ELKC SERIES UNITS

The ELKC units are designed for light commercial applications, with a remotely located blower-coil unit or a furnace with an add-on evaporator coil. Capacities for the series are 6, 7.5, 10, 12.5, 15 and 20 tons (21, 26, 35, 44, 53, and 70 kW). EL072KC, EL090KC, and EL120KCSST models have one dual-speed scroll compressor. EL120KCSDT, EL150KC, EL180KC, and EL240KC models have two dual-speed scroll compressors. ELKC units match with the ELKA blower-coil units. All ELKC units are three phase and use R-454B refrigerant.

***NOTE** – The ELKC is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements in this standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard, UL 60335-2-40/ CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.*

This manual covers EL072KCSST, EL090KCSST, EL120KCSST, EL120KCSDT, EL180KCSDT, and EL240KCSST units. It is divided into sections which discuss the major components, refrigerant system, charging procedure, maintenance and operation sequence.

Information in this manual is intended for qualified service technicians only. All specifications are subject to change. Procedures in this manual are presented as a recommendation only and do not supersede or replace local or state codes.

⚠ 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 licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

⚠ WARNING

Electric shock hazard! - Disconnect all power supplies before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

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⚠ WARNING

To prevent serious injury or death:

1. Lock-out/tag-out before performing maintenance.
2. If system power is required (e.g., smoke detector maintenance), disable power to blower, remove fan belt where applicable, and ensure all controllers and thermostats are set to the “OFF” position before performing maintenance.
3. Always keep hands, hair, clothing, jewelry, tools, etc. away from moving parts.

⚠ IMPORTANT

This unit must be matched with an indoor coil as specified with AHRI. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com.

⚠ WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.

⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

⚠ WARNING

Ducts connected to an appliance shall not contain a potential ignition source

⚠ WARNING

Every working procedure that affects safety means shall only be carried out by competent persons. This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure they do not play with the appliance.

⚠ IMPORTANT

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out.

⚠ IMPORTANT

Verify cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.

⚠ WARNING

PARTIAL UNITS shall only be connected to an appliance suitable for the same refrigerant.

⚠ IMPORTANT

Pipe work, including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

⚠ CAUTION

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

⚠ CAUTION

Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition to check for gas leaks.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

⚠ IMPORTANT

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed and, since flammability is a consideration, procedures such as safely remove refrigerant following local and national regulations, purging the circuit with inert gas, evacuating (optional for A2L), purging with inert gas (optional for A2L), or opening the circuit by cutting or brazing be adhered to. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants.

This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

⚠ IMPORTANT

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak tested on completion of charging, but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

⚠ IMPORTANT

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

⚠ IMPORTANT

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements;

– Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of .2 oz. per year of refrigerant or better, under pressure.

No leak shall be detected.

⚠ IMPORTANT

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

⚠ IMPORTANT

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

⚠ IMPORTANT

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

⚠ IMPORTANT

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

⚠ IMPORTANT

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO^2 fire extinguisher adjacent to the charging area.

⚠ IMPORTANT

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

⚠ IMPORTANT

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

– the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;

– the ventilation machinery and outlets are operating adequately and are not obstructed;

– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

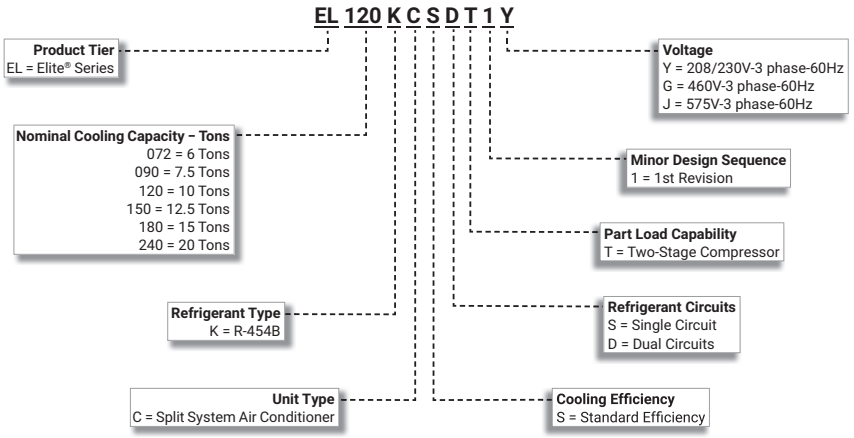
⚠ IMPORTANT

Sealed electrical components shall be replaced.

⚠ IMPORTANT

Intrinsically safe components must be replaced.

Model Number Identification



Form Number 211143 | February 2025
Supersedes all previous versions

SPECIFICATIONS — 6 TON | 7.5 TON

Model		EL072KCSST	EL090KCSST
Nominal Tonnage		**6**	**7.5**
Connections (sweat)	Liquid line (OD) - in.	(1) 3/8	(1) 5/8
	Suction line (OD) - in.	(1) 1-1/8	(1) 1-1/8
Refrigerant	Factory Charge	R-454B holding charge (2 lbs. per circuit)	
	Circuits	1	1
	[1] Field charge (25 ft. line set)	15 lbs. 0 oz. (includes holding charge)	19 lbs. 0 oz. (includes holding charge)
Compressor Type (Number)		Two Stage Scroll (1)	Two Stage Scroll (1)
Condenser Coil	Net face area - ft.² Outer coil	29.3	29.3
	Inner coil	14.2	28.4
	Tube diameter - in.	3/8	3/8
	Rows	1.5	2
	Fins - in.	20	20
Condenser Fan	Diameter - in. (Number)	24 (1)	24 (1)
	Blades	3	3
	Motor HP (Number)	1/3 (1)	1/2 (1)
	Total Cfm	4700	5600
	Rpm	1075	1075
	Watts	400	580

ELECTRICAL DATA

Line voltage data - 60Hz - 3 phase		208/230V	460V	575V	208/230V	460V	575V
[2] Maximum Overcurrent Protection (amps)		45	20	15	60	25	20
[3] Minimum circuit ampacity		27	13	9	36	16	13
Compressor	Number of Compressors	1	1	1	1	1	1
	Rated load amps	19.2	9.1	6.2	26.3	11	9.2
	Locked rotor amps	162.3	70.8	58.2	178.5	95.3	65
Condenser Fan Motor (1 phase)	No. of motors	1	1	1	1	1	1
	Full load amps	2.4	1.3	1	3	1.5	1.2
	Locked rotor amps	4.3	2.4	1.9	6	3	2.9

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5kA.

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

[1] Approximate field provided charge with 25 ft. line set. Refer to unit installation instructions for detailed charging information. Refer to the Lennox Refrigerant Piping Manual to determine refrigerant charge required with longer length refrigerant lines.

[2] HACR type circuit breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

SPECIFICATIONS — 10 TON

Model			EL120KCSST	EL120KCSDT
Nominal Tonnage			**10**	**10**
Connections (sweat)		Liquid line (OD) - in.	(1) 5/8	(2) 3/8
		Suction line (OD) - in.	(1) 1-1/8	(2) 1-1/8
Refrigerant		Factory Charge	R-454B holding charge (2 lbs. per circuit)	
		Circuits	1	2
	[1] Field charge (25 ft. line set)	Circuit 1	21 lbs. 0 oz. (includes holding charge)	10 lbs. 12 oz. (includes holding charge)
		Circuit 2	- - -	10 lbs. 12 oz. (includes holding charge)
Compressor Type (Number)			Two Stage Scroll (1)	Two Stage Scroll (2)
Condenser Coil		Net face area - ft.² Outer coil	29.3	29.3
		Inner coil	28.4	28.4
		Tube diameter - in.	3/8	3/8
		Rows	2	2
		Fins - in.	20	20
Condenser Fans		Diameter - in. (Number)	24 (2)	24 (2)
		Blades	3	3
		Motor HP (Number)	1/3 (2)	1/3 (2)
		Total Cfm	8300	8300
		Rpm	1075	1075
		Watts	830	830

ELECTRICAL DATA

Line voltage data - 60Hz - 3 phase			208/230V	460V	575V	208/230V	460V	575V
[2] Maximum Overcurrent Protection (amps)			60	30	25	40	20	15
[3] Minimum circuit ampacity			38	21	17	33	18	13
Compressor		Number of Compressors	1	1	1	2	2	2
		Rated load amps (total)	26.5	14	11.5	12.4 (24.8)	6.5 (13)	4.8 (9.6)
		Locked rotor amps (total)	255	123	93.7	93 (186)	60 (120)	41 (82)
Condenser Fan Motor (1 phase)		No. of motors	2	2	2	2	2	2
		Full load amps (total)	2.4 (4.8)	1.3 (2.6)	1 (2)	2.4 (4.8)	1.3 (2.6)	1 (2)
		Locked rotor amps (total)	4.3 (8.6)	2.4 (4.8)	1.9 (3.8)	4.3 (8.6)	2.4 (4.8)	1.9 (3.8)

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5kA.

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

[1] Approximate field provided charge with 25 ft. line set. Refer to unit installation instructions for detailed charging information. Refer to the Lennox Refrigerant Piping Manual to determine refrigerant charge required with longer length refrigerant lines.

[2] HACR type circuit breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

SPECIFICATIONS — 12.5 TON | 20 TON

Model			EL150KCSDT	EL180KCSDT	EL240KCSDT
Nominal Tonnage			**12.5**	**15**	**20**
Connections (sweat)		Liquid line (OD) - in.	(2) 3/8	(2) 5/8	(2) 5/8
		Suction line (OD) - in.	(2) 1-1/8	(2) 1-1/8	(2) 1-1/8
Refrigerant		Factory Charge	R-454B holding charge (2 lbs. per circuit)		
		Circuits	2	2	2
	[1] Field charge (25 ft. line set)	Circuit 1	12 lbs. 8 oz. (includes holding charge)	21 lbs. 0 oz. (includes holding charge)	19 lbs. 15 oz. (includes holding charge)
		Circuit 2	12 lbs. 8 oz. (includes holding charge)	22 lbs. 0 oz. (includes holding charge)	19 lbs. 15 oz. (includes holding charge)
Compressor Type (Number)			Two Stage Scroll (2)	Two Stage Scroll (2)	Two Stage Scroll (2)
Condenser Coil		Net face area - ft.² Outer coil	34.2	58.7	58.7
		Inner coil	33.3	57.7	57.7
		Tube diameter - in.	3/8	3/8	3/8
		Rows	2	2	2
		Fins - in.	20	20	20
Condenser Fans		Diameter - in. (Number)	24 (2)	24 (4)	24 (4)
		Blades	4	3	3
		Motor HP (Number)	1/2 (2)	1/3 (4)	1/3 (4)
		Total Cfm	10,300	16,600	16,600
		Rpm	1075	1075	1075
		Watts	1130	1660	1660

ELECTRICAL DATA

Line voltage data - 60Hz - 3 phase		208/230V	460V	575V	208/230V	460V	575V	208/230V	460V	575V
[2] Maximum Overcurrent Protection (amps)		60	30	20	90	40	30	90	50	40
[3] Minimum circuit ampacity		50	24	17	70	30	25	70	37	30
Compressor	Number of Compressors	2	2	2	2	2	2	2	2	2
	Rated load amps (total)	19.2 (38.4)	9.1 (18.2)	6.2 (12.4)	26.3 (52.6)	11 (22)	9.2 (18.4)	26.5 (53)	14 (28)	11.5 (23)
	Locked rotor amps (total)	162.3 (324.6)	70.8 (141.6)	58.2 (116.4)	178.5 (357)	95.3 (190.6)	65 (130)	255 (510)	123 (246)	93.7 (187.4)
Condenser Fan Motor (1 phase)	No. of motors	2	2	2	4	4	4	4	4	4
	Full load amps (total)	3 (6)	1.5 (3)	1.2 (2.4)	2.4 (9.6)	1.3 (5.2)	1 (4)	2.4 (9.6)	1.3 (5.2)	1 (4)
	Locked rotor amps (total)	6 (12)	3 (6)	2.9 (5.8)	4.3 (17.2)	2.4 (9.6)	1.9 (7.6)	4.3 (17.2)	2.4 (9.6)	1.9 (7.6)

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5kA.

NOTE - Extremes of operating range are plus and minus 10% of line voltage.

[1] Approximate field provided charge with 25 ft. line set. Refer to unit installation instructions for detailed charging information. Refer to the Lennox Refrigerant Piping Manual to determine refrigerant charge required with longer length refrigerant lines.

[2] HACR type circuit breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

OPTIONS / ACCESSORIES

Item	Order Number	EL 072 KCSS	EL 090 KCSS	EL 120 KCSS	EL 120 KCSD	EL 150 KCSD	EL 180 KCSD	EL 240 KCSD
CABINET								
Combined Coil/Hail Guards	**13T29**	X	X					
	13T30			X	X			
	13T32					X		
	13T37						X	X
CONTROLS								
BACnet® Module	**38V32**	X	X	X				
BACnet® Sensor with Display	**97W23**	X	X	X				
BACnet® Sensor without Display	**97W24**	X	X	X				
Low Ambient Control (0ºF)	**37P63**	X	X	X				
	37P60				X			
	37P62					X	X	X
Furnace Twinning Panel	**Y3653**	X	X	X				
ELECTRICAL								
GFI Service Outlets — 15 amp non-powered, field-wired (208/230V, 460V only)	**74M70**	X	X	X	X	X	X	X
GFI Service Outlets — 20 amp non-powered, field-wired (575V only)	**67E01**	X	X	X	X	X	X	X
INDOOR AIR QUALITY								
Sensor - Wall-mount, off-white plastic cover with LCD display	**24C58**	X	X	X	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display	**23V86**	X	X	X	X	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting	**87N52**	X	X	X	X	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	**23V87**	X	X	X	X	X	X	X
CO_2 Sensor Duct Mounting Kit	**23Y47**	X	X	X	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensor (**24C58**)	**90N43**	X	X	X	X	X	X	X

NOTE - The order numbers that appear here are for ordering field installed accessories only.

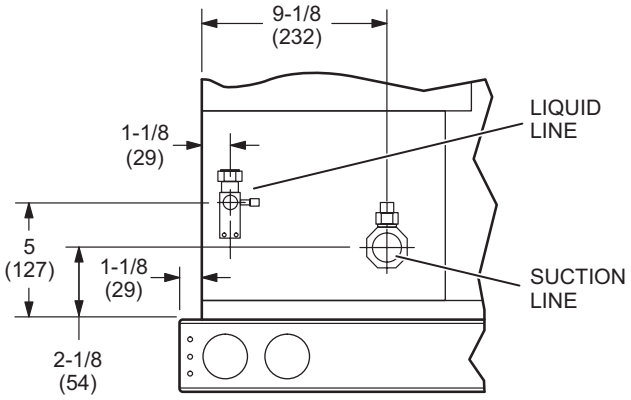
O - Factory Installed with extended lead time.

X - Field Installed

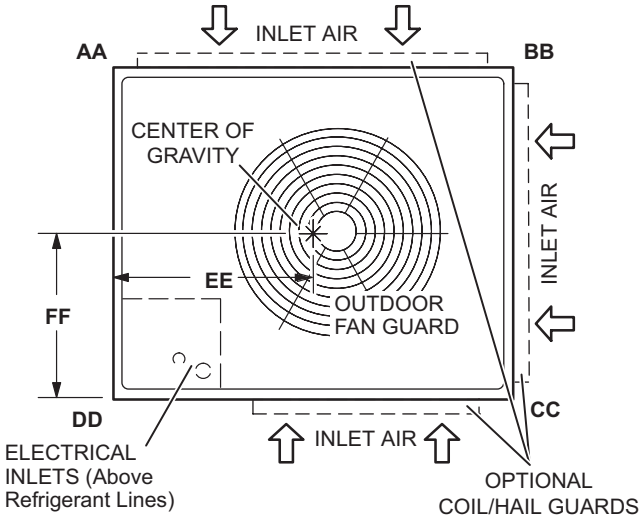
DIMENSIONS

EL072KCSST | EL090KCSST

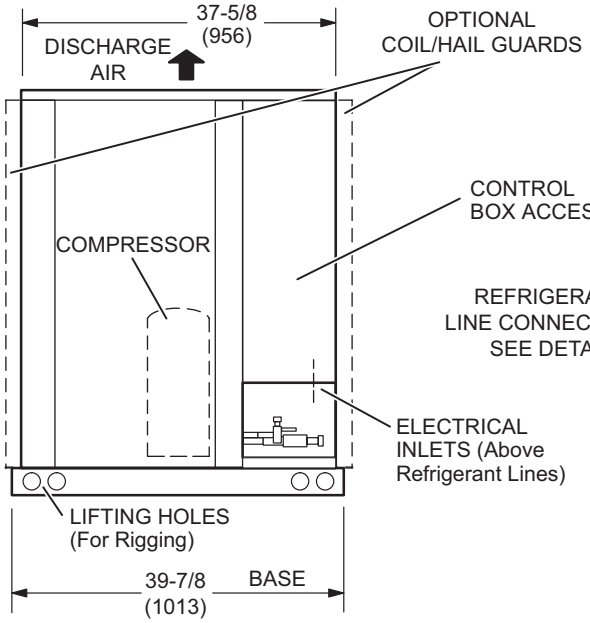
Model	CORNER WEIGHTS								CENTER OF GRAVITY			
	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
EL072KCSST	66	30	73	33	97	44	82	37	23-1/4	591	19-1/4	489
EL090KCSST	75	34	89	40	112	51	88	40	25	635	20-1/4	514



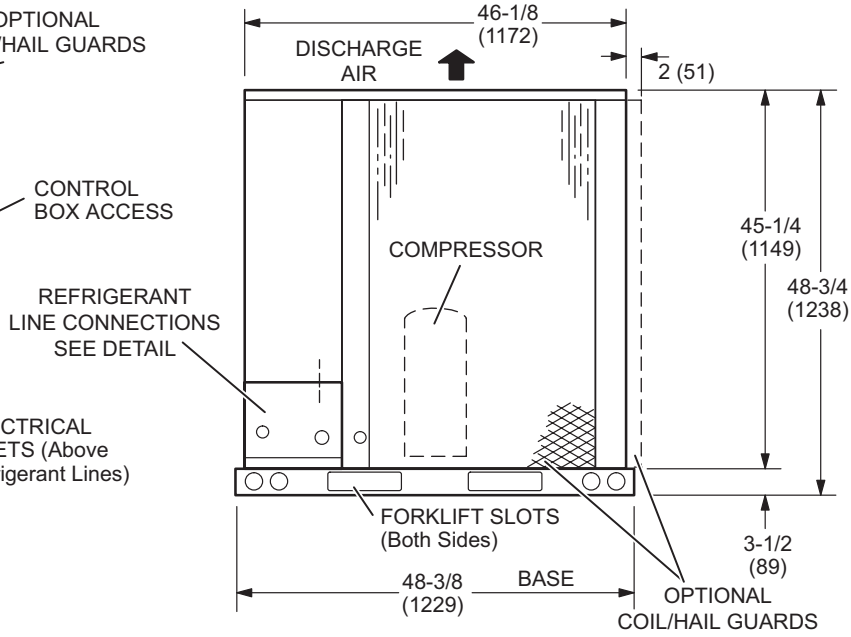
REFRIGERANT LINE CONNECTIONS DETAIL



TOP VIEW

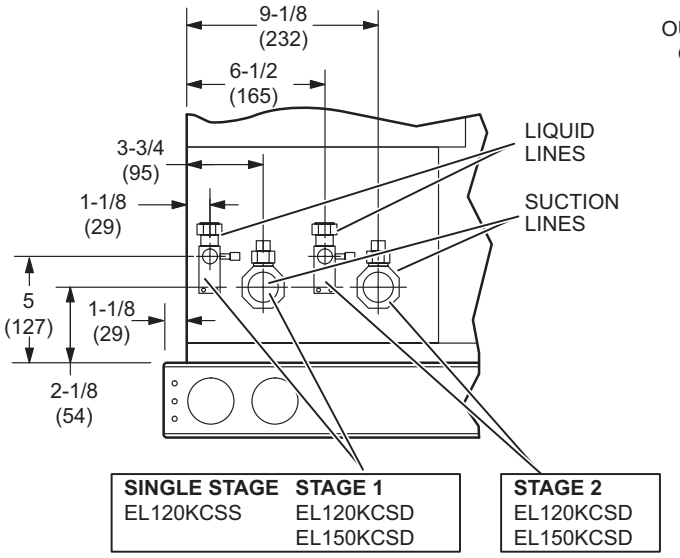


FRONT VIEW

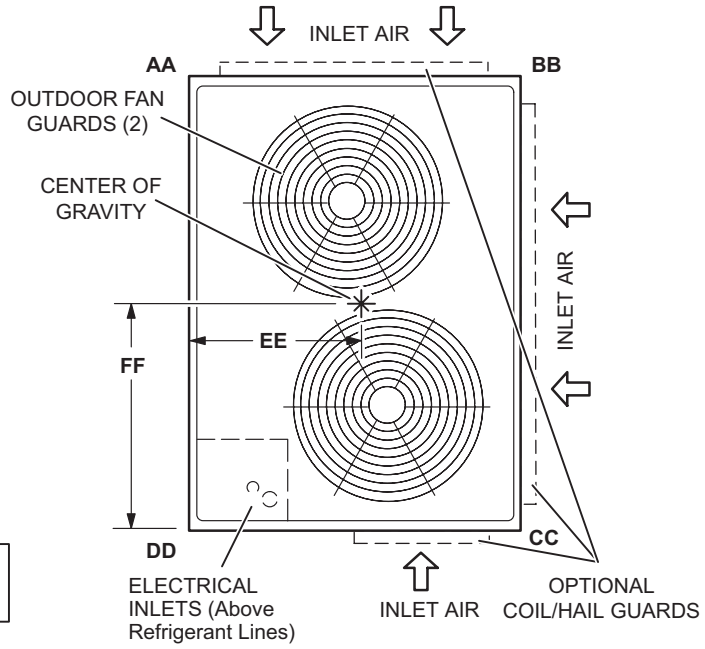


SIDE VIEW

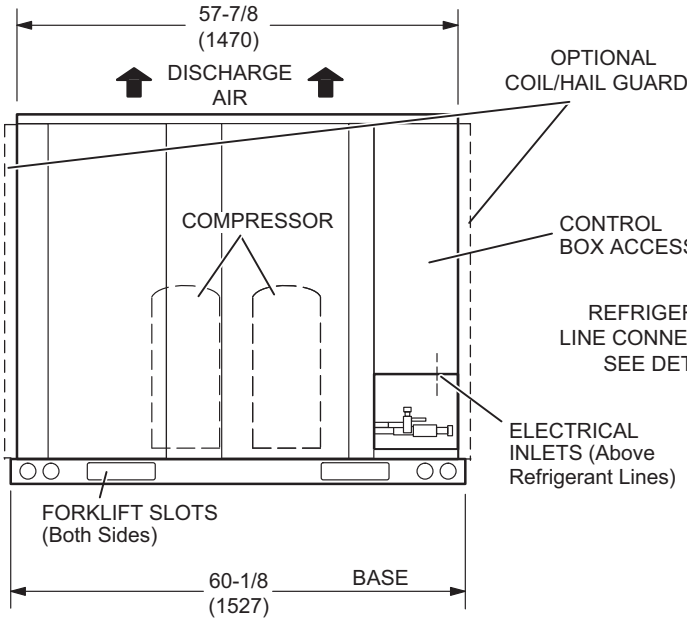
Model	CORNER WEIGHTS								CENTER OF GRAVITY			
	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
EL120KCSST	130	59	124	56	107	49	111	50	20-1/2	521	33-1/2	851
EL120KCSDT	122	55	119	54	127	58	131	59	21	533	28-1/2	724
EL150KCSDT	144	66	132	60	133	60	145	66	19	483	30	762



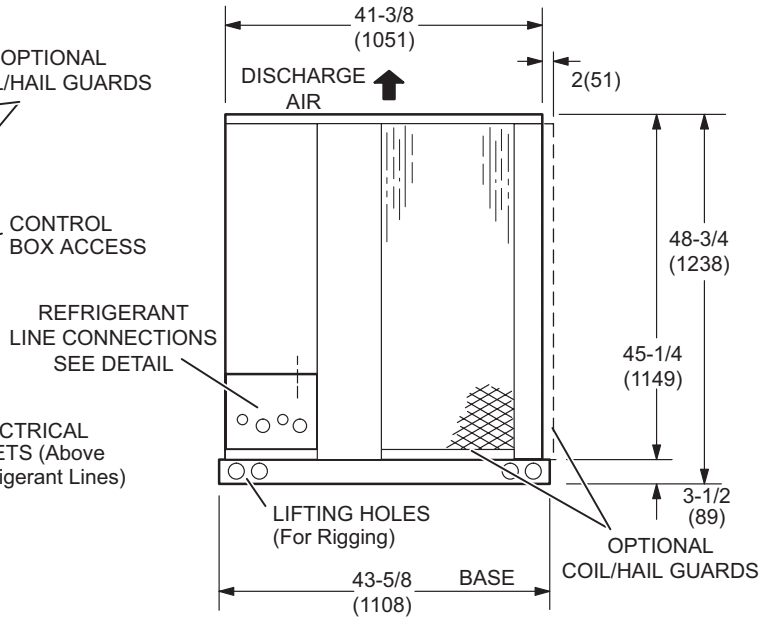
REFRIGERANT LINE CONNECTIONS DETAIL



TOP VIEW

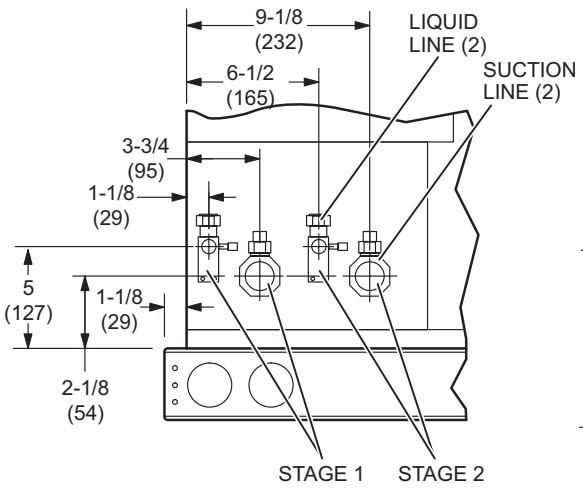


FRONT VIEW

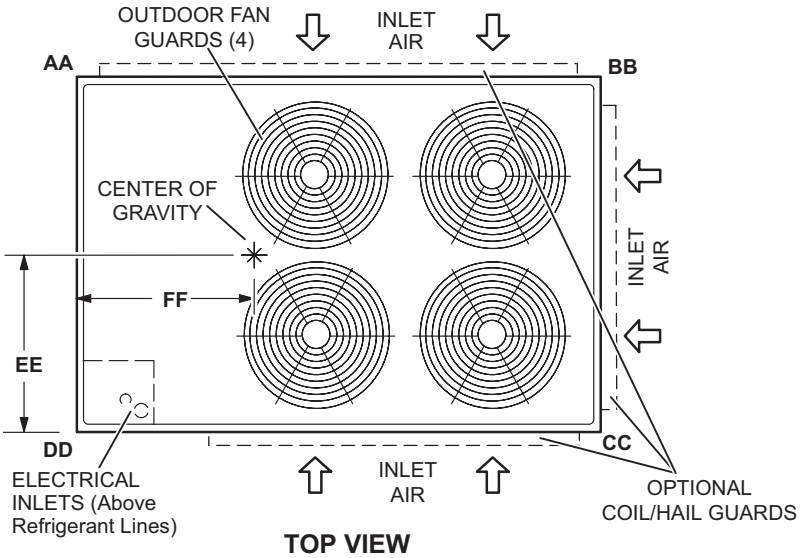


SIDE VIEW

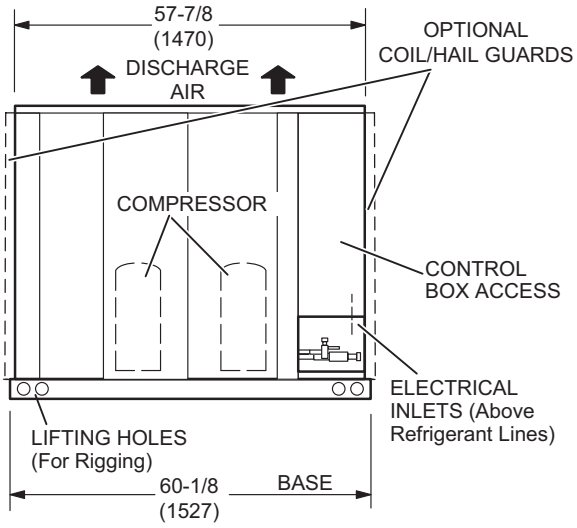
Model	CORNER WEIGHTS								CENTER OF GRAVITY			
	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
EL180KCSDT	181	82	177	81	215	98	221	100	29	737	38	965
EL240KCSDT	192	87	189	86	232	105	238	108	29	737	37-1/2	953



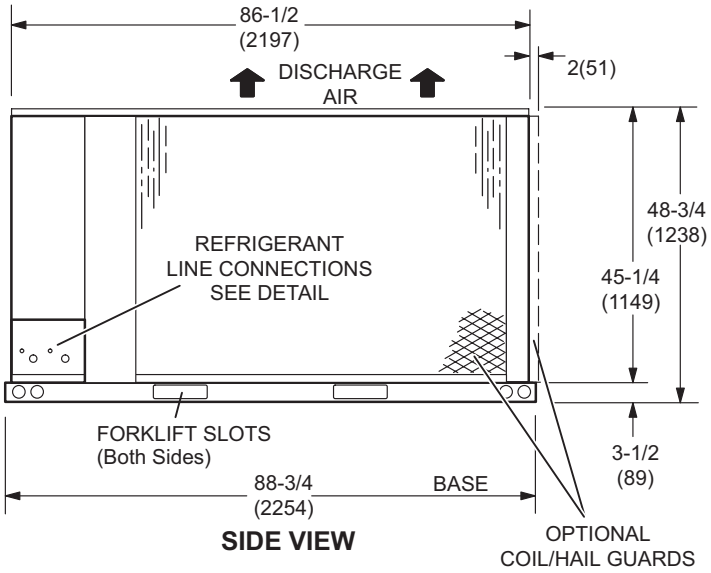
REFRIGERANT LINE CONNECTIONS DETAIL



TOP VIEW



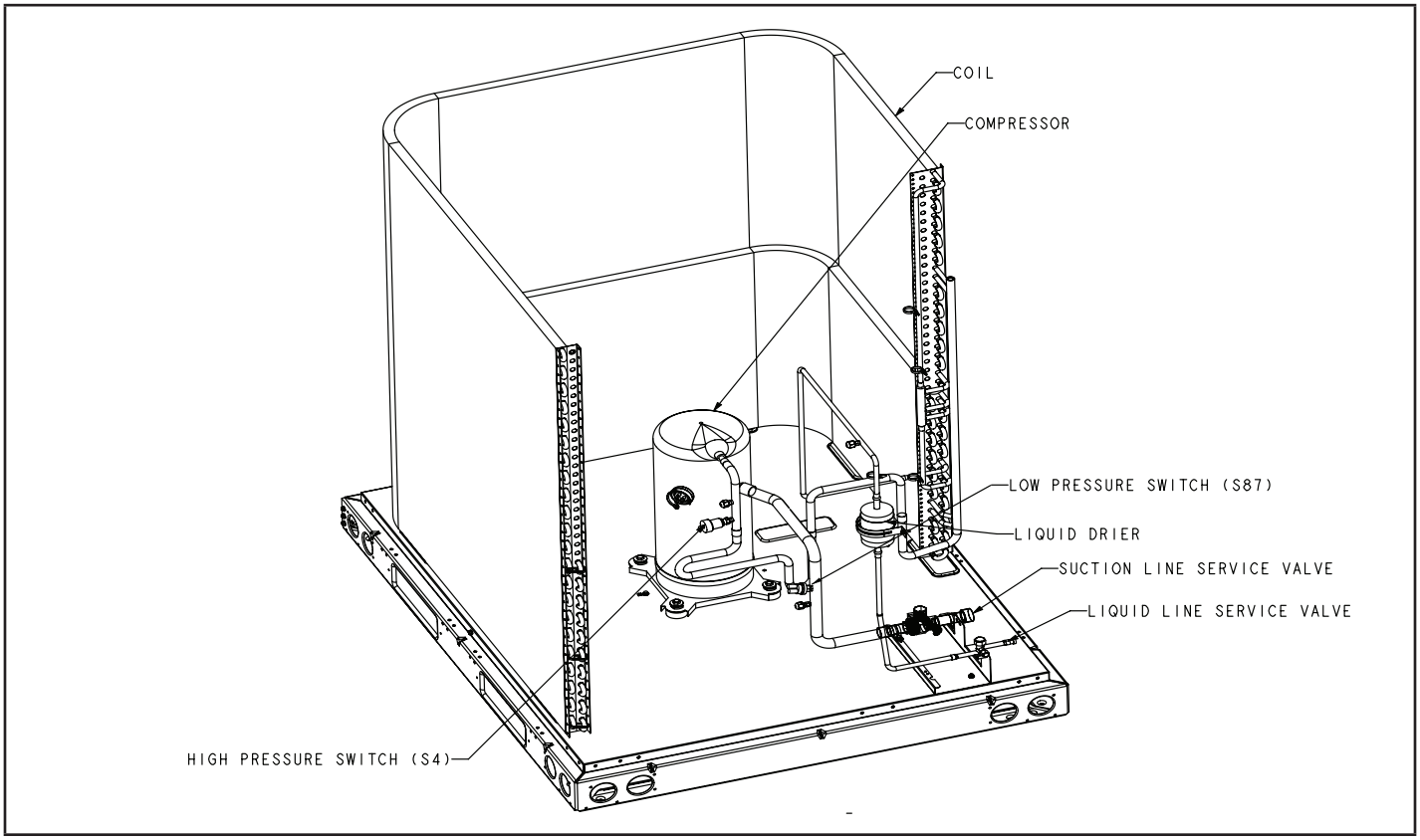
FRONT VIEW



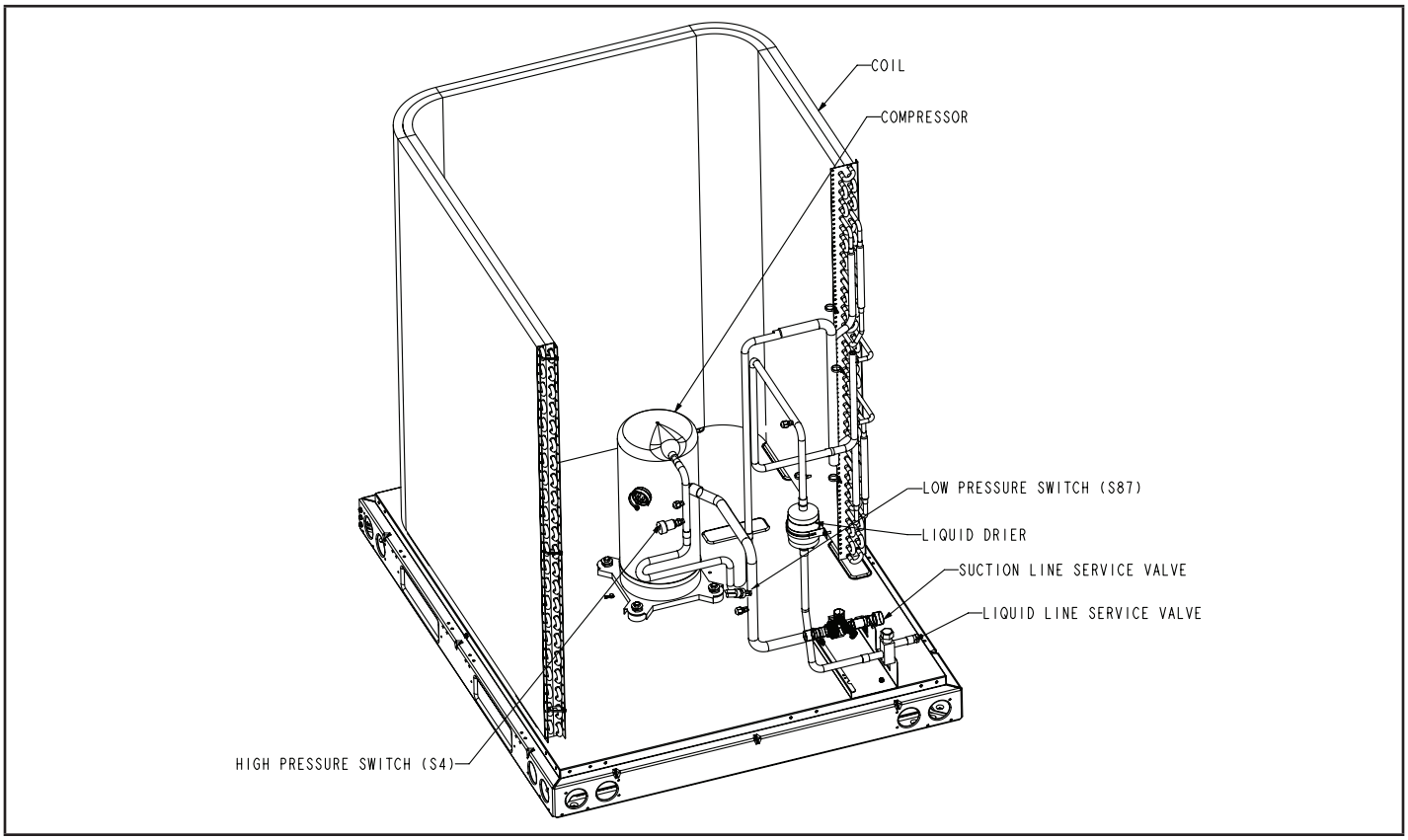
SIDE VIEW

Unit Plumbing Parts Arrangement

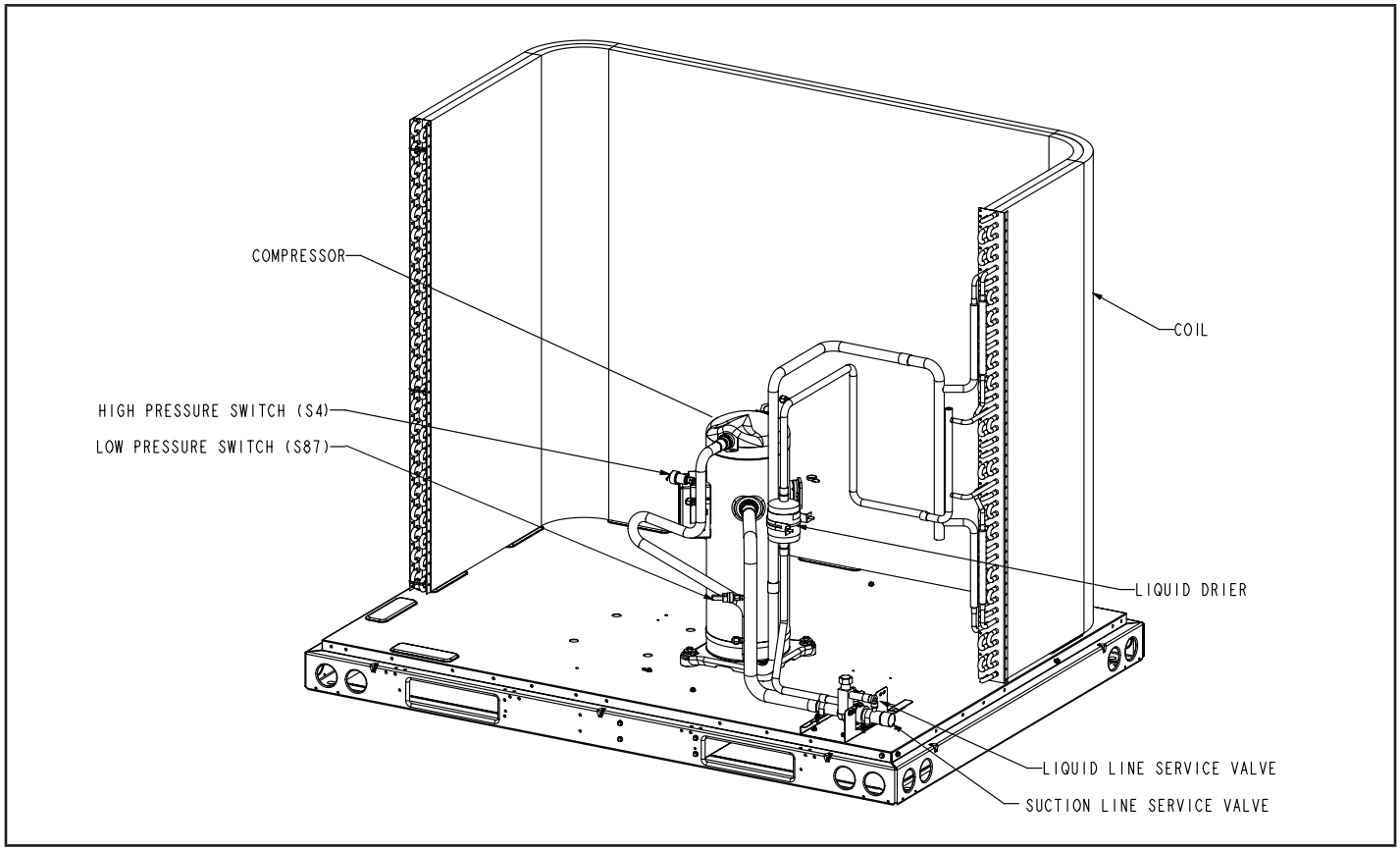
EL072KCSST



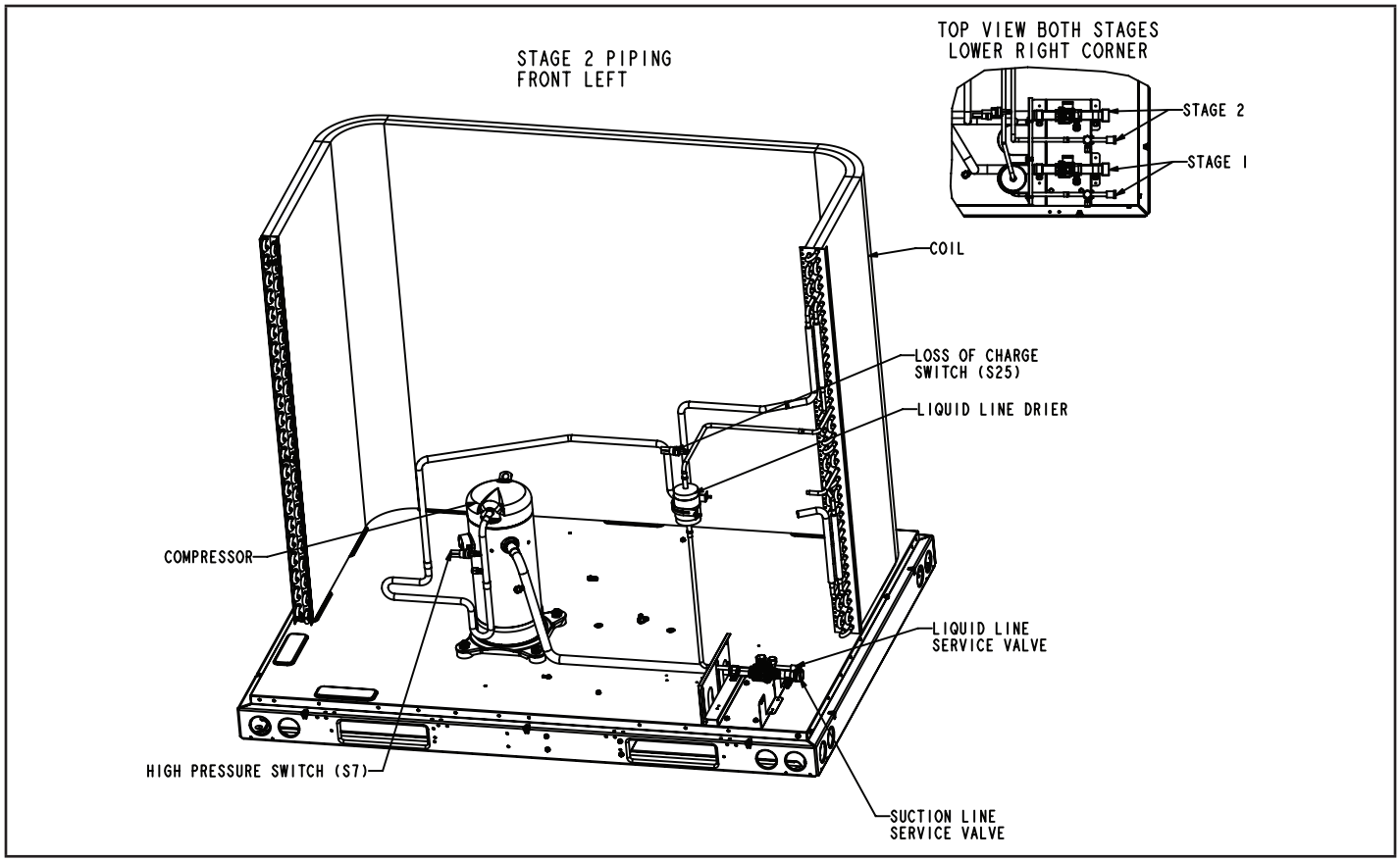
EL090KCSST



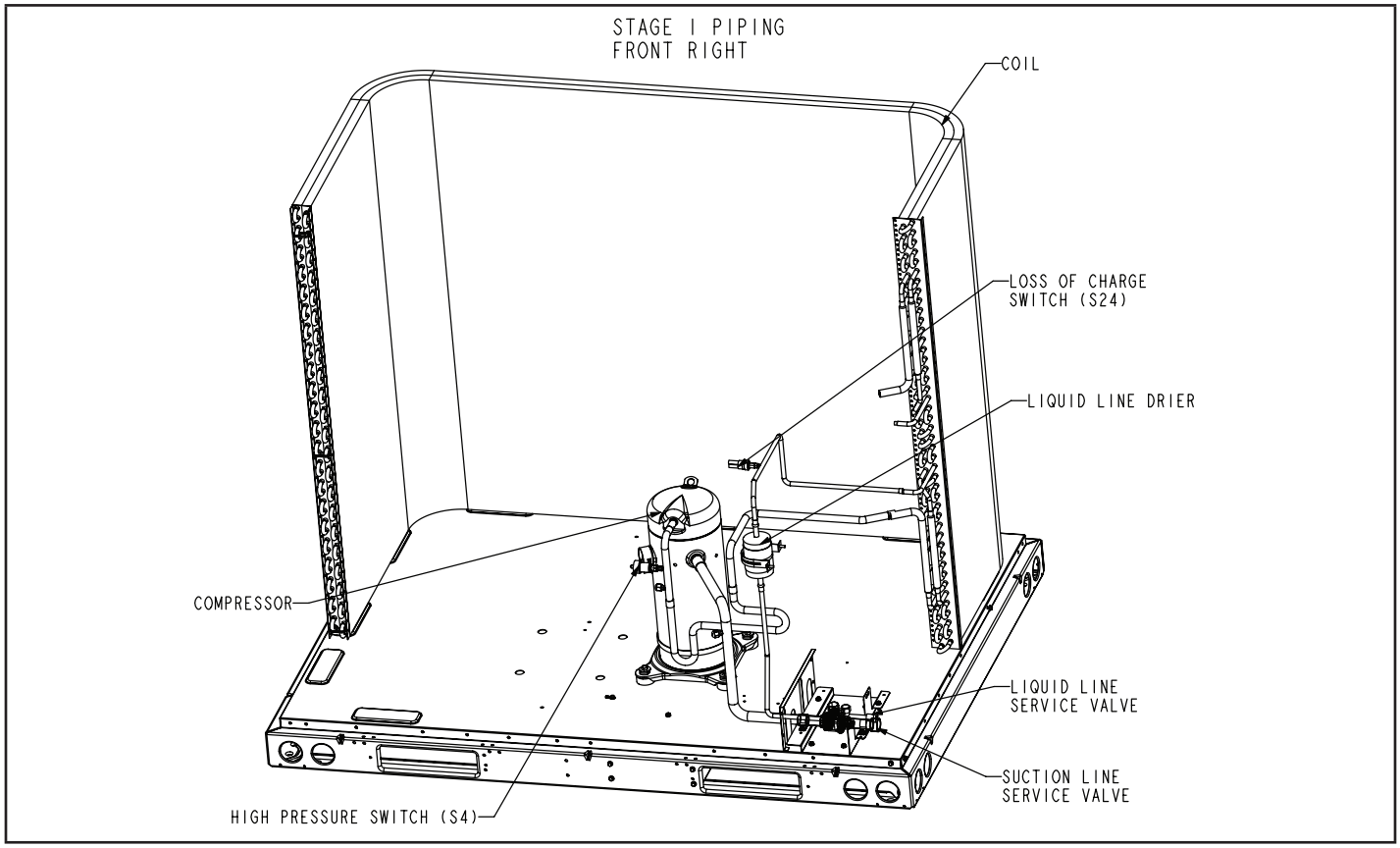
EL120KCSST



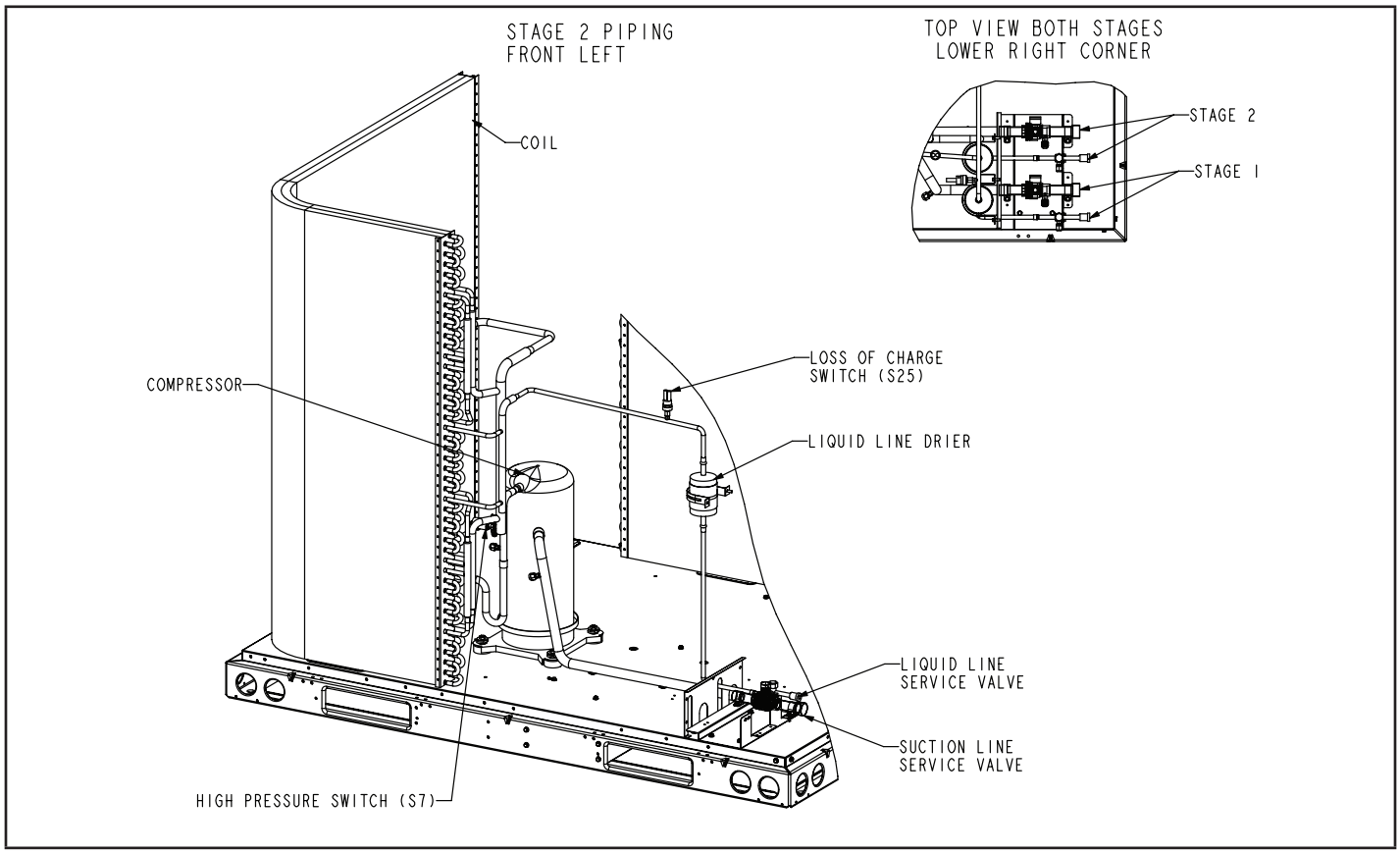
EL120KCSDT – STAGE 2



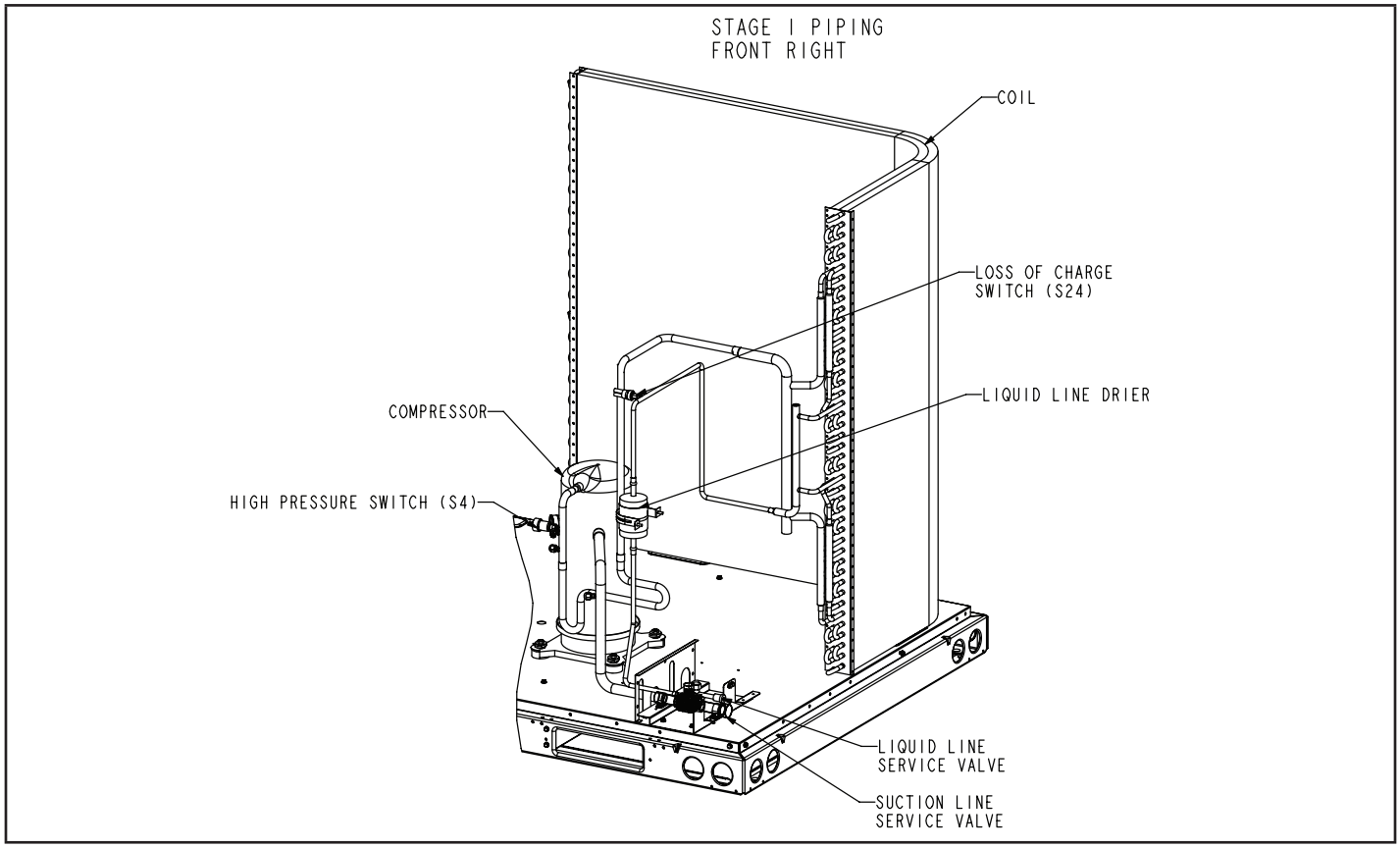
EL120KCSDT – STAGE 1



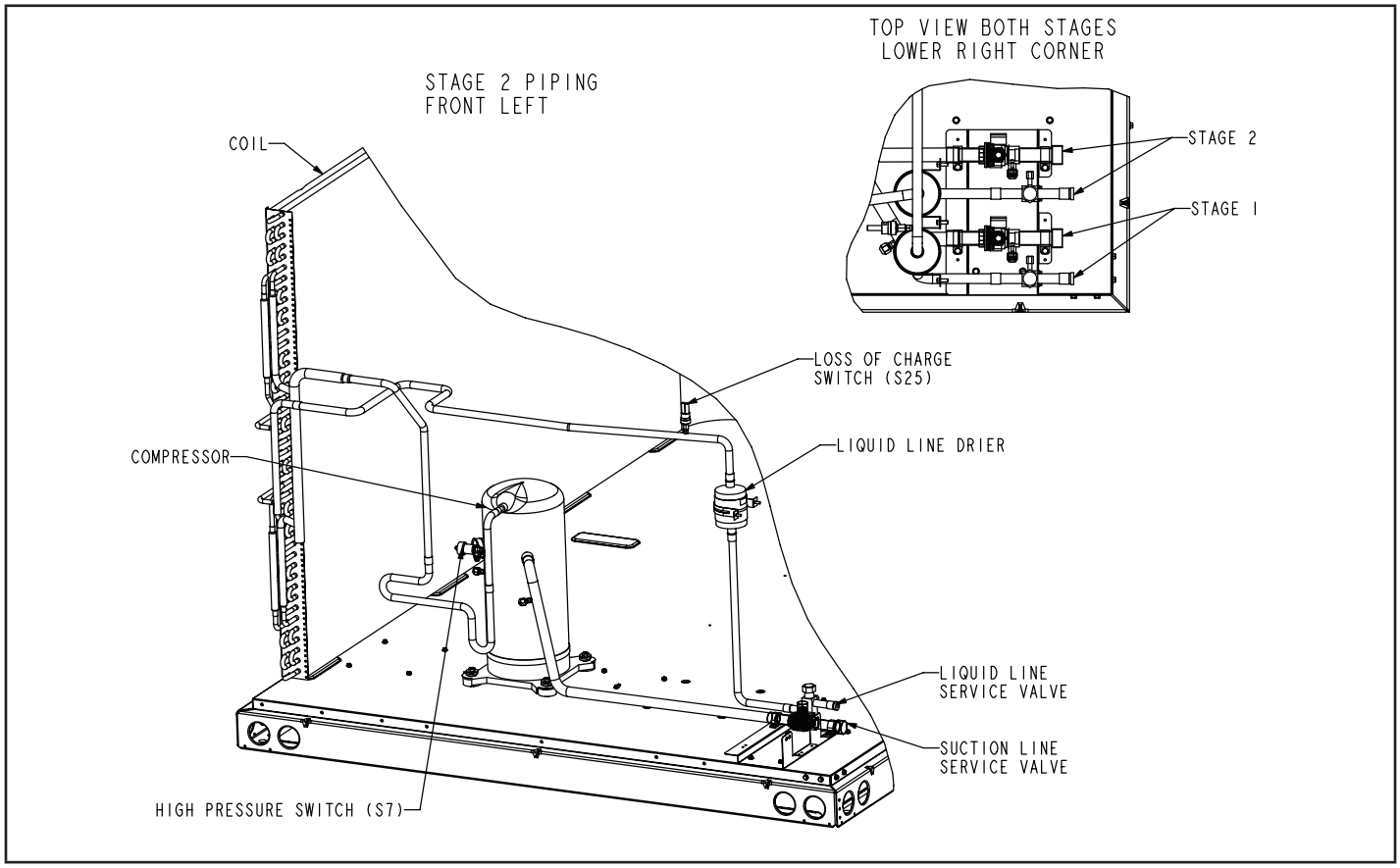
EL150KCSDT – STAGE 2



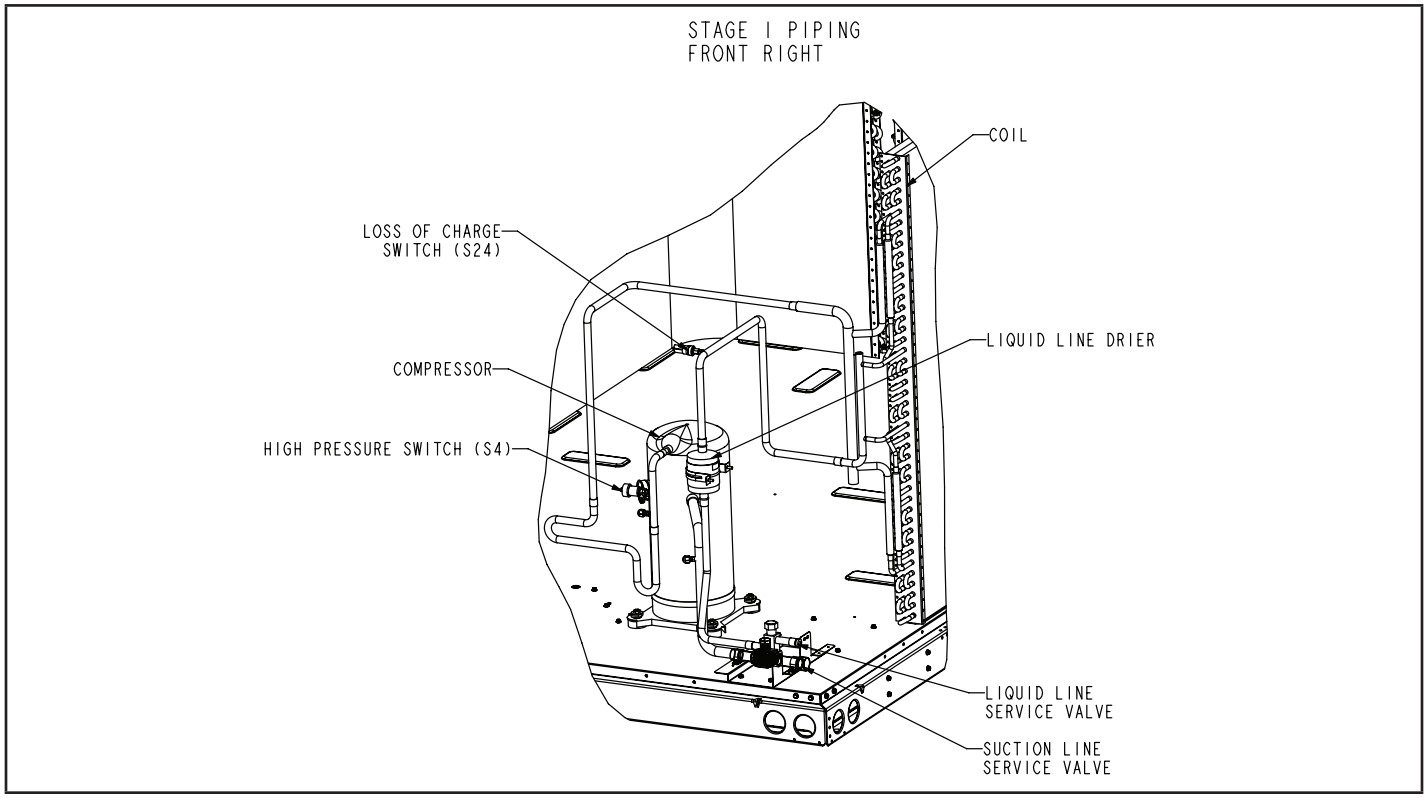
EL150KCSDT – STAGE 1



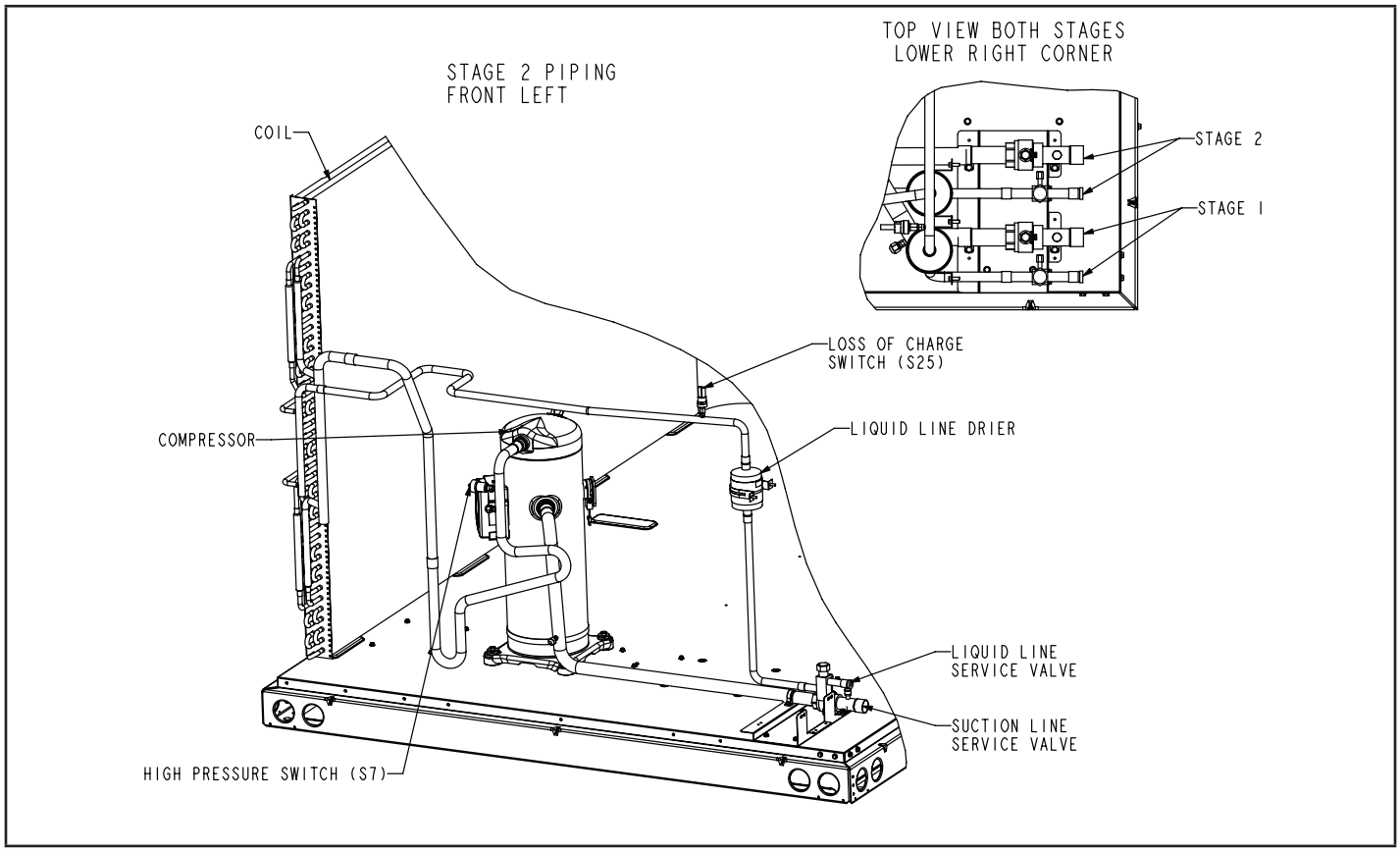
EL180KCSDT – STAGE 2



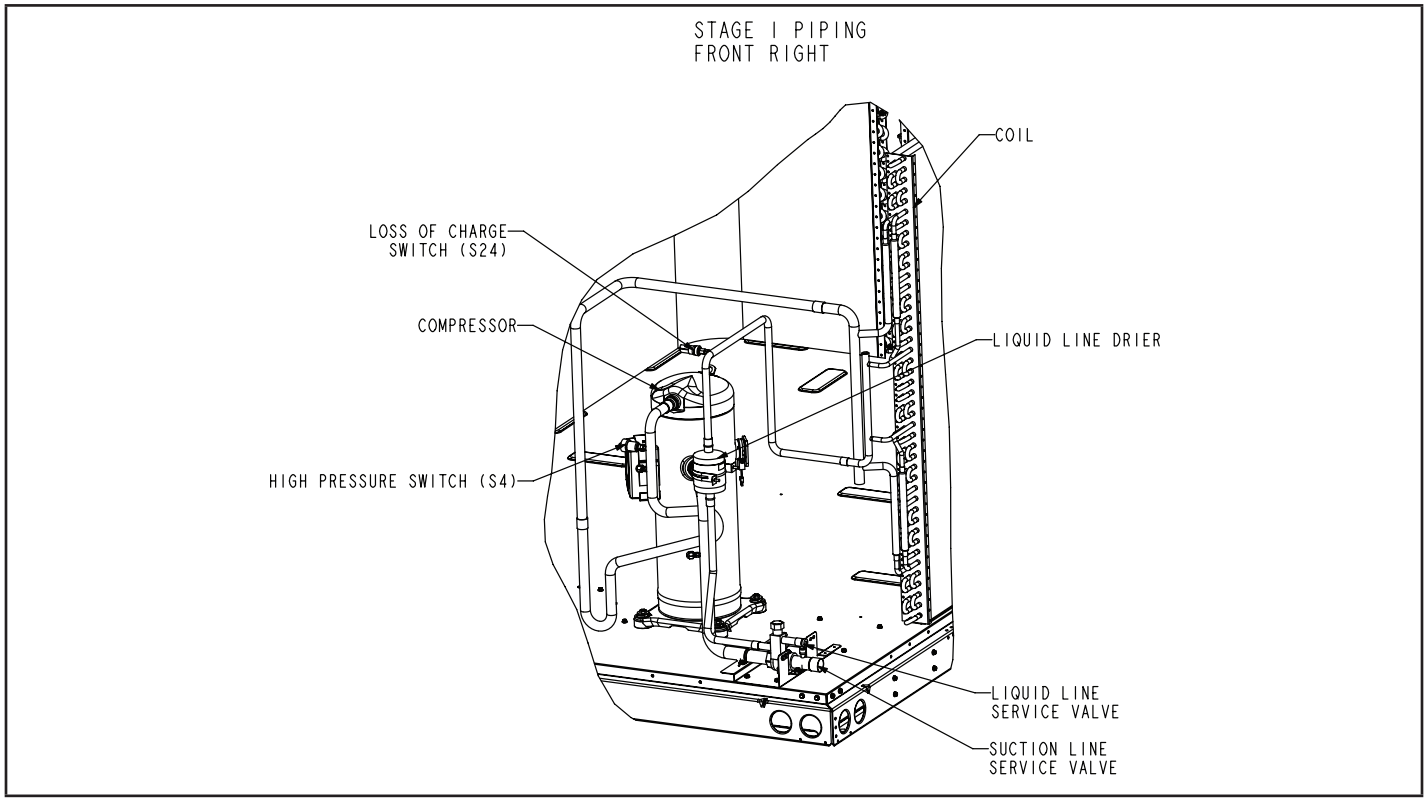
EL180KCSDT – STAGE 1



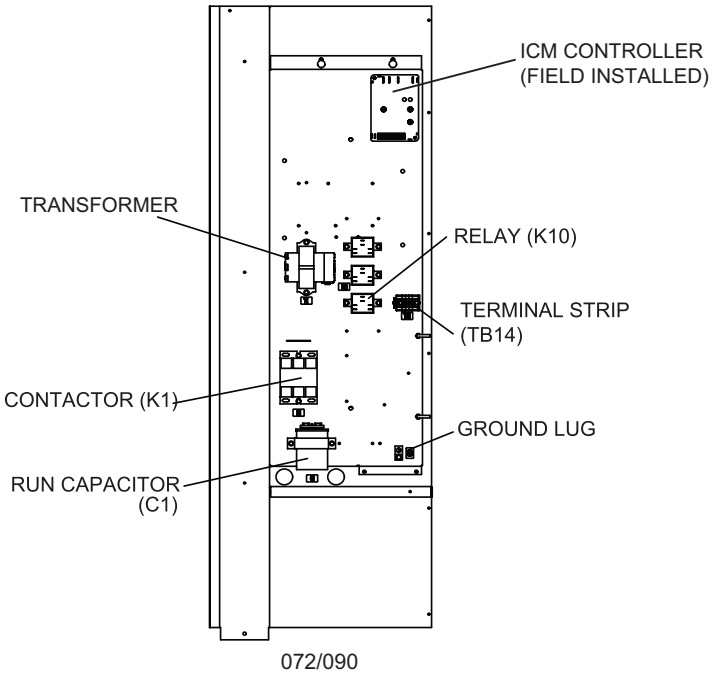
EL240KCSDT – STAGE 2



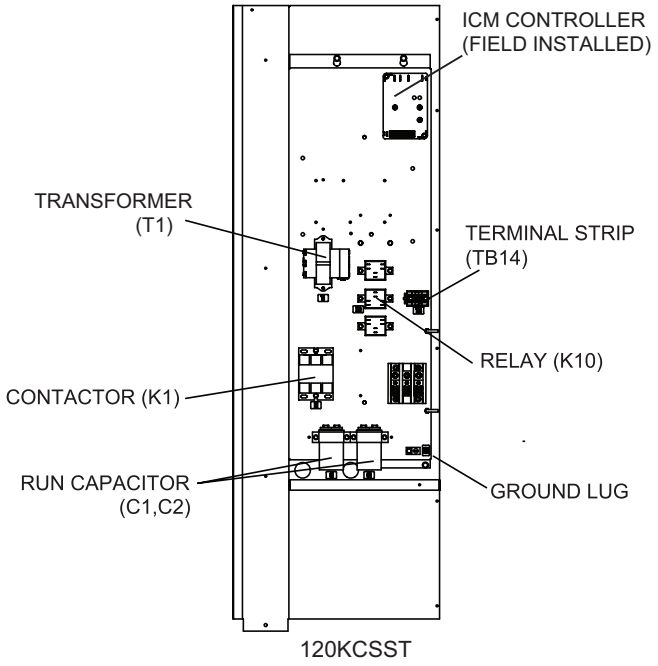
EL240KCSDT – STAGE 1



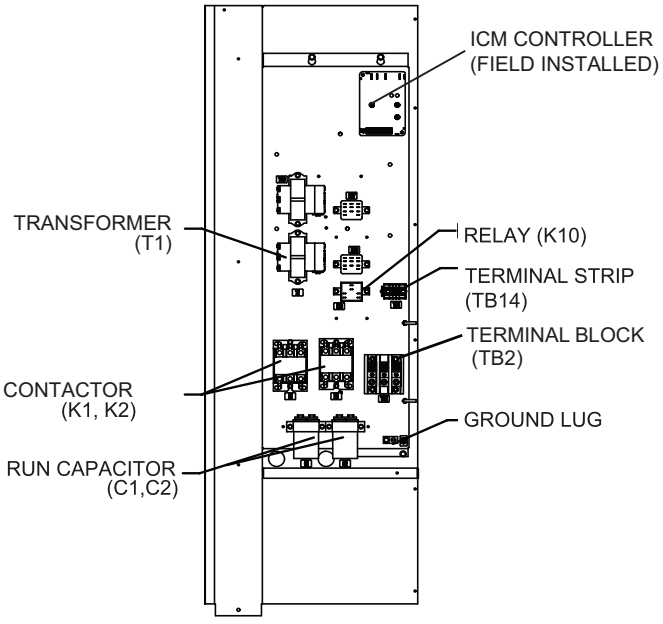
Unit Control Box Components Arrangement



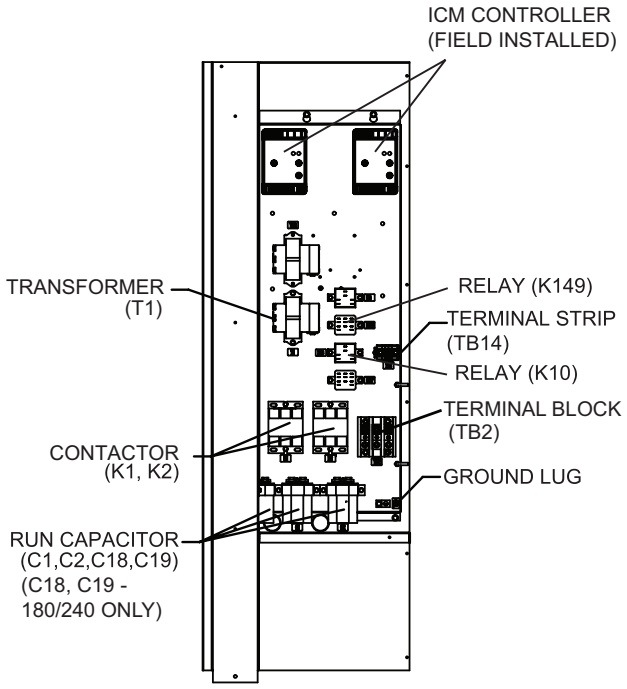
072/090



120KCSST



EL120KCSDT



EL150/180/240KCSDT

I-UNIT COMPONENTS

The parts arrangements are shown on pages 12-17 and control boxes on page 18.

⚠ WARNING	
ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures	Electrostatic discharge can affect electronic components. Take care 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. Touch hand and all tools on an unpainted unit surface before performing any service procedure to neutralize electrostatic charge.

A-Control Box Components

1 - Transformer T1

All models use a single line voltage to 24VAC transformer mounted in the control box. Transformer T1 supplies power to control circuits in the unit. The transformer is rated at 90VA and is protected by a 6.0 amp circuit breaker (CB8). CB8 is internal to the transformer. The 208/230 (Y) voltage transformers use two primary voltage taps as shown in-FIGURE 1, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

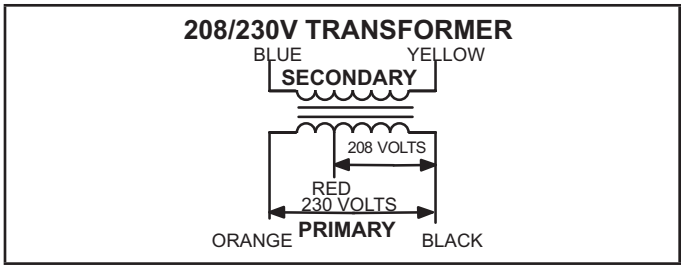


FIGURE 1

***NOTE** – 208 volt units are field wired with the red wire connected to control transformer. 230 volt units are factory wired with the orange wire connected to control transfomer primary.*

2 - Terminal Strip TB14 & TB2

Terminal strip TB14 used in all units distributes 24V power and common from the transformer T1 to the indoor mating air handler unit. TB14 distributes 24V thermostat signals to the low voltage components. Terminal block TB2 used in the 120, 150, 180 and 240 units, distributes line voltage to line voltage components.

3 - Condenser Fan Capacitors C1, C2, C18, C19

All units use single-phase condenser fan motors. Motors are equipped with a fan run capacitor to maximize motor efficiency. Condenser fan capacitors C1, C2, C18 and C19 assist in the start up of condenser fan motors B4, B5, B21 and B22. Capacitor ratings will be on condenser fan motor nameplate.

4 - Compressor Contactor K1 (all units) K2 (120KCSD, 150, 180, 240)

All compressor contactors are three-pole double-break contactors with auxiliary switch with a 24V coil. In all units, K1 energizes compressor B1. In EL120KCSD, 150, 180 and 240 units, K2 energizes compressor B2.

5 - Condenser Fan Relay K10 (all units) K149 (150, 180, 240)

K10 energizes condenser fan B4 (fan 1) in EL072 /090/150KC and fans B4, B5 (fan 1, 2) in EL120/180/240KC units in response to thermostat demand. K149 energizes condenser fan B5 (fan 2) in EL150KC and fans B21, B22 (fan 3, 4) in EL180/240KC in response to thermostat demand.

B-Cooling Components

⚠ 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.

1 - Compressor

All units use scroll compressors. 072, 090 and 120KCSS models have one two-stage scroll compressor. 120KCSD, 150, 180, and 240 models have two two-stage scroll compressors.

Compressor consists of two involute spiral scrolls matched together to generate a series of crescent shaped gas pockets between them.

During compression, one scroll remains stationary while the other scroll orbits around it.

Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates.

As the spiral movement continues, gas pockets are pushed to the center of the scrolls. Volume between the pockets is simultaneously reduced.

When pocket reaches the center, gas is now high pressure and is forced out of a port located in the center of the fixed scrolls.

During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle.

Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency.

Scroll compressor is tolerant to the effects of slugging and contaminants. If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged.

Low gas pulses during compression reduces operational sound levels.

Compressor motor is internally protected from excessive current and temperature.

Compressor is installed in the unit on resilient rubber mounts for vibration-free operation.

See ELECTRICAL section or compressor nameplate for compressor specifications.

All Compressors are Two Stage Models

A 24-volt DC solenoid valve inside the compressor controls staging. When the 3-way solenoid is energized it moves the lift ring assembly to block the ports and the compressor operates at full-load or 100% capacity. When the solenoid is de-energized the lift ring assembly moves to unblock the compressor ports and the compressor operates at part-load or approximately 67% of its full-load capacity.

The “loading” and “unloading” of the two stage scroll is done “on the fly” without shutting off the single-speed compressor motor between stages.

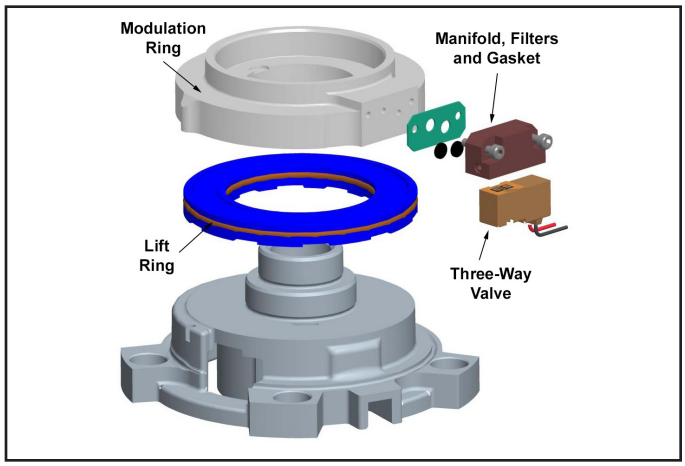


FIGURE 2. Two-Stage Scroll Compressor

2 - Two Stage Compressor Solenoids (L34, L44) Resistance Check

Resistance check: Measure the resistance from the end of one molded plug lead to either of the two female connectors in the plug. One of the connectors should read close to zero ohms while the other should read infinity. Repeat with other wire. The same female connector as before should read zero while the other connector again reads infinity. Reverse polarity on the ohmmeter leads and repeat. The female connector that read infinity previously should now read close to zero ohms. Replace plug if either of these test methods don't show the desired results.

3 - Crankcase Heaters HR1 (all units) and HR2 (120KCSD, 150, 180, 240)

All units use a belly-band type crankcase heater. Heater HR1 is wrapped around compressor B1 and heater HR2 is wrapped around compressor B2. HR1 and HR2 assure proper compressor lubrication at all times.

4 - High Pressure Switch S4 (all units) & S7 (120KCSD, 150, 180, 240)

The high pressure switch is a manual-reset SPST N.C. switch which opens on a pressure rise. The switch is located in the compressor discharge line and is wired in series with the compressor contactor coil. When discharge pressure rises to 640 + 10 psig (4413 + 69 kP) the switch opens and the compressor is de-energized.

5 - Filter Drier (all units)

All units have a filter drier that is located in the liquid line of each refrigerant circuit at the exit of each condenser coil. The drier removes contaminants and moisture from the system.

6 - Condenser Fan Motor B4 (all units) B5 (120, 150, 180, 240) B21 & B22 (180, 240)

See pages 5 through 7 for the specifications on the condenser fans used in the units. All condenser fans have single- phase motors. The 072 and 090 units are equipped with a single condenser fan motor. The 120 and 150 are equipped with two fan motors and the 180 and 240 have four fan motors. The fan assembly may be removed for servicing by removing the fan grill, unplugging the motor then loosening the motor bracket. The assembly will lift out.

7 - Loss of Charge Switch S24 & S25 (120KCSD, 150, 180, 240)

The loss of charge switch is an auto-reset SPST N.C. switch which opens on a pressure drop (almost a complete loss of charge). The switch is located in the liquid line and wired in series with compressor contactor and high pressure switch. S24 is wired in series with first stage cool and S25 is wired in series with second stage cool. When pressure drops below 40+ 5 psig (indicating loss of charge in the system) the switch opens and compressor is de-energized. The switch automatically resets when refrigerant is added and pressure in the discharge line rises above 90+ 5 psig.

8 - Head Pressure Control A190 & A191 and Pressure Transducer A188 & A189

The low ambient kit is designed to maintain the head pressure across the liquid line by varying the condenser speed fan.

Head pressure Control A190 (all units) and A191 (150, 180, 240) is used to set the desired liquid line pressure (315 psig). The pressure transducer A190 (all units) A191 (120KCSD through 240) measures the liquid line pressure sending an analog signal to the head pressure controller. If pressure falls below set point, the head pressure controller reduces the fan speed to increase the liquid line pressure to the set point.

9 - Low Pressure Switch S87 (072, 090, 120KCSS).

The low pressure switch is an auto-reset SPST N.C. switch which opens on a pressure drop. The switch is located on the suction line and wired in series with compressor contactor and high pressure switch. When pressure drops below 40 ± 5 psig the switch opens and compressor is de-energized. The switch automatically resets when pressure rises above 90 ± 5 psig.

II-REFRIGERANT SYSTEM

A-Line Set

Field refrigerant piping consists of liquid and suction lines connecting the condensing unit and the indoor unit. Liquid and suction service valves are located in a compartment at the corner of the unit below the control box.

Piping can be routed directly from the service valves or field supplied elbows can be added to divert the piping as required.

Refer to TABLE 1 for field-fabricated refrigerant line sizes for runs up to 50 linear feet (15 m).

TABLE 1. Refrigerant Line Sizes for Runs Up to 50 Linear Feet

Unit	Liquid Line	Suction Line
EL072KCSS	3/8" (10mm)	1-1/8" (29mm)
EL090KCSS	5/8" (16mm)	1-1/8" (29mm)
EL120KCSS	5/8" (16mm)	1-1/8" (29mm)
EL120KCSD	3/8" (10mm)	1-1/8" (29mm)
EL150KCSD	3/8" (10mm)	1-1/8" (29mm)
EL180KCSD	5/8" (16mm)	1-1/8" (29mm)
EL240KCSD	5/8" (16mm)	1-1/8" (29mm)

Refrigerant Line Limitations

You may install the unit in applications that have line set lengths of up to 50 linear feet (15 m) with refrigerant line sizes as outlined in TABLE 1 (excluding equivalent length of fittings). Size refrigerant lines longer than 50 linear feet (15m or greater) according to the Refrigerant Piping Design and Fabrication Guidelines (Corp. 9351-L9) or latest version.

B-Service Valves

USING MANIFOLD GAUGE SETS

When checking the system charge, use a manifold gauge set that features low-loss anti-blow back fittings. See FIGURE 3 for a typical manifold gauge connection setup.

Manifold gauge sets used with R-454B refrigerant systems must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 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.

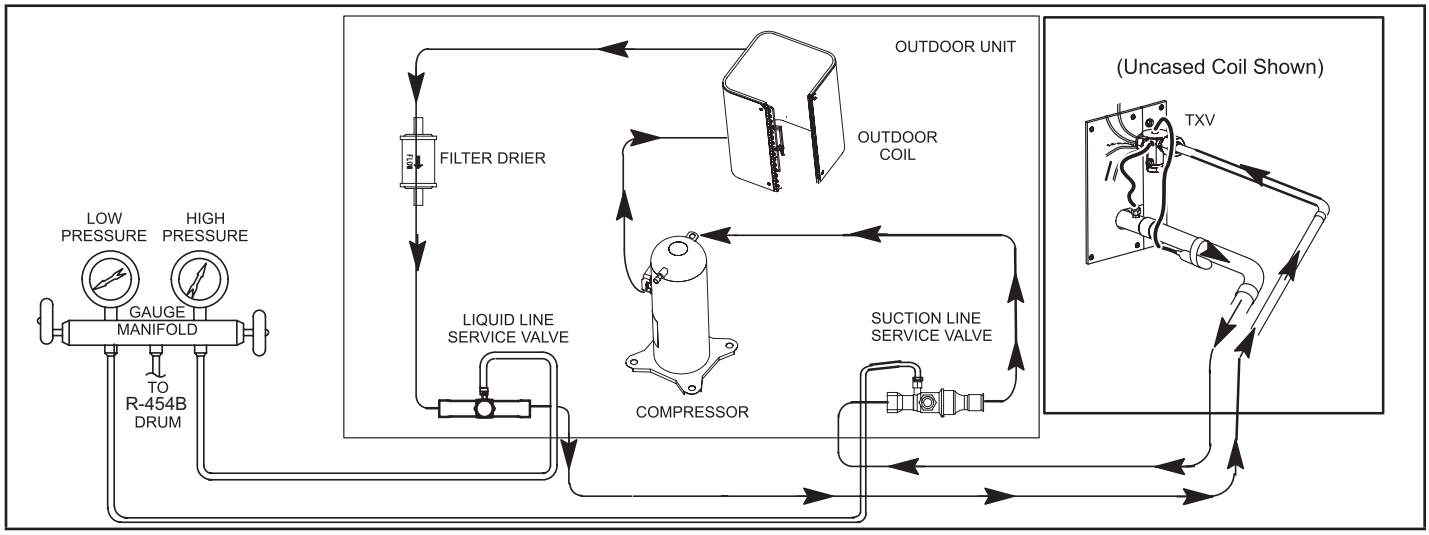


FIGURE 4

OPERATING SERVICE VALVES

The liquid and suction line service valves are typically used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.

⚠ IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued (from 9 ft-lbs for small valves, to 25 ft-lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

Each valve is equipped with a service port which has a factory-installed valve stem.

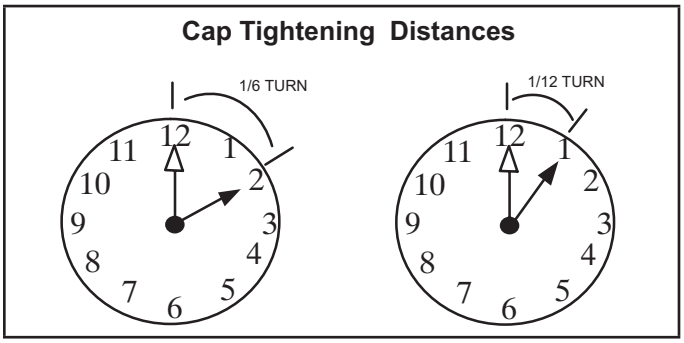


FIGURE 3

⚠ IMPORTANT

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

TABLE 2
Torque Requirements

Part	Recommended Torque	
Service valve cap	8 ft.-lb.	11 NM
Sheet metal screws	16 in.-lb.	2 NM
Machine screws #10	28 in.-lb.	3 NM
Compressor bolts	80 in.-lb.	9 NM
Gauge port seal cap	8 ft.-lb.	11 NM

To Access Angle-Type Service Port:

A service port cap protects the service port core from contamination and serves as the primary leak seal.

1 - Remove service port cap with an appropriately sized wrench.
2 - Connect gauge to the service port.
3 - When testing is completed, replace service port cap and tighten as follows:

- *With Torque Wrench*: Finger tighten and then tighten per TABLE 2.
- *Without Torque Wrench*: Finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise as illustrated in FIGURE 4.

To Open Liquid Line Service Valve:

1 - Remove stem cap with an adjustable wrench.
2 - Using service wrench and 5/16" hex head extension if needed (part #49A71) back the stem out counterclockwise until the valve stem just touches the retaining ring.
3 - Replace stem cap. Tighten finger tight, then tighten an additional 1/6 turn. Do not over torque.

To Close Liquid Line Service Valve:

1 - Remove stem cap with an adjustable wrench.
2 - Using service wrench and 5/16" hex head extension if needed (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. Do not over torque.

Service (Ball) Valve

Some air conditioner units are equipped with a full service ball valve, as shown in FIGURE 6. One service port that contains a valve core is present in this valve. A cap is also provided to seal off the service port. The valve is not rebuildable so it must always be replaced if failure has occurred.

Opening the Suction Line Service Valve

1 - Remove the stem cap with an adjustable wrench.
2 - Using a service wrench, turn the stem counterclockwise for 1/4 of a turn.
1 - Replace the stem cap and tighten it firmly.

Closing the Suction Line Service Valve

1 - Remove the stem cap with an adjustable wrench.
2 - Using a service wrench, turn the stem clockwise for 1/4 of a turn.
3 - Replace the stem cap and tighten firmly.

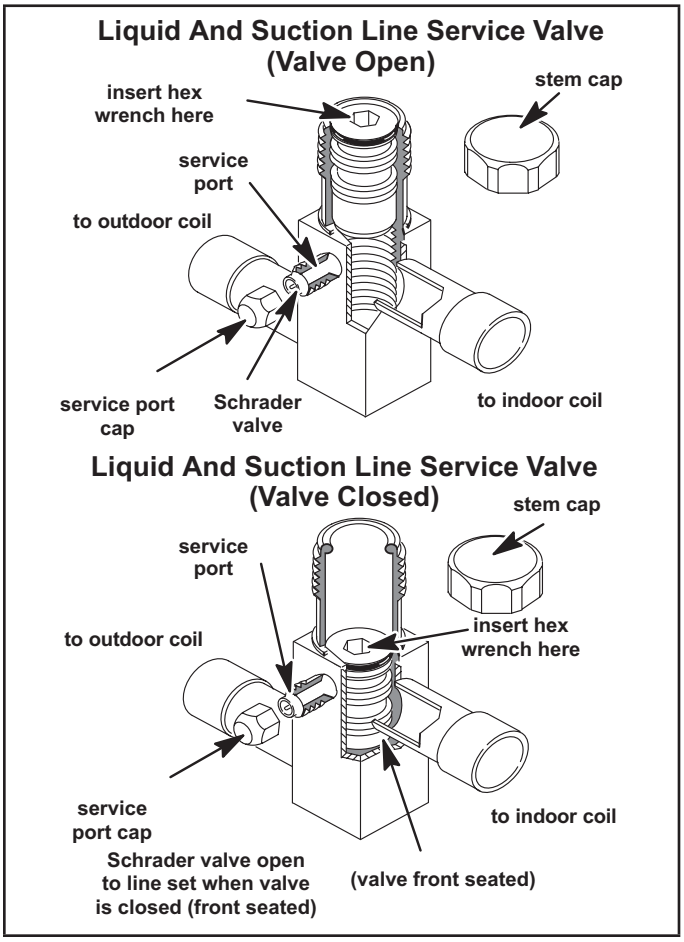


FIGURE 5

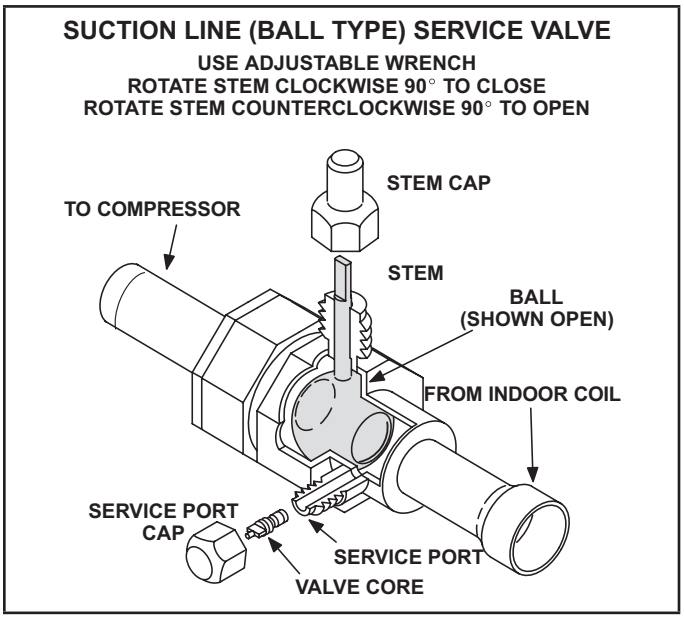


FIGURE 6

III-START-UP

The following is a general procedure and does not apply to all thermostat control systems. Refer to sequence of operation in this manual for more information.

⚠ IMPORTANT

If unit is equipped with a crankcase heater and the outdoor ambient air is 50ºF (10ºC) or below, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

1 - Set fan switch to AUTO or ON and move the system selection switch to COOL. Adjust the thermostat to a setting far enough below room temperature to bring on compressors. Compressors will start and cycle on demand from the thermostat (allowing for unit and thermostat time delays).

2 - Each circuit is field charged with R-454B refrigerant.

3 - Refer to Charging section for proper method of checking and charging the system.

⚠ IMPORTANT

Three-phase scroll compressors must be phased sequentially to ensure correct compressor rotation and operation. At compressor start-up, a rise in discharge and drop in suction pressures indicate proper compressor phasing and operation. If discharge and suctions pressures do not perform normally, follow the steps below to correctly phase in the unit.

1 - Disconnect power to the unit.

2 - Reverse any two field power leads (L1 and L3 preferred) to the unit.

3 - Reapply power to the unit.

Discharge and suction pressures should operate at their normal start-up ranges.

NOTE *- Compressor noise level will be significantly higher when phasing is incorrect and the unit will not provide cooling when compressor is operating backwards. Continued backward operation will cause the compressor to cycle on internal protector.*

IV-CHARGING

A-Leak Testing

⚠ 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.

⚠ WARNING

Fire, Explosion and Personal Safety hazard. Failure to follow this warning could result in damage, personal injury or death.

Never use oxygen to pressurize or purge refrigeration lines. Oxygen, when exposed to a spark or open flame, can cause fire and/or an explosion, that could result in property damage, personal injury or death.

1 - Connect an R-454B manifold gauge set as illustrated in FIGURE 7.

2 - Open the valve on the R-454B cylinder (suction only).

3 - Open the high pressure side of the manifold to allow R-454B into the line set and indoor unit. Weigh in a trace amount of R-454B. [A trace amount is a maximum of two ounces (57 g) refrigerant or three pounds (31 kPa) pressure].

4 - Close the valve on the R-454B cylinder and the valve on the high pressure side of the manifold gauge set.

5 - Disconnect the R-454B cylinder.

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

7 - Adjust dry nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set in order to pressurize the line set and the indoor unit.

8 - After a few minutes, open one of the service valve ports and verify that the refrigerant added to the system earlier is measurable with a leak detector.

NOTE *- Amounts of refrigerant will vary with line lengths*.

9 - Check all joints for leaks.

10 - Purge dry nitrogen and R-454B mixture.

11 - Correct any leaks and recheck.

12 - After leak testing, disconnect gauges from service ports.

A Connect an R-454B manifold gauge set high pressure hose to the suction valve service port.

B With both manifold valves closed, connect the cylinder of R-454B refrigerant to the center port of the manifold gauge set.

C After the line set has been connected to both the indoor and outdoor units, check the line set connections and indoor unit for leaks. Use the following procedure to test for leaks:

NOTE - LATER IN THE PROCEDURE, THE R-454B CONTAINER WILL BE REPLACE BY THE NITROGEN CONTAINER.

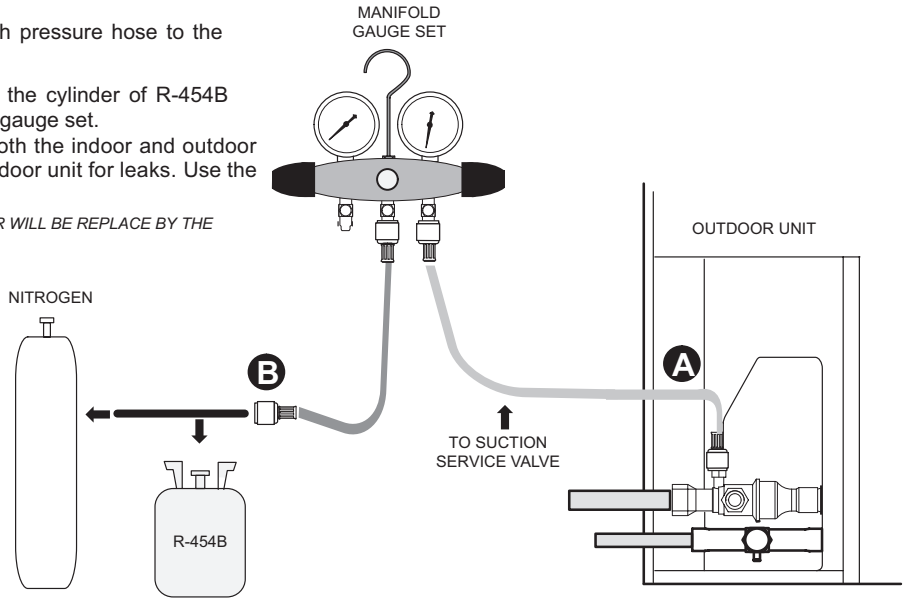
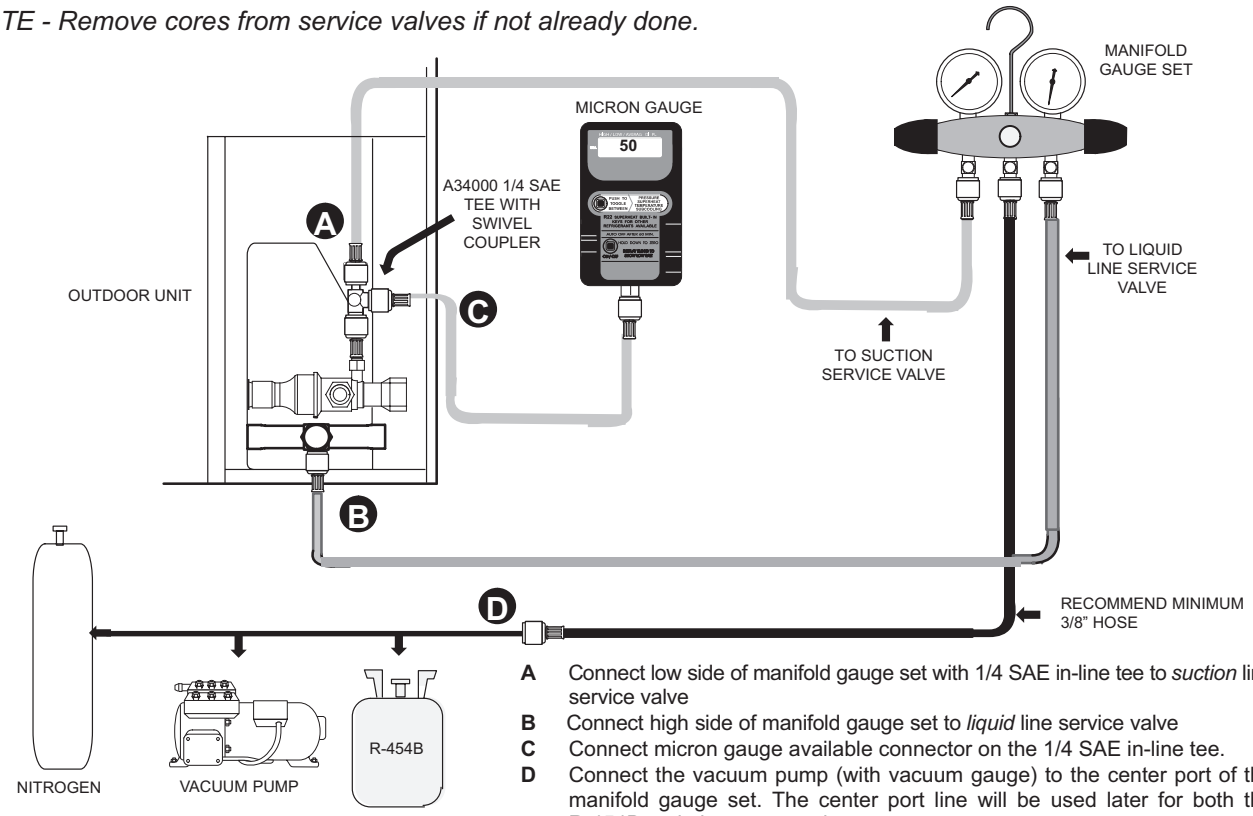


FIGURE 7

B-Evacuating the System

NOTE - Remove cores from service valves if not already done.



A Connect low side of manifold gauge set with 1/4 SAE in-line tee to *suction* line service valve

B Connect high side of manifold gauge set to *liquid* line service valve

C Connect micron gauge available connector on the 1/4 SAE in-line tee.

D Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set. The center port line will be used later for both the R-454B and nitrogen containers.

FIGURE 8

⚠ WARNING

Possible equipment damage.

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

⚠ IMPORTANT

Use a thermocouple or thermistor electronic vacuum gauge that is calibrated in microns. Use an instrument capable of accurately measuring down to 50 microns.

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 suction combine with refrigerant to produce substances that corrode copper piping and compressor parts.

***NOTE** - Remove cores from service valves if not already done.*

1 - Connect an R-454B manifold gauge set as illustrated in FIGURE 8.

2 - Open both manifold valves and start the vacuum pump.

3 - Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29 inches of mercury).

NOTE** - 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 pressure this 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.*

4 - When the absolute pressure reaches 23,000 microns (29 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 dry 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.

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

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

6 - 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 R-454B refrigerant. Open the manifold gauge valve pressure line set to break vacuum with 2 to 5 psi.

7 - Perform the following:

A - Close manifold gauge valves

B - Shut off R-454B cylinder

C - Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.

D - Replace the stem caps and secure finger tight, then tighten an additional one-sixth (1/6) of a turn as illustrated in figure 4.

C-Refrigerant Charge

The ELKC units have a factory holding charge of 2 pounds of R-454B in each circuit. Additional refrigerant will need to be added during installation. Charge using the R-454B charging information label provided in the unit. The R-454B charging information label in the unit applies to Indoor and Outdoor unit with same full load capacity, see table below. For all other unit matches, please contact Commercial Application department for Charging Procedure Information (form # 508349-02).

Split System Matches		
Cooling Unit	**Air Handler**	**Air Handler SCFM**
EL072KC	EL072KA	2385
EL090KC	EL090KA	2600
EL120KCSS	EL120KA	4075
EL120KCSD	EL120KA	4000
EL150KC	EL150KA	4425
EL180KC	EL180KA	5200
EL240KC	EL240KA	7025

ELKC Sequence of Operations

Models – 072; 090; 120KCSS

First Stage Cooling Call

Y1 thermostat demand from Air handler energizes 24VAC signal to TB14-C1 connection.

TB14-C1 signal passes though along parallel paths energizing K10 Fan Relay and K1 Compressor Contactor (assuming both S87 low pressure switch and S4 high pressure switch remain closed).

K1-1 closes, energizing B1 compressor on low speed.

K1-2 opens to de-energize HR1 crankcase heater.

K10-1 closes, energizing outdoor fan B4 (and B5 on 120KCSS only).

Note: *When high voltage power is applied to unit, K1-2 N.C. energizes HR1 crankcase heater*.

Second Stage Cooling Call

Y2 thermostat demand from Air handler energizes 24VAC signal to TB14-C2 connection.

TB14-C2 signal passes though energizing L34 Solenoid shifting B1 compressor to high speed.

Models – 120KCSD; 150

First Stage Cooling Call

Y1 thermostat demand from Air handler energizes 24VAC signal to TB14-C1 connection.

TB14-C1 signal passes though along parallel paths energizing K10 Fan Relay and K1 Compressor Contactor (assuming both S24 loss of charge switch and S4 high pressure switch remain closed).

K1-1 closes, energizing B1 compressor on low speed.

K1-2 opens to de-energize HR1 crankcase heater.

K10-1 closes, energizing B4 outdoor fan (and B5 outdoor fan on 120KCSD only).

Note: *When high voltage power is applied to unit, K1-2 N.C. energizes HR1 crankcase heater.*

Second Stage Cooling Call

Y2 thermostat demand from Air handler energizes 24VAC signal to TB14-C2 connection.

TB14-C2 signal passes though along parallel paths energizing K149 Fan Relay (150 only) and K2 Compressor Contactor (assuming both S25 loss of charge switch and S7 high pressure switch remain closed).

K2-1 closes, energizing B2 compressor on low speed.

K2-2 opens to de-energize HR2 crankcase heater.

K149-1 closes, energizing B5 outdoor fan (150 only).

Note: *When high voltage power is applied to unit, K2-2 N.C. energizes HR2 crankcase heater*.

Third Stage Cooling Call

Y3 thermostat demand from Air handler energizes 24VAC signal to TB14-C3 connection.

TB14-C3 signal passes though energizing L34, L44 Solenoids shifting B1, B2 compressors to high speed.

First Stage Cooling Call

Y1 thermostat demand from Air handler energizes 24VAC signal to TB14-C1 connection.

TB14-C1 signal passes though along parallel paths energizing K10 Fan Relay and K1 Compressor Contactor (assuming both S24 loss of charge switch and S4 high pressure switch remain closed).

K1-1 closes, energizing B1 compressor on low speed.

K1-2 opens to de-energize HR1 crankcase heater.

K10-1 closes, energizing B4, B5 outdoor fans.

Note: *When high voltage power is applied to unit, K1-2 N.C. energizes HR1 crankcase heater.*

Second Stage Cooling Call

Y2 thermostat demand from Air handler energizes 24VAC signal to TB14-C2 connection.

TB14-C2 signal passes though along parallel paths energizing K149 Fan Relay and K2 Compressor Contactor (assuming both S25 loss of charge switch and S7 high pressure switch remain closed).

K2-1 closes, energizing B2 compressor on low speed.

K2-2 opens to de-energize HR2 crankcase heater.

K149-1 closes, energizing B21, B22 outdoor fans.

Note: *When high voltage power is applied to unit, K2-2 N.C. energizes HR2 crankcase heater.*

Third Stage Cooling Call

Y3 thermostat demand from Air handler energizes 24VAC signal to TB14-C3 connection.

TB14-C3 signal passes though energizing L34, L44 Solenoids shifting B1, B2 compressors to high speed.

V-PREVENTATIVE MAINTENANCE / REPAIR

IMPORTANT MAINTENANCE / REPAIR SAFETY INSTRUCTIONS

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

Work shall be undertaken under a controlled procedure to minimize the risk of a flammable gas or vapor being present while the work is being performed.

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

– the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;

– the ventilation machinery and outlets are operating adequately and are not obstructed;

– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

During repairs to sealed electrical components, the components shall be replaced. Replacement parts shall be in accordance with the manufacturer’s specifications.

During repairs to intrinsically safe components, the components must be replaced. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

⚠ IMPORTANT

Sprinklers and soaker hoses should not be installed where they could cause prolonged exposure to the outdoor unit by treated water. Prolonged exposure of the unit to treated water (i.e., sprinkler systems, soakers, waste water, etc.) will corrode the surface of the steel and aluminum parts, diminish performance and affect longevity of the unit.

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

OUTDOOR UNIT

1 - Clean and inspect the condenser coil. You can flush the coil with a water hose.

2 - The outdoor fan motor is prelubricated and sealed. No further lubrication is necessary.

3 - Visually inspect connecting lines and coils for evidence of oil leaks.

4 - Check wiring for loose connections.

5 - Check for correct voltage at the unit while the unit is operating and while it is off.

6 - Check amp-draw of the outdoor fan motor(s).
Unit nameplate _____ Actual _____

7 - Check amp-draw of the compressor(s).
Unit nameplate _____
Compressor #1 _____
Compressor #2 _____

***NOTE** – If the owner complains of insufficient cooling, gauge the unit and check the refrigerant charge. Refer to section on refrigerant charging in this instruction.*

VI-DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before starting decommissioning.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- all personal protective equipment is available and being used correctly;
- the recovery process is supervised at all times by a competent person;
- recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with instructions.

h) Do not overfill cylinders (no more than 80% volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

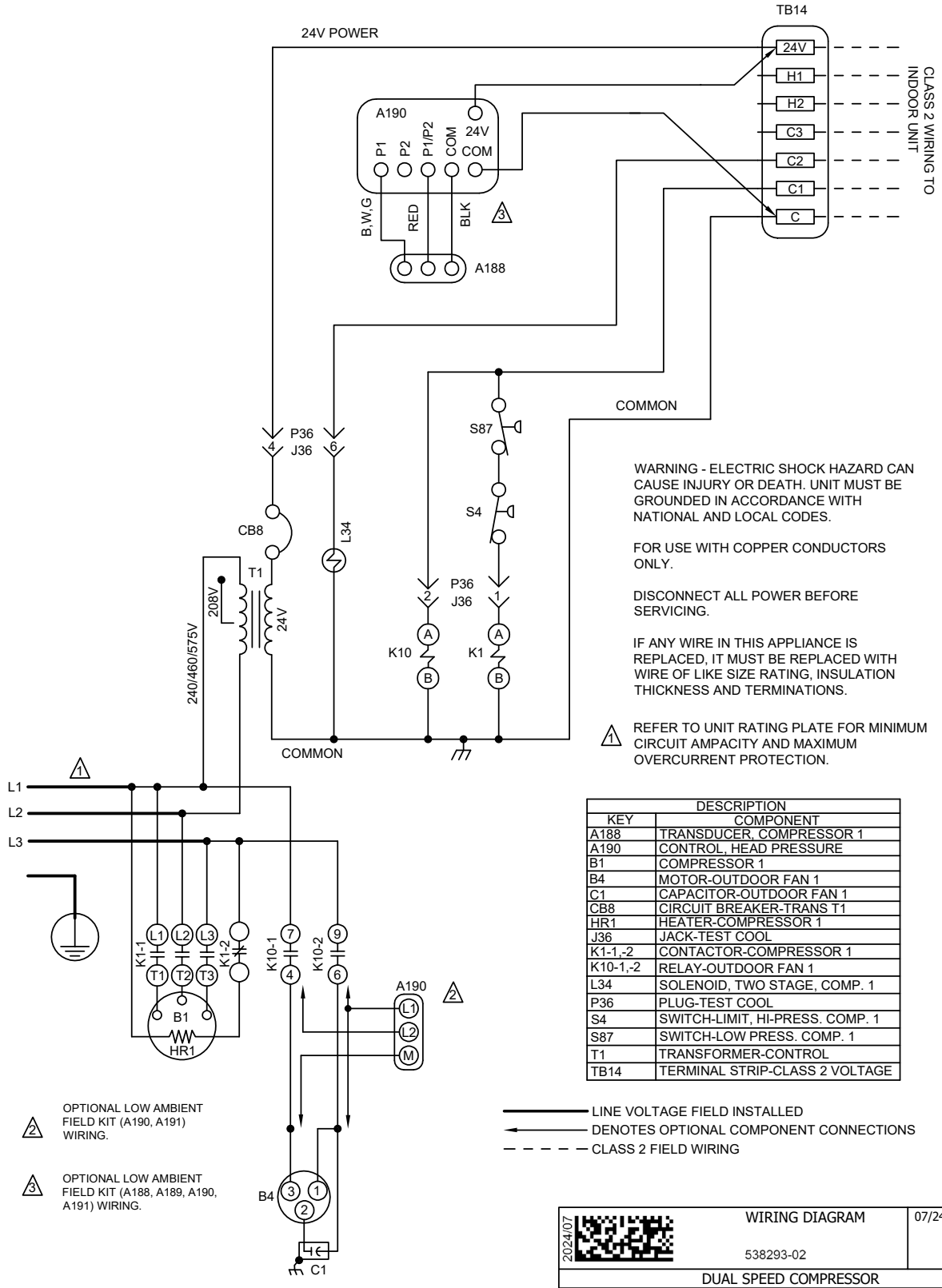
k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

⚠ IMPORTANT

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be signed and dated. Ensure that there are labels on the equipment that state the flammability of the refrigerant used.

VII-WIRING DIAGRAMS

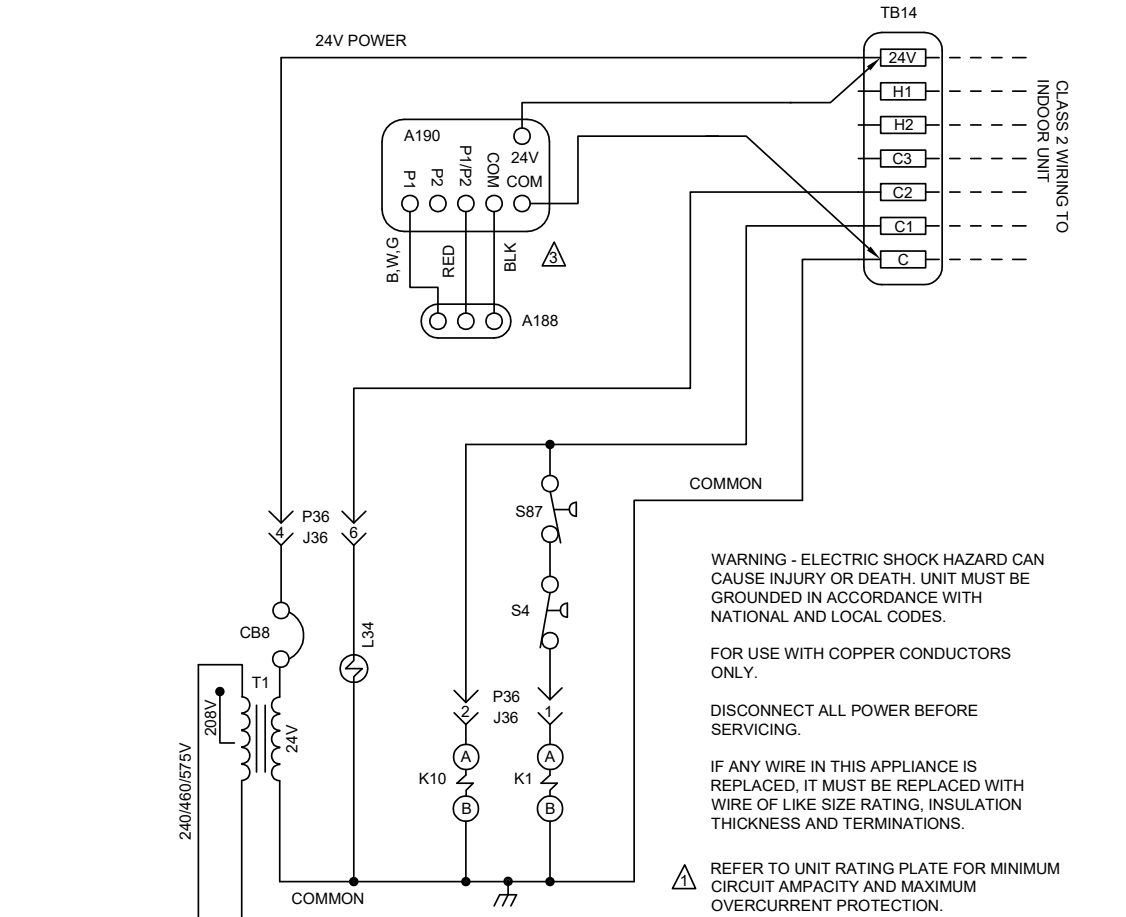
EL072/090KCSST



DESCRIPTION	
KEY	COMPONENT
A188	TRANSDUCER, COMPRESSOR 1
A190	CONTROL, HEAD PRESSURE
B1	COMPRESSOR 1
B4	MOTOR-OUTDOOR FAN 1
C1	CAPACITOR-OUTDOOR FAN 1
CB8	CIRCUIT BREAKER-TRANS T1
HR1	HEATER-COMPRESSOR 1
J36	JACK-TEST COOL
K1-1,-2	CONTACTOR-COMPRESSOR 1
K10-1,-2	RELAY-OUTDOOR FAN 1
L34	SOLENOID, TWO STAGE, COMP. 1
P36	PLUG-TEST COOL
S4	SWITCH-LIMIT, HI-PRESS. COMP. 1
S87	SWITCH-LOW PRESS. COMP. 1
T1	TRANSFORMER-CONTROL
TB14	TERMINAL STRIP-CLASS 2 VOLTAGE

2024/07	WIRING DIAGRAM 538293-02	07/24
DUAL SPEED COMPRESSOR		
ELITE AIR CONDITIONERS - 072,090-G,J,Y		
SECTION A 1		REV. 0
Supersedes 538293-01	New Form No. 538293-02	

EL120KCSST



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

FOR USE WITH COPPER CONDUCTORS ONLY.

DISCONNECT ALL POWER BEFORE SERVICING.

IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE RATING, INSULATION THICKNESS AND TERMINATIONS.

1 REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION.

KEY	DESCRIPTION COMPONENT
A188	TRANSDUCER, COMPRESSOR 1
A190	CONTROL, HEAD PRESSURE
B1	COMPRESSOR 1
B4	MOTOR-OUTDOOR FAN 1
B5	MOTOR-OUTDOOR FAN 2
C1	CAPACITOR-OUTDOOR FAN 1
C2	CAPACITOR-OUTDOOR FAN 2
CB8	CIRCUIT BREAKER-TRANS T1
HR1	HEATER-COMPRESSOR 1
J36	JACK-TEST COOL
K1-1,-2	CONTACTOR-COMPRESSOR 1
K10-1,-2	RELAY-OUTDOOR FAN 1
L34	SOLENOID, TWO STAGE, COMP. 1
P36	PLUG-TEST COOL
S4	SWITCH-LIMIT, HI-PRESS. COMP. 1
S87	SWITCH-LOW PRESS. COMP. 1
T1	TRANSFORMER-CONTROL
TB14	TERMINAL STRIP-CLASS 2 VOLTAGE

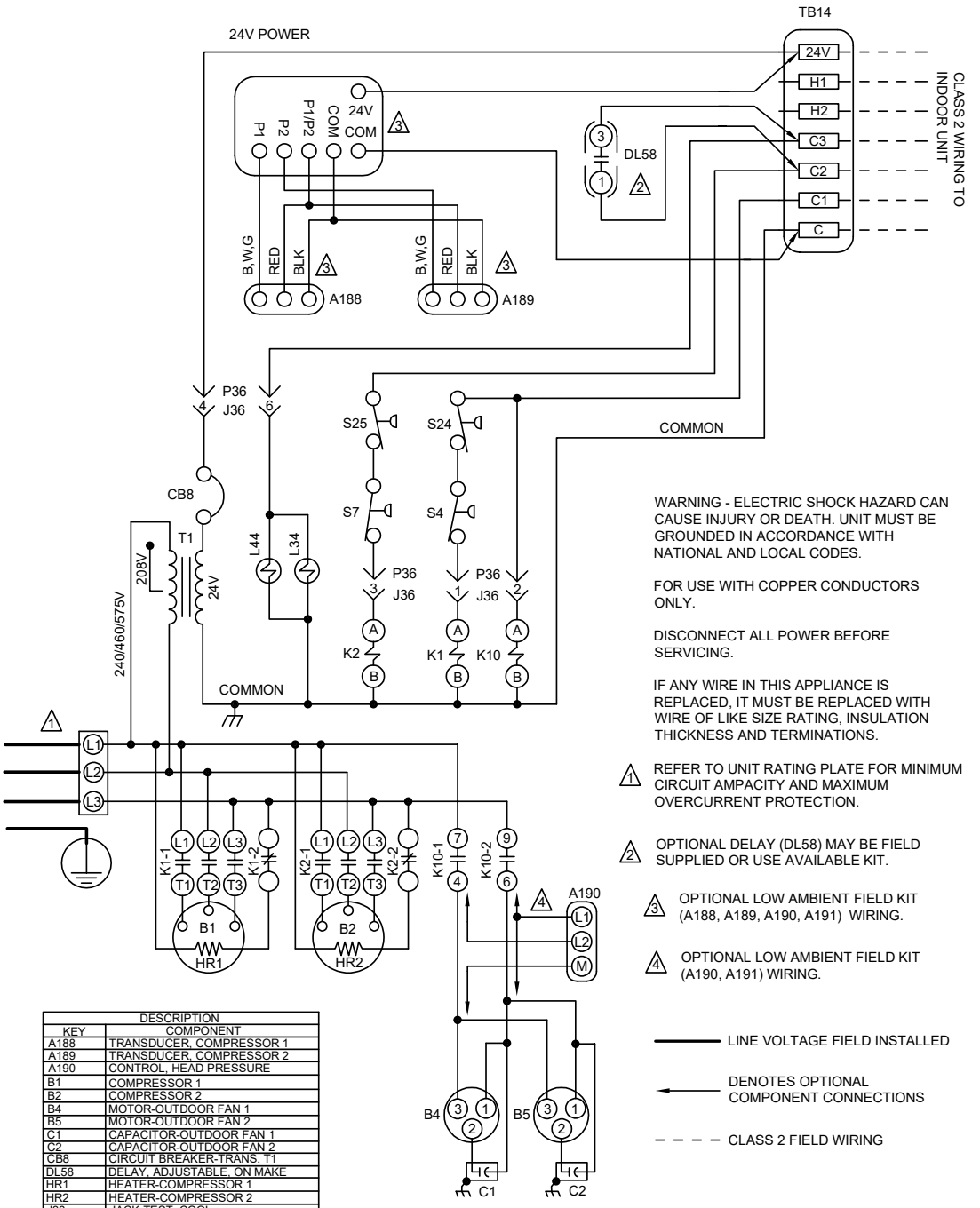
2 OPTIONAL LOW AMBIENT FIELD KIT (A190, A191) WIRING.

3 OPTIONAL LOW AMBIENT FIELD KIT (A188, A189, A190, A191) WIRING.

LINE VOLTAGE FIELD INSTALLED
DENOTES OPTIONAL COMPONENT CONNECTIONS
CLASS 2 FIELD WIRING

2024/07	WIRING DIAGRAM 538294-02	07/24
DUAL SPEED COMPRESSOR		
ELITE AIR CONDITIONERS 120 - G,J,Y		
SECTION A 2		REV. 0
Supersedes 538294-01	New Form No. 538294-02	

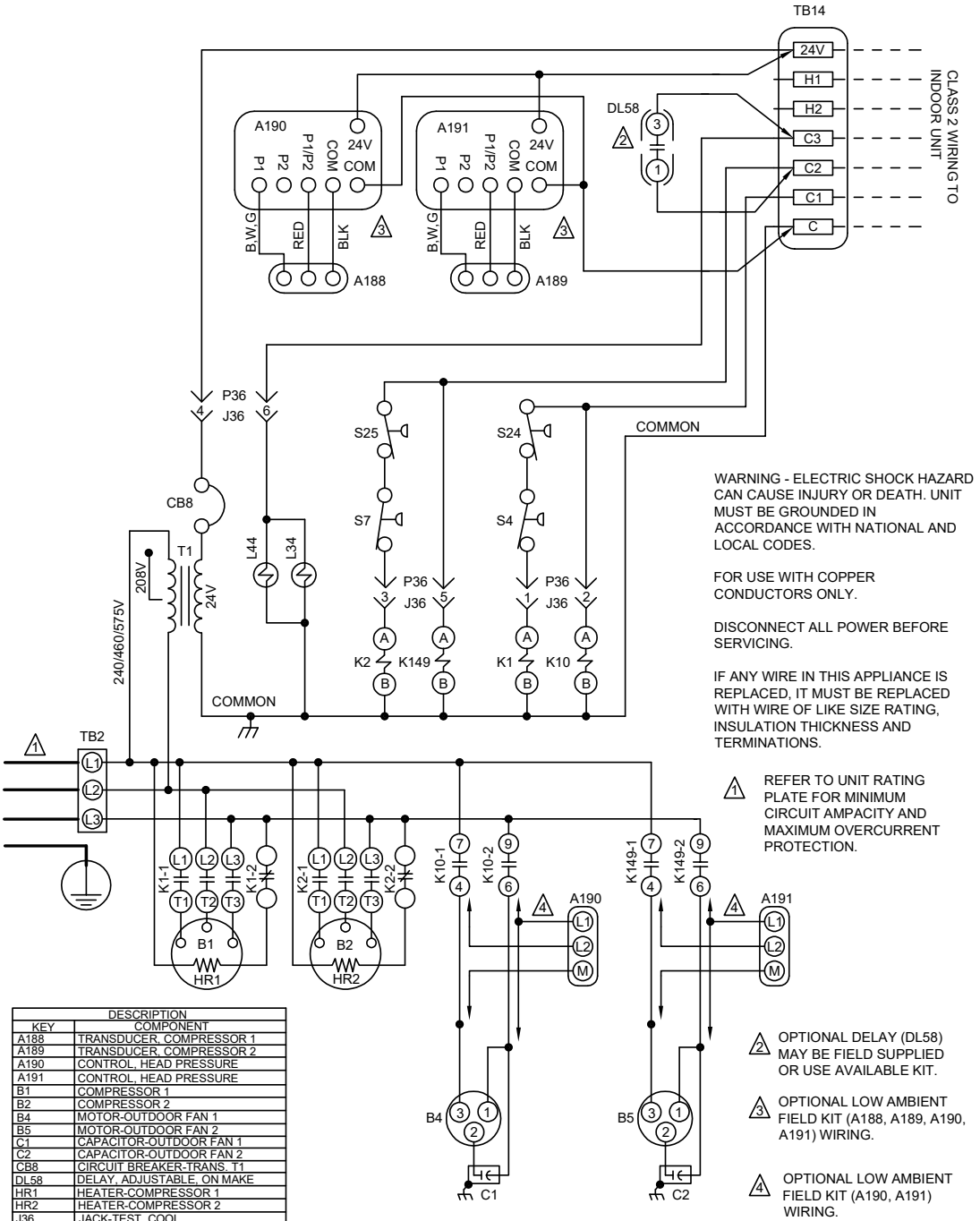
EL120KCSDT



KEY	DESCRIPTION COMPONENT
A188	TRANSDUCER, COMPRESSOR 1
A189	TRANSDUCER, COMPRESSOR 2
A190	CONTROL, HEAD PRESSURE
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B4	MOTOR-OUTDOOR FAN 1
B5	MOTOR-OUTDOOR FAN 2
C1	CAPACITOR-OUTDOOR FAN 1
C2	CAPACITOR-OUTDOOR FAN 2
CB8	CIRCUIT BREAKER-TRANS. T1
DL58	DELAY, ADJUSTABLE, ON MAKE
HR1	HEATER-COMPRESSOR 1
HR2	HEATER-COMPRESSOR 2
J36	JACK-TEST, COOL
K1-1,-2	CONTACTOR-COMPRESSOR 1
K2-1,-2	CONTACTOR-COMPRESSOR 2
K10-1,-2	RELAY-OUTDOOR FANS 1, 2
L34	SOLENOID, TWO STAGE, COMP. 1
L44	SOLENOID, TWO STAGE, COMP. 2
P36	PLUG-TEST, COOL
S4	SWITCH-LIMIT, HI-PRESS. COMP. 1
S7	SWITCH-LIMIT, HI-PRESS. COMP. 2
S24	SWITCH-LOSS OF CHARGE, COMP. 1
S25	SWITCH-LOSS OF CHARGE, COMP. 2
T1	TRANSFORMER-CONTROL
TB2	TERMINAL STRIP-UNIT
TB14	TERMINAL STRIP-CLASS 2 VOLTAGE

2024/07	WIRING DIAGRAM 538295-02	07/24
DUAL SPEED COMPRESSOR		
ELITE AIR CONDITIONERS 120-G,J,Y		
SECTION A 3		REV. 0
Supersedes 538295-01	New Form No. 538295-02	

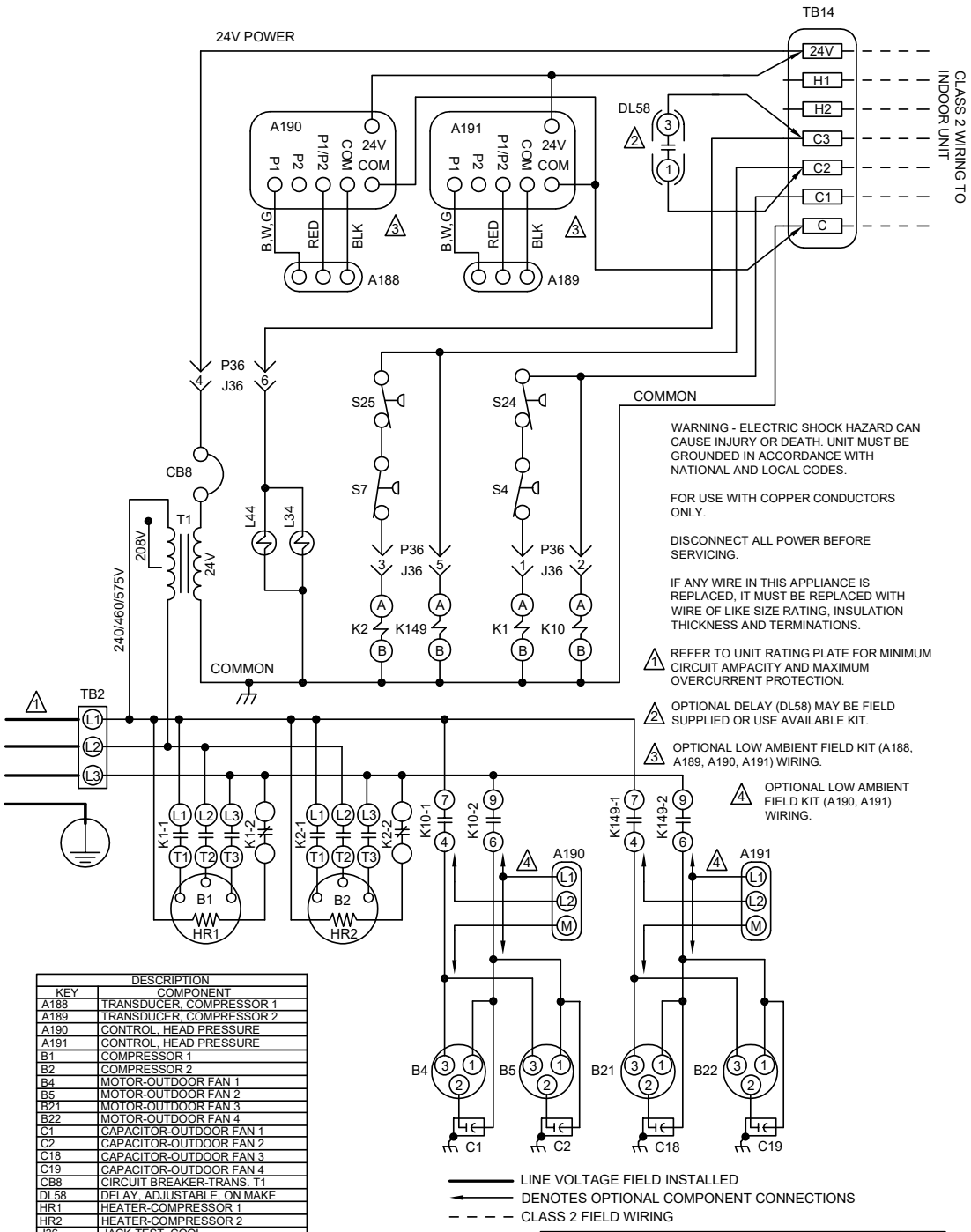
EL150KCSDT



DESCRIPTION	
KEY	COMPONENT
A188	TRANSDUCER, COMPRESSOR 1
A189	TRANSDUCER, COMPRESSOR 2
A190	CONTROL, HEAD PRESSURE
A191	CONTROL, HEAD PRESSURE
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B4	MOTOR-OUTDOOR FAN 1
B5	MOTOR-OUTDOOR FAN 2
C1	CAPACITOR-OUTDOOR FAN 1
C2	CAPACITOR-OUTDOOR FAN 2
CB8	CIRCUIT BREAKER-TRANS. T1
DL58	DELAY, ADJUSTABLE, ON MAKE
HR1	HEATER-COMPRESSOR 1
HR2	HEATER-COMPRESSOR 2
J36	JACK-TEST, COOL
K1-1,-2	CONTACTOR-COMPRESSOR 1
K2-1,-2	CONTACTOR-COMPRESSOR 2
K10-1,-2	RELAY-OUTDOOR FANS 1, 2
K149-1,-2	RELAY-OUTDOOR FANS 3, 4
L34	SOLENOID, TWO STAGE, COMP. 1
L44	SOLENOID, TWO STAGE, COMP. 2
P36	PLUG-TEST, COOL
S4	SWITCH-LIMIT, HI-PRESS. COMP. 1
S7	SWITCH-LIMIT, HI-PRESS. COMP. 2
S24	SWITCH-LOSS OF CHARGE, COMP. 1
S25	SWITCH-LOSS OF CHARGE, COMP. 2
T1	TRANSFORMER-CONTROL
TB2	TERMINAL STRIP-UNIT
TB14	TERMINAL STRIP-CLASS 2 VOLTAGE

2024/07	WIRING DIAGRAM 538298-02	07/24
DUAL SPEED COMPRESSOR		
ELITE AIR CONDITIONERS 150-G, J, Y		
SECTION A 3		REV. 0
Supersedes 538298-01	New Form No. 538298-02	

EL180/240KCSDT



DESCRIPTION	
KEY	COMPONENT
A188	TRANSDUCER, COMPRESSOR 1
A189	TRANSDUCER, COMPRESSOR 2
A190	CONTROL, HEAD PRESSURE
A191	CONTROL, HEAD PRESSURE
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B4	MOTOR-OUTDOOR FAN 1
B5	MOTOR-OUTDOOR FAN 2
B21	MOTOR-OUTDOOR FAN 3
B22	MOTOR-OUTDOOR FAN 4
C1	CAPACITOR-OUTDOOR FAN 1
C2	CAPACITOR-OUTDOOR FAN 2
C18	CAPACITOR-OUTDOOR FAN 3
C19	CAPACITOR-OUTDOOR FAN 4
CB8	CIRCUIT BREAKER-TRANS. T1
DL58	DELAY, ADJUSTABLE, ON MAKE
HR1	HEATER-COMPRESSOR 1
HR2	HEATER-COMPRESSOR 2
J36	JACK-TEST, COOL
K1-1,-2	CONTACTOR-COMPRESSOR 1
K2-1,-2	CONTACTOR-COMPRESSOR 2
K10-1,-2	RELAY-OUTDOOR FANS 1, 2
K149-1,-2	RELAY-OUTDOOR FANS 3, 4
L34	SOLENOID, TWO STAGE, COMP. 1
L44	SOLENOID, TWO STAGE, COMP. 2
P36	PLUG-TEST, COOL
S4	SWITCH-LIMIT, HI-PRESS. COMP. 1
S7	SWITCH-LIMIT, HI-PRESS. COMP. 2
S24	SWITCH-LOSS OF CHARGE, COMP. 1
S25	SWITCH-LOSS OF CHARGE, COMP. 2
T1	TRANSFORMER-CONTROL
TB2	TERMINAL STRIP-UNIT
TB14	TERMINAL STRIP-CLASS 2 VOLTAGE

2024/07	WIRING DIAGRAM 538296-02	07/24
DUAL SPEED COMPRESSOR		
ELITE AIR CONDITIONERS - 180,240 - G,J,Y		
SECTION A 4		REV. 0
Supersedes 538296-01	New Form No. 538296-02	