LENNOX®
Service Literature

UNIT INFORMATION

Corp. 9622-L12
Revised 04-2002

HS26

HS26 SERIES UNITS

The HS26 is a high efficiency residential split-system condensing unit which features a scroll compressor. **Early** model HS26 units (-261,-311,-411, and -461) are available in sizes ranging from 2 through 3-1/2 tons. **Late** model HS26 units (-018, -024, -030, -036, -042, -048 and -060) 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. Information in this manual covers both **early** and **late** model HS26 units.

All specifications in this manual are subject to change.

⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of (CFC's and HFC's) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration my be levied for noncompliance.

⚠WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

TABLE OF CONTENTS

SPECIFICATIONS (Early Model)

Model No.		HS26-261	HS26-311	HS26-411	HS26-461
Outdoor Coil	Face area (sq.ft.) outer / inner	11.8/5.4	15.9/5.5	15.9/15.3	21.6/20.8
	Tube diameter (in.)	3/8	3/8	3/8	3/8
	No. of Rows	1.36	1.36	2.0	2.0
	Fins per inch	20	20	20	20
Condenser Fan	Diameter (in.)	24	24	24	24
	No. of Blades	3	3	3	3
	Motor hp	1/6	1/6	1/6	1/6
	Cfm	3150	3150	3000	3230
	RPM	820	820	820	820
	Watts	210	210	230	205
HCFC-22 (charge furnished)		7lbs. 11oz.	8lbs. 1oz.	9lbs. 0oz.	11lbs. 3oz.
Liquid line connection		3/8	3/8	3/8	3/8
Suction line connection		3/4	3/4	3/4	1-1/8

*Refrigerant charge sufficient for 25 ft. (7.6 m) length of refrigerant lines.

ELECTRICAL DATA (Early Model)

Model No.		HS26-261	HS26-311	HS26-411	HS26-461
Line voltage data - 60hz./1 phase		208/230V	208/230V	208/230V	208/230V
Compressor	Rated load amps	11.6	13.5	18.0	20
	Power factor	.96	.96	.96	.97
	Locked rotor amps	62.5	76.0	90.5	107
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)		25	30	40	45
*Minimum circuit ampacity		15.6	18.0	23.6	26.1

*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 (Late Model)

Model No.			HS26-018	HS26-024	HS26-030	HS26-036	HS26-042	HS26-048	HS26-060
Condenser Coil	Net face area — sq. ft. (m^2)	Outer coil	11.9 (1.11)	11.9 (1.11)	16.0 (1.59)	16.0 (1.59)	16.0 (1.59)	18.2 (1.69)	21.6 (2.01)
		Inner coil	5.5 (0.51)	5.5 (0.51)	5.6 (0.52)	13.3 (1.24)	13.3 (1.24)	13.3 (1.24)	20.8 (1.93)
	Tube diameter — in. (mm)		5/16 (7.9)	5/16 (7.9)	5/16 (7.9)	5/16 (7.9)	5/16 (7.9)	5/16 (7.9)	5/16 (7.9)
	No. of rows		1.48	1.48	1.36	1.86	1.86	1.75	2
	Fins per inch (m)		22 (866)	22 (866)	22 (866)	22 (866)	22 (866)	22 (866)	22 (866)
Condenser Fan	Dia. - in. (mm) no. of blades		20 (508) - 4	20 (508) - 4	24 (610) - 3	24 (610) - 3	24 (610) - 3	24 (610) — 4	24 (610) — 4
	Motor hp (W)		1/10 (75)	1/6 (124)	1/6 (124)	1/6 (124)	1/6 (124)	1/4 (187)	1/4 (187)
	Cfm (L/s)		2500 (1180)	2450 (1155)	3150 (1485)	3150 (1485)	3000 (1415)	3900 (1840)	4200 (1980)
	Rpm		825	825	825	825	825	820	820
	Watts		160	210	225	225	230	310	350
*Refrigerant — HCFC-22 charge furnished			3 lbs. 11 oz. (2.04 kg)	3 lbs. 11 oz. (2.04 kg)	4 lbs. 11 oz. (2.12 kg)	5 lbs. 7 oz. (2.45 kg)	6 lbs. 5 oz. (2.86 kg)	6 lbs. 15 oz. (3.14 kg)	10 lbs. 2 oz. (4.58 kg)
Liquid line (o.d.) — in. (mm) sweat			3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)	3/8 (9.5)
Suction line (o.d.) in. — (mm) sweat			5/8 (16)	3/4 (19)	3/4 (19)	3/4 (19)	7/8 (22.2)	7/8 (22.2)	1-1/8 (28.6)
Shipping weight — lbs. (kg) 1 package			177 (80)	185 (84)	192 (87)	221 (100)	231 (105)	274 (124)	308 (140)

*Refrigerant charge sufficient for 15 ft. (4.5 m) length of refrigerant lines.

ELECTRICAL DATA (Late Model)

Model No.		HS26-018	HS26-024	HS26-030	HS26-036		HS26-042	
Line voltage data — 60hz		208/230v 1ph	208/230v 1ph	208/230v 1ph	208/230v 1ph	208/230v 3ph	208/230v 1ph	208/230v 3ph
Compressor	Rated load amps	8.4	10.3	13.5	16.0	10.3	18.0	12.5
	Power factor	0.97	0.96	0.96	0.96	0.82	0.94	0.82
	Locked rotor amps	47	56	72.5	88	77	104	88
Condenser Coil Fan Motor	Full load amps	0.8	1.1	1.1	1.1	1.1	1.1	1.1
	Locked rotor amps	1.6	2.0	2.0	2.0	2.0	2.0	2.0
Rec. max. fuse or circuit breaker size (amps)		15	20	30	35	20	40	25
*Minimum circuit ampacity		13	14	18	21.3	14	23.6	16.4

*Refer to National or Canadian 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.

ELECTRICAL DATA (Late Model)

Model No.		HS26-048			HS26-060		
Line voltage data — 60hz		208/230v 1ph	208/230v 3ph	460v 3ph	208/230v 1ph	208/230v 3ph	460v 3ph
Compressor	Rated load amps	23.7	13.5	7.4	28.8	17.4	9.0
	Power factor	.97	.87	.87	.97	.85	.85
	Locked rotor amps	129	99	49.5	169	123	62
Condenser Coil Fan Motor	Full load amps	1.7	1.7	1.1	1.7	1.7	1.1
	Locked rotor amps	3.1	3.1	2.2	3.1	3.1	2.2
Rec. max. fuse or circuit breaker size (amps)		50	30	15	60	40	20
*Minimum circuit ampacity		31.4	18.6	10.4	37.7	23.5	12.4

*Refer to National or Canadian 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.

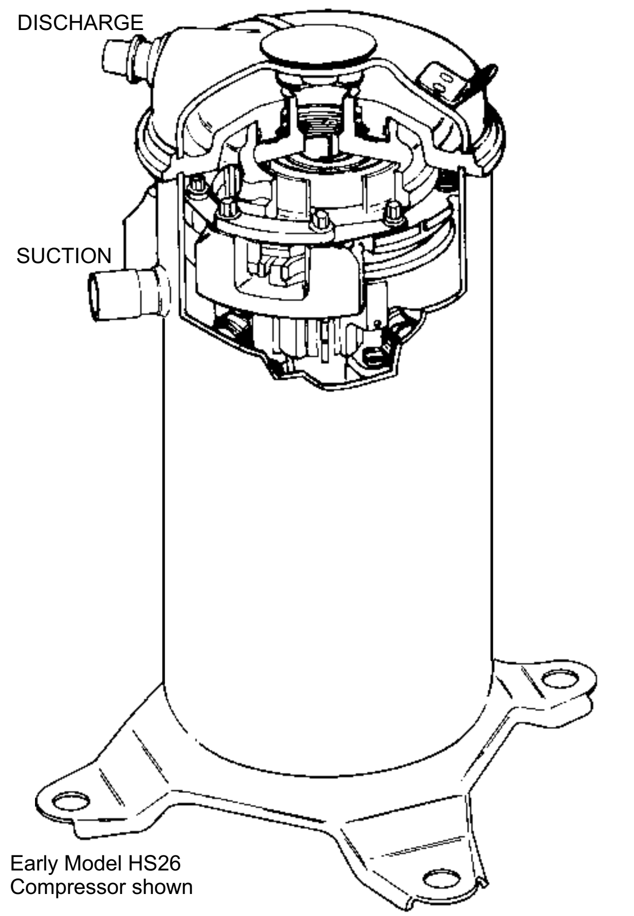


FIGURE 1

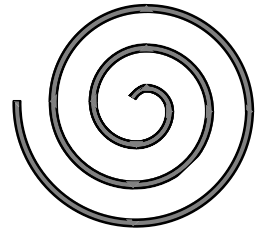


FIGURE 2

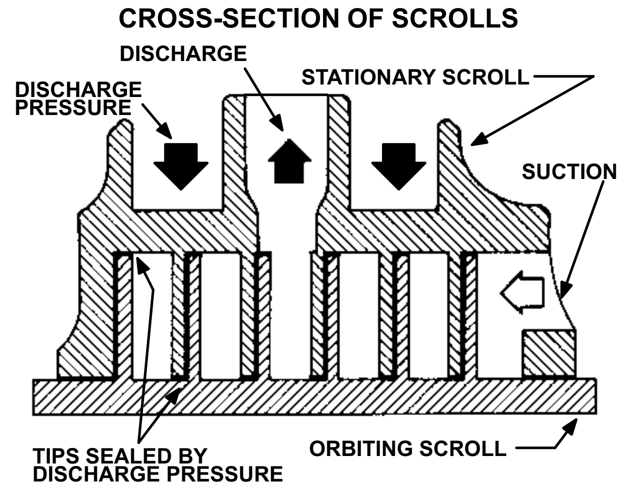


FIGURE 3

I-APPLICATION

All major components (indoor blower and 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 in figure 1.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 2 shows the basic scroll form. Two identical scrolls are mated together forming concentric spiral shapes (figure 3). One scroll remains stationary, while the other is allowed to “orbit” (figure 4). Note that the orbiting scroll does not rotate or turn but merely “orbits” the stationary scroll.

The counterclockwise orbiting scroll draws gas into the outer crescent shaped gas pocket created by the two scrolls (figure 4 - 1). The centrifugal action of the orbiting scroll seals off the flanks of the scrolls (figure 4 - 2). As the orbiting motion continues, the gas is forced toward the center of the scroll and the gas pocket becomes compressed (figure 4 -3). When the compressed gas reaches the center, it is discharged vertically into a chamber and discharge port in the top of the compressor (figure1). The discharge pressure forcing down on the top scroll helps seal off the upper and lower edges (tips) of the scrolls (figure 3). 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 fusite 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.

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

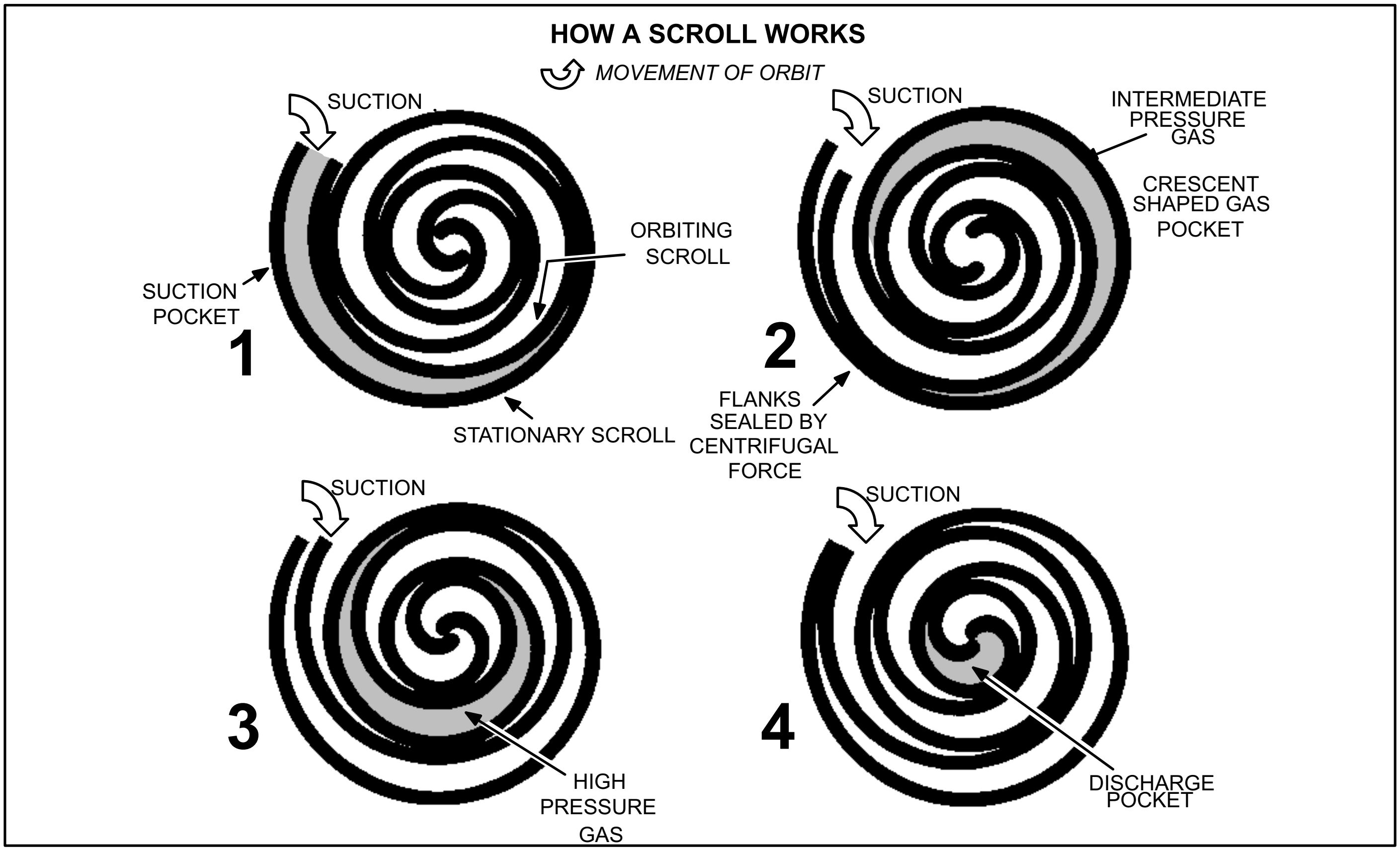


FIGURE 4

III-UNIT COMPONENTS

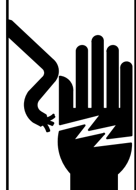
A-Transformer

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 HS26 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. Early model units use single-pole contactors.Late model single-phase units use single pole and two-pole contactors. See wiring diagrams for specific unit. Late model three-phase units use three-pole contactors. The contactor is energized by indoor thermostat terminal Y when thermostat demand is present.

DANGER



Electric Shock Hazard.
May cause injury or death.

Disconnect all remote electrical power supplies berore opening unit panel. Unit may have multiple power supplies.

Some units are equipped with single-pole contactors. When unit is equipped with a single-pole contactor, line voltage is present at all components (even when unit is not in operation).

ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures

CAUTION

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface before performing any service procedure.

C-TD1-1 Time Delay (Early Models)

Some early model HS26 units are equipped with a Lennox-built TD1-1 time delay located in the control box (figure 5). 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 trip of safety limits (internal overload). For this reason, if a TD1-1 delay should fail, it must be replaced. Do not bypass the control.

D-TOC Timed Off Control (Early and Late Models)

Some early and late model HS26 units (see wiring diagrams) are equipped with a TOC, timed off control. The TOC is located in the control box (figure 6). The time delay is electrically connected between thermostat terminal Y and the compressor contactor. Between cycles, the compressor contactor is delayed for 5 minutes ± 2 minutes. 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. Without the time 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. For this reason, if a TOC fails it must be replaced.

⚠ DANGER

DO NOT ATTEMPT TO REPAIR THE TD1-1 OR THE TOC CONTROL. UNSAFE OPERATION WILL RESULT. IF THE CONTROL IS FOUND TO BE INOPERATIVE, SIMPLY REPLACE IT.

HS26 UNIT COMPONENTS (EARLY MODEL)

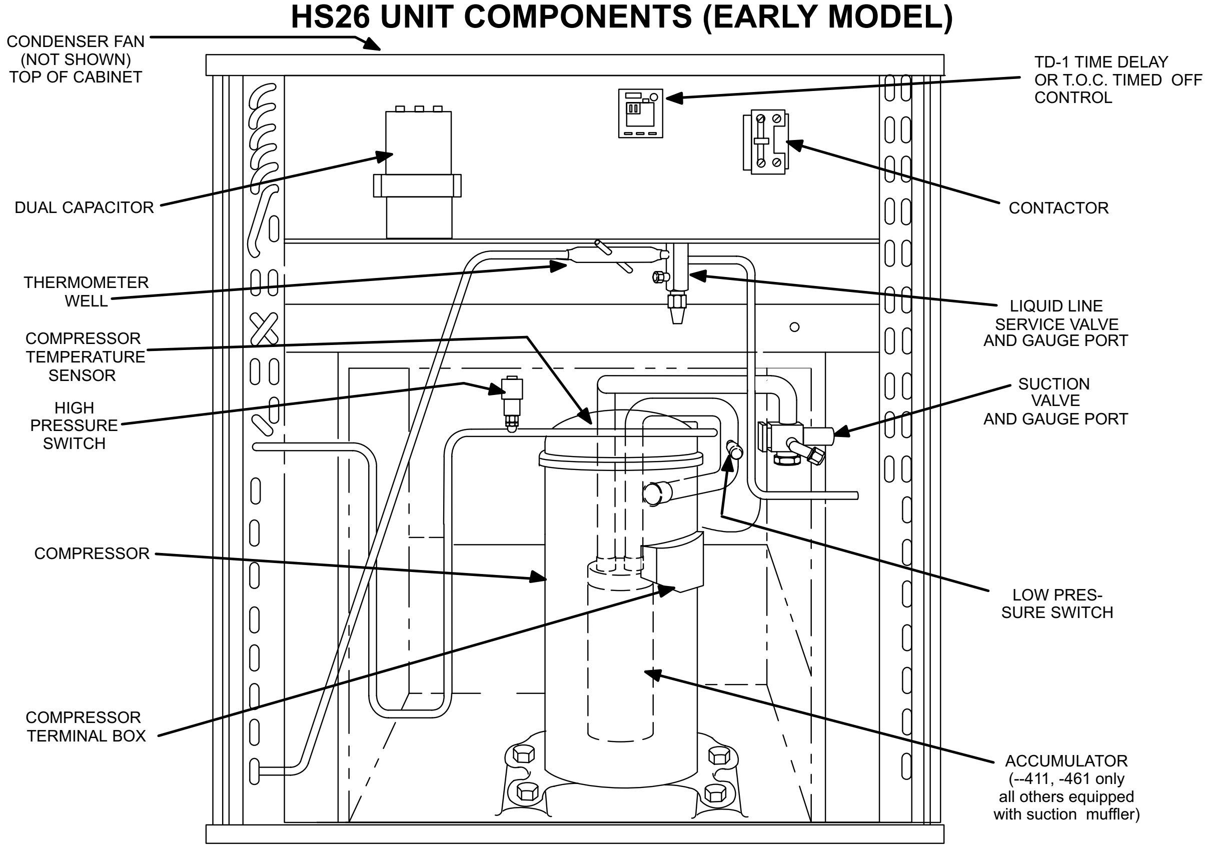


FIGURE 5

PARTS ARRANGEMENT FOR HS26 (LATE MODEL)

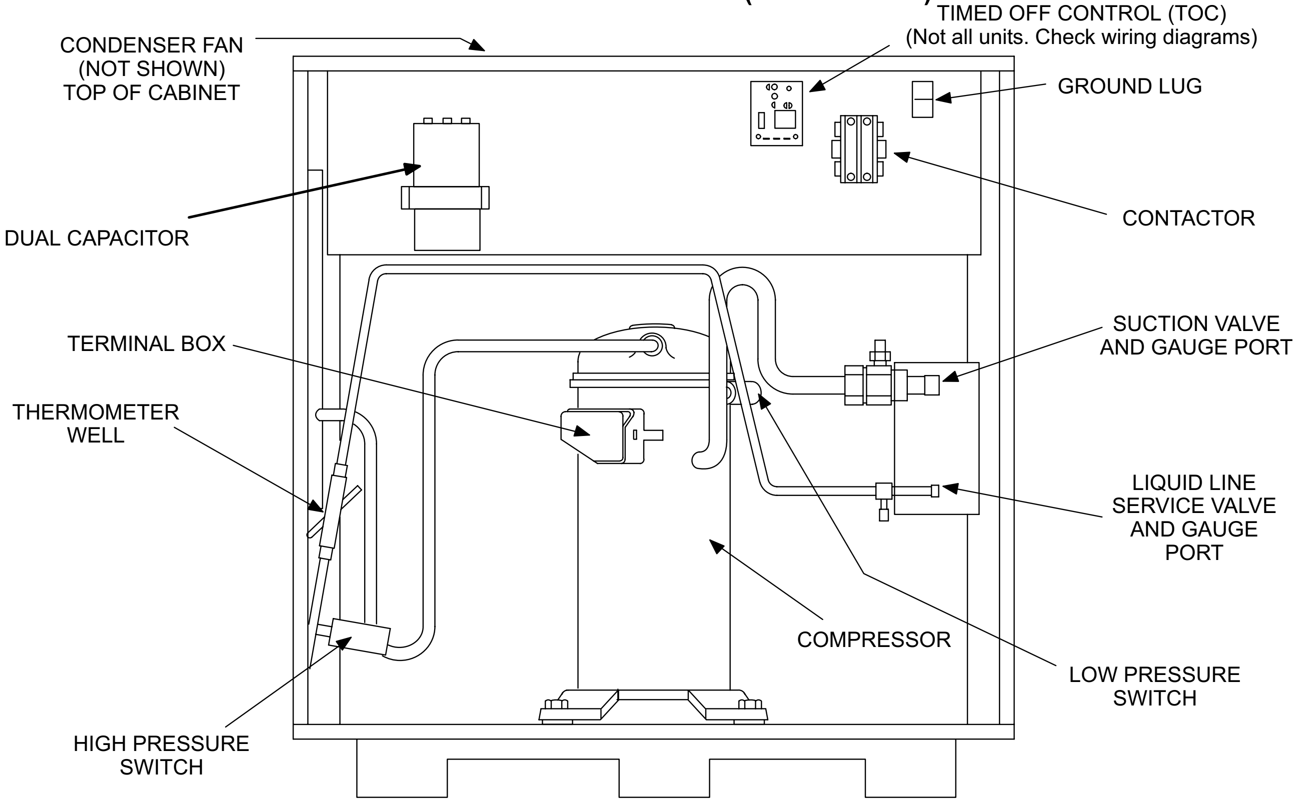
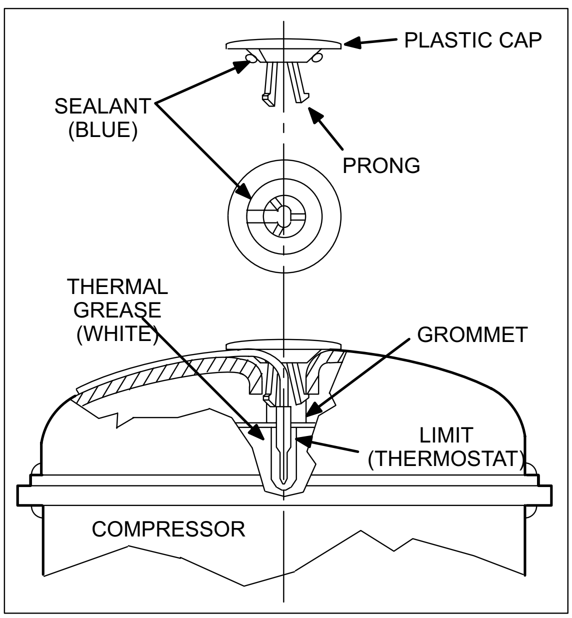


FIGURE 6

COMPRESSOR HIGH TEMPERATURE LIMIT CHANGEOUT (EARLY MODELS ONLY)



Instructions

1- With power off, disconnect wiring to limit.
2- Dislodge limit/cap assembly from compressor. Plastic cap and silicone seal will break away. Discard all pieces.
3- Remove thermostat and grommet from compressor. Thoroughly clean all blue adhesive and white silicone thermal grease from compressor and the inside of the thermostat tube. Thermostat tube should be clean and free of debris.
4- Using Lennox kit 93G8601, dip end of thermostat into plastic bottle labeled “Silicone Thermal Grease G.E. #G641” and coat end of thermostat. Carefully insert thermostat/grommet assembly into thermostat tube of compressor. Avoid contact with top of compressor.
5- Clean excess thermal grease from under cap lip and top lip of compressor opening.
6- Install protector assembly as shown, feeding wire leads through channel provided in cap.
7- Apply a bead of sealant around lip of cap at area shown in illustration and into the thermostat tube area.
8- Install assembly as shown. Align wires to channel in compressor shell. Sufficient force is required to snap plastic cap into tube to engage all three prongs.
9- Re-connect wiring.
10-After completing thermostat replacement, discard remaining parts.

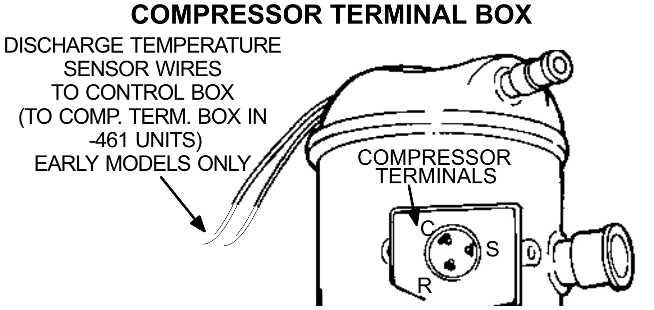
FIGURE 7

E-Compressor High Temperature Limit (Early Models)

Each scroll compressor in the HS26-261, -311, -411, -461 is equipped with a compressor high temperature limit located on the outside top of the compressor. The sensor is a SPST thermostat which opens when the discharge temperature exceeds 280°F ± 8°F (138°C ± 4.5°C) 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°F ± 14°F. (54°C ± 8°C)

The sensor can be accessed by prying off the snap plug on top of the compressor (see figure 7). Make sure to securely seal the limit after replacement. The limit pigtails are located inside the unit control box. Figure 8 shows the arrangement of compressor line voltage terminals and discharge sensor pigtails.

COMPRESSOR TERMINAL BOX



⚠ WARNING

COMPRESSOR MUST BE GROUNDED. DO NOT OPERATE WITHOUT PROTECTIVE COVER OVER TERMINALS. DISCONNECT ALL POWER BEFORE REMOVING PROTECTIVE COVER. DISCHARGE CAPACITORS BEFORE SERVICING UNIT. COMPRESSOR WIRING DIAGRAM IS FURNISHED INSIDE COMPRESSOR TERMINAL BOX COVER. FAILURE TO FOLLOW THESE PRECAUTIONS COULD CAUSE ELECTRICAL SHOCK RESULTING IN INJURY OR DEATH.

FIGURE 8

F-High/Low Pressure Switch

A manual-reset single-pole single-throw high pressure switch located in the liquid line, shuts off the compressor when liquid line pressure rises above the factory setting. The switch is normally closed and is permanently adjusted to trip (open) at 410 ± 10 psi. See figure 5 or 6 for switch location

An auto-reset single-pole single-throw low pressure switch located in the suction line 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 ± 5 psi. The switch automatically resets when suction line pressure rises above 55 ± 5 psi. See figure 5 or 6 for switch location.

G-Dual Capacitor

The compressor and fan in HS26 single-phase units 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 and will be printed on the side of the capacitor. The capacitor is located inside the unit control box (see figure 5 or 6).

H-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 tables on page 1 and 2 of this manual show the specifications of outdoor fans used in HS26s. In all units, the outdoor fan is controlled by the compressor contactor. See figure 9 if condenser fan motor replacement is necessary.

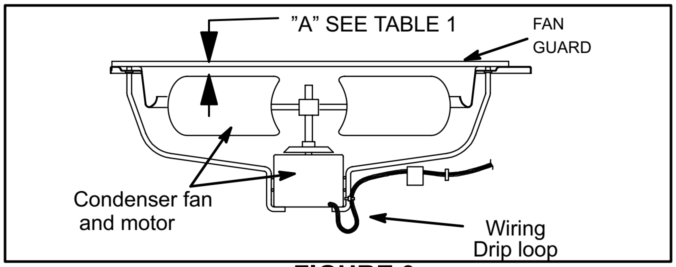


FIGURE 9

TABLE 1

HS26 UNIT	”A” DIM. ± 1/8”	Fan Blade Vendor
-018, -024, -261,	7/8”	Lau
-018, -024, -261,	7/8”	Revcor
-030, -311, -036, -411, -042, -461	1-1/16”	Lau
-030, -311, -036, -411, -042, -461	1-1/16”	Revcor
-048	1-3/4”	Lau
-048	1-1/2”	Revcor
-060	1-3/16”	Lau
-060	1-3/16”	Revcor

IV-REFRIGERANT SYSTEM

A-Plumbing

Field refrigerant piping consists of liquid and suction lines from the outdoor unit (sweat connections). Use Lennox L10 or L15 series line sets as shown in table 2 or 3 for 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.

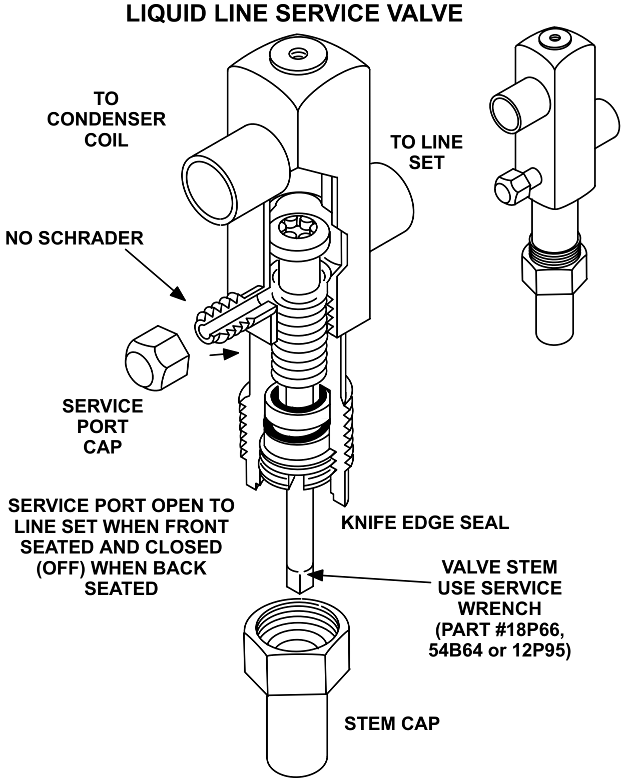
TABLE 2 (Early Models)

HS26 UNIT	LIQUID LINE	SUCTION LINE	L10 LINE SET	L15 LINE SET
-261, -311, -411	3/8 in. (10 MM)	3/4 in. (19 mm)	L10-41 20ft. - 50 ft. (6m - 15 m)	L15 - 41 20 ft. - 50 ft. (6 m - 15 m)
-461	3/8 in. (10 MM)	1-1/8 in. (29 m)	Field Fabricated	Field Fabricated
-511	3/8 in. (10 MM)	7/8 in. (22 m)	L10-65 30 ft. - 50 ft. (9 m - 15m)	L15-65 30 ft. - 50 ft. (9 m - 15m)
-651	3/8 in. (10 MM)	1-1/8 in. (29 m)	Field Fabricated	Field Fabricated

TABLE 3 (Late Models)

HS26 UNIT	LIQUID LINE	SUCTION LINE	L10 LINE SET	L15 LINE SET
-018	3/8 in. (10 mm)	5/8 in. (16 mm)	L10-26 20ft. - 50 ft. (6m - 15 m)	L15 - 26 15 ft. - 50 ft. (4.5 m - 15 m)
-024 -030 -036	3/8 in. (10 mm)	3/4 in. (19 mm)	L10-41 20 ft. - 50 ft. (6m - 15 m)	L15-41 15 ft. - 50 ft. (4.5m - 15m)
-042 -048	3/8 in. (10 mm)	7/8 in. (22 m)	L10-65 30 ft. - 50 ft. (9 m - 15m)	L15-65 15 ft. - 50 ft. (4.5 m - 15m)
-060	3/8 in. (10 mm)	1-1/8 in. (29 m)	Field Fabricated	Field Fabricated

LIQUID LINE SERVICE VALVE



IMPORTANT

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

FIGURE 10

B-Service Valves (Early Models)

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.The service ports are used for leak testing, evacuating, charging and checking charge.

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 are not rebuildable. If a valve has failed it must be replaced. The liquid line service valve is illustrated in figure 10.

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 open.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, but do not overtighten.

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, but do not overtighten.

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 early HS26 series units (except -461). Different manufacturers of valves may be used. All suction line service valves function the same way, differences are in construction.

Valves are not rebuildable. If a valve has failed it must be replaced. The suction line service valve is illustrated in figure 11.

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.

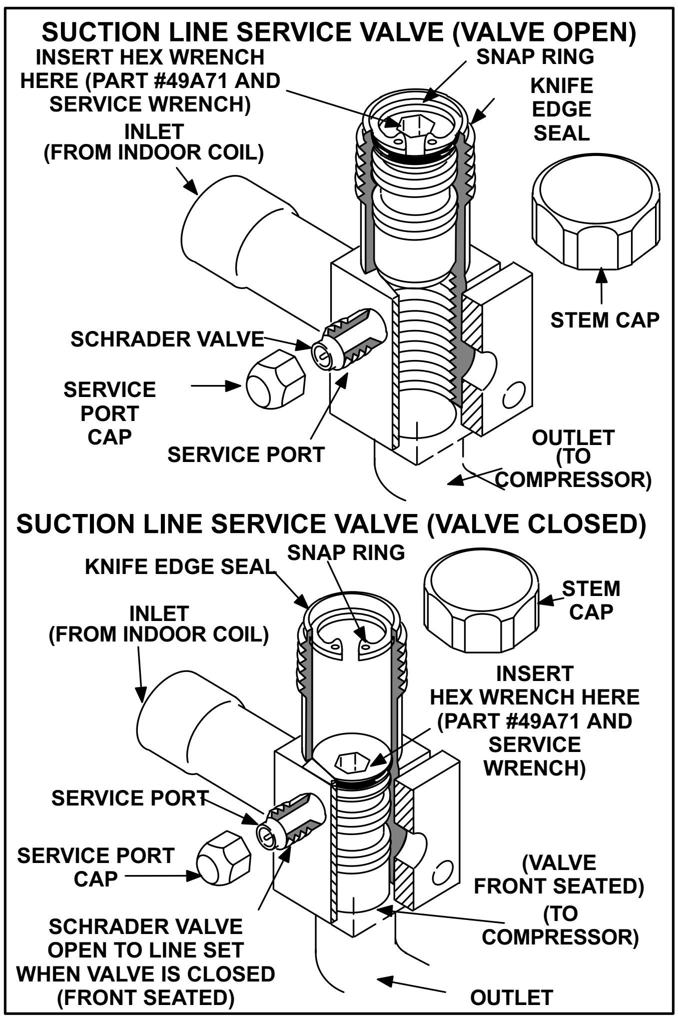


FIGURE 11

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 tighten 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 and 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- Using service wrench and 5/16” hex head extension (part #49A71) turn stem in clockwise to seat the valve. Tighten firmly, but do not overtighten.
3- Replace stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

3 - Suction Line (Ball Type) Service Valve

A ball-type full service valve is used on the early model HS26-461 units. This valve is manufactured by Aeroquip. All suction line service valves function the same way, differences are in construction. Valves are not rebuildable. If a valve has failed it must be replaced. A ball valve is illustrated in figure 12.

The ball 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.

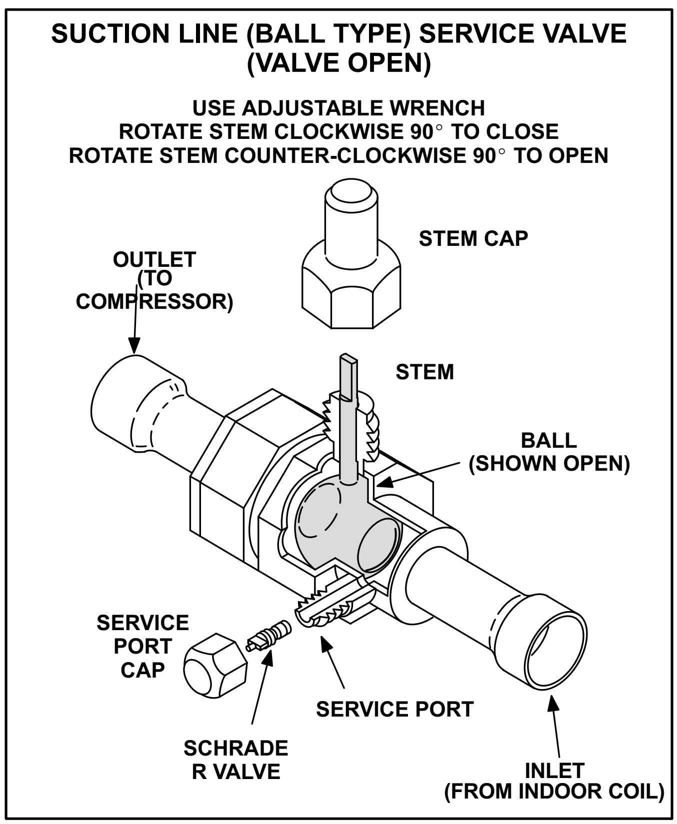


FIGURE 12

C-Service Valves (Late Models)

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 figures13 and 14. The service ports are used for leak testing, evacuating, charging and checking charge. Service valves have a factory installed schrader valve. A service port cap is supplied to protect the schrader valve from contamination and assure a leak free seal. Valves are not rebuildable. If a valve has failed it must be replaced.

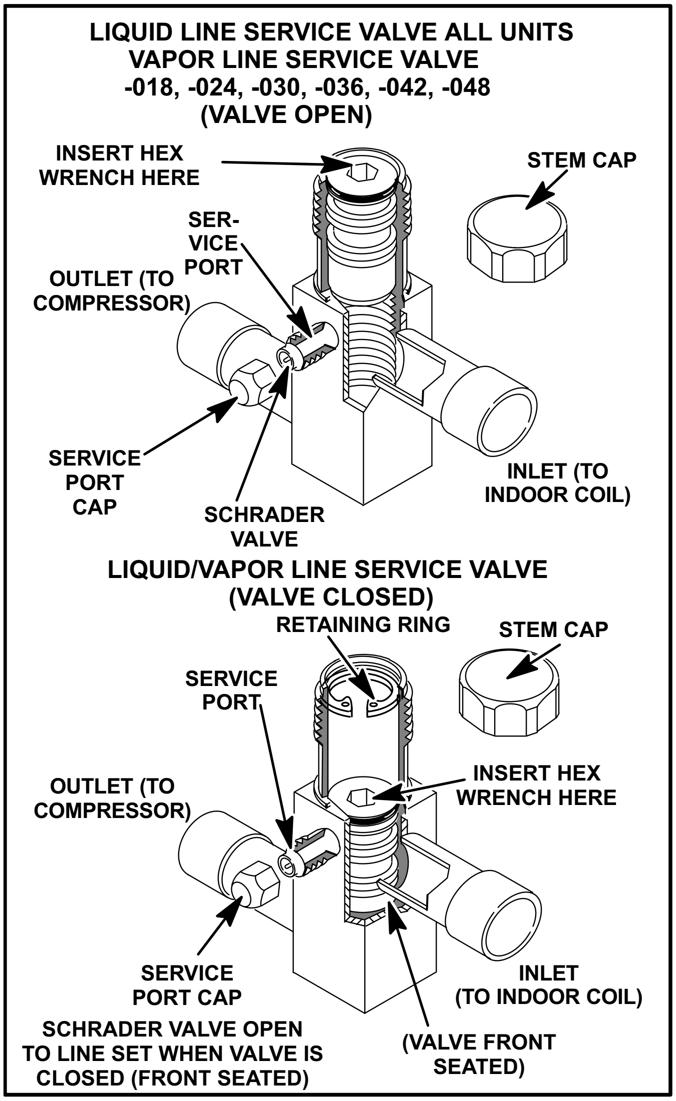


FIGURE 13

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 Liquid or Suction Line Service Valve:

1- Remove stem cap with an adjustable wrench.

2- Using service wrench and 5/16” hex head extension back the stem out counterclockwise until the valve stem just touches the retaining ring.

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

⚠ 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.

To Close Liquid or Suction Line Service Valve:

1- Remove stem cap with an adjustable wrench.

2-Using service wrench and 5/16” hex head extension, turn stem clockwise to seat the valve. Tighten firmly, but do not overtighten.

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

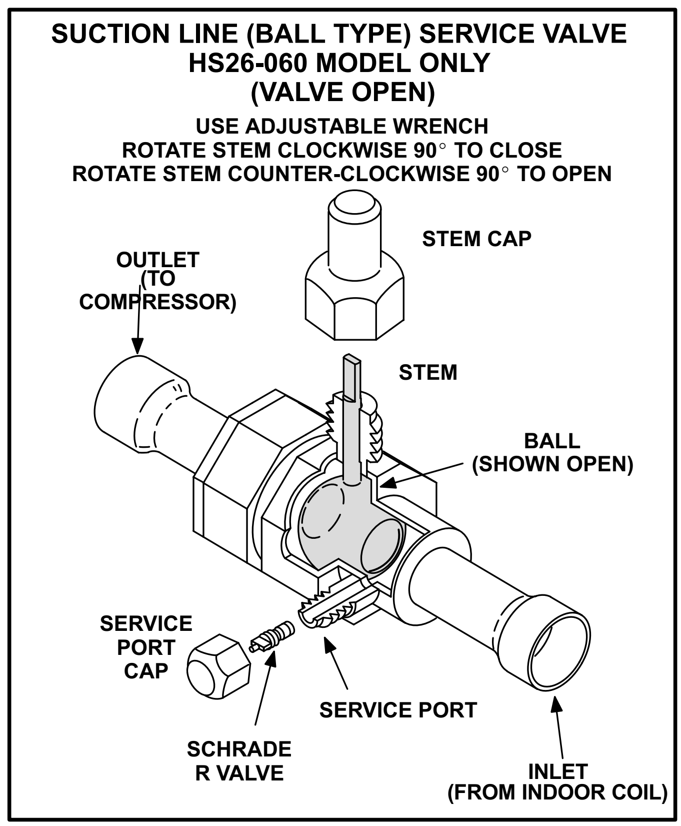


FIGURE 14

V-CHARGING

⚠ WARNING

Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.

Failure to follow this warning may result in personal injury or death.

The unit is factory-charged with the amount of R-22 refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with a 15 foot (4.5m) line set. For varying lengths of line set, refer to table 4 for refrigerant charge adjustment for both, early and late model HS26 units. A blank space is provided on the unit rating plate to list actual field charge.

TABLE 4

LIQUID LINE SET DIAMETER	Ounce per 5 ft. (ml per mm) adjust from 15 ft. (4.5m) line set*
5/16 in. (8mm)	2 ounce per 5 ft. (60 ml per 1524 mm)
3/8 in. (10 mm)	3 ounce per 5 ft. (90 ml per 1524 mm)

If line set is greater than 15 ft. (4.5m) add this amount. If line set is less than 15 ft. (4.5m) subtract this amount.

Units are designed for line sets up to 50 ft. (15m).Consult Lennox Refrigerant Piping Manual for line sets over 50 ft. (15m).

⚠ IMPORTANT

If line length is greater than 15 feet (4.5m), add this amount. If line length is less than 15feet (4.5m), subtract this amount.

A-Leak Testing

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

⚠WARNING

Danger of explosion: Can cause equipment damage, injury or death. Never use oxygen to pressurize a refrigeration or air conditioning system. Oxygen will explode on contact with oil and could cause personal injury.

⚠ WARNING

Danger of explosion: Can cause equipment damage, injury or death. When using a high pressure gas such as dry nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

Using an Electronic Leak Detector or Halide

1 - Connect a cylinder of HCFC-22 to the center port of the manifold gauge set.

2 - With both manifold valves closed, open the valve on the HCFC-22 cylinder (vapor only).

3 - Open the high pressure side of the manifold to allow the HCFC-22 into the line set and indoor unit. Weigh in a trace amount of HCFC-22. [A trace amount is a maximum of 2 ounces (57 g) or 3 pounds (31 kPa) pressure.] Close the valve on the HCFC-22 cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the HCFC-22 cylinder.

4 - Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set.

5 - Connect the manifold gauge set high pressure hose to the vapor valve service port. *(Normally, the high pressure hose is connected to the liquid line port; however, connecting it to the vapor port better protects the manifold gauge set from high pressure damage.)*

6 - Adjust the nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set which will pressurize line set and indoor unit.

7 - After a few minutes, open a refrigerant port to ensure the refrigerant you added is adequate to be detected. (Amounts of refrigerant will vary with line lengths.) Check all joints for leaks. Purge nitrogen and HCFC-22 mixture. Correct any leaks and recheck.

B-Evacuating the System

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

NOTE - This evacuation process 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.

⚠ IMPORTANT

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.

1 - Connect manifold gauge set to the service valve ports :
- low pressure gauge to *vapor* 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 the vacuum pump.

5 - Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29.01 inches 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, repeat the leak testing procedure.

*NOTE - The term **absolute pressure** means the total actual pressure within 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 23,000 microns (29.01 inches of mercury), close the manifold gauge valves, turn off the vacuum pump and disconnect the manifold gauge center port hose from vacuum pump. Attach the manifold center port hose to a nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) 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.

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.

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 500 microns (29.9 inches 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 HCFC-22 refrigerant. Open the manifold gauge valves to break the vacuum from 1 to 2 psig positive pressure in the line set and indoor unit. Close manifold gauge valves and shut off the HCFC-22 cylinder and remove the manifold gauge set.

IMPORTANT

Use tables 5 and 6 as a general guide for performing maintenance checks. Table 5 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, tables 5 and 6 could serve as a useful service guide.

C-Charging

TABLE 5 (Early Models)

NORMAL OPERATING PRESSURES

OUTDOOR TEMP. (°F)	HS26-261		HS26-311		HS26-411		HS26-461	
	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	141	77	140	69	141	75	140	62
75	163	79	160	74	167	77	170	77
85	191	80	186	78	195	79	170	77
95	220	82	216	80	225	80	223	80
105	255	83	254	81	260	81	261	81

TABLE 6 (Late Models)

NORMAL OPERATING PRESSURES

OUTDOOR TEMP. (°F)	HS26-018		HS26-024		HS26-030		HS26-036		HS26-042		HS26-048		HS26-060	
	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig	Liq.± 10 psig	Suct.± 5 psig
65	142	75	143	76	139	72	138	70	141	74	130	71	171	73
75	167	76	168	77	163	73	164	71	166	75	156	72	196	74
85	194	77	196	78	191	74	192	72	186	76	175	73	225	75
95	223	78	226	79	223	76	223	73	227	78	216	75	232	76
105	256	79	260	80	255	77	256	75	261	79	251	77	251	77

Weighing in the Charge Fixed Orifice *or* *TXV Systems – Outdoor Temp < 65° F (18° C)*

If the system is void of refrigerant, or if the outdoor ambient temperature is cool, the refrigerant charge should be weighed into the unit. Do this after any leaks have been repaired.

1 - Recover the refrigerant from the unit.
2 - Conduct a leak check, then evacuate as previously outlined.
3 - Weigh in the unit nameplate charge.

If weighing facilities are not available or if you are charging the unit during warm weather, follow one of the other procedures outlined below.

Approach and Normal Operating Pressures TXV Systems – Outdoor Temp. ≥ 65° F (18° C)

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°F (21°C) to 80°F (26°C). 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 in tables 5 or 6, “Normal Operating Pressures.” 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 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. Verify adjusted charge using the approach method.
4 - Outdoor temperature should be 65°F (18°C) or above. 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 the ambient and liquid temperatures should match values given in table 3. 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 values don’t agree with the those in tables 7 or 8, add refrigerant to lower the approach temperature or recover refrigerant from the system to increase the approach temperature.

TABLE 7

APPROACH METHOD - EXPANSION VALVES SYSTEM	
MODEL	**Liquid Line °F (°C) Warmer Than Outside Ambient Temperature**
H2-26-261,311	3 ± 1 (1.6 ± .5)
HS26-411	4 ± 1 (2.2 ± .5)
HS26-461	6 ± 1 (3.3 ± .5)

TABLE 8

APPROACH METHOD - EXPANSION VALVES SYSTEMS	
MODEL	**Liquid Line °F (°C) Warmer Than Outside Ambient Temperature**
HS26-036, 048	5 ± 1 (2.8 ± .5)
HS26-018, 030, 042, 060	8 ± 1 (4.44 ± .5)
HS26-024	9 ± 1 (5± .5)

VI-MAINTENANCE

⚠WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

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 the outdoor coil. The coil may be flushed with a water hose. Ensure the power is turned off before you clean the coil.
2 - Condenser fan motor is prelubricated 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 (unit operating).
6 - Check amp-draw condenser fan motor.
Unit nameplate _________ Actual ____________ .
NOTE - If owner complains of insufficient cooling, the unit should be gauged and refrigerant charge checked. Refer to section on refrigerant charging in this instruction.

Indoor Coil

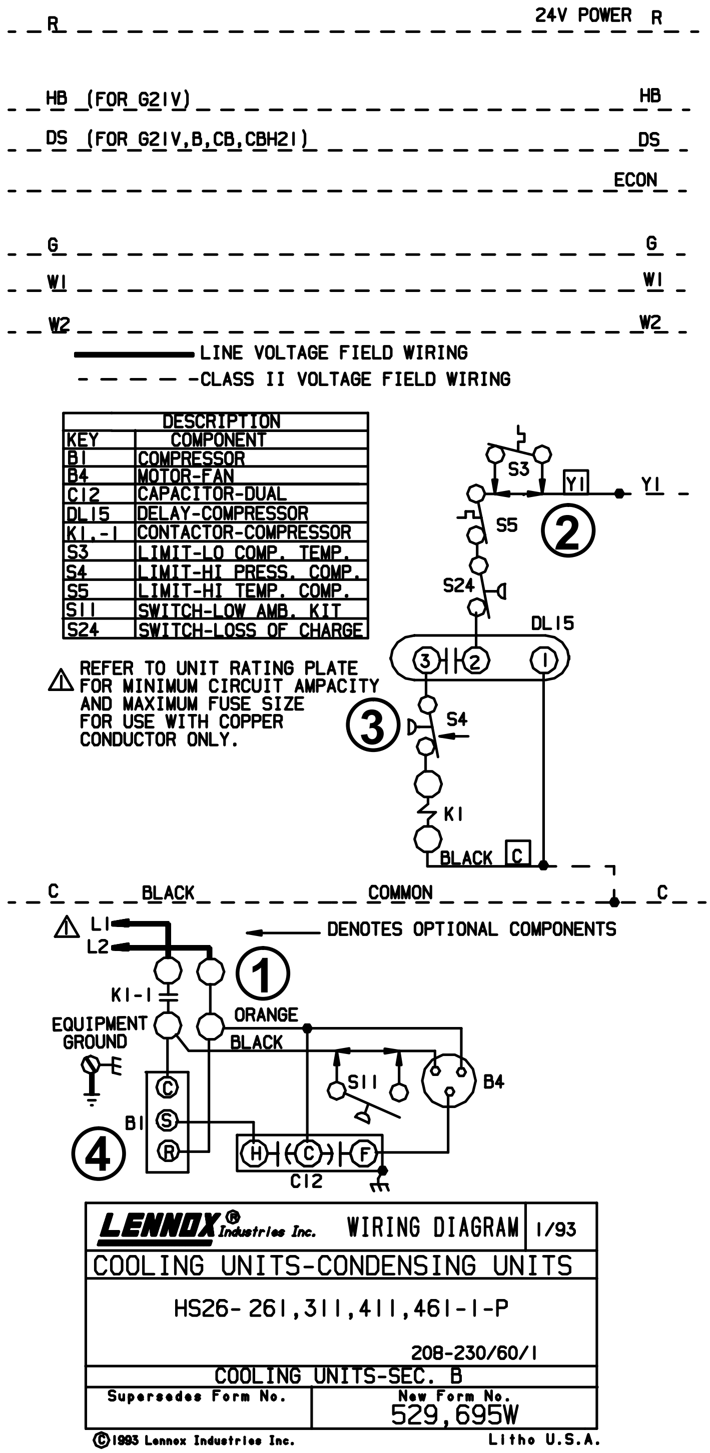
1 - Clean coil, if necessary.
2 - Check connecting lines and coils for evidence of oil leaks.
3 - Check the condensate line and clean it if necessary.

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 (blower operating).
6 - Check amp-draw on blower motor
Unit nameplate_________ Actual ____________.

VII-DIAGRAMS / OPERATING SEQUENCE
A-Unit Diagram HS26-261/461-1P (Early Models)

UNIT DIAGRAM



Operation Sequence

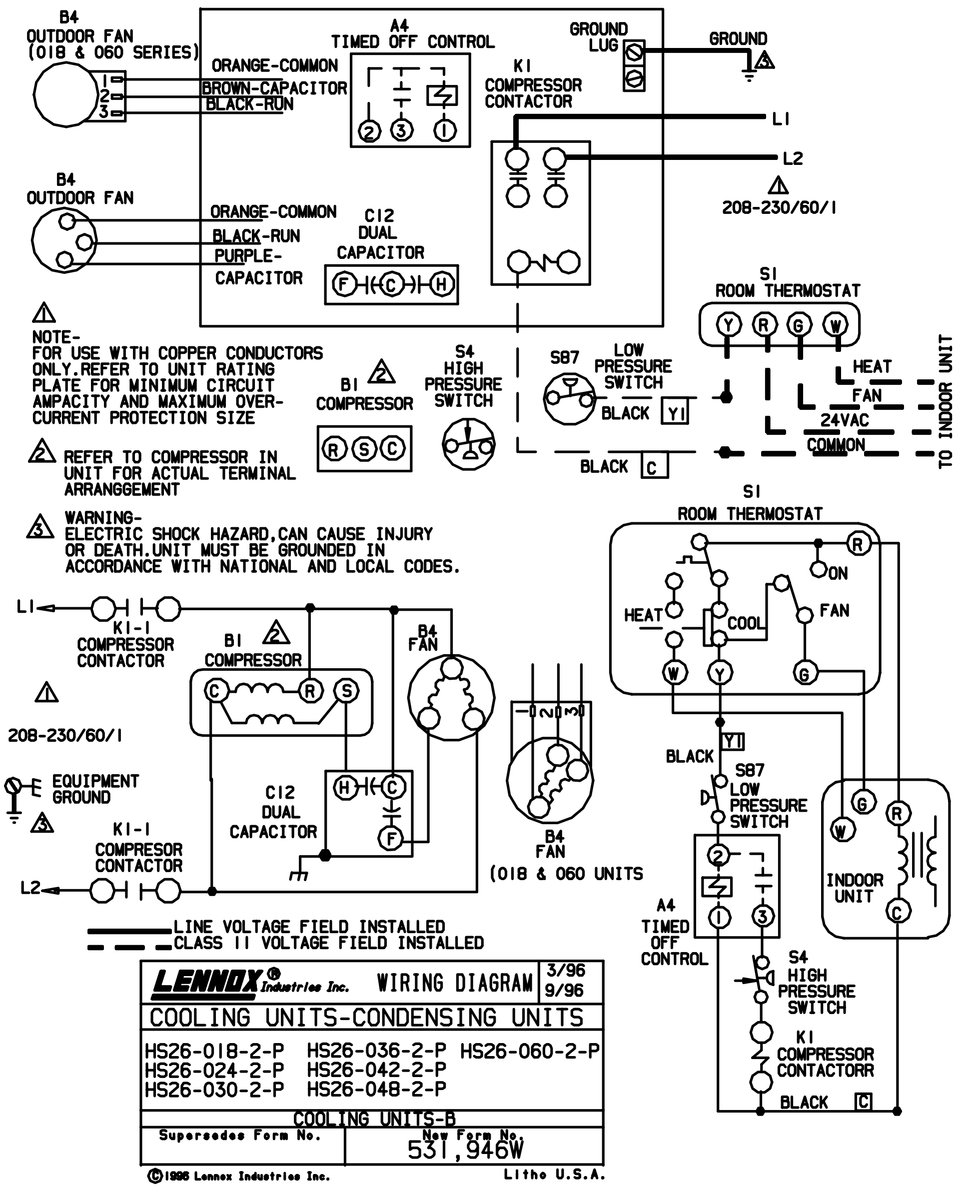
1- **WARNING-Early HS26 units use single-pole contactors. Capacitor terminal "COM," orange condenser fan wire and red "R" compressor wire are all connected to L2 at all times. Remove all power at disconnect before servicing.**

2- 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.

3- 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.

4- When compressor contactor is energized, N.O. contactor contacts close to energize compressor terminal "C" (black wire) and black condenser fan motor wire. Condenser fan and compressor immediately begin operating.

B-Unit Diagram HS26 -2 P Voltage (Late Models)



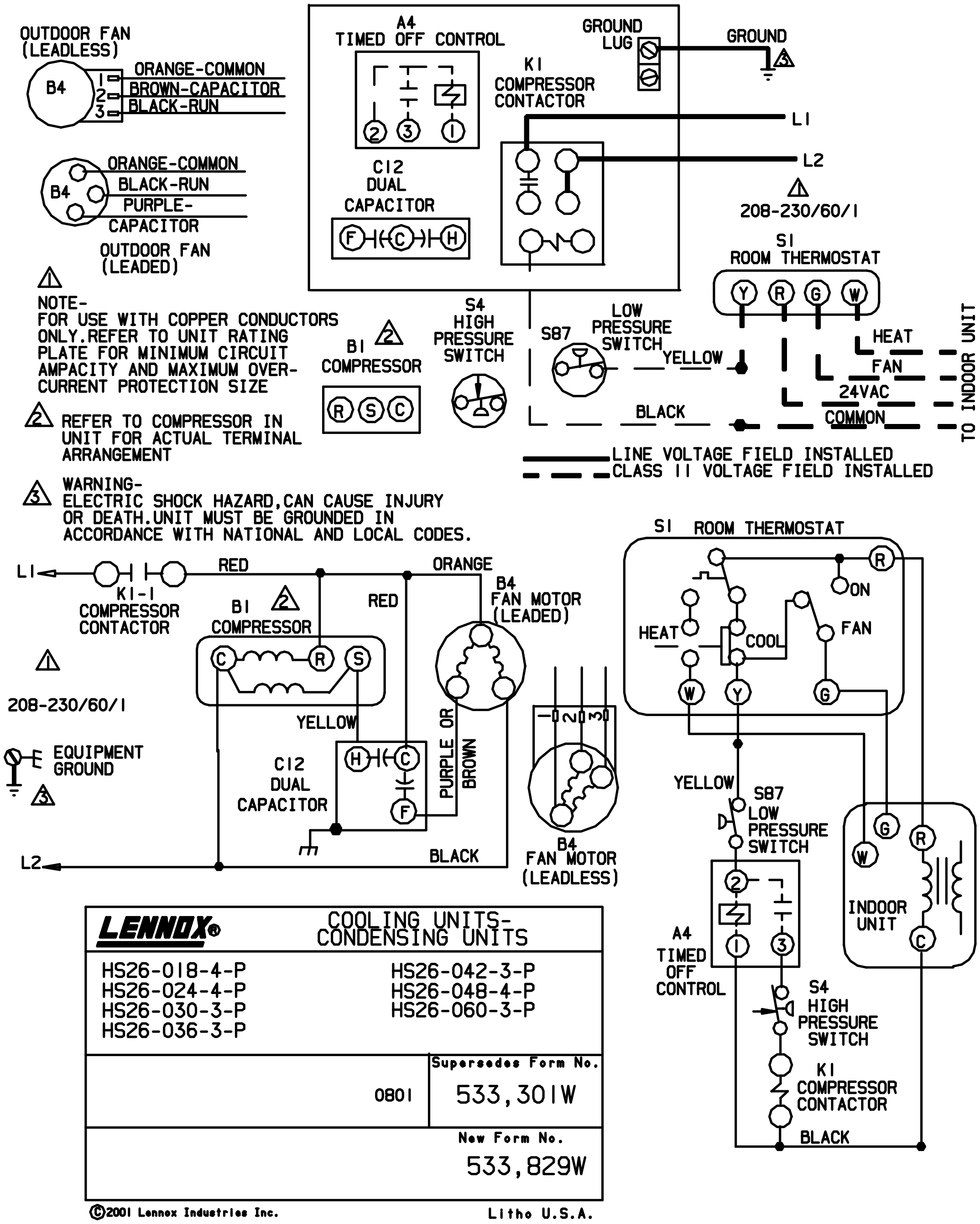
Operation Sequence

1- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through low pressure switch and the timed off control (TOC), which energizes K1 compressor contactor coil (provided 5 minute delay is satisfied).

2- K1-1 and K1-2 contacts close energizing B1 compressor and B4 outdoor fan.

3- When cooling demand is satisfied, K1-1 and K1-2 contacts open de-energizing compressor and outdoor fan. Timed off control begins 5 minute off time.

C-Unit Diagram HS26 -3 & -4 P Voltage (Late Models)



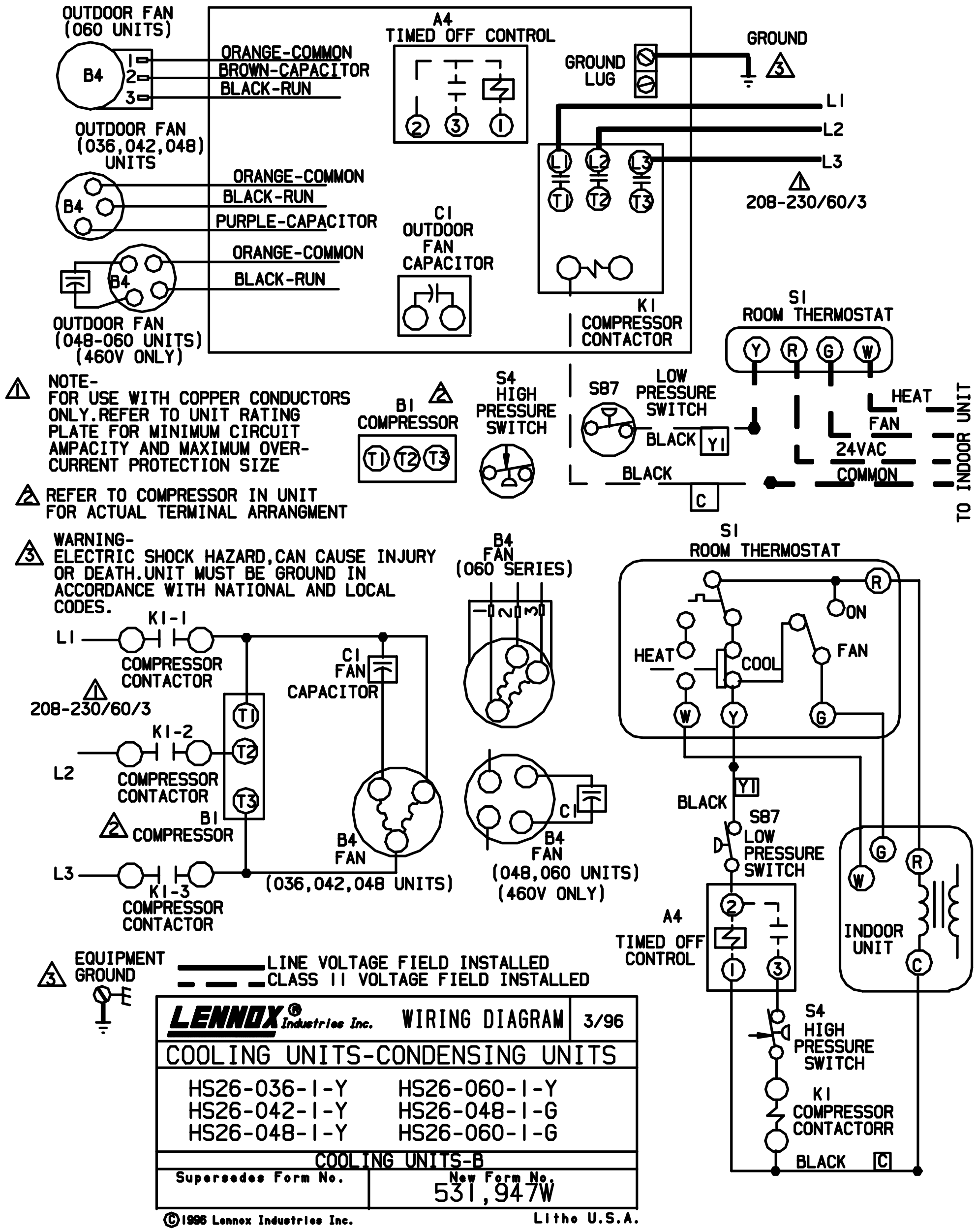
Operation Sequence

1- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through low pressure switch and the timed off control (TOC), which energizes K1 compressor contactor coil (provided 5 minute delay is satisfied).

2- K1-1 and K1-2 contacts close energizing B1 compressor and B4 outdoor fan.

3- When cooling demand is satisfied, K1-1 and K1-2 contacts open de-energizing compressor and outdoor fan. Timed off control begins 5 minute off time.

D-Unit Diagram HS26 -1 Y and G Voltage (Late Models)

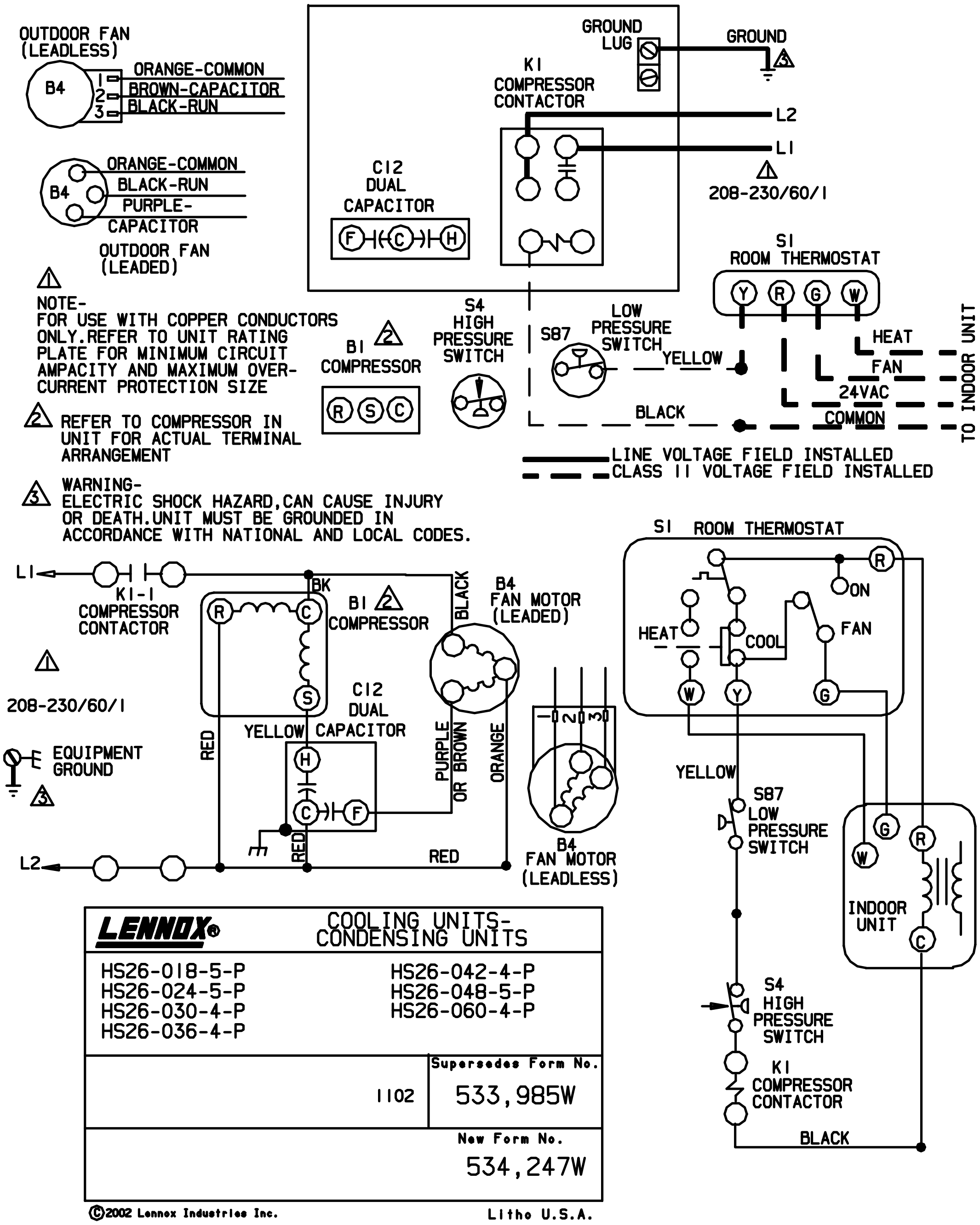


Operation Sequence

1- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through low pressure switch and timed off control (T.O.C.), which energizes K1 compressor contactor coil (provided 5 minute delay is satisfied.)
2- K1-1, K1-2 and K1-3 contacts close energizing B1 compressor and B4 outdoor fan.
3- When cooling demand is satisfied, K1-1, K1-2 and K1-3 contacts open de-energizing compressor and outdoor fan. Timed off control begins 5 minute off time.

NOTE-Three-phase compressors must be phased correctly. Compressor noise will be significantly higher if phasing is incorrect. Compressor will operate backwards so unit will not provide cooling. Continued backward operation will cause compressor to cycle on internal protector.

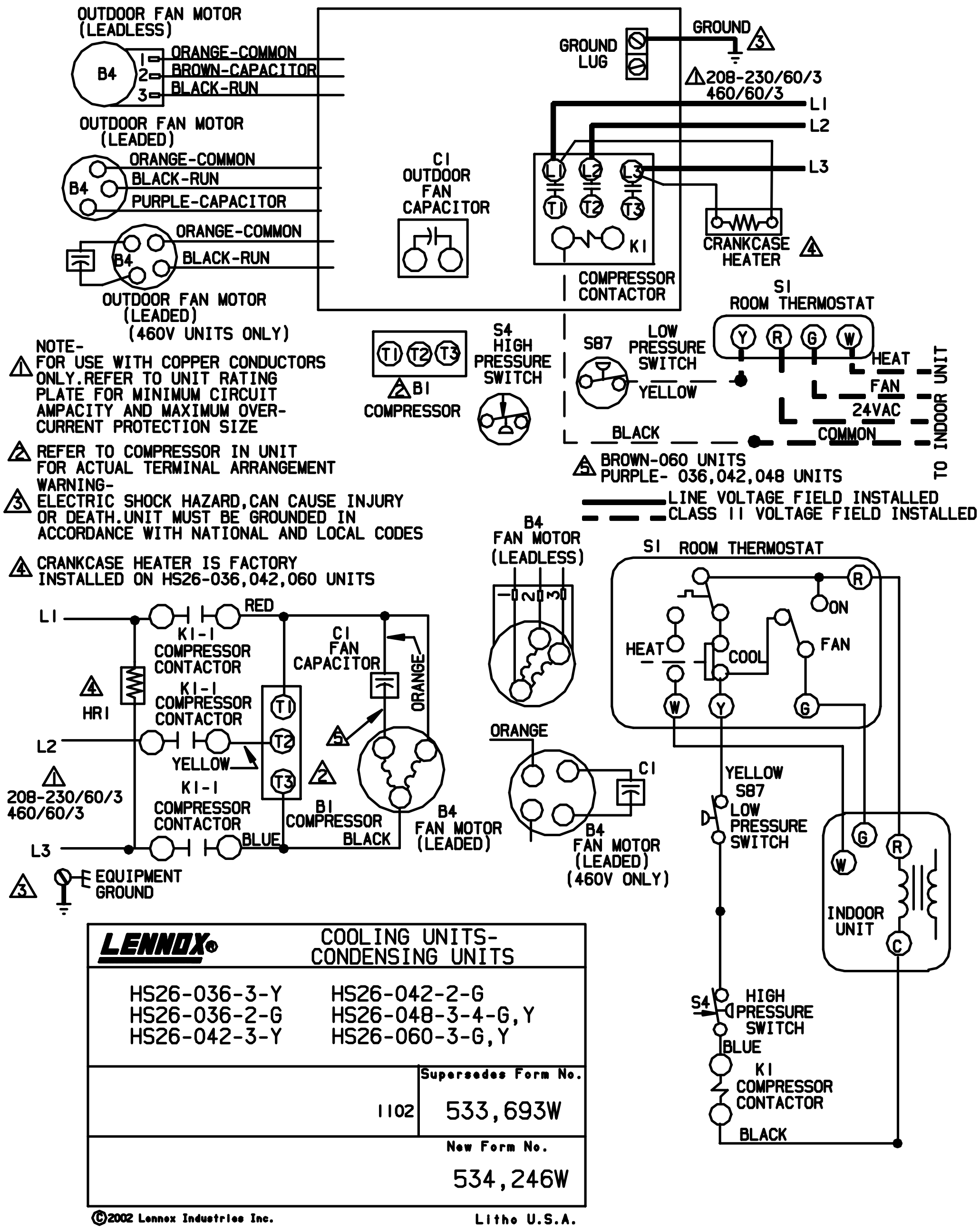
E-Unit Diagram HS26 -4 & 5 P Voltage (Late Models)



Operation Sequence

1- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through low pressure switch and energizes K1 compressor contactor coil.
2- K1-1 and K1-2 contacts close energizing B1 compressor and B4 outdoor fan.
3- When cooling demand is satisfied, K1-1 and K1-2 contacts open de-energizing compressor and outdoor fan.

F-Unit Diagram HS26 -2 through -4 Y and G Voltage (Late Models)



Operation Sequence

1- Cooling demand energizes thermostat terminal Y. Voltage from terminal Y passes through low pressure switch and energizes K1 compressor contactor coil.
2- K1-1, K1-2 and K1-3 contacts close energizing B1 compressor and B4 outdoor fan.
3- When cooling demand is satisfied, K1-1, K1-2 and K1-3 contacts open de-energizing compressor and outdoor fan.

NOTE-Three-phase compressors must be phased correctly. Compressor noise will be significantly higher if phasing is incorrect. Compressor will operate backwards so unit will not provide cooling. Continued backward operation will cause compressor to cycle on internal protector.