UNIT INFORMATION

LGM SERIES
3 to 6 ton

100126
09/2026

Service Literature

Ultra High Efficiency LGM036U through 074U with R-454B

LGM036, 048, 060, and 074 are ultra high efficiency gas packaged units equipped with variable speed direct drive blowers, an inverter-driven variable speed compressor, and a variable speed outdoor fan.

LGM036 units are available in 65,000 to 108,000 Btuh (19 to 31 kW) heating inputs. LGM048, 060 and 074 units are available in 65,000 to 150,000 Btuh (19 to 43.9 kW) heating inputs. Gas heat sections are designed with aluminized (stainless optional) steel tube heat exchangers. Cooling capacities range from 3 to 6 tons (7 to 21kW).

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

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

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

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

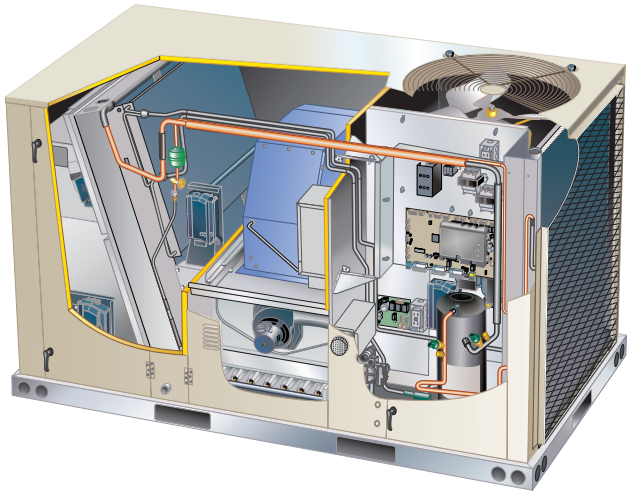
Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

⚠ 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

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.



⚠ 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.

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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.

⚠ WARNING

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

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

•Do not pierce or burn.

•Be aware that refrigerants may not contain an odor.

⚠ CAUTION

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

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

⚠ CAUTION

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

⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

⚠ 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.

⚠ WARNING

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

⚠ 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.

⚠ 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.

⚠ 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.

OPTIONS / ACCESSORIES

Item		Order Number	Size 036	048	060	074
COOLING SYSTEM						
Condensate Drain Trap	PVC	**22H54**	OX	OX	OX	OX
	Copper	**76W27**	X	X	X	X
Drain Pan Overflow Switch		**21Z07**	OX	OX	OX	OX
HEATING SYSTEM						
Bottom Gas Piping Kit		**19W50**	X	X	X	X
Combustion Air Intake Extensions		**19W51**	X	X	X	X
[1] Modulating Gas Heat		Factory	O	O	O	O
Gas Heat Input (Low NOx)	Standard - 53,000-65,000 Btuh input	Factory	O	O	O	O
	Medium - 81,000-108,000 Btuh input	Factory	O	O	O	O
	High - 113,000-150,000 Btuh input	Factory		O	O	O
LPG/Propane Conversion Kits	Two-Stage Standard Heat	**21Z24**	X	X	X	X
	Two-Stage Medium and High Heat	**21Z23**	X	X	X	X
NOTE - Combination Two-Stage and Modulating Kits will not be available until 11/16/2026	Two-Stage and Modulating Standard Heat	**39H79**	X	X	X	X
	Two-Stage and Modulating Medium and High Heat	**39H78**	X	X	X	X
Low Temperature Vestibule Heater	208/230V-3ph	**21Z17**	X	X	X	X
	460V-3ph	**21Z18**	X	X	X	X
	575V-3ph	**21Z19**	X	X	X	X
Stainless Steel Heat Exchanger		Factory	O	O	O	O
Vertical Vent Extension		**31W62**	X	X	X	X
BLOWER - SUPPLY AIR						
Motors	DirectPlus™ Direct Drive ECM Blower System with MSAV®	Factory	O	O	O	O
	DirectPlus™ Direct Drive ECM Blower System with VAV	Factory	O	O	O	O
CABINET						
Burglar Bars		**Y1037**	X	X	X	X
Combination Coil/Hail Guards		**13T03**	OX	OX	OX	OX
Corrosion Protection (indoor coil / outdoor coil)		Factory	O	O	O	O
CONTROLS						
Blower Proving Switch		**21Z10**	OX	OX	OX	OX
Commercial Controls	Lennox® CORE Control System - LonTalk® Module	**54W27**	OX	OX	OX	OX
	CPC Einstein Integration	Factory	O	O	O	OX
	Novar® LSE	Factory	O	O	O	O
Dirty Filter Switch		**53W66**	OX	OX	OX	OX
[1] Remote Discharge Air Temperature Sensor / Fresh Air Tempering		**21Z08**	OX	OX	OX	OX
Smoke Detector - Supply or Return (Power board and one sensor)		**21Z11**	OX	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)		**21Z12**	OX	OX	OX	OX

1 Modulating Gas Heat for Horizontal Applications requires a Remote Discharge Air Temperature / Fresh Air Tempering Sensor (21Z08). Sensor is shipped with the unit for field installation if unit is configured at the factory. Sensor must be ordered separately for field installation if unit is not factory configured.

NOTE - Catalog 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		Order Number	Size 036	048	060	074
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
[2] Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O	O
Disconnect Switch	80 amp	**22A25**	OX	OX	OX	OX
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
Phase/Voltage Detection - 3 Phase Models Only		Factory	O	O	O	O
ECONOMIZER						
High Performance Economizer With Outdoor Air Hood (Sensible Control) (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)						
High Performance Economizer - Includes Barometric Relief Dampers and Combination Hood		**20H48**	OX	OX	OX	OX
High Performance Economizer - No Exhaust Option		Factory	O	O	O	O
Economizer Accessories						
Horizontal Economizer Conversion Kit		**17W45**	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
Outdoor Air CFM Control		**13J76**	X	X	X	X
Global Control	Sensor Field Provided	Factory	O	O	O	O
Building Pressure Control		**13J77**	X	X	X	X
POWER EXHAUST FAN						
Standard Static	208/230V-3ph	**21Z13**	OX	OX	OX	OX
NOTE - Factory installed Power Exhaust Fan requires "Barometric Relief Dampers for Power Exhaust Kit" for field installation. See below.	460V-3ph	**21Z14**	OX	OX	OX	OX
	575V-3ph	**21Z15**	OX	OX	OX	OX
BAROMETRIC RELIEF						
[4] Barometric Relief Dampers for Power Exhaust Kit		**21Z21**	X	X	X	X
[5] Horizontal Barometric Relief Dampers With Outdoor Air and Exhaust Hood		**19F01**	X	X	X	X
OUTDOOR AIR						
Outdoor Air Dampers With Outdoor Air Hood						
Motorized		**15D17**	OX	OX	OX	OX
Manual		**15D18**	X	X	X	X
HUMIDITROL™+ HOT GAS REHEAT OPTION						
Humiditrol™+ Dehumidification Option		Factory	O	O	O	O

2 Disconnect Switch is furnished and factory installed with High SCCR option.

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

4 Required when Economizer is factory installed with factory installed Power Exhaust Fan option.

5 Required when Economizer is configured for horizontal airflow.

NOTE - Catalog numbers shown are for ordering optional accessories if a field installed optio nis available.

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OPTIONS / ACCESSORIES

Item		Order Number	Size 036	048	060	074
INDOOR AIR QUALITY						
Air Filters						
Healthy Climate® High Efficiency Air Filters 20 x 20 x 2 in.	MERV 8 (Order 4)	**54W21**	OX	OX	OX	OX
	MERV 13 (Order 4)	**52W39**	OX	OX	OX	OX
	MERV 16 (Order 4)	**21U40**	OX	OX	OX	OX
Replaceable Media Filter With Metal Mesh Frame 20 x 20 x 2 in. (includes non-pleated filter media)	(Order 4)	**44N60**	X	X	X	X
Needlepoint Bipolar Ionization (NPBI)						
Needlepoint Bipolar Ionization Kit		**21U35**	X	X	X	X
Indoor Air Quality (CO_2) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display		**77N39**	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		**87N53**	X	X	X	X
Sensor - Black plastic case, LCD display, rated for plenum mounting		**87N52**	X	X	X	X
Sensor - Black plastic case, no display, rated for plenum mounting		**87N54**	X	X	X	X
CO2 Sensor Duct Mounting Kit - for downflow applications		**85L43**	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensors (**77N39**)		**90N43**	X	X	X	X
UVC Germicidal Lamps						
[6] Healthy Climate® UVC Light Kit (110/230V-1ph)		**21A92**	X	X	X	X
Step-Down Transformer	460V primary, 230V secondary	**10H20**	X	X	X	X
	575V primary, 230V secondary	**10H21**	X	X	X	X
ROOF CURBS						
Hybrid Roof Curbs, Downflow						
8 in. height		**11F50**	X	X	X	X
14 in. height		**11F51**	X	X	X	X
18 in. height		**11F52**	X	X	X	X
24 in. height		**11F53**	X	X	X	X
Adjustable Pitched Curb						
14 in. height		**43W27**	X	X	X	X
Transition Curb						
Matches Model L™ 036-074 Units to existing L Series® Curbs		**31B05**	X	X	X	X
CEILING DIFFUSERS						
Step-Down - Order one	RTD9-65S	**13K60**	X	X	X	
	RTD11-95S	**13K61**				X
Flush - Order one	FD9-65S	**13K55**	X	X	X	
	FD11-95S	**13K56**				X
Transitions (Supply and Return) - Order one	T1TRAN10AN1	**17W53**	X	X	X	
	T1TRAN20N-1	**17W54**				X

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

NOTE - Catalog numbers shown are for ordering optional accessories if a field installed optio nis available.

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SPECIFICATIONS — UNIT

Model		LGM036U5E	LGM048U5E	LGM060U5E	LGM074U5E
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 Number		**LGM036U5P**	**LGM048U5P**	**LGM060U5P**	**LGM074U5P**
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
Efficiency Type		Ultra-High	Ultra-High	Ultra-High	Ultra-High
Nominal Tonnage		3 Ton	4 Ton	5 Ton	6 Ton
Cooling Performance	Gross Cooling Capacity (Btuh)	36,000	48,500	60,000	71,000
	[1] Net Cooling Capacity (Btuh)	35,000	48,000	58,000	69,000
	AHRI Rated Air Flow (cfm)	1320	1600	1850	2150
	SEER2 (Btuh/Watt)	21.2	19.9	19.5	- - -
	EER2 (Btuh/Watt)	14.3	13.2	12.5	- - -
	IEER (Btuh/Watt)	- - -	- - -	- - -	23.1
	EER (Btuh/Watt)	- - -	- - -	- - -	12.2
	Total Unit Power - kW	2.5	3.6	4.6	5.5
Sound Rating Number	dBA	73	76	78	80
Refrigerant Charge	Refrigerant Type	R-454B	R-454B	R-454B	R-454B
	Without Reheat Option	4 lbs. 8 oz.	5 lbs. 1 oz.	5 lbs. 1 oz.	5 lbs. 1 oz.
	With Reheat Option	5 lbs. 11 oz.	5 lbs. 9 oz.	5 lbs. 9 oz.	5 lbs. 9 oz.
Gas Heating Options		See page 7			
Compressor Type (Number)		Variable Capacity Scroll (1)			
Outdoor Coil	Net face area - ft.^{2}	17.8	17.8	17.8	17.8
	Rows	1	1	1	1
	Fins - in.	23	23	23	23
Outdoor Coil Fans	Motor HP (number and type)	1/3 (1 ECM)	1/3 (1 ECM)	1/3 (1 ECM)	1/3 (1 ECM)
	Rpm	550 - 850	600 - 900	700 - 950	700 - 1050
	Watts	50 - 200	80 - 236	120 - 272	120 - 360
	Diameter (Number) - in.	(1) 24	(1) 24	(1) 24	(1) 24
	Blades	3	3	3	3
	Total air volume - cfm	2500 - 3850	2750 - 4100	3200 - 4300	3200 - 4700
Indoor Coil	Net face area - ft.^{2}	8.65	8.65	8.65	8.65
	Rows	1	1	1	1
	Fins - in.	20	20	20	20
	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)	1.5 HP (1 ECM)	1.5 HP (1 ECM)	1.5 HP (1 ECM)	1.5 HP (1 ECM)
	Wheel (Number) diameter x width - in.	(1) 14 x 5	(1) 14 x 5	(1) 14 x 5	(1) 14 x 5
Filters	Type of filter	MERV 4, Disposable			
	Number and size - in.	(4) 20 x 20 x 2			
Line voltage data (Volts-Phase-Hz)		208/230-3-60, 460-3-60, 575-3-60			

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

1 AHRI Certified to AHRI Standard 210/240 (3-5 ton) or 340/360 (6 ton): 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

SPECIFICATIONS — GAS HEAT

Model		036, 048, 060	072	036, 048, 060, 072	048, 060, 072
Gas Heat Input - Two-Stage or Modulating		**Standard**		**Medium**	**High**
Input Btuh	Minimum	53,000		81,000	113,000
	Maximum	65,000		108,000	150,000
Output Btuh	Minimum	43,000		66,000	92,000
	Maximum	52,000		87,000	121,000
Temperature Rise Range - °F	Minimum	5 - 35		25 - 55	30 - 60
	Maximum	15-45 (0.5, 1 and 1.5 HP)	10-40 (1.5 HP)	30 - 70	45 - 75
Minimum air volume - cfm		960 (0.5 and 1 HP) 1075 (1.5 HP)	1075 (1.5 HP)	1150	1500
[1] AFUE (Single Phase)		81%		81%	81%
[2] Thermal Efficiency (Three Phase)		81%		81%	81%
Gas Supply Connections		1/2 in. NPT			
Recommended Gas Supply Pressure - Nat. / LPG		7 in. w.g. / 11 in. w.g.			
Gas Supply Pressure Range	Min./Max. (Natural)	4.5 - 10.5 in. w.g.			
	Min./Max. (LPG)	10.8 - 13.5 in. w.g.			

NOTE - Modulating Gas Heat operates between the minimum and maximum gas heat inputs shown.

NOTE - Air volume may modulate below minimum volume if heat input is below maximum.

1 Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations.

2 Thermal Efficiency at full input.

HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 2000 feet above sea level without any modifications.
At altitudes above 2000 feet units must be derated to match gas manifold pressures shown in table below.
At altitudes above 4500 feet unit must be derated 2% for each 1000 feet above sea level.

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

Refer to the Installation Instructions for more detailed information.

Heat Input Type	Altitude Feet	Gas Manifold Pressure in. w.g.		Input Rate (Btuh)
		Natural Gas	LPG/ Propane	
Standard	2001 - 4500	1.7 / 3.0	5.1 / 9.0	49,000 - 60,000
Medium	2001 - 4500	1.7 / 3.0	5.1 / 9.0	75,000 - 100,000
High	2001 - 4500	1.7 / 3.0	5.1 / 9.0	104,000 - 139,000

BLOWER DATA 1.5 HP

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

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

Minimum Air Volume Required For Different Gas Heat Sizes:
Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

See page 10 for wet coil and options/accessory air resistance data.

DOWNFLOW

Total Air cfm	Total Static Pressure - in. w.g.																									
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.1		1.2		1.3	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
400	- - -	- - -	734	19	823	40	910	60	985	78	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
600	766	28	856	51	944	73	1029	93	1108	111	1180	127	1248	139	1315	149	1383	158	1451	169	- - -	- - -	- - -	- - -	- - -	- - -
800	899	57	989	81	1079	104	1163	125	1242	145	1317	161	1386	174	1454	185	1519	198	1582	214	1643	234	1701	255	1755	281
1000	1084	95	1163	117	1244	139	1323	160	1398	180	1470	196	1538	211	1603	227	1663	245	1721	267	1776	292	1828	320	1876	350
1200	1319	113	1385	138	1451	162	1517	186	1581	209	1644	231	1703	254	1759	278	1812	306	1863	337	1912	367	1960	397	2003	427
1400	1542	146	1596	177	1649	208	1703	239	1757	269	1809	300	1860	331	1909	362	1956	393	2003	425	2050	456	2095	483	2139	508
1600	1721	225	1772	258	1823	291	1873	324	1923	356	1972	388	2019	419	2065	450	2110	480	2156	510	2200	539	2244	565	2287	590
1800	1909	309	1957	341	2006	373	2054	404	2101	435	2146	465	2190	495	2234	526	2277	557	2320	588	2362	620	2404	651	2444	685
2000	2103	385	2148	417	2193	450	2239	483	2283	516	2325	550	2367	584	2408	620	2449	658	2490	696	2529	735	2568	777	2605	822
2200	2299	478	2342	514	2384	552	2426	590	2467	630	2507	671	2547	714	2586	757	2625	800	2663	844	2700	889	2735	935	2770	982
2400	2500	606	2540	647	2580	690	2618	734	2656	779	2694	824	2731	870	2768	915	2804	961	2839	1006	2874	1051	2907	1096	2941	1141
2600	2704	768	2741	810	2778	855	2813	901	2849	947	2884	993	2918	1039	2952	1085	2986	1129	3019	1173	3051	1217	3083	1259	3115	1300
2800	2908	941	2943	985	2976	1030	3010	1076	3042	1121	3075	1166	3107	1210	3139	1253	3170	1296	3200	1338	3231	1379	3261	1419	3290	1456
3000	3110	1111	3142	1156	3173	1201	3205	1245	3236	1289	3267	1332	3296	1373	3325	1414	3354	1455	3382	1496	3412	1536	3439	1573	3465	1609

Total Air cfm	Total Static Pressure - in. w.g.													
	1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
800	1805	309	1850	337	1895	366	1940	392	- - -	- - -	- - -	- - -	- - -	- - -
1000	1920	380	1962	410	2005	439	2050	466	2094	492	2138	517	2181	541
1200	2045	456	2087	484	2130	510	2174	537	2217	563	2260	589	2302	615
1400	2182	531	2225	555	2268	581	2310	610	2352	640	2393	671	2433	703
1600	2330	616	2371	645	2412	678	2452	713	2491	750	2530	787	2568	824
1800	2484	723	2523	765	2561	808	2598	849	2636	890	2672	931	2708	971
2000	2641	868	2677	915	2713	961	2749	1003	2784	1044	2819	1084	2853	1124
2200	2804	1028	2839	1072	2873	1114	2907	1155	2940	1194	2973	1234	3006	1272
2400	2974	1184	3006	1225	3039	1266	3071	1305	3103	1344	3134	1382	3166	1420
2600	3146	1340	3177	1379	3207	1417	3238	1456	3269	1494	3299	1532	3329	1569
2800	3319	1493	3347	1530	3376	1567	3406	1605	3435	1643	3465	1681	3495	1718
3000	3491	1644	3517	1680	3543	1716	3572	1754	3602	1792	3631	1830	3661	1867

BLOWER DATA 1.5 HP

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

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

Minimum Air Volume Required For Different Gas Heat Sizes:
Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

See page 10 for wet coil and options/accessory air resistance data.

HORIZONTAL

Total Air cfm	Total Static Pressure - in. w.g.																									
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0		1.1		1.2		1.3	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
400	708	16	793	37	872	53	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
600	835	46	918	65	1000	82	1077	95	1149	107	1221	109	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
800	981	75	1064	92	1144	109	1221	124	1294	139	1365	148	1434	154	1497	163	1555	179	1607	200	1656	226	1704	254	- - -	- - -
1000	1166	105	1241	124	1315	141	1387	159	1454	176	1520	191	1582	207	1638	227	1689	252	1737	279	1783	308	1829	335	1873	362
1200	1374	142	1440	162	1506	182	1569	203	1630	224	1687	246	1739	271	1787	299	1832	330	1876	361	1920	391	1964	419	2007	444
1400	1591	183	1647	209	1701	235	1755	263	1806	291	1854	320	1899	351	1942	382	1984	412	2026	442	2068	469	2110	496	2153	520
1600	1778	258	1827	290	1876	323	1923	355	1970	386	2015	416	2059	444	2102	470	2144	494	2185	519	2227	545	2268	572	2309	600
1800	1973	352	2018	383	2063	415	2107	445	2151	476	2194	504	2237	531	2279	557	2319	584	2359	613	2397	645	2435	679	2471	713
2000	2182	437	2224	468	2265	499	2306	531	2346	563	2385	596	2424	630	2461	666	2496	705	2530	745	2564	786	2598	826	2631	866
2200	2388	540	2426	576	2464	613	2500	651	2536	691	2571	731	2605	774	2637	819	2668	863	2700	907	2732	949	2764	990	2795	1029
2400	2589	679	2624	719	2658	761	2691	803	2724	846	2756	890	2786	935	2816	980	2846	1025	2876	1068	2907	1109	2937	1149	2967	1188
2600	2787	845	2819	887	2850	930	2881	973	2911	1017	2941	1060	2970	1104	2999	1147	3028	1189	3057	1230	3087	1270	- - -	- - -	- - -	- - -
2800	2983	1021	3013	1063	3042	1106	3070	1149	3099	1191	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

Total Air cfm	Total Static Pressure - in. w.g.													
	1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
800	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
1000	1916	386	1957	408	1998	428	2037	447	2077	465	- - -	- - -	- - -	- - -
1200	2049	468	2089	490	2128	510	2168	529	2207	549	2246	569	2285	591
1400	2194	543	2235	565	2274	588	2313	611	2350	637	2387	664	2423	694
1600	2349	627	2387	657	2423	688	2457	722	2490	757	2522	793	2554	830
1800	2506	749	2539	787	2571	825	2602	864	2632	903	2662	942	2692	981
2000	2663	906	2694	945	2725	985	2755	1024	2785	1063	2815	1101	2845	1138
2200	2826	1068	2857	1107	2887	1146	2916	1184	2946	1221	2975	1259	3005	1296
2400	2997	1227	3027	1266	3056	1304	3085	1342	- - -	- - -	- - -	- - -	- - -	- - -
2600	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
2800	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

BLOWER DATA

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

Air Volume cfm	Wet Indoor Coil		Humiditrol™+ Reheat Coil	Gas Heating		Economizer	Filters		
	036, 048	060, 074		Medium Heat	High Heat		MERV 8	MERV 13	MERV 16
800	0.01	- - -	- - -	0.02	0.02	0.04	0.04	0.05	0.04
1000	0.02	0.02	0.00	0.02	0.02	0.04	0.04	0.07	0.05
1200	0.03	0.04	0.00	0.02	0.02	0.04	0.04	0.07	0.05
1400	0.04	0.05	0.01	0.02	0.03	0.04	0.04	0.07	0.06
1600	0.05	0.07	0.02	0.03	0.04	0.04	0.04	0.07	0.08
1800	0.06	0.08	0.02	0.04	0.05	0.05	0.04	0.07	0.09
2000	0.08	0.10	0.02	0.04	0.06	0.05	0.05	0.08	0.10
2200	- - -	0.11	0.04	0.04	0.07	0.05	0.05	0.08	0.11
2400	- - -	0.13	0.04	0.05	0.08	0.05	0.05	0.08	0.12

CEILING DIFFUSERS AIR RESISTANCE (in. w.g.)

Air Volume cfm	RTD9-65S Step–Down Diffuser			FD9-65S Flush Diffuser	RTD11-95S Step–Down Diffuser			FD11-95S Flush Diffuser
	2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open		2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open	
800	0.15	0.13	0.11	0.11	- - -	- - -	- - -	- - -
1000	0.19	0.16	0.14	0.14	- - -	- - -	- - -	- - -
1200	0.25	0.20	0.17	0.17	- - -	- - -	- - -	- - -
1400	0.33	0.26	0.20	0.20	- - -	- - -	- - -	- - -
1600	0.43	0.32	0.20	0.24	- - -	- - -	- - -	- - -
1800	0.56	0.40	0.30	0.30	0.13	0.11	0.09	0.09
2000	0.73	0.50	0.36	0.36	0.15	0.13	0.11	0.10
2200	0.95	0.63	0.44	0.44	0.18	0.15	0.12	0.12
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

POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure in. w.g.	Air Volume Exhausted cfm
0.00	2000
0.05	1990
0.10	1924
0.15	1810
0.20	1664
0.25	1507
0.30	1350
0.35	1210

CEILING DIFFUSER AIR THROW DATA

Air Volume - cfm	[1] Effective Throw - ft.	
Model	**RTD9-65S**	**FD9-65S**
800	10 - 17	14 - 18
1000	10 - 17	15 - 20
1200	11 - 18	16 - 22
1400	12 - 19	17 - 24
1600	12 - 20	18 - 25
1800	13 - 21	20 - 28
2000	14 - 23	21 - 29
2200	16 - 25	22 - 30
Model	**RTD11-95S**	**FD11-95S**
2600	24 - 29	19 - 24
2800	25 - 30	20 - 28
3000	27 - 33	21 - 29

[1] 1 Effective throw based on terminal velocities of 75 ft. per minute.

ELECTRICAL DATA — 3 TON

Model		LGM036U5E / LGM036U5P		
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor (Inverter)	Rated Load Amps	9.1	5.1	4.1
	Locked Rotor Amps	11	6	12
Outdoor Fan Motor	Full Load Amps (1 ECM)	2.8	1.4	1.1
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	Horsepower	1.5	1.5	1.5
	Full Load Amps	4.4	2.3	2.3
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	25	15	15
	With (1) 0.33 HP Power Exhaust	30	15	15
[3] Minimum Circuit Ampacity (MCA)	Unit Only	19	11	9
	With (1) 0.33 HP Power Exhaust	21	12	10

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

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

2 HACR type breaker or fuse.

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

ELECTRICAL DATA — 4 TON

Model No.		LGM048U5E / LGM048U5P		
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor (Inverter)	Rated Load Amps	13.8	6.5	5.5
	Locked Rotor Amps	17	10	12
Outdoor Fan Motor	Full Load Amps (1 ECM)	2.8	1.4	1.1
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	Horsepower	1.5	1.5	1.5
	Full Load Amps	4.4	2.3	2.3
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	35	15	15
	With (1) 0.33 HP Power Exhaust	40	15	15
[3] Minimum Circuit Ampacity (MCA)	Unit Only	25	12	11
	With (1) 0.33 HP Power Exhaust	27	14	12

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

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

2 HACR type breaker or fuse.

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

ELECTRICAL DATA — 5 TON

Model		LGM060U5E / LGM060U5P		
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor (Inverter)	Rated Load Amps	14.6	7	5.8
	Locked Rotor Amps	21	11	12
Outdoor Fan Motor	Full Load Amps (1 ECM)	2.8	1.4	1.1
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	Horsepower	1.5	1.5	1.5
	Full Load Amps	4.4	2.3	2.3
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	40	15	15
	With (1) 0.33 HP Power Exhaust	40	20	15
[3] Minimum Circuit Ampacity (MCA)	Unit Only	26	13	11
	With (1) 0.33 HP Power Exhaust	28	14	12

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

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

2 HACR type breaker or fuse.

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

ELECTRICAL DATA — 6 TON

Model		LGM074U5E / LGM074U5P		
[1] Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor (Inverter)	Rated Load Amps	16.9	8.3	6.8
	Locked Rotor Amps	21	11	12
Outdoor Fan Motor	Full Load Amps (1 ECM)	2.8	1.4	1.1
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	Horsepower	1.5	1.5	1.5
	Full Load Amps	4.4	2.3	2.3
[2] Maximum Overcurrent Protection (MOCP)	Unit Only	45	20	15
	With (1) 0.33 HP Power Exhaust	45	20	15
[3] Minimum Circuit Ampacity (MCA)	Unit Only	29	15	12
	With (1) 0.33 HP Power Exhaust	31	16	13

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.

MINIMUM R454B SPACE AND CFM REQUIREMENTS

Minimum Airflow[1]		
Unit	Q_{min}(CFM)	Q_{min}(m^3h)
LGM036	500	850
LGM048	500	850
LGM060	500	850
LGM074	500	850
LGM036 W/ Humidtrol	500	850
LGM048 W/ Humidtrol	500	850
LGM060 W/ Humidtrol	500	850
LGM074 W/ Humidtrol	500	850

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

Refrigerant Charge R-454B		
Unit	M_c(lbs)	M_c(kg)
LGM036	4.50	2.0412
LGM048	5.0625	2.2963
LGM060	5.0625	2.2963
LGM074	5.0625	2.2963
LGM036 W/ Humidtrol	5.6875	2.5798
LGM048 W/ Humidtrol	5.5625	2.5231
LGM060 W/ Humidtrol	5.5625	2.5231
LGM074 W/ Humidtrol	5.5625	2.5231

Minimum Room Area of Conditioned Space[2]		
Unit	TA_{min}(ft^2)	TA_{min}(m^2)
LGM036	46.73	4.34
LGM048	75.44	7.01
LGM060	71.19	6.61
LGM074	70.31	6.53
LGM036 W/ Humidtrol	78.52	7.29
LGM048 W/ Humidtrol	76.17	7.08
LGM060 W/ Humidtrol	70.02	6.51
LGM074 W/ Humidtrol	66.07	6.14

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

Altitude Adjustment Factor[3]									
Halt	0	200	400	600	800	1000	1200	1400	1600
AF	1	1	1	1	1.02	1.05	1.07	1.1	1.12
Halt	1600	1800	2000	2200	2400	2600	2800	3000	3200
AF	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.4

***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 LGM036 at 1000 ft. above see level, multiply 500 by 1.05 to get 525 CFM as the new Q_{min}.*

PARTS ARRANGEMENT

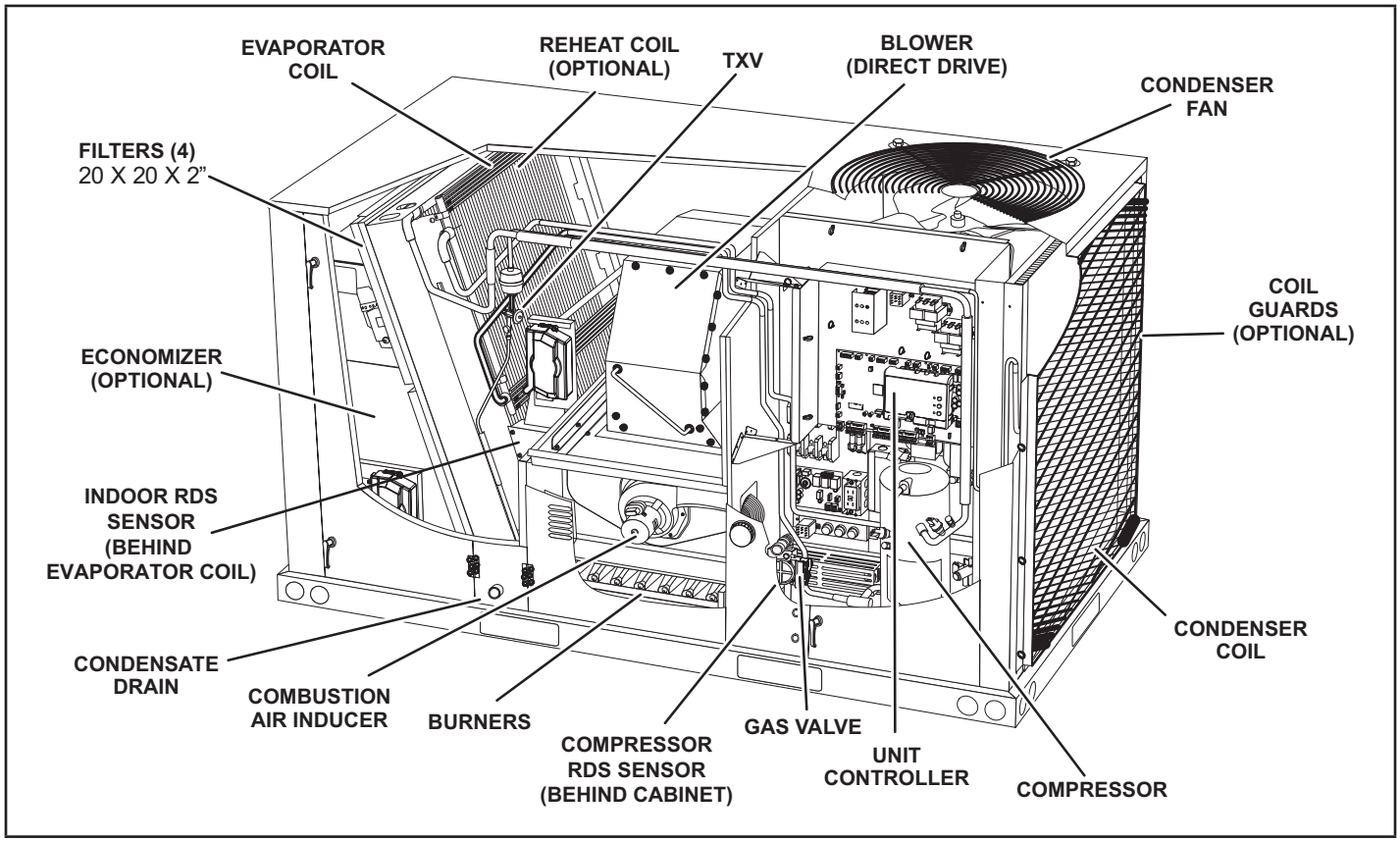


Figure 1

HINGED CONTROL PANEL

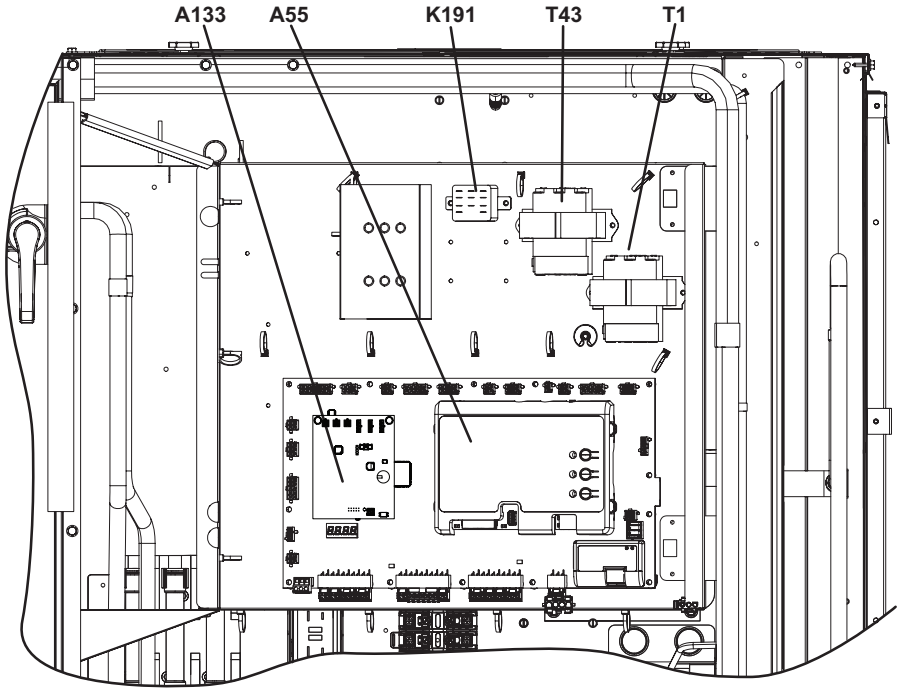


Figure 2

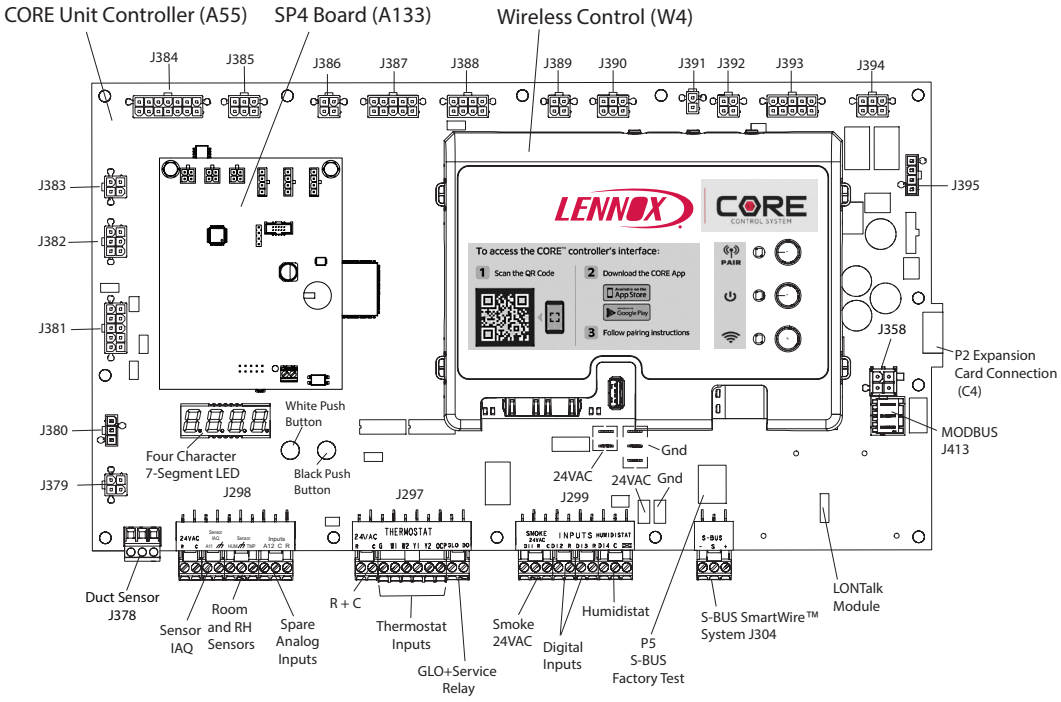


Figure 3

SP4 CONTROLLER

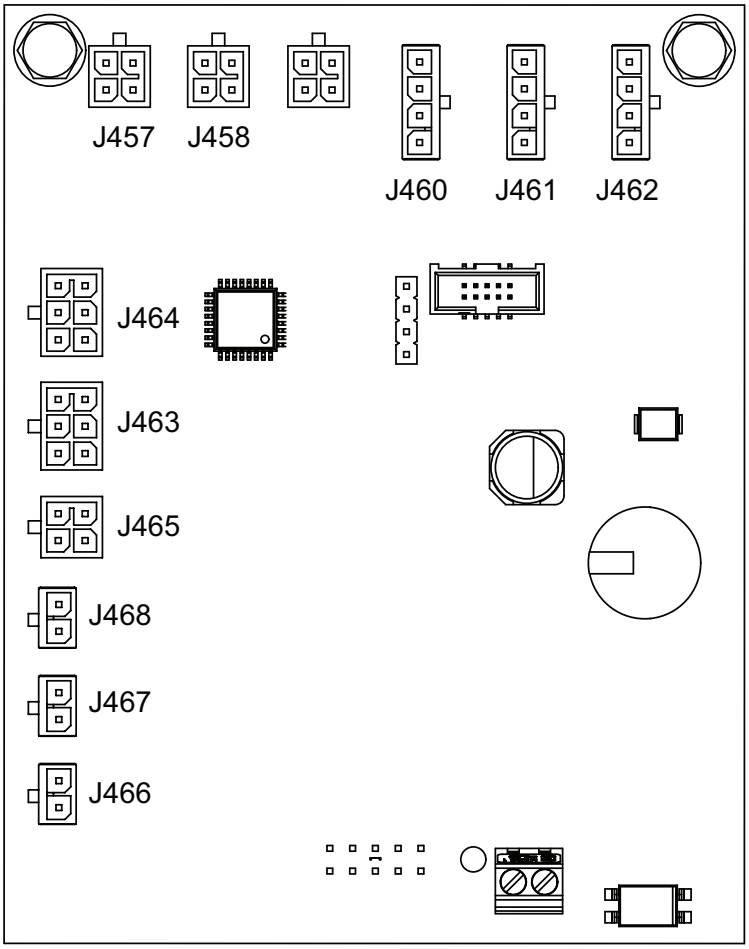


Figure 4

I. UNIT COMPONENTS

All 3 through 6 ton (19 through 43.9 kW) units are configure to order units (CTO). The LGM unit components are shown in 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

LGM control box components are shown in Figure 2. The control box is located in the upper right portion of the compressor compartment.

1. Control Transformers T1 / T43

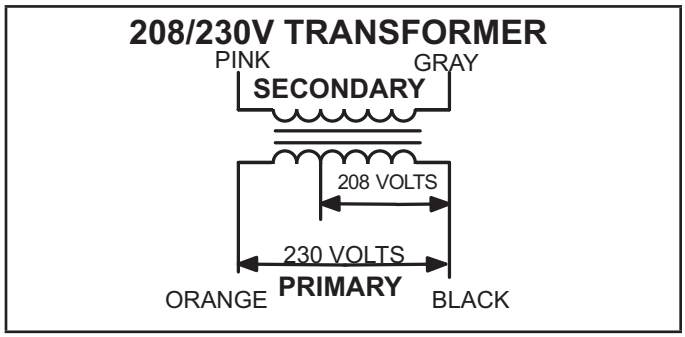


Figure 5

All use a single line voltage to 24VAC transformer mounted on the hinged control panel. Transformer supplies power to control circuits in the unit. The transformer is rated at 70VA and is protected by a 3.5 amp circuit (CB8).

The 208/230 (Y) voltage transformers use two primary voltage taps as shown in Figure 4, while the 460 (G) voltage transformer use a single primary voltage tap. T43 is used for units with hot gas reheat for additional 24VAC.

2. Transformer T4 (J voltage)

All J volt units are equipped with a line voltage to 460V 3-phase transformer to power the indoor blower motor. T4 is mounted in the back panel of the compressor section above T5.

3. Transformer T5 (G and J voltage)

All units use transformer T5 mounted in the back panel in the compressor section. T5 is a line voltage to 230V transformer to power the combustion air inducer, outdoor fan motor, and optional UVC light ballast.. It is connected to line voltage and is powered at all times.

4. Unit Controller A55 (Figure 3)

The Unit Controller provides all unit control functions, unit status information, unit diagnostics, programmable parameters, and USB verification and profile sharing. The unit controller can only be interfaced with via the CORE Service mobile app. Refer to the Unit controller instructions provided for additional details on pairing and app functions

Attention!

Use this QR code to download the mobile service app. Follow the prompts to pair the app with the unit control system and configure the unit. Refer to the “Download Mobile App” section in this manual and the Setup Guide provided with this unit. The QR code is also available in the unit control area.

The app can be downloaded from the appropriate iOS or Android store. Look for the following icon.

The Unit Controller uses input from a zone/room sensor cooling, a thermostat, or a third-party controller to operate the unit. Zone/room sensor, thermostat, and third-party controller wires are connected to J297 on the Unit Controller.

Many default Unit Controller settings are adjustable. Refer to the unit installation instruction or the Unit Controller manual provided with the unit.

The Unit Controller is configured to identify optional kits and accessories for proper function. Each character in the configuration ID represents a different option. Refer to the unit installation instruction or the Unit Controller manual provided with the unit.

5. Compressor Contactor K1

The Unit Controller closes n.o. K1 contacts to provide power to the inverter control board (A192). The contactor does not energize the compressor in the same manner as a traditional cooling system. Three phase units use three pole double break contactors with a 24 volt coil.

6. Crankcase Heater Relay K191

All units use relay K191 to control crnkcase heater HR1.

7. 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 LGM units equipped with the optional power exhaust dampers. K65 is energized by the economizer control panel (A56), after the economizer dampers reach 50% open (adjustable in ECTO). When K65 closes, the exhaust fan B10 is are energized.

8. SP4 Board A133

This boards provides connections for the Mixed Air Temperature Sensor (RT15) and Modulating Gas Valve (GV4) in Modulating Gas Heat unit.

B. Cooling Components

All units use a single cooling circuit consisting of a variable speed compressor, fin/tube condenser coil and evaporator coil. See Figure 5. All units use one draw-through type condenser fan and a single direct drive blower. The blower draws air across the evaporator during unit operation. Cooling may be supplemented by a factory- or field-installed economizer. The evaporator coil is slab type and uses a thermostatic expansion valve as the primary refrigerant metering device. The evaporator is also equipped with enhanced fins and rifled tubing. The compressor is protected by a high pressure switch (S4) on the discharge line, a high temperature limit switch (S5) on the compressor, and a low pressure switch (S87) on the suction line.

1. High Pressure Switch S4

The high pressure switch is an auto-reset SPST N.C. switch which opens on a pressure rise.

S4 is located in the compressor discharge line and wired to the A55 Unit Controller.

When discharge pressure rises to 640 ± 10 psig (4412 ± 69 kPa) (indicating a problem in the system) the switch opens and the compressor inverter is de-energized (the economizer can continue to operate). The switch automatically resets at 475 + 10 psig.

2. Low Pressure Switch S87

The compressor circuit is protected by a loss of charge switch located on the suction line. Switch opens at 40 psig ± 5 psig (276 ± 34 kPa) and automatically resets at 90 psig ± 5 psig (621 kPa ± kPa).

3. High Temperature Limit Switch S5

The variable speed compressor is equipped with a compressor- mounted normally closed temperature switch that prevents compressor damage due to overheating caused by internal friction. The switch is located on top of the compressor casing. This switch senses the compressor casing temperature and opens at 239-257°F to shut-off compressor operation. The auto-reset switch closes when the compressor casing temperature falls to 151-187°F, and the compressor is re-energized. This switch is a single-pole, single-throw (SPST) bi-metallic switch and is wired to the A55 Unit Controller.

PLUMBING AND COMPRESSOR PROTECTION COMPONENTS

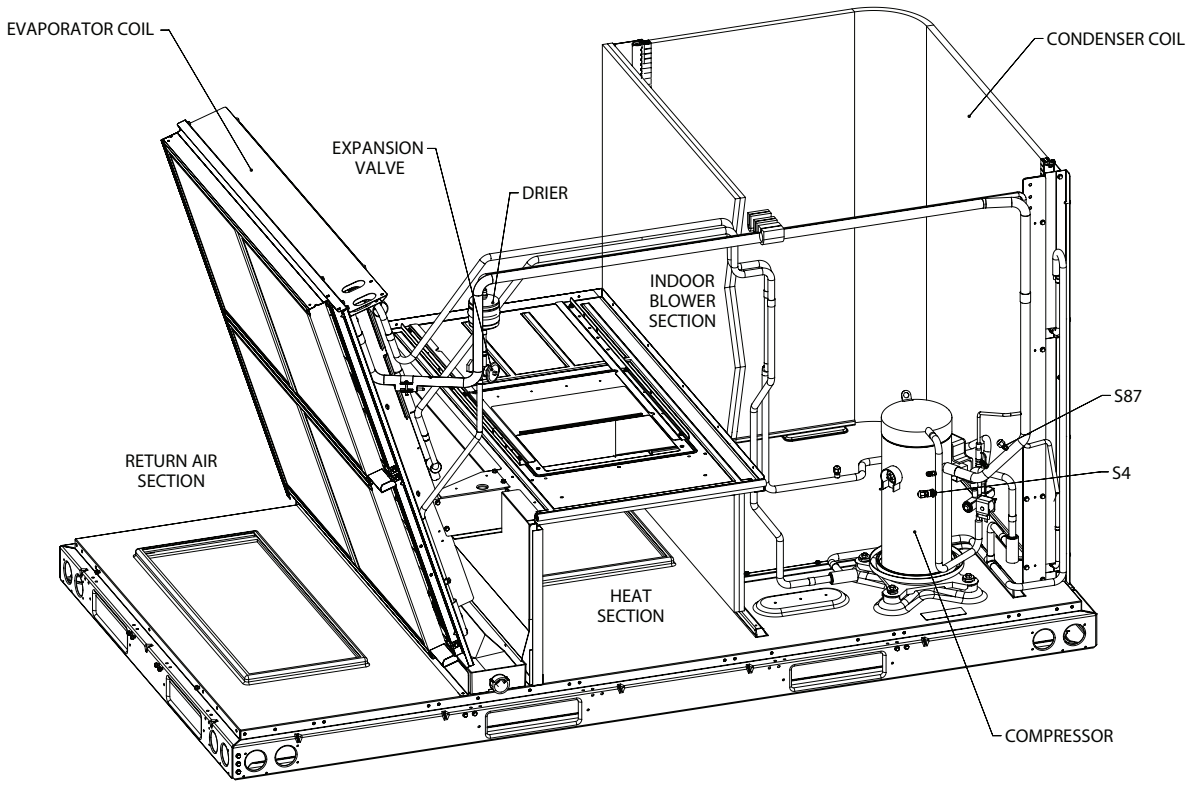


Figure 6

4. Thermistors

Units are equipped with four factory-installed thermistors (RT42, RT44, RT46, and RT48) 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.

Each thermistor must be specifically placed for proper unit operation and to initiate valid alarms. See Table 1 for proper locations.

Table 1
THERMISTOR LOCATION

Sensor	Figure
RT42, RT46	Figure 7
RT44	Figure 8
RT48	Figure 9

LGM/LCM/LGT/LCT/SGH/SCH036, 048, 060, 072/074
EVAPORATOR COIL
RT42, 46

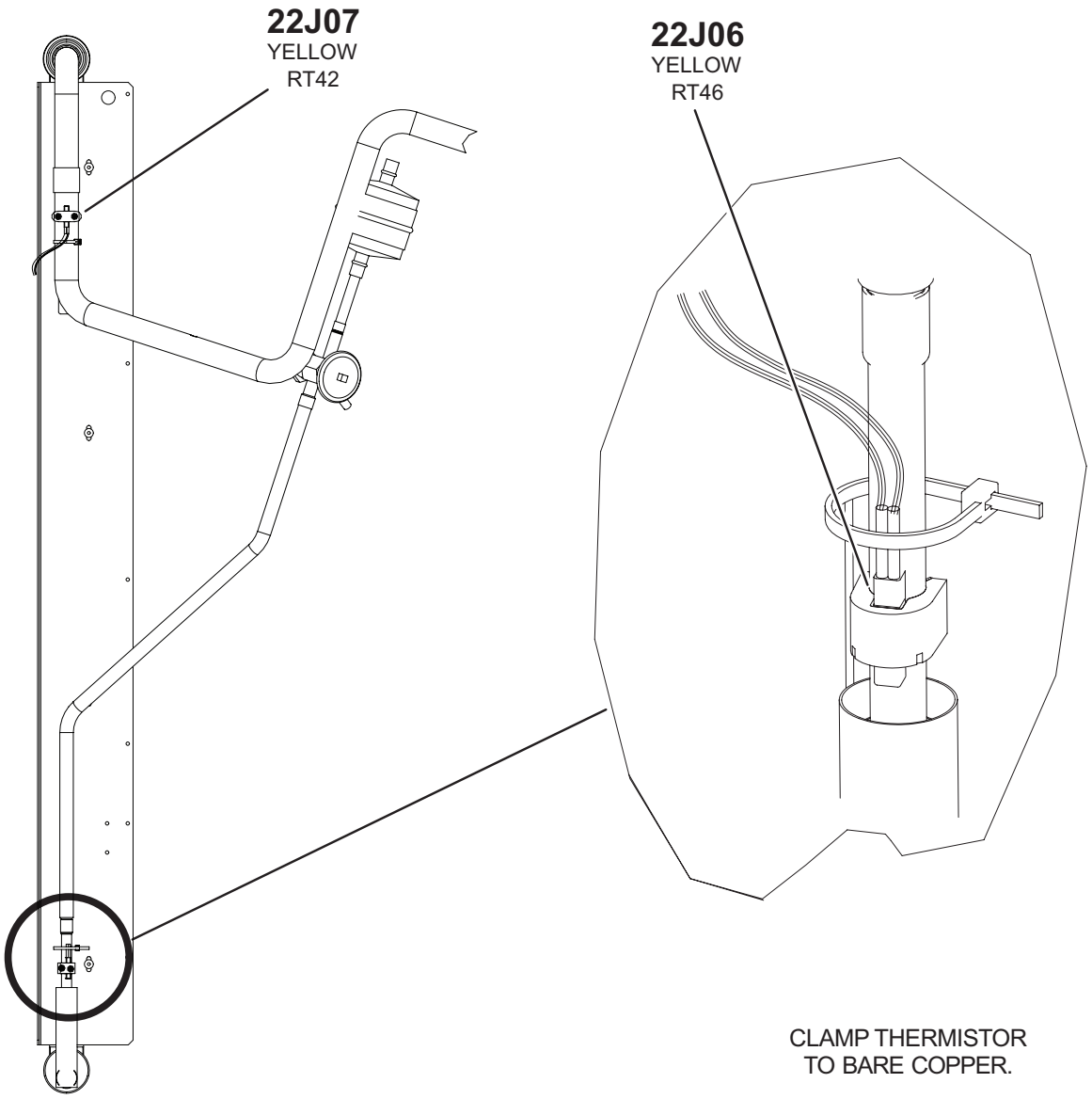


Figure 7

LGM/LCM036, 048, 060, 074U5
CONDENSER COIL
(RT44)

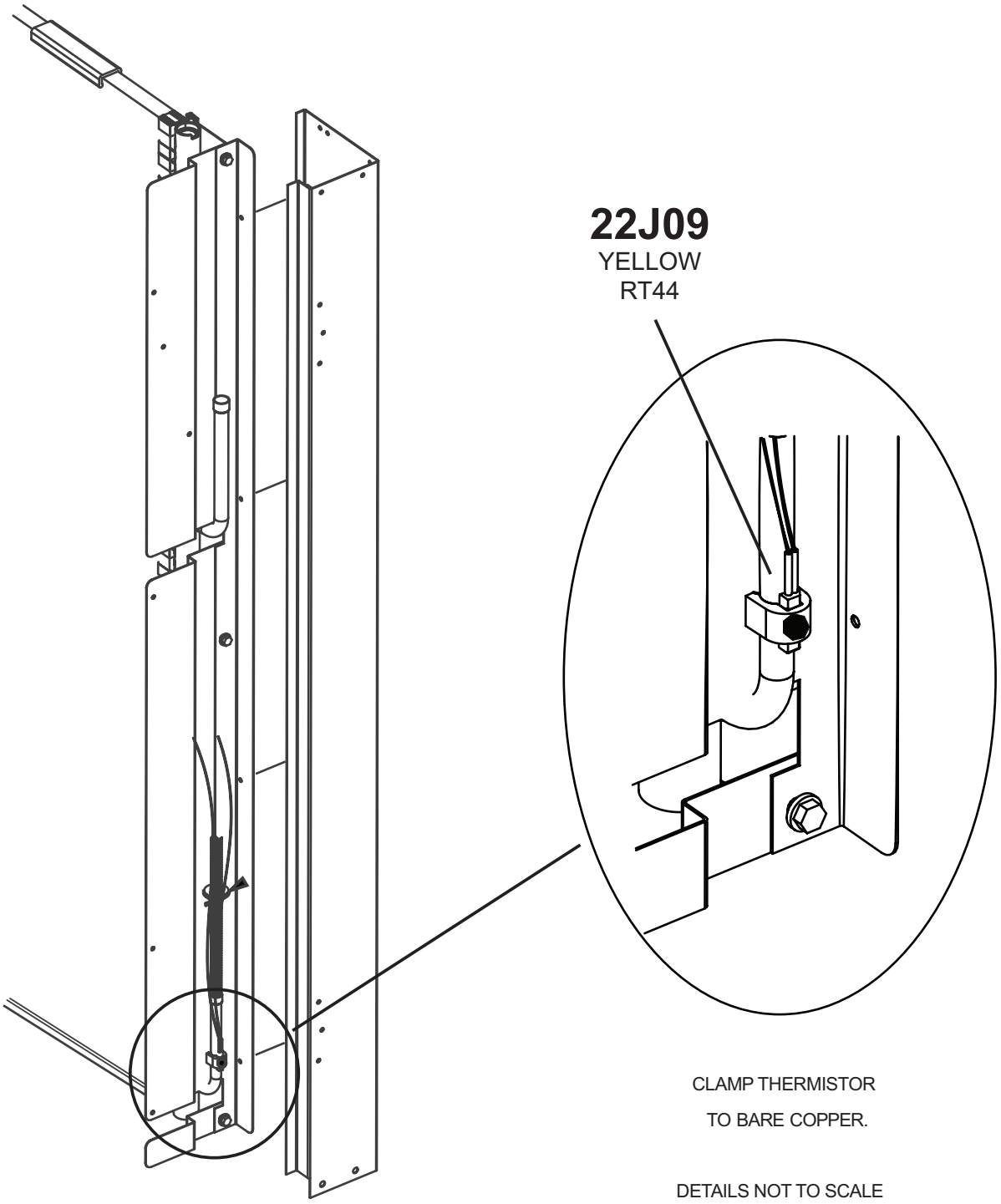


Figure 8

LCM/LGM036, 048, 060, 074
CONDENSER COIL
RT48

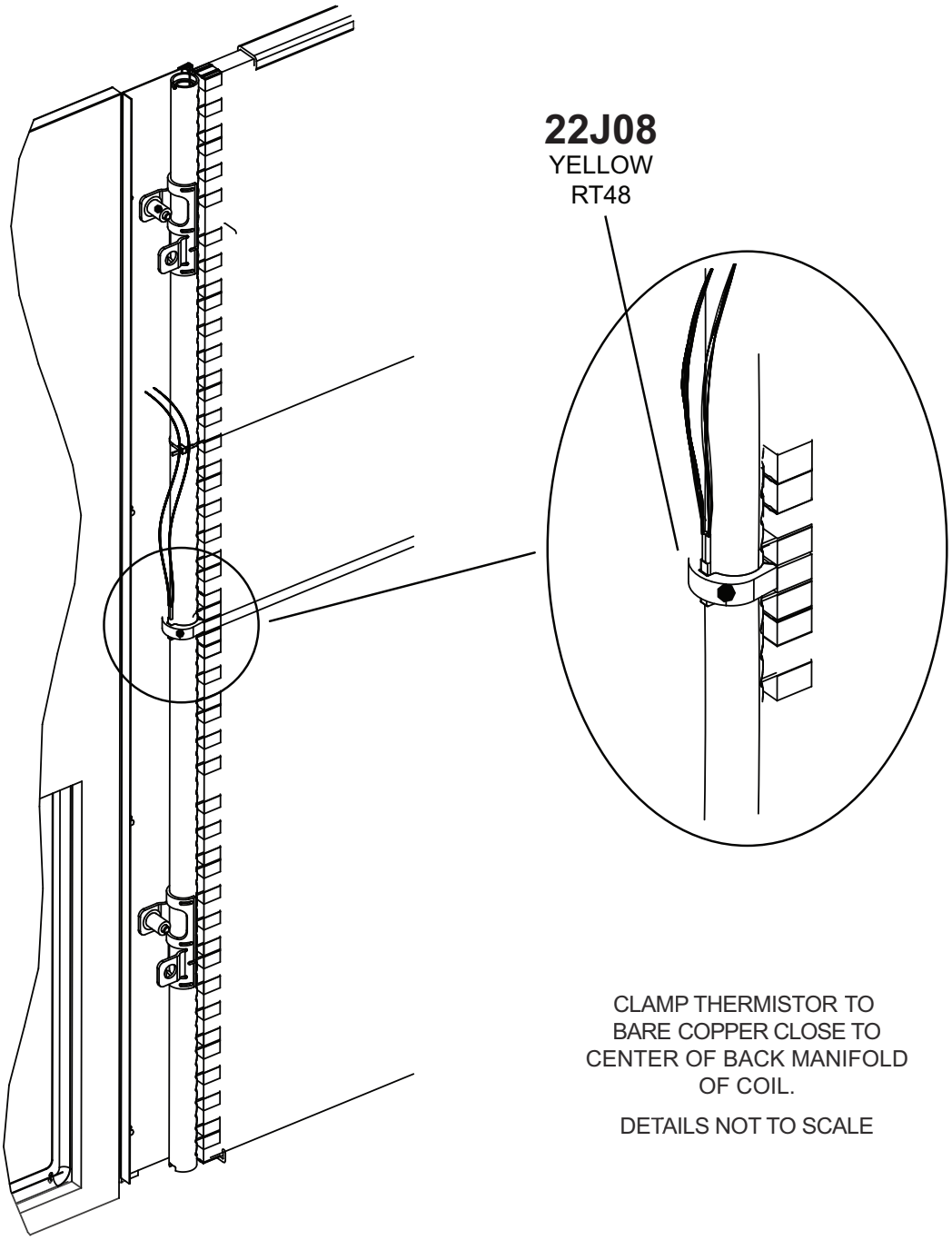


Figure 9

5. RDS Sensors

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

Each sensor must be specifically placed for proper unit operation and to initiate valid alarms. To identify sensor locations see Table 2.

Table 2

RDS Sensor Figures

Model	Qty.	Type	Figure
LGM036-074	2 sensors	INDOOR SENSOR	Figure 10
		COMPRESSOR SENSOR	Figure 11

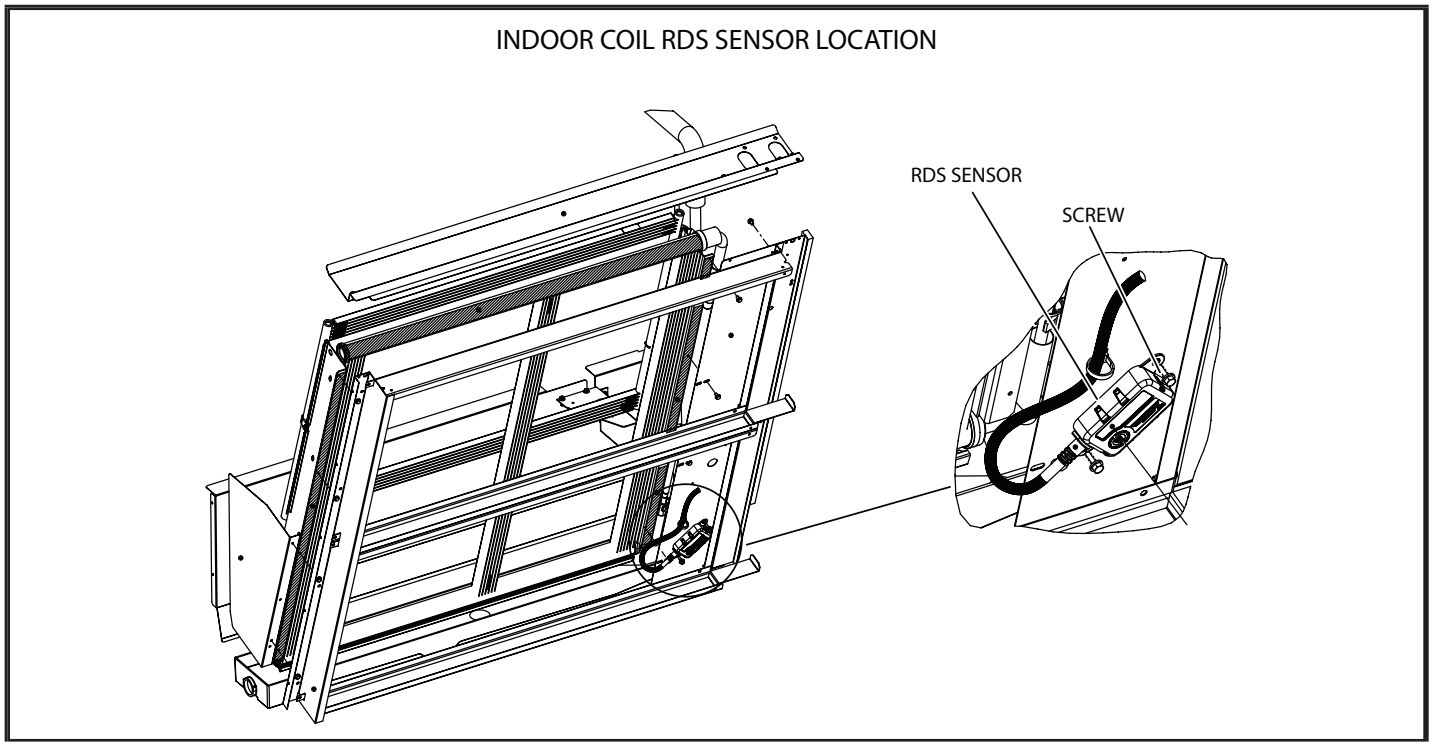


Figure 10

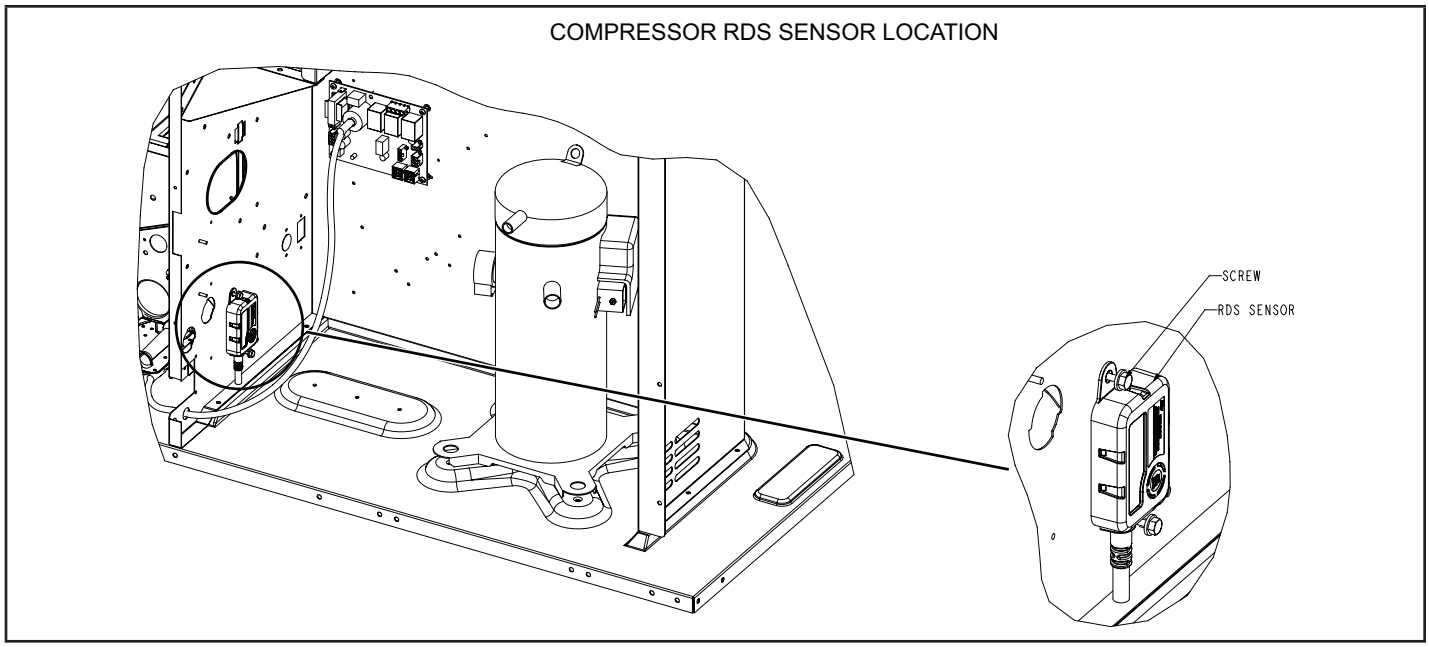


Figure 11

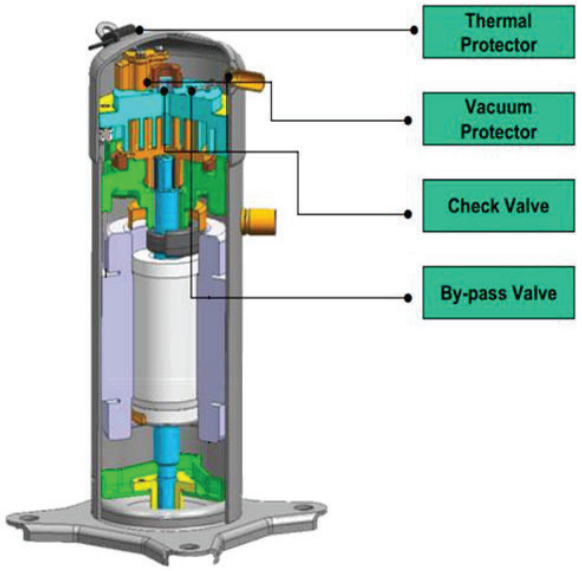
⚠ WARNING

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.

6. Variable Speed Compressor B1

All units use one variable speed scroll compressor. See "SPECIFICATIONS" and "ELECTRICAL DATA" (table of contents) or compressor nameplate for compressor specifications. Refer to Figure 12 for compressor safety devices and Figure 13 for compressor diagnostics.

COMPRESSOR SAFETY DEVICES



Temperature protection:
Opens 248±9°F; Closes 168.8 ±18°F

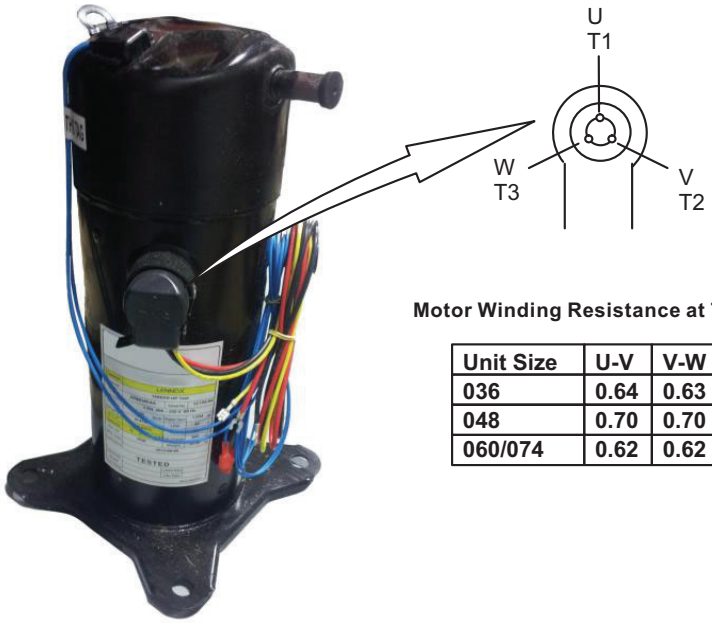
Low suction pressure protection:
Opens below 20 psig

Prevents reverse rotation after stop and increased Cd value

By-passes liquids during compression.

Figure 12

COMPRESSOR DIAGNOSTICS



Motor Winding Resistance at 77°F (+/-7%)

Unit Size	U-V	V-W	W-U
036	0.64	0.63	0.63
048	0.70	0.70	0.70
060/074	0.62	0.62	0.62

Figure 13

7. 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 14 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 3 for inverter-related alarms. Inverter component wire routing is shown in Figure 15.

⚠ 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

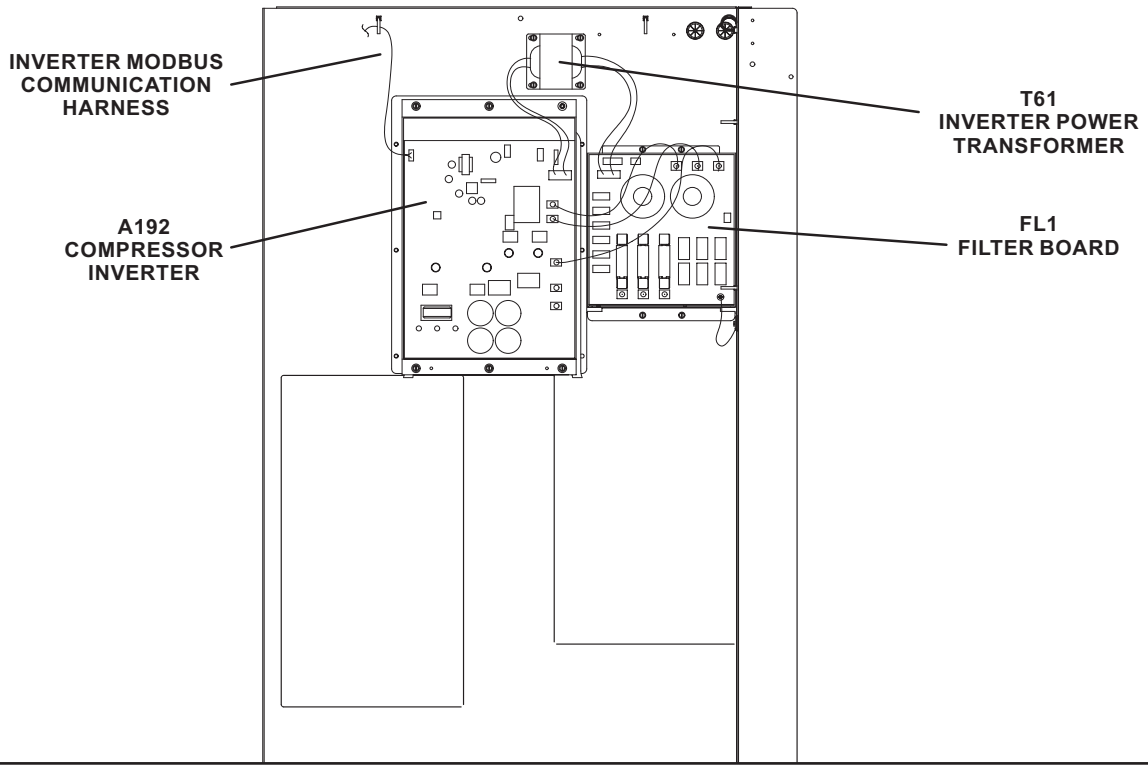


Figure 14

Table 3

INVERTER-RELATED ALARMS

ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
187	INVERTER LOW LEVEL ALARM	Possible alarming valyes 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 continued 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 an 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. RESET 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.

8. 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.

9. 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.

10. Inverter Heat Sink

An inverter heat sink is located on the back side of the wall between the compressor and outdoor fan sections. The outdoor fan draws air across the heat sink to cool inverter control board components. See Figure 16.

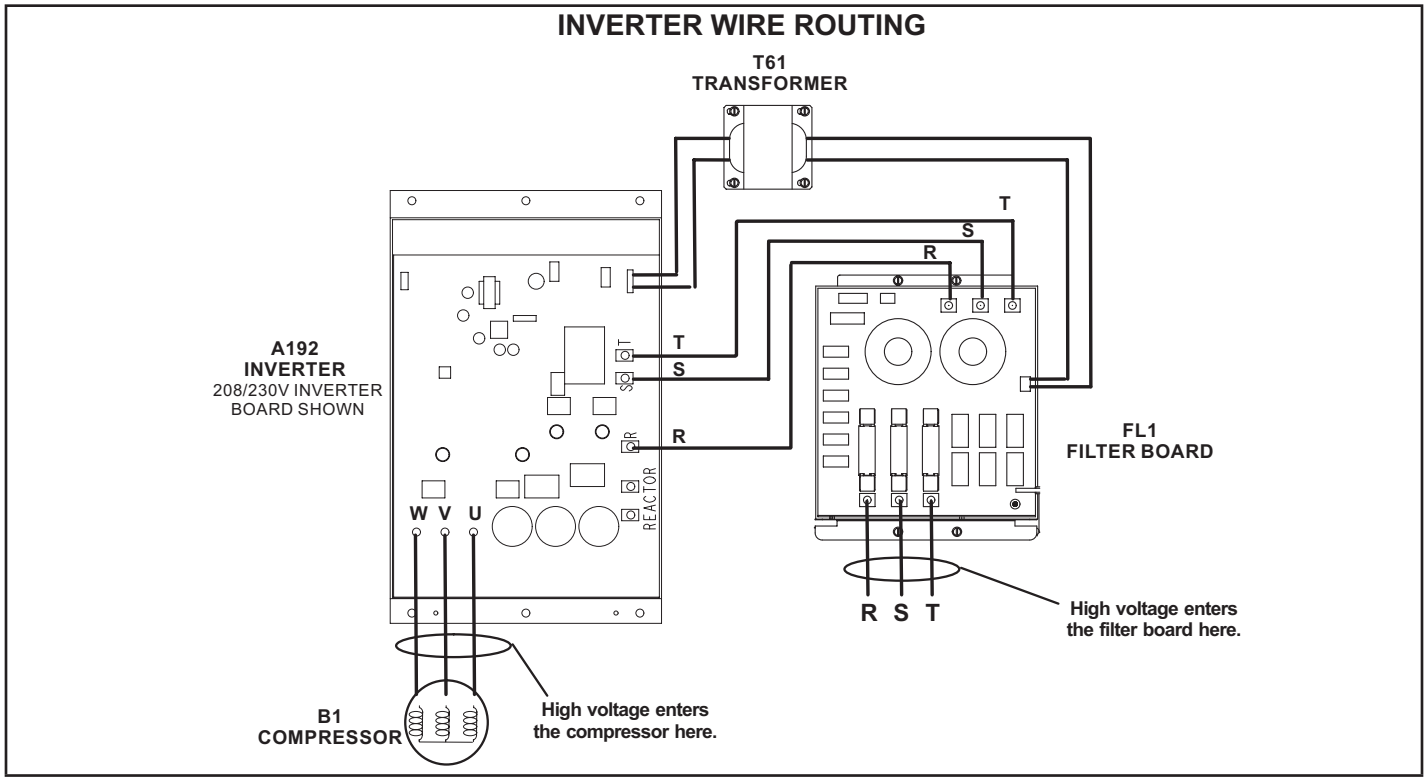


Figure 15

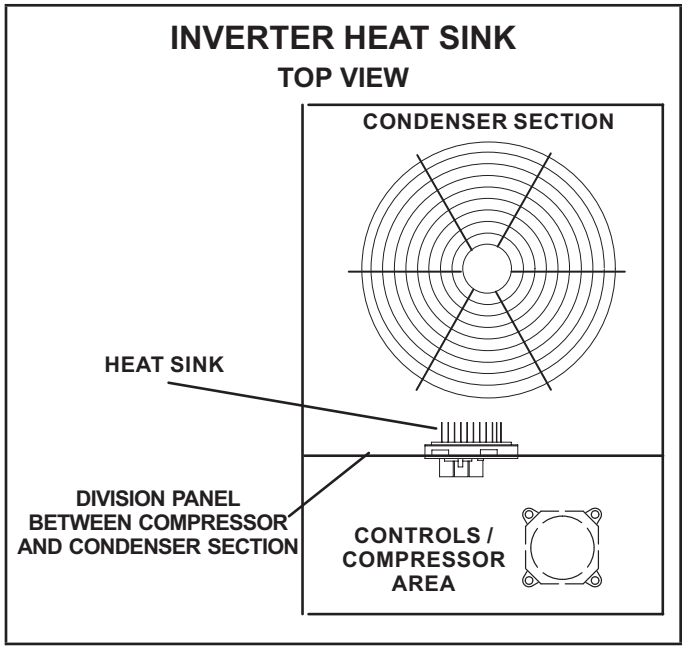


Figure 16

C. Gas Heat Components

LGM units are available with either two stages of gas heat or modulating gas heat. See SPECIFICATION - LOW NOX GAS HEAT

⚠ WARNING

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

1. Direct Spark Ignition Control A3

The Direct Spark Ignition (DSI) control performs or manages several key functions during gas heating demand cycle. Several of the key functions are ignition sequence, gas valve operation (GV1, GV4), Combustion Air Inducer operation (B6), monitoring and responding to safety switches (S10, S18, S47), and heating sequence extinguishment.

The DSI control's red light (LED) is provided as a visual communication of the current operational status or active errors (refer to Table 4 for LED Codes).

Additionally, the DSI control communicates information to the CORE control using MODBUS.

Operation - Normal

On activation of W1 heating demand to A3 Direct Spark Ignition (DSI) control, a check for proper switch contact positions: S10 Limit (closed); S47 Rollout (closed); S18 Pressure switch (open) is performed. Once this check is complete and conditions are correct, the DSI control activates B6 Combustion Air Inducer in Low Speed and waits for the S18 Pressure switch contacts to change from open to closed. After S18 contact have closed (CAI operation proven), DSI control starts a 30 second Pre-Purge Period. The **Pre-Purge** period enables the combustion air inducer to vent exhaust gases present in the burners, heat exchanger tubes, and collector box. With S18 Pressure switch contacts closed and expiration of Pre-Purge period, the DSI control starts the Trial for Ignition sequence.

A **Trial for Ignition** starts with DSI control simultaneously activating 2-stage gas valve GV1 (Low Fire) OR modulating gas valve GV4 (min. position) and the E1 Spark Electrode. DSI control deactivates the E1 Spark Electrode immediately when EITHER a flame is sensed at FS1 Flame Sense Electrode OR expiration of the 10 second Trial for Ignition Period.

NOTE - *The blower operation is managed by the CORE Controller. At the start of the Trial for Ignition Period, the CORE Controller initiates the Blower On Delay timer.*

Once the flame is established (sensed), the ignition control then proceeds to "steady state" mode where all inputs are monitored to ensure the S10 limit switch, S47 roll-out switch and S18 prove switch are closed as well as flame remains present (sensed via FS1).

NOTE - *For units equipped with modulating gas valve GV4 option, after flame establishment, GV4 gas valve starts modulating based upon the CORE provided position signal. Also, with the modulating option, CORE controller manages the B6 CAI speed by adding or removing a W2 demand signal to DSI controller based upon the calculated gas valve position.*

If additional heating demand W2 is applied to the DSI control, the DSI control switches B6 Combustion Air Inducer from Low to High Speed and switches the 2-stage gas valve GV1 from Low to High Fire.

When heating demand is removed from the DSI control, gas valve (GV1 or GV4) is de-energized. DSI control continues Combustion Air Inducer operation for a 45 second Post-Purge Period, then deactivates the B6 Combustion Air Inducer.

NOTE - *CORE controller starts Blower Off Delay timer when heating demand is removed (satisfied).*

Operation - Abnormal

If flame is not sensed during the **Trial for Ignition***,* A3 DSI control will deactivate the gas valve and B6 CAI continues operating for a 30 second **Inter-Purge Period**. The Inter-Purge period enables combustion air inducer to vent built-up gas, such as unburned fuel-air mixture or exhaust products, from the burners, heat exchanger tubes, and collector box. After expiration of the Inter-Purge Period, DSI control simultaneously activates 2-stage gas valve GV1 (Low Fire) OR modulating gas valve GV4 (min. position) and the E1 Spark Electrode. DSI control deactivates the E1 Spark Electrode immediately when EITHER a flame is sensed at FS1 Flame Sense Electrode OR expiration of the 10 second Trial for Ignition Period. The DSI will attempt, up to 2 more times, a Trial for Ignition, to establish a flame during the same heating demand.

If flame is established, then lost during "steady state" mode, A3 DSI control will deactivate the gas valve and B6 CAI continues operating for a 30 second **Inter-Purge Period**. The Inter-Purge period enables combustion air inducer to vent exhaust gases from the burners, heat exchanger tubes, and collector box. After expiration of the Inter-Purge Period, DSI control simultaneously activates 2-stage gas valve GV1 (Low Fire) OR modulating gas valve GV4 (min. position) and the E1 Spark Electrode. DSI control deactivates the E1 Spark Electrode immediately when EITHER a flame is sensed at FS1 Flame Sense Electrode OR expiration of the 10 second Trial for Ignition Period. The DSI will attempt, up to 4 more times, an Ignition Recycle to re-establish a flame during the same heating demand. Refer to Table 4 for A3 DSI control status codes and definitions.

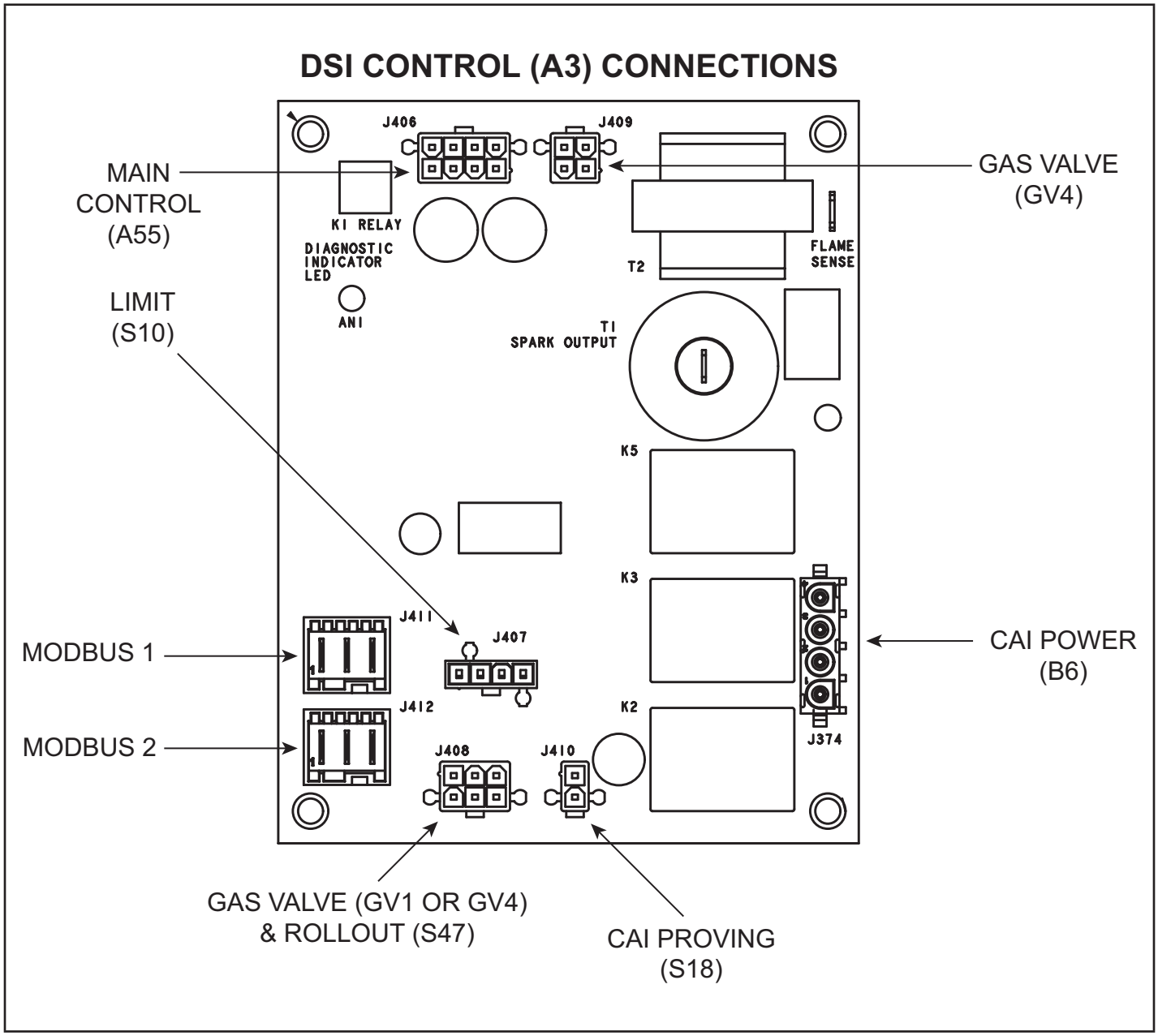


Figure 17

Table 4
A3 DIRECT SPARK IGNITION CONTROL (DSI) – DIAGNOSTIC CODES AND DETAILS

Diagnostic Indicator	Status	Description	Potential Remedy Actions
Slow Flash	Normal Operation	No Heating demand at DSI control.	None
Fast Flash	Normal Operation	Heating demand at DSI control	None
Steady Off	Internal Control Fault OR No Power	DSI control is OFF (no 24VAC power) or has an internal fault.	Determine status of 24VAC power supplied to DSI (refer to Unit Wiring Diagram). • If DSI control is ON (24VAC present), replace DSI control. • If DSI control is OFF (no 24VAC present), correct issues and restore 24VAC to DSI control.
Steady On	Control Internal Failure	**Internal DSI control board hardware fault.** • DSI internal hardware fault detected, indicator activated, DSI function locked out. • DSI automatically removes lockout if hardware fault clears.	• Power cycle DSI control to clear fault. • If fault remains, replace DSI control.
1 Flash	S47 Rollout Open	**DSI detects open Rollout contacts (N.C.) during W1 demand.** • When contacts open, DSI closes Gas Valve, runs Combustion Air Inducer (CAI) high speed, activates indicator flash. DSI function locked out. • If Rollout manually reset (contacts close), DSI continues CAI operation for post purge period, then turns CAI off, indicator flash continues. DSI remains locked out.	• DSI Lockout cleared by a manual reset of Rollout switch before power cycling DSI. • Investigate / correct possible issues leading to Rollout contacts opening (e.g., CAI off or failed, blocked tubes, blocked flue, etc.). • Verify correct Rollout operation (see section, *5. Flame Roll-out Limit Switch S47*).
2 Flashes	S10 Limit Open or Opened multiple times during one heating demand	**DSI detects open Limit contacts (N.C.) during W1 demand.** • When contacts open, DSI closes Gas Valve, runs CAI high speed, activates indicator flashes. • When contacts re-close & W1 demand present, DSI restarts ignition sequence, deactivates indicator flashes. • When contacts re-close & no W1 demand present, DSI runs CAI for post purge period, then turns CAI off, deactivates LED flashes. ***NOTE** - for 3rd occurrence of open contacts during same W1 demand, DSI activates indicator flashes, DSI function is locked out.*	• DSI Lockout cleared by Limit contacts re-close AND 1 of the following occurs: expiration of a 1-hour timer; removing W1 demand for 5 - 10 seconds from DSI; or power cycling DSI. • Investigate / correct possible issues leading to Limit contacts opening (e.g., low blower airflow, duct restrictions, high gas pressure, etc.). • Verify correct Limit operation (see section, *2. Primary High Temperature Limits S10*).
3 Flashes	S18 Pressure Switch open with CAI ON	**DSI detects Pressure switch contacts (N.O.) did not close when CAI activated.** • DSI activates CAI, if Pressure switch contact closure is not detected in 300 seconds, DSI turns off CAI for 300 seconds, then repeats sequence until Pressure switch contacts close or W1 demand removed.	• Confirm CAI is ON. • Verify Pressure switch tubing integrity (e.g., no obstructions, kinks, cracks, or splits). • Verify Pressure switch proper contact operation (see section, 7-Combustion Air Prove Switch S18).

4 Flashes	Control lockout – failed to detect or sustain flame	**DSI does not sense flame during initial trial for ignition.** When flame not sensed during ignition period, DSI closes Gas Valve, deenergizes ignitor, runs CAI for inter-purge period, activates LED Flashes. After CAI inter-purge period, DSI reenergizes ignitor, opens Gas Valve, deactivates indicator flashes. ***NOTE -*** *on the 3rd failure to detect flame during the same W1 demand, DSI runs CAI for inter-purge period, turns off CAI, and activates indictor flashes. DSI function locked out.* **Flame established during initial trial for ignition, then lost afterwards.** When flame is lost, DSI closes Gas Valve, runs CAI for inter purge period, activates indicator flashes. After inter purge period, DSI maintains CAI operation, opens Gas Valve, energizes spark and attempts to re-establish flame. ***NOTE -*** *on the 5th loss of established flame during the same W1 demand, DSI closes Gas Valve, runs CAI for post purge period, turns off CAI, activates indicator flash. DSI function locked out.*	• DSI Lockout cleared when one of the following occurs: expiration of a 1-hour timer; removing W1 demand for 5 - 10 seconds from DSI; or power cycling DSI. • Confirm FS1 flame sensor operation (see section, 11-Flame Sensor). • Confirm E1 ignitor operation (see section, 10-Spark Electrode (Ignitor)). • Confirm adequate Gas Valve flow during trial for ignition.
5 Flashes	Flame present with gas off	**DSI detects flame signal for more than 4 seconds when Gas Valve is closed.** • While flame is sensed, DSI turns on and runs CAI, activates indicator flashes. • When flame is no longer sensed, DSI runs CAI for post purge period, then turns CAI off, LED remains Flashing, DSI function locked out.	• DSI Lockout cleared when one of the following occurs: expiration of a 1-hour timer; removing W1 demand for 5 - 10 seconds from DSI; or power cycling DSI. • Confirm FS1 flame sensor operation (see section, 11-Flame Sensor).
6 Flashes	Pressure Switch closed with CAI OFF	**DSI detects closed Pressure Switch contacts (N.O.) when CAI is off.** • DSI control finds Pressure Switch contacts closed prior to pre-purge ignition step. DSI activates indicator flashes and waits indefinitely for contacts to open before turning on CAI.	• Confirm CAI is OFF. • Verify Pressure Switch proper operation (see section, 7-Combustion Air Prove Switch S18).
7 Flashes	Not used	Not Applicable	Not Applicable
8 Flashes	Pressure switch opened repeatedly during heating demand	**DSI detects Pressure Switch contacts (N.O.) change from Closed to Open 3 times during same W1 demand.** ***NOTE -*** *On 3rd contact opening during same W1 demand, DSI closes Gas Valve, runs CAI for post purge period, then turns CAI off, activates indicator flashes, DSI function locked out.*	• DSI Lockout cleared when one of the following occurs: expiration of a 1-hour timer; removing W1 demand for 5 - 10 seconds from DSI; or power cycling DSI. • Verify Pressure switch tubing integrity (e.g., no obstructions, kinks, cracks, or splits). • Verify Pressure Switch proper contact operation (see section, 7-Combustion Air Prove Switch S18).

Table 5
S10 LIMIT TEMPERATURE VALUES

Indoor Blower Type	Heating Imput (BTU)	Limit Actuation (Open on Temp. Rise)	Limit Auto-Reset (Close on Temp. Fall)
DirectPlus™ Direct Drive ECM Blower System	65,000	145°F ± 5°F	105°F ± 8°F
	108,000	150°F ± 5°F	110°F ± 8°F
	150,000	160°F ± 6°F	120°F ± 9°F
Variable-Speed ECM Direct Drive Motor	65,000	220°F ± 6°F	180°F ± 8°F
	108,000	175°F ± 3°F	135°F ± 7°F
	150,000	200°F ± 3°F	160°F ± 7°F

2. Primary Heat Temperature S10

S10 is a SPST N.C., auto-reset, high temperature primary limit for gas heat. S10 limit contact Actuation (change from closed to open) occurs when the switch temperature rises to the setting. Limit contacts will Auto-Reset (automatically re-close) when the switch temperature cools to the setting. Refer to Table 5 for Actuation and Auto-Reset temperatures.

S10 Limits are wired directly to the A3 Direct Spark Ignition control. Limit contact open signals the DSI control when excessive temperature is reached in the heat exchanger compartment. Refer to Table 4 for DSI response to open contacts.

The S10 limit location depends upon the indoor blower assembly installed. S10 limit for the Direct Plus Blowers are located on the left wall in the control box area (Figure 18). This S10 limit style is a closed faced switch mounted on a 3 inch stilt. S10 limit for the ECM blowers are located on the vestibule panel in the heat access compartment (Figure 19). This S10 limit style is an open-faced button switch mounted though a 1” diameter hole.

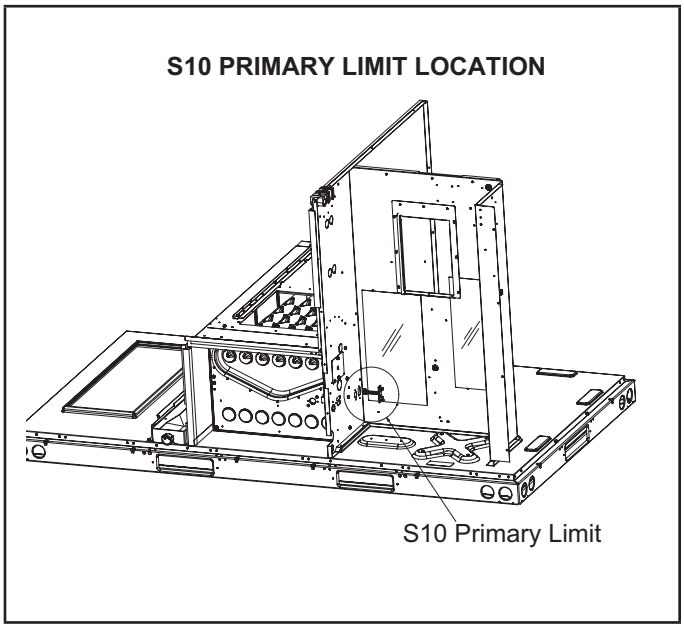


Figure 18

3. Heat Exchanger (Figure 19)

The LGM units use aluminized steel inshot burners with tubular aluminized (stainless is optional) steel heat exchangers and redundant gas valve. Burners in all units use a burner venturi to mix gas and air for proper combustion. Combustion takes place at each tube entrance. As hot combustion gases are drawn upward through each tube by the combustion air inducer, exhaust gases are drawn out the top and fresh air/gas mixture is drawn in at the bottom. Heat is transferred to the air stream from all surfaces of the heat exchanger tubes. The supply air blower forces air across the tubes to extract the heat of combustion. The shape of the tubes ensures maximum heat exchange.

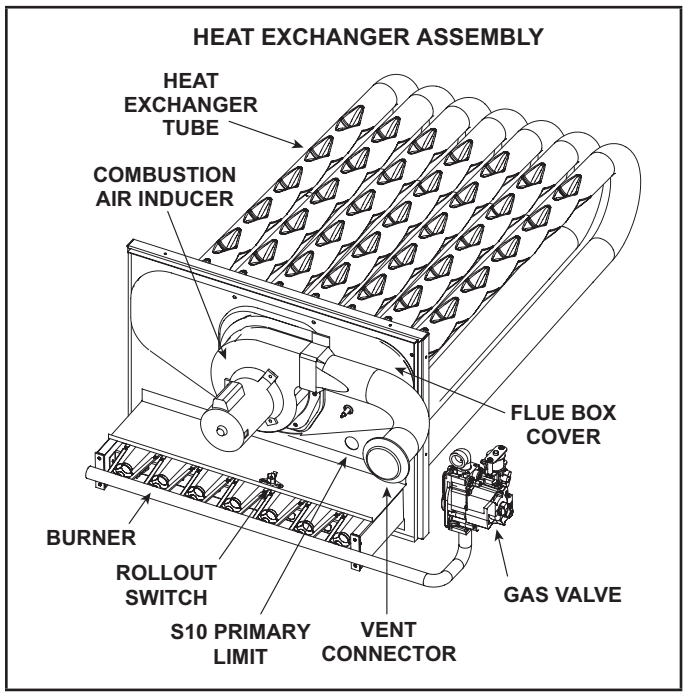


Figure 19

4. Burner Box Assembly (Figure 20)

The burner box assembly contains the following components: Burners, manifolds, orifices, E1 igniter, FS1 flame sensor, S47 roll-out switch, and surrounding sheet metal enclosure. For E1, FS1, and S47 details, see separate sections for each component.

Burners

All units use inshot style burners. Burners are factory set and do not require adjustment. A peep hole with cover is furnished in the heating access panel for flame viewing. Always operate the unit with the access panel in place.

The 3, 5, or 7 burners are made into a single assembly and can only be removed as a single assembly from the burner box. Burner maintenance and service is detailed in the SERVICE CHECKS section of this manual. See Figure 20 for burner removal. See Figure 21 for number of burners.

Manifold and Orifices

For each burner assembly, the unit has a corresponding manifold assembly. The manifold assembly is a formed, painted, 1/2" diameter, black iron pipe with 3, 5, or 7 brass orifices installed. The manifold assembly secures to the burner box (See Figure 20) using sheet metal screws. A manifold is correctly installed when the each orifice falls inside the small inlet ring at each burner's inlet.

Orifices are machined from 7/16" Hex Brass Stock with male 1/8-27 NPT on one end, a small hole (orifice) on opposite end-face, and orifice size permanently stamped into brass. When installing orifices into the manifold, tighten to 70 +/- 20 IN-LBS.

NOTE – *Do not use thread sealing compound on the orifices. Using thread sealing compound may plug the orifices.*

BURNER BOX ASSEMBLY

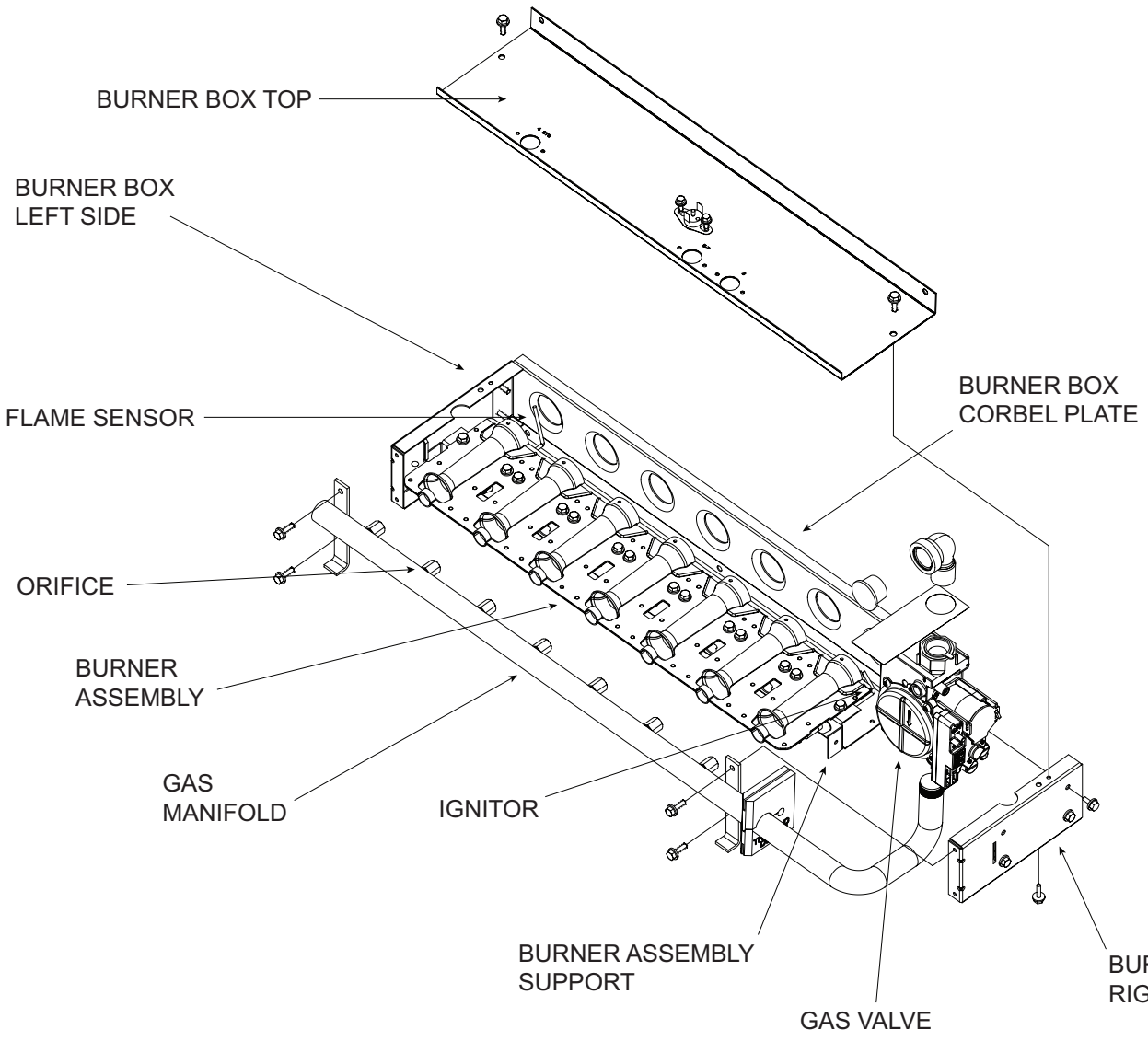


Figure 20

5. Flame Roll-out Limit Switch S47

The flame roll-out limit switch is a SPST N.C., manually reset, high temperature limit located just above the burner air intake opening in the burner enclosures. The switch is wired to the A3 ignition controller. When the limit switch senses flame roll-out (indicating a blockage in the combustion air passages), the flame roll-out limit trips, and the A3 DSI control immediately closes the gas valve.

Limit is factory preset to open at 340F ± 16F on a temperature rise on all units. The flame roll-out switch is not manually resettable until it cools down below 190F. Once cooled down, reset by carefully depressing button on top of the switch until a distinct "click" is heard. If distinct "click" is not heard, verify contact closure by a continuity check between switch's 1/4" electrical connections after unplugging unit wiring from switch. If continuity is confirmed, switch contacts have closed.

6. Combustion Air Motor Capacitor C3

The combustion air inducer motors in all LGM units require run capacitors. The C3 Capacitor is supplied as an integrated part of the B6 Combustion Air Inducer Assembly. The C3 capacitor is mounted and wired to the B6 assembly by the motor manufacturer. Ratings will be on side of capacitor or combustion air motor nameplate.

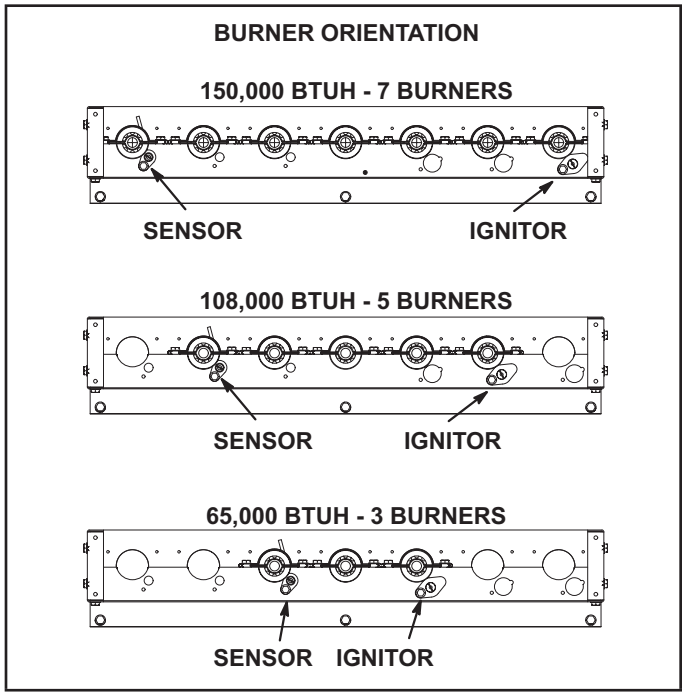


Figure 21

7. Combustion Air Prove Switch S18

The S18 Pressure switch is a SPST N.O. switch located to the right of the B6 Combustion Air Inducer in the heating compartment (See Figure 22). S18 Pressure switch is wired directly to the A3 DSI control enabling switch contact position comparison to CAI operating status. Pressure switch is designed for the contacts to change from open when CAI off to closed when the CAI is activated proving that the CAI is operating. A 3/16" I.D. silicone rubber tubing connects pressure switch port to vestibule panel port (near CAI).

The S18 switch closes at negative 0.10" w.c. +/- 0.05" w.c. on pressure fall (larger negative number). This pressure switch is factory set and not adjustable. Verify pressure switch operation by performing a continuity test between the switch's 1/4" electrical connections after unplugging unit wiring from switch. When CAI is OFF (not running), no continuity (open contacts) should be measured. When the CAI is ON (running), continuity (closed contacts) should be measured.

NOTE – *An obstruction or leak in silicone tubing or metal vestibule port can prevent the pressure switch contacts from changing upon CAI activation (turned ON). DO NOT Exhale (blow) into the pressure switch port as any pressure above 3" w. c. (0.1 psi) can damage the switch diaphragm.*

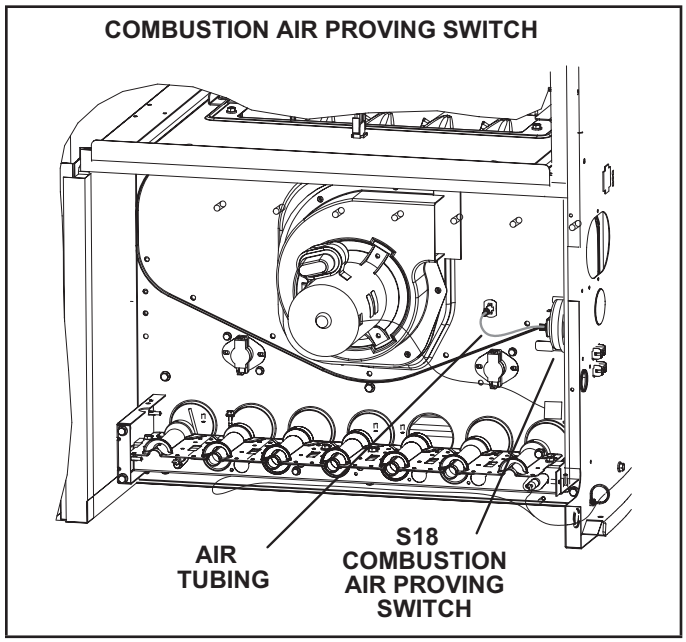


Figure 22

8. Combustion Air Inducer B6

The Combustion Air Inducer (CAI) Assembly draws fresh outside air (for combustion) into the burners through the heat exchanger, and expels the hot combustion products out the flue pipe (outside).

The LGM units Combustion Air Inducer B6 (CAI) assembly consists of a blower wheel, sheet metal wheel enclosure, and a motor secured to enclosure driving the wheel. The motor is a 208/230V, single phase, PSC motor with 2 speed (rpm) taps. The motor has auto-resetting internal overload protection. Inducers are supplied by various manufacturers. Ratings may vary by manufacturer. Specific motor electrical ratings can be found on the unit rating plate. All Combustion Air inducer motors are sealed and cannot be oiled. The CAI cannot be adjusted, but can be removed from the heating section and cleaned.

For LGM models with main power not 208/230V, a T5 transformer is installed upstream of DSI control adjusting power to CAI back to 208/230V power. Refer to unit wiring diagram for details.

9. Gas Valves

Units are equipped with one of 2 types of gas valves based upon the unit configuration. The unit will have either a Copeland 36J54 series two-stage gas valve GV1 or a Copeland 36J27 modulating gas valve GV4.

9a. Two-Stage Gas Valve GV1

The Copeland 36J54 series two stage gas valve features are indicated in Figure 34. When a W1 heating demand is present as input to DSI control, the valve is energized in low fire by the ignition control at the same time as the spark electrode. If the heating demand increases (W1 and W2 demands inputs to DSI control), high fire signal is provided by the ignition controller. Both the low fire and high fire signals are required for the gas valve GV1 to operate in high fire.

A shut-off switch is provided on the valve for manual shut-off. The shut-off switch will immediately close both stages without delay.

Both low fire and high fire valve outputs are adjustable. The gas manifold pressure requires adjustment when the unit is installed at altitudes higher than 2000 feet. Refer to section, **"V. SYSTEMS SERVICE CHECKS"**, *A. Heating System Service Checks*, for procedure to adjust manifold.

9b. Modulating Gas Valve GV4

The Copeland 36J27 series modulating gas valve has 7 features highlighted in Table 6. Refer to Figure 23 for the location of each feature.

Table 6
MGV PHYSICAL FEATURES

Figure #	Description	Features
1	Inlet Side Wrenching Surface	Outside dimension across hex flats = 1.25”; wrenching surface depth = 0.5” minimum.
2 [1]	Outlet Pressure Port	To open port, rotate hex screw 1 complete turn counterclockwise. To close port, rotate hex screw clockwise until securely closed. **Tools required:** 3/32” hex wrench (Allen), 5/16” ID tubing, 5/16” ID to 1/4” ID tubing connector (or Lennox # 69M1701).
3	Outlet Pressure Adjustment Cap	Manifold pressure adjustment screw under removable, translucent cap. Turn to increase (+) or decrease (-) manifold pressure. Adjustment range about ±1.0” w.c. (at min. & max.) **Tool required:** 1/8” flat blade screwdriver
4	Fuel Label	Label, “NAT. GAS”, will be removed for LP conversion. See kit for details.
5	Main Solenoid Power Switch	On/Off switch for main valve open/close solenoid.
6	Electrical Connection	Valve has one 5 pin electrical plug. See section, Electrical Connections, for details.
7 [1]	Inlet Pressure Post	To open port, rotate hex screw 1 complete turn counterclockwise. To close port, rotate hex screw clockwise until securely closed. **Tools required:** 3/32” hex wrench (Allen), 5/16” ID tubing, 5/16” ID to 1/4” ID tubing connector (or Lennox # 69M1701).

1 The hex screws SHOULD NOT be completely removed from the Pressure Port due to their very small size.

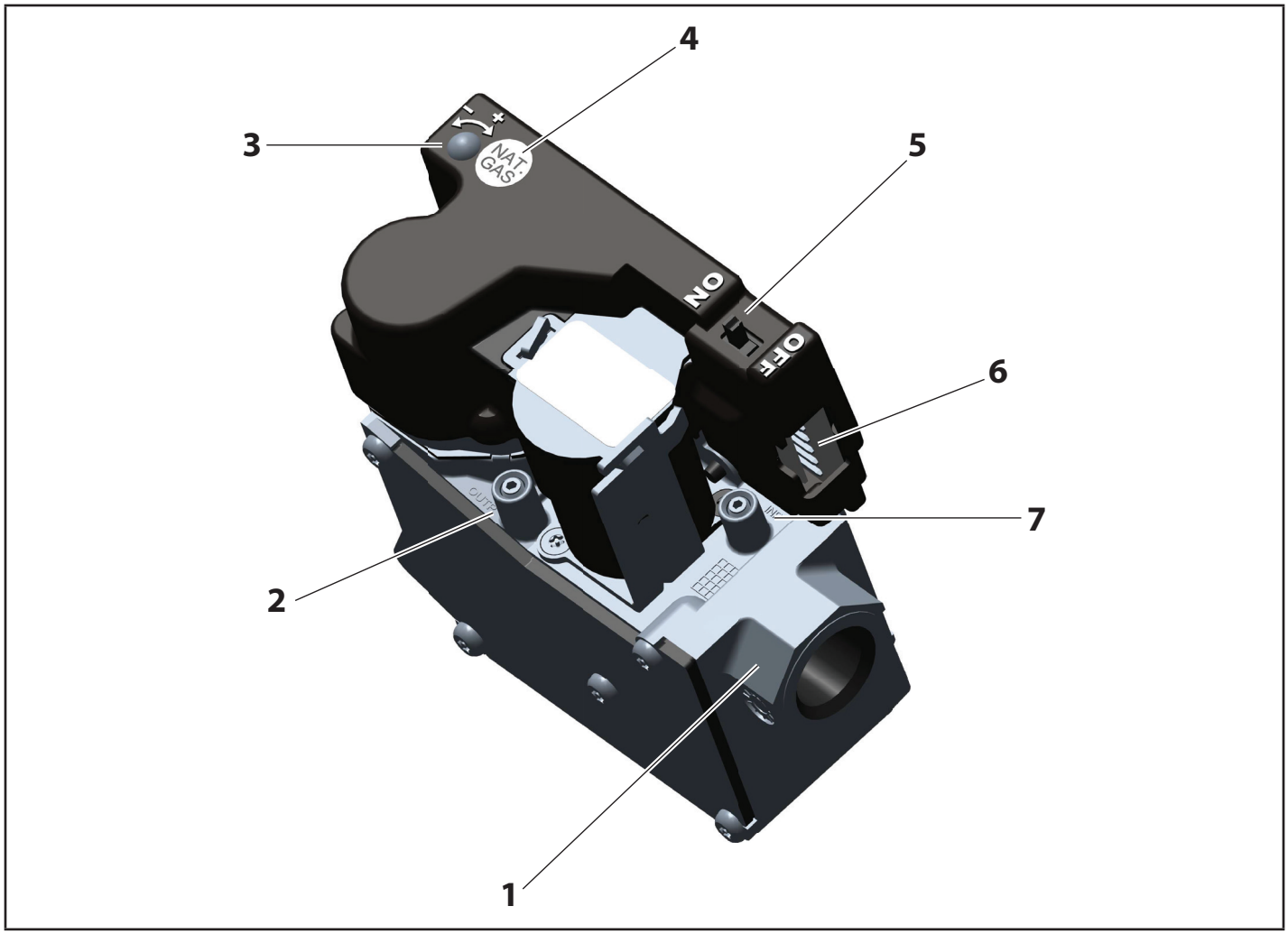


Figure 23

Modulating Gas Valve (MGV) Electrical Connections

The 36J27 modulating gas valve electrical connections are all contained in one JST style 5-pin connector (S5P-VH). Table 7 details the 5 Pins.

Table 7
MGV CONNECTOR FUNCTION BY PIN NUMBER

Pin #	Control Board Stenciling [1]	Description
1	TH	Constant 24VAC input power; supplies control board and stepper motor; Pin 1 is on bottom or farthest pin from On/Off switch.
2	VOL/RXD	Communication, Input. Stepper motor position signal; 0VDC - 10VDC.
3	TXD	Communication, Feedback. NOT USED.
4	TR	Ground, reference.
5	MV TH	Main Valve 24VAC; power applied to Pin 5 opens main valve. Pin 5 is on top or closest pin to On/Off switch.

1 White stencil lettering on green PCB at 5-pin jack connection; visible when unit harness plug disconnected.

Modulating Gas Valve – Turn Power On, Home Function initiates

MGV control board does not save the stepper motor position when powered off. When 24VAC power is applied to Pin #1, MGV initiates a stepper motor "Home" function that can take 10 - 15 seconds to complete. After the Home function is complete, MGV sends the stepper motor to the position per VDC signal on Pin #2.

NOTE – *24VAC power to MGV (Pin #1) is supplied from the DSI (Direct spark ignition) control.*

MGV Manifold Pressure Adjustments – Use CORE Component Test Mode

During heating operation, the CORE is continually recalculating and adjusting the signal to the MGV (0 - 10 VDC to Pin #2) changing the manifold pressure. CORE Component Test mode is the only means of adjusting the manifold pressure settings (minimum or maximum). In Component Test mode, the CORE does not vary the signal to the MGV. The CORE sends a preset VDC signal of either 0 VDC (minimum) or 10 VDC (maximum) depending upon the user's selection.

The 36J27 valve has software that must recognize a user is making a change to a setpoint and then respond. When adjusting either minimum or maximum setpoints (in CORE Component Test mode), rotate the adjustment screw slowly until the software recognizes a change and starts adjusting the manifold pressure. The recommended rotation rate is ¼ turn (90°) in 4 - 5 seconds.

NOTE – *starting a setpoint change by rapidly rotating the adjustment screw may result in the software not detecting the request.*

MGV Manifold Pressure Adjustments – Valve Software Restrictions

The valve's software requires a minimum number of motor steps between the minimum setting (input = 0 VDC) and maximum setting (input = 10 VDC). When decreasing the maximum or increasing the minimum setpoints, the valve will stop adjusting the manifold pressure when the setpoints are closer than 0.75" w.c. (Natural Gas) or 3.0" w.c. (LP/Propane). In Figure 24, the 0.75" w.c. separation concept is illustrated so valve software behavior can be understood. To avoid this software restriction when making large adjustments (i.e., high altitude derate), decrease the minimum first, then adjust the maximum.

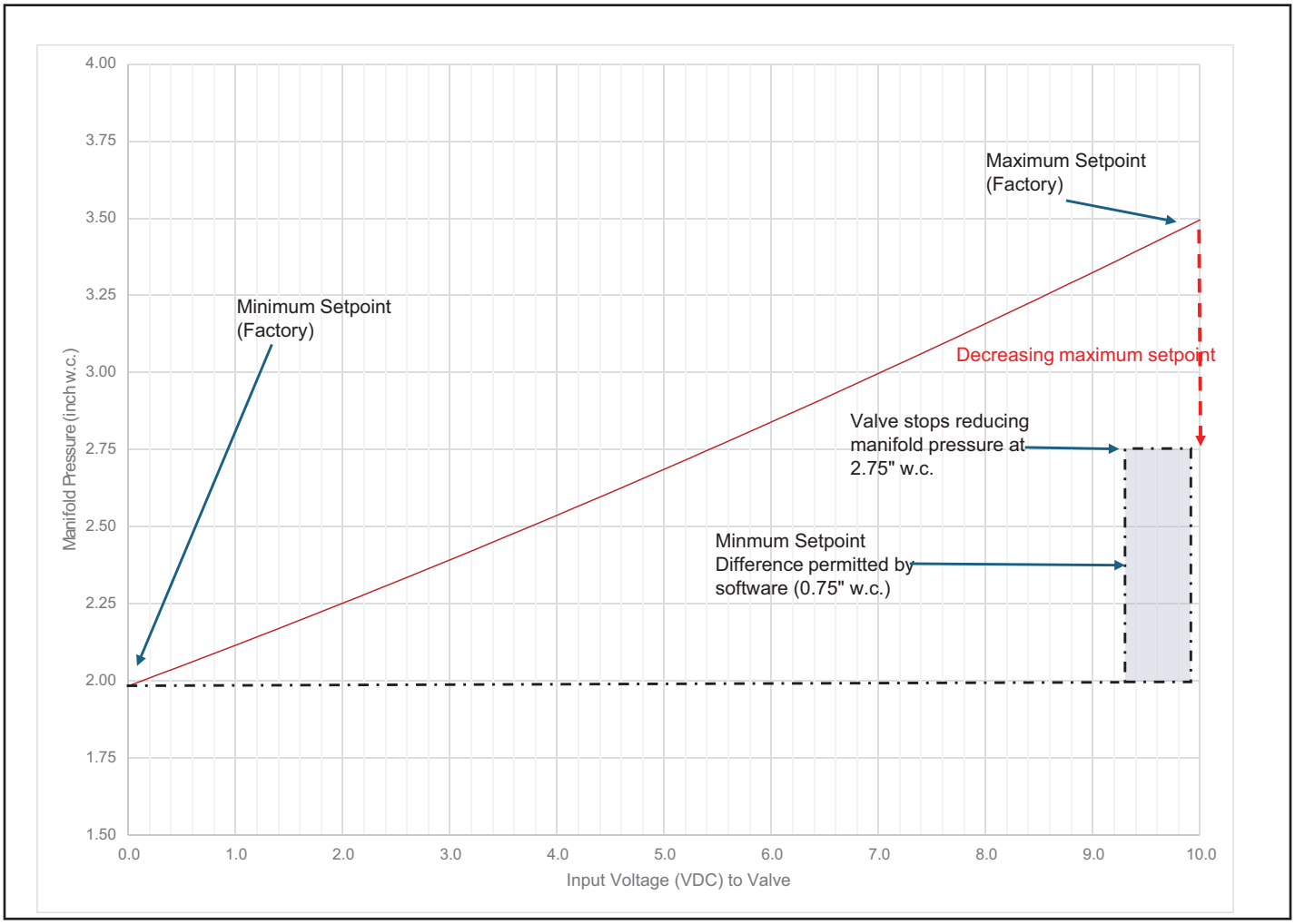


Figure 24

Input Voltage (VDC) vs. MGV Manifold Pressure – What happens when manifold pressure is changed?

The Modulating Gas Valve's minimum and maximum manifold pressure setpoints are adjusted individually. The manifold pressure adjustment options are minimum only, maximum only, and both minimum and maximum. When an adjustment is made, the manifold pressure output for each input VDC is recalculated accordingly. To illustrate, two graphs have been provided. Both graphs have a red line showing the factory settings.

The first graph (Figure 25) illustrates how the intermediate manifold pressures change (for same input VDC) when the maximum manifold setpoint is increased or decreased. The manifold pressure at each input VDC either increases or decreases when compared to the original setpoint. A similar change occurs when adjusting only the minimum manifold setpoint.

The second graph (Figure 26) illustrates how the intermediate manifold pressure settings change when both the minimum and maximum manifold pressure settings are increased or decreased the same amount.

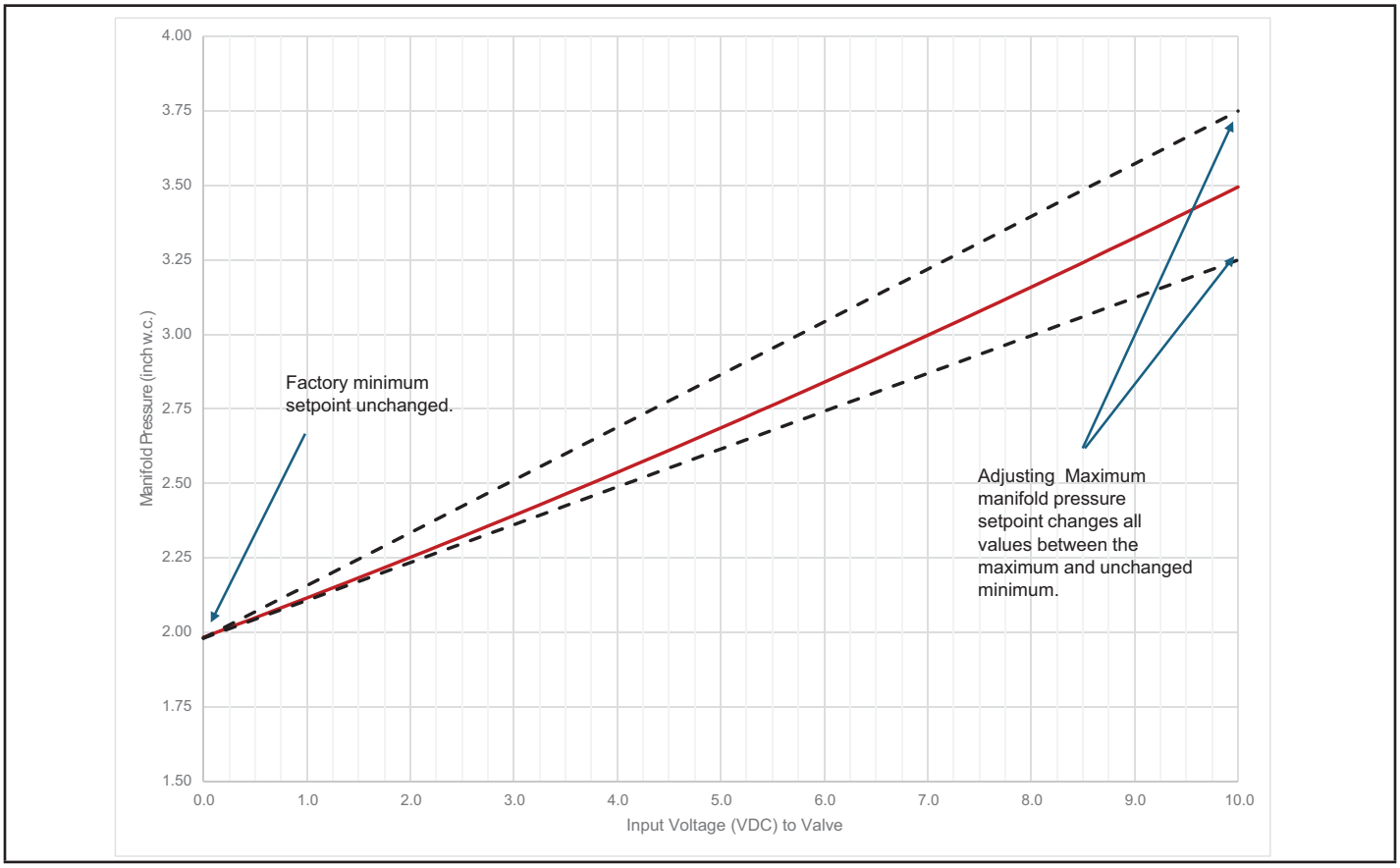


Figure 25

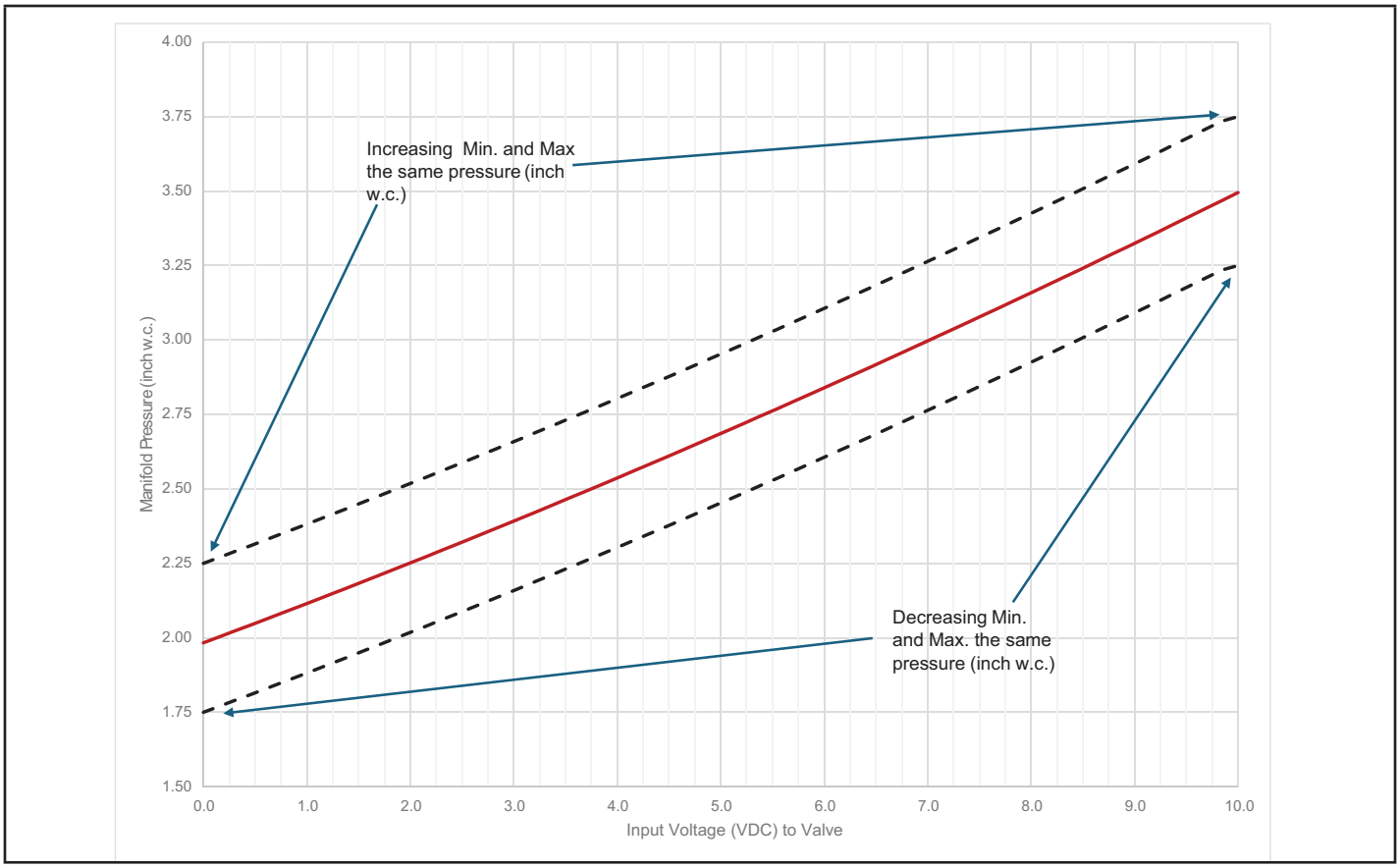


Figure 26

2. Spark Electrode E1 (Ignitor)

An electrode assembly is used for ignition spark. The electrode is inserted through holes in the burner support. See Figure 27. The electrode tip protrudes into the flame envelope of the adjacent burner. The electrode assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

During ignition, DSI control generates spark energy which is transmitted through an insulated noise suppression cable into E1 electrode assembly at male 1/4" quick connect. Spark energy continues through electrode's center rod, arcs (sparks) across gap between rods at opposite electrode end, then ignites the fuel-air mixture at the burner. Flame travels from burner to burner until all are lit.

The noise suppression cable is a 8 mm silicone-insulated stranded high voltage wire. The wire uses 1/4" (6.35 mm) female quick connect on both ends of the wire.

NOTE – *If electrode wire must be replaced, wire and suppression must be same type cable.*

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

For proper unit operation, electrodes must be positioned and gapped correctly. Spark gap may be checked with appropriately sized twist drills or feeler gauges. Disconnect power to the unit and remove electrode assembly. The gap should be between 0.125" ± 0.015" (3.2 mm ± .4 mm).

⚠ IMPORTANT

In order to maximize spark energy to electrode, high voltage wire should touch unit cabinet as little as possible.

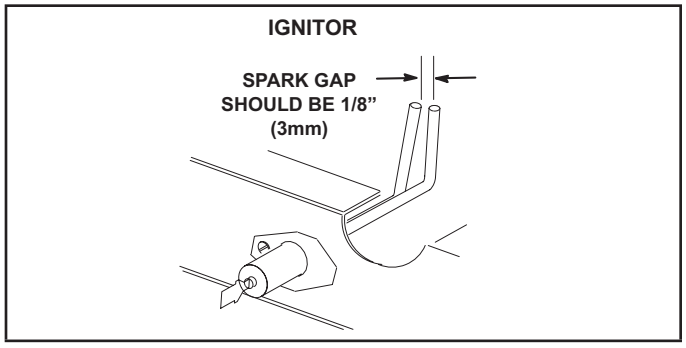


Figure 27

3. Flame Sensor Electrode FS1

Flame rectification sensing is used on all LGM units. When a flame is present, a small electric current (micro amps) flows out of the DSI control's FS terminal through the flame to ground. Conversely, when the flame is not present, current should not flow. The designed electrical pathway for current flow is DSI control to wire harness to FS1 electrode to FLAME to ground (via either burner assembly or E1 ground rod).

The flame sensor electrode is mounted through a hole in the burner support, electrode tip protrudes into the flame envelope of the appropriate burner, and the electrode assembly is secured with a screw to burner support. The electrode assembly can be removed for service without removing any part of the burners. Figure 21 shows the burner support mounting location by heater size. A side view of the FS electrode can be seen in Figure 28. The FS electrode is designed so the tips are at least 1/2" (12.7 mm) inside the flame envelope. FS electrode is not field adjustable. Do not bend or alter the electrode as this may create a hazardous condition that can cause property damage or personal injury.

To measure flame current, follow the procedure:

1. Disconnect power to unit.
2. Remove lead from sensing electrode and install a 0-50DC microamp meter in series between the sensing electrode and the sensing lead.
3. Reconnect power and adjust thermostat for heating demand.
4. When flame is established, microamp reading should be 0.5 to 1.0. Drop out signal is .09 or less.
5. Remove heating demand and disconnect power to unit before disconnecting meter.
6. Make sure sensor wire is securely reconnected before reconnecting power to unit.

NOTE – *If the meter scale reads 0, the leads are reversed. Adjust thermostat to remove heating demand, disconnect power, and reconnect leads for proper polarity.*

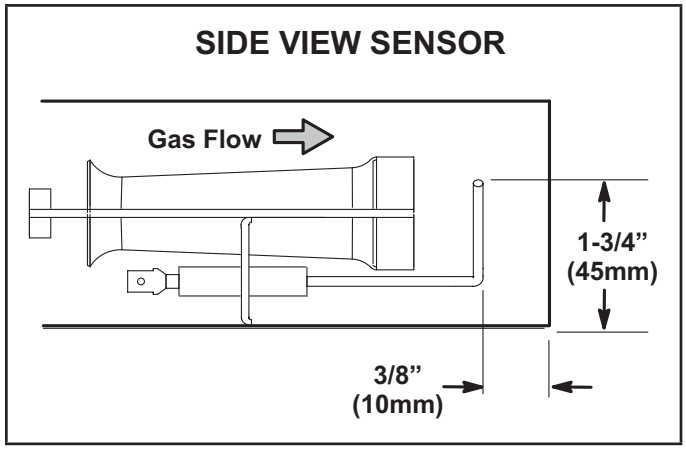


Figure 28

7. Mixed Air Temperature Sensor RT15

On units with the modulating gas heat option, an additional indoor air temperature sensor, Mixed Air Temperature RT15, is installed in the blower compartment. The sensor measures the temperature of indoor air downstream of the indoor coil and prior to entering the blower intake. The Mixed Air Temperature Sensor is a 2-wire, 10k thermistor that snaps into a 9/16" diameter hole. Refer to Figure 29 and Figure 30 for installed location by blower type.

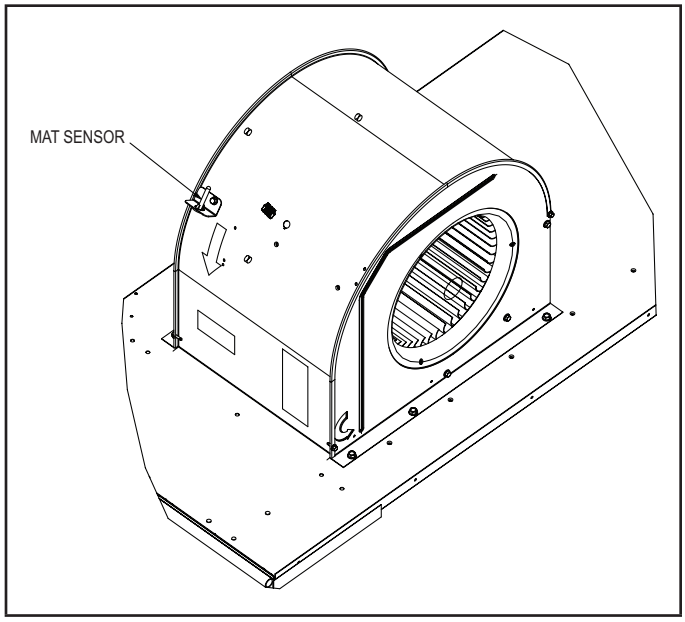


Figure 29

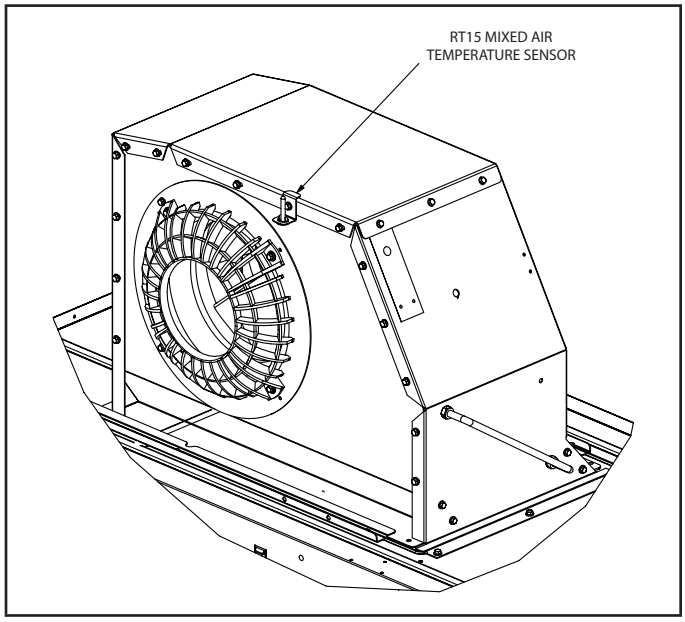


Figure 30

8. Discharge Air Temperature

All units are equipped with a Discharge Air Temperature Sensor RT6 (DAT). The RT6 Sensor is a 2-wire 10K thermistor whose location varies based upon unit options. The DAT (RT6) sensor has 3 possible factory locations. The most common, or standard, location is in the control compartment along the left rear wall as illustrated in Figure 31. The DAT (RT6) location changes with either of the following options: Remote RT6 or Modulating Gas Heat.

For units with a Factory Remote RT6 option, DAT (RT6) is field installed and shipped as a Bag Assembly with instructions in the control compartment. Refer to Figure 32 for the Bag Assembly shipping location.

For the units with the Modulating Gas Heat option, the DAT (RT6) is a multi-part assembly. The assembly consists of the RT6 sensor, a sensor positioning bracket, a short tube, and long tube. The assembly is designed for air to be drawn into the long tube air holes (in the heating compartment) and exit at the short tube's open end (in the blower compartment). RT6 sensor has been factory positioned just inside the short tube's open end and along the tube's centerline (not touching the tube sides). Refer to Figure 33 for the details regarding the installed location DAT (RT6) assembly.

NOTE – *For units with Modulating Gas Option AND configured for Horizontal Ductwork (Side Discharge and Return air flow), the Remote RT6 Option MUST be used.*

Modulating Gas Heat CORE Parameters

User has the ability to adjust the following parameters for modulating gas heat discharge air temperature setpoint (Parameter 647) and sensor fine tune adjustment (Parameter 648).

In the CORE mobile app, use the user interface to change parameters as needed:

Go to SETTINGS > RTU OPTIONS > EDIT PARAMETER

Refer to LENNOX® CORE CONTROL SYSTEM (UNIT CONTROLLER, LOW GWP) APPLICATION GUIDE for more details.

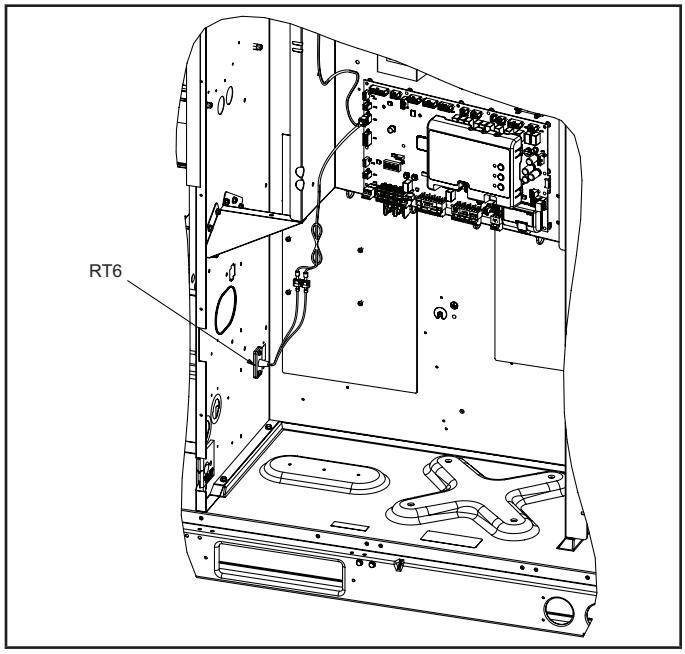


Figure 31

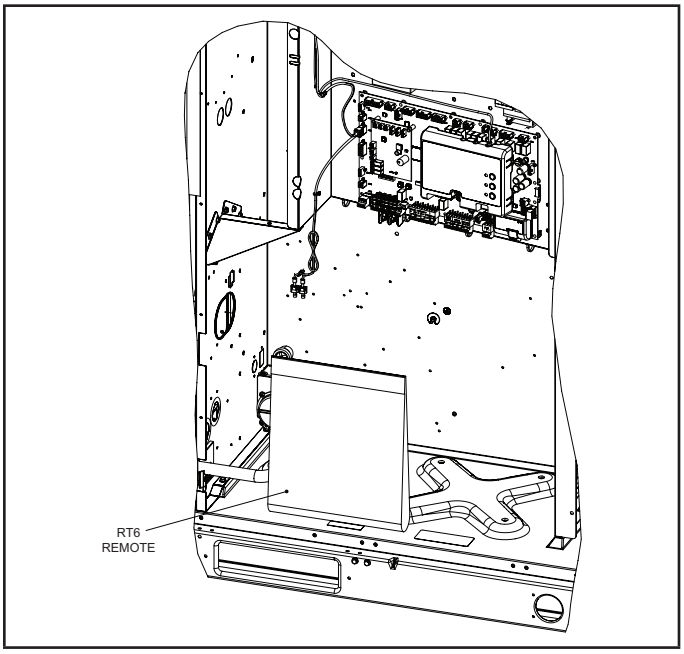


Figure 32

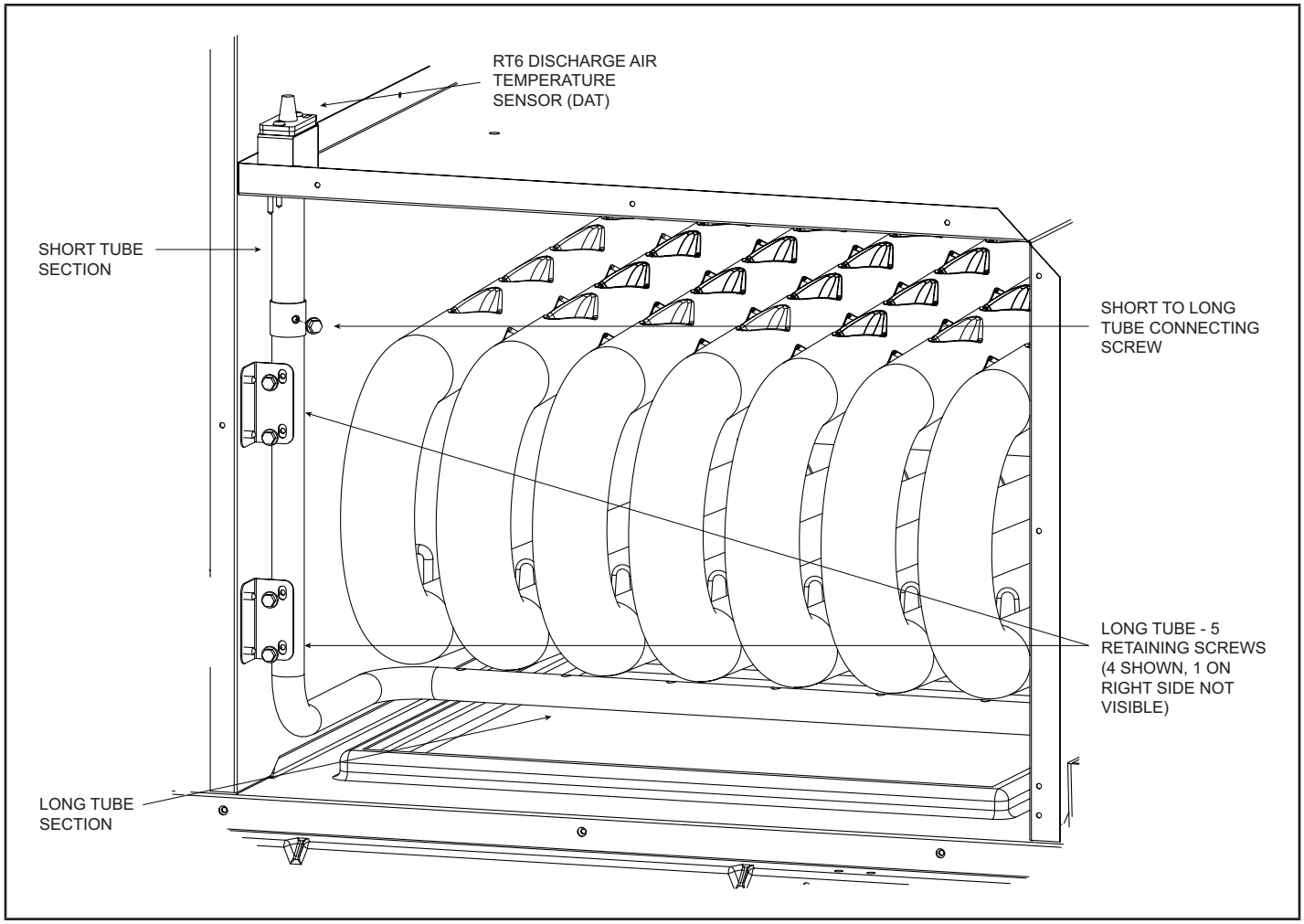


Figure 33

TO REPLACE SHORT TUBE
(refer to Figure 33)

1. Remove Horizontal discharge cover (at rear of unit).
2. Remove and retain screw connecting short tube to long tube.
3. Open Blower Access Panel and remove blower assembly to gain access to DAT (RT6) Assembly.
4. Remove and retain 2 screws securing the RT6 positioning bracket to blower deck. If preferred, RT6 sensor can be removed from positioning bracket by removing 2 the screws (see note).
5. Slip Sensor & positioning bracket (assembled) from inside short tube and set aside.
6. Remove and retain 2 screws securing short mounting tube plate to blower deck.
7. Lift short tube up and into blower compartment.
8. Reverse steps to install new short tube using retained parts.

NOTE – *When the RT6 Sensor has been removed from its positioning bracket. To re-install the sensor, first, resecure positioning bracket to blower deck. Second, slip sensor through bracket into short tube opening and torque each screw to 15 - 17 IN-LBS). Visually check sensor does not touch sides of short tube.*

TO REPLACE LONG TUBE
(refer to Figure 33)

1. Remove Horizontal discharge cover (at rear of unit).
2. Remove and retain 6 screws securing long tube into unit (2 screws on the 2 brackets, 1 screw connecting short to long tube, and 1 on right wall not shown).
3. Slide left end of long tube downward and off short tube.
4. Rotate right end of tube toward the inside of the unit while moving whole tube toward inside of unit to clear left support brackets.
5. Slip tube out the side discharge opening.
6. Reverse steps to install new tube using retained screws.

D. Adjusting Unit CFM

The supply CFM can be adjusted by changing Unit Controller settings. Refer to Table 8 for menu paths and default settings. Record any CFM changes on the parameter settings label located on the inside of the compressor access panel.

⚠ CAUTION

The BLOWER CALIBRATION process starts the indoor 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 blower. 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 8
LG/LC/LH/LD 036-074 PARAMETER SETTINGS

Parameter	Field Setting	Description
NOTE - *Any changes to Smoke CFM setting must be adjusted before the oter CFM settings. Use SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 12 for EBM, 6 for ECM.*		
BLOWER SMOKE CFM	%	Percentage of torque for blower smoke speed
SETUP > TEST & BALANCE > BLOWER		
BLOWER HEATING HIGH CFM	%	Percentage of torque for blower heating high speed.
BLOWER HEATING LOW CFM	%	Percentage of torque for blower heating low speed. (Applies to: Units with Heat Code = P, K, R OR P Volt + Heat Code = B, Q, X)
BLOWER COOLING HIGH CFM	%	Percentage of torque for blower cooling high speed.
BLOWER COOLING LOW CFM	%	Percentage of torque for blower cooling low speed and vent speed for standard static blowers.
BLOWER VENTILATION CFM	%	Percentage of torque for high static blower ventilation speed.
SETUP > TEST & BALANCE > DAMPER		
BLOWER HIGH CFM DAMPER POS %	%	Minimum damper position for high speed blower operation. Default 0%.
BLOWER LOW CFM DAMPER POS %	%	Minimum damper position for low speed blower operation. Default 0%.
BLOWER EXHAUST CFM DAMPER POS %	%	Minimum damper position for exhaust speed blower operation. Default 0%.
SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 216		
POWER EXHAUST DEADBAND	%	Deadband % for power exhaust operation. Default 0%.
SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 10 (Applies to Thermostat Mode ONLY)		
FREE COOLING STAGE-UP DELAY	%	Number of seconds to hold blower at low speed before switching to blower at high speed. Default 300 seconds.

Installer - Record any parameter changes under “Field Setting” column. Settings need to be recorded by installer for use when Unit Controller is replaced or reprogrammed.

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 (T1CURB-AN or C1CURB-AN).

III. START UP – OPERATION

A, Preliminary and Seasonal Checks

1. Make sure the unit is installed in accordance with the installation instructions and applicable codes.
2. Inspect all electrical wiring, both field and factory installed for loose connections. Tighten as required. Refer to unit diagram located on inside of unit compressor access panel.
3. Check to ensure that refrigerant lines are in good condition and do not rub against the cabinet or other refrigerant lines.
4. Sealed electrical components shall be replaced, not repaired.
5. Intrinsically safe components must be replaced, not repaired.
6. Check voltage at the disconnect switch. Voltage must be within the range listed on the nameplate. If not, consult the power company and have the voltage corrected before starting the unit.
7. 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. Heating Start-Up

FOR YOUR SAFETY READ BEFORE LIGHTING

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

⚠ WARNING

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

⚠ WARNING

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

⚠ CAUTION

SMOKE POTENTIAL

The heat exchanger in this unit could be a source of smoke on initial firing. Take precautions with respect to building occupants and property. Vent initial supply air outside when possible.

The gas valve may be equipped with either a gas control lever or gas control knob. Use only your hand to push the lever or turn the gas control knob. Never use tools. If the lever will not move or the knob will not push in or turn by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.

⚠ WARNING

Danger of explosion. Can cause injury or death. Do not attempt to light manually. Unit has a direct spark ignition system.

This unit is equipped with an automatic spark ignition system. There is no pilot. In case of a safety shutdown, move thermostat switch to OFF and return the thermostat switch to **HEAT** to reset ignition control.

⚠ WARNING

Danger of explosion and fire. Can cause injury or product or property damage. You must follow these instructions exactly.

Turning On Gas To Unit

1. Set thermostat to lowest setting.
2. Turn off all electrical power to appliance.
3. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
4. Open or remove the control access panel.
5. Move gas valve switch to **OFF**. See Figure 34 and Figure 35.
6. Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.
7. Move gas valve switch to **ON**. See Figure 34 and Figure 35.
8. Close or replace the control access panel.
9. Turn on all electrical power to appliance.
10. Set thermostat to desired setting.

    NOTE - *When unit is initially started, steps 1 through 10 may need to be repeated to purge air from gas line.*

11. The ignition sequence will start.
12. If the furnace does not light the first time (gas line not fully purged), it will attempt up to two more ignitions before locking out.
13. If lockout occurs, repeat steps 1 through 10.
14. If the appliance will not operate, follow the instructions "Turning Off Gas to Appliance" and call your service technician or gas supplier.

Turning Off Gas to Unit

1. If using an electromechanical thermostat, set to the lowest setting.
2. Before performing any service, turn off all electrical power to the appliance.
3. Open or remove the control access panel.
4. Move gas valve switch to OFF.
5. Close or replace the control access panel.

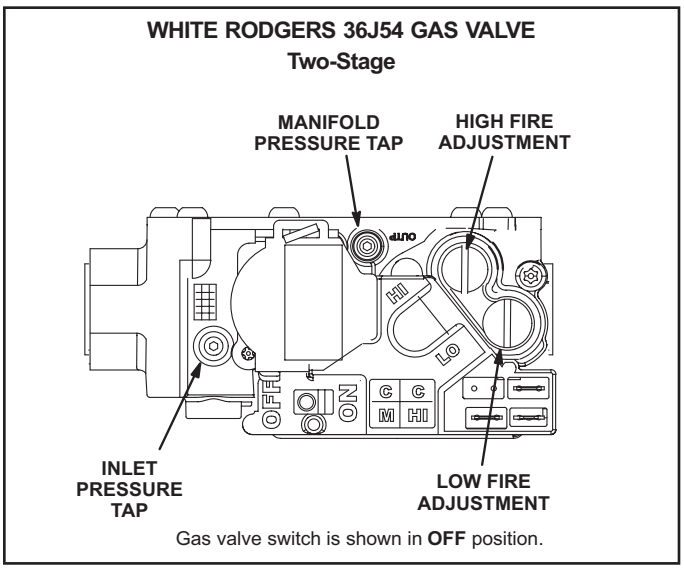


Figure 34

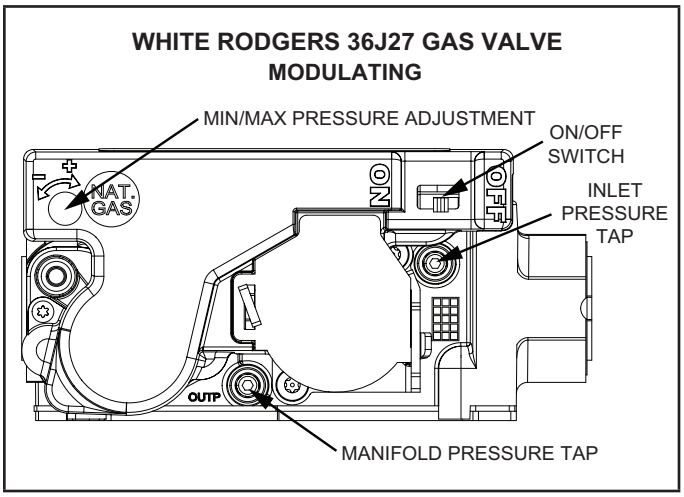


Figure 35

C. Cooling Start-Up

1. Operation

1. Initiate full load cooling operation using the following mobile service app menu path:

   SERVICE > TEST > COOL > COOL 3

   (COOL 4 on 074U units)

NOTE – *Refer to Cooling Operation section for ultra high efficiency unit operation in zone sensor mode.*

2. Units contain one refrigerant circuit or stage.
3. Unit is charges with R-454B refrigerant. See unit rating plate for correct amount of charge.
4. Refer to charging section method to check refrigerant stage.

D. Safety or Emergency Shutdown

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

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.

E. Refrigerant Leak Detection System

The Refrigerant Leak Detection System can be tested by using the following mobile service app menu path:

RTU MENU > COMPONENT TEST > LEAK DETECTION > START TEST

Ensure that the indoor blower, outdoor fan, and combustion air blower (LGM Only) are energized.

IV. CHARGING

A. Refrigerant Charge and Check

⚠ WARNING

Do not exceed nameplate charge under any condition.

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

Refrigerant Charge R-454B		
Unit	M_c(lbs)	M_c(kg)
LGM036	4.50	2.0412
LGM048	5.0625	2.2963
LGM060	5.0625	2.2963
LGM074	5.0625	2.2963
LGM036 W/ Humidtrol	5.6875	2.5798
LGM048 W/ Humidtrol	5.5625	2.5231
LGM060 W/ Humidtrol	5.5625	2.5231
LGM074 W/ Humidtrol	5.5625	2.5231

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

1. Safely remove refrigerant following local and national regulations
2. Evacuate the circuit
3. Purge the circuit with inert gas
4. Evacuate
5. Purge with inert gas
6. 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.

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

- Ensure the 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 labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-of f valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery

- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

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

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

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

NOTE – *Pressures are listed for sea level applications.*

4. Use the same thermometer to accurately measure the liquid temperature (in the outdoor section).

- If measured liquid temperature is higher than the target liquid temperature, add refrigerant to the 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.
7. Example: For the 036 non-reheat model at 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 96°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

B. Subcooling Method - Ultra High Efficiency Units

1. Attach gauge manifold to the liquid line. With the economizer disabled, operate the unit in cooling mode at high speed using the following mobile service app menu path:

SERVICE > TEST > COOL > COOL 3

(COOL 4 on 074U units)

2. Use the liquid line pressure and a PT chart to determine the saturated liquid temperature.
3. Measure the liquid line temperature at the condenser outlet.

Subcooling Temperature =
(Liquid Saturated Temperature – Liquid Temperature)

4. The subcooling temperature should be as shown in Table 9. A subcooling temperature greater than this value indicates an overcharge. A subcooling temperature less than this value indicates an undercharge.

Table 9

SUBCOOLING TEMPERATURE

Unit	Liquid Saturated Temp. Minus Liquid Temperature
036U	11°F ± 1 (6.0°C ± 0.5)
048U	11.5°F ± 1 (6.4°C ± 0.5)
060U	13.5°F ± 1 (7.5°C ± 0.5)
074U	15°F ± 1 (8.3°C ± 0.5)

Table 10

• 036 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581223-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
114	214	116	251	118	292	119	340	119	392	120	449
122	216	124	253	126	294	128	341	129	393	131	450
138	222	141	257	144	298	147	344	150	395	152	452
154	228	158	263	162	303	166	348	170	399	173	454

036 Charging Curve - No Reheat - All-Aluminum Coil - 581223-01

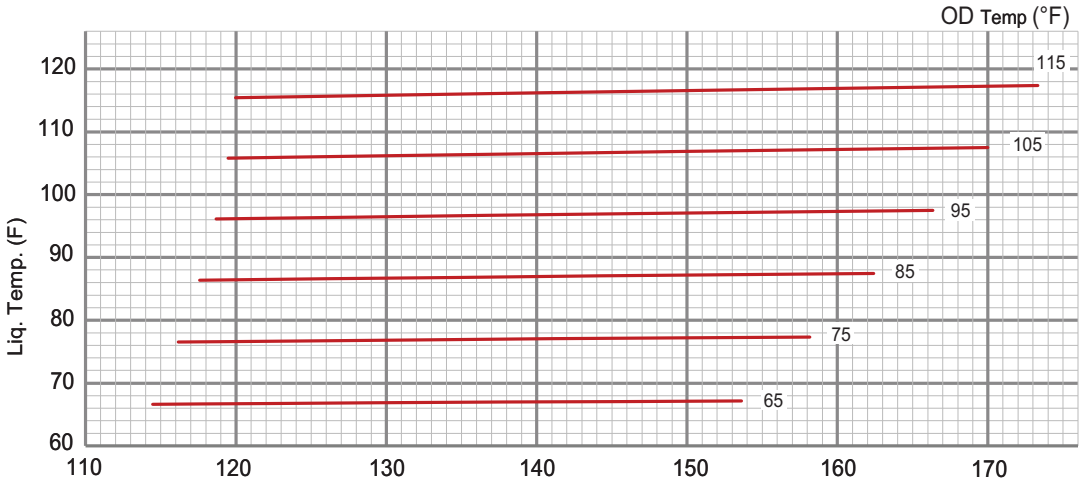


Table 11

• 048 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581224-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
106	224	108	259	110	300	111	347	113	400	114	459
115	227	117	261	119	302	121	349	123	401	124	460
133	235	136	269	138	309	141	354	143	406	145	463
152	247	155	280	158	318	161	363	164	413	166	470

048 Charging Curve - No Reheat - All-Aluminum Coil - 581224-01

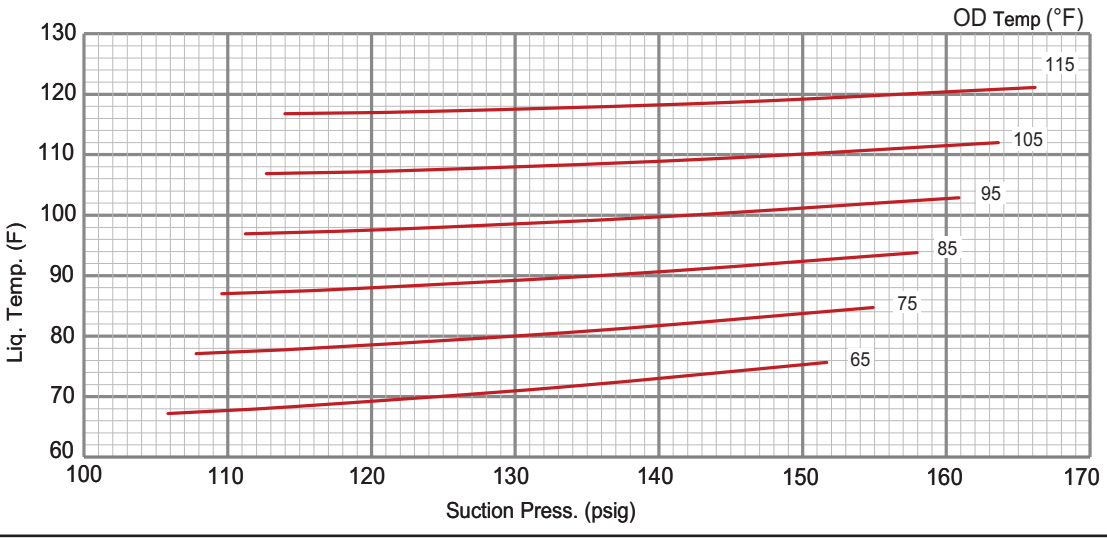


Table 12

• 060 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581225-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
101	231	103	269	105	313	107	360	108	413	110	471
111	236	112	274	114	317	116	364	118	417	120	475
130	243	132	281	134	324	137	372	139	424	141	482
150	250	153	288	155	331	158	378	160	431	163	488

060 Charging Curve - No Reheat - All-Aluminum Coil - 581225-01

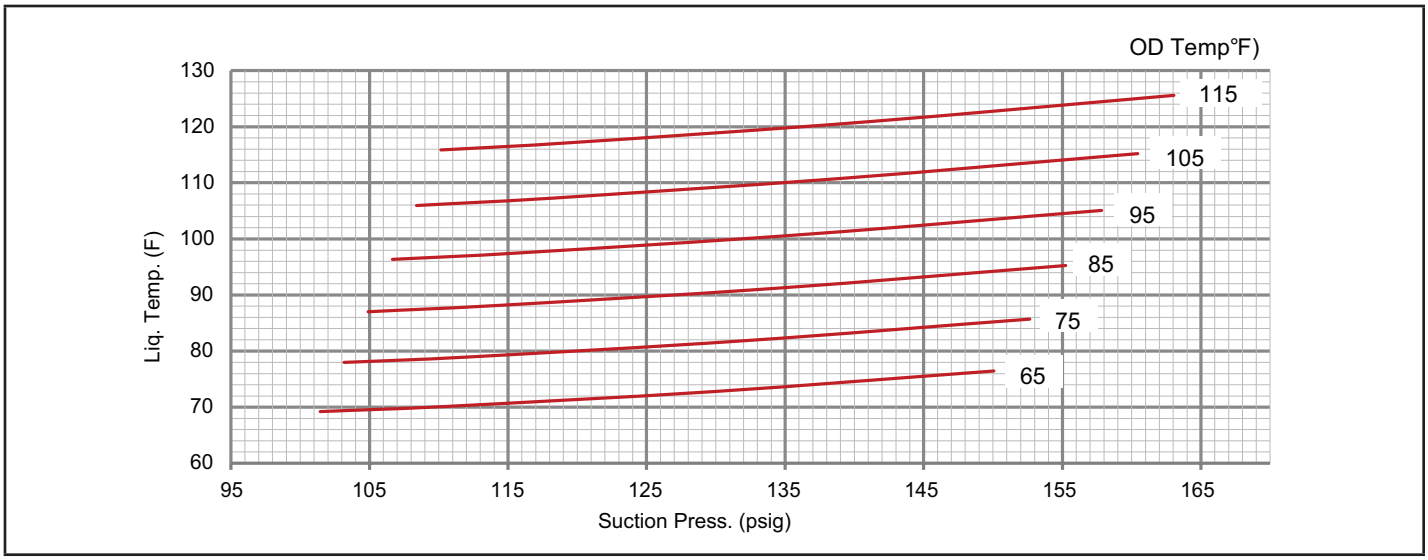


Table 13

• 074 Normal Operating Pressures - No Reheat - All-Aluminum Coil - 581226-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
101	237	102	279	104	324	106	370	109	419	113	470
108	242	110	284	112	329	115	375	118	424	122	475
126	252	128	294	131	338	134	384	138	433	142	484
146	260	149	302	152	346	156	393	161	441	166	492

074 Charging Curve - No Reheat - All-Aluminum Coil - 581226-01

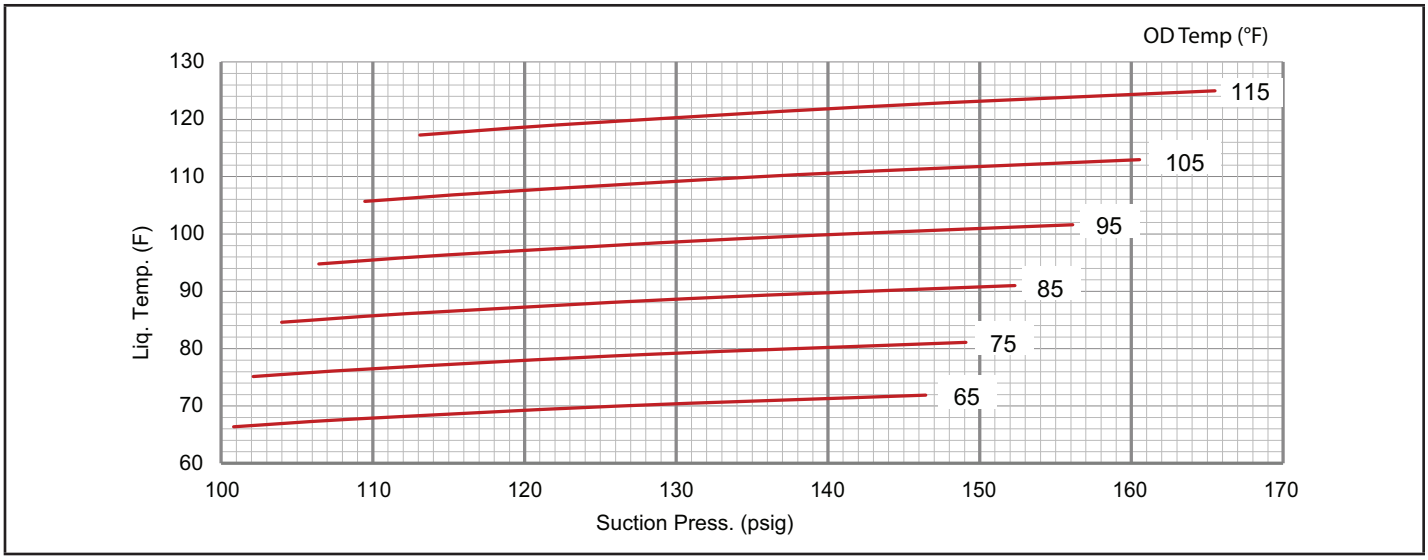


Table 14

• 036 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581267-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
113	217	115	252	117	291	119	335	120	384	122	437
120	219	123	254	125	293	127	338	129	386	131	440
136	224	140	259	143	299	146	343	148	392	151	445
154	229	158	264	162	304	166	348	169	397	173	451

036 Charging Curve - Reheat - All-Aluminum Coil - 581267-01

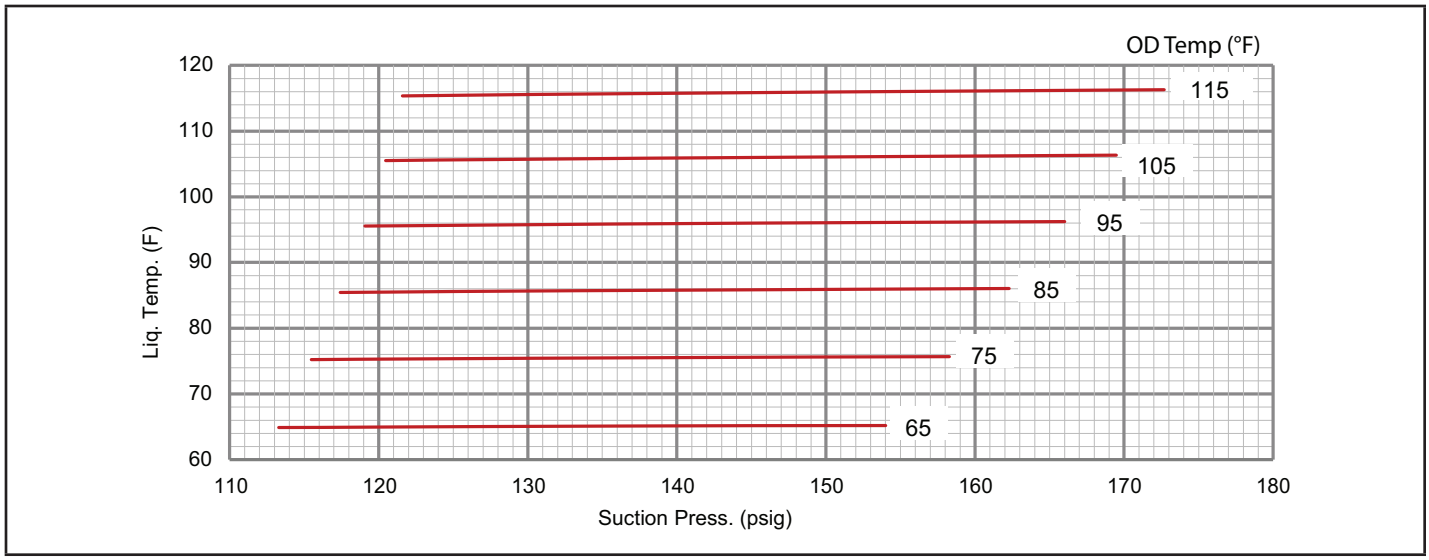


Table 15

• 048 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581268-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
110	228	112	264	114	304	116	348	117	396	118	448
118	232	120	268	122	309	124	353	126	401	127	454
135	239	137	276	140	317	143	362	145	411	147	464
154	245	157	283	160	324	163	370	166	420	169	473

048 Charging Curve - Reheat - All-Aluminum Coil - 581268-01

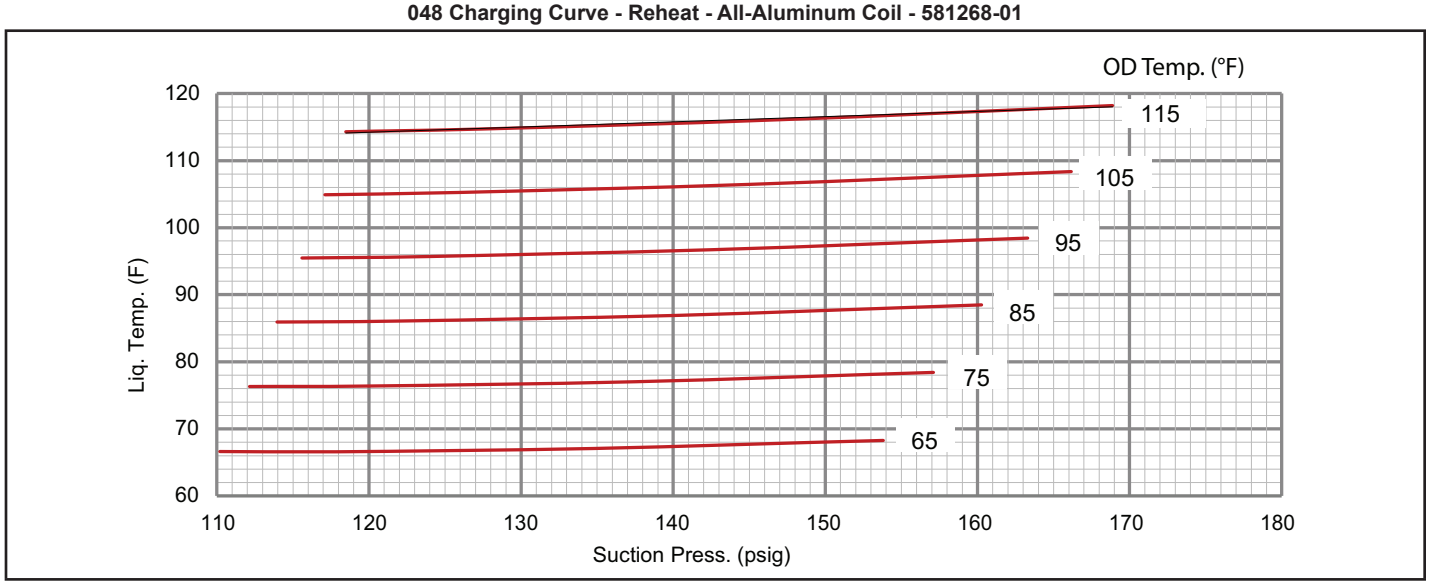


Table 16

• 060 Normal Operating Pressures - Reheat - All-Aluminum Coil - 581269-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
109	233	110	269	112	308	114	352	116	400	119	453
117	241	118	277	120	318	122	363	124	412	127	465
133	253	135	291	137	333	139	380	142	431	145	486
153	259	155	299	157	344	159	392	162	445	165	502

060 Charging Curve - Reheat - All-Aluminum Coil - 581269-01

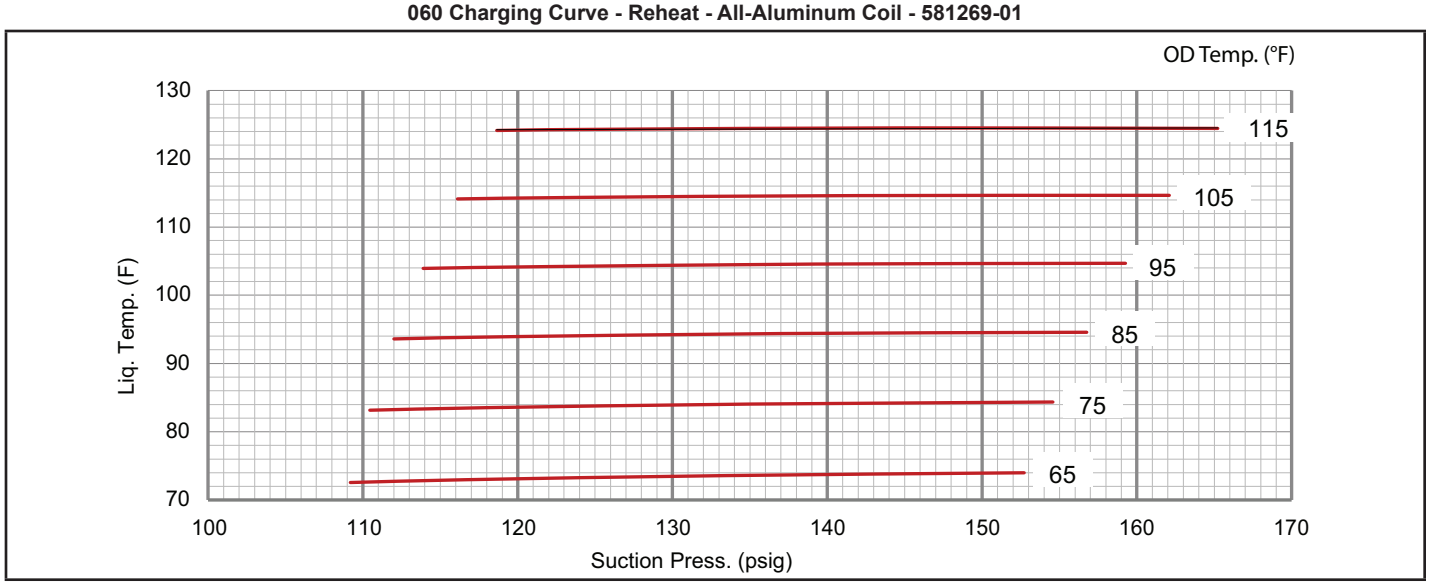
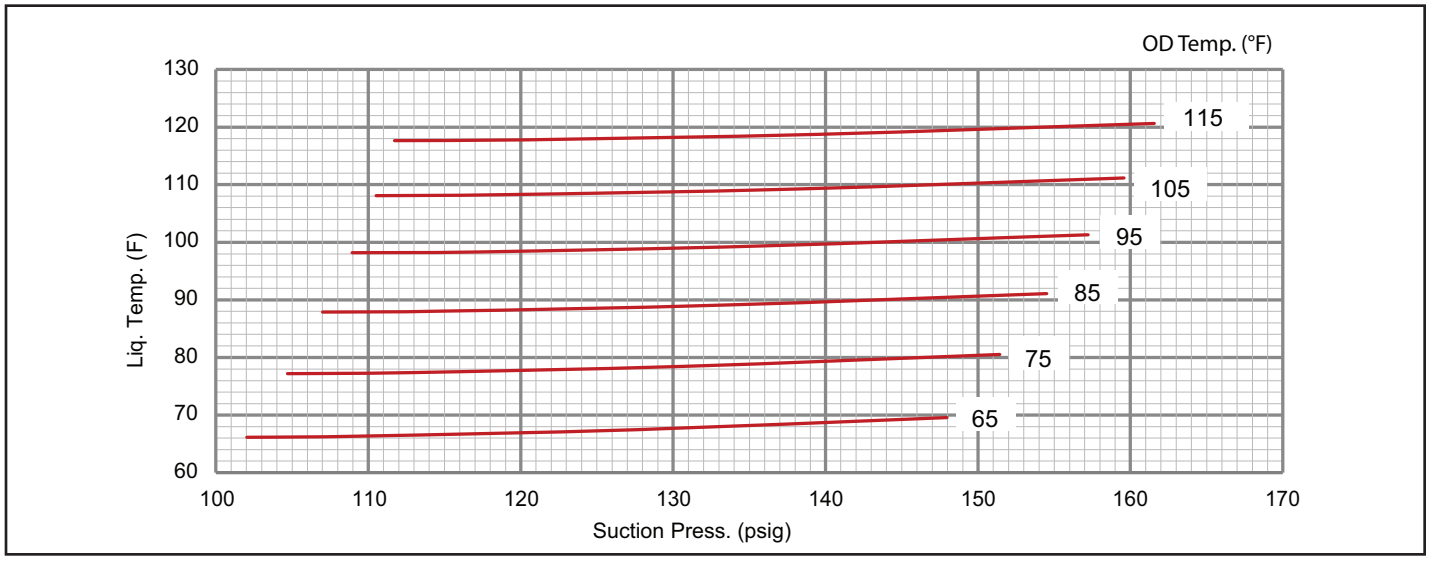


Table 17

074 Charging Curve - Reheat - All-Aluminum Coil - 581270-01

• Outdoor Coil Entering Air Temperature											
65°F		75°F		85°F		95°F		105°F		115°F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
102	244	105	280	107	321	109	366	111	417	112	472
110	251	113	288	115	329	117	375	119	426	120	482
128	262	131	300	133	343	136	391	138	443	140	500
148	270	151	309	155	353	157	402	160	456	162	514

036 Charging Curve - No Reheat - All-Aluminum Coil - 581223-01



V. SYSTEMS SERVICE CHECKS

A. Heating System Service Checks

Prior to beginning work on systems containing refrigerant, checking that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

Servicing shall be performed only as recommended by the manufacturer and a warning that ducts connected to an appliance shall not contain a potential ignition source.

All LGM units are C.S.A. design certified without modification.

1. Gas Piping

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

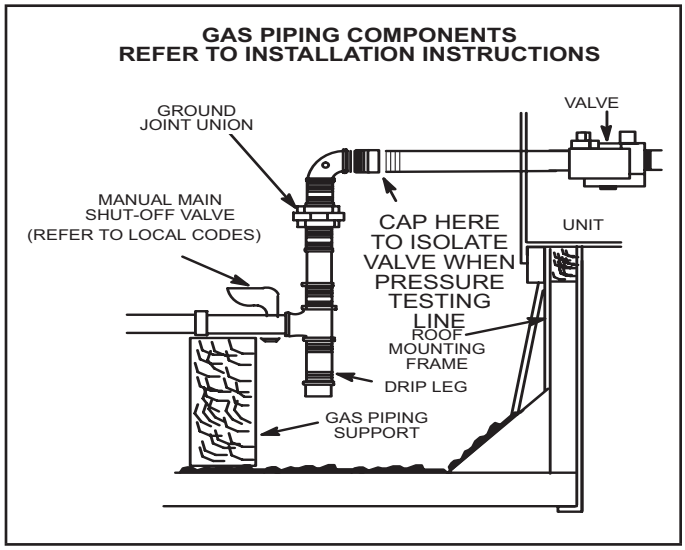


Figure 36

Gas supply piping must not allow more than 0.5"W.C. (124.3 Pa) drop in pressure between the gas meter and the unit. Supply gas pipe must not be smaller than the unit gas connection. Refer to installation instructions for details.

Table 18
OPERATING PRESSURE AT GAS CONNECTON
"w.c.

	Natural Gas		LP/Propane Gas	
	Min.	Max.	Min.	Max.
036-072	4.5	10.5	11	13

2. Testing Gas Piping

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

ATTENTION!

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig [14"W.C. (3481 Pa)]. See Figure 37.

When checking piping connection for gas leaks, use the preferred means. Common kitchen detergents can cause harmful corrosion on various metals used in gas piping. The use of specialty Gas Leak Detector is strongly recommended.

Do not use matches, candles, flame or any other source of ignition to check for gas leaks.

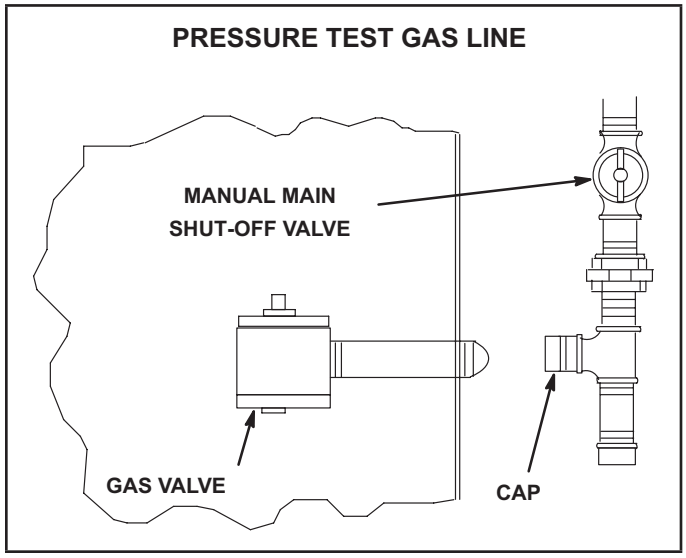


Figure 37

3. Gas Flow

To check for proper gas flow, determine the Btu input from the unit rating plate. Divide this input rating by the Btu per cubic feet of available gas. Result is the required number of cubic feet per hour. Determine the flow of gas through the gas meter for two minutes and multiply by 30 to get the hourly flow of gas.

4. Supply Gas Pressure

Supply pressure should be checked with unit firing at maximum rate. For Natural Gas, supply pressure should be maintained in accordance with the specified minimum and maximum supply pressures on the unit rating plate.

For LP/propane, a natural gas to LP/propane gas changeover kit is required to convert the unit in the field. Refer to installation instructions provided with changeover kit for conversion procedure along with propane minimum and maximum supply pressures.

NOTE - *On multiple unit installations, each unit should be checked separately, with and without other units operating. Supply pressures on both single and multiple unit installations must fall within range listed on the rating plate.*

5. Supply Gas Measurement

1. Shut off the manual main supply valve (field furnished) when installing or removing the measuring device (Steps 2 and 6).
2. Connect the measuring device based upon type of gas valve.

   For White Rodgers 36J54 valve (Figure 34), supply pressure is accessed by removing 1/8" hex screw. Remove the 1/8" hex screw and install a 1/8" fitting with hose barb. Connect tubing from the barbed fitting and route to measuring device to measure supply pressure.

   For White Rodgers 36J27 valve (Figure 35), locate the 5/16" inlet pressure post on top of the valve. Using a 3/32" hex wrench, rotate pressure tap screw one rotation counter-clockwise. Connect a piece of 5/16" I.D. tubing over the post and route to measuring device.
3. Open manual main supply valve.
4. Ignite unit and let run for 5 minutes to allow for steady state conditions.
5. After allowing unit to stabilize for 5 minutes, record supply pressure.
6. Shut unit off and remove measuring device, tubing, or fittings as soon as an accurate reading has been obtained.

   For White Rodgers 36J54 valve (Figure 34), remove supply pressure barbed fitting and reinstall the 1/8" hex screw.

   For White Rodgers 36J27 valve (Figure 35), remove tubing from the post. Then using 3/32" hex wrench, rotate the inlet pressure tap screw clockwise to seal the pressure port.

6. Manifold Pressure Measurement and Adjustment

1. Shut off the manual main supply valve (field furnished) when installing or removing the measuring devise (Steps 2 and 7).
2. Connect the measuring device based upon the type of gas valve.

   For White Rodgers 36J54 valve (Figure 34) manifold pressure, remove the 1/8" hex screw, install 1/8" fitting with hose barb, connect hose from barb to "+" side of measuring device.

   For White Rodgers 36J27 valve (Figure 35) manifold pressure, locate the 5/16" manifold pressure post on top of the valve. Using a 3/32" hex wrench, rotate the outlet pressure tap screw one rotation counter-clockwise. Place 5/16" I.D. tubing over post and route to measuring device.
3. Ignite unit and let run for 5 minutes to allow for steady state conditions. If unit has 2 heating inputs, start on higher input.
4. After allowing unit to stabilize for 5 minutes, record manifold pressure. Compare measurement to the unit nameplate values.

   NOTE - *For elevations higher than 2001 feet above sea level, see High Altitude Adjustment section for details.*
5. If necessary, adjust manifold pressure. Figure 34 and Figure 35 show adjustment screw(s) locations.
6. Repeat steps 3, 4 and 5 on lower input.
7. Shut unit off and remove measuring device as soon as accurate reading has been obtained.

   For White Rodgers 36J54 valve (Figure 34), remove 1/8" fitting with hose barb and reinstall 1/8" hex screw.

   For White Rodgers 36J27 valve (Figure 35), remove tubing from the post. Then using 3/32" hex wrench, rotate the manifold pressure tap screw clockwise to seal the pressure port.
8. Start unit and perform leak check. Seal leaks if found.

NOTE - *White Rodgers offers a Pressure Check Kit (69M1701) which includes 5/16" ID tubing, 3/32" hex wrench, and 1/4" to 5/16" tubing connector.*

7. High Altitude Adjustments

Units in Canada and US may be fired at full input up to 2000 feet (610m) above sea level. Above 2000 feet (610m), manifold pressures must be adjusted.

In Canada, certification for installation at altitudes over 4500 feet (1372m) above sea level is the jurisdiction of local authorities. Lennox recommends reducing input (de-rate) by two percent for each additional 1000 feet above 4,500 feet. Refer to Table 19 for guidance.

In US, the heating input shall be reduced (de-rated) by two percent per 1000 feet above sea level. Refer to Table 20 for guidance.

Once any high-altitude adjustments have been completed, locate the high-altitude conversion sticker in the unit literature bag. Fill out the conversion sticker and affix next to the unit nameplate.

NOTE - *For heating values above 1000 Btu/cu. ft., Lennox recommends verifying the reduced input rate using local heating values and gas flow rate as detailed in section A-Gas Flow.*

Table 19

CANADA – NATURAL GAS MANIFOLD PRESSURES [inch w.c. (kPa)]

Altitude in Feet (Meters)	Low (Minimum) Input Rate	High (Maximum) Input Rate
2001 – 4500 (610 – 1372)	See unit nameplate	
4501-5500 (1372–1676)	1.6 (0.40)	2.8 (0.70)
5501-6500 (1677–1981)	1.5 (0.37)	2.7 (0.67)
6501-7500 (1981–2286)	1.4 (0.35)	2.6 (0.65)
Fuel heating value = 1000 btu/cu ft		

Table 20

US – NATURAL GAS MANIFOLD PRESSURES [inch w.c. (kPa)]

Altitude in Feet (Meters)	Low (Minimum) Input Rate	High (Maximum) Input Rate
2001 – 4500 (610 – 1372)	See unit nameplate	
4501-5000 (1372–1524)	1.7 (0.42)	3.0 (0.75)
5001-6000 (1524–1829)	1.6 (0.40)	2.8 (0.70)
6001-7000 (1829–2134)	1.5 (0.37)	2.7 (0.67)
7001–8000 (2134–2438)	1.4 (0.35)	2.6 (0.65)
Fuel heating value = 1000 btu/cu ft		

⚠ CAUTION

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

⚠ IMPORTANT

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

8. Heat Exchanger

To Access or Remove Heat Exchanger From Unit:

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

B. Cooling System Service Checks

LGM units are factory charged and require no further adjustment; however, charge should be checked periodically using the approach method. The approach method compares actual liquid temperature with the outdoor ambient temperature. See section IV- CHARGING.

NOTE – *When unit is properly charged discharge line pressures should approximate those in Table 10 through Table 17.*

VI. MAINTENANCE

IMPORTANT MAINTENANCE / REPAIR SAFETY INSTRUCTIONS

⚠ WARNING

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

- All work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i. e. non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, the appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- Where electrical components are being changed, service technicians shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance. The following checks shall be applied to installations using flammable refrigerants as applicable:
  1. The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
  2. The ventilation machinery and outlets are operating adequately and are not obstructed.
  3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
  4. Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.
- Refrigerating pipes or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
- For systems containing refrigerant all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.

NOTE – *Sealed electrical components shall be replaced, not repaired.*

NOTE – *Intrinsically safe components must be replaced, not repaired.*

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.
- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:
  a. Safely remove refrigerant following local and national regulations
  b. Evacuate the circuit
  c. Purge the circuit with inert gas
  d. Evacuate
  e. Purge with inert gas,
  f. Open the circuit.
- The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

⚠ 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.

A. Filters

Units are equipped with temporary filters which must be replaced prior to building occupation. See Figure 38. All units have 20 X 20 X 2 in. (508 X 508 X 51mm) filters.

Refer to local codes or appropriate jurisdiction for approved filters.

NOTE – *Filters must be U.L.C. certified or equivalent for use in Canada.*

B. Lubrication

All motors are lubricated at the factory. No further lubrication is required.

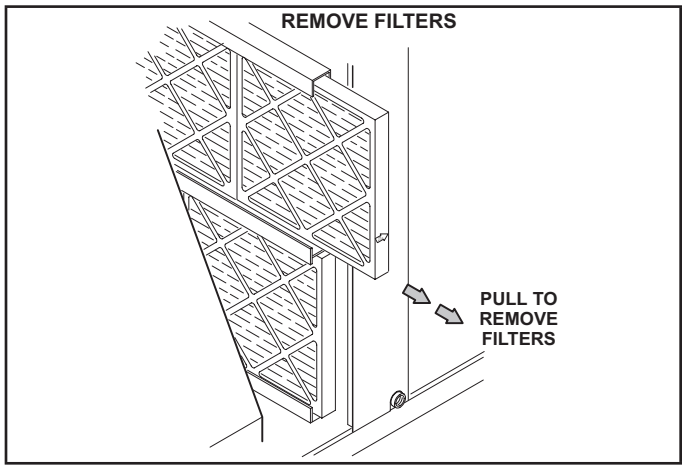


Figure 38

C. Burners

Periodically examine burner flames for proper appearance during the heating season. Before each heating season examine the burners for any deposits or blockage which may have occurred.

Clean burners as follows:

1. Turn off both electrical power and gas supply to unit.
2. Remove burner compartment access panel.
3. Remove top burner box panel.
4. Remove two screws securing burners to burner support and lift the burners from the orifices. See Figure 20. Clean as necessary.

⚠ WARNING

Danger of explosion. Can cause injury or death. Do not overtighten main burner mounting screws. Snug tighten only.

D. Combustion Air Inducer

A combustion air proving switch checks combustion air inducer operation before allowing power to the gas controller. Gas controller will not operate if inducer is obstructed.

Under normal operating conditions, the combustion air inducer wheel should be checked and cleaned prior to the heating season. However, it should be examined periodically during the heating season to establish an ideal cleaning schedule.

Clean combustion air inducer as follows:

1. Shut off power supply and gas to unit.
2. Remove the mullion on the right side of the heat section.
3. Disconnect pressure switch air tubing from combustion air inducer port.
4. Remove and retain screws securing combustion air inducer to flue box. Remove vent connector. See Figure 19.
5. Clean inducer wheel blades with a small brush and wipe off any dust from housing. Take care not to damage exposed fan blades. Clean accumulated dust from front of flue box cover.
6. Return combustion air inducer motor and vent connector to original location and secure with retained screws. It is recommended that gaskets be replaced during reassembly.
7. Replace mullion.
8. Clean combustion air inlet louvers on heat access pane lusing a small brush.

E. Flue Passageway and Flue Box

Remove flue box cover only when necessary for equipment repair. Clean inside of flue box cover and heat exchanger tubes with a wire brush when flue box cover has to be removed. Install a new flue box cover gasket and replace cover. Make sure edges around flue box cover are tightly sealed.

F. Evaporator Coil

Inspect and clean coil at beginning of each cooling season. Clean the all-aluminum coil by spraying the coil steadily and uniformly from top to bottom. Do not exceed 900 psi or a 45° angle; nozzle must be at least 12 inches from the coil face. Take care not to fracture the braze between f ins and refrigerant tubes. Reduce pressure and work cautiously to prevent damage. Flush condensate drain with water, taking care not to get insulation, filters, and return air ducts wet through entire cleaning process.

G. Condenser Coil

Clean condenser coil annually with water and inspect monthly during the cooling season. Clean the all-aluminum coil by spraying the coil steadily and uniformly from top to bottom. Do not exceed 900 psi or a 45° angle; nozzle must be at least 12 inches from the coil face. Take care not to fracture the braze between the fins and refrigerant tubes. Reduce pressure and work cautiously to prevent damage.

NOTE – *Remove all screws and gaskets prior to cleaning procedure and replace upon completion.*

H. Supply Blower Wheel

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

VII. ACCESSORIES

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

A. C1 / T1CURB

When installing the LGM units on a combustible surface for downflow discharge applications, the C1/T1CURB 8 inch, 14-inch, 18 inch or 24-inch height roof mounting frame is used. The roof mounting frames are recommended in all other applications but not required. If the LGM 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 mounting frame is shown in Figure 38. Refer to the roof mounting frame installation instructions for details of proper assembly and mounting. The roof mounting frame MUST be squared to the roof and level before mounting. Plenum system MUST be installed before the unit is set on the mounting frame. Typical roof curbing and flashing is shown in Figure 39. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

B. Transitions

Optional supply/return transitions are available for use with the LGM 3, 4, 5, and 6 ton units (refer to EHB for appropriate transition model). Transition must be installed in the C1/T1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

C. Outdoor Air Dampers

Optional outdoor air dampers are available for use with the LGM 3, 4, 5, and 6 ton units in both manually operated and motorized options (refer to EHB for appropriate damper model). Both sets include the outdoor air hood. The manual damper is set at a fixed point to bring outside air into the building anytime the blower is operating.The motorized damper opens when the blower is operating and the thermostat is sending an occupied signal to the Unit Controller. If the thermostat signal is unoccupied, the motorized damper will not open. Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to re-installation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

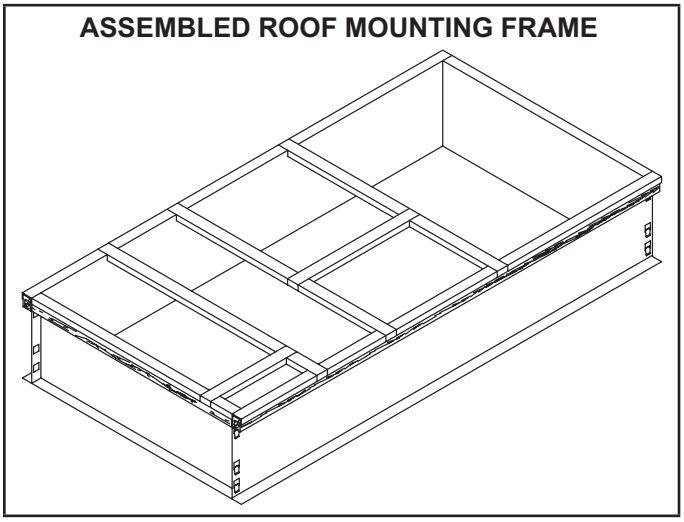


Figure 39

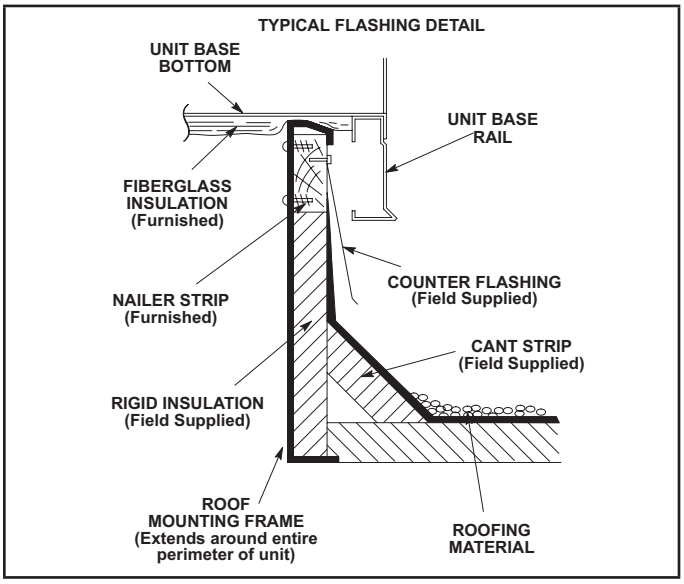


Figure 40

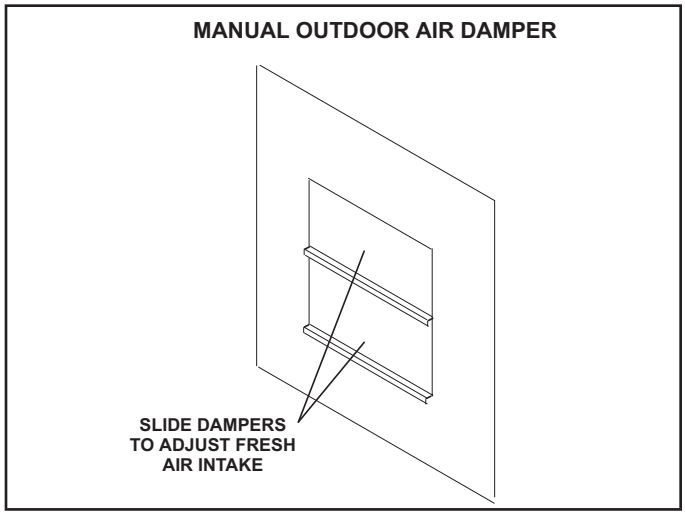


Figure 41

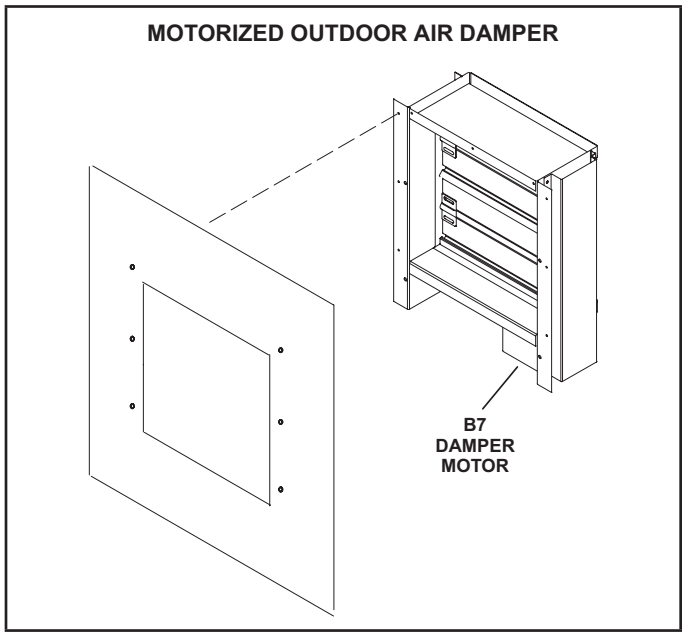


Figure 42

D. Supply and Return Diffusers

Optional flush mount diffuser/return FD9-65 and FD11-95 and extended mount diffuser/return RTD9-65 and RTD11-95 are available for use with all LGM units. Refer to manufacturer's instructions included with transition for detailed installation procedures.

E. Economizer

(Optional Field- or Factory-Installed)

The economizer uses outdoor air for free cooling when temperature is suitable. See Figure 42.

When outdoor air is suitable, the Unit Controller will modulate the economizer dampers to maintain 55°F discharge air (RT6). Refer to unit controller manual for menu paths to adjust economizer setpoints.

Sensors

Units are equipped with the following factory-installed, EC Title 24 approved sensors:

RT17 - Outside Air Temperature

RT16 - Return Air Temperature

RT6 - Discharge Air Temperature

See Figure 43 for sensor location.

Optional field-provided sensors may be used instead of unit sensors to determine whether outdoor air is suitable for free cooling. Refer to Table 21. TEMP OFFSET is the default mode.

NOTE – *Network OAS signal and California Title 24 Compliance options use either TEMPERATURE OFFSET or TEMPERATURE SETPT mode.*

Minimum Position

The Unit Controller will move the dampers to minimum position during the following:

Ventilation mode (G demand only)

Outdoor air is NOT suitable for free cooling

The damper position will vary linearly with blower speed based on the damper position settings for high and low CFM. Damper calibration must be initiated in the mobile service app to set high and low damper positions.

GED (Gravity Exhaust / Barometric Relief Dampers)

Field-Installed Option

The GED is located in the economizer except in downflow applications or when a PEF (power exhaust fan) is NOT installed. In horizontal airflow applications or when a PEF is installed, the GED is located in the exhaust air hood.

Horizontal Air Discharge Economizers

The economizer is located in the unit the same as downflow applications but note the position of the return air duct. The duct attaches to a duct transition and duct inlet on the end of the unit. An optional GED is located in the duct transition. See Figure 44.

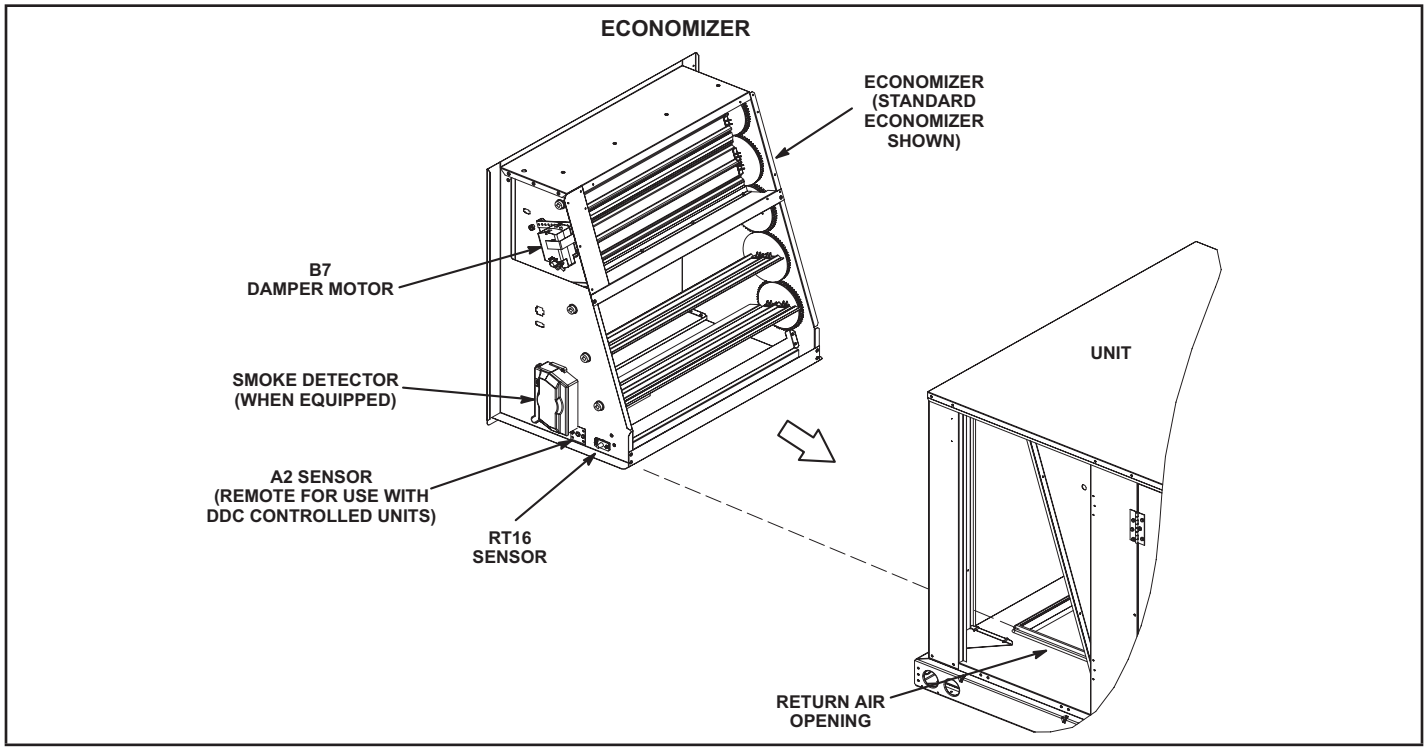


Figure 43

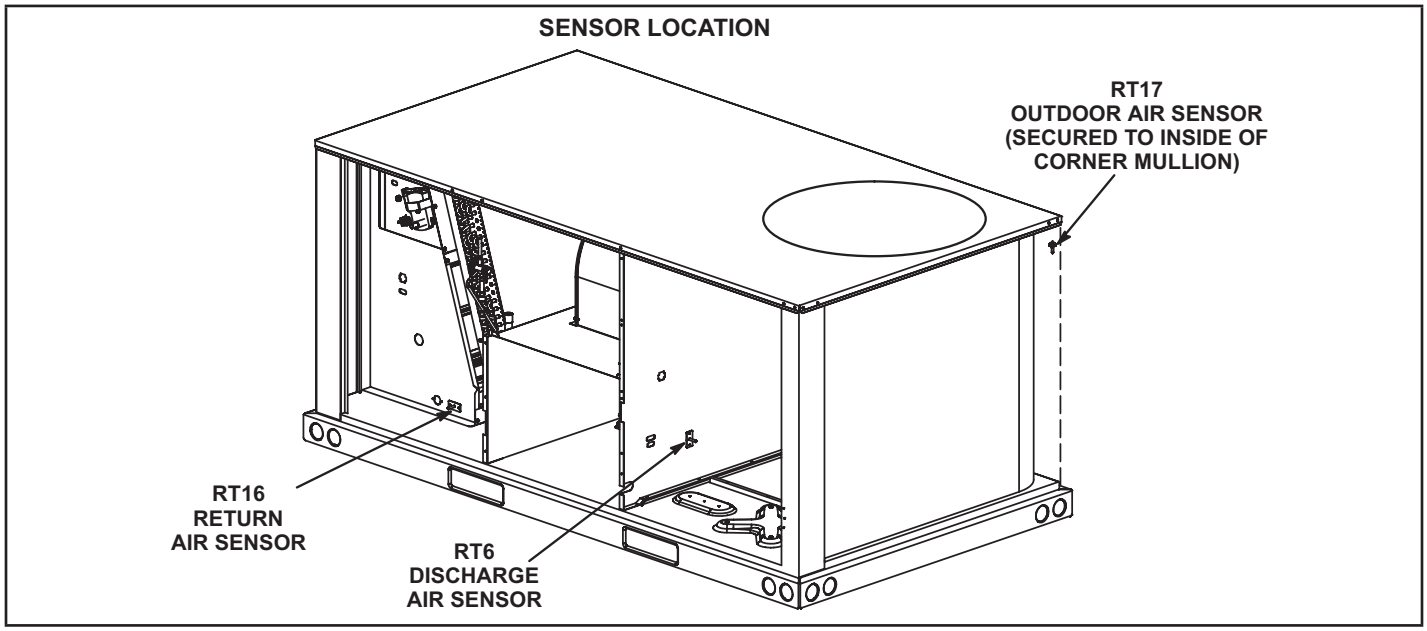


Figure 44

Table 21

ECONOMIZER MODES AND SETPOINT

Free| Cooling Mode	Free Cooling Setpoint	Field-Provide Sensors	**Dampers will modulate to 55°F discharge air (RT6) when outdoor air is suitable:**	Permitted Inputs
TEMP	OFFSET	None Needed	Outdoor air temperature (RT17) is less than return air temperature (RT16) by at least the OFFSET value.	0-40°F
TEMP	OAT STPT	None Needed	Outdoor air temperature (RT17) is less than the OAT STPT value.	41-75°F
Remote	Remote	Eneergy 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.	0mA-4mA
ENTH	ODE STPT	C7400	Outdoor air enthalpy (A7) is less than free cooling setpoint.	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

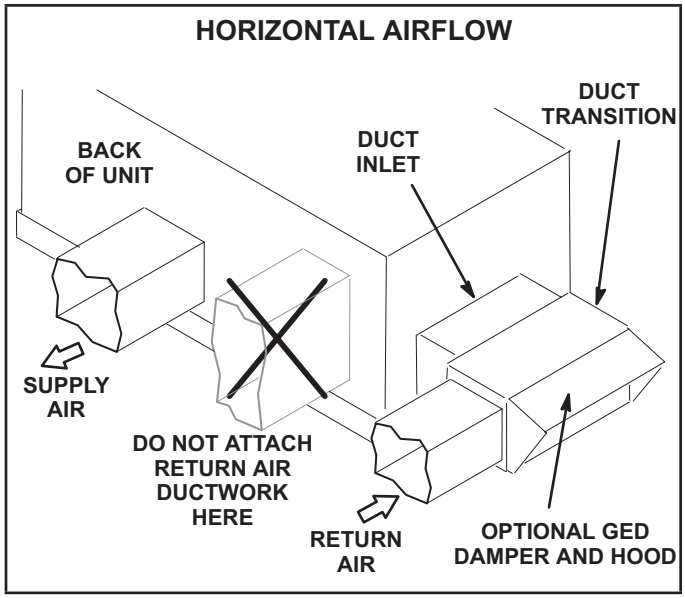


Figure 45

Outdoor Air Damper and Economizer Operation

DIRECT DRIVE DRIVE SYSTEM OPERATION:

NOTE – *Direct drive units feature ECM condenser fans that are staged to match the compressor's capacity. The condenser fans speed linearly follows the compressor speed.*

Modulating Outdoor Air Damper:

Damper minimum positions #1 and 2 are adjusted during unit setup to provide minimum fresh air requirements at the indicated supply fan speeds per ASHRAE 62.1.

-Supply fan is off and the outdoor air damper is closed

-Supply fan is on low speed and the outdoor air damper is at minimum position 1

-Supply fan is on high speed and the outdoor air damper is at minimum position 2

[1]Outdoor Air is Suitable

Note: When outdoor air is not suitable during the occupied time period, damper modulates to minimum position. When outdoor air is not suitable during the unoccupied time period, damper modulates closed.

1. Economizer With Outdoor Air Suitable

Low Cooling Demand

Compressor Off

Blower Variable

Dampers Modulate

High Cooling Demand

Compressor Variable

Blower Variable

Dampers Full Open

NOTE – *Compressor is energized after damper has been at full open for three minutes.*

NOTE – *Free cooling is locked out when a dehumidification demand is received. The unit operates in dehumidification mode as if the outdoor air is not suitable.*

2. No Economizer or Outdoor Air Not Suitable

Any Demand

Compressor Variable

Blower Variable

Damper Minimum Position

F. Power Exhaust Relay K65 (power exhaust units)

Power exhaust relay K65 is a DPDT relay with a 24VAC coil. K65 is used in all LGM units equipped with the optional power exhaust dampers. K65 is energized by the Unit Controller after the economizer dampers reach 50% open (adjustable). When K65 closes, exhaust fan B10 is energized.

G. Power Exhaust Fans

Optional power exhaust fans are available for use with the LGM 3, 4, 5, and 6 ton units to provide exhaust air pressure relief (refer to EHB for appropriate fan model). See Figure 45 and installation instructions for more detail.

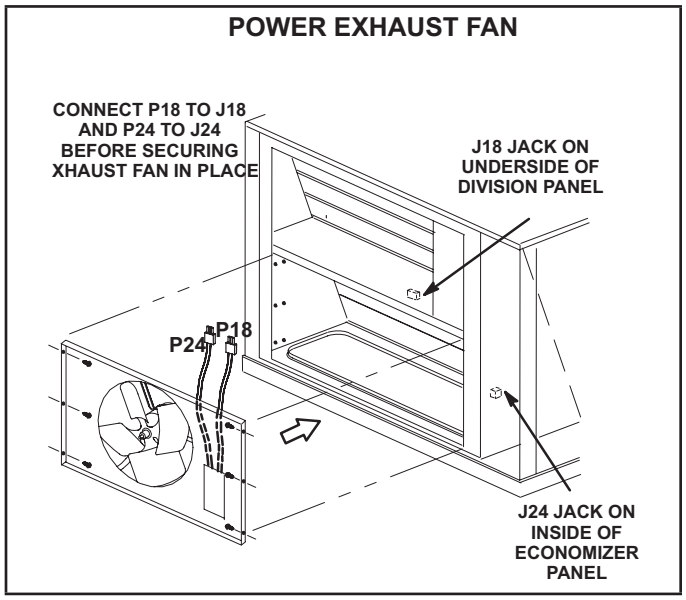


Figure 46

H. Optional UVC Lights

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

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

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

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

I. Needlepoint Bipolar Ionizer (Optional)

The optional, brush-type ionizer produces positive and negative ions to clean air and reduce airborne contaminants. The ionizer was designed to be low maintenance. The device should be checked semi-annually to confirm the brushes are clean for maximum output. The ionizer is located behind on the blower deck to the left of the blower. See Figure 47.

1. On the back side of the unit, remove the screw securing the back of the ionizer bracket. See Figure 46. Retain the screw to secure the back side of the ionizer bracket.
2. Remove two screws securing the front side of the ionizer bracket and pull out of unit and clean brushes.
3. Replace ionizer in the reverse order it was removed

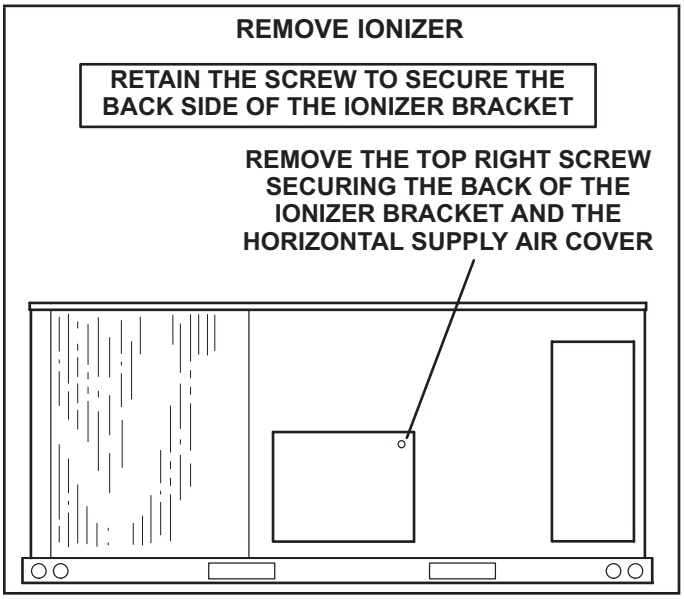


Figure 47

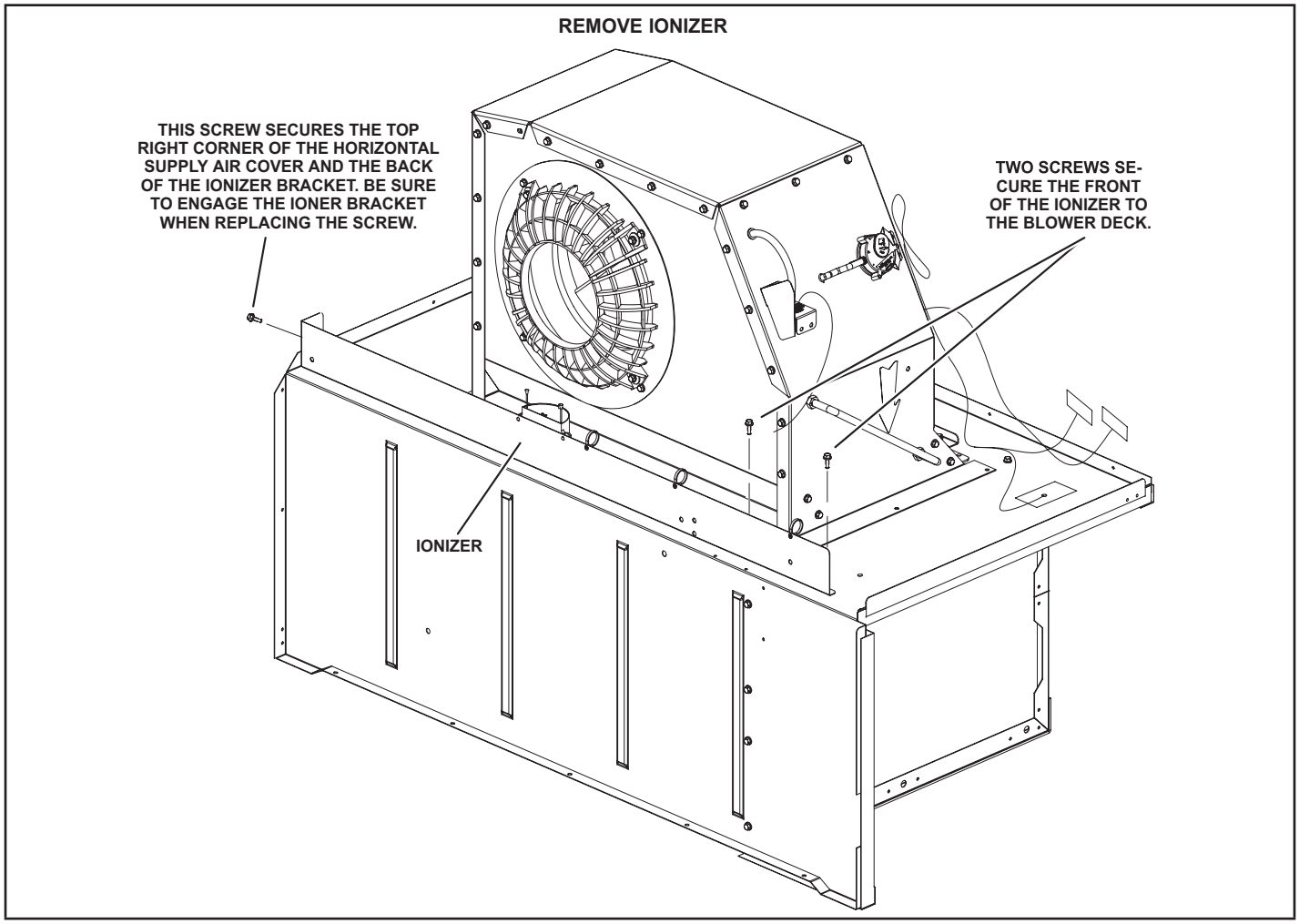


Figure 48

J. Optional Cold Weather Kit

An electric heater is available to automatically control the minimum temperature in the gas burner compartment. Heater is C.S.A. certified to allow cold weather operation of unit down to -60° F (-50° C). The kit includes the following parts:

1. The strip heater (HR6) is located as close as possible to the gas valve. The strip heater is rated at 500 Watts
2. A thermostat mounting box is installed on the wall of the compressor compartment. Included in the box are the following thermostat switches:
   a. Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -30° F (-35° C) the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (-12° C).
   b. Thermostat switch (S60) is an auto-reset SPST N.C. switch which opens on a temperature rise. The switch is wired in series with HR6. When the temperature rises above 20° F (-7° C) the switch opens and the electric heater is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (23.3° C).
   c. Thermostat switch (S61) is an auto-reset SPST N.O. switch which closes on a temperature drop. The switch is wired in series with HR6. When temperature drops below 20° F (-7° C) the switch closes and electric heater is energized. The switch automatically opens when heating compartment temperature reaches 70° F (21° C).

K. Smoke Detectors A171 and A172

Photoelectric smoke detectors are a factory- or field-installed option. The smoke detectors can be installed in the supply air duct (A172), return air section (A171), or in both the supply duct and return air section.

L. Indoor Air Quality (CO2) Sensor A63

The indoor air quality sensor monitors CO2 levels and reports the levels to the Unit Controller. The Unit Controller adjusts the economizer dampers according to the CO2 levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment.

M. LP / Propane Kit

All units operated on LP/Propane require a natural to LP / propane kit. The kit for single-stage units include one LP spring, seven burner orifices, and three stickers. Two-stage kits include the same but has a prove switch used to lock out first stage on the combustion air inducer. Four-stage units require (2) two-stage kits. For more detail refer to the natural to LP gas changeover kit installation instructions.

N. 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 five-second 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.

O. 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 in the supply air section on the evaporator coil seal.

P. Hot Gas Reheat

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 48 for reheat refrigerant routing and Figure 49 for standard cooling refrigerant routing.

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 P269-3) and refrigerant is routed to the reheat coil.

Reheat Setpoint

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

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

CHECK-OUT

Test reheat operation using the following procedure.

1. Make sure reheat is wired as shown in wiring section.
2. Make sure unit is in local thermostat mode.
3. Use mobile service app menu path to select

RTU MENU > COMPONENT > TEST > DEHUMIDIFICATION

The blower, compressor, and reheat valve should be energized. Pressure can be checked on the reheat line pressure tap. Pressure on the reheat line should match discharge pressure closely in reheat mode.

DEFAULT REHEAT OPERATION

During reheat mode free cooling is locked out.

A. Thermostat Mode With 24V Humidistat

No Y1 demand but a call for dehumidification:

Compressor operates at 100%, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Y1 demand:

Compressor is modulating, blower is on low, and the reheat valve is de-energized.

Y2 demand:

Compressor is modulating, blower is on high, reheat valve is de-energized.

B. Thermostat Mode With Zone RH Sensor

No Y1 demand but a call for dehumidification.

Compressor modulates based on zone relative humidity, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Y1 and dehumidification demand:

Compressor is modulating, blower is on low, and the reheat valve is de-energized.

Y2 and dehumidification demand:

Compressor is modulating, blower is on high, reheat valve is de-energized.

C. Zone Sensor Mode With Humidistat

No cooling demand but a call for dehumidification:

Compressor operates at 100%, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Cooling and dehumidification demand:

Compressor is modulating, blower is modulating, reheat valve is de-energized.

D. Zone Sensor Mode With Zone RH Sensor

No cooling demand but a call for dehumidification:

Compressor modulates based on zone relative humidity, blower and outdoor fan modulate to maintain indoor coil and discharge air temperatures, reheat valve is energized.

Cooling and dehumidification demand:

Compressor is modulating, blower is modulating, and the reheat valve is de-energized.

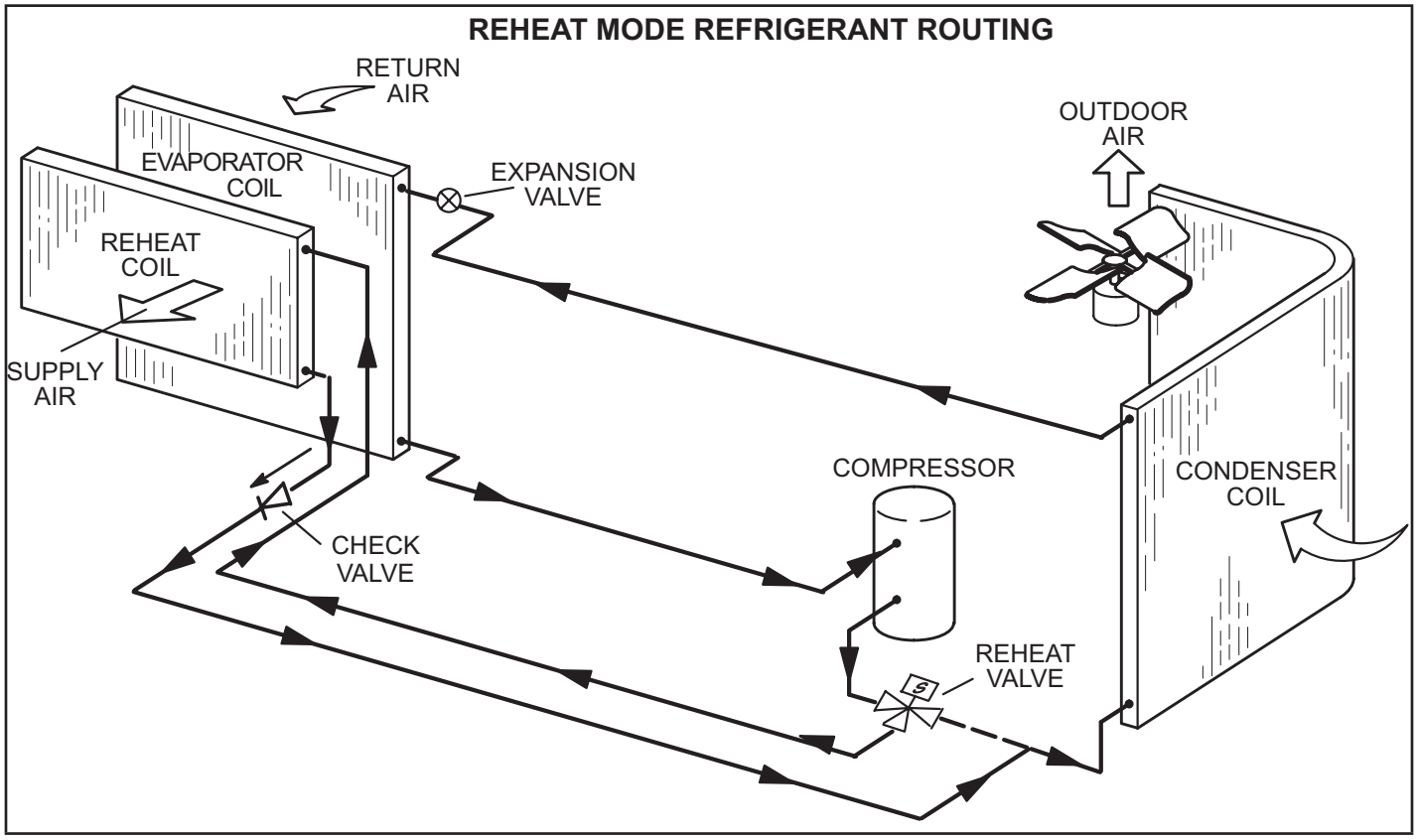


Figure 49

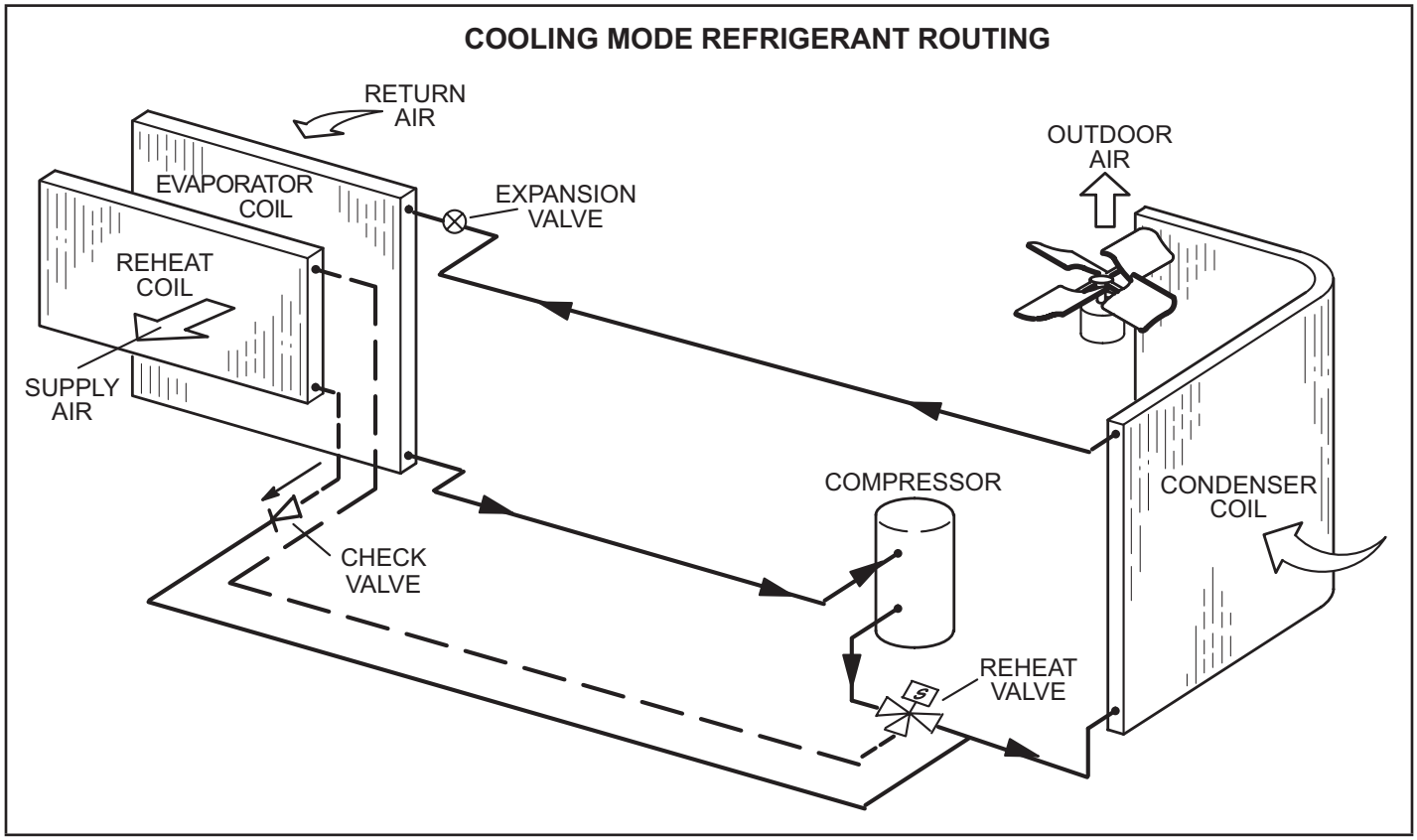


Figure 50

VIII. DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available befor the task is commenced.

Steps to ensure this are:

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

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

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

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area).

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

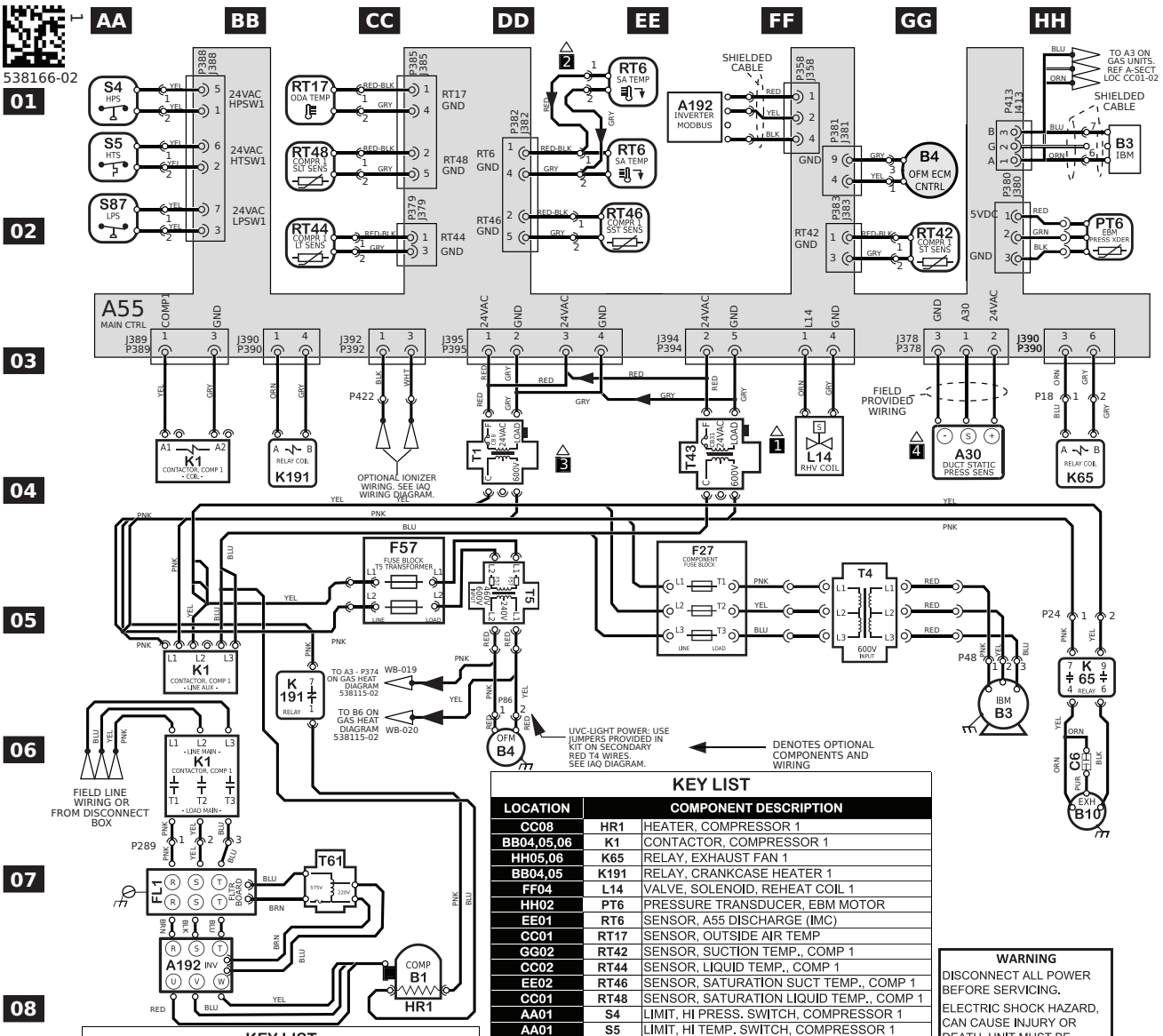
When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations
2. Evacuate the circuit
3. Purge the circuit with inert gas
4. Evacuate
5. Purge with inert gas
6. 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.

IX. WIRING DIAGRAMS AND SEQUENCE OF OPERATION

LGM036-074 J VOLT DIAGRAM



KEY LIST

LOCATION	COMPONENT DESCRIPTION	
CC08	HR1	HEATER, COMPRESSOR 1
BB04,05,06	K1	CONTACTOR, COMPRESSOR 1
HH05,06	K65	RELAY, EXHAUST FAN 1
BB04,05	K191	RELAY, CRANKCASE HEATER 1
FF04	L14	VALVE, SOLENOID, REHEAT COIL 1
HH02	PT6	PRESSURE TRANSDUCER, EBM MOTOR
EE01	RT6	SENSOR, A55 DISCHARGE (IMC)
CC01	RT17	SENSOR, OUTSIDE AIR TEMP
GG02	RT42	SENSOR, SUCTION TEMP., COMP 1
CC02	RT44	SENSOR, LIQUID TEMP., COMP 1
EE02	RT46	SENSOR, SATURATION SUCT TEMP., COMP 1
CC01	RT48	SENSOR, SATURATION LIQUID TEMP., COMP 1
AA01	S4	LIMIT, HI PRESS. SWITCH, COMPRESSOR 1
AA01	S5	LIMIT, HI TEMP. SWITCH, COMPRESSOR 1
AA02	S87	SWITCH, LOW PRESS., COMP. 1
DD04	T1	TRANSFORMER, CONTROL
GG05	T4	TRANSFORMER, BLOWER MOTOR
DD05	T5	TRANSFORMER, OUTDOOR FAN MOTOR
EE04	T43	TRANSFORMER, REHEAT
CC07	T61	TRANSFORMER, INV INTERNAL POWER

KEY LIST

LOCATION	COMPONENT DESCRIPTION	
AA02	A55	CONTROL BOARD, MAIN
GG04	A30	SENSOR, DUCT STATIC PRESS.
EE01, BB08	A192	INVERTER, COMPRESSOR 1
CC08	B1	COMPRESSOR 1
EE06	B3	MOTOR, BLOWER
DD06, GG01	B4	MOTOR, OUTDOOR FAN 1
HH06	B10	MOTOR, EXHAUST FAN 1
HH05	C6	CAPACITOR, EXHAUST FAN 1
EE05	F27	FUSE, T4 TRANSFORMER PRIMARY
CC05	F57	FUSE, T5 TRANSFORMER PRIMARY
AA07	FL1	FILTER BOARD

NOTES

1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	RT6 REMOTE MOUNT WIRING
3	T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL
4	USED ON VAV UNITS ONLY

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.

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

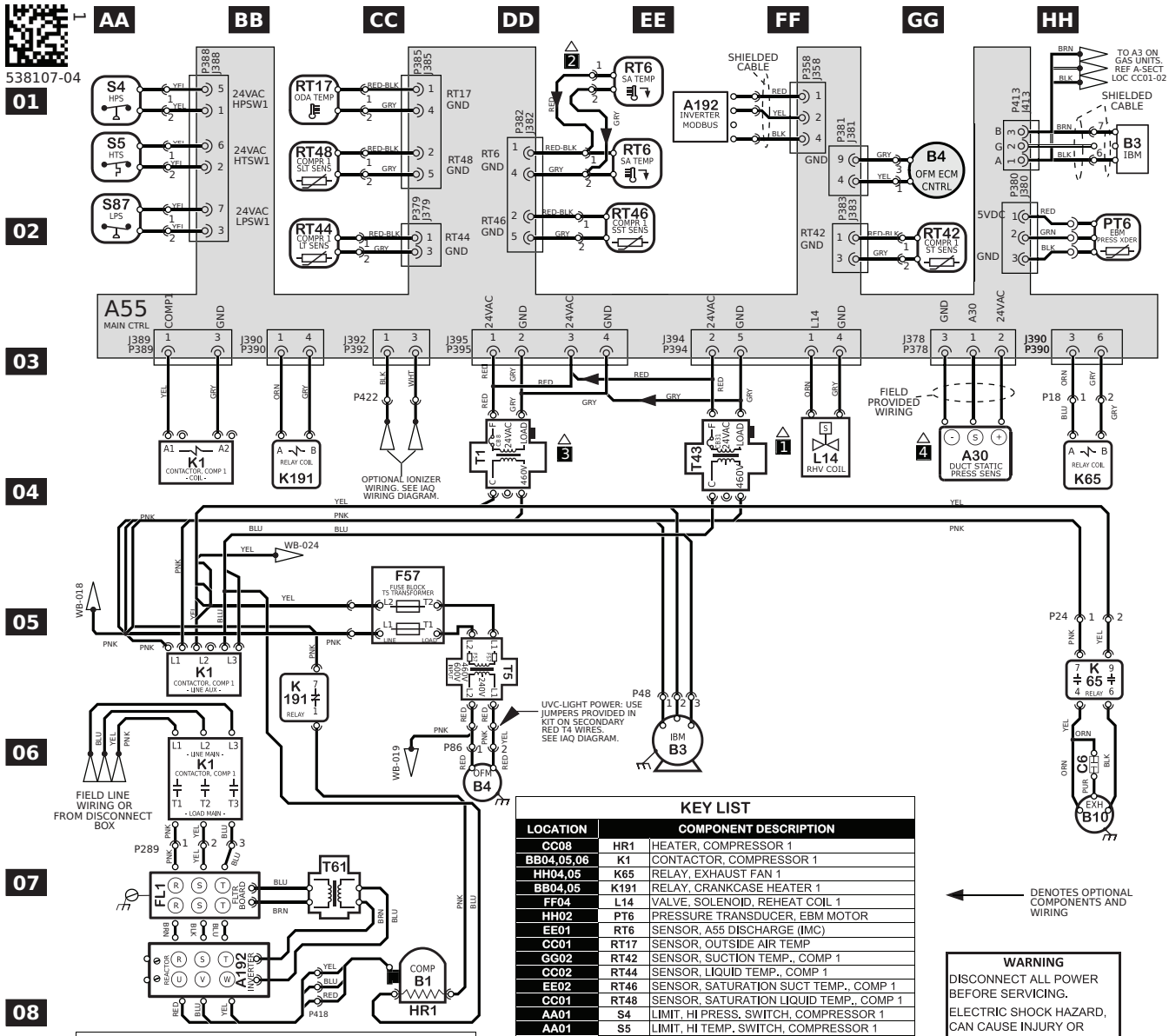
WIRING DIAGRAM FLOW

Model: LCM, LGM 036U - 074U J VOLT
Cooling Diagram without Higher SCCR
Voltage: 600/3/60 (J)
Supersedes: N/A Form No: 538166-02 Rev: 1

8.5 x 10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
--	CN-008852AS	01/10/2023	AXL	AAH	ORIGINATED AT PD&R CARROLLTON, TX
1	CN-013185	1/7/2025	AXL	AAH	A) REMOVED AM1/AM2

LGM036-074 G VOLT DIAGRAM



KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
AA02	A55	CONTROL BOARD, MAIN
GG04	A30	SENSOR, DUCT STATIC PRESS.
EE01, BB08	A192	INVERTER, COMPRESSOR 1
CC08	B1	COMPRESSOR 1
EE06	B3	MOTOR, BLOWER
DD06, GG01	B4	MOTOR, OUTDOOR FAN 1
HH06	B10	MOTOR, EXHAUST FAN 1
HH05	C6	CAPACITOR, EXHAUST FAN 1
CC05	F57	FUSE, T5 TRANSFORMER PRIMARY
AA07	FL1	FILTER BOARD

KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
CC08	HR1	HEATER, COMPRESSOR 1
BB04,05,06	K1	CONTACTOR, COMPRESSOR 1
HH04,05	K65	RELAY, EXHAUST FAN 1
BB04,05	K191	RELAY, CRANKCASE HEATER 1
FF04	L14	VALVE, SOLENOID, REHEAT COIL 1
HH02	PT6	PRESSURE TRANSDUCER, EBM MOTOR
EE01	RT6	SENSOR, A55 DISCHARGE (IMC)
CC01	RT17	SENSOR, OUTSIDE AIR TEMP
GG02	RT42	SENSOR, SUCTION TEMP., COMP 1
CC02	RT44	SENSOR, LIQUID TEMP., COMP 1
EE02	RT46	SENSOR, SATURATION SUCT TEMP., COMP 1
CC01	RT48	SENSOR, SATURATION LIQUID TEMP., COMP 1
AA01	S4	LIMIT, HI PRESS. SWITCH, COMPRESSOR 1
AA01	S5	LIMIT, HI TEMP. SWITCH, COMPRESSOR 1
AA02	S87	SWITCH, LOW PRESS., COMP. 1
DD04	T1	TRANSFORMER, CONTROL
DD05	T5	TRANSFORMER, OUTDOOR FAN MOTOR
EE04	T43	TRANSFORMER, REHEAT
CC07	T61	TRANSFORMER, INV INTERNAL POWER

DENOTES OPTIONAL COMPONENTS AND WIRING

NOTES	
1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	RT6 REMOTE MOUNT WIRING
3	T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL
4	USED ON VAV UNITS ONLY

WARNING

DISCONNECT ALL POWER BEFORE SERVICING.

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

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

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

Model: LCM, LGM 036U - 074U G VOLT
Cooling Diagram without Higher SCCR

Voltage: 460/3/60 (G)

Supersedes: N/A Form No: 538107-04 Rev: 1

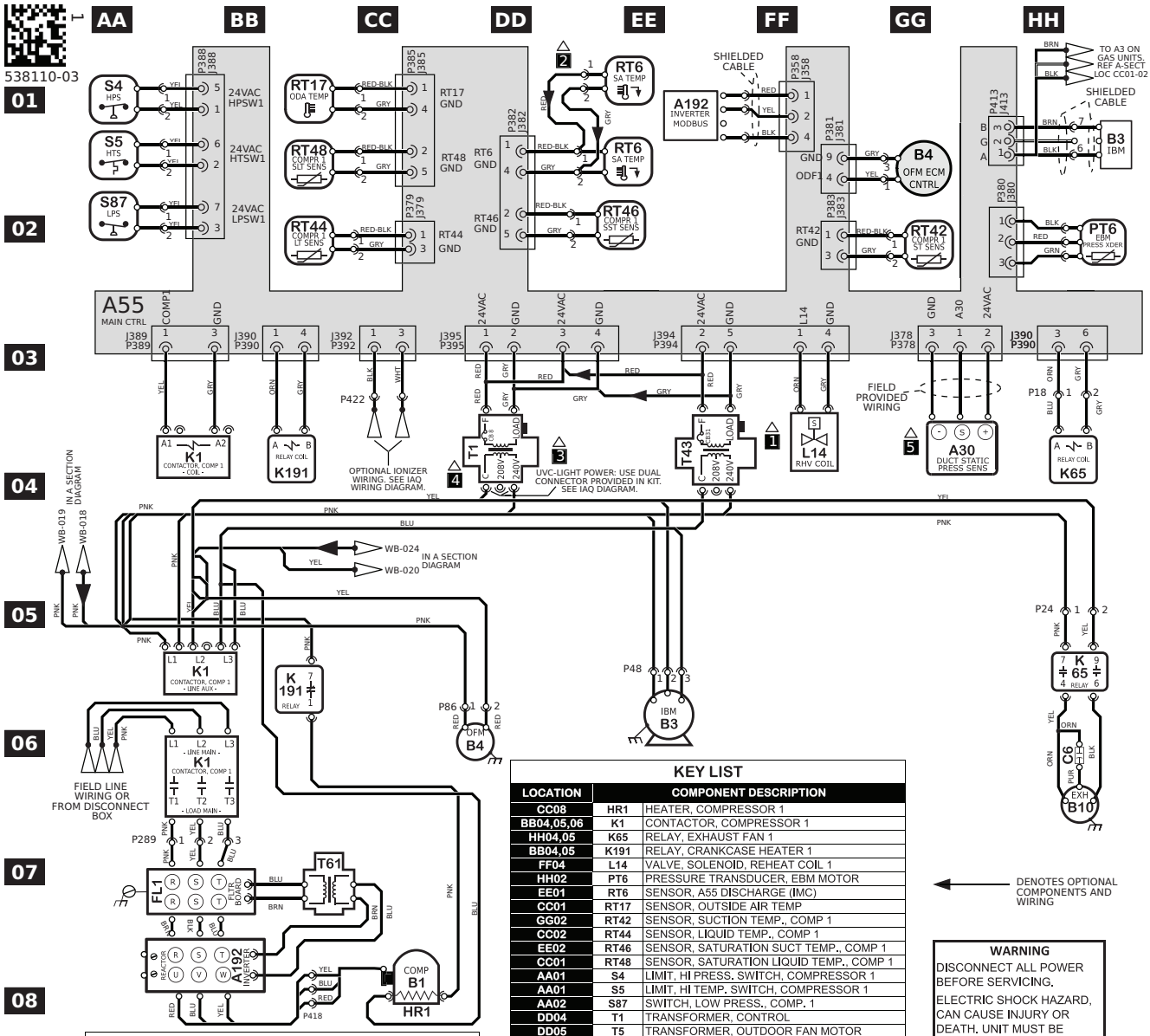
HEATING	COOLING	COOLING	ACCS	ACCS
SECTION A	SECTION B	SECTION B3	SECTION C	SECTION D

WIRING DIAGRAM FLOW

8.5 x 10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
---	CN-011764C	07/24/2024	AXL	AAH	ORIGINATED AT PD&R CARROLLTON, TX
1	CN-013185	1/7/2025	AXL	AAH	A) REMOVED AM1/AM2

LGM036-074 Y VOLT DIAGRAM



KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
CC08	HR1	HEATER, COMPRESSOR 1
BB04,05,06	K1	CONTACTOR, COMPRESSOR 1
HH04,05	K65	RELAY, EXHAUST FAN 1
BB04,05	K191	RELAY, CRANKCASE HEATER 1
FF04	L14	VALVE, SOLENOID, REHEAT COIL 1
HH02	PT6	PRESSURE TRANSDUCER, EBM MOTOR
EE01	RT6	SENSOR, A55 DISCHARGE (IMC)
CC01	RT17	SENSOR, OUTSIDE AIR TEMP
GG02	RT42	SENSOR, SUCTION TEMP., COMP 1
CC02	RT44	SENSOR, LIQUID TEMP., COMP 1
EE02	RT46	SENSOR, SATURATION SUCT TEMP., COMP 1
CC01	RT48	SENSOR, SATURATION LIQUID TEMP., COMP 1
AA01	S4	LIMIT, HI PRESS. SWITCH, COMPRESSOR 1
AA01	S5	LIMIT, HI TEMP. SWITCH, COMPRESSOR 1
AA02	S87	SWITCH, LOW PRESS., COMP. 1
DD04	T1	TRANSFORMER, CONTROL
DD05	T5	TRANSFORMER, OUTDOOR FAN MOTOR
EE04	T43	TRANSFORMER, REHEAT
CC07	T61	TRANSFORMER, INV INTERNAL POWER

KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
AA02	A55	CONTROL BOARD, MAIN
GG04	A30	SENSOR, DUCT STATIC PRESS.
EE01, BB08	A192	INVERTER, COMPRESSOR 1
CC08	B1	COMPRESSOR 1
EE06	B3	MOTOR, BLOWER
DD06, GG01	B4	MOTOR, OUTDOOR FAN 1
HH06	B10	MOTOR, EXHAUST FAN 1
HH05	C6	CAPACITOR, EXHAUST FAN 1
AA07	FL1	FILTER BOARD

DENOTES OPTIONAL COMPONENTS AND WIRING

NOTES	
1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	RT6 REMOTE MOUNT WIRING
3	T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL
4	MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
5	USED ON VAV UNITS ONLY

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.

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

WIRING DIAGRAM FLOW

Model: LCM, LGM 036U - 074U Y VOLT
Cooling Diagram without Higher SCCR
Voltage: 208-230/3/60 (Y)
Supersedes: N/A Form No: 538110-03 Rev: 1

8.5 x 10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
--	CN-011764C	07/24/2024	AXL	AAH	ORIGINATED AT PD&R CARROLLTON, TX
1	CN-013185	1/7/2025	AXL	AAH	A) REMOVED AM1/AM2

COOLING SEQUENCE OF OPERATION

POWER

1. Line voltage energizes transformer T1. T1 provides 24VAC power to the A55 Unit Controller. A55 provides 24VAC to the unit cooling, heating and blower controls.
2. Line voltage provides voltage to compressor crankcase heater relay K191-1 N.C. contacts, compressor contactor K1, blower motor B3, and outdoor fan motor B4 (on G volt units line voltage is supplied to two fuses F27, transformer T4, blower motor B3, and outdoor fan motor B4).

BLOWER OPERATION

3. A55 Unit Controller receives a cooling demand from the room/zone sensor. Unit Controller A55 energizes the blower motor B3 by sending a PWM signal. The blower motor modulates between High Cool CFM and Low Cool CFM (based on the difference between the zone/room temperature A2 and setpoint).

COOLING

4. A55 proves high temperature switch S5, N.C. low pressure switch S87, N.C. high pressure switch S4, and compressor contactor K1 is energized. A55 makes sure unit voltage and variable speed compressor inverter A192 voltage are equal. A55 also communicates the unit refrigeration tonnage to A192.
5. N.O. contacts K1-1 close providing voltage to A192 through FL1 filter board, T61 transformer, and L43 reactor. A192 varies B1 compressor speed based on a compressor demand from A55 P358 via MODBUS. The A55 compressor demand varies based on the difference between discharge air temperature (RT6) and discharge air temperature setting (default 55°F).

NOTE – *The A55 will start to reduce the three- through five-ton compressor speed at a heat sink temperature of 125°F. Typical competitor equipment reduces compressor speed at 115°F.*

6. A55 modulates outdoor fan B4 speed by sending a PWM signal from P259 (based on the compressor speed).
7. During cooling operation, A55 energizes crankcase heater relay K191. K191-1 N.C. Contacts open to de-energize HR1 crankcase heater.

POWER EXHAUST FAN OPERATION

8. A55 receives a position feedback signal from the economizer damper motor and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).
9. N.O. contact K65-1 & 2 close, energizing exhaust fan motor B10.

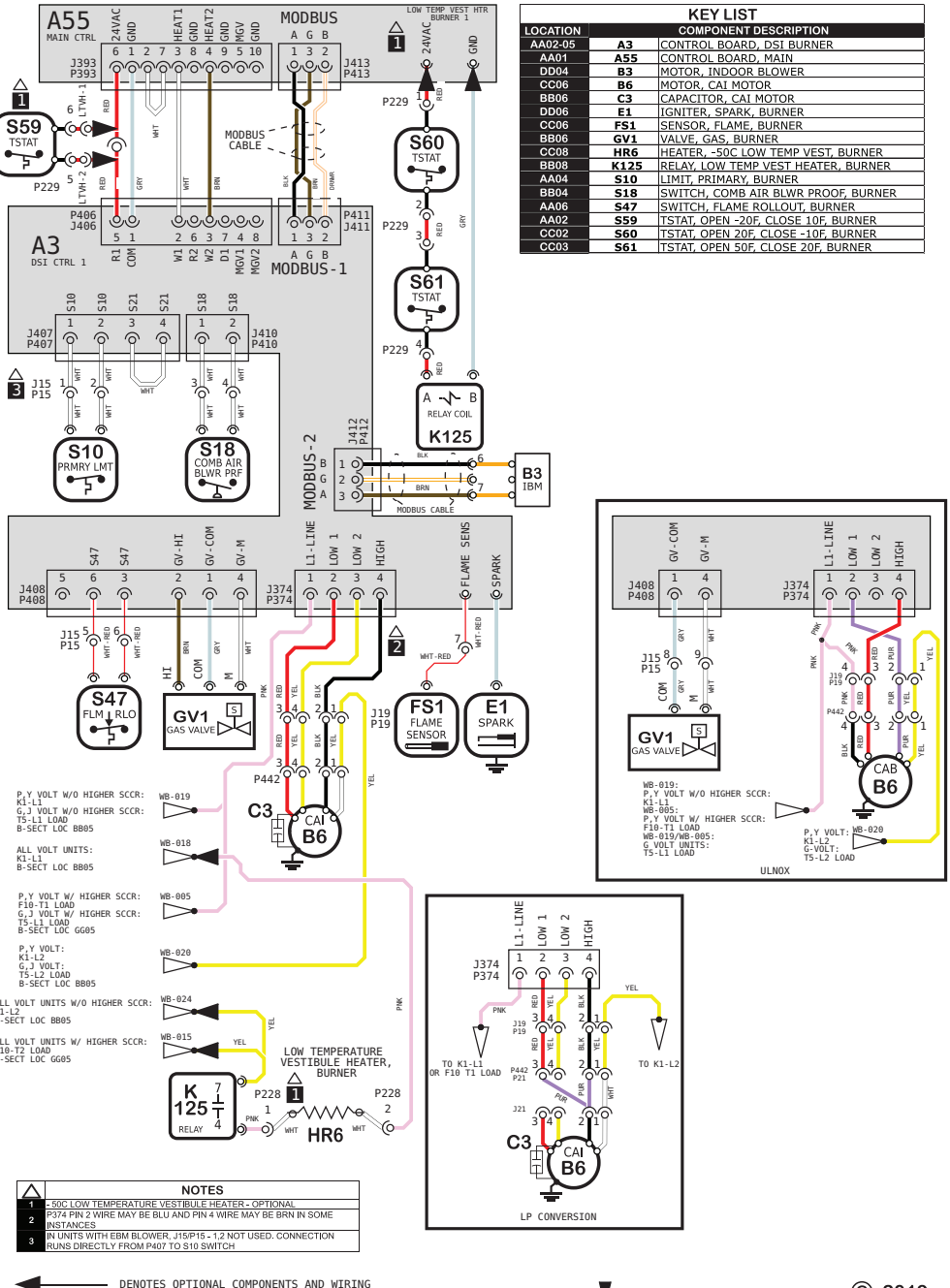
LGM036-074 GAS HEAT DIAGRAM

Rev 0

538237-02

AA BB CC DD EE FF

01 02 03 04 05 06 07 08 09 10



KEY LIST		
LOCATION	COMPONENT DESCRIPTION	
AA02-05	A3	CONTROL BOARD, DSI BURNER
AA01	A55	CONTROL BOARD, MAIN
DD04	B3	MOTOR, INDOOR BLOWER
CC06	B6	MOTOR, CAI MOTOR
BB06	C3	CAPACITOR, CAI MOTOR
DD06	E1	IGNITER, SPARK, BURNER
CC06	FS1	SENSOR, FLAME, BURNER
BB06	GV1	VALVE, GAS, BURNER
CC08	HR6	HEATER, -50C LOW TEMP VEST, BURNER
BB08	K125	RELAY, LOW TEMP VEST HEATER, BURNER
AA04	S10	LIMIT, PRIMARY, BURNER
BB04	S18	SWITCH, COMB AIR BLWR PROOF, BURNER
AA06	S47	SWITCH, FLAME ROLLOUT, BURNER
AA02	S59	TSTAT, OPEN -20F, CLOSE 10F, BURNER
CC02	S60	TSTAT, OPEN 20F, CLOSE -10F, BURNER
CC03	S61	TSTAT, OPEN 50F, CLOSE 20F, BURNER

NOTES
1 - 50C LOW TEMPERATURE VESTIBULE HEATER - OPTIONAL
2 P374 PIN 2 WIRE MAY BE BLU AND PIN 4 WIRE MAY BE BRN IN SOME INSTANCES
3 IN UNITS WITH EBM BLOWER, J15/P15 - 1,2 NOT USED. CONNECTION RUNS DIRECTLY FROM P407 TO S10 SWITCH

DENOTES OPTIONAL COMPONENTS AND WIRING

Model: LG, LDT SERIES RTU - GAS HEAT
Input Heat Capacity 60k - 150k Btuh

Voltage: 208-240/1/60(P),208-240/3/60(Y),460/3/60(G), 575/3/60(J)

Supersedes: N/A Form No: 538237-02 Rev: 0

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

WIRING DIAGRAM FLOW

7x10 CUT SIZE

REV	EC NO.	DATE	BY	APVD	REVISION NOTE
--	CN-011764	06/01/2022	AXL	AAH	ORIGINATED AT PD&R CARROLLTON, TX

TWO-STAGE GAS HEAT SEQUENCE OF OPERATION

FIRST STAGE HEAT DEMAND (INCLUDING IGNITION SEQUENCE)

1. Thermostat initiates heating demand (W1) to A55.
2. A55 Main Control board activates HEAT1 demand signal to W1 on A3 Direct Spark Ignition control.
3. A3 control verifies S10 and S47 contacts are closed, then A3 activates B6 Combustion Air Inducer at low speed by energizing LOW 1.
4. A3 waits until S18 Pressure switch contacts change from open to closed proving B6 operation.
5. After a pre-purge period (30 seconds), A3 control energizes the E1 spark electrode and opens gas valve (Low Fire) by energizing GV-M.
6. The E1 spark electrode ignites the gas, and flame is verified by FS1 flame sensor. When flame is sensed, A55 starts the B3 Blower On Delay time.
7. After Blower On Delay expires, A55 starts B3 indoor blower operation. A55 operates B3 indoor blower at the Blower Heating High CFM Setpoint (refer to Table 8).

NOTE - *For units with 12th character "P" (208/230V-1phase), the B3 indoor blower operates at Blower Heating Low CFM Set point during a W1 demand and at Blower Heating High CFM Set point during a W2 demand.*

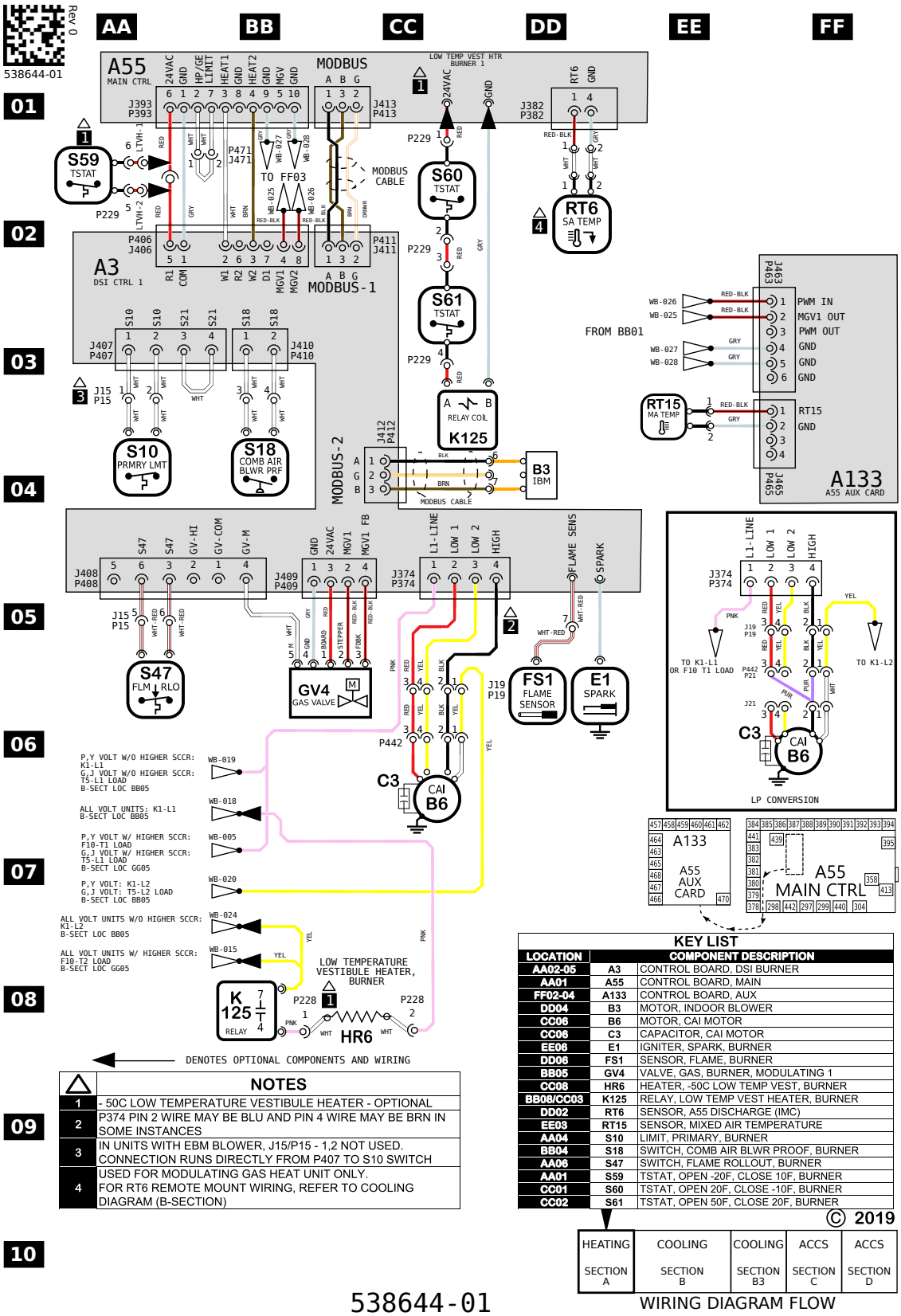
SECOND STAGE HEAT DEMAND

1. With 1st stage heating (W1) operating, the thermostat initiates W2 demand to A55.
2. A55 activates HEAT2 demand signal to W2 on A3 control.
3. A3 changes B6 speed from low to high by energizing HIGH, then opens gas valve to next setting (High Fire) by energizing GV-HI.

FIRST AND SECOND STAGE HEATING DEMAND TERMINATION

1. When thermostat demand is satisfied, heating demands (W1, W2) are removed from A55.
2. A55 removes any active demand signals (HEAT1, HEAT2) to A3 control.
3. A3 de-actives any active signals to the GV1 (GV-M, GV-HI) which closes the valve.
4. A3 maintains B6 operation for post purge period (45 seconds), then A3 removes the active signals (LOW 1, HIGH) shutting off B6.
5. A55 maintains B3 operation until Gas Blower Off Delay expires, then A55 shuts off the B3 indoor blower.

MODULATING GAS HEAT



NOTES	
1	- 50C LOW TEMPERATURE VESTIBULE HEATER - OPTIONAL
2	P374 PIN 2 WIRE MAY BE BLU AND PIN 4 WIRE MAY BE BRN IN SOME INSTANCES
3	IN UNITS WITH EBM BLOWER, J15/P15 - 1,2 NOT USED. CONNECTION RUNS DIRECTLY FROM P407 TO S10 SWITCH
4	USED FOR MODULATING GAS HEAT UNIT ONLY. FOR RT6 REMOTE MOUNT WIRING, REFER TO COOLING DIAGRAM (B-SECTION)

KEY LIST		
LOCATION	COMPONENT	DESCRIPTION
AA02-05	A3	CONTROL BOARD, DSI BURNER
AA01	A55	CONTROL BOARD, MAIN
FF02-04	A133	CONTROL BOARD, AUX
DD04	B3	MOTOR, INDOOR BLOWER
CC06	B6	MOTOR, CAI MOTOR
CC06	C3	CAPACITOR, CAI MOTOR
EE06	E1	IGNITER, SPARK, BURNER
DD06	FS1	SENSOR, FLAME, BURNER
BB05	GV4	VALVE, GAS, BURNER, MODULATING 1
CC08	HR6	HEATER, -50C LOW TEMP VEST, BURNER
BB08/CC03	K125	RELAY, LOW TEMP VEST HEATER, BURNER
DD02	RT6	SENSOR, A55 DISCHARGE (IMC)
EE03	RT15	SENSOR, MIXED AIR TEMPERATURE
AA04	S10	LIMIT, PRIMARY, BURNER
BB04	S18	SWITCH, COMB AIR BLWR PROOF, BURNER
AA06	S47	SWITCH, FLAME ROLLOUT, BURNER
AA01	S59	TSTAT, OPEN -20F, CLOSE 10F, BURNER
CC01	S60	TSTAT, OPEN 20F, CLOSE -10F, BURNER
CC02	S61	TSTAT, OPEN 50F, CLOSE 20F, BURNER

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

WIRING DIAGRAM FLOW

538644-01

MODULATING IGNITION SEQUENCE

1. Thermostat initiates heating demand (W1) to A55.
2. A55 Main Control board activates HEAT1 demand signal to W1 on A3 Direct Spark Ignition control.
3. A3 control verifies S10 and S47 contacts are closed, then A3 activates B6 Combustion Air Inducer at low speed by energizing LOW 1.
4. A3 waits until S18 Pressure switch contacts change from open to closed proving B6 operation.
5. After a pre-purge period (30 seconds), A3 control energizes the E1 spark electrode and opens GV4 by energizing GV-M.
6. A133 transmits MGV1 OUT (0VDC) signal to A3 MGV1. Signal passes through A3 and out MGV1 to GV4 (pin 2).
7. The E1 spark electrode ignites the gas, and flame is verified by FS1 flame sensor. When flame is sensed, A55 starts the B3 Blower On Delay time.
8. After Blower On Delay expires, A55 starts B3 indoor blower operation at the Blower Heating Low CFM Setpoint (refer to Table 8) and A133 MGV1 OUT start varying based upon CORE internal algorithm results (0VDC - 10VDC).
9. When Thermostat adds a W2 heating signal to A55, A55 changes B3 indoor blower operation to Blower Heating High CFM Setpoint (refer to Table 8).

MODULATING HEATING DEMAND – GAS VALVE POSITIONS

1. CORE monitors RT6 (Discharge Air Temperature), compares RT6 value to the user setpoint, and calculates new value for the gas valve position (A133 MGV1 OUT).
2. A133 updates the MGV1 OUT to the GV4 (valve position signal).
3. GV4 receives the new signal from A3 MGV1 output and adjusts accordingly.

   NOTE - *During modulating heating demand, A133 monitors RT15. CORE calculates the Rise Range (difference between RT15 and RT6) and maintains operation below maximum rise.*
4. Steps 1 thru 3 are repeated until heating demand has been satisfied.

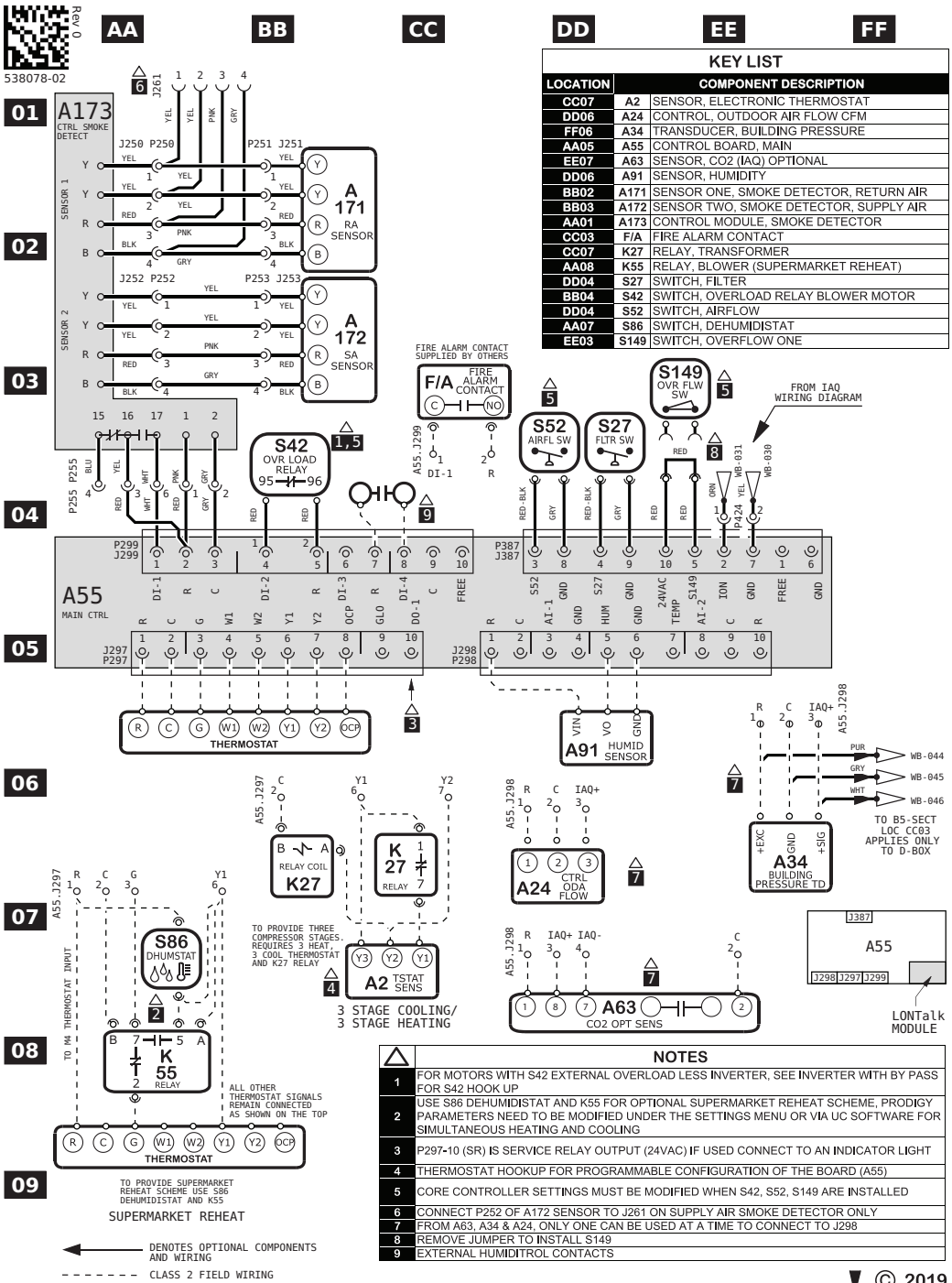
MODULATING HEATING DEMAND – CAB SPEEDS

1. When CORE increases the MGV Position (A133 MGV1 OUT) above a programmed value, CORE outputs HEAT2 signal to W1 input on A3. A3 changes B6 speed by de-activation LOW 1 and activating HIGH.
2. When CORE decreases MGV Position (A133 MGV1 OUT) to minimum and holds A133 MGV1 OUT signal at minimum position for preset time, CORE removes HEAT2 signal to A3. A3 changes B6 speed by deactivating HIGH and activating LOW 1.

MODULATING HEATING DEMAND TERMINATION

1. When thermostat demand is satisfied, heating demands (W1, W2) are removed from A55.
2. A55 removes any active demand signals (HEAT1, HEAT2) to A3 control. A133 removes the MGV1 OUT signal.
3. A3 control closes GV4 by deactivating GV-M signal.
4. A3 control maintains B6 operation for post purge period (45 seconds), then shuts off B6 by removing active signal (LOW 1, HIGH).
5. A55 maintains B3 indoor blower operation until Gas Blower Off Delay expires, then A55 shuts off the indoor blower.

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

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

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

WIRING DIAGRAM FLOW

7x10 CUT SIZE

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

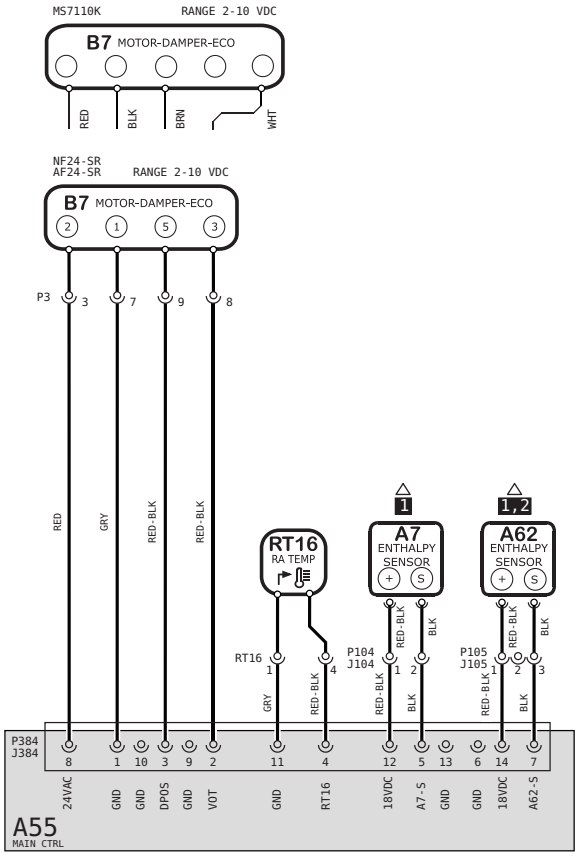
ECONOMIZER

Rev 2

538072-01

AA BB CC DD

01 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

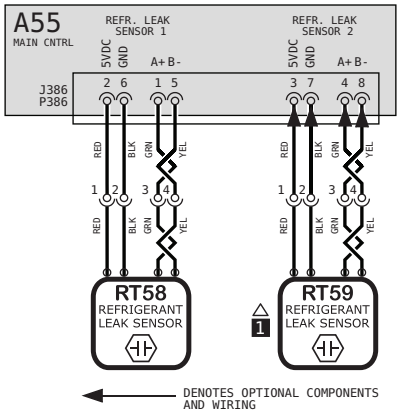
HTG SEC A	CLG SEC B	CLG SEC B3	ACCS SEC C	ACCS SEC D

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

RDS SENSOR WIRING DIAGRAM



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

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

WARNING

DISCONNECT ALL POWER BEFORE SERVICING.

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

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

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

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

Rev 0

3 x 7
CUT SIZE

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