/or premature component failure.

These instructions are intended as a general guide only for use by qualified personnel and do not supersede any national or local codes in any way. The installation must comply with all provincial, state, and local codes as well as the National Electrical Code (U.S.) or Canadian Electrical Code (Canada). Compliance should be determined prior to installation.

SCU12M condensing units use R410A which is an ozone-friendly HFC refrigerant. This unit must be installed with a matching indoor coil and line set. SCU12M units are designed for use in expansion valve (TXV) and fixed orifice systems. The orifice is shipped with the unit while the TXV expansion valve must be ordered separately from the manufacturer. A filter drier approved for use with 410A has been shipped with the unit. These components must be installed prior to unit operation.

Inspection of Shipment

Upon receipt of equipment, carefully inspect it for possible shipping damage. If damage is found, it should be noted on the carrier's freight bill. Take special care to examine the unit inside the carton if the carton is damaged. Any concealed damage discovered should be reported to the last carrier immediately, preferably in writing, and should include a request for inspection by the carrier's agent.

If any damages are discovered and reported to the carrier DO NOT INSTALL THE UNIT**, as claim may be denied.**

Check the unit rating plate to confirm specifications are as ordered.

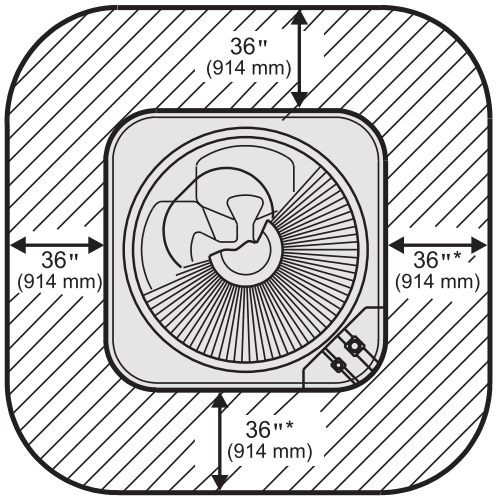
Location of Unit

Refer to **UNIT DIMENSIONS** on page 2 for information on sizing mounting slab, platforms, or supports. Refer to Figure 1 for installation clearances.

Slab Mounting

When installing unit at grade level, install on a level slab high enough above grade to allow adequate drainage of water. Top of slab should be located so runoff water from higher ground will not collect around unit.

Installation Clearances



* A service clearance of 30" must be maintained on one of the sides adjacent to the control box. Clearance to one of the other three sides must be 36". Clearance to one of the remaining two sides may be 12" and the final side may be 6".

A clearance of 24" must be maintained between units.

48" clearance required on top of unit. Maximum soffit overhang is 36".

Figure 1

Roof Mounting

Install unit at a minimum of 4" above surface of the roof. Care must be taken to ensure weight of unit is properly distributed over roof joists and rafters. Either redwood or steel supports are recommended.

Electrical Wiring

All field wiring must be done in accordance with the National Electrical Code (NEC) recommendations, Canadian Electrical Code (CEC) and CSA Standards, or local codes, where applicable.

Refer to the furnace or blower coil Installation Instructions for additional wiring application diagrams and refer to unit rating plate for minimum circuit ampacity and maximum overcurrent protection size.

Unit must be grounded in accordance with national and local codes.

1. Install line voltage power supply to unit from a properly sized disconnect switch.

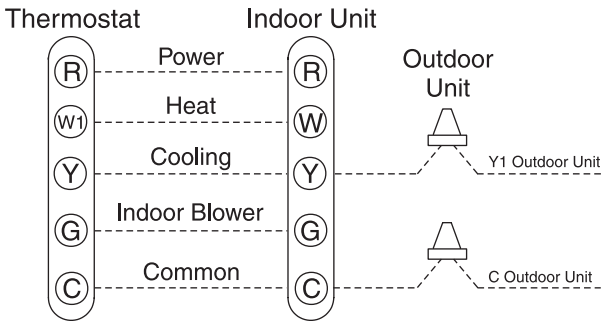
2. Ground unit at unit disconnect switch or to an earth ground. To facilitate conduit, a hole is in the bottom of the control box. Connect conduit to the control box

using a proper conduit fitting. Units are approved for use only with copper conductors. 24V Class II circuit connections are made in the low voltage junction box. Refer to Figure 7 on page 15 for field wiring diagram (wiring diagram also found inside unit control box cover).

3. Install room thermostat on an inside wall that is not subject to drafts, direct sunshine, or other heat sources.

4. Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit (see Figure 2).

Thermostat Designations



See unit wiring diagram for power supply connections. If the indoor unit is not equipped with a blower relay, one must be field-supplied and installed.

Figure 2

Refrigerant Piping

If the SCU12M unit is being installed with a new indoor coil and line set, the refrigerant connections should be made as outlined in the section found on page 6 entitled ***Plumbing Connections Using New Indoor Coil and Line Set***. If an existing line set and/or indoor coil will be used to complete the system, refer to the following section entitled ***Flushing Existing Line Set and Indoor Coil***.

If this unit is being matched with an approved line set or indoor coil which was previously charged with R22 refrigerant, the line set and coil must be flushed prior to installation. If the unit is being used with an existing indoor coil which was equipped with a liquid line which served as a metering device (RFCI), the liquid line must be replaced prior to the installation of the SCU12M unit.

Field refrigerant piping consists of liquid and suction lines from the outdoor unit (sweat connections) to the indoor coil (flare or sweat connections).

⚠ WARNING

Before opening any system, make sure the pressure in the system is brought to and remains at atmospheric pressure. Failure to comply can result in system damage and/or personal injury.

⚠ WARNING

Polyol ester (POE) oils used with R410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until ready to make connections.

Flushing Existing Line Set and Indoor Coil

⚠ CAUTION

When flushing existing line set and/or indoor coil, be sure to empty all existing traps. Residual mineral oil can act as an insulator, preventing proper heat transfer. It can also clog the thermal expansion valve, reducing system performance and capacity. Failure to properly flush the system as explained in these instructions will void the warranty.

This procedure should not be performed on systems which contain contaminants, such as compressor burn out.

Required Equipment (see Figure 3)

The following equipment is needed to flush the existing line set and indoor coil: Two clean R22 recovery bottles, an oil-less recovery machine with a pump down feature, and two sets of gauges (one for use with R22 and one for use with R410A).

Flushing Procedure

IMPORTANT: The line set and/or indoor coil must be flushed with at least the same amount of refrigerant that previously charged the system. Check the charge in the flushing cylinder before flushing the unit.

1. Remove existing R22 refrigerant using the appropriate procedure.

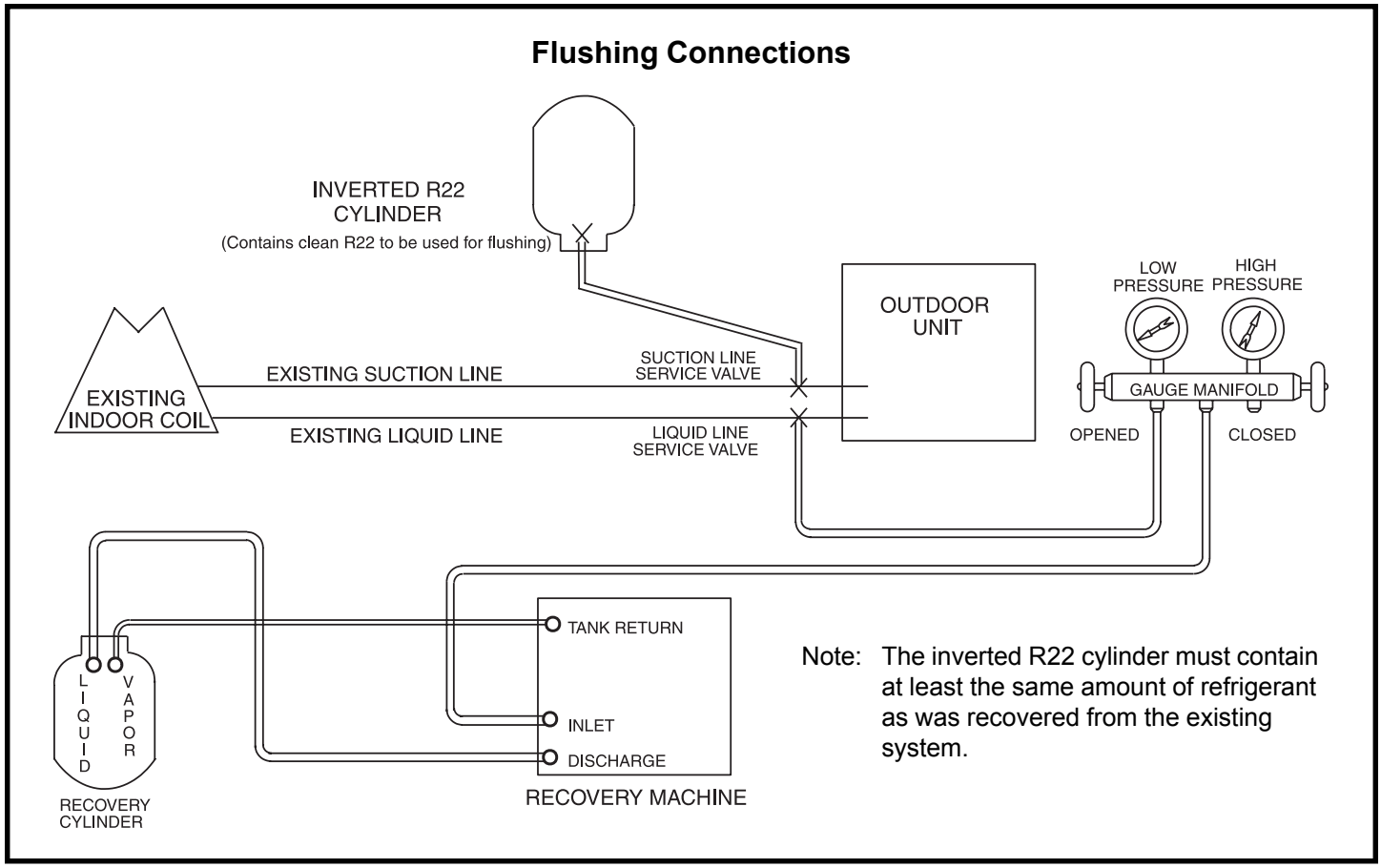


Figure 3

*If the existing outdoor unit is not equipped with shutoff valves, or if the unit is not operational AND you plan to use the **existing** R22 refrigerant to flush the system:*

Disconnect all power to the existing outdoor unit. Connect the existing unit, a clean recovery cylinder, and the recovery machine according to the instructions provided with the recovery machine. Remove all R22 refrigerant from the existing system. Refer to the gauges after shutdown to confirm that the entire system is completely void of refrigerant. Disconnect the liquid and suction lines from the existing outdoor unit.

*If the existing outdoor unit is equipped with manual shutoff valves AND you plan to use **new** R22 refrigerant to flush the system:*

Start the existing R22 refrigerant system in cooling mode and close the liquid line valve. Pump all the existing R22 refrigerant back into the outdoor unit. (It may be necessary to bypass the low pressure switches to ensure complete refrigerant evacuation.) When the low side system pressures reach 0 psig, close the suction line valve. Disconnect all power to the existing outdoor unit. Refer to the gauges after shutdown to confirm that the valves are not allowing refrigerant to flow back into the low side of the system. Disconnect the liquid and vapor lines from the existing outdoor unit.

2. Remove the existing outdoor unit. Set the new R410A unit and follow the brazing connection procedure (see page 6) to make line set connections. **Do not install the fixed orifice or R410A thermo expansion valve at this time.**

   Make low voltage and line voltage connections to the new outdoor unit. **Do not turn on power to the unit or open the outdoor unit service valves at this time.**

3. Remove the existing refrigerant flow control orifice or thermal expansion valve before continuing with flushing procedures. The existing devices are not approved for use with R410A refrigerant and may prevent proper flushing. Use a field-provided fitting to reconnect the lines.

4. Remove the pressure tap valve cores from the SCU12M unit's service valves. Connect an R22 cylinder with clean refrigerant to the suction service valve. Connect the R22 gauge set to the liquid line valve and connect a recovery machine with an empty recovery tank to the gauge set.

5. Set the recovery machine for liquid recovery and start the recovery machine. Open the gauge set valves to allow the recovery machine to pull a vacuum on the existing system line set and indoor coil.

6. Invert the cylinder of clean R22 and open its valve to allow liquid refrigerant to flow into the system through the suction line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor coil before it enters the recovery machine.

7. After all of the liquid refrigerant has been recovered, switch the recovery machine to vapor recovery so that all of the R22 vapor is recovered. Allow the recovery to pull a vacuum on the system.

   NOTE: A single system flush should remove all of the mineral oil from the existing refrigerant lines and indoor coil. A second flushing may be done (using clean refrigerant) if insufficient amounts of mineral oil were removed during the first flush. **Each time the system is flushed, you must allow the recovery machine to pull a vacuum on the system at the end of the procedure.**

8. Close the valve on the inverted R22 cylinder and the gauge set valves. Pump the remaining refrigerant out of the recovery machine and turn the machine off.

9. Use nitrogen to break the vacuum on the refrigerant lines and indoor coil before removing the recovery machine, gauges, and R22 refrigerant drum. Re-install pressure tap valve cores into the SCU12M service valves.

10. Install the provided orifice or expansion valve (approved for use with R410A refrigerant) in the liquid line at the indoor coil.

Plumbing Connections Using New Indoor Coil and Line Set

If refrigerant lines are to be routed through a wall, seal and isolate the opening so vibration is not transmitted to the building.

Line length should be no greater than 50'. Use Table 1 to select line set diameters to ensure oil return to the compressor.

Brazing Connection Procedure

1. The end of the refrigerant line must be cut square and its internal shape must remain round. The line must be free of nicks or dents and must be deburred (I.D. and O.D.).

2. Before making line set connections, use dry nitrogen to purge the refrigerant piping. This will help to prevent oxidation and the introduction of moisture into the system.

3. Use silver alloy brazing rods (5% or 6% silver alloy for copper-to-copper brazing or 45% silver alloy for copper-to-brass or copper-to-steel brazing) which are rated for use with R410A refrigerant. Wrap a wet cloth around the valve body and the copper tube stub. Remove light maroon washers from service valves and shield light maroon stickers to protect them during brazing. Braze the line set to the service valve.

4. Quench the joint with water or a wet cloth to prevent heat damage to the valve core and opening port. **The tube end must stay bottomed in the fitting during final assembly to ensure proper seating, sealing, and rigidity.**

5. Flush line set and evaporator if required (refer to ***Flushing Existing Line Set and Indoor Coil*** on page 4).

6. Install the fixed orifice (supplied with unit) or R410A approved thermal expansion valve (not supplied) in the liquid line at the indoor coil. (See **Refrigerant Metering Device** section that follows.)

7. Install the provided filter drier (approved for use with R410A refrigerant) in the liquid line as close as possible to the fixed orifice or expansion device. **Do not leave the drier uncapped for more than 10 – 15 minutes prior to brazing, evacuation, and leak testing. Polyol ester oils used in this system absorb moisture quickly. Failure to install the filter drier will void the warranty.**

Refrigerant Metering Device

SCU12M units are designed for use with either a fixed orifice or an expansion valve system. See the indoor coil installation instructions approved TXV and fixed orifice matchups and application information. Refer to the appropriate following section for information on installing the chosen refrigerant metering device.

Refrigerant Line Set Diameters

Model	Liquid Line	Suction Line
SCU12M-024 SCU12M-030 SCU12M-036	3/8 in. (10mm)	3/4 in. (19mm)
SCU12M-042 SCU12M-048	3/8 in. (10mm)	7/8 in. (22mm)
SCU12M-060	3/8 in. (10mm)	1-1/8 in. (29mm)

Table 1

Fixed Orifice Systems

SCU12M units are shipped with a fixed orifice refrigerant metering device. Replace the existing indoor unit fixed orifice with the orifice supplied with this unit. Place the supplied fixed orifice sticker on the indoor cabinet after installation. See Table 2 for the proper fixed orifice size for each unit. In nonstandard applications, the provided fixed orifice may not be appropriately sized.

Install the fixed orifice as shown in Figure 4. Do not twist cap tubes when loosening the seal nut from the orifice housing.

Fixed Orifice Sizes

Model	Fixed Orifice Size
SCU12M-024	.063
SCU12M-030	.063
SCU12M-036	.071
SCU12M-042	.078
SCU12M-048	.081
SCU12M-060	.090

Table 2

Expansion Valve Systems

Expansion valves equipped with Chatleff-type fittings are available from the manufacturer. To install a thermo extension valve (see Figure 4):

1. Insert suction line splice between evaporator and suction line with the equalizer port pointing upwards. **To prevent plugging the equalizer line with oil, the equalizer port must be between a 10:00 and 2:00 position.**

2. Separate the distributor assembly and remove the piston orifice and used teflon seal. Insert nozzle end of the thermo expansion valve along with a new teflon seal into the distributor and tighten to 20 – 30 ft. lbs. Use backup wrench on all wrench flats. **Overtightening will crush the teflon seal and may cause a leak.**

3. Attach liquid line portion of distributor assembly along with new teflon seal to the inlet of the thermo expansion valve. Tighten to 20 – 30 ft. lbs. Use backup wrench on all wrench flats. **Overtightening will crush the teflon seal and may cause a leak.**

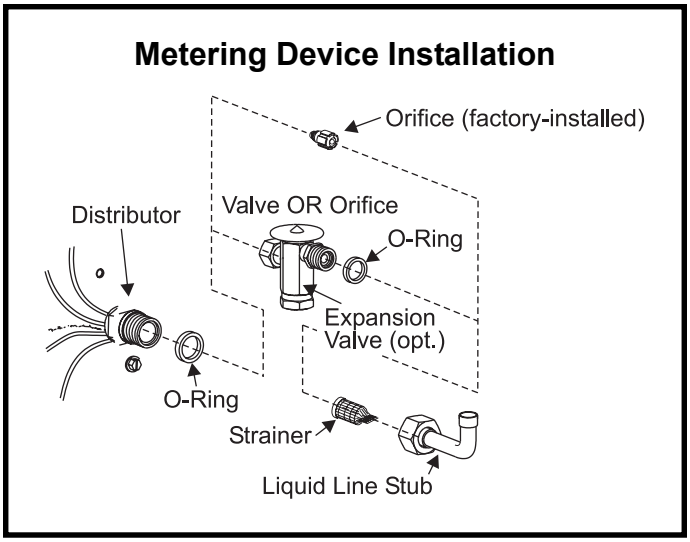


Figure 4

4. Connect the external equalizer line to the equalizer port on the suction line splice.

5. Strap the superheat sensing bulb to the suction header.

If installing an expansion valve on an indoor coil that previously used a fixed orifice, be sure to remove the existing fixed orifice. Failure to remove a fixed orifice when installing an expansion valve to the indoor coil will result in improper operation and damage to the system.

Manifold Gauge Set

Manifold gauge sets used with systems charged with R410A refrigerant must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures 0 – 800 on the high side and a low side of 30" vacuum to 250 psi with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psi of pressure with a 4000 psi burst rating.

Liquid and Suction Line Service Valves

The liquid line and suction line service valves (see Figure 5 on page 8) and gauge ports are accessible from inside the unit, behind the access panel. The service ports are used for leak testing, evacuating, charging, and checking charge. See Table 3 on page 8 for torque requirements.

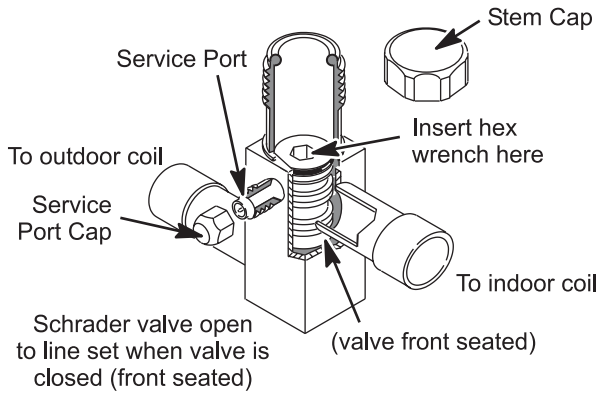
Each valve is equipped with a service port which has a factory-installed Schrader valve. A service port cap protects the schrader valve from contamination and serves as the primary leak seal.

To Access the Schrader Port:

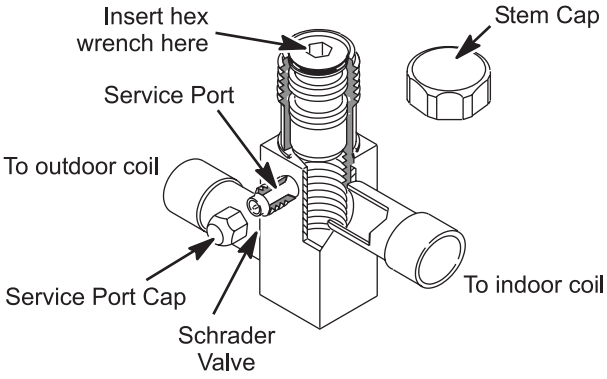
1. Remove the access panel.

2. Remove the service port cap with an adjustable wrench.

Service Valve



Valve Closed



Valve Open

Figure 5

Torque Table

Fastener	Torque
Gauge Port Seal Caps	8 ft. lbs.
Service Valve Caps	8 ft. lbs.
Sheet Metal Screws	16 in. lbs.
#10 Machine Screws	28 in. lbs.
Compressor Bolts	90 in. lbs.

Table 3

3. Connect gauge to the service port.

4. When testing is completed, replace service port cap. Tighten finger tight, then an additional 1/6 turn.

To Open Liquid or Suction Line Service Valve:

1. Remove stem cap with an adjustable wrench.

2. Use a service wrench with a hex-head extension to back the stem out counterclockwise as far as it will go. Use a 3/16" hex head extension for liquid line service valves or a 5/16" extension for suction line service valves.

3. Replace the stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

To Close Liquid or Suction Line Service Valve:

1. Remove the stem cap with an adjustable wrench.

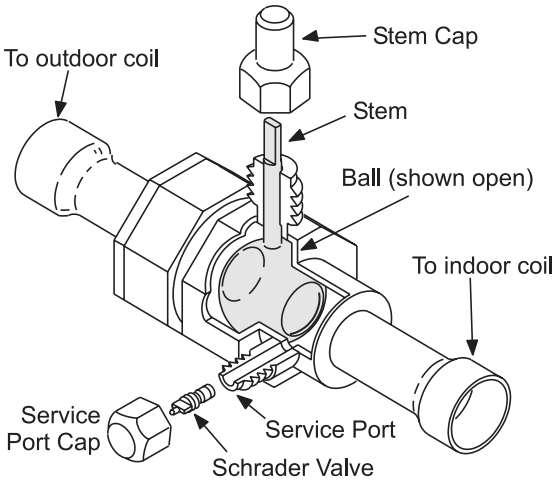
2. Use a service wrench with a hex-head extension to turn the stem clockwise to seat the valve. Tighten it firmly.

3. Replace the stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

Suction Line (Ball Type) Service Valve

Suction line (ball type) service valves function the same way as the other valves; the difference is in the construction (see Figure 6).

Ball Type Service Valve (Valve Open)



Use adjustable wrench. To open, rotate stem clockwise 90∞. To close, rotate stem counterclockwise 90∞.

Figure 6

The ball valve is equipped with a service port with a factory-installed Schrader valve. A service port cap protects the Schrader valve from contamination and serves as the primary seal.

⚠ WARNING

Do not attempt to backseat the valve. Attempts to backseat the valve will cause snap ring to explode from valve body under pressure of refrigerant. Personal injury and unit damage will result.

Leak Testing

After the line set has been connected to the indoor and outdoor units, the line set connections and indoor unit must be checked for leaks.

⚠ WARNING

Refrigerant can be harmful if inhaled. Refrigerant must always be used and recovered responsibly. Incorrect or irresponsible use of refrigerant can result in personal injury or death.

⚠ WARNING

Never use oxygen to pressurize refrigeration or air conditioning systems. Oxygen will explode on contact with oil and could cause personal injury or death.

Using an Electronic Leak Detector

1. Connect the high pressure hose of the manifold gauge set to the suction valve service port. (Normally the high pressure hose is connected to the liquid line port; however, connecting it to the suction ports helps to protect the manifold gauge set from damage caused by high pressure.)

2. With both manifold valves closed, connect the cylinder of R410A refrigerant. Open the valve on the R410A cylinder (vapor only).

3. Open the high pressure side of the manifold to allow R410A into the line set and indoor unit. Weigh in a trace amount of R410A. (A trace amount is a maximum of 2 oz. of refrigerant or 3 lbs. pressure.) Close the valve on the R410A cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the R410A cylinder.

4. Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set. **When using high pressure gas such as nitrogen for this purpose, be sure to use a regulator that can control the pressure down to 1 or 2 psig.**

5. Adjust nitrogen pressure to 150 psig. Open the valve on the high side of the manifold gauge set to pressurize the line set and the indoor coil.

6. After a short period of time, open a refrigerant port to make sure that an adequate amount of refrigerant has been added for detection (refrigerant requirements will vary with lengths). Check all joints for leaks. Purge nitrogen and R410A mixture. Correct any leaks and recheck.

IMPORTANT: The leak detector must be capable of sensing HFC refrigerant.

Evacuation

Evacuating the system of non-condensables is critical for proper operation of the unit. Non-condensables are defined as any gas that will not condense under temperatures and pressures present during operation of an air conditioning system. Non-condensables and water vapor combine with refrigerant to produce substances that corrode copper piping and compressor parts.

⚠ WARNING

Do not use a compressor to evacuate a system. Avoid deep vacuum operation. Extremely low vacuums can cause internal arcing and compressor failure. Danger of equipment damage. Damage caused by deep vacuum operation will void warranty.

Use a thermocouple or thermistor electronic vacuum gauge that is calibrated in microns. Use an instrument that reads from 50 microns to at least 10,000 microns.

Compliant scroll compressors (or any refrigerant compressor) should never be used to evacuate a refrigeration or air conditioning system.

1. Connect the manifold gauge set to the service valve ports as follows:

   - Low pressure gauge to suction line service valve
   - High pressure gauge to liquid line service valve

2. Connect micron gauge.

3. Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set.

4. Open both manifold valves and start vacuum pump.

5. Evacuate the line set and indoor unit to an absolute pressure of 23mm (23,000 microns) of mercury (approximately 1 in. of mercury). During the early stages of evacuation, it is desirable to close the manifold gauge valve at least once to determine if there is a rapid rise in absolute pressure. A rapid rise in pressure indicates a relatively large leak. If this occurs, the leak testing procedure must be repeated.

   NOTE – The term *absolute pressure* means the total actual pressure with a given volume or system, above the absolute zero of pressure. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.

6. When the absolute pressure reaches 23mm of mercury, close the manifold gauge valves, turn off the vacuum pump, and disconnect the manifold gauge center port hose from the vacuum pump. Attach the manifold gauge center port hose to a nitrogen cylinder with pressure regulator set to 150 psig and purge the hose. Open the manifold gauge valves to break the vacuum in the line set and indoor unit. Close the manifold gauge valves.

7. Shut off the nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the nitrogen from the line set and indoor unit.

8. Reconnect the manifold gauge to the vacuum pump, turn the pump on, and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above .5mm (500 microns) of mercury within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.

9. When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to an upright cylinder of R410A refrigerant. Open the manifold gauge valves to break the vacuum in the line set and indoor unit. Close manifold gauge valves and shut off R410A cylinder and remove manifold gauge set.

START-UP

1. Rotate fan to check for frozen bearings or binding.

2. Inspect all factory and field-installed wiring for loose connections.

3. Open liquid line and suction line service valves to release refrigerant charge (contained in outdoor unit) into system. Replace and tighten caps. Use a backup wrench on the suction and liquid valves when removing or replacing valve caps.

4. To open suction valve, remove hex cap and turn valve stem fully open using an Allen (hex) wrench. To open liquid valve, remove cap and turn valve stem until it is fully open.

   NOTE: When replacing valve caps, the caps should be finger tight then tightened an additional 1/6 of a turn.

5. Check voltage supply at the disconnect switch. the voltage must be within the range listed on the unit nameplate. If not, do not start equipment until the power company has been consulted and the voltage condition corrected.

6. Set thermostat for cooling demand, turn on power to indoor blower and close the outdoor unit disconnect switch to start the unit.

7. Recheck unit voltage with unit running. Power must be within range shown on unit nameplate. Check amperage draw of unit. Refer to unit nameplate for correct running amps.

Charging

This system is charged with R410A refrigerant which operates at much higher pressures than R22. The liquid line drier provided with the unit is approved for use with R410A. Do not replace it with one designed for use with R22. **This unit is NOT approved for use with coils which use capillary tubes as a refrigerant metering device.**

Factory Charge

Units are factory charged with the amount of R410A refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with 15' line set. For varying lengths of line set, refer to Table 4 for refrigerant charge adjustment.

⚠ IMPORTANT

Mineral oils are not compatible with R410A. If oil must be added, it must be a polyol ester oil.

Refrigerant Charge Adjustment

Liquid Line Set Diameter	Oz. per 5 ft. adjust from 15 ft. line set*
5/16 in.	2 oz. per 5 ft.
3/8 in.	3 oz. per 5 ft.

* If line length is **greater than 15 ft.**, add this amount.
If line length is **less than 15 ft.**, remove this amount.

Table 4

The compressor is charged with sufficient polyol ester oil for line set lengths up to 50'. If line set lengths longer than 50' will be required, add 1 oz. of oil for every additional 10' of line set. Do not add any more than 7 oz. of oil. Copeland has approved Mobil EAL™ Arctic 22CC and ICI EMKARATE™ RL32CF for use with these compressors when oil must be added in the field.

If the system is void of refrigerant, the unit must be returned to the warehouse for exchange. Do not install a unit which has been delivered void of refrigerant.

The following procedure is intended as a general guide and is for use on expansion valve systems only. For best results, indoor temperature should be 70° – 80°F. Be sure to monitor system pressures while charging.

1. Record outdoor ambient temperature using a digital thermometer.

2. Attach high pressure gauge set and operate unit for several minutes to allow system pressures to stabilize.

3. Compare stabilized pressures with those provided below in Table 5. Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some other component in the system. Pressures higher than those listed indicate that the system is overcharged. Pressures lower than those listed indicate that the system is undercharged. A temperature/pressure chart for R410A refrigerant is provided in Table 7 on page 12. Verify adjusted charge using the approach method.

4. Outdoor temperature should be 60°F or above. **For best results, use the same digital thermometer used to check outdoor ambient temperature to check liquid line temperature.** Verify the unit charge using the approach method. The difference between

Normal Operating Pressures*
(Liquid +/–10 psig and Suction +/–5 psig)

Mode	Outdoor Coil Entering Air Temperature	SCU12M-024		SCU12M-030		SCU12M-036		SCU12M-042		SCU12M-048		SCU12M-060	
		L	S	L	S	L	S	L	S	L	S	L	S
Fixed Orifice	65°F (18.3°C)	261	131	261	128	268	130	254	121	270	124	280	121
	75°F (23.9°C)	300	135	300	133	308	134	296	128	311	130	332	126
	85°F (29.4°C)	343	139	343	138	351	138	340	133	356	134	379	130
	95°F (35.0°C)	391	143	387	141	398	142	389	138	404	139	427	135
	105°F (40.6°C)	441	147	434	145	447	146	440	142	456	143	479	140
TXV	65°F (18.3°C)	256	134	256	137	264	135	256	124	269	131	262	121
	75°F (23.9°C)	298	137	296	139	305	138	296	127	312	133	304	127
	85°F (29.4°C)	344	140	339	141	349	139	341	133	357	135	349	132
	95°F (35.0°C)	394	142	384	144	396	140	389	136	406	137	397	136
	105°F (40.6°C)	448	143	432	146	446	143	440	140	460	140	449	140

* These are typical pressures only. Indoor matchup, indoor air quality, and indoor load will cause the pressures to vary.

L = Liquid S = Suction

Table 5

the ambient and liquid temperatures should match values given in Table 6. Refrigerant must be added to lower approach temperature and removed to increase approach temperature. Loss of charge results in low capacity and efficiency.

5. If the system is low on charge, R410A refrigerant must be added. Be aware of the R410A refrigerant cylinder. It will be light maroon colored. Refrigerant should be added through the suction valve in the liquid state. **Some R410A cylinders are equipped with a dip tube which allows liquid to be drawn from the bottom of the cylinder without turning the cylinder upside-down. The cylinder will be marked if it is equipped with a dip tube.**

Approach Temperatures

Model	Approach Temperature Liquid Line - Outdoor Ambient °F (°C)
SCU12M-024	12 (6.7)
SCU12M-030	13 (7.2)
SCU12M-036	12 (6.7)
SCU12M-042	11 (6.1)
SCU12M-048	13 (7.2)
SCU12M-060	14 (7.8)

Table 6

R410A Temperature/Pressure Chart

Temp. °F	Pressure Psig	Temp. °F	Pressure Psig	Temp. °F	Pressure Psig
32	100.8	74	214.0	116	396.0
33	102.9	75	217.4	117	401.3
34	105.0	76	220.9	118	406.7
35	107.1	77	224.4	119	412.2
36	109.2	78	228.0	120	417.7
37	111.4	79	231.6	121	423.2
38	113.6	80	235.3	122	428.8
39	115.8	81	239.0	123	434.5
40	118.0	82	242.7	124	440.2
41	120.3	83	246.5	125	445.9
42	122.6	84	250.3	126	451.8
43	125.0	85	254.1	127	457.6
44	127.3	86	258.0	128	463.5
45	129.7	87	262.0	129	469.5
46	132.2	88	266.0	130	475.6
47	134.6	89	270.0	131	481.6
48	137.1	90	274.1	132	487.8
49	139.6	91	278.2	133	494.0
50	142.2	92	282.3	134	500.2
51	144.8	93	286.5	135	506.5
52	147.4	94	290.8	136	512.9
53	150.1	95	295.1	137	519.3
54	152.8	96	299.4	138	525.8
55	155.5	97	303.8	139	532.4
56	158.2	98	308.2	140	539.0
57	161.0	99	312.7	141	545.6
58	163.9	100	317.2	142	552.3
59	166.7	101	321.8	143	559.1
60	169.6	102	326.4	144	565.9
61	172.6	103	331.0	145	572.8
62	175.5	104	335.7	146	579.8
63	178.5	105	340.5	147	586.8
64	181.6	106	345.3	148	593.8
65	184.3	107	350.1	149	601.0
66	187.7	108	355.0	150	608.1
67	190.9	109	360.0	151	615.4
68	194.1	110	365.0	152	622.7
69	197.3	111	370.0	153	630.1
70	200.6	112	375.1	154	637.5
71	203.9	113	380.2	155	645.0
72	207.2	114	385.4		
73	210.6	115	390.7		

Table 7

OPERATION

Outdoor unit and indoor blower cycle on demand from the room thermostat. When the thermostat blower switch is moved to the ON position, the indoor blower operates continuously.

Compressor Time Delay (TD1)

A compressor time delay is used to prevent compressor short cycling and to prevent the compressor from running backwards. When there is demand for a cooling cycle, the control delays compressor operation for about 5 minutes (+ or – 2 minutes). Do not bypass the control.

High Pressure Switch

SCU12M units are equipped with a high pressure switch that is located in the liquid line of the compressor. The switch (SPST, manual reset, normally closed) removes power from the compressor when discharge pressure rises above factory setting at 640 ± 10 psi.

Filter Drier

A drier is shipped with each SCU12M unit. The drier must be field installed in the liquid line between the liquid line service valve and the expansion valve. **This drier must be installed to ensure a clean, moisture-free system.** A replacement drier is available through the local distributor.

Failure to install the filter drier will void the warranty.

MAINTENANCE

⚠ WARNING

Before performing maintenance operations on system, turn the electric power to unit OFF at disconnect switch(es). Unit may have multiple power supplies. Electrical shock could cause personal injury or death.

Maintenance and service must be performed by a qualified installer or service agency.

At the beginning of each cooling season, the system should be checked as follows:

1. Clean and inspect condenser coil. Coil may be flushed with a water hose. Be sure the power is off before using water to clean the coil.
2. Outdoor fan motor is pre-lubricated and sealed. No further lubrication is needed.
3. Visually inspect connecting lines and coils for evidence of oil leaks.
4. Check wiring for loose connections.
5. Check for correct voltage at unit (with unit operating).
6. Check amp-draw outdoor fan motor.

   Unit nameplate _____ Actual _____

   NOTE – If owner complains of insufficient cooling, the unit should be gauged and refrigerant charge checked. Refer to the **Charging** section on page 10.

Indoor Coil

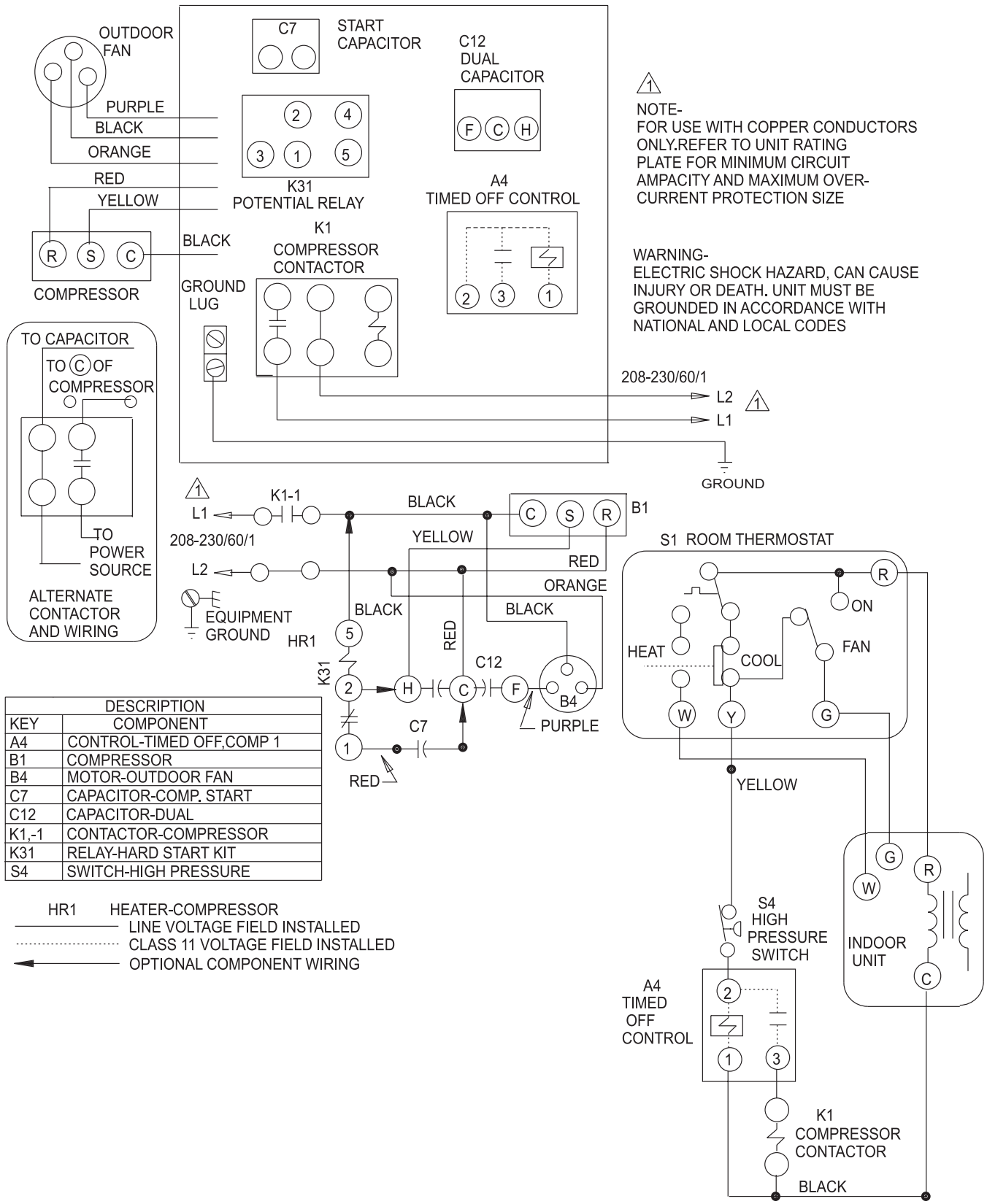
1. Clean coil, if necessary.
2. Check connecting lines and coils for evidence of oil leaks.
3. Check condensate line and clean, if necessary.

Indoor Unit

1. Clean or change filters.
2. Adjust blower speed for cooling. Measure the pressure drop over the coil to determine the correct blower CFM. Refer to the unit information service manual for pressure drop tables and procedure.
3. Belt drive blowers: Check belt for wear and proper tension.

4. Check all wiring for loose connections.
5. Check for correct voltage at unit (with unit operating).
6. Check amp-draw on blower motor.

   Unit nameplate _____ Actual _____



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF,COMP 1
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C7	CAPACITOR-COMP. START
C12	CAPACITOR-DUAL
K1,-1	CONTACTOR-COMPRESSOR
K31	RELAY-HARD START KIT
S4	SWITCH-HIGH PRESSURE

HR1 HEATER-COMPRESSOR
LINE VOLTAGE FIELD INSTALLED
CLASS 11 VOLTAGE FIELD INSTALLED
OPTIONAL COMPONENT WIRING

Connection Diagram
Part # 534, 638W

Figure 7

Limited Warranty

August 1, 1997

This warranty gives you specific legal rights and you may have other rights which vary from state/province to state/province.

Warrantor: Armstrong Air Conditioning Inc., 421 Monroe St., Bellevue, OH 44811

Armstrong Air Conditioning Inc. products are available under the following names: Air Ease, Armstrong Air, American Aire, Concord

Subject to the limitations stated in this warranty, we warrant to the first buyer for use the residential heating, cooling or heat pump unit, when installed, operated and maintained as required by this warranty, to be free of defects in workmanship or material for a period of 5 years (1 year for commercial equipment) from the time of installation. We will replace any defective component without cost or expense to you except for the costs of delivery and labor for removal and replacement of the defective component.

The SCU 12 Series air conditioners carry a 10 -year compressor warranty.

Warranty Begins

The warranty period begins when the installation is complete and the product is ready to operate. You must be able to verify this date whenever a warranty claim is made. Original bill of sale, installer's invoice or other similar document will suffice. If the beginning date cannot be verified, we will consider warranty coverage to begin 6 months after the date the product was shipped from our factory.

Limitations on Implied Warranties

Implied warranties of merchantability or, to the extent applicable, fitness for a particular purpose are limited to 5 years, the same duration as the basic limited written warranty provided herein. Some states/provinces do not allow limitations on how long an implied warranty of merchantability or fitness lasts, so the above limitations or exclusions may not apply to you.

Only Warranty

This written Limited Warranty is the only warranty made by the warrantor; this warranty is in lieu of and excludes all other warranties, express or implied. The warrantor does not authorize any person to provide any other warranty or to assume for it any further obligation in connection with the warranted product.

What is NOT Covered

1. Cabinets or cabinet pieces.
2. Normal maintenance items such as filters, fan belts, fuses or other consumable items.
3. Damage caused by misuse, failure to maintain properly, accidents or acts of God.
4. External wiring, piping, venting or attachment of accessory products not integral to our product, including without limitation, humidifier, air cleaner, vent damper, thermostat or other mechanical devices not manufactured by the warrantor.
5. Products that have been operated in a corrosive atmosphere where a concentration of acids, halogenated hydrocarbons or other corrosive elements causes deterioration to metal surfaces or integral components. NOTE: Operation in a corrosive atmosphere is considered abuse and voids this warranty.
6. Products that have NOT been installed in accordance with our published installation instructions, applicable local, state/ provincial or national codes, ACCA published standards.
7. Products that have NOT been installed by competent, qualified installers.
8. Products that have been moved from their original place of installation.

Warranty on Replacement Components

Any replacement component furnished by us will assume the remaining (unused) portion of the Limited Warranty.

Consequential Damages

The warrantor shall not be responsible for any consequential damages caused by any defect in the product. Some state/provinces do not allow the exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This product must be installed, used and cared for in accordance with the instruction manual. You are responsible for required periodic maintenance or service, such as changing or cleaning of air filters and lubrication or cleaning of components. Failure to properly install, operate or maintain your unit voids this warranty.

Owner Record

Model # _____ Serial # _____ Installation Date _____

INSTALLED BY:

Dealer _____

Address _____

Telephone # _____ License # _____