UNIT INFORMATION

100129

LCM SERIES
13 to 25 ton
45.7 to 88 kW

Service Literature

LCM092U through 150U

The LCM092U, 102U, 120U and 150U units are configure to order units (CTO) with a wide selection of factory installed options.

Cooling capacities range from 7.5 to 12.5 tons. Units use two separate refrigeration circuits. One circuit uses a high efficiency variable speed scroll compressor and the second circuit uses a fixed speed scroll compressor. Units also offer mechanical cooling down to 0^0F.

Optional electric heat is factory-or field-installed. Electric heat operates in single or multiple stages depending on the kW input size. 7.5kW to 45kW heat sections are available for the 092 & 102 units and 15kW to 60kW heat sections are available for 120 &150 units.

All units are equipped with direct drive blowers. The blower will operate at lower speeds when demand is low and increase to higher speeds when demand is high. Variable speed VAV system is available as an option which enables supply duct static measurement to control blower CFM and discharge air temperature to control cooling stages.

All LCM 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.

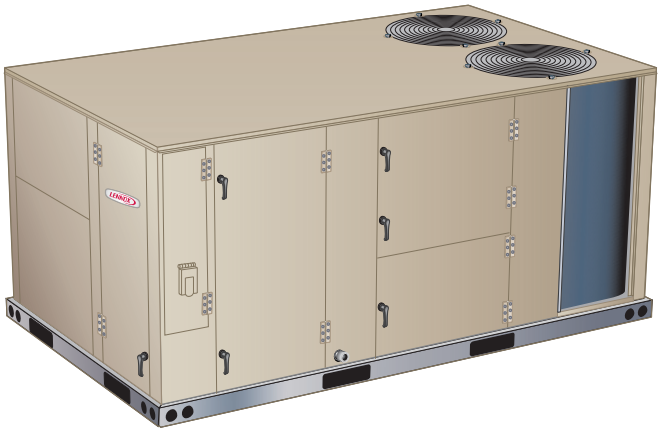
The CORE Control System is designed to accelerate equipment install and service. Standard with all Model L™ rooftop units, control system integrates key technologies that lower installation costs, drive system efficiency, and protect your investments. The CORE Unit Controller is a microprocessor-based 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.

⚠ 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

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, jewelery, tools, etc., away from moving parts.

⚠ WARNING

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

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⚠ WARNING

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

⚠ WARNING

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

⚠ CAUTION

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

⚠ 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

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

⚠ 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

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

⚠ WARNING

•Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

•The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

•Do not pierce or burn.

•Be aware that refrigerants may not contain an odor

⚠ WARNING

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.

OPTIONS / ACCESSORIES

Item Description		Order Number	Size 092	102	120	150
COOLING SYSTEM						
Condensate Drain Trap	PVC	**22H54**	OX	OX	OX	OX
	Copper	**76W27**	X	X	X	X
Corrosion Protection		Factory	O	O	O	O
Drain Pan Overflow Switch		**21Z07**	OX	OX	OX	OX
BLOWER - SUPPLY AIR						
Blower	DirectPlus™ Direct Drive ECM Blower System with SZVAV	Factory	O	O	O	O
	DirectPlus™ Direct Drive ECM Blower System with VAV	Factory	O	O	O	O
CABINET						
Combination Coil/Hail Guards		**24C85**	OX	OX	OX	OX
Horizontal Discharge Kit		**51W25**	X	X	X	X
Return Air Adaptor Plate (for LC/LG and TC/TG/TH unit replacement)		**54W96**	OX	OX	OX	OX
CONTROLS						
Commercial Controls	LonTalk® Module - For Lennox® CORE Control System	**54W27**	OX	OX	OX	OX
	Novar® LSE	Factory	O	O	O	O
Dirty Filter Switch		**53W67**	OX	OX	OX	OX
Fresh Air Tempering		**21Z08**	OX	OX	OX	OX
Smoke Detector - Supply or Return (Power board and one sensor)		**31A68**	OX	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)		**31A69**	OX	OX	OX	OX
INDOOR AIR QUALITY						
Air Filters						
Healthy Climate® High Efficiency Air Filters 20 x 25 x 2 in.	MERV 8 (Order 4)	**50W61**	OX	OX	OX	OX
	MERV 13 (Order 4)	**52W41**	OX	OX	OX	OX
	MERV 16 (Order 4)	**21U51**	OX	OX	OX	OX
Replacement Media Filter With Metal Mesh Frame 20 x 25 x 2 in. (includes non-pleated filter media)	(Order 4)	**Y3063**	X	X	X	X
Indoor Air Quality (CO_2) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display		**24C58**	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 (**24C58**)		**90N43**	X	X	X	X
Needlepoint Bipolar Ionization (NPBI)						
Needlepoint Bipolar Ionization (NPBI) Kit		**21U36**	OX	OX	OX	OX
UVC Germicidal Lamps						
[1] Healthy Climate® UVC Light Kit (110/230V-1ph)		**21A93**	OX	OX	OX	OX

[1] For 460V and 575V units, field installed lamps utilize jumpers to the outdoor fan transformer for voltage needed. See the installation Instructions.

NOTE - Order numbers shown are for ordering optional accessories if a field installed option is available.

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

O = Configure To Order (Factory Installed)

X = Field Installed

OPTIONS / ACCESSORIES

Item Description		Order Number	Size 092	102	120	150
ELECTRICAL						
Voltage 60 Hz	208/230V-3ph	Factory	O	O	O	O
	460V-3ph	Factory	O	O	O	O
	575V-3ph	Factory	O	O	O	O
HACR Circuit Breakers		Factory	O	O	O	O
Disconnect Switch - See Electrical/Electric Heat tables for selection	80 amp	**54W56**	OX	OX	OX	OX
	150 amp	**54W57**	OX	OX	OX	OX
[2] Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O	O
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V only)	**74M70**	OX	OX	OX	OX
	[3] 20 amp non-powered, field-wired (208/230V, 460V, 575V)	**67E01**	X	X	X	X
	[3] 20 amp non-powered, field-wired (575V only)	Factory	O	O	O	O
Weatherproof Cover for GFI		**10C89**	X	X	X	X
ELECTRIC HEAT						
7.5 kW	208/240V-3ph	**30U33**	OX	OX		
	460V-3ph	**30U34**	OX	OX		
	575V-3ph	**30U35**	OX	OX		
15 kW	208/240V-3ph	**30U36**	OX	OX	OX	OX
	460V-3ph	**30U37**	OX	OX	OX	OX
	575V-3ph	**30U38**	OX	OX	OX	OX
22.5 kW	208/240V-3ph	**30U39**	OX	OX	OX	OX
	460V-3ph	**30U40**	OX	OX	OX	OX
	575V-3ph	**30U41**	OX	OX	OX	OX
30 kW	208/240V-3ph	**30U42**	OX	OX	OX	OX
	460V-3ph	**30U43**	OX	OX	OX	OX
	575V-3ph	**30U44**	OX	OX	OX	OX
45 kW	208/240V-3ph	**30U45**	OX	OX	OX	OX
	460V-3ph	**30U46**	OX	OX	OX	OX
	575V-3ph	**30U47**	OX	OX	OX	OX
60 kW	208/240V-3ph	**30U48**			OX	OX
	460V-3ph	**30U49**			OX	OX
	575V-3ph	**30U50**			OX	OX

[1] Disconnect Switch not available with higher SCCR option. Short-Circuit Current Rating option only available with factory installed electric heat.
[2] Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

NOTE - Order numbers shown are for ordering optional accessories if a field installed option is available.
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O = Configure To Order (Factory Installed)
X = Field Installed

OPTIONS / ACCESSORIES

Item Description		Order Number	Size 092	102	120	150
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 and Barometric Relief Dampers with Exhaust Hood Downflow Applications - Use furnished Outdoor Air Hood and Barometric Relief Dampers with Exhaust Hood Horizontal Applications - Use furnished Outdoor Air Hood and Barometric Relief Dampers with Exhaust Hood - Order Horizontal Discharge Kit separately Horizontal Applications (reduced height) - Order Horizontal Low Profile Barometric Relief Dampers with Exhaust Hood and Horizontal Discharge Kit (**51W25**) separately		**20U80**	OX	OX	OX	OX
Horizontal Low Profile Barometric Relief Dampers						
Horizontal Low Profile Barometric Relief Dampers With Exhaust Hood		**53K04**	X	X	X	X
Economizer Controls						
Differential Enthalpy (Not for Title 24)	Order 2	**21Z09**	OX	OX	OX	OX
Sensible Control	Sensor is Furnished	Factory	O	O	O	O
Single Enthalpy (Not for Title 24)		**21Z09**	OX	OX	OX	OX
Global Control	Sensor Field Provided	Factory	O	O	O	O
Building Pressure Control		**13J77**	X	X	X	X
Outdoor Air CFM Control		**13J76**	X	X	X	X
OUTDOOR AIR						
Outdoor Air Dampers						
Motorized Dampers (Hood furnished)		**14G28**	OX	OX	OX	OX
Manual Dampers (Hood furnished)		**14G29**	OX	OX	OX	OX
POWER EXHAUST						
Standard Static	208/230V-3ph	**53W44**	OX	OX	OX	OX
	460V-3ph	**53W45**	OX	OX	OX	OX
	575V-3ph	**53W46**	OX	OX	OX	OX
HUMIDITROL®+ HOT GAS REHEAT OPTION (SZVAV MODELS ONLY)						
Humiditrol+ Dehumidification Option			O	O	O	O
ROOF CURBS						
Hybrid Roof Curbs, Downflow						
8 in. height		**11F54**	X	X	X	X
14 in. height		**11F55**	X	X	X	X
18 in. height		**11F56**	X	X	X	X
24 in. height		**11F57**	X	X	X	X
Adjustable Pitch Curb						
14 in. height		**54W50**	X	X	X	X
CEILING DIFFUSERS						
Step-Down - Order one	RTD11-95S	**13K61**	X	X		
	RTD11-135S	**13K62**			X	
	RTD11-185S	**13K63**				X
Flush - Order one	FD11-95S	**13K56**	X	X		
	FD11-135S	**13K57**			X	
	FD11-185S	**13K58**				X
Transitions (Supply and Return) - Order one	C1DIFF30B-1	**12X65**	X	X		
	C1DIFF31B-1	**12X66**			X	
	C1DIFF32B-1	**12X67**				X

NOTE - Order numbers shown are for ordering optional accessories if a field installed option is available.

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

O = Configure To Order (Factory Installed)

X = Field Installed

SPECIFICATIONS — UNIT

Model			LCM092U5E	LCM102U5E	LCM120U5E	LCM150U5E
Blower Type			DirectPlus™ ECM Direct Drive with SZVAV	DirectPlus™ ECM Direct Drive with SZVAV	DirectPlus™ ECM Direct Drive with SZVAV	DirectPlus™ ECM Direct Drive with SZVAV
Model			**LCM092U5P**	**LCM102U5P**	**LCM120U5P**	**LCM150U5P**
Blower Type			DirectPlus™ ECM Direct Drive with VAV	DirectPlus™ ECM Direct Drive with VAV	DirectPlus™ ECM Direct Drive with VAV	DirectPlus™ ECM Direct Drive with VAV
Nominal Tonnage			7.5 Ton	8.5 Ton	10 Ton	12.5 Ton
Efficiency Type			Ultra-High	Ultra-High	Ultra-High	Ultra-High
Cooling Performance	Gross Cooling Capacity (Btuh)		90,000	100,000	117,500	141,000
	[1] Net Cooling Capacity (Btuh)		88,000	97,000	114,000	136,000
	AHRI Rated Air Flow (cfm)		2800	3400	3600	4200
	[1] IEER (Btuh/Watt)		21.0	21.0	20.7	19.5
	[1] EER (Btuh/Watt)		12.7	12.7	12.2	11.0
	Total Unit Power (kW)		6.9	7.6	9.3	12.4
Sound Rating Number (minimum/maximum)		dBA	68 / 85	68 / 85	67 / 89	67 / 89
Refrigerant Charge	Refrigerant Type		R-454B	R-454B	R-454B	R-454B
	Without Reheat Option	Circuit 1	7 lbs. 5 oz.	7 lbs.. 5 oz.	8 lbs. 4 oz.	8 lbs. 2 oz.
		Circuit 2	5 lbs. 2 oz.	5 lbs. 2 oz.	4 lbs. 9 oz.	5 lbs. 12 oz.
	With Reheat Option	Circuit 1	8 lbs. 2 oz.	8 lbs. 2 oz.	8 lbs. 4 oz.	8 lbs. 2 oz.
		Circuit 2	4 lbs. 12 oz.	4 lbs. 12 oz.	4 lbs. 12 oz.	5 lbs. 14 oz.
Electric Heat Available - See page 10			7.5, 15, 22.5, 30 & 45 kW		15, 22.5, 30, 45 & 60 kW	
Compressor Type (number)			Variable Capacity Scroll (1) Fixed Capacity Scroll (1)			
Outdoor Coil	Net face area - ft.[2]		26.7	26.7	26.7	26.7
	Rows		1	1	1	1
	Fins - in.		20	20	20	20
Outdoor Coil Fans	Motor HP (number and type)		1/3 (2 ECM)	1/3 (2 ECM)	1/3 (2 ECM)	1/3 (2 ECM)
	Rpm		300-950	300-1075	300-1075	300-1075
	Watts		65-650	65-750	65-750	65-750
	Diameter (Number) - in.		(2) 24	(2) 24	(2) 24	(2) 24
	Blades		3	3	3	3
	Total Air volume - cfm		6600	8800	8800	8800
Indoor Coil	Net face area - ft.[2]		13.54	13.54	13.54	13.54
	Tube diameter - in.		3/8	3/8	3/8	3/8
	Rows		4	4	4	4
	Fins - in.		14	14	14	14
	Condensate drain size (NPT) - in.		(1) 1			
	Expansion device type		Balanced Port Thermostatic Expansion Valve,removable power head			
Indoor Blower	Motor HP (number and type)		3.75 (1 ECM)	3.75 (1 ECM)	3.75 (1 ECM)	3.75 (1 ECM)
	Blower wheel nominal diameter x width - in.		(1) 22 x 9	(1) 22 x 9	(1) 22 x 9	(1) 22 x 9
Filters	Type of filter		MERV 4, Disposable			
	Number and size - in.		(4) 20 x 25 x 2			
Line voltage data (Volts-Phase-Hz)			208/230-3-60, 460-3-60, 575-3-60			

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

[2] 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.

BLOWER DATA

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY (NO HEAT SECTION) WITH DRY INDOOR COIL AND 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 (duct resistance, diffuser, etc.)
See page 8 for wet coil and option/accessory air resistance data.
See page 8 for minimum air volume required for use with optional electric heat.

Total Air Volume cfm	Total Static Pressure - in. w.g.													
	0.2		0.4		0.6		0.8		1.0		1.2		1.4	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
1750	644	137	740	235	796	302	833	343	873	373	996	558	1065	664
2000	675	165	768	260	821	330	861	386	960	507	1026	629	1094	753
2250	711	195	803	290	856	375	901	497	991	564	1058	703	1128	840
2500	764	241	852	335	904	439	951	568	1025	641	1097	789	1170	934
2750	847	316	901	399	946	543	1004	674	1074	746	1146	895	1220	1041
3000	944	426	980	511	1021	671	1074	803	1136	874	1205	1021	1276	1167
3250	1022	544	1057	640	1099	810	1149	942	1207	1012	1272	1156	1338	1304
3500	1092	666	1131	770	1174	948	1225	1081	1281	1151	1342	1297	1402	1451
3750	1161	780	1202	892	1248	1079	1298	1217	1353	1291	1409	1445	1463	1609
4000	1230	888	1273	1010	1319	1212	1369	1362	1421	1441	1471	1608	1518	1784
4250	1299	1006	1342	1140	1388	1362	1436	1526	1483	1612	1528	1790	1571	1975
4500	1366	1142	1409	1289	1454	1532	1498	1708	1542	1798	1583	1984	1623	2172
4750	1432	1295	1474	1457	1516	1719	1558	1903	1598	1997	1637	2187	1674	2377
5000	1496	1471	1537	1645	1577	1921	1616	2110	1654	2205	1690	2396	1726	2586
5250	1560	1667	1598	1849	1636	2132	1673	2324	1709	2419	1744	2609	1779	2796
5500	1623	1878	1659	2064	1695	2349	1731	2539	1765	2634	- - -	- - -	- - -	- - -
5750	1686	2097	1720	2284	1755	2567	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
6000	1748	2316	1781	2502	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

Total Air Volume cfm	Total Static Pressure - in. w.g.											
	1.6		1.8		2.0		2.2		2.4		2.6	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
1750	1134	775	1203	896	1275	1025	1356	1149	1422	1287	1470	1439
2000	1162	878	1231	1007	1302	1139	1379	1268	1440	1411	1486	1570
2250	1198	975	1268	1111	1338	1250	1409	1388	1464	1542	1507	1711
2500	1243	1075	1313	1217	1380	1365	1442	1517	1491	1685	1533	1860
2750	1293	1186	1361	1336	1423	1494	1477	1661	1520	1839	1561	2016
3000	1346	1317	1410	1474	1466	1642	1514	1818	1554	2000	1594	2180
3250	1402	1460	1460	1627	1511	1803	1553	1986	1591	2172	1631	2352
3500	1459	1616	1509	1793	1555	1976	1594	2165	1631	2352	1671	2531
3750	1512	1785	1557	1970	1599	2159	1636	2350	1673	2536	1713	2714
4000	1562	1969	1604	2157	1643	2347	1680	2538	1717	2722	1756	2896
4250	1611	2163	1650	2352	1688	2541	1724	2729	1762	2908	- - -	- - -
4500	1661	2362	1698	2552	1734	2739	1770	2922	- - -	- - -	- - -	- - -
4750	1710	2567	1746	2754	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
5000	1761	2774	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

BLOWER DATA

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

Air Volume cfm	Wet Indoor Coil		Electric Heat	Economizer	Humiditrol + Condenser Reheat Coil	Filters			Return Air Adaptor Plate
	092, 102	120, 150				MERV 8	MERV 13	MERV 16	
1750	0.04	0.04	0.03	0.05	0.02	0.01	0.03	0.06	0.00
2000	0.05	0.05	0.03	0.06	0.02	0.01	0.03	0.08	0.00
2250	0.06	0.06	0.04	0.08	0.02	0.01	0.04	0.09	0.00
2500	0.07	0.07	0.04	0.11	0.03	0.01	0.05	0.10	0.00
2750	0.08	0.08	0.05	0.12	0.03	0.02	0.05	0.11	0.00
3000	0.10	0.09	0.06	0.13	0.03	0.02	0.06	0.12	0.02
3250	0.11	0.10	0.06	0.15	0.04	0.02	0.06	0.13	0.02
3500	0.12	0.11	0.09	0.15	0.04	0.03	0.07	0.15	0.04
3750	0.14	0.13	0.09	0.15	0.05	0.03	0.08	0.16	0.07
4000	0.15	0.14	0.09	0.19	0.05	0.04	0.08	0.17	0.09
4250	0.17	0.15	0.13	0.19	0.06	0.04	0.09	0.19	0.11
4500	0.19	0.17	0.14	0.22	0.07	0.04	0.09	0.20	0.12
4750	0.20	0.18	0.17	0.25	0.07	0.05	0.10	0.21	0.16
5000	0.22	0.20	0.20	0.29	0.08	0.06	0.10	0.23	0.18
5250	0.24	0.22	0.22	0.32	0.08	0.06	0.11	0.24	0.19
5500	0.25	0.23	0.25	0.34	0.09	0.07	0.12	0.25	0.22
5750	0.27	0.25	0.31	0.45	0.10	0.07	0.12	0.27	0.25
6000	0.29	0.27	0.33	0.52	0.10	0.08	0.13	0.28	0.27

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

Electric Heat kW	Minimum cfm
7.5	1750
15	2750
22.5	2750
30	2750
45	2750
60	3500

POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure	Air Volume Exhausted
in. w.g.	cfm
0	3175
0.05	2955
0.10	2685
0.15	2410
0.20	2165
0.25	1920
0.30	1420
0.35	1200

BLOWER DATA

CEILING DIFFUSERS AIR RESISTANCE - in. w.g.

Size	RTD11 Step-Down Diffuser				FD11 Flush Diffuser
	Air Volume cfm	2 Ends Open	1 Side, 2 Ends Open	All Ends & Sides Open	
092	2400	0.21	0.18	0.15	0.14
	2600	0.24	0.21	0.18	0.17
	2800	0.27	0.24	0.21	0.20
	3000	0.32	0.29	0.25	0.25
	3200	0.41	0.37	0.32	0.31
	3400	0.50	0.45	0.39	0.37
	3600	0.61	0.54	0.48	0.44
	3800	0.73	0.63	0.57	0.51
102 & 120	3600	0.36	0.28	0.23	0.15
	3800	0.40	0.32	0.26	0.18
	4000	0.44	0.36	0.29	0.21
	4200	0.49	0.40	0.33	0.24
	4400	0.54	0.44	0.37	0.27
	4600	0.60	0.49	0.42	0.31
	4800	0.65	0.53	0.46	0.35
	5000	0.69	0.58	0.50	0.39
	5200	0.75	0.62	0.54	0.43
150	4200	0.22	0.19	0.16	0.10
	4400	0.28	0.24	0.20	0.12
	4600	0.34	0.29	0.24	0.15
	4800	0.40	0.34	0.29	0.19
	5000	0.46	0.39	0.34	0.23
	5200	0.52	0.44	0.39	0.27
	5400	0.58	0.49	0.43	0.31
	5600	0.64	0.54	0.47	0.35
	5800	0.70	0.59	0.51	0.39

CEILING DIFFUSER AIR THROW DATA

Size	Air Volume	[1] Effective Throw Range	
		RTD11 Step-Down	FD11 Flush
	cfm	ft.	ft.
092	2600	24 - 29	19 - 24
	2800	25 - 30	20 - 28
	3000	27 - 33	21 - 29
	3200	28 - 35	22 - 29
	3400	30 - 37	22 - 30
102, 120	3600	25 - 33	22 - 29
	3800	27 - 35	22 - 30
	4000	29- 37	24 - 33
	4200	32 - 40	26 - 35
	4400	34 - 42	28 - 37
150	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 air stream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. per minute. Four sides open.

ELECTRICAL/ELECTRIC HEAT DATA — 7.5 TON

Model			LCM092U5E/ LCM092U5P		
[1] Voltage - 60Hz			208/230V-3ph	460V-3ph	575V-3ph
Compressor 1 (Inverter)	Rated Load Amps		10.6	6.1	5.6
	Locked Rotor Amps		17	11.5	12
Compressor 2 (Non-Inverter	Rated Load Amps		12.8	6	5.8
	Locked Rotor Amps		120.4	49.4	41
Outdoor Fan Motors (2)	Full Load Amps (2 ECM)		2.8	1.4	1.1
	Total		5.6	2.8	2.2
Power Exhaust (1) 0.33 HP	Full Load Amps		2.4	1.3	1
Service Outlet 115V GFI (amps)			15	15	20
Indoor Blower Motor	HP		3.75	3.75	3.75
	Full Load Amps		8	4.2	3.6
[2] Maximum Overcurrent Protection (MOCP)	Unit Only		50	25	20
	With (1) 0.33 HP Power Exhaust		50	25	25
[3] Minimum Circuit Ampacity (MCA)	Unit Only		41	21	19
	With (1) 0.33 HP Power Exhaust		43	22	20

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	**7.5 kW**	50	50	25	20
		15 kW	[4] 50	60	30	25
		22.5 kW	[4] 70	80	40	35
		30 kW	[4] 90	110	60	45
		45 kW	150	150	80	60
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	**7.5 kW**	41	41	21	19
		15 kW	50	56	28	23
		22.5 kW	69	78	40	32
		30 kW	89	101	51	41
		45 kW	128	146	73	59
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**7.5 kW**	50	50	25	25
		15 kW	60	60	30	25
		22.5 kW	[4] 80	90	45	35
		30 kW	[4] 100	110	60	45
		45 kW	150	150	80	60
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**7.5 kW**	43	43	22	20
		15 kW	53	59	30	24
		22.5 kW	72	81	41	33
		30 kW	92	104	52	42
		45 kW	131	149	75	60

ELECTRICAL ACCESSORIES

Disconnect	**7.5 kW**	**54W56**	**54W56**	**54W56**	**54W56**
	15 kW	**54W56**	**54W56**	**54W56**	**54W56**
	22.5 kW	**54W56**	**54W56**	**54W56**	**54W56**
	30 kW	**54W57**	**54W57**	**54W56**	**54W56**
	45 kW	**54W57**	**54W57**	**54W56**	**54W56**

Disconnects - 54W56 - 80A
54W57 - 150A

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.

[4] Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA — 8.5 TON

Model			LCM102U5E/ LCM102U5P		
[1] Voltage - 60Hz			208/230V-3ph	460V-3ph	575V-3ph
Compressor 1 (Inverter)	Rated Load Amps		10.6	6.1	5.6
	Locked Rotor Amps		17	11.5	12
Compressor 2 (Non-Inverter)	Rated Load Amps		12.8	6	5.8
	Locked Rotor Amps		120.4	49.4	41
Outdoor Fan Motors (2)	Full Load Amps (2 ECM)		2.8	1.4	1.1
	Total		5.6	2.8	2.2
Power Exhaust (1) 0.33 HP	Full Load Amps		2.4	1.3	1
Service Outlet 115V GFI (amps)			15	15	20
Indoor Blower Motor	HP		3.75	3.75	3.75
	Full Load Amps		8	4.2	3.6
[2] Maximum Overcurrent Protection (MOCP)	Unit Only		50	25	20
	With (1) 0.33 HP Power Exhaust		50	25	25
[3] Minimum Circuit Ampacity (MCA)	Unit Only		41	21	19
	With (1) 0.33 HP Power Exhaust		43	22	20

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	**7.5 kW**	50	50	25	20
		15 kW	[4] 50	60	30	25
		22.5 kW	[4] 70	80	40	35
		30 kW	[4] 90	110	60	45
		45 kW	150	150	80	60
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	**7.5 kW**	41	41	21	19
		15 kW	50	56	28	23
		22.5 kW	69	78	40	32
		30 kW	89	101	51	41
		45 kW	128	146	73	59
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**7.5 kW**	50	50	25	25
		15 kW	60	60	30	25
		22.5 kW	[4] 80	90	45	35
		30 kW	[4] 100	110	60	45
		45 kW	150	150	80	60
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**7.5 kW**	43	43	22	20
		15 kW	53	59	30	24
		22.5 kW	72	81	41	33
		30 kW	92	104	52	42
		45 kW	131	149	75	60

ELECTRICAL ACCESSORIES

Disconnect	**7.5 kW**	**54W56**	**54W56**	**54W56**	**54W56**
	15 kW	**54W56**	**54W56**	**54W56**	**54W56**
	22.5 kW	**54W56**	**54W56**	**54W56**	**54W56**
	30 kW	**54W57**	**54W57**	**54W56**	**54W56**
	45 kW	**54W57**	**54W57**	**54W56**	**54W56**

Disconnects - 54W56 - 80A
54W57 - 150A

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.

[4] Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA — 10 TON

Model			LCM120U5E/ LCM120U5P		
[1] Voltage - 60Hz			208/230V-3ph	460V-3ph	575V-3ph
Compressor 1 (Inverter)	Rated Load Amps		13.7	7.5	6.7
	Locked Rotor Amps		21	12	12
Compressor 2 (Non-Inverter	Rated Load Amps		16	7.1	6.4
	Locked Rotor Amps		156.4	69	47.8
Outdoor Fan Motors (2)	Full Load Amps (2 ECM)		2.8	1.4	1.1
	Total		5.6	2.8	2.2
Power Exhaust (1) 0.33 HP	Full Load Amps		2.4	1.3	1
Service Outlet 115V GFI (amps)			15	15	20
Indoor Blower Motor	HP		3.75	3.75	3.75
	Full Load Amps		8	4.2	3.6
[2] Maximum Overcurrent Protection (MOCP)	Unit Only		60	30	25
	With (1) 0.33 HP Power Exhaust		60	30	25
[3] Minimum Circuit Ampacity (MCA)	Unit Only		48	24	21
	With (1) 0.33 HP Power Exhaust		50	25	22

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	**15 kW**	60	60	30	25
		22.5 kW	[4] 70	80	40	35
		30 kW	[4] 90	110	60	45
		45 kW	150	150	80	60
		60 kW	[4] 150	175	80	70
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	**15 kW**	50	56	28	23
		22.5 kW	69	78	40	32
		30 kW	89	101	51	41
		45 kW	128	146	73	59
		60 kW	136	155	78	63
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**15 kW**	60	60	30	25
		22.5 kW	[4] 80	90	45	35
		30 kW	[4] 100	110	60	45
		45 kW	150	150	80	60
		60 kW	[4] 150	175	80	70
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**15 kW**	53	59	30	24
		22.5 kW	72	81	41	33
		30 kW	92	104	52	42
		45 kW	131	149	75	60
		60 kW	139	158	80	64

ELECTRICAL ACCESSORIES

Disconnect	**15 kW**	**54W56**	**54W56**	**54W56**	**54W56**
	22.5 kW	**54W56**	**54W56**	**54W56**	**54W56**
	30 kW	**54W57**	**54W57**	**54W56**	**54W56**
	45 kW	**54W57**	**54W57**	**54W56**	**54W56**
	60 kW	**N/A**	**N/A**	**54W57**	**54W56**

Disconnects - 54W56 - 80A
54W57 - 150A

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.

[4] Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA — 12.5 TON

Model			LCM150U5E/ LCM150U5P		
[1] Voltage - 60Hz			208/230V-3ph	460V-3ph	575V-3ph
Compressor 1 (Inverter)	Rated Load Amps		13.7	7.5	6.7
	Locked Rotor Amps		21	12	12
Compressor 2 (Non-Inverter	Rated Load Amps		22.4	9.1	7.2
	Locked Rotor Amps		166.2	74.6	54
Outdoor Fan Motors (2)	Full Load Amps (2 ECM)		2.8	1.4	1.1
	Total		5.6	2.8	2.2
Power Exhaust (1) 0.33 HP	Full Load Amps		2.4	1.3	1
Service Outlet 115V GFI (amps)			15	15	20
Indoor Blower Motor	HP		3.75	3.75	3.75
	Full Load Amps		8	4.2	3.6
[2] Maximum Overcurrent Protection (MOCP)	Unit Only		70	30	25
	With (1) 0.33 HP Power Exhaust		80	35	25
[3] Minimum Circuit Ampacity (MCA)	Unit Only		56	26	22
	With (1) 0.33 HP Power Exhaust		58	28	23

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	**15 kW**	70	70	30	25
		22.5 kW	[4] 70	80	40	35
		30 kW	[4] 90	110	60	45
		45 kW	150	150	80	60
		60 kW	[4] 150	175	80	70
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	**15 kW**	56	56	28	23
		22.5 kW	69	78	40	32
		30 kW	89	101	51	41
		45 kW	128	146	73	59
		60 kW	136	155	78	63
[2] Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**15 kW**	80	80	35	25
		22.5 kW	[4] 80	90	45	35
		30 kW	[4] 100	110	60	45
		45 kW	150	150	80	60
		60 kW	[4] 150	175	80	70
[3] Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.33 HP Power Exhaust	**15 kW**	58	59	30	24
		22.5 kW	72	81	41	33
		30 kW	92	104	52	42
		45 kW	131	149	75	60
		60 kW	139	158	80	64

ELECTRICAL ACCESSORIES

Disconnect	**15 kW**	**54W56**	**54W56**	**54W56**	**54W56**
	22.5 kW	**54W56**	**54W56**	**54W56**	**54W56**
	30 kW	**54W57**	**54W57**	**54W56**	**54W56**
	45 kW	**54W57**	**54W57**	**54W56**	**54W56**
	60 kW	**N/A**	**N/A**	**54W57**	**54W56**

Disconnects - 54W56 - 80A
54W57 - 150A

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.

[4] Factory installed circuit breaker not available.

ELECTRIC HEAT CAPACITIES

Volts Input	7.5 kW			15 kW			22.5 kW			30 kW			45 kW			60 kW		
	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages
208	5.6	19,100	1	11.3	38,600	1	16.9	57,700	2	22.5	76,800	2	33.8	115,300	2	45.0	153,600	2
220	6.3	21,500	1	12.6	43,000	1	18.9	64,500	2	25.2	86,000	2	37.8	129,000	2	50.4	172,000	2
230	6.9	23,600	1	13.8	47,100	1	20.7	70,700	2	27.5	93,900	2	41.3	141,000	2	55.1	188,000	2
240	7.5	25,600	1	15.0	51,200	1	22.5	76,800	2	30.0	102,400	2	45.0	153,600	2	60.0	204,800	2
440	6.9	21,500	1	12.6	43,000	1	18.9	64,500	2	25.2	86,000	2	37.8	129,000	2	50.4	172,000	2
460	6.9	23,600	1	13.8	47,100	1	20.7	70,700	2	27.5	93,900	2	41.3	141,000	2	55.1	188,000	2
480	7.5	25,600	1	15.0	51,200	1	22.5	76,800	2	30.0	102,400	2	45.0	153,600	2	60.0	204,800	2
550	6.3	21,500	1	12.6	43,000	1	18.9	64,500	2	25.2	86,000	2	37.8	129,000	2	50.4	172,000	2
575	6.9	23,600	1	13.8	47,100	1	20.7	70,700	2	27.5	93,900	2	41.3	141,000	2	55.1	188,000	2
600	7.5	25,600	1	15.0	51,200	1	22.5	76,800	2	30.0	102,400	2	45.0	153,600	2	60.0	204,800	2

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)
LCM/LGM092	193	328
LCM/LGM102	193	328
LCM/LGM120	217	369
LCM/LGM150	214	364
LCM/LGM092 W/ Humidtrol	215	365
LCM/LGM102 W/ Humidtrol	215	365
LCM/LGM120 W/ Humidtrol	215	365
LCM/LGM150 W/ Humidtrol	215	365

[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)
LCM/LGM092	107	9.9
LCM/LGM102	107	9.9
LCM/LGM120	121	11.2
LCM/LGM150	119	11.0
LCM/LGM092 W/ Humidtrol	120	11.1
LCM/LGM102 W/ Humidtrol	120	11.1
LCM/LGM120 W/ Humidtrol	120	11.1
LCM/LGM150 W/ Humidtrol	120	11.1

[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)
LCM/LGM092 STG 1	7.3	3.31
LCM/LGM092 STG 2	5.1	2.31
LCM/LGM102 STG 1	7.3	3.31
LCM/LGM102 STG 2	5.1	2.31
LCM/LGM120 STG 1	8.22	3.73
LCM/LGM120 STG 2	4.59	2.08
LCM/LGM150 STG 1	8.1	3.67
LCM/LGM150 STG 2	5.78	2.62
LCM/LGM092 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM092 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM102 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM102 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM120 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM120 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM150 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM150 W/ Humidtrol STG 2	5.875	2.66

Altitude Adjustment Factor[3]									
Halt	0	200	400	600	800	1000	1200	1400	1600
AF	0	200	400	600	800	1000	1200	1400	1600
Halt	1	1	1	1	1.02	1.05	1.04	1.1	1.12
AF	1600	1800	2000	2200	2400	2600	2800	3000	3200
	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 LCM/LGM092 at 1000 ft. above see level, multiply 193 by 1.05 to get 202.65 CFM as the new Q_{min}.*

PARTS ARRANGEMENT 092U / 150U

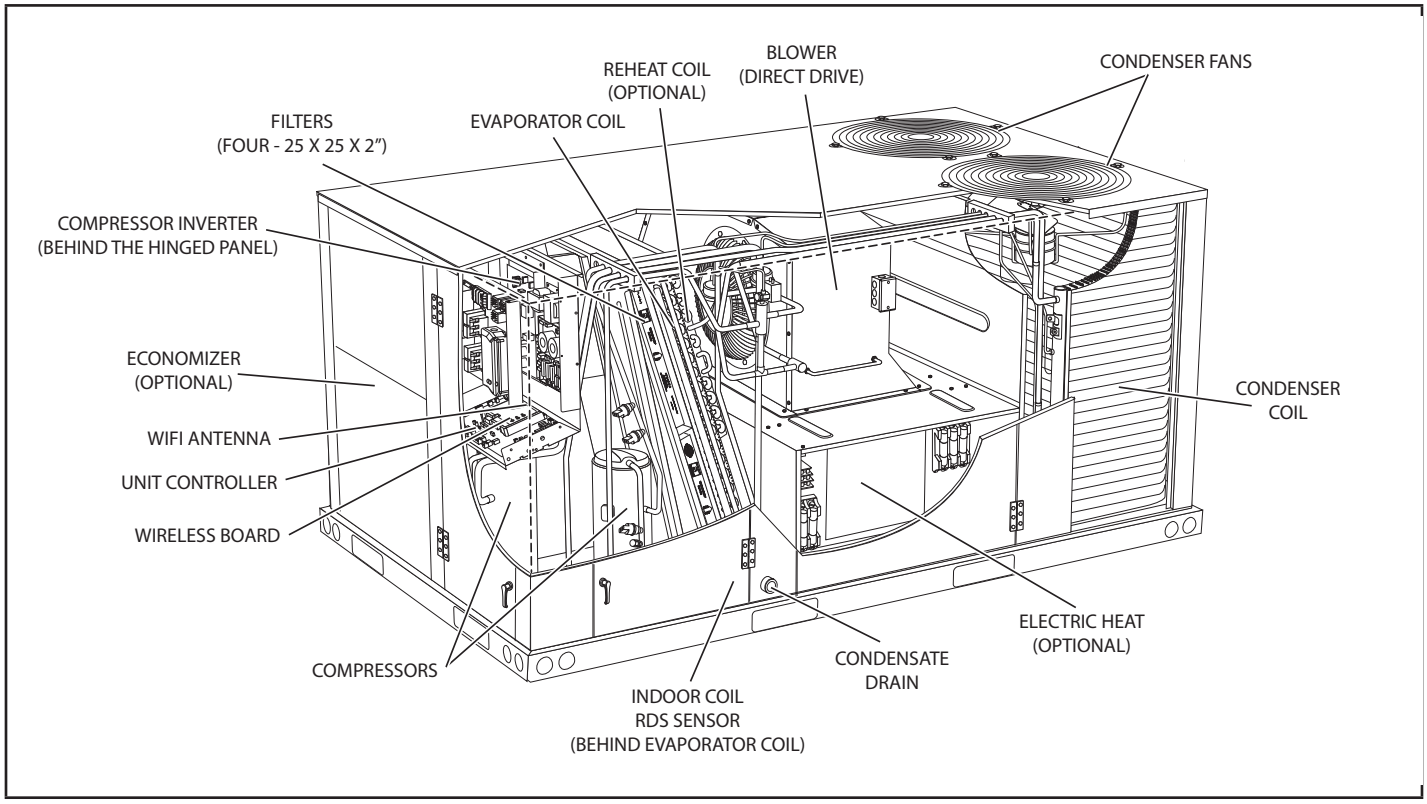
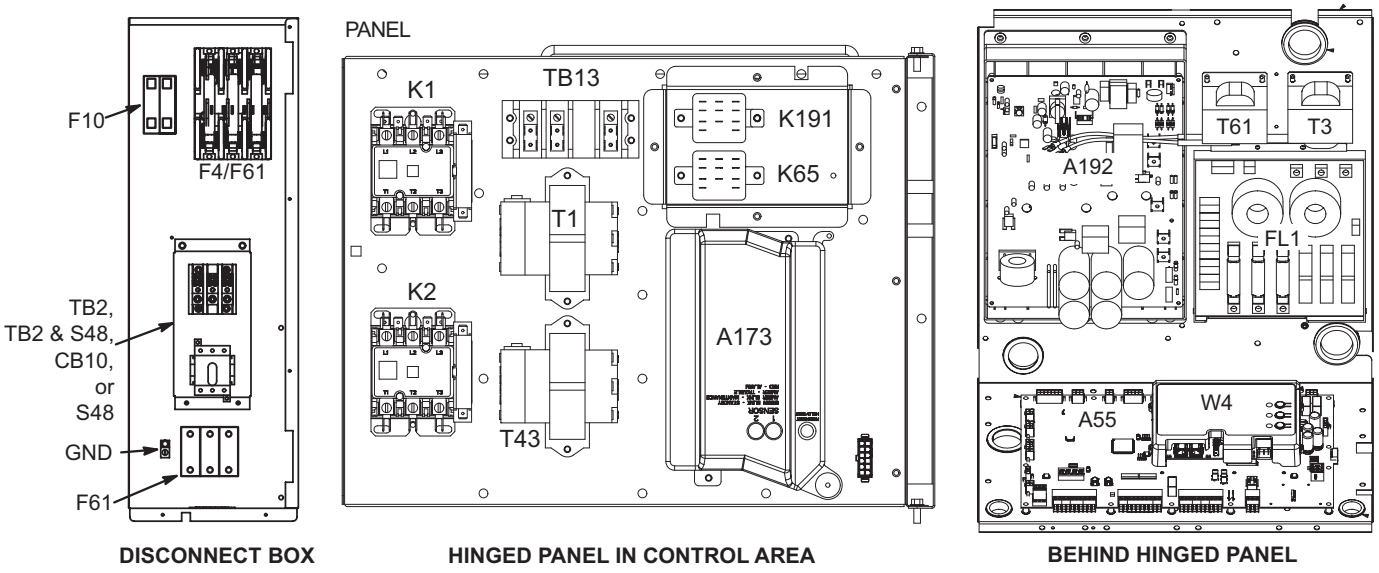


FIGURE 1

CONTROL BOX PARTS ARRANGEMENT



DISCONNECT BOX **HINGED PANEL IN CONTROL AREA** **BEHIND HINGED PANEL**

FIGURE 2

⚠ 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.

I-UNIT COMPONENTS

All 7.5 through 12.5 ton (38.1 through 70.3 kW) units are configure to order units (CTO). The LCM unit components are shown FIGURE 1. All units come standard with hinged unit panels. All L1, L2, and L3 wiring is color coded; L1 is red, L2 is yellow, and L3 is blue.

A-Control Box Components

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.

Unit control box components are shown in FIGURE 2. The control box is located in the upper portion of the compressor compartment.

1-Disconnect Switch S48 (Optional)

All units may be equipped with an optional disconnect switch S48. Other factory or field installed optional circuit breakers may be used, such as CB10. S48 and CB10 are toggle 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 92VA and is protected by a 6 amp circuit breaker (CB8). The 208/230 (Y) voltage transformers use primary voltage taps as shown in FIGURE 3, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

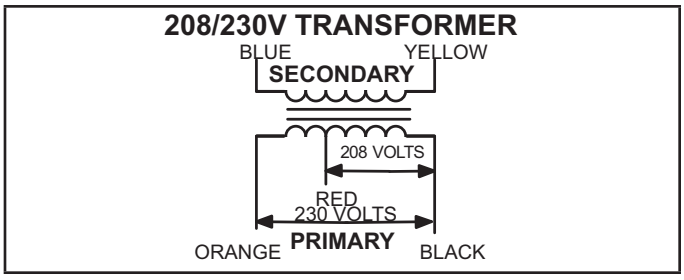


FIGURE 3

3-Control Transformer T43 (Re-Heat Units)

T43 is a single line voltage to 24VAC and ties into T1. See unit diagram. T43 is mounted in the control box. The transformer supplies power to control circuits (through T1).The transformer is rated at 70VA and is protected by a 3.5 amp circuit breaker (CB31). The 208/230 (Y) voltage transformers use primary voltage taps as shown in figure 3, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

4-Compressor Contactor K1, K2

All compressor contactors are three-pole, double-break contactors with 24VAC coils. Contactor K1 energizes the A192 inverter for compressor B1. Contactor K2 energizes compressor B2. Both contactors are energized by A55.

5-Power Exhaust Relay K65 (PED units)

Power exhaust relay K65 is a N.O. DPDT relay with a 24VAC coil. K65 is used in all LCM units equipped with the optional power exhaust dampers. K65 is energized by the unit controller A55, after the economizer dampers reach 50% open (adjustable in CORE APP). When K65 closes, the exhaust fans B10 IS energized.

6-Unit Controller A55

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

7-Terminal Block TB13

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

8-Outdoor Fan Motor Fuse Block & Fuse F10

STD SCCR 240V, 300V and higher rated SCCR units have three line voltage fuses F10 provide overcurrent protection to all condenser fans. The fuses are rated at 30A in all 208/230V units but 10A in the 208/230V 240U and 300U models.

9-Ultraviolet Germicidal Lamp (UVC) Transformer T49

UVC transformer T49 is used by units of all voltages except 208/230V 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.

10-Wireless Antenna

Wireless antenna is located above the return air compartment of the unit. FIGURE 4 shows location and FIGURE 5 shows cable routing. Please follow the CORE Controller setup guide included in the unit.

Antenna Location

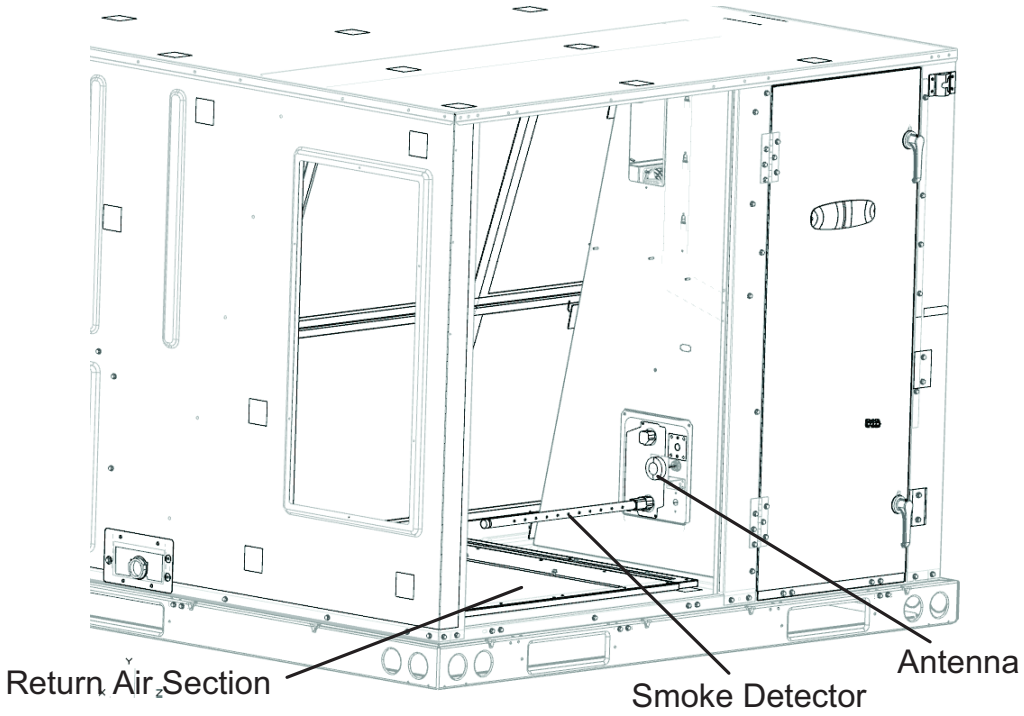


FIGURE 4

Cable Routing

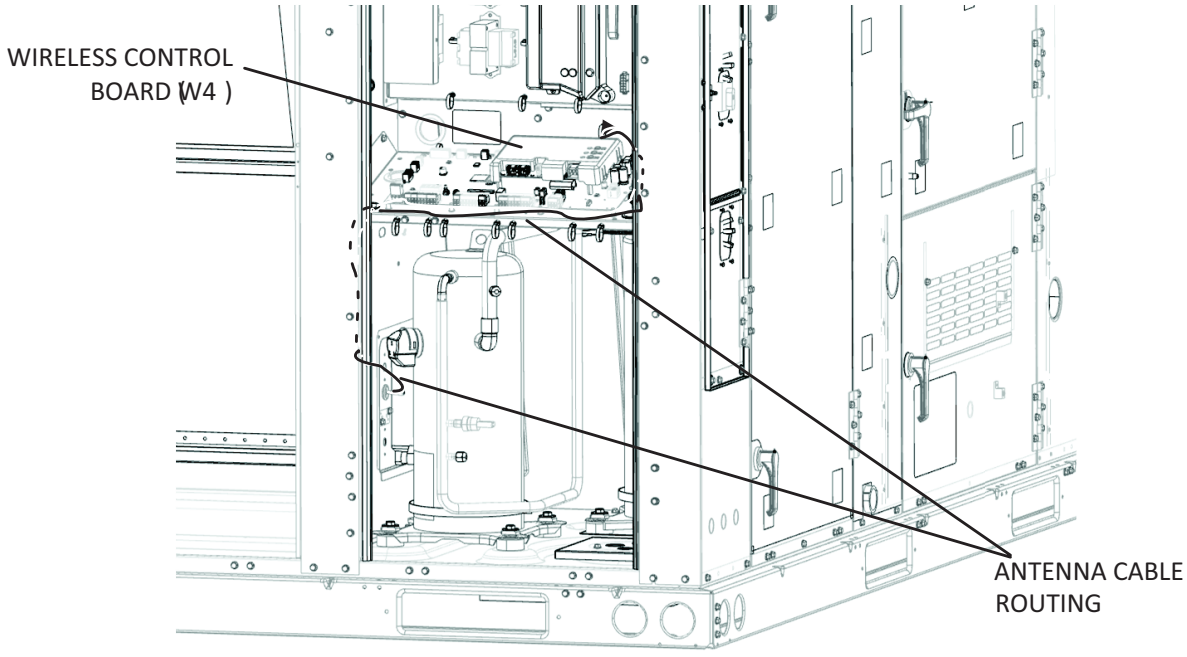


FIGURE 5

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	DCV	Carbon Dioxide PPM	DC Voltage	Carbon Dioxide PPM	DC Voltage	Carbon Dioxide PPM	DCV
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

Static Pressure

Pressure “w.c.	DCV	Pressure “w.c.	DC Voltage	Pressure “w.c.	DC Voltage	Pressure “w.c.	DCV
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		

Relative Humidity Sensor - Option - 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 - Option - 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 M3 unit control.

Economizer Differential Pressure Sensor - Option - Rooftop units installed with Smart Airflow™ will have a Pressure Transducer (PT5) present in the economizer. PT5 requires 5VDC power supply (P266-5 and {P266-6) and gives 0.25 VDC to 4 VDC output (P266-4) corresponding to 0” water column and 2” water column respectively. For all practical purposes the output should be less than 1.2” water column if not an error code is stored and service alarm output is turned on.

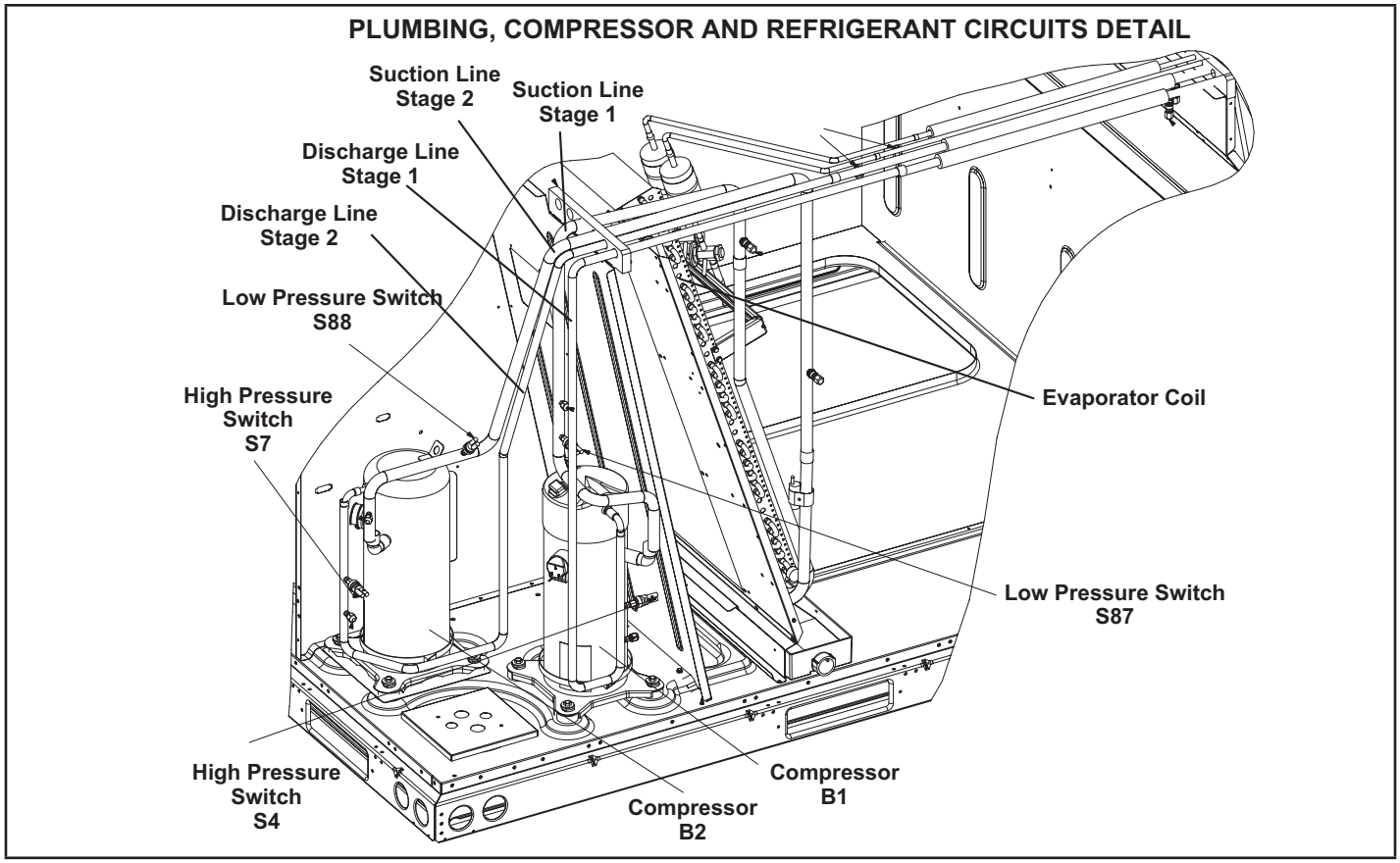


FIGURE 6

B-Cooling Components

Units use two separate refrigeration circuits. Circuit 1 uses a variable speed compressor (B1) and Circuit two uses a fixed speed scroll compressor (B2). The single evaporator coil is row-split and return air first goes to circuit two before passing through circuit one. A single condenser coil is used that has interlaced circuits for circuit one and two. See FIGURE 6. Units are equipped with a direct drive drive blower which draws air across the evaporator during unit operation.

Units are equipped with a single slab style evaporator. The evaporator uses two thermostatic expansions valves. Evaporators are 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. Additional protection comes from the use of temperature sensors that are located in the evaporator and condenser coils.

See sub section 8 for more details on location of of the thermistors (temperature sensors) for added compressor reliability. Cooling may be supplemented by a factory- or field-installed economizer.

1-Compressors B1, B2

Units are equipped with one variable speed scroll and one fixed scroll compressor each operating on a separate cooling circuit. 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 cover over 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, , however contactor (K1) provides power to the compressor inverter (A192) which then controls compressor according to signal from unit controller (A55).

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

If Interlink 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-Compressor Inverter A192

⚠ WARNING

Electrical Hazard High Voltage

Wait 7 Minutes Electrical components may hold charge. Do not remove this panel or service this area for 7 minutes after the power has been removed.

See FIGURE 7 for compressor inverter controls located behind the hinged control panel.

The inverter varies the compressor speed (capacity) by converting an AC input signal to a pulse high voltage DC output. To initiate cooling operation, the Unit Controller (A55) supplies a control signal to the inverter (A192) via a MODBUS protocol. Inverter status and diagnostics are continuously monitored and reported to the Unit Controller such as:

-Improper Unit Controller input voltage compared to unit model number

-High input voltage

-Low input voltage

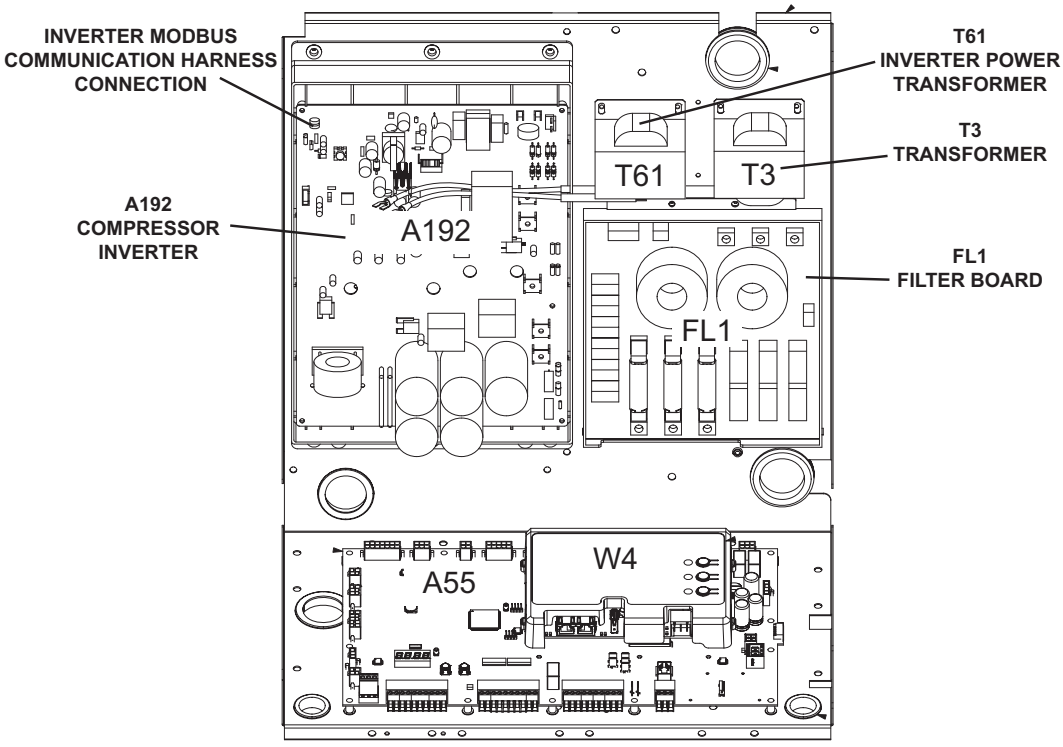
-Imbalanced input voltage

-A communication issue - check MODBUS communication wire for good connections between the Unit Controller and the inverter board. See table 5 for inverter-related alarms. Inverter component wire routing is shown in FIGURE 8.

⚠ WARNING

Electrical shock hazard. Variable speed compressor components must be grounded. Failure to follow these precautions could cause electrical shock resulting in injury or death.

INVERTER CONTROLS BEHIND THE HINGED CONTROL PANEL



BEHIND HINGED PANEL

FIGURE 7

TABLE 5

INVERTER-RELATED ALARMS

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
187	INVERTER LOW LEVEL ALARM	Possible alarming values for Prodigy Alarm 187 are: 12 - High compressor input current 13 - High heat sink temperature 14 - High PFC input current Alarm might be caused by outdoor fan abnormal operation, high ambient conditions, dirty outdoor coil, refrigerant overcharge, or a blocked heat sink. The compressor speed will slow down until the temperature or current lowers, then the compressor will speed up again. If the alarm continues after outdoor conditions have moderated, check the fan, charge and coil. Alarm 187 will automatically clear when minimum off time expires. **REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.**
188	INVERTER HIGH LEVEL ALARM	Possible alarming values for Prodigy Alarm 188 are: 21 - Peak DC current - Intelligent Power Module (IPM) fault condition (follow 12) 22 - Maximum current reached lockout 23 - DC link low voltage 26 - Locked rotor 28 - DC link high voltage 29 - Compressor over-current 61 - Low outdoor ambient inverter lockout 62 - High heat sink temperature lockout 75 - Low input voltage No action required. Compressor stops for the duration of the minimum run time (anti-short-cycle delay of 180 seconds). Unit shuts down after ten occurrences in one hour and Alarm 189 is initiated. Alarm 188 will automatically clear when inverter error clears. **REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.**
189	INVERTER FATAL ALARM	Possible alarming values for Prodigy Alarm 189 are the same as alarm 188. Alarm 189 will clear upon manual reset. **REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION**.
190	INVERTER COMMUNICATION ERROR	Unable to communicate with inverter. Unit Controller will disable compressor operation. Replace communication cable between inverter and M3 unit controller. If alarm continues, replace M3 unit controller or inverter.
191	INVERTER VOLTAGE MISMATCH	Unit Controller will disable compressor operation. Replace with correct inverter part.

a-Filter Board FL1

The filter, also called a line or noise filter, is used to prevent static interference from outside sources. In addition, the filter prevents electrical interference from transferring to other appliances. The input voltage should read the same value as the output voltage. The same filter is used on all unit sizes and voltages.

b-Inverter Transformer T61

This transformer is used to supply power to the inverter's low voltage logic circuit. It also provides electrical isolation to protect sensitive components from electrical surges.

c-Inverter Heat Sink

The A192 inverter heat sink is cooled by B47 fan located behind the inverter mounting panel. The B47 fan can be accessed as shown by opening the filter access panel. Relay K191 provides power to the B47 fan through P417 Plug. The fan is always energized while the B1 Compressor is running. See FIGURE 9.

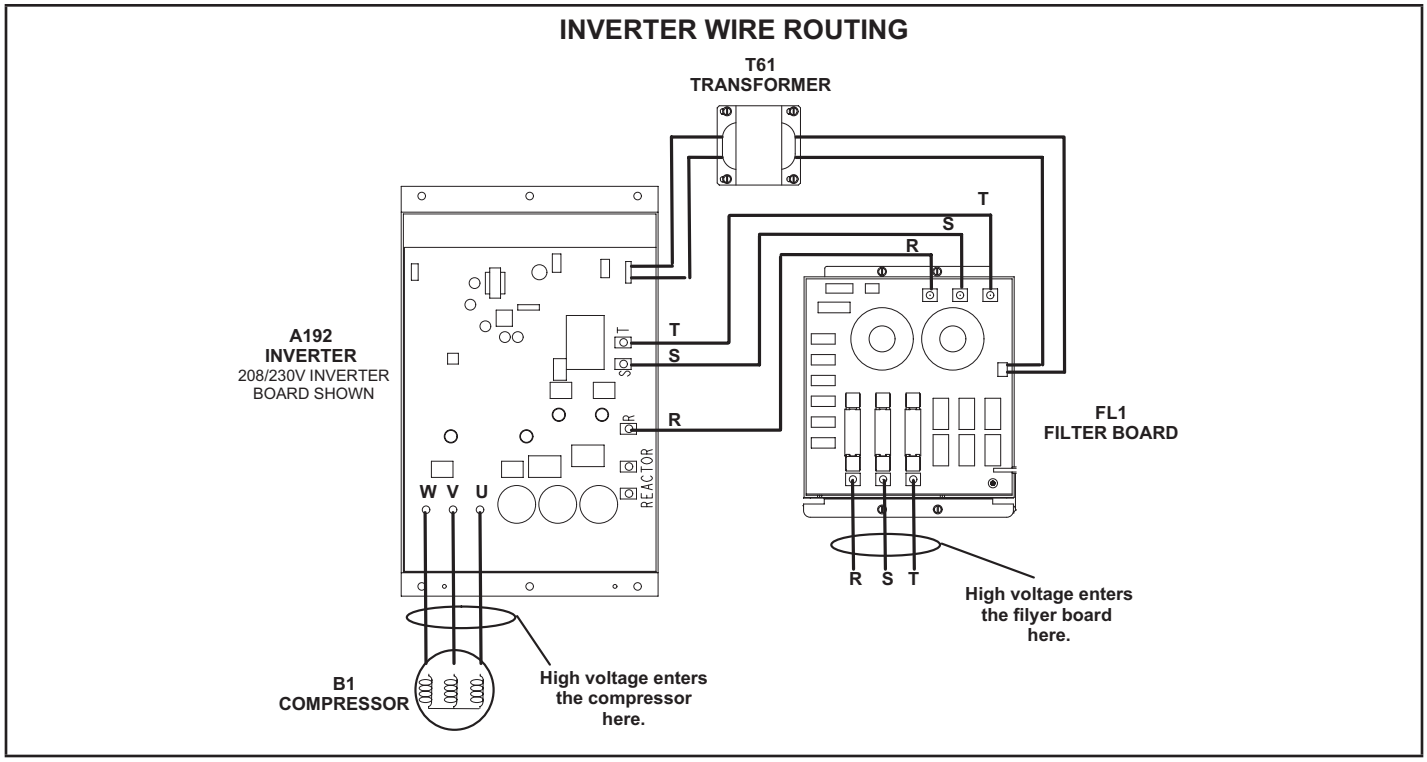


FIGURE 8

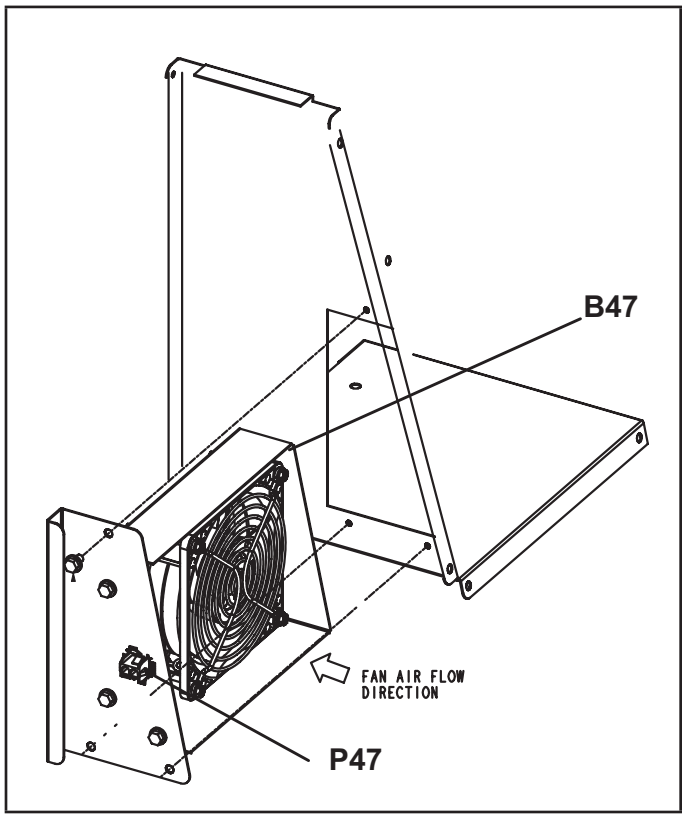


FIGURE 9

3-Crankcase Heaters HR1, HR2

All LCM units use insertion type heaters. Heater HR1 is installed around compressor B1 and heater HR2 is installed around compressor B2. Crankcase heater wattage varies by compressor size. Power to crankase heater (HR1) is controlled through the K191 relay and power to HR2 controlled by auxiliary contact on K2 compressor contactor that is normally closed.

4-High Pressure Switches S4, S7

The high pressure switch is an auto-reset SPST N.C. which open on a pressure rise. The switch is located in the compressor discharge line and is wired to the both the compressor contactor via controller A55. S4 protects compressor B1 and S7 protects compress B2. S4 is wired to the K1 contactor that disables power to the A192 Compressor Variable Speed Inverter. S7 is wired to the K2 contactor that dissables power to the B2 compressor.

When discharge pressure rises to 640 ± 20 psig (4413 ± 138 kPa) (indicating a problem in the system) the switch opens and the respective compressor is de-energized (the economizer can continue to operate). When discharge pressure drops to 475 ± 20 psig (3275 ± 138 kPa) the pressure switch will close.

The A55 Unit Controller 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.

5-Filter Drier

LCM units have a filter drier located in the liquid line of each refrigerant circuit The drier removes contaminants and moisture from the system.

6-Low Pressure Switches S87, S88

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 and wired to A55 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 first thermostat demand, before the compressor is locked out. The control is reset by breaking and remaking the thermostat demand or manually resetting the control.

When suction pressure drops to 40 ± 5 psig (276 ± 34 kPa), (indicating low pressure), the switch opens and the compressor(s) is(are) de-energized. The switch automatically resets when pressure in the suction line rises to 90 + 5 psig (620 ± 34 kPa) due to many causes such as refrigerant being added.

7-Condenser Fans B4 and B5

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

Units are equipped with electronically commutated condenser fan motors (ECM). The ECM motors are wired directly to 230VAC power but do not operate until a pulse width modulated (PWM) control signal is sent from the A55 Unit Controller. The PWM signal determines the condenser fan speed. Both fans will operate in low speed with a Y1 demand and both will will operate in high speed with a Y2 demand.

Transformer T5 and Fuse F57 460VAC & 575VAC only
460VAC and 575VAC units will use a Transformer T5 to step-down the line voltage to the correct 230VAC. There are two fuses F57 located next to the T5 transformer. The location of the T5 transformer is behind the disconnect box just above the bottom power entry cover.

Both low and high voltage plugs are located at the top of the blower compartment in the indoor section of the unit. Condenser fan motors B4 and B5 high voltage plugs are J86, and J87. Low voltage plugs are J336 and and J338 respectively.

Refer to wiring markings to identify plugs.

If an ECM fan is not operating:

1 - Check to make sure high voltage is present before checking low voltage.

2 - Read the voltage at the appropriate high voltage fan motor plug (J86 or J87) using the VAC meter setting.

3 - If high voltage is present, check the low voltage plug (J336 or J337) for a signal from the Unit Controller. Use either the duty cycle (%) or a VDC meter setting.

Note - *The VDC reading may fluctuate and is normal for a PWM signal.*

8-Temperature Sensors RT42, RT43, RT44, RT45, RT46, RT47, RT48 and RT49

Units are equipped with eight factory-installed thermistors (RT42 - RT49) located on different points on the refrigerant circuit.

The thermistors provide the Unit Controller with constant temperature readings of four specific locations on the refrigeration circuit. These temperatures are used as feedback in certain modes of unit operation. In addition, the Unit Controller uses these temperatures to initiate alarms such as loss of condenser or evaporator airflow and loss of charge. See FIGURE 10 and FIGURE 11 for locations.

LGM/LCM092, 102, 120, 150
EVAPORATOR COIL
RT42, 43, 46, 47

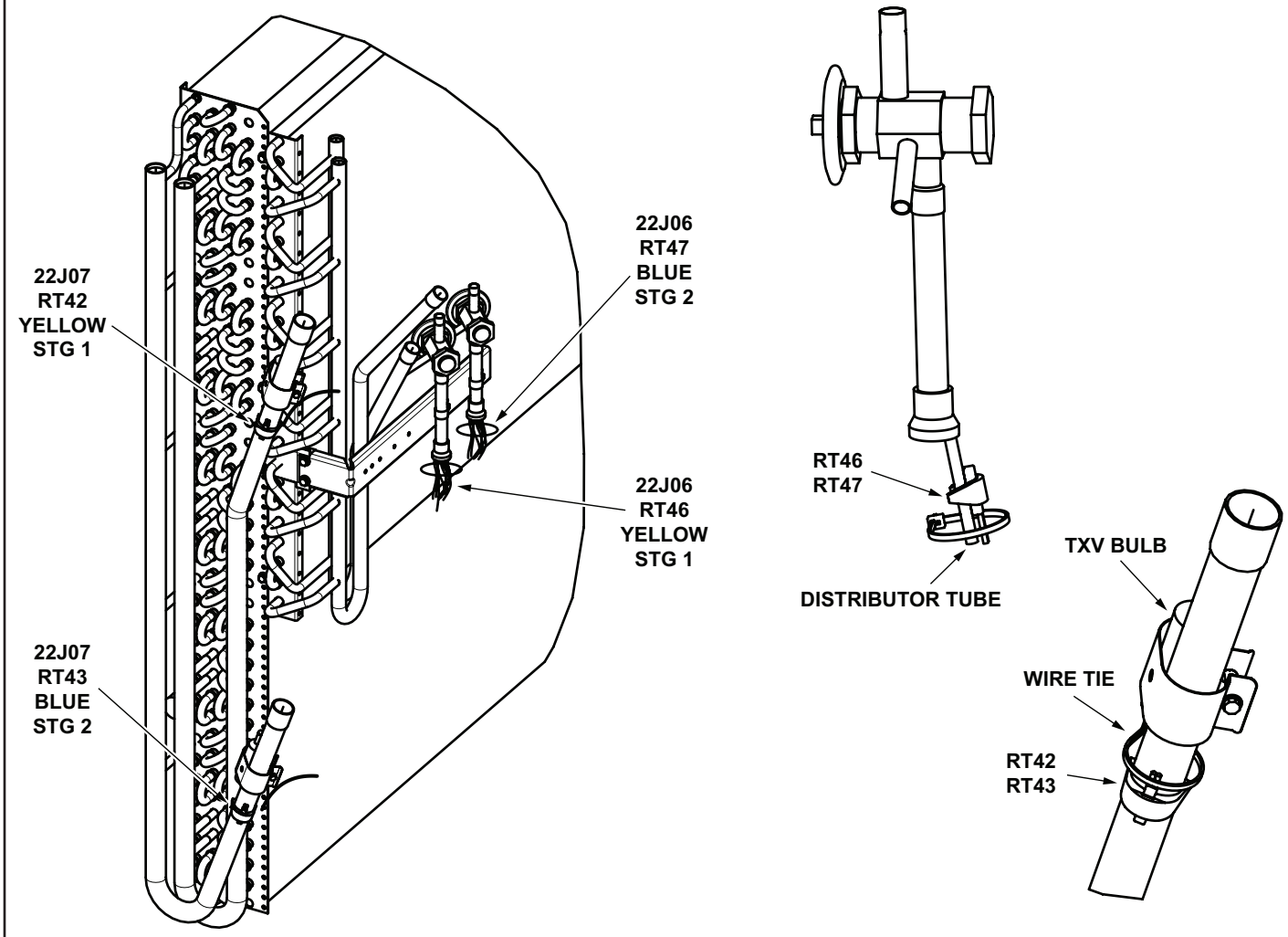


FIGURE 10

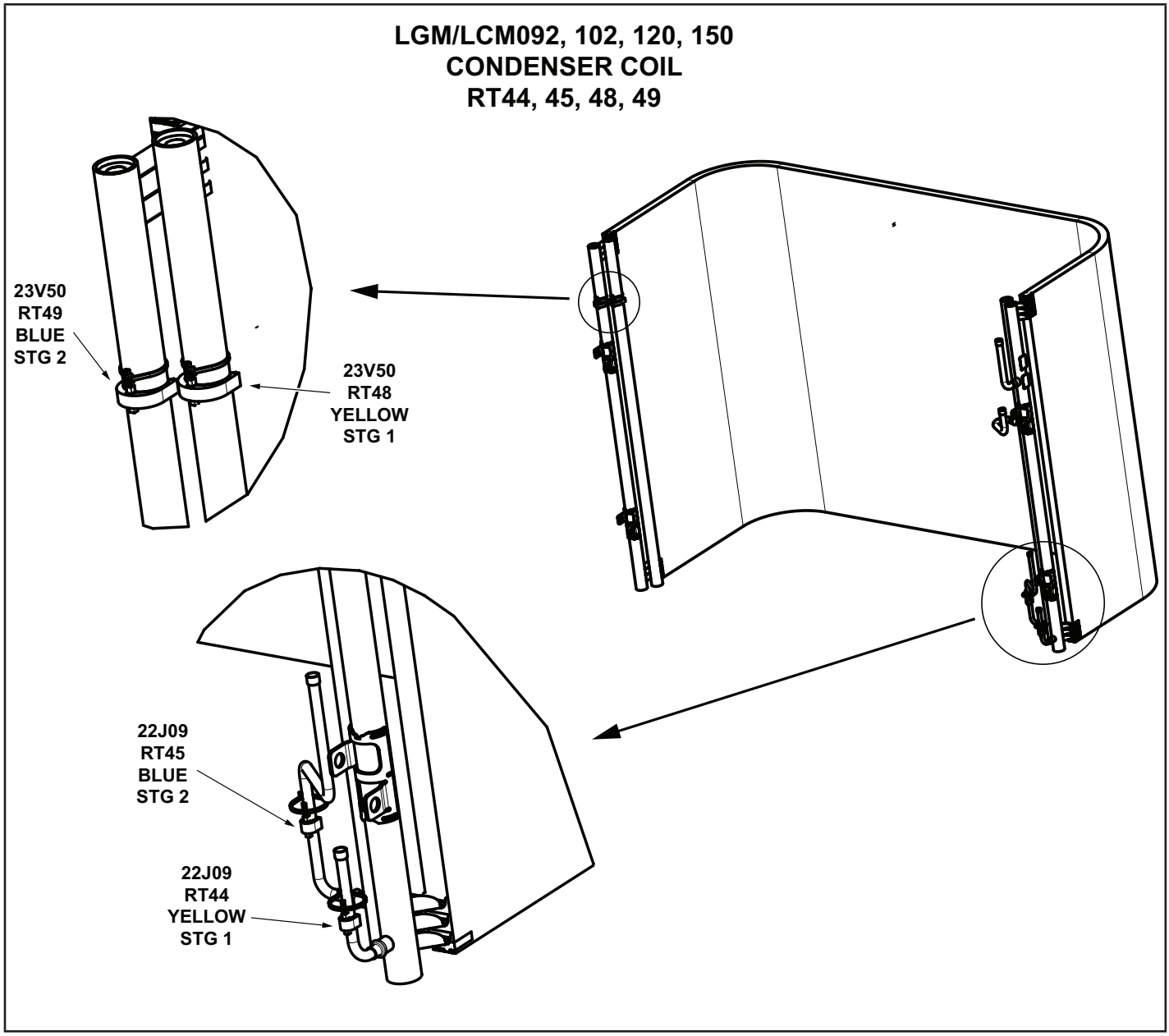

LGM/LCM092, 102, 120, 150
CONDENSER COIL
RT44, 45, 48, 49
23V50
RT49
BLUE
STG 2
23V50
RT48
YELLOW
STG 1
22J09
RT45
BLUE
STG 2
22J09
RT44
YELLOW
STG 1

FIGURE 11

9-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 FIGURE 12.

LGT/LCT 092-150
INDOOR COMPARTMENT RDS SENSOR

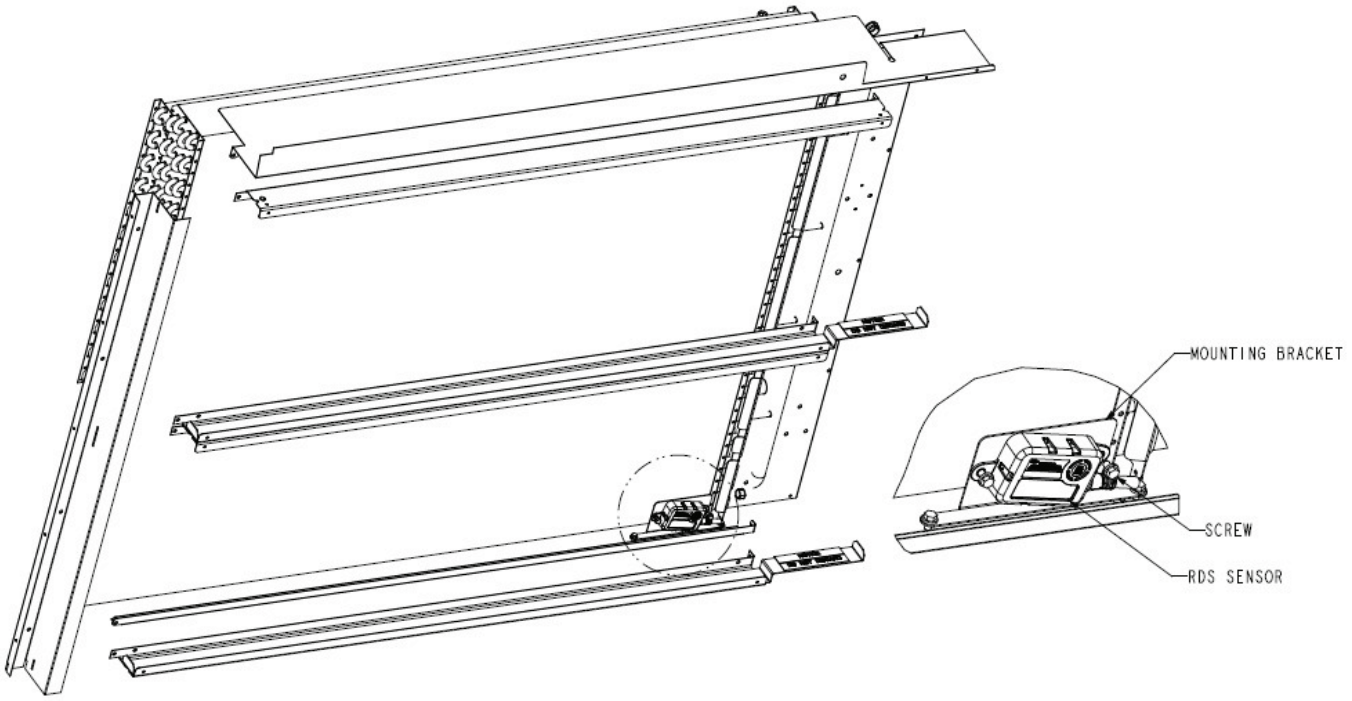


FIGURE 12

C-Blower Compartment

1-Blower Wheels

Units are equipped with an optional direct drive blower assembly with a backward inclined blower wheel.

2-Indoor Blower Motor B3

Units are equipped with a direct drive blower assembly with a three-phase, variable speed, direct drive blower motor. 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.

A-Blower Operation

Refer to the Unit Controller Setup Guide to energize blower. Use the mobile service app menu; see SERVICE > TEST. In thermostat control mode, the Unit Controller will stage the blower between low and high speed. In zone sensor control mode, the Unit Controller will vary (VAV) the blower between low and high speed.

⚠ 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.

Initiate blower only (G) demand at thermostat according to instructions provided with thermostat. 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.

NOTE - *Blower operation mode can also be initiated by the mobile service app.*

B-Blower Access

The blower assembly is secured to a sliding frame which allows the blower assembly to be pulled out of the unit. See FIGURE 14.

1 - Loosen the reusable wire tie which secures the controls and high voltage blower wiring to the blower housing. Disconnect the pressure sensor low voltage wire harness.

2 - Remove and retain screws on either side (and on the front for direct drive) of sliding frame. Use the metal handle to pull frame toward outside of unit.

3 - Slide frame back into original position when finished servicing. Reattach the blower wiring in the previous location using the wire tie. Reconnect pressure sensor low voltage wire harness.

4 - Replace retained screws.

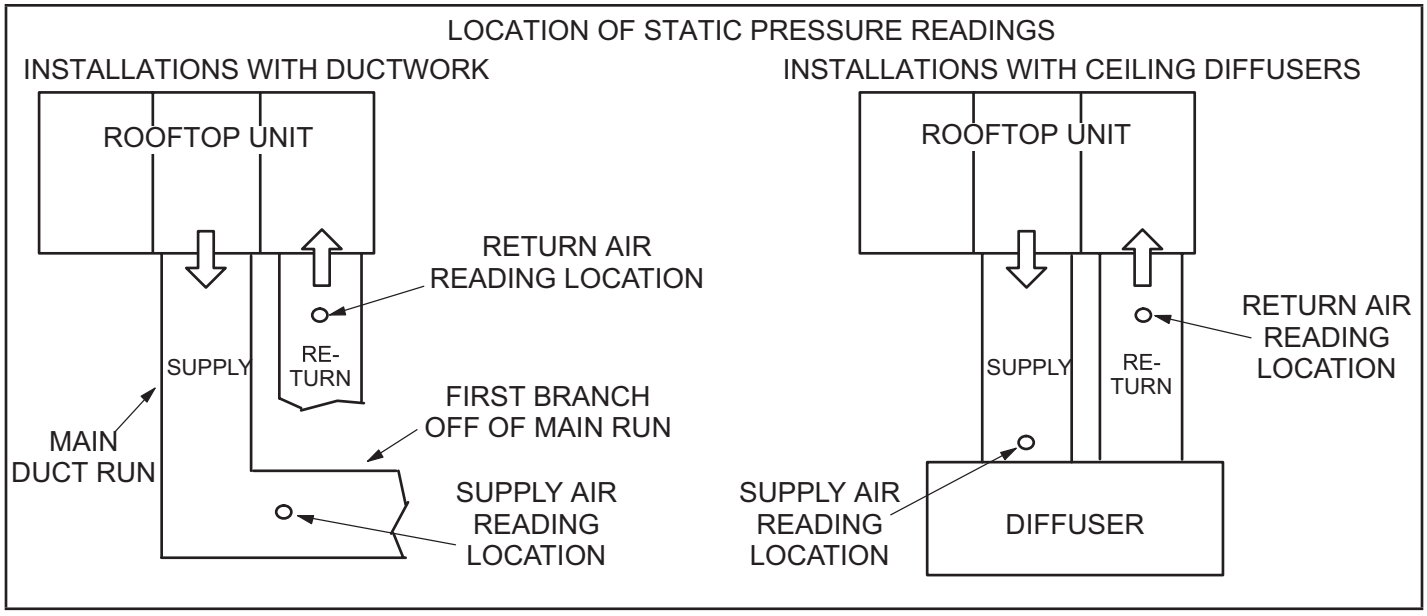


FIGURE 13

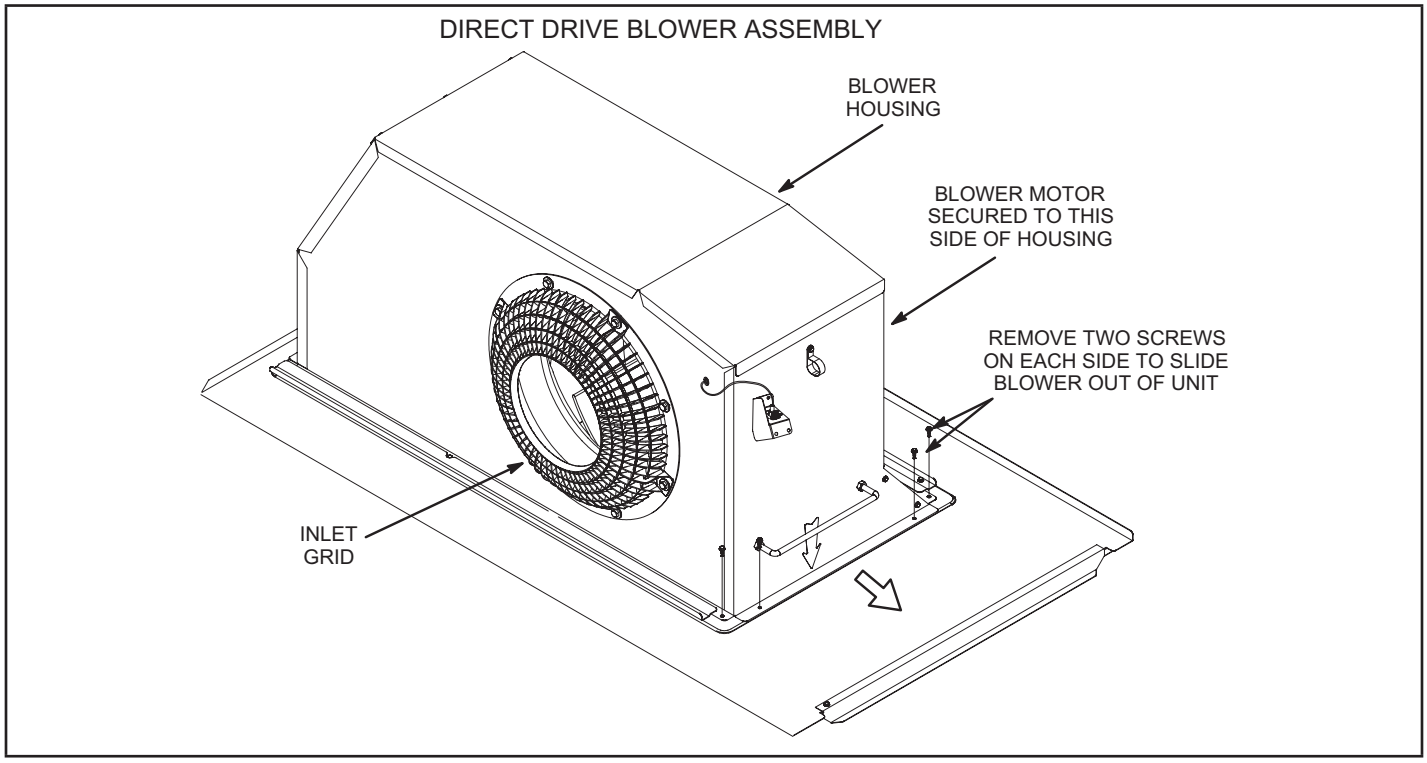


FIGURE 14

Direct Drive Start-Up

The supply CFM can be adjusted by changing Unit Controller settings. Refer to TABLE 6 for menu paths and default settings. Record any CFM changes on the parameter settings label located on the inside of the compressor access panel.

⚠ IMPORTANT

The BLOWER CALIBRATION process starts the in door blower at operational speeds and moves the economizer damper blades. Before starting this process, replace any access panels and close all unit doors except compressor compartment door.

Blower calibration is required only on units that are newly installed or if there is a change in the duct work or air filters after installation. Use the mobile service app to navigate to the SETUP>TEST & BALANCE>BLOWER menu. After the new CFM values are entered, select START CALIBRATION.

The blower calibration status is displayed as a % complete. Upon successful completion, the mobile service app will display CALIBRATION SUCCESS and go back to the blower calibration screen.

IMPORTANT - *The default value for Cooling Low CFM is lower than a traditional singe- or two-speed unit. If operating the unit with a 2- or 3-stage controller (2- or 3-stage thermostat, DDC controller, etc.), it is recommended to increase the Cooling Low CFM default value to a suitable level for part load cooling (typically 60% of full load CFM).*

TABLE 6

DIRECT DRIVE PARAMETER SETTINGS

Parameter	Factory Setting				Field Setting	Description
	092	102	120	150		
NOTE - *Any changes to Smoke CFM setting must be adjusted before the other CFM settings. Use SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 12*						
BLOWER SMOKE CFM	3000	3400	4000	5000	CFM	Smoke blower speed
SETUP > TEST & BALANCE > BLOWER						
BLOWER HEATING HIGH CFM	3000	3400	4000	5000	CFM	Heating blower speed
BLOWER COOLING HIGH CFM	2625	2975	3500	4375	CFM	High cooling blower speed
BLOWER COOLING LOW CFM	800	800	875	1100	CFM	Low cooling blowr speed
BLOWER VENTILATION CFM	800	800	875	1100	CFM	Ventilation blower speed
SETUP > TEST & BALANCE > DAMPER						
BLOWER HIGH CFM DAMPER POS %	0%	0%	0%	0%	%	Minimum damper position for high speed blower operation.
BLOWER LOW CFM DAMPER POS %	0%	0%	0%	0%	%	Minimum damper position for low speed operation.
BLOWER EXHAUST DAMPER POS %	50%	50%	50%	50%	%	Minimum damper position for power exhaust operation.
SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 216						
POWER EXHAUST DEADBAND %	10%	10%	10%	10%	%	Deadband % for power exhaust operation.
SETTINGS > RTU OPTIONS > EDIT PARAMETER = 10 (Applies to Thermostat Mode ONLY)						
FREE COOLING STAGE-UP DELAY	300 sec,	300 sec.	300 sec.	300 sec.	sec	Number of seconds to hold indoor blower at low speed before switching to indoor blower at high speed.

Installer - Circle applicable unit model number and record any parameter changes under "Field Setting" column. Settings need to be recorded by installer for use when Unit Controller is replaced or reprogrammed.

TABLE 7

DIRECT DRIVE BLOWER MOTOR TROUBLESHOOTING

Failure	Error	Warning	Reason	Troubleshoot
Locked Rotor	•		No changes in hall signals within 2000ms	Check for obstruction keeping impeller from rotating
Braking Mode		•	Warning, no error code set, Motor start not possible after 20 sec	Check for secondary airflow source in the system causing the impeller to rotate backwards when off
Hall Error	•		Combination of 3 hall signals-gives false signal after one rotation	Measure voltage across each leg, Check electrical connections
Power Module Overheated	•		Temperature > 115°C	Check operating conditions in blower compartment, Check for high motor load (current draw), Check for corrosion-free and secure electrical connections
Motor Overheated	•		Motor over-temperature protector opens	
Gate Driver Error	•		Internal software fault	Measure voltage across each leg, Check electrical connections
Phase Failure	•		Input voltage has phase imbalance	Measure voltage across each leg, Check electrical connections, Repair low/high voltage leg(s)
DC Link Voltage Low	•		Rectified DC link voltage is too low	
DC Link Over-voltage	•		Rectified DC link voltage is too high	
Line Over-voltage	•		Line voltage too high	
Line Under-voltage	•		Line voltage too low	
Communication Error	•		Internal communication failure. Not connected with master/ slave wiring	Check low voltage wiring connections
DC Link Voltage Low		•	Warning, not low enough to set error code	Measure voltage across each leg, Check electrical connections, Repair low/high voltage leg(s)
Electronics Temp High		•	Warning, not high enough to set error code, Temperature > 95°C	Check operating conditions in blower compartment, Check for high motor load (current draw), Check for corrosion-free and secure electrical connections
Power Module Temp High		•	Warning, not high enough to set error code, Temperature > 105°C	
Motor Temp High		•	rning, not high enough to set error code, Temperature > 130°C	

D-Electric Heat Components

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

Electric heat is shown in FIGURE 15. All electric heat sections consist of electric heating elements exposed directly to the air stream.

1-Heating Elements HE1, HE2, HE3, HE4, HE5, HE6

Heating elements are composed of helix wound bare nichrome wire exposed directly to the air stream. Three elements are connected in a three-phase arrangement. The elements in 208/230V units are connected in a "Delta" arrangement. Elements in 460 and 575V units are connected in "Wye" arrangement. Each stage is energized independently by the corresponding contactors located on the electric heat vestibule panel. Once energized, heat transfer is instantaneous. High temperature protection is provided by primary and redundant high temperature limits and overcurrent protection is provided by fuses.

2-Contactors K15, K16

Contactors K15 and K16 are three-pole double-break contactors located on the electric heat vestibule. All contactors are equipped with a 24VAC coil and are energized by the A55 Unit Controller. Contactors energize the first and only stage of heating elements.

3-Primary Limit Switch S15

S15 is a SPST N.C. auto-reset switch located on the back panel of the electric heat section below the heating elements. The switch is wired in series with the first stage contactor coil. When S15 opens, indicating a problem in the system, contactor K15 is de-energized. When K15 is de-energized, first stage and all subsequent stages of heat are de-energized. The switch is factory-set to open at 200ºF ± 5ºF (93.3ºC ± 2.8ºC) on a temperature rise and automatically reset at 160ºF ± 6ºF (71.1ºC ± 3.3ºC) on a temperature fall. The switch is not adjustable.

4-High Temperature Limits S20, S157, S158, S159

Limits are SPST N.C. manual-reset thermostats. Like the primary temperature limit, S20 and S157 are wired in series with the first-stage contactor coil (K15). S158 and S159 are wired in series with contactor coil (K16). When any of the switches open the respective heating elements are de-energized. When the contactors are de-energized, first-stage and all subsequent stages of heat are de-energized. The limits are factory-set to open at 220ºF ± 6ºF (104ºC ± 3.3ºC) on a temperature rise and can be manually reset when temperature falls below 160F (71.0ºC).

5-Terminal Strip TB2

Terminal strip TB2 is used for single point power installations only. TB2 distributes L1, L2 and L3 power to TB3. Units with multi-point power connection do not use TB2.

6-Terminal Strip TB3

Electric heat line voltage connections are made to terminal strip TB3, located in the upper left corner of the electric heat vestibule. TB3 distributes power to the electric heat components.

7-Fuse F3 and F42

Fuses are housed in a fuse block which holds three fuses. Each fuse is connected in series with each leg of electric heat. FIGURE 16 and TABLE 8 show the fuses used with each electric heat section. For simplicity, the service manual labels the fuses F3 - 1, 2 and F42 - 1, 2.

8-Unit Fuse Block F4

Three line voltage fuses provide short circuit and ground fault protection to all cooling components in units equipped with electric heat. The fuses are rated in accordance with the amperage of the cooling components.

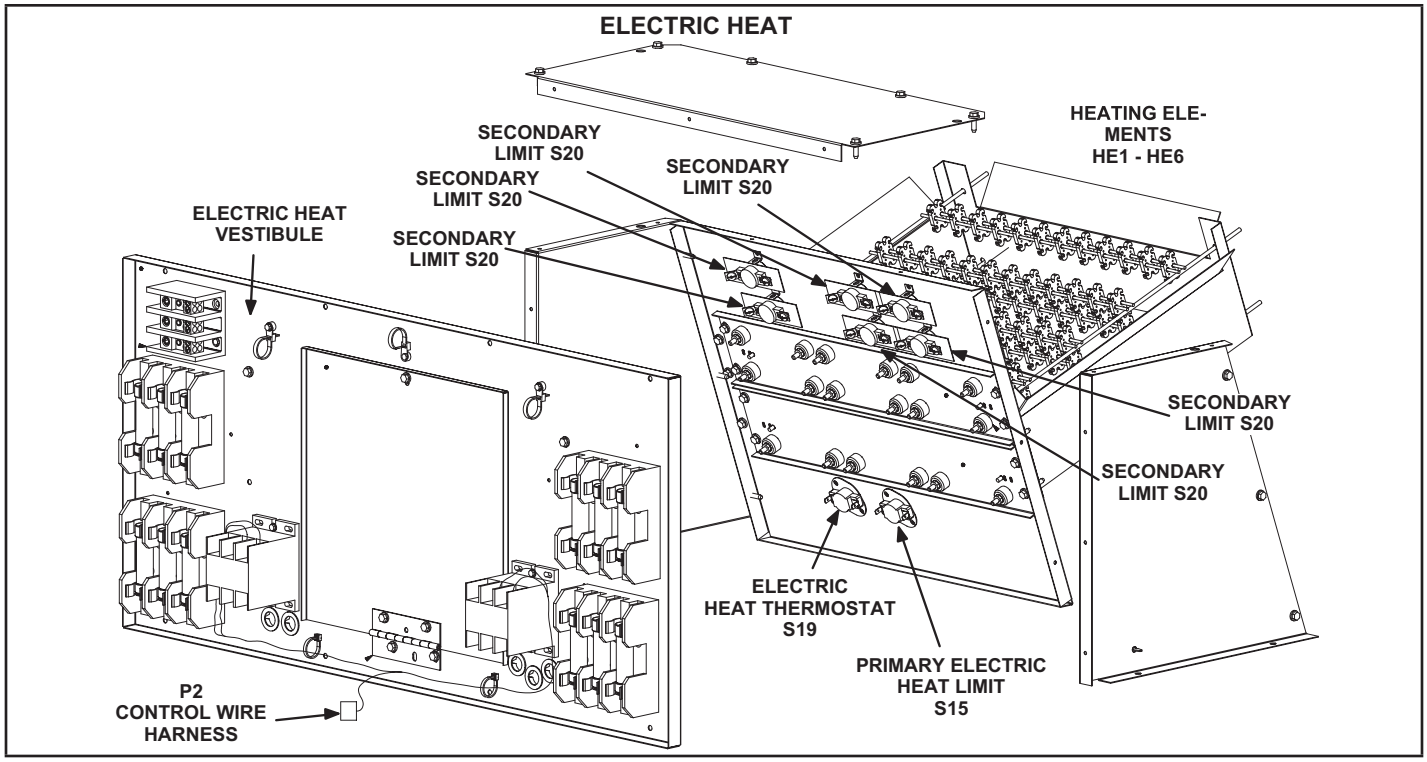


FIGURE 15

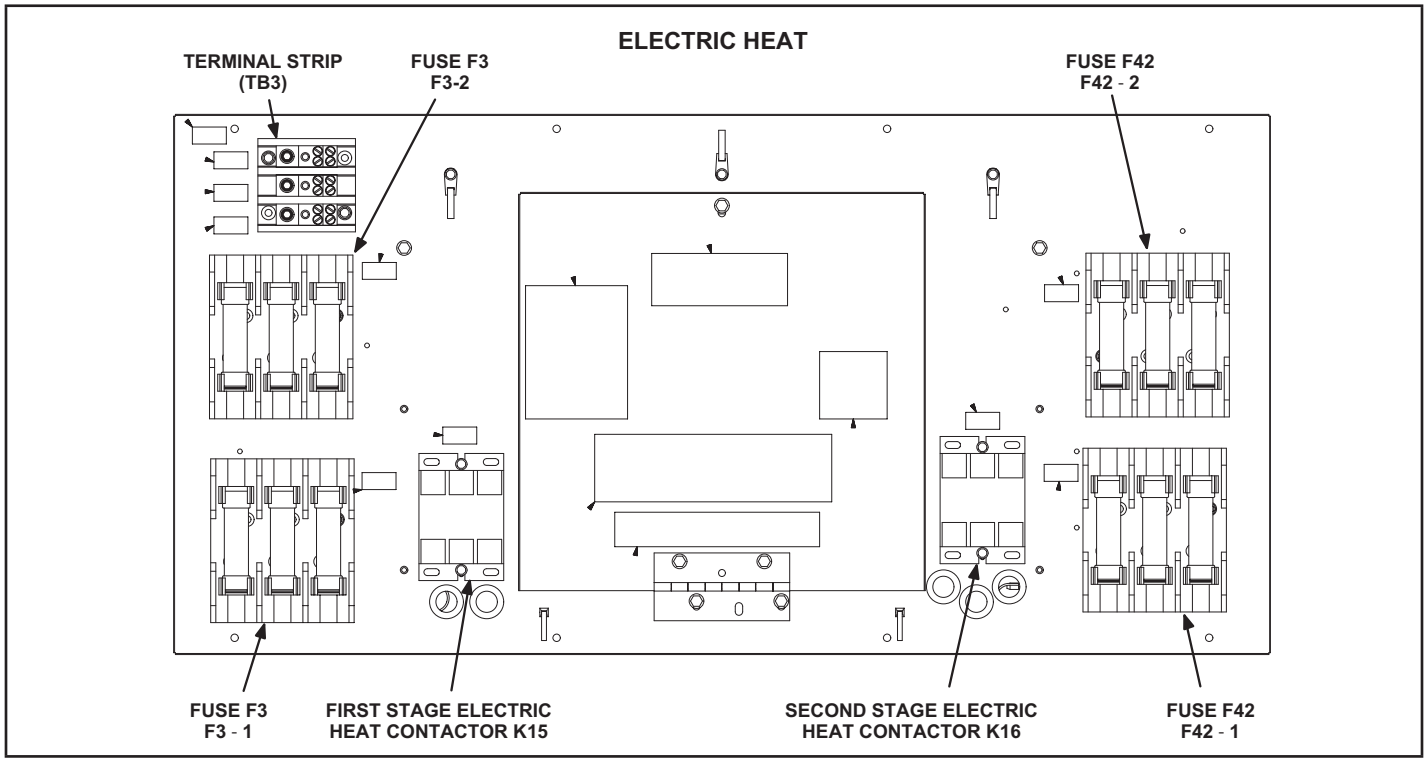


FIGURE 16

TABLE 8

ELECTRIC HEAT SECTION FUSE RATING

EHA QUANTITY & SIZE	VOLTAGES	FUSE (3 each)			
		F3 - 1	F3 - 2	F42 - 1	F42 - 2
EHO075-1, 7.5	208/230	-	25 Amp 250V		
	460	-	15 Amp 600V		
	575	-	10 Amp 600V		
EHO150-1, 15	2-8/230	-	50 Amp 250V		
	460	-	25 Amp 600V		
	575	-	20 Amp 600V		
EHO225-1, 22.5	203/230	50 Amp 250V		25 Amp 250V	
	460	25 Amp 600V		15 Amp 600V	
	575	20 Amp 600V		10 Amp 600V	
EHO300-1, 30	208/230	50 Amp 250V		50 Amp 250V	
	460	25 Amp 600V		25 Amp 600V	
	575	20 Amp 600V		20 Amp 600V	
EHO450-1, 45	208/230	50 Amp 250V		60 Amp 250V	60 Amp 250V
	460	25 Amp 600V		50 Amp 600V	
	575	20 Amp 600V		40 Amp 600V	
EHO600-1, 60	208/230	60 Amp 250V		60 Amp 250V	60 Amp 250V
	460	50 Amp 600V		50 Amp 600V	
	575	40 Amp 600V		40 Amp 600V	

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 (C1CURB10).

III-CHARGING

Units charged with R454B refrigerant operate at lower pressures than R410A. The expansion valve and liquid line dryer provided with the unit are approved for use with R454B and R410A.

R454B refrigerant is stored in a gray cylinder.

⚠ CAUTION

Mineral oils are not compatible with R454B. If oil must be added, it must be a polyolester oil.

Refrigerant Charge R-454B		
Unit	M_c(lbs)	M_c(kg)
LCM/LGM092 STG 1	7.3	3.31
LCM/LGM092 STG 2	5.1	2.31
LCM/LGM102 STG 1	7.3	3.31
LCM/LGM102 STG 2	5.1	2.31
LCM/LGM120 STG 1	8.22	3.73
LCM/LGM120 STG 2	4.59	2.08
LCM/LGM150 STG 1	8.1	3.67
LCM/LGM150 STG 2	5.78	2.62
LCM/LGM092 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM092 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM102 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM102 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM120 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM120 W/ Humidtrol STG 2	4.75	2.15
LCM/LGM150 W/ Humidtrol STG 1	8.125	3.69
LCM/LGM150 W/ Humidtrol STG 2	5.875	2.66

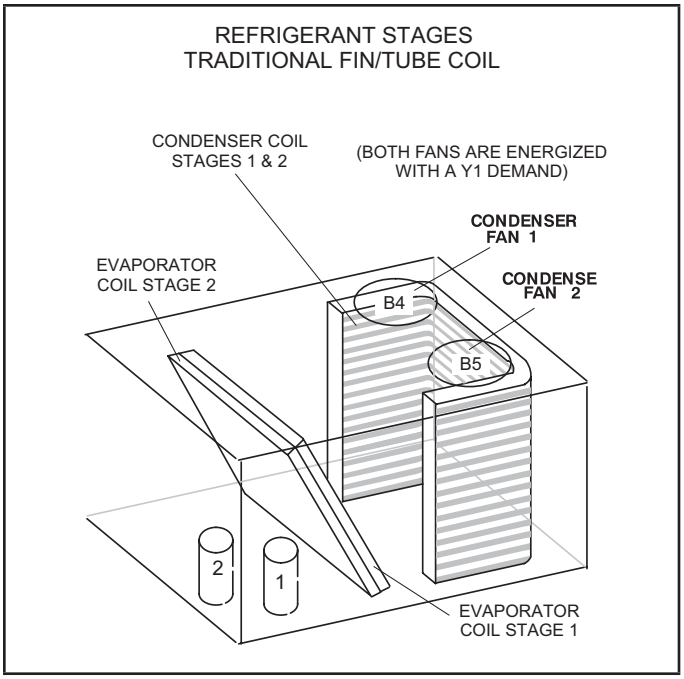


FIGURE 17

Manifold gauge sets used with systems charged with R454B refrigerant must be capable of handling various system operating pressures. The gauges should be rated for use with pressures of 0-800 on the high side and a low side of 30” vacuum to 250 psi with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psi of pressure with a 4000 psi burst rating.

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

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

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

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

- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-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 using the following mobile service app menu path:

RTU MENU > SERVICE > COMPONENT TEST > COOLING > COOL 4

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 system.
- 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.

Example: For the 092U no reheat unit, with a 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature for Circuit 1 is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

TABLE 9 581241-01
LGM/LCM092U No Reheat

	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	219	105	253	108	291	111	335	113	383	114	437
	108	223	112	256	116	295	119	338	122	386	123	440
	122	231	127	264	132	302	136	345	139	393	142	446
	137	241	143	273	148	311	153	354	157	402	160	455
Circuit 2	102	222	105	257	107	297	110	341	113	390	115	443
	110	225	113	260	115	300	118	344	120	393	123	446
	126	231	129	267	131	307	134	352	137	400	140	454
	143	239	146	275	149	315	152	360	155	409	158	462

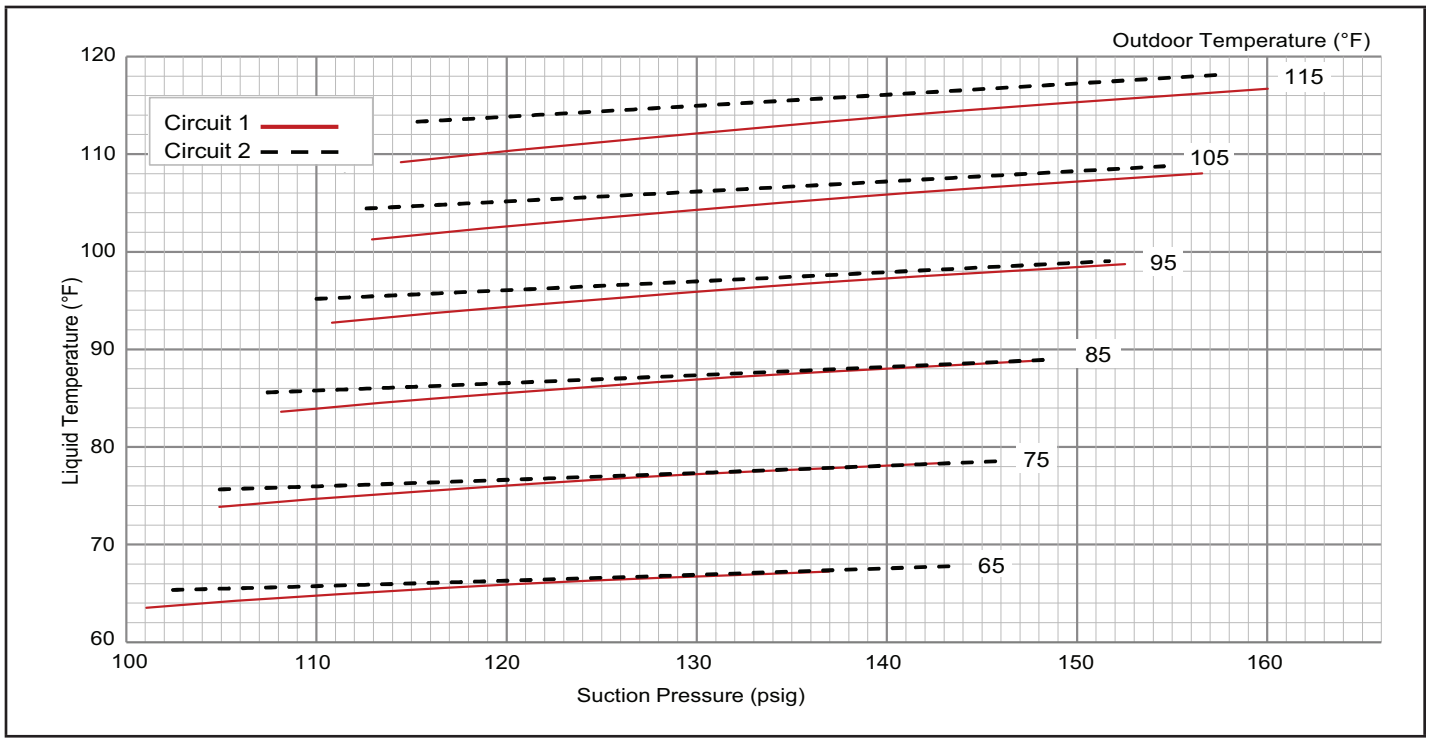


TABLE 10 581242-01
LGM/LCM092U Reheat

	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	104	218	105	253	106	292	107	337	109	386	111	440
	112	222	113	256	115	296	116	340	118	389	120	443
	129	228	131	263	133	302	135	346	138	394	141	448
	148	235	150	269	153	308	155	351	159	400	162	453
Circuit 2	100	217	101	250	102	289	104	331	106	379	108	430
	108	220	110	254	111	293	113	336	115	383	118	435
	126	227	128	261	130	300	132	343	134	391	137	443
	145	232	147	267	149	306	151	349	154	397	157	450

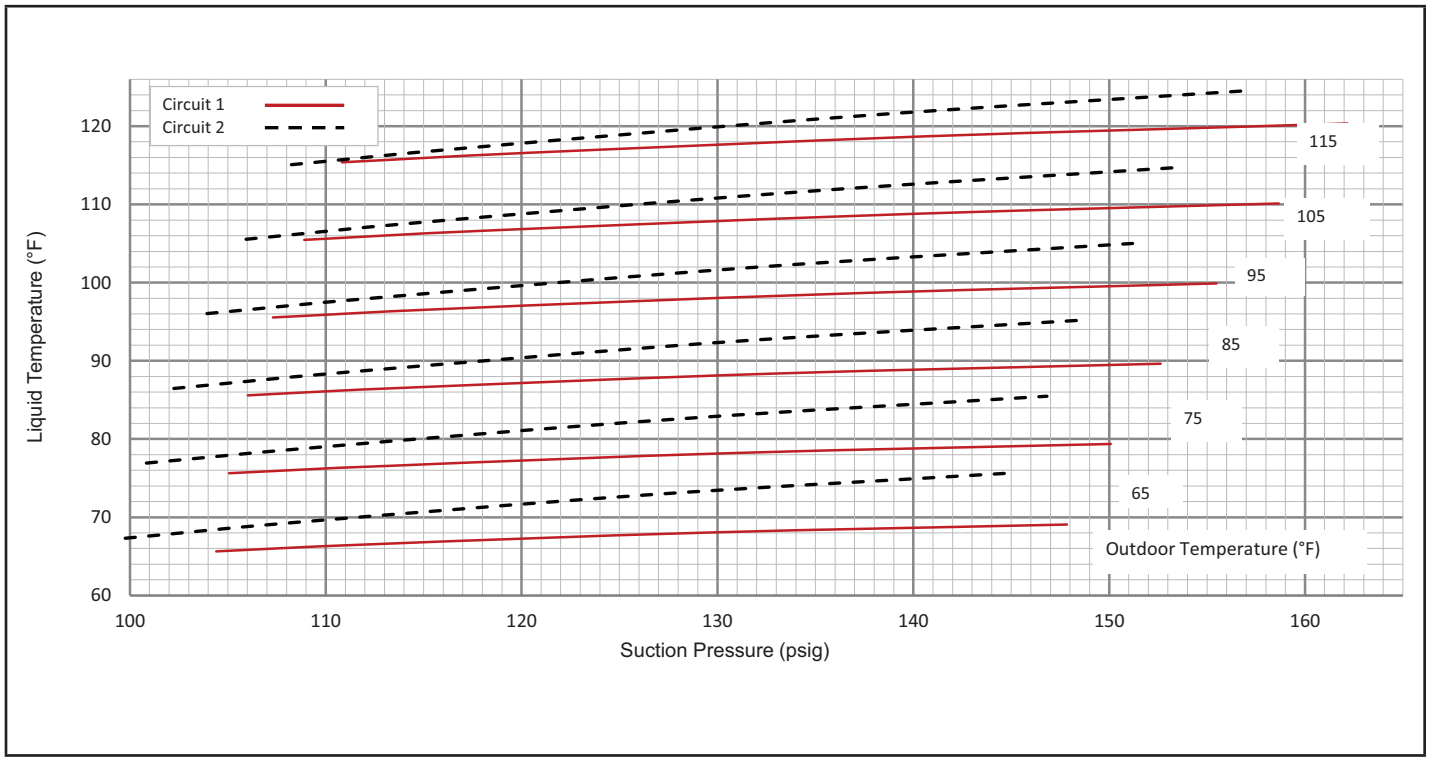


TABLE 11 581243-01
LGM/LCM102U No Reheat

	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	105	224	108	257	111	295	113	338	115	386	116	440
	111	226	115	259	119	297	121	340	124	388	126	441
	126	234	130	266	135	303	139	346	142	394	145	447
	141	244	147	276	152	314	157	356	161	404	165	457
Circuit 2	106	225	108	259	110	298	113	342	116	391	119	444
	113	227	115	262	118	301	121	345	123	393	127	447
	129	234	132	268	134	308	137	352	140	400	143	454
	148	243	150	277	153	317	156	361	159	409	162	463

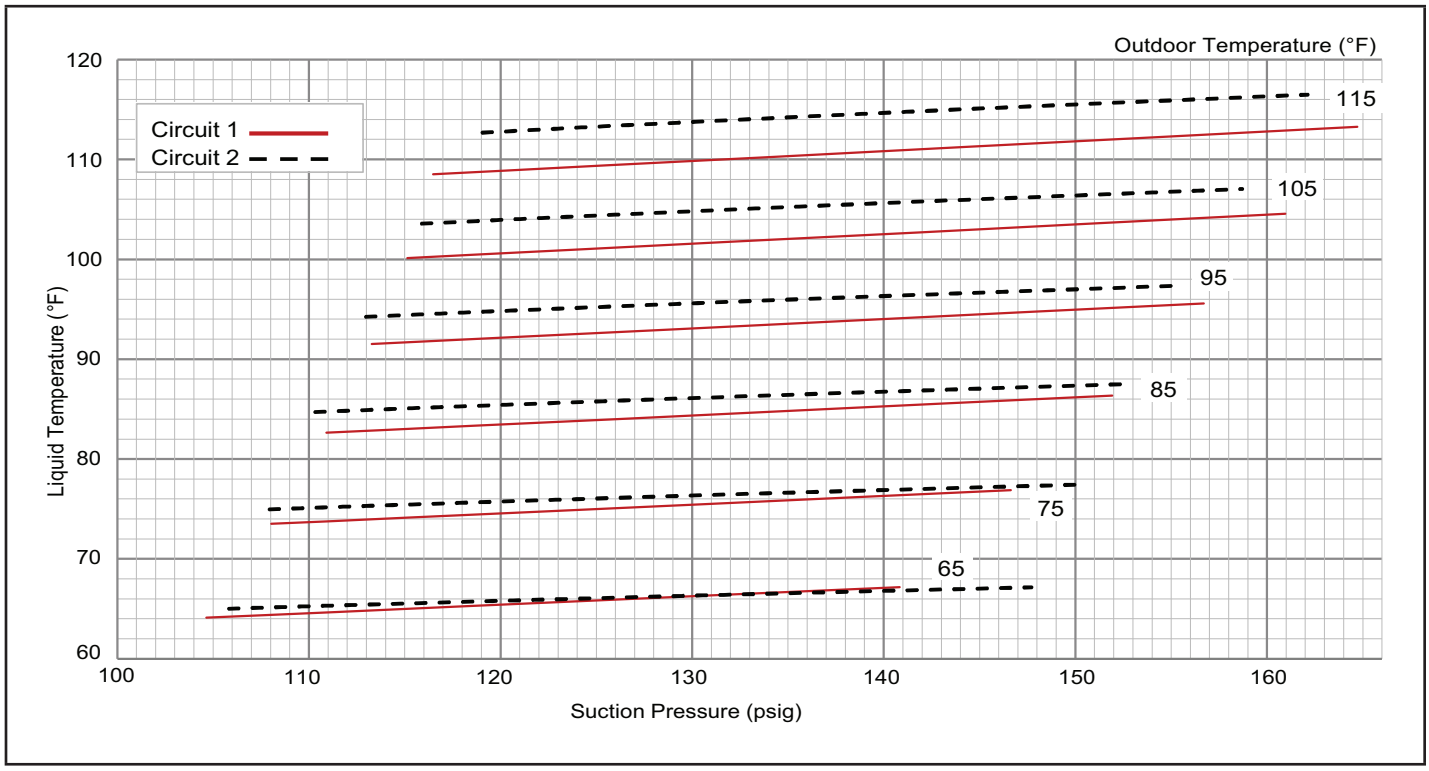


TABLE 12 581244-01
LGM/LCM102U Reheat

	65°F		75°F		85°F		95°F		105°F		115°F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	105	223	107	257	108	296	109	340	111	389	112	443
	113	226	115	259	117	298	118	342	120	390	122	444
	130	233	132	266	134	304	137	347	139	396	142	449
	146	242	149	275	152	312	155	355	159	403	162	456
Circuit 2	104	217	105	251	106	289	107	332	109	380	111	432
	112	220	114	254	115	292	117	336	119	383	121	435
	130	226	131	260	133	299	135	342	138	390	141	442
	147	231	150	266	152	305	155	348	157	396	161	449

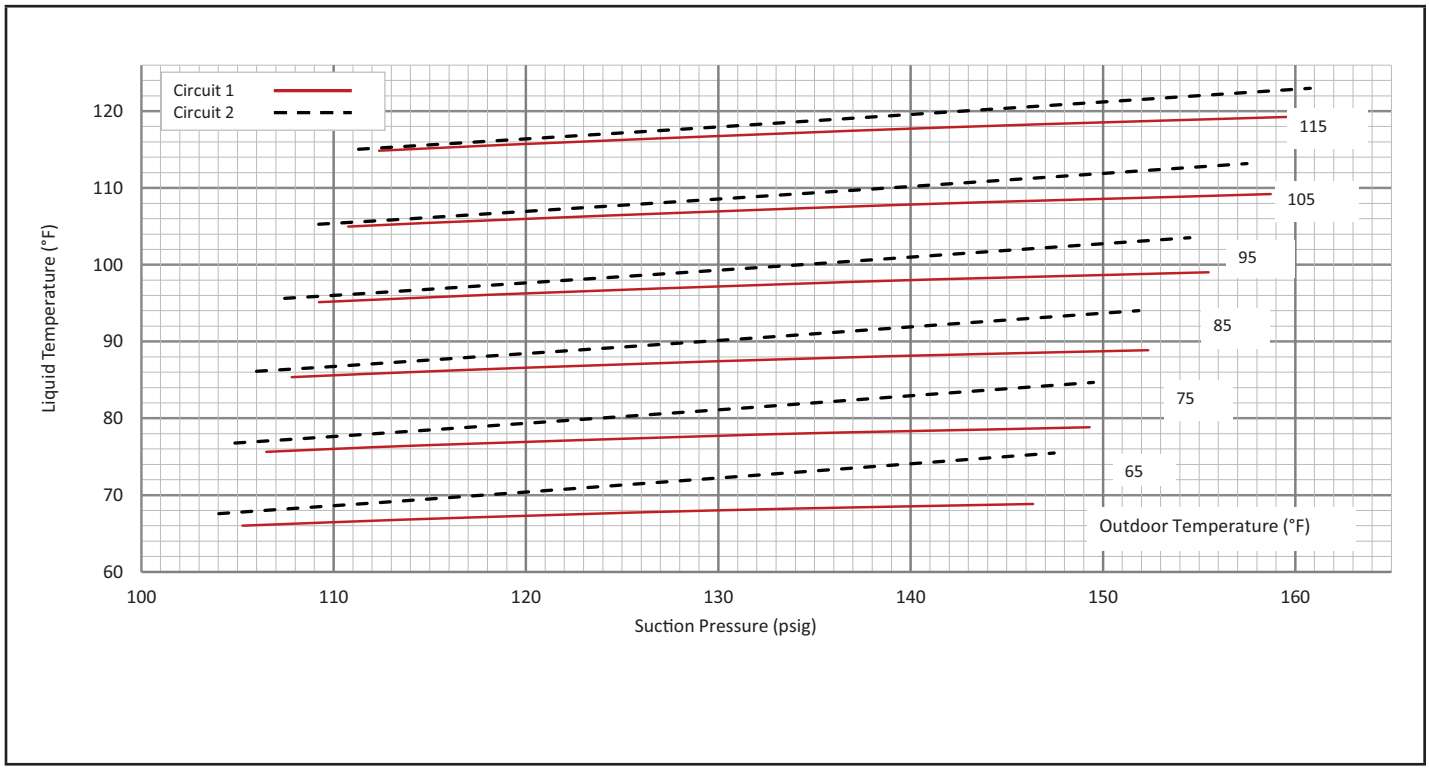


TABLE 13 581245-01
LGM/LCM120U No Reheat

	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	230	104	266	107	307	109	353	111	404	113	460
	108	233	111	269	114	310	117	356	119	406	122	462
	123	243	127	278	131	318	134	363	137	413	140	469
	138	256	143	291	148	331	152	375	156	425	160	479
Circuit 2	99	228	101	265	103	306	106	351	108	400	111	453
	107	231	109	268	111	309	114	354	116	403	119	456
	123	239	125	276	128	317	130	362	133	411	136	465
	141	248	143	285	145	326	148	371	151	421	154	474

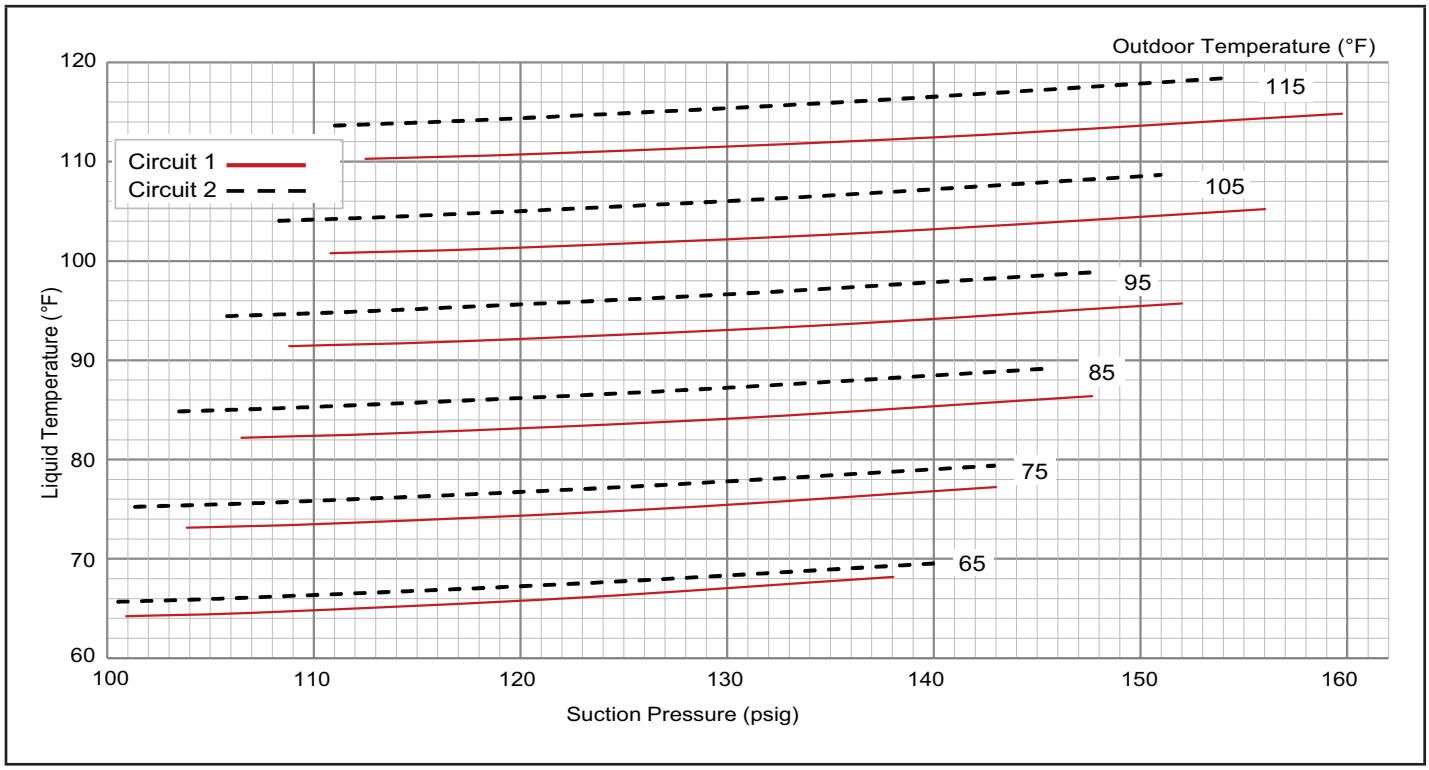


TABLE 14 581246-01
LGM/LCM120U Reheat

	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	231	103	265	104	304	105	347	107	396	108	449
	110	234	111	268	113	307	114	350	116	398	118	451
	126	242	128	275	130	314	133	357	135	405	139	458
	141	251	144	284	148	322	151	365	155	413	159	466
Circuit 2	98	226	99	259	101	297	102	339	104	387	106	439
	106	229	107	263	109	301	111	343	113	391	115	443
	123	236	124	269	126	308	129	351	131	399	134	452
	140	241	142	276	145	315	147	358	150	407	153	460

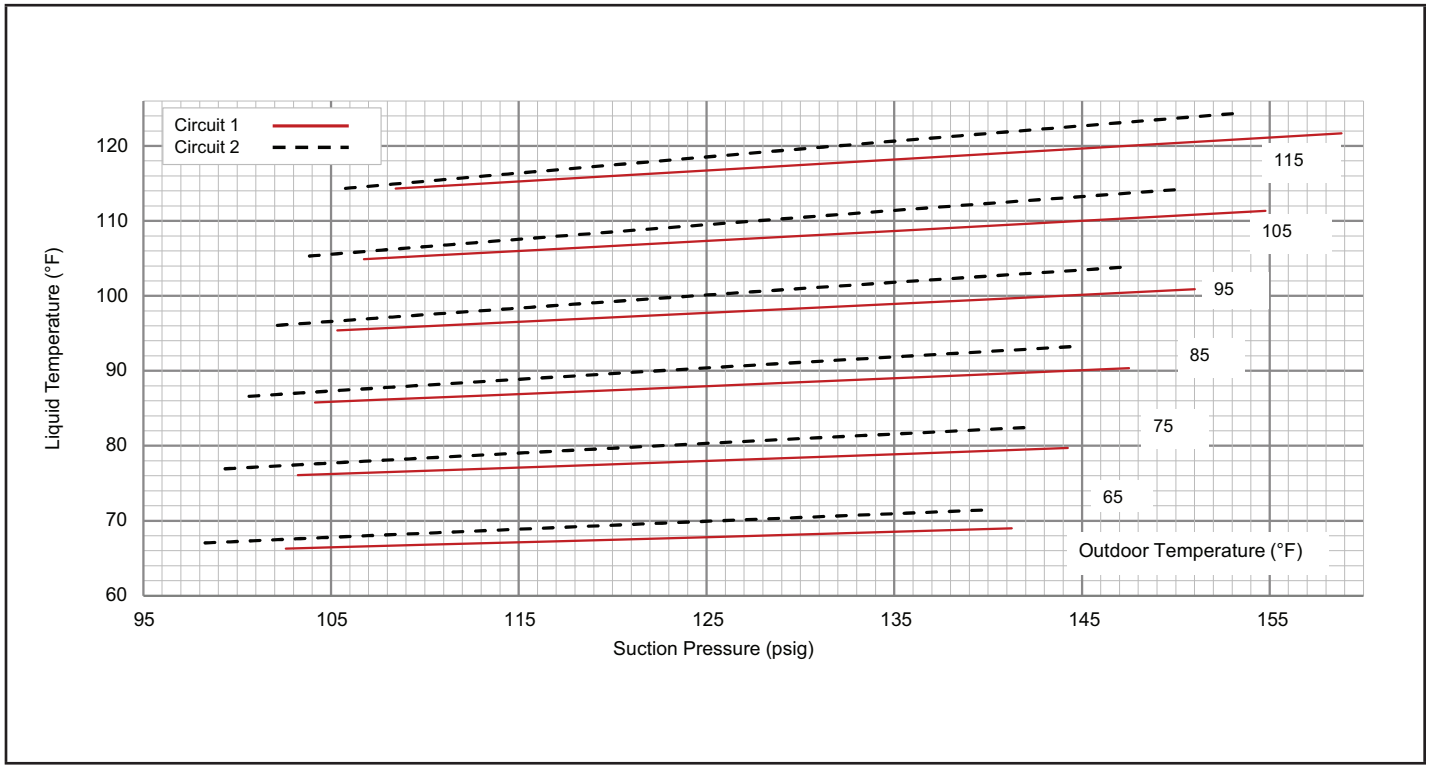


TABLE 15 581247-01
LGM/LCM150U No Reheat

	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	99	244	102	284	104	328	106	374	108	425	110	479
	106	248	109	288	111	331	114	377	116	428	119	481
	120	257	123	296	127	339	130	385	133	435	136	488
	135	267	139	306	143	349	148	395	152	444	155	497
Circuit 2	94	250	96	291	98	337	100	389	102	445	105	506
	101	254	103	294	105	340	107	391	110	447	113	507
	115	263	117	303	120	347	122	397	125	452	129	512
	131	273	133	312	136	356	139	405	142	459	146	518

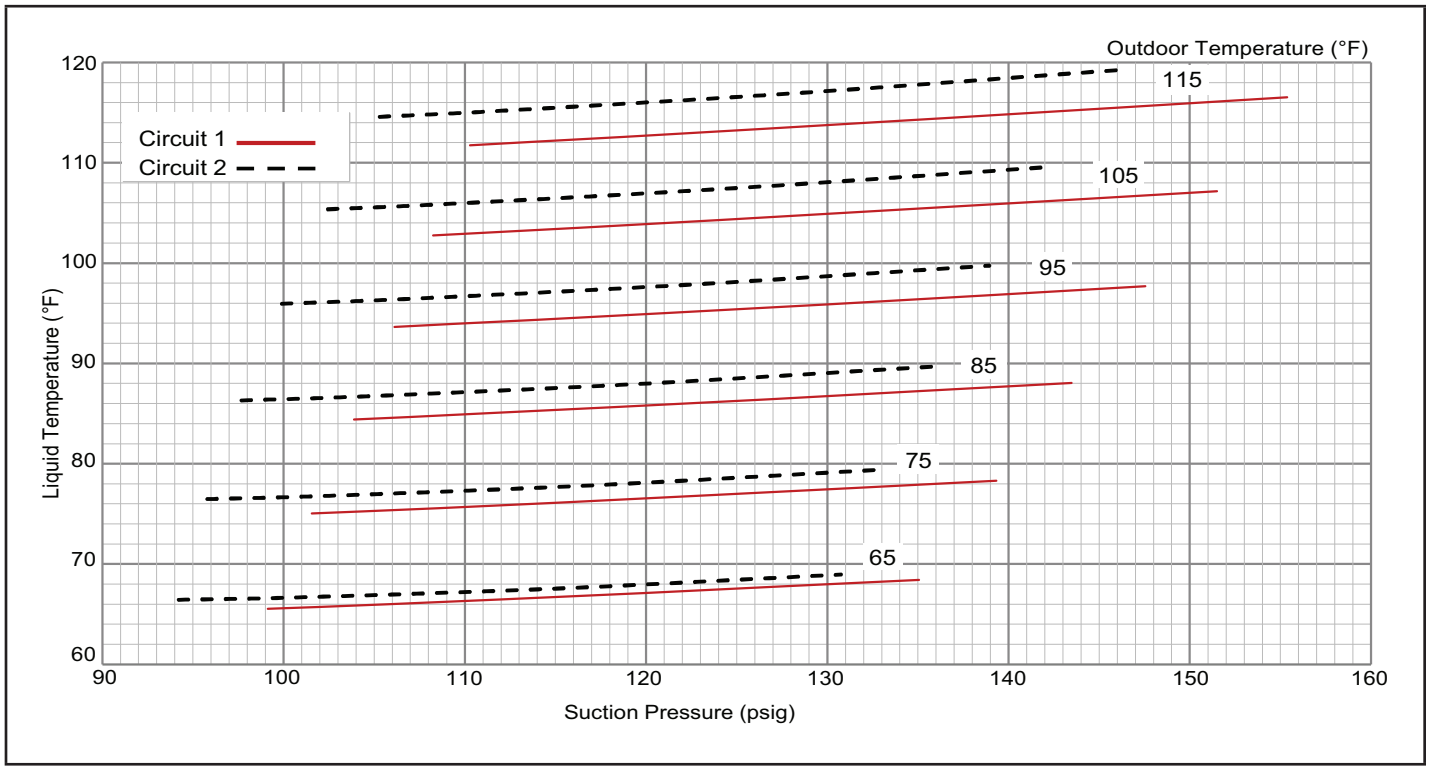
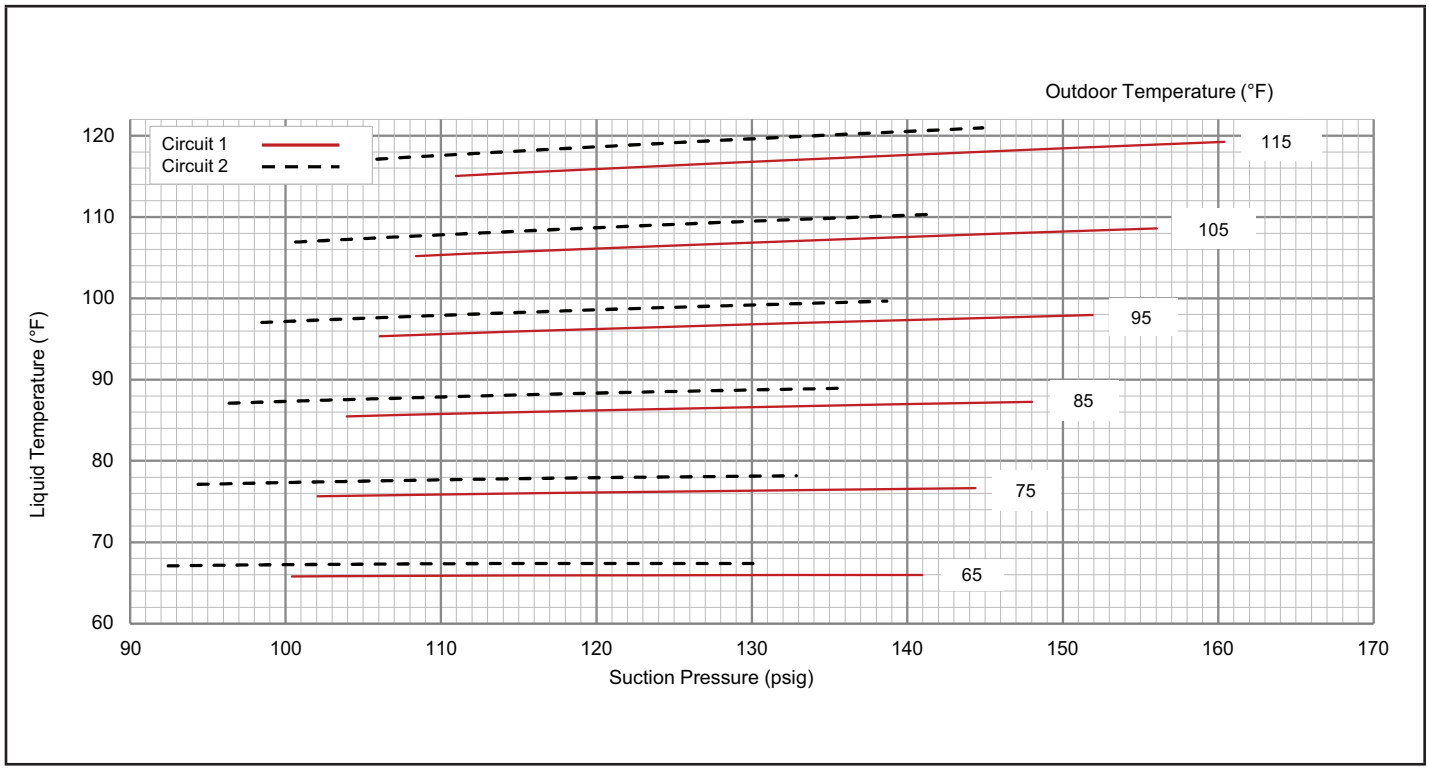


TABLE 16 581248-01
LGM/LCM150U Reheat

	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	253	102	296	104	344	106	399	108	460	111	526
	108	252	110	293	112	340	115	393	117	452	120	516
	124	260	126	297	129	340	133	389	136	444	140	505
	141	278	144	312	148	351	152	397	156	448	160	505
Circuit 2	92	250	94	290	96	337	98	392	101	455	103	524
	100	254	102	293	104	340	106	394	109	456	111	524
	115	264	117	301	120	346	122	398	125	458	128	525
	130	274	133	310	136	353	139	403	142	461	145	526



IV-STARTUP - OPERATION

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

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.

B-Cooling Start-up See FIGURE 18

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.*

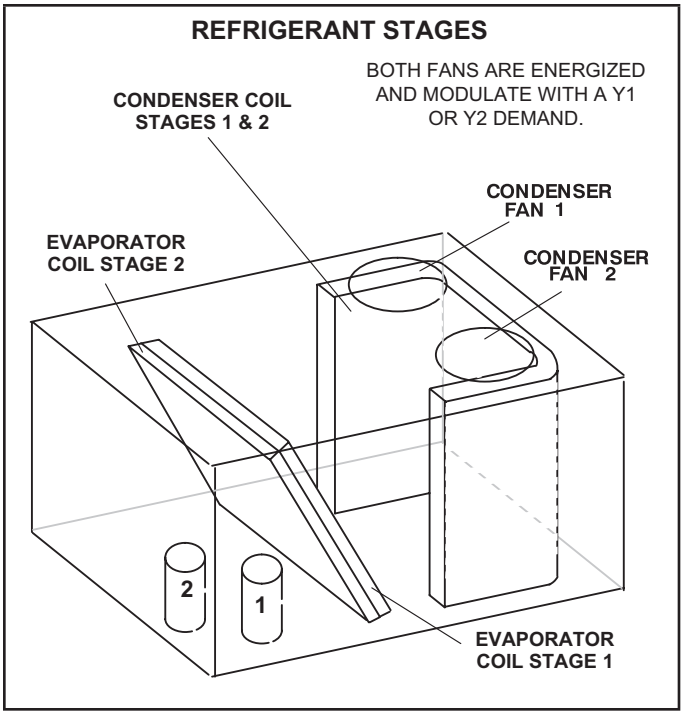


FIGURE 18

VFD Units - Refer to the Supply Air Inverter Start-Up section.

1 - Initiate first and second stage cooling demands according to instructions provided with thermostat or from the mobile service app at the following path:

RTU MENU > SERVICE > COMPONENT TEST > COOLING > COOLING STAGE 1/2/3/4

2 - First-stage and second-stage thermostat demand will energize compressor 1. Compressor 2 will energize as needed to maintain target discharge air temperature.

3 - Each refrigerant circuit is separately charged with refrigerant. See unit rating plate for correct amount of charge.

V- SYSTEMS SERVICE CHECKS

A-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.

VI-ACCESSORIES

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

A-Mounting Frames

When installing units on a combustible surface for down-flow discharge applications, the C1CURB roof mounting frame is used. The roof mounting frames are recommended in all other applications but not required. If the LCM 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. The assembled C1CURB mounting frame is shown in FIGURE 19. 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 20. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

B-Transitions

Optional supply/return transitions C1DIFF30B is available for use with the LCM 7.5 ton units and C1DIFF31B is available for the 8.5 and 10 ton units, utilizing optional C1CURB roof mounting frames. LCM 12.5 ton units will use C1DIFF32B with C1CURB roof mounting frame. Transition must be installed in the C1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

C-C1DAMP Outdoor Air Dampers (all units)

C1DAMP consists of a set of dampers which may be manually C1DAMP10B-2 or motor C1DAMP20B-1 operated to allow up to 25 percent outside air into the system at all times (see FIGURE 21and FIGURE 22). Either air damper can be installed in LCM 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. Produwcts coating no. 418 and is available as Part No. P-8-5069.

D-Supply and Return Diffusers (all units)

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

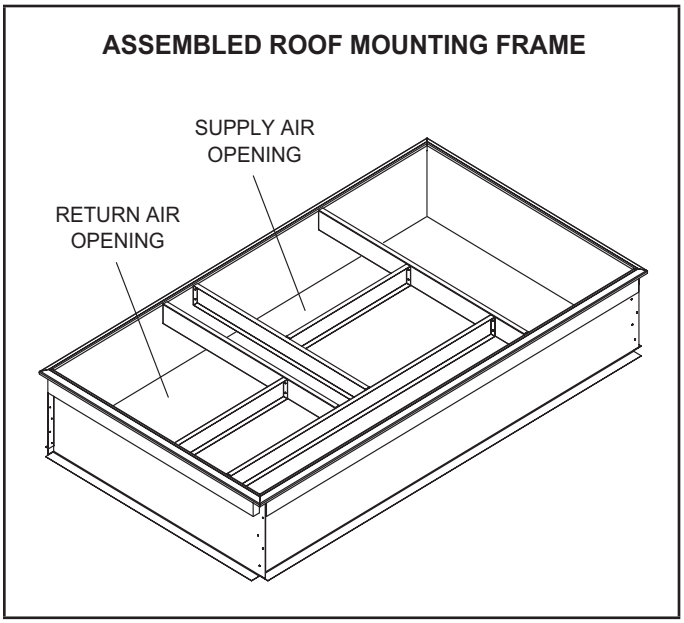


FIGURE 19

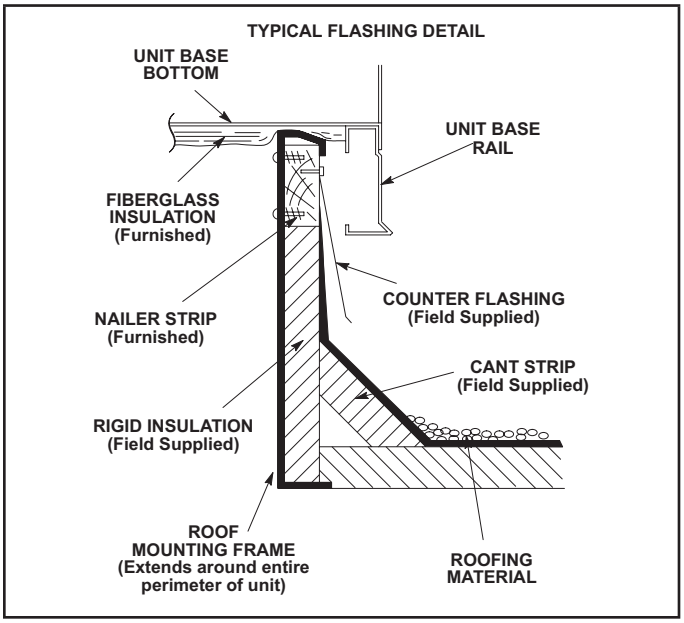


FIGURE 20

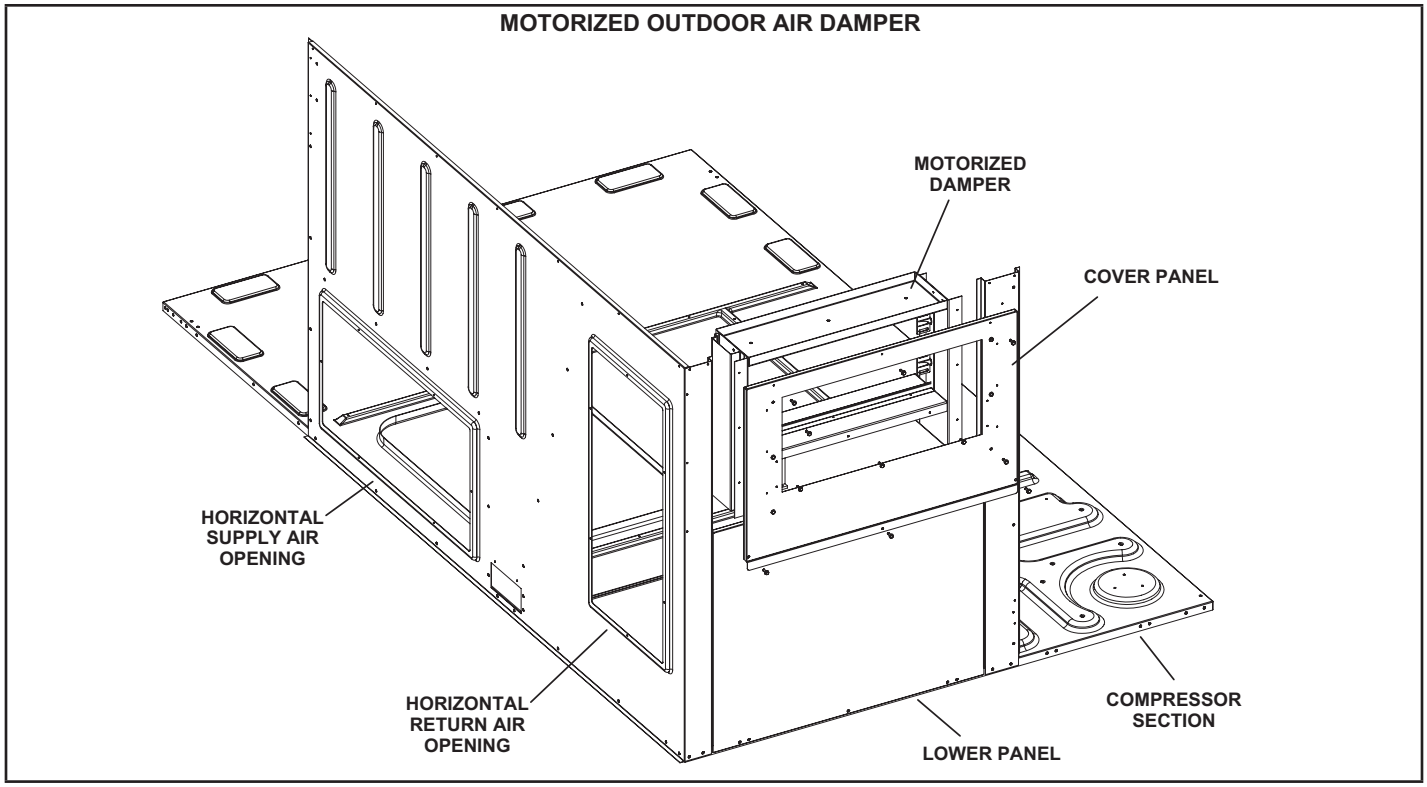


FIGURE 21

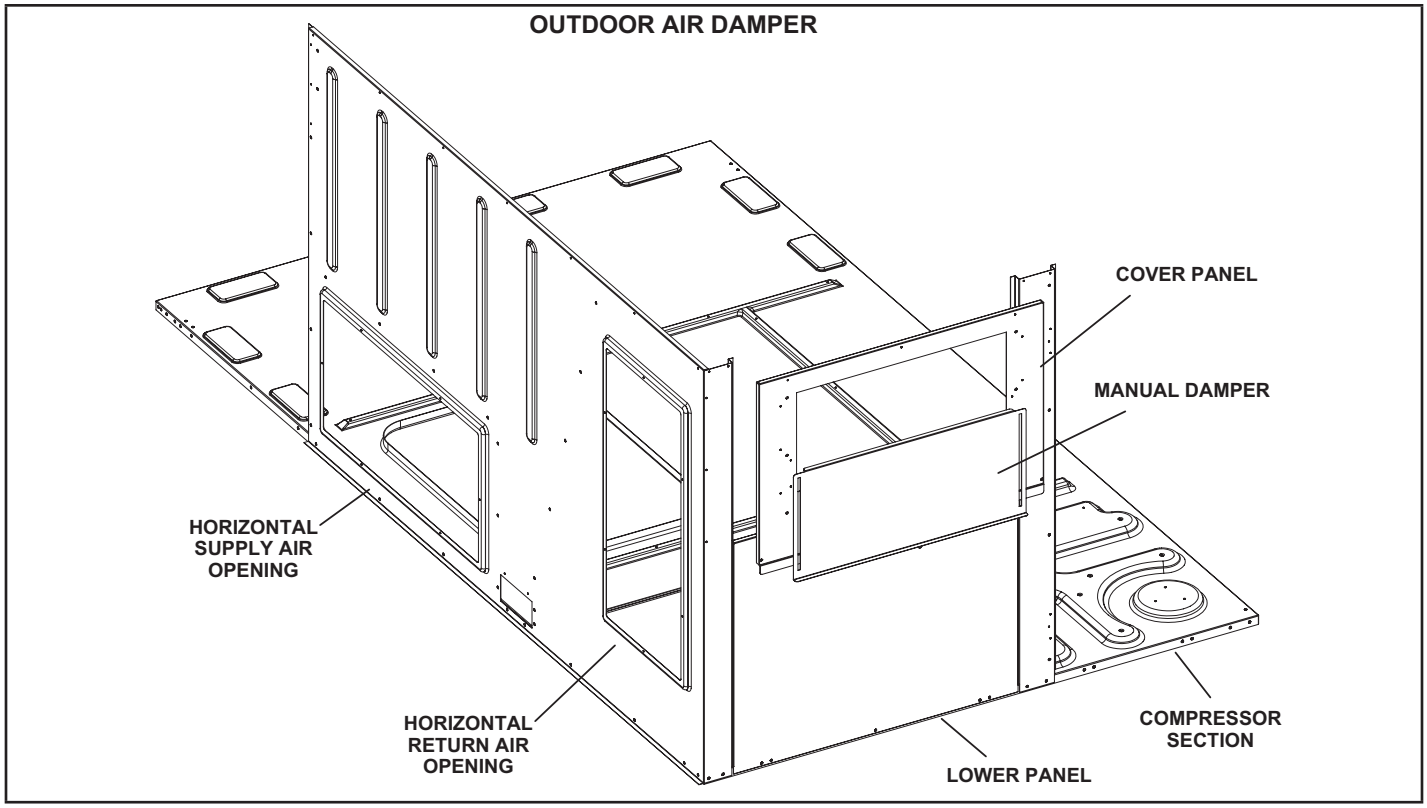


FIGURE 22

E-Economizer E1ECON15 (standard) or E1ECON17 (high performance)

The following is a brief description of standard economizer E1ECON15. For more detail on this or high performance economizer E1ECON17 see economizer installation instruction.

The optional E1ECON15 economizer can be used with downflow and horizontal air discharge applications. See FIGURE 24. The economizer uses outdoor air for free cooling when outdoor temperature and/or humidity is suitable. The economizer is controlled by the A55 Unit Controller.

Free Cooling Mode

The Unit Controller will allow free cooling in one of five modes. Each mode uses different combinations of sensors to determine outdoor air suitability. See TABLE 17 for modes and FIGURE 23 for factory installed sensors. Temperature offset is the default free cooling mode.

NOTE - All free cooling modes of operation will modulate dampers to 55F (13C) supply / discharge air.

Unit Controller Settings

On early versions, switches are located on the Unit Controller to adjust settings. On newer versions, the display and keypad on the Unit Controller are used to navigate through menus to adjust settings. Some versions require a configuration ID be entered to enable the economizer. Refer to economizer installation instructions and Unit Controller installation and application manuals.

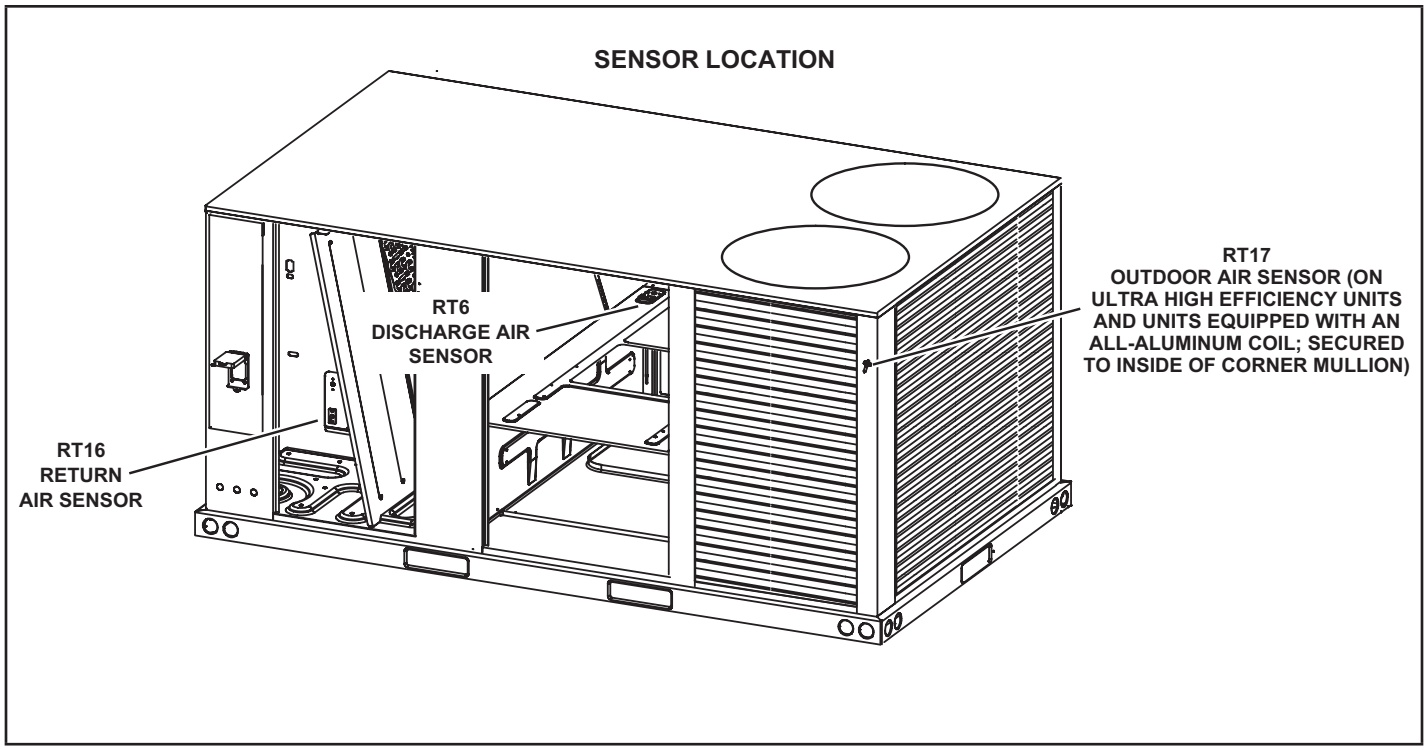


FIGURE 23

TABLE 17

ECONOMIZER MODES AND SETPOINT

Free Cooling Mode	Free Cooling Setpoint	Field-Provided Sensors	Dampers will modulate to 55°F (default, parameter 159) discharge air (RT6) when outdoor air is suitable:	Input Ranges
TEMP	OFFSET	None Needed	Outdoor air temperature (RT17) is less than return air temperature (RT16) by at least the OFFSET value (10°F default; parameter 161).	0 - 40ºF
TEMP	OAT STPT	None Needed	Outdoor air temperature (RT17) is less than the OAT STPT value (75°F default; parameter 160).	41 - 75ºF
Remote	Remote	Energy Management System	Either of the TEMP modes can be used when a network OAS signal is provided by an energy management or building control system, via BACnet, LonTalk, or L Connection. The network can command OAS, NOT OAS, or AUTO. AUTO returns to local control of OAS, which is the selected TEMP mode.	NA
ENTH	DIFF OFFSET	(Two) C7400	Outdoor air enthalpy* (A7) is less than return air enthalpy (A62) by at least the OFFSET value (1mA = 2°F default; parameter 163).	0Ma-4mA
ENTH	ODE STPT	C7400	Outdoor air enthalpy (A7) is less than free cooling setpoint (12mA = 75°F default, parameter 162).	12-19mA
GLOBAL	GLOBAL	24VAC Input Signal	Global input is energized by (P297-9). This setting is also used for outdoor air damper applications. Global input also brings on the blower. (This mode is NOT used when OAS signal is provided via network connection. GLO is only used when a 24VAC signal is used to energize the P297-9 GLO input.)	NA

*Enthalpy includes effects of both temperature and humidity.

**Energy management systems may require additional field-provided sensors; refer to manufacturer's instructions.

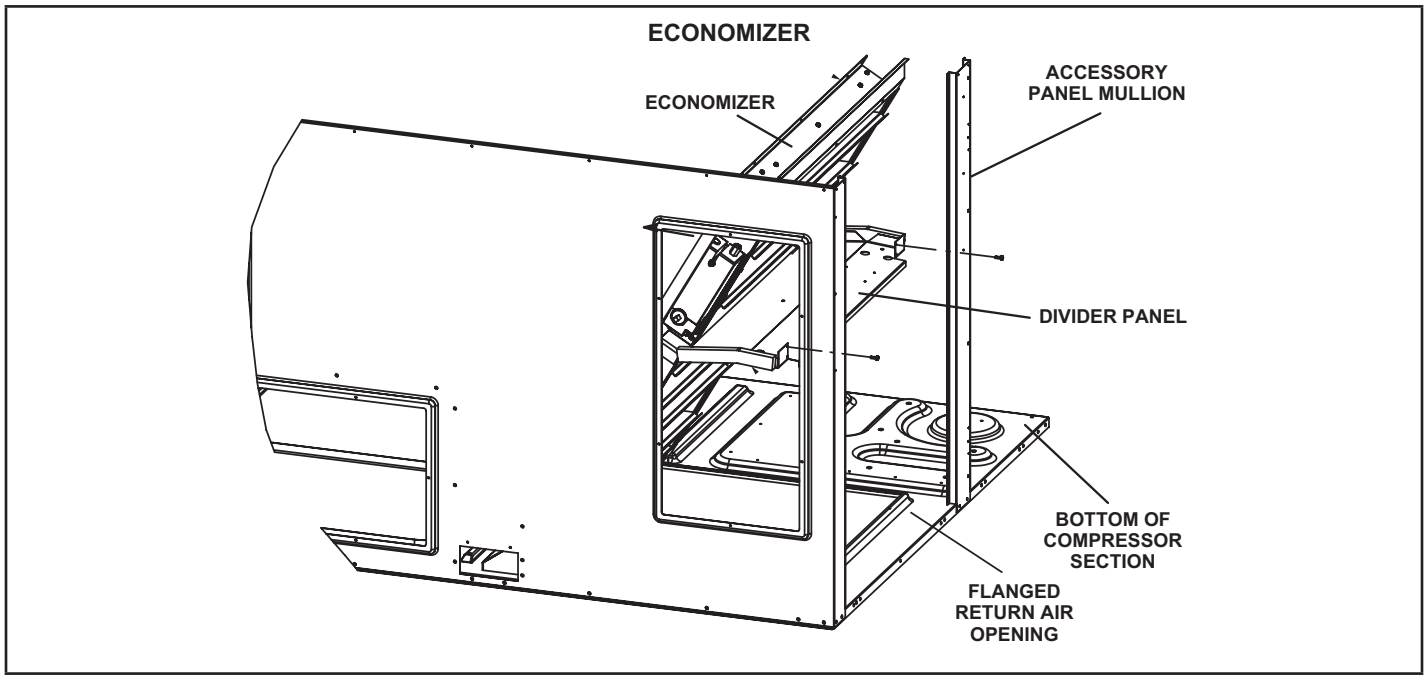


FIGURE 24

F-Gravity Exhaust Dampers

LAGEDH03/15 dampers (FIGURE 25) are used in downflow and horizontal air discharge applications. Horizontal 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 LCM units.

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.

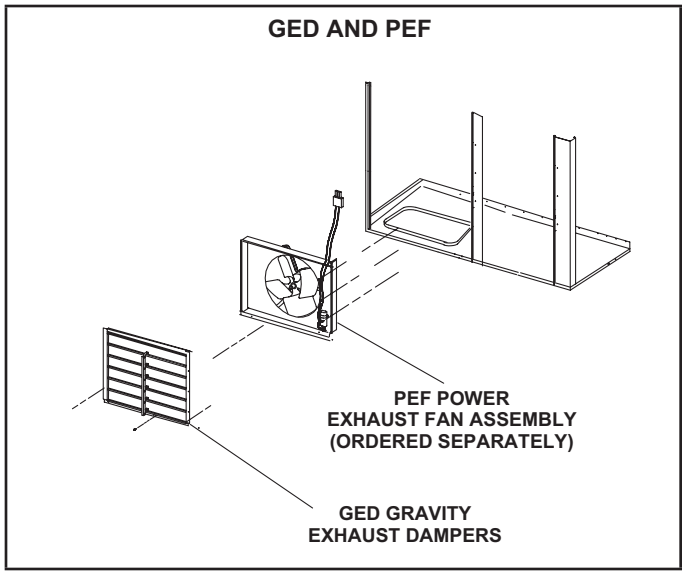


FIGURE 25

G-LAPEF Power Exhaust Fans

Power exhaust fans are used in downflow applications only. Fan requires optional down flow gravity exhaust dampers and economizer. Power exhaust fans provide exhaust air pressure relief and also run when return air dampers are closed and supply air blowers are operating. FIGURE 26 shows the location of the LAPEF. See installationinstructions for more detail.

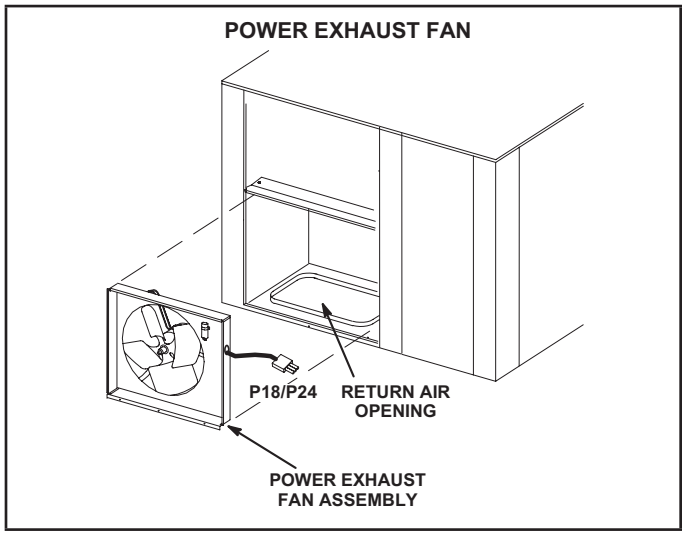


FIGURE 26

H-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 daisychained 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.

I-Smoke Detectors A17 and A64

Photoelectric smoke detectors are a factory installed option. The smoke detectors can be installed in the supply air section (A64), return air section (A17), or in both the supply and return air section. Wiring for the smoke detectors are shown on the temperature control section (C2) wiring diagram in back of this manual.

J-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 .14” W.C. (34.9 Pa) The switch is mounted on the upper left hand corner of the blower deck. Wiring for the blower proving switch is shown on the temperature control section (C2) wiring diagram in back of this manual.

K-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. (248.6 Pa) The switch is mounted on the top filter channel corner. Wiring for the dirty filter switch is shown on the temperature control section (C2) wiring diagram in back of this manual.

L-Drain Pan Overflow Switch S149 (optional)

The overflow switch is used to interrupt cooling operation when excessive condensate collects in the drain pan. The N.O. overflow switch is controlled by K220 and DL46 relays, located in the unit control panel. When the overflow switch closes, 24VAC power is interrupted and after a fivesecond delay unit compressors are de-energized. Once the condensate level drops below the set level, the switch will open. After a five-minute delay the compressor will be energized.

P-Factory Installed-Hot Gas Reheat (optional)

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 valve, L14, routes 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. See FIGURE 27 for reheat refrigerant routing and FIGURE 28 for standard cooling refrigerant routing.

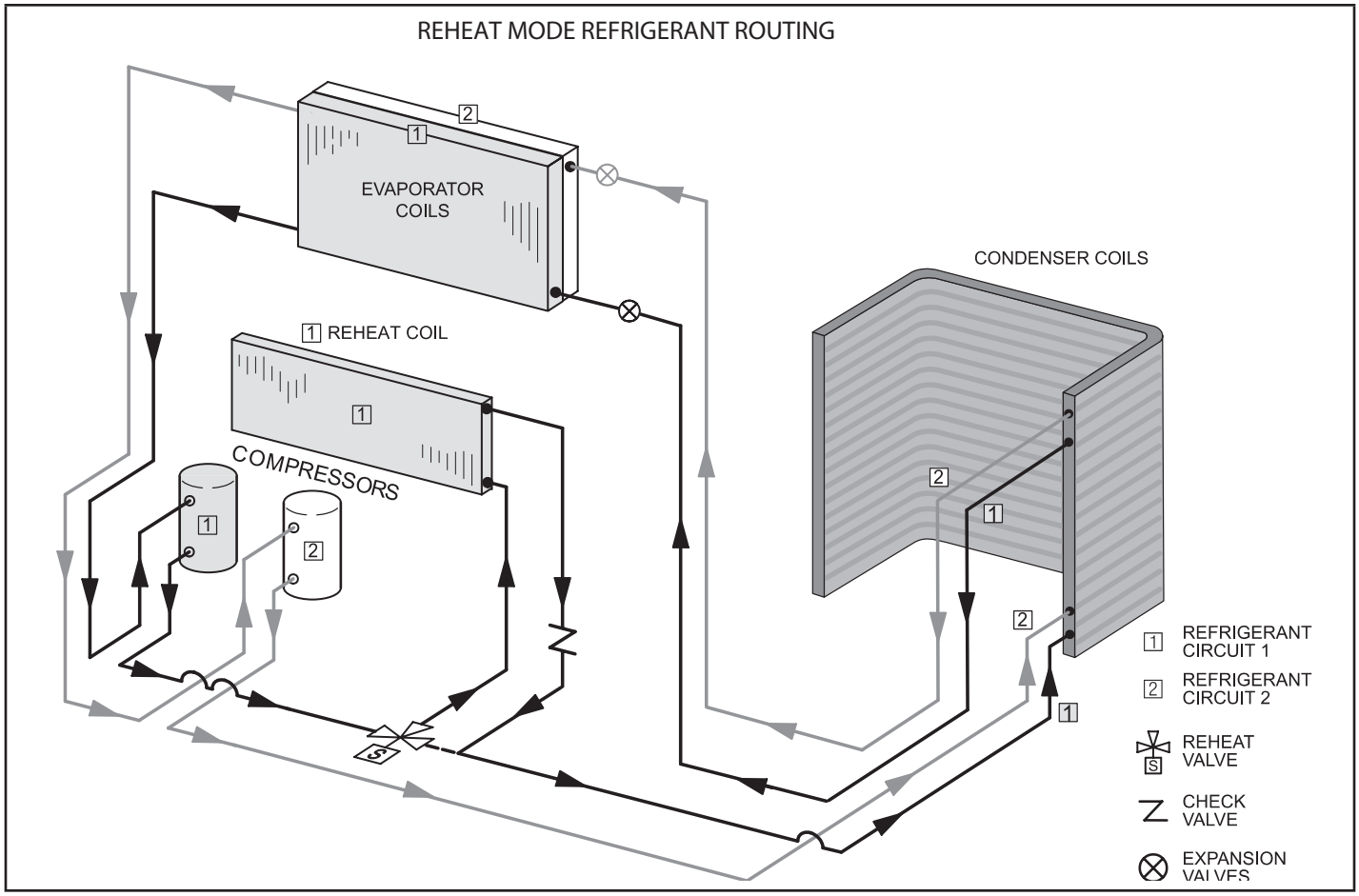


FIGURE 27

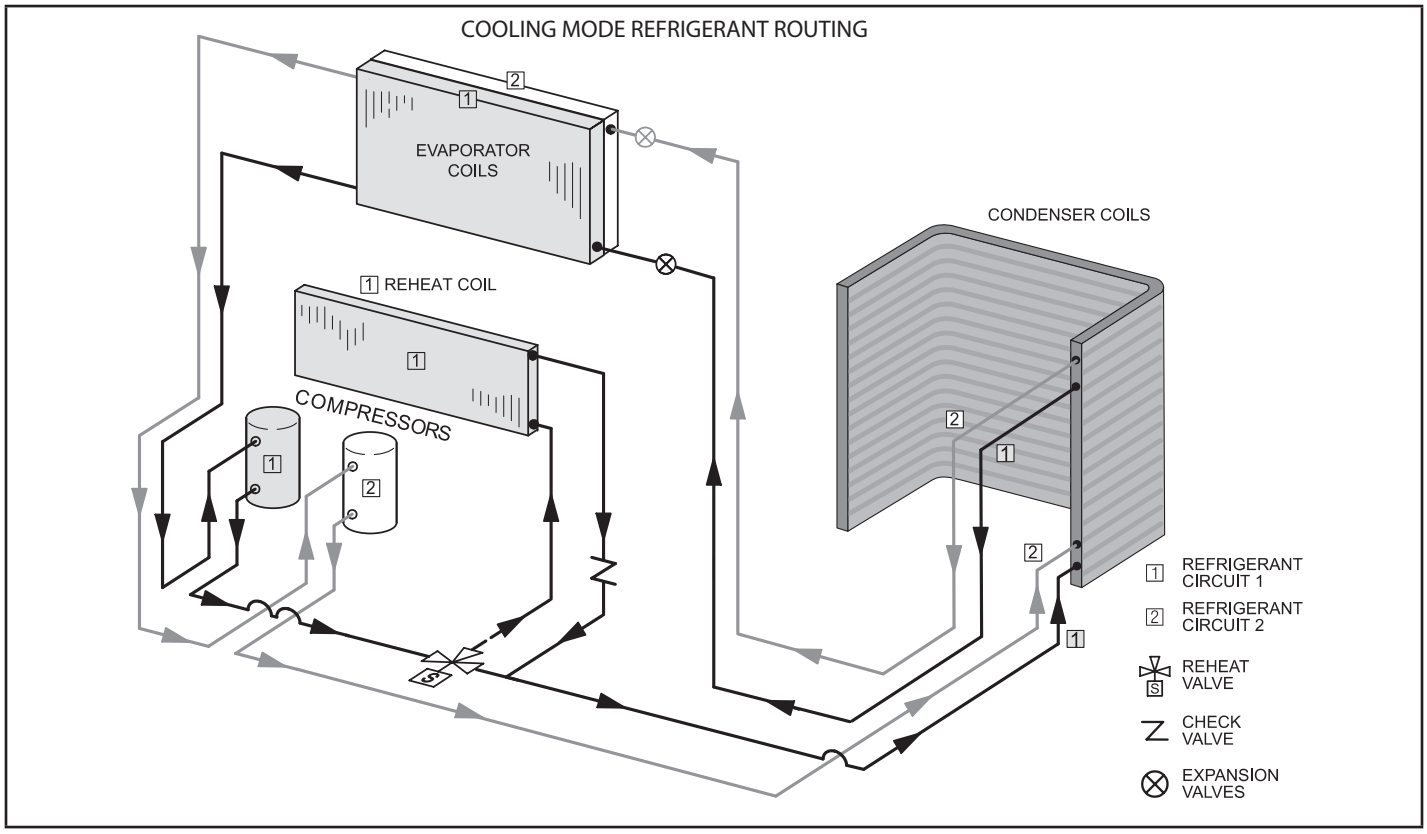


FIGURE 28

L14 Reheat Coil Solenoid Valve

When Unit Controller input (Unit Controller J298-5 or J299-8) indicates room conditions require dehumidification, L14 reheat valve is energized (Unit Controller P394-1) 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 Unit Controller 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.

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 - Select Unit Controller *Service - Test.*

The blower and compressor 1 (reheat) should be operating. Reheat mode will be appear on the Unit Controller display.

4 - Deselect Unit Controller *Service - Test*.

Compressor 1 (reheat) and blower should de-energize.

Default Reheat Operation

TABLE 18
Reheat Operation - Two Cooling Stages - Default

T'stat and Humidity Demands	Operation
Reheat Only	Compressor 1 Reheat
Reheat & Y1	Compressor 1 & 2 Enhanced Dehumidification at Low CFM
Reheat & Y1 & Y2	Compressor 1 & 2 Enhanced Dehumidification at High CFM

*If there is no reheat demand and outdoor air is suitable, free cooling will operate.

**If there is no reheat demand and outdoor air is suitable, free cooling and compressor 1 will operate.

VII-MAINTENANCE

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

⚠ WARNING

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

⚠ IMPORTANT

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

⚠ WARNING

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

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

- All work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i. e. non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, the appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.

A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

- Where electrical components are being changed, service technicians shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's

technical department for assistance. The following checks shall be applied to installations using 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 constructed 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.

VIII-Direct Drive Supply Air Inverter

If a test and balance contractor has not commissioned the unit, use this section to set supply air CFM.

A-Set Blower Speed

1 - Use TABLE 19 to fill in field-provided, design specified blower CFM.

TABLE 19

Blower CFM Design Specifications

Blower Speed	Design Specified CFM
Heating	
Cooling High	
Cooling Low	
Ventilation	

2 - Use the following menu to enter the blower design specified CFM into the Unit Controller. ***Don't press "SAVE" until all CFM are entered.*** Make sure blower CFM is within limitations shown in TABLE 20. Refer to the Unit Controller manual provided with unit.

SETUP > TEST & BALANCE > BLOWER

3 - Once all four speeds are entered, the target (highest of the heating and cooling settings) CFM and default RPM will be displayed.

Note - *When units are not equipped with heat, the Blower Heat speed will not be displayed. Blower Cooling High will be the first blower speed to appear.*

4 - Measure the static pressure as shown in the Blower Start-Up section. Use the static pressure, target CFM and blower tables to determine the RPM needed. Values in the blower table reflect the static pressures taken in locations shown in FIGURE 13.

5 - Enter the RPM and repeat the previous step until the design CFM is reached.

6 - Press SAVE followed by MAIN MENU.

Note - *Once the CFM settings are saved, the Unit Controller will set all other blower CFM.*

B-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 dampers to "Min OCP Blwr Low" when blower CFM is BELOW a "midpoint" CFM. 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 calculate the "midpoint" CFM.

Set Minimum Position 1

Use the following 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 bring on the corresponding blower speed and allow damper position adjustment.

SETTINGS > RTU Options > EDIT PARAMETER > ENTER DATA ID - 9 > MIN DAMPER LOW BLOWER = X.X %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 same menu in the Unit Controller to set "Min OCP Blwr High" for the blower CFM above the "midpoint" CFM. When navigating into this menu, the Unit Controller will bring on the corresponding blower speed and allow damper position adjustment.

SETTINGS > RTU OPTIONS > DAMPER > MIN

DAMPER POSITION BLOWER ON HIGH = X.X %

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.

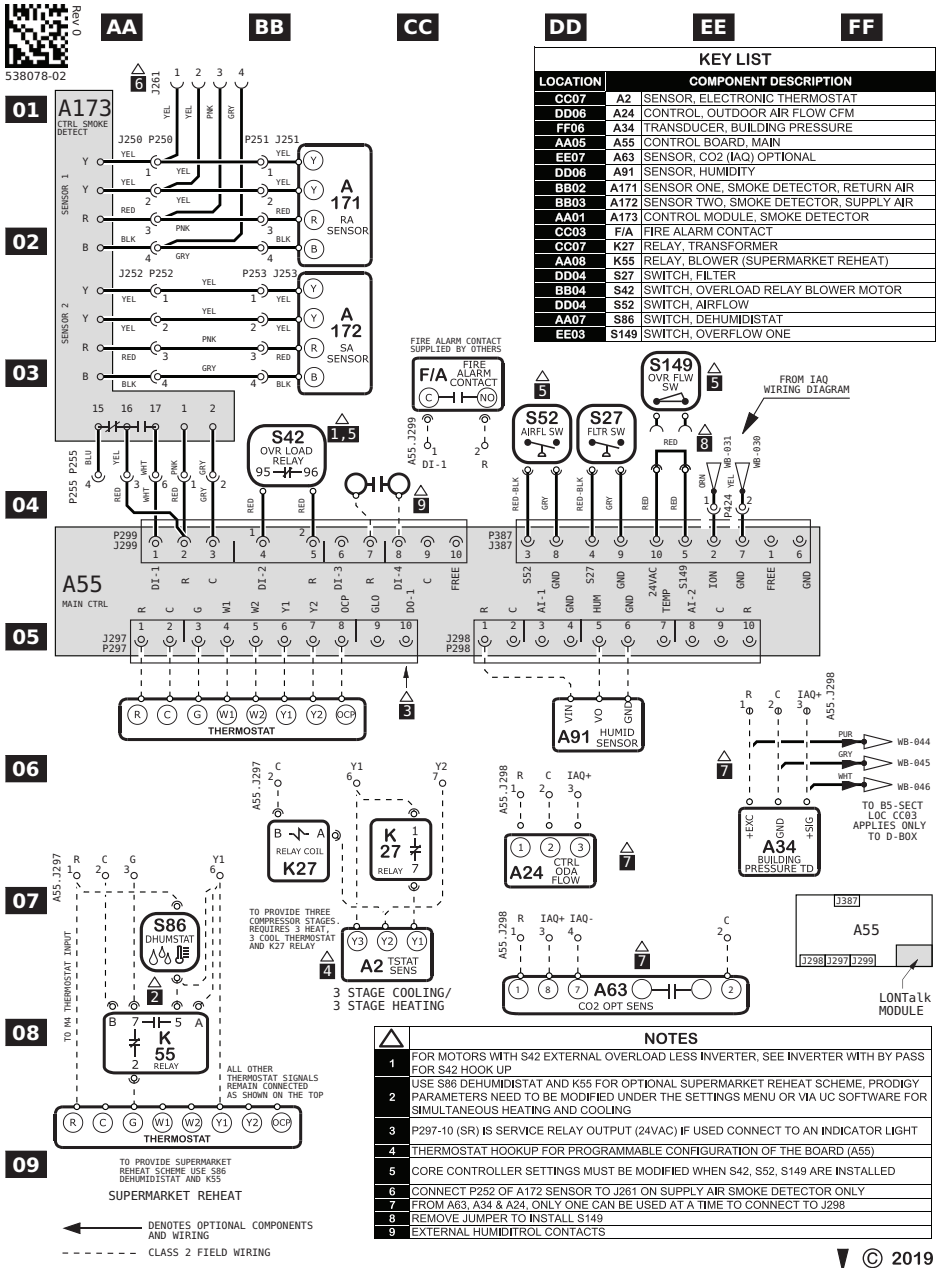
Note - *Intake air CFM can also be determined using the outdoor air temperature, return air temperature and mixed air temperature. Refer to the economizer or outdoor air damper installation instructions.*

TABLE 20

MINIMUM AND MAXIMUM CFM

Electric Heat Minimum CFM		
Unit	Heat Size (kw)	Aitflow CFM
LCM092, 102	7.5	1750
LCM092, 102	0,15, 22.5, 30, 45	2750
LCM120, 150	15, 22.5, 30, 45	2750
LCM120, 150	0, 60	3500
Cooling Low Minimum CFM		
Unit	Blower Speed	Airflow CFM
LCM092-150	Low	800
Cooling High Minimum CFM - 250 CFM/ton		
Unit	Blower Speed	Airflow CFM
LCM092	High	1875
LCM102	High	2125
LCM120	High	2500
LCM150	High	3125
Smoke and Ventilation Minimum CFM - 150 CFM/ton		
Unit	Not Applicable	Airflow CFM
LCM092	NA	1125
LCM102	NA	1275
LCM120	NA	1500
LCM150	NA	1875
Heating and Cooling Maximum CFM - 480 CFM/ton		
Unit	Blower Speed	Airflow CFM
LCM092	High	3600
LCM102	High	4075
LCM120	High	4800
LCM150	High	6000

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

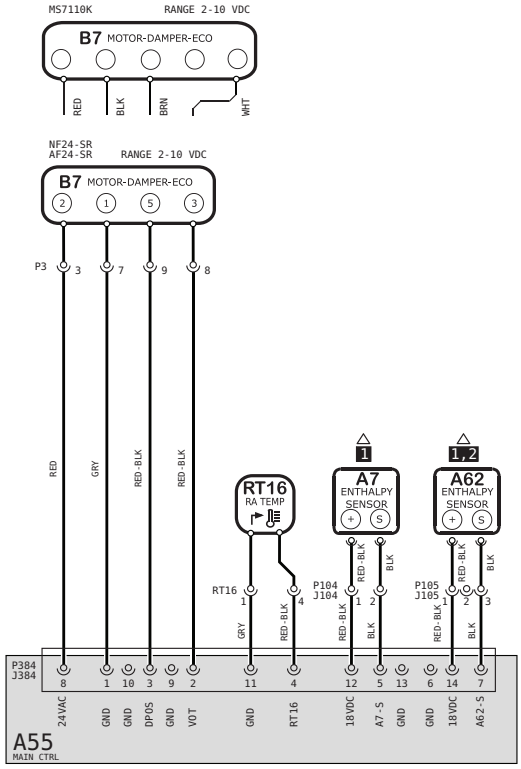
ECONOMIZER

Rev 2

538072-01

AA BB CC DD

01 02 03 04 05 06 07 08 09



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

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

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

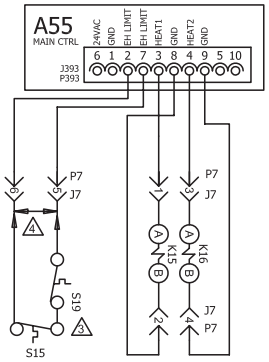
5x10 CUT SIZE

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

EHA 7.5-60 - G & J VOLT

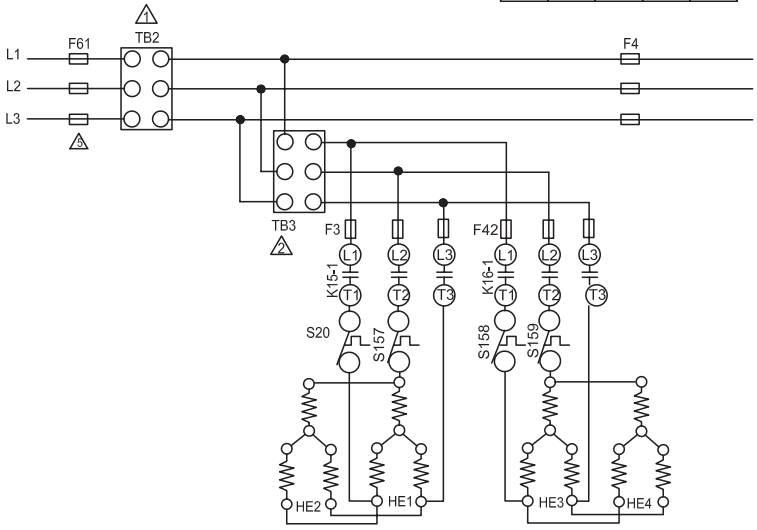
J/P	JACK/PLUG DESCRIPTION
7	ELECTRIC HEAT SUB BASE KIT
271	HEATING SENSORS STG 1

KEY	DESCRIPTION
A55	PANEL MAIN
F3	FUSE, ELECTRIC HEAT 1
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 2
F43	FUSE, ELECTRIC HEAT 3 ,4
F44	FUSE, ELECTRIC HEAT 5
F61	FUSE, UNIT - SCCR
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
HE6	ELEMENT, ELECTRIC HEAT 6
K15-1	CONTACTOR, ELECTRIC HEAT 1, 2
K16-1	CONTACTOR, ELECTRIC HEAT 3, 4
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S19	THERMOSTAT, ELECTRIC HEAT LIMIT
S20	SWITCH, LIMIT SECONDARY ELEC. HEAT 1 (NO RESET)
S157	SWITCH, LIMIT SECONDARY ELEC. HEAT 2 (NO RESET)
S158	SWITCH, LIMIT SECONDARY ELEC. HEAT 3 (NO RESET)
S159	SWITCH, LIMIT SECONDARY ELEC. HEAT 4 (NO RESET)
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRC HEAT



G, J VOLT UNITS

KW	HE1	HE2	HE3	HE4
7.5	7.5			
15	15			
22.5	15		7.5	
30	15		15	
45	15		15	15
60	15	15	15	15

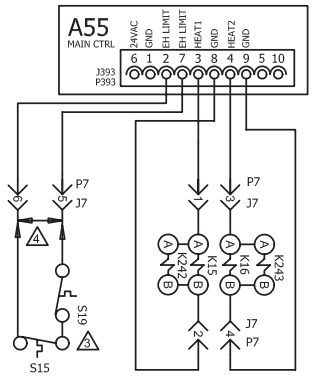


1. TB2,S48 OR CB10 MAY BE USED
2. TB3 IS USED ON SOME UNITS
3. S19 IS USED ON HEAT PUMP APPLICATIONS ONLY
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLATING ELECTRIC HEAT
5. F61 USED ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS

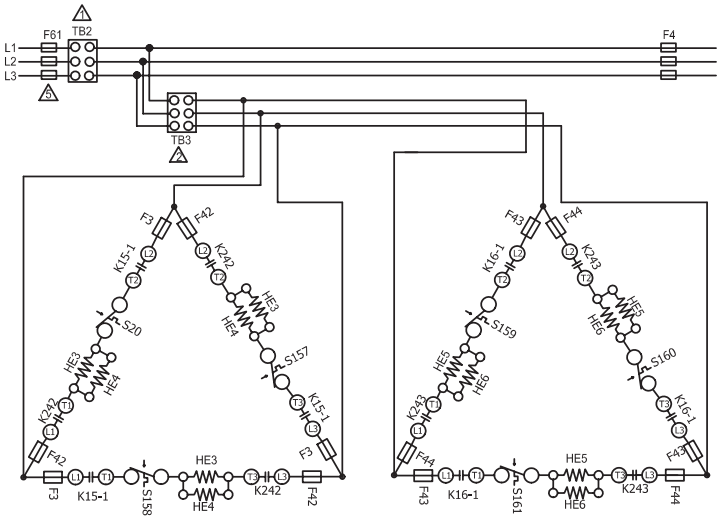
2021/09	WIRING DIAGRAM 538121-02	9/21
HEATING-ELECTRIC		
7.5, 15, 22.5, 30, 45, 60 - G, J		
SECTION A		REV. 0
Supersedes 538121-01	New Form No. 538121-02	

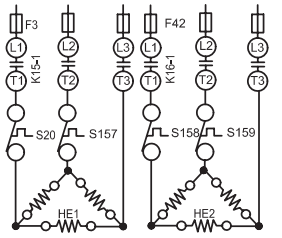
ELECTRIC HEAT FOR LCM092/150 Y Volt-



KEY	DESCRIPTION
A55	PANEL MAIN
F3	FUSE, ELECTRIC HEAT 1
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 2
F43	FUSE, ELECTRIC HEAT 3 ,4
F44	FUSE, ELECTRIC HEAT 5
F61	FUSE, UNIT - SCCR
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
HE6	ELEMENT, ELECTRIC HEAT 6
K15-1	CONTACTOR, ELECTRIC HEAT 1, 2
K16-1	CONTACTOR, ELECTRIC HEAT 3, 4
K242-1	CONTACTOR, ELECTRIC HEAT 1
K243-1	CONTACTOR, ELECTRIC HEAT 2
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S19	THERMOSTAT, ELECTRIC HEAT LIMIT
S20	SWITCH, LIMIT SECONDARY ELEC. HEAT 1 (NO RESET)
S157	SWITCH, LIMIT SECONDARY ELEC. HEAT 2 (NO RESET)
S158	SWITCH, LIMIT SECONDARY ELEC. HEAT 3 (NO RESET)
S159	SWITCH, LIMIT SECONDARY ELEC. HEAT 4 (NO RESET)
S160	SWITCH, LIMIT SECONDARY ELEC. HEAT 5 (NO RESET)
S161	SWITCH, LIMIT SECONDARY ELEC. HEAT 6 (NO RESET)
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRC HEAT

J/P	JACK/PLUG DESCRIPTION
7	ELECTRIC HEAT SUB BASE KIT





1. TB2,S48 OR CB10 MAY BE USED
2. TB3 IS USED ON SOME UNITS
3. S19 IS USED ON HEAT PUMP APPLICATIONS ONLY
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
5. F61 USED ON UNITS WITH SCCR OPTION

DENOTES OPTIONAL COMPONENTS

KW	HE1	HE2	HE3	HE4	HE5	HE6
7.5	7.5					
15	15					
22.5	15	7.5				
30	15	15				
45	15				15	15
60			15	15	15	15

2020/10	WIRING DIAGRAM 538120-01	10/20
HEATING - ELECTRIC		
ELECTRIC HEAT 7.5, 15, 22.5, 30, 45, 60 - Y		
SECTION A		REV 0
Supersedes	New Form No. 538120-01	

SEQUENCE OF OPERATION EHA7.5, 15, 22.5, 30, 45, 60 kW - G, J and Y

G and J Voltage

1 - Terminal strip TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1, HE2, HE3 and HE4. HE1 and HE2 elements are protected by F3 and HE3 and HE4 elements are protected by fuse F42.

First Stage Heat:

2 - Heating demand initiates at W1 in the thermostat.

3 - 24VAC is routed through A55 Unit Controller. A55 proves N.C. primary limit S15, proves N.C. limit S19 (heat pumps only), then energizes contactor K15.

4 - N.O. K15-1 contacts close energizing HE1 and HE2

Second Stage Heat:

5 - With first stage heat operating, an additional heating demand initiates W2 in the thermostat.

6 - A second stage heating demand is received by A55 control module.

7 - A55 energizes contactor K16.

8 - N.O. K16-1 contacts close energizing HE3 and HE4.

Y Voltage

1 - Terminal strip TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1, HE2, HE3, HE4, HE5 and HE6.

First Stage Heat:

2 - ***2 7.5 - 45 KW*** - Heating demand initiates at W1 in the thermostat.

3 - 24VAC is routed through A55 Unit Controller. After A55 proves N.C. primary limit S157, contactor K242 is energized.

4 - N.O. K15 contacts close energizing HE1.

5 - ***60KW -*** Heating demand initiates at W1 in the thermostat.

6 - 24VAC is routed through A55 Unit Controller. After A55 proves N.C. primary limit S157, contactor K242 is energized.

7 - N.O. K242 contacts close energizing HE3 and HE4.

Second Stage Heat:

8 - ***22.5 - 45 KW*** - With first stage heat operating, an additional heating demand initiates W2 in the thermostat.

9 - A second stage heating demand is received by A55 control module. After A55 proves N.C. primary limit S58 and S159, contactor K16 is energized.

10 - N.O. K16 contacts close energizing HE2 (22.5 and 30KW units only) and HE5 and HE6 (45 KW units only).

11 - ***60KW -*** With first stage heat operating, an additional heating demand initiates W2 in the thermostat.

12 - A second stage heating demand is received by A55 control module. After A55 proves N.C. primary limit S160 and S161, contactor K16 is energized.

13 - N.O. K16 contacts close energizing HE5 and HE6.

SEQUENCE OF OPERATION LCM092U-150U

Power:

1 - Line voltage through the TB13 terminal block powers the T1 transformer. T1 provides 24VAC power to A55 Unit Controller which provides 24VAC to the unit cooling, heating and blower controls.

2 - Line voltage is also routed to compressor crankcase heaters, compressor contactors, supply air inverter control, condenser fan relays and exhaust fan relays.

Blower Operation:

Refer to Direct Drive blower diagram and sequence of operation.

Economizer Operation:

3 - A55 receives a demand and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).

4 - N.O. K65-1 and N.O. K65-2 both close, energizing exhaust fan motor B10.

Cooling Operation:

1 - After A55 proves N.C. low pressure switch S87 and N.C. high pressure switch S4, compressor contactor K1 is energized. K1 contactor energizes FL1 filter board, T61 transformer, and A192 compressor inverter. A192 compressor inverter powers compressor B1. A55 varies the operating hz of compressor B1 based on Y1/Y2 thermostat inputs and RT42, RT44, RT46, and RT48 temperature sensors.

2 - After proving N.C. low pressure switch S88 and N.C. high pressure switch S7, A55 stages compressor B2 on/off as needed based on Y1/Y2 thermostat inputs and RT43, RT45, RT47, and RT49 temperature sensors by energizing/deenergizing K2.

3 - Both condenser fans B4 and B5 operate when one or both compressors are operating. B4 and B5 modulate RPM to follow B1+B2 compressor load.

DIRECT DRIVE BLOWER SEQUENCE OF OPERATION / TROUBLESHOOTING

Blower Operation:

1 - Line voltage is routed to B3 blower motor through TB2 terminal strip, TB13 terminal strip, and J/P48 terminals 1, 2 and 3.

2 - B3 blower motor runs internal diagnostics to check for proper temperature, voltage, etc. (KL2-2 and -3). This process takes approximately 10 seconds. Refer to the Failure Handling/Troubleshooting section.

3 - A55 Unit Controller receives a thermostat demand. After A55 proves (P259-7 and -6) that B3 blower motor internal relay (KL2-2 and -3) is closed, B3 blower motor is energized (0-10VDC from P259-4 to KL3-4). B3 blower motor controls are grounded through KL2-2 and -3 to A55 P259-6.

4 - If configured, A55 checks S52 blower proving switch to make sure it closes within 16 seconds of the 0-10VCD signal being sent to B3 blower motor.

Blower Fault Sequence Direct Drive Motor - No S52:

1 - Line voltage is provided to B3 blower motor.

2 - After 10 seconds, the B3 blower motor internal relay does not close.

3 - Alarm 186 is set by the A55 Unit Controller, de-energizing unit. If one of the “Error” failures listed in table NO TAG occurs (“Warning” failures will not set Alarm 186), service is required. Refer to the Failure Handling/Troubleshooting section.

4 - If B3 blower motor internal relay closes continue to next step.

5 - A55 sends 0-10VDC signal to B3 blower motor.

6 - During B3 blower motor operation, the internal motor relay opens.

7 - Alarm 186 is set by A55 and de-energizes the unit. Service is required. Refer to the Failure Handling/Troubleshooting section.

Blower Fault Sequence Direct Drive Motor - With S52 (If Configured):

1 - A55 Unit Controller sends 0-10VDC signal to B3 blower motor.

2 - After 16 seconds, if S52 blower proving switch remains open, A55 will remove 0-10VDC signal for 5 minutes.

3 - A55 sends 0-10VDC signal to B3 blower motor.

4 - After 16 seconds, if S52 blower proving switch remains open, A55 will remove 0-10VDC signal for another 5 minutes.

5 - After the third try, A55 will de-energize the unit. Service is required.

Failure Handling/Troubleshooting:

1 - Follow table 7 to troubleshoot possible failures that would cause Alarm 186 to set.

2 - BEFORE DETERMINING THAT THE BLOWER ASSEMBLY HAS FAILED, use the A55 Unit Controller to clear delays and operate the blower.

3 - Main Menu > Service > Offline > Clear Delays > Yes > Save

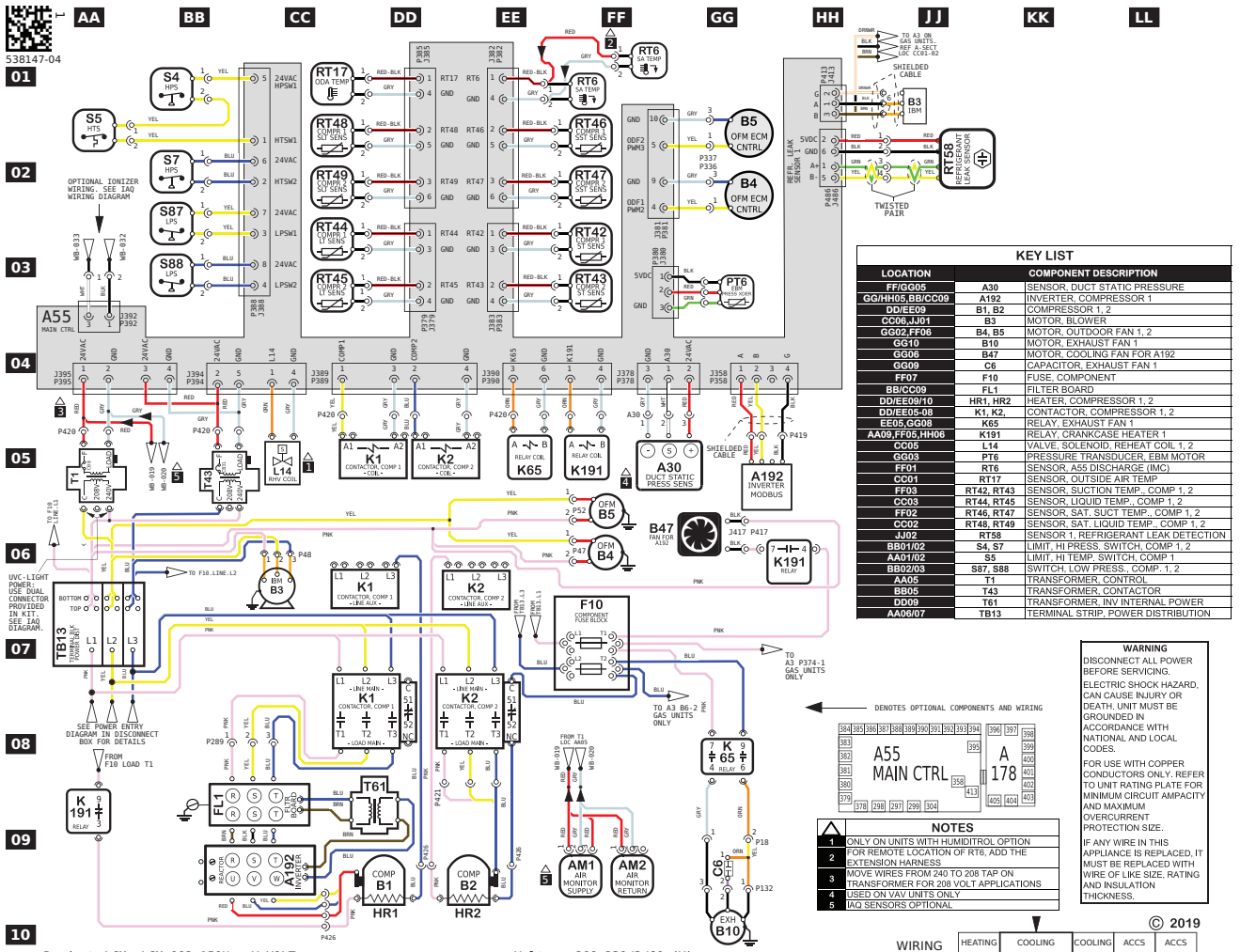
4 - Main Menu > Service > Test > Blower

5 - Observe if the blower operates or if Alarm 186 sets again.

6 - If blower does not operate and Alarm 186 is set again, blower assembly must be replaced.

7 - If blower assembly does operate, wait a minimum of 30 minutes to ensure Alarm 186 is not set again.

LCM092-150 Y VOLT DIAGRAM



KEY LIST

LOCATION	COMPONENT DESCRIPTION	
FF/GG05	A30	SENSOR, DUCT STATIC PRESSURE
GG/HH05,BB/CC09	A192	INVERTER, COMPRESSOR 1
DD/EE09	B1, B2	COMPRESSOR 1, 2
CC06,JJ01	B3	MOTOR, BLOWER
GG02,FF06	B4, B5	MOTOR, OUTDOOR FAN 1, 2
GG10	B10	MOTOR, EXHAUST FAN 1
GG06	B47	MOTOR, COOLING FAN FOR A192
GG09	C6	CAPACITOR, EXHAUST FAN 1
FF07	F10	FUSE, COMPONENT
BB/CC09	FL1	FILTER BOARD
DD/EE09/10	HR1, HR2	HEATER, COMPRESSOR 1, 2
DD/EE05-08	K1, K2,	CONTACTOR, COMPRESSOR 1, 2
EE05,GG08	K65	RELAY, EXHAUST FAN 1
AA09,FF05,HH06	K191	RELAY, CRANKCASE HEATER 1
CC05	L14	VALVE, SOLENOID, REHEAT COIL 1, 2
GG03	PT6	PRESSURE TRANSDUCER, EBM MOTOR
FF01	RT6	SENSOR, A55 DISCHARGE (IMC)
CC01	RT17	SENSOR, OUTSIDE AIR TEMP
FF03	RT42, RT43	SENSOR, SUCTION TEMP., COMP 1, 2
CC03	RT44, RT45	SENSOR, LIQUID TEMP., COMP 1, 2
FF02	RT46, RT47	SENSOR, SAT. SUCT TEMP., COMP 1, 2
CC02	RT48, RT49	SENSOR, SAT. LIQUID TEMP., COMP 1, 2
JJ02	RT58	SENSOR 1, REFRIGERANT LEAK DETECTION
BB01/02	S4, S7	LIMIT, HI PRESS. SWITCH, COMP 1, 2
AA01/02	S5	LIMIT, HI TEMP. SWITCH, COMP 1
BB02/03	S87, S88	SWITCH, LOW PRESS., COMP. 1, 2
AA05	T1	TRANSFORMER, CONTROL
BB05	T43	TRANSFORMER, CONTACTOR
DD09	T61	TRANSFORMER, INV INTERNAL POWER
AA06/07	TB13	TERMINAL STRIP, POWER DISTRIBUTION

NOTES

1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	FOR REMOTE LOCATION OF RT6, ADD THE EXTENSION HARNESS
3	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
4	USED ON VAV UNITS ONLY
5	IAQ SENSORS OPTIONAL

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.

WIRING DIAGRAM FLOW

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

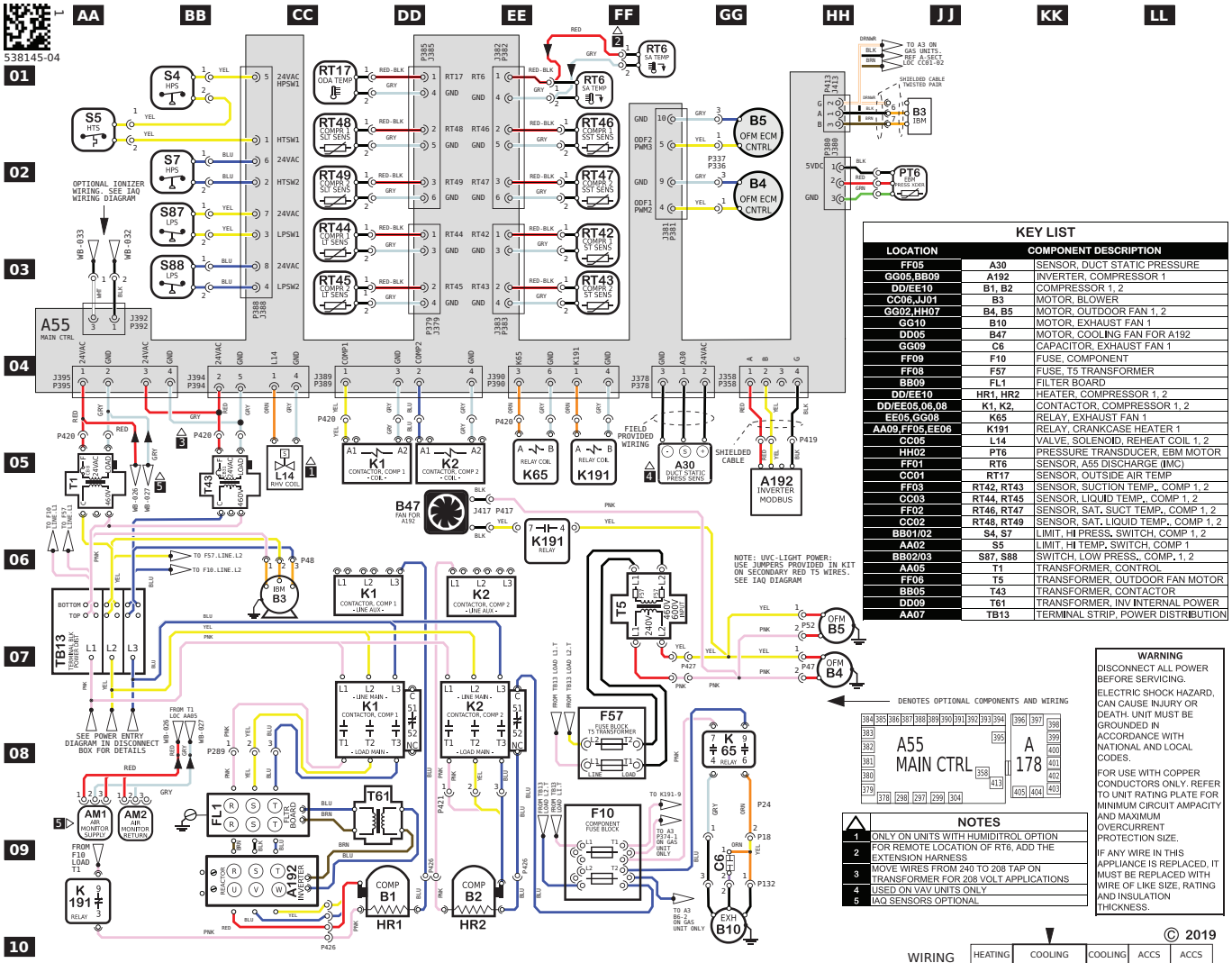
Product: LCM, LGM 092-150U - Y VOLT
Cooling Diagram with Higher SCCR

Voltage: 208-230/3/60 (Y)
Supersedes: XXXXXX-XX Form No: 538147-04 Rev: 1

10x12 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-012081C	04-29-2024	FEP	MCF	ORIGINATED AT PD&R CARROLLTON, TX
001	CN-012081W	09-19-2024	FEP	FXY	A) UPDATED P18 CONNECTORS FROM 3 & 4 TO 1 & 2
					B) REMOVED L43 REACTOR

LCM092-150 G & J VOLT DIAGRAM



KEY LIST

LOCATION		COMPONENT DESCRIPTION
FF05	A30	SENSOR, DUCT STATIC PRESSURE
GG05,BB09	A192	INVERTER, COMPRESSOR 1
DD/EE10	B1, B2	COMPRESSOR 1, 2
CC06,JJ01	B3	MOTOR, BLOWER
GG02,HH07	B4, B5	MOTOR, OUTDOOR FAN 1, 2
GG10	B10	MOTOR, EXHAUST FAN 1
DD05	B47	MOTOR, COOLING FAN FOR A192
GG09	C6	CAPACITOR, EXHAUST FAN 1
FF09	F10	FUSE, COMPONENT
FF08	F57	FUSE, T5 TRANSFORMER
BB09	FL1	FILTER BOARD
DD/EE10	HR1, HR2	HEATER, COMPRESSOR 1, 2
DD/EE05,06,08	K1, K2,	CONTACTOR, COMPRESSOR 1, 2
EE05,GG08	K65	RELAY, EXHAUST FAN 1
AA09,FF05,EE06	K191	RELAY, CRANKCASE HEATER 1
CC05	L14	VALVE, SOLENOID, REHEAT COIL 1, 2
HH02	PT6	PRESSURE TRANSDUCER, EBM MOTOR
FF01	RT6	SENSOR, A55 DISCHARGE (IMC)
CC01	RT17	SENSOR, OUTSIDE AIR TEMP
FF03	RT42, RT43	SENSOR, SUCTION TEMP., COMP 1, 2
CC03	RT44, RT45	SENSOR, LIQUID TEMP., COMP 1, 2
FF02	RT46, RT47	SENSOR, SAT. SUCT TEMP., COMP 1, 2
CC02	RT48, RT49	SENSOR, SAT. LIQUID TEMP., COMP 1, 2
BB01/02	S4, S7	LIMIT, HI PRESS. SWITCH, COMP 1, 2
AA02	S5	LIMIT, HI TEMP. SWITCH, COMP 1
BB02/03	S87, S88	SWITCH, LOW PRESS., COMP. 1, 2
AA05	T1	TRANSFORMER, CONTROL
FF06	T5	TRANSFORMER, OUTDOOR FAN MOTOR
BB05	T43	TRANSFORMER, CONTACTOR
DD09	T61	TRANSFORMER, INV INTERNAL POWER
AA07	TB13	TERMINAL STRIP, POWER DISTRIBUTION

NOTES

1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	FOR REMOTE LOCATION OF RT6, ADD THE EXTENSION HARNESS
3	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
4	USED ON VAV UNITS ONLY
5	IAQ SENSORS OPTIONAL

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.

WIRING DIAGRAM FLOW

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

Product: LCM, LGM 092U, 102U, 120U & 150U - G & J VOLT
Cooling Diagram with Higher SCCR

Voltage: 460/3/60 (G), 575/3/60 (J)
Supersedes: 538145-02 Form No: 538145-04 Rev: 1

10x12 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-012081S	07-17-2024	FEP	MCF	ORIGINATED AT PD&R CARROLLTON, TX.
001	CN-012081W	09-19-2024	FEP	FXY	A) UPDATED P18 CONNECTORS 3 & 4 TO 1 & 2
					B) REMOVED L43

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 before starting decommissioning.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

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

d) Pump down refrigerant system, if possible.

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

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

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

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

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

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

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

⚠ IMPORTANT

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