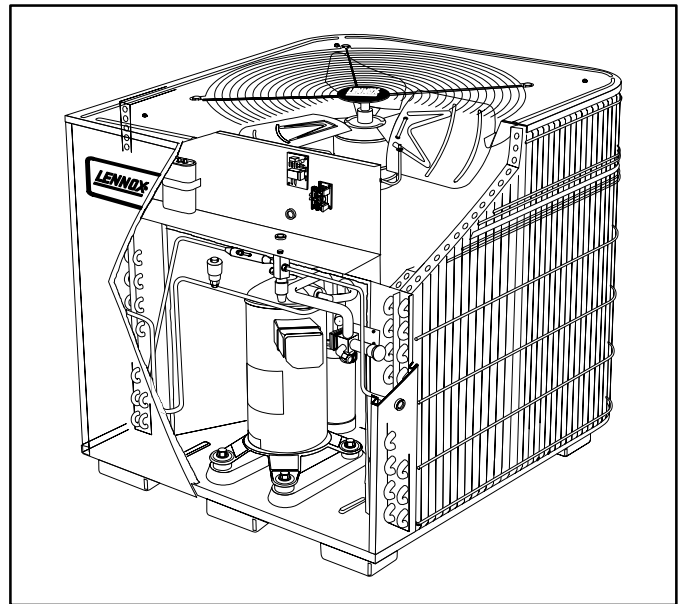


## HS25 SERIES UNITS

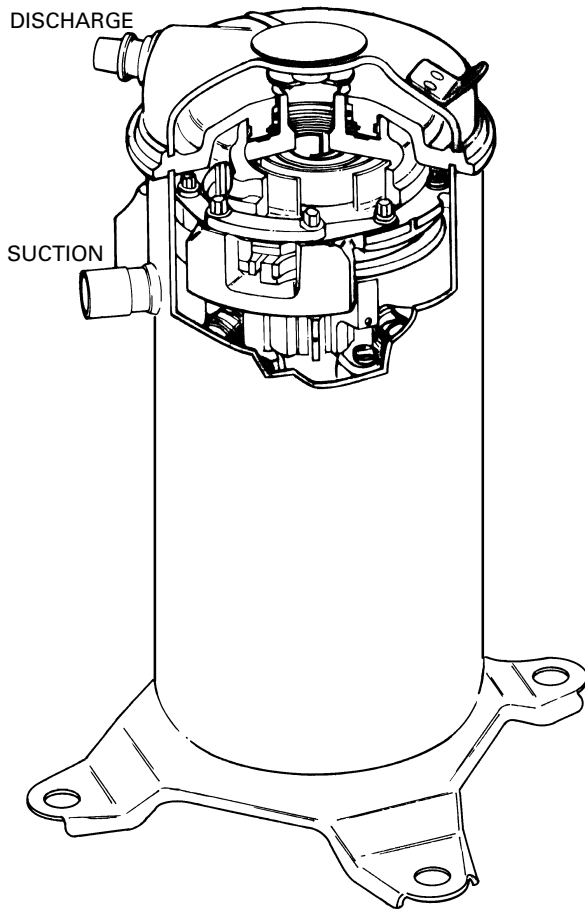
The HS25 is a high efficiency residential split-system condensing unit which features a scroll compressor. It operates much like a standard condensing unit, but the HS25's scroll compressor is unique in the way that it compresses refrigerant. Several models are available in sizes ranging from 1-1/2 through 5 tons. The series is designed for use with an expansion valve in the indoor unit.

This manual is divided into sections which discuss the major components, refrigerant system, charging procedure, maintenance and operation sequence.

All specifications in this manual are subject to change.



### SCROLL COMPRESSOR



### I-APPLICATION

All major components (indoor blower/coil) must be matched according to Lennox recommendations for the compressor to be covered under warranty. Refer to the Engineering Handbook for approved system matchups. A misapplied system will cause erratic operation and can result in early compressor failure.

### II-SCROLL COMPRESSOR

The scroll compressor design is simple, efficient and requires few moving parts. A cutaway diagram of the scroll compressor is shown on the cover. The scrolls are located in the top of the compressor can and the motor is located just below. The oil level is immediately below the motor.

The scroll is a simple compression concept centered around the unique spiral shape of the scroll and its inherent properties. Figure 1 shows the basic scroll form. Two identical scrolls are mated together forming concentric spiral shapes (figure 2). One scroll remains stationary, while the other is allowed to orbit (figure 3). Note that the orbiting scroll does not rotate or turn but merely orbits the stationary scroll.

### SPECIFICATIONS

Model No.		HS25-211	HS25-261	HS25-311	HS25-411
Outdoor Coil	Face area (sq.ft.) inner / outer	-- /11.8	5.4/11.8	5.5/15.9	5.5/15.9
	Tube diameter (in.)	3/8	3/8	3/8	3/8
	No. of Rows	1.0	1.48	1.36	1.36
	Fins per inch	20	20	20	20
Condenser Fan	Diameter (in.)	20	20	24	24
	No. of Blades	4	4	3	3
	Motor hp	1/6	1/6	1/6	1/6
	Cfm	2600	2450	3150	3150
	RPM	820	820	820	820
Watts	200	210	215	210	
HCFC-22 (charge furnished)		6lbs. 2oz.	6lbs. 8oz.	8lbs. 1oz.	8lbs. 1oz.
Liquid line connection		3/8	3/8	3/8	3/8
Suction line connection		5/8	3/4	3/4	3/4

### ELECTRICAL DATA

Model No.		HS25-211	HS25-261	HS25-311	HS25-411
Line voltage data – 60hz./1 phase		208/230V	208/230V	208/230V	208/230V
Compressor	Rated load amps	9.7	11.6	13.5	18.0
	Power factor	.96	.96	.96	.96
	Locked rotor amps	50.0	62.5	76.0	90.5
Condenser Fan Motor	Full load amps	1.1	1.1	1.1	1.1
	Locked rotor amps	2.0	2.0	2.0	2.0
Max fuse or c.b. size (amps)		20	25	30	40
*Minimum circuit ampacity		13.3	15.6	18.0	23.6

\*Refer to National Electrical Code Manual to determine wire, fuse and disconnect size requirements.

NOTE – Extremes of operating range are plus 10% and minus 5% of line voltage

### SPECIFICATIONS

Model No.		HS25-461	HS25-511	HS25-651
Outdoor Coil	Face area (sq.ft.) inner / outer	8.8/15.9	20.8/21.6	20.8/21.6
	Tube diameter (in.)	3/8	3/8	3/8
	No. of Rows	1.57	2.0	2.0
	Fins per inch	20	20	20
Condenser Fan	Diameter (in.)	24	24	24
	No. of Blades	3	4	4
	Motor hp	1/6	1/4	1/4
	Cfm	3100	3870	4250
	RPM	820	840	820
Watts	205	330	350	
HCFC-22 (charge furnished)		8lbs. 5oz.	13lbs. 8oz.	15lbs. 8oz.
Liquid line connection		3/8	3/8	3/8
Suction line connection		7/8	7/8	1-1/8

### ELECTRICAL DATA

Model No.		HS25-461	HS25-511	HS25-651
Line voltage data – 60hz./1 phase		208/230V	208/230V	208/230V
Compressor	Rated load amps	20	23.7	28.8
	Power factor	.97	.89	0.97
	Locked rotor amps	107	129	169
Condenser Fan Motor	Full load amps	1.1	1.7	1.6
	Locked rotor amps	2.0	3.1	3.8
Max fuse or c.b. size (amps)		45	50	60
*Minimum circuit ampacity		26.1	31.3	37.7

\*Refer to National Electrical Code Manual to determine wire, fuse and disconnect size requirements.

NOTE – Extremes of operating range are plus 10% and minus 5% of line voltage

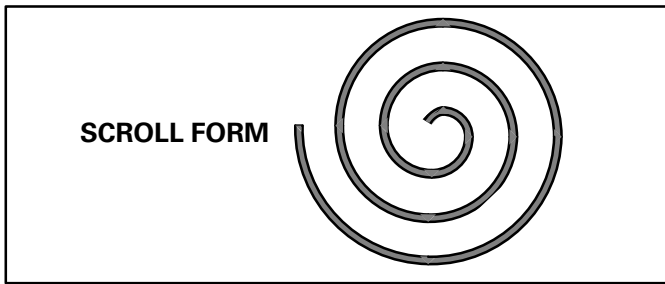


FIGURE 1

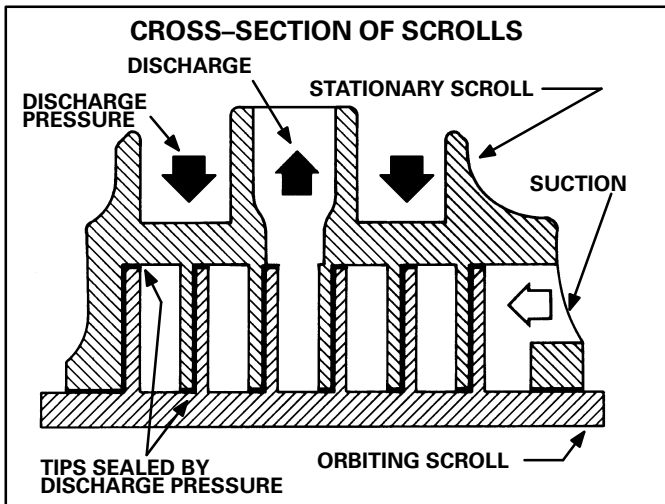


FIGURE 2

NOTE – During operation, the head of a scroll compressor may be hot since it is in constant contact with discharge gas.

The counterclockwise orbiting scroll draws gas into the outer crescent shaped gas pocket created by the two scrolls (figure 3 – 1). The centrifugal action of the orbiting scroll seals off the flanks of the scrolls (figure 3 – 2). As the orbiting motion continues, the gas is forced toward the center of the scroll and the gas pocket becomes compressed (figure 3 – 3). When the compressed gas reaches the center, it is discharged vertically into a chamber and discharge port in the top of the compressor (figure 2). The discharge pressure forcing down on the top scroll helps seal off the upper and lower edges (tips) of the scrolls (figure 2). During a single orbit, several pockets of gas are compressed simultaneously providing smooth continuous compression.

The scroll compressor is tolerant to the effects of liquid return. If liquid enters the scrolls, the orbiting scroll is allowed to separate from the stationary scroll. The liquid is worked toward the center of the scroll and is discharged. If the compressor is replaced, conventional Lennox cleanup practices must be used.

Due to its efficiency, the scroll compressor is capable of drawing a much deeper vacuum than reciprocating compressors. Deep vacuum operation can cause internal fuse arcing resulting in damaged internal parts and will result in compressor failure. Never use a scroll compressor for evacuating or “pumping-down” the system. This type of damage can be detected and will result in denial of warranty claims.

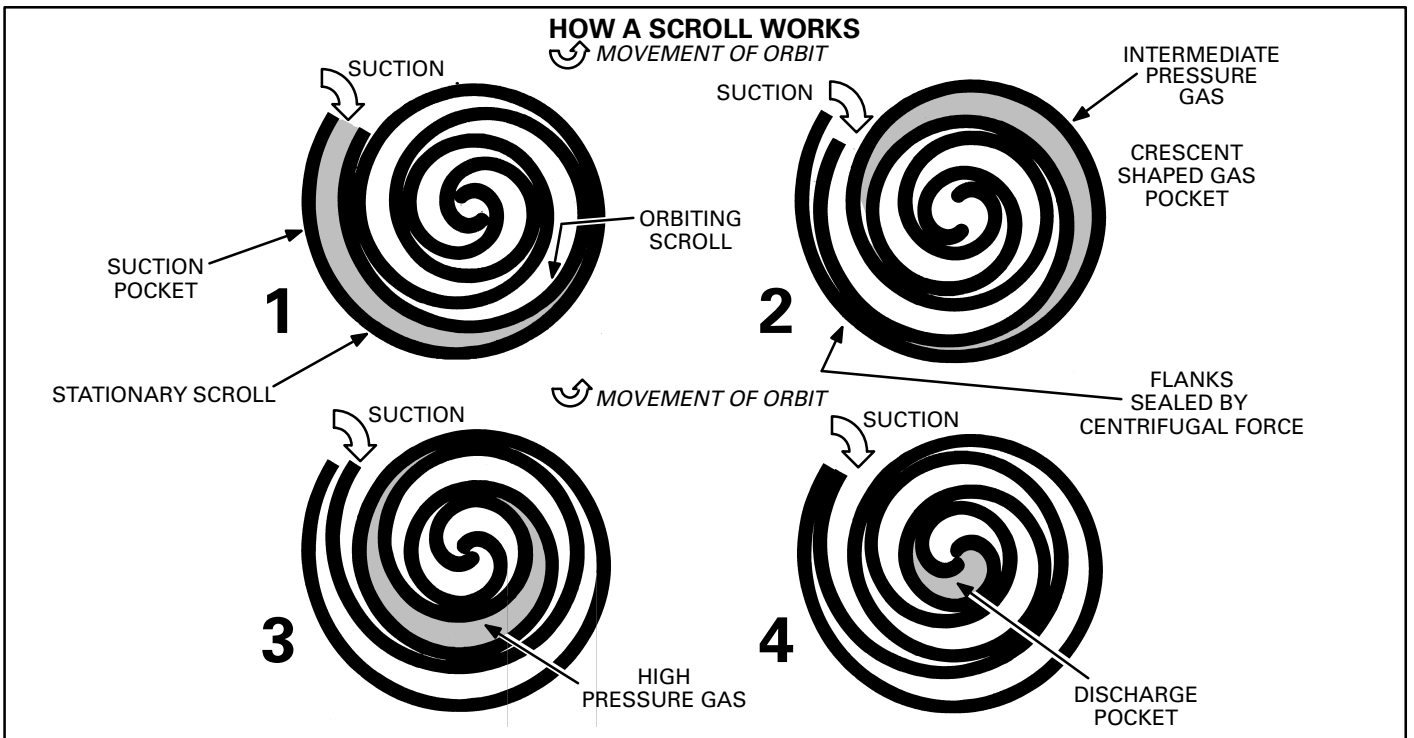


FIGURE 3

### III-UNIT COMPONENTS

#### A-Transformer

The contactor coil, time delay and temperature sensor are all energized by 24VAC supplied by the indoor unit. All other controls in the outdoor unit are powered by line voltage. Refer to unit wiring diagram. The HS25 is not equipped with an internal line voltage to 24V transformer.

#### B-Contactor

The compressor is energized by a contactor located in the control box. HS25-211 through -511 units use SPST contactors. HS25-651 units use a DPST contactor. The contactor is energized by indoor thermostat terminal Y when thermostat demand is present.

#### C-TD1-1 Time Delay

Each HS25 is equipped with a Lennox built TD1-1 time delay located in the control box (figure 4). The time delay is electrically connected between thermostat terminal Y and the compressor contactor. On initial thermostat demand, the compressor contactor is delayed for 8.5 seconds. At the end of the delay, the compressor is allowed to energize. When thermostat demand is satisfied, the time delay opens the circuit to the compressor contactor coil and the compressor is de-energized.

The time delay performs no other functions. Without the delay it would be possible to short cycle the compressor. A scroll compressor, when short cycled, can run backward if head pressure is still high. It does not harm a scroll compressor to run backward, but it could cause a nuisance tripout of safety limits (internal overload). For this reason, if a TD1-1 delay should fail, it must be replaced. Do not bypass the control.

### ⚠ WARNING

**HS25 UNITS USING SINGLE-POLE CONTACTORS: ONE LEG OF COMPRESSOR, CAPACITOR AND CONDENSER FAN ARE CONNECTED TO LINE VOLTAGE AT ALL TIMES. POTENTIAL EXISTS FOR ELECTRICAL SHOCK RESULTING IN INJURY OR DEATH. REMOVE ALL POWER AT DISCONNECT BEFORE SERVICING.**

### ⚠ DANGER

**DO NOT ATTEMPT TO REPAIR THIS CONTROL. UNSAFE OPERATION WILL RESULT. IF THE CONTROL IS FOUND TO BE INOPERATIVE, SIMPLY REPLACE THE ENTIRE CONTROL.**

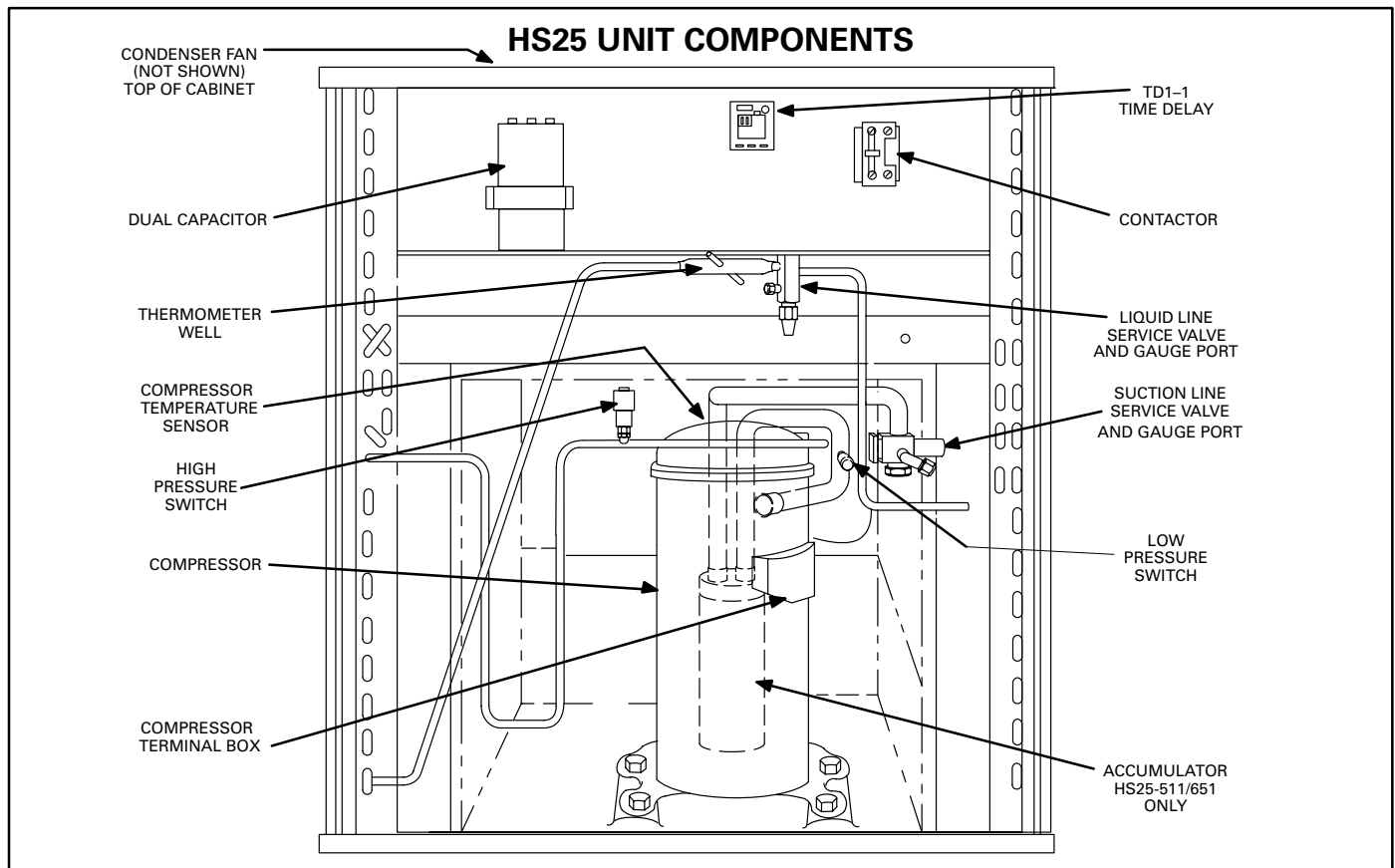


FIGURE 4

## D-Compressor

Table 1 shows the specifications of compressors used in HS25 series units.

**TABLE 1**

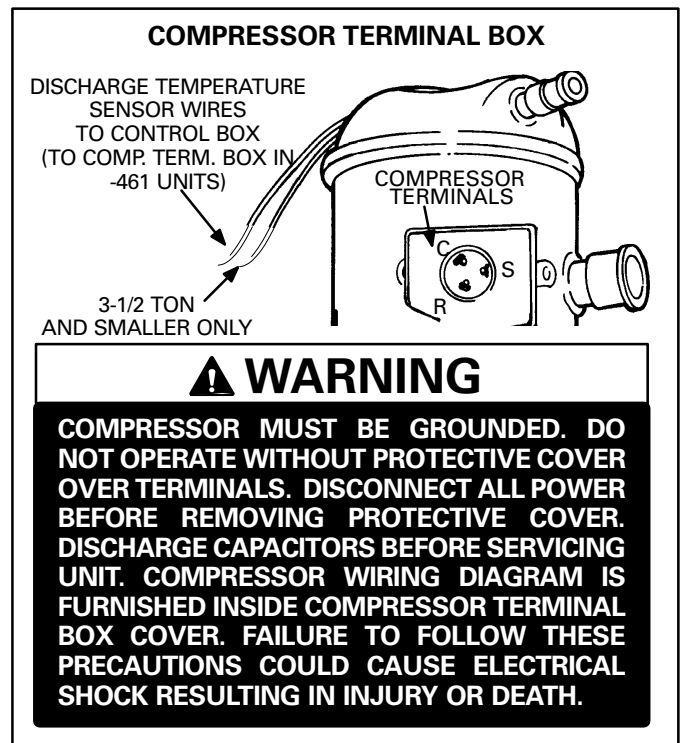
Unit	Phase	LRA	RLA	Oil fl.oz.
HS25-211	1	50.0	9.7	24*
HS25-261	1	62.5	11.6	28*
HS25-311	1	76.0	13.5	28*
HS25-411	1	90.5	18.0	34*
HS25-461	1	107	20.0	38*
HS25-511	1	129	23.7	52*
HS25-651	1	169	28.8	54*

\*Shipped with conventional white oil (Sontex 200LT). 3GS oil may be used if additional oil is required.

## E-Temperature Sensor

Scroll compressors up to 3-1/2 tons are equipped with a temperature sensor located on the outside top of the compressor. The sensor is a SPST thermostat which opens when the discharge temperature exceeds  $280^{\circ}\text{F} \pm 8^{\circ}\text{F}$  on a temperature rise. When the switch opens, the circuit to the compressor contactor and the time delay is de-energized and the unit shuts off. The switch automatically resets when the compressor temperature drops below  $130^{\circ}\text{F} \pm 14^{\circ}\text{F}$ .

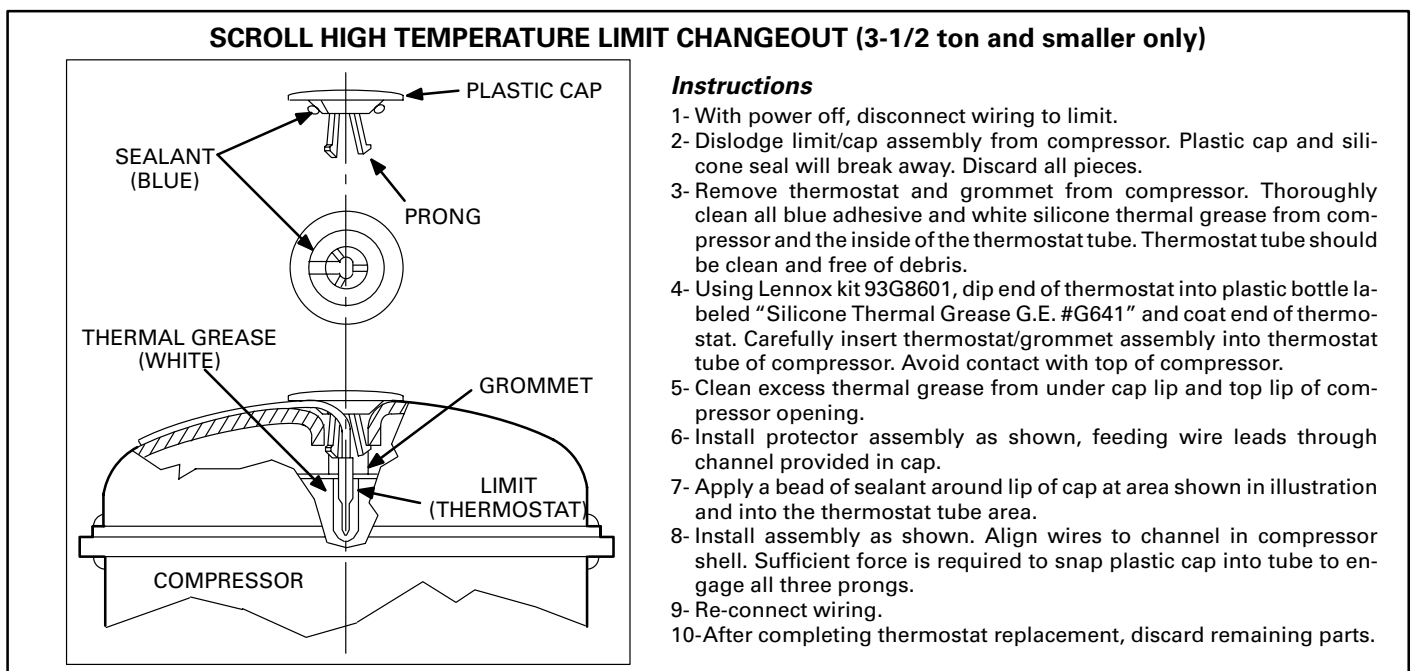
The sensor can be accessed by prying off the snap plug on top of the compressor (see figure 6). Make sure to securely seal the sensor after replacement. The sensor pigtailed are located inside the unit control box. Figure 5 shows the arrangement of compressor line voltage terminals and discharge sensor pigtailed.



**FIGURE 5**

## F-High Pressure Switch

A manual-reset single-pole single-throw high pressure switch located in the discharge line of the compressor shuts off the compressor when discharge pressure rises above the factory setting. The switch is normally closed and is permanently adjusted to trip (open) at  $410 \pm 10$  psi. See figure 4 for reset switch location.



**FIGURE 6**

## G–Low Pressure Switch

An auto-reset single-pole single-throw low pressure switch located in the suction line of the compressor shuts off the compressor when suction pressure drops below the factory setting. The switch is normally closed and is permanently adjusted to trip (open) at  $25 \pm 5$  psi. The switch automatically resets when suction line pressure rises above  $55 \pm 5$  psi. See figure 4 for re-set switch location.

## H–Dual Capacitor

The compressor and fan on all models use permanent split capacitor motors. A single “dual” capacitor is used for both the fan motor and the compressor (see unit wiring diagram). The fan side of the capacitor and the compressor side of the capacitor have different mfd ratings. The capacitor is located inside the unit control box (see figure 4). Table 2 shows the ratings of the dual capacitor.

**TABLE 2**

HS25 DUAL CAPACITOR RATING				
Units	Terminal	MFD	VAC	
HS25–211	FAN	5	370	
	HERM	25		
HS25–261	FAN	5		
	HERM	30		
HS25–311	FAN	5		440
	HERM	35		
HS25–411, -461	FAN	5		
	HERM	35		
HS25–511	FAN	10		
	HERM	40		
HS25–651	FAN	10		
	HERM	55		

## I–Condenser Fan Motor

All units use single-phase PSC fan motors which require a run capacitor. The “FAN” side of the dual capacitor is used for this purpose. The specifications table on page 1 of this manual shows the specifications of outdoor fans used in HS25s. In all units, the outdoor fan is controlled by the compressor contactor.

## IV–REFRIGERANT SYSTEM

### A–Plumbing

Field refrigerant piping consists of liquid and suction lines from the outdoor unit (sweat connections). Use Lennox L10 series line sets as shown in table 3 or field fabricated refrigerant lines. Refer to the piping section of the Lennox Service Unit Information Manual (SUI–803–L9) for proper size, type and application of field-fabricated lines.

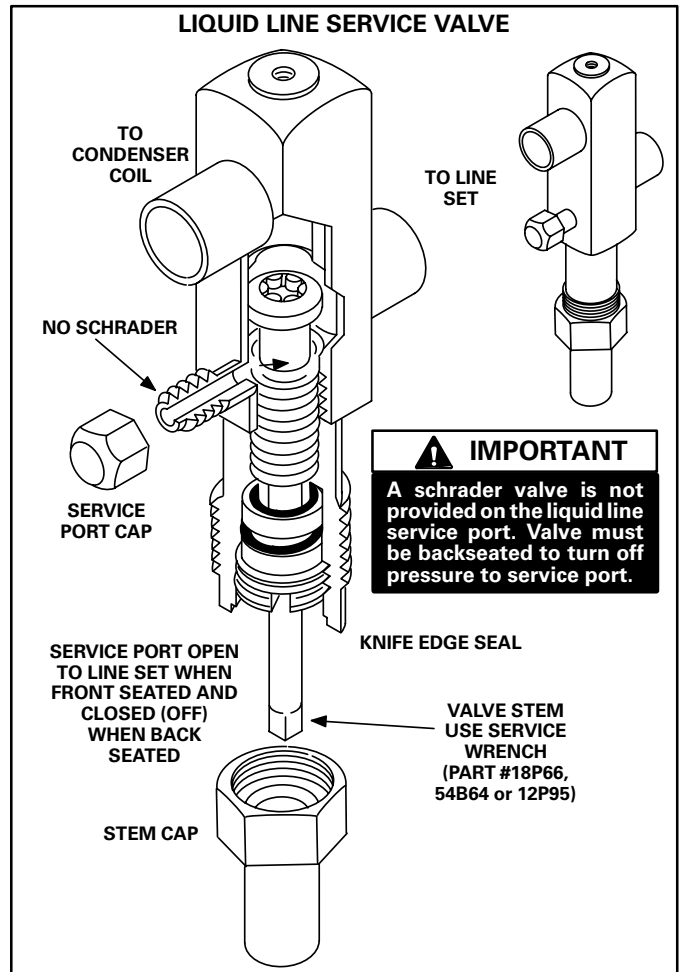
Separate discharge and suction service ports are provided at the compressor for connection of gauge manifold during charging procedure.

**TABLE 3**

Model No.	LIQUID LINE	SUCTION LINE	L10 LINE SETS
HS25–211	3/8 in.	5/8 in.	L10–26 20 ft. – 50 ft.
HS25–261 HS25–311 HS25–411	3/8 in.	3/4 in.	L10–41 20 ft. – 50 ft.
HS25–461 HS25–511	3/8 in.	7/8 in.	L10–65 20 ft. – 50 ft.
HS25–651	3/8 in.	1-1/8 in.	Field Fabricate

## B–Service Valves

The liquid line and suction line service valves and gauge ports are accessible by removing the compressor access cover. Full service liquid and suction line valves are used. See figures 7 and 8. The service ports are used for leak testing, evacuating, charging and checking charge.



**FIGURE 7**

### 1 – Liquid Line Service Valve

A full-service liquid line valve made by one of several manufacturers may be used. All liquid line service valves function the same way, differences are in construction. Valves manufactured by Parker are forged assemblies. Valves manufactured by Primore are brazed together. Valves are not rebuildable. If a valve has failed it must be replaced. The liquid line service valve is illustrated in figure 7.

The valve is equipped with a service port. There is no schrader valve installed in the liquid line service port. A service port cap is supplied to seal off the port.

The liquid line service valve is a front and back seating valve. When the valve is backseated the service port is not pressurized. The service port cap can be removed and gauge connections can be made.

### To Access Service Port:

- 1- Remove the stem cap. Use a service wrench (part #18P66, 54B64 or 12P95) to make sure the service valve is backseated.

## ⚠ CAUTION

The service port cap is used to seal the liquid line service valve. Access to service port requires backseating the service valve to isolate the service port from the system. Failure to do so will cause refrigerant leakage.

## ⚠ IMPORTANT

A schrader valve is not provided on the liquid line service port. Valve must be backseated to turn off pressure to service port.

- 2- Remove service port cap and connect high pressure gauge to service port.
- 3- Using service wrench, open valve stem (one turn clockwise) from backseated position.
- 4- When finished using port, backseat stem with service wrench. Tighten firmly.
- 5- Replace service port and stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

### To Close Off Service Port:

- 1- Using service wrench, backseat valve.
  - a - Turn stem counterclockwise.
  - b - Tighten firmly.

### To Open Liquid Line Service Valve:

- 1- Remove the stem cap with an adjustable wrench.
- 2- Using service wrench, backseat valve.
  - a - Turn stem counterclockwise until backseated.
  - b - Tighten firmly.
- 3- Replace stem cap, finger tighten then tighten an additional 1/6 turn.

### To Close Liquid Line Service Valve:

- 1- Remove the stem cap with an adjustable wrench.
- 2- Turn the stem in clockwise with a service wrench to front seat the valve. Tighten firmly.
- 3- Replace stem cap, finger tighten then tighten an additional 1/6 turn.

## 2 – Suction Line (Seating Type) Service Valve

A full service non-backseating suction line service valve is used on all HS25 series units. Different manufacturers of valves may be used. All suction line service valves function the same way, differences are in construction. Valves manufactured by Parker are forged assemblies. Primore and Aeroquip valves are brazed together. Valves are not rebuildable. If a valve has failed it must be replaced. The suction line service valve is illustrated in figure 8.

The valve is equipped with a service port. A schrader valve is factory installed. A service port cap is supplied to protect the schrader valve from contamination and assure a leak free seal.

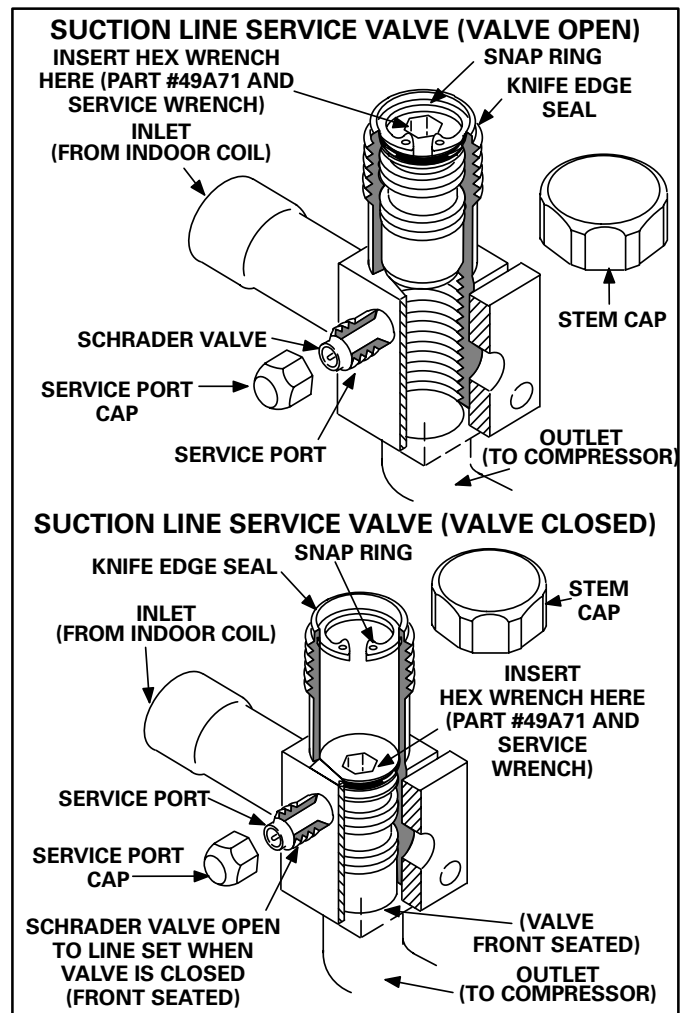


FIGURE 8

### To Access Schrader Port:

- 1- Remove service port cap with an adjustable wrench.
- 2- Connect gauge to the service port.
- 3- When testing is completed, replace service port cap. Tighten finger tight, then an additional 1/6 turn.

### To Open Suction Line Service Valve:

- 1- Remove stem cap with an adjustable wrench.
- 2- Using service wrench and 5/16" hex head extension (part #49A71) back the stem out counterclockwise until the valve stem just touches the retaining ring.

## ⚠ DANGER

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

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

### To Close Suction Line Service Valve:

- 1- Remove stem cap with an adjustable wrench.
- 2- Use service wrench and 5/16" hex head extension (part #49A71) turn stem clockwise to seat the valve. Tighten firmly.

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

### V-CHARGING

The unit is factory-charged with the amount of HCFC-22 refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with a 25 foot (6096mm) line set. For varying lengths of line set, refer to table 4 for refrigerant charge adjustment. A blank space is provided on the unit rating plate to list actual field charge.

**TABLE 4**

LIQUID LINE SET DIAMETER	Ounce per 5 foot (ml per mm) adjust from 20 foot (6096 mm) line set*
1/4 in. (6 mm)	1 ounce per 5 feet (30 ml per 1524 mm)
5/16 in. (8mm)	2 ounce per 5 feet (60 ml per 1524 mm)
3/8 in. (10 mm)	3 ounce per 5 feet (90 ml per 1524 mm)

\*If line set is greater than 20 ft. (6.09m) add this amount. If line set is less than 20 feet (6.09m) subtract this amount

Units are designed for line sets up to 50ft. Consult Lennox Refrigerant Piping Manual for line sets over 50ft.

### ! IMPORTANT

If line length is greater than 20 feet (6096mm), add this amount. If line length is less than 20 feet (6096 mm), subtract this amount.

### A-Leak Testing

- 1- Attach gauge manifold and connect a drum of dry nitrogen to center port of gauge manifold.
- 2- Add a small amount of refrigerant to the lines. Open high pressure valve on gauge manifold. Pressurize line set and indoor coil to 150 psig (1034 kPa).

### ! WARNING



**Danger of Explosion.**  
Can cause injury, death and equipment damage.  
When using dry nitrogen, use a pressure-reducing regulator, set at 150 psig (1034 kPa) or less to prevent excessive pressure.

- 3- Check lines and connections for leaks.

*NOTE – If electronic leak detector is used, add a trace of refrigerant to nitrogen for detection by leak detector.*

- 4- Release nitrogen pressure from the system, correct any leaks and recheck.

### B-Evacuating the System

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-condensable such as water vapor, combines with refrigerant to produce substances that corrode copper piping and compressor parts.

- 1- Attach gauge manifold and connect vacuum pump (with vacuum gauge) to center port of gauge manifold. With both gauge manifold ser-

vice valves open, start pump and evacuate evaporator and refrigerant lines.

### ! IMPORTANT

A temperature vacuum gauge, mercury vacuum (U-tube), or thermocouple gauge should be used. The usual Bourdon tube gauges are not accurate enough in the vacuum range.

### ! IMPORTANT

The compressor should never be used to evacuate a refrigeration or air conditioning system.

### ! CAUTION

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

- 2- Evacuate system to **absolute** pressure of .92 inches of mercury, 23 mm of mercury, or 23,000 microns.
- 3- After system has been evacuated to an absolute pressure of .92 inches mercury, 23 mm mercury, or 23,000 microns, close manifold valve to center port.
- 4- Stop vacuum pump and disconnect from gauge manifold. Attach a drum of dry nitrogen to center port of gauge manifold, open drum valve slightly to purge line, then break vacuum in system to 3 psig (20.7 kPa) pressure by opening manifold high pressure valve to center port.
- 5- Close nitrogen valve, disconnect drum from manifold center port and release nitrogen from system.
- 6- Reconnect vacuum pump to manifold center port hose. Evacuate the system to an absolute pressure less than .197 inches of mercury, 5 mm of mercury, or 5000 microns, then turn off vacuum pump. If the absolute pressure rises above .197 inches of mercury, 5 mm of mercury, or 5000 microns within a 20-minute period after stopping vacuum pump, repeat step 6. If not, evacuation is complete. This evacuation procedure is adequate for a new installation with clean and dry lines. If excessive moisture is present, the evacuation process may be required more than once.
- 7- After evacuation has been completed, close gauge manifold service valves. Disconnect vacuum pump from manifold center port and connect refrigerant drum. Pressurize system slightly with refrigerant to break vacuum.

### C-Charging

If the system is completely void of refrigerant, the recommended and most accurate method of charging is to weigh the refrigerant into the unit according to the total amount shown on the unit nameplate. Also refer to the SPECIFICATIONS tables on page 2.



If weighing facilities are not available or if unit is just low on charge, the following procedure applies.

The following procedures are intended as a general guide for use with expansion valve systems only. For best results, indoor temperature should be between 70 °F and 80 °F. Outdoor temperature should be 60 °F or above. Slight variations in charging temperature and pressure should be expected. Large variations may indicate a need for further servicing.

**APPROACH METHOD (TXV SYSTEMS)  
(Ambient Temperature of 60°F [16°C] or Above)**

- 1- Connect gauge manifold. Connect an upright HCFC-22 drum to center port of gauge manifold.

**⚠ IMPORTANT**

The following procedure requires accurate readings of ambient (outdoor) temperature, liquid temperature and liquid pressure for proper charging. Use a thermometer with accuracy of ±2 °F and a pressure gauge with accuracy of ±5 PSIG.

- 2- Record outdoor air (ambient) temperature.
- 3- Operate indoor and outdoor units in cooling mode. Allow units to run until system pressures stabilize.
- 4- Make sure thermometer well is filled with mineral oil before checking liquid line temperature.
- 5- Place thermometer in well and read liquid line temperature. Liquid line temperature should be a few degrees warmer than the outdoor air temperature. Table 5 shows how many degrees warmer the liquid line temperature should be.  
Add refrigerant to make the liquid line cooler.  
Recover refrigerant to make the liquid line warmer.
- 6- When unit is properly charged liquid line pressures should approximate those in table 6.

**TABLE 5**

APPROACH METHOD - EXPANSION VALVE SYSTEMS	
Model	Liquid Line °F Warmer Than Outside (Ambient) Temperature
HS25-211	7±1
HS25-261	7±1
HS25-311	3±1
HS25-411	4±1
HS25-461	5±1
HS25-511	3±1
HS25-651	4±1

**TABLE 6**

OUTDOOR COIL ENTERING AIR TEMPERATURE	NORMAL OPERATING PRESSURES													
	HS25-211		HS25-261		HS25-311		HS25-411		HS25-461		HS25-511		HS25-651	
	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG	LIQ. ± 10 PSIG	SUC. ± 10 PSIG
65° F (TXV)	138	78	143	73	140	69	136	74	149	69	138	73	138	69
75° F (TXV)	162	79	167	77	160	74	160	76	176	72	163	75	164	73
85° F (TXV)	189	80	195	80	186	78	191	78	209	74	182	76	185	74
95° F (TXV)	222	82	229	82	216	80	225	79	244	76	222	78	228	75
105° F (TXV)	255	84	263	84	254	81	260	80	275	78	255	79	260	76

**⚠ IMPORTANT**

Use table 6 as a general guide for performing maintenance checks. Table 6 is not a procedure for charging the system. Minor variations in these pressures may be expected due to differences in installations. Significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system. Used prudently, table 6 could serve as a useful service guide.

**D-Oil Charge**

Refer to Table 1 on page 5.

**VI-MAINTENANCE**

At the beginning of each heating or cooling season, the system should be cleaned as follows:

**A-Outdoor Unit**

- 1- Clean and inspect condenser coil. (Coil may be flushed with a water hose).
- 2- Visually inspect all connecting lines, joints and coils for evidence of oil leaks.

**⚠ IMPORTANT**

If insufficient heating or cooling occurs, the unit should be gauged and refrigerant charge checked.

**B-Indoor Coil**

- 1- Clean coil if necessary.
- 2- Check connecting lines and coil for oil leaks.
- 3- Check condensate line and clean if necessary.

**C-Indoor Unit**

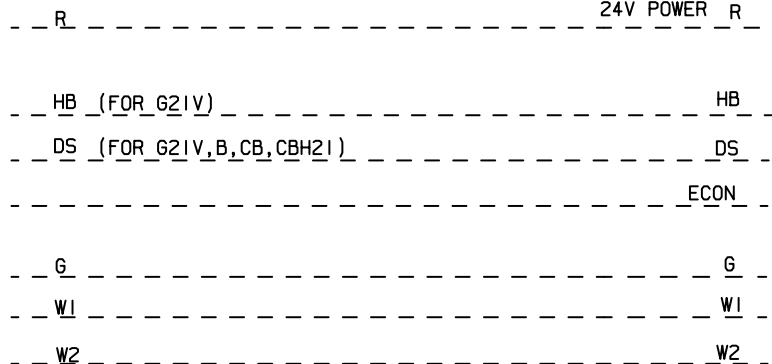
- 1- Clean or change filters.
- 2- Adjust blower cooling speed. Check static pressure drop over coil to determine correct blower CFM. Refer to Lennox Engineering Handbook.
- 3- Belt Drive Blowers - Check condition/tension.
- 4- Check all wiring for loose connections.
- 5- Check for correct voltage at unit.
- 6- Check amp-draw on blower motor.  
Unit nameplate \_\_\_\_\_ Actual \_\_\_\_\_.

# VII-DIAGRAMS / OPERATING SEQUENCE

## A-Unit Diagram

### UNIT DIAGRAM

24V POWER R



— LINE VOLTAGE FIELD WIRING  
 - - - - CLASS II VOLTAGE FIELD WIRING

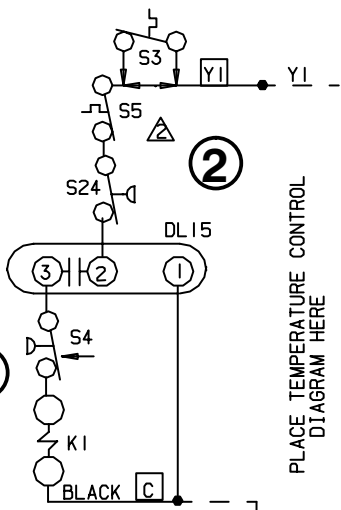
KEY	DESCRIPTION
B1	COMPRESSOR
B4	MOTOR-FAN
C12	CAPACITOR-DUAL
DL15	DELAY-COMPRESSOR
K1,-1	CONTACTOR-COMPRESSOR
S3	LIMIT-LO COMP. TEMP.
S4	LIMIT-HI PRESS. COMP.
S5	LIMIT-HI TEMP. COMP.
S11	SWITCH-LOW AMB. KIT
S24	SWITCH-LOSS OF CHARGE

ADD TO BLOWER OR FURNACE DIAGRAM

△ REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM FUSE SIZE FOR USE WITH COPPER CONDUCTOR ONLY.

△ USED ONLY IF COMPRESSOR THERMOSTAT IS NOT INTERNAL

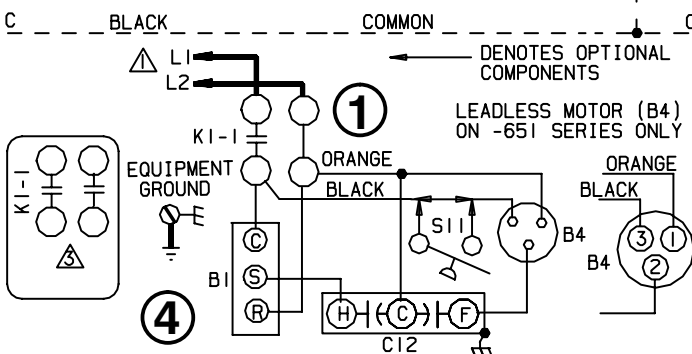
△ USED ON "651" SERIES UNITS ONLY



PLACE TEMPERATURE CONTROL DIAGRAM HERE

### B-Operation Sequence

- WARNING**—HS25 units using single-pole contactors: Capacitor terminal "COM," orange condenser fan wire and red "R" compressor wire are all connected to L2 at all times. Remove all power at disconnect before servicing.
- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through discharge temperature sensor (compressor thermostat) and low pressure switch to energize time delay terminal 2.
- Time delay action is at the beginning of a thermostat demand. When energized, time delay TD1-1 delays 8.5 seconds before energizing TD1-1 terminal 3. When TD1-1 terminal 3 is energized, the contactor coil is energized.
- When compressor contactor is energized, N.O. contacts close to energize compressor terminal "C" (black wire) and black condenser fan motor wire. Condenser fan and compressor immediately begin operating.



<b>LENNOX</b> Industries Inc. WIRING DIAGRAM 5/93	
COOLING UNITS-CONDENSING UNITS	
HS25-211, 261, 311, 411, 461-1-P HS25-511, 651-1-P 208-230/60/1	
COOLING UNITS-SEC. B	
Supersedes Form No.	New Form No. 529, 691W

© 1993 Lennox Industries Inc.

Litho U.S.A.