

UNIT INFORMATION

LCX SERIES

100141

10/2026

15 to 25 ton

15 to 90 kW

Service Literature

LCX180 through 300 with R-454B

The LCX180, 210, 240 and 300 units are configured to order units (CTO) with a wide selection of factory installed options.

Cooling capacities range from 15 to 25 tons. LCX 180 & 210 utilize three compressors and three condenser fans. LCX 240 utilizes three compressors and four condenser fans. LCX 300 utilize four compressors and six condenser fans.

All LCX units are designed to accept any of several different energy management thermostat control systems with minimum field wiring. Factory- or field-provided control options connect to the unit through Smartwire connectors. When “plugged in” the controls become an integral part of the unit wiring.

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

False ceilings or drop ceiling may be used as a return air plenum only if the unit being installed has a Refrigerant Detection System installed.

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

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. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

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.

WARNING

If this appliance is conditioning a space with an area smaller than TA min or stored in a space with an area smaller than A min as defined by this instruction, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

WARNING

Auxiliary devices which may be potential ignition sources shall not be installed in the duct work. Examples of potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching components.

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

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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.

WARNING

Only Manufacturer approved auxiliary devices are permitted to be installed in this unit.

CAUTION

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants.

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.

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.

WARNING

- This appliance must be installed in accordance with local and national wiring regulations.
- If the appliance is not fitted with an option for full disconnection from power, a means of disconnection must be incorporated in the fixed wiring in accordance with national and local wiring regulations.

CAUTION

The 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

CAUTION

Children should be supervised not to play with the appliance.

CAUTION

Servicing shall be performed only as recommended by the manufacturer.

CAUTION

Leak Detection System installed. Unit must be powered except for service.

WARNING

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

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.

IMPORTANT

Refrigerant sensors for refrigerant detection systems shall only be replaced with sensors specified by the appliance manufacture.

CAUTION

This unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

A2L Refrigerant Considerations

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. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

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

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 practices be followed since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations.
- Evacuate the circuit.
- Purge the circuit with inert gas.
- Evacuate.
- Purge the circuit with inert gas.
- Open the circuit

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. 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. This process 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.

OPTIONS / ACCESSORIES

Item Description			Order Number	Size			
				180	210	240	300
COOLING SYSTEM							
Condensate Drain Trap	PVC	22H54	X	X	X	X	
	Copper	76W27	X	X	X	X	
Drain Pan Overflow Switch		21Z07	X	X	X	X	
Low Ambient Kits (0°F)		37G59	X	X			
		37G60			X		
		37G63				X	
BLOWER - SUPPLY AIR							
Blower Motors	Belt Drive - 3 HP	Factory	O	O			
	Belt Drive - 5 HP	Factory	O	O	O	O	
	Belt Drive 7.5 HP	Factory	O	O	O	O	
	Belt Drive 10 HP	Factory			O	O	
VFD Bypass Kit	3, 5, 7.5 HP - No Overload	37G64	X	X	X	X	
	10 HP - With Overload	37G65			X	X	
Drive Kits See Blower Data Tables for usage and selection	Kit #1 535-725 rpm	Factory	O	O			
	Kit #2 710-965 rpm	Factory	O	O			
	Kit #3 685-856 rpm	Factory	O	O	O	O	
	Kit #4 850-1045 rpm	Factory	O	O	O	O	
	Kit #5 945-1185 rpm	Factory	O	O	O	O	
	Kit #6 850-1045 rpm	Factory	O	O	O	O	
	Kit #7 945-1185 rpm	Factory	O	O	O	O	
	Kit #8 1045-1285 rpm	Factory	O	O	O	O	
	Kit #10 1045-1285 rpm	Factory			O	O	
	Kit #11 1135-1330 rpm	Factory			O	O	
	Blower Belt Auto-Tensioner	24B80	X	X	X	X	
CABINET							
Burglar Bars	(US)	44N20	X	X	X	X	
	(CA)	X2889	X	X	X	X	
Combination Coil/Hail Guards		23U69	OX	OX			
		23U71			OX	OX	
Hinged Access Panels		Factory	O	O	O	O	
CONTROLS							
BACnet® MS/TP Module		38B35	X	X	X	X	
Dirty Filter Switch		53W68	X	X	X	X	
Smoke Detector - Supply or Return (Power board and one sensor)		37G73	X	X	X	X	
Smoke Detector - Supply and Return (Power board and two sensors)		37G74	X	X	X	X	

NOTE - Order numbers shown are for ordering field installed accessories.

OX - Configure To Order (Factory Installed) or Field Installed

O = Configure To Order (Factory Installed)

X = Field Installed

OPTIONS / ACCESSORIES

Item Description			Order Number	Size			
				180	210	240	300
ELECTRICAL							
Voltage 60 Hz	208/230V - 3 phase	Factory	O	O	O	O	
	460V - 3 phase	Factory	O	O	O	O	
	575V - 3 phase	Factory	O	O	O	O	
Disconnect Switch (see Electric Heat Tables for usage)	80 amp	54W85	OX	OX	OX	OX	
	150 amp	54W86	OX	OX	OX	OX	
	250 amp	54W87	OX	OX	OX	OX	
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V only)	74M70	OX	OX	OX	OX	
	1 20 amp non-powered, field-wired (208/230V, 460V, 575V)	67E01	X	X	X	X	
	1 20 amp non-powered, field-wired (575V)	Factory	O	O	O	O	
Weatherproof Cover for GFI		10C89	X	X	X	X	
ELECTRIC HEAT							
15 kW	208/240V-3ph	30U62	X	X	X	X	
	460V-3ph	30U63	X	X	X	X	
	575V-3ph	30U64	X	X	X	X	
30 kW	208/240V-3ph	30U65	X	X	X	X	
	460V-3ph	30U66	X	X	X	X	
	575V-3ph	30U67	X	X	X	X	
45 kW	208/240V-3ph	30U71	X	X	X	X	
	460V-3ph	30U72	X	X	X	X	
	575V-3ph	30U73	X	X	X	X	
60 kW	208/240V-3ph	30U77	X	X	X	X	
	460V-3ph	30U78	X	X	X	X	
	575V-3ph	30U79	X	X	X	X	
90 kW	208/240V-3ph	30U83		X	X	X	
	460V-3ph	30U84		X	X	X	
	575V-3ph	30U85		X	X	X	
HUMIDITROL® DEHUMIDIFICATION REHEAT OPTION							
Humiditrol® Dehumidification Option		Factory	O	O	O	O	

Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

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OPTIONS / ACCESSORIES

Item Description	Order Number	Size				
		180	210	240	300	
INDOOR AIR QUALITY						
Air Filters						
Healthy Climate® High Efficiency Air Filters 24 x 24 x 2 in. (Order 6 per unit)	MERV 8	54W67	X	X	X	X
	MERV 13	52W40	X	X	X	X
	MERV 16	21U42	X	X	X	X
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)		44N61	X	X	X	X
Indoor Air Quality (CO₂) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display		77N39	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		87N53	X	X	X	X
Sensor - Black plastic case, LCD display, rated for plenum mounting		87N52	X	X	X	X
Sensor - Black plastic case, no display, rated for plenum mounting		87N54	X	X	X	X
CO₂ Sensor Duct Mounting Kit - for downflow applications		23Y47	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO₂ sensors (77N39)		90N43	X	X	X	X
UVC Germicidal Light Kit						
² Healthy Climate® UVC Light Kit (110/230V-1ph)		21A94	X	X	X	X
Step-Down Transformers	460V primary, 230V secondary	10H20	X	X	X	X
	575V primary, 230V secondary	10H21	X	X	X	X
Needlepoint Bipolar Ionization (NPBI)						
Needlepoint Bipolar Ionization (NPBI) Kits		21U37	X	X		
		21U38			X	
		21U39				X
ECONOMIZER						
High Performance Economizer (Approved for California Title 24 Building Standards AMCA Class 1A Certified)						
High Performance Economizer (Downflow or Horizontal)		22J18	OX	OX	OX	OX
Includes Economizer Dampers with Outdoor Air Hood						
Downflow Applications - Use furnished Outdoor Air Hood - Order Downflow Barometric Relief Dampers with Exhaust Hood separately						
Horizontal Applications - Use furnished Outdoor Air Hood - Order Horizontal Barometric Relief Dampers with Exhaust Hood separately						
Economizer Controls						
Differential Enthalpy (Not for Title 24)	Order 2	21Z09	X	X	X	X
Sensible Control	Sensor is Furnished	Factory	O	O	O	O
Single Enthalpy (Not for Title 24)		21Z09	OX	OX	OX	OX
Barometric Relief Dampers With Exhaust Hood						
Downflow Barometric Relief Dampers		54W78	OX	OX	OX	OX
Horizontal Barometric Relief Dampers		16K99	X	X	X	X

Lamps operate on 110-230V single-phase power supply. Step-down transformer may be ordered separately for 460V and 575V units. Alternately, 110V power supply may be used to directly power the UVC ballast(s).

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OPTIONS / ACCESSORIES

Item Description	Order Number	Size			
		180	210	240	300
OUTDOOR AIR					
Outdoor Air Dampers With Outdoor Air Hood					
Motorized	22J27	X	X	X	X
Manual	13U05	X	X	X	X
³ POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)					
Standard Static, SCCR Rated	208/230V 22H90	X	X	X	X
	460V 22H91	X	X	X	X
	575V 22V34	X	X	X	X
ROOF CURBS					
Hybrid Roof Curbs, Downflow					
8 in. height	11F58	X	X	X	X
14 in. height	11F59	X	X	X	X
18 in. height	11F60	X	X	X	X
24 in. height	11F61	X	X	X	X
Adjustable Pitch Curb					
14 in. height	43W26	X	X	X	X
Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit					
26 in. height - slab applications	11T89	X	X	X	
30 in. height - slab applications	11T90				X
37 in. height - rooftop applications	11T96	X	X	X	
41 in. height - rooftop applications	11T97				X
Insulation Kit For Standard Horizontal Curbs					
For 26 in. Curb	73K32	X	X	X	
For 30 in. Curb	73K33				X
For 37 in. Curb	73K34	X	X	X	
For 41 in. Curb	73K35				X
Horizontal Return Air Panel Kit					
Required for Horizontal Applications with Roof Curb	87M00	X	X	X	X
CEILING DIFFUSERS					
Step-Down - Order one	13K63	X			
	13K64		X	X	X
Flush - Order one	13K58	X			
	13K59		X	X	X
Transitions (Supply and Return) - Order one	12X68	X			
	12X70		X	X	X

Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately.

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SPECIFICATIONS

Model			LCX180S5M	LCX210S5M	LCX240S5M	LCX300S5M	
Nominal Tonnage			15 Ton	17.5 Ton	20 Ton	25 Ton	
Efficiency Type			Standard	Standard	Standard	Standard	
Blower Type			MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume	
Cooling Performance	Gross Cooling Capacity - Btuh		178,000	206,000	236,000	282,000	
	¹ Net Cooling Capacity - Btuh		172,000	200,000	228,000	270,000	
	¹ AHRI Rated Air Flow - cfm		7200	6150	7100	7450	
	Total Unit Power - kW		15.6	18.2	20.7	27	
	¹ IEER (Btuh/Watt)		14.2	14.2	14.2	13.2	
	¹ EER (Btuh/Watt)		11.0	11.0	11.0	10.0	
Sound Rating Number			dBA	86	86	93	94
Refrigerant Charge			Refrigerant Type	R-454B	R-454B	R-454B	R-454B
Environ™ Evaporator	Without Reheat Option	Circuit 1	5 lbs. 3 oz.	5 lbs. 2 oz.	6 lbs. 4 oz.	5 lbs. 9 oz.	
		Circuit 2	5 lbs. 6 oz.	5 lbs. 2 oz.	6 lbs. 3 oz.	5 lbs. 10 oz.	
		Circuit 3	6 lbs. 3 oz.	4 lbs. 13 oz.	5 lbs. 15 oz.	5 lbs. 12 oz.	
		Circuit 4	---	---	---	5 lbs. 12 oz.	
Fin/Tube Evaporator	With Reheat Option	Circuit 1	6 lbs. 4 oz.	6 lbs. 4 oz.	7 lbs. 10 oz.	6 lbs. 15 oz.	
		Circuit 2	6 lbs. 0 oz.	6 lbs. 4 oz.	7 lbs. 4 oz.	6 lbs. 5 oz.	
		Circuit 3	5 lbs. 12 oz.	5 lbs. 15 oz.	6 lbs. 15 oz.	4 lbs. 11 oz.	
		Circuit 4	---	---	---	5 lbs. 3 oz.	
Electric Heat Available, see page 5			15-30-45-60 kW		15-30-45-60-90 kW		
Compressor Type (number)			Scroll (3)	Scroll (3)	Scroll (3)	Scroll (4)	
Outdoor Coils	Net face area - ft.² (total)		41.1	41.1	55.0	55.0	
	Rows		1	1	1	1	
	Fins - in.		23	23	23	23	
Outdoor Coil Fans	Motor HP (number and type)		1/3 (3 PSC)	1/3 (3 PSC)	1/3 (4 PSC)	1/3 (6 PSC)	
	Rpm		1075	1075	1075	1075	
	Watts		1100	1100	1665	1950	
	Diameter - (No.) in.		(3) 24	(3) 24	(4) 24	(6) 24	
	Blades		3	3	3	3	
	Total Air volume - cfm		12,000	12,000	16,000	20,000	
Indoor Coils	Environ™ Evaporator	Net face area - ft.²	20.1	20.1	20.1	20.1	
		Rows	2	2	2	2	
		Fins - in.	18	18	18	18	
	Fin/Tube Evaporator	Net face area - ft.²	21.4	21.4	21.4	21.4	
		Tube diameter - in.	3/8	3/8	3/8	3/8	
		Rows	3	4	4	4	
		Fins - in.	14	14	14	14	
	Condensate drain size (NPT) - in.		(1) 1	(1) 1	(1) 1	(1) 1	
Expansion device type			Balanced Port Thermostatic Expansion Valve, removable element head				
² Indoor Blower and Drive Selection	Nominal motor HP		3, 5, 7.5		5, 7.5, 10		
	Maximum usable motor HP (US)		3.45, 5.75, 8.62		5.75, 8.62, 11.5		
	Motor - Drive kit number		3 HP		5 HP		
			Kit 1 535-725 rpm		Kit 3 685-856 rpm		
			Kit 2 710-965 rpm		Kit 4 850-1045 rpm		
			5 HP		Kit 5 945-1185 rpm		
			Kit 3 685-856 rpm		7.5 HP		
			Kit 4 850-1045 rpm		Kit 6 850-1045 rpm		
			Kit 5 945-1185 rpm		Kit 7 945-1185 rpm		
			7.5 HP		Kit 8 1045-1285 rpm		
		Kit 6 850-1045 rpm		10 HP			
		Kit 7 945-1185 rpm		Kit 7 945-1185 rpm			
		Kit 8 1045-1285 rpm		Kit 10 1045-1285 rpm			
				Kit 11 1135-1330 rpm			
Wheel (Number) diameter x width - in.			(2) 15 x 15				
Filters	Type of filter		MERV 4, Disposable				
	Number and size - in.		(6) 24 x 24 x 2				
Line voltage data (Volts-Phase-Hz)			208/230-3-60 460-3-60 575-3-60				

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

AHRI Certified to AHRI Standard 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – Motor service factor limit - 1.0.

(ENVIRON™ INDOOR COIL)

BLOWER DATA

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL & AIR FILTERS IN PLACE

FOR ALL UNITS ADD:

- 1 - Wet indoor coil air resistance of selected unit.
- 2 - Any factory installed options air resistance (electric heat, economizer, etc.)
- 3 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output and drive required.

See page 67 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.

See page 12 for minimum air volume required for use with optional electric heat.

Air Volume cfm	TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)																	
	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2750	401	0.50	515	0.75	613	1.02	696	1.28	763	1.57	819	1.87	868	2.19	913	2.53	955	2.89
3000	412	0.56	526	0.82	624	1.11	706	1.37	772	1.66	827	1.96	875	2.29	919	2.64	961	3.02
3250	424	0.63	538	0.90	635	1.20	715	1.47	780	1.76	833	2.07	880	2.40	924	2.76	967	3.15
3500	437	0.70	550	0.98	646	1.30	724	1.57	787	1.86	838	2.18	884	2.52	929	2.89	973	3.29
3750	450	0.77	563	1.07	656	1.40	732	1.67	793	1.98	844	2.30	889	2.65	934	3.03	979	3.44
4000	464	0.86	576	1.17	667	1.51	740	1.79	800	2.10	850	2.44	896	2.80	941	3.19	986	3.61
4250	479	0.95	588	1.27	676	1.63	748	1.91	806	2.23	857	2.58	903	2.95	949	3.36	994	3.79
4500	494	1.04	601	1.38	686	1.75	755	2.03	813	2.37	864	2.73	911	3.12	957	3.53	1002	3.97
4750	509	1.15	613	1.50	695	1.88	762	2.17	820	2.52	871	2.89	919	3.29	966	3.72	1011	4.16
5000	524	1.25	625	1.63	703	2.01	769	2.31	827	2.68	878	3.06	927	3.47	975	3.91	1021	4.36
5250	538	1.37	636	1.76	712	2.16	776	2.46	834	2.84	886	3.24	936	3.66	984	4.11	1031	4.57
5500	552	1.48	647	1.90	720	2.30	783	2.62	841	3.02	894	3.43	945	3.86	994	4.32	1042	4.78
5750	566	1.61	658	2.05	729	2.46	791	2.79	850	3.20	903	3.63	955	4.07	1004	4.53	1052	5.00
6000	579	1.73	669	2.22	738	2.63	800	2.97	858	3.39	912	3.83	964	4.29	1014	4.76	1063	5.23
6250	593	1.87	680	2.39	747	2.80	808	3.15	867	3.60	922	4.05	974	4.51	1025	4.99	1074	5.47
6500	606	2.03	691	2.57	756	2.99	817	3.35	876	3.81	932	4.27	985	4.75	1036	5.23	1085	5.71
6750	618	2.19	702	2.77	766	3.18	827	3.56	886	4.03	942	4.51	995	4.99	1047	5.47	1096	5.96
7000	631	2.37	713	2.97	775	3.38	836	3.77	896	4.26	952	4.75	1006	5.24	1058	5.73	1108	6.22
7250	644	2.56	724	3.18	785	3.59	846	4.00	906	4.50	963	5.00	1017	5.49	1070	5.99	1120	6.48
7500	656	2.77	735	3.40	795	3.81	856	4.24	917	4.75	974	5.26	1029	5.76	1081	6.25	1132	6.75
7750	669	2.98	746	3.63	805	4.04	867	4.49	928	5.01	986	5.52	1041	6.02	1094	6.52	1145	7.01
8000	681	3.21	756	3.86	816	4.28	878	4.75	940	5.28	998	5.80	1053	6.30	1106	6.80	1157	7.29
8250	693	3.45	768	4.11	827	4.53	890	5.02	951	5.56	1010	6.08	1065	6.58	1119	7.07	1170	7.57
8500	705	3.71	779	4.37	838	4.79	902	5.30	963	5.84	1022	6.36	1078	6.86	1131	7.36	1183	7.85
8750	718	3.97	790	4.63	850	5.07	914	5.59	976	6.13	1034	6.65	1090	7.15	1144	7.64	1196	8.13
9000	730	4.25	802	4.91	862	5.35	926	5.89	988	6.43	1047	6.94	1103	7.44	1157	7.93	1210	8.42
9250	743	4.54	813	5.19	874	5.64	939	6.19	1001	6.72	1059	7.23	1116	7.73	1170	8.22	1223	8.71
9500	756	4.84	825	5.48	886	5.94	951	6.49	1013	7.02	1072	7.53	1129	8.03	1183	8.52	1236	9.00
9750	768	5.15	837	5.78	899	6.24	964	6.79	1026	7.32	1085	7.83	1142	8.33	1196	8.81	1250	9.29
10,000	781	5.47	849	6.08	911	6.54	977	7.10	1039	7.63	1098	8.13	1155	8.63	1210	9.11	1263	9.58
10,250	794	5.80	861	6.39	924	6.85	990	7.41	1051	7.93	1111	8.44	1168	8.93	1223	9.41	1277	9.88
10,500	807	6.13	874	6.69	937	7.15	1003	7.73	1064	8.24	1124	8.74	1181	9.23	1236	9.71	1290	10.18
10,750	820	6.47	886	7.01	950	7.46	1016	8.04	1077	8.55	1137	9.05	1194	9.53	1249	10.01	1304	10.47
11,000	834	6.81	899	7.32	963	7.77	1029	8.36	1090	8.87	1150	9.36	1207	9.84	1263	10.31	1317	10.77

(FIN/TUBE INDOOR COIL)

BLOWER DATA

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL & AIR FILTERS IN PLACE

FOR ALL UNITS ADD:

1 - Wet indoor coil air resistance of selected unit.

2 - Any factory installed options air resistance (electric heat, economizer, etc.)

3 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output and drive required.

See page 67 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.

See page 12 for minimum air volume required for use with optional electric heat.

Air Volume cfm	TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)																							
	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80		2.00		2.20		2.40	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2750	385	0.30	505	0.50	600	0.70	680	0.90	755	1.10	820	1.30	885	1.50	950	1.70	1005	1.90	1060	2.10	1110	2.30	1160	2.50
3000	395	0.35	515	0.55	610	0.75	685	1.00	760	1.20	825	1.45	885	1.70	950	1.95	1005	2.20	1060	2.45	1110	2.70	1160	2.95
3250	405	0.40	520	0.60	615	0.85	695	1.10	765	1.30	830	1.60	890	1.85	955	2.10	1005	2.35	1060	2.60	1110	2.90	1160	3.15
3500	415	0.45	530	0.70	620	0.95	700	1.20	775	1.45	840	1.70	900	2.00	955	2.25	1005	2.50	1060	2.75	1110	3.00	1160	3.25
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	960	2.40	1005	2.65	1060	2.90	1110	3.15	1160	3.40
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	965	2.55	1005	2.80	1060	3.05	1110	3.30	1160	3.55
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	970	2.70	1005	2.95	1060	3.20	1110	3.45	1160	3.70
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	980	2.90	1005	3.15	1060	3.40	1110	3.65	1160	3.90
4750	470	0.75	575	1.10	660	1.45	740	1.75	810	2.15	870	2.50	930	2.85	985	3.10	1005	3.35	1060	3.60	1110	3.85	1160	4.10
5000	480	0.85	585	1.25	670	1.60	750	1.95	815	2.30	880	2.70	940	3.05	995	3.30	1005	3.55	1060	3.80	1110	4.10	1160	4.35
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.50	1005	3.75	1060	4.00	1110	4.30	1160	4.55
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.70	1005	3.95	1060	4.20	1110	4.50	1160	4.75
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.65	1015	3.90	1005	4.15	1060	4.40	1110	4.65	1160	4.90
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.85	1020	4.10	1005	4.35	1060	4.60	1110	4.85	1160	5.10
6250	545	1.40	640	1.90	720	2.35	795	2.80	860	3.25	920	3.70	975	4.10	1030	4.35	1005	4.55	1060	4.80	1110	5.05	1160	5.30
6500	560	1.55	650	2.05	730	2.50	805	3.00	870	3.45	930	3.95	985	4.30	1040	4.55	1005	4.75	1060	5.00	1110	5.25	1160	5.50
6750	570	1.70	665	2.20	745	2.70	815	3.20	880	3.70	940	4.20	995	4.65	1045	4.85	1005	4.95	1060	5.20	1110	5.45	1160	5.70
7000	585	1.85	675	2.35	755	2.90	825	3.40	890	3.95	950	4.45	1005	4.85	1055	5.05	1005	5.15	1060	5.40	1110	5.65	1160	5.90
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	955	4.65	1015	5.05	1065	5.25	1005	5.35	1060	5.60	1110	5.85	1160	6.10
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	965	4.95	1020	5.35	1075	5.55	1005	5.45	1060	5.70	1110	5.95	1160	6.25
7750	630	2.40	715	3.00	790	3.55	855	4.10	920	4.70	975	5.25	1030	5.65	1080	5.85	1005	5.55	1060	5.80	1110	6.05	1160	6.35
8000	640	2.55	725	3.20	800	3.80	865	4.35	930	4.95	985	5.50	1040	6.05	1090	6.20	1005	5.65	1060	6.00	1110	6.20	1160	6.45
8250	655	2.80	740	3.40	810	4.00	880	4.65	940	5.25	995	5.85	1050	6.35	1100	6.50	1005	5.75	1060	6.20	1110	6.40	1160	6.60
8500	670	3.00	750	3.65	825	4.30	890	4.90	950	5.55	1005	6.15	1060	6.65	1110	6.80	1005	5.85	1060	6.40	1110	6.60	1160	6.75
8750	685	3.25	765	3.90	835	4.55	900	5.20	960	5.85	1015	6.45	1070	7.15	1120	7.30	1005	5.95	1060	6.60	1110	6.80	1160	6.90
9000	700	3.50	780	4.20	850	4.85	910	5.50	970	6.15	1025	6.80	1080	7.50	1130	7.65	1005	6.05	1060	6.80	1110	7.00	1160	7.10
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.55	1040	7.20	1090	7.85	1140	8.00	1005	6.15	1060	7.00	1110	7.20	1160	7.25
9500	730	4.00	805	4.75	875	5.45	935	6.15	995	6.90	1050	7.60	1100	8.25	1150	8.40	1005	6.25	1060	7.20	1110	7.40	1160	7.40
9750	745	4.30	820	5.05	885	5.75	950	6.55	1005	7.20	1060	7.95	1110	8.65	1160	8.80	1005	6.35	1060	7.40	1110	7.60	1160	7.55
10,000	760	4.60	835	5.40	900	6.15	960	6.85	1015	7.60	1070	8.35	1120	9.05	1170	9.20	1005	6.45	1060	7.60	1110	7.80	1160	7.70
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	9.70	1005	6.55	1060	7.80	1110	8.00	1160	7.85
10,500	790	5.20	860	6.00	925	6.85	985	7.65	1040	8.40	1095	9.20	1145	10.00	1190	10.20	1005	6.65	1060	8.00	1110	8.20	1160	8.00
10,750	805	5.55	875	6.40	940	7.25	1000	8.05	1055	8.85	1105	9.65	1155	10.45	1200	10.65	1005	6.75	1060	8.20	1110	8.40	1160	8.15
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	1210	11.10	1005	6.85	1060	8.40	1110	8.60	1160	8.30

BLOWER DATA

FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Nominal HP	Maximum HP	Drive Kit Number	RPM Range
3	3.45	1	535 - 725
3	3.45	2	710 - 965
5	5.75	3	685 - 856
5	5.75	4	850 - 1045
5	5.75	5	945 - 1185
7.5	8.63	6	850 - 1045
7.5	8.63	7	945 - 1185
7.5	8.63	8	1045 - 1285
10	11.50	7	945 - 1185
10	11.50	10	1045 - 1285
10	11.50	11	1135 - 1330

NOTE - Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE - Motor service factor limit - 1.0.

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE - in w.g.

Air Volume cfm	Wet Indoor Coil				Reheat Coil Fin/Tube	Electric Heat	Economizer	Filters			Horizontal Roof Curb	
	180, 210, 240 Environ™	300 Environ™	180 Fin/Tube	210, 240 300 Fin/Tube				MERV 8	MERV 13	MERV 16	180 thru 240	300
2750	0.09	0.13	.01	.02	.01	---	---	.01	.03	.06	.03	---
3000	0.09	0.19	.01	.02	.01	---	---	.01	.03	.06	.04	---
3250	0.09	0.19	.01	.03	.01	---	---	.01	.04	.07	.04	.01
3500	0.10	0.20	.01	.03	.02	---	---	.01	.04	.08	.05	.01
3750	0.10	0.20	.01	.03	.02	---	---	.01	.04	.08	.05	.01
4000	0.10	0.20	.02	.04	.02	---	---	.01	.04	.09	.06	.02
4250	0.10	0.20	.02	.04	.02	---	---	.01	.05	.10	.07	.02
4500	0.10	0.21	.02	.05	.02	---	---	.01	.05	.10	.07	.02
4750	0.11	0.21	.02	.05	.02	---	---	.02	.05	.11	.08	.03
5000	0.11	0.21	.02	.05	.02	---	---	.02	.06	.12	.08	.03
5250	0.11	0.21	.02	.06	.03	---	---	.02	.06	.12	.09	.04
5500	0.11	0.22	.02	.07	.03	---	---	.02	.06	.13	.10	.04
5750	0.11	0.22	.03	.07	.03	---	---	.02	.07	.14	.11	.05
6000	0.12	0.22	.03	.08	.03	.01	---	.03	.07	.14	.11	.06
6250	0.12	0.22	.03	.08	.03	.01	.01	.03	.07	.15	.12	.07
6500	0.12	0.23	.03	.09	.04	.01	.02	.03	.08	.16	.13	.08
6750	0.12	0.23	.04	.10	.04	.01	.03	.03	.08	.17	.14	.08
7000	0.12	0.23	.04	.10	.04	.01	.04	.04	.08	.17	.15	.09
7250	0.13	0.23	.04	.11	.04	.01	.05	.04	.09	.18	.16	.10
7500	0.13	0.24	.05	.12	.05	.01	.06	.04	.09	.19	.17	.11
8000	0.13	0.24	.05	.13	.05	.02	.09	.05	.10	.21	.19	.13
8500	0.14	0.25	.06	.15	.05	.02	.11	.05	.10	.22	.21	.15
9000	0.14	0.25	.07	.16	.06	.04	.14	.06	.11	.24	.24	.17
9500	0.15	0.26	.08	.18	.07	.05	.16	.07	.12	.25	.26	.19
10,000	0.15	0.26	.08	.20	.07	.06	.19	.07	.12	.27	.29	.21
10,500	0.15	0.27	.09	.22	.08	.09	.22	.08	.13	.29	.31	.24
11,000	0.16	0.27	.11	.24	.08	.11	.25	.09	.14	.30	.34	.27

BLOWER DATA

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

Electric Heat kW	Minimum cfm
15	5200
30	5200
45	5200
60	5200
90	6000

POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure	Air Volume Exhausted
in. w.g.	cfm
0.00	8630
0.05	8210
0.10	7725
0.15	7110
0.20	6470
0.25	5790
0.30	5060
0.35	4300
0.40	3510
0.45	2690
0.50	1840

CEILING DIFFUSER AIR RESISTANCE - in. w.g.

Air Volume cfm	Step-Down Diffuser						Flush Diffuser	
	RTD11-185S			RTD11-275S			FD11-185S	FD11-275S
	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open		
5000	.51	.44	.39	---	---	---	.27	---
5200	.56	.48	.42	---	---	---	.30	---
5400	.61	.52	.45	---	---	---	.33	---
5600	.66	.56	.48	---	---	---	.36	---
5800	.71	.59	.51	---	---	---	.39	---
6000	.76	.63	.55	.36	.31	.27	.42	.29
6200	.80	.68	.59	---	---	---	.46	---
6400	.86	.72	.63	---	---	---	.50	---
6500	---	---	---	.42	.36	.31	---	.34
6600	.92	.77	.67	---	---	---	.54	---
6800	.99	.83	.72	---	---	---	.58	---
7000	1.03	.87	.76	.49	.41	.36	.62	.40
7200	1.09	.92	.80	---	---	---	.66	---
7400	1.15	.97	.84	---	---	---	.70	---
7500	---	---	---	.51	.46	.41	---	.45
7600	1.20	1.02	.88	---	---	---	.74	---
8000	---	---	---	.59	.49	.43	---	.50
8500	---	---	---	.69	.58	.50	---	.57
9000	---	---	---	.79	.67	.58	---	.66
9500	---	---	---	.89	.75	.65	---	.74
10,000	---	---	---	1.00	.84	.73	---	.81
10,500	---	---	---	1.10	.92	.80	---	.89
11,000	---	---	---	1.21	1.01	.88	---	.96

CEILING DIFFUSER AIR THROW DATA

Size	Air Volume cfm	¹ Effective Throw Range - ft.		Size	Air Volume cfm	¹ Effective Throw Range - ft.	
		RTD11-185S Step-Down	FD11-185S Flush			RTD11-275S Step-Down	FD11-275S Flush
180	5600	39 - 49	28 - 37	210 240 300	7200	33 - 38	26 - 35
	5800	42 - 51	29 - 38		7400	35 - 40	28 - 37
	6000	44 - 54	40 - 50		7600	36 - 41	29 - 38
	6200	45 - 55	42 - 51		7800	38 - 43	40 - 50
	6400	46 - 55	43 - 52		8000	39 - 44	42 - 51
	6600	47 - 56	45 - 56		8200	41 - 46	43 - 52
					8400	43 - 49	44 - 54
					8600	44 - 50	46 - 57
					8800	47 - 55	48 - 59

¹ Throw is the horizontal or vertical distance an airstream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. per minute. Four sides open.

ELECTRICAL/ELECTRIC HEAT DATA

15 TON

Model		LCX180S5								
¹ Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	13.1			6.6			4.8		
	Locked Rotor Amps	93			60			41		
Compressor 2 (Non-Inverter)	Rated Load Amps	13.1			6.6			4.8		
	Locked Rotor Amps	93			60			41		
Compressor 3 (Non-Inverter)	Rated Load Amps	13.1			6.6			4.8		
	Locked Rotor Amps	93			60			41		
Outdoor Fan Motors (3)	Full Load Amps (3 Non-ECM)	2.4			1.3			1		
	Total	7.2			3.9			3		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	3	5	7.5	3	5	7.5	3	5	7.5
	Full Load Amps	10.6	16.7	24.2	4.8	7.6	11	3.9	6.1	9
² Maximum Overcurrent Protection (MOCP)	Unit Only	70	80	100	35	40	45	25	30	35
	With (2) 0.33 HP Power Exhaust	70	80	100	35	40	50	25	30	35
³ Minimum Circuit Ampacity (MCA)	Unit Only	61	68	77	31	34	38	23	26	29
	With (2) 0.33 HP Power Exhaust	66	73	82	33	36	41	25	28	31

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	70	70	80	80	100	100	35	40	45	25	30	35
		30 kW	100	110	100	125	110	125	60	60	60	45	45	50
		45 kW	150	150	150	175	150	175	80	80	90	60	70	70
		60 kW	150	175	150	175	175	175	80	90	90	70	70	70
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	61	61	68	68	77	77	31	34	38	23	26	30
		30 kW	92	104	100	112	109	121	52	55	59	41	44	48
		45 kW	131	149	139	157	148	166	74	78	82	60	62	66
		60 kW	139	158	146	166	156	175	79	82	86	63	66	69
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	70	70	80	80	100	100	35	40	50	30	30	35
		30 kW	100	110	110	125	125	150	60	60	70	45	50	50
		45 kW	150	175	150	175	175	175	80	90	90	70	70	70
		60 kW	150	175	175	175	175	200	90	90	90	70	70	80
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	66	66	73	73	82	82	33	36	41	26	29	32
		30 kW	98	110	106	118	115	127	55	58	63	44	47	50
		45 kW	137	155	145	163	154	172	77	81	85	62	65	68
		60 kW	145	164	152	172	162	181	82	85	90	66	68	72

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

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

HACR type breaker or fuse.

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

ELECTRICAL/ELECTRIC HEAT DATA

17.5 TON

Model		LCX210S5								
¹ Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	21.2			9.1			7.7		
	Locked Rotor Amps	156.5			74.8			47.8		
Compressor 2 (Non-Inverter)	Rated Load Amps	21.2			9.1			7.7		
	Locked Rotor Amps	156.5			74.8			47.8		
Compressor 3 (Non-Inverter)	Rated Load Amps	21.2			9.1			7.7		
	Locked Rotor Amps	156.5			74.8			47.8		
Outdoor Fan Motors (3)	Full Load Amps (3 Non-ECM)	2.4			1.3			1		
	Total	7.2			3.9			3		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	3	5	7.5	3	5	7.5	3	5	7.5
	Full Load Amps	10.6	16.7	24.2	4.8	7.6	11	3.9	6.1	9
² Maximum Overcurrent Protection (MOCP)	Unit Only	100	110	125	45	50	50	35	40	45
	With (2) 0.33 HP Power Exhaust	110	110	125	45	50	50	40	40	45
³ Minimum Circuit Ampacity	Unit Only	87	93	102	39	42	45	32	35	38
	With (2) 0.33 HP Power Exhaust	92	98	106	41	44	48	34	37	40

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	100	100	110	110	125	125	45	50	50	35	40	45
		30 kW	100	110	110	125	125	125	60	60	60	45	45	50
		45 kW	150	150	150	175	150	175	80	80	90	60	70	70
		60 kW	150	175	150	175	175	175	80	90	90	70	70	70
		90 kW	225	250	225	250	225	250	125	125	125	100	100	100
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	87	87	93	93	102	102	39	42	45	32	35	38
		30 kW	92	104	100	112	109	121	52	55	59	41	44	48
		45 kW	131	149	139	157	148	166	74	78	82	60	62	66
		60 kW	139	158	146	166	156	175	79	82	86	63	66	69
		90 kW	201	230	209	238	218	247	115	118	123	92	95	98
² Maximum Overcurrent Protection (MOCP) and (2) 0.33 HP Power Exhaust	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	110	110	110	110	125	125	45	50	50	40	40	45
		30 kW	110	110	110	125	125	150	60	60	70	45	50	50
		45 kW	150	175	150	175	175	175	80	90	90	70	70	70
		60 kW	150	175	175	175	175	200	90	90	90	70	70	80
		90 kW	225	250	225	250	225	300	125	125	150	100	100	110
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	92	92	98	98	106	106	41	44	48	34	37	40
		30 kW	98	110	106	118	115	127	55	58	63	44	47	50
		45 kW	137	155	145	163	154	172	77	81	85	62	65	68
		60 kW	145	164	152	172	162	181	82	85	90	66	68	72
		90 kW	207	236	215	244	224	253	118	122	126	94	97	101

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

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

HACR type breaker or fuse.

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

ELECTRICAL/ELECTRIC HEAT DATA

20 TON

Model		LCX240S5								
¹ Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	22.4			9.1			7.2		
	Locked Rotor Amps	166.2			74.6			54		
Compressor 2 (Non-Inverter)	Rated Load Amps	22.4			9.1			7.2		
	Locked Rotor Amps	166.2			74.6			54		
Compressor 3 (Non-Inverter)	Rated Load Amps	24.4			11.9			9.4		
	Locked Rotor Amps	210			103			78		
Outdoor Fan Motors (4)	Full Load Amps (4 Non-ECM)	2.4			1.3			1		
	Total	9.6			5.2			4		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
² Maximum Overcurrent Protection (MOCP)	Unit Only	125	125	125	50	60	60	45	45	50
	With (2) 0.33 HP Power Exhaust	125	125	150	60	60	60	45	50	50
³ Minimum Circuit Ampacity (MCA)	Unit Only	102	110	118	46	50	53	37	40	42
	With (2) 0.33 HP Power Exhaust	107	114	123	49	52	56	39	42	44

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	125	125	125	125	125	125	50	60	60	45	45	50
		30 kW	125	125	125	125	150	150	60	60	70	45	50	50
		45 kW	150	175	150	175	175	175	80	90	90	70	70	70
		60 kW	150	175	175	175	200	200	90	90	90	70	70	80
		90 kW	225	250	225	250	300	300	125	125	150	100	100	110
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	102	102	110	110	118	118	46	50	53	37	40	42
		30 kW	102	112	110	121	118	129	55	59	63	44	48	50
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	125	125	125	125	150	150	60	60	60	45	50	50
		30 kW	125	125	125	150	150	150	60	70	70	50	50	60
		45 kW	150	175	175	175	175	200	90	90	90	70	70	80
		60 kW	175	175	175	200	175	200	90	90	100	70	80	80
		90 kW	225	250	225	4 300	250	300	125	150	150	100	110	110
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	107	107	114	114	123	123	49	52	56	39	42	44
		30 kW	107	118	115	127	123	135	58	63	66	47	50	53
		45 kW	145	163	154	172	162	180	81	85	89	65	68	71
		60 kW	152	172	162	181	170	189	85	90	93	68	72	74
		90 kW	215	244	224	253	233	262	122	126	130	97	101	103

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

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

HACR type breaker or fuse.

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

ELECTRICAL/ELECTRIC HEAT DATA

25 TON

Model		LCX300S5								
¹ Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	21.2			9.1			7.7		
	Locked Rotor Amps	156.5			74.8			47.8		
Compressor 2 (Non-Inverter)	Rated Load Amps	21.2			9.1			7.7		
	Locked Rotor Amps	156.5			74.8			47.8		
Compressor 3 (Non-Inverter)	Rated Load Amps	22.4			9.1			7.2		
	Locked Rotor Amps	166.2			74.6			54		
Compressor 4 (Non-Inverter)	Rated Load Amps	22.4			9.1			7.2		
	Locked Rotor Amps	166.2			74.6			54		
Outdoor Fan Motors (6)	Full Load Amps (6 Non-ECM)	2.4			1.3			1		
	Total	14.4			7.8			6		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
² Maximum Overcurrent Protection (MOCP)	Unit Only	125	150	150	60	60	70	50	50	60
	With (2) 0.33 HP Power Exhaust	150	150	175	60	70	70	50	50	60
³ Minimum Circuit Ampacity (MCA)	Unit Only	124	132	141	55	58	62	44	48	50
	With (2) 0.33 HP Power Exhaust	129	137	145	57	61	65	46	50	52

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	125	125	150	150	150	150	60	60	70	50	50	60
		30 kW	125	125	150	150	150	150	60	60	70	50	50	60
		45 kW	150	175	150	175	175	175	80	90	90	70	70	70
		60 kW	150	175	175	175	175	200	90	90	90	70	70	80
		90 kW	225	250	225	250	250	300	125	125	150	100	100	110
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	124	124	132	132	141	141	55	58	62	44	48	50
		30 kW	124	124	132	132	141	141	55	59	63	44	48	50
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
² Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	150	150	150	150	175	175	60	70	70	50	50	60
		30 kW	150	150	150	150	175	175	60	70	70	50	50	60
		45 kW	150	175	175	175	175	200	90	90	90	70	70	80
		60 kW	175	175	175	200	175	200	90	90	100	70	80	80
		90 kW	225	250	225	300	250	300	125	150	150	100	110	110
³ Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	129	129	137	137	145	145	57	61	65	46	50	52
		30 kW	129	129	137	137	145	145	58	63	66	47	50	53
		45 kW	145	163	154	172	162	180	81	85	89	65	68	71
		60 kW	152	172	162	181	170	189	85	90	93	68	72	74
		90 kW	215	244	224	253	233	262	122	126	130	97	101	103

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

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

HACR type breaker or fuse.

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

ELECTRICAL ACCESSORIES - DISCONNECTS

15 TON | LCX180S5

Motor HP Electric Heat Voltage	3		5		7.5		3	5	7.5	3	5	7.5
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 15 kW	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85

17.5 TON | LCX210S5

Motor HP Electric Heat Voltage	3		5		7.5		3	5	7.5	3	5	7.5
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 90 kW	1NA	1NA	1NA	1NA	1NA	1NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 90 kW	1NA	1NA	1NA	1NA	1NA	1NA	54W86	54W86	54W86	54W86	54W86	54W86

Disconnects - 54W85 - 80A
54W86 - 150A
54W87 - 250A

Disconnect must be field furnished.

ELECTRICAL ACCESSORIES - DISCONNECTS

20 TON | LCX240S5

Motor HP Electric Heat Voltage	5		7.5		10		5	7.5	10	5	7.5	10
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 90 kW	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Power Exhaust + Elec. Heat 90 kW	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	54W86	54W86	54W86	54W86	54W86	54W86

25 TON | LCX300S5

Motor HP Electric Heat Voltage	5		7.5		10		5	7.5	10	5	7.5	10
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 90 kW	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Power Exhaust + Elec. Heat 90 kW	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	¹ NA	54W86	54W86	54W86	54W86	54W86	54W86

Disconnects - 54W85 - 80A
54W86 - 150A
54W87 - 250A

Disconnect must be field furnished.

FIELD WIRING NOTES

- For use with copper wiring only
- Field wiring not furnished
- All wiring must conform to NEC or CEC and local electrical codes
- For specific wiring information, please refer to the installation instructions

ELECTRIC HEAT CAPACITIES

Volts Input	15 kW			30 kW			45 kW			60 kW			90 kW		
	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages
208	11.3	38,600	1	22.5	76,800	1	33.8	115,300	2	45.0	153,600	2	67.6	230,700	2
220	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
230	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
240	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
440	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
460	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
480	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
550	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
575	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
600	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2

Minimum R454B Space and CFM Requirements

Minimum Airflow ¹		
Unit	Q _{min} (CFM)	Q _{min} (m³h)
LCX180	177	300
LCX210	207	351
LCX240	192	326
LCX300	157	267
LCX180 W/ Humidrol	165	281
LCX210 W/ Humidrol	165	281
LCX240 W/ Humidrol	202	342
LCX300 W/ Humidrol	183	312

¹ **NOTE** - The minimum airflow is the lowest CFM allowed during venting operation (leak mitigation).

Minimum Room Area of Conditioned Space ²		
Unit	TA _{min} (ft²)	TA _{min} (m²)
LCX180	98	9.10
LCX210	115	10.63
LCX240	107	9.87
LCX300	88	8.08
LCX180 W/ Humidrol	92	8.51
LCX210 W/ Humidrol	92	8.51
LCX240 W/ Humidrol	112	10.38
LCX300 W/ Humidrol	102	9.44

² **NOTE** - The minimum room area of conditioned space is the smallest area the unit can service.

Refrigerant Charge R-454B		
Unit	M _c (lbs)	M _c (kg)
LCX180 STG 1	5.19	2.35
LCX180 STG 2	5.38	2.44
LCX180 STG 3	6.19	2.81
LCX210 STG 1	5.13	2.32
LCX210 STG 2	5.13	2.32
LCX210 STG 3	4.81	2.18
LCX240 STG 1	6.25	2.83
LCX240 STG 2	6.19	2.81
LCX240 STG 3	5.94	2.69
LCX300 STG 1	5.56	2.52
LCX300 STG 2	5.63	2.55
LCX300 STG 3	5.75	2.61
LCX300 STG 4	5.75	2.61
LCX180 STG 1 W/ Humidrol	6.25	2.83
LCX180 STG 2 W/ Humidrol	6.00	2.72
LCX180 STG 3 W/ Humidrol	5.75	2.61
LCX210 STG 1 W/ Humidrol	6.25	2.83
LCX210 STG 2 W/ Humidrol	6.25	2.83
LCX210 STG 3 W/ Humidrol	5.94	2.69
LCX240 STG 1 W/ Humidrol	7.63	3.46
LCX240 STG 2 W/ Humidrol	7.25	3.29
LCX240 STG 3 W/ Humidrol	6.94	3.15
LCX300 STG 1 W/ Humidrol	6.94	3.15
LCX300 STG 2 W/ Humidrol	6.31	2.86
LCX300 STG 3 W/ Humidrol	4.69	2.13
LCX300 STG 4 W/ Humidrol	5.19	2.35

Altitude Adjustment Factor ³									
Halt	0	200	400	600	800	1000	1200	1400	1600
AF	1	1	1	1	1.02	1.05	1.04	1.1	1.12
Halt	1600	1800	2000	2200	2400	2600	2800	3000	3200
AF	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.4

³ **NOTE** - Use the Altitude Adjustment Factor to adjust the values in the tables above to different altitudes. Find the relevant altitude above sea level in the two "Halt" rows and then multiply the value needed from the tables above by the altitude factor number. Example: For the minimum airflow in CFM for an LCX180 at 1000 ft. above sea level, multiply 177 by 1.05 to get 185.85 CFM as the new Q_{min}.

UNIT PARTS ARRANGEMENT

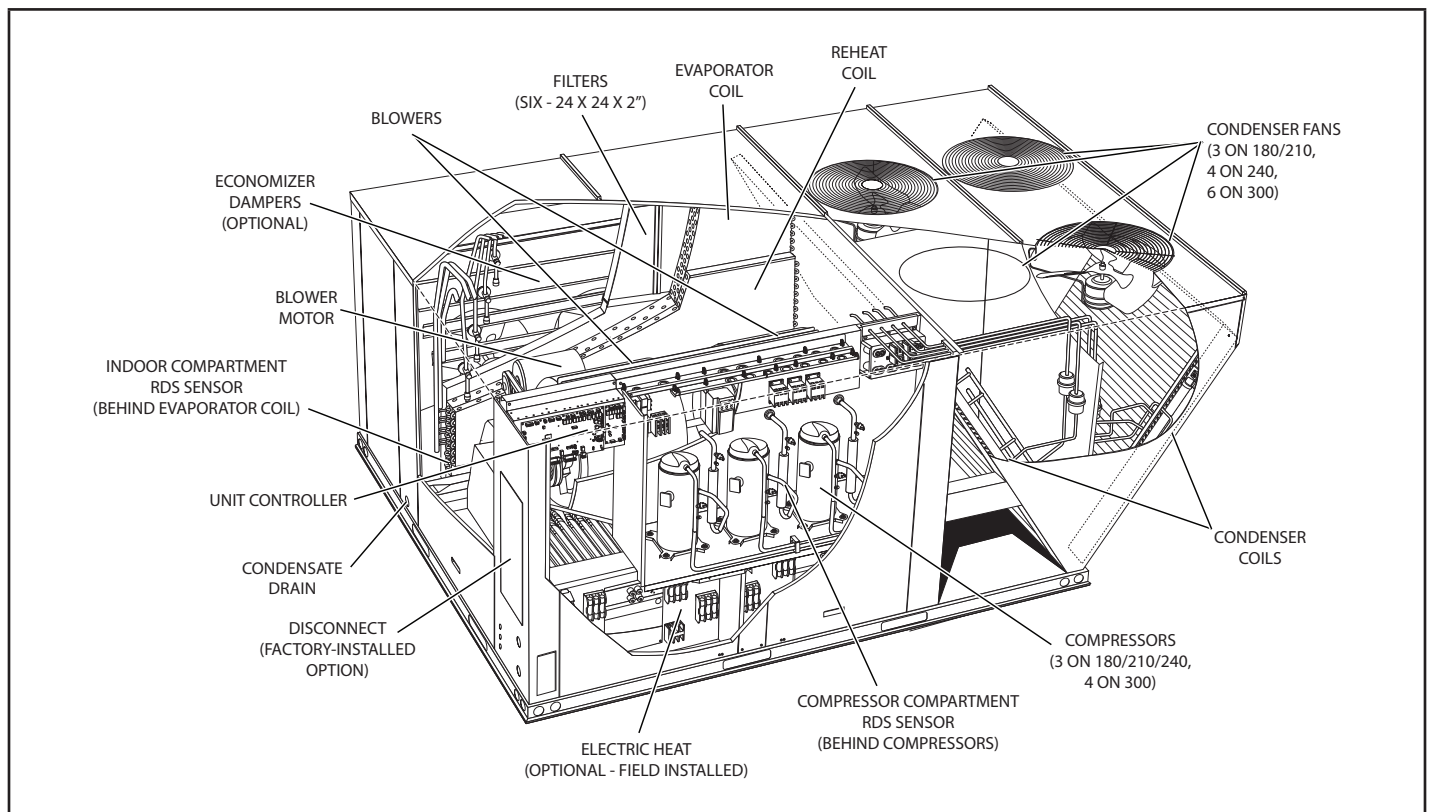
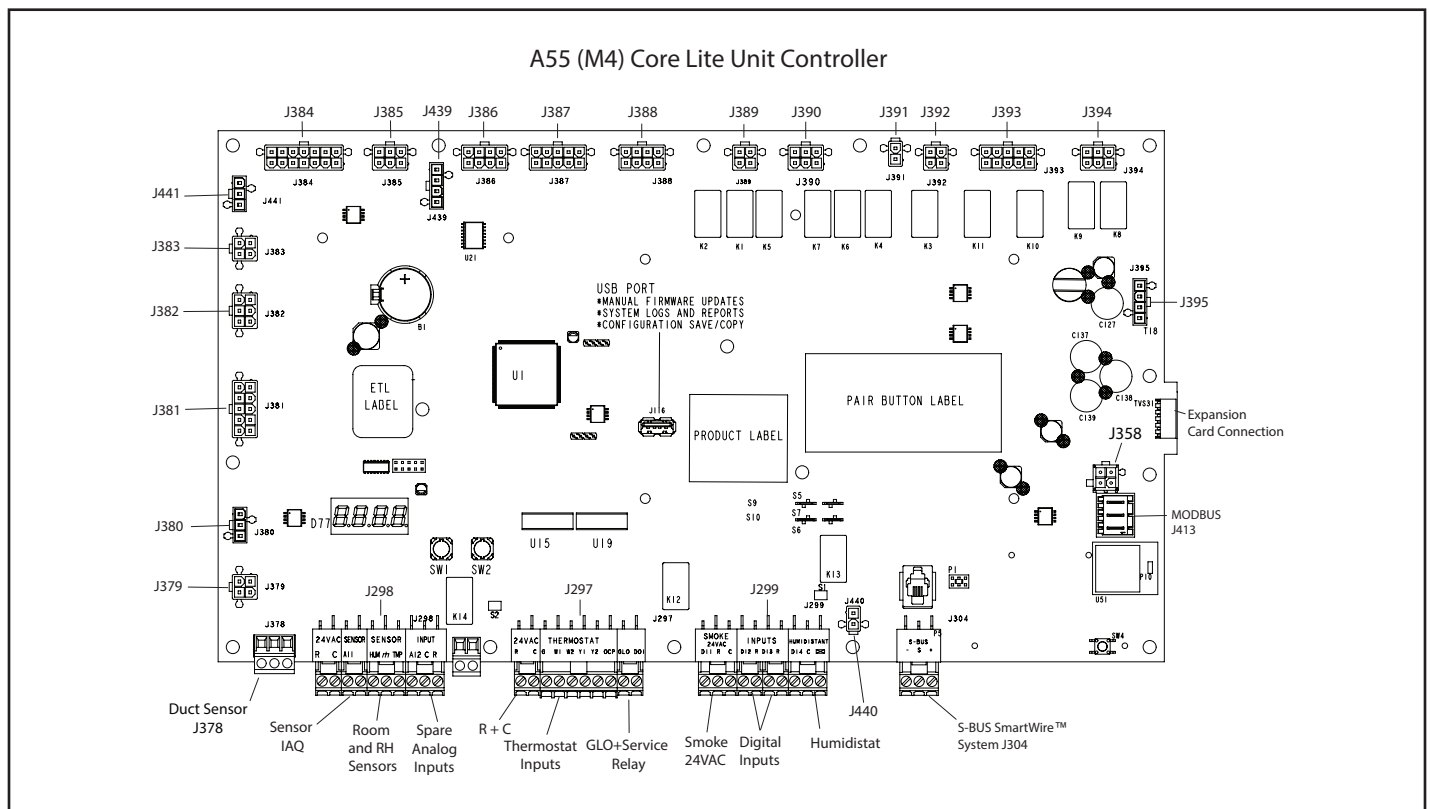


FIGURE 1



Components Arrangement

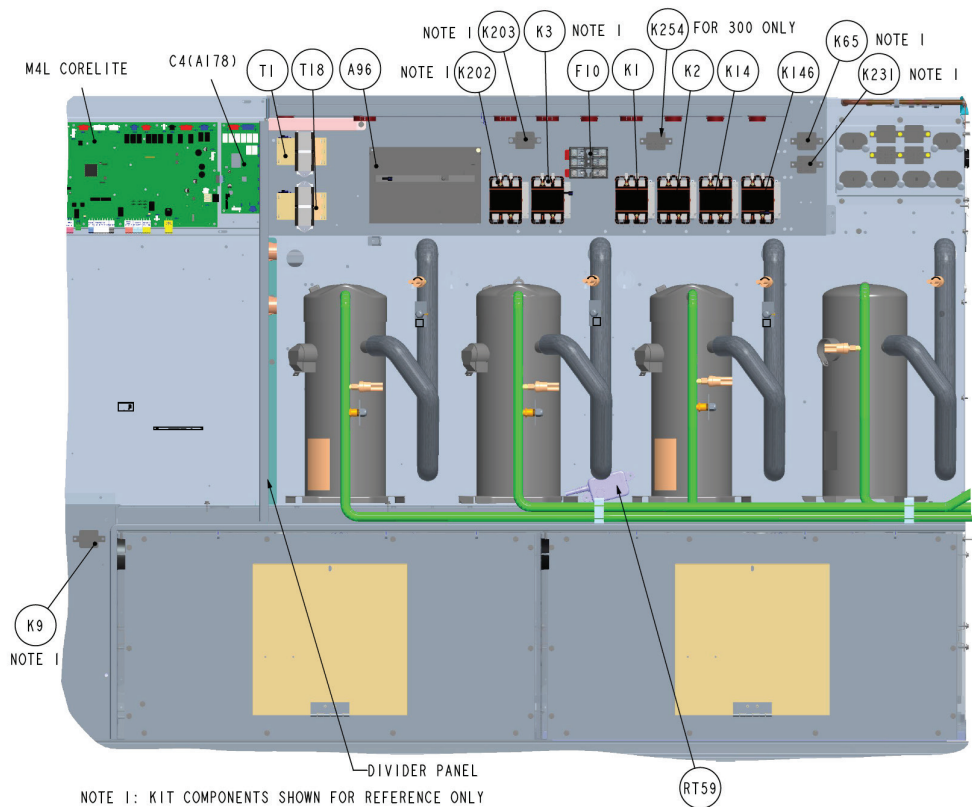


FIGURE 3

Components Arrangement

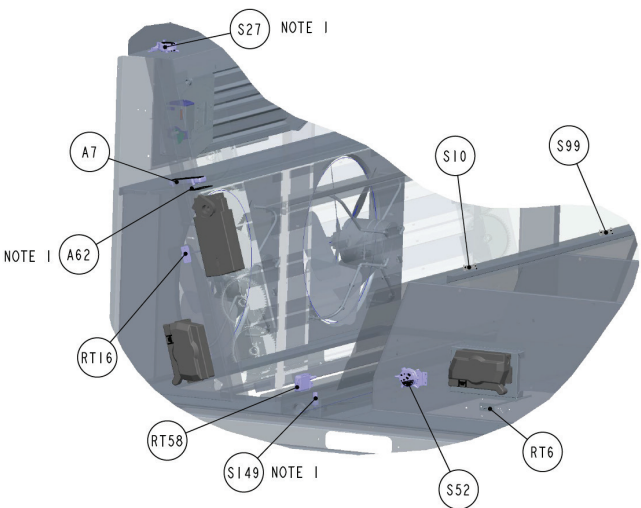


FIGURE 4

Components Arrangement

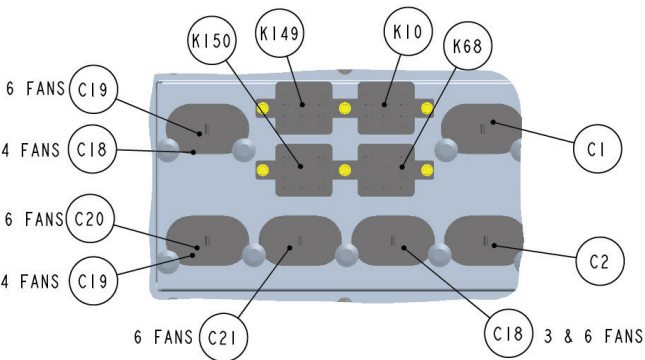


FIGURE 5

I-UNIT COMPONENTS

All 15 through 25 ton (45.7 through 88 kW) units are configure to order units (CTO). Unit components are shown in FIGURE 1. All L1, L2 and L3 wiring is color coded; L1 is red, L2 is yellow and L3 is blue.

⚠ 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.

ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures

⚠ CAUTION



Electrostatic discharge can affect electronic components. Take precautions to neutralize electrostatic charge by touching your hand and tools to metal prior to handling the control.

A-CONTROL BOX COMPONENTS

Control box components are shown in FIGURE 3, FIGURE 4, & FIGURE 5. The control box is located in the upper portion of the compressor compartment.

1-Disconnect Switch S48

Units may be equipped with disconnect switch S48, a toggle or twist-style switch, which can be used by the service technician to disconnect power to the unit.

2-Control Transformer T1

All use a single line voltage to 24VAC transformer mounted in the control box. Transformer supplies power to control circuits in the unit. The transformer is rated at 70VA and is protected by a 3.5 amp circuit breaker (CB8). The 208/230 (Y) voltage transformers use two primary voltage taps as shown in FIGURE 6, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

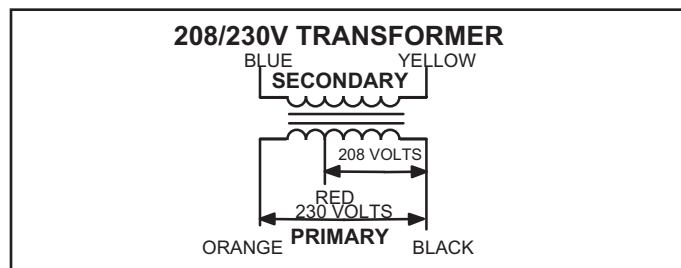


FIGURE 6

3-Contactor Transformer T18

T18 is a single line voltage to 24VAC transformer used in all LCX 15 to 25 ton units. Transformer T18 is protected by a 3.5 amp circuit breaker (CB18). T18 is identical to transformer T1. The transformer supplies 24VAC power to the contactors. 4-Terminal Block TB13

TB13 terminal block distributes line voltage power to the line voltage items in the unit.

4-Outdoor Fan Motor Fuse Block & Fuses

F10 Power Exhaust Fan Motor Fuse Block and Fuses F6. STD SCCR 240V, 300V and higher rated SCCR units have three line voltage fuses F10 provide overcurrent protection to all condenser fans. Two line voltage fuses F6 provide overcurrent protection to the two optional power exhaust fans. The fuses are rated at 30A in all 208/230V units but 10A in the 208/230V 240U and 300U models.

5-Compressor Contactor K1, K2, K14, K146

K1, K2: All units

K14: 180, 210, 240, 300 units

K146: 210, 240, 300 units

All compressor contactors are three-pole-double-break contactors with 24VAC coils. In 156 units, K1 (energized by A55) energizes compressors B1 in response to first stage cool demand, and K2 (energized by A55) energizes B2 in response to second stage cool demand. In the 180 units, K1 and K2 (energized by A55) energizes compressors B1 and B2 in response to first stage cool demand, and K14 (energized by A178) energizes B13 in response to second stage cool demand. In 210, 240 and 300 units K14 and K146 (energized by A178) energize compressors B13 and B20 in response to second stage cool demand.

6-Ultraviolet Germicidal Lamp (UVC) Transformer T49

UVC transformer T49 is used in 460V and 575V units which are equipped with a UVC. The auto voltage to 230VAC transformer is installed in the control box. The transformer has an output rating of 0.5 amps. T49 transformer supplies 230VAC power to the UVC lamp.

7-Power Exhaust Relay K65 & K231 (PED units)

Power exhaust relays K65 and K231 are N.O. DPDT relays with a 24VAC coil. The relay are used in units equipped with the optional power exhaust dampers. K65 and K231 are energized by the A55 Unit Controller, after the economizer dampers reach 50% open (adjustable in ECTO). When K65 closes, exhaust fan B10 is energized and when K231 closes B11 is energized.

8-Variable Frequency Drive A96

Staged-Blower units are equipped with a VFD which alters the supply power frequency and voltage to the blower motor. Blower speed is staged depending on the compressor stages, heating demand, ventilation demand, or smoke alarm. The amount of airflow for each stage is preset from the factory. Airflow can be adjusted by changing ECTO parameters in the A55 Unit Controller. The VFD is assembled on the control board..

9-1VFD Power To Motor Contactor K202 Kit

Contactor is used in Staged-Blower units equipped with a VFD bypass option. The three pole 40 amp contactor with a 24VAC coil is energized by the A55 Unit Controller. K202 allows power from the VFD to the B3 blower motor in response to blower demand.

10-Inverter Start Forward Rotation Relay K203 Kit

Relay is used in staged-blower units and is a three-pole double-throw relay with a 24VAC coil. K203 is energized by the A55 Unit Controller and provides input to the A96 VFD to start blower forward rotation.

11–Unit Controller A55

The Unit Controller provides all unit control functions, unit status information, unit diagnostics, programmable parameters and USB verification and profile sharing. Refer to the Unit Controller guide provided with the unit. Thermostat wires are connected to J297 on the Unit Controller. See FIGURE 2 for A55 board components.

12–Compressor 3 & 4 Controller

The compressor 3 & 4 control module A178 controls two additional compressor stages. A178 includes all inputs and outputs required for compressor and fan control, compressor stage diagnostics and low ambient control.

The A55 unit controller is only compatible with L-Connection sensors provided with the unit or purchased separately as specified in the Product Specification. TABLE 8, TABLE 1, TABLE 2 and TABLE 3 show thermistor and pressure transducer readings.

13–Relative Humidity Sensor - Optional

The indoor relative humidity sensor (A91) is an analog sensor with a 0-10VDC output over a relative humidity range of 0-100% relative humidity. The sensor is powered with 24VAC.

14–Enthalpy Sensor - Optional

The optional enthalpy sensors (A7 and A63) used with the economizer have an output of 4-20mA. The sensor is powered with 18VAC provided by M4 unit control.

15–Room Sensors

Room sensor (A2) is a two-wire thermistor with 1k series resistor.

TABLE 1
Two-Wire Thermistor

Temp. °F (°C)	Resistance +/-2%	Temperature °F (°C)	Resistance +/-2%	Temp. °F (°C)	Resistance +/-2%
40 (4.4)	27,102	60 (15.6)	16,313	80 (26.7)	10,299
45 (7.2)	23,764	65 (18.3)	14,474	85 (29.4)	9,249
50 (10)	20,898	70 (21.1)	12,882	90 (32.2)	8,529
55 (12.8)	18,433	75 (23.9)	11,498		

17-Carbon Dioxide Sensor

The indoor carbon dioxide sensor (A63) is an analog sensor with a 0-10VDC output over a carbon dioxide range of 0-2000 ppm as shown in the following table. The sensor is powered with 24VAC.

TABLE 2
Carbon Dioxide Range

Carbon Dioxide PPM	DC Voltage	Carbon Dioxide PPM	DC Voltage	Carbon Dioxide PPM	DC Voltage	Carbon Dioxide PPM	DC Voltage
0	0	600	3	1200	6	1800	9
200	1	800	4	1400	7	2000	10
400	2	1000	5	1600	8		

18-VAV Supply Static Sensor

The supply duct differential static pressure sensor (A30) is an analog sensor with a 0-10VDC output over a range of 0-5" w.c as shown in the following table. The sensor is powered with 24VAC.

TABLE 3
Carbon Dioxide Range

Pressure "w.c.	DC Voltage	Pressure "w.c.	DC Voltage	Pressure "w.c.	DC Voltage	Pressure "w.c.	DC Voltage
0	0	1.5	3	3	6	4.5	9
0.5	1	2	4	3.5	7	5	10
1	2	2.5	5	4	8		

16–Second-Stage Power Exhaust Relay K231 (Staged-Blower units equipped with power exhaust)

The second power exhaust fan is controlled by K231. A133 will enable K231 only when the blower reaches 70% of full speed (adjustable ECTO). This prevents a negative building pressure when the blower is operating in low speed. Refer to the Unit Controller manual and ECTO labels on the unit.

17–Fuse F61 (Higher SCCR units only)

Fuse F61 is used on units with higher SCCR rating. F61 provides overcurrent protection to compressor and other cooling components. F61 and S48 are located inside a sheet metal enclosure in the unit left front corner mullion.

18–Blower Motor Overload Relay S42

The relay (S42) is connected in line with the blower motor to monitor the current flow to the motor. When the relay senses an overload condition, a set of normally closed contacts open to de-energize pin #1 in plug P299 of the A55 Unit Controller. A55 de-energizes all outputs. Units will be equipped with a relay manufactured by Telemecanique FIGURE 7 or Siemens FIGURE 8.

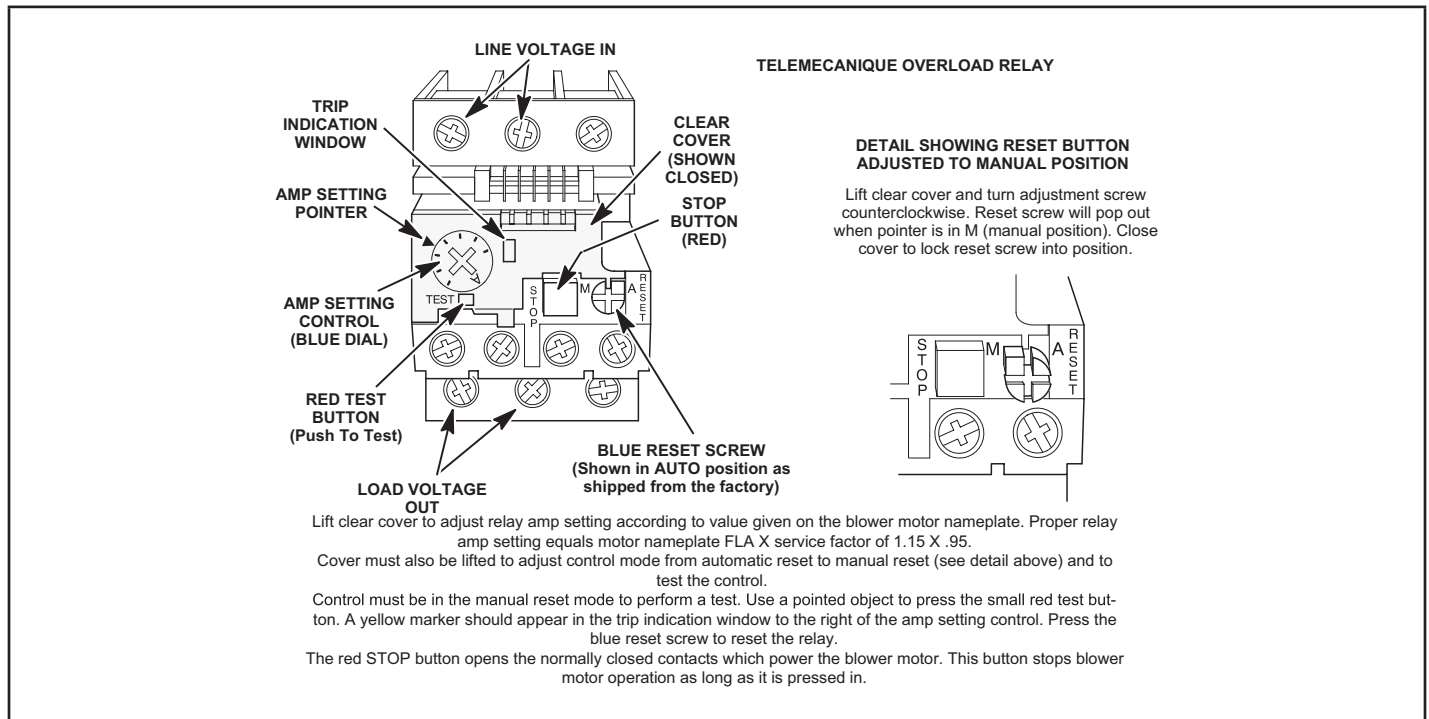


FIGURE 7

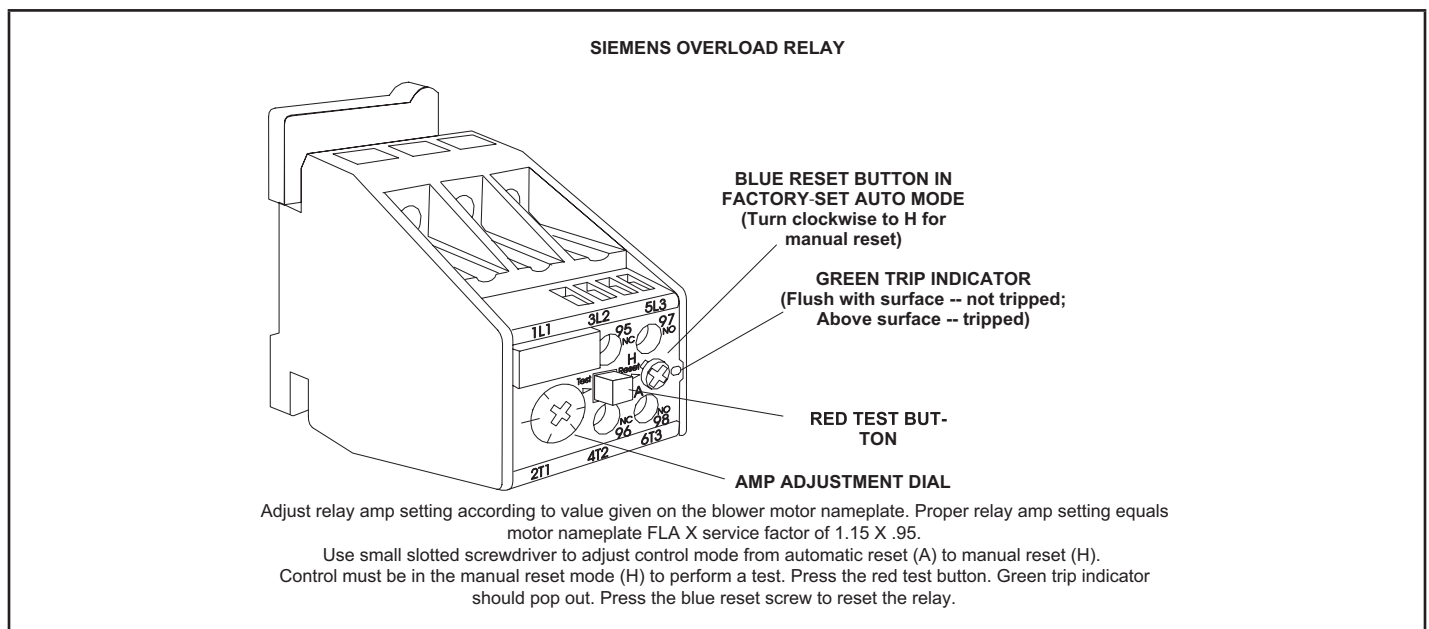


FIGURE 8

**Compressor Detail
B1, B2, B13**

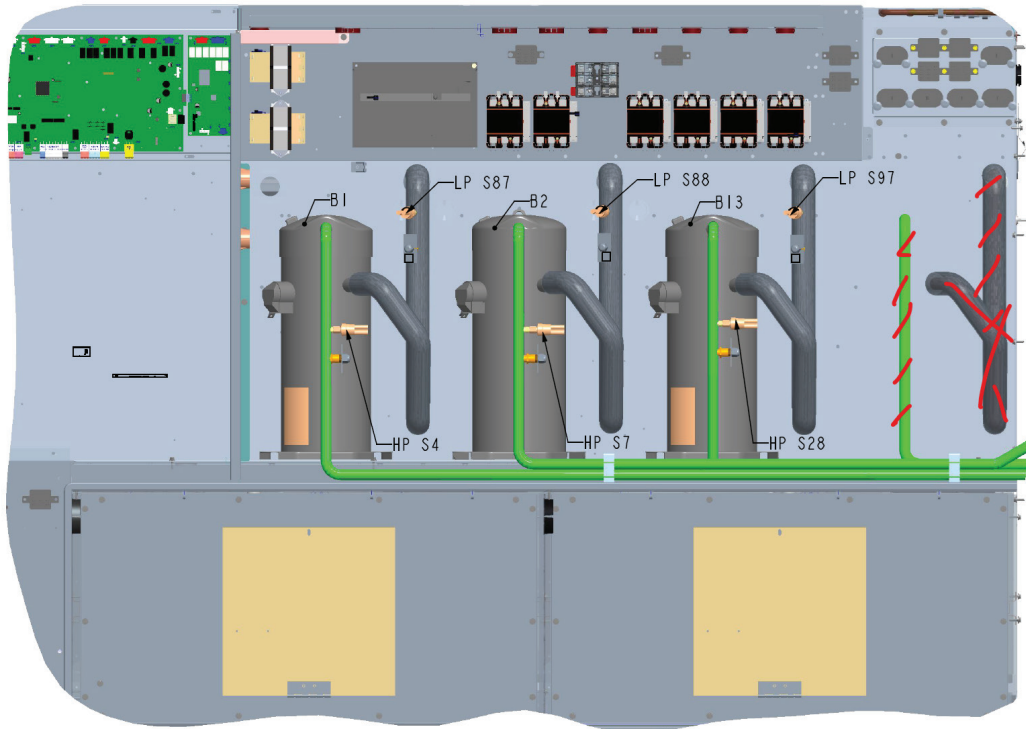


FIGURE 9

**Compressor Detail
B1, B2, B13, B20**

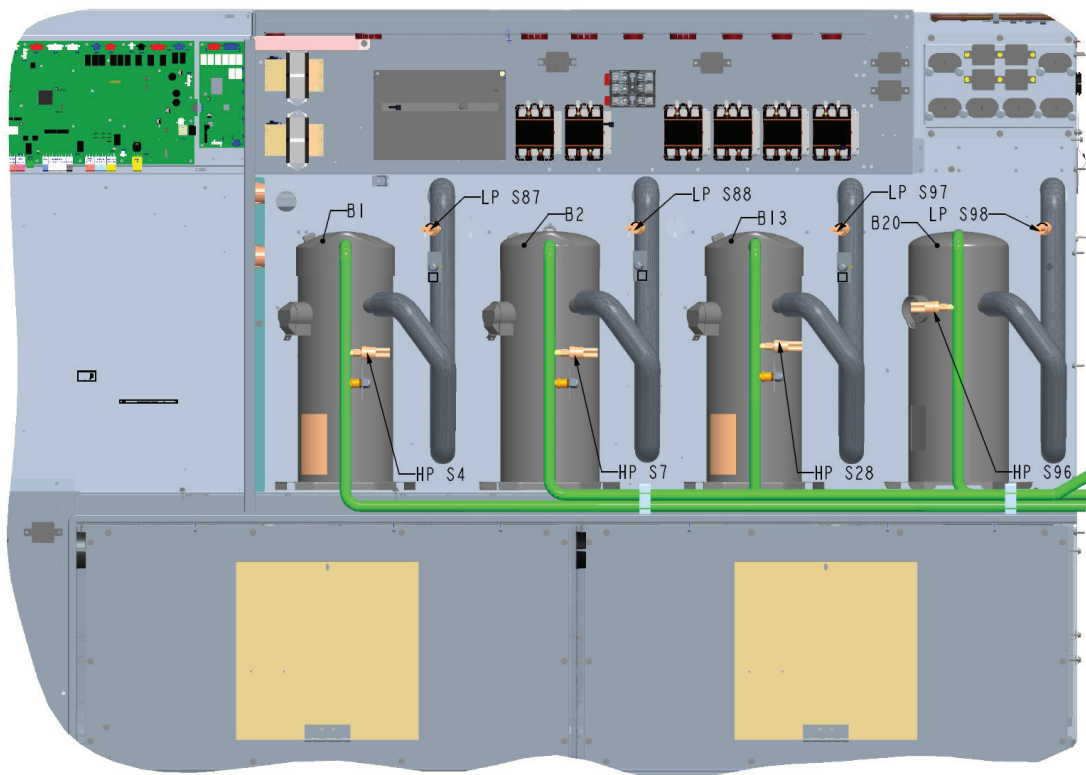


FIGURE 10
Page 26

180S, 210S UNITS - THREE REFRIGERANT CIRCUITS

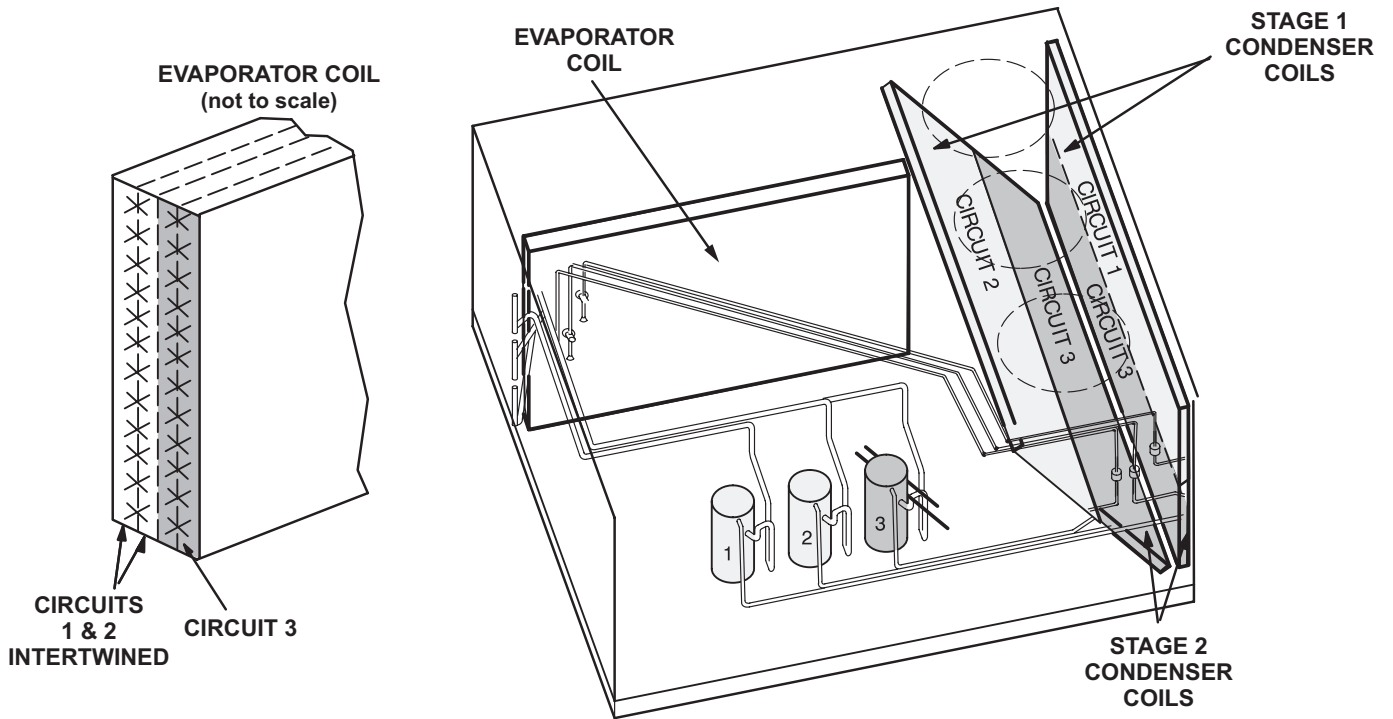


FIGURE 11

240S - THREE REFRIGERANT CIRCUITS

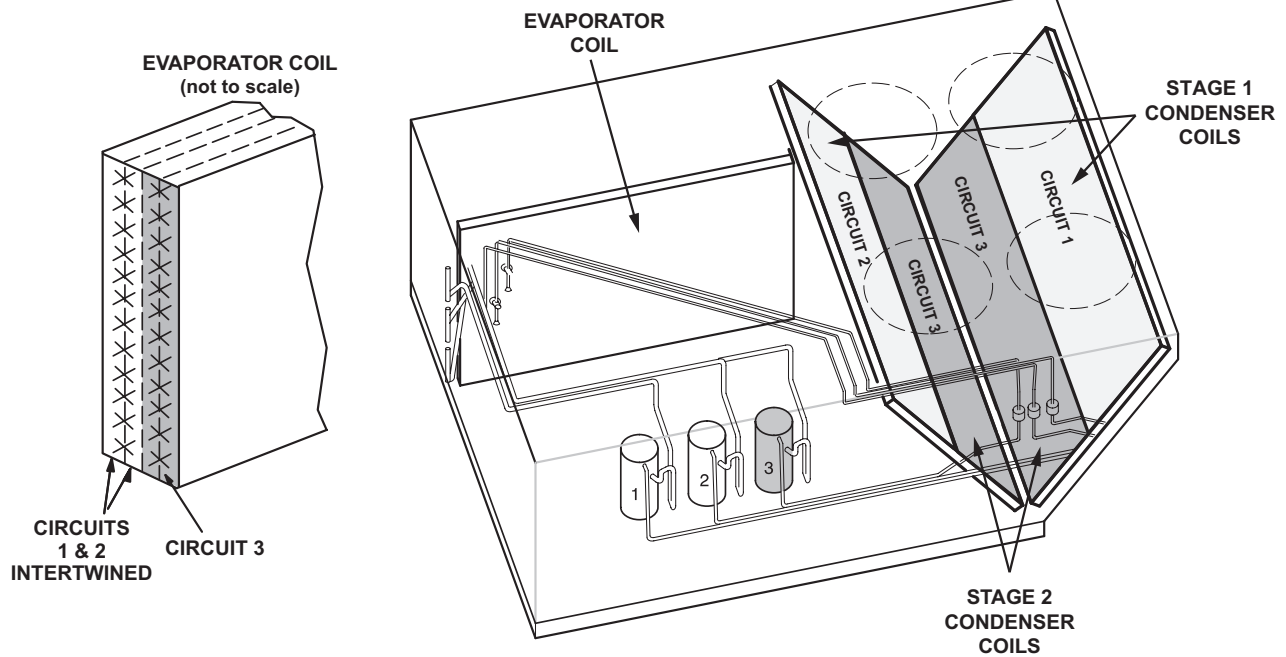


FIGURE 12

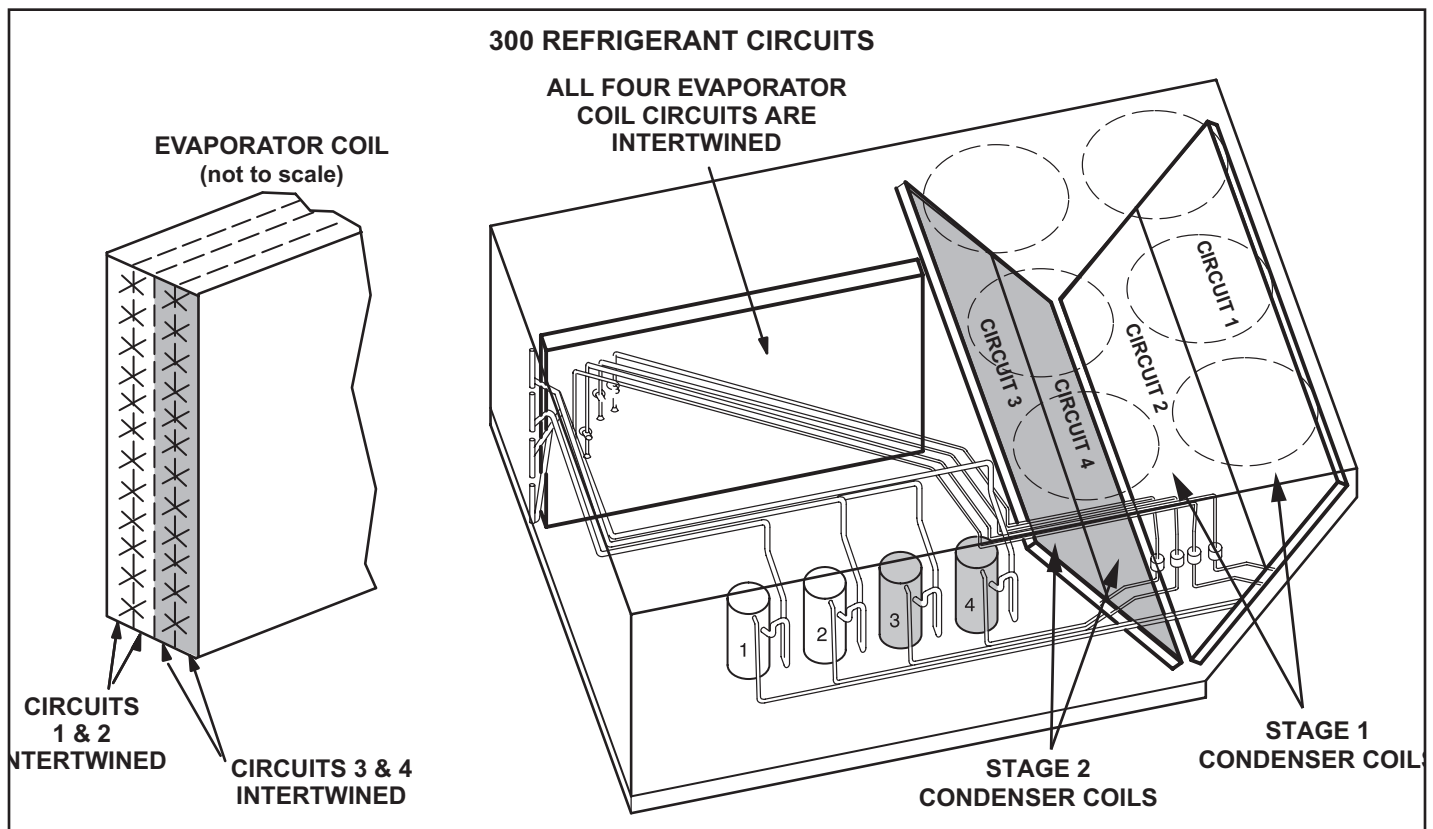


FIGURE 13

B-COOLING COMPONENTS

Units use independent cooling circuits consisting of one compressor, one condenser coil, and one evaporator coil per circuit.

Three draw-through type condenser fans are used in LCX180 & 210, four draw-through type condenser fans are used in LCX240 units and six draw-through type condenser fans are used in LCX300 units.

Cooling may be supplemented by a factory-or field-installed economizer. 180, 210, 240 and 300 units use intertwined evaporators. Each evaporator uses a thermostatic expansion valve as the primary expansion device.

All non-reheat units come with lightweight, all-aluminum evaporator coils, while reheat units come with a copper-tube aluminum-fin evaporator coil. In all units each compressor is protected by a crankcase heater, high pressure switch and low pressure switch.

1-Compressors B1, B2, B13, B20

All units use scroll compressors. LCX180, 210, & 240 use 3 compressors and LCX300 uses four compressors. Compressor capacity may vary from stage to stage. In all cases, the capacity of each compressor is added to reach the total capacity of the unit. See "SPECIFICATIONS" and "ELECTRICAL DATA" (table of contents) or compressor nameplate for compressor specifications.

⚠ WARNING

Electrical shock hazard. Compressor must be grounded. Do not operate without protective coverover terminals. Disconnect power before removing protective cover. Discharge capacitors before servicing unit. Failure to follow these precautions could cause electrical shock resulting in injury or death.

Each compressor is energized by a corresponding compressor contactor.

NOTE – Refer to the wiring diagram section for specific unit operation.

If a compressor replacement is necessary, call 1-800-453-6669.

⚠ IMPORTANT

Some scroll compressors have an internal vacuum protector that will unload scrolls when suction pressure goes below 20 psig. A hissing sound will be heard when the compressor is running unloaded. Protector will reset when low pressure in system rises above 40 psig. DO NOT REPLACE COMPRESSOR.

2–Crankcase Heaters HR1, HR2, HR5 & HR11

All LCX units use insertion type heaters. Heater HR1 is installed around compressor B1, heater HR2 compressor B2, HR5 compressor B13 and HR11 compressor B20.

3–High Pressure Switches S4, S7, S28, S96

S4 all units

S7 all units

S28 180, 210, 240, 300 units

S96 210, 240, 300

The high pressure switches is an auto-reset SPST N.C. switch which opens on a pressure rise. All units are equipped with this switch. The switch is located in the compressor discharge line and is wired in series with the compressor contactor coil through A55 unit controller or A178 compressor 3 and 4 controller. See FIGURE 9 and FIGURE 10.

S4 and S7 are is wired in series with B1 and B2 compressor contactors and S28 and S96 are wired in series with B13 and B20 compressor contactors.

When discharge pressure rises to 640 ± 10 psig (indicating a problem in the system) the switch opens and the respective compressor(s) is de-energized (the economizer can continue to operate). When discharge pressure drops to 475 ± 20 psig the pressure switch will close re-energizing the compressor(s). Main control A55 has a three-strike counter before locking out. This means the control allows three high pressure trips per one thermostat demand. The control can be reset by breaking and remaking the thermostat demand or manually resetting the control

4–Low Pressure Switches S87, S88, S97, S98

S87 all units

S88 all units

S97 180, 210, 240, 300 units

S98 210, 240, 300 units

The low pressure switch is an auto-reset SPST N.O. switch (held N.C. by refrigerant pressure) which opens on a pressure drop. All units are equipped with this switch. The switch is located in the compressor suction line. See FIGURE 9 and FIGURE 10. .

S87 and S88 (compressor one and two) and S98 (compressor three) and S98 (compressor 4) are wired in series with the contactor coils through the A55 Unit Controller

The Unit Controller A55 governs the low pressure switches by shunting the switches during start up until pressure is stabilized. After the shunt period, the control has a three-strike counter, during a single thermostat demand, before the compressor(s) is locked out. The control is reset by breaking and remaking the thermostat demand or manually resetting the control.

When suction pressure drops to 40 ± 5 psig (indicating low pressure), the switch opens and the compressor(s) is de-energized. The switch automatically resets when pressure in the suction line rises to 90 ± 5 psig.

5–Filter Drier (all units)

Units have a filter drier 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 Fans

B4, B5, B21 (180, 210 units)

B4, B5, B21, B22 (240 units)

B4, B5, B21, B22, B23 and B24 (300 units)

See SPECIFICATIONS tables at the front of this manual for specifications of condenser fans used in all units. All condenser fans used have single-phase motors. The fan assembly may be removed for servicing and cleaning.

7–Temperature Sensors

Temperature thermistor sensors (RT46-51) are located on specific points for each refrigeration circuit. Temperature thermistors provide continuous temperature input to the unit controller for proper cooling operation as well as system protection. Controller logic will de-energize compressors for each refrigeration circuit when evaporator coil temperature falls below 32°F (0°C) to prevent evaporator freeze-up.

Each thermistor must be specifically placed for proper unit operation and to initiate valid alarms. See TABLE 4 and TABLE 5 for proper locations.

The return air (RT16) and discharge air (RT6) duct probes and the outdoor air (RT17) are all two wire thermistors. See TABLE 8 for resistance vs. temperature.

TABLE 4
LCX180, 210, 240

Cat. No.	Ass'y. No.	Sensor Yellow, Blue, Red	Figure
22J06	623049-01	RT46, 47, 50	FIGURE 14

TABLE 5
LCX300

Cat. No.	Ass'y. No.	Sensor Yel, Blu, Red, Grn	Figure
22J06	623049-01	RT46, 47, 50, 51	FIGURE 15

LGX/LCX180, 210, 240
NON-REHEAT EVAPORATOR / INDOOR COIL
RT46, 47, 50

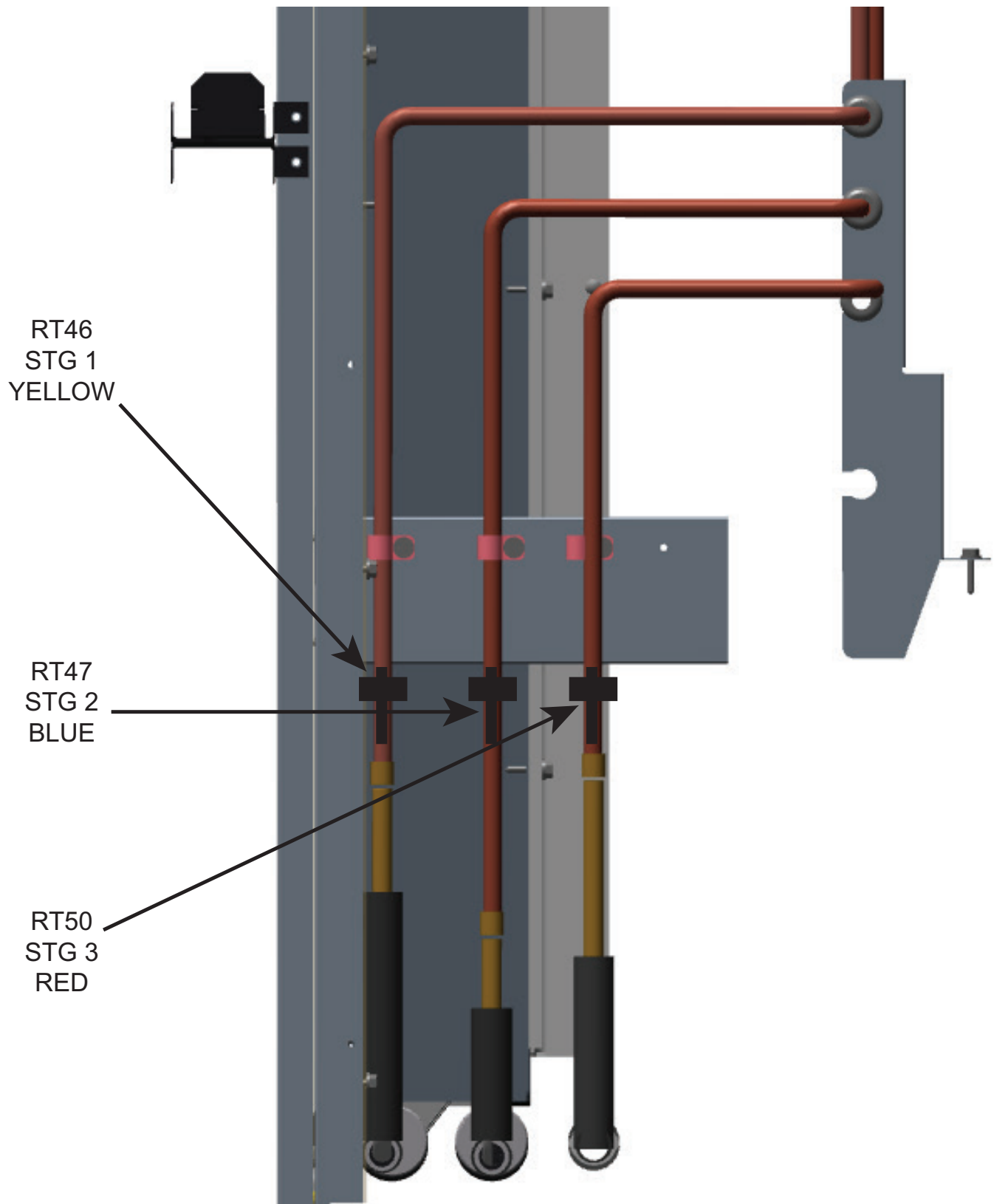


FIGURE 14

**LGX/LCX300
NON-REHEAT EVAPORATOR / INDOOR COIL
RT46, 47, 50, 51**

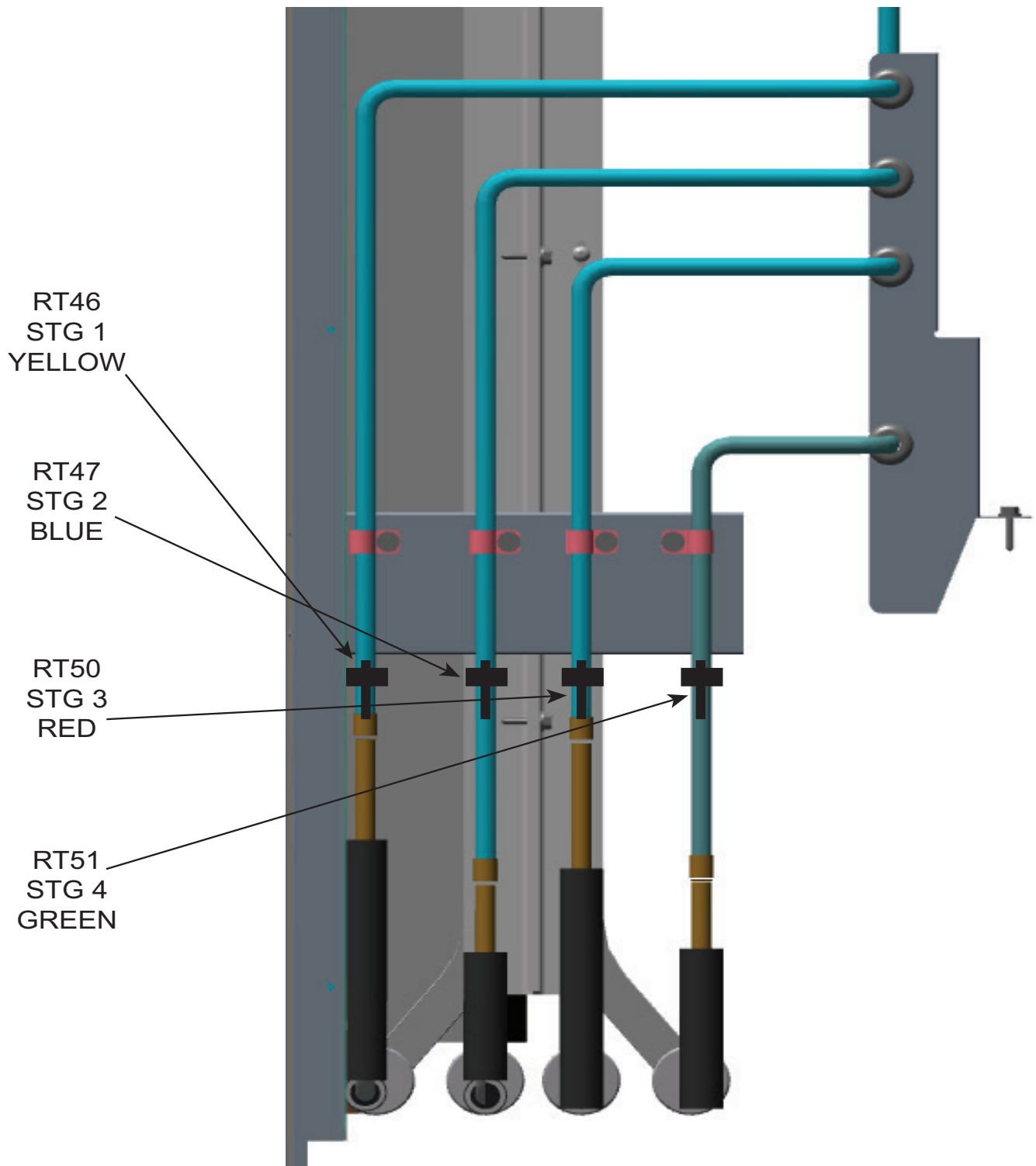


FIGURE 15

LGX180, 210, 240
REHEAT EVAPORATOR / INDOOR COIL
RT46, 47, 50

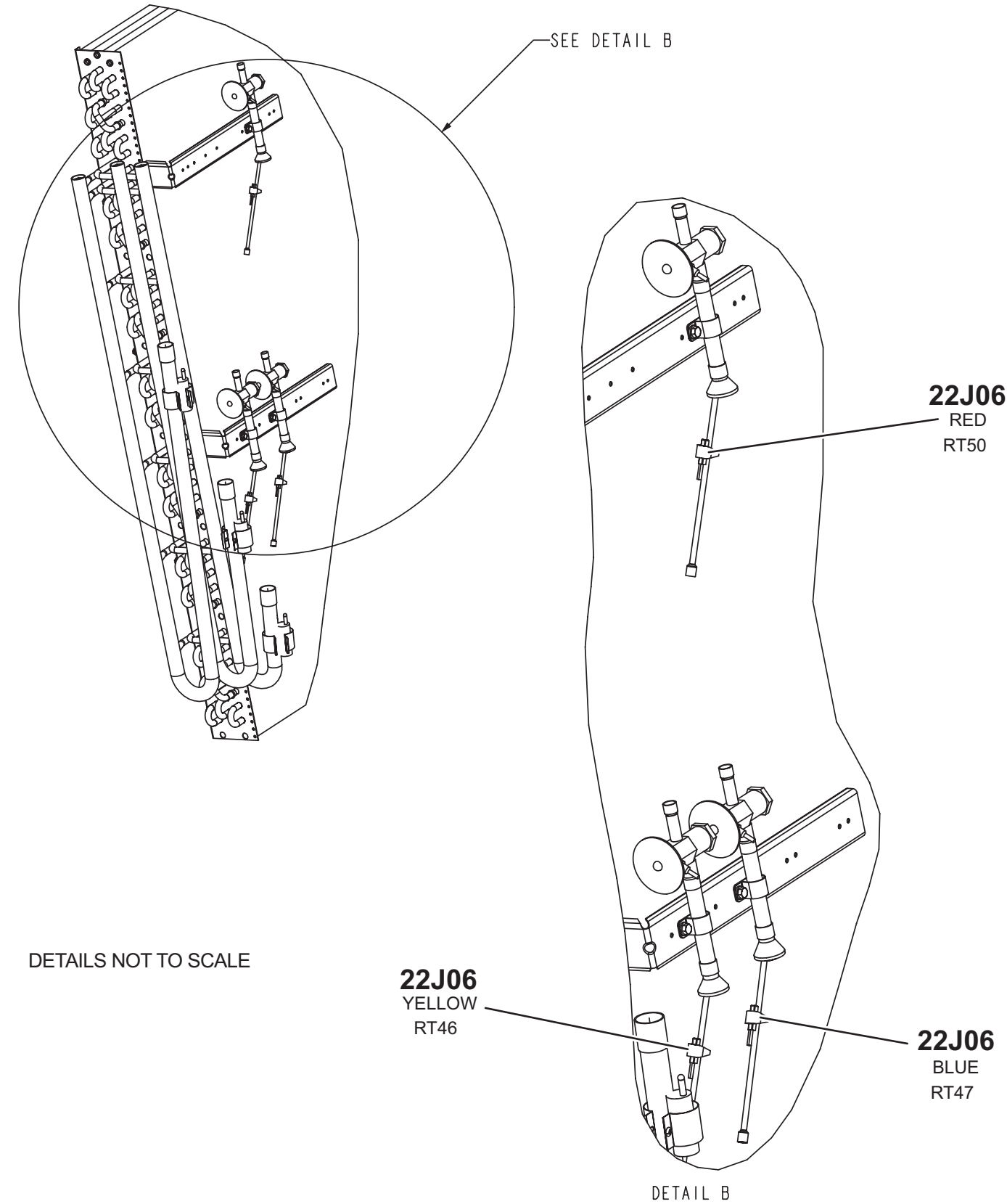


FIGURE 16

LGX300
REHEAT EVAPORATOR / INDOOR COIL
RT46, 47, 50, 51

SEE DETAIL C

22J06
GREEN
RT51

22J06
RED
RT50

22J06
BLUE
RT47

22J06
YELLOW
RT46

DETAILS NOT TO SCALE

DETAIL C

FIGURE 17

TABLE 8
Resistance vs. Temperature

Temp. °F (°C)	Resistance +/-2%	Temperature °F (°C)	Resistance +/-2%	Temp. °F (°C)	Resistance +/-2%
-40 (-40)	335,671	40 (4.4)	26,106	90 (32.2)	7,332
-20 (-28.9)	164,959	50 (10)	19,904	100 (37.8)	5,826
0 (-17.8)	85,323	60 (15.6)	15,313	120 (48.9)	3,756
20 (-6.7)	46,218	70 (21.1)	11,884	130 (54.4)	3,047
30 (-1.1)	34,566	80 (26.7)	9,298		

8-RDS Sensors

Units are equipped with factory-installed RDS Sensors located on different points on the unit. The RDS sensors provide the Unit Controller with continuous readings for leaked refrigerant concentration levels and sensor health status (Good or Fault). These readings are used to modify unit operation to disperse the leaked refrigerant and to remove possible ignition sources. In addition, the Unit Controller uses these readings to initiate alarms to alert the operator of a refrigerant leak or faulty sensor(s).

Each sensor must be specifically placed for proper unit operation and to initiate valid alarms. To identify sensor locations see TABLE 6.

TABLE 6

Unit Model	Figure
Indoor Coil Area Sensor	FIGURE 18
Control/Compressor Compartment Sensor	FIGURE 19

TABLE 7 - RDS Alarms

Alarm	Alarm description	RDS Sensor Location
257	Refrigerant leak sensor fault in the Indoor section (sensor #1)	Indoor compartment
258	Refrigerant leak sensor fault in the control panel/compressor section (sensor #2)	"Control/Compressor or Compressor compartment"

LCX 180-300 INDOOR COMPARTMENT RDS SENSOR

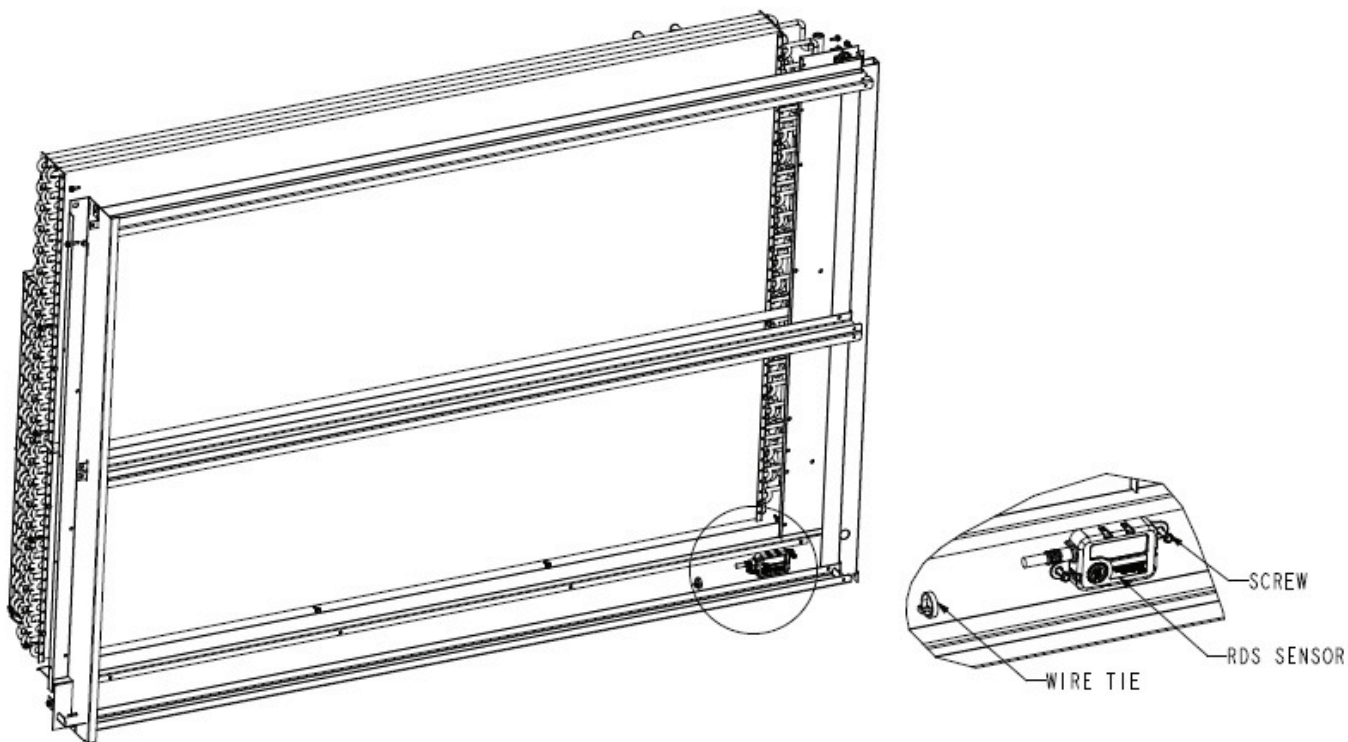


FIGURE 18

LCX 180-300
COMPRESSOR RDS SENSOR

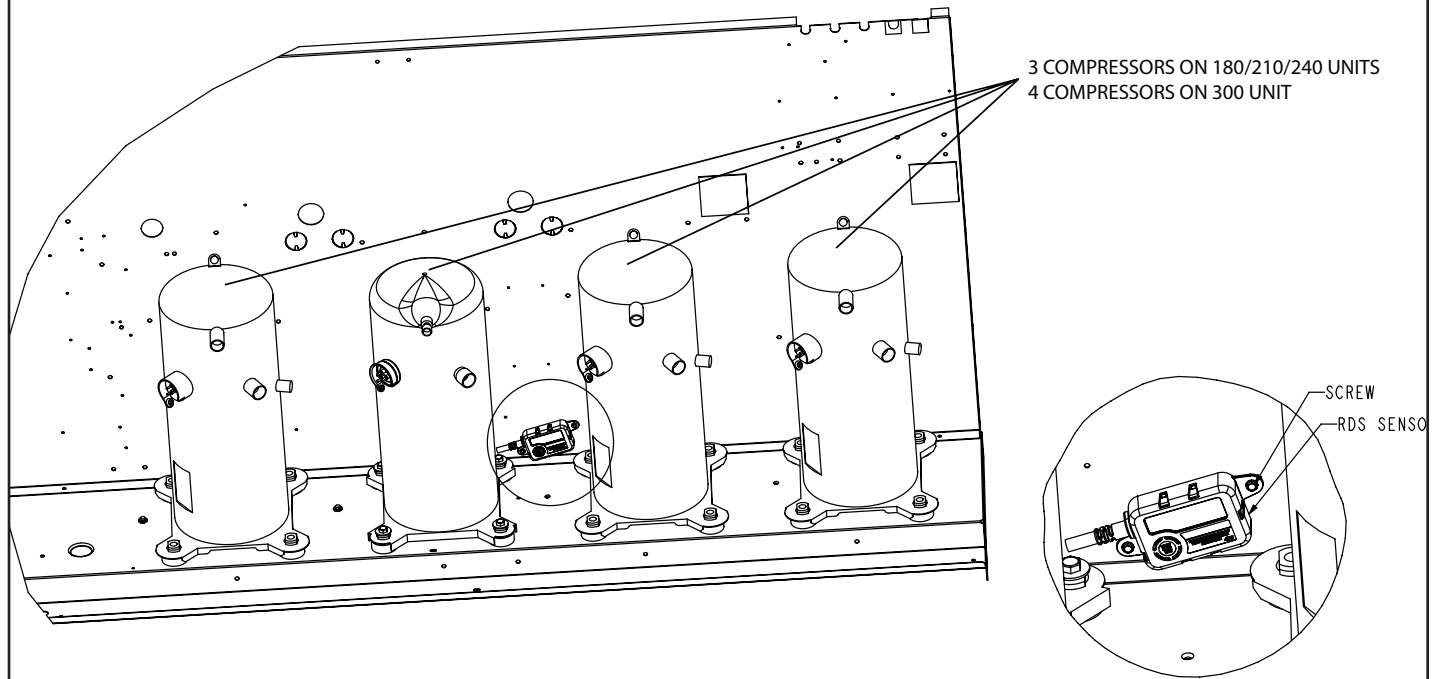
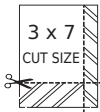
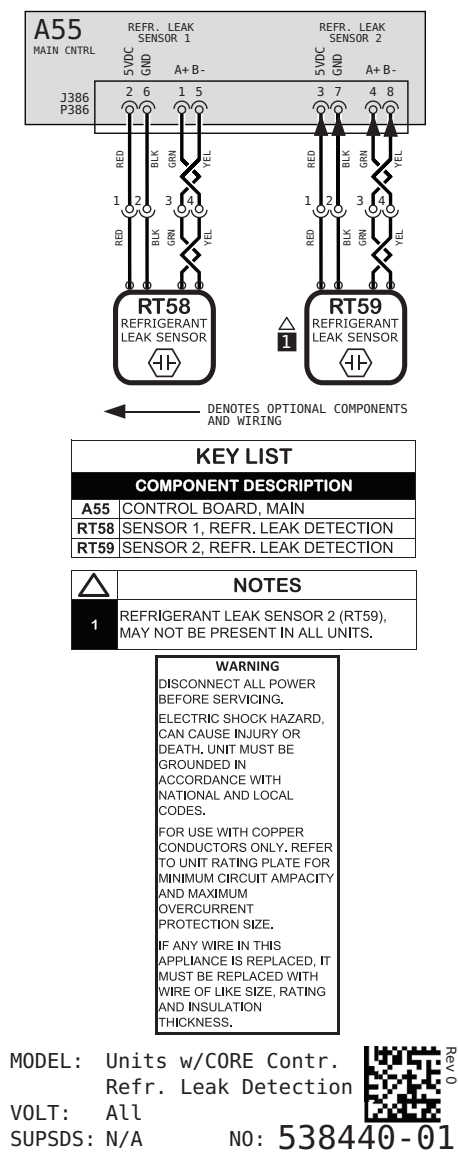


FIGURE 19

RDS SENSOR



REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-012295C	04-03-2024	MXR6	MXT5	ORIGINATED AT PD&R CARROLLTON, TX

FIGURE 20

C-BLOWER COMPARTMENT

The blower compartment is located between the evaporator coil and the compressor / control section on the opposite side of the condenser coil. The blower assembly is accessed by disconnecting the blower motor wiring (and all other plugs) and removing the screws on either side of the sliding base. The base pulls out as shown in FIGURE 22.

1-Blower Wheels

All units have two 15 in. x 15 in. blower wheels. Both wheels are driven by one motor.

2-Indoor Blower Motor B3

All units use three-phase single-speed blower motors. CFM adjustments are made by adjusting the motor pulley (sheave). Motors are equipped with sealed ball bearings. All motor specifications are listed in the SPECIFICATIONS (table of contents) in the front of this manual. Units may be equipped with motors manufactured by various manufacturers, therefore electrical FLA and LRA specifications will vary. See unit rating plate for information specific to your unit.

OPERATION / ADJUSTMENT

Supply Air Staged Units - The blower rotation will always be correct on units equipped with an inverter. Checking blower rotation is not a valid method of determining voltage phasing for incoming power.**Supply Air Staged Units and Units Equipped With Optional Voltage or Phase Detection** - The Unit Controller checks the incoming power during start-up. If the voltage or phase is incorrect, the Unit Controller will display an alarm and the unit will not start.

A-Blower Operation

Refer to the Unit Controller Setup Guide to energize blower. Use this mobile service app (the QR is located in the control area) menu:

SERVICE > TEST > BLOWER

Instructions provided with the thermostat may also be used to initiate blower only (G) demand. Unit will cycle on thermostat demand. The following steps apply to applications using a typical electro-mechanical thermostat.

- 1 - Blower operation is manually set at the thermostat subbase fan switch. With fan switch in ON position, blowers will operate continuously.
- 2 - With fan switch in AUTO position, the blowers will cycle with demand. Blowers and entire unit will be off when system switch is in OFF position.

IMPORTANT

Three Phase Scroll Compressor Voltage Phasing

Three phase scroll compressors must be phased sequentially to ensure correct compressor and blower* rotation and operation. Compressor and blower are wired in phase at the factory. Power wires are color-coded as

follows: line 1-red, line 2-yellow, line 3-blue.

1-Observe suction and discharge pressures and blower* rotation on unit start-up.

2-Suction pressure must drop, discharge pressure must rise and blower* rotation must match rotation marking. If pressure differential is not observed or blower* rotation is not correct:

3-Disconnect all remote electrical power supplies.

4-Reverse any two field-installed wires connected to the line side of S48 disconnect or TB13 terminal strip. Do not reverse wires at blower contactor.

5-Make sure the connections are tight. Discharge and suction pressures should operate at their normal start-up ranges.

*Supply air inverter blower motors should rotate in the correct direction; verify scroll compressor rotation separately. Contact technical support if the blower is rotating incorrectly.

WARNING

1-Make sure that unit is installed in accordance with the installation instructions and applicable codes.

2-Inspect all electrical wiring, both field- and factory-installed, for loose connections. Tighten as required.

3-Check to ensure that refrigerant lines do not rub against the cabinet or against other refrigerant lines.

4-Check voltage at disconnect switch. Voltage must be within range listed on nameplate. If not, consult power company and have voltage condition corrected before starting unit.

5-Make sure filters are new and in place before start-up.

B-Blower Access

- 1 - Disconnect jack/plug connector to blower motor. Also disconnect jack/plug connector heating limit switches on gas units.
- 2 - Remove screws on either side of blower assembly sliding base. See FIGURE 22.
- 3 - Pull base toward outside of unit.

C-Determining Unit CFM

IMPORTANT - Multi-staged supply air units are factory-set to run the blower at full speed when there is a blower (G) demand without a heating or cooling demand. Refer to the field-provided, design specified CFM for all modes of operation. Use the following procedure to adjust motor pulley to deliver the highest CFM called for in the design spec. See Inverter Start-Up section to set blower CFM for all modes once the motor pulley is set.

- 1 - The following measurements must be made with a dry indoor coil. Run blower (G demand) without a cooling demand. Measure the indoor blower shaft RPM. Air filters must be in place when measurements are taken.

- 2 - With all access panels in place, measure static pressure external to unit (from supply to return). Blower performance data is based on static pressure readings taken in locations shown in FIGURE 21.

Note - Static pressure readings can vary if not taken where shown.

- 3 - See table of contents for Blower Data and or Optional Accessories. Use static pressure and RPM readings to determine unit CFM.
- 4 - The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See FIGURE 22. Do not exceed minimum and maximum number of pulley turns as shown in TABLE 9.

TABLE 9

MINIMUM AND MAXIMUM PULLEY ADJUSTMENT

Belt	Min Turns Open	Max Turns Open
A Section	No Minimum	5
B Section	1*	6

*No minimum number of turns open when B belt is used on pulleys 6" O.D. or larger.

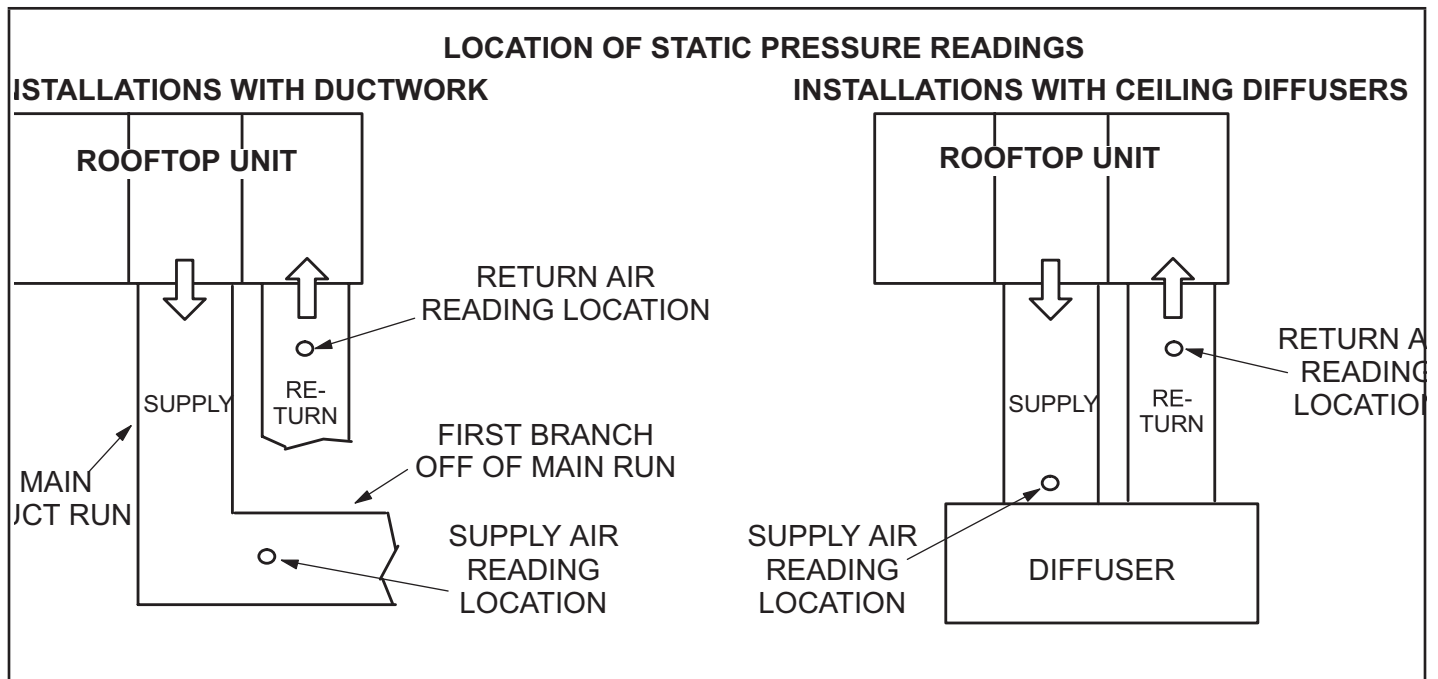


FIGURE 21

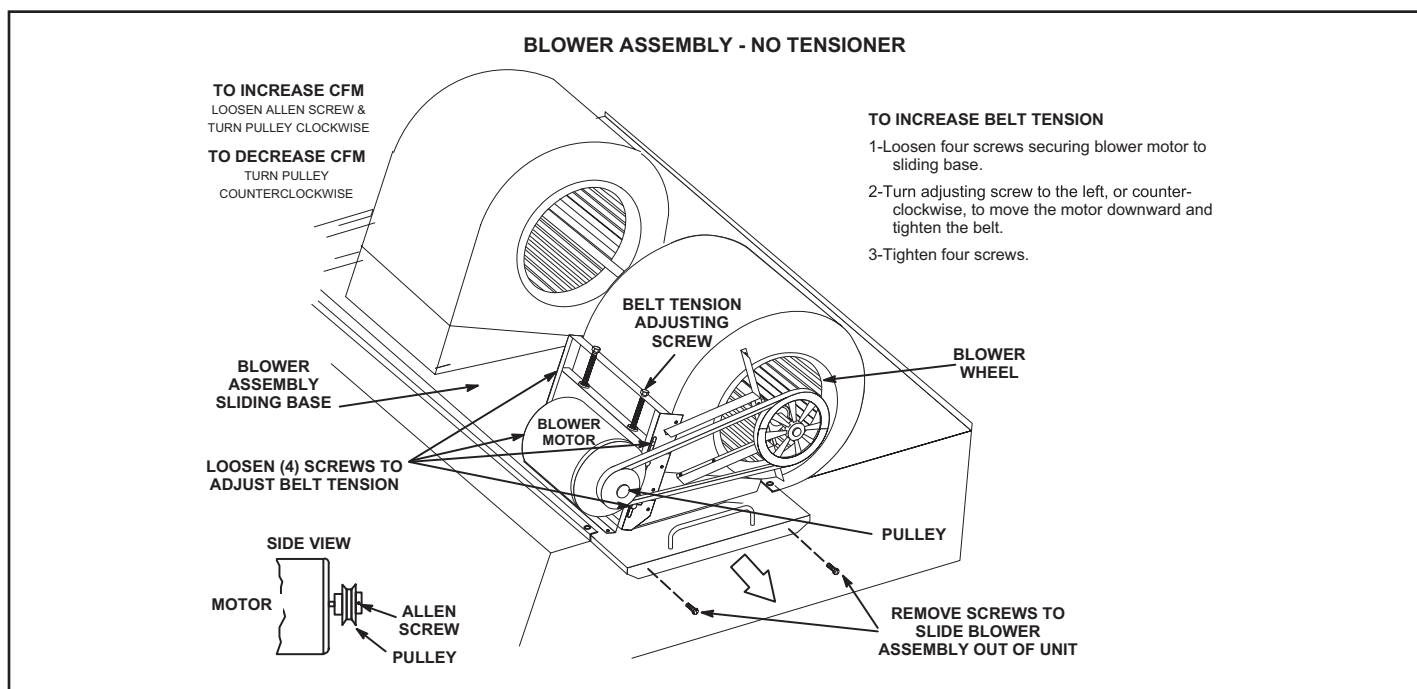


FIGURE 22

D-Blower Belt Adjustment

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24-48 hour period of operation. This will allow belt to stretch and seat into pulley grooves. Make sure blower and motor pulley are aligned. See FIGURE 23 for blowers not equipped with a tensioner and FIGURE 24 for units equipped with an optional belt tensioner.

Blowers Without Belt Tensioner

- 1 - Loosen four screws securing blower motor to sliding base. See FIGURE 22.
- 2 - *To increase belt tension -*
Turn belt tension adjusting screw to the left, or counterclockwise, to tighten the belt. This increases the distance between the blower motor and the blower housing.
- 3 - *To loosen belt tension -*
Turn the adjusting screw to the right, or clockwise to loosen belt tension. 3- Tighten four screws securing blower motor to sliding base once adjustments have been made.

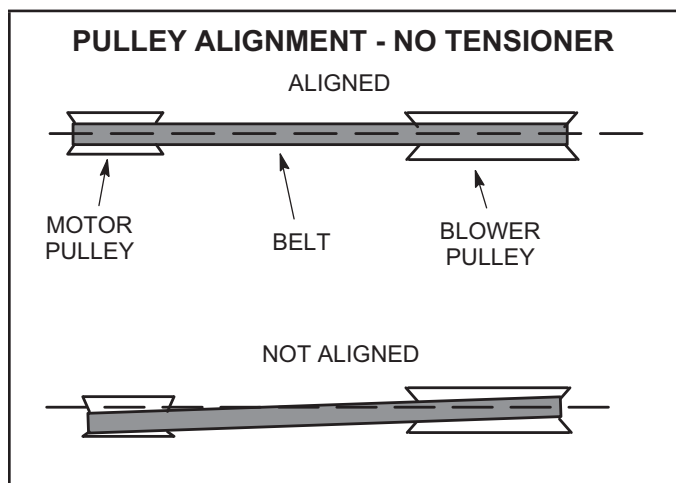


FIGURE 23

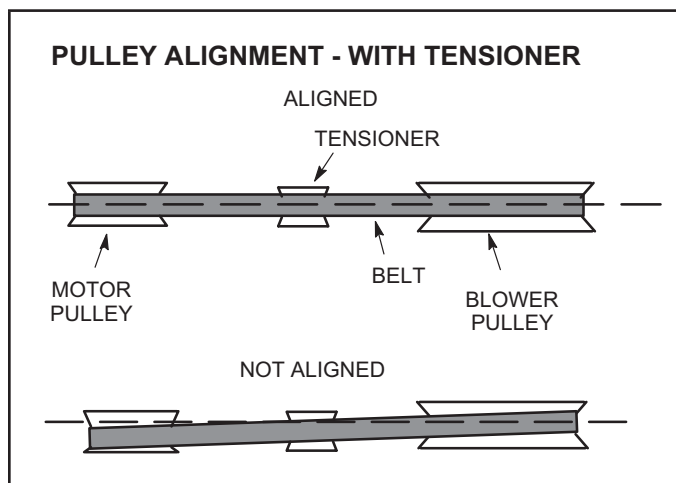


FIGURE 24

E-Check Belt Tension

Overtensioning belts shortens belt and bearing life. Check belt tension as follows:

- 1 - Measure span length X. See FIGURE 25.
- 2 - Apply perpendicular force to center of span (X) with enough pressure to deflect belt $1/64$ " for every inch of span length.

Example: Deflection distance of a 40" span would be $40/64$ " or $5/8$ ".

- 3 - Measure belt deflection force. For a used belt, the deflection force should be 5 lbs. . A new belt deflection force should be 7 lbs

A force below these values indicates an undertensioned belt. A force above these values indicates an overtensioned belt.

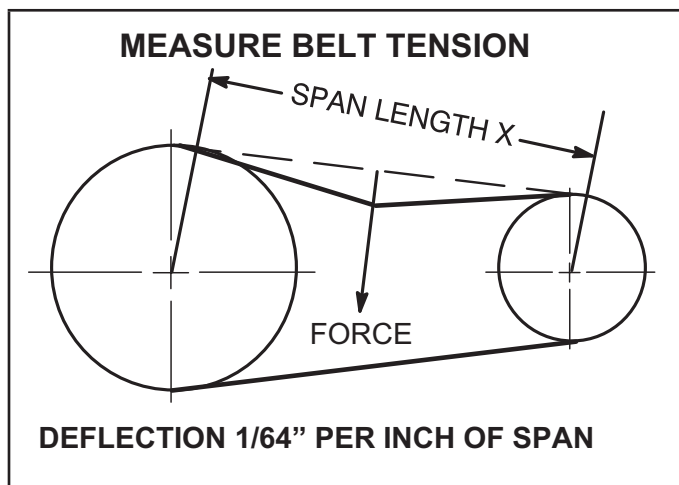


FIGURE 25

F-Field-Furnished Blower Drives

See BLOWER DATA tables for blower drives.

F-Optional Electric Heat

See ELECTRICAL / ELECTRIC HEAT DATA and ELECTRIC HEAT CAPACITIES (table of contents) for LCH to EHA match-ups and electrical ratings.

EHA parts arrangement is shown in FIGURE 27 and FIGURE 28. All electric heat sections consist of electric heating elements exposed directly to the air stream. Two electric heat sections (first section and second section) are used in all 15kW through 90kW heaters. See FIGURE 26. Multiple-stage elements are sequenced on and off in response to thermostat demand.

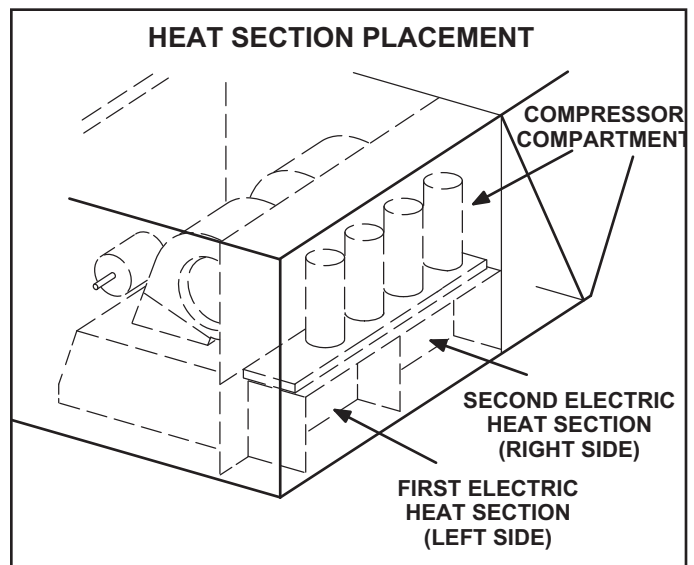


FIGURE 26

1-Main Control Box Components A55, K9

The main control box (FIGURE 3) houses the A55 Unit Controller and the K9 electric heat relay.

2-Contactors K15, K16, K17 and K18

Contactors K15, K16, K17 and K18 are all three-pole double-break contactors located on the electric heat vestibule. K15 and K16 are located on the first electric heat section, while K17 and K18 are located on the second electric heat section. However, in the 15 and 30kW heaters, the first section houses all contactors and fuses. All contactors are equipped with a 24VAC coil. The coils in the K15, K16, K17 and K18 contactors are energized by the main panel A55. Contactors K15 and K17 energize the first stage heating elements, while K16 and K18 energize the second stage heating elements.

3-High Temperature Limits S15 and S107 (Primary)

S15 and S107 are SPST N.C. auto-reset thermostats located on the back panel of the electric heat section below the heating elements. S15 is the high temperature limit for the first electric heat section, while S107 is the high temperature limit for the second electric heat section. Both thermostats are identical and are wired to the A55 Unit Controller. When either S15 or S107 opens, indicating a problem in the system, contactor K15 is de-energized. When K15 is de-energized, first stage and all subsequent stages of heat are de-energized. The thermostats used on EHA360-45-1 Y/G/J are factory set to open at $200F \pm 5F$ on a temperature rise and automatically reset at $160F \pm 6F$ on a temperature fall. All other electric heat section thermostats are factory set to open at $170F \pm 5F$ on a temperature rise and automatically reset at $130F \pm 6F$ on a temperature fall. The thermostats are not adjustable.

4–Terminal Strip TB3

Electric heat line voltage connections are made to terminal strip TB3 (or a fuse block on some models) located in the upper left corner of the electric heat vestibule.

5–Heating Elements HE1 through HE14

Heating elements are composed of helix wound bare nichrome wire exposed directly to the air stream. Three elements are connected in a three-phase arrangement. The elements in 208/230V units are connected in a “Delta” arrangement. Elements in 460 and 575V units are connected in “Wye” arrangement.

Each stage is energized independently by the corresponding contactors located on the electric heat vestibule panel. Once energized, heat transfer is instantaneous. High temperature protection is provided by primary and redundant high temperature limits and overcurrent protection is provided by fuses.

6–Fuse F3

Fuse F3 are housed in a fuse block which holds three fuses. Each F3 fuse is connected in series with each leg of electric heat. FIGURE 27, FIGURE 28 and TABLE 10 shows the fuses used with each electric heat section. For simplicity, the service manual labels the fuses F3 - 1 through F3 - 8..

TYPICAL ELECTRIC HEAT SECTION COMPONENT LAYOUT

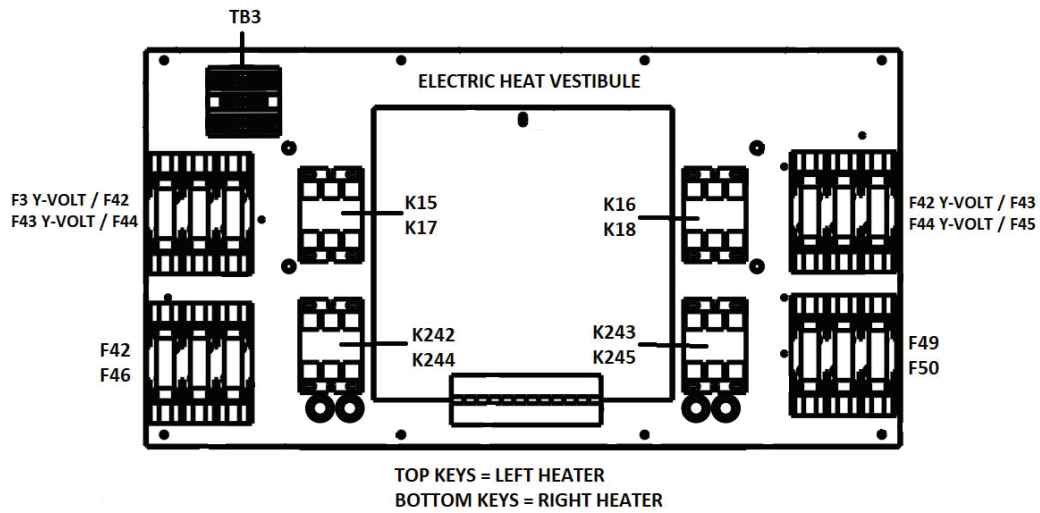


FIGURE 27

EHA 15, 30, 45, 60 and 90 KW ELECTRIC HEAT SECTION PARTS ARRANGEMENT

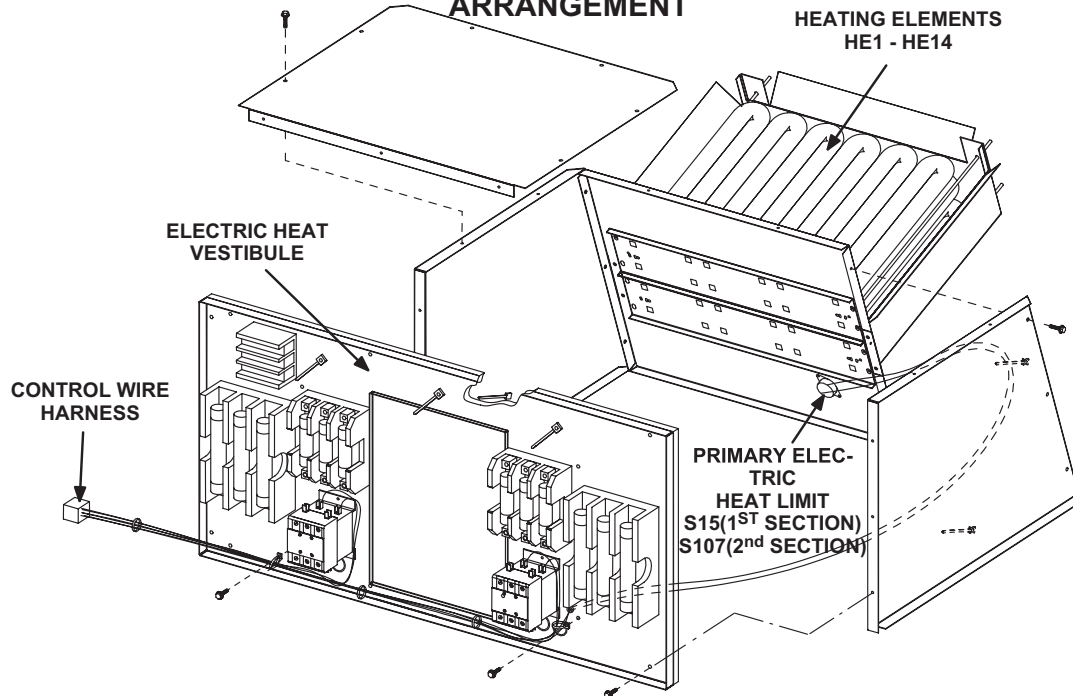


FIGURE 28

TABLE 10

ELECTRIC HEAT SECTION FUSE RATING									
EHA QUANTITY & SIZE	VOLTAGES	FUSE (3 each)							
		F3 - 1	F3 - 2	F3 - 3	F3 - 4	F3 - 5	F3 - 6	F3 - 7	F3 - 8
(1) EHA240-7.5 & (1) EHA240S-7.5 (15 kW Total)	208/230V	50 Amp 250V	-----	-----	-----	-----	-----	-----	-----
	460V	25 Amp 600V	-----	-----	-----	-----	-----	-----	-----
	575V	20 Amp 600V	-----	-----	-----	-----	-----	-----	-----
(1) EHA360-15 & (1) EHA360S-15 (30 kW Total) or (1) EHA156-15 & (1) EHA156S-15	208/230V	60 Amp 250V	60 Amp 250V	-----	-----	-----	-----	-----	-----
	460V	50 Amp 600V	-----	-----	-----	-----	-----	-----	-----
	575V	40 Amp 600V	-----	-----	-----	-----	-----	-----	-----
(2) EHA360-22.5 (45 kW Total) or (2) EHA156-22.5	208/230V	50 Amp 250V	-----	-----	25 Amp 250V	50 Amp 250V	-----	-----	25 Amp 250V
	460V	25 Amp 600V	-----	-----	15 Amp 600V	25 Amp 600V	-----	-----	15 Amp 600V
	575V	20 Amp 600V	-----	-----	10 Amp 600V	20 Amp 600V	-----	-----	10 Amp 600V
(2) EHA150-30 (60 kW Total) or (2) EHA156-30	208/230V	50 Amp 250V	-----	-----	50 Amp 250V	50 Amp 250V	-----	-----	50 Amp 250V
	460V	25 Amp 600V	-----	-----	25 Amp 600V	25 Amp 600V	-----	-----	25 Amp 600V
	575V	20 Amp 600V	-----	-----	20 Amp 600V	20 Amp 600V	-----	-----	20 Amp 600V
(2) EHA360-45 (90 kW Total)	208/230V	50 Amp 250V	-----	60 Amp 250V	60 Amp 250V	50 Amp 250V	-----	60 Amp 250V	60 Amp 250V
	460V	25 Amp 600V	-----	-----	50 Amp 600V	25 Amp 600V	-----	-----	50 Amp 600V
	575V	20 Amp 600V	-----	-----	40 Amp 600V	20 Amp 600V	-----	-----	40 Amp 600V

II-CHARGING

A-Refrigerant Charge and Check - All-Aluminum Coil

WARNING-Do not exceed nameplate charge under any condition.

This unit is factory charged and should require no further adjustment. If the system requires additional refrigerant, reclaim the charge, evacuate the system, and add required nameplate charge.

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 unit is earth grounded 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 unit.

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.

- 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
- 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.

NOTE – System charging is not recommended below 60°F (15°C). In temperatures below 60°F (15°C), the charge must be weighed into the system.

If weighing facilities are not available, or to check the charge, use the following procedure:

- 1 - Make sure outdoor coil is clean. Attach gauge manifolds and operate unit at full CFM in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.
- 2 - Compare the normal operating pressures to the pressures obtained from the gauges. Check unit components if there are significant differences.
- 3 - Measure the outdoor ambient temperature and the suction pressure. Refer to the charging curve to determine a target liquid temperature.

NOTE – Pressures are listed for sea level applications.

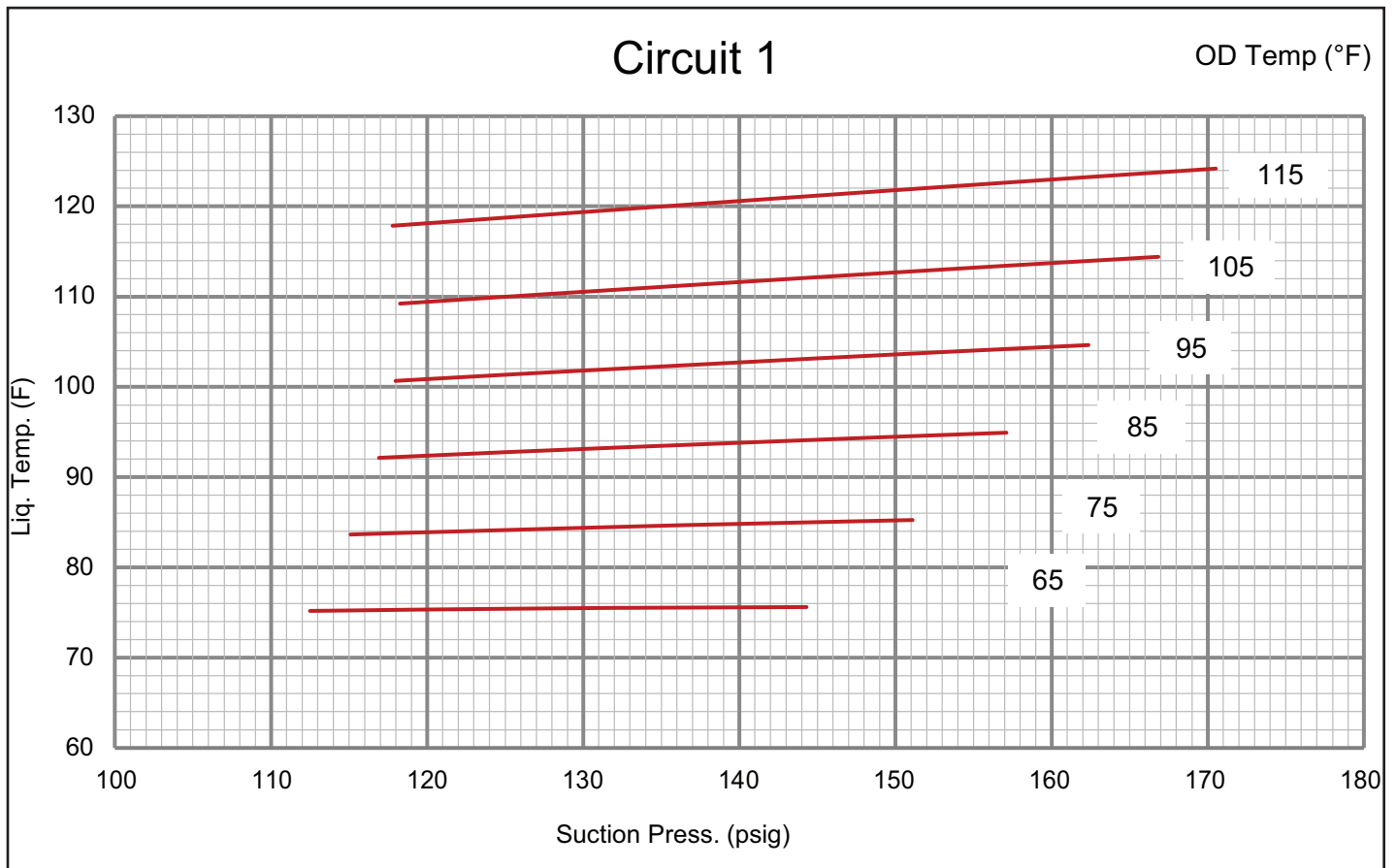
- 1 - Use the same thermometer to accurately measure the liquid temperature (in the outdoor section).
 - If measured liquid temperature is higher than the target liquid temperature, add refrigerant to the system.
 - If measured liquid temperature is lower than the target liquid temperature, recover some refrigerant from the system..
- 2 - Add or remove charge in increments. Allow the system to stabilize each time refrigerant is added or removed.
- 3 - Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.
- 4 - Example: 156 model, no reheat - 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

TABLE 11

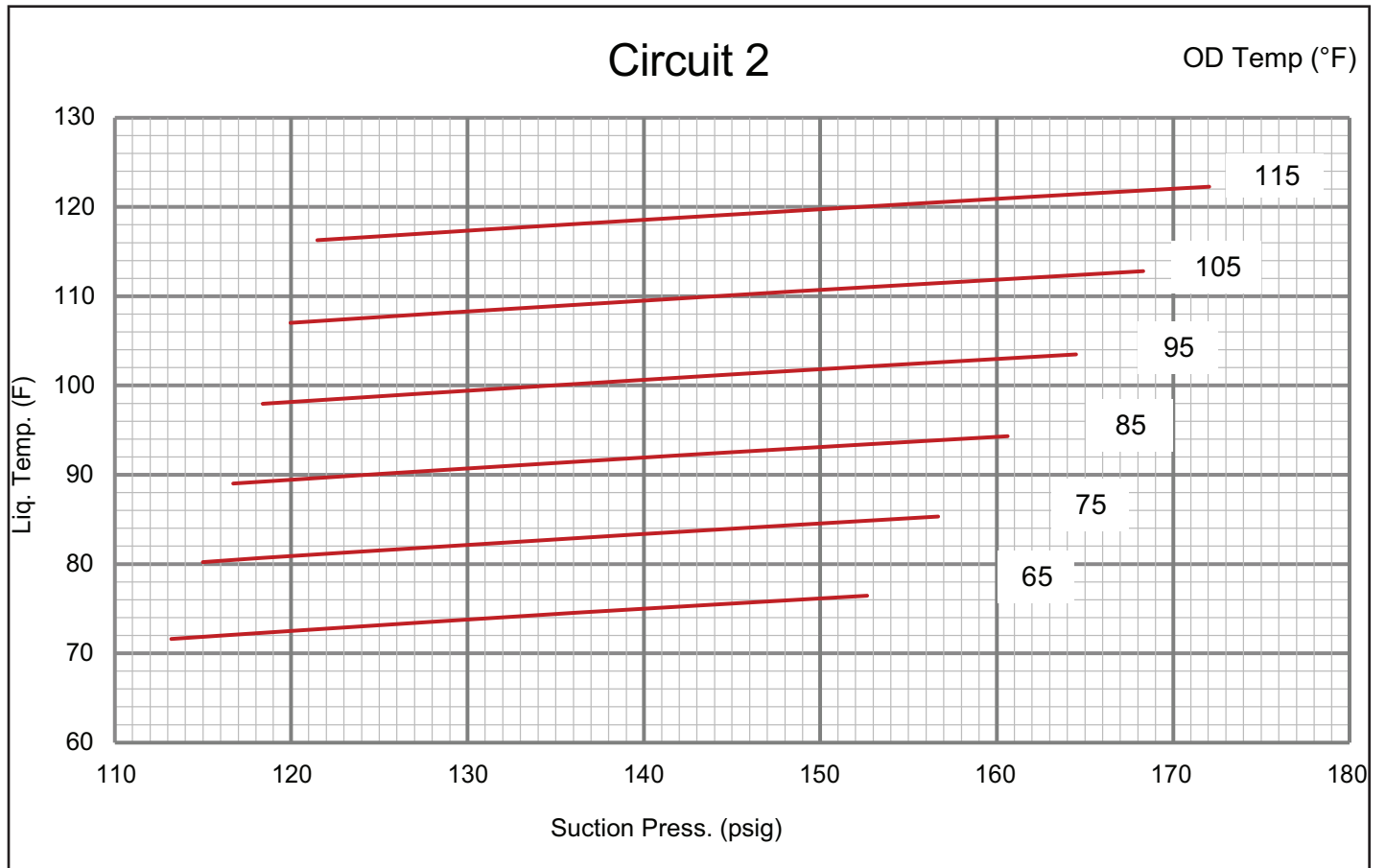
LGX/LCX 180 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM ID & OD COIL - 581450-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	112	222	115	256	117	296	118	342	118	394	118	452
	119	223	122	258	125	298	127	345	128	397	128	456
	132	228	137	263	141	305	145	352	147	405	149	465
	144	234	151	270	157	313	162	361	167	416	171	476
Circuit 2	113	233	115	267	117	306	118	351	120	401	121	457
	121	236	123	269	125	309	127	354	129	404	131	461
	136	243	139	277	142	317	145	362	148	413	151	469
	153	253	157	287	161	327	165	372	168	423	172	480
Circuit 3	103	239	105	274	107	315	109	360	111	412	112	468
	111	242	113	278	115	319	117	365	119	416	122	473
	128	251	131	287	133	328	136	375	138	427	141	485
	147	261	150	298	153	340	156	388	159	441	162	499

LGX/LCX 180 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM ID & OD COIL - 581447-01



LGX/LCX 180 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM ID & OD COIL - 581447-01



LGX/LCX 180 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM ID & OD COIL - 581447-01

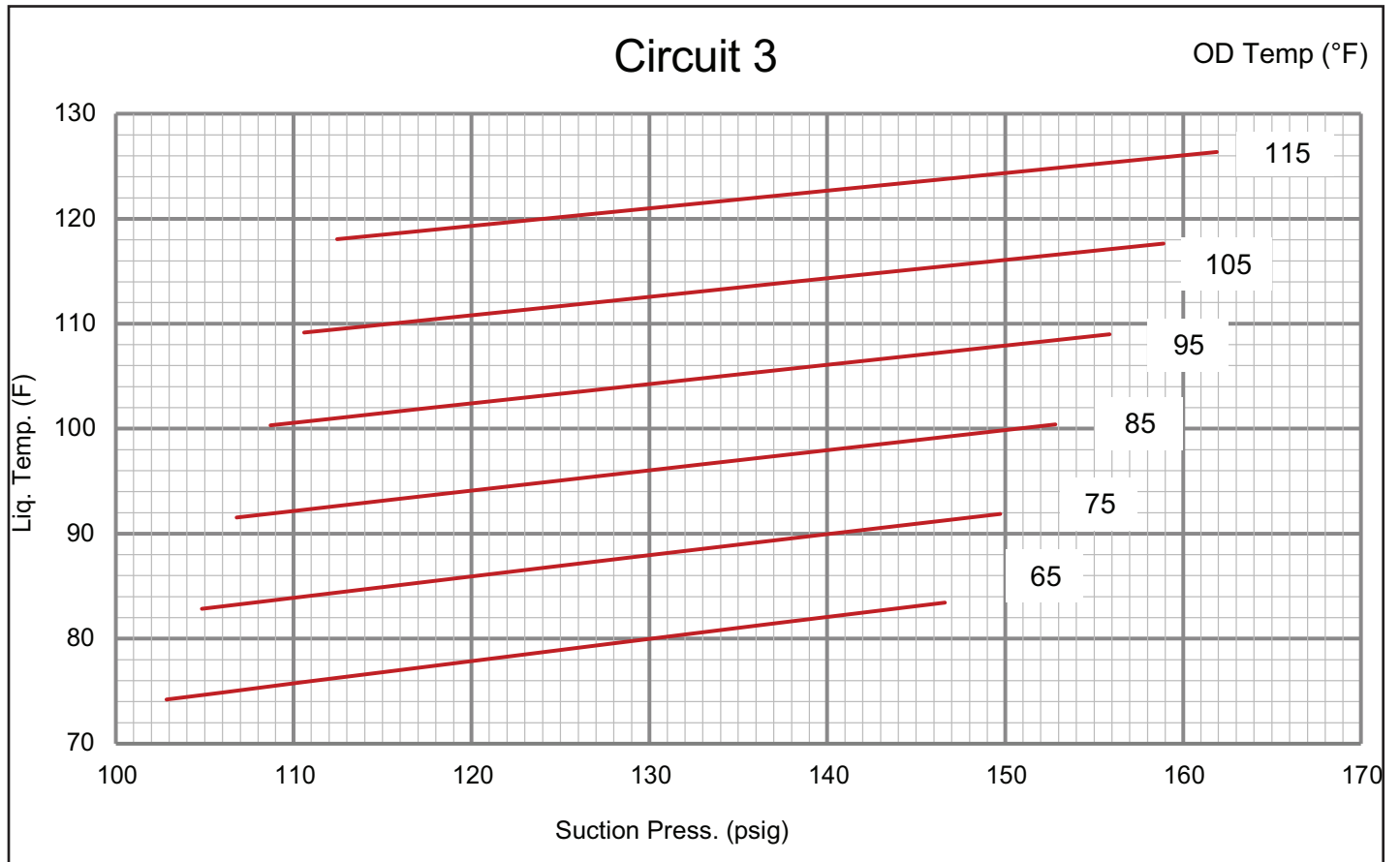
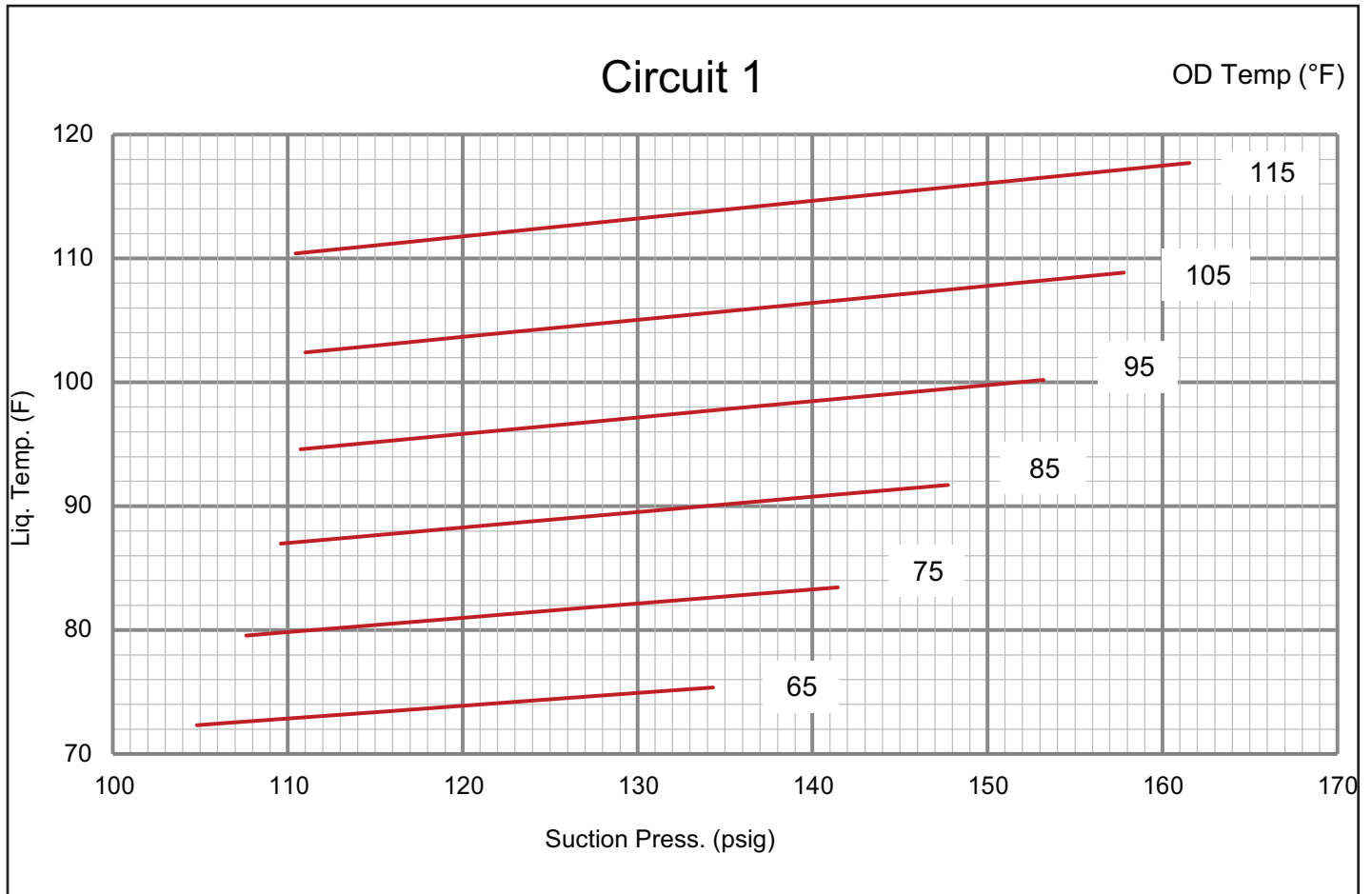


TABLE 12

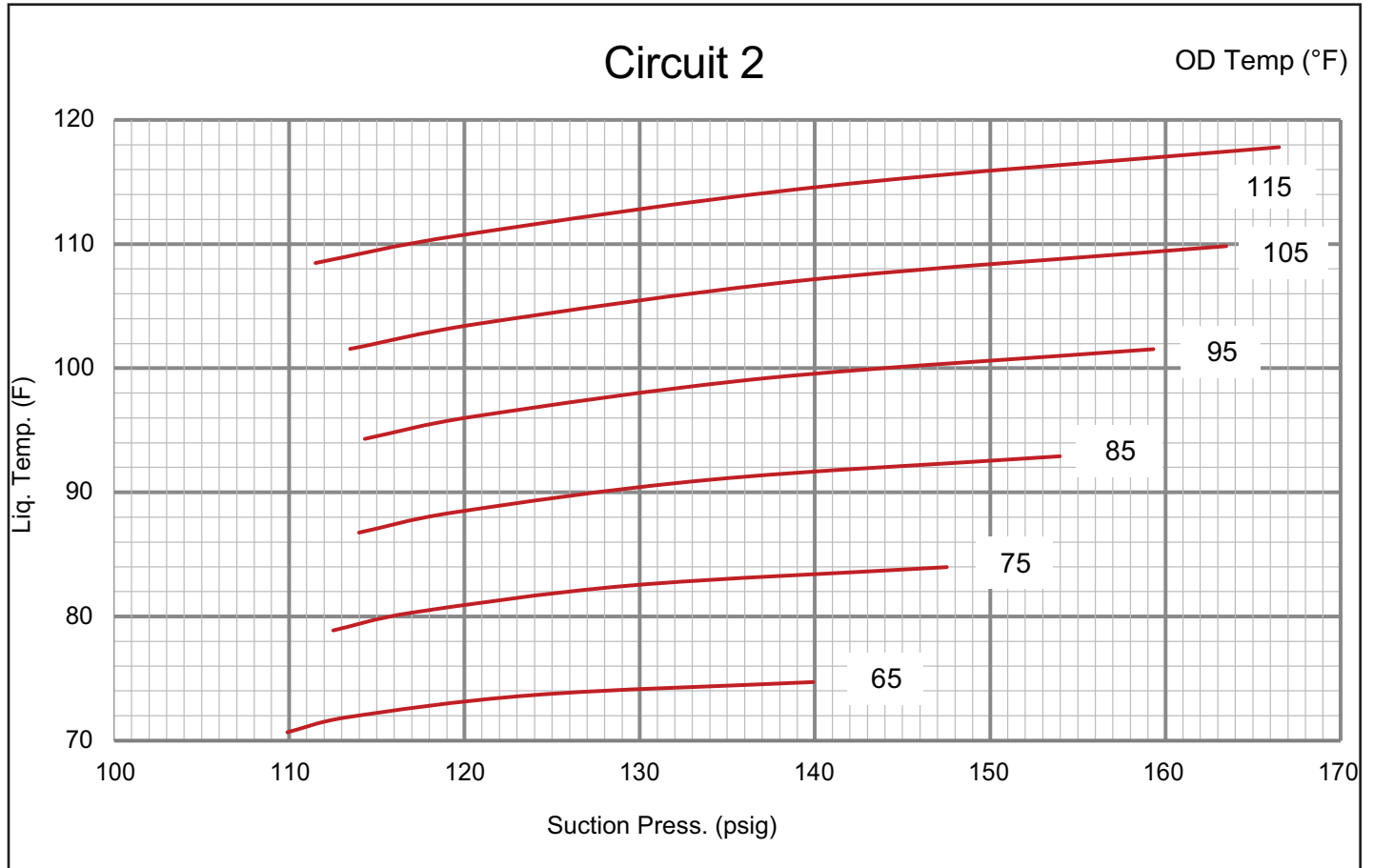
LGX/LCX 210 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM ID & OD COIL - 581451-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	105	230	108	268	110	310	111	356	111	406	110	459
	110	234	114	273	117	315	119	361	120	411	120	465
	122	243	127	282	132	325	136	371	138	422	140	476
	134	252	141	291	148	334	153	381	158	432	162	487
Circuit 2	110	232	113	269	114	310	114	356	113	406	112	461
	113	237	117	273	119	313	121	358	121	408	120	462
	124	253	130	287	134	326	137	369	139	417	141	470
	140	277	148	309	154	346	159	388	163	434	166	486
Circuit 3	90	239	92	277	94	319	96	366	99	417	101	473
	97	245	100	283	102	325	104	372	107	423	109	479
	113	257	116	295	119	337	122	384	124	436	127	492
	131	270	134	308	137	350	141	398	144	449	147	506

LGX/LCX 210 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM ID & OD COIL - 581448-01



LGX/LCX 210 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM ID & OD COIL - 581448-01



LGX/LCX 210 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM ID & OD COIL - 581448-01

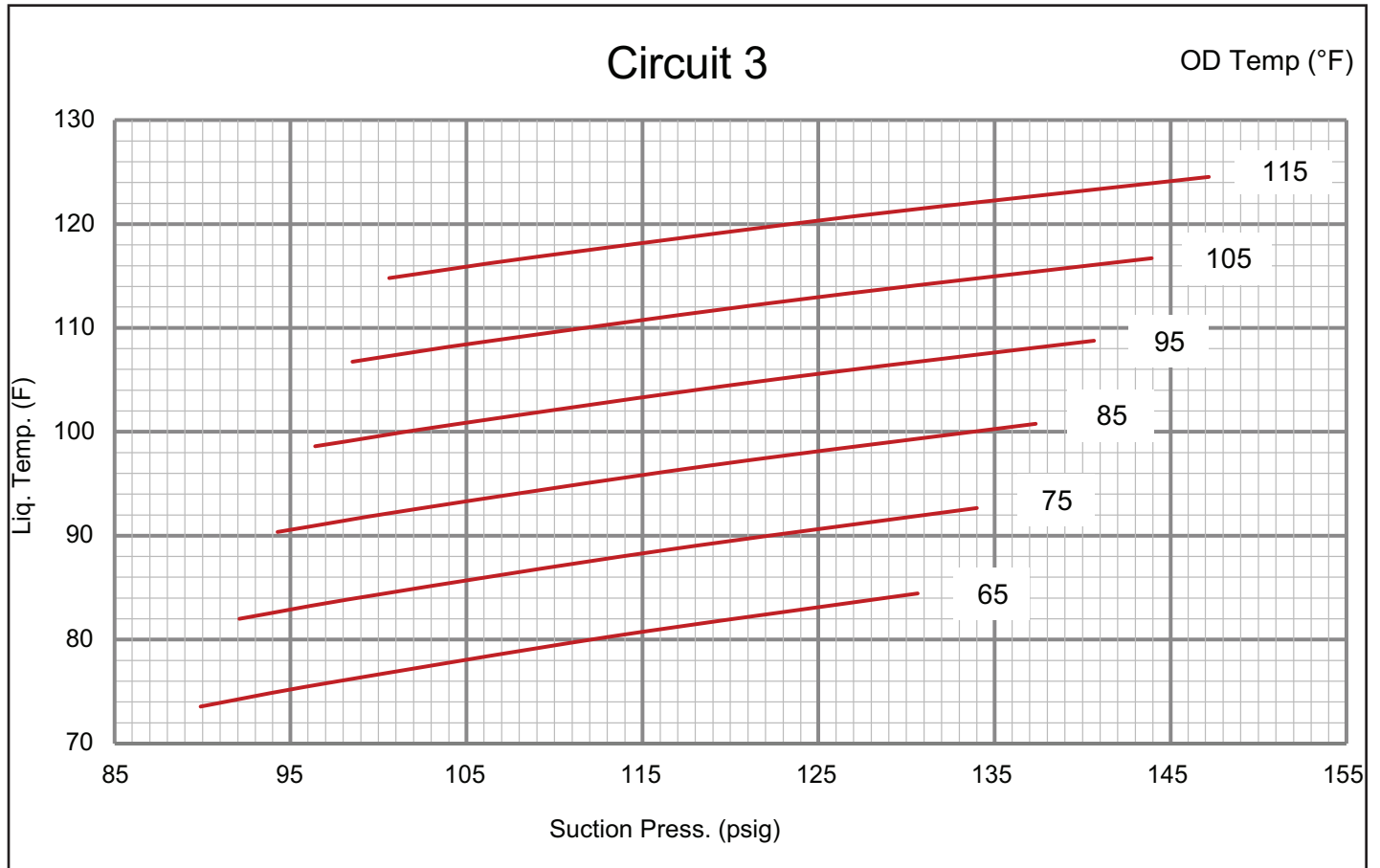
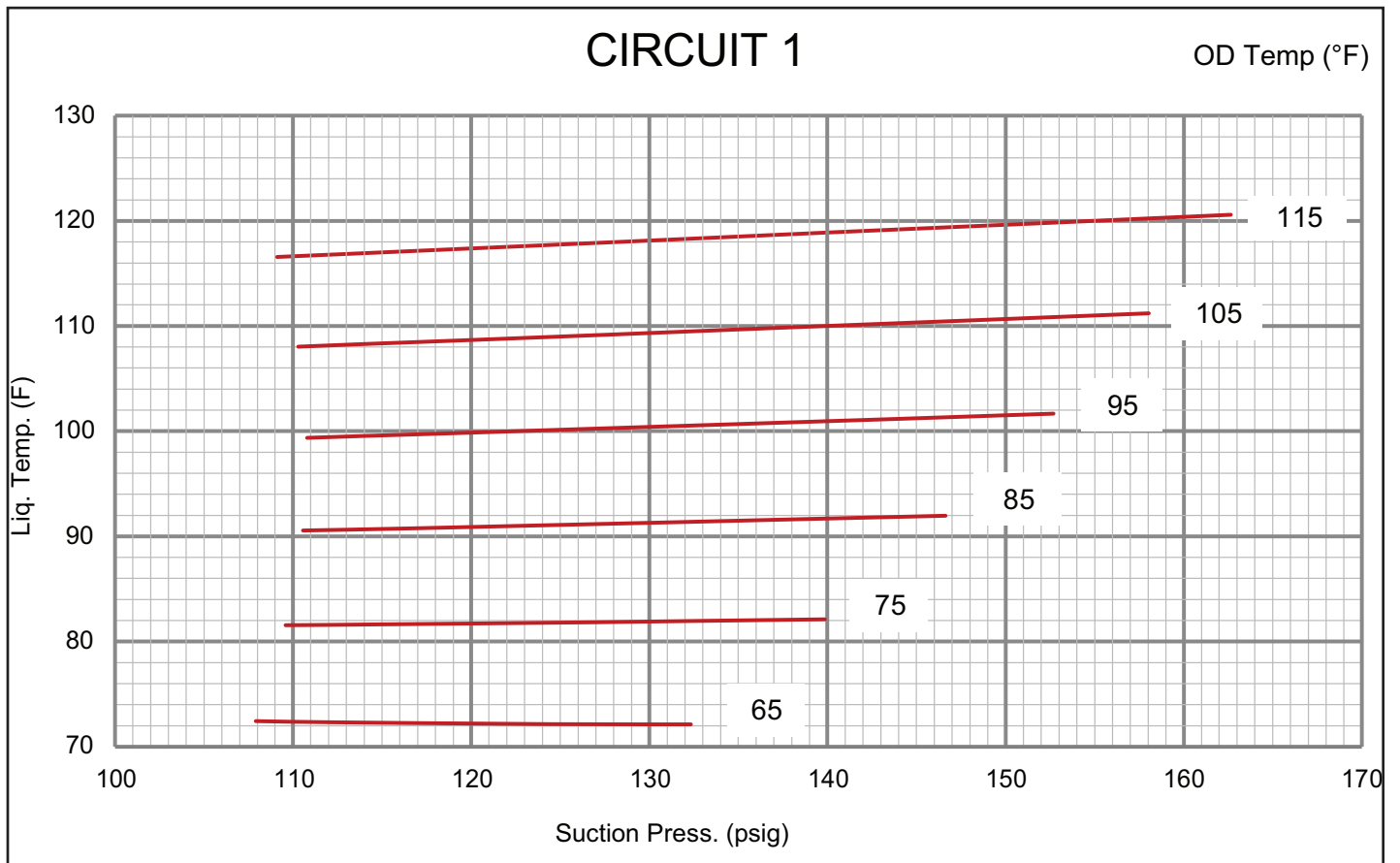


TABLE 13

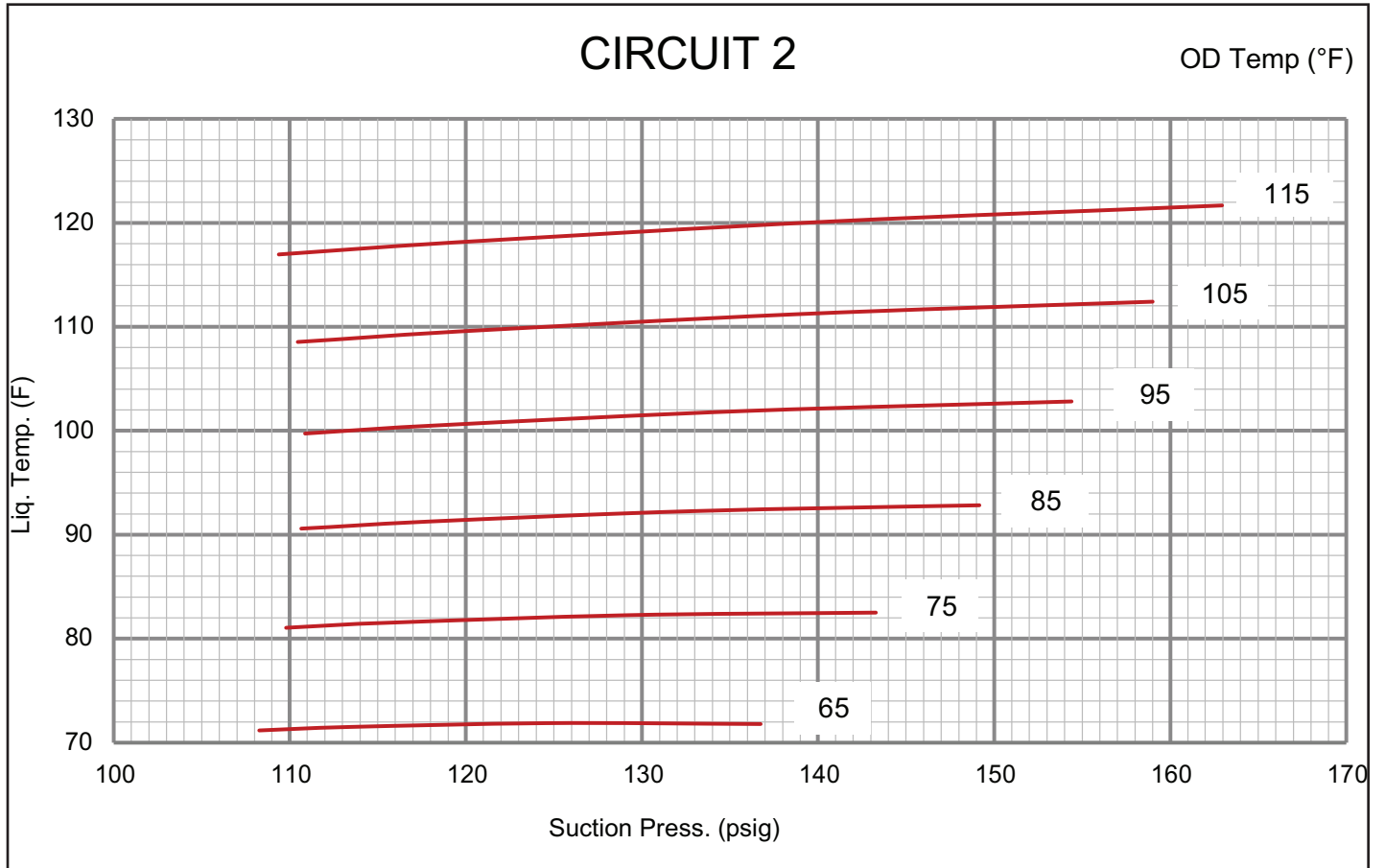
LGX/LCX 240 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM ID & OD COIL - 581452-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	108	226	110	264	111	305	111	350	110	400	109	453
	112	228	115	266	117	308	119	354	119	404	119	458
	122	231	127	270	131	313	135	360	138	411	140	467
	132	235	140	275	147	319	153	367	158	419	163	476
Circuit 2	108	234	110	271	111	312	111	357	110	405	109	458
	113	235	116	273	118	314	119	360	120	410	120	463
	125	239	129	278	133	321	136	368	139	419	141	473
	137	244	143	284	149	328	154	376	159	429	163	485
Circuit 3	91	237	93	273	94	314	96	358	97	407	99	460
	96	240	98	277	100	318	102	363	105	412	107	466
	106	246	110	284	114	326	117	373	121	424	125	479
	119	253	124	292	130	336	135	384	140	436	145	492

LGX/LCX 240 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM ID & OD COIL - 581449-01



LGX/LCX 240 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM ID & OD COIL - 581449-01



LGX/LCX 240 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM ID & OD COIL - 581449-01

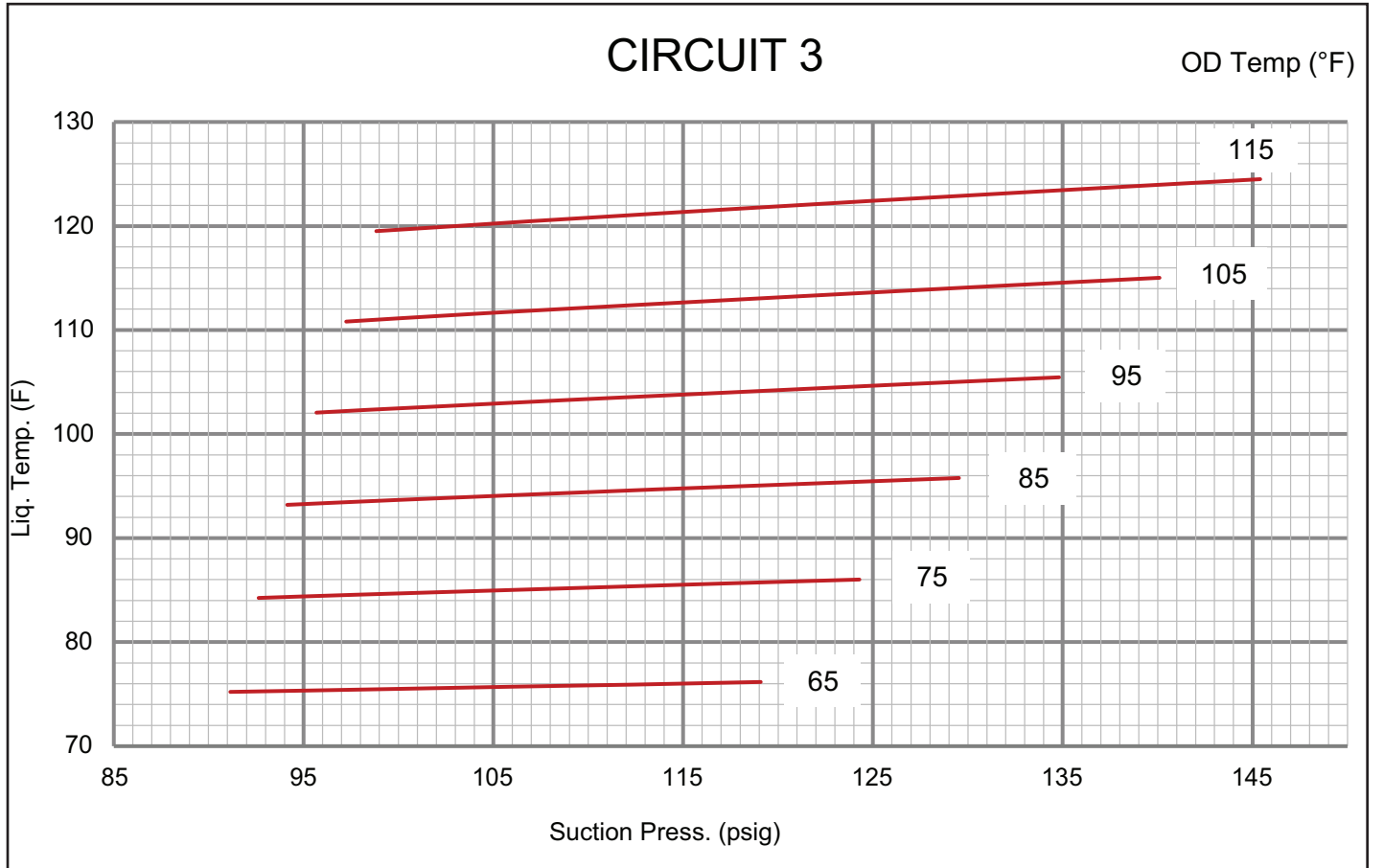
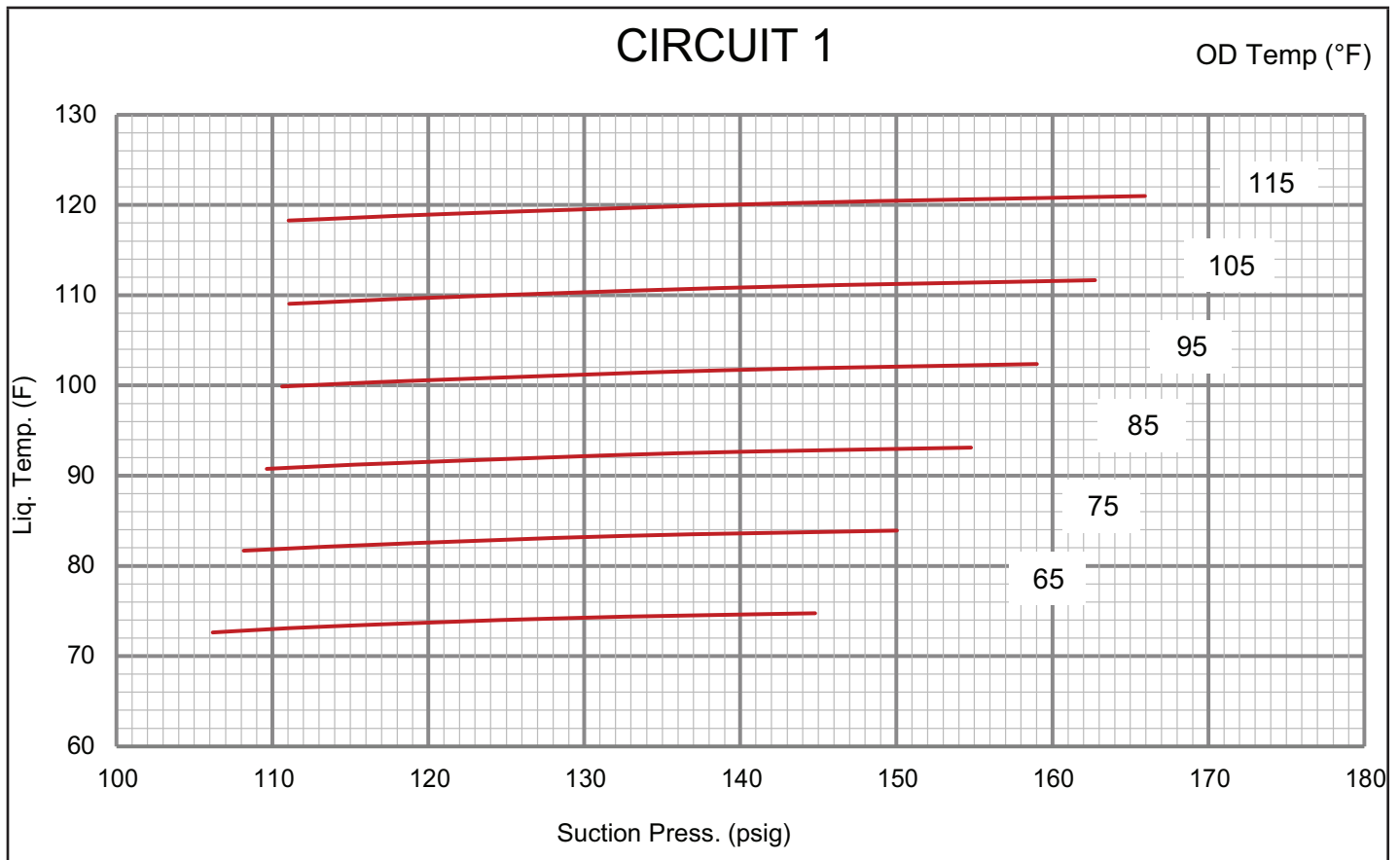


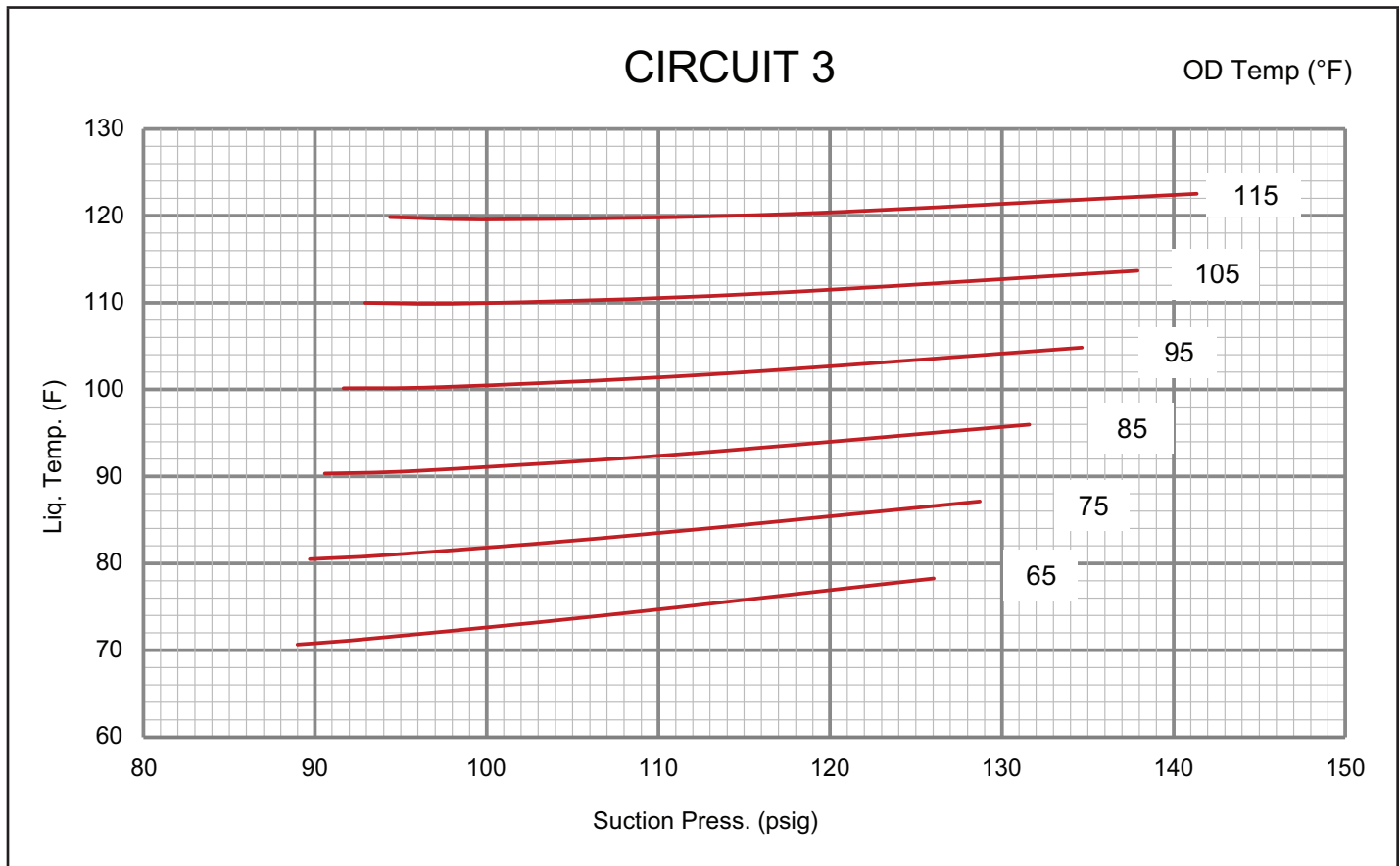
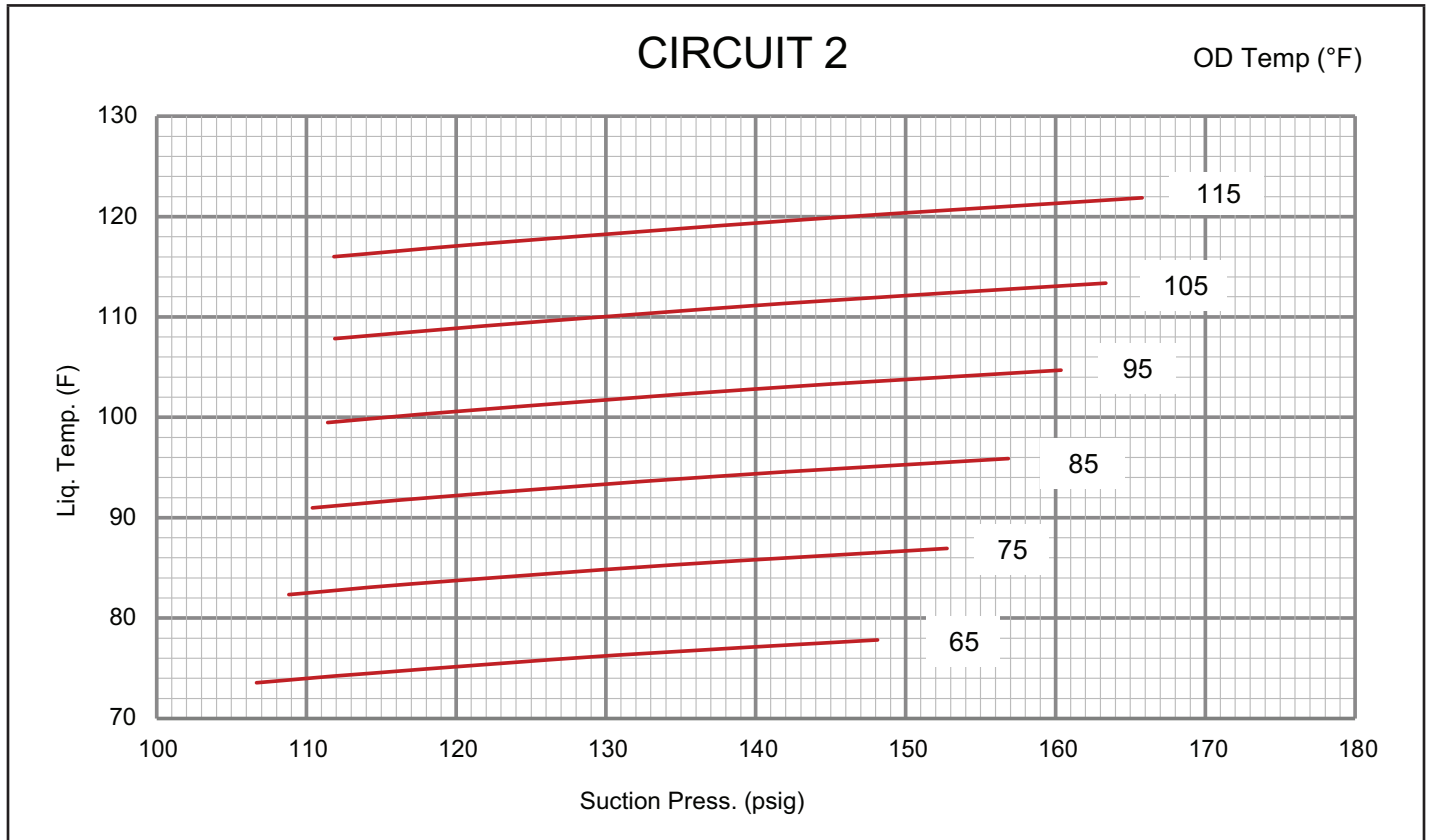
TABLE 14

LGX/LCX 300 NO REHEAT NORMAL OPERATING PRESSURES ALL - ALUMINUM ID & OD COIL - 581454-01

	Outdoor Coil Entering Air Temperature											
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	106	230	108	267	110	309	111	356	111	407	111	463
	113	232	116	270	118	313	120	360	121	413	122	470
	129	238	133	278	136	322	139	371	141	425	143	484
	145	245	150	286	155	332	159	383	163	438	166	499
Circuit 2	107	236	109	273	110	314	111	360	112	411	112	466
	114	240	117	277	119	319	121	366	122	417	122	472
	131	248	134	286	137	329	140	377	142	429	143	486
	148	257	153	296	157	340	160	389	163	442	166	500
Circuit 3	89	238	90	274	91	315	92	361	93	413	94	470
	93	240	95	276	96	318	97	365	99	417	101	475
	107	246	109	284	111	327	113	375	116	428	118	487
	126	255	129	294	132	338	135	387	138	442	141	502
Circuit 4	89	244	90	280	91	321	92	368	93	421	94	479
	94	247	95	284	96	326	98	373	99	426	101	485
	107	256	109	293	111	336	114	385	116	439	119	499
	125	267	128	305	131	350	135	400	138	455	142	516

LGX/LCX 300 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM ID & OD COIL - 581453-01





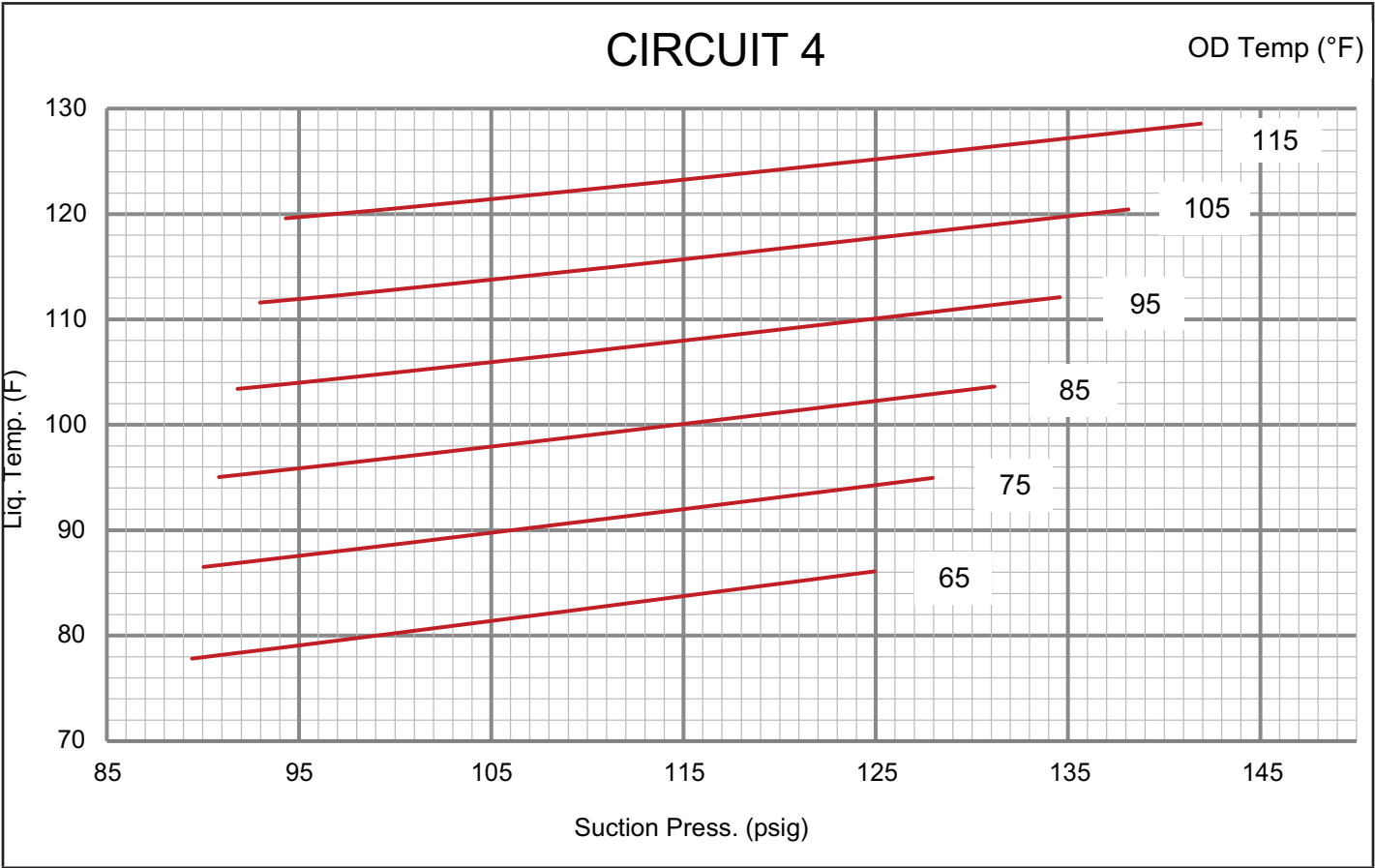
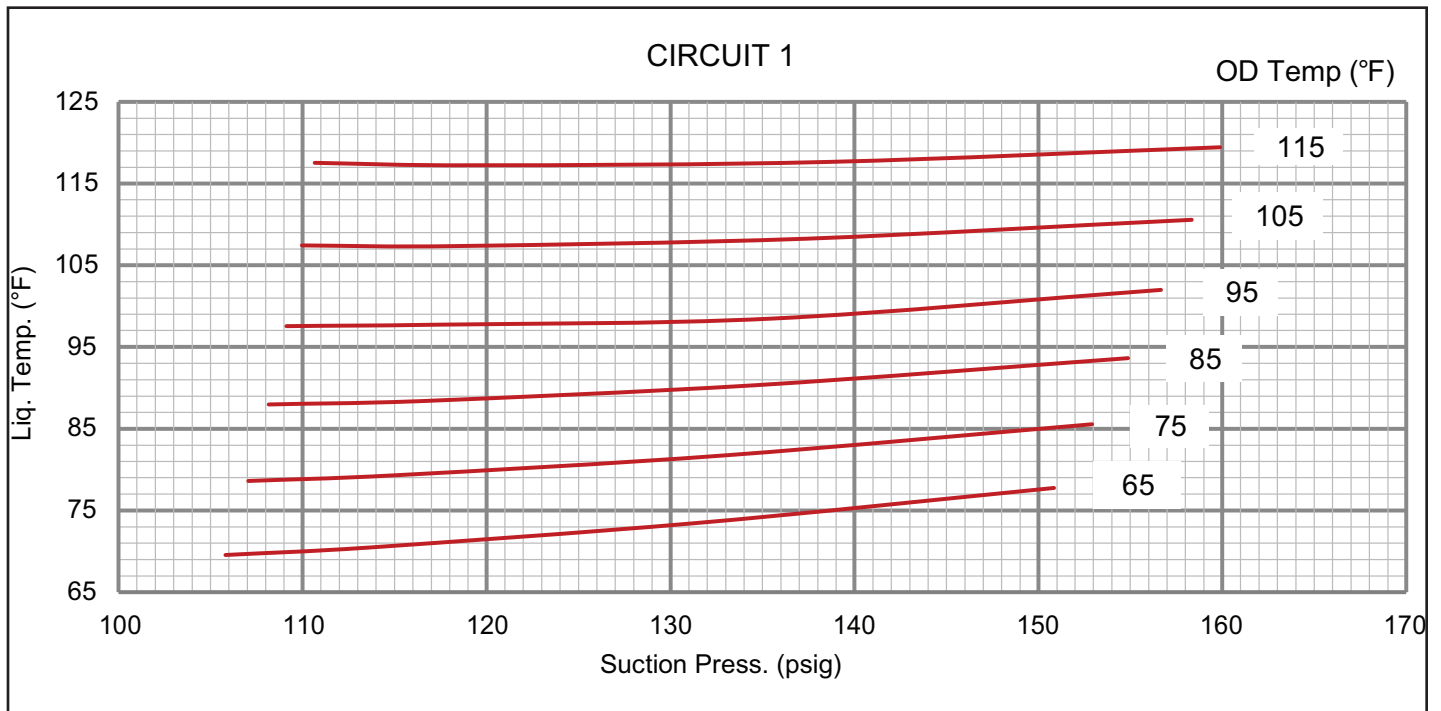


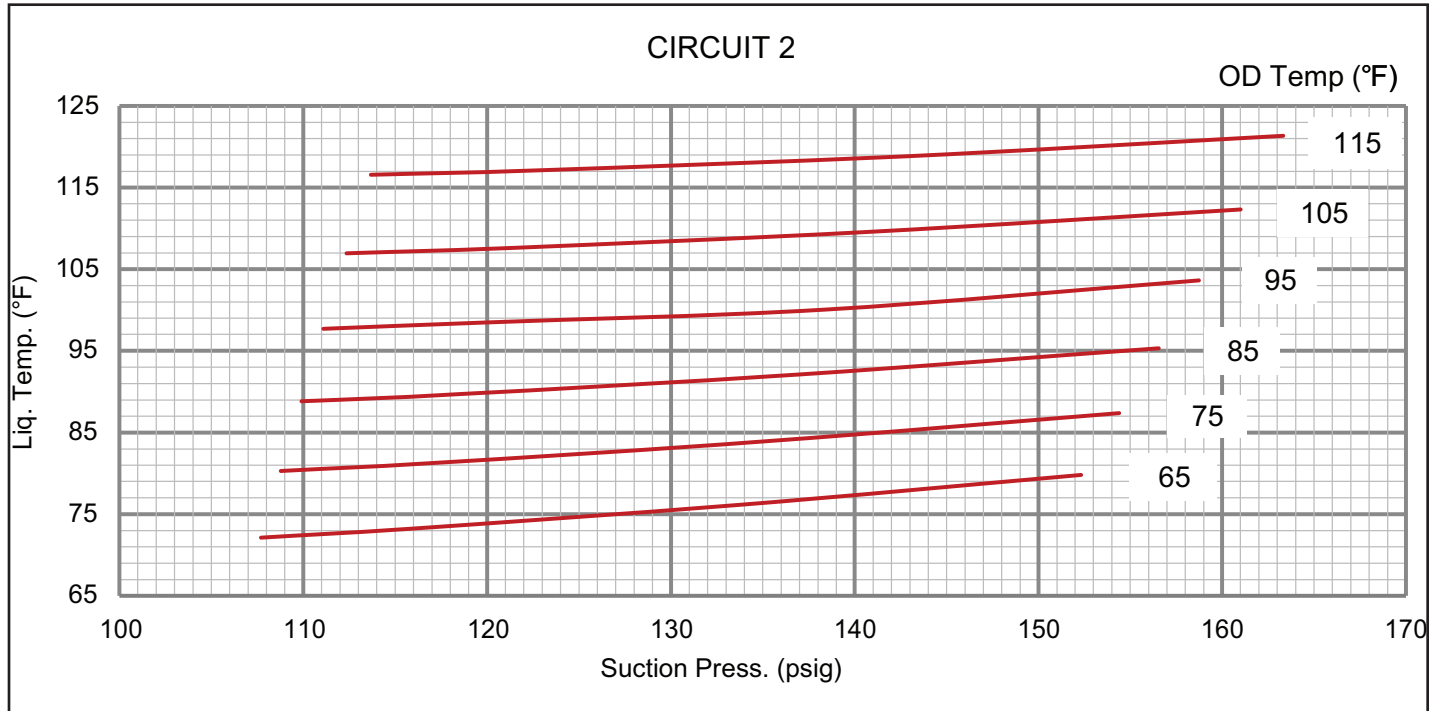
TABLE 15
LGX/LCX 180 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581295-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	106	225	107	261	108	302	109	349	110	401	111	458
	114	226	115	261	116	302	118	348	119	400	119	457
	131	231	133	266	135	306	136	355	137	402	139	458
	151	241	153	275	155	314	157	359	158	408	160	464
Circuit 2	108	231	109	268	110	309	111	355	112	405	114	459
	116	233	117	270	119	311	120	357	121	407	123	461
	134	239	135	276	137	317	138	364	141	412	143	466
	152	248	154	284	157	325	159	371	161	420	163	474
Circuit 3	105	241	106	280	107	323	108	372	109	425	109	483
	114	244	115	282	116	326	117	374	118	427	118	485
	132	251	134	290	135	333	135	384	137	434	138	491
	152	262	154	300	156	343	157	391	158	444	159	501

LGX/LCX 180 REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581296-01



LGX/LCX 180 REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581296-01



LGX/LCX 180 REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581296-01

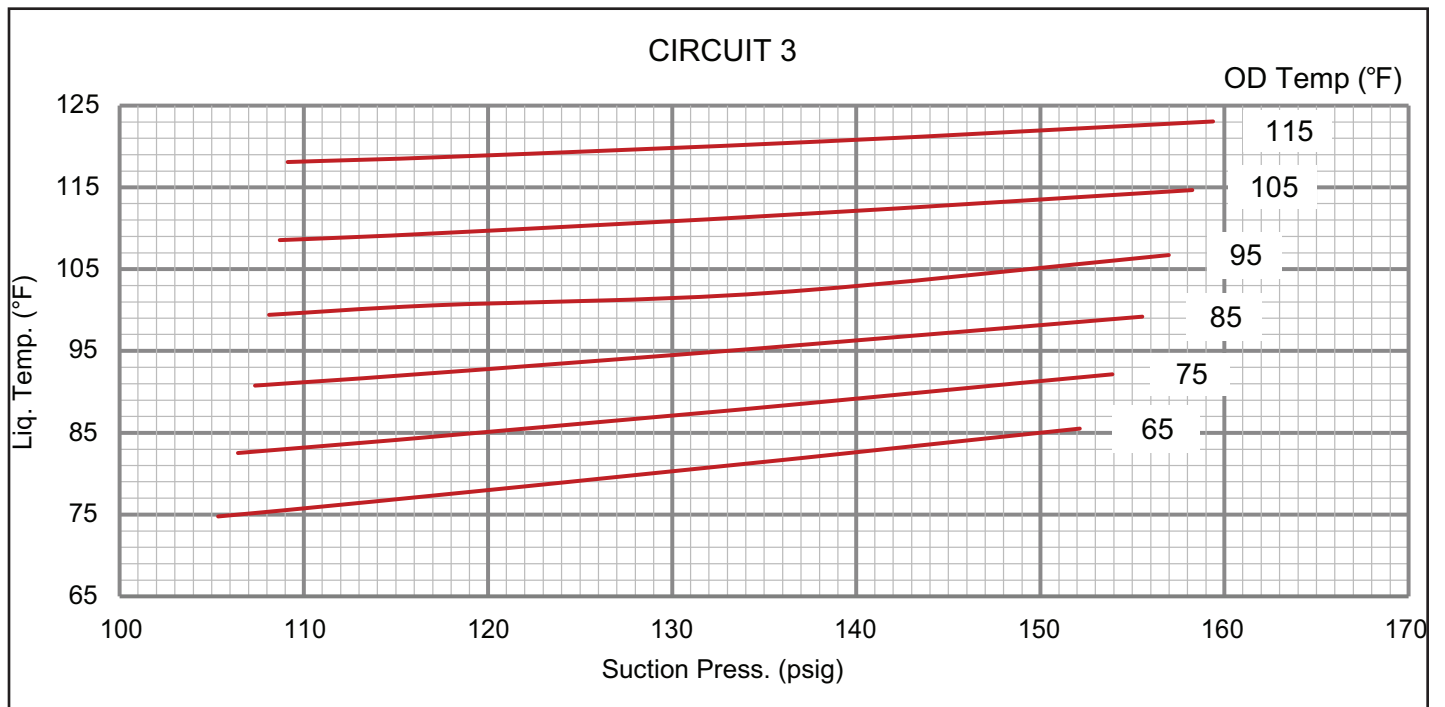
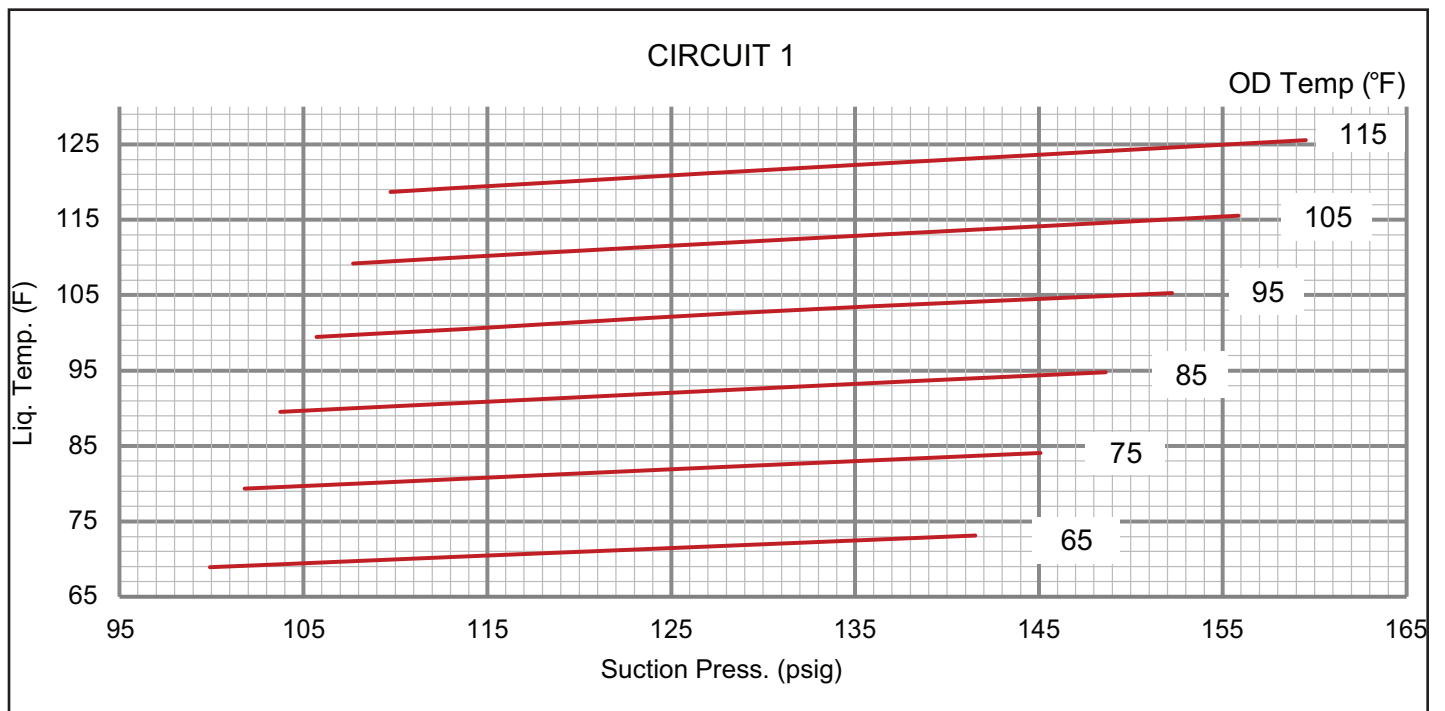


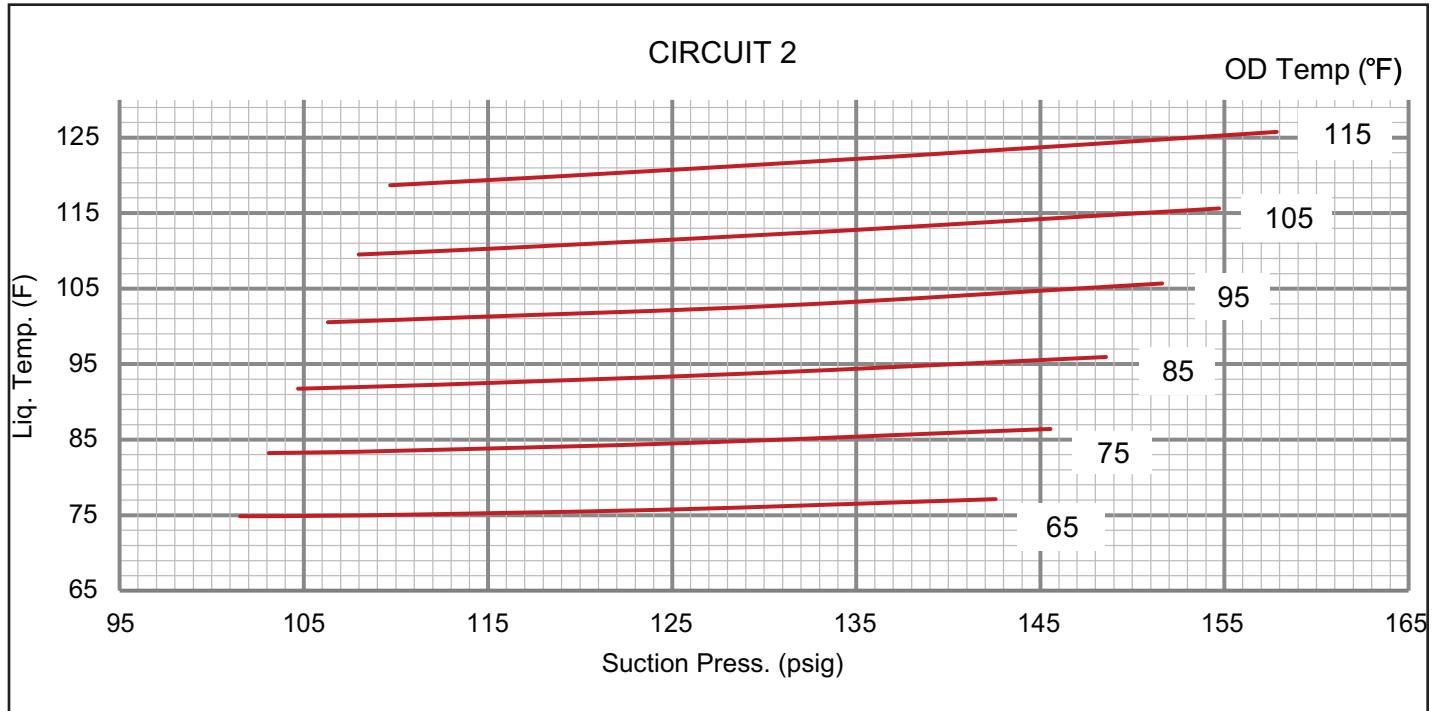
TABLE 16
LGX/LCX 210 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581297-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	100	235	102	274	104	318	106	368	108	423	110	484
	107	237	109	275	112	319	114	368	116	423	118	484
	123	244	126	281	129	324	131	370	135	427	138	487
	142	257	145	294	149	336	152	384	156	437	160	496
Circuit 2	102	237	103	275	105	318	106	367	108	420	110	479
	109	241	110	278	112	322	114	370	116	423	118	482
	124	250	127	288	129	330	131	377	134	432	137	490
	143	262	146	300	149	342	152	390	155	443	158	501
Circuit 3	102	247	104	287	105	333	107	385	109	441	111	503
	110	250	112	290	114	336	116	387	118	443	120	504
	127	260	129	300	132	344	134	392	138	449	141	509
	145	275	148	313	152	357	155	406	159	460	162	519

LGX/LCX 210 REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581298-01



LGX/LCX 210 REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581298-01



LGX/LCX 210 REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581298-01

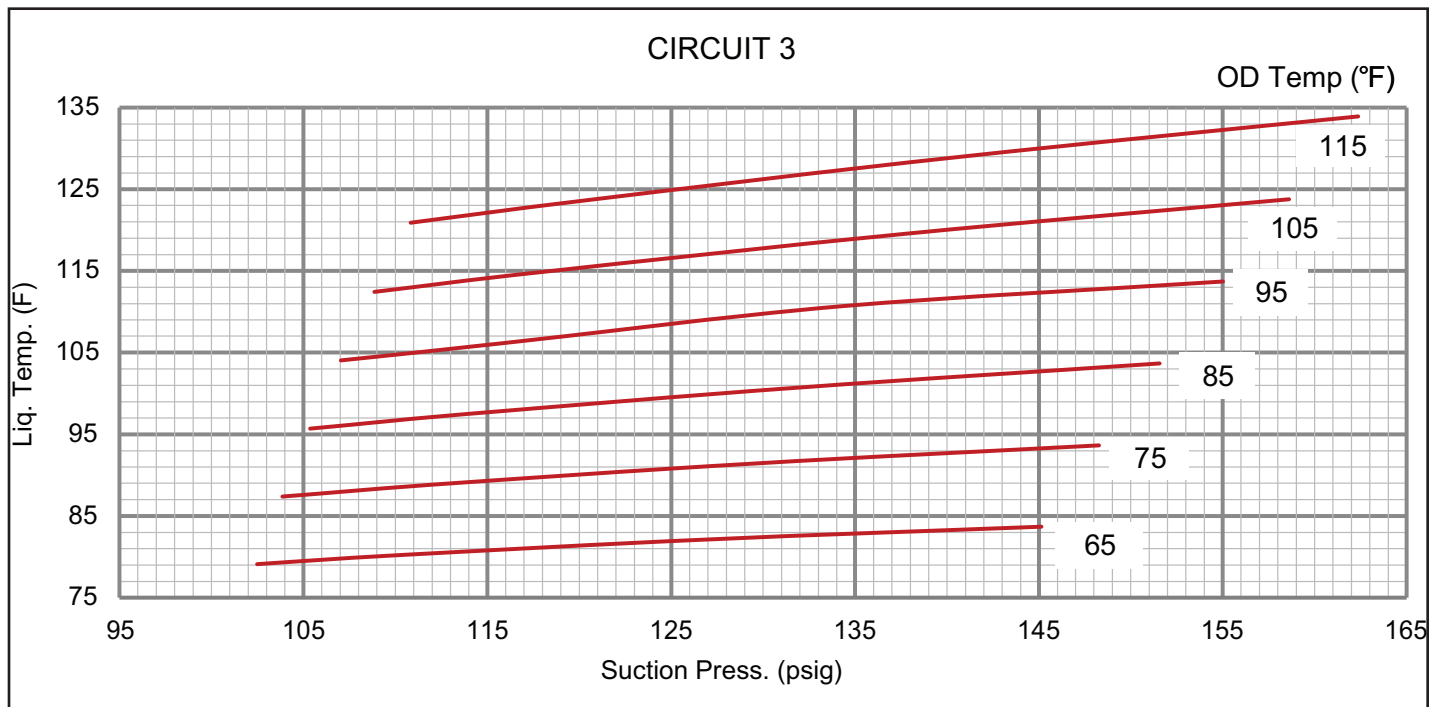
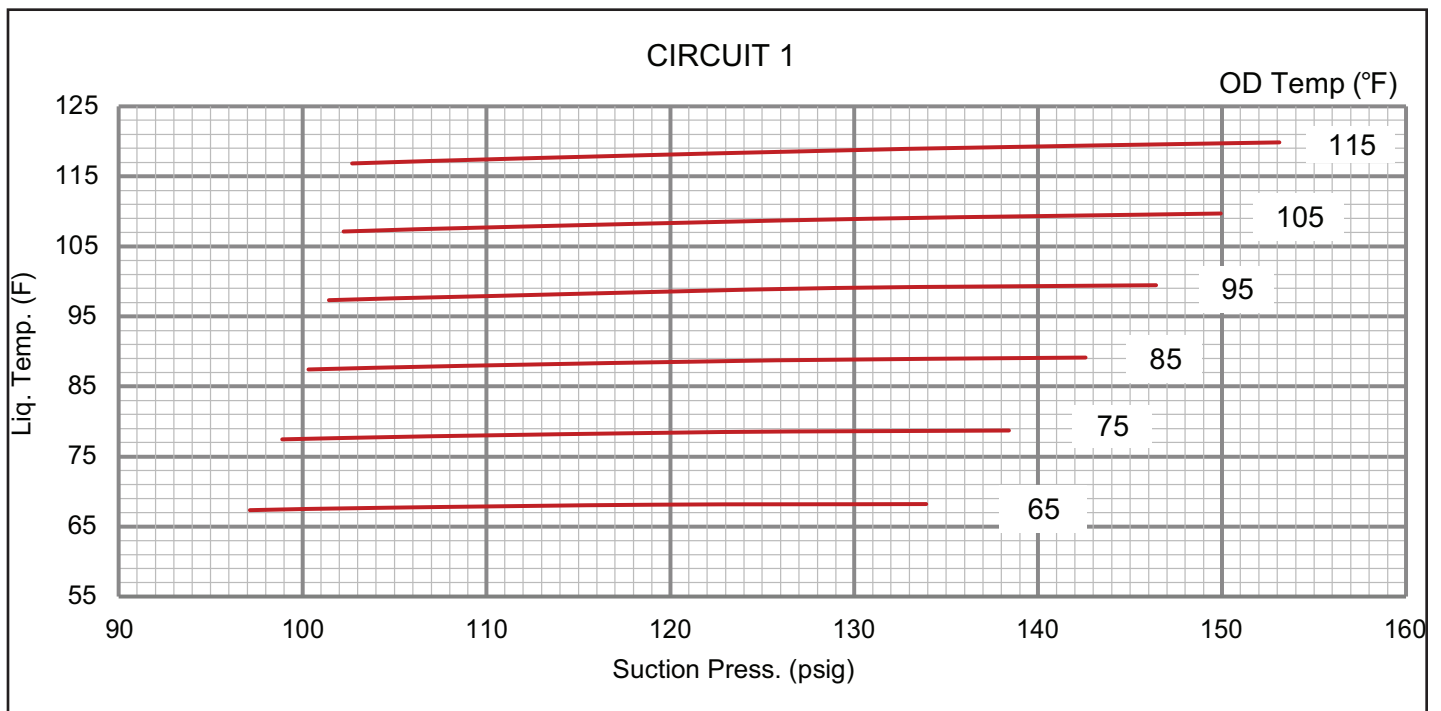


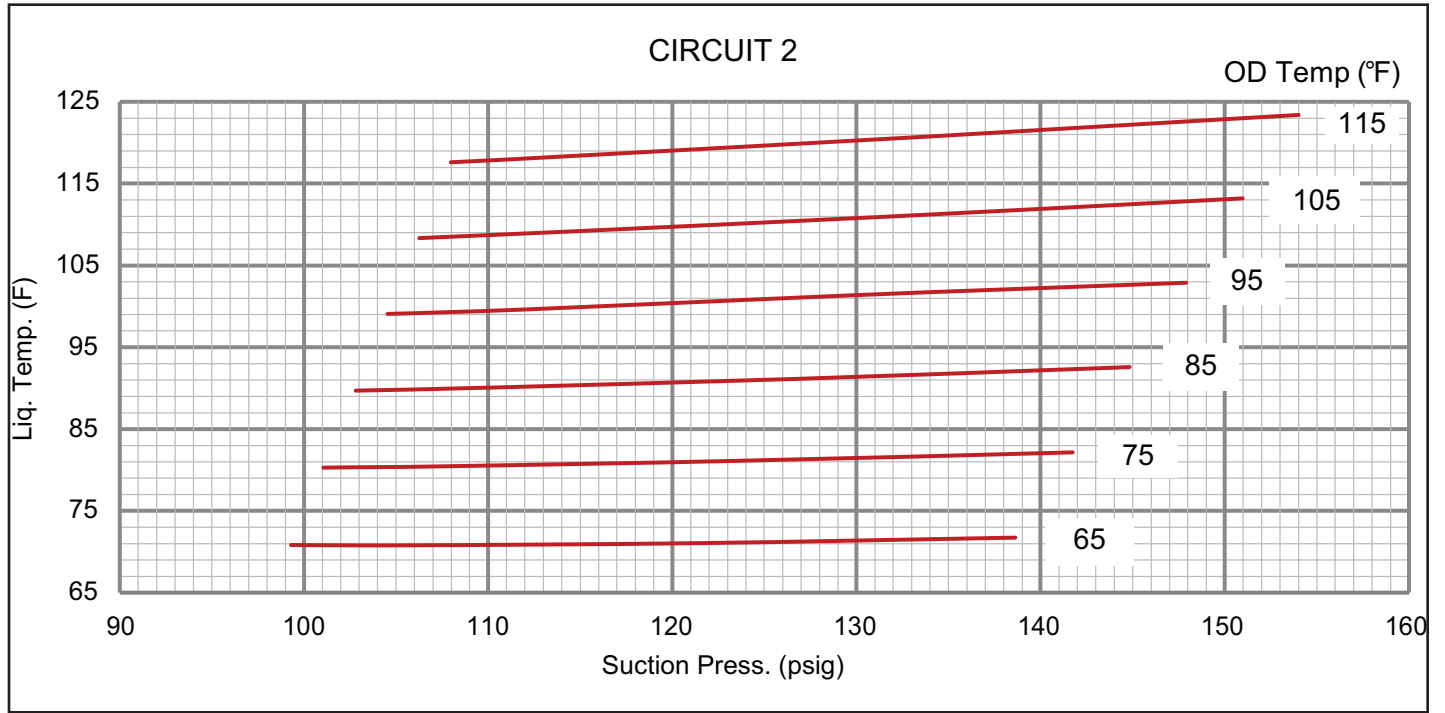
TABLE 17
LGX/LCX 240 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581299-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	97	224	99	261	100	304	101	351	102	404	103	462
	105	228	107	265	109	307	111	354	112	406	113	464
	119	235	123	271	126	313	129	358	131	411	133	468
	134	243	138	278	143	319	146	365	150	416	153	473
Circuit 2	99	229	101	266	103	308	105	355	106	407	108	465
	106	234	108	271	110	313	112	360	114	411	116	468
	121	244	124	280	127	321	129	367	132	419	134	475
	139	252	142	288	145	328	148	374	151	425	154	480
Circuit 3	97	240	99	278	100	322	100	370	101	423	101	481
	104	244	106	282	108	326	109	373	110	426	111	484
	119	254	122	292	125	334	127	381	129	434	131	491
	134	266	138	303	142	345	146	391	149	443	152	499

LGX/LCX 240 REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581300-01



LGX/LCX 240 REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581300-01



LGX/LCX 240 REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581300-01

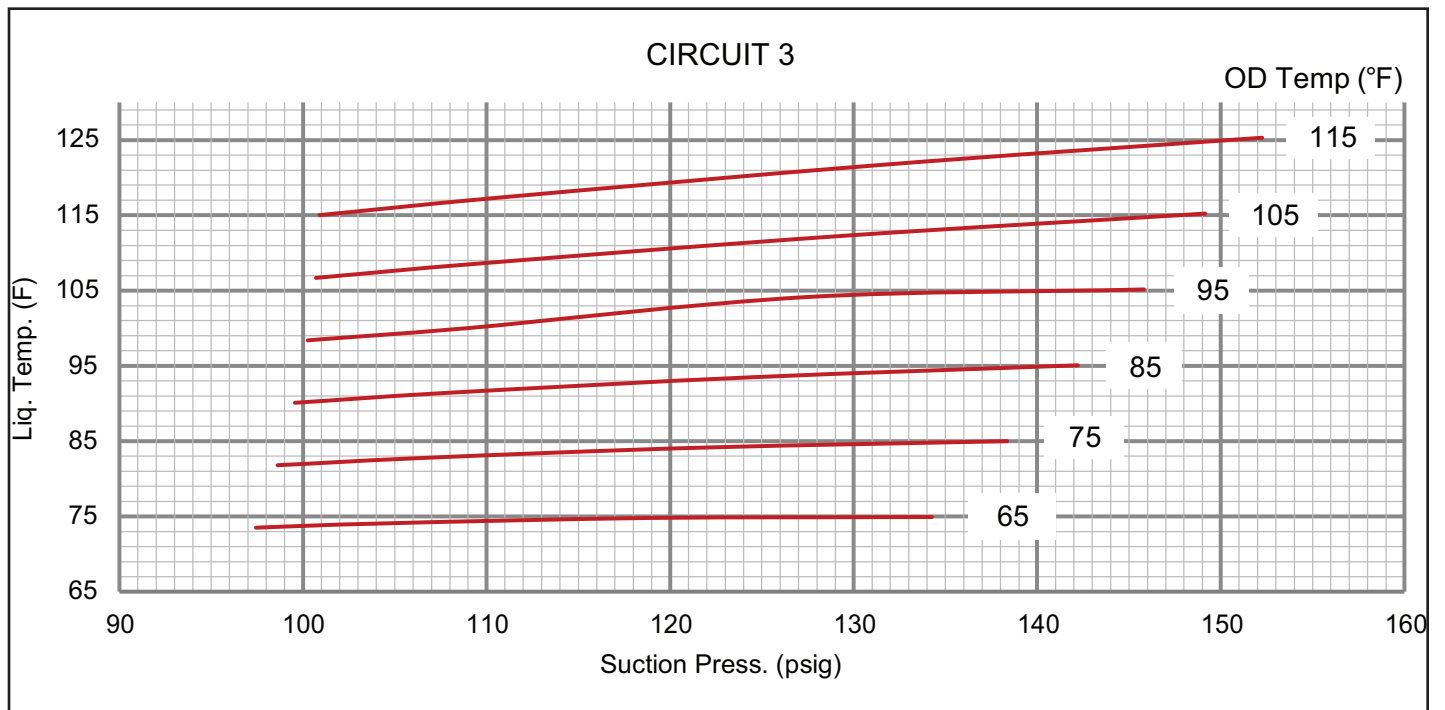
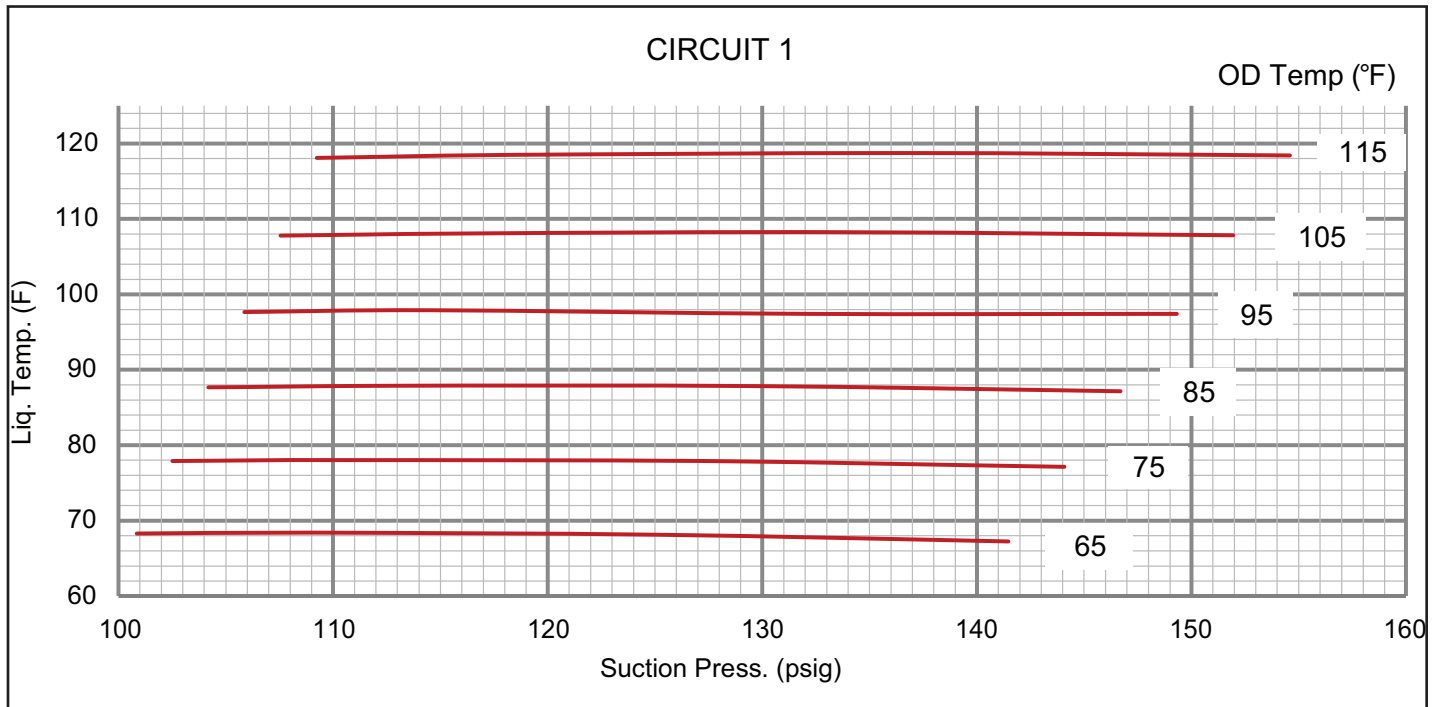


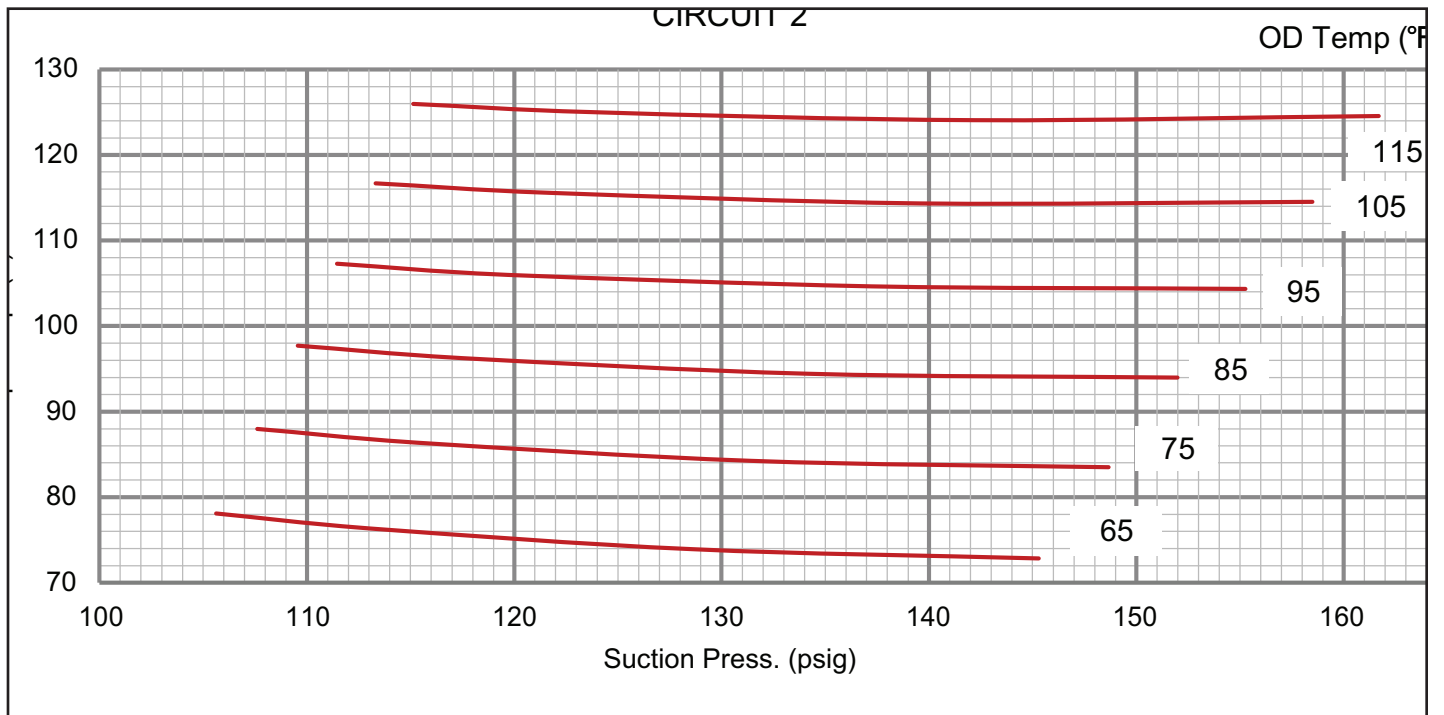
TABLE 18
LGX/LCX 300 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581381-01

Outdoor Coil Entering Air Temperature												
	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	100	233	102	269	104	311	106	358	107	410	109	467
	108	236	110	272	112	314	114	361	116	412	118	469
	123	242	126	278	129	319	132	366	134	417	137	474
	138	248	142	284	146	325	149	371	153	422	156	479
Circuit 2	104	238	106	276	108	319	109	367	111	420	112	477
	111	241	113	280	116	323	118	371	119	423	121	481
	126	249	129	287	132	330	135	378	137	431	139	488
	142	256	146	295	149	338	152	385	155	438	158	495
Circuit 3	80	234	82	272	84	315	86	363	88	417	90	476
	87	236	89	273	91	316	93	364	95	418	97	477
	102	242	104	279	106	321	109	369	111	422	113	481
	120	251	122	288	124	330	127	377	129	430	131	488
Circuit 4	87	234	89	272	91	315	92	361	94	412	95	467
	93	238	96	276	98	319	100	365	102	416	103	471
	106	246	109	285	112	327	115	374	118	425	121	480
	120	255	124	294	128	336	132	383	136	434	139	489

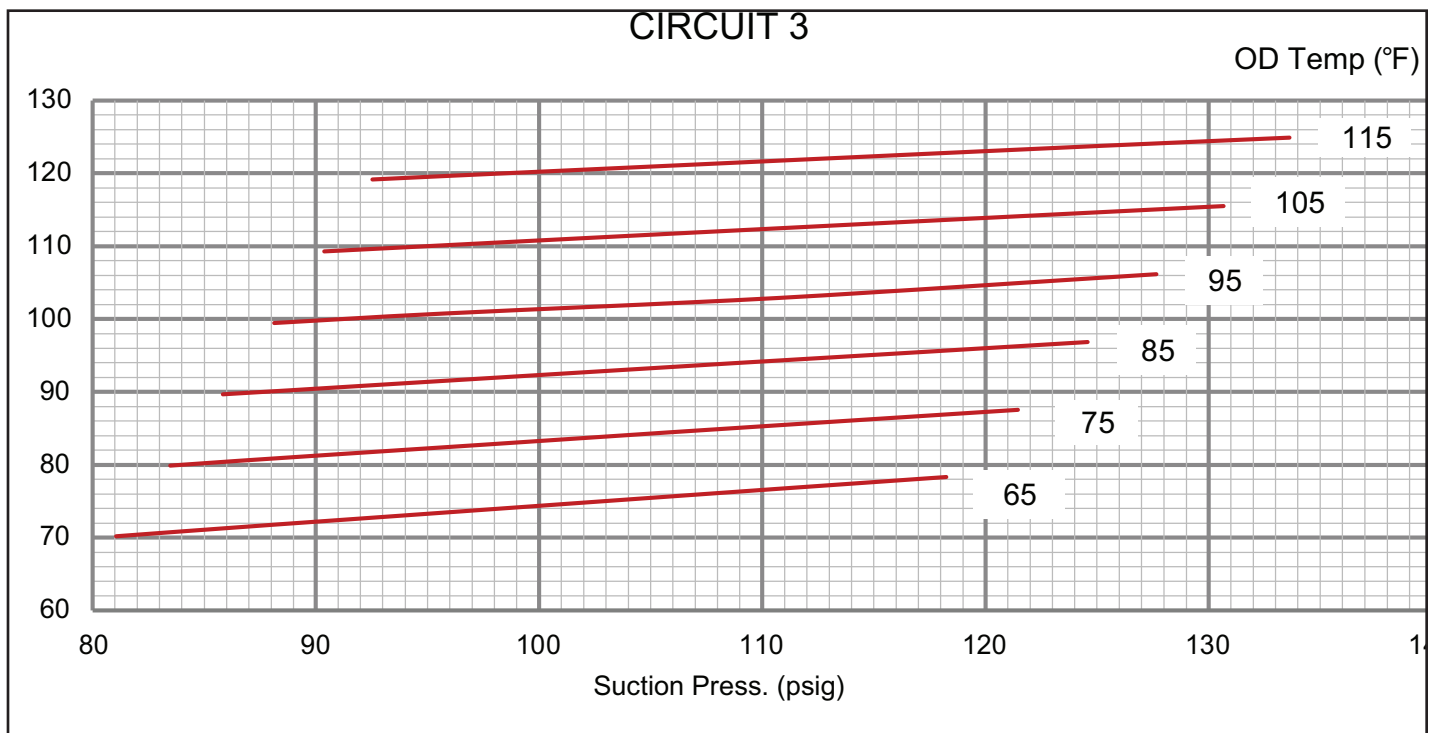
LGX/LCX 300 REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581380-01



LGX/LCX 300 REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581380-01

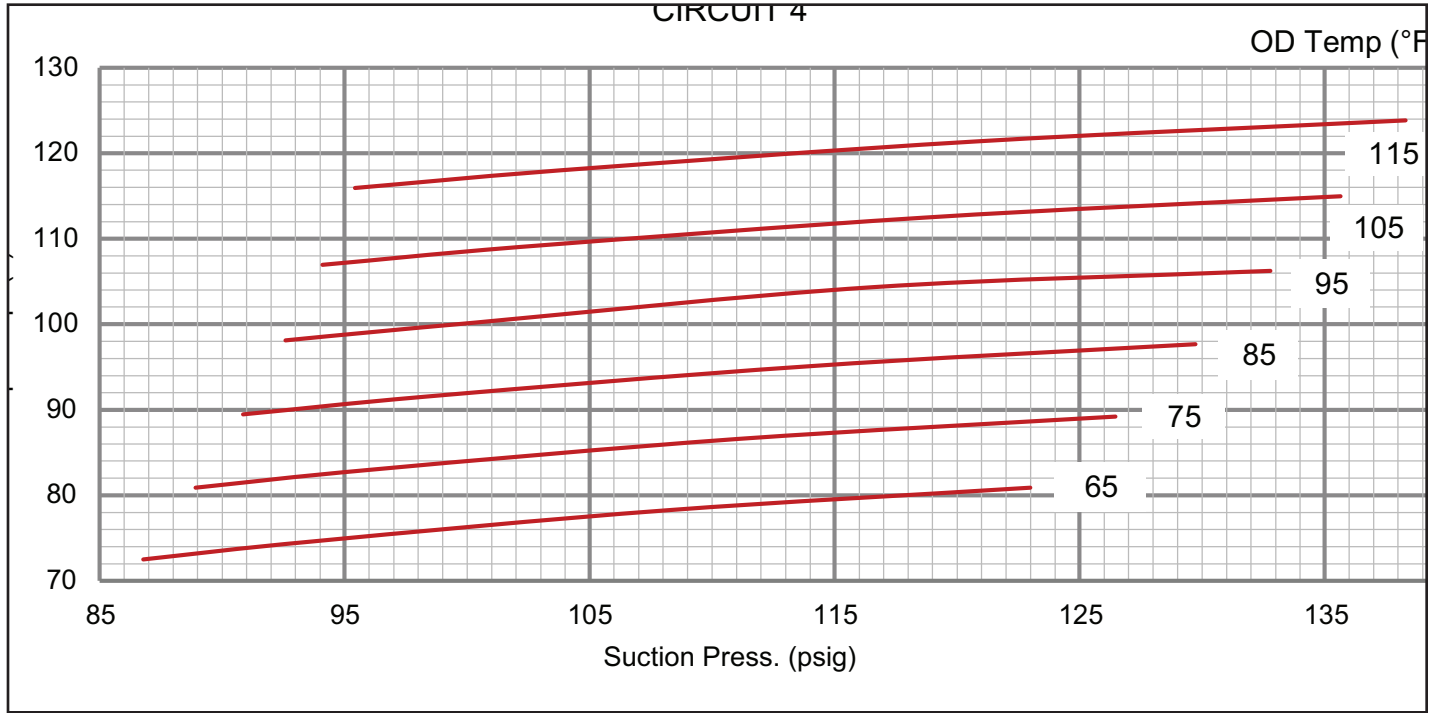


LGX/LCX 300 REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581380-01



LGX/LCX 300 REHEAT CHARGING CURVE CIRCUIT 4 - ALL-ALUMINUM OD COIL - 581380-01

CIRCUIT 4



III-START UP - OPERATION

Refer to startup directions and to the unit wiring diagram when servicing. See unit nameplate for minimum circuit ampacity and maximum fuse size.

A-Cooling Startup See FIGURE 11, FIGURE 12 and FIGURE 13 for unit refrigerant circuits

NOTE-Crankcase heaters must be energized 24 hours before attempting to start compressor. Set thermostat so that there is no demand to prevent compressor from cycling. Apply power to unit.

- 1 - Initiate first and second stage cooling demands according to instructions provided with thermostat.
- 2 - First-stage thermostat demand will energize indoor blower in Low Cooling CFM. Second-stage thermostat demand will energize indoor blower in High Cooling CFM. Both demands energize compressor 1. The remaining compressors will be energized as needed to meet cooling demand.
- 3 - 180, 210, and 240 units contain three refrigerant circuits or systems. 300 units contain four refrigerant circuits or systems.
- 4 - Each refrigerant circuit is separately charged with R454B refrigerant. See unit rating plate for correct amount of charge.
- 5 - Refer to the Refrigerant Check and Charge section to check refrigerant charge.

IV-SYSTEMS SERVICE CHECKS

A-Preliminary and Seasonal Checks

- 1 - Make sure the unit is installed in accordance with the installation instructions and applicable codes.
- 2 - Inspect all electrical wiring, both field and factory installed for loose connections. Tighten as required. Refer to unit diagram located on inside of unit control box cover.
- 3 - Check to ensure that refrigerant lines are in good condition and do not rub against the cabinet or other refrigerant lines.
- 4 - Check voltage. Voltage must be within the range listed on the nameplate. If not, consult power company and have the voltage corrected before starting the unit.
- 5 - Recheck voltage and amp draw with unit running. If voltage is not within range listed on unit nameplate, stop unit and consult power company. Refer to unit nameplate for maximum rated load amps.
- 6 - Inspect and adjust blower belt (see section on Blower Compartment - Blower Belt Adjustment).

B-Cooling System Service Checks

LCX units are factory charged and require no further adjustment; however, charge should be checked periodically using the liquid temperature plots in section II CHARGING.

V-MAINTENANCE

The unit should be inspected once a year by a qualified service technician.

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.

IMPORTANT

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

WARNING

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants

Prior to beginning work on systems containing refrigerant to ensure the risk of ignition is minimized:

- All 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.
- 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, the 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.
- 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. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

- Where electrical components are being changed, service technicians 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 as applicable:

- 1 - The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
 - 2 - The ventilation machinery and outlets are operating adequately and are not obstructed.
 - 3 - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
 - 4 - Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.
 - 5 - Refrigerating pipes 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.
- For systems containing refrigerant all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.

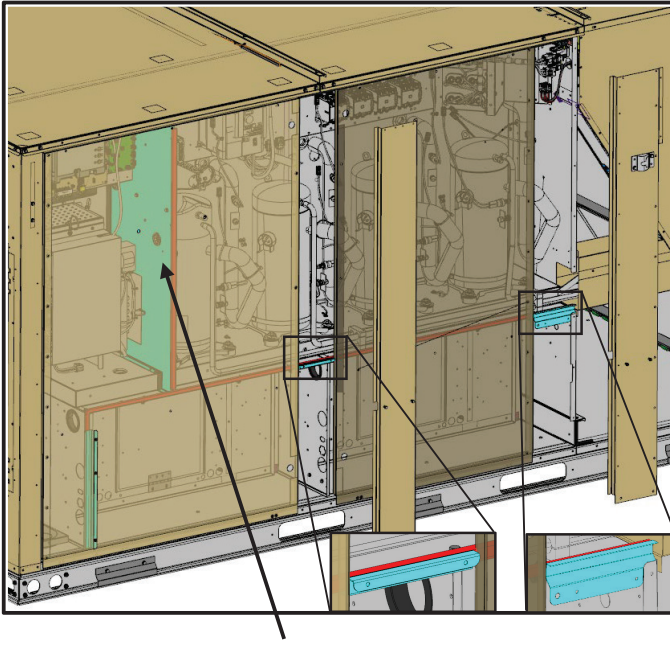
NOTE - Sealed electrical components shall be replaced, not repaired.

NOTE - Intrinsically safe components must be replaced, not repaired.

- 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. 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.
- 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, since flammability is a consideration. The following procedure shall be adhered to:
 - a. Safely remove refrigerant following local and national regulations,
 - b. Evacuate the circuit,
 - c. Purge the circuit with inert gas,
 - d. Evacuate,
 - e. Purge with inert gas,
 - f. Open the circuit.
- 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. Refrigerant 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. This process shall be repeated until no refrigerant is within the system. 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.

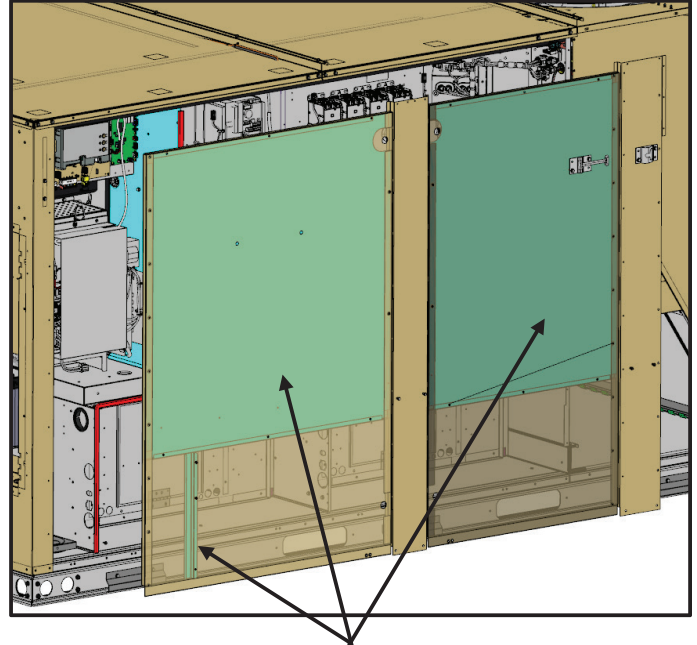
Critical Components for Refrigerant Leak Containment

All Units



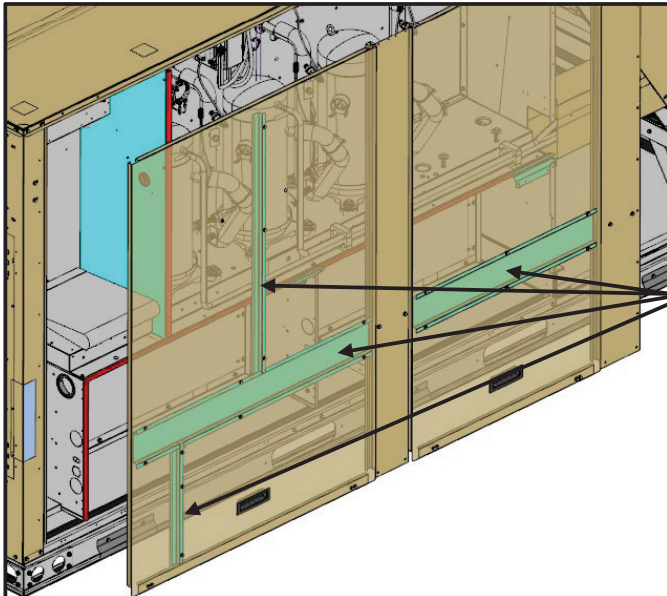
If the door panels, barrier, mullions and rubber seals (highlighted in red) must be removed for service, ensure they are returned to their proper places before starting the unit. Verify that the rubber seals on the barrier and the compressor base panel are properly aligned and tightly secured. Verify that the brackets behind the mullions are secured.

Hinged Door Panels



Verify that the door panel liners and bracket are tightly secured. These steps are critical to containing flammable refrigerant and preventing it from migrating to sources of ignition in the event of a leak.

Non-hinged Door Panels



Verify that the door panel brackets are tightly secured. This is critical to containing flammable refrigerant and preventing it from migrating to sources of ignition in the event of a leak.

A-Filters

LCX units use six 24 X 24 X 2" fiberglass throw-away type filters. Filters may be accessed through the economizer / filter access door. Filters should be checked monthly (or more frequently in severe use) and cleaned or replaced regularly. Take note of the "AIR FLOW DIRECTION" marking on the filter frame when re-installing.

B-Lubrication

All motors and blower wheels used in LCX units are lubricated; no further lubrication is required.

C-Supply Air Blower Wheel

Annually inspect supply air blower wheel for accumulated dirt or dust. Turn off power before attempting to remove access panel or to clean blower wheel.

D-Evaporator Coil

Inspect and clean coil at beginning of each season. Clean using mild detergent or commercial coil cleanser. Check condensate drain pan and line, if necessary. Flush coil and condensate drain with water taking care not to get insulation, filters and return air ducts wet. Check connecting lines and coil for evidence of oil and refrigerant leaks.

E-Condenser Coil

Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season. Check connecting lines and coil for evidence of oil and refrigerant leaks.

F-Electrical

- 1 - Check all wiring for loose connections.
- 2 - Check for correct voltage at unit (unit operating).
- 3 - Check amp-draw on both condenser fan motor and blower motor.

Fan Motor Rating Plate ____ Actual ____

Indoor Blower Motor Rating Plate ____ Actual ____

VI-ACCESSORIES

The accessories section describes the application of most of the optional accessories which can be factory or field installed to the LCX units.

A-Roof Curbs

When installing the LCX units on a combustible surface for downflow discharge applications, the hybrid C1CURB70C-1 8-in height, C1CURB71C-1 14-in height, C1CURB72C-01 18-in height and C1CURB73C-1 24-in roof mounting frame is used. The assembled hybrid mounting frame is shown in FIGURE 29. Refer to the roof mounting frame installation instructions for details of proper assembly and mounting. The roof mounting frame **MUST** be squared to the roof and level before mounting. Plenum system **MUST** be installed before the unit is set on the mounting frame. Typical roof curbing and flashing is shown in FIGURE 30. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

For horizontal discharge applications, use the standard C1URB14C-1 26-in or C1CURB16C-1 37-in height roof mounting frame. This frame converts unit from down-flow to horizontal air flow. The 37 inch horizontal frame meets National Roofing Code requirements. The roof mounting frames are recommended in all other applications but not required. If the LCX units are not mounted on a flat (roof) surface, they **MUST** be supported under all edges and under the middle of the unit to prevent sagging. The units **MUST** be mounted level within 1/16" per linear foot or 5mm per meter in any direction.

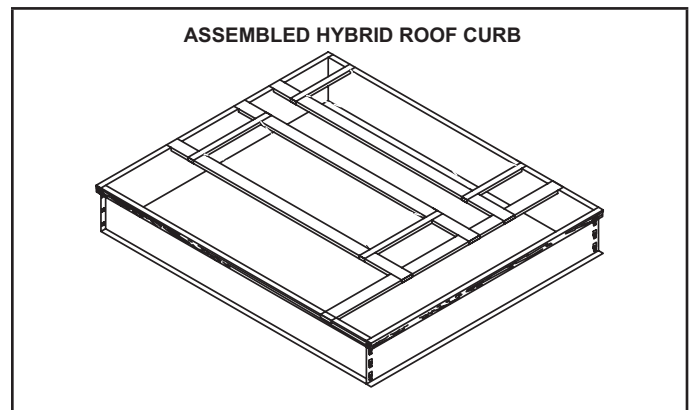


FIGURE 29

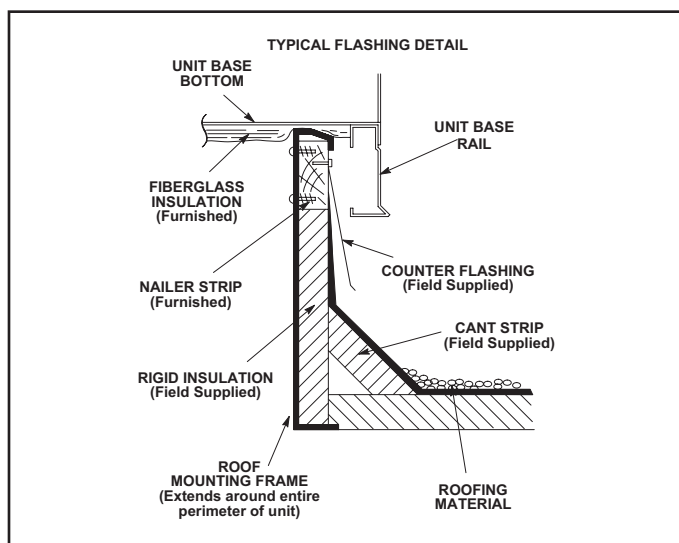


FIGURE 30

B-Transitions

Optional supply/return transitions C1DIFF33C-1 and C1DIFF34C-1 are available for use with LCX series units utilizing optional C1CURB roof curbs. Transition must be installed in the roof curb before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

C-C1DAMP10 & E1DAMP20 Outdoor Air Dampers

C1DAMP10C and E1DAMP20C (FIGURE 31) consist of a set of dampers which may be manually or motor operated to allow up to 25 percent outside air into the system at all times. Either air damper can be installed in LCX units. Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to re-installation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

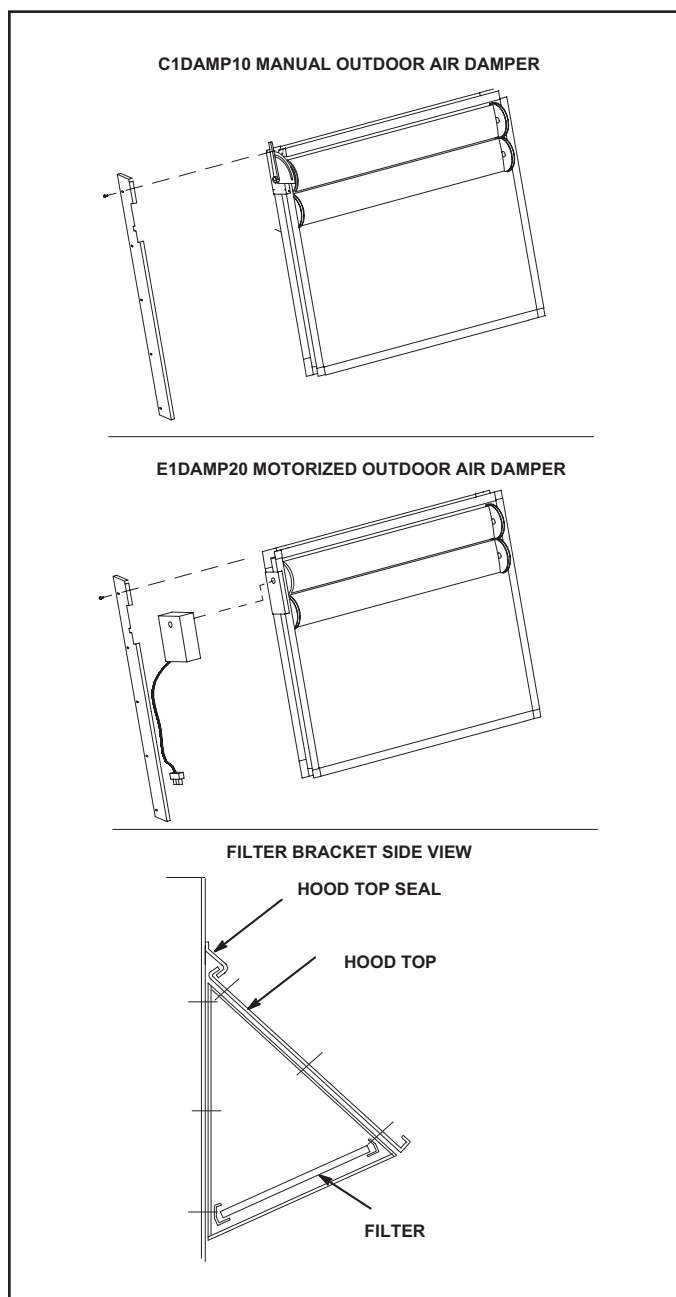


FIGURE 31

D-Supply and Return Diffusers

Optional flush mount diffuser/return FD11 and extended mount diffuser/return RTD11 are available for use with all LCX units. Refer to manufacturer's instructions included with transition for detailed installation procedures.

High Performance Economizer (Field or Factory Installed)

The optional economizer can be used with downflow and horizontal air discharge applications. The economizer uses outdoor air for free cooling when temperature and/or humidity is suitable. An economizer hood is furnished with the economizer.

NOTE – Gravity exhaust dampers are required with power exhaust.

The economizer is controlled by the A55 Unit Controller. The economizer will operate in one of four modes. Each mode requires a different A55 Unit Controller DIP switch setting. Each mode also requires different sensors. The following is a brief description. See economizer installation instruction for more detail.

1-“TMP” MODE (SENSIBLE TEMPERATURE)

In the “TMP” mode, the IMC uses input from the factory installed RT6 Supply Air Sensor, RT16 Return Air Sensor and RT17 Outdoor Air Sensor to determine suitability of outside air and economizer damper operation. When outdoor sensible temperature is less than return air sensible temperature, outdoor air is used for cooling. This may be supplemented by mechanical cooling to meet comfort demands. This application does not require additional optional sensors.

2-“ODE” MODE (OUTDOOR ENTHALPY)

The “ODE” or outdoor enthalpy mode requires a field-provided and -installed Honeywell C7400 enthalpy sensor (16K96). The sensor monitors outdoor air temperature and humidity (enthalpy). When outdoor air enthalpy is below the enthalpy control setpoint, the economizer modulates to allow outdoor air for free cooling.

3-“DIF” MODE (DIFFERENTIAL ENTHALPY)

The “DIF” or differential enthalpy mode requires two field-provided and -installed Honeywell C7400 enthalpy sensors (16K97). One sensor is installed in the outside air opening and the other sensor is installed in the return air opening. When the outdoor air enthalpy is below the return air enthalpy, the economizer opens to bring in outdoor air for free cooling.

4-“GLO” MODE (GLOBAL)

Global Mode - The “GLO” or global mode is used with an energy management system which includes a global control feature. Global control is used when multiple units (in one location) respond to a single outdoor air sensor. Each energy management system uses a specific type of outdoor sensor which is installed and wired by the controls contractor.

Motorized Outdoor Air Damper - The “GLO” mode is also used when a motorized outdoor air damper is installed in the system.

NOTE – All economizer modes of operation will modulate dampers to 55F supply air. Gravity Exhaust Dampers

C1DAMP50C dampers (FIGURE 32) are used in downflow and LAGEDH are used in horizontal air discharge applications. LAGEDH gravity exhaust dampers are installed in the return air plenum. The dampers must be used any time an economizer or power exhaust fans are applied to LCX series units. An exhaust hood is furnished with the gravity exhaust damper.

Gravity exhaust dampers allow exhaust air to be discharged from the system when an economizer and/or power exhaust is operating. Gravity exhaust dampers also prevent outdoor air infiltration during unit off cycle. See installation instructions for more detail.

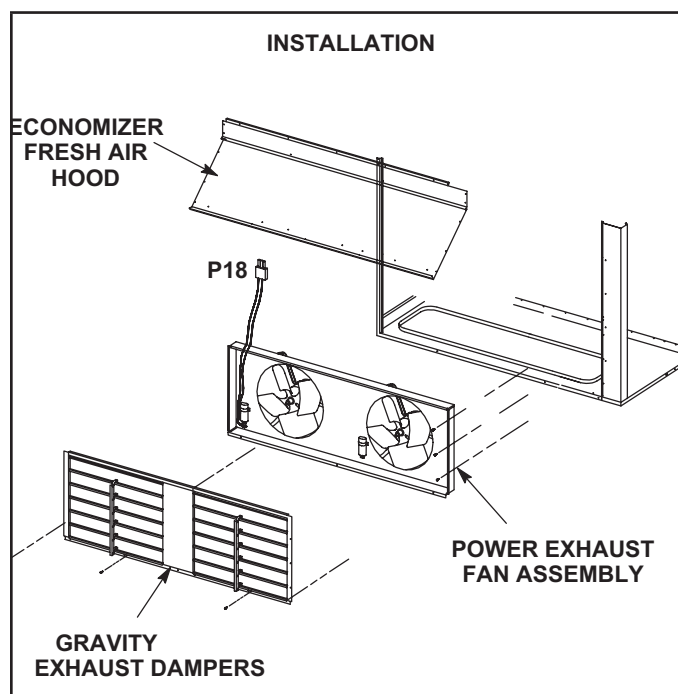


FIGURE 32

E-C1PWRE10 Power Exhaust Fans

C1PWRE10 power exhaust fans are used in downflow applications only. C1PWRE10 fans require optional downflow gravity exhaust dampers and E1ECON15 economizers. Power exhaust fans provide exhaust air pressure relief and also run when return air dampers are closed and supply air blowers are operating. FIGURE 32 shows the location of the power exhaust fans. See installation instructions for more detail.

F–Optional Cold Weather Kit (Canada only)

Electric heater is available to automatically control the minimum temperature in the gas burner compartment. Heater is C.G.A. certified to allow cold weather operation of unit down to -60° F.

The kit includes the following parts:

- 1 - The strip heater (HR6) is located as close as possible to the gas valve. The strip heater is rated at 500 Watts (line voltage).
- 2 - A thermostat mounting box is installed on the vestibule of the heating compartment. Included in the box are the following thermostat switches:
 - a. Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -30° F the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F.
 - b. Thermostat switch (S60) is an auto-reset SPST N.C. switch which opens on a temperature rise. The switch is wired in series with K125 coil. When the temperature rises above 20° F the switch opens and the electric heater is de-energized through K125. The switch automatically resets when the heating compartment temperature reaches -10° F.
 - c. Thermostat switch (S61) is an auto-reset SPST N.O. switch which closes on a temperature drop. The switch is wired in series with K125 coil. When temperature drops below 20° F the switch closes and electric heater is energized through K125. The switch automatically opens when heating compartment temperature reaches 76° F.

G–Control Systems

The A55 Unit Controller provides all control function for the rooftop unit. Default operation requires a standard room thermostat or direct digital controller (DDC). The A55 can also control the unit from a zone temperature sensor. The A55 Unit Controller is a network controller when daisy-chained to the L Connection® Network Control System. For ease of configuration, the A55 can be connected to a PC with Unit Controller PC software installed. Smoke Detectors A171, A172, A173

Photoelectric smoke detectors are a factory- and field-installed option. The smoke detectors can be installed in the supply air section (A172), return air section (A171), or in both the supply and return air section. Smoke detection control module (A173) is located below the control panel. Wiring for the smoke detectors are shown on the temperature control section (C) wiring diagram in back of this manual.

H–Blower Proving Switch S52

The blower proving switch monitors blower operation and locks out the unit in case of blower failure. The switch is N.O. and closes at .15" W.C. The switch is mounted on the middle left corner of the blower support panel. Wiring for the blower proving switch is shown on the temperature control section (C) wiring diagram in back of this manual.

I–Dirty Filter Switch S27

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 1" W.C. The switch is mounted on the top corner of the economizer. Wiring for the dirty filter switch is shown on the temperature control section (C) wiring diagram in back of this manual.

J–Optional UVC Lights

The Healthy Climate- germicidal light emits ultraviolet (UVC) energy that has been proven effective in reducing microbial life forms (viruses, bacteria, yeasts and molds) in the air.

UVC germicidal lamps greatly reduce the growth and proliferation of mold and other bio-aerosols (bacteria and viruses) on illuminated surfaces.

K–Optional UVC Lights

The Healthy Climate germicidal light emits ultraviolet (UVC) energy that has been proven effective in reducing microbial life forms (viruses, bacteria, yeasts and molds) in the air.

UVC germicidal lamps greatly reduce the growth and proliferation of mold and other bio-aerosols (bacteria and viruses) on illuminated surfaces.

Germicidal lamps are NOT intended to be used for removal of active mold growth. Existing mold growth must be appropriately removed PRIOR to installation of the germicidal lamp.

Refer closely to UVC light installation instruction warnings when servicing units.

L–Drain Pan Overflow Switch S149 (optional)

The overflow switch is used to interrupt cooling operation when excessive condensate collects in the drain pan. The N.C. overflow switch is connected to the M4 Unit Controller (A55) through DI-3. When the switch opens, the Unit Controller will shut off the unit. After a five-minute time out, the Unit Controller will verify the overflow switch position and restart the unit (if the switch has closed). The Unit Controller has a three-strike counter before the unit locks out. This means the Unit Controller will allow the overflow switch to open three times per thermostat demand. If the unit locks out, a reset of the Unit Controller is required after the switch has closed to restore unit operation.

M–Bipolar Ionizer

The Needlepoint Bipolar Ionizer (NBPI) kit is specifically designed for LG/LC/LH/LD/KG/KC/KH 024-300 units. The ionizer is equipped with dry contacts which allow a Building Automation System (BAS) to interface and indicate ionizer functionality.

NOTE – The BAS will be able to monitor units equipped with M4 Unit Controllers only.

The Ionizers are also equipped with a green LED which indicates power is on. When the blower is in operation, power is delivered to the Ionizers and ions are generated. See TABLE 19 for unit application.

TABLE 19

LCX Unit	Part No.	
180-210	21U37	622688-03
240	21U38	622688-04
300	21U39	622688-05

VII–FACTORY-INSTALLED HOT GAS RE-HEAT

General

Hot gas reheat units provide a dehumidifying mode of operation. These units contain a reheat coil adjacent to and downstream of the evaporator coil. Reheat coil solenoid valves, L14 and L30, route hot discharge gas from the compressor to the reheat coil. Return air pulled across the evaporator coil is cooled and dehumidified; the reheat coil adds heat to supply air. FIGURE 33 and FIGURE 34 show reheat refrigerant routing and cooling mode refrigerant routing.

L14 and L30 Reheat Coil Solenoid Valves

When Unit Controller (P298-5 or J299-8) indicates room conditions require dehumidification, reheat valves L14 and L30 are energized (Unit Controller J394-1 or J394-3) and refrigerant is routed to the reheat coil.

Reheat Setpoint

Reheat is factory-set to energize when indoor relative humidity rises above 60% (default). The reheat setpoint can be adjusted by changing mobile service app *Settings* - *Control* menu. A setting of 100% will operate reheat from an energy management system digital output. The reheat setpoint can also be adjusted using an optional Network Control Panel (NCP).

Reheat will terminate when the indoor relative humidity falls 3% (57% default) or the digital output de-energizes. The reheat deadband can be adjusted at *Settings* - *Control* menu.

A91 Humidity Sensor

Relative humidity should correspond to the sensor (A91) output voltage listed in TABLE 20. For example: if indoor air relative humidity is 80% + 3%, the humidity sensor output should read 8.00VDC.

Check the sensor output annually for accuracy. Keep the air intake openings on the sensor clean and free of obstructions and debris.

TABLE 20

Relative Humidity (%RH $\pm$ 3%)	Sensor Output (VDC)
20	2.00
30	3.00
40	4.00
50	5.00
60	6.00
70	7.00
80	8.00
90	9.00

Check-Out

Test hot gas reheat operation using the following procedure.

- 1 - Make sure reheat is wired as shown in wiring section.
- 2 - Make sure unit is in local thermostat mode.
- 3 - Use mobile service app (the QR is located in the control area) menu path to select:

SERVICE > TEST > DEHUMIDIFIER

The blower, compressor 1 and compressor 2 (reheat) should be operating. Reheat mode will appear on the mobile service app display.

- 4 - Deselect:

SERVICE > TEST > DEHUMIDIFIER

Compressor 1 and 2 (reheat) should de-energize, blower should still be energized.

Default Reheat Operation

Reheat will operate as shown in TABLE 21 once this condition is met:

- 1 - System must NOT be operating in heating mode.

IMPORTANT - Free cooling does not operate during reheat.

For other reheat control options, refer to the Unit Controller manual.

Additional Cooling Stages

Units are shipped from the factory to provide two stages of cooling.

Compressors are not de-energized when unit operation changes from cooling to reheat or from reheat to cooling. Instead, L14 and L30 reheat valves are energized (reheat) or de-energized (cooling).

NOTE - Another thermostat staging option is available which allows both compressors to be energized during free cooling. See Unit Controller manual for details.

REFRIGERANT SCHEMATIC (180, 210 AND 240 MODELS ONLY)

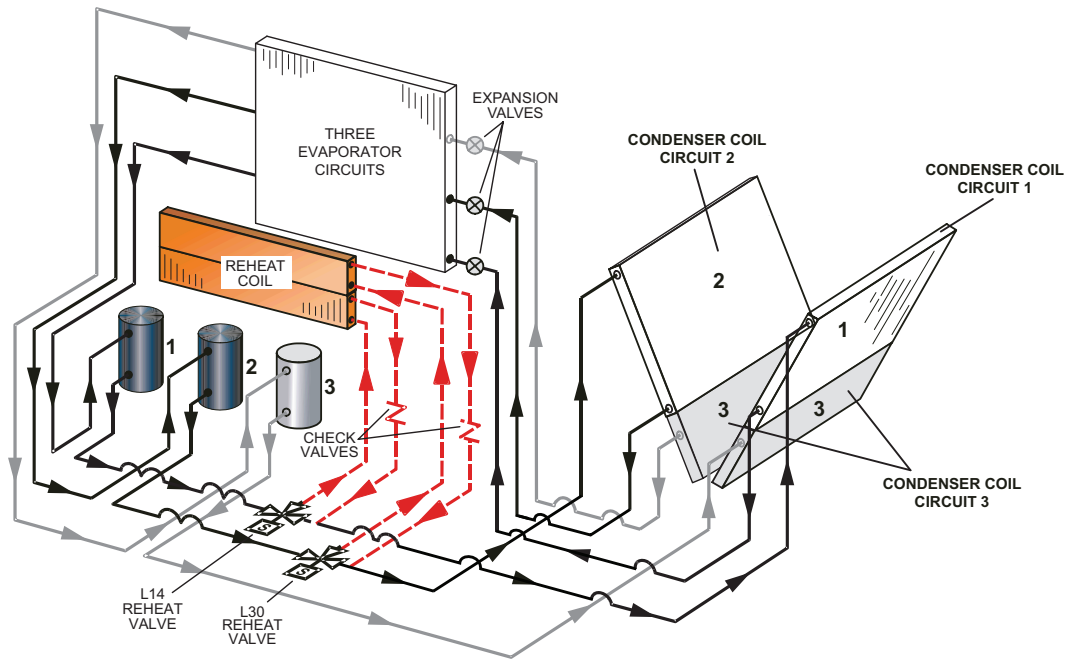


FIGURE 33

REFRIGERANT SCHEMATIC (300S MODELS ONLY)

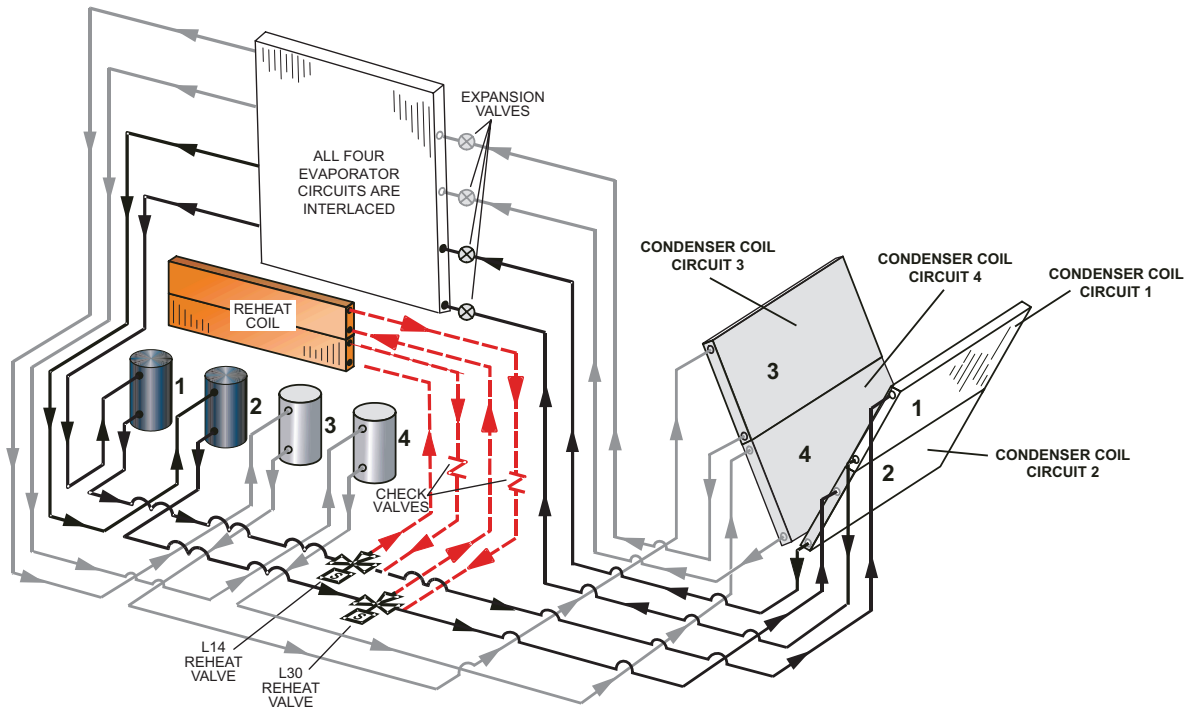


FIGURE 34

TABLE 21
REHEAT OPERATION

Thermostat Mode With 24V Humidistat	
Humidity Demands	Operation
24V Demand for Dehumidification only	• Compressor 1 and 2 reheat on • Reheat valves are energized • Remaining compressors are off
24V Demand for Dehumidification only is still present after Five Minutes	• Compressor 1 & 2 reheat on • Reheat valves are energized • Remaining compressors are energized as needed to meet cooling
Thermostat Mode with Zone Relative Humidity (RH) Sensor	
Zone humidity is greater than Setpoint +2%	• Compressor 1 and 2 reheat on • Reheat valves are energized • Remaining compressors are off
Zone humidity is greater than Setpoint +2% OR Zone humidity is greater than Setpoint for 5 minutes	• Compressor 1 & 2 reheat on • Reheat valves are energized • Remaining compressors are energized as needed to meet cooling

VIII—MULTI-STAGED BLOWER

A—Design Specifications

Use the “Blower CFM Design Specifications” table attached to the unit (table 18 in the installation instructions) to fill in test and balance values when setting up the unit. If only high and low cooling design specifications are provided, set the medium cooling CFM at the high or low cooling design spec or any CFM between.

B—Set Maximum CFM

Use attached table to determine highest blower CFM for appropriate unit. Adjust the blower pulley to deliver that amount of CFM with only the blower operating. See Determining Unit CFM in the Blower Operation and Adjustment section.

C—Set Blower Speeds

- 1 - Use the following mobile service app menu to enter the blower design specified CFM into the Unit Controller. Make sure blower CFM is within limitations shown in TABLE 22 or TABLE 23. Refer to the Unit Controller manual provided with unit.

RTU MENU > RTU OPTIONS > BLOWER > SPEED

- 2 - Enter the following design specifications as shown in TABLE 22.

Blower /

Heat CFM

Cooling High CFM

Cooling Low CFM

Vent CFM

- 3 - Adjust the blower RPM to deliver the target CFM based on the measured static pressure using the blower table.
- 4 - Measure the static pressure again and apply the static pressure and RPM to the blower tables to determine adjusted CFM.
- 5 - Repeat adjustments until design CFM is reached.

D—Set Damper Minimum Position

To maintain required minimum ventilation air volumes when the unit is in the occupied mode, two minimum damper positions must be set.

The Unit Controller will open the damper to “Min OCP Blwr High” when blower CFM is at or ABOVE the “midpoint” CFM.

The Unit Controller will open the dampers to “Min OCP Blwr Low” when blower CFM is BELOW a “midpoint” CFM.

The Unit Controller will calculate the “midpoint” CFM.

*Available blower speeds vary by unit and thermostat stages.

Set Minimum Position 1

Use the following mobile service app menu to set “Min OCP Blwr High” for the blower CFM above the “midpoint” CFM. When navigating into this menu, the Unit Controller will run damper calibration and allow damper position adjustment.

RTU MENU > SETTINGS > RTU OPTIONS > DAMPER

Tap “Next” to skip tabs and complete damper position calibration until “Damper Calibration Blower Speed High” tab appears.

Measure the intake air CFM. If the CFM is lower than the design specified CFM for ventilation air, use the Unit Controller to increase the damper percent open. If the CFM is higher than specified, decrease the damper percent open.

NOTE – *Intake air CFM can also be determined using the outdoor air temperature, return air temperature and mixed air temperature. Refer to the economizer or outdoor air damper installation instructions.*

Set Minimum Position 2

Use the following mobile service app menu in the Unit Controller to set “Min OCP Blwr Low” for the blower CFM below the “midpoint” CFM. When navigating into this menu, the Unit Controller will run damper calibration and allow damper position adjustment.

RTU MENU > SETTINGS > RTU OPTIONS > DAMPER

Tap “Next” to skip tabs and complete damper position calibration until “Damper Calibration Blower Speed High” tab appears.

Measure the intake air CFM. If the CFM is lower than the design specified CFM for ventilation air, use the Unit Controller to increase the damper percent open. If the CFM is higher than specified, decrease the damper percent open.

NOTE – *Intake air CFM can also be determined using the outdoor air temperature, return air temperature and mixed air temperature. Refer to the economizer or outdoor air damper installation instructions.*

E—Inverter Bypass

The supply air inverter is factory-set to bypass the inverter manually. To bypass the inverter and operate the blower in the constant air volume mode, use the following Unit Controller menu and set to “engaged”:

SETTINGS > RTU OPTIONS > BLOWER > VFD BYPASS

To configure the unit to by-pass the inverter automatically, use the following Unit Controller menu.

SETUP > INSTALL

Press SAVE until the menu reads:

CONFIGURATION ID 1

Change the 6th character position to “A” for automatic bypass option.

Press SAVE

CAUTION - *Units not equipped with an inverter will have the 6th character set to “N”, indicating the inverter is not bypassed. The blower motor could be damaged and/or result in product or property damage if the setting is changed to automatic or manual.*

TABLE 22
HEATING, VENTILATION, & SMOKE MINIMUM AND MAXIMUM CFM

Unit				Heating CFM			Vent CFM			Smoke CFM		
Tons	Model	Speed	Heat Code	Default	Min.	Max.	Default	Min.	Max.	Default	Min.	Max.
15	LGX180	Std	S	6000	4325	7200	6000	2250	7200	6000	2250	7200
		Med	M		4500							
		High	H		5125							
	LCX180	15, 30, 45, 60kW	N, E, J, K, L		5200							
17.5	LGX210	Std, Med	S, M	7000	4500	8400	7000	2625	8400	7000	2625	8400
		High	H		5125							
	LCX210	15, 30, 45, 60kW	N, E, J, K, L		5200							
		90kW	P		6000							
20	LGX240	Std, Med	S, M	8000	4500	9600	8000	3000	9600	8000	3000	9600
		High	H		5125							
	LCX240	15, 30, 45, 60kW	N, E, J, K, L		5200							
		90kW	P		6000							
25	LGX300	Std, Med	S, M	10000	4500	12000	10000	3750	12000	10000	3750	12000
		High	H		5125							
	LCX300	15, 30, 45, 60kW	N, E, J, K, L		5200							
		90kW	P		6000							

*Use highest value between Heating and Cooling High CFM Max.

TABLE 23
COOLING MINIMUM AND MAXIMUM CFM

LCX Unit	Cooling Low CFM			Cooling High CFM		
	Default	Min.	Max.	Default	Min.	Max.
180	3900	2000	7200	5400	5000	7200
210	4550	2500	8400	6300	6000	8400
240	5200	3000	9600	7200	6250	9600
300	6500	3500	12000	9000	7000	12000

*Use Cooling High CFM Max

IX-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 the task is commenced.

Steps to ensure this are:

- Become familiar with the equipment and its operation,
- Isolate the system electrically,
- Ensure that before attempting the procedure that mechanical handling equipment is available, if required, for handling refrigerant cylinders, and that all personal protective equipment is available and being used correctly while the recovery process is supervised at all times by a competent person and that the recovery equipment and cylinders conform to the appropriate standards.

Additionally, pump down refrigerant system, if possible, and if a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system. Make sure that cylinders are situated on the scales before recovery takes place. Start the recovery machine and operate in accordance with instructions. Do not overfill cylinders (no more than 80 % volume liquid charge). Do not exceed the maximum working pressure of the cylinder, even temporarily. 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. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

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.

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.

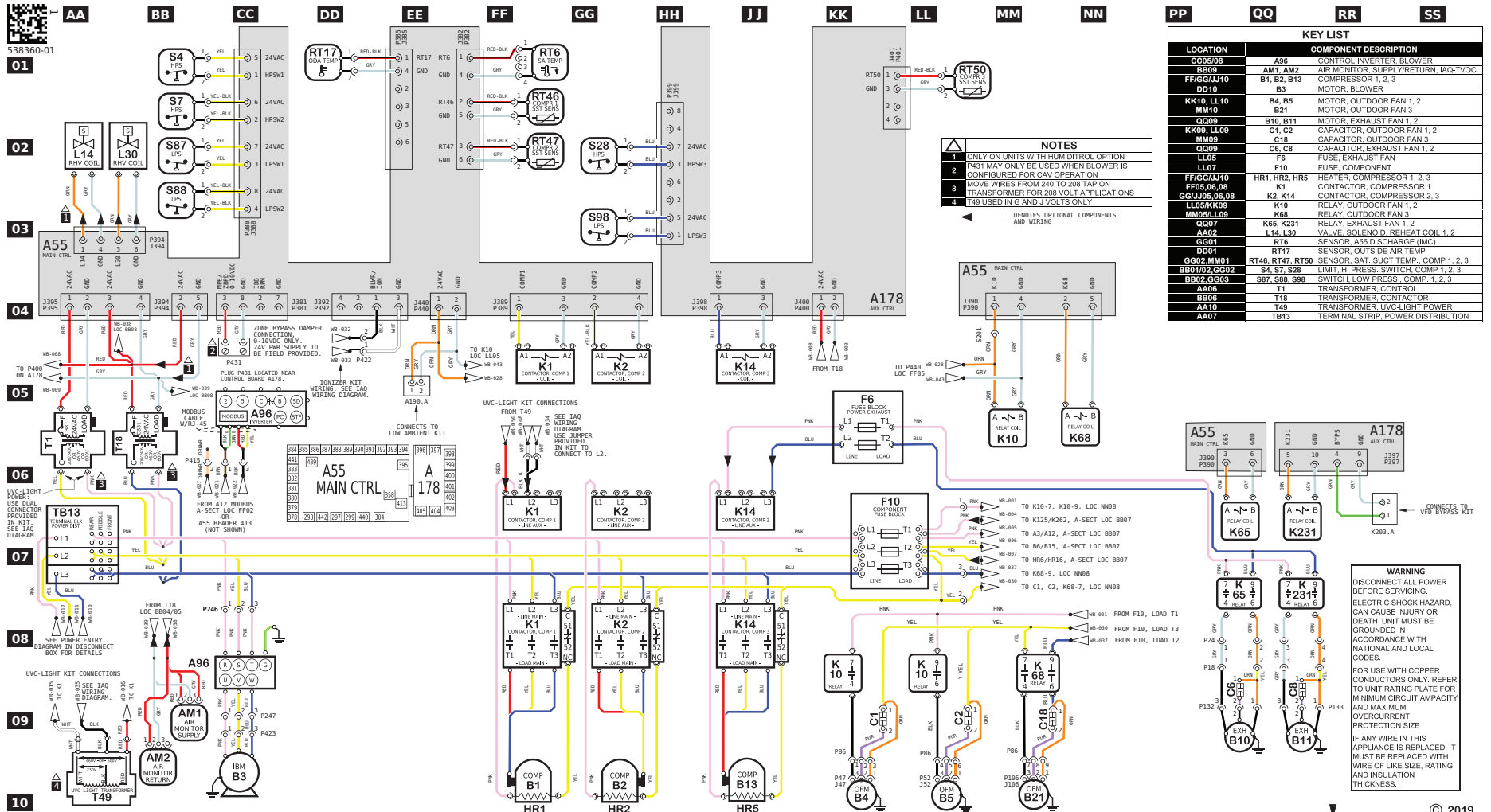
When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations,
- Evacuate the circuit,
- Purge the circuit with inert gas,
- Evacuate,
- Purge with inert gas,
- Open the circuit.

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. Refrigerant 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. This process shall be repeated until no refrigerant is within the system. 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.

X-WIRING DIAGRAMS AND SEQUENCE OF OPERATION

LCX180, 210 G, J, Y VOLT DIAGRAM COOLING - MSAV



Model: LGX LCX 180S, 210S G J Y-VOLT
COOLING - MSAV - 3 COMPRESSORS 3 CONDENSER FANS

Voltage: 460V/3~60Hz (G), 575V/3~60Hz (J), 208-240V/3~60Hz (Y)
Supersedes: N/A Form No: 538360-01 Rev: 1

HEATING SECTION A COOLING SECTION B COOLING SECTION C ACCS SECTION D ACCS SECTION E

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-012404E	04-30-2024	DEV	JAL21	ORIGINATED AT PDSR CARROLLTON, TX
001	CN-012122CW	08-01-2024	DEV	JAL21	GND FOR K231 WAS PIN 8, IS NOW PIN 10 AT LOC RR6

538361-01

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AJ

WIRING DIAGRAM FLOW	HEATING	COOLING	COOLING	ACCS	ACCS
	SECTION A	SECTION B	SECTION B3/5	SECTION C	SECTION D

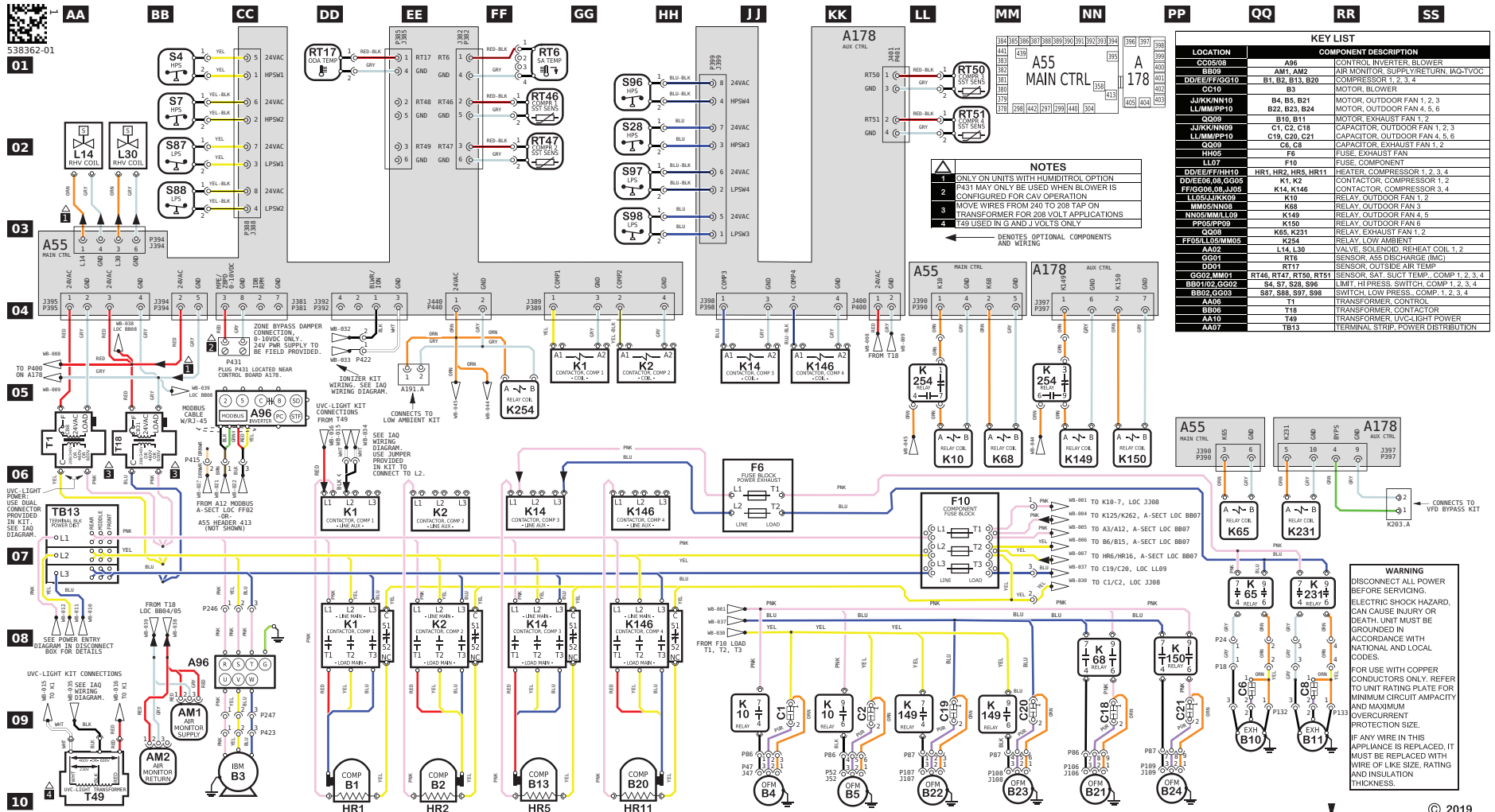
REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-012404E	04-24-2024	DEV	JAL21	ORIGINATED AT PD&R CARROLLTON, TX



10x17
CUT SIZE

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LCX300 G, J, Y VOLT DIAGRAM COOLING - MSAV



Model: LCX LGX LHX 300S - G J Y-VOLT
COOLING - MSAV - 4 COMPRESSORS 6 CONDENSER FANS

Voltage: 460V/3~60Hz (G), 575V/3~60Hz (J), 208-240V/3~60Hz (Y)
Supersedes: XXXXX-XX Form No: 538362-01 Rev: 1

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WIRING DIAGRAM FLOW
HEATING SECTION A COOLING SECTION B COOLING SECTION C ACCS SECTION D ACCS SECTION E

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
...	CN-012404E	04-24-2024	DEV	JAL21	ORIGINATED AT PD&R CARROLLTON, TX
001	CN-012122CW	07-29-2024	DEV	JAL21	ADDED RELAY K254 AT LOCATION FF05, LL05, MM05

180/210/240/300 MODELS (3 AND 4 COMPRESSORS)**UNIT OPERATION WITH 2-STAGE THERMOSTAT (2 COOLING STAGES, Y1, Y2)****SUPPLY AIR BLOWER SPEED**

Unit has following supply air blower speed setting:

- Ventilation speed
- Cooling Speed - Low
- Cooling Speed - High
- Heating Speed
- Smoke Speed (Using only in smoke removal option - not discussed)

¹ Unit Features and Economizer and Outdoor Air is Suitable

Y1 Demand:

All compressors are off, supply air blower is on low cooling speed to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting).

Y2 Demand:

All compressors are off, supply air blower is on high cooling speed providing higher cooling capacity, and economizer modulates to maintain 55°F supply air temperature. If economizer stays at maximum open for 3 minutes, 1st stage compressors (compressor 1 and 2) are energized while supply air blower stays on high cooling speed providing maximum cooling capacity.

¹ Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third party controller and provided to the rooftop unit via a network connection.

Unit Does Not Feature An Economizer Or Outdoor Air Is Not Suitable**Y1 Demand:**

1st stage compressors 1 & 2 operate and supply air blower operates at low cooling speed.

Y2 Demand:

All compressors operate and supply air blower operates at high cooling speed.

180/210/240/300 MODELS (3 AND 4 COMPRESSORS)**ZONE SENSOR****SUPPLY AIR BLOWER SPEED**

Unit has following supply air blower speed setting:

- Ventilation speed
- Cooling Speed - Low
- Cooling Speed - High
- Heating Speed MSAV® MULTI-STAGE AIR VOLUME
- Smoke Speed (Using only in smoke removal option - not discussed)

¹ Unit Features and Economizer and Outdoor Air is Suitable 3

COMPRESSOR UNITS**Y1 Demand:**

All compressors are off, supply air blower is on low cooling speed to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting).

Y2 Demand:

All compressors are off, supply air blower is on high cooling speed providing higher cooling capacity, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting). If economizer stays at maximum open for 3 minutes then compressor 1 is energized while supply air blower stays on high cooling speed. After compressor is energized the economizer stays at maximum open.

Y3 Demand:

Compressors 1 and 2 are energized while supply air blower stays on high cooling speed. After compressors are energized the economizer stays at maximum.

Y4 Demand:

All compressors are energized and supply air blower stays on high cooling speed.

4 COMPRESSOR UNITS**Y1 Demand:**

All compressors are off, supply air blower is on low cooling speed to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting).

Y2 Demand:

All compressors are off, supply air blower is on high cooling speed providing higher cooling capacity, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting). If economizer stays at maximum open for 3 minutes then compressors 1 and 2 are energized while supply air blower stays on high cooling speed. After compressors are energized the economizer stays at maximum open.

Y3 Demand:

Compressors 1, 2 and 3 are energized and supply air blower stays on high cooling speed.

Y4 Demand:

All compressors are energized and supply air blower stays on high cooling speed.

¹ Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third party controller and provided to the rooftop unit via a network connection.

Heating Mode (Electric Heat)

NOTE - HEATING MODE IS THE SAME FOR ALL CONTROL OPTIONS

W1 Demand:

1st stage electric heat is energized and the supply air blower operates at heating speed.

W2 Demand:

2nd stage electric heat is energized and the supply air blower operates at heating speed (45, 60 or 90 kW electric heat option only).

ACCESSORIES**Modulating Outdoor Air Damper**

The minimum damper position for “occupied low blower” and “occupied high blower” is adjusted during unit setup to provide minimum fresh air requirements per ASHRAE 62.1 at the corresponding supply air blower speeds.

- When supply air blower is off or the unit is in unoccupied mode, the outdoor air damper is closed.
- When unit is in occupied mode and supply air blower is operating at a speed below the “midpoint” blower speed, the outdoor air damper is at minimum “low blower” position.
- When unit is in occupied mode and supply air blower is operating at a speed equal to or above the “midpoint” blower speed, the outdoor air damper is at minimum “high blower” position.

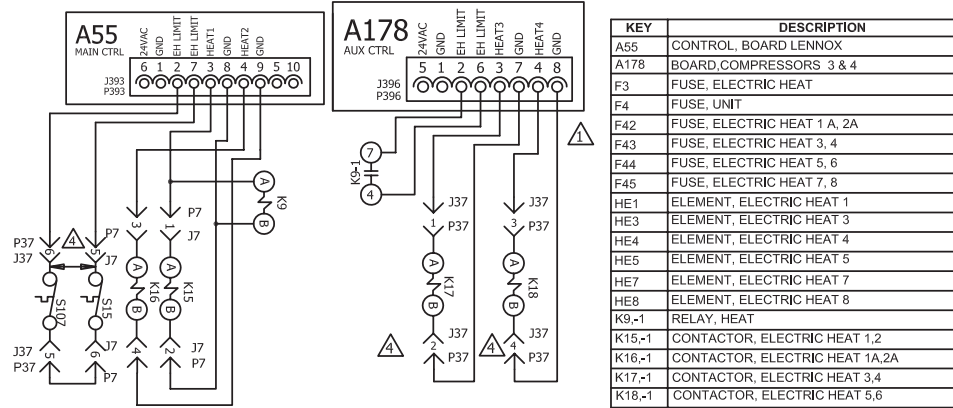
NOTE - The “midpoint” blower speed is an average of the minimum and maximum blower speed (minimum speed + maximum speed divided by 2).

Power Exhaust Operation

NOTE - POWER EXHAUST OPERATION IS THE SAME FOR ALL CONTROL OPTIONS

MSAV® models are equipped with 2-stage power exhaust fans. Power exhaust fans operate when economizer outdoor air dampers are 50% open (adjustable). Power exhaust operates in 1st stage (one fan) up to 70% of supply air blower speed. 2nd stage power exhaust fans (both fans) operate when supply air blower speed is above 70% (adjustable) of full speed.

EHA 15/120 - G & J VOLTAGE

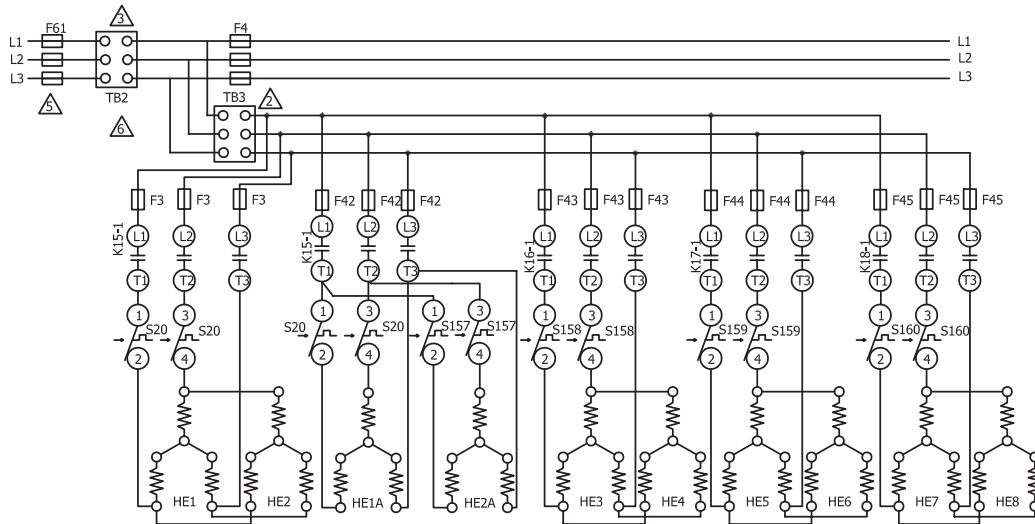


S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S20	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2
S107	SWITCH, PRIMARY ELECTRIC HEAT
S157	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1A
S158	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2A
S159	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3,4
S160	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 5,6
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRIC HEAT

J/P	DESCRIPTION
7	ELECTRIC HEAT CONTROL
37	ELECTRIC HEAT CONTROL

DESIGNATION	VOLTAGE
G	460/60/3
J	575/3

- ⚠ NOT USED ON 15 AND 30KW UNITS
- ⚠ TB3 IS USED IN SOME UNITS
- ⚠ TB2, S48 OR CB10 MAY BE USED
- ⚠ REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
- ⚠ F61 USED ON UNITS WITH SCCR OPTION
- ⚠ TB2 IS USED IN SOME SCCR OPTION UNITS ONLY

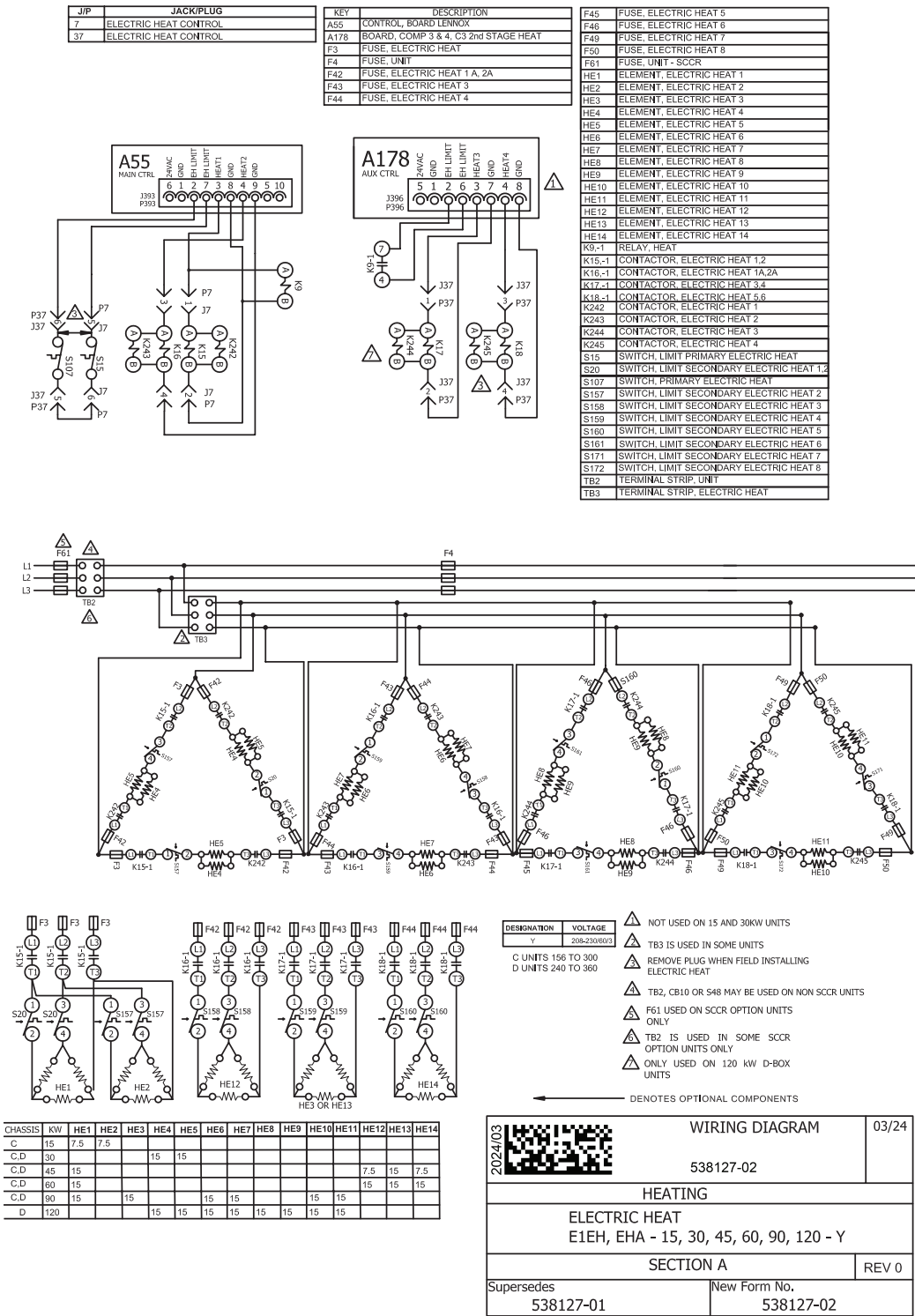


CHASSIS	KW	HE1	HE1A	HE2	HE2A	HE3	HE4	HE5	HE6	HE7	HE8
C	15		7.5		7.5						
D	20		10		10						
CD	30		15		15						
D	40	10				10		10		10	
CD	45	15				7.5		15		7.5	
CD	60	15				15		20		15	
D	80	20			20			20	20		
CD	90	15				15	15	15		15	15
D	120	15		15		15	15	15	15	15	15

← DENOTES OPTIONAL COMPONENTS

2025/01		WIRING DIAGRAM	01/25
	538126-03		
	HEATING		
	ELECTRIC HEAT LCT/LHT/LCX/LHX/SCH E1EH,EHA-15, 20, 30, 40, 45,60, 80, 90, 120 - G, J		
SECTION A		REV.0	
Supersedes 538126-02		New Form No. 538126-03	

EHA 15/120 - Y VOLTAGE



ECONOMIZER



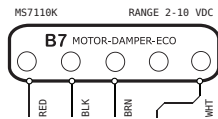
01

AA

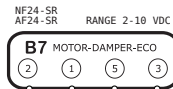
BB

CC

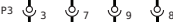
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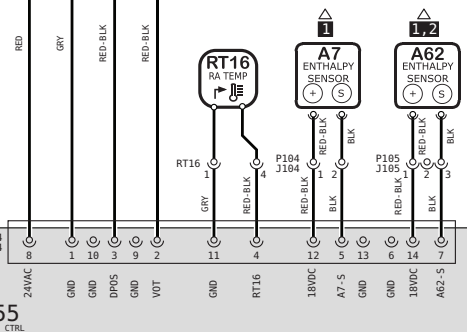
02



03



04



05

06

07

NOTES
1 A7 AND A62 NOT USED FOR SENSIBLE TEMPERATURE CONTROL
2 FOR UNIT DIFFERENTIAL ENTHALPY CONTROL, ADD A62 RETURN AIR ENTHALPY SENSOR

08

KEY LIST	
LOCATION	COMPONENT DESCRIPTION
CC05	A7 SENSOR, SOLID STATE ENTHALPY
AA06	A55 CONTROL BOARD, MAIN
DD05	A62 SENSOR, ENTHALPY INDOOR
BB02	B7 MOTOR, DAMPER ECONOMIZER
CC05	RT16 SENSOR, RETURN AIR TEMP

09

10 Model: LC, LG, LH, LD, SC, SG Series Economizer & Motorized OAD
Voltage: All Voltages
Supersedes: N/A Form No: 538072-01 Rev: 2

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HTG SEC A	CLG SEC B	CLG SEC B3	ACCS SEC C	ACCS SEC D
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WIRING DIAGRAM FLOW



REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-008594	10/15/2020	RV	MXR6	ORIGINATED AT PD&R CARROLLTON, TX
001	CN-010356B	03/24/2022	MXR6	JAL21	UPDATED APPLICABLE MODEL NUMBERS.
002	CN-012457P	03/06/2024	AXL	AAH	A) ADDED SC, SG TO MODELS

THERMOSTAT

