UNIT INFORMATION

100140
05/2025

LGX SERIES
15 to 25 ton
45.7 to 88 kW

Service Literature

LGX180 through 300 with R454B

LGX180, 210, 240 and 300 units are available in 260000, 360000 and 480000 Btuh heating inputs. Gas heat sections are designed with aluminized steel tube heat exchangers.

LGX units are available in standard cooling efficiencies only. Cooling capacities range from 15 to 25 tons. The LGX180, 210 and 240 use three compressors; and the LGX300 use four compressors.

All models have Multi-Stage Air Volume. The blower will operate at lower speeds when cooling demand is low and increase to higher speeds when cooling demand is high.

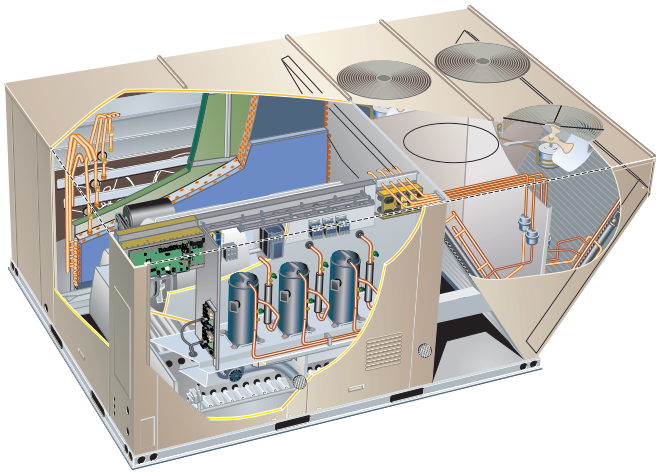
All LGX units are designed to accept any of several different energy management thermostat control systems with minimum field wiring. Factory- or field-provided control options connect to the unit through Smartwire connectors. When “plugged in” the controls become an integral part of the unit wiring.

The CORE Lite Control System is designed to accelerate equipment install and service. Standard with all Xion rooftop units, control system integrates key technologies that lower installation costs, drive system efficiency, and protect your investments.

The CORE Lite Unit Controller is a microprocessor-based controller that provides flexible control of all unit functions.

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.

If the unit must be lifted for service, rig unit by attaching four cables to the holes located in the unit base rail (two holes at each corner). Refer to the installation instructions for the proper rigging technique.



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

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.

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⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier

⚠ WARNING

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 work area 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 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
HEATING SYSTEM						
Bottom Gas Piping Kit		**85M31**	X	X	X	X
Combustion Air Intake Extensions (order two)		**89L97**	X	X	X	X
Gas Heat Input	Standard - 260,000 Btuh	Factory	O	O	O	O
	Medium - 360,000 Btuh	Factory	O	O	O	O
	High - 480,000 Btuh	Factory	O	O	O	O
Low Temperature Vestibule Heater	208/230V-3ph	**37G86**	X	X	X	X
	460V	**37G90**	X	X	X	X
	575V	**37G92**	X	X	X	X
LPG/Propane Conversion Kits (Order 2 kits)	Standard heat	**14N28**	X	X	X	X
	Medium heat	**14N29**	X	X	X	X
	High heat	**14N30**	X	X	X	X
Stainless Steel Heat Exchanger		Factory	O	O	O	O
Vertical Vent Extension Kit		**42W16**	X	X	X	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 Auto Bypass Kit	3, 5, 7.5 HP VFD Bypass - No Overload	**37G64**	X	X	X	X
	10 HP - With Overload	**37G65**			X	X
Drive Kits	Kit #1 535-725 rpm	Factory	O	O		
See Blower Data Tables for usage and selection	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
HUMIDITROL® DEHUMIDIFICATION REHEAT OPTION						
Humiditrol® Dehumidification Option		Factory	O	O	O	O

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)

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OPTIONS / ACCESSORIES

Item Description		Order Number	Size 180	210	240	300
CABINET						
Combination Coil/Hail Guards		**23U69**	OX	OX		
		23U71			OX	OX
Hinged Access Panels		Factory	O	O	O	O
CONTROLS						
NOTE - Also see Conventional Thermostat Control Systems page 12 of Engineering Handbook for Additional Options.						
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
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 Disconnect Table for usage, page 15)	80 amp	**54W88**	OX	OX	OX	OX
	150 amp	**54W89**	OX	OX	OX	OX
	250 amp	**90W82**				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
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 (CO_2) 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		**23V86**	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		**23V87**	X	X	X	X
CO_2 Sensor Duct Mounting Kit - for downflow applications		**23Y47**	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensors (**77N39**)		**90N43**	X	X	X	X
Needlepoint Bipolar Ionization (NPBI)						
Needlepoint Bipolar Ionization (NPBI) Kits		**21U37**	X	X		
		21U38			X	
		21U39				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

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

[2] 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)

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

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OPTIONS / ACCESSORIES

Item Description		Order Number	Size 180	210	240	300
ECONOMIZER						
High Performance Economizer (Approved for California Title 24 Building Standards AMCA Class 1A Certified)						
High Performance Economizer (Downflow or Horizontal) 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		**22J18**	OX	OX	OX	OX
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
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	208/230V	**22H90**	X	X	X	X
	460V	**22H91**	X	X	X	X
	575V	**22V34**	X	X	X	X

[1] 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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OPTIONS / ACCESSORIES

Item Description		Order Number	Size 180	210	240	300
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	RTD11-185S	**13K63**	X			
	RTD11-275S	**13K64**		X	X	X
Flush - Order one	FD11-185S	**13K58**	X			
	FD11-275S	**13K59**		X	X	X
Transitions (Supply and Return) - Order one	C1DIFF33C-1	**12X68**	X			
	C1DIFF34C-1	**12X70**		X	X	X

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

Model			LGX180S5	LGX210S5	LGX240S5	LGX300S5
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
		[1] IEER (Btuh/Watt)	14.0	14.0	14.0	13.0
		[1] EER (Btuh/Watt)	10.8	10.8	10.8	9.8
		Total Unit Power - kW	15.9	18.5	21.1	27.6
Sound Rating Number		dBA	86	86	93	94
Refrigerant Charge		Refrigerant Type	R-454B	R-454B	R-454B	R-454B
	Without Reheat Option	Circuit 1	6 lbs. 11 oz.	6 lbs. 6 oz.	7 lbs. 4 oz.	5 lbs. 15 oz.
		Circuit 2	5 lbs. 3 oz.	6 lbs. 2 oz.	7 lbs. 2 oz.	5 lbs. 8 oz.
		Circuit 3	5 lbs. 5 oz.	7 lbs. 13 oz.	6 lbs. 15 oz.	5 lbs. 5 oz.
		Circuit 4	- - -	- - -	- - -	5 lbs. 6 oz.
	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.
Gas Heat Available			See page 9			
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		Net face area - ft.² (total)	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 Kit 1 535-725 rpm Kit 2 710-965 rpm 5 HP Kit 3 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm 7.5 HP Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm		5 HP Kit 3 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm 7.5 HP Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm 10 HP Kit 7 945-1185 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.

[1] 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.

[2] 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.

SPECIFICATIONS — GAS HEAT

Heat Input Type			Standard (S)	Medium (M)	High (H)
Number of Gas Heat Stages			[1] Two	[1] Two	[1] Two
Gas Heating Performance	Input - Btuh	First Stage	85,000	117,000	156,000
		Second Stage	169,000	234,000	312,000
		Third Stage	214,000	297,000	396,000
		Fourth Stage	260,000	360,000	480,000
	Output - Btuh	First Stage	- - -	- - -	- - -
		Second Stage	- - -	- - -	- - -
		Third Stage	- - -	- - -	- - -
		Fourth Stage	211,000	292,000	389,000
Temperature Rise Range - °F		First Stage	15 - 45	30 - 60	40 - 70
		Second Stage	- - -	- - -	- - -
Minimum air volume - cfm			4500	4500	5125
Thermal Efficiency			81%	81%	81%
Gas Supply Connections			1 in. NPT	1 in. NPT	1 in. NPT
Recommended Gas Supply Pressure - Nat. / LPG		Natural	7	7	7
		LPG/Propane	11	11	11
Gas Supply Pressure Range		Min./Max. (Natural)	4.7 - 10.5 in. w.g.		
		Min./Max. (LPG)	10.8 - 13.5 in. w.g.		

[1] Two-stage heat models can be operated with four stages of gas heating when controlled in either zone sensor, discharge air control, or fresh air tempering mode on the Lennox® CORE Lite unit controller.

HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 2000 feet above sea level without any modification.

At altitudes above 2000 feet, units must be derated to match gas manifold pressures shown in table below.

At altitudes above 4500 feet units must be derated 4% for each 1000 feet above sea level.

NOTE – This is the only permissible derate for these units.

Refer to the Installation Instructions for more detailed information.

ONE STAGE HEAT

No Adjustment Required

TWO STAGE HEAT

Heat Input Type	Altitude Feet	Gas Manifold Pressure in. w.g.		Input Rate (Btuh)	
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage
Standard (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	169,000	239,000
Medium (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	234,000	331,000
High (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	312,000	442,000

FOUR STAGE HEAT

[1] Heat Input Type	Altitude Feet	Gas Manifold Pressure in. w.g.		Input Rate (Btuh)			
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage	Third Stage	Fourth Stage
Standard (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	85,000	169,000	204,000	239,000
Medium (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	117,000	234,000	283,000	331,000
High (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	156,000	312,000	377,000	442,000

[1] Four-Stage Gas Heating is field configured.

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

Then determine from blower table blower motor output and drive required.
See page 11 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.

Minimum Air Volume Required For Different Gas Heat Sizes:
Standard and Medium Heat - 4500 cfm | High Heat - 5125 cfm

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		2.60	
	RPM	BHP	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	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3000	395	0.35	515	0.55	610	0.75	685	1.00	760	1.20	825	1.45	885	1.70	---	---	---	---	---	---	---	---	---	---	---	---
3250	405	0.40	520	0.60	615	0.85	695	1.10	765	1.30	830	1.60	890	1.85	950	2.10	---	---	---	---	---	---	---	---	---	---
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	2.55	---	---	---	---	---	---	---	---
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	960	2.45	1010	2.70	1060	3.00	1110	3.30	---	---	---	---
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	965	2.60	1020	2.90	1070	3.25	1115	3.55	1160	3.85	1205	4.15
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	970	2.80	1025	3.10	1075	3.45	1120	3.75	1165	4.10	1210	4.45
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	980	3.00	1030	3.30	1080	3.65	1130	4.05	1175	4.35	1215	4.70
4750	470	0.75	575	1.10	660	1.45	740	1.80	810	2.15	870	2.50	930	2.85	985	3.20	1040	3.55	1085	3.90	1135	4.25	1180	4.65	1225	5.00
5000	480	0.85	585	1.25	670	1.60	750	1.95	815	2.30	880	2.70	940	3.05	995	3.40	1045	3.80	1095	4.15	1140	4.50	1185	4.90	1230	5.30
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.65	1050	4.00	1100	4.40	1150	4.80	1195	5.20	1235	5.60
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.85	1060	4.25	1110	4.70	1155	5.10	1200	5.50	1240	5.90
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.65	1015	4.10	1065	4.50	1115	4.95	1160	5.35	1205	5.80	1250	6.25
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.90	1025	4.35	1075	4.80	1120	5.20	1170	5.65	1215	6.10	1255	6.55
6250	545	1.40	640	1.90	720	2.35	795	2.80	860	3.25	920	3.70	975	4.15	1030	4.60	1080	5.05	1130	5.50	1175	5.95	1220	6.45	1265	6.90
6500	560	1.55	650	2.05	730	2.50	805	3.00	870	3.45	930	3.95	985	4.40	1040	4.85	1090	5.35	1140	5.85	1185	6.30	1225	6.75	1270	7.25
6750	570	1.70	665	2.20	745	2.70	815	3.20	880	3.70	940	4.20	995	4.65	1045	5.10	1095	5.60	1145	6.10	1190	6.60	1235	7.10	1275	7.60
7000	585	1.85	675	2.35	755	2.90	825	3.40	890	3.95	950	4.45	1005	4.95	1055	5.40	1105	5.95	1155	6.45	1200	6.95	1240	7.45	1285	8.00
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	955	4.65	1015	5.25	1065	5.75	1115	6.25	1160	6.75	1205	7.30	1250	7.85	1290	8.35
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	965	4.95	1020	5.50	1075	6.05	1125	6.60	1170	7.15	1215	7.65	1260	8.25	1300	8.75
7750	630	2.40	715	3.00	790	3.55	855	4.10	920	4.70	975	5.25	1030	5.80	1080	6.35	1130	6.90	1180	7.50	1225	8.05	1265	8.60	1305	9.15
8000	640	2.55	725	3.20	800	3.80	865	4.35	930	4.95	985	5.50	1040	6.10	1090	6.70	1140	7.25	1185	7.85	1230	8.40	1275	9.00	1315	9.60
8250	655	2.80	740	3.40	810	4.00	880	4.65	940	5.25	995	5.85	1050	6.45	1100	7.05	1150	7.65	1195	8.25	1240	8.85	1280	9.40	1325	10.05
8500	670	3.00	750	3.65	825	4.30	890	4.90	950	5.55	1005	6.15	1060	6.80	1110	7.40	1160	8.05	1205	8.65	1250	9.25	1290	9.85	1330	10.45
8750	685	3.25	765	3.90	835	4.55	900	5.20	960	5.85	1015	6.45	1070	7.15	1120	7.75	1165	8.35	1215	9.05	1255	9.65	1300	10.30	---	---
9000	700	3.50	780	4.20	850	4.85	910	5.50	970	6.15	1025	6.80	1080	7.50	1130	8.15	1175	8.75	1220	9.40	1265	10.10	1310	10.80	---	---
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.55	1040	7.20	1090	7.85	1140	8.55	1185	9.20	1230	9.85	1275	10.55	1315	11.20	---	---
9500	730	4.00	805	4.75	875	5.45	935	6.15	995	6.90	1050	7.60	1100	8.25	1150	8.95	1195	9.60	1240	10.30	1285	11.05	---	---	---	---
9750	745	4.30	820	5.05	885	5.75	950	6.55	1005	7.20	1060	7.95	1110	8.65	1160	9.40	1205	10.05	1250	10.80	1295	11.50	---	---	---	---
10,000	760	4.60	835	5.40	900	6.15	960	6.85	1015	7.60	1070	8.35	1120	9.05	1170	9.80	1215	10.50	1260	11.25	---	---	---	---	---	---
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	10.25	1225	11.00	---	---	---	---	---	---	---	---
10,500	790	5.20	860	6.00	925	6.85	985	7.65	1040	8.40	1095	9.20	1145	10.00	1190	10.70	1235	11.45	---	---	---	---	---	---	---	---
10,750	805	5.55	875	6.40	940	7.25	1000	8.05	1055	8.85	1105	9.65	1155	10.45	1200	11.20	---	---	---	---	---	---	---	---	---	---
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	---	---	---	---	---	---	---	---	---	---	---	---

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	Gas Heat Exchanger			Economizer	Filters			Horizontal Roof Curb	
	180	210 240 300		Standard Heat	Medium Heat	High Heat		MERV 8	MERV 13	MERV 16	180 thru 240	300
2750	.01	.02	.01	.02	.04	.05	- - -	.01	.03	.06	.03	- - -
3000	.01	.02	.01	.03	.04	.05	- - -	.01	.03	.06	.04	- - -
3250	.01	.03	.01	.03	.05	.06	- - -	.01	.04	.07	.04	.01
3500	.01	.03	.02	.03	.05	.06	- - -	.01	.04	.08	.05	.01
3750	.01	.03	.02	.04	.06	.07	- - -	.01	.04	.08	.05	.01
4000	.02	.04	.02	.04	.06	.07	- - -	.01	.04	.09	.06	.02
4250	.02	.04	.02	.04	.06	.08	- - -	.01	.05	.10	.07	.02
4500	.02	.05	.02	.05	.07	.09	- - -	.01	.05	.10	.07	.02
4750	.02	.05	.02	.05	.08	.10	- - -	.02	.05	.11	.08	.03
5000	.02	.05	.02	.05	.09	.11	- - -	.02	.06	.12	.08	.03
5250	.02	.06	.03	.06	.10	.12	- - -	.02	.06	.12	.09	.04
5500	.02	.07	.03	.06	.10	.13	- - -	.02	.06	.13	.10	.04
5750	.03	.07	.03	.06	.11	.14	- - -	.02	.07	.14	.11	.05
6000	.03	.08	.03	.07	.12	.15	- - -	.03	.07	.14	.11	.06
6250	.03	.08	.03	.07	.12	.16	.01	.03	.07	.15	.12	.07
6500	.03	.09	.04	.08	.13	.17	.02	.03	.08	.16	.13	.08
6750	.04	.10	.04	.08	.14	.18	.03	.03	.08	.17	.14	.08
7000	.04	.10	.04	.09	.15	.19	.04	.04	.08	.17	.15	.09
7250	.04	.11	.04	.09	.16	.20	.05	.04	.09	.18	.16	.10
7500	.05	.12	.05	.10	.17	.21	.06	.04	.09	.19	.17	.11
8000	.05	.13	.05	.11	.19	.24	.09	.05	.10	.21	.19	.13
8500	.06	.15	.05	.12	.20	.26	.11	.05	.10	.22	.21	.15
9000	.07	.16	.06	.13	.23	.29	.14	.06	.11	.24	.24	.17
9500	.08	.18	.07	.14	.25	.32	.16	.07	.12	.25	.26	.19
10,000	.08	.20	.07	.16	.27	.35	.19	.07	.12	.27	.29	.21
10,500	.09	.22	.08	.17	.30	.38	.22	.08	.13	.29	.31	.24
11,000	.11	.24	.08	.18	.31	.40	.25	.09	.14	.30	.34	.27

BLOWER DATA

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.	
		RTD11-185S Step-Down	FD11-185S Flush
180	5600	39 - 49	28 - 37
	5800	42 - 51	29 - 38
	6000	44 - 54	40 - 50
	6200	45 - 55	42 - 51
	6400	46 - 55	43 - 52
	6600	47 - 56	45 - 56

[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.

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

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

Model		LGX180S5								
[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

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

Model		LGX210S5								
[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 (MCA)	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

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

Model		LGX240S5								
[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	24.2	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	125	60	60	60	45	50	50
[3] Minimum Circuit Ampacity (MCA)	Unit Only	102	110	110	46	50	53	37	40	42
	With (2) 0.33 HP Power Exhaust	107	114	114	49	52	56	39	42	44

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

Model		LGX300S5								
[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

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.
[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] HACR type breaker or fuse.
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL ACCESSORIES - DISCONNECTS

15 TON | LGX180S5

Motor HP	3		5		7.5		3	5	7.5	3	5	7.5
Voltage	208V	230V	208V	230V	208V	230V	460V	460V	460V	575V	575V	575V
Unit Only	54W88	54W88	54W88	54W88	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit w/ Power Exhaust	54W88	54W88	54W88	54W88	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88

17.5 TON | LGX210S5

Motor HP	3		5		7.5		3	5	7.5	3	5	7.5
Voltage	208V	230V	208V	230V	208V	230V	460V	460V	460V	575V	575V	575V
Unit Only	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit w/ Power Exhaust	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88

20 TON | LGX240S5

Motor HP	5		7.5		10		5	7.5	10	5	7.5	10
Voltage	208V	230V	208V	230V	208V	230V	460V	460V	460V	575V	575V	575V
Unit Only	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit w/ Power Exhaust	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88

25 TON | LGX300S5

Motor HP	5		7.5		10		5	7.5	10	5	7.5	10
Voltage	208V	230V	208V	230V	208V	230V	460V	460V	460V	575V	575V	575V
Unit Only	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit w/ Power Exhaust	54W89	54W89	54W89	54W89	90W82	90W82	54W88	54W88	54W88	54W88	54W88	54W88

Disconnects - 54W88 - 80A
54W89 - 150A
90W82 - 250A

[1] 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

Minimum R454B Space and CFM Requirements

Minimum Airflow[1]		
Unit	Q_{min}(CFM)	Q_{min}(m^3h)
LGX180	177	300
LGX210	207	351
LGX240	192	326
LGX300	157	267
LGX180 W/ Humidtrol	165	281
LGX210 W/ Humidtrol	165	281
LGX240 W/ Humidtrol	202	342
LGX300 W/ Humidtrol	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}(ft^2)	TA_{min}(m^2)
LGX180	98	9.10
LGX210	115	10.63
LGX240	107	9.87
LGX300	88	8.08
LGX180 W/ Humidtrol	92	8.51
LGX210 W/ Humidtrol	92	8.51
LGX240 W/ Humidtrol	112	10.38
LGX300 W/ Humidtrol	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)
LGX180 STG 1	6.69	3.03
LGX180 STG 2	5.19	2.35
LGX180 STG 3	5.31	2.41
LGX210 STG 1	6.38	2.89
LGX210 STG 2	6.13	2.78
LGX210 STG 3	7.81	3.54
LGX240 STG 1	7.25	3.29
LGX240 STG 2	7.13	3.23
LGX240 STG 3	6.94	3.15
LGX300 STG 1	5.94	2.69
LGX300 STG 2	5.46	2.48
LGX300 STG 3	5.34	2.42
LGX300 STG 4	5.38	2.44
LGX180 STG 1 W/ Humidtrol	6.25	2.83
LGX180 STG 2 W/ Humidtrol	6.00	2.72
LGX180 STG 3 W/ Humidtrol	5.75	2.61
LGX210 STG 1 W/ Humidtrol	6.25	2.83
LGX210 STG 2 W/ Humidtrol	6.25	2.83
LGX210 STG 3 W/ Humidtrol	5.94	2.69
LGX240 STG 1 W/ Humidtrol	7.63	3.46
LGX240 STG 2 W/ Humidtrol	7.25	3.29
LGX240 STG 3 W/ Humidtrol	6.94	3.15
LGX300 STG 1 W/ Humidtrol	6.94	3.15
LGX300 STG 2 W/ Humidtrol	6.31	2.86
LGX300 STG 3 W/ Humidtrol	4.69	2.13
LGX300 STG 4 W/ Humidtrol	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 LGX180 at 1000 ft. above see level, multiply 177 by 1.05 to get 185.85 CFM as the new Q_{min}.*

UNIT PARTS ARRANGEMENT

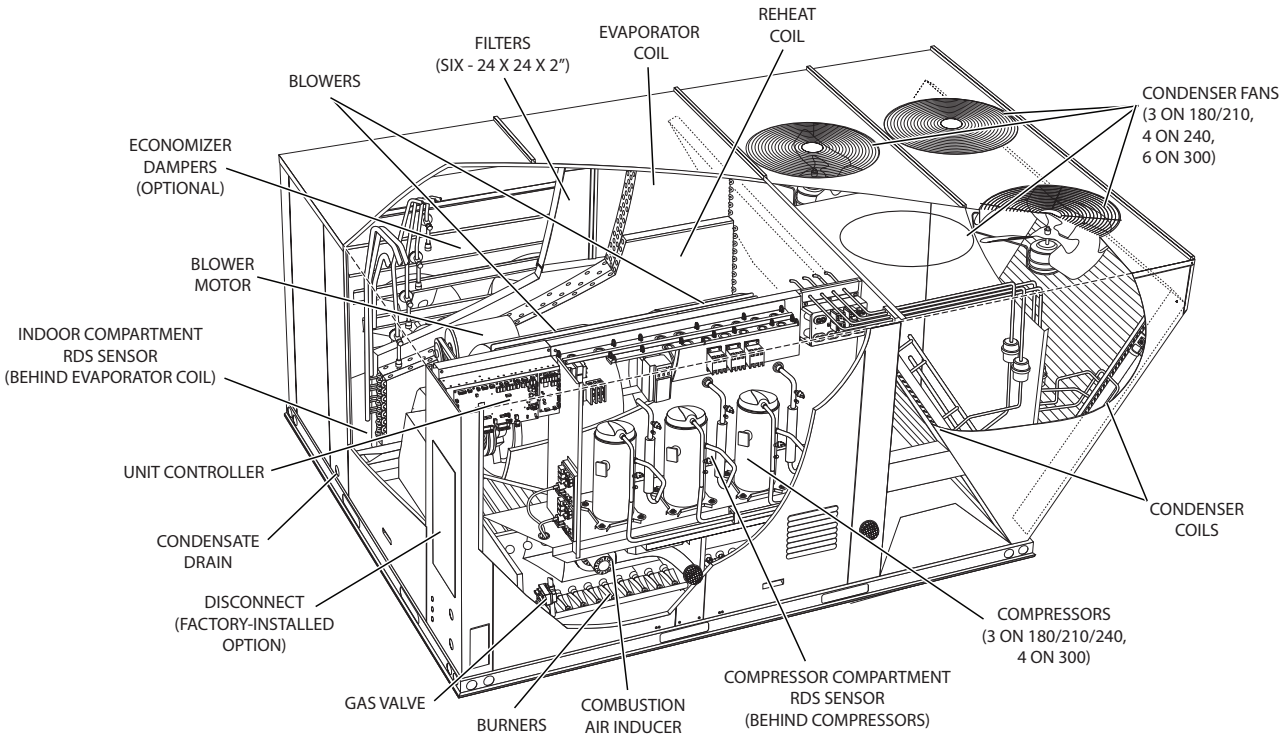


FIGURE 1

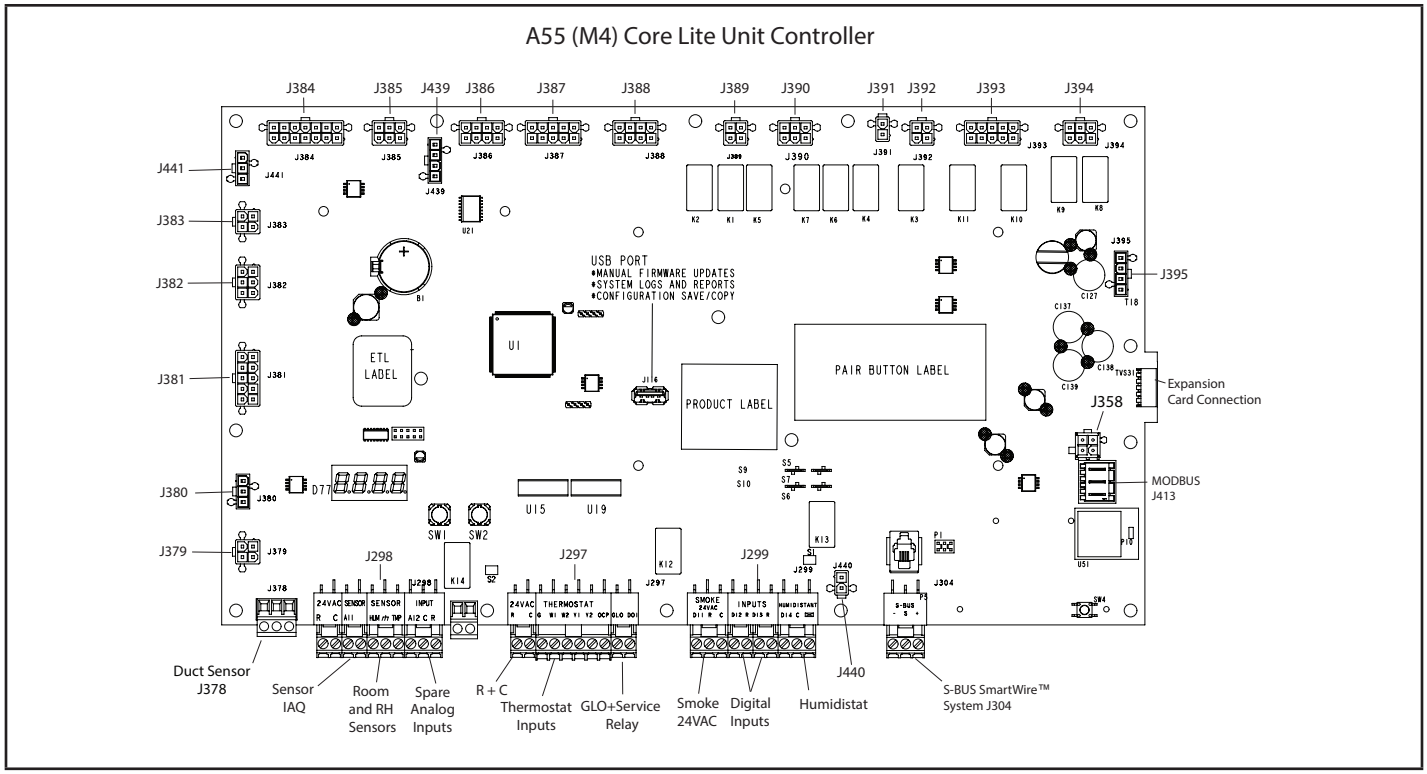


FIGURE 3

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 figures 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 4 and FIGURE 5. The control box is located in the upper portion of the compressor compartment.

1-Disconnect Switch S48

Units may be equipped with a disconnect switch S48, a toggle or twist-style switches, 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 2, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

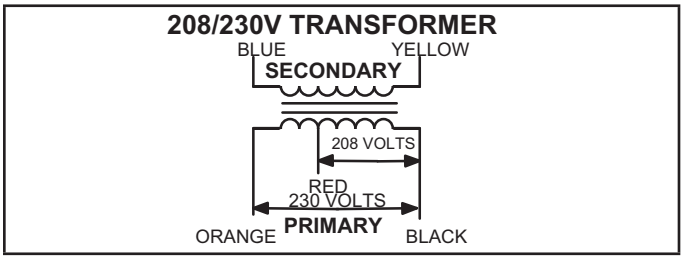


FIGURE 2

3-Contactor Transformer T18

T18 is a single line voltage to 24VAC transformer used in all LGX 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 he contactors.

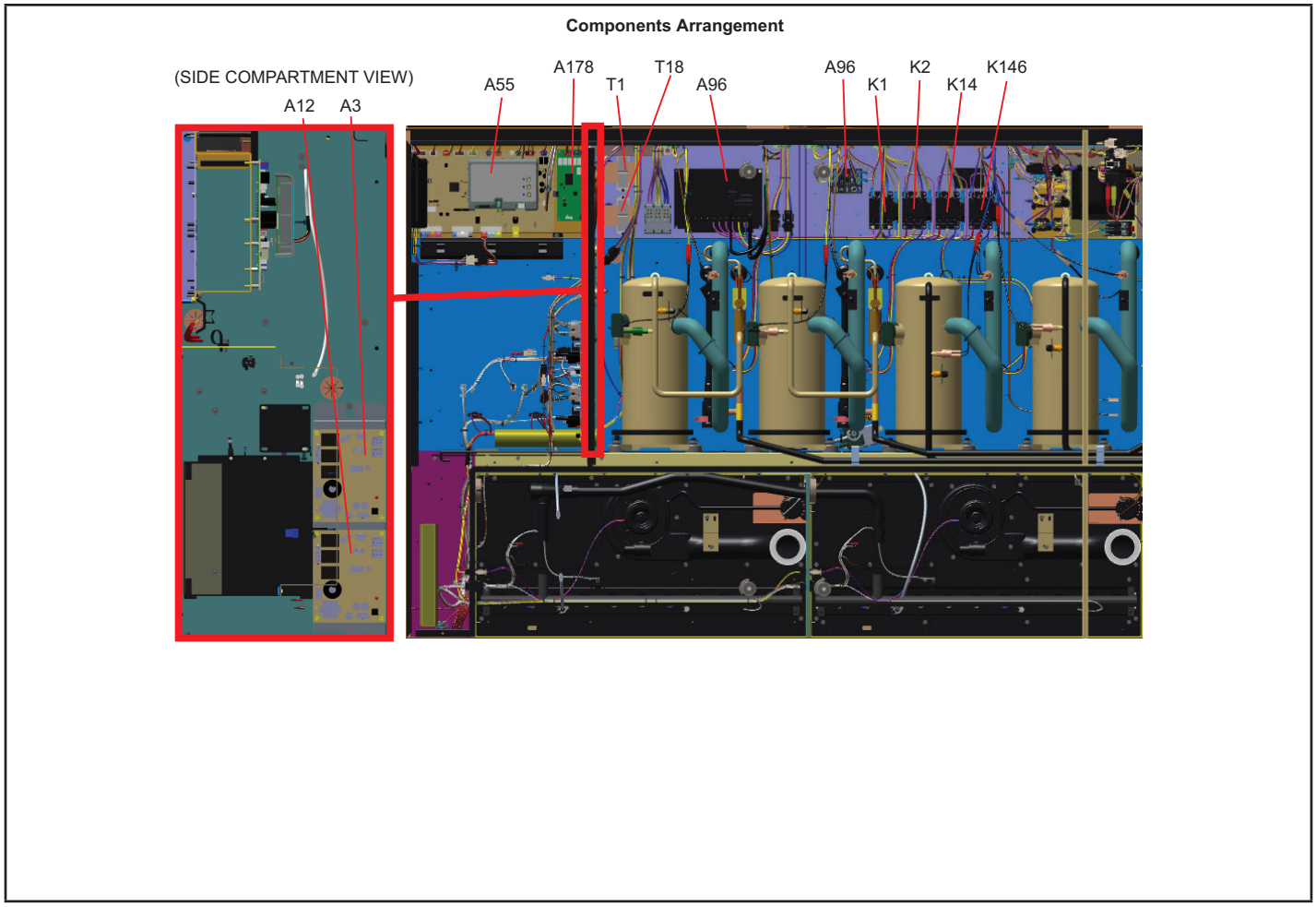


FIGURE 4

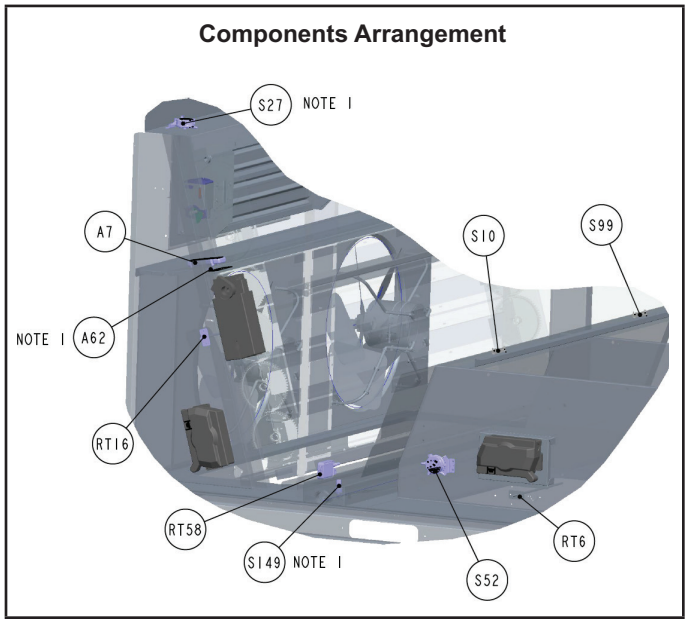


FIGURE 5

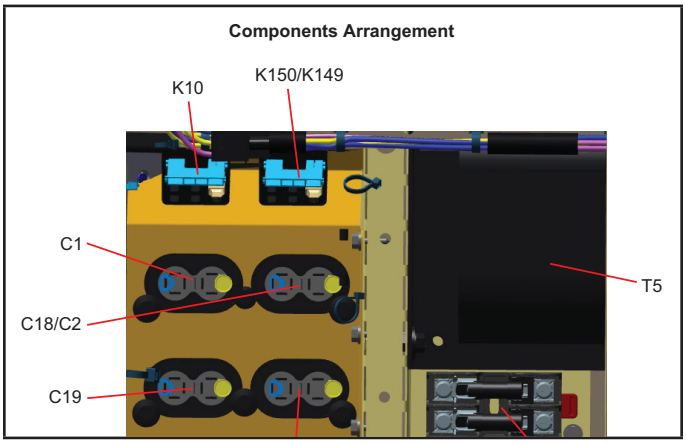


FIGURE 6

4-Terminal Block TB13

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

5-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.

6-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.

7-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.

8-Burner Controls A3 & A12

Units have two burner controls. A3 controls gas heat section one and A12 controls gas heat section two. The first gas heat section and the second gas heat section burner controls are identical. Both burner controls are factory set and are not adjustable. The control makes three attempts at ignition and then locks out the system if ignition is not obtained after the third trial. Reset after lockout requires only breaking and remaking thermostat demand. The control shuts off gas flow immediately in the event of a gas or power failure.

Upon restoration of gas and power, the control will restart the ignition sequence and continue until flame is established or system locks out. For a more detailed description see the Gas Heat Components section.

9-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.

10-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 onto the control panel.

11-VFD 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.

12-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.

13-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. Also see FIGURE 3 for board components.

Thermostat wires are connected to J297 on the Unit Controller.

14-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 1 through TABLE 4 show thermistor and pressure transducer readings.

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.

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.

Temperature Sensors

The return air (RT16) and discharge air (RT6) duct probes and the outdoor air (RT17) are all two wire thermistors. The resistance vs. temperature table is shown below:

TABLE 1

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		

Room Sensors

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

TABLE 2

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		

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 3

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		

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 4

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		

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

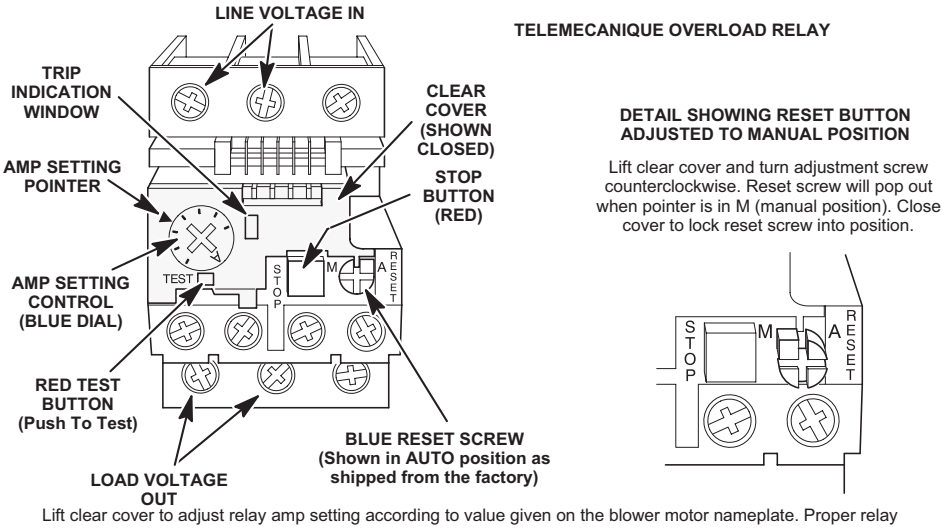
The second power exhaust fan is controlled by K231. A133 will enable K231 only when the blower reaches 70% of full speed (adjustable ECTO). This prevents a negative building pressure when the blower is operating in low speed. Refer to the Unit Controller manual and ECTO labels on the unit.

16-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.

17-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.



Lift clear cover to adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.

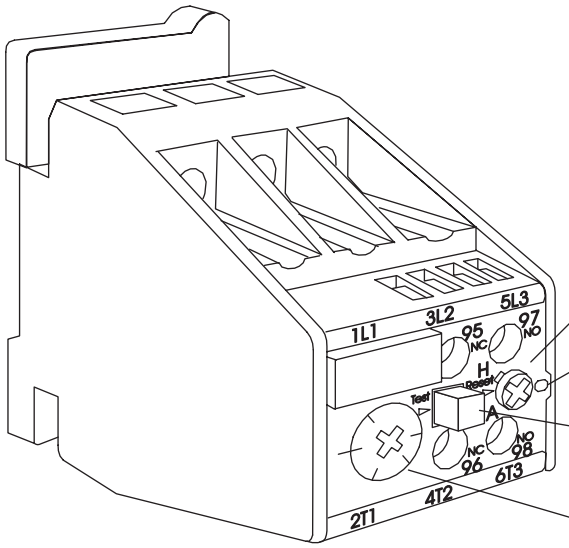
Cover must also be lifted to adjust control mode from automatic reset to manual reset (see detail above) and to test the control.

Control must be in the manual reset mode to perform a test. Use a pointed object to press the small red test button. A yellow marker should appear in the trip indication window to the right of the amp setting control. Press the blue reset screw to reset the relay.

The red STOP button opens the normally closed contacts which power the blower motor. This button stops blower motor operation as long as it is pressed in.

FIGURE 7

SIEMENS OVERLOAD RELAY



BLUE RESET BUTTON IN FACTORY-SET AUTO MODE (Turn clockwise to H for manual reset)

GREEN TRIP INDICATOR (Flush with surface -- not tripped; Above surface -- tripped)

RED TEST BUTTON

AMP ADJUSTMENT DIAL

Adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.

Use small slotted screwdriver to adjust control mode from automatic reset (A) to manual reset (H).

Control must be in the manual reset mode (H) to perform a test. Press the red test button. Green trip indicator should pop out. Press the blue reset screw to reset the relay.

FIGURE 8

Compressor Detail
B1, B2, B13

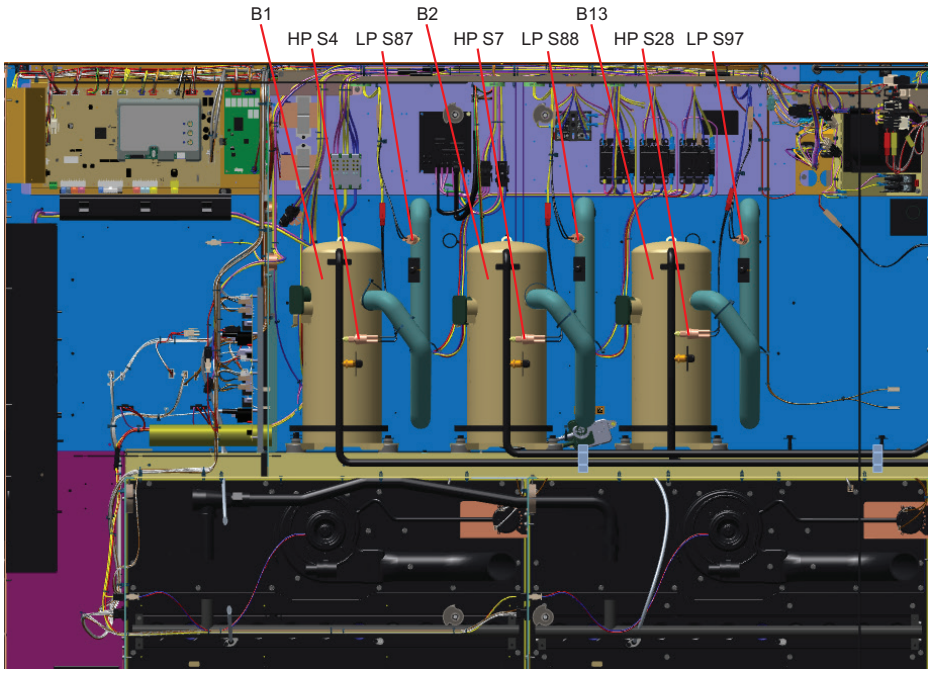


FIGURE 9

Compressor Detail
B1, B2, B13, B20

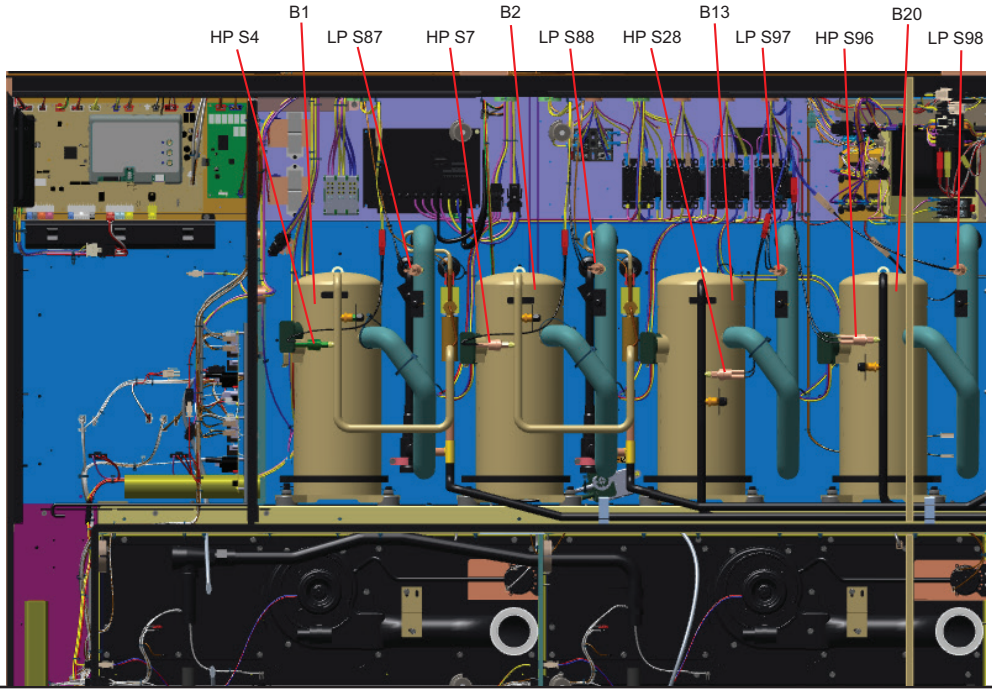


FIGURE 10

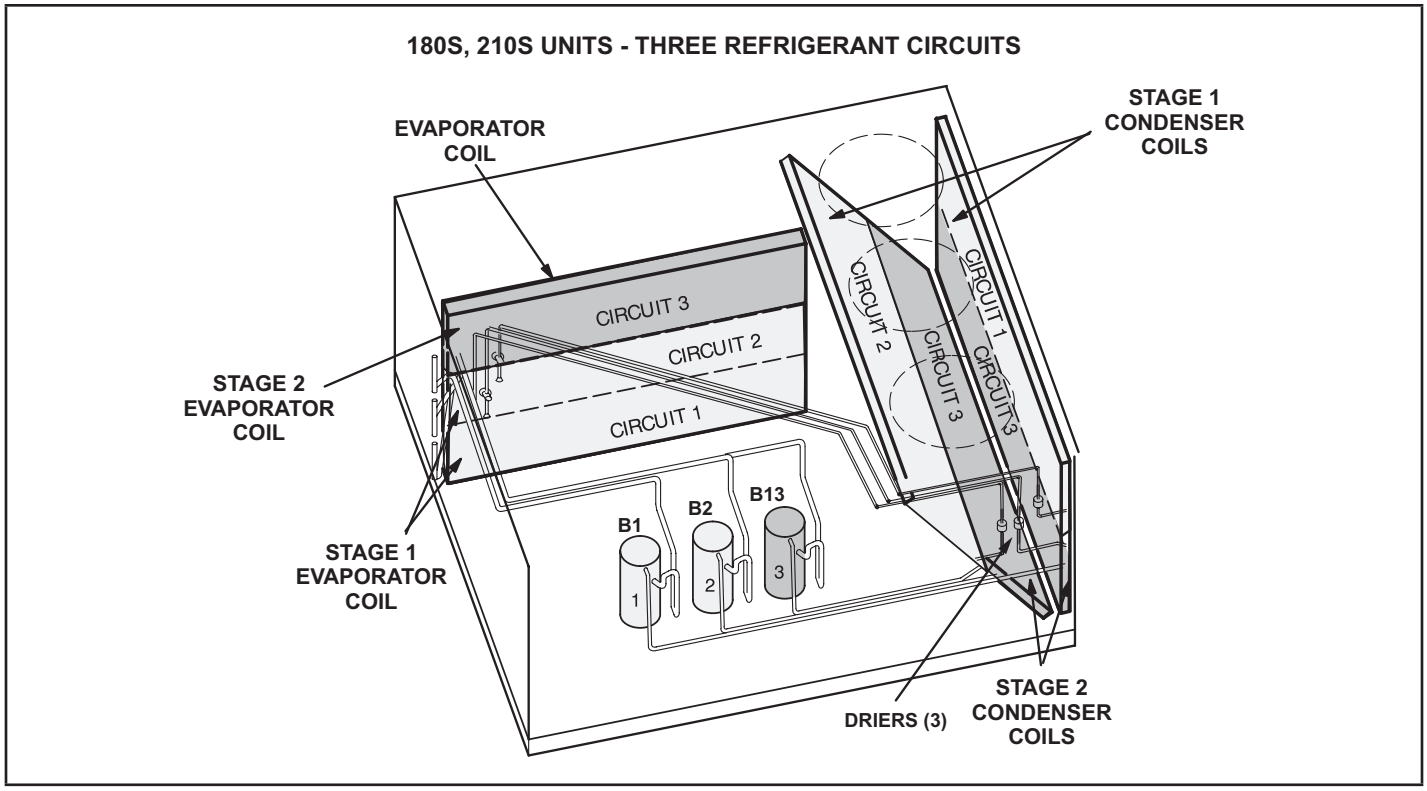


FIGURE 11

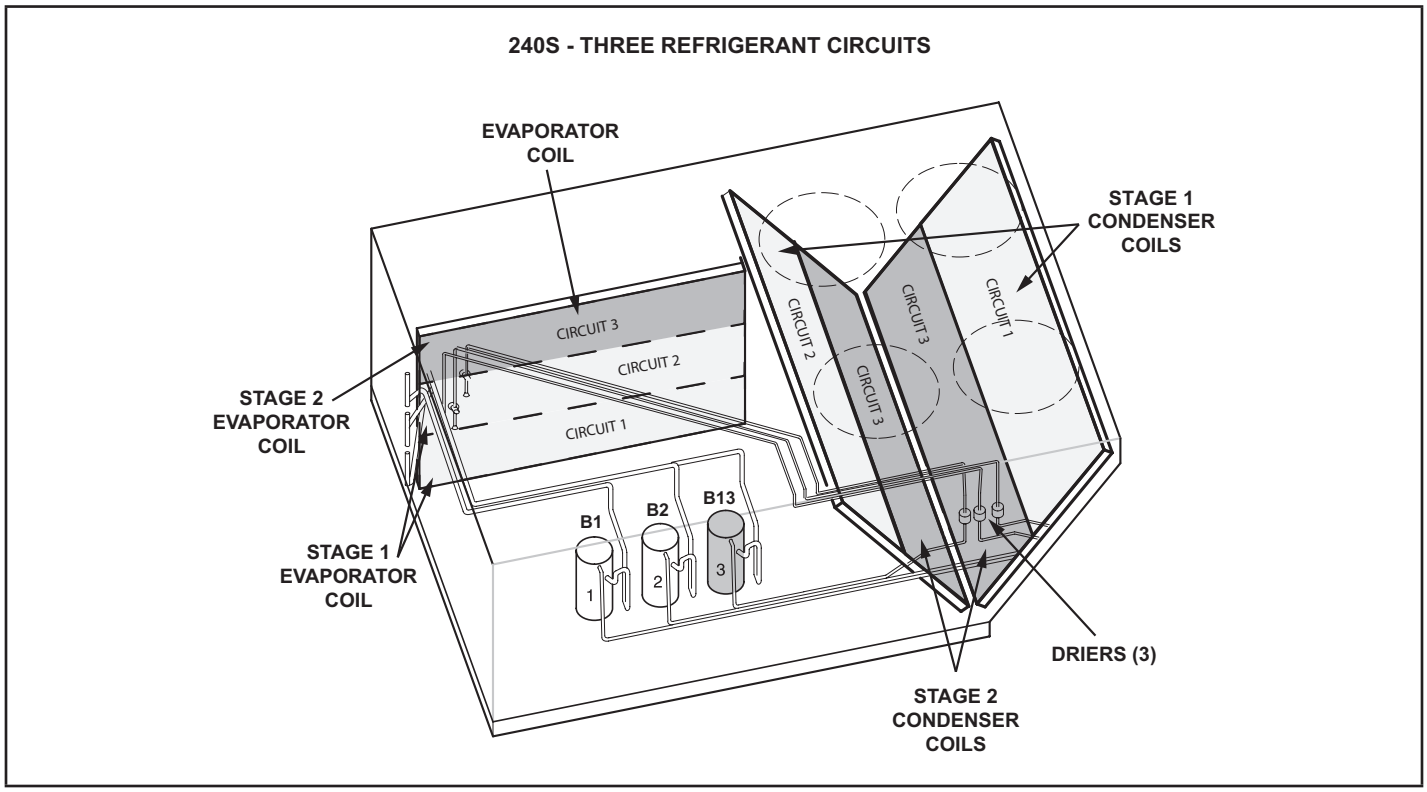


FIGURE 12

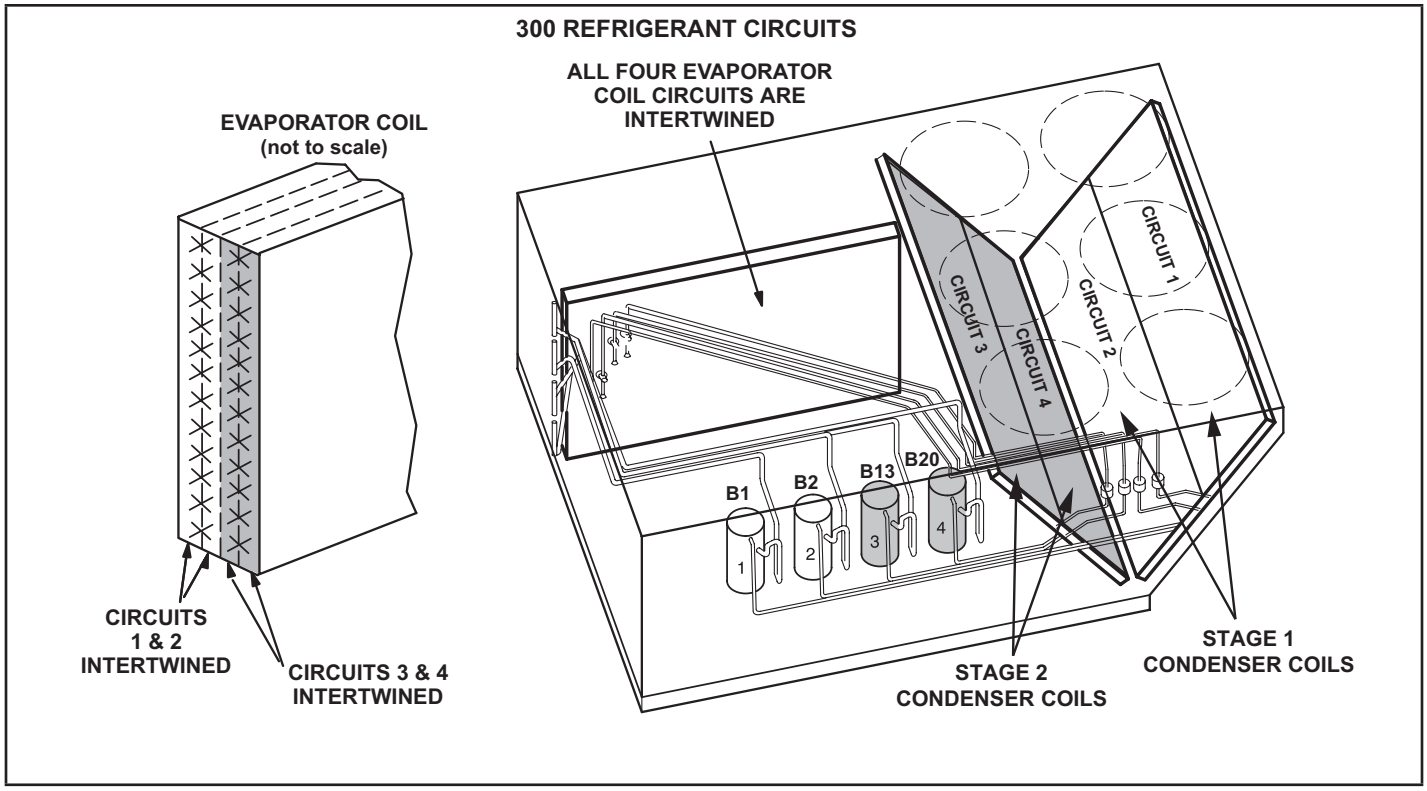


FIGURE 13

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 LGX180 & 210, four draw-through type condenser fans are used in LGX240 units and six draw-through type condenser fans are used in LGX300 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. Each evaporator is also equipped with enhanced fins and rifled tubing. 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. LGX180, 210, & 240 use 3 compressors and LGX300 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 LGX 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) ans 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 resetby breaking and remaking the thermostat demand or manually resetting the control.

When suction pressure drops to 40 $\pm$ 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 $\pm$ 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-Diagnostic Sensors

Temperature thermistor sensors (RT46-53) 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 5 and TABLE 6 for proper locations.

TABLE 5
LGX180, 210, 240

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

TABLE 6
LGX300

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

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

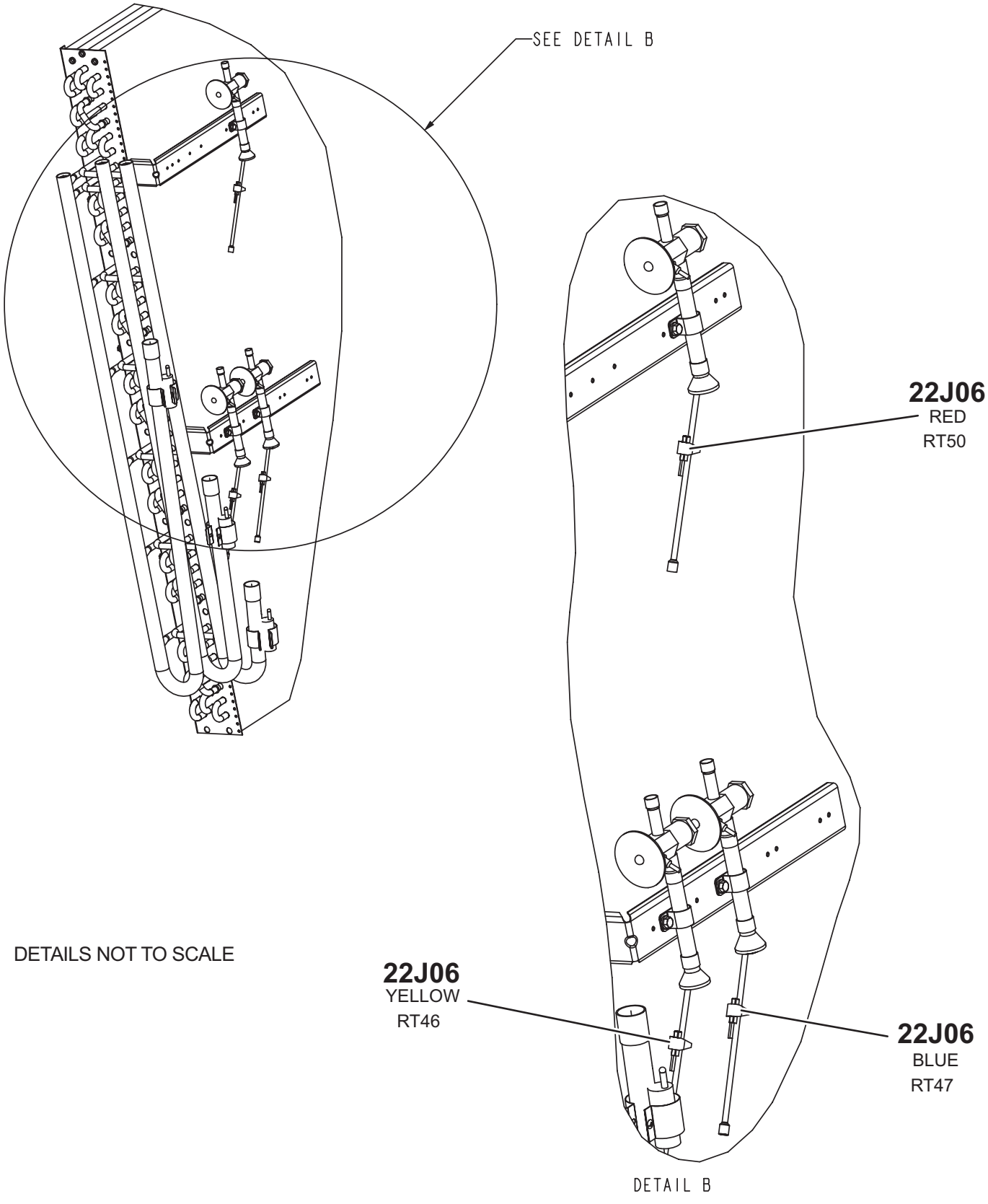


FIGURE 14

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

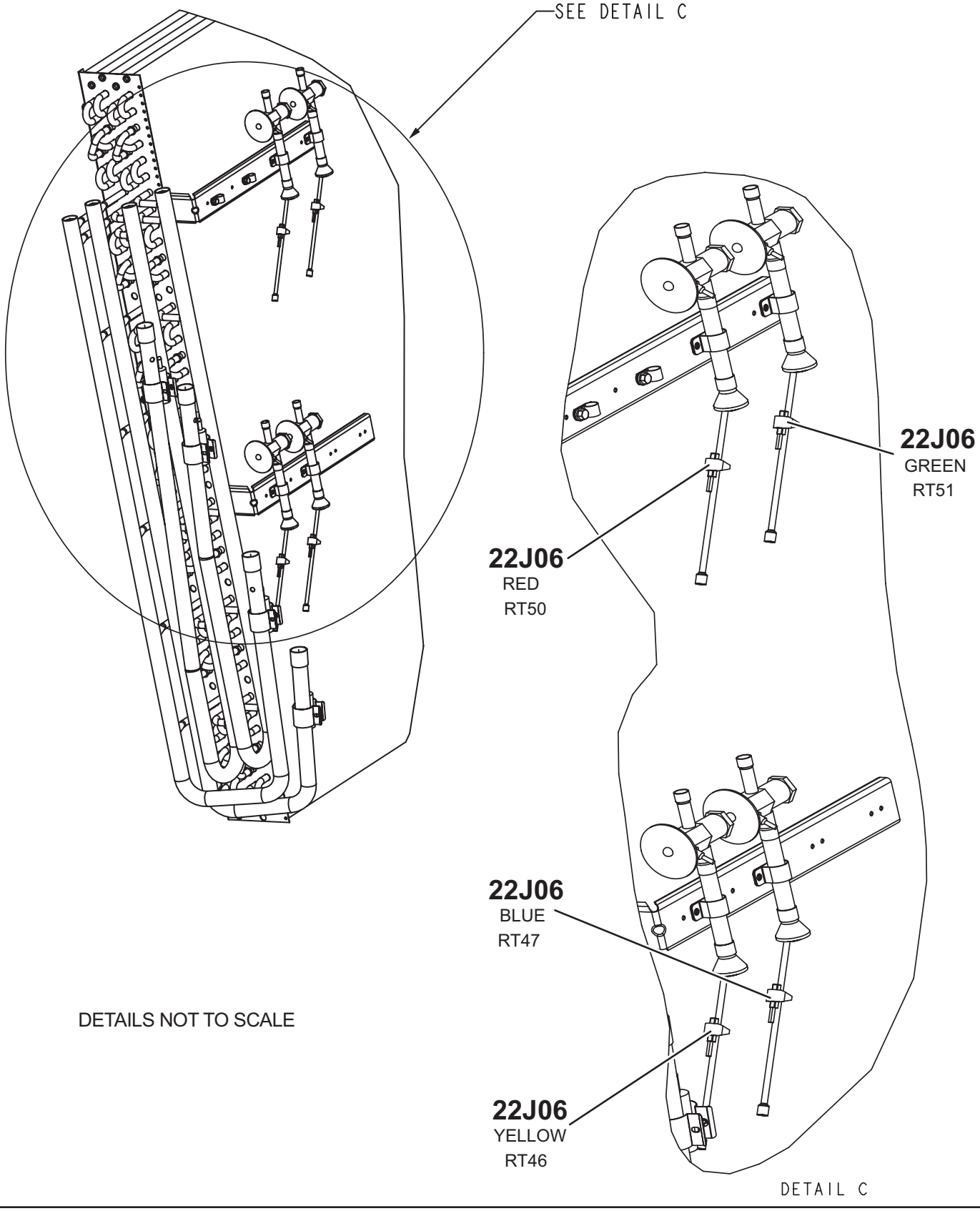


FIGURE 15

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 7. To identify sensor alarms see TABLE 8.

TABLE 7

Unit Model	Figure
Indoor Coil Area Sensor	FIGURE 16
Control/Compressor Compartment Sensor	FIGURE 17

TABLE 8 - 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"

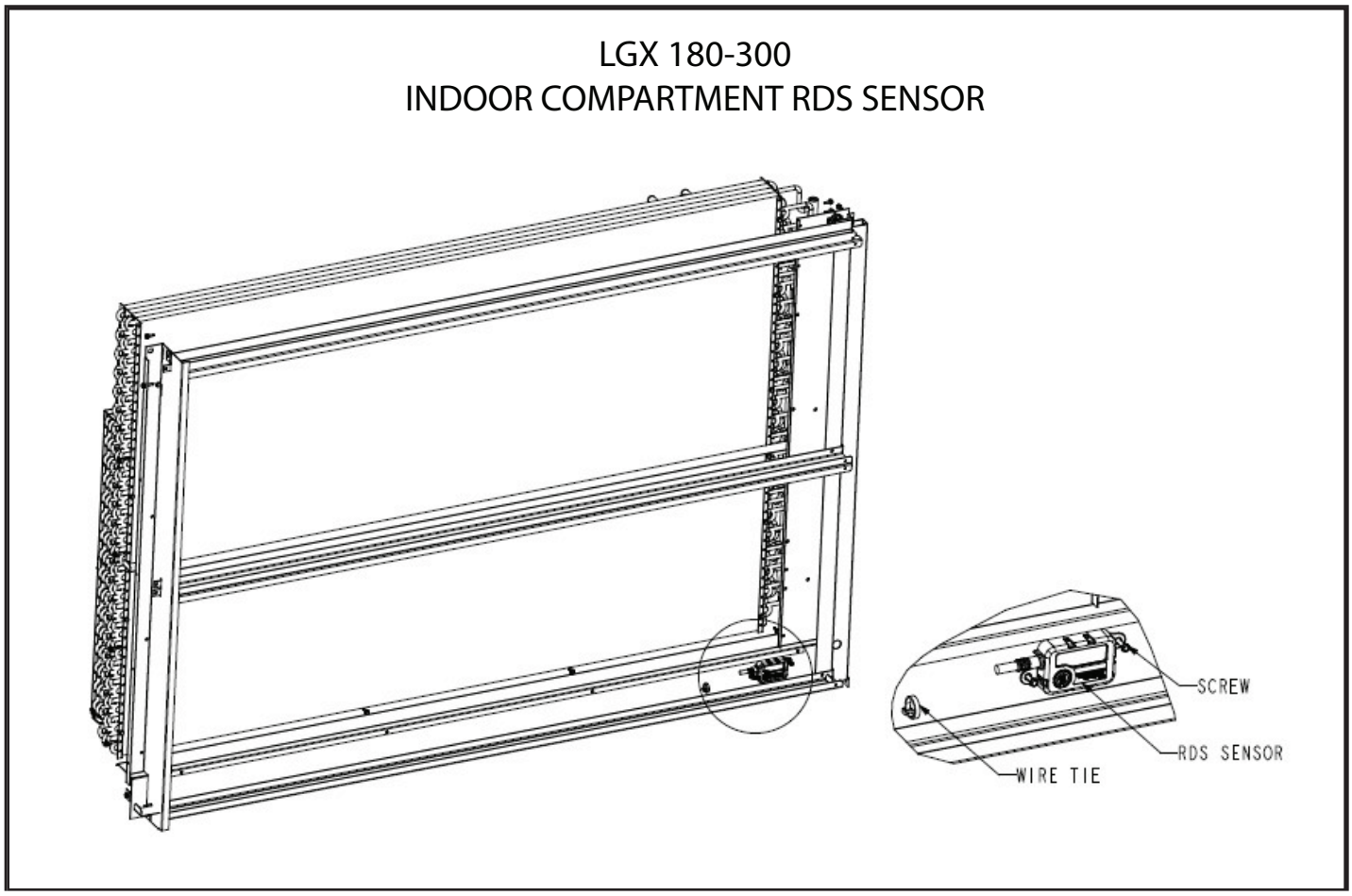


FIGURE 16

LGX 180-300
COMPRESSOR RDS SENSOR

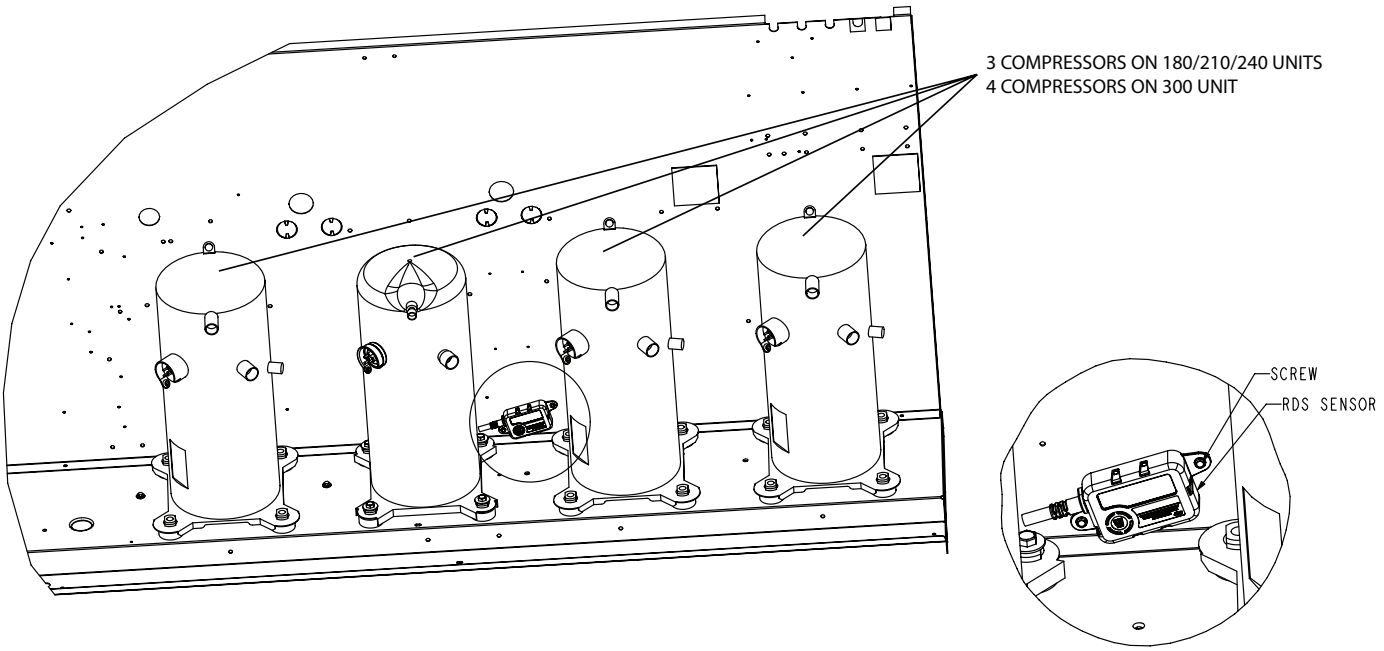
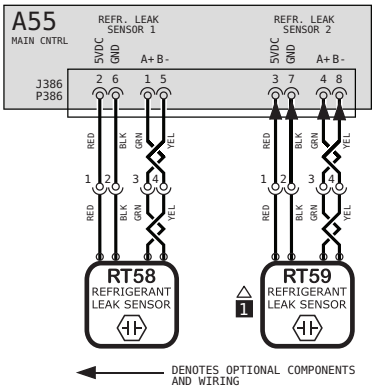


FIGURE 17



KEY LIST	
COMPONENT	**DESCRIPTION**
A55	CONTROL BOARD, MAIN
RT58	SENSOR 1, REFR. LEAK DETECTION
RT59	SENSOR 2, REFR. LEAK DETECTION

△	NOTES
1	REFRIGERANT LEAK SENSOR 2 (RT59), MAY NOT BE PRESENT IN ALL UNITS.

WARNING

DISCONNECT ALL POWER BEFORE SERVICING.

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

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

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

MODEL: Units w/CORE Contr.
Refr. Leak Detection
VOLT: All
SUPSDS: N/A NO: 538440-01

Rev 0

3 x 7
CUT SIZE

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

FIGURE 18

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 20.

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 factoryinstalled, 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 20.

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 19.

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 20. 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.

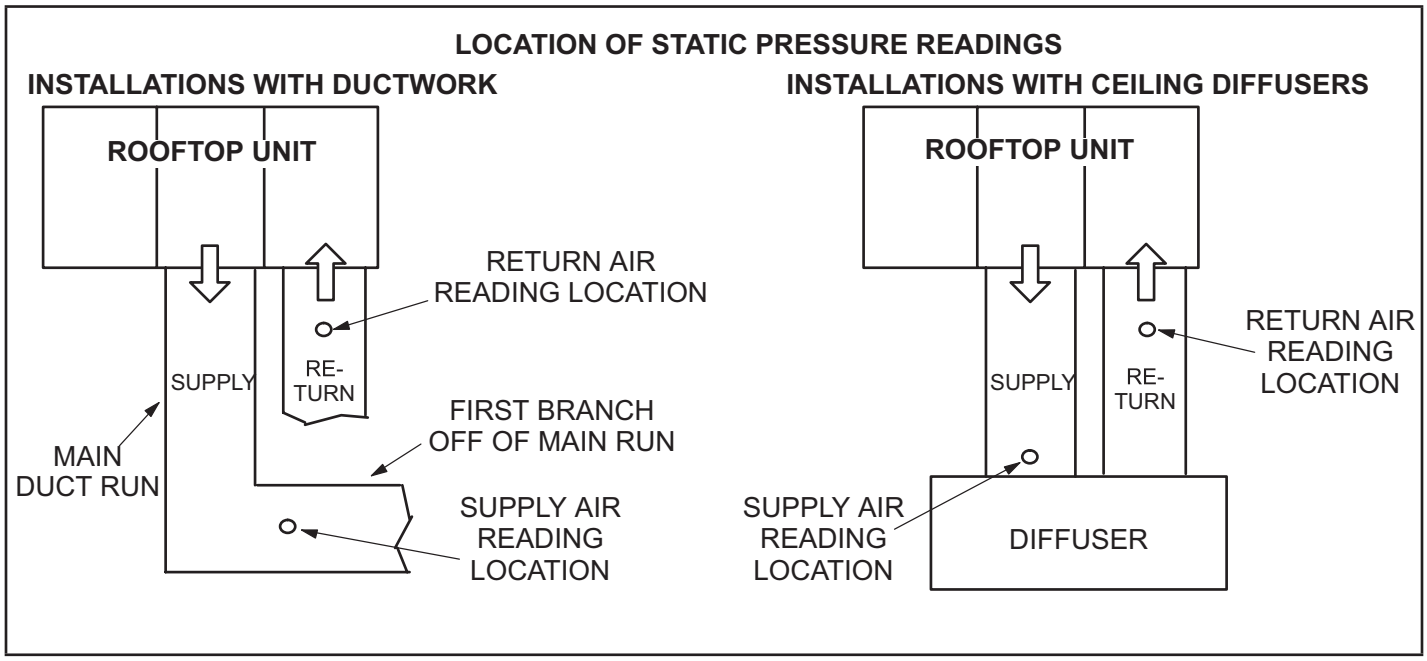


FIGURE 19

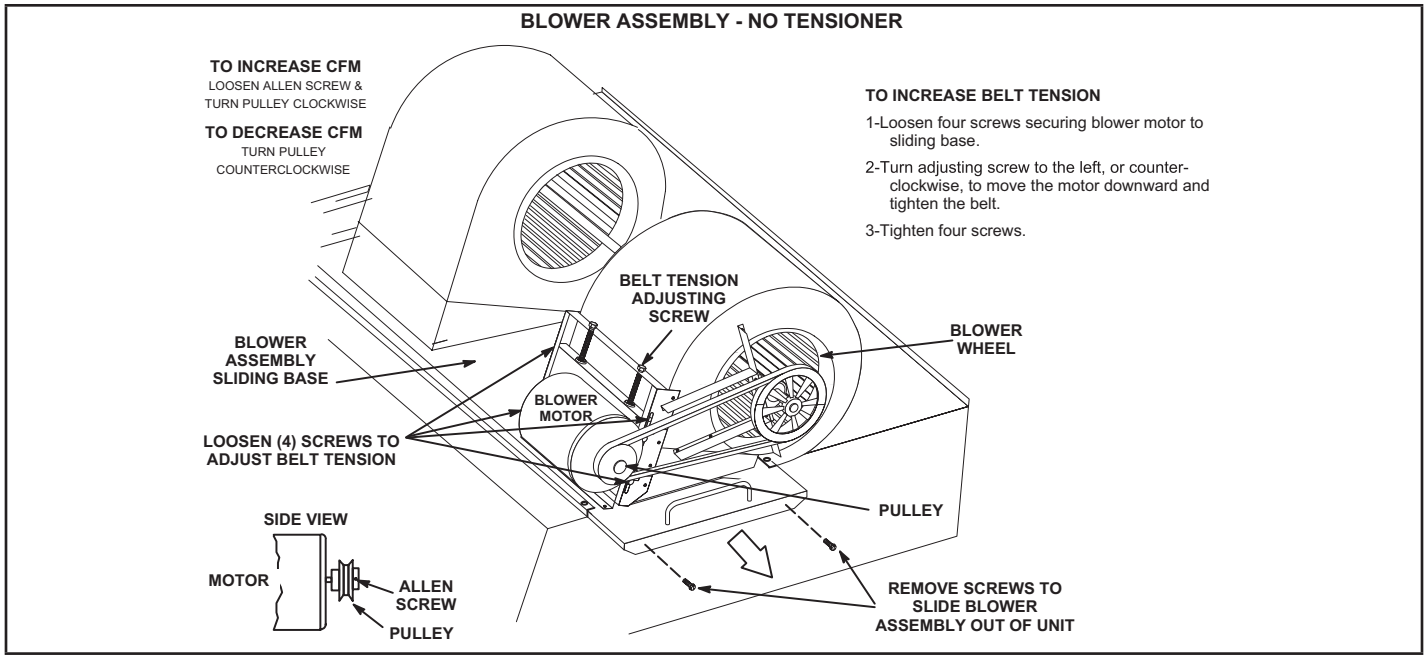


FIGURE 20

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 21 for blowers not equipped with a tensioner and FIGURE 22 for units equipped with an optional belt tensioner.

Blowers Without Belt Tensioner

1 - Loosen four screws securing blower motor to sliding base. See FIGURE 20.

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.

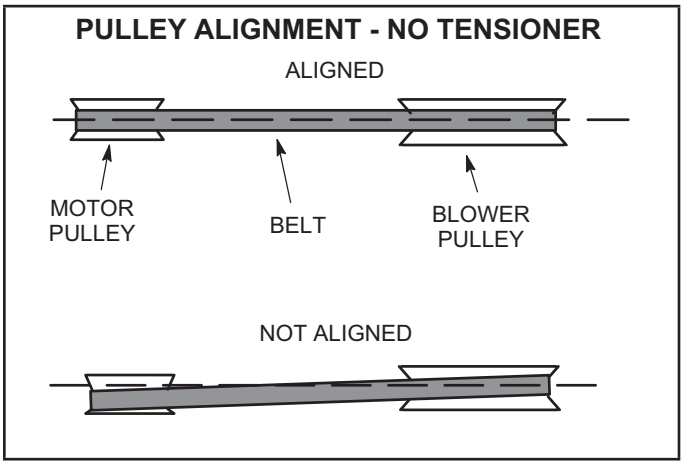


FIGURE 21

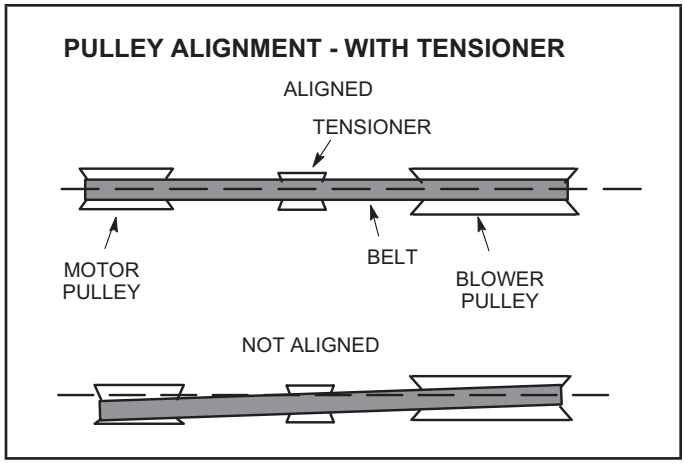


FIGURE 22

E-Check Belt Tension

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

1 - Measure span length X. See FIGURE 23.

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

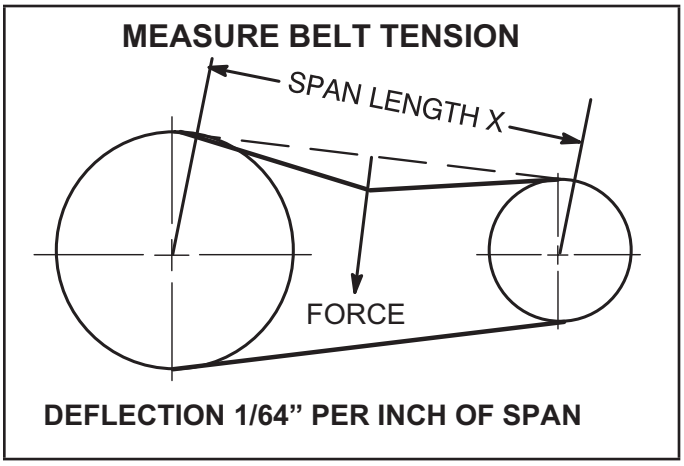


FIGURE 23

F-Field-Furnished Blower Drives

See BLOWER DATA tables for blower drives.

D-GAS HEAT COMPONENTS

See SPECIFICATIONS tables or unit nameplate for Btuh capacities. Units are equipped with two identical gas heat sections (gas heat section one and gas heat section two) see FIGURE 24. Stainless steel flex pipe will feed supply gas to the right side and black pipe will feed the left side. If for service the flexible connection must broken, hand tighten then turn additional 1/4" with a wrench for metal to metal seal (do not overtighten).

NOTE - *Do not use thread sealing compound on flex pipe flare connections.*

1-Control Box Components A3, A12, A55

⚠ WARNING

Shock hazard. Spark related components contain high voltage which can cause personal injury or death. Disconnect power before servicing. Control is not field repairable. Unsafe operation will result. If control is inoperable, simply replace the entire control.

Burner Ignition Control A3, A12

The ignition controls are located in the heat section areas (FIGURE 24) below the compressors. The controls are manufactured UTEC. See TABLE 10 for LED codes. The ignition control provides three main functions: gas valve control, ignition and flame sensing. There are three trials for ignition. Each trial is 10 second long with 30 seconds in between trial. After the third attempt for ignition the unit will lockout for 60 minutes. After lockout, the ignition control automatically resets and provides three more attempts at ignition. Manual reset after lockout requires breaking and remaking power to the ignition control. See FIGURE 25 for a normal ignition sequence and FIGURE 26 for the ignition attempt sequence with retrials (nominal timings given for simplicity). Specific timings for the ignition controls are shown in FIGURE 27.

TABLE 10

LED Flashes	Indicates
Slow Flash	Control ok, no call for heat
Fast Flash	Control ok, call for heat present.
Steady Off	Control ok, call for heat present.
Steady On Failure	Control internal failure
1 Flash	Rollout switch open
2 Flashes	Limit open or lockout from to many tries during a single heat demand
3 Flashes	Pressure switch open with inducer on/ open during 5 minute inducer off time.
4 Flashes	Ignition lockout from no flame detected or from too many flame losses.
5 Flashes	Flame sensed out of sequence
6 Flashes	Pressure switch closed with inducer off
7 Flashes	Gas valve relay failure
8 Flashes	Lockout due to too many pressure switch openings during one heat demand

GAS HEAT COMPONENTS

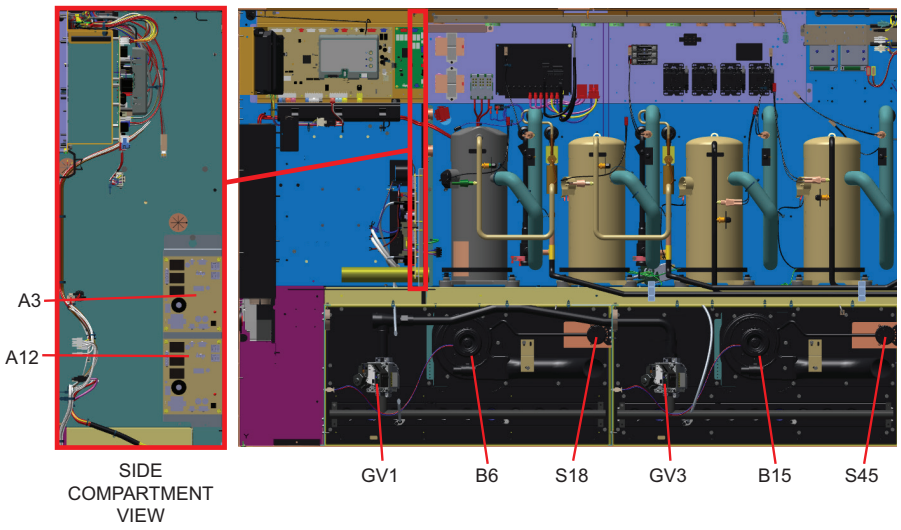


FIGURE 24

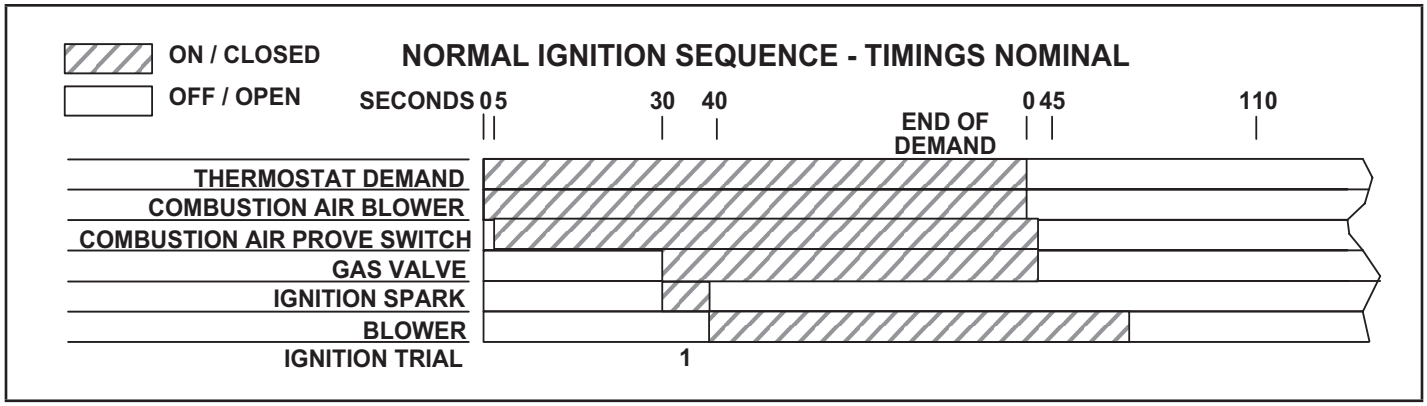


FIGURE 25

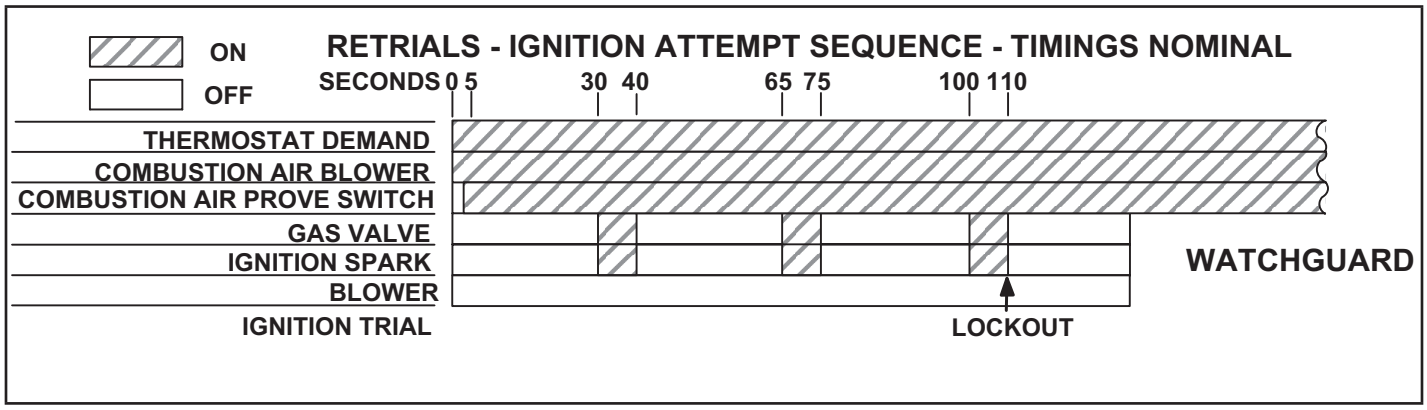


FIGURE 26

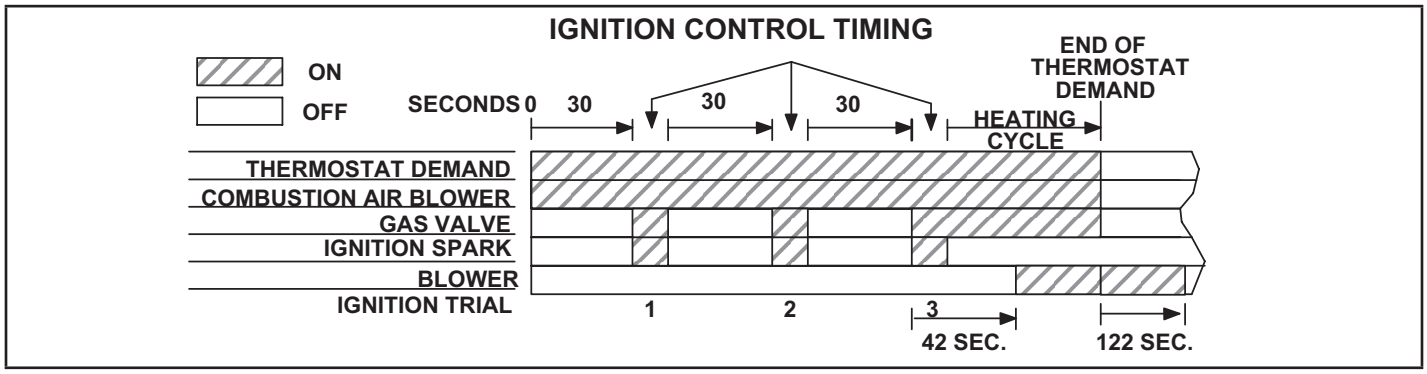


FIGURE 27

Flame rectification sensing is used on all units. Loss of flame during a heating cycle is indicated by an absence of flame signal (0 microamps). If this happens, the control will immediately restart the ignition sequence and then lock out if ignition is not gained after the third trial. See System Service Checks section for flame current measurement.

The control shuts off gas flow immediately in the event of a power failure. Upon restoration of gas and power, the control will restart the ignition sequence and continue until flame is established or system locks out.

On a heating demand, the ignition control is energized by the A55 Unit Controller. The ignition control then allows 30 to 40 seconds for the combustion air blower to vent exhaust gases from the burners.

When the combustion air blower is purging the exhaust gases, the combustion air prove switch is closing proving that the combustion air blower is operating before allowing the ignition control to energize.

When the combustion air prove switch is closed and the delay is over, the ignition control activates gas valve, the spark electrode and the flame sensing electrode. Sparking stops immediately after flame is sensed. The combustion air blower continues to operate throughout the heating demand. If the flame fails or if the burners do not ignite, the ignition control will attempt to ignite the burners up to two more times. If ignition cannot be obtained after the third attempt, the control will lock out. The ignition control is not adjustable

2-Heat Exchanger (FIGURE 28)

Units use aluminized steel cluster inshot burners with matching tubular aluminized (stainless steel is an option) steel heat exchangers and two-stage redundant gas valves. LGX180-300 uses two eleven-tube/burners for high heat, two six-tube/burners for standard or low heat and two nine-tube/burners for medium heat. Burners in all units use a burner venturi to mix gas and air for proper combustion. Combustion takes place at each tube entrance.

As hot combustion gases are drawn upward through each tube by the combustion air blower, exhaust gases are drawn out the top and fresh air/gas mixture is drawn in at the bottom. Heat is transferred to the air stream from all surfaces of the heat exchanger tubes. The supply air blowers, controlled by the Unit Controller A55, force air across all surfaces of the tubes to extract the heat of combustion. The shape of the tubes ensures maximum heat exchange. The gas valves accomplish staging by allowing more or less gas to the burners as called for by heating demand.

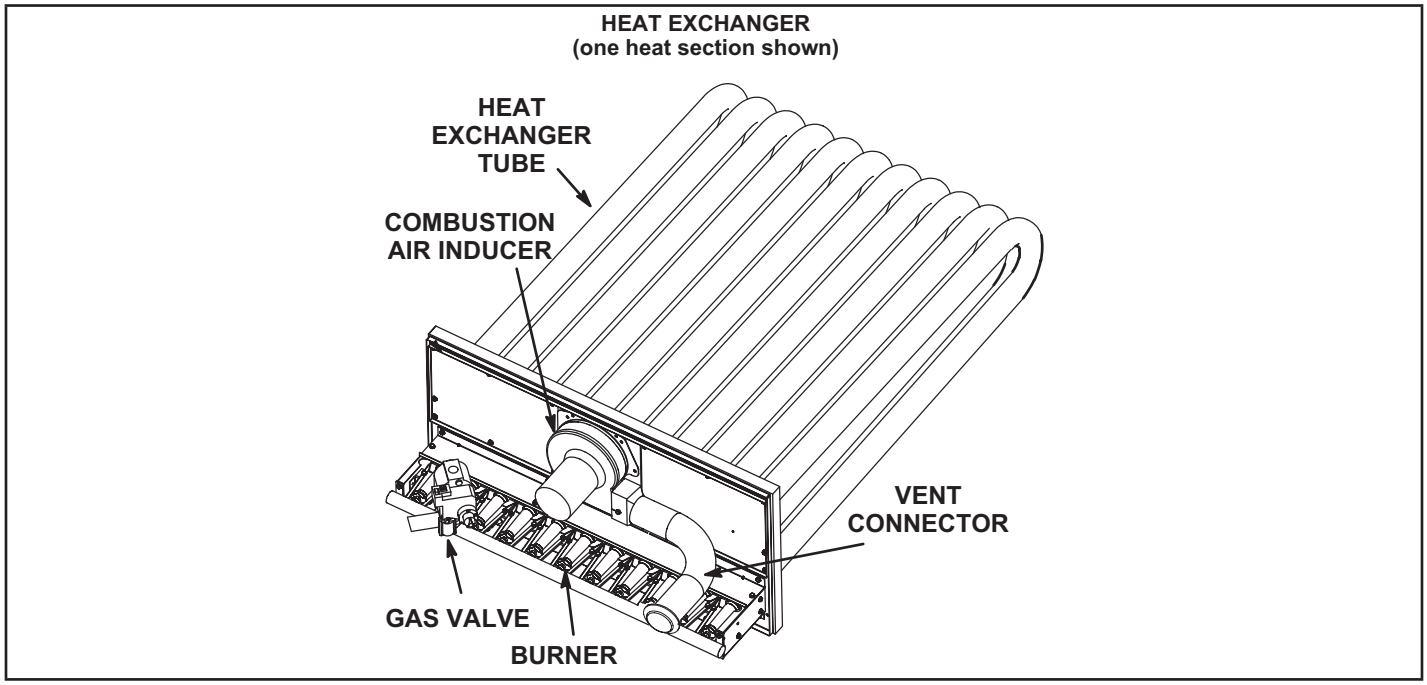


FIGURE 28

3-Burner Assembly (FIGURE 29)

The burners are controlled by the spark electrode, flame sensing electrode, gas valve and combustion air blower. The spark electrode, flame sensing electrode and gas valve are directly controlled by ignition control. Ignition control and combustion air blower is controlled by Unit Controller A55.

Burners

All units use cluster inshot burners. Burners are factory set and do not require adjustment. A peep hole with cover is furnished in the heating access panel for flame viewing. Always operate the unit with the access panel in place. Burners can be removed for service. Burner maintenance and service is detailed in the SERVICE CHECKS section of this manual.

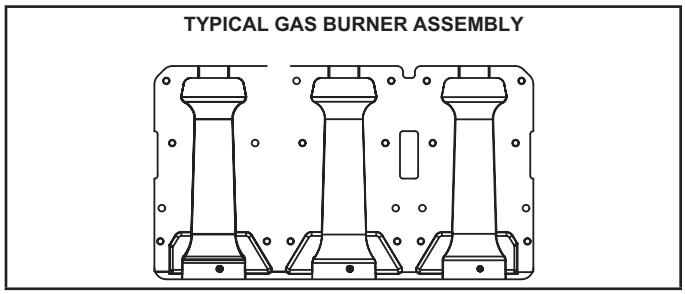


FIGURE 29

Orifice

Each burner uses an orifice (FIGURE 30) which is precisely matched to the burner input. Install only the orifices with the same threads. The orifice is threaded into the burner manifold. The burner is supported by the orifice and will easily slide off for service.

NOTE-*Do not use thread sealing compound on the orifices. Using thread sealing compound may plug the orifices. Natural gas orifice size is on nameplate. The LP gas orifice size is on the label provided in the LP kit.*

NOTE- *In primary and secondary high temperature limits S10 and S99 the ignition circuits in both gas heat sections one and two are immediately de-energized when terminals 1-3 open and the indoor blower motor is immediately energized when terminals 1-2 close. This is the primary and secondary safety shut-down function of the unit.*

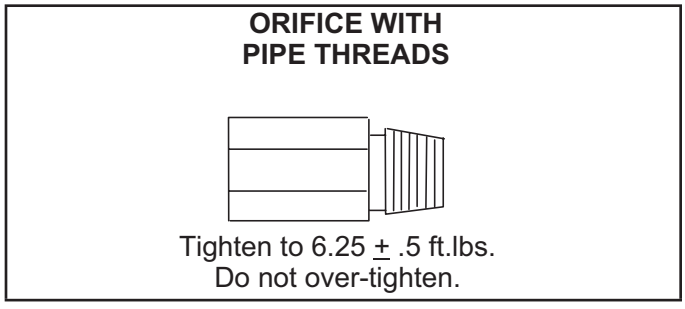


FIGURE 30

4-Primary High Temperature Limits S10 & S99

S10 is the primary high temperature limit for gas heat section one and S99 is the primary high temperature limit for gas heat section two.

In LGX180-300 units, S10 and S99 are located on the drip shield behind the blower housing. In this location S10 and S99 also serve as secondary limits. See FIGURE 31.

Primary limit S10 is wired to the Unit Controller A55 which energizes burner 1 control (A3), while primary limit S99 is wired to the A55 Unit Controller which energizes burner 2 control (A12). Its N.C. contacts open to de-energize the ignition control when excessive temperature is reached in the blower compartment. At the same time, the N.O. contacts of S10 and S99 close energizing the blower relay coil K3 through control A55. If either limit trips the blower will be energized. Limits settings are factory set and cannot be adjusted. If limit must be replaced same type and set point must be used. See Repair Parts Handbook.

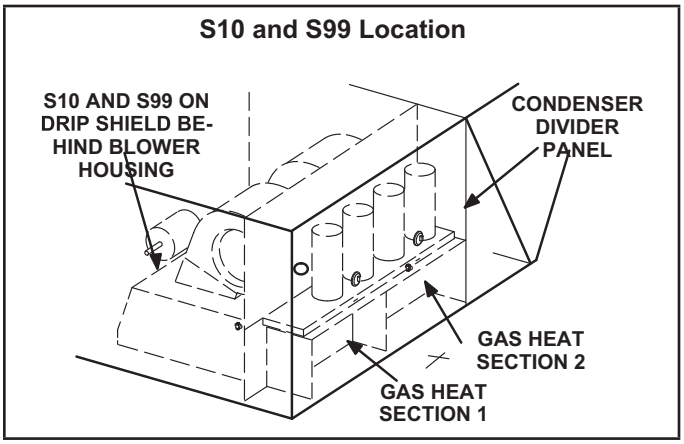


FIGURE 31

5-Flame Rollout Limits S47, S69

Flame rollout limits S47 on first heat section and S69 on second heat section are SPST N.C. high temperature limits located just above the burner air intake opening in the burner enclosures (see figure22). Both switches are wired to the A55 Unit Controller. When S47 or S69 senses flame rollout (indicating a blockage in the combustion air passages), the corresponding flame rollout limit trips and the ignition control immediately closes the gas valve. Limit S47 and S69 in standard heat units are factory preset to open at 290F ± 12F on a temperature rise, while on high heat units both limits open at 270F ± 12F on a temperature rise. All flame rollout limits are manual reset.

6-Combustion Air Prove Switches S18, S45

Prove switches S18 (first heat section) and S45 (second heat section) are located in the compressor compartment. Each has its own control box. Both are identical SPST N.O. switches and monitor combustion air inducer operation. Switch S18 and S45 are wired to the A55 Unit Controller.

The switch closes on a negative pressure fall. This negative pressure fall and switch actuation allows the ignition sequence to continue (proves, by closing, that the combustion air inducer is operating before allowing the gas valve to open.) The combustion air prove switch is factory set and not adjustable. The switch will automatically open on a pressure rise (less negative pressure). TABLE 11 shows prove switch settings.

TABLE 11

S18 & S45 Prove Switch Settings

Close“ w.c.	Open “ w.c.
0.25 ± 5	0.10±5

7-Combustion Air Inducers B6 & B15

Combustion air blowers B6 on the first heat section and B15 on the second heat section, are identical blowers which provide fresh air to the corresponding burners while clearing the combustion chamber of exhaust gases. The blowers begin operating immediately upon receiving a thermostat demand and are de-energized immediately when thermostat demand is satisfied.

Both combustion air blowers use a 208/230 or 460V single-phase PSC motor and a 4.81in. x 1.25in blower wheel. All motors operate at 3200 or 3450 RPM and are equipped with auto-reset overload protection. Blowers are supplied by various manufacturers. Ratings may vary by manufacturer. Specific blower electrical ratings can be found on the unit rating plate.

All combustion air blower motors are sealed and cannot be oiled. The blower cannot be adjusted but can be disassembled for cleaning.

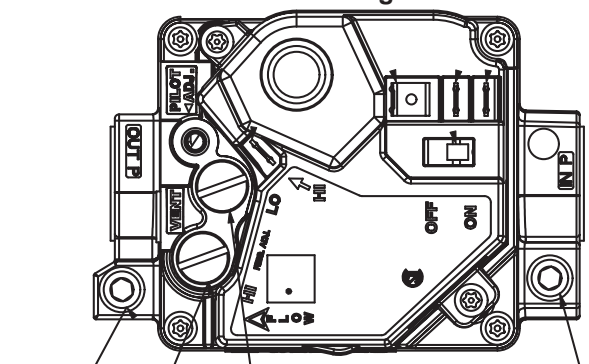
8-Combustion Air Motor Capacitors C3 & C11

The combustion air blower motors in all LGX units require run capacitors. Capacitor C3 is connected to combustion air blower B6 and C11 is connected to combustion air blower B15. Capacitors are rated at 208/230V CAB has 4uF 450V capacitors 460V CAB has 2uF 450V capacito3 or 4 MFD for 208/230 CAB.

9-Gas Valves GV1 & GV3

Gas valves GV1 and GV3 are identical. The gas valves are two-stage redundant valves. Units are equipped with valves manufactured by WhiteRodgers.. On a call for first stage heat (low fire), the valve is energized by the ignition control simultaneously with the spark electrode. On a call for second stage heat (high fire), the second stage operator is energized directly from A55 (GV1, GV3). The valve is adjustable for both low fire and high fire. A manual shut-off knob is provided on the valve for shut-off. Manual shut-off knob immediately closes both stages without delay. FIGURE 32 shows gas valve components. TABLE 12 shows factory gas valve regulation for LGX series units.

WHITE RODGERS 36H54 GAS VALVE
Two-Stage



Outlet Pressure Tap
Low Fire Adjustment (under cap)
Inlet Pressure Tap
High Fire Adjustment (under cap)

GAS VALVE SWITCH SHOWN IN **ON** POSITION.

FIGURE 32

TABLE 12

GAS VALVE REGULATION FOR LGX UNITS

Max Inlet Pressure “W.C.	Operating Pressure “W.C. (outlet) Factory Setting			
	Natural		L.P. Propane	
	Low	High	Low	High
13.0	1.6±0.2.	3.7±0.3	5.5±0.3	0.5±0.5

10-Spark Electrodes

An electrode assembly is used for ignition spark. Two identical electrodes are used (one for each gas heat section). The electrode is mounted through holes on the left-most end of the burner support. The electrode tip protrudes into the flame envelope of the adjacent burner.

The electrode assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

During ignition, spark travels through the spark electrode (FIGURE 33) and ignites the left burner. Flame travels from burner to burner until all are lit.

The spark electrode is connected to the ignition control by a 8 mm silicone-insulated stranded high voltage wire. The wire uses 1/4” female quick connect on the electrode end and female spark plug-type terminal on the ignition control end.

NOTE- *IN ORDER TO MAXIMIZE SPARK ENERGY TO ELECTRODE, HIGH VOLTAGE WIRE SHOULD TOUCH UNIT CABINET AS LITTLE AS POSSIBLE.*

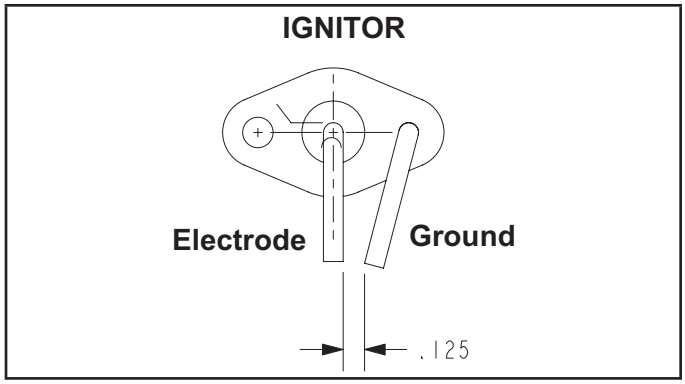


FIGURE 33

11-Flame Sensors

A flame sensor is located on the right side of each burner support. The sensor is mounted through a hole in the burner support and the tip protrudes into the flame envelope of the right most burner. The sensor assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

When flame is sensed by the flame sensor (indicated by microamp signal through the flame) sparking stops immediately. During operation, flame is sensed by current passed along the ground electrode (located on the spark electrode), through the flame and into the sensing electrode. The ignition control allows the gas valve to stay open as long as a flame signal (current passed through he flame) is sensed.

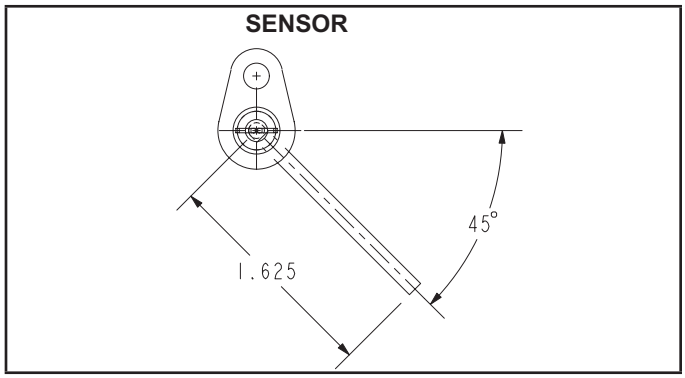


FIGURE 34

II-PLACEMENT AND INSTALLATION

Make sure the unit is installed in accordance with the installation instructions and all applicable codes. See accessories section for conditions requiring use of the optional roof mounting frame.

III-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 min- imize 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-of f 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

- 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.*

4 - 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 sys- tem.
- If measured liquid temperature is lower than the target liquid temperature, recover some refrigerant from the system..

5 - Add or remove charge in increments. Allow the system to stabilize each time refrigerant is added or removed.

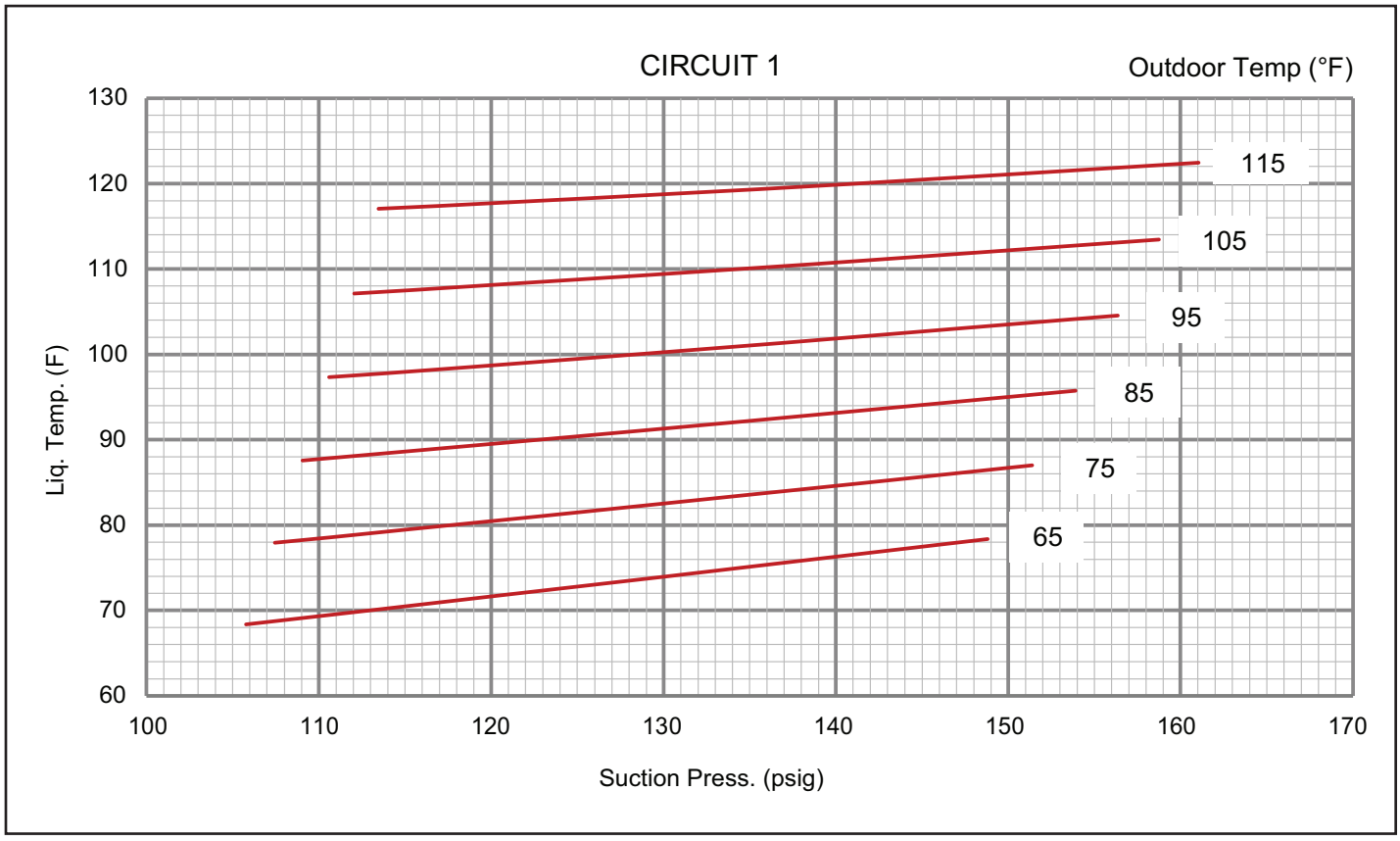
6 - Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.

7 - Example: 180 model, no reheat - 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 100°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

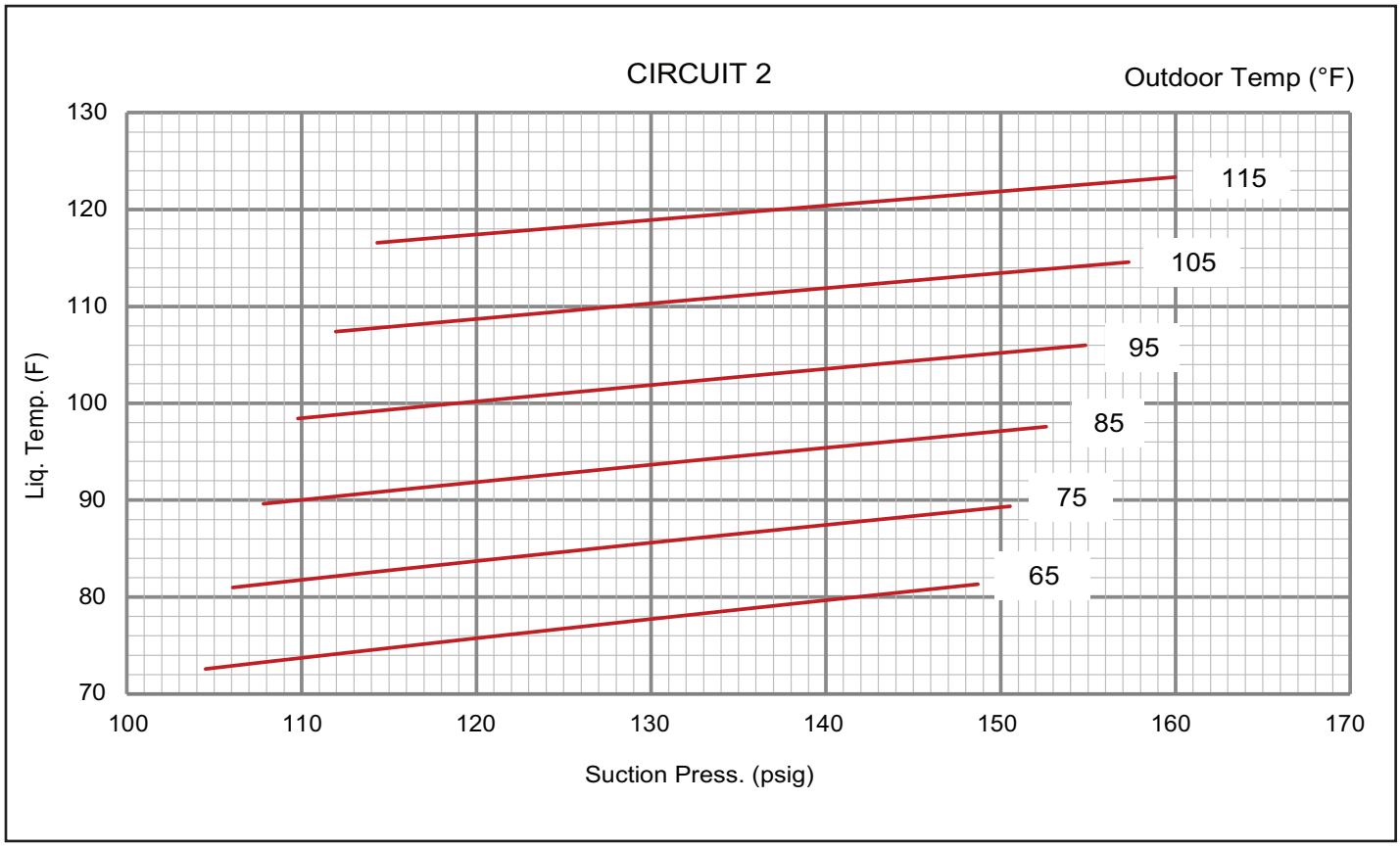
TABLE 13
LGX 180 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581137-02

	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	224	107	261	109	303	111	351	112	403	113	460
	113	227	115	264	117	306	119	353	120	405	122	462
	130	234	132	270	135	312	137	358	139	409	141	466
	149	240	151	276	154	317	156	363	159	414	161	470
Circuit 2	105	231	106	269	108	312	110	360	112	413	114	471
	112	234	114	272	116	315	118	363	120	415	122	473
	129	241	131	279	133	321	135	369	138	421	140	478
	149	250	151	287	153	329	155	376	157	428	160	485
Circuit 3	105	249	106	289	108	336	110	388	112	445	114	509
	112	252	114	292	116	338	118	390	120	447	122	511
	130	261	132	300	133	345	135	396	138	453	140	515
	150	270	151	309	153	353	155	404	158	460	160	522

LGX 180 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581136-02



LGX 180 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581136-02



LGX 180 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581136-02

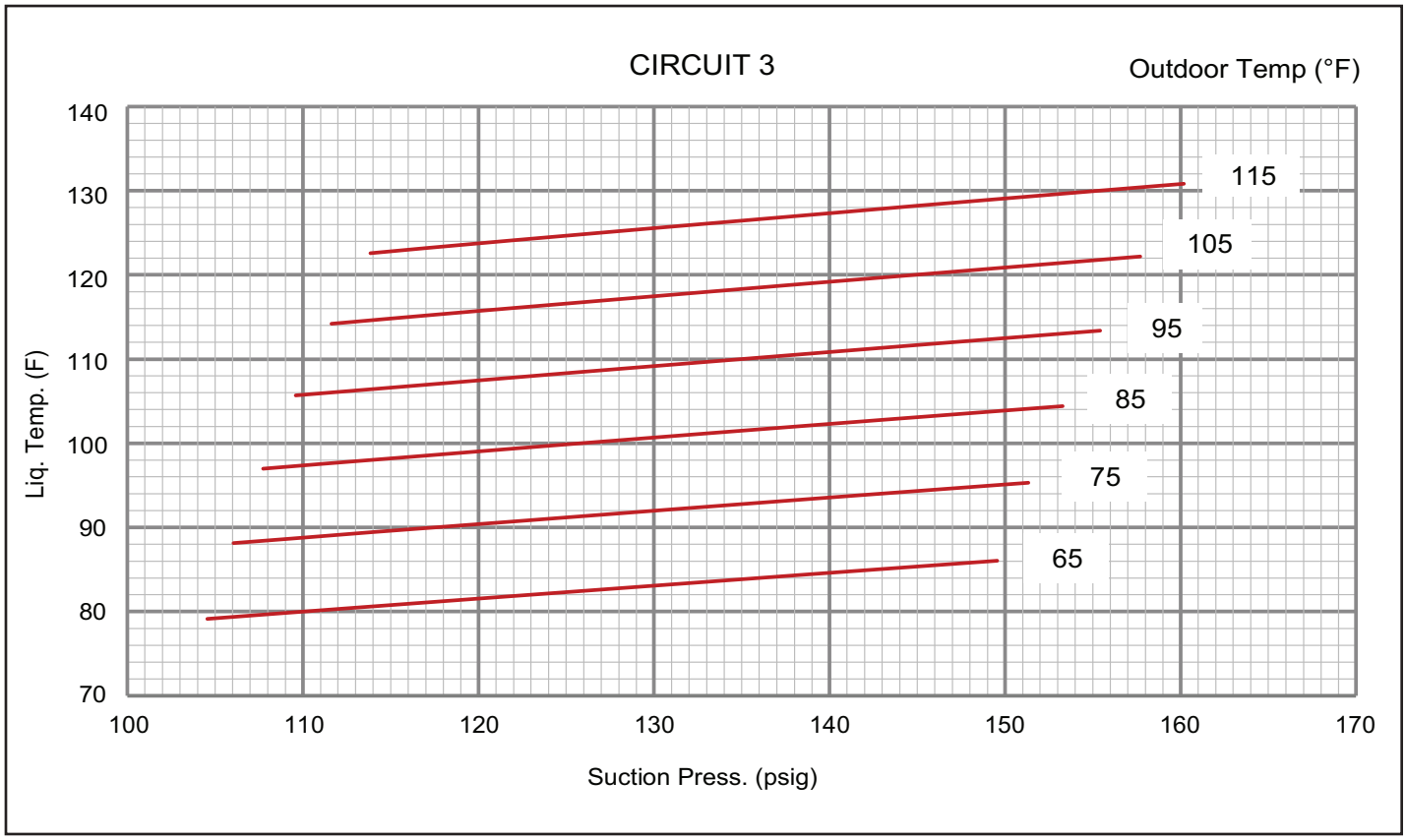
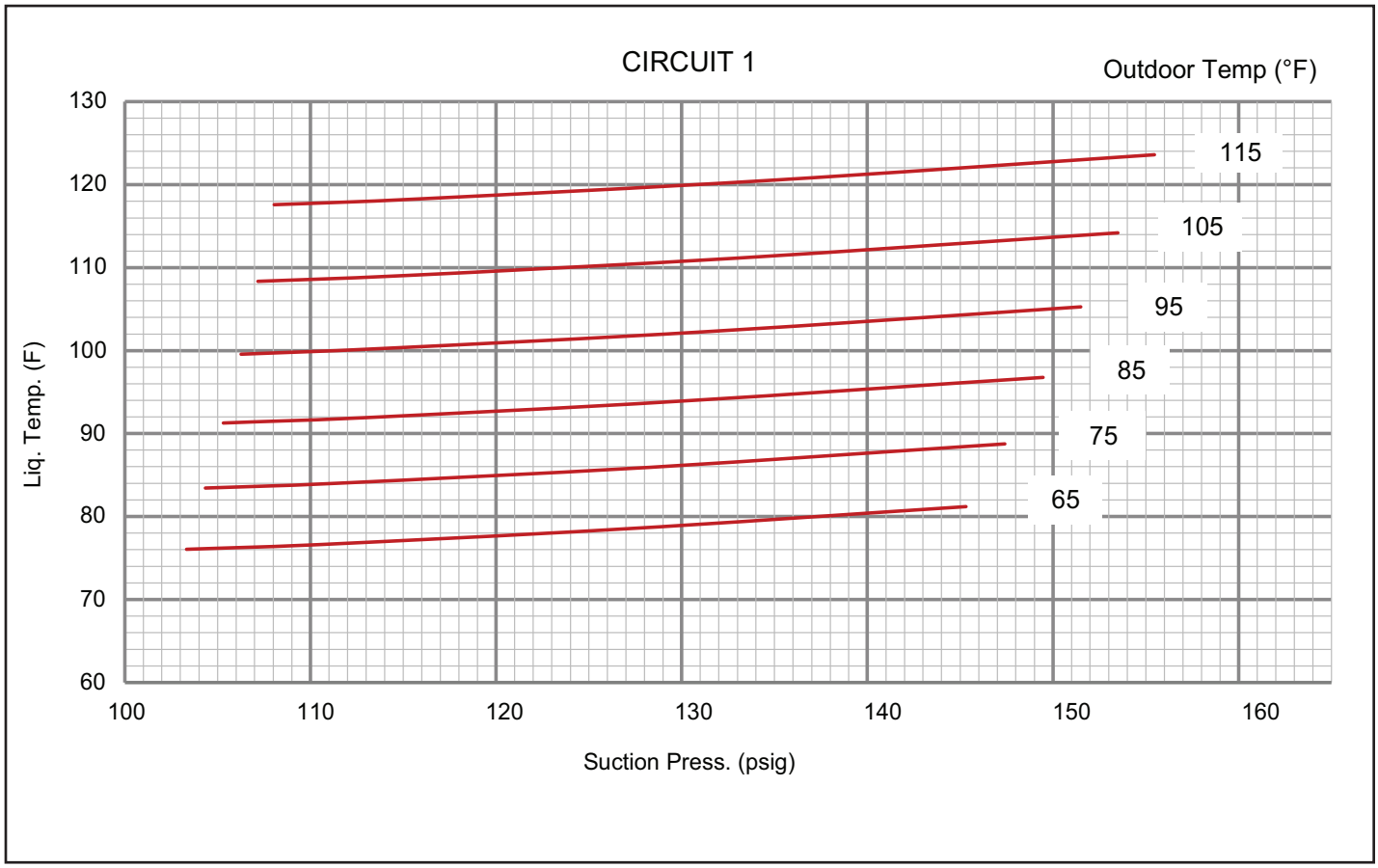


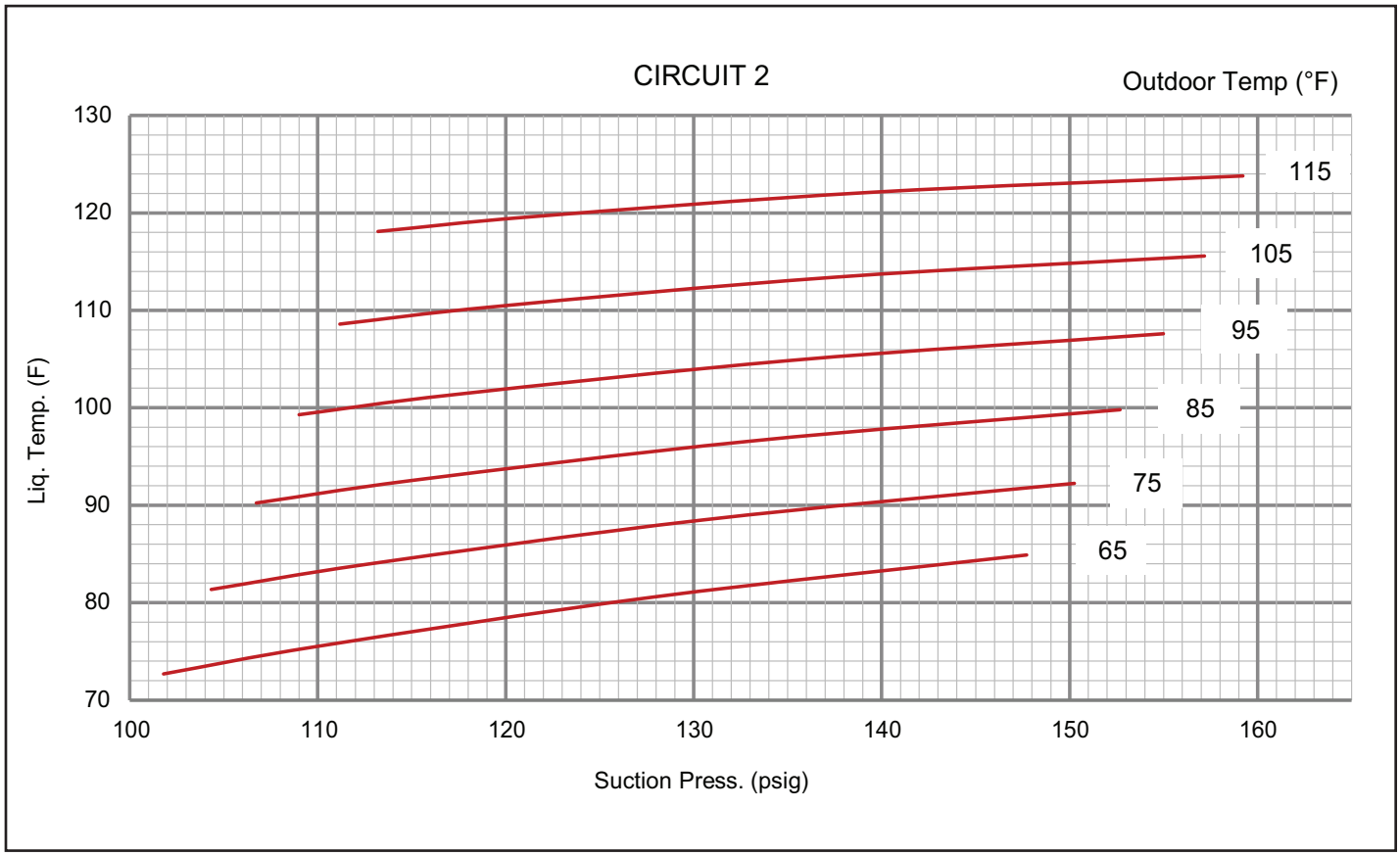
TABLE 14
LGX 210 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581139-02

	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	103	239	104	277	105	321	106	371	107	427	108	489
	110	243	112	280	113	324	114	373	115	429	116	491
	127	250	128	287	130	330	131	379	133	434	135	495
	145	258	147	294	149	336	151	385	153	439	155	500
Circuit 2	102	246	104	285	107	329	109	379	111	433	113	493
	110	250	113	289	115	333	117	383	119	437	121	496
	128	260	131	298	133	342	135	391	137	445	139	504
	148	270	150	309	153	352	155	401	157	454	159	513
Circuit 3	105	254	107	294	110	340	112	392	114	449	115	513
	113	259	116	299	118	344	120	396	122	453	124	515
	130	270	133	309	136	353	138	404	140	460	142	522
	150	282	153	320	155	364	158	413	160	468	162	529

LGX 210 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581138-02



LGX 210 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581138-02



LGX 210 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581138-02

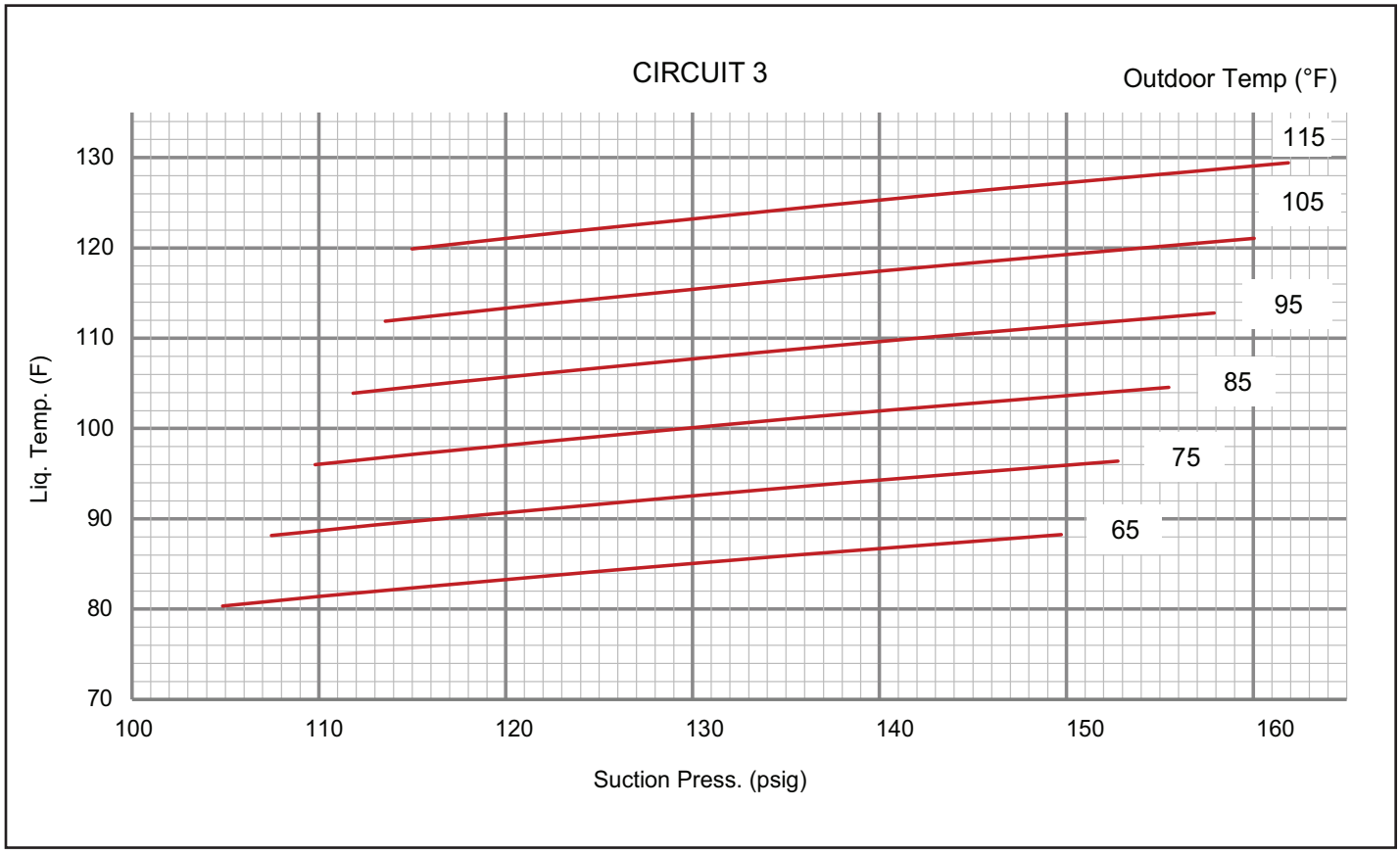
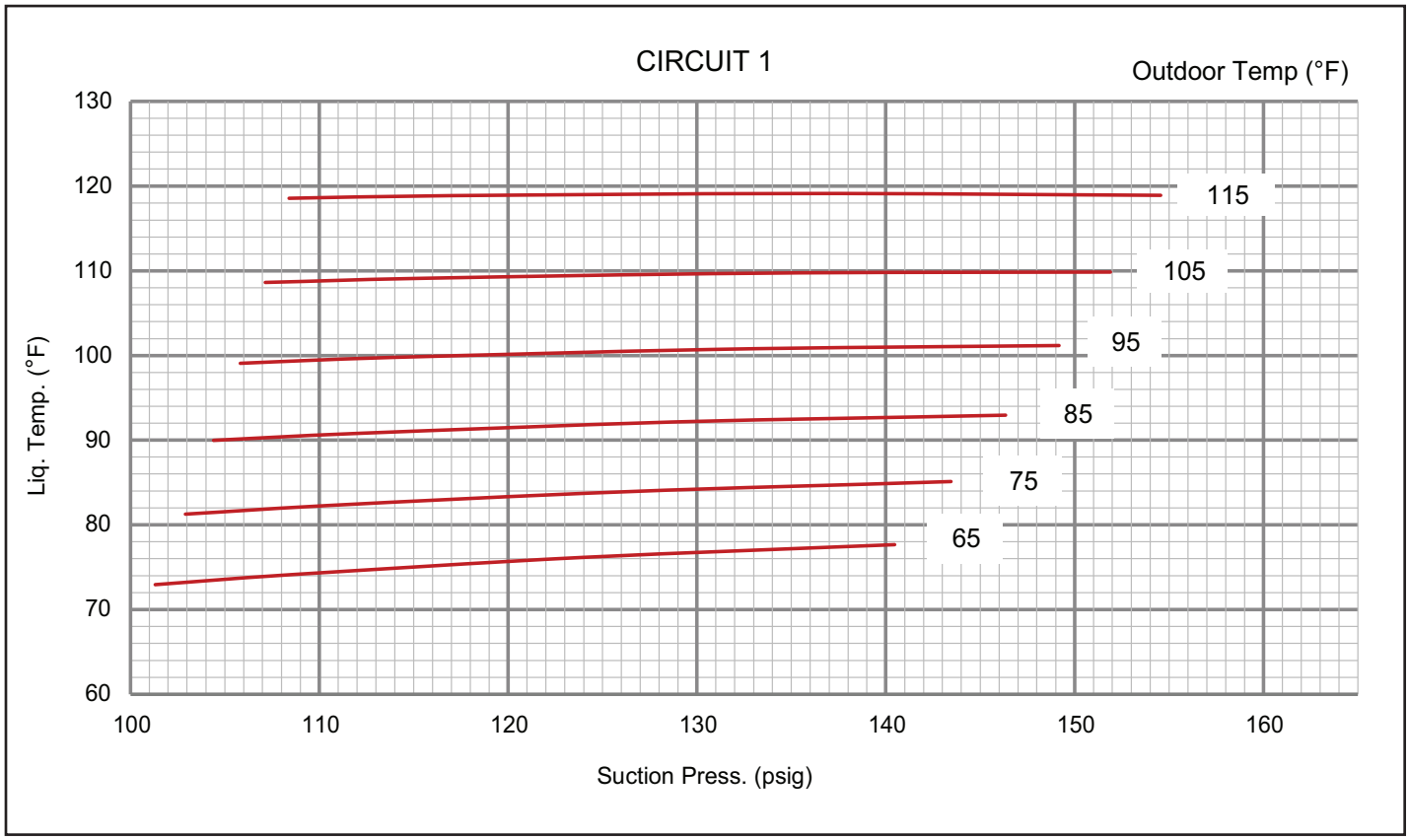


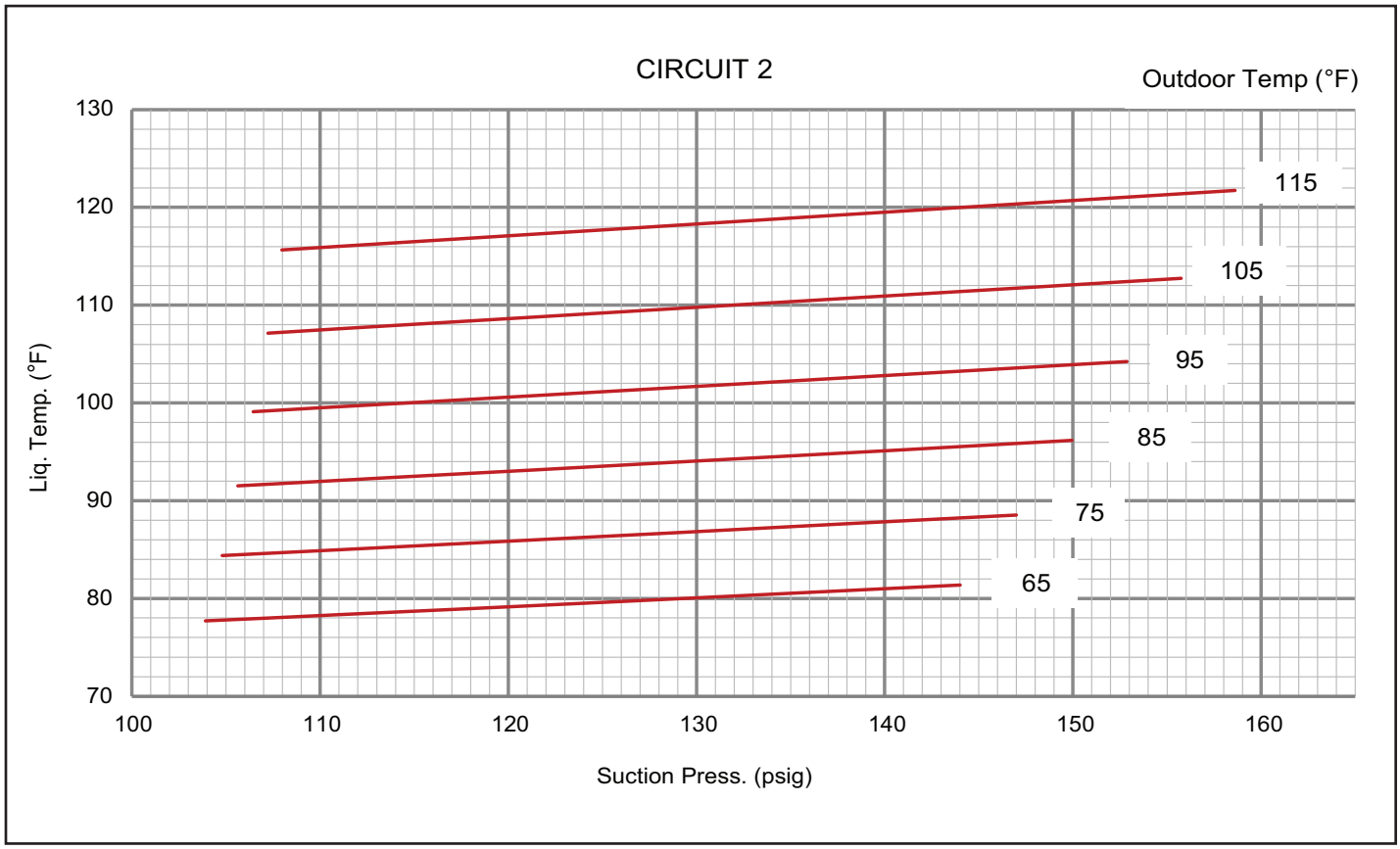
TABLE 15
LGX 240 NO REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581141-02

	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	101	233	103	271	104	315	106	362	107	415	108	471
	109	234	110	272	112	315	114	362	116	414	117	471
	124	238	126	276	129	318	131	365	133	416	135	472
	140	246	143	283	146	324	149	371	152	421	155	476
Circuit 2	104	240	105	281	106	326	106	375	107	426	108	481
	111	242	112	283	114	328	115	375	116	427	117	481
	127	248	129	289	131	332	133	380	135	430	137	484
	144	257	147	297	150	340	153	387	156	436	159	489
Circuit 3	99	247	101	285	104	328	106	374	108	424	109	478
	106	250	109	288	111	331	114	377	116	427	118	481
	121	257	124	296	128	338	130	384	133	434	135	488
	137	266	141	305	144	347	147	393	151	443	153	497

LGX 240 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581140-02



LGX 240 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581140-02



LGX 240 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581140-02

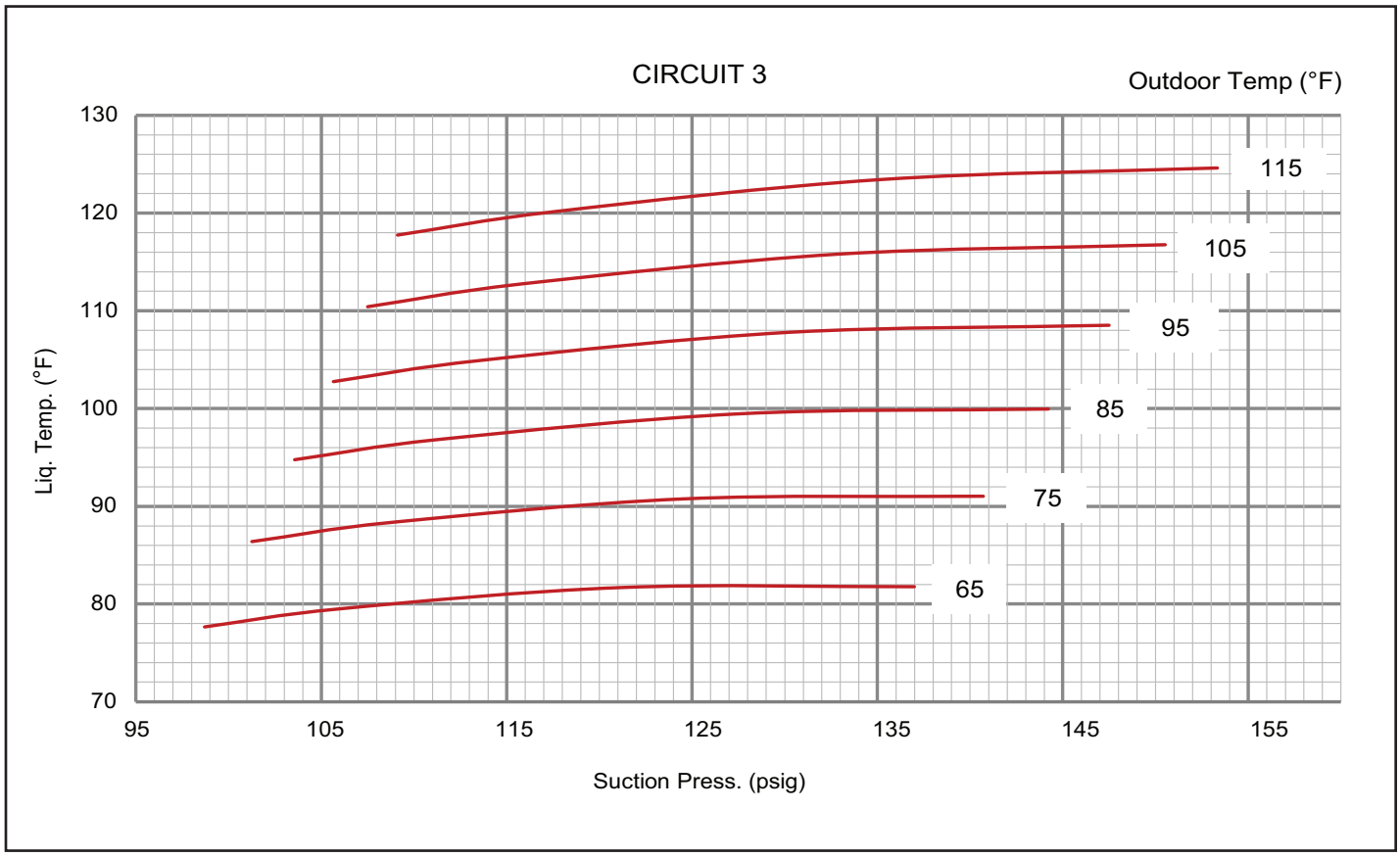
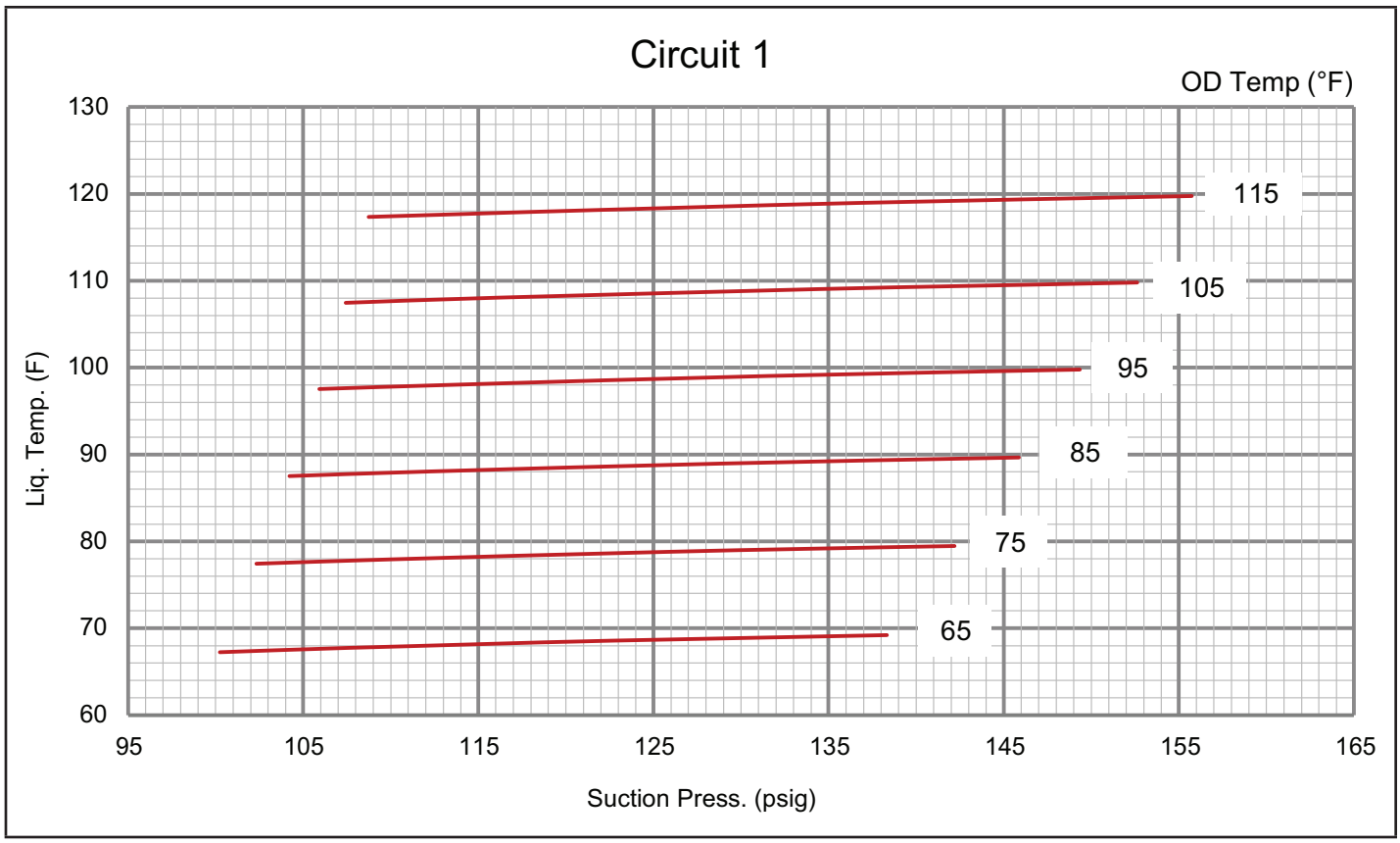


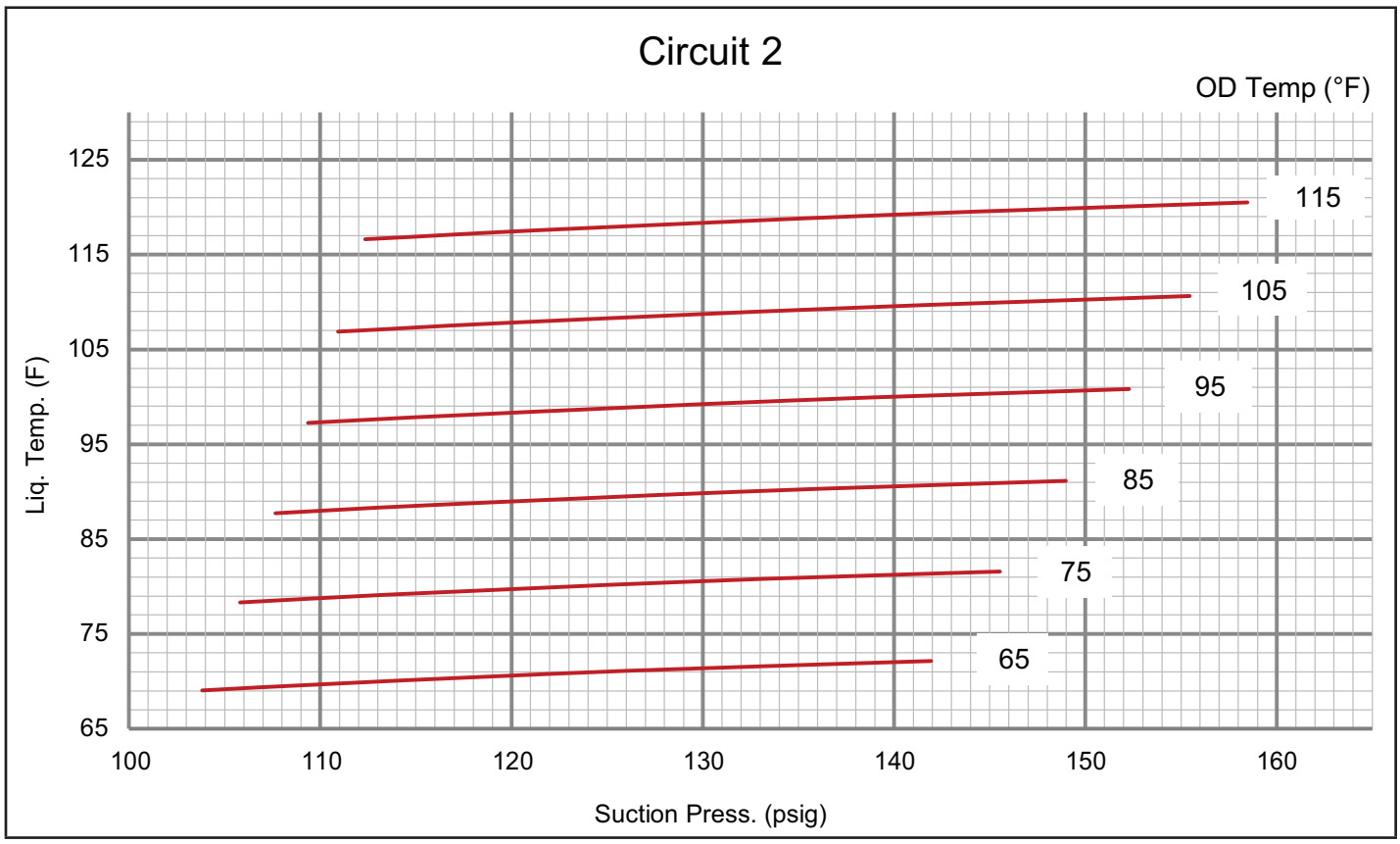
TABLE 16

LGX 300 NO REHEAT NORMAL OPERATING PRESSURES ALL - ALUMINUM COIL - 581143-02												
	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

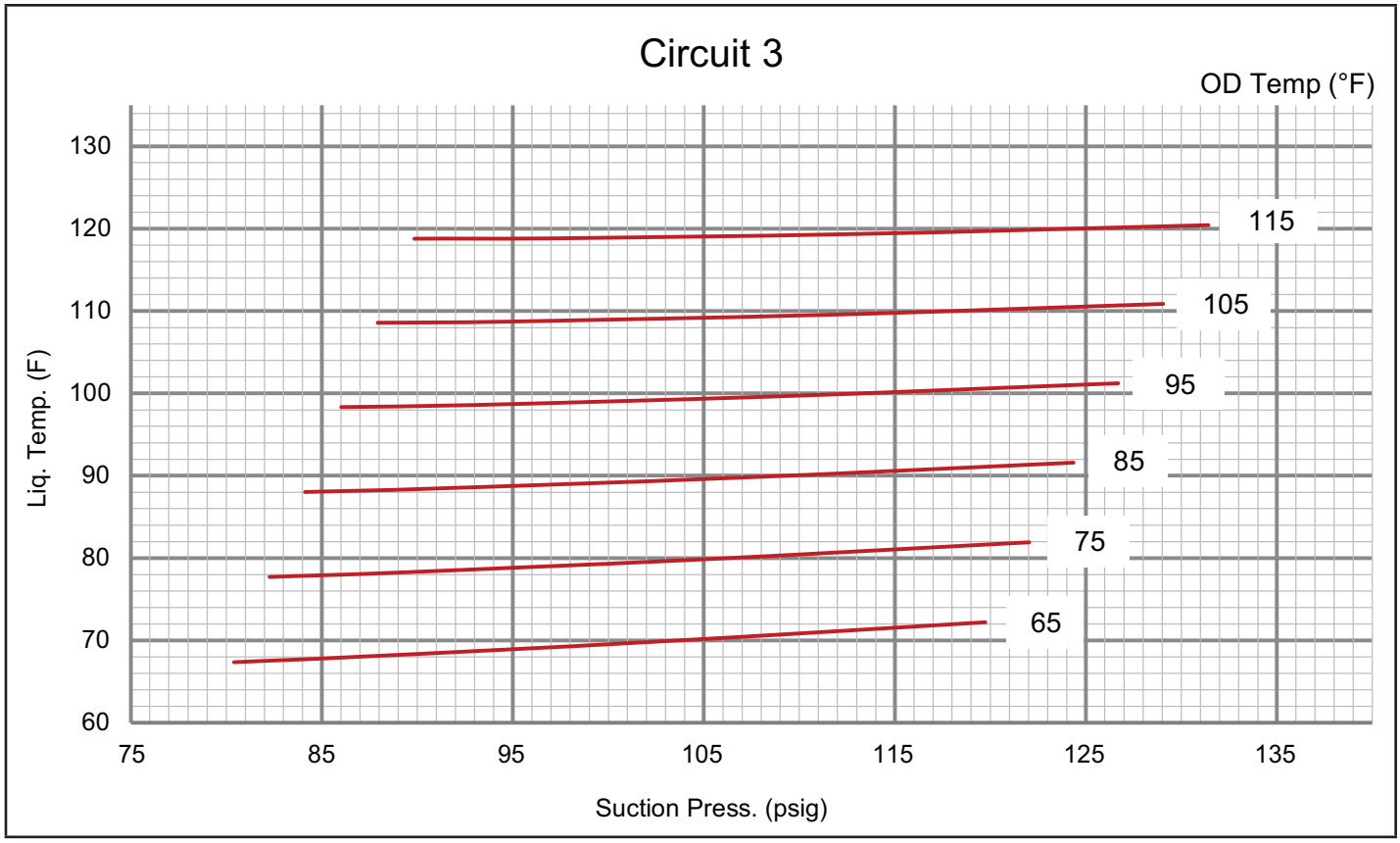
LGX 300 NO REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581142-02



LGX 300 NO REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581142-02



LGX 300 NO REHEAT CHARGING CURVE CIRCUIT 3 - ALL-ALUMINUM OD COIL - 581142-02



LGX 300 NO REHEAT CHARGING CURVE CIRCUIT 4 - ALL-ALUMINUM OD COIL - 581142-02

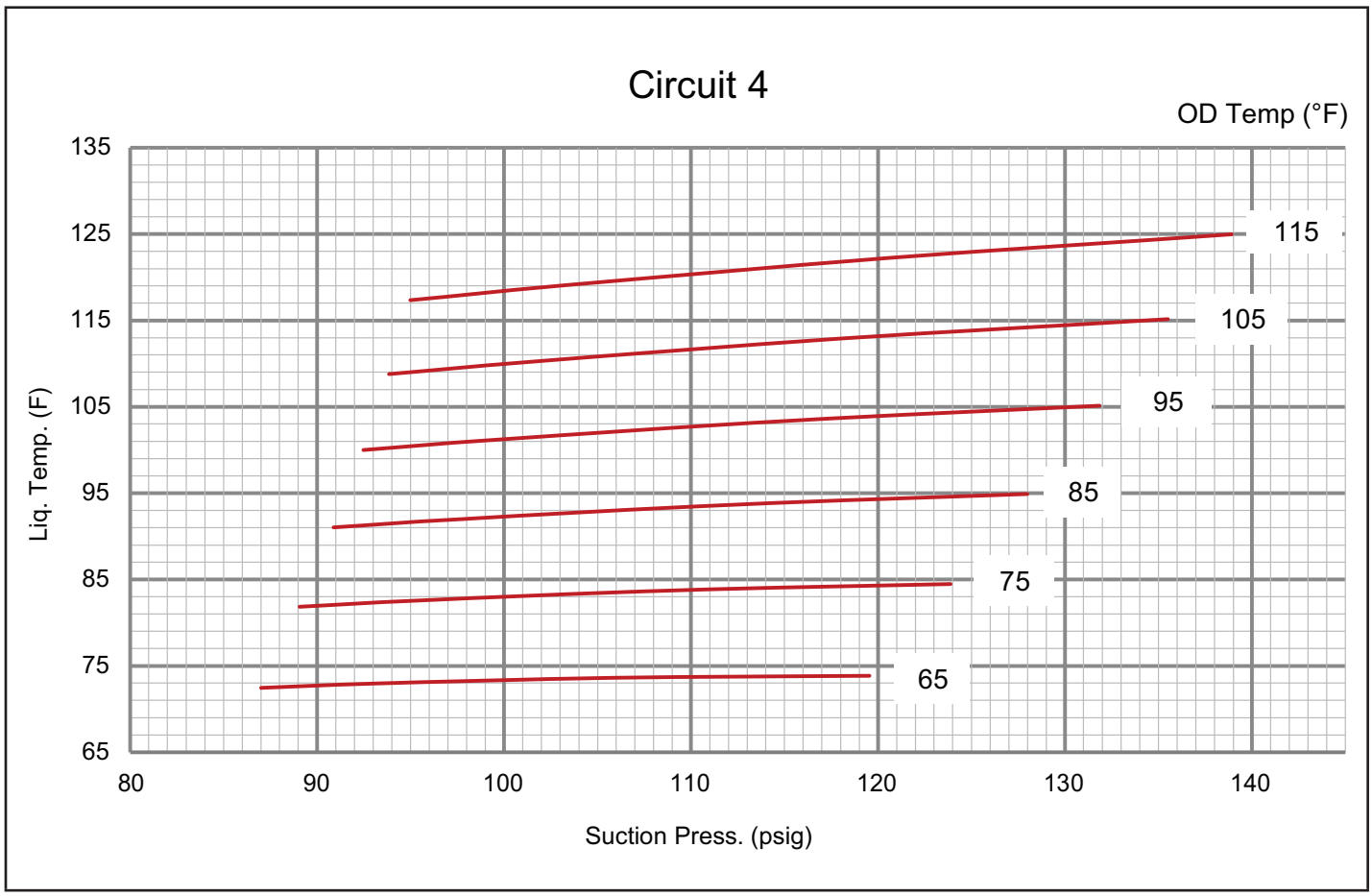
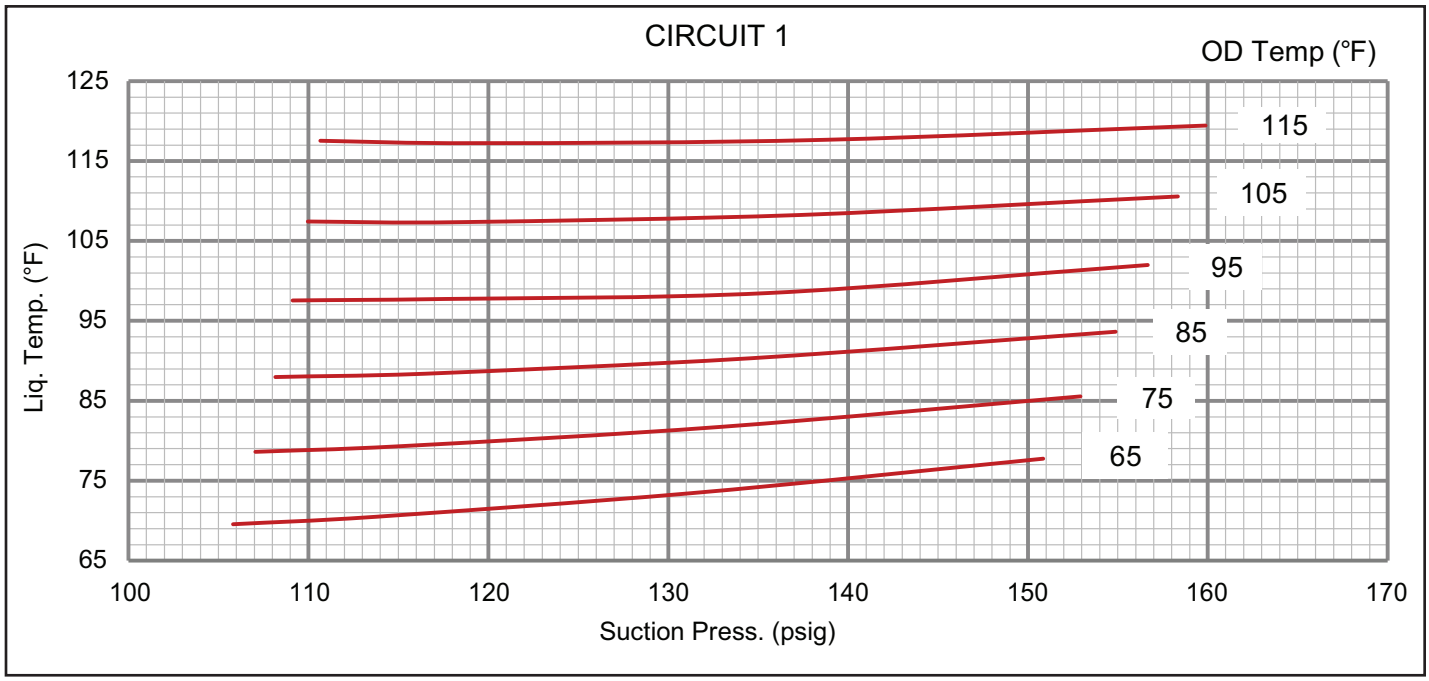


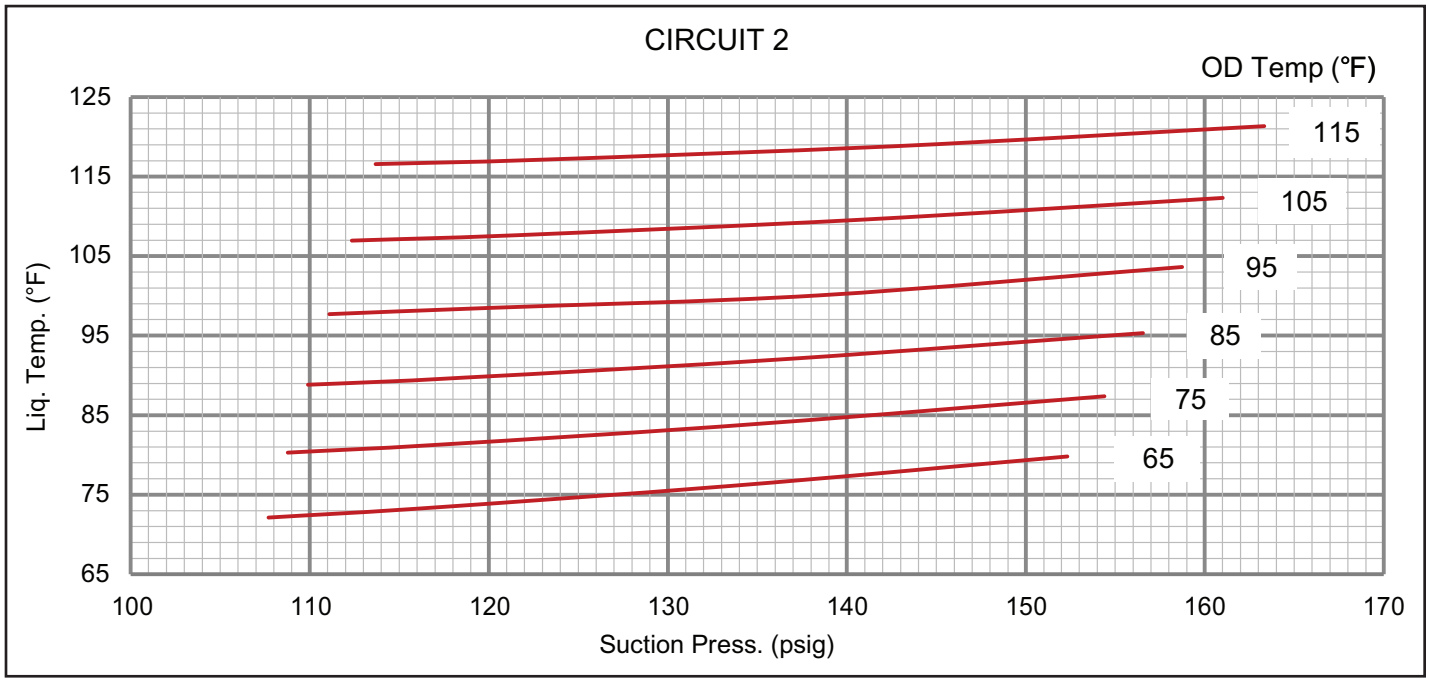
TABLE 17
LGX 180 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581295-01

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



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



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

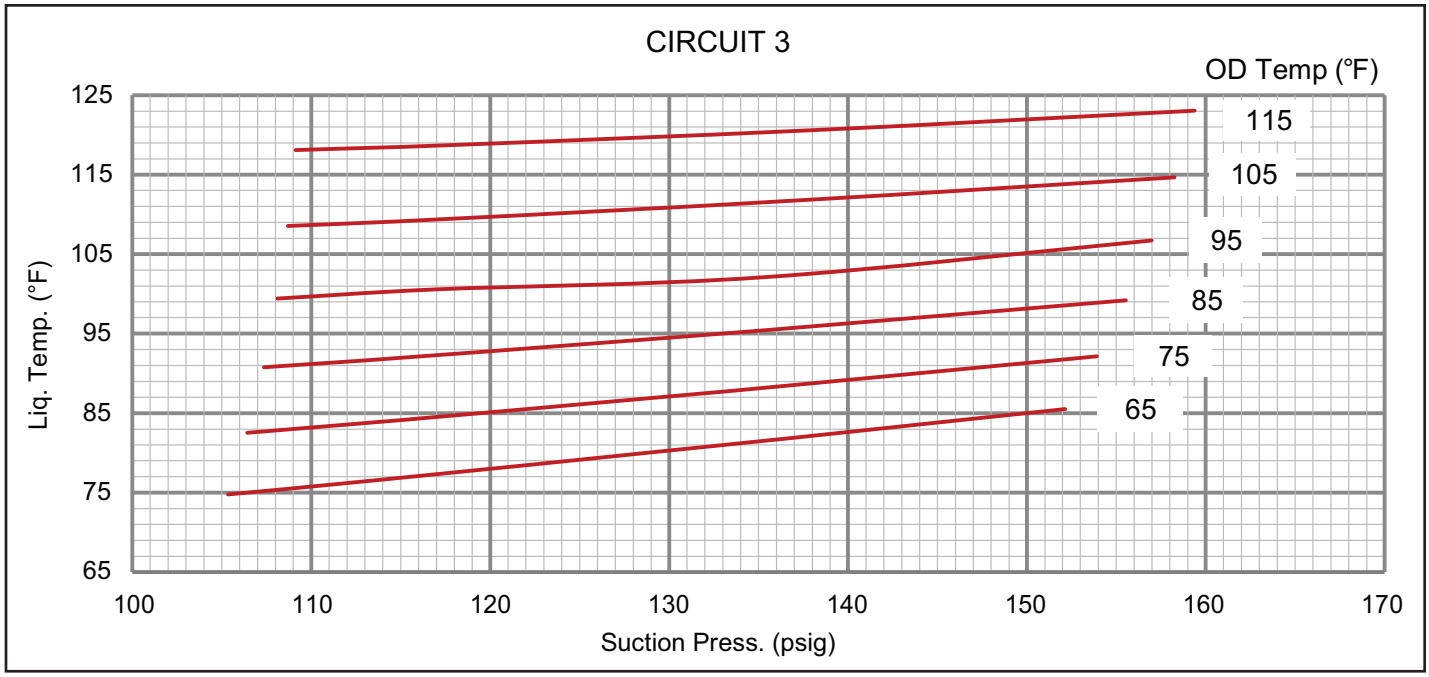
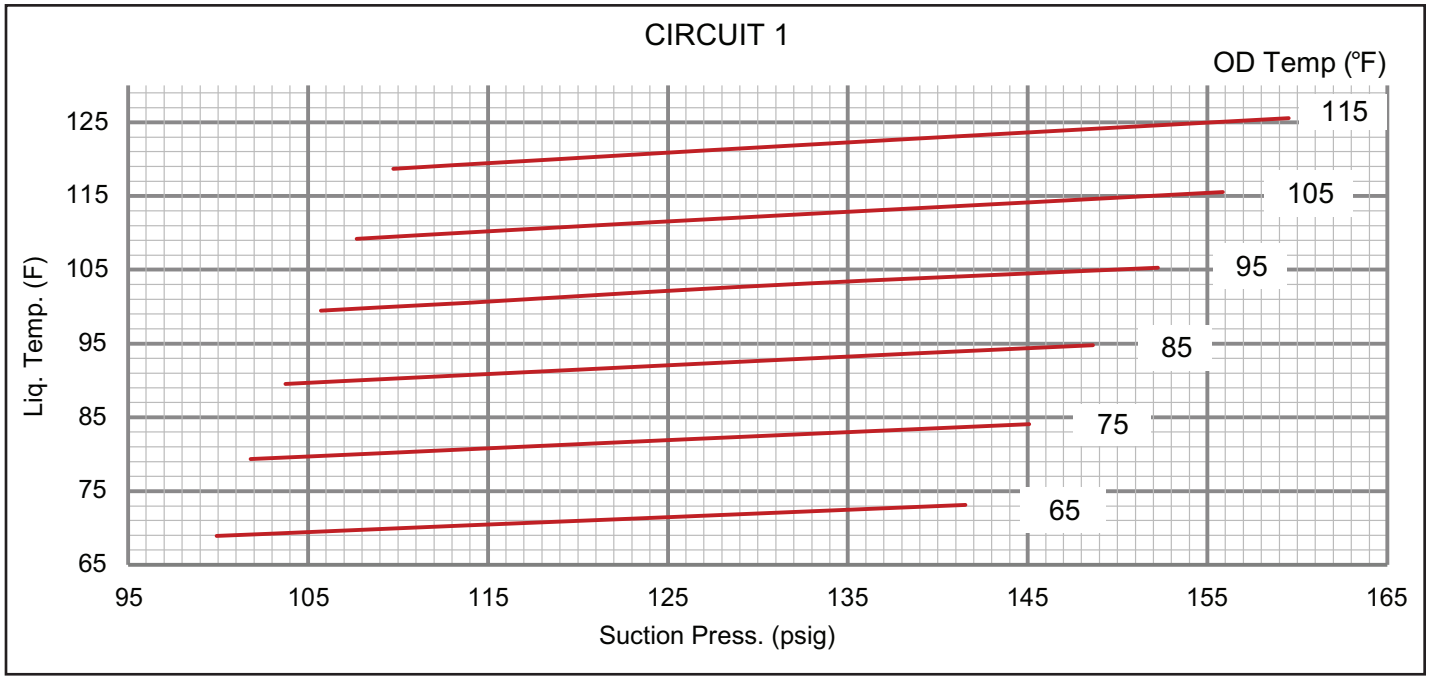


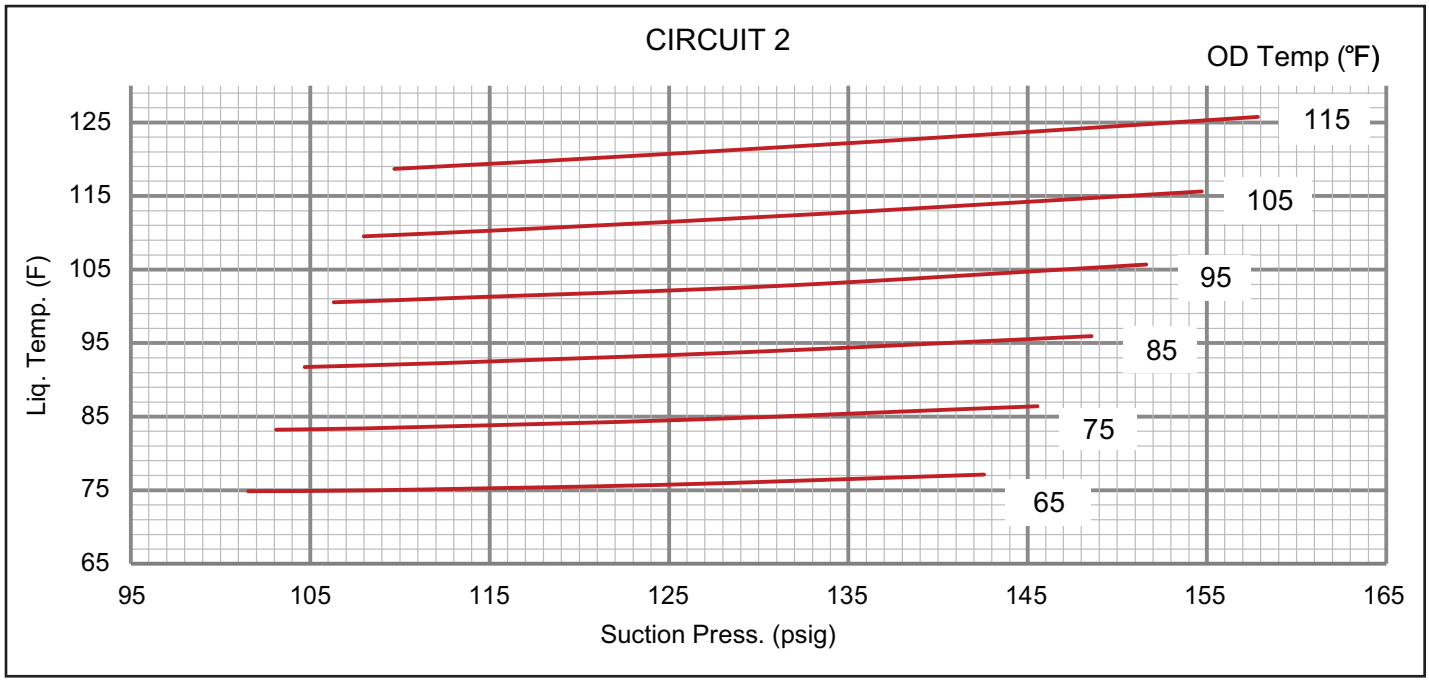
TABLE 18
LGX 210 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581297-01

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



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



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

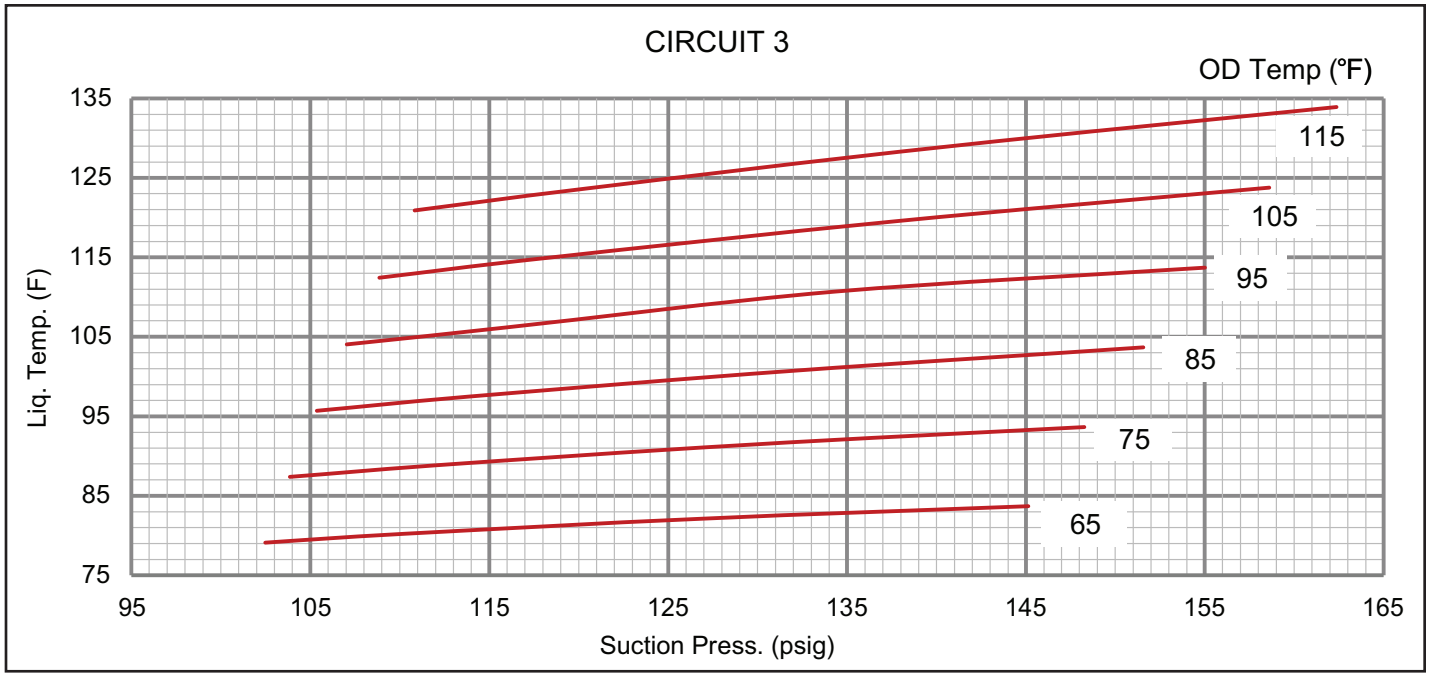
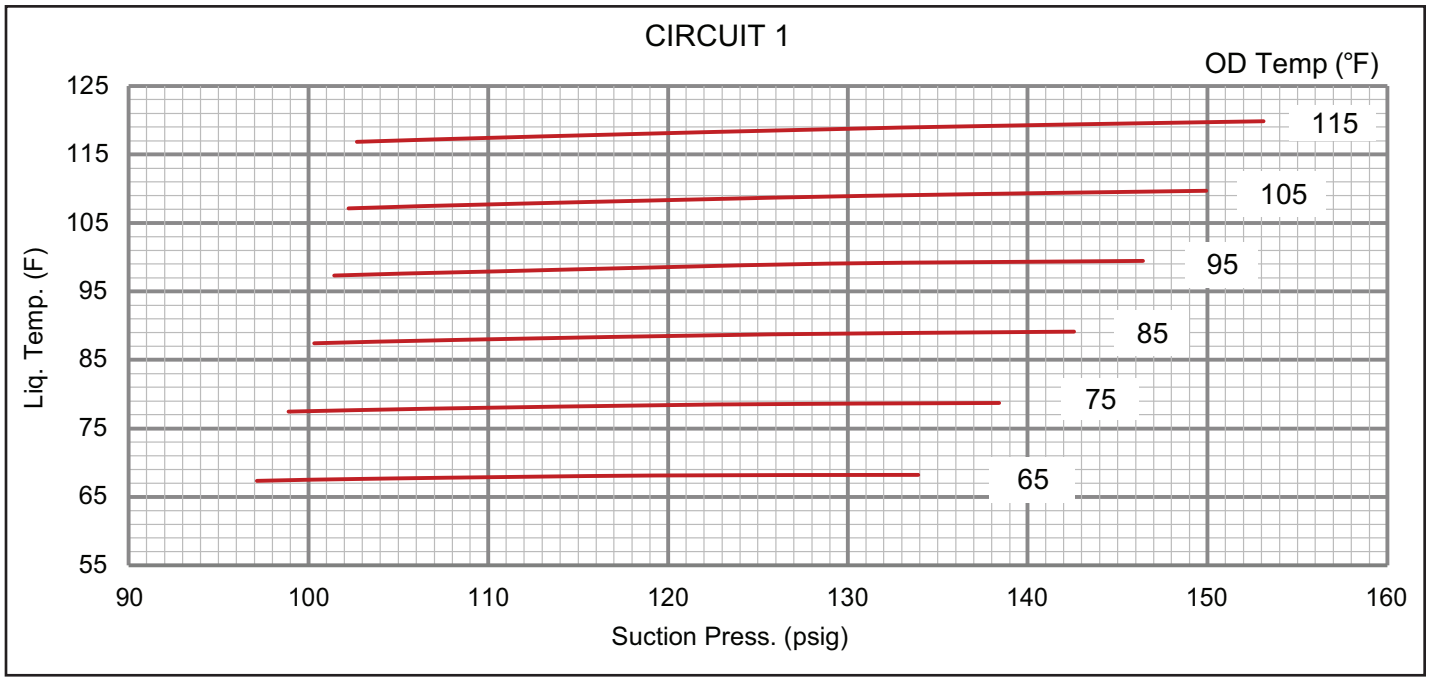


TABLE 19
LGX 240 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581299-01

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



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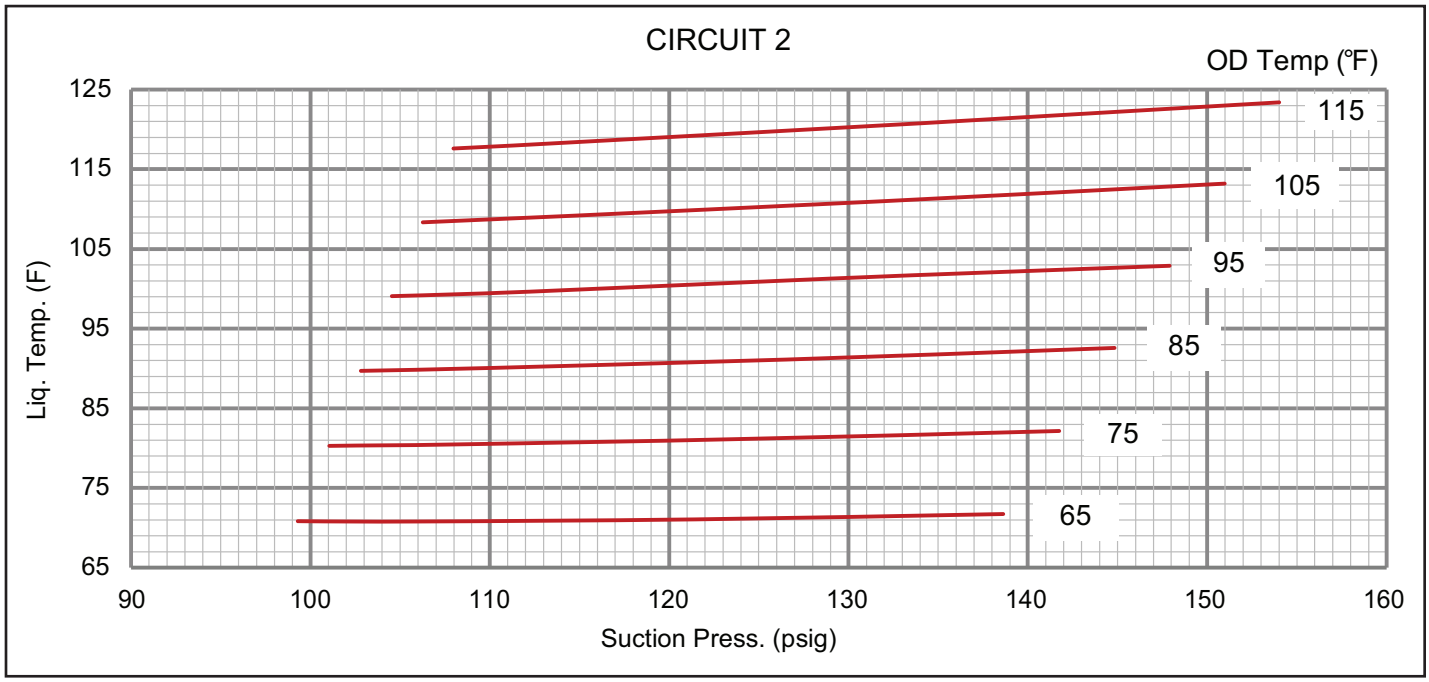

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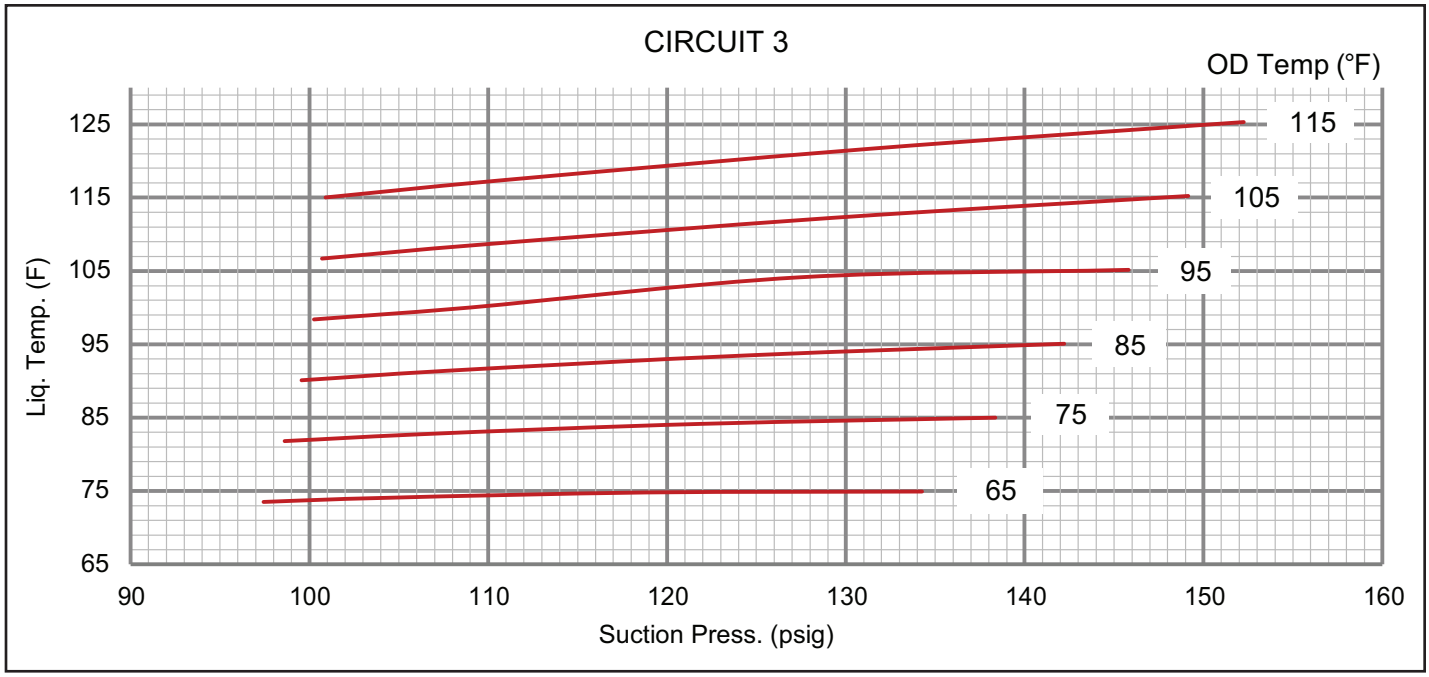
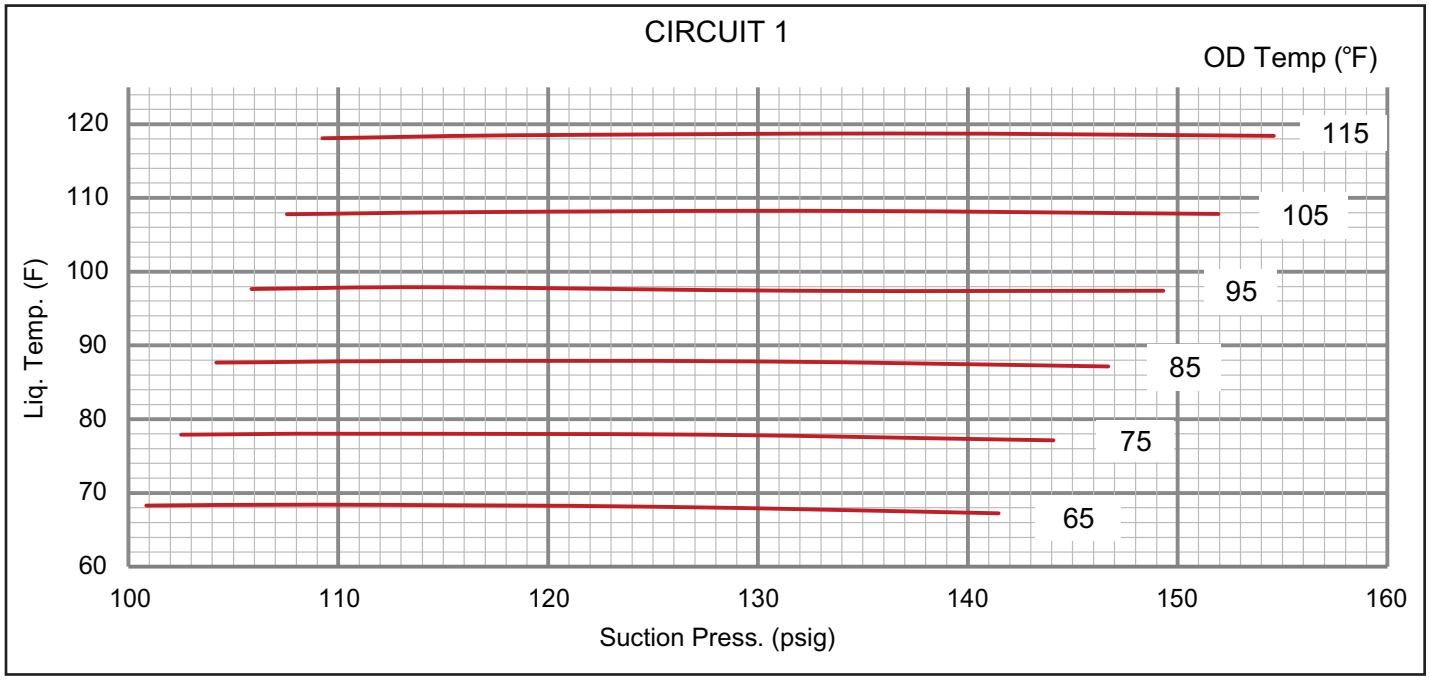


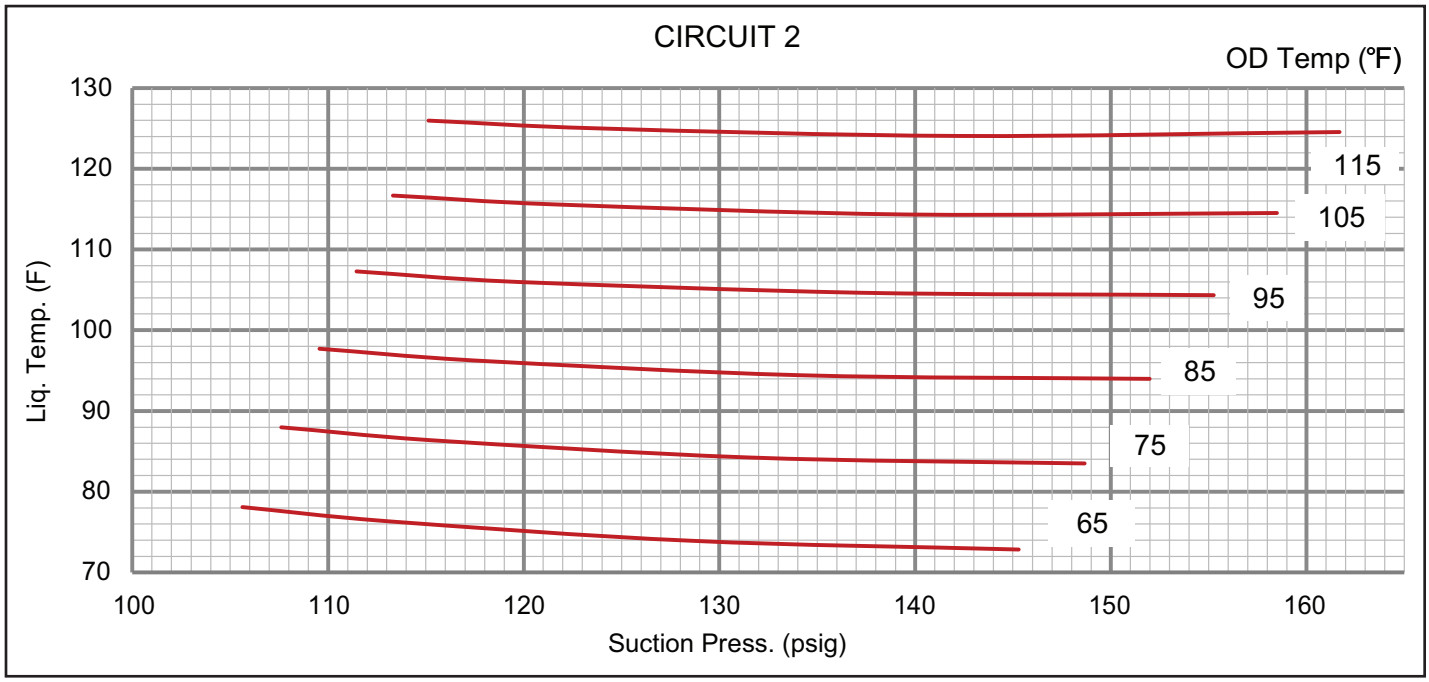
TABLE 20
LGX 300 REHEAT NORMAL OPERATING PRESSURES - ALL-ALUMINUM OD COIL - 581381-01

	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

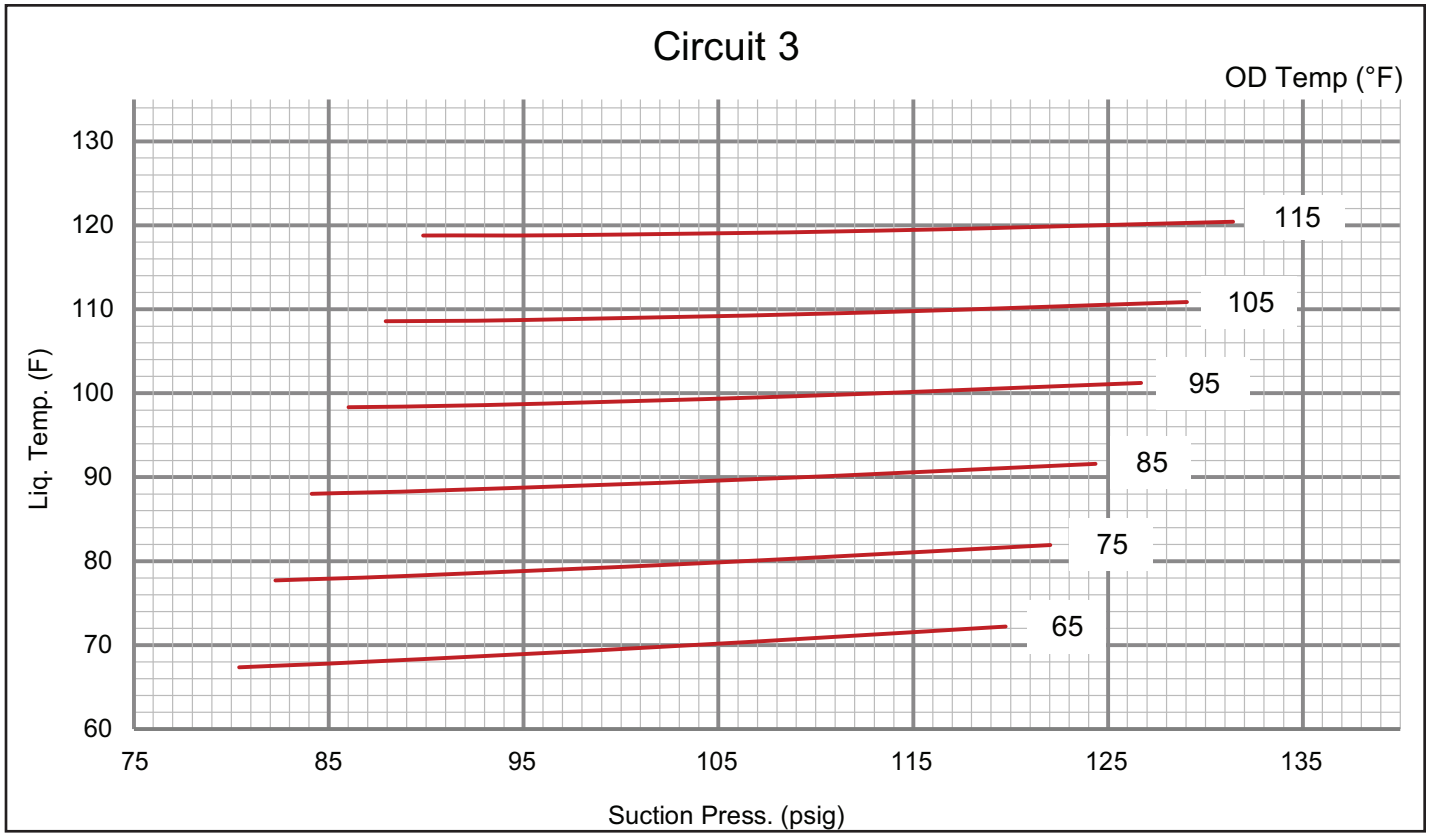
LGX 300 REHEAT CHARGING CURVE CIRCUIT 1 - ALL-ALUMINUM OD COIL - 581380-01



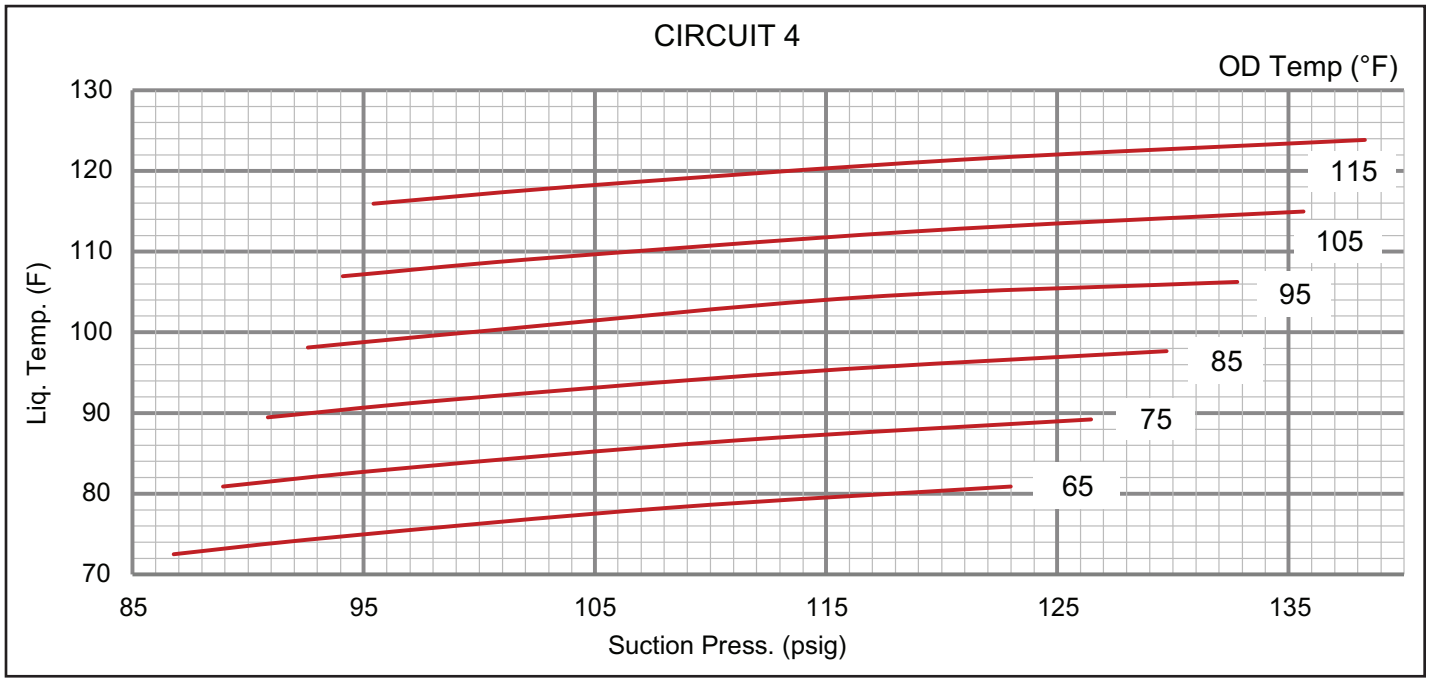
LGX 300 REHEAT CHARGING CURVE CIRCUIT 2 - ALL-ALUMINUM OD COIL - 581380-01



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



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



IV-START-UP OPERATION

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 Start-up

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, & 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.

C-Heating Startup

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠ WARNING

Danger of explosion. Can cause injury or product or property damage. If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the appliance before shutting off electrical supply.

⚠ WARNING

Electric shock hazard. Can cause injury or death. Do not use this unit if any part has been under water. Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.

BEFORE LIGHTING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

⚠ IMPORTANT

This unit is equipped with an automatic spark ignition system. Do not attempt to light manually.

In case of a safety shutdown, move thermostat switch to **OFF** and return the thermostat switch to **HEAT** to reset ignition control.

Placing Furnace In Operation

Gas Valve Operation FIGURE 35

1 - Set thermostat to lowest setting.

2 - Turn off all electrical power to appliance.

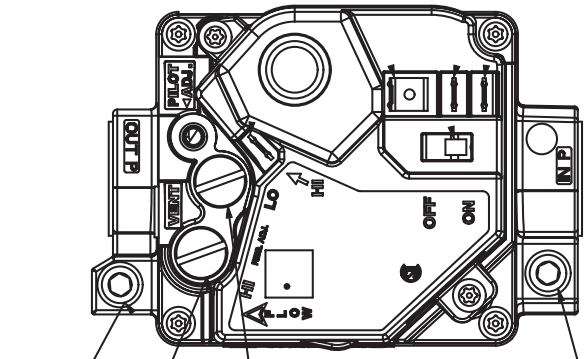
3 - This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.

4 - Open or remove the heat section access panel.

5 - Turn the knob on the gas valve to **"OFF"**. Do not force.

6 - Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.

WHITE RODGERS 36H54 GAS VALVE
Two-Stage



Outlet Pressure Tap

Low Fire Adjustment (under cap)

Inlet Pressure Tap

High Fire Adjustment (under cap)

GAS VALVE SWITCH SHOWN IN **ON** POSITION.

FIGURE 35

7 - Turn the knob on the gas valve to “ON”. Do not force.

8 - Close or replace the heat section access panel.

9 - Turn on all electrical power to appliance.

10 - Set thermostat to desired setting.

11 - The combustion air inducer will start. The burners will light within 40 seconds.

12 - If the appliance does not light the first time (gas line not fully purged), it will attempt up to two more ignitions before locking out.

13 - If lockout occurs, repeat steps 1 through 10.

14 - If the appliance will not operate, follow the instructions “Turning Off Gas to Appliance” and call your service technician or gas supplier.

Turning Off Gas to Appliance

1 - If using an electromechanical thermostat, set to the lowest setting.

2 - Before performing any service, turn off all electrical power to the appliance.

3 - Open or remove the heat section access panel.

4 - Turn the knob on the gas valve to “OFF”. Do not force.

D-Safety or Emergency Shutdown

Turn off power to the unit. Close manual and main gas valves.

V- SYSTEMS SERVICE CHECKS

A-Heating System Service Checks

All LGX units are ETL/CSA design certified without modification.

Before checking piping, check with gas company or authorities having jurisdiction for local code requirements. Refer to the LGX Installation, Operation and Maintenance instruction for more information.

1-Gas Piping

Gas supply piping must not allow more than 0.5"W.C. drop in pressure between the gas meter and the unit. Supply gas pipe must not be smaller than the unit gas connection. Refer to installation instructions for details.

2-Testing Gas Piping

NOTE-*In case emergency shutdown is required, turn off the main manual shut-off valve and disconnect the main power to the unit. These controls should be properly labeled by the installer.*

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig. See FIGURE 36.

When checking piping connection for gas leaks, use the preferred means. Common kitchen detergents can cause harmful corrosion on various metals used in gas piping.

The use of specialty Gas Leak Detector is strongly recommended. It is available through under part number 31B2001. See CORP 8411-L10, for further details. Do not use matches, candles, flame or any other source of ignition to check for gas leaks.

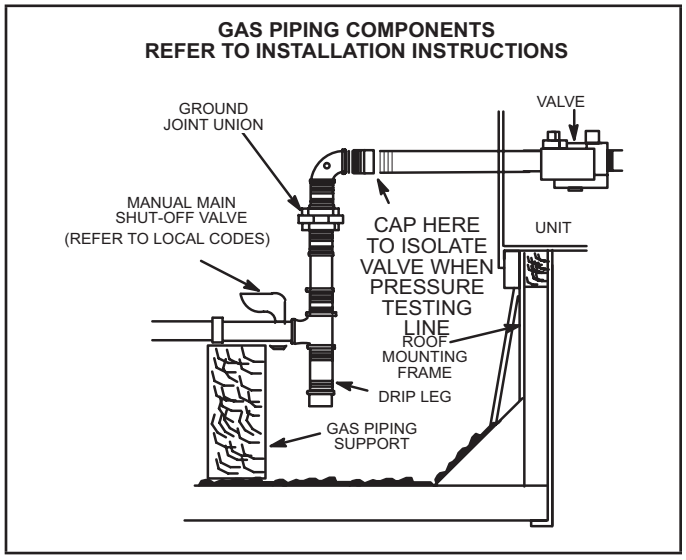


FIGURE 36

3-Testing Gas Supply Pressure

When testing gas supply pressure, connect test gauge to the inlet pressure tap located on unit gas valve GV1 and or GV3. Test supply gas pressure with unit firing at maximum rate (both stages energized).

Make sure the reading falls within the range of the following values. Low pressure may result in erratic operation or "underfire." High pressure can result in permanent damage to the gas valve or "overfire.". See table 19 for supply pressures.

On multiple unit installations, each unit should be checked separately while operating at maximum rate, beginning with the one closest to the supply gas main and progressing to the one furthest from the main. Multiple units should also be tested with and without the other units operating. Supply pressure must fall within the range listed in the previous paragraph.

4-Check and Adjust Manifold Pressure

After line pressure has been checked and adjusted, check manifold pressure. Move test gauge to the outlet pressure tap located on unit gas valve GV1 and or GV3. See FIGURE 35 for location of pressure tap on the gas valve.

The manifold pressure is factory set and should not require adjustment. If manifold pressure is incorrect and no other source of improper manifold pressure can be found, the valve must be replaced. See FIGURE 35 for location of gas valve (manifold pressure) adjustment screw.

All gas valves are factory regulated. The gas valve should completely and immediately cycle off in the event of gas or power failure. The manual shut-off knob can be used to immediately shut off gas supply.

⚠ CAUTION

For safety, connect a shut-off valve between the manometer and the gas tap to permit shut off of gas pressure to the manometer.

Manifold Adjustment Procedure

1 - Connect test gauge to the outlet pressure tap on the gas valve. Start the unit (call for second stage heat) and allow five minutes for the unit to reach steady state.

2 - While waiting for the unit to stabilize, notice the flame. The flame should be stable without flashback and should not lift from the burner heads. Natural gas should burn basically blue with some clear streaks. L.P. gas should burn mostly blue with some clear yellow streaks.

3 - After allowing the unit to stabilize for five minutes, record the manifold pressure and compare to the values given in TABLE 21.

⚠ IMPORTANT

Disconnect heating demand as soon as an accurate reading has been obtained.

TABLE 21

Manifold Pressure "W.C.				Supply Pressure "W.C.	
Natural		LP.Propane		Nat	LP
Low	High	Low	High	4.7-10.5	10.8-13.5
1.6± 0.2	3.7±0.3	5.5± 0.3	10.5± 0.5		

Combustion gases

Flue products must be analyzed and compared to the unit specifications. Problems detected during the inspection may make it necessary to temporarily shut down the furnace until the items can be repaired or replaced.

5-Proper Gas Flow

To check for proper gas flow to burners, determine Btuh input from unit rating plate or the gas heating capacity in the SPECIFICATIONS tables. Divide this input rating by the Btuh per cubic foot of available gas. Result is the number of cubic feet per hour required. Determine the flow of gas through gas meter for two minutes and multiply by 30 to get hourly flow of gas to the burners.

NOTE - *To obtain accurate reading, shut off all other gas appliances connected to meter.*

6-Inshot Burner

Burners are factory set for maximum air and cannot be adjusted. Always operate unit with access panel in place. A peep hole is furnished in the heating access panel for flame viewing. Natural gas should burn basically blue with some clear streaks. L.P. gas should burn mostly blue with some clear yellow streaks.

Follow steps below to remove burner assembly.

1 - Turn off power to unit and shut off gas supply.
2 - Remove screws holding the burner support cap.
3 - Burner assembly is a cluster assembly (FIGURE 37) and can be removed as one.
4 - Clean and reassemble (reverse steps 1-3).
5 - Be sure to secure all wires and check plumbing.
6 - Turn on power to unit. Follow lighting instructions attached to unit and operate unit in heating mode. Check burner flames. They should be blue with yellow streaks.

7-Spark Electrode Gap

The spark electrode assembly can be removed for inspection by removing two screws securing the electrode assembly and sliding it out of unit.

For proper unit operation, electrodes must be positioned and gapped correctly.

Spark gap may be checked with appropriately sized twist drills or feeler gauges. Disconnect power to the unit and remove electrode assembly. The gap should be between 0.125" ± 0.015". See FIGURE 33.

TYPICAL GAS BURNER ASSEMBLY

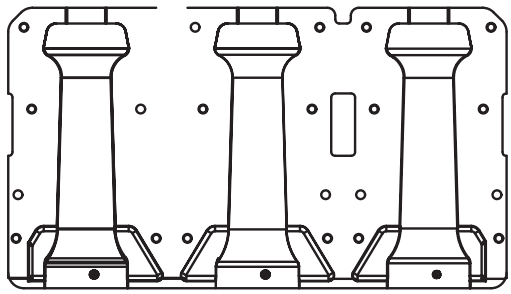


FIGURE 37

8-Heat Exchanger

To Access or Remove Heat Exchanger From Unit:

1 - Turn off gas and electric power.
2 - Remove access panel(s) and unit center mullion.
3 - Remove gas valve, manifold assembly and burners.
4 - Remove combustion air inducer and flue box. Pay careful attention to the order in which gaskets and orifice are removed.
5 - Support heat exchanger (to prevent it from falling when final screws are removed.)
6 - Remove screws supporting heat exchanger.
7 - To install heat exchanger, reverse procedure. Be sure to secure all wires and check plumbing and burner plate for airtight seal. Screws must be torqued to 35 in.-lbs. to ensure proper operation.

9-Flame Sensing

Flame current is an electrical current which passes from the ignition control through the sensor electrode during unit operation. The current passes from the sensor through the flame to the ground electrode (located on the flame electrode) to complete a safety circuit. The electrodes should be located so the tips are at least 1/2" (12.7 mm) inside the flame envelope. Do not bend electrodes. To measure flame current, follow the procedure on the following page:

NOTE-*Electrodes are not field adjustable. Any alterations to the electrode may create a hazardous condition that can cause property or personal injury.*

1 - Disconnect power to unit.
2 - Remove lead from sensing electrode and install a 0-50DC microamp meter in series between the sensing electrode and the sensing lead.
3 - Reconnect power and adjust thermostat for heating demand.
4 - When flame is established, compare reading to TABLE 22. Do not bend electrodes.
5 - Disconnect power to unit before disconnecting meter. Make sure sensor wire is securely reconnected before reconnecting power to unit.

TABLE 22

Manufacturer	Nominal Signal Microamps	Drop Out
UTEC	0.5 - 1.0	.09

NOTE-*If the meter scale reads 0, the leads are reversed. Disconnect power and reconnect leads for proper polarity.*

10-Combustion Air Inducer

The combustion air inducer is factory set and is not field adjustable. However, operation should be monitored to ensure proper operation. The combustion air inducer is used to draw fresh air into the combustion chamber while simultaneously expelling exhaust gases. The inducer operates throughout the heating cycle.

On a heating demand, the ignition control is energized by the A55 Unit Controller. The ignition control then allows 30 to 40 seconds for the combustion air inducer to vent exhaust gases from the burners. When the combustion air inducer is purging the exhaust gases, the combustion air prove switch is closing proving that the combustion air inducer is operating before allowing the ignition control to energize. When the combustion air prove switch is closed and the delay is over, the ignition control activates the first stage operator of the gas valve (low fire), the spark and the flame sensing electrode. Sparking stops immediately after flame is sensed.

B-Cooling System Service Checks

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

VI-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 refigerant 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 flameable 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 construct-

ed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

- For systems containing refigerant 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,

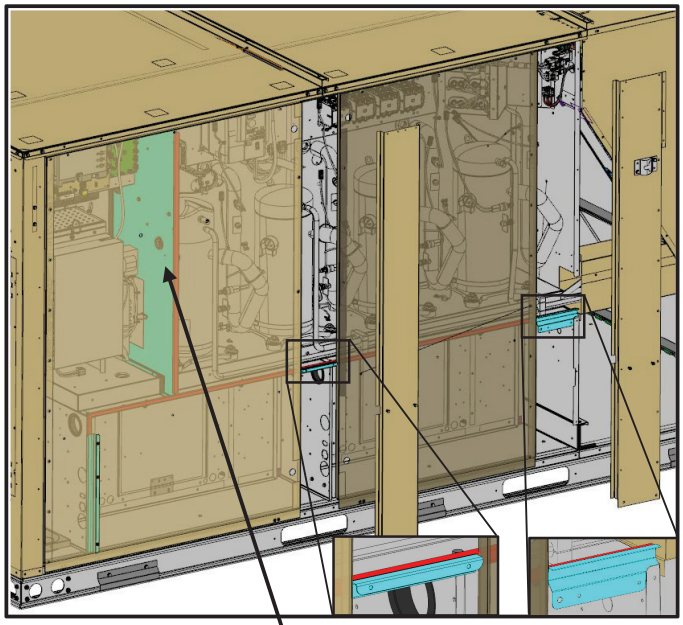
  e. Purge with inert gas,

  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.

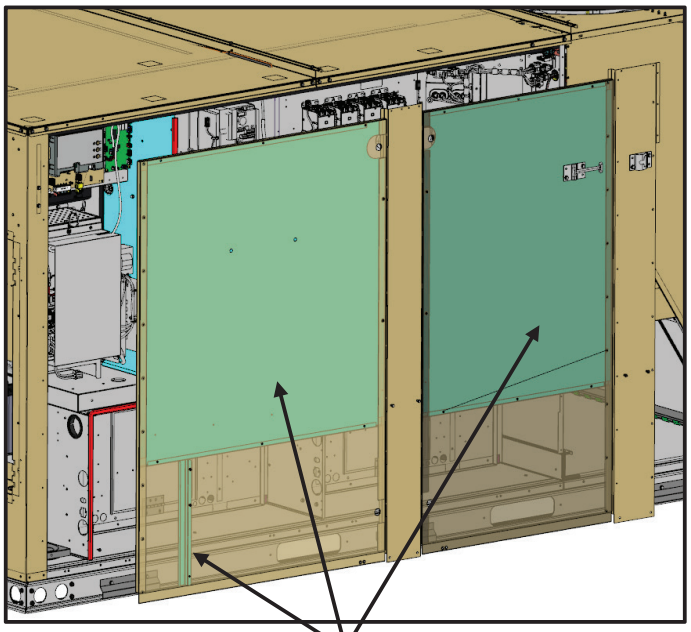
Critical Components for Refrigerant Leak Containment

All Units



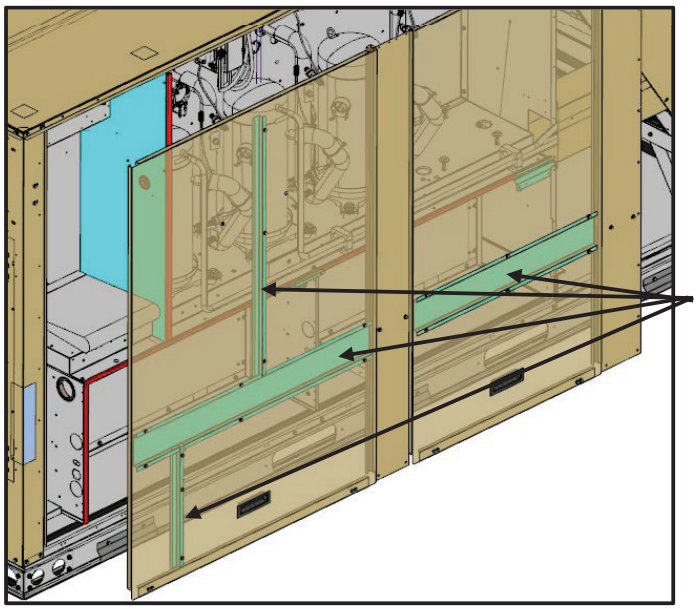
If the door panels, barrier, mullions and rubber seals (highlighted in red) must be removed for service, ensure they are returned to their proper places before starting the unit. Verify that the rubber seals on the barrier and the compressor base panel are properly aligned and tightly secured. Verify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

LGX 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 LGX 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____

VII-ACCESSORIES

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

A-Roof Curbs

When installing the LGX 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 hybribd mounting frame is shown in FIGURE 38. 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 39. 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 LGX 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.

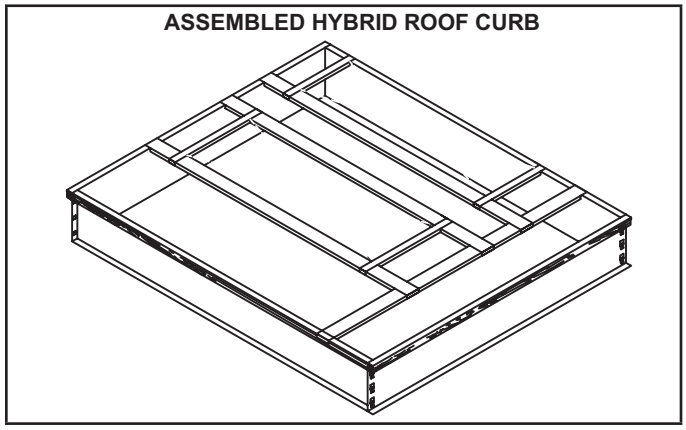


FIGURE 38

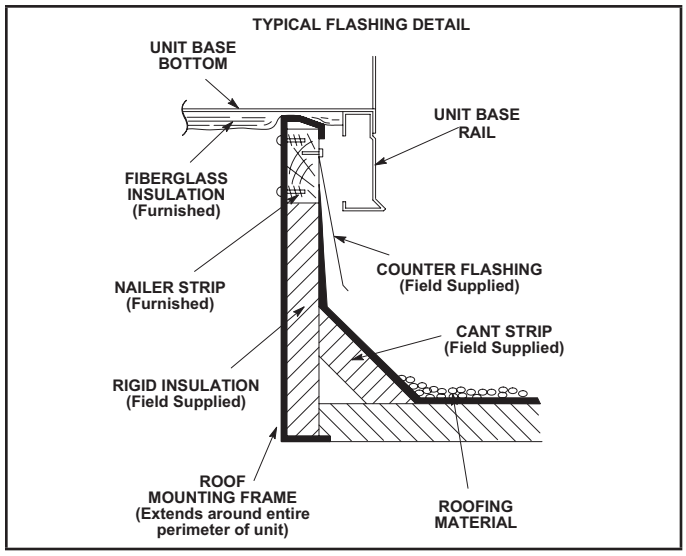


FIGURE 39

B-Transitions

Optional supply/return transitions C1DIFF33C-1 and C1DIFF34C-1 are available for use with LGX 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 40) 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 (see FIGURE 40). Either air damper can be installed in LGX 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 reinstallation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

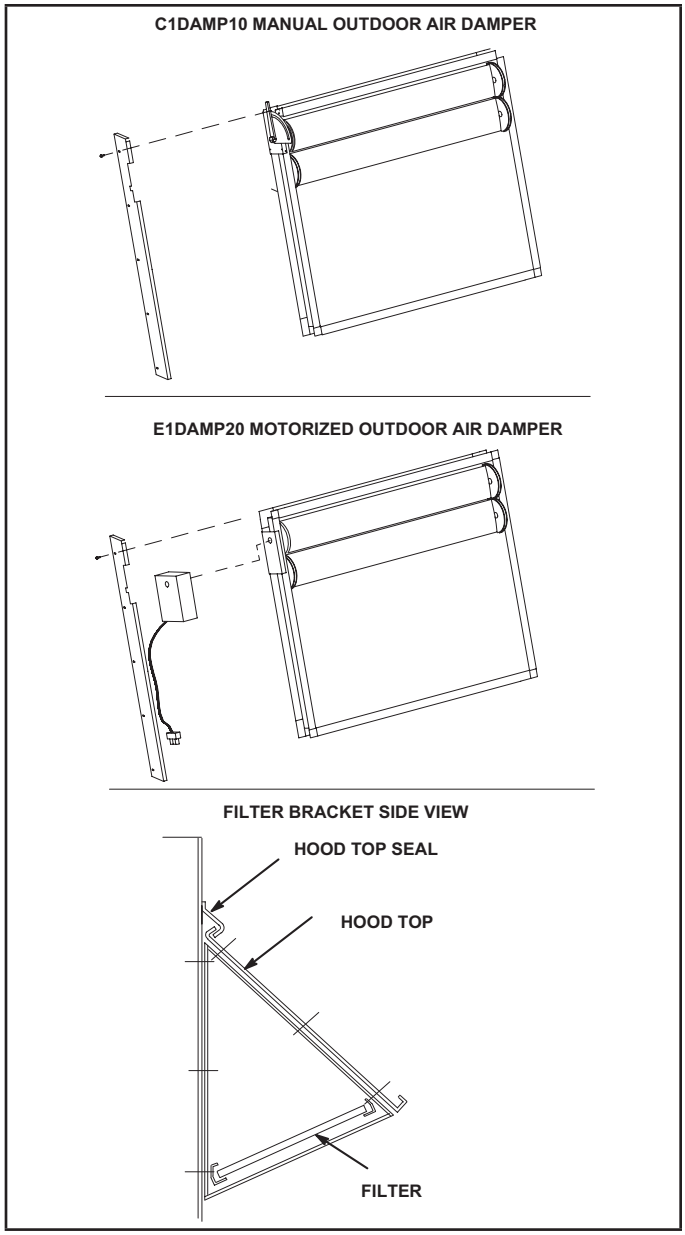


FIGURE 40

D-Supply and Return Diffusers

Optional flush mount diffuser/return FD11 and extended mount diffuser/return RTD11 are available for use with all LGX 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 ou door 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.*

F-Gravity Exhaust Dampers

Dampers (FIGURE 41) 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 LGX 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.

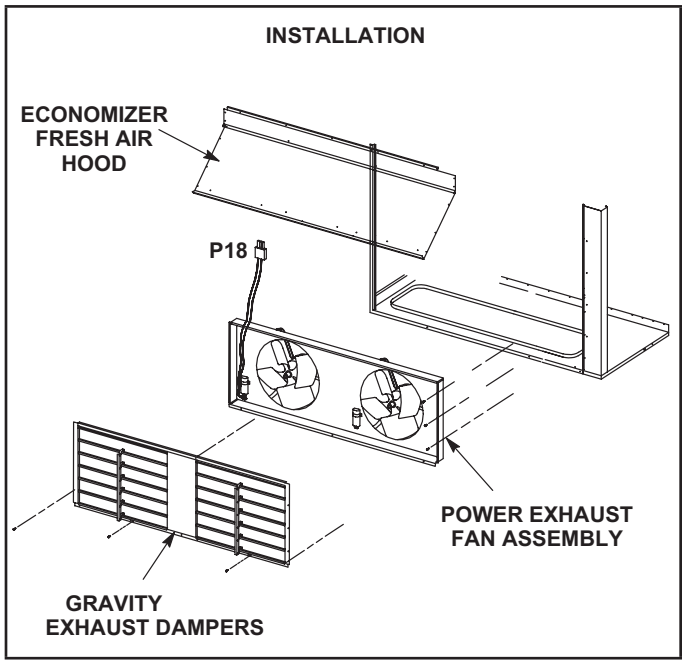


FIGURE 41

G-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 41 shows the location of the power exhaust fans. See installation instructions for more detail.

H-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.

I-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.

J-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.

K-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.

L-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.

M-LP / Propane Kit

Units require two (one for each gas heat section) natural to LP/propane kit. The kit includes one gas valve, eleven burner orifices and three stickers. For more detail refer to the natural to LP gas changeover kit installation instructions.

N-Indoor Air Quality (CO2) Sensor A63

The indoor air quality sensor monitors CO2 levels and reports the levels to the A55 Unit Controller. The board adjusts the economizer dampers according to the CO2 levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment. Wiring for the indoor air quality switch is shown on the temperature control section (C) wiring diagram in back of this manual.

O-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.

P-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.

Q-Bipolar Ionizer (Field Installed Option)

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 23 for unit application.

TABLE 23

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

VIII-FACTORY-INSTALLED HOT GAS REHEAT

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 42 and FIGURE 43 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 24. 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 24

Relative Humidity (%RH ± 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 25 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)

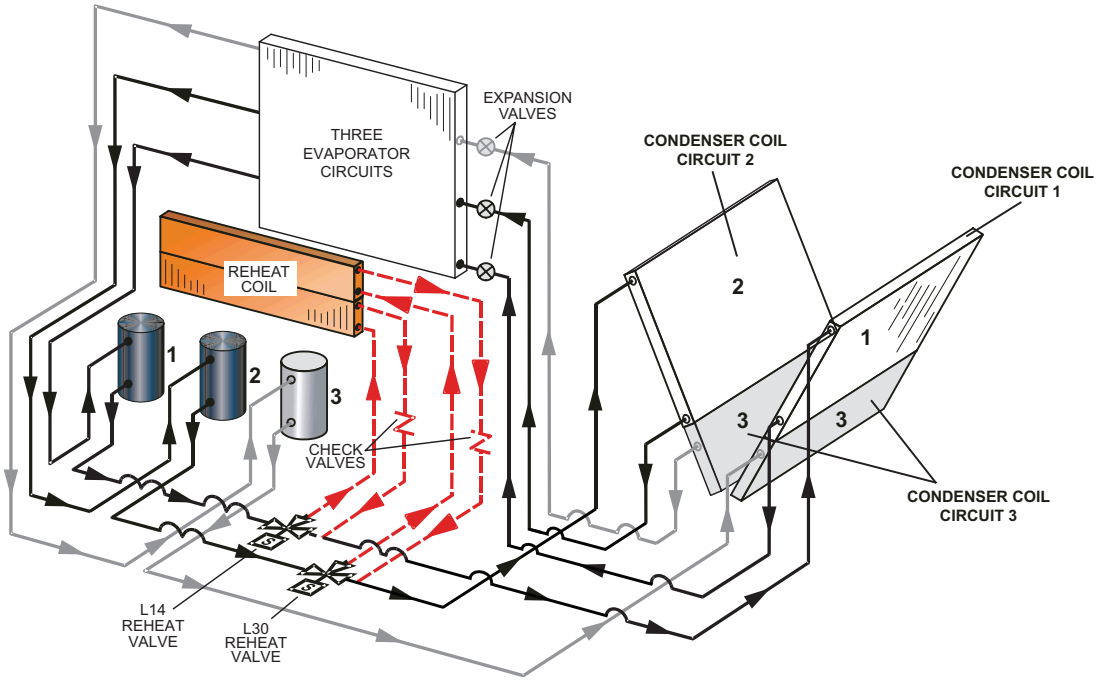


FIGURE 42

REFRIGERANT SCHEMATIC (300S MODELS ONLY)

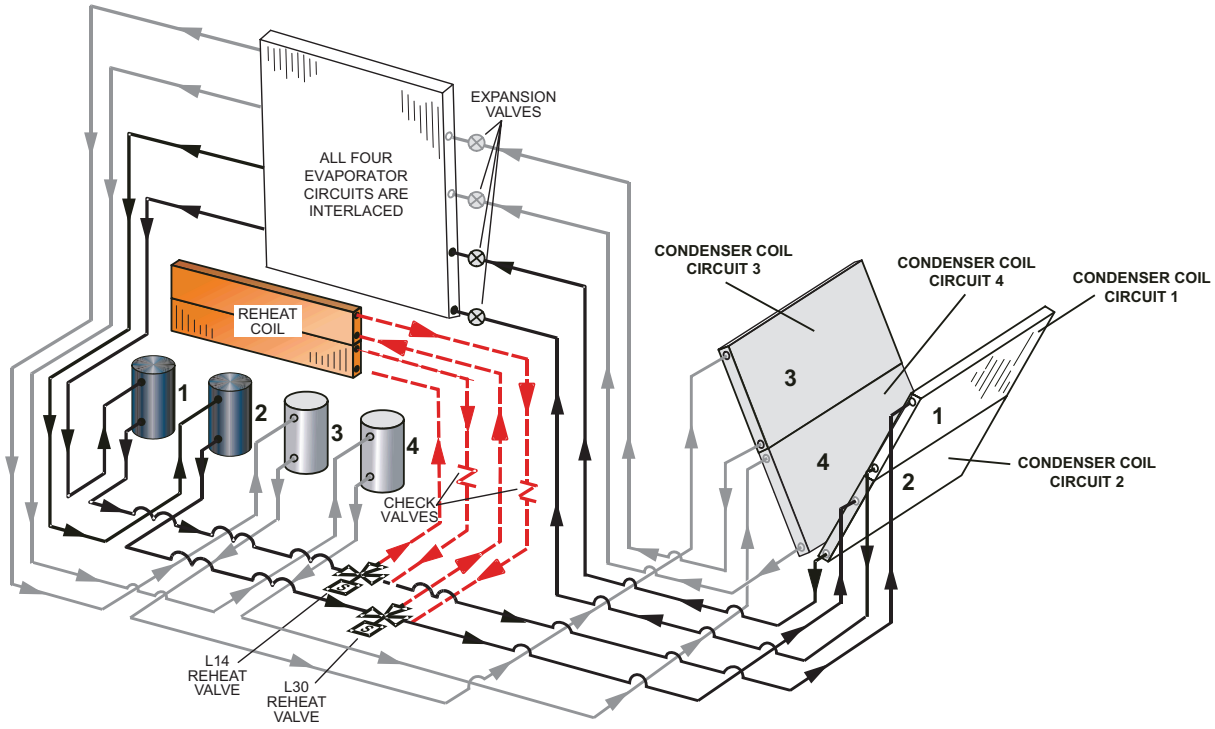


FIGURE 43

TABLE 25

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

IX--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 26 or TABLE 27. Refer to the Unit Controller manual provided with unit.

RTU MENU > RTU OPTIONS > BLOWER > SPEED

2 - Enter the following design specifications as shown in the attached table (table18 in the installation instructions).

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 Kit

The supply air inverter is factory-set to by-pass the inverter manually. To by-pass 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 by-pass option.

Press SAVE

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

TABLE 26
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 27
COOLING MINIMUM AND MAXIMUM CFM

LGX/ 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

X-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 befor 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.

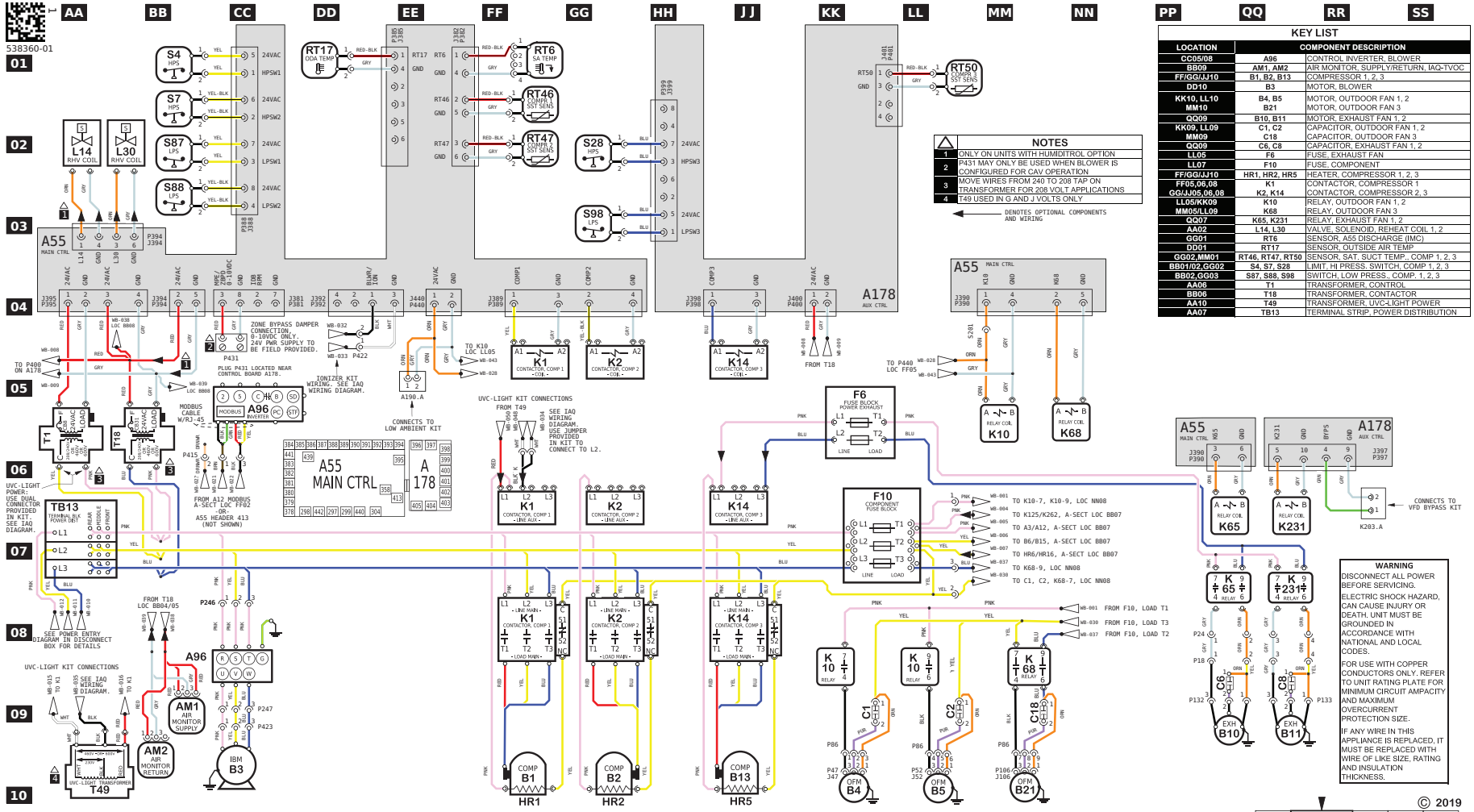
Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition 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.

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



KEY LIST

LOCATION	COMPONENT DESCRIPTION
CC05/08	A96, CONTROL INVERTER, BLOWER
BB09	AM1, AM2, AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC
FF/GG/JJ10	B1, B2, B13, COMPRESSOR 1, 2, 3
DD10	B3, MOTOR, BLOWER
KK10, LL10 MM10	B4, B5 B21, MOTOR, OUTDOOR FAN 1, 2 MOTOR, OUTDOOR FAN 3
QQ09	B10, B11, MOTOR, EXHAUST FAN 1, 2
KK09, LL09	C1, C2, CAPACITOR, OUTDOOR FAN 1, 2
MM09	C18, CAPACITOR, OUTDOOR FAN 3
QQ09	C6, C8, CAPACITOR, EXHAUST FAN 1, 2
LL05	F6, FUSE, EXHAUST FAN
LL07	F10, FUSE, COMPONENT
FF/GG/JJ10	HR1, HR2, HR5, HEATER, COMPRESSOR 1, 2, 3
FF05,06,08	K1, CONTACTOR, COMPRESSOR 1
GG/JJ05,06,08	K2, K14, CONTACTOR, COMPRESSOR 2, 3
LL05/KK09	K10, RELAY, OUTDOOR FAN 1, 2
MM05/LL09	K68, RELAY, OUTDOOR FAN 3
QQ07	K65, K231, RELAY, EXHAUST FAN 1, 2
AA02	L14, L30, VALVE, SOLENOID, REHEAT COIL 1, 2
GG01	RT6, SENSOR, A55 DISCHARGE (IMC)
DD01	RT17, SENSOR, OUTSIDE AIR TEMP
GG02,MM01	RT46, RT47, RT50, SENSOR, SAT. SUCT TEMP., COMP 1, 2, 3
BB01/02,GG02	S4, S7, S28, LIMIT, HI PRESS. SWITCH, COMP 1, 2, 3
BB02,GG03	S87, S88, S98, SWITCH, LOW PRESS., COMP. 1, 2, 3
AA09	T1, TRANSFORMER, CONTROL
BB06	T18, TRANSFORMER, CONTACTOR
AA10	T49, TRANSFORMER, UVC-LIGHT POWER
AA07	TB13, TERMINAL STRIP, POWER DISTRIBUTION

NOTES

1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	P431 MAY ONLY BE USED WHEN BLOWER IS CONFIGURED FOR CAV OPERATION
3	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
4	T49 USED IN G AND J VOLTS ONLY

DENOTES OPTIONAL COMPONENTS AND WIRING

WARNING

DISCONNECT ALL POWER BEFORE SERVICING.

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

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

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

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

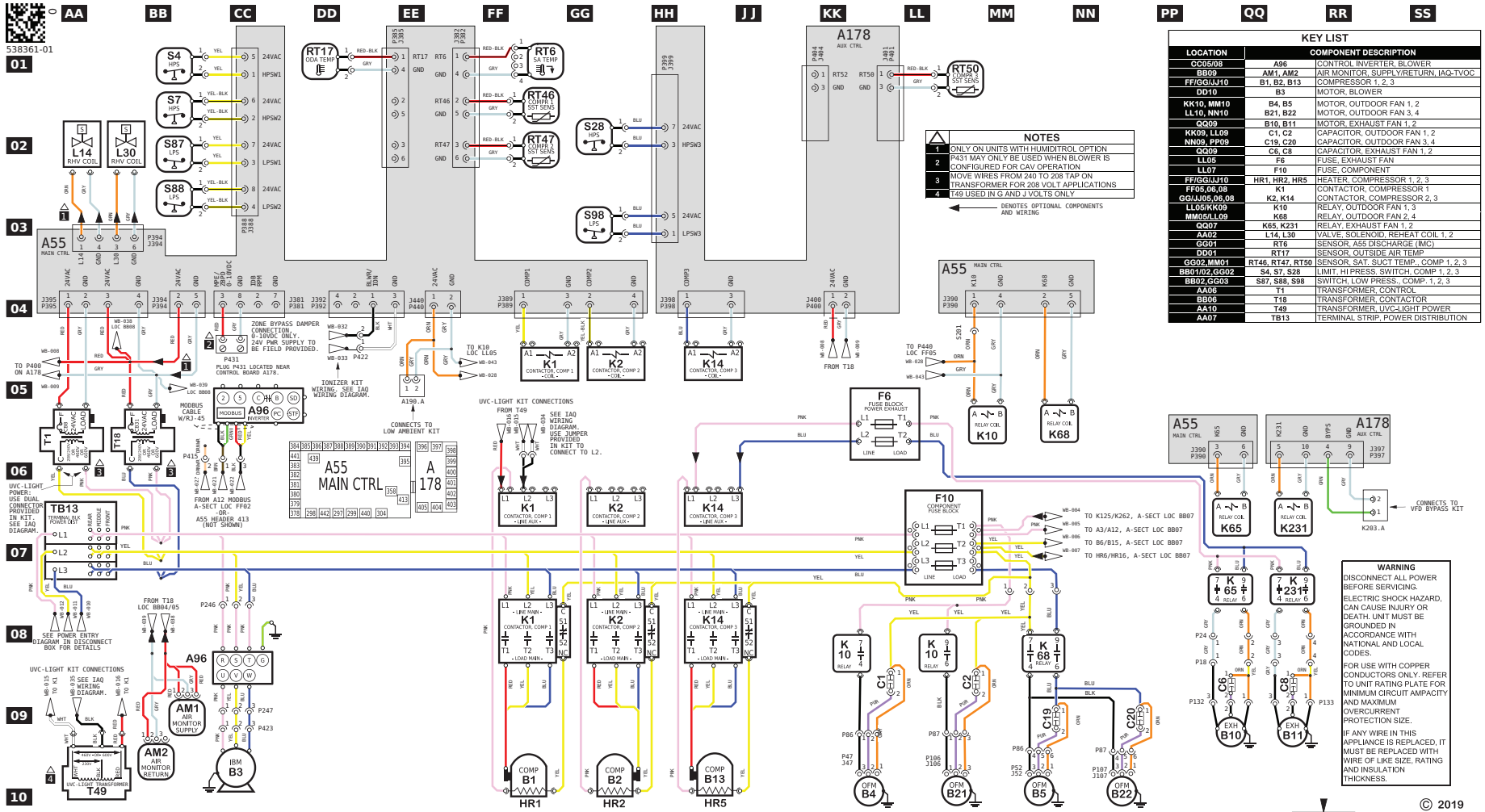
WIRING DIAGRAM FLOW

HEATING	COOLING	COOLING	ACCS	ACCS
SECTION A	SECTION B	SECTION B3/5	SECTION C	SECTION D

10x17 CUT SIZE

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

LCX240 G, J, Y VOLT DIAGRAM
COOLING - MSAV



KEY LIST	
LOCATION	**COMPONENT DESCRIPTION**
GC05/08	A96, CONTROL INVERTER, BLOWER
BB09	AM1, AM2, AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC
FF/GG/JJ10	B1, B2, B13, COMPRESSOR 1, 2, 3
DD10	B3, MOTOR, BLOWER
KK10, MM10 LL10, NN10	B4, B5 MOTOR, OUTDOOR FAN 1, 2 B21, B22 MOTOR, OUTDOOR FAN 3, 4
QQ09	B10, B11, MOTOR, EXHAUST FAN 1, 2
KK09, LL09 NN09, PP09	C1, C2 CAPACITOR, OUTDOOR FAN 1, 2 C19, C20 CAPACITOR, OUTDOOR FAN 3, 4
QQ09	C6, C8 CAPACITOR, EXHAUST FAN 1, 2
LL05	F6 FUSE, EXHAUST FAN
LL07	F10 FUSE, COMPONENT
FF/GG/JJ10	HR1, HR2, HR5 HEATER, COMPRESSOR 1, 2, 3
FF05,06,08 GG/JJ05,06,08	K1 CONTACTOR, COMPRESSOR 1 K2, K14 CONTACTOR, COMPRESSOR 2, 3
LL05/KK09 MM05/LL09	K10 RELAY, OUTDOOR FAN 1, 3 K68 RELAY, OUTDOOR FAN 2, 4
QQ07	K65, K231 RELAY, EXHAUST FAN 1, 2
AA02	L14, L30 VALVE, SOLENOID, REHEAT COIL 1, 2
GG01	RT6 SENSOR, A55 DISCHARGE (IMC)
DD01	RT17 SENSOR, OUTSIDE AIR TEMP
GG02,MM01	RT46, RT47, RT50 SENSOR, SAT. SUCT TEMP., COMP 1, 2, 3
BB01/02,GG02	S4, S7, S28 LIMIT, HI PRESS. SWITCH, COMP 1, 2, 3
BB02,GG03	S87, S88, S98 SWITCH, LOW PRESS., COMP. 1, 2, 3
AA05	T1 TRANSFORMER, CONTROL
BB06	T18 TRANSFORMER, CONTACTOR
AA10	T49 TRANSFORMER, UVC-LIGHT POWER
AA07	TB13 TERMINAL STRIP, POWER DISTRIBUTION

NOTES	
1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	P431 MAY ONLY BE USED WHEN BLOWER IS CONFIGURED FOR CAV OPERATION
3	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
4	T49 USED IN G AND J VOLTS ONLY

△ DENOTES OPTIONAL COMPONENTS AND WIRING

WARNING

DISCONNECT ALL POWER BEFORE SERVICING.

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

FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

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

Model: LGX, LCX 240S - G, J, Y -VOLT
COOLING - MSAV - 3 COMPRESSORS 4 CONDENSER FANS

Voltage: 460V/3~/60Hz (G), 575V/3~/60Hz (J), 208-240V/3-60Hz (Y)
Supersedes: N/A Form No: 538361-01 Rev: 0

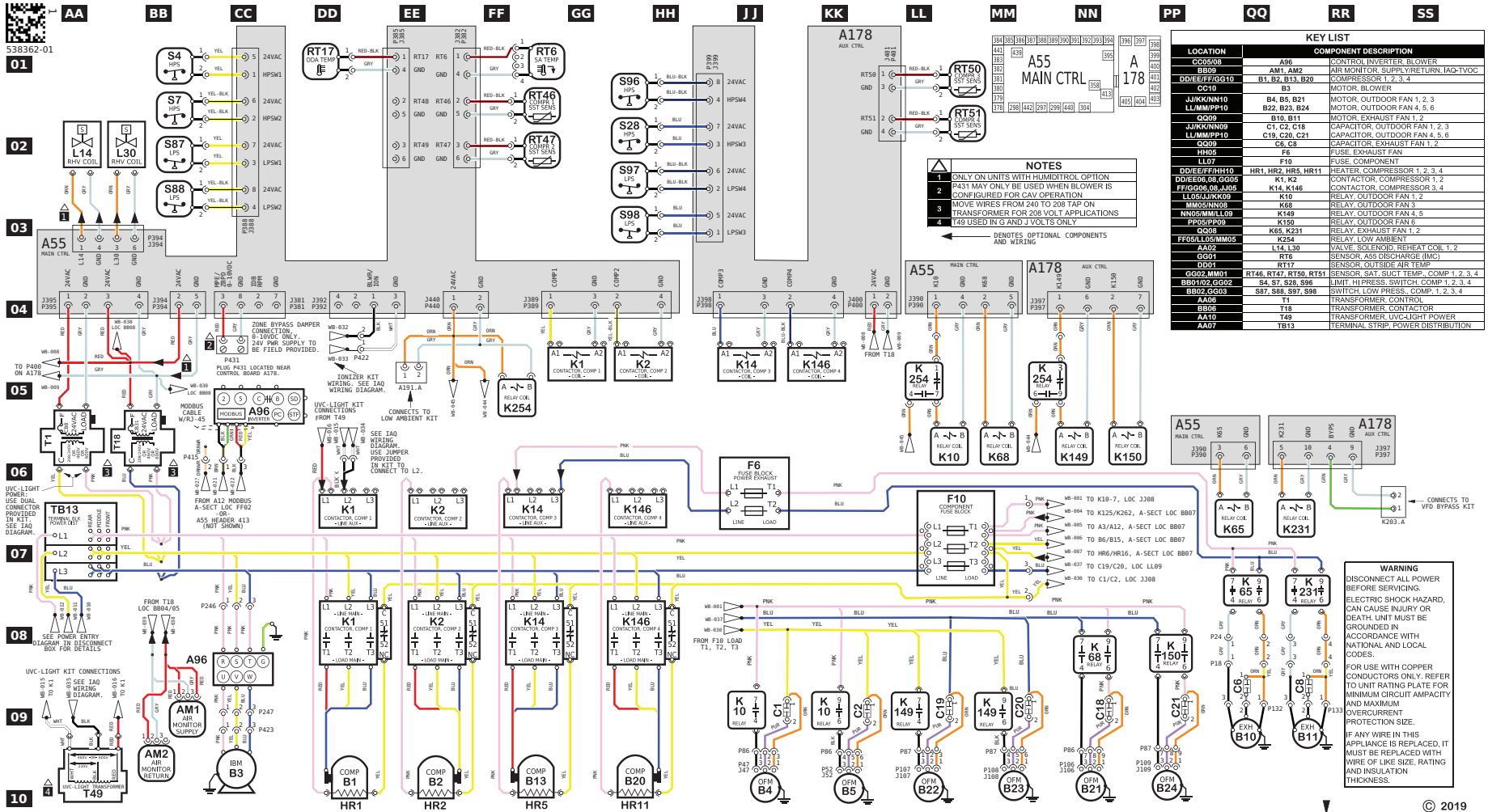
WIRING DIAGRAM FLOW

HEATING SECTION A	COOLING SECTION B	COOLING SECTION B3/5	ACCS SECTION C	ACCS SECTION D

10x17 CUT SIZE

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

LCX300 G, J, Y VOLT DIAGRAM
COOLING - MSAV



KEY LIST	
LOCATION	**COMPONENT DESCRIPTION**
CC05/08	A96, CONTROL INVERTER, BLOWER
BB09	AM1, AM2, AIR MONITOR, SUPPLY/RETURN, IAQ-TVOC
DD/EE/FF/GG10	B1, B2, B13, B20, COMPRESSOR 1, 2, 3, 4
CC10	B3, MOTOR, BLOWER
JJ/KK/NN10 LL/MM/PP10	B4, B5, B21 MOTOR, OUTDOOR FAN 1, 2, 3 MOTOR, OUTDOOR FAN 4, 5, 6
QQ09	B10, B11, MOTOR, EXHAUST FAN 1, 2
JJ/KK/NN09 LL/MM/PP10	C1, C2, C18 CAPACITOR, OUTDOOR FAN 1, 2, 3 C19, C20, C21 CAPACITOR, OUTDOOR FAN 4, 5, 6
QQ08	C6, C8, CAPACITOR, EXHAUST FAN 1, 2
HH05	F6, FUSE, EXHAUST FAN
LL07	F10, FUSE, COMPONENT
DD/EE/FF/HH10	HR1, HR2, HR5, HR11, HEATER, COMPRESSOR 1, 2, 3, 4
DD/EE06,08,GG05	K1, K2, CONTACTOR, COMPRESSOR 1, 2
FF/GG06,08,JJ05	K14, K146, CONTACTOR, COMPRESSOR 3, 4
LL05/JJ/KK09	K10, RELAY, OUTDOOR FAN 1, 2
MM05/NN08	K68, RELAY, OUTDOOR FAN 3
NN05/MM/LL09	K149, RELAY, OUTDOOR FAN 4, 5
PP05/PP09	K150, RELAY, OUTDOOR FAN 6
QQ08	K65, K231, RELAY, EXHAUST FAN 1, 2
FF05/LL05/MM05	K254, RELAY, LOW AMBIENT
AA02	L14, L30, VALVE, SOLENOID, REHEAT COIL 1, 2
GG01	RT6, SENSOR, ASS DISCHARGE (IMC)
DD01	RT17, SENSOR, OUTSIDE AIR TEMP
GG02,MM01	RT46, RT47, RT50, RT51, SENSOR, SAT, SUCT TEMP., COMP 1, 2, 3, 4
BB01/02,GG02	S4, S7, S28, S96, LIMIT, HI PRESS. SWITCH, COMP 1, 2, 3, 4
BB02,GG03	S87, S88, S97, S98, SWITCH, LOW PRESS., COMP. 1, 2, 3, 4
AA06	T1, TRANSFORMER, CONTROL
BB06	T18, TRANSFORMER, CONTACTOR
AA10	T49, TRANSFORMER, UVC-LIGHT POWER
AA07	TB13, TERMINAL STRIP, POWER DISTRIBUTION

NOTES	
1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	P431 MAY ONLY BE USED WHEN BLOWER IS CONFIGURED FOR CAV OPERATION
3	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
4	T49 USED IN G AND J VOLTS ONLY

DENOTES OPTIONAL COMPONENTS AND WIRING

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: XXXXXX-XX Form No: 538362-01 Rev: 1

WIRING DIAGRAM FLOW

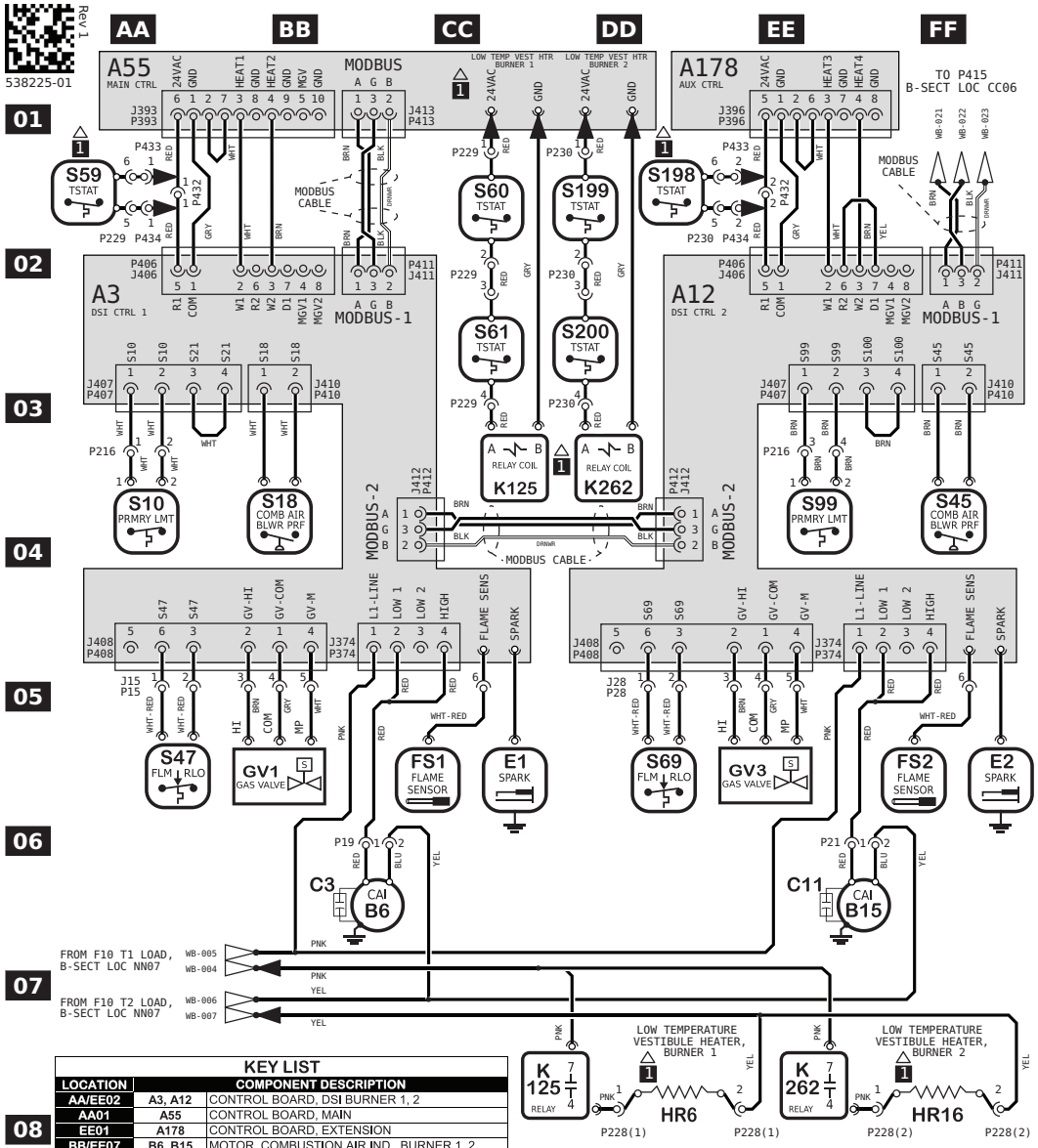
HEATING SECTION A	COOLING SECTION B	COOLING SECTION B3/5	ACCS SECTION C	ACCS SECTION D

10x17 CUT SIZE

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

GAS HEAT DIAGRAM - Y & G VOLTS

Rev 1
538225-01



KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
AA/EE02	A3, A12	CONTROL BOARD, DSI BURNER 1, 2
AA01	A55	CONTROL BOARD, MAIN
EE01	A178	CONTROL BOARD, EXTENSION
BB/EE07	B6, B15	MOTOR, COMBUSTION AIR IND., BURNER 1, 2
BB/EE06	C3, C11	CAPACITOR, CAI MOTOR 1, 2
CC/FF06	E1, E2	IGNITER, SPARK, BURNER 1, 2
CC/FF06	FS1, FS2	SENSOR, FLAME, BURNER 1, 2
BB/EE06	GV1, GV2	VALVE, GAS, BURNER 1, 2
DD/FF08	HR6, HR16	HEATER, -50C LOW TEMP VEST, BURNER 1, 2
CC/DD03	K125, K262	RELAY, LOW TEMP VEST HEATER, BURNER 1, 2
DD/EE08	K125, K262	
AA/EE04	S10, S99	LIMIT, PRIMARY, BURNER 1, 2
BB/FF04	S18, S45	SWITCH, COMB AIR BLWR PROOF, BURNER 1, 2
AA/DD06	S47, S69	SWITCH, FLAME ROLLOUT, BURNER 1, 2
AA/DD02	S59, S198	TSTAT, OPEN -20F, CLOSE 10F, BURNER 1, 2
CC/DD02	S60, S199	TSTAT, OPEN 20F, CLOSE -10F, BURNER 1, 2
CC/DD03	S61, S200	TSTAT, OPEN 50F, CLOSE 20F, BURNER 1, 2

NOTES
1 - 50C LOW TEMPERATURE VESTIBULE HEATER - OPTIONAL

DENOTES OPTIONAL COMPONENTS AND WIRING

HEATING	COOLING	COOLING	ACCS	ACCS
SECTION A	SECTION B	SECTION B3	SECTION C	SECTION D

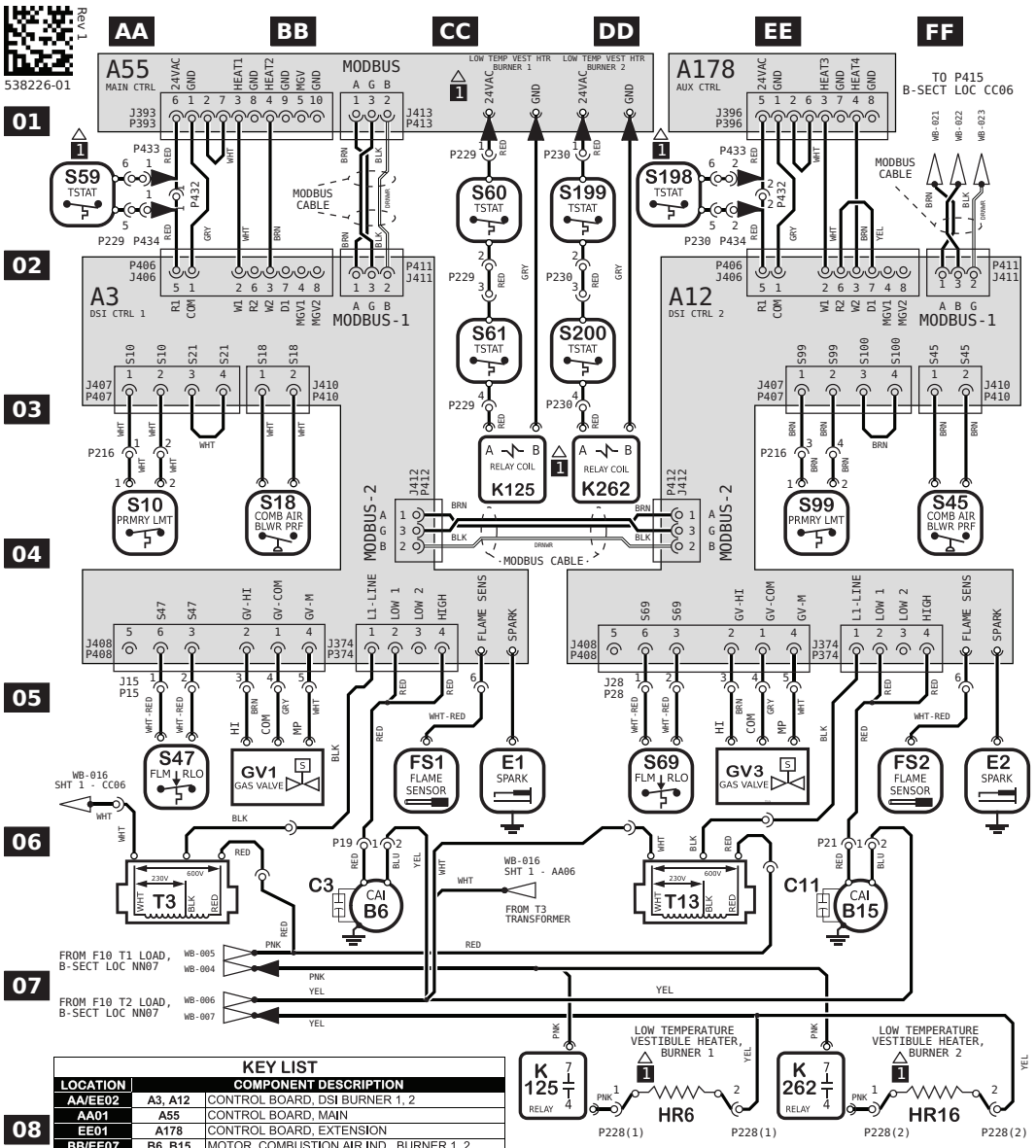
WIRING DIAGRAM FLOW

Model: LG, LD, SG Series RTU - Gas Heat
Input Heat Capacity 169k - 480k Btuh
Voltage: 208-240V/3~/60Hz (Y), 460V/3~/60Hz (G)
Supersedes: N/A Form No: 538225-01 Rev: 1

7x10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-010356	06-21-2022	MXR6	JAL21	ORIGINATED AT PD&R CARROLLTON, TX
001	CN-012295C	04-03-2024	MXR6	MXT5	A) REVISED CAI B6/B15 SYMBOL B) ADDED SG MODEL TO TITLE BLOCK.

GAS HEAT DIAGRAM - J VOLT



KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
AA/EE02	A3, A12	CONTROL BOARD, DSI BURNER 1, 2
AA01	A55	CONTROL BOARD, MAIN
EE01	A178	CONTROL BOARD, EXTENSION
BB/EE07	B6, B15	MOTOR, COMBUSTION AIR IND., BURNER 1, 2
BB/EE06	C3, C11	CAPACITOR, CAI MOTOR 1, 2
CC/FF06	E1, E2	IGNITER, SPARK, BURNER 1, 2
CC/FF06	FS1, FS2	SENSOR, FLAME, BURNER 1, 2
BB/EE06	GV1, GV2	VALVE, GAS, BURNER 1, 2
DD/FF08	HR6, HR16	HEATER, -50C LOW TEMP VEST, BURNER 1, 2
CC/DD03	K125, K262	RELAY, LOW TEMP VEST HEATER, BURNER 1, 2
DD/EE08	K125, K262	
AA/EE04	S10, S99	LIMIT, PRIMARY, BURNER 1, 2
BB/FF04	S18, S45	SWITCH, COMB AIR BLWR PROOF, BURNER 1, 2
AA/DD06	S47, S69	SWITCH, FLAME ROLLOUT, BURNER 1, 2
AA/DD02	S59, S198	TSTAT, OPEN -20F, CLOSE 10F, BURNER 1, 2
CC/DD02	S60, S199	TSTAT, OPEN 20F, CLOSE -10F, BURNER 1, 2
CC/DD03	S61, S200	TSTAT, OPEN 50F, CLOSE 20F, BURNER 1, 2
AA06	T3	TRANSFORMER, CAB MOTOR 1
EE06	T13	TRANSFORMER, CAB MOTOR 2

NOTES	
1	- 50C LOW TEMPERATURE VESTIBULE HEATER - OPTIONAL

DENOTES OPTIONAL COMPONENTS AND WIRING

HEATING	COOLING	COOLING	ACCS	ACCS
SECTION A	SECTION B	SECTION B3	SECTION C	SECTION D

WIRING DIAGRAM FLOW

Model: LG, LD, SG Series RTU - Gas Heat
Input Heat Capacity 169k - 480k Btuh
Voltage: 575V/3~/60Hz (J)
Supersedes: N/A Form No: 538226-01 Rev: 1

7x10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-010356	06/21/2022	MXR6	JAL21	ORIGINATED AT PD&R CARROLLTON, TX
001	CN-012295C	04-03-2024	MXR6	MXT5	REVISED CAI B6/B15 SYMBOL.

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 (Gas Heat)

NOTE - *HEATING MODE CAN BE SET TO TWO-STAGE IN THERMOSTAT MODE OR AT FOUR-STAGE IN ROOM SENSOR MODE CONTROL OPTIONS.*

Two-Stage Operation (Thermostat Mode)

W1 Demand:

Both gas valves are open on Low Fire (stage 1 on units with 2-stage gas valves) and supply air blower operates at heating speed

W2 Demand:

Both gas valves are open on High Fire (stage 2 on units with 2-stage gas valves) and supply air blower operates at heating speed

Four-Stage Operation (Room Sensor Mode)

W1 Demand:

Left heat exchanger gas valve is open on Low Fire (stage 1 on units with 4-stage gas valves) and supply air blower operates at heating speed.

W2 Demand:

Both gas valves are open on Low Fire (stage 2 on units with 4-stage gas valves) and supply air blower operates at heating speed.

W3 Demand:

Left heat exchanger gas valve will open on High Fire and the right heat exchanger will remain open on Low Fire (stage 3 on units with 4-stage gas valves) and supply air blower operates at heating speed.

W4 Demand:

Both gas valves are open on High Fire (stage 4 on units with 4-stage gas valves) and supply air blower operates at heating speed.

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.

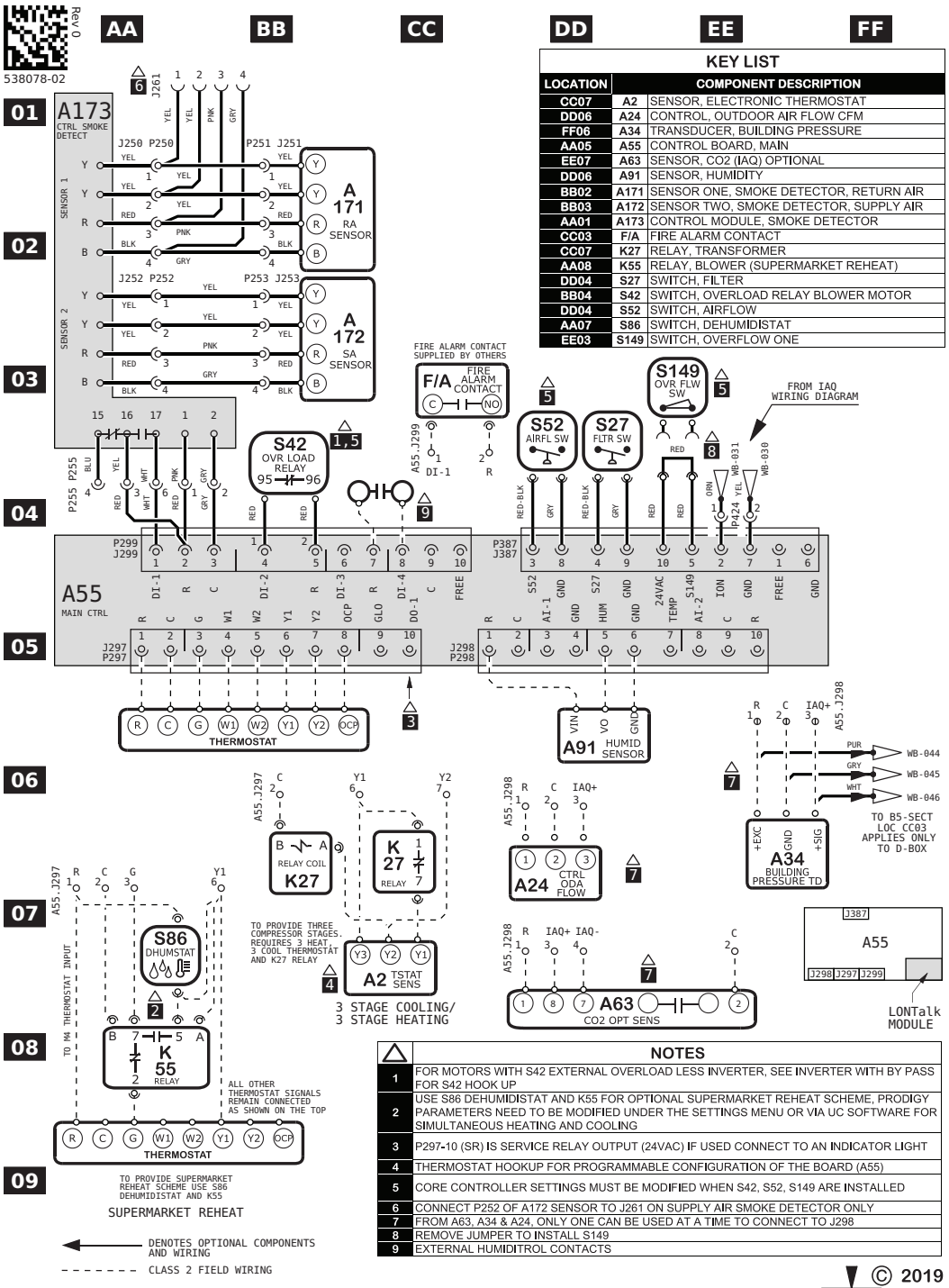
NOTE - *The “midpoint” blower speed is an average of the minimum and maximum blower speed (minimum speed + maximum speed divided by 2).*

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.

THERMOSTAT



KEY LIST

LOCATION		COMPONENT DESCRIPTION
CC07	A2	SENSOR, ELECTRONIC THERMOSTAT
DD06	A24	CONTROL, OUTDOOR AIR FLOW CFM
FF06	A34	TRANSDUCER, BUILDING PRESSURE
AA05	A55	CONTROL BOARD, MAIN
EE07	A63	SENSOR, CO2 (IAQ) OPTIONAL
DD06	A91	SENSOR, HUMIDITY
BB02	A171	SENSOR ONE, SMOKE DETECTOR, RETURN AIR
BB03	A172	SENSOR TWO, SMOKE DETECTOR, SUPPLY AIR
AA01	A173	CONTROL MODULE, SMOKE DETECTOR
CC03	F/A	FIRE ALARM CONTACT
CC07	K27	RELAY, TRANSFORMER
AA08	K55	RELAY, BLOWER (SUPERMARKET REHEAT)
DD04	S27	SWITCH, FILTER
BB04	S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
DD04	S52	SWITCH, AIRFLOW
AA07	S86	SWITCH, DEHUMIDISTAT
EE03	S149	SWITCH, OVERFLOW ONE

NOTES

1	FOR MOTORS WITH S42 EXTERNAL OVERLOAD LESS INVERTER, SEE INVERTER WITH BY PASS FOR S42 HOOK UP
2	USE S86 DEHUMIDISTAT AND K55 FOR OPTIONAL SUPERMARKET REHEAT SCHEME, PRODIGY PARAMETERS NEED TO BE MODIFIED UNDER THE SETTINGS MENU OR VIA UC SOFTWARE FOR SIMULTANEOUS HEATING AND COOLING
3	P297-10 (SR) IS SERVICE RELAY OUTPUT (24VAC) IF USED CONNECT TO AN INDICATOR LIGHT
4	THERMOSTAT HOOKUP FOR PROGRAMMABLE CONFIGURATION OF THE BOARD (A55)
5	CORE CONTROLLER SETTINGS MUST BE MODIFIED WHEN S42, S52, S149 ARE INSTALLED
6	CONNECT P252 OF A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY
7	FROM A63, A34 & A24, ONLY ONE CAN BE USED AT A TIME TO CONNECT TO J298
8	REMOVE JUMPER TO INSTALL S149
9	EXTERNAL HUMIDITROL CONTACTS

10 Model: LC, LG, LH, LD Series RTU
Thermostat
Voltage: All Voltages
Supersedes: 538078-01 Form No: 538078-02 Rev: 0

HEATING SECTION A	COOLING SECTION B	COOLING SECTION B3/5	ACCS SECTION C	ACCS SECTION D

WIRING DIAGRAM FLOW

7x10 CUT SIZE

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

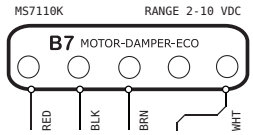
ECONOMIZER

Rev 2

538072-01

AA BB CC DD

01



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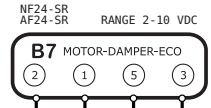

03

04

05

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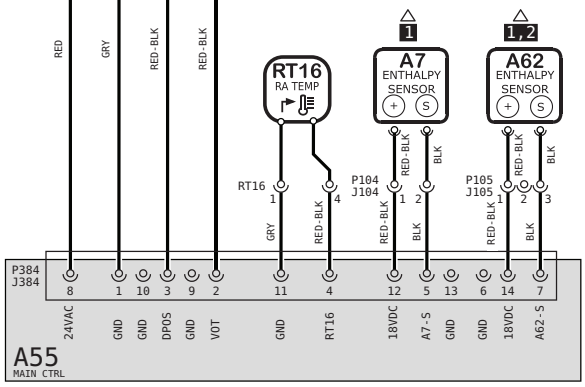

07

△	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

HTG SEC A	CLG SEC B	CLG SEC B3	ACCS SEC C	ACCS SEC D

WIRING DIAGRAM FLOW

5x10 CUT SIZE

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