

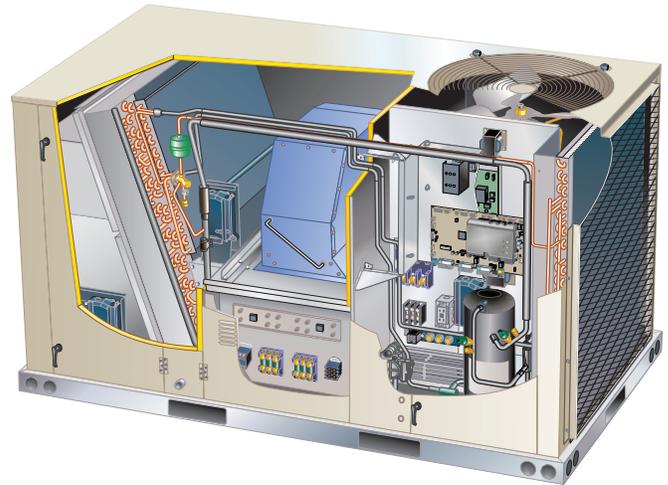
Ultra High Efficiency LCM036U through 074U

LCM036U, 048U, 060U, and 074U are ultra high efficiency packaged units equipped with variable speed direct drive blowers, an inverter-driven variable speed compressor, and a variable speed outdoor fan.

Optional electric heat is factory or field installed. Electric heat operates in single stage depending on the kW input size. 7.5kW through 22.5 kW heat sections are available for the LCM unit.

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.



ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures

CAUTION



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

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WARNING

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

WARNING



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

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HCFC's) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

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.

OPTIONS / ACCESSORIES

Item	Catalog Number	Unit Model Number				
		036	048	060	074	
COOLING SYSTEM						
Condensate Drain Trap	PVC	22H54	OX	OX	OX	OX
	Copper	76W27	OX	OX	OX	OX
Drain Pan Overflow Switch		21Z07	OX	OX	OX	OX
Service Valves (not for Humiditrol™+ equipped units)		Factory	O	O	O	O
BLOWER - SUPPLY AIR						
Motors	DirectPlus™ Direct Drive ECM Blower System with SZVAV	Factory	O	O	O	O
	DirectPlus™ Direct Drive ECM Blower System with VAV	Factory	O	O	O	O
CABINET						
Combination Coil/Hail Guards		13T03	X	X	X	X
Corrosion Protection (indoor coil / outdoor coil)		Factory	O	O	O	O
CONTROLS						
Commercial Controls	Lennox® CORE Control System - LonTalk® Module	54W27	OX	OX	OX	OX
	CPC Einstein Integration	Factory	O	O	O	O
	Novar® LSE	Factory	O	O	O	O
Dirty Filter Switch		53W66	OX	OX	OX	OX
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
ELECTRICAL						
Voltage 60 Hz	208/230V-3ph	Factory	O	O	O	O
	460V-3ph	Factory	O	O	O	O
	575V-3ph	Factory	O	O	O	O
HACR Circuit Breakers		Factory	O	O	O	O
Disconnect Switch (See Electrical / Electric Heat Tables for selection)	80 amp	22A23	OX	OX	OX	OX
	150 amp	22A24			OX	OX
¹ Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O	O
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V only)	74M70	OX	OX	OX	OX
	20 amp non-powered, field-wired (575V only)	67E01	OX	OX	OX	OX
Weatherproof Cover for GFI		10C89	X	X	X	X
Phase/Voltage Detection		Factory	O	O	O	O
ELECTRIC HEAT						
7.5 kW	208/230V-3ph	21Z26	OX	OX	OX	OX
	460V-3ph	21Z27	OX	OX	OX	OX
	575V-3ph	22U17	OX	OX	OX	OX
15 kW	208/230V-3ph	21Z28	OX	OX	OX	OX
	460V-3ph	21Z29	OX	OX	OX	OX
	575V-3ph	22U18	OX	OX	OX	OX
22.5 kW	208/230V-3ph	21Z30			OX	OX
	460V-3ph	21Z31			OX	OX
	575V-3ph	22U19			OX	OX

¹ Disconnect Switch not available with higher SCCR option. Short-Circuit Current Rating option not available on field installed electric heat.

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

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

O = Configure To Order (Factory Installed)

X = Field Installed

OPTIONS / ACCESSORIES

Item	Catalog Number	Unit Model Number			
		036	048	060	074
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
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 (DOWNFLOW ONLY)					
Standard Static	208/230V-3ph 21Z13	OX	OX	OX	OX
<i>NOTE - Factory installed Power Exhaust Fan requires "Barometric Relief Dampers for Power Exhaust Kit" for field installation. See below.</i>	460V-3ph 21Z14	OX	OX	OX	OX
	575V-3ph 21Z15	OX	OX	OX	OX
BAROMETRIC RELIEF					
¹ Barometric Relief Dampers for Power Exhaust Kit	21Z21	X	X	X	X
² Horizontal Barometric Relief Dampers With Exhaust Hood	19F01	X	X	X	X
OUTDOOR AIR					
Outdoor Air Dampers With Outdoor Air Hood					
Motorized	15D17	OX	OX	OX	OX
Manual	15D18	OX	OX	OX	OX
HUMIDITROL™+ HOT GAS REHEAT OPTION					
Humiditrol™+ Dehumidification Option	Factory	O	O	O	O
¹ Required when Economizer is factory installed with factory installed Power Exhaust Fan option.					
² Required when Economizer is configured for horizontal airflow.					
NOTE - Catalog numbers shown are for ordering field installed accessories. OX - Configure To Order (Factory Installed) or Field Installed O = Configure To Order (Factory Installed) X = Field Installed					

OPTIONS / ACCESSORIES

Item	Catalog Number	Unit Model Number				
		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	OX	OX	OX	OX
Indoor Air Quality (CO₂) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display		77N39	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		87N53	X	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting		87N52	X	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting		87N54	X	X	X	X
CO ₂ Sensor Duct Mounting Kit - for downflow applications		85L43	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO ₂ sensors (87N53 or 77N39)		90N43	X	X	X	X
UVC Germicidal Lamps						
¹ Healthy Climate® UVC Light Kit (110/230V-1ph)		21A92	OX	OX	OX	OX
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
Transition Curb						
Matches Model L™ 036-074 Units to existing L Series® Curbs		31B05	X	X	X	X
CEILING DIFFUSERS						
Step-Down - Order one	RTD11-95S	13K61	X	X	X	X
Flush - Order one	FD11-95S	13K56	X	X	X	X
Transitions (Supply and Return) - Order one	T1TRAN20N-1	17W54	X	X	X	X

¹ 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 field installed accessories.
OX - Configure To Order (Factory Installed) or Field Installed
O = Configure To Order (Factory Installed)
X = Field Installed

SPECIFICATIONS		UNIT			
General Data		3 Ton	4 Ton	5 Ton	6 Ton
	Nominal Tonnage				
	Efficiency Type	Ultra-High	Ultra-High	Ultra-High	Ultra-High
	Model Number	LCM036U4E	LCM048U4E	LCM060U4E	LCM074U4E
	Blower Type	DirectPlus™ ECM Direct Drive with SZVAV			
	Model Number	LCM036U4P	LCM048U4P	LCM060U4P	LCM074U4P
	Blower Type	DirectPlus™ ECM Direct Drive with VAV			
Cooling Performance	Gross Cooling Capacity - Btuh	34,600	47,000	58,500	71,000
	¹ Net Cooling Capacity - Btuh	34,000	46,000	57,000	69,000
	AHRI Rated Air Flow - cfm	1200	1550	1800	2150
	Total Unit Power - kW	2.3	3.3	4.4	5.8
	SEER (Btuh/Watt) - 208/230V-3ph	¹ 22.5	¹ 21.0	¹ 20.0	---
	SEER (Btuh/Watt) - 460V-3ph	¹ 22.0	¹ 20.2	¹ 19.5	---
	SEER (Btuh/Watt) - 575V-3ph	¹ 22.0	¹ 20.2	¹ 19.5	---
	IEER (Btuh/Watt) - 208/230V-3ph	---	---	---	² 23.3
	IEER (Btuh/Watt) - 460V-3ph	---	---	---	² 23.3
	IEER (Btuh/Watt) - 575V-3ph	---	---	---	² 23.3
	EER (Btuh/Watt) - 208/230V-3ph	¹ 15.0	¹ 14.0	¹ 13.0	² 12.0
	EER (Btuh/Watt) - 460V-3ph	¹ 14.5	¹ 13.7	¹ 12.5	² 12.0
EER (Btuh/Watt) - 575V-3ph	¹ 14.5	¹ 13.7	¹ 12.5	² 12.0	
Refrigerant Charge	Refrigerant Type	R-410A	R-410A	R-410A	R-410A
	Without Reheat Option	17 lbs. 0 oz.	17 lbs. 0 oz.	16 lbs. 8 oz.	16 lbs. 8 oz.
	With Reheat Option	17 lbs. 2 oz.	17 lbs. 2 oz.	16 lbs. 13 oz.	16 lbs. 13 oz.
Electric Heat Available		7.5 and 15 kW	7.5 and 15 kW	7.5, 15 and 22.5 kW	7.5, 15 and 22.5 kW
Compressor Type (Number)		Variable Capacity Scroll (1)			
Outdoor Coil	Net face area (total) - sq. ft.	19.3	19.3	19.3	19.3
	Tube diameter - in.	3/8	3/8	3/8	3/8
	Number of rows	2	2	2	2
	Fins per inch	20	20	20	20
Outdoor Coil Fans	Motor - (No.) HP	(1) 1/3 (ECM)	(1) 1/3 (ECM)	(1) 1/3 (ECM)	(1) 1/3 (ECM)
	Motor rpm	550 - 850	600 - 900	700 - 950	700 - 1050
	Total Motor watts	50 - 200	80 - 236	120 - 272	120 - 360
	Diameter - (No.) in.	(1) 24	(1) 24	(1) 24	(1) 24
	Number of blades	3	3	3	3
	Total air volume - cfm	2500 - 3850	2750 - 4100	3200 - 4300	3200 - 4700
Indoor Coil	Net face area (total) - sq. ft.	9.72	9.72	9.72	9.72
	Tube diameter - in.	3/8	3/8	3/8	3/8
	Number of rows	3	3	4	4
	Fins per inch	14	14	14	14
	Drain connection - Number and size.	1 in. NPT coupling			
Expansion device type	Balance port TXV				
Indoor Blower	Nominal motor output	1.5 HP (ECM)	1.5 HP (ECM)	1.5 HP (ECM)	1.5 HP (ECM)
	Blower wheel nominal diameter x width - in.	(1) 14 x 5			
Filters	Type of filter	Disposable			
	Number and size - in.	(4) 20 x 20 x 2			
Electrical characteristics		208/230V, 460V, or 575V - 60 hz -3 phase			

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

^{1, 2} AHRI Certified to AHRI Standard ¹ 210/240 or ² 340/360: 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

BLOWER DATA

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

Air Volume cfm	Wet Indoor Coil		Humiditrol® Condenser Reheat Coil	Electric Heat	Economizer	Filters		
	036, 048	060, 074				MERV 8	MERV 13	MERV 16
800	0.01	---	---	0.01	0.04	0.04	0.05	0.04
1000	0.02	0.02	0.00	0.03	0.04	0.04	0.07	0.05
1200	0.03	0.04	0.00	0.06	0.04	0.04	0.07	0.05
1400	0.04	0.05	0.01	0.09	0.04	0.04	0.07	0.06
1600	0.05	0.07	0.02	0.12	0.04	0.04	0.07	0.08
1800	0.06	0.08	0.02	0.15	0.05	0.04	0.07	0.09
2000	0.08	0.10	0.02	0.18	0.05	0.05	0.08	0.10
2200	---	0.11	0.04	0.18	0.05	0.05	0.08	0.11
2400	---	0.13	0.04	0.20	0.05	0.05	0.08	0.12

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 DIFFUSERS AIR RESISTANCE (in. w.g.)

Air Volume - cfm	RTD11-95S Step-Down Diffuser			FD11-95S Flush Diffuser
	2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open	
1800	0.13	0.11	0.09	0.09
2000	0.15	0.13	0.11	0.10
2200	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

ELECTRICAL/ELECTRIC HEAT DATA

3 TON

Model No.		LCM036U4E / LCM036U4P		
¹ Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor	Rated Load Amps	9.1	5.1	4.1
Outdoor Fan Motor	Full Load Amps	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

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	30	30	15	15
	Electric Heat	15 kW	⁴ 45	60	30	25
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	26	29	15	12
	Electric Heat	15 kW	45	51	26	21
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	30	35	20	15
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	⁴ 50	60	30	25
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	29	32	16	14
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	48	54	28	23

ELECTRICAL ACCESSORIES

Disconnect	7.5 kW	22A23	22A23	22A23	22A23
	15 kW	22A23	22A23	22A23	22A23

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

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

² HACR type breaker or fuse.

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

⁴ Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA

4 TON

Model No.		LCM048U4E / LCM048U4P		
¹ Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor	Rated Load Amps	13.8	6.5	5.5
Outdoor Fan Motor	Full Load Amps	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	2.4
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

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	35	35	15	15
	Electric Heat	15 kW	⁴ 45	60	30	25
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	26	29	15	13
	Electric Heat	15 kW	45	51	26	22
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	40	40	20	15
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	⁴ 50	60	30	25
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	29	32	16	14
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	48	54	28	23

ELECTRICAL ACCESSORIES

Disconnect	7.5 kW	22A23	22A23	22A23	22A23
	15 kW	22A23	22A23	22A23	22A23

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

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

² HACR type breaker or fuse.

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

⁴ Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA

5 TON

Model No.		LCM060U4E / LCM060U4P		
¹ Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor	Rated Load Amps	14.6	7	5.8
Outdoor Fan Motor	Full Load Amps	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	2.4
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

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	40	40	15	15
	Electric Heat	15 kW	⁴ 45	60	30	25
		22.5 kW	⁴ 70	80	40	35
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	26	29	15	13
	Electric Heat	15 kW	45	51	26	22
		22.5 kW	65	74	37	31
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	40	40	20	15
	Electric Heat and (1) 0.33 HP	15 kW	⁴ 50	60	30	25
	Power Exhaust	22.5 kW	70	80	40	35
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	29	32	16	14
	Electric Heat and (1) 0.33 HP	15 kW	48	54	28	23
	Power Exhaust	22.5 kW	68	77	39	32

ELECTRICAL ACCESSORIES

Disconnect	7.5 kW	22A23	22A23	22A23	22A23
	15 kW	22A23	22A23	22A23	22A23
	22.5 kW	22A24	22A24	22A23	22A23

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

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

² HACR type breaker or fuse.

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

⁴ Factory installed circuit breaker not available.

ELECTRICAL/ELECTRIC HEAT DATA

6 TON

Model No.		LCM074U4E / LCM074U4P		
¹ Voltage - 60Hz		208/230V-3ph	460V-3ph	575V-3ph
Compressor	Rated Load Amps	16.9	8.3	6.8
Outdoor Fan Motor	Full Load Amps	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	2.4
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

ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	480V	600V
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	45	45	20	15
	Electric Heat	15 kW	⁴ 45	60	30	25
		22.5 kW	⁴ 70	80	40	35
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	29	29	15	13
	Electric Heat	15 kW	45	51	26	22
		22.5 kW	65	74	37	31
² Maximum Overcurrent Protection (MOCP)	Unit+	7.5 kW	45	45	20	15
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	⁴ 50	60	30	25
		22.5 kW	⁴ 70	80	40	35
³ Minimum Circuit Ampacity (MCA)	Unit+	7.5 kW	31	32	16	14
	Electric Heat and (1) 0.33 HP Power Exhaust	15 kW	48	54	28	23
		22.5 kW	68	77	39	32

ELECTRICAL ACCESSORIES

Disconnect	7.5 kW	22A23	22A23	22A23	22A23
	15 kW	22A23	22A23	22A23	22A23
	22.5 kW	22A24	22A24	22A23	22A23

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

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

² HACR type breaker or fuse.

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

⁴ Factory installed circuit breaker not available.

ELECTRIC HEAT CAPACITIES

Input Voltage	7.5 kW			15 kW			22.5 kW		
	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output
208	1	5.6	19,200	1	11.2	38,200	1	16.9	57,700
220	1	6.3	21,500	1	12.6	43,000	1	18.9	64,500
230	1	6.9	23,500	1	13.8	47,000	1	20.7	70,700
240	1	7.5	25,600	1	15	51,200	1	22.5	76,800
440	1	6.3	21,500	1	12.6	43,000	1	18.9	64,500
460	1	6.9	23,500	1	13.8	47,000	1	20.7	70,700
480	1	7.5	25,600	1	15	51,200	1	22.5	76,800
550	1	6.3	21,500	1	12.6	43,000	1	18.9	64,500
575	1	6.9	23,500	1	13.8	47,000	1	20.7	70,700
600	1	7.5	25,600	1	15	51,200	1	22.5	76,800

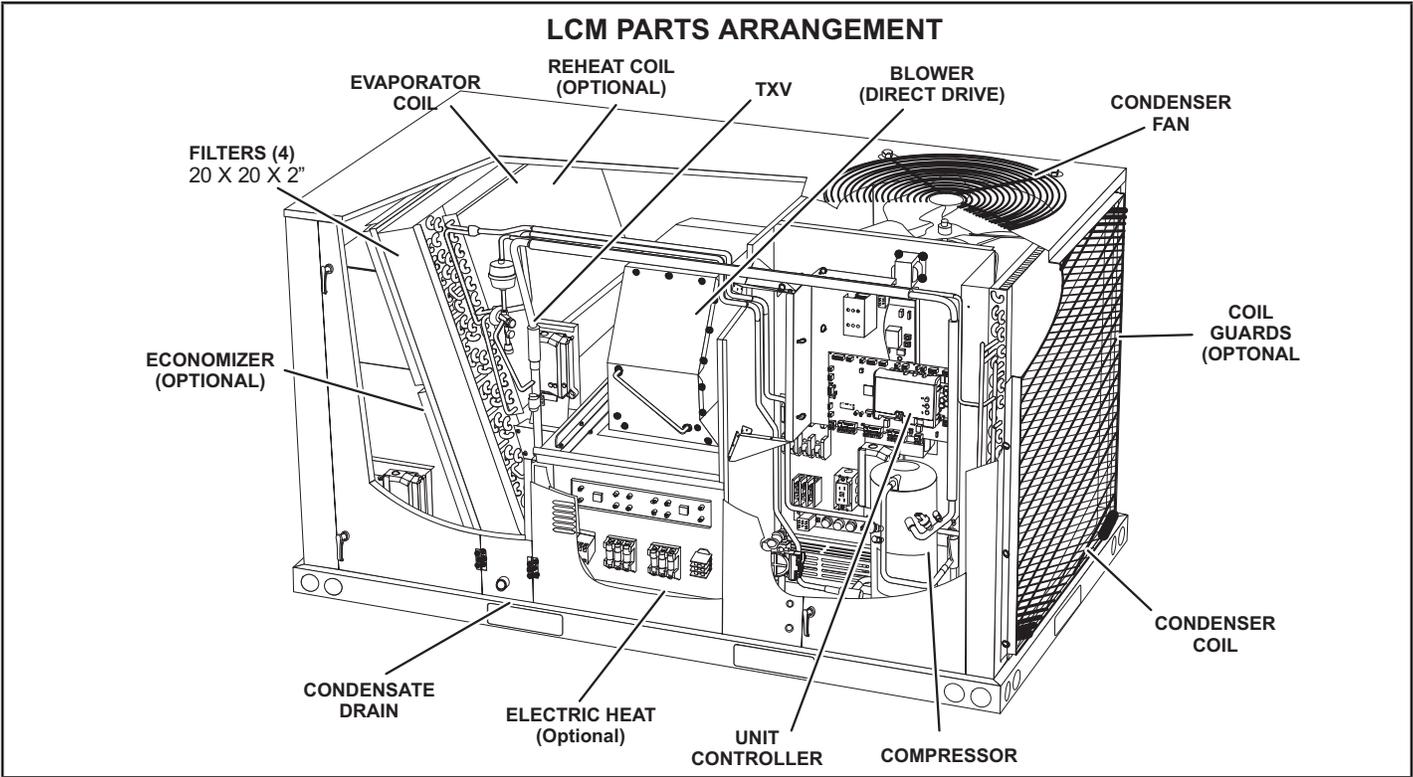


FIGURE 1

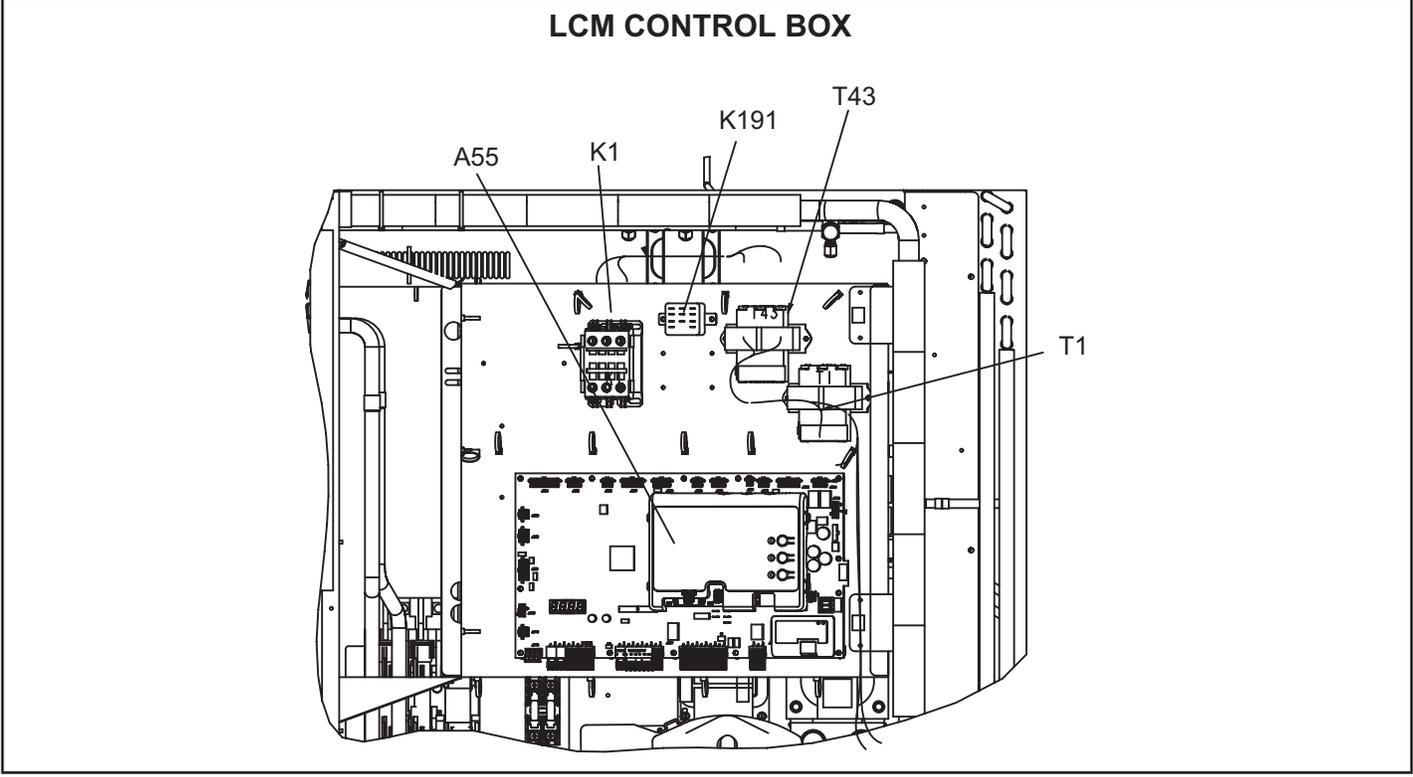


FIGURE 2

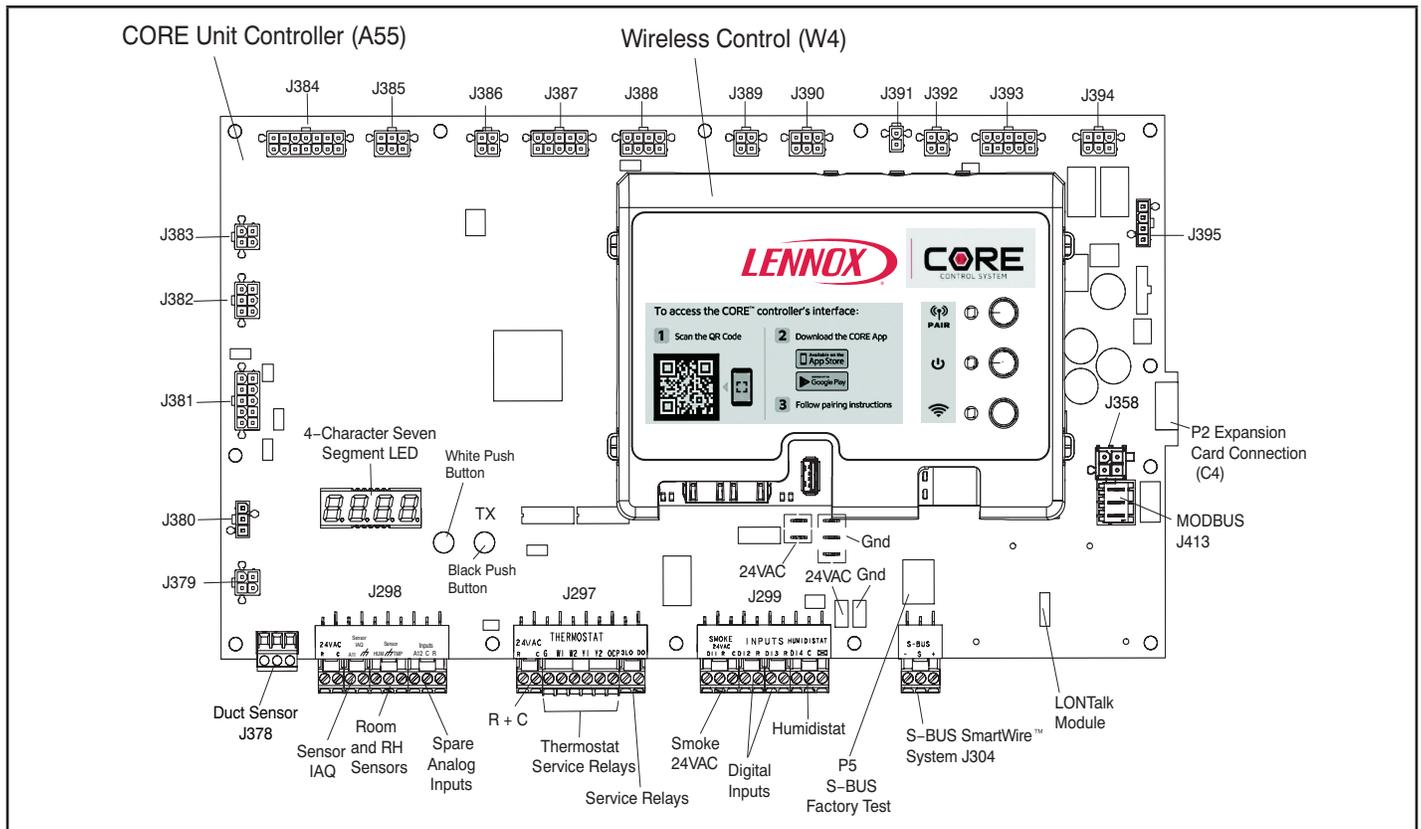


FIGURE 3

I-UNIT COMPONENTS

All 3 through 6 ton (7 through 21 kW) units are configured 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

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

1-Control Transformers T1/T43

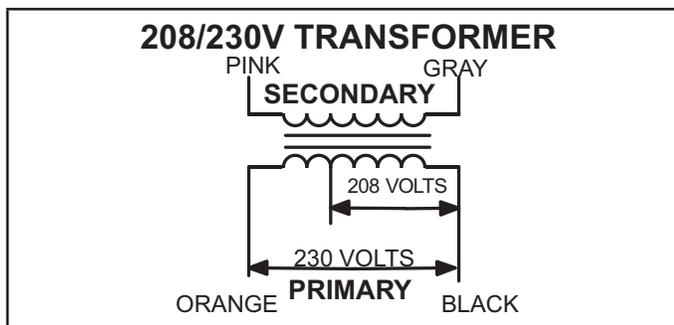


FIGURE 4

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 crankcase 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 LCM 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 energized.

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 \pm 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

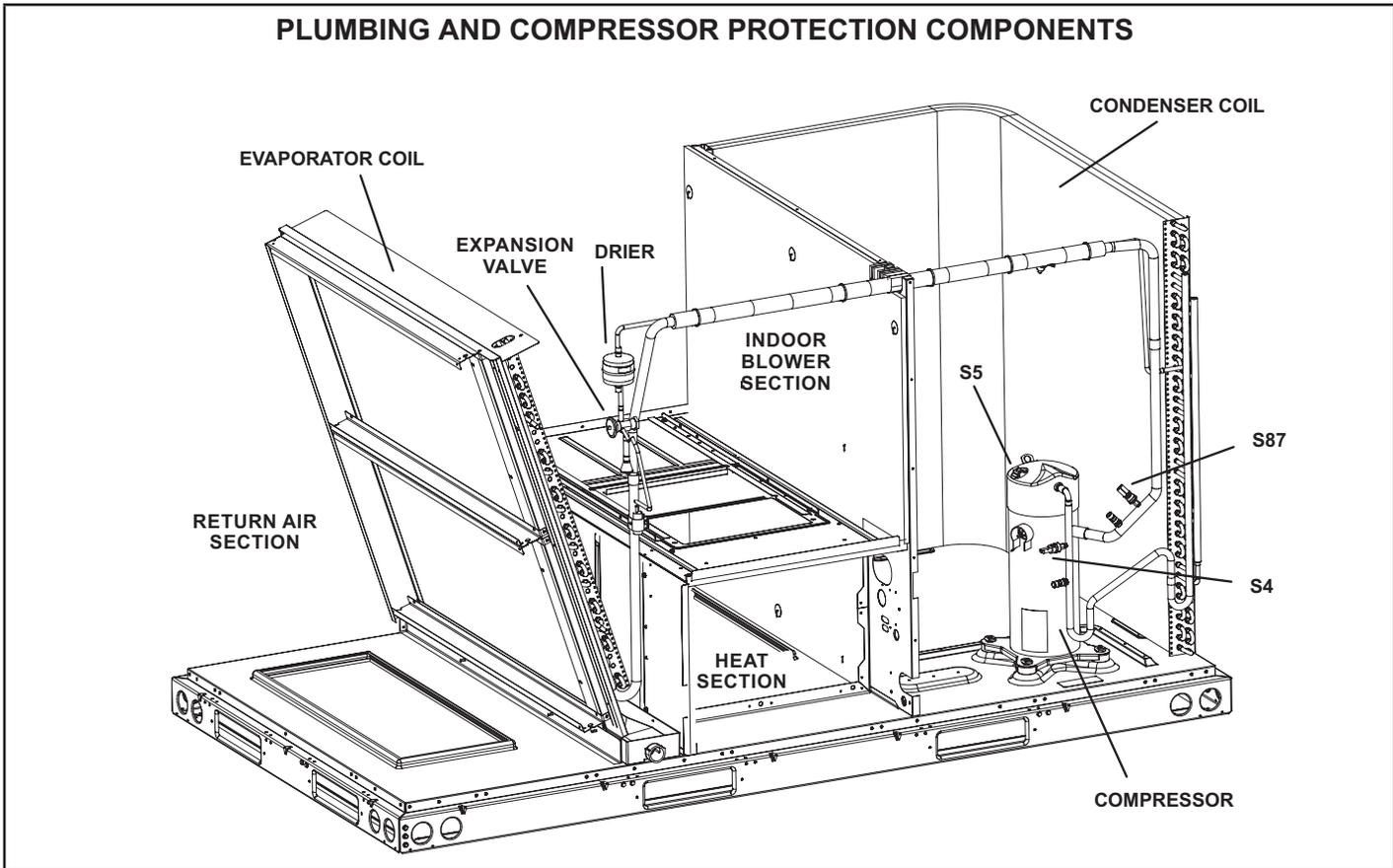


FIGURE 5

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**

Unit	RT42 & RT46	RT44 & RT48
036U, 048U	Figure 6	Figure 8
060U, 074U	Figure 7	

**THERMISTOR LOCATION RT42 & 46
036 & 048 THREE-ROW EVAPORATOR COIL
(VIEW FROM FRONT SIDE OF UNIT)**

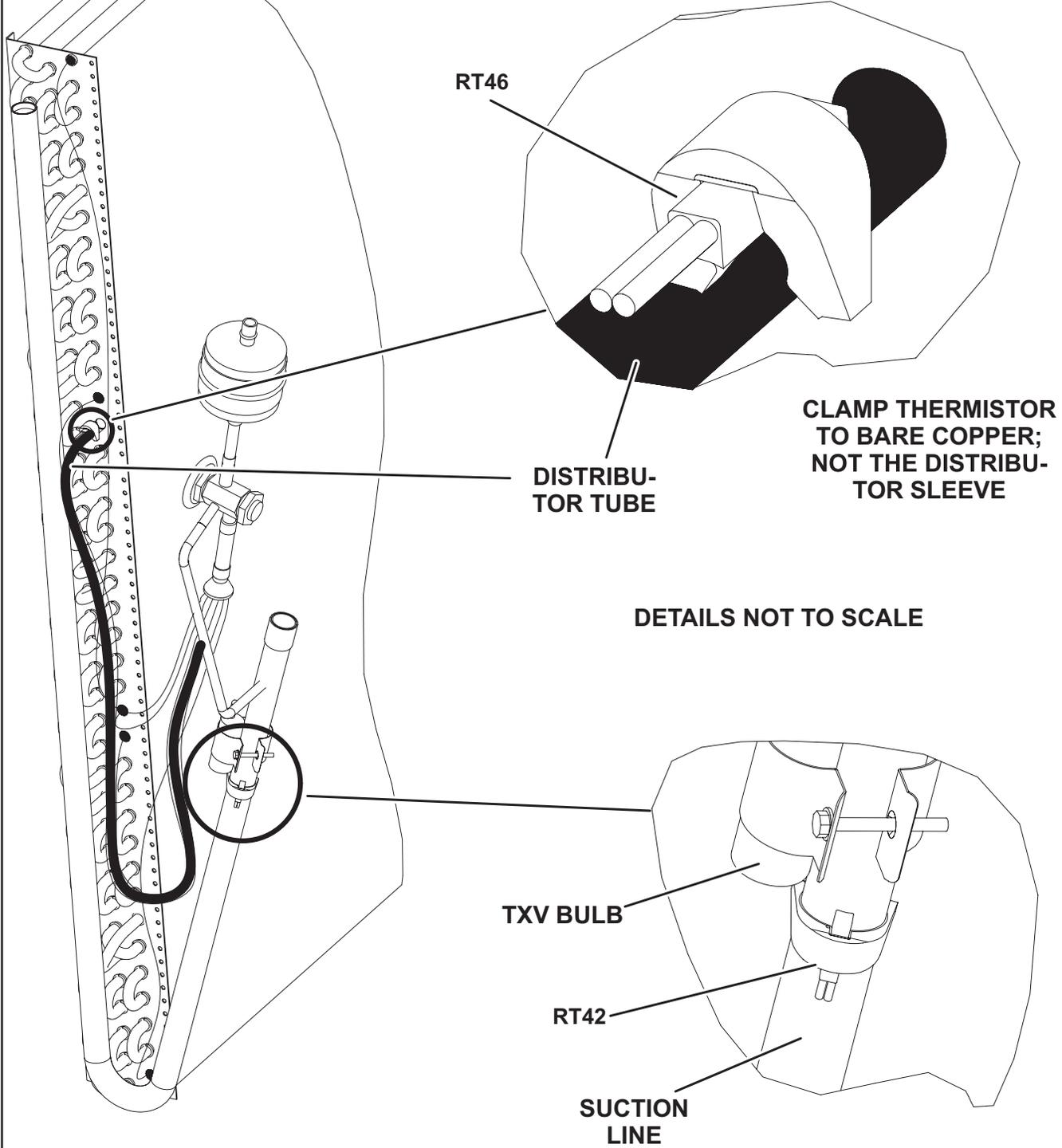


FIGURE 6

**THERMISTOR LOCATION RT42 & 46
060U & 074 FOUR-ROW EVAPORATOR COIL
(VIEW FROM FRONT SIDE OF UNIT)**

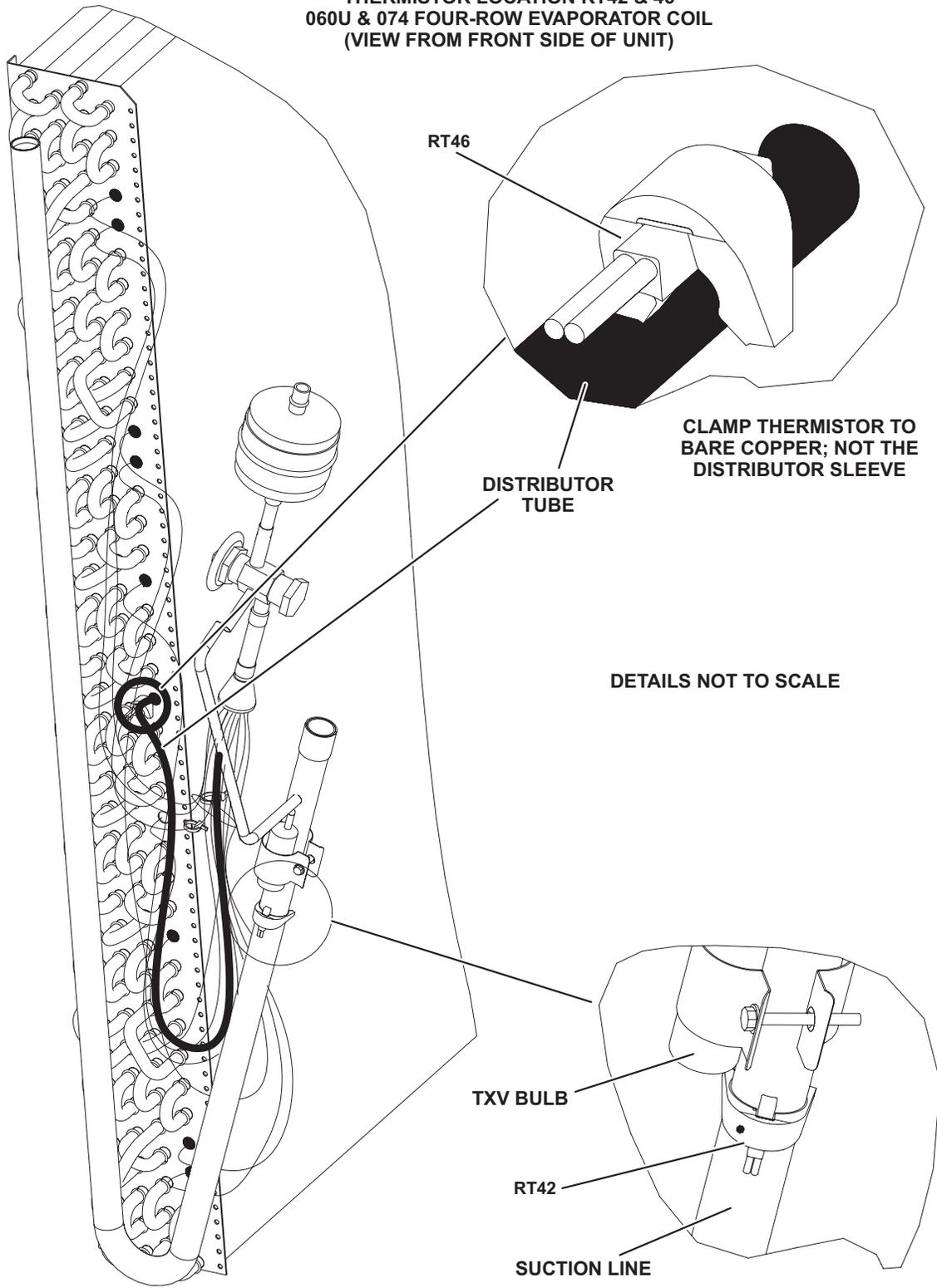


FIGURE 7

**THERMISTOR LOCATION RT44 & RT48
036-048 CONDENSER COIL
(VIEW FROM FRONT SIDE OF UNIT)**

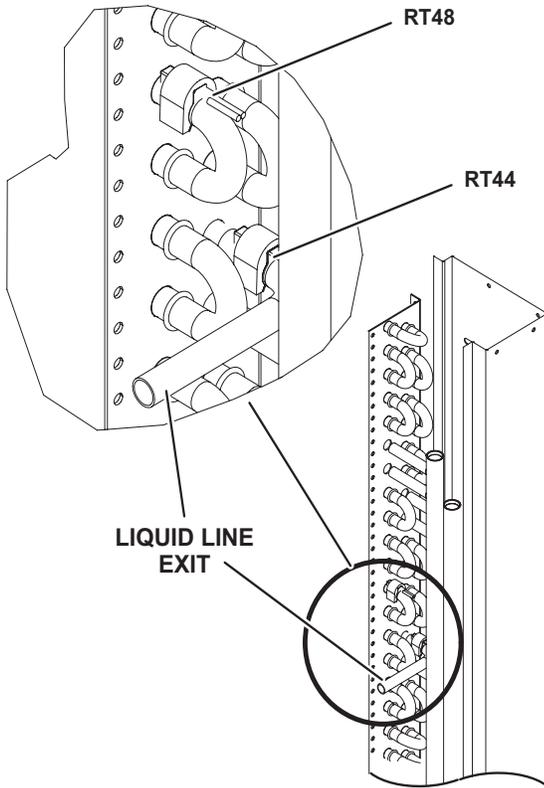


FIGURE 8

⚠ 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.

5-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 9 for compressor safety devices and FIGURE 10 for compressor diagnostics.

COMPRESSOR SAFETY DEVICES

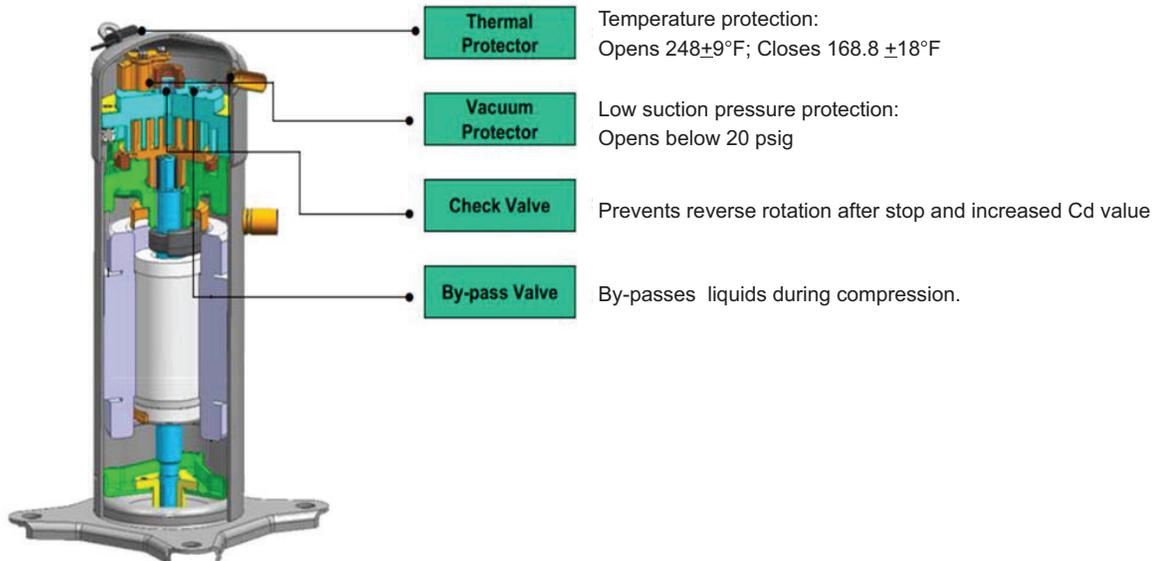


FIGURE 9

COMPRESSOR DIAGNOSTICS

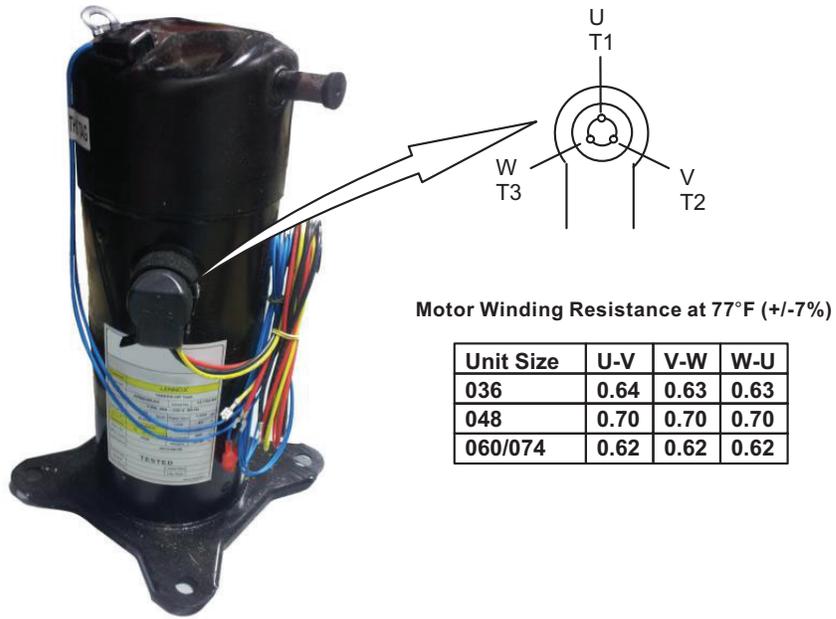


FIGURE 10

6-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 11 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 2 for inverter-related alarms. Inverter component wire routing is shown in FIGURE 12.

⚠ 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.

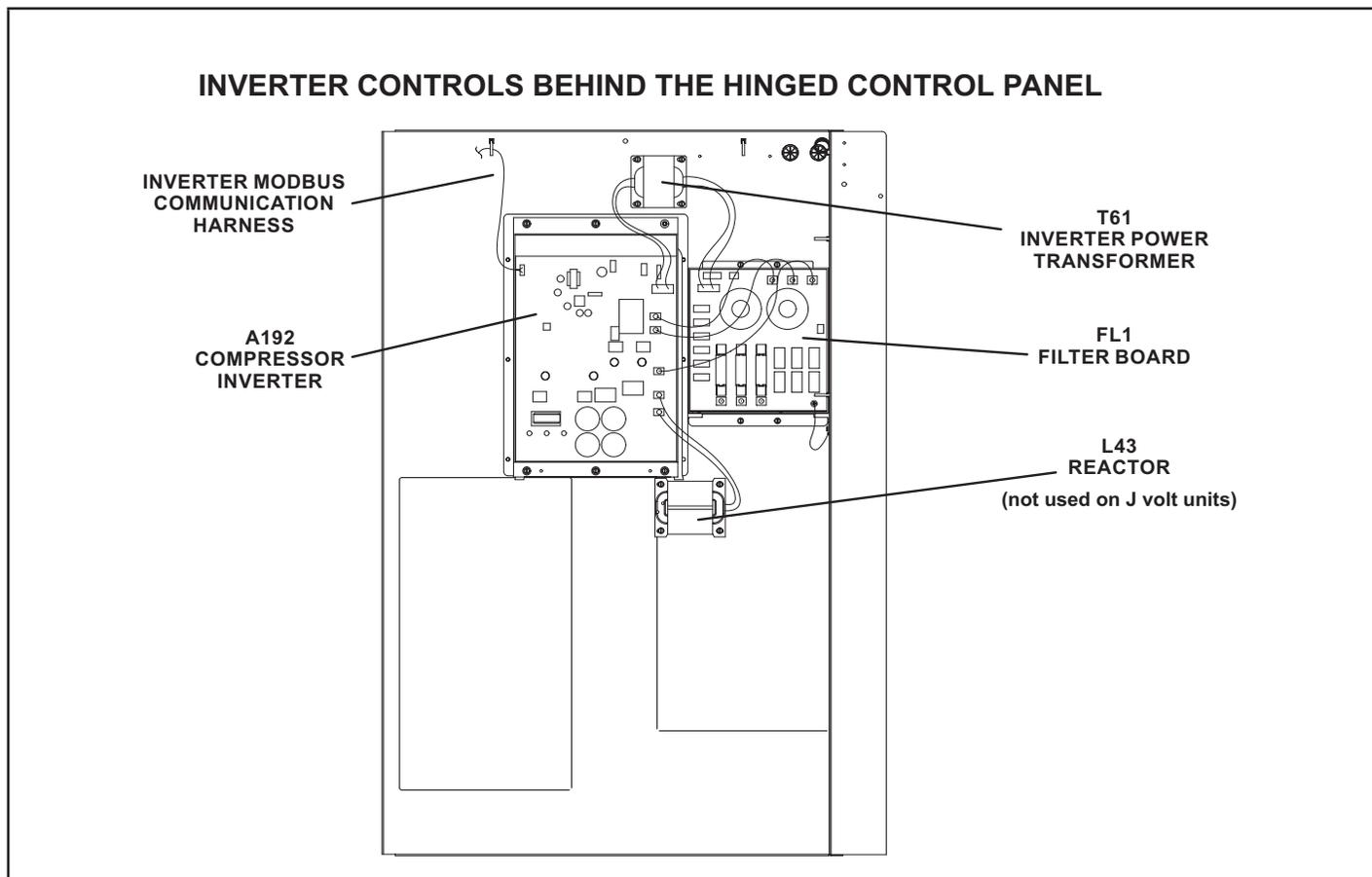


FIGURE 11

TABLE 2

INVERTER-RELATED ALARMS		
ALARM CODE	DISPLAY MESSAGE	EVENT ACTION
187	INVERTER LOW LEVEL ALARM	<p>Possible alarming values for Prodigy Alarm 187 are:</p> <ul style="list-style-type: none"> 12 - High compressor input current 13 - High heat sink temperature 14 - High PFC input current <p>Alarm might be caused by outdoor fan abnormal operation, high ambient conditions, dirty outdoor coil, refrigerant overcharge, or a blocked heat sink.</p> <p>The compressor speed will slow down until the temperature or current lowers, then the compressor will speed up again.</p> <p>If the alarm continues after outdoor conditions have moderated, check the fan, charge and coil. Alarm 187 will automatically clear when minimum off time expires.</p> <p>REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.</p>
188	INVERTER HIGH LEVEL ALARM	<p>Possible alarming values for Prodigy Alarm 188 are:</p> <ul style="list-style-type: none"> 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 <p>No action required. Compressor stops for the duration of the minimum run time (anti-short-cycle delay of 180 seconds). Unit shuts down after ten occurrences in one hour and Alarm 189 is initiated. Alarm 188 will automatically clear when inverter error clears.</p> <p>REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.</p>
189	INVERTER FATAL ALARM	<p>Possible alarming values for Prodigy Alarm 189 are the same as alarm 188.</p> <p>Alarm 189 will clear upon manual reset.</p> <p>REFER TO TROUBLE SHOOTING GUIDE IN SERVICE MANUAL FOR MORE INFORMATION.</p>
190	INVERTER COMMUNICATION ERROR	<p>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.</p>
191	INVERTER VOLTAGE MISMATCH	<p>Unit Controller will disable compressor operation. Replace with correct inverter part.</p>

7-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.

8-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.

9-Reactor L43

The reactor (inductor or choke) is used to improve the power factor. This passive, two-terminal electrical component has a magnetic field that stores energy. Reactors are one of the basic components used in electronics where current and voltage change with time (due to the ability of inductors to delay and reshape alternating currents). This component is connected to the compressor inverter A192. A 2mH reactor is used on 208/230V units and a 13mH reactor is used on 460V units.

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 13.

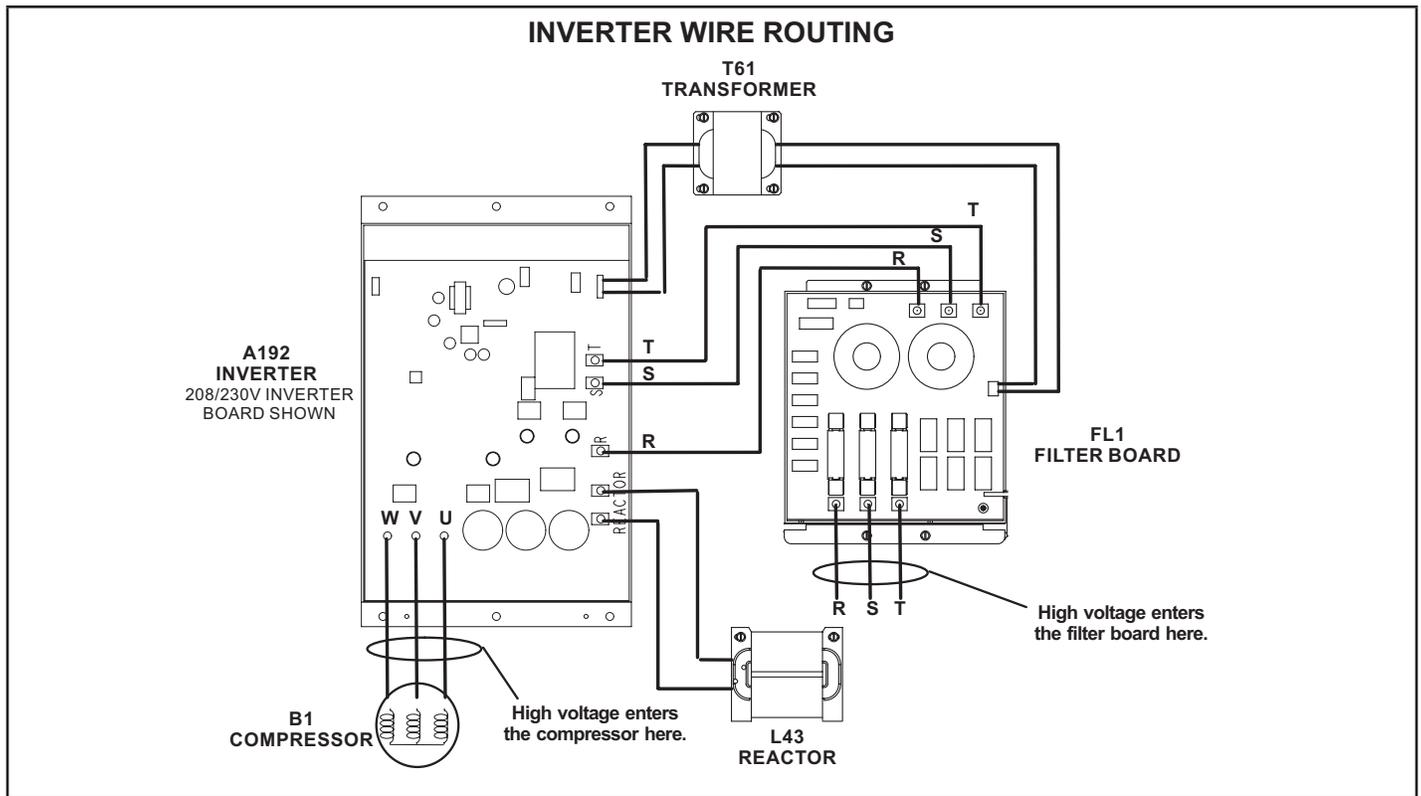


FIGURE 12

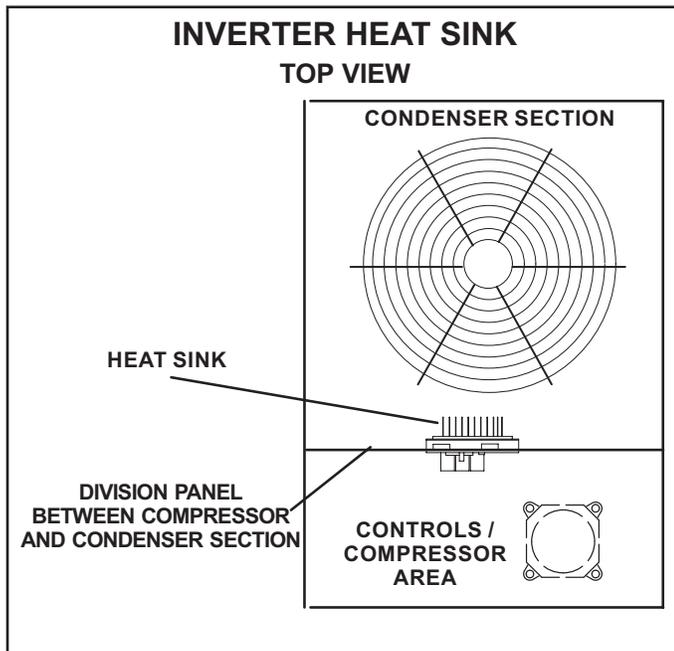


FIGURE 13

C-Blower Compartment

Units are equipped with a variable speed, direct drive blower. The installer is able to enter the design-specified supply air CFM into the Unit Controller for optimal efficiency. The Unit Controller calibrates the supply air volume which eliminates the need to manually take duct static measurements.

1-Indoor Blower Motor B3

All direct drive blower motors are electronically commutated, brushless, DC motors. The motors are powered with high voltage 3-phase AC power. CFM adjustments are made by changing Unit Controller parameters via the service app. Motors are equipped with sealed ball bearings. All motor specifications are listed in the SPECIFICATIONS (table of contents) in the front of this manual. Motors come with pre-mounted aluminum impellers.

⚠ IMPORTANT

Three phase scroll compressors must be phased sequentially for correct compressor and blower rotation. Follow "COOLING START-UP" section of installation instructions to ensure proper compressor and blower operation.

A-Blower Operation

Refer to the Unit Controller Setup Guide to energize blower. Use the mobile service app menu; see SERVICE > TEST.

⚠ WARNING

- 1-Make sure that unit is installed in accordance with the installation instructions and applicable codes.
- 2-Inspect all electrical wiring, both field-and factory-installed, for loose connections. Tighten as required.
- 3-Check to ensure that refrigerant lines do not rub against the cabinet or against other refrigerant lines.
- 4-Check voltage at disconnect switch. Voltage must be within range listed on nameplate. If not, consult power company and have voltage condition corrected before starting unit.
- 5-Make sure filters are new and in place before startup.

B-Determining Unit CFM

CFM is calculated using a supplied pressure transducer and can be viewed in the mobile service app. CFM can also be manually checked as follows:

- 1 - The following measurements must be made with air filters in place.

IMPORTANT - A low speed adjustment less than 2/3 of high speed will improve humidity removal; refer to product data for more information.

- 2 - With all access panels in place, measure static pressure external to unit (from supply to return). Blower performance data is based on static pressure readings taken in locations shown in FIGURE 14.

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

- 3 - Measure the indoor blower wheel RPM.
- 4 - Referring to the blower tables in the front of this manual, use static pressure and RPM readings to determine unit CFM. Apply the optional accessory air resistance.

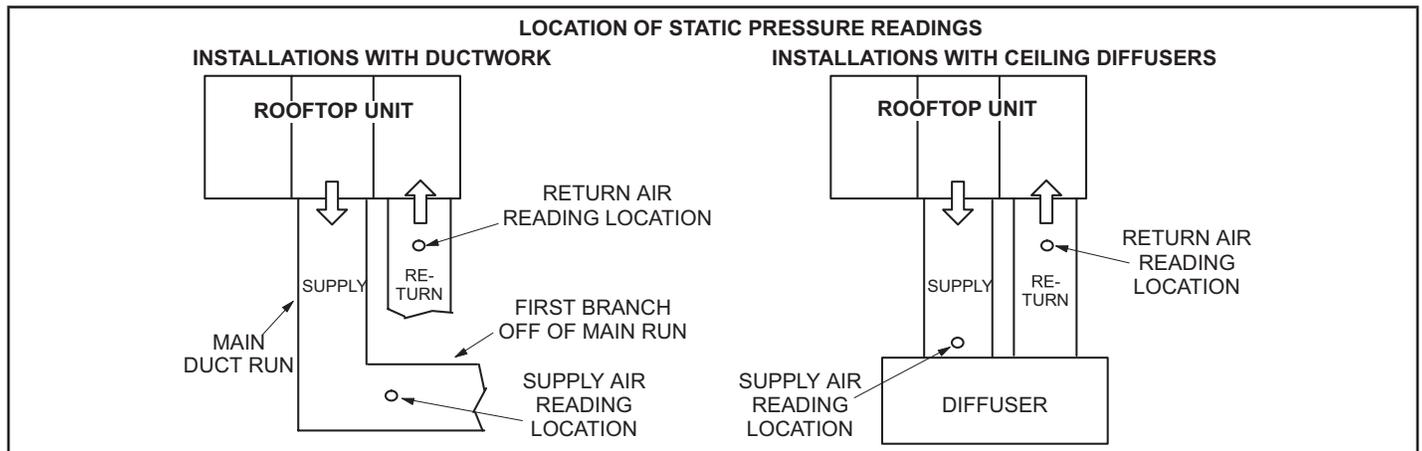


FIGURE 14

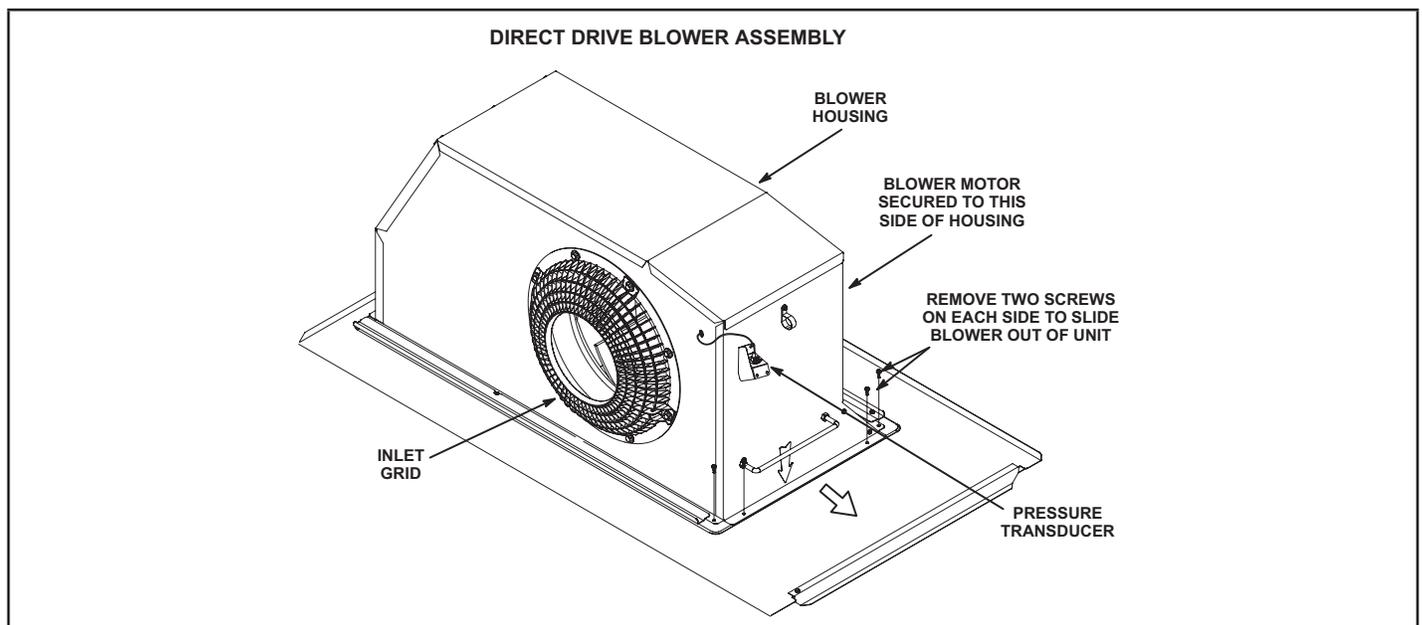


FIGURE 15

C-Adjusting Unit CFM

The supply CFM can be adjusted by changing Unit Controller settings. Refer to TABLE 3 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 single- 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 3

036, 048, 060, 074U DIRECT DRIVE PARAMETER SETTINGS

LGM/LCH036-074U4E Default Parameter Settings						
Parameter	Factory Setting				Field Setting	Description
	036	048	060	074		
Note: Any changes to Smoke CFM setting must be adjusted before the other CFM settings. Use SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 12						
BLOWER SMOKE CFM	1200	1600	2000	2400	CFM	Smoke blower speed
SETUP > TEST & BALANCE > BLOWER						
BLOWER HEATING HIGH CFM	1200	1600	2000	2000	CFM	High heat blower speed
BLOWER HEATING LOW CFM	N/A	1250	1250	1250	CFM	Low heat blower speed (applies to 150kBtuh 4-stg. gas heat only)
BLOWER COOLING HIGH CFM	1100	1450	1825	2200	CFM	High cooling blower speed
BLOWER COOLING LOW CFM	575	750	950	950	CFM	Low cooling blower speed
BLOWER VENTILATION CFM	575	750	950	1150	CFM	Ventilation blower speed
SETUP > TEST & BALANCE > DAMPER						
BLOWER HIGH CFM DAMPER POS %	0%	0%	0%	0%	%	Minimum damper position for high speed blower operation.
BLOWER LOW CFM DAMPER POS %	0%	0%	0%	0%	%	Minimum damper position for low speed blower operation.
POWER EXHAUST DAMPER POS %	50%	50%	50%	50%	%	Minimum damper position for power exhaust operation.
SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 216						
POWER EXHAUST DEAD-BAND %	10%	10%	10%	10%	%	Deadband % for power exhaust operation.
SETTINGS > RTU OPTIONS > EDIT PARAMETER = 10 (Applies to Thermostat Mode ONLY)						
FREE COOLING STAGE-UP DELAY	300 sec.	300 sec.	300 sec.	300 sec.	sec	Number of seconds to hold indoor blower at low speed before switching to indoor blower at high speed.

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

D-ELECTRIC HEAT COMPONENTS

Electric heat match-ups are found in the ELECTRICAL DATA tables. See table of contents. All electric heat sections consist of electric heating elements exposed directly to the air stream. See FIGURE 16. See FIGURE 17 for vestibule parts arrangement.

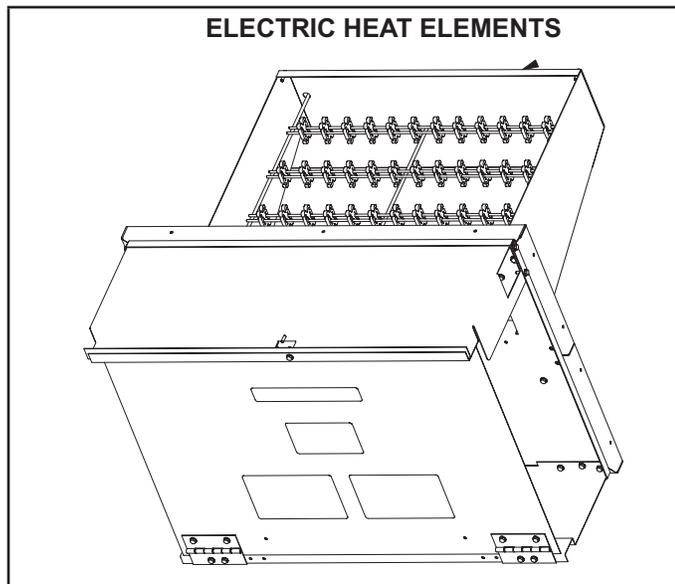


FIGURE 16

1-Contactors K15, K16

All contactors are double break and either single, double or three pole (see diagram) and equipped with a 24VAC coil. The coils in the K15 and K16 contactors are energized by the indoor thermostat. In all units K15 energizes the heating elements, while in the 22.5 kW units, K15 and K16 energize the heating elements simultaneously.

2-High Temperature Limits S15 (Primary)

S15 is a SPST N.C. auto-reset thermostat located on the back panel of the electric heat section above the heating elements. S15 is the high temperature limit for the electric heat section. When S15 opens, indicating a problem in the system, contactor K15 is de-energized (including K16 in 22.5 kW units). When K15 is de-energized, all stages of heat are de-energized. See TABLE 4 for S15 set points. Set points are factory set and not adjustable.

TABLE 4

Unit kW (Voltage)	S15 Opens ° F	S15 Closes ° F
7.5 (Y, G, J)	160	120
15 (Y)	170	130
15 (G, J)	160	120
22.5 (Y, G, J)	160	120

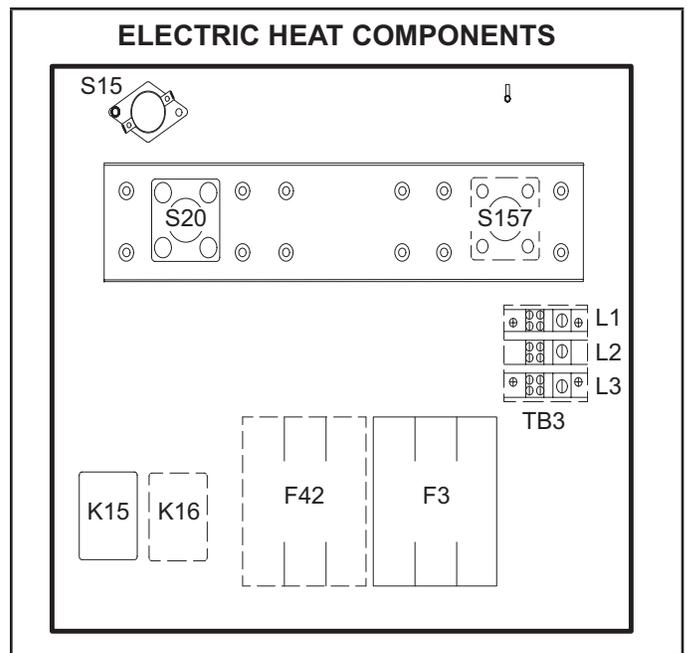


FIGURE 17

3-High Temperature Limit S20 and S157 (Secondary)

S20 and S157 are SPST N.C. manual-reset thermostats. S20 and S157 are wired in series with the heating elements. When S20 or S157 opens, power is interrupted to the heating elements which are wired in series with the limits. K15/K16 are only de-energized when S15 opens. When the contactors are de-energized, all stages of heat are de-energized. The thermostat is factory set to open at 220F + 6F (104C + 3.3C) on a temperature rise and can be manually reset when temperature falls below 160F (71.0C). See FIGURE 17 for location.

4-Terminal Strip TB2

Terminal strip TB2 is used for single point power installations only. TB2 distributes power to TB3. Units with multi-point power connections will not use TB2.

5-Terminal Strip TB3

P and Y voltage units are equipped with terminal strip TB3. Electric heat line voltage connections are made to TB3, which distributes power to the electric heat components and is located on the vestibule. See FIGURE 17.

6-Heating Elements HE1 through HE6

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

7-Fuse F3

Fuse F3 is housed in a fuse block which holds two or three fuses. Each F3 fuse is connected in series with each leg of electric heat. FIGURE 17 and TABLE 5 show the fuses used with each electric heat section.

8-Unit Fuse Block & Fuse F4

Three line voltage fuses F4 provide short circuit and ground fault protection to all cooling components in the LCM units with electric heat. The fuses are rated in accordance with the amperage of the cooling components. The F 4 fuse block is located inside a sheet metal enclosure .

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 curb (T1CURB-AN or C1CURBAN).

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 - 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.
- 5 - Recheck voltage and amp draw with unit running. If voltage is not within range listed on unit nameplate, stop unit and consult power company. Refer to unit nameplate for maximum rated load amps.

TABLE 5

Unit	Voltage / Phase	Fuse	Quantity	Quantity
		F3	Each	Each
E1EH0075	208/230V-3P	25 A-250V	3	3
	460V-3P	15 A-600V	3	3
	575V-3P	15 A-600V	3	3
E1EH0150	208/230V-3P	50 A-250V	3	3
	460V	25 A-600V	3	3
	575V	20 A-600V	3	3
E1EH0225	208/230V-3P	45 A-250V	3	3
	460V-3P	35 A-600V	3	3
	575V-3P	30 A-600V	3	3

B-Cooling Start up

- 1 - Initiate full load cooling operation using the following mobile service app menu path:
SERVICE > TEST > COOL > COOL 3 (COOL 4 on 074U units)
- 2 - Units contain one refrigerant circuit or stage.
- 3 - Unit is charged with R-410A refrigerant. See unit rating plate for correct amount of charge.
- 4 - Refer to charging section method to check refrigerant charge.

C-Electric Heat Start Up

Optional electric heat will stage on and cycle with thermostat demand. See electric heat wiring diagram on unit for sequence of operation.

D-Safety or Emergency Shutdown

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

IV-CHARGING

A-Refrigerant Charge and Check - Fin/Tube Coil

WARNING-Do not exceed nameplate charge under any condition.

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

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 - Attach gauge manifolds and operate unit in cooling mode on **HIGH SPEED** with economizer disabled until system stabilizes (approximately five minutes). Make sure outdoor air dampers are closed.

Note - Use mobile service app menu path SERVICE > TEST > COOL > COOL 3 for 036, 048 and 060U units. Use COOL 4 for 074U units.

- 2 - Use a thermometer to accurately measure the outdoor ambient temperature.
- 3 - Apply the outdoor temperature to TABLE 6 through TABLE 9 to determine normal operating pressures. Pressures are listed for sea level applications at 80°F dry bulb and 67°F wet bulb return air.

- 4 - Compare the normal operating pressures to the pressures obtained from the gauges. Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system. Correct any system problems before proceeding.
- 5 - If discharge pressure is high, remove refrigerant from the system. If discharge pressure is low, add refrigerant to the system.
 - Add or remove charge in increments.
 - Allow the system to stabilize each time refrigerant is added or removed.
- 6 - Use one of the following charge verification methods along with the normal operating pressures to confirm readings.

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.
$$\text{Subcooling Temperature} = \text{Liquid Saturated Temperature} - \text{Liquid Temperature.}$$
- 4 - The subcooling temperature should be as shown in TABLE 10. A subcooling temperature greater than this value indicates an overcharge. A subcooling temperature less than this value indicates an undercharge.

TABLE 6
581009-01

LG/LC 036SU NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65°	232	146
75°	267	149
85°	307	150
95°	351	151
100°	400	151
115°	454	154

TABLE 7
581010-01

LG/LC 048U NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ± 10 psig	Suction ± 5 psig
65°	252	142
75°	289	145
85°	332	147
95°	379	149
100°	428	151
115°	484	153

TABLE 8
581011-01

LG/LC 060U NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ± 10 psig	Suction ± 5 psig
65°	261	135
75°	299	138
85°	341	140
95°	388	142
100°	441	144
115°	499	146

TABLE 9
581012-01

LG/LC 060U NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ± 10 psig	Suction ± 5 psig
65°	268	128
75°	307	134
85°	351	137
95°	399	140
100°	450	142
115°	505	144

TABLE 10
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)

V- SYSTEMS SERVICE CHECKS

A-Cooling System Service Checks

LCM 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 6 through TABLE 9.

VI-MAINTENANCE

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

⚠ WARNING

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

⚠ IMPORTANT

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

A-Filters

Units are equipped with temporary filters which must be replaced prior to building occupation. See FIGURE 18. 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.

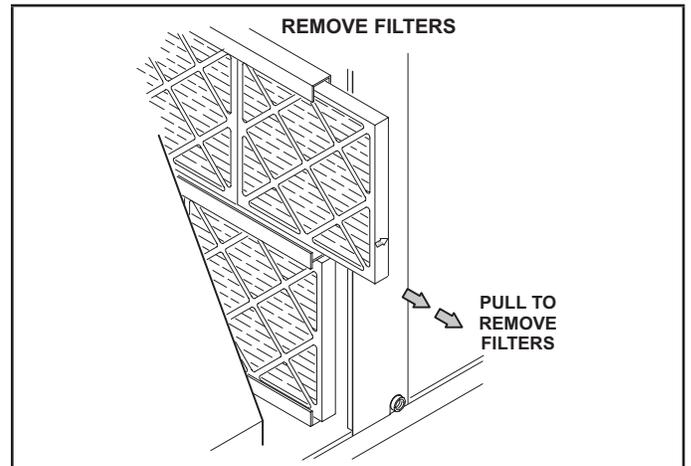


FIGURE 18

B-Lubrication

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

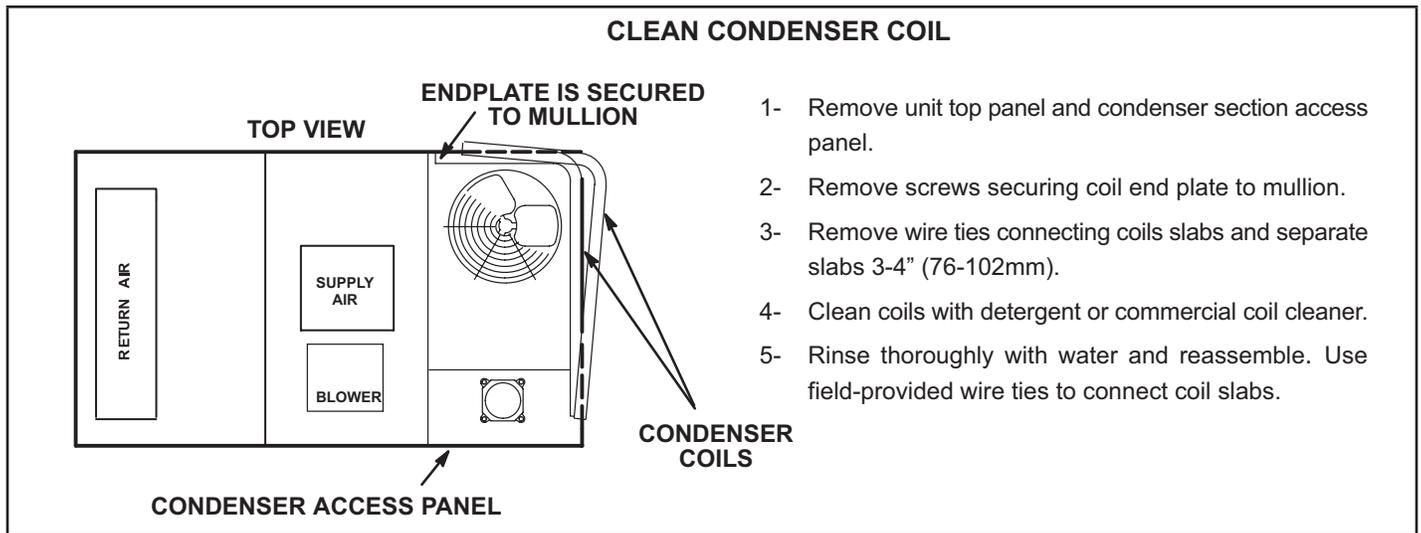


FIGURE 19

C-Evaporator Coil

Inspect and clean coil at beginning of each cooling season. Clean using mild detergent or commercial coil cleanser. Flush coil and condensate drain with water taking care not to get insulation, filters and return air ducts wet

D-Condenser Coil

Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season. Condenser coils are made of single and two formed slabs. On units with two slabs, dirt and debris may become trapped between the slabs. To clean between slabs, carefully separate coil slabs and wash them thoroughly. See FIGURE 19. Flush coils with water following cleaning.

E-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 LCM units.

A-C1/T1CURB

When installing the LCM 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 LCM units are not mounted on a flat (roof) surface, they MUST be supported under all edges and under the middle of the unit to prevent sagging. The units MUST be mounted level within 1/16" per linear foot or 5mm per meter in any direction.

The assembled mounting frame is shown in FIGURE 20. 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 21. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

B-Transitions

Optional supply/return transitions T1TRAN10AN1 is available for use with the LGM 3, 4 and 5 ton units and the T1TRAN20N-1 is available for the 6 ton units utilizing optional T1CURB roof mounting frames. 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

E1DAMP11A-1 manually operated outdoor air damper and E1DAMP21A-1 motorized outdoor air damper is available for LGM 3 and 4 ton units (see FIGURE 22 or FIGURE 23). E1DAMP11AT-1 manually operated outdoor air damper and E1DAMP21AT-1 motorized outdoor air damper is available for LCM 5 and 6 ton units. 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

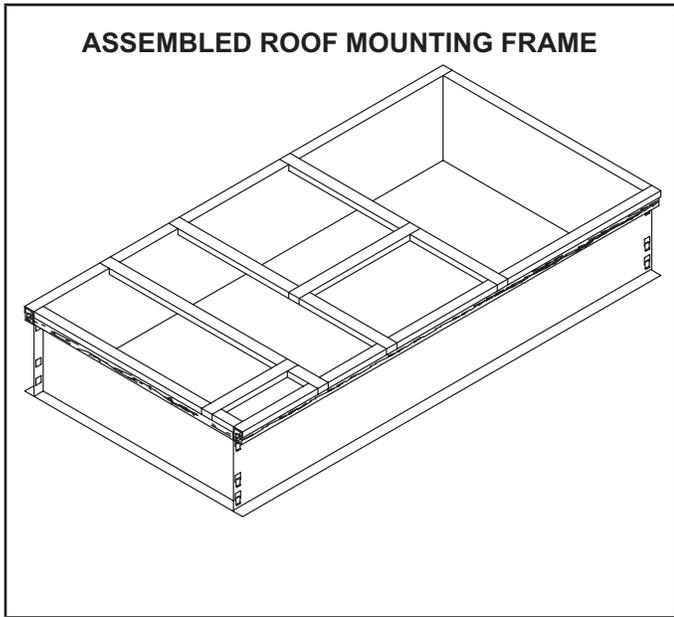


FIGURE 20

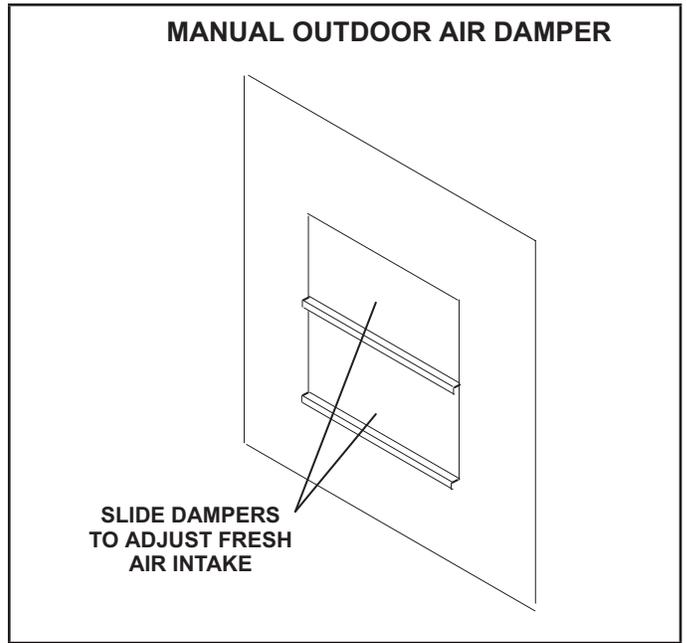


FIGURE 22

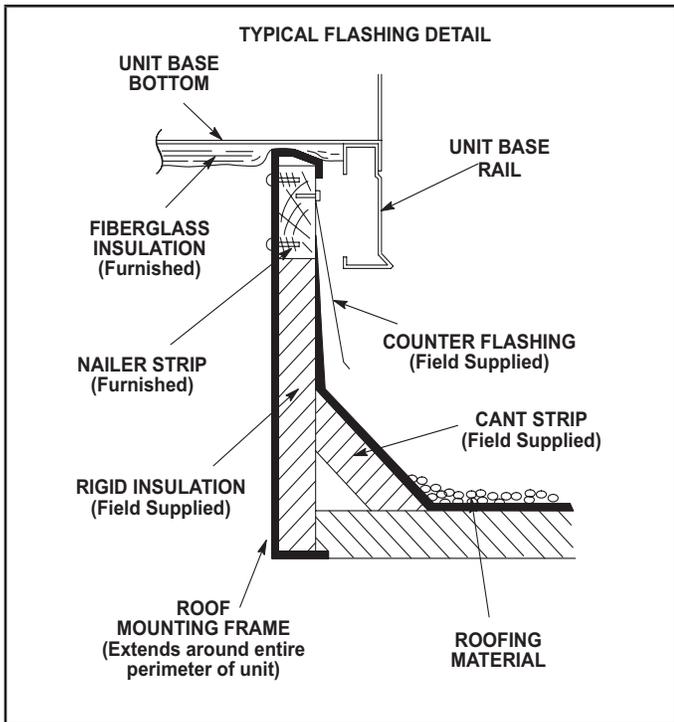


FIGURE 21

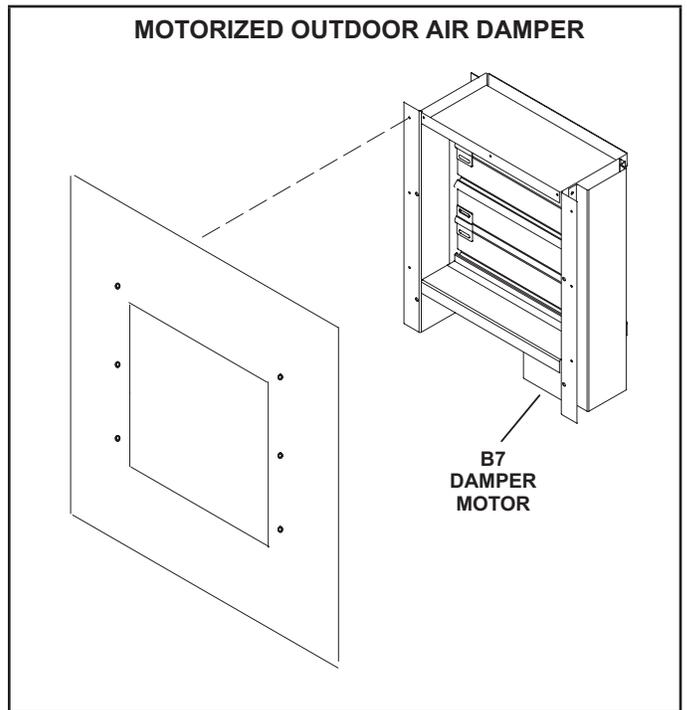


FIGURE 23

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 24.

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 25 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 11. 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 26.

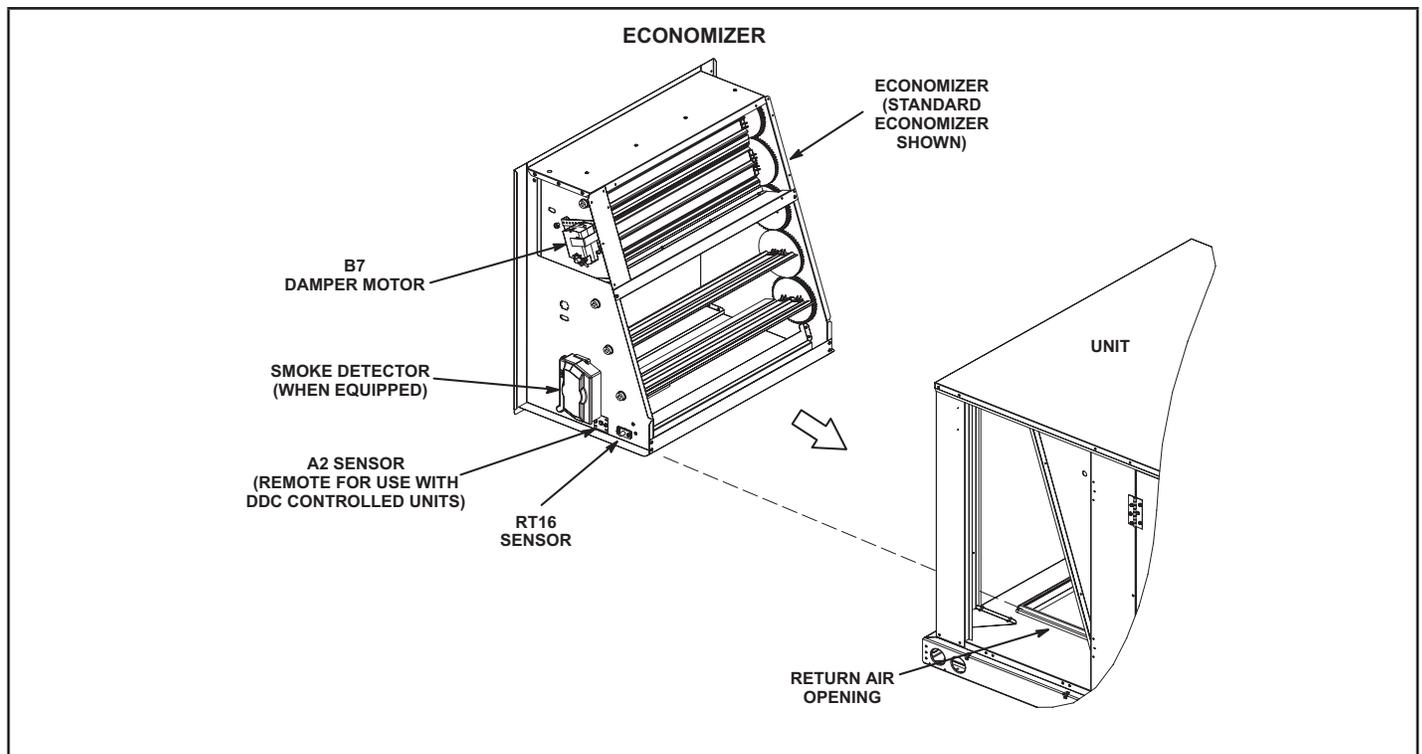


FIGURE 24

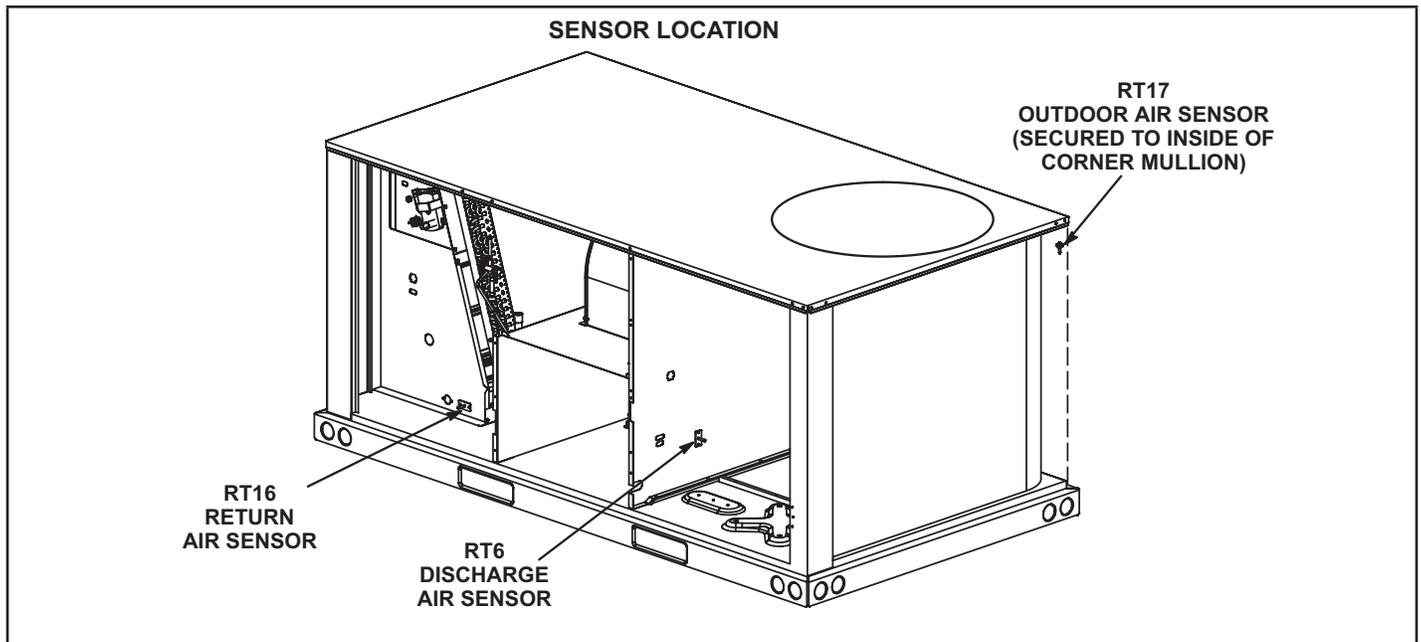


FIGURE 25

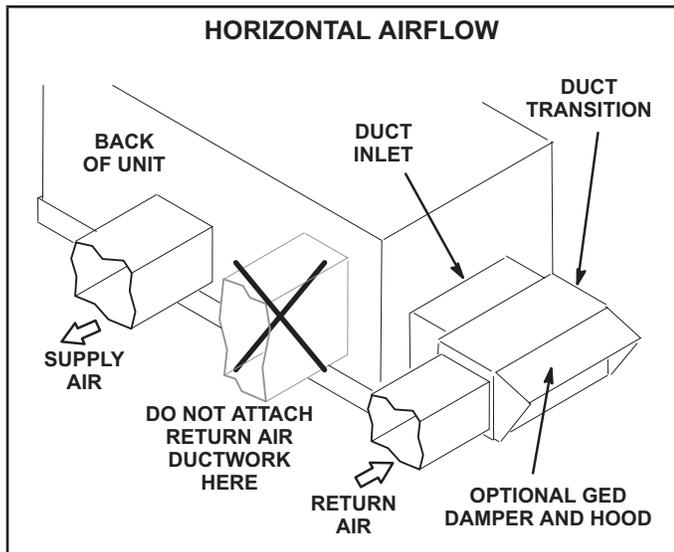


FIGURE 26

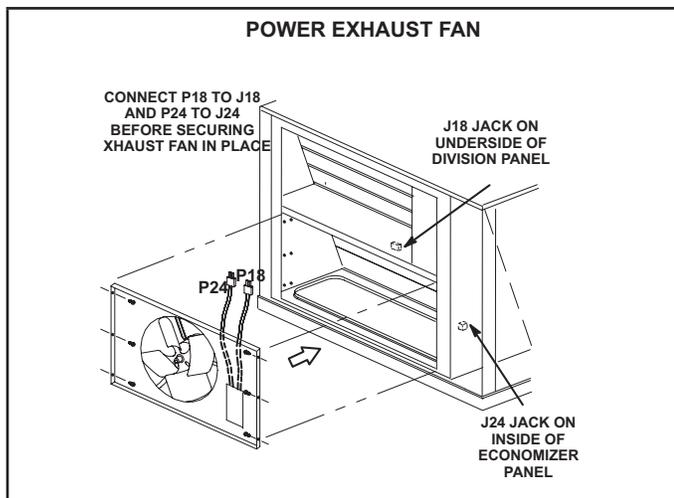


FIGURE 27

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 LCM 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

E1PWRE10A available for LCM 3 and 4 ton units and ET-1PWRE10N available for 5 and 6 ton units, provide exhaust air pressure relief. See FIGURE 27 and installation instructions for more detail.

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.

**TABLE 11
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	Energy Management System**	Either of the TEMP modes can be used when a network OAS signal is provided by an energy management or building control system, via BACnet, LonTalk, or L Connection. The network can command OAS, NOT OAS, or AUTO. AUTO returns to local control of OAS, which is the selected TEMP mode.	NA
ENTH	DIFF OFFSET	(Two) C7400	Outdoor air enthalpy* (A7) is less than return air enthalpy (A62) by at least the OFFSET value.	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

*Enthalpy includes effects of both temperature and humidity.

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

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

¹Outdoor 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

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 29.

- 1 - On the back side of the unit, remove the screw securing the back of the ionizer bracket. See FIGURE 28. 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 remove

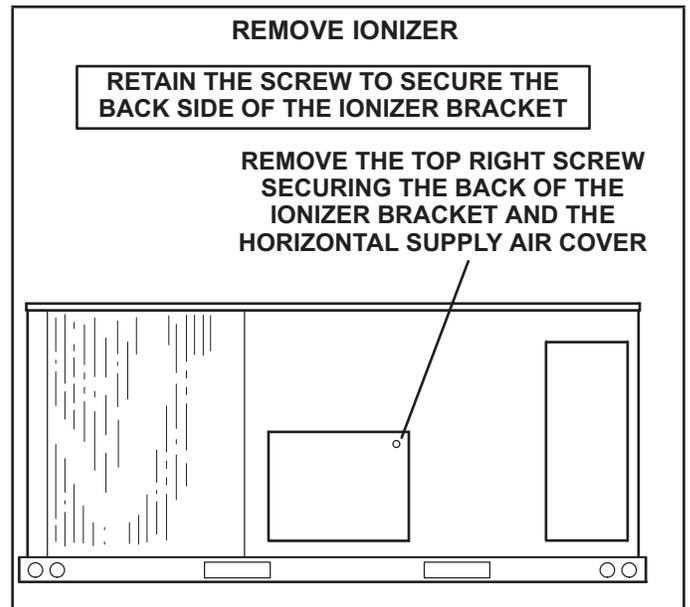


FIGURE 28

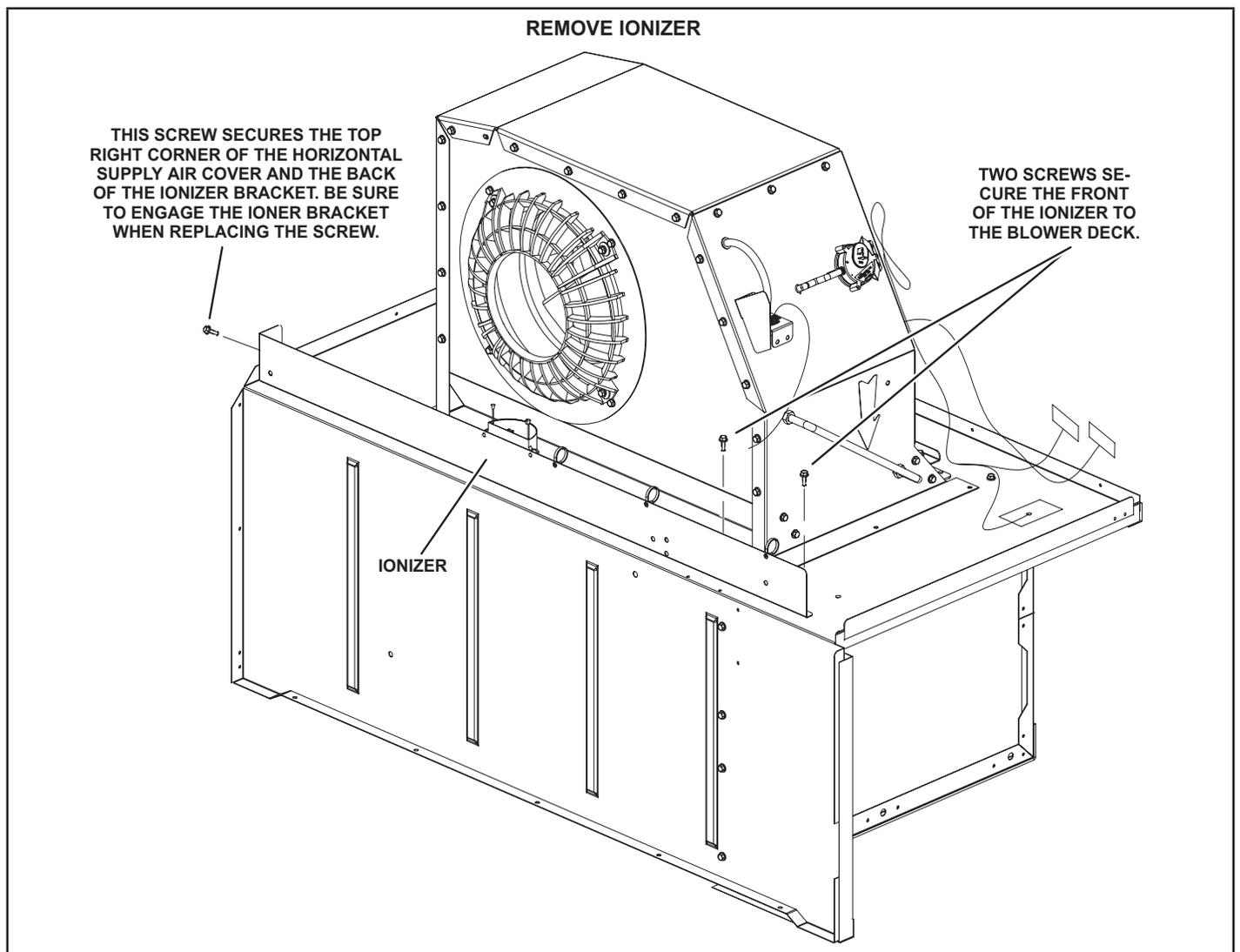


FIGURE 29

J-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 30 for reheat refrigerant routing and FIGURE 31 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 SERVICE > TEST > DEHUMIDIFIER.

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.

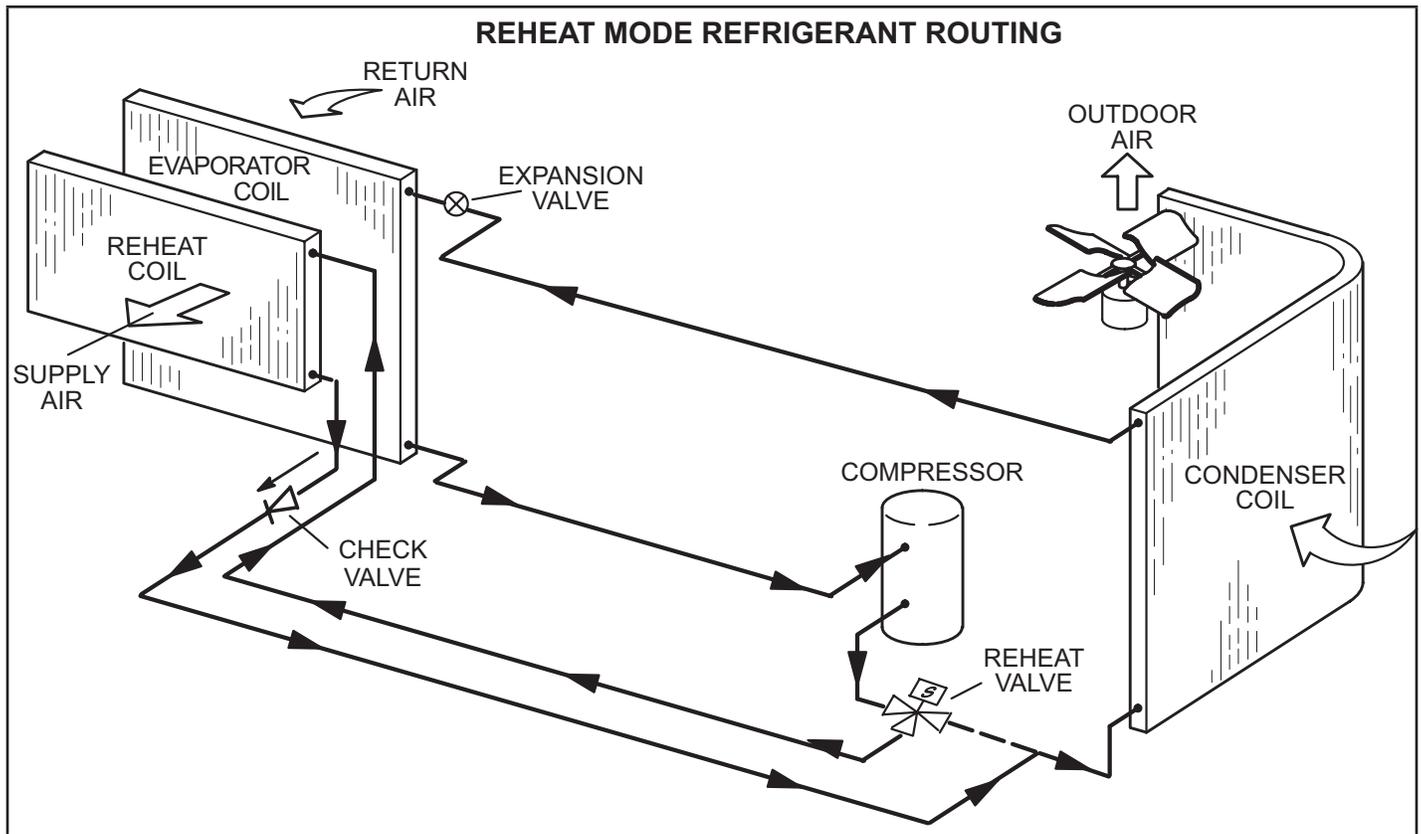


FIGURE 30

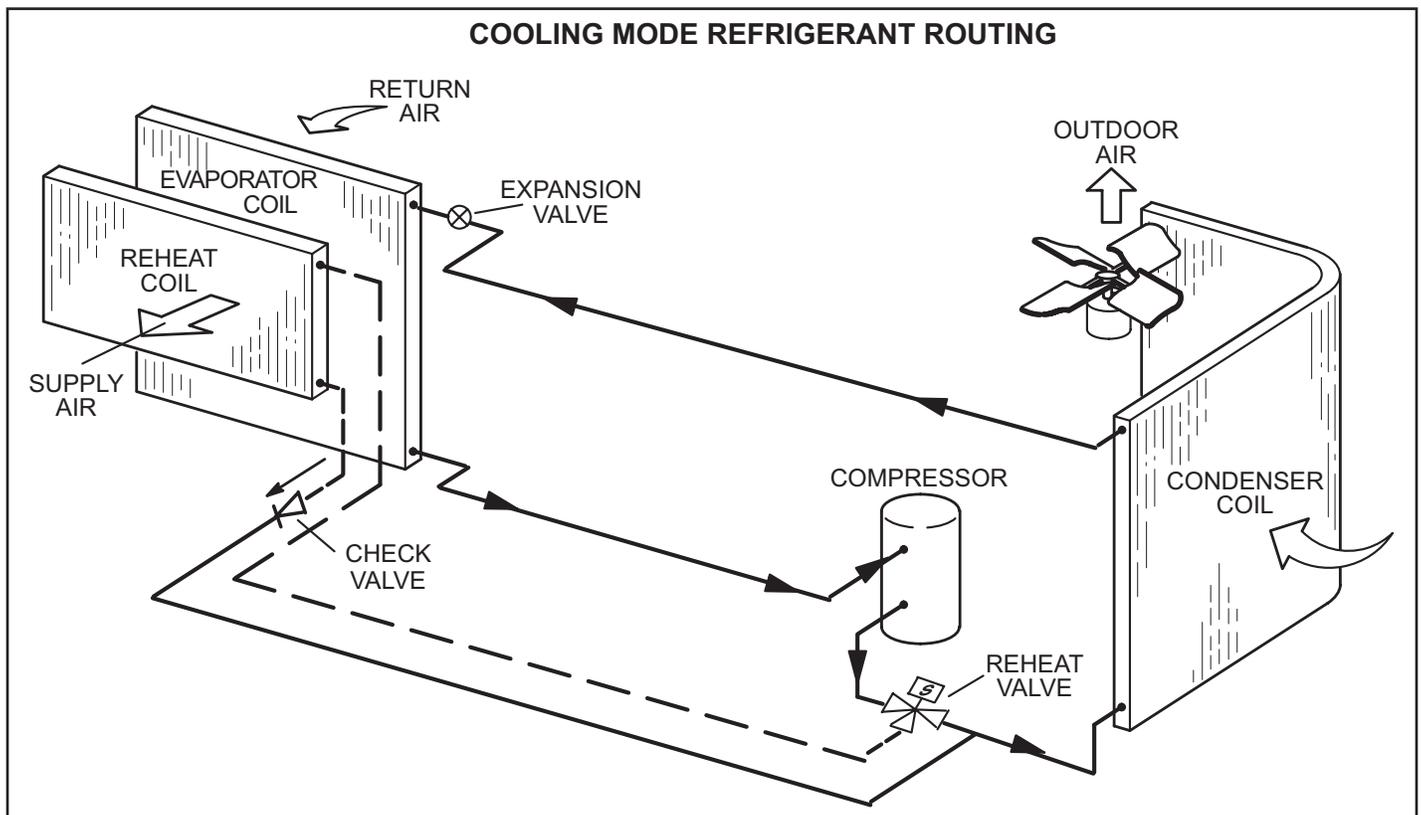
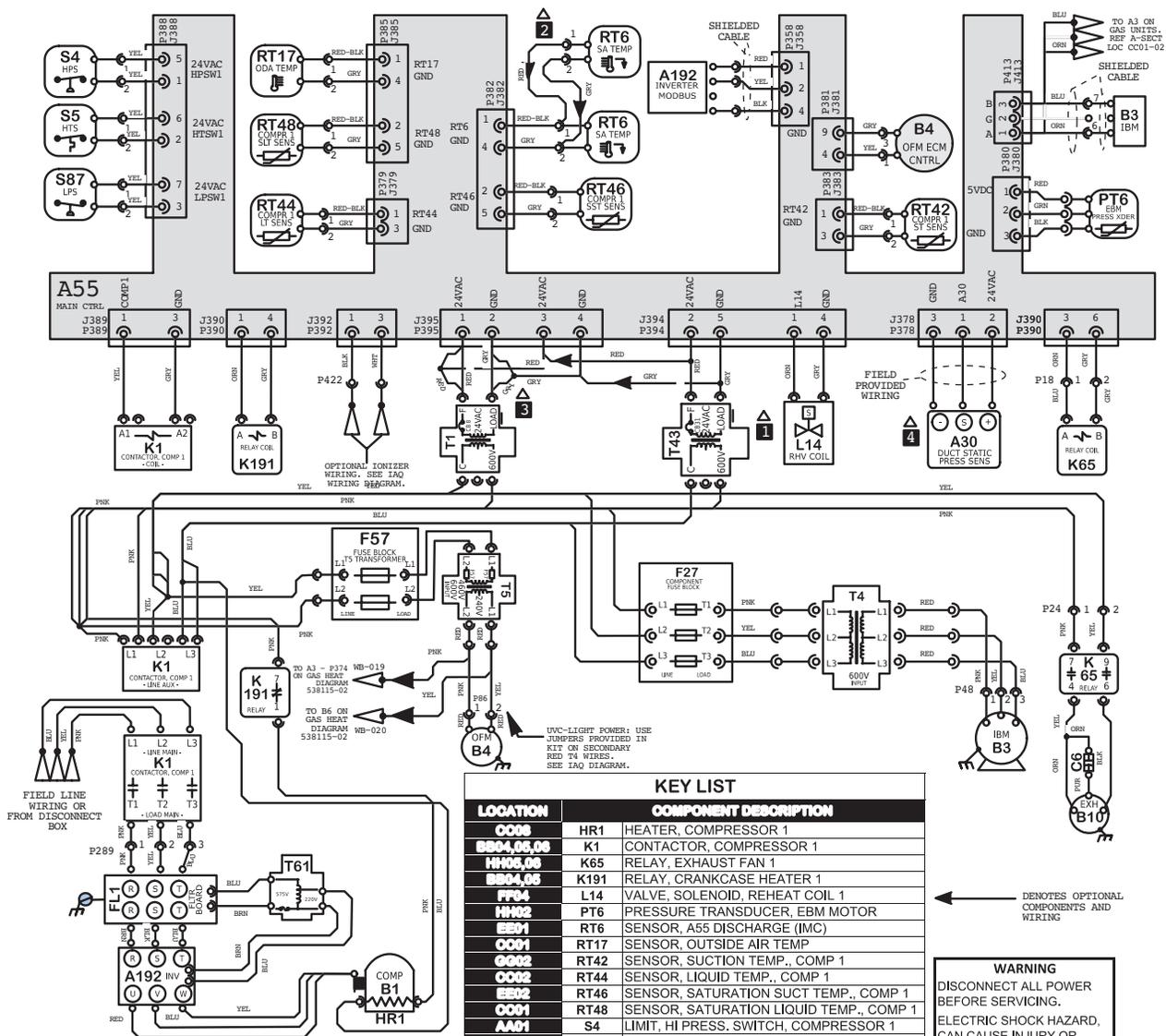


FIGURE 31

VIII-Wiring Diagrams and Sequence of Operation

LGM/LCM036/074 J Voltage



LOCATION	COMPONENT DESCRIPTION
AA02	A55 CONTROL BOARD, MAIN
EE01, EE08	A192 INVERTER, COMPRESSOR 1
OO08	B1 COMPRESSOR 1
HH08	B3 MOTOR, BLOWER
DD08, DD01	B4 MOTOR, OUTDOOR FAN 1
HH08	B10 MOTOR, EXHAUST FAN 1
HH08	C6 CAPACITOR, EXHAUST FAN 1
EE08	F27 FUSE, T4 TRANSFORMER PRIMARY
OO08	F57 FUSE, TRANSFORMER T5
AA07	FL1 FILTER BOARD

LOCATION	COMPONENT DESCRIPTION
OO08	HR1 HEATER, COMPRESSOR 1
BB04, BB08	K1 CONTACTOR, COMPRESSOR 1
HH08, OO08	K65 RELAY, EXHAUST FAN 1
BB04, OO08	K191 RELAY, CRANKCASE HEATER 1
FF04	L14 VALVE, SOLENOID, REHEAT COIL 1
HH02	PT6 PRESSURE TRANSDUCER, EBM MOTOR
BB01	RT6 SENSOR, A55 DISCHARGE (IMC)
OO01	RT17 SENSOR, OUTSIDE AIR TEMP
OO02	RT42 SENSOR, SUCTION TEMP., COMP 1
OO02	RT44 SENSOR, LIQUID TEMP., COMP 1
EE02	RT46 SENSOR, SATURATION SUCT TEMP., COMP 1
OO01	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	T4 TRANSFORMER, BLOWER MOTOR
DD05	T5 TRANSFORMER, OUTDOOR FAN MOTOR
EE04	T43 TRANSFORMER, REHEAT
OO07	T61 TRANSFORMER, INV INTERNAL POWER

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

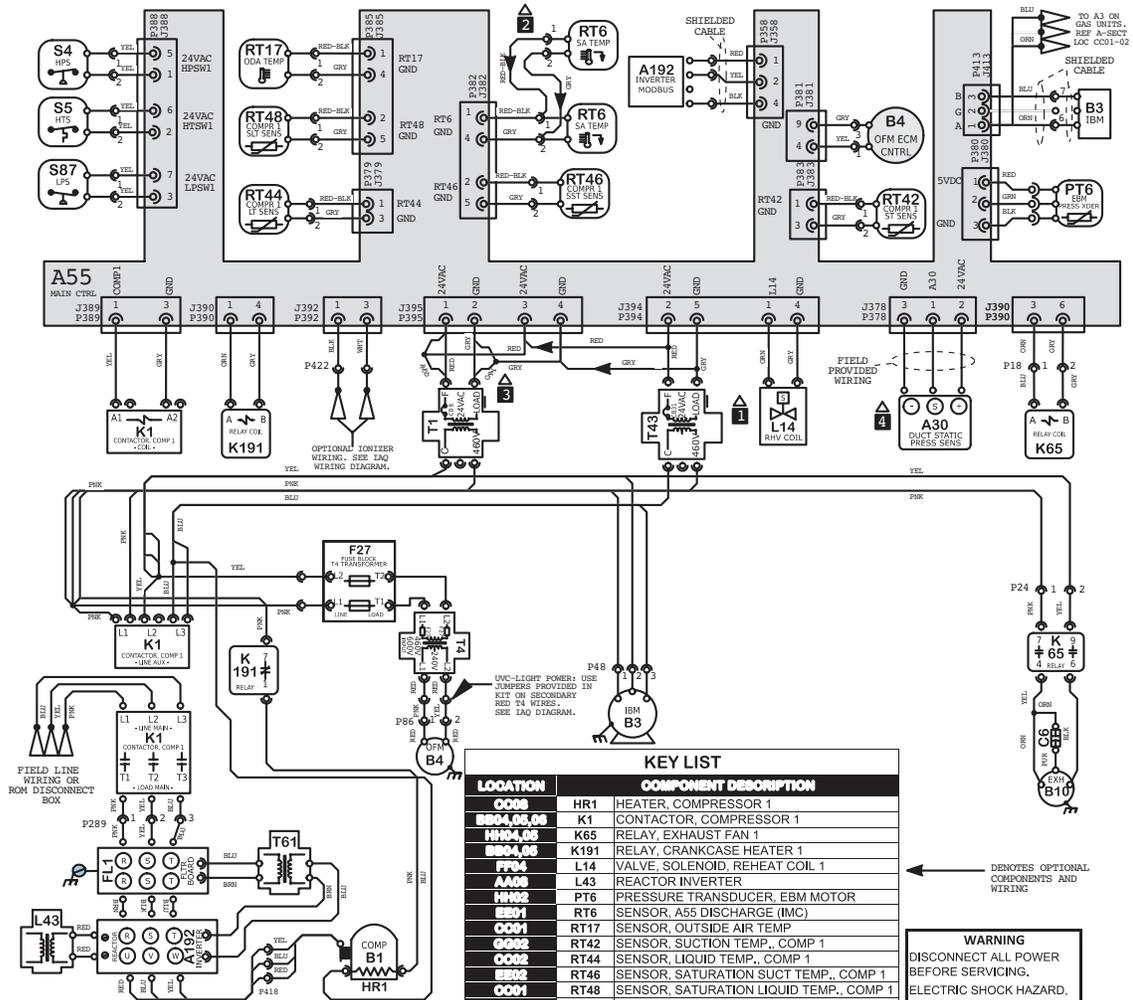
← DENOTES OPTIONAL COMPONENTS AND WIRING

WARNING
DISCONNECT ALL POWER BEFORE SERVICING.
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.
FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING AND INSULATION THICKNESS.

Model: LCM, LGM 036U - 074U J VOLT
Cooling Diagram without Higher SCCR
Voltage: 600/3/60 (J)
Supersedes N/A Form No. 538166-01 Rev: 0



LGM/LCM036/074 G Voltage



KEY LIST	
LOCATION	COMPONENT DESCRIPTION
0008	HR1 HEATER, COMPRESSOR 1
0004, 0006	K1 CONTACTOR, COMPRESSOR 1
0004, 0005	K65 RELAY, EXHAUST FAN 1
0004, 0005	K191 RELAY, CRANKCASE HEATER 1
0004	L14 VALVE, SOLENOID, REHEAT COIL 1
AA02	L43 REACTOR INVERTER
HH02	PT6 PRESSURE TRANSDUCER, EBM MOTOR
0001	RT6 SENSOR, A55 DISCHARGE (IMC)
0001	RT17 SENSOR, OUTSIDE AIR TEMP
0002	RT42 SENSOR, SUCTION TEMP., COMP 1
0002	RT44 SENSOR, LIQUID TEMP., COMP 1
0001	RT46 SENSOR, SATURATION SUCT TEMP., COMP 1
0001	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	T4 TRANSFORMER, OUTDOOR FAN MOTOR
0004	T43 TRANSFORMER, REHEAT
0007	T61 TRANSFORMER, INV INTERNAL POWER

KEY LIST	
LOCATION	COMPONENT DESCRIPTION
AA02	A55 CONTROL BOARD, MAIN
0004	A30 SENSOR, DUCT STATIC PRESS.
0001, 0004	A192 INVERTER, COMPRESSOR 1
0008	B1 COMPRESSOR 1
0006	B3 MOTOR, BLOWER
DD04, 0001	B4 MOTOR, OUTDOOR FAN 1
HH03	B10 MOTOR, EXHAUST FAN 1
HH05	C6 CAPACITOR, EXHAUST FAN 1
0006	F27 FUSE, T4 TRANSFORMER PRIMARY
AA07	FL1 FILTER BOARD

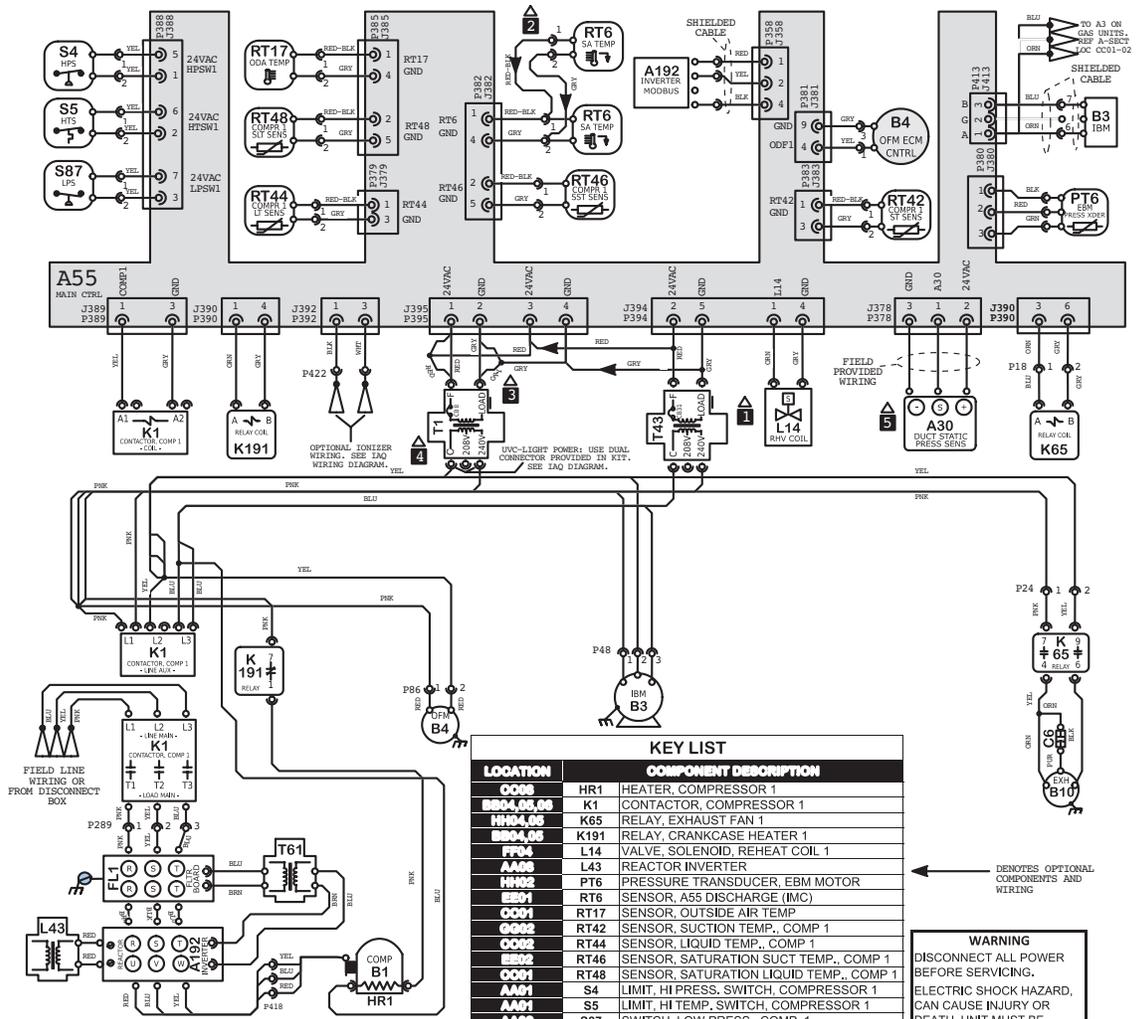
NOTES	
1	ONLY ON UNITS WITH HUMIDITROL OPTION
2	RT6 REMOTE MOUNT WIRING
3	T1 CONNECTED TO JP395-1,2 ONLY WITH HUMIDITROL
4	USED ON VAV UNITS ONLY

HEATING	COOLING	COOLING	ACCUMULATOR	ACCUMULATOR
SECTION A	SECTION B	SECTION B3	SECTION C	SECTION D
WIRING	WIRING	WIRING	WIRING	WIRING
DIAGRAM	DIAGRAM	DIAGRAM	DIAGRAM	DIAGRAM
FLOW	FLOW	FLOW	FLOW	FLOW

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: 538107-01 Rev: 0

LGM/LCM036/074 Y Voltage



KEY LIST	
LOCATION	COMPONENT DESCRIPTION
0008	HR1 HEATER, COMPRESSOR 1
0004, 0006	K1 CONTACTOR, COMPRESSOR 1
0004, 0006	K65 RELAY, EXHAUST FAN 1
0004, 0006	K191 RELAY, CRANKCASE HEATER 1
0004	L14 VALVE, SOLENOID, REHEAT COIL 1
0002	L43 REACTOR INVERTER
0002	PT6 PRESSURE TRANSDUCER, EBM MOTOR
0001	RT6 SENSOR, A55 DISCHARGE (IMC)
0001	RT17 SENSOR, OUTSIDE AIR TEMP
0002	RT42 SENSOR, SUCTION TEMP., COMP 1
0002	RT44 SENSOR, LIQUID TEMP., COMP 1
0002	RT46 SENSOR, SATURATION SUCT TEMP., COMP 1
0001	RT48 SENSOR, SATURATION LIQUID TEMP., COMP 1
0001	S4 LIMIT, HI PRESS, SWITCH, COMPRESSOR 1
0001	S5 LIMIT, HI TEMP, SWITCH, COMPRESSOR 1
0002	S87 SWITCH, LOW PRESS., COMP. 1
0004	T1 TRANSFORMER, CONTROL
0004	T43 TRANSFORMER, REHEAT
0007	T61 TRANSFORMER, INV INTERNAL POWER

KEY LIST	
LOCATION	COMPONENT DESCRIPTION
AA02	A55 CONTROL BOARD, MAIN
0004	A30 SENSOR, DUCT STATIC PRESS.
0001, 0006	A192 INVERTER, COMPRESSOR 1
0001	B1 COMPRESSOR 1
0001	B3 MOTOR, BLOWER
0001, 0001	B4 MOTOR, OUTDOOR FAN 1
0001	B10 MOTOR, EXHAUST FAN 1
0002	C6 CAPACITOR, EXHAUST FAN 1
AA07	FL1 FILTER BOARD

- NOTES**
- ONLY ON UNITS WITH HUMIDITROL OPTION
 - RT6 REMOTE MOUNT WIRING
 - T1 CONNECTED TO J/P395-1,2 ONLY WITH HUMIDITROL
 - MOVE WIRES FROM 240 TO 208 TAP ON TRANSFORMER FOR 208 VOLT APPLICATIONS
 - 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 Y VOLT
Cooling Diagram without Higher SCCR
Voltage: 208-230/3/60 (Y)
Supersedes N/A Form No: 538110-01 Rev: 0



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).

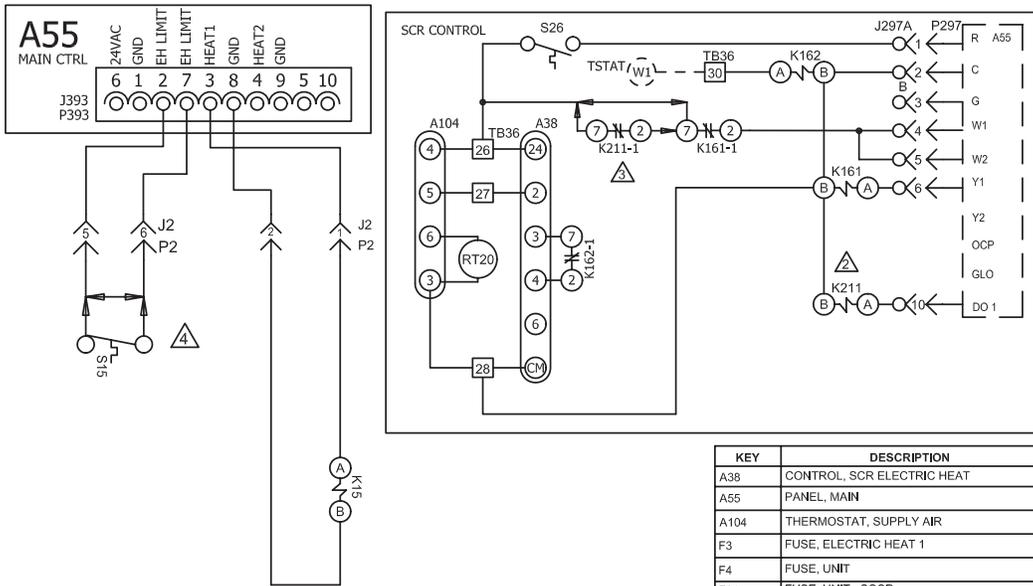
Note - The A55 will start to reduce the three- through five-ton compressor speed at a heat sink temperature of 125°F. Typical competitor equipment reduces compressor speed at 115°F.

- 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

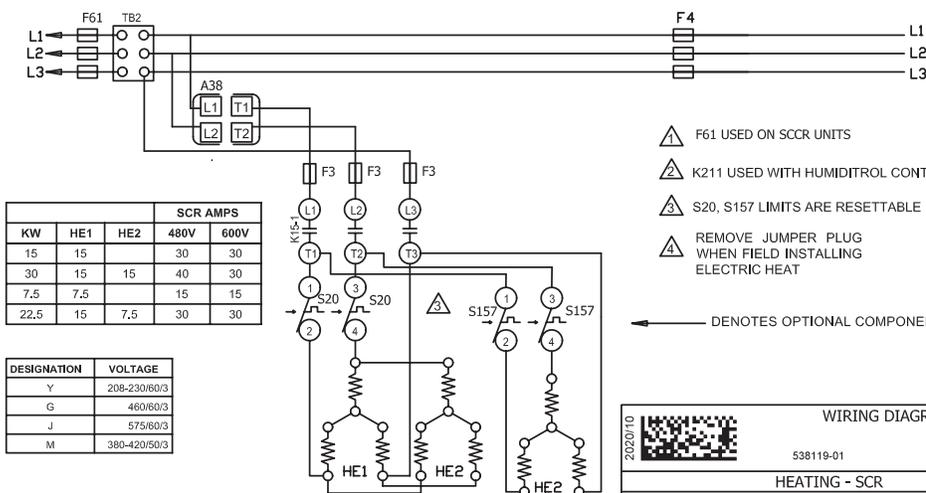
- 8 - A55 receives a position feedback signal from the economizer damper motor and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).
- 9 - N.O. contact K65-1 & 2 close, energizing exhaust fan motor B10.

E1EH 7.5, 15, 22.5 - G, J VOLT WITH SCR



J/P	DESCRIPTION
2	ELECTRIC HEAT
297	PLUG, THERMOSTAT INTERFACE
393	PLUG, ELECTRIC HEAT CONTROL

KEY	DESCRIPTION
A38	CONTROL, SCR ELECTRIC HEAT
A55	PANEL, MAIN
A104	THERMOSTAT, SUPPLY AIR
F3	FUSE, ELECTRIC HEAT 1
F4	FUSE, UNIT
F61	FUSE, UNIT - SCCR
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
K15,-1	CONTACTOR, ELECTRIC HEAT 1
K161,-1	RELAY, SCR INTERRUPT
K162,-1	RELAY, SCR HIGH OUTPUT
K211-1	RELAY, LOCKOUT
RT20	SENSOR, DISCHARGE SCR
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S20	SWITCH, LIMIT SECONDARY ELEC. HEAT 1
S26	THERMOSTAT, AMBIENT
S157	SWITCH, LIMIT SECONDARY ELEC. HEAT 2
TB2	TERMINAL STRIP, UNIT
TB36	TERMINAL STRIP, SCR

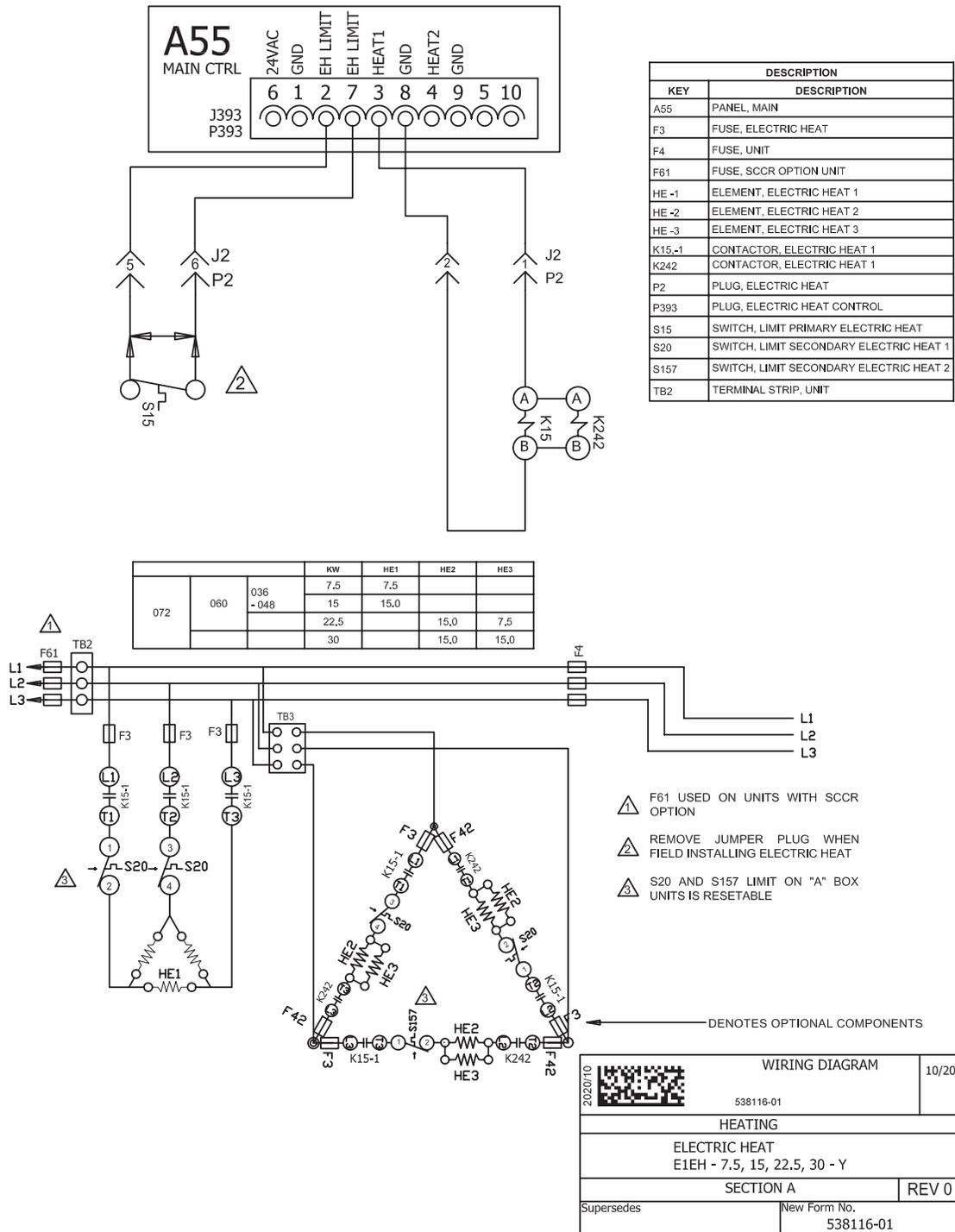


KW	SCR AMPS	
	HE1	HE2
15	15	30
30	15	40
7.5	7.5	15
22.5	15	30

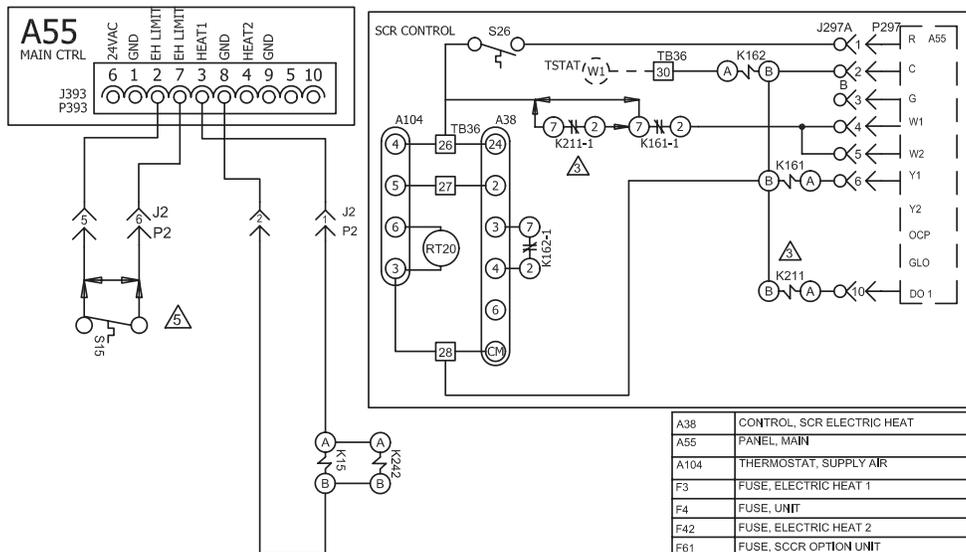
DESIGNATION	VOLTAGE
Y	208-230/60/3
G	460/60/3
J	575/60/3
M	380-420/50/3

202010	WIRING DIAGRAM	10/20
538119-01		
HEATING - SCR		
ELECTRIC HEAT SCR CONTROL E1EH - 7.5, 15, 22.5, 30 - G, J		
SECTION A		REV. 0
Supersedes	New Form No. 538119-01	

E1EH 7.5, 15, 22.5 - Y VOLTAGE



E1EH 7.5, 15, 22.5 - Y VOLTAGE WITH SCR

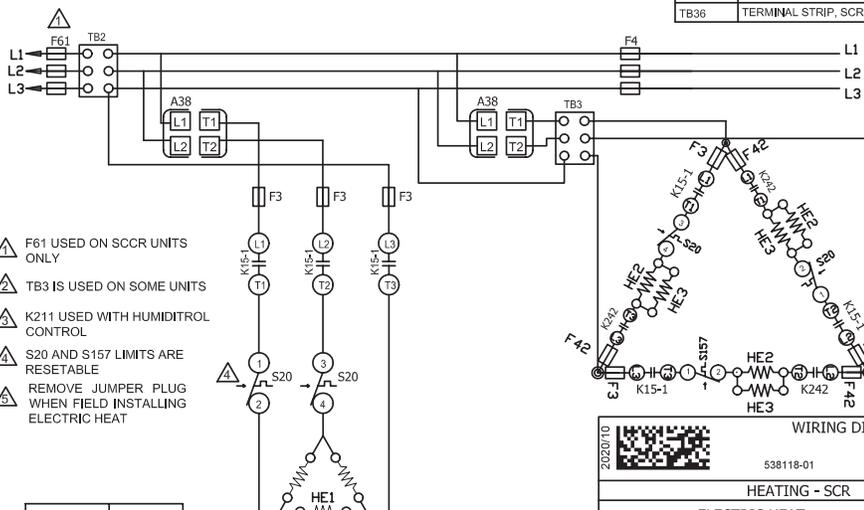


A38	CONTROL, SCR ELECTRIC HEAT
A55	PANEL, MAIN
A104	THERMOSTAT, SUPPLY AIR
F3	FUSE, ELECTRIC HEAT 1
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 2
F61	FUSE, SCCR OPTION UNIT
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
K15-1	CONTACTOR, ELECTRIC HEAT 1
K161-1	RELAY, SCR INTERRUPT
K162-1	RELAY, SCR HIGH OUTPUT
K211-1	RELAY, LOCKOUT
K242	CONTACTOR, ELECTRIC HEAT 1
RT20	SENSOR, DISCHARGE SCR
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S20	SWITCH, LIMIT SECONDARY ELEC. HEAT 1
S26	THERMOSTAT, AMBIENT
S157	SWITCH, LIMIT SECONDARY ELEC. HEAT 2
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRIC HEAT
TB36	TERMINAL STRIP, SCR

A AND B UNITS

KW	SCR AMPS			208V	240V
	HE1	HE2	HE3		
7.5	7.5			30	30
15	15			40	40
22.5		15	7.5	50	75
30		15	15	75	75

J/P	DESCRIPTION
2	ELECTRIC HEAT
297	PLUG, THERMOSTAT INTERFACE
393	PLUG, ELECTRIC HEAT CONTROL



- ⚠ F61 USED ON SCCR UNITS ONLY
- ⚠ TB3 IS USED ON SOME UNITS
- ⚠ K211 USED WITH HUMIDITROL CONTROL
- ⚠ S20 AND S157 LIMITS ARE RESETTABLE
- ⚠ REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT

DESIGNATION	VOLTAGE
Y	208-230/60/3
G	460/60/3
J	575/60/3
M	380-420/50/3

← DENOTES OPTIONAL COMPONENTS

2020/10	WIRING DIAGRAM	10/20
	538118-01	
HEATING - SCR		
ELECTRIC HEAT E1EH - 7.5, 15, 22.5, 30 - Y		
SECTION A		REV. 0
Supersedes	New Form No. 538118-01	

Sequence of Operation -E1EH 7.5, 15, 22.5 - G, J Voltage

HEATING ELEMENTS:

- 1 - Terminal Strip TB2 is energized when the unit disconnect closes. TB2 supplies line voltage to electric heat elements HE1 and HE2. Elements are protected by fuse F3.

FIRST STAGE HEAT:

- 2 - Heating demand initiates at W1 in thermostat.
- 3 - 24VAC is routed to the A55 Unit Controller (A55 routes power to the A38 if equipped) After A55 proves N.C. primary limit S15, the electric heat contactor K15 is energized. A55 energizes the blower and economizer.

- 4 - *7.5kW, 15kW units* - N.O. contacts K15-1 close energizing HE1.

22.5kW units - N.O. contacts K15-1 close energizing HE1 and HE2.

END OF FIRST STAGE HEAT:

- 5 - Heating demand is satisfied. Terminal W1 in the thermostat is de-energized.
- 6 - Electric heat contactor K15 is de-energized.
- 7 - *7.5kW, 15kW units* - N.O. contacts K15-1 open de-energizing HE1.
22.5kW units - N.O. contacts K15-1 open de-energizing HE1 and HE2.

Sequence of Operation -E1EH 7.5, 15, 22.5 - Y Voltage

HEATING ELEMENTS:

- 1 - Terminal Strip TB2 is energized when the unit disconnect closes. TB2 supplies line voltage to electric heat elements HE1 and TB3. TB3 supplies line voltage to HE2 and HE3. Elements are protected by fuses F3 and or F42.

FIRST STAGE HEAT:

- 2 - Heating demand initiates at W1 in thermostat.
- 3 - 24VAC is routed to the A55 Unit Controller (A55 routes power to the A38 if equipped). After A55 proves N.C. primary limit S15, the electric heat contactor K15 is energized. A55 energizes the blower and economizer.

- 4 - *7.5kW and 15kW units* - N.O. contacts K15-1 close energizing HE1.

22.5kW units - N.O. contacts K242-1 close energizing HE2 and HE3.

END OF FIRST STAGE HEAT:

- 5 - Heating demand is satisfied. Terminal W1 in the thermostat is de-energized.

- 6 - Electric heat contactor K15 is de-energized.

7.5kW, 15kW units - N.O. contacts K15-1 open de-energizing HE1.

22.5kW units - N.O. contacts K242-1 open de-energizing HE2 and HE3.

Optional factory-installed SCR (A38) All Voltages

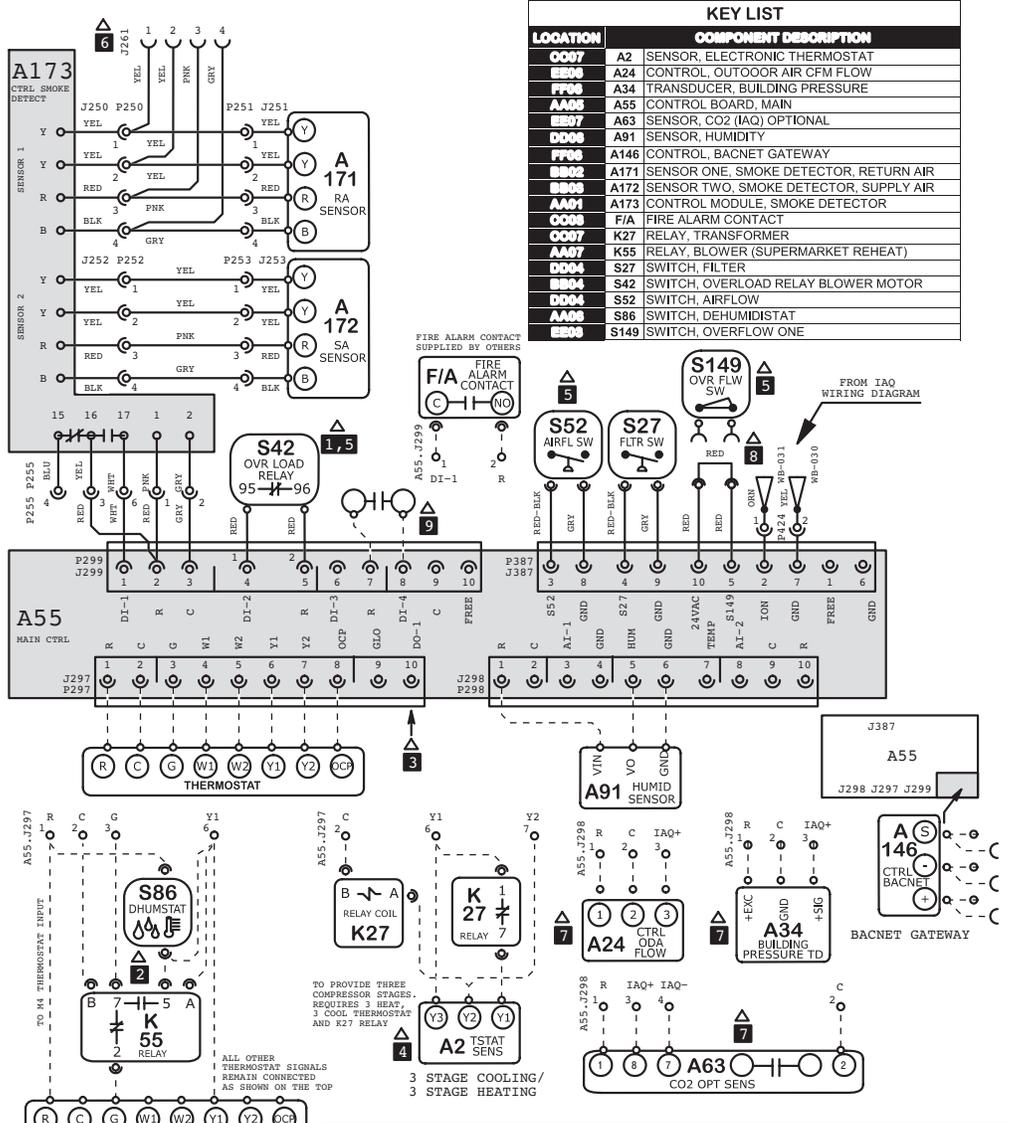
Control A38 will provide small amounts of power to the electric heat elements to efficiently maintain warm duct air temperatures when there is no heating demand. The SCR maintains duct air temperature based on input from a field-provided and installed thermostat (A104) and duct sensor (RT20). SCR is located in the compressor section on the left wall. Use only with a thermostat or specified DDC control system.

Use the instructions provided with the thermostat to set DIP switches as follows: S1 On, S2 Off, S3 Off. Use the instructions provided with the duct sensor to install sensor away from electric element radiant heat and in a location where discharge air is a mixed average temperature.

Once power is supplied to unit, zero SCR as follows:

- 1 - Adjust thermostat (A104) to minimum position.
- 2 - Use a small screwdriver to slowly turn the ZERO potentiometer on the SCR until the LED turns solid red.
- 3 - Very slowly adjust the potentiometer the opposite direction until the LED turns off.

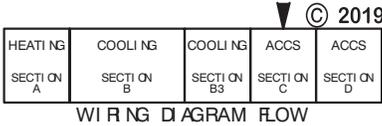
ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT



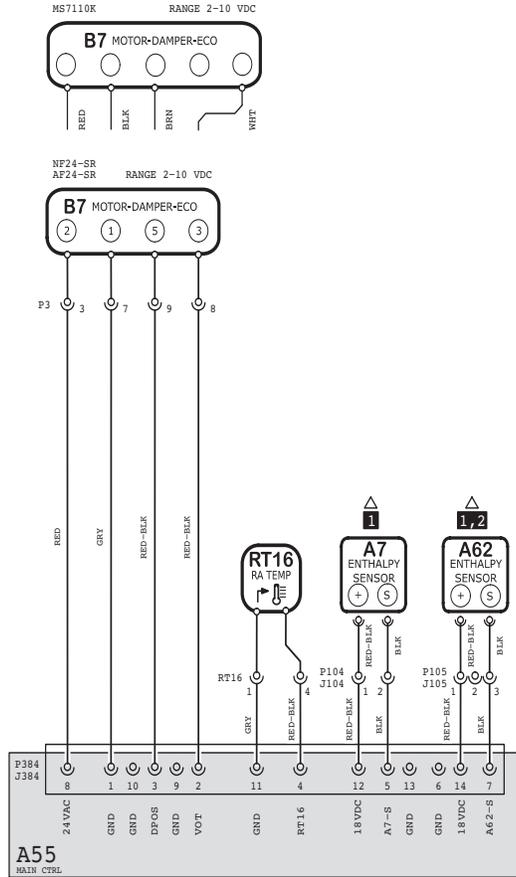
KEY LIST	
LOCATION	COMPONENT DESCRIPTION
0007	A2 SENSOR, ELECTRONIC THERMOSTAT
0000	A24 CONTROL, OUTDOOR AIR CFM FLOW
FF00	A34 TRANSDUCER, BUILDING PRESSURE
AA00	A55 CONTROL BOARD, MAIN
0007	A63 SENSOR, CO2 (IAQ) OPTIONAL
0000	A91 SENSOR, HUMIDITY
FF00	A146 CONTROL, BACNET GATEWAY
0002	A171 SENSOR ONE, SMOKE DETECTOR, RETURN AIR
0000	A172 SENSOR TWO, SMOKE DETECTOR, SUPPLY AIR
AA01	A173 CONTROL MODULE, SMOKE DETECTOR
0000	F/A FIRE ALARM CONTACT
0007	K27 RELAY, TRANSFORMER
AA07	K55 RELAY, BLOWER (SUPERMARKET REHEAT)
0004	S27 SWITCH, FILTER
0004	S42 SWITCH, OVERLOAD RELAY BLOWER MOTOR
0004	S52 SWITCH, AIRFLOW
AA00	S86 SWITCH, DEHUMIDISTAT
0000	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	PRODIGY 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
8	REMOVE JUMPER TO INSTALL S149
9	EXTERNAL HUMIDITROL CONTACTS

Model: LCM, LGM Series RTU
 Thermostat
 Voltage: All Voltages
 Supersedes: N/A Form No: 538078-01 Rev: 0



ECONOMIZER



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

Model: LCM, LGM Series RTU
Economizer & Motorized OAD

Voltage: All Voltages

Supersedes: N/A

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