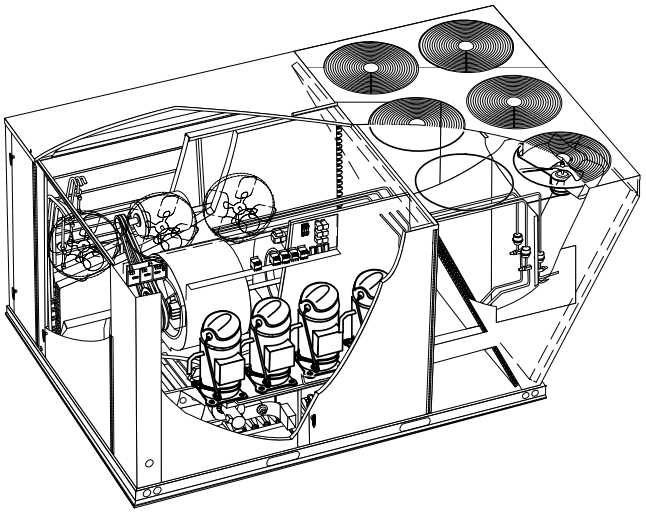
LGH/LCH SERIES

The LGH/LCH242H, 300H, 360H (20, 25 and 30 ton) units are configured to order units (CTO) with a wide selection of factory-installed options. The LGH gas/electric packaged rooftop units are available in 260,000 Btuh, 360,000 Btuh and 480,000 Btuh (76.2 kW, 105.5 and 137.7 kW) heating inputs. Gas heat sections are designed with aluminized steel tube heat exchangers. The LCH cooling packaged rooftop units are equipped with the same cooling sections as the LGH units. Units utilize four compressors.



LGH360

Units may contain a supply air blower equipped with a variable frequency drive A96 (VFD) which varies supply air CFM.

Optional electric heat is factory-or field-installed in LCH units. Electric heat operates in single or multiple stages depending on the kW input size. 30kW through 120kW heat sections are available.

Units are also designed for R-410A refrigerant. See unit nameplate for refrigerant type and charge. Service equipment for R-410A units must be rated for R-410A refrigerant.

Units are designed to accept any of several different energy management thermostat control systems with minimum field wiring. Factory or field provided control options connect to the Unit Controller through Smartwire™ connectors. When "plugged in" the controls become an integral part of the unit wiring.

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

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.

⚠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 qualified installer or service agency.

⚠WARNING

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

⚠CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

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OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No. 242	300	360
COOLING SYSTEM					
Condensate Drain Trap	PVC - C1TRAP20AD2	**76W26**	OX	OX	OX
	Copper - C1TRAP10AD2	**76W27**	OX	OX	OX
Corrosion Protection		Factory	O	O	O
Drain Pan Overflow Switch	E1SNSR71AD1	**68W88**	OX	OX	OX
Efficiency	High	Factory	O	O	O
Refrigerant Type	R-410A	Factory	O	O	O
Plastic Condensate Drain Pan		Factory	O	O	O
Stainless Steel Condensate Drain Pan	C1DPAN10D-1-	**83W42**	OX	OX	OX
BLOWER - SUPPLY AIR					
Motors	Belt Drive (standard efficiency) - 5 hp	Factory	O	O	O
	Belt Drive (standard efficiency) - 7.5 hp	Factory	O	O	O
	Belt Drive (standard efficiency) - 10 hp	Factory	O	O	O
	Supply VFD Blower Bypass (VAV/MSAV units w/VFD only)	Factory	O	O	O
Drive Kits See Blower Data Tables for usage and selection	Kit #1 740-895 rpm	Factory	O	O	O
	Kit #2 870-1045 rpm	Factory	O	O	O
	Kit #3 715-880 rpm	Factory	O	O	O
	Kit #4 770-965 rpm	Factory	O	O	O
	Kit #5 660-810 rpm	Factory	O	O	O
	Kit #6 770-965 rpm	Factory	O	O	O
	Kit #7 570-720 rpm	Factory	O	O	O
	Kit #8 480-630 rpm	Factory	O	O	O
	Kit #9 410-535 rpm	Factory	O	O	O
	Blower Belt Auto-Tensioner	Factory	O	O	O
CABINET					
Combination Coil/Hail Guards	C1GARD52D-1	**13T16**	X	X	X
Grille Guards	C1GARD39D-1-	**86K30**	X	X	X
Horizontal Return Air Panel Kit		**38K48**	X	X	X
CONTROLS					
Blower Proving Switch	C1SNSR35FF1	**53W65**	OX	OX	OX
Commercial Controls	CPC Einstein Integration	Factory	O	O	O
	Prodigy® Control System - BACnet® Module - C0CTRL60AE1L	**59W51**	OX	OX	OX
	Prodigy® Control System - LonTalk® Module - C0CTRL65FF1	**54W27**	OX	OX	OX
	Novar® ETM-2051 Unit Controller - E0CTRL30C1	**64W74**	OX	OX	OX
	Novar® LSE	Factory	O	O	O
	L Connection® Building Automation System	- - -	OX	OX	OX
Dirty Filter Switch	E1SNSR55C-1	**53W68**	OX	OX	OX
Discharge Air Temperature Sensor		Factory	O	O	O
Fresh Air Tempering	C1SNSR75AD1	**58W63**	OX	OX	OX
General Purpose Control Kit	E1GPBK30C1	**13J78**	X	X	X
Smoke Detector - Supply or Return (Power board and one sensor)	C1SNSR44C-1	**83W40**	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)	C1SNSR43C-1	**83W41**	OX	OX	OX
Supply Static Limit Switch	C0SNSR11AE1	**79M80**	X	X	X
Supply Static Limit Switch - Mounting Kit	C0SNSR12AE1	**79M81**	X	X	X

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

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OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No. 242	300	360
INDOOR AIR QUALITY					
Air Filters					
Healthy Climate® High Efficiency Air Filters 20 x 20 x 2 - order 12 per unit	MERV 8 - C1FLTR15D-1-	**54W21**	OX	OX	OX
	MERV 13 - C1FLTR40D-1-	**52W39**	OX	OX	OX
Replaceable Media Filter with Metal Mesh Frame (includes Non-Pleated Filter Media) 20 x 20 x 2- order 12 per unit	C1FLTR30D-1-	**44N60**	X	X	X
Indoor Air Quality (CO_2) Sensors					
Sensor - Wall-mount, off-white plastic cover with LCD display	C0SNSR50AE1L	**77N39**	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display	C0SNSR52AE1L	**87N53**	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting	C0SNSR51AE1L	**87N52**	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	C0MISC19AE1	**87N54**	X	X	X
CO_2 Sensor Duct Mounting Kit - for downflow applications	C0MISC19AE1-	**85L43**	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensors (**87N53** or **77N39**)	C0MISC16AE1-	**90N43**	X	X	X
UVC Germicidal Light Kit					
[1] Healthy Climate® UVC Light Kit (110/230v-1ph)		Factory	O	O	O
ELECTRICAL					
Voltage 60 hz	208/230V - 3 phase	Factory	O	O	O
	460V - 3 phase	Factory	O	O	O
	575V - 3 phase	Factory	O	O	O
HACR Circuit Breakers		Factory	O	O	O
Disconnect Switch	80 amp	**54W85**	OX	OX	OX
	150 amp	**54W86**	OX	OX	OX
	250 amp	**54W87**	OX	OX	OX
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V) LTAGFIK10/15	**74M70**	OX	OX	OX
	15 amp factory-wired and powered (208/230V, 460V, 575V)	Factory	O	O	O
	20 amp non-powered, field-wired (575V only) C1GFCI20FF1	**67E01**	OX	OX	OX
Weatherproof Cover for GFI	C1GFCI99FF1	**10C89**	X	X	X
Phase/Voltage Detection		Factory	O	O	O
ELECTRIC HEAT					
30 kW	208/230V-3ph - C1EH0300C21Y	**53W92**	OX	OX	OX
	460V-3ph - C1EH0300C21G	**53W94**	OX	OX	OX
	575V-3ph - C1EH0300C21J	**53W95**	OX	OX	OX
45 kW	208/230V-3ph - C1EH0450C21Y	**54W00**	OX	OX	OX
	460V-3ph - C1EH0450C21G	**54W02**	OX	OX	OX
	575V-3ph - C1EH0450C21J	**54W03**	OX	OX	OX
60 kW	208/230V-3ph - C1EH0600C21Y	**54W08**	OX	OX	OX
	460V-3ph - C1EH0600C21G	**54W10**	OX	OX	OX
	575V-3ph - C1EH0600C21J	**54W11**	OX	OX	OX
90 kW	208/230V-3ph - C1EH0900C21Y	**54W12**	OX	OX	OX
	460V-3ph - C1EH0900C21G	**54W14**	OX	OX	OX
	575V-3ph - C1EH0900C21J	**54W15**	OX	OX	OX
120 kW	208/230V-3ph - E1EH1200D-1Y	**73W98**	OX	OX	OX
	460V-3ph - E1EH1200D-1G	**73W99**	OX	OX	OX
	575V-3ph - E1EH1200D-1J	**74W00**	OX	OX	OX
SCR (Silicon Controlled Rectifier) Electric Heat Control NOTE - The SCR option is not available with 60 kW, 90 kW (208/230V) and 120 kW (208/230V, 460V, 575V) electric heat models.		Factory	O	O	O
Thermostat (required)		**45N59**	X	X	X
Duct Sensor (required)		**45N60**	X	X	X

[1] Lamps operate on 110/230V, single phase power supply. Step-down transformer is furnished with lamps when used with 460V and 575V rooftop units.

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OPTIONS / ACCESSORIES

Item Description		Model Number	Catalog Number	Unit Model No. 242	300	360
ECONOMIZER						
Standard Economizer (Not for Title 24)						
Standard Economizer Downflow or Horizontal Applications - Includes Outdoor Air Hood. Order Downflow or Horizontal Barometric Relief Dampers separately.		E1ECON15D-1	**74W43**	OX	OX	OX
High Performance Economizer (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)						
High Performance Economizer Downflow or Horizontal Applications - Includes Outdoor Air Hood. Order Downflow or Horizontal Barometric Relief Dampers separately.		E1ECON17D-1	**10U62**	OX	OX	OX
Economizer Controls						
Differential Enthalpy (Not for Title 24)		Order 2 - C1SNSR64FF1	**53W64**	OX	OX	OX
Sensible Control		Sensor is Furnished	Factory	O	O	O
Single Enthalpy (Not for Title 24)		C1SNSR64FF1	**53W64**	OX	OX	OX
Global, Enthalpy		Sensor Field Provided	Factory	O	O	O
Building Pressure Control		E1GPBK20C1	**13K77**	X	X	X
Differential Sensible		Sensor is Furnished	Factory	O	O	O
Outdoor Air CFM Control		E1GPBK10C1	**13K76**	OX	OX	OX
Barometric Relief Dampers With Exhaust Hood						
Downflow Barometric Relief Dampers		E1DAMP60D-1	**76W17**	OX	OX	OX
Horizontal Barometric Relief Dampers		LAGEDH30/36	**33K78**	OX	OX	OX
OUTDOOR AIR						
Outdoor Air Dampers With Outdoor Air Hood						
Motorized		E1DAMP25D-1-	**74W44**	OX	OX	OX
Manual		E1DAMO15D-1-	**74W45**	OX	OX	OX
POWER EXHAUST						
Standard Static		208/230V - E1PWRE40D-1Y	**74W21**	OX	OX	OX
		460V - E1PWRE40D-1G	**74W22**	OX	OX	OX
		575V - E1PWRE40D-1J	**74W23**	OX	OX	OX
High Static - 50%	208/230V - Drive Kit #1 (405-533 rpm) - LAPEB30/36AY		**83M83**	X	X	X
	208/230V - Drive Kit #2 (531-731 rpm) - LAPEB30/36BY		**84M34**	X	X	X
	208/230V - Drive Kit #3 (731-932 rpm) - LAPEB30/36CY		**84M35**	X	X	X
	460V - Drive Kit #1 (405-533 rpm) - LAPEB30/36AG		**83M84**	X	X	X
	460V - Drive Kit #2 (531-731 rpm) - LAPEB30/36BG		**84M36**	X	X	X
	460V - Drive Kit #3 (731-932 rpm) - LAPEB30/36CG		**84M37**	X	X	X
	575V - Drive Kit #1 (405-533 rpm) - LAPEB30/36AJ		**83M85**	X	X	X
	575V - Drive Kit #2 (531-731 rpm) - LAPEB30/36BJ		**84M38**	X	X	X
	575V - Drive Kit #3 (731-932 rpm) - LAPEB30/36CJ		**84M39**	X	X	X
High Static - 100%	208/230V - Drive Kit #1 (406-533 rpm) - LAPEB30/36DY		**83M86**	X	X	X
	208/230V - Drive Kit #2 (531-731 rpm) - LAPEB30/36EY		**84M40**	X	X	X
	208/230V - Drive Kit #3 (731-932 rpm) - LAPEB30/36FY		**84M41**	X	X	X
	460V - Drive Kit #1 (406-533 rpm) - LAPEB30/36DG		**83M87**	X	X	X
	460V - Drive Kit #2 (531-731 rpm) - LAPEB30/36EG		**84M42**	X	X	X
	460V - Drive Kit #3 (731-932 rpm) - LAPEB30/36FG		**84M43**	X	X	X
	575V - Drive Kit #1 (406-533 rpm) - LAPEB30/36DJ		**83M88**	X	X	X
	575V - Drive Kit #2 (531-731 rpm) - LAPEB30/36EJ		**84M44**	X	X	X
	575V - Drive Kit #3 (731-932 rpm) - LAPEB30/36FJ		**84M45**	X	X	X
100% with VFD		208/230V - LAPEV30/36GY	**83M89**	X	X	X
		460V - LAPEV30/36GG	**83M90**	X	X	X
		575V - LAPEV30/36GJ	**83M91**	X	X	X
100% with VFD and Bypass		208/230V - LAPEV30/36HY	**83M92**	X	X	X
		460V - LAPEV30/36HG	**83M93**	X	X	X
		575V - LAPEV30/36HJ	**83M94**	X	X	X
Power Exhaust Control						
[1] Pressure Switch		C0SNSR10AE1	**79M79**	X	X	X

[1] Order one per unit with Standard or High Static Power Exhaust without VFD. Order two per unit with standard static power exhaust for MSAV® or VAV models.

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OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No.		
			242	300	360
ROOF CURBS					
Hybrid Roof Curbs, Downflow					
14 in. height	C1CURB71D-1	**11F62**	X	X	X
18 in. height	C1CURB72D-1	**11F63**	X	X	X
24 in. height	C1CURB73D-1	**11F64**	X	X	X
Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit					
30 in. height - slab applications	C1CURB15C-1	**11T90**	X	X	X
41 in. height - rooftop applications	C1CURB17C-1	**11T97**	X	X	X
Horizontal Return Air Panel Kit (Required)		**38K48**	X	X	X
Insulation Kit For Standard Horizontal Curbs					
	for C1CURB15C-1	**73K33**	X	X	X
	for C1CURB17C-1	**73K35**	X	X	X
CEILING DIFFUSERS					
Step-Down - Order one	LARTD30/36S	**45K74**	X	X	X
Flush - Order one	LAFD30/36S	**45K75**	X	X	X
Transitions (Supply and Return) - Order one	LASRT30/36	**33K80**	X	X	X

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SPECIFICATIONS LGH, LCH

General Data		**Nominal Tonnage**	**20 Ton**	**25 Ton**	**25 Ton**	**25 Ton**
		Model Number	**242H4V**	**300H4B**	**300H4V**	**300H4M**
		Efficiency Type	**High**	**High**	**High**	**High**
		Blower Type	Variable Air Volume (VAV)	Constant Air Volume (CAV)	Variable Air Volume (VAV)	MSAV® (Multi-Stage Air Volume)
Cooling Performance	Gross Cooling Capacity - Btuh		244,000	310,000	310,000	310,000
	Net Cooling Capacity - Btuh		[1] 238,000	[2] 300,000	[2] 300,000	[2] 300,000
	AHRI Rated Air Flow - cfm		6800	8100	8100	8100
	Total Unit Power - kW		19	25.4	25.8	25.8
	EER (Btuh/Watt)		[1] 12.5	[2] 11.8	[2] 11.6	[2] 11.6
	IEER (Btuh/Watt)		[1] 15.5	[2] 12.5	[2] 14.3	[2] 14.4
	Refrigerant Type		R-410A	R-410A	R-410A	R-410A
	Refrigerant Charge	Circuit 1	8 lbs. 0 oz.	9 lbs. 4 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 2	8 lbs. 0 oz.	9 lbs. 0 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 3	8 lbs. 8 oz.	8 lbs. 12 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 4	8 lbs. 8 oz.	8 lbs. 8 oz.	8 lbs. 8 oz.	8 lbs. 8 oz.
Electric Heat Available			30-45-60-90-120 kW			
Compressor Type (number)			Scroll (4)	Scroll (4)	Scroll (4)	Scroll (4)
Outdoor Coils	Net face area (total) - sq. ft.		68.3	68.3	68.3	68.3
	Number of rows		1	1	1	1
	Fins per inch		23	23	23	23
Outdoor Coil Fans	Motor - (No.) horsepower		(6) 1/3	(6) 1/3	(6) 1/3	(6) 1/3
	Motor rpm		1075	1075	1075	1075
	Total Motor watts		2500	2500	2500	2500
	Diameter - (No.) in.		(6) 24	(6) 24	(6) 24	(6) 24
	Number of blades		3	3	3	3
	Total Air volume - cfm		21,500	21,500	21,500	21,500
Indoor Coils	Net face area (total) - sq. ft.		31.40	31.40	31.40	31.40
	Tube diameter - in.		3/8	3/8	3/8	3/8
	Number of rows		4	4	4	4
	Fins per inch		14	14	14	14
	Drain connection - No. and size		(1) 1 in. NPT	(1) 1 in. NPT	(1) 1 in. NPT	(1) 1 in. NPT
	Expansion device type		Balance port TXV, removable head			
[3] **Indoor Blower and Kit Selection**	Nominal motor output		5 hp, 7.5 hp, 10 hp			
	Maximum usable motor output (US Only)		5.75 hp, 8.63 hp, 11.5 hp			
	Motor - Kit kit number		**5 hp** **Kit 5** 660-810 rpm **Kit 6** 770-965 rpm **Kit 7** 570-720 rpm **Kit 8** 480-630 rpm **Kit 9** 410-535 rpm **7.5 hp** **Kit 3** 715-880 rpm **Kit 4** 770-965 rpm 1**0 hp** **Kit 1** 740-895 rpm **Kit 2** 870-1045 rpm			
	Blower wheel nom. D x W - in.		(2) 18 x 15	(2) 18 x 15	(2) 18 x 15	(2) 18 x 15
Filters	Type of filter		Fiberglass, disposable			
	Number and size - in.		(12) 20 x 20 x 2			
Electrical characteristics			208/230V, 460V or 575V - 60 hertz - 3 phase			

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

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

[2] Tested at conditions included in with AHRI Standard 340/360.

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

SPECIFICATIONS LGH, LCH

General Data		**Nominal Tonnage**	**30 Ton**	**30 Ton**	**30 Ton**
		Model Number	**360H4B**	**360H4V**	**360H4M**
		Efficiency Type	**High**	**High**	**High**
		Blower Type	Constant Air Volume (CAV)	Variable Air Volume (VAV)	MSAV® (Multi-Stage Air Volume)
Cooling Performance	Gross Cooling Capacity - Btuh		370,000	370,000	370,000
	[1] Net Cooling Capacity - Btuh		354,000	350,000	350,000
	AHRI Rated Air Flow - cfm		9600	8600	8600
	Total Unit Power - kW		32.8	32.4	32.4
	[1] EER (Btuh/Watt)		10.8	10.8	10.8
	[1] IEER (Btuh/Watt)		11.6	13.5	14.0
	Refrigerant Type		R-410A	R-410A	R-410A
	Refrigerant Charge	Circuit 1	9 lbs. 0 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 2	8 lbs. 0 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 3	9 lbs. 0 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
		Circuit 4	7 lbs. 8 oz.	8 lbs. 0 oz.	8 lbs. 0 oz.
Electric Heat Available -			30-45-60-90-120 kW		
Compressor Type (number)			Scroll (4)	Scroll (4)	Scroll (4)
Outdoor Coils	Net face area (total) - sq. ft.		68.3	68.3	68.3
	Number of rows		1	1	1
	Fins per inch		23	23	23
Outdoor Coil Fans	Motor - (No.) horsepower		(6) 1/3	(6) 1/3	(6) 1/3
	Motor rpm		1075	1075	1075
	Total Motor watts		2500	2500	2500
	Diameter - (No.) in.		(6) 24	(6) 24	(6) 24
	Number of blades		3	3	3
	Total Air volume - cfm		21,500	21,500	21,500
Indoor Coils	Net face area (total) - sq. ft.		31.40	31.40	31.40
	Tube diameter - in.		3/8	3/8	3/8
	Number of rows		4	4	4
	Fins per inch		14	14	14
	Drain connection - No. and size		(1) 1 in. NPT	(1) 1 in. NPT	(1) 1 in. NPT
	Expansion device type		Balance port TXV, removable head		
[3] Indoor Blower and Kit Selection	Nominal motor output		5 hp, 7.5 hp, 10 hp		
	Maximum usable motor output (US Only)		5.75 hp, 8.63 hp, 11.5 hp		
	Motor - Kit kit number		**5 hp** **Kit 5** 660-810 rpm **Kit 6** 770-965 rpm **Kit 7** 570-720 rpm **Kit 8** 480-630 rpm **Kit 9** 410-535 rpm **7.5 hp** **Kit 3** 715-880 rpm **Kit 4** 770-965 rpm **10 hp** **Kit 1** 740-895 rpm **Kit 2** 870-1045 rpm		
	Blower wheel nom. D x W - in.		(2) 18 x 15	(2) 18 x 15	(2) 18 x 15
Filters	Type of filter		Fiberglass, disposable		
	Number and size - in.		(12) 20 x 20 x 2		
Electrical characteristics			208/230V, 460V or 575V - 60 hertz - 3 phase		

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

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

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

SPECIFICATIONS - GAS HEAT

Usage Data		Model Number	LGH242 LGH300 LGH360		
		Heat Input Type	**Standard (S)**	**Medium (M)**	**High (H)**
		Number of Gas Heat Stages	2	2	2
Gas Heating Performance (Two-Stage)	Input - Btuh	First Stage	169,000	234,000	312,000
		Second Stage	260,000	360,000	480,000
	Output - Btuh	First Stage	- - -	- - -	- - -
		Second Stage	208,000	288,000	384,000
[1] **Gas Heating Performance (Four-Stage)**	Input - Btuh	First Stage	84,500	117,000	156,000
		Second Stage	169,000	234,000	312,000
		Third Stage	214,000	297,000	396,000
		Fourth Stage	260,000	360,000	480,000
	Output - Btuh	First Stage	- - -	- - -	- - -
		Second Stage	- - -	- - -	- - -
		Third Stage	- - -	- - -	- - -
		Fourth Stage	208,000	288,000	384,000
Temperature Rise Range - °F			15 - 45	30 - 60	40 - 70
Thermal Efficiency			80.0%	80.0%	80.0%
Gas Supply Connections			1 in. npt	1 in. npt	1 in. npt
Recommended Gas Supply Pressure - in. w.g.		Natural	7	7	7
		LPG/Propane	11	11	11

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

HIGH ALTITUDE DERATE

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

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

At altitudes above 4500 feet unit must be derated 2% for each 1000 feet above sea level.

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

TWO-STAGE

Gas Heat Type (Two-Stage)	Altitude - ft.	Gas Manifold Pressure - in. w.g.		Input Rate Natural Gas or LPG/Propane - Btuh	
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage
Low (L)	No adjustment required				
Standard (S)	2001 - 4500	3.4	9.6	169,000	249,000
Medium (M)	2001 - 4500	3.4	9.6	234,000	345,000
High (H)	2001 - 4500	3.4	9.6	312,000	460,000

FOUR-STAGE

[1] Gas Heat Type (Four-Stage)	Altitude - ft.	Gas Manifold Pressure - in. w.g.		Input Rate Natural Gas or LPG/Propane - Btuh			
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage	Third Stage	Fourth Stage
Low (L)	No adjustment required						
Standard (S)	2001 - 4500	3.4	9.6	84,000	169,000	209,000	249,000
Medium (M)	2001 - 4500	3.4	9.6	117,000	234,000	289,000	345,000
High (H)	2001 - 4500	3.4	9.6	156,000	312,000	386,000	460,000

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

BLOWER DATA

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

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

Then determine from blower table blower motor output and drive required.
See page 29 for wet coil and option/accessory air resistance data.
See page 29 for factory installed drive kit specifications.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

All units require 10,500 cfm minimum air with electric heat.

Air Volume cfm	TOTAL STATIC PRESSURE - In. w.g.																									
	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80		2.00		2.20		2.40		2.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4000	372	0.26	433	0.65	497	0.99	565	1.27	630	1.54	687	1.79	738	2.04	784	2.30	824	2.56	861	2.82	897	3.10	932	3.40	- - -	- - -
4500	382	0.41	441	0.79	506	1.12	574	1.41	638	1.69	694	1.95	744	2.22	790	2.50	831	2.77	868	3.05	903	3.35	938	3.66	974	4.01
5000	392	0.56	451	0.93	516	1.25	584	1.55	646	1.85	702	2.12	751	2.41	796	2.70	837	3.00	874	3.30	909	3.61	944	3.93	980	4.30
5500	402	0.73	462	1.08	527	1.40	594	1.72	655	2.02	710	2.31	758	2.61	802	2.92	843	3.24	880	3.56	916	3.88	951	4.22	987	4.60
6000	414	0.89	473	1.24	539	1.56	605	1.90	665	2.21	718	2.51	766	2.83	809	3.16	850	3.51	887	3.84	922	4.18	957	4.52	994	4.91
6500	426	1.07	486	1.41	551	1.74	616	2.10	675	2.42	727	2.73	774	3.07	817	3.43	857	3.80	894	4.15	929	4.49	964	4.85	1001	5.24
7000	439	1.26	499	1.60	565	1.93	628	2.31	685	2.64	737	2.97	782	3.34	825	3.72	864	4.11	901	4.48	937	4.83	971	5.19	1008	5.59
7500	453	1.46	513	1.79	579	2.14	641	2.55	696	2.88	747	3.24	792	3.63	833	4.04	872	4.45	909	4.83	945	5.20	979	5.56	1016	5.97
8000	467	1.66	528	2.00	593	2.38	653	2.81	708	3.15	757	3.53	801	3.95	843	4.39	881	4.82	918	5.22	953	5.59	988	5.96	1025	6.37
8500	483	1.88	544	2.22	608	2.65	667	3.10	720	3.44	768	3.85	812	4.30	852	4.78	890	5.22	927	5.63	962	6.01	997	6.39	1034	6.81
9000	499	2.11	561	2.47	624	2.95	681	3.41	733	3.76	780	4.20	823	4.69	862	5.19	900	5.65	936	6.07	972	6.46	1007	6.85	1044	7.28
9500	516	2.36	578	2.75	640	3.26	696	3.73	746	4.10	792	4.58	834	5.11	873	5.64	910	6.12	946	6.54	982	6.93	1018	7.34	1055	7.78
10,000	534	2.64	596	3.06	657	3.60	711	4.07	760	4.48	805	5.00	845	5.57	884	6.12	921	6.61	957	7.03	992	7.43	1028	7.86	1066	8.32
10,500	553	2.93	615	3.39	674	3.95	727	4.44	775	4.90	817	5.46	857	6.06	895	6.62	932	7.12	967	7.55	1003	7.96	1039	8.40	1077	8.89
11,000	572	3.24	634	3.74	692	4.31	744	4.83	789	5.35	830	5.95	869	6.58	907	7.16	943	7.65	978	8.09	1013	8.51	1050	8.98	1089	9.49
11,500	592	3.58	653	4.12	711	4.70	760	5.27	803	5.85	843	6.49	881	7.13	918	7.71	954	8.21	989	8.65	1025	9.10	1062	9.59	1101	10.12
12,000	613	3.95	674	4.53	729	5.14	776	5.75	818	6.39	857	7.06	894	7.71	930	8.30	965	8.80	1000	9.25	1036	9.71	1073	10.22	1112	10.77
12,500	635	4.37	695	4.98	748	5.62	792	6.29	832	6.98	870	7.67	906	8.33	941	8.91	976	9.42	1011	9.87	1048	10.35	1085	10.86	1124	11.42
13,000	657	4.83	715	5.50	766	6.18	808	6.89	847	7.61	883	8.32	918	8.98	953	9.56	988	10.06	1023	10.52	1059	11.00	- - -	- - -	- - -	- - -
13,500	680	5.35	736	6.06	784	6.78	824	7.53	861	8.29	896	9.00	930	9.66	965	10.24	1000	10.74	1035	11.20	- - -	- - -	- - -	- - -	- - -	- - -
14,000	704	5.92	757	6.67	801	7.44	839	8.23	875	9.00	909	9.72	943	10.38	977	10.94	1012	11.43	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
14,500	727	6.55	777	7.34	818	8.16	854	8.97	889	9.75	922	10.48	955	11.12	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
15,000	750	7.23	797	8.07	834	8.92	868	9.75	902	10.54	935	11.26	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

BLOWER DATA

DRIVE KIT SPECIFICATIONS

Motor Efficiency	Nominal hp	Maximum hp	Drive Kit Number	RPM Range
Standard	5	5.75	5	660 - 810
Standard	5	5.75	6	770 - 965
Standard	5	5.75	7	570 - 720
Standard	5	5.75	8	480 - 630
Standard	5	5.75	9	410 - 535
Standard	7.5	8.63	3	715 - 880
Standard	7.5	8.63	4	770 - 965
Standard	10	11.50	1	740 - 895
Standard	10	11.50	2	870 - 1045

NOTES

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

For VFD applications, nominal motor output is also maximum usable motor output.

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume cfm	Wet Indoor Coil	Electric Heat	Economizer	Filters		Horizontal Roof Curb
				MERV 8	MERV 13	
	in. w.g.	in. w.g.	in. w.g.	in. w.g.	in. w.g.	in. w.g.
4000	0.04	0.01	0.00	0.00	0.00	0.04
4500	0.04	0.01	0.00	0.00	0.00	0.05
5000	0.05	0.01	0.00	0.00	0.00	0.06
5500	0.06	0.02	0.01	0.00	0.01	0.07
6000	0.07	0.02	0.01	0.00	0.02	0.08
6500	0.08	0.02	0.01	0.01	0.02	0.09
7000	0.09	0.03	0.02	0.01	0.03	0.10
7500	0.10	0.03	0.02	0.01	0.04	0.11
8000	0.11	0.03	0.02	0.01	0.04	0.13
8500	0.12	0.04	0.03	0.01	0.04	0.15
9000	0.13	0.04	0.04	0.01	0.04	0.17
9500	0.14	0.05	0.04	0.02	0.06	0.19
10,000	0.15	0.05	0.05	0.02	0.06	0.21
10,500	0.16	0.06	0.06	0.02	0.06	0.24
11,000	0.18	0.06	0.07	0.02	0.07	0.27
11,500	0.19	0.07	0.08	0.02	0.08	0.30
12,000	0.20	0.07	0.10	0.02	0.08	0.33
12,500	0.21	0.08	0.11	0.03	0.10	0.37
13,000	0.23	0.08	0.13	0.03	0.10	0.40
13,500	0.24	0.09	0.14	0.03	0.11	0.44
14,000	0.26	0.10	0.16	0.03	0.12	0.49
14,500	0.27	0.10	0.18	0.04	0.13	0.53
15,000	0.29	0.11	0.21	0.04	0.13	0.58

POWER EXHAUST PERFORMANCE - STANDARD STATIC

Return Duct Negative Static Pressure	Air Volume Exhausted
in. w.g.	cfm
0.00	12,800
0.05	12,200
0.10	11,500
0.15	10,800
0.20	9900
0.25	9000
0.30	7900
0.35	6750
0.40	5450
0.45	4150
0.50	2900

POWER EXHAUST - 50% HIGH STATIC OPERATION

Air Volume cfm	RETURN DUCT NEGATIVE STATIC PRESSURE - In. w.g.																					
	0		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4000	- - -	- - -	- - -	- - -	430	0.40	475	0.45	520	0.50	570	0.55	615	0.65	665	0.70	710	0.75	755	0.85	- - -	- - -
4500	- - -	- - -	415	0.45	460	0.55	500	0.60	545	0.65	585	0.70	625	0.80	670	0.85	710	0.95	750	1.00	795	1.10
5000	415	0.55	455	0.65	490	0.70	530	0.75	570	0.85	605	0.90	645	1.00	680	1.05	720	1.15	755	1.20	795	1.30
5500	460	0.75	495	0.85	525	0.90	560	0.95	595	1.05	630	1.10	665	1.20	700	1.30	735	1.35	765	1.45	800	1.55
6000	500	1.00	530	1.05	565	1.15	595	1.20	625	1.30	660	1.40	690	1.45	720	1.55	750	1.65	785	1.70	815	1.80
6500	540	1.25	570	1.30	600	1.40	630	1.50	660	1.60	685	1.65	715	1.75	745	1.85	775	1.95	805	2.05	830	2.10
7000	585	1.55	610	1.65	635	1.70	665	1.85	690	1.90	720	2.00	745	2.10	770	2.20	800	2.30	825	2.40	855	2.50
7500	625	1.90	650	2.00	675	2.10	700	2.20	725	2.30	750	2.40	775	2.50	800	2.60	825	2.70	850	2.80	875	2.90
8000	665	2.30	690	2.40	715	2.55	735	2.60	760	2.70	785	2.85	810	2.95	830	3.05	855	3.15	880	3.25	905	3.40
8500	710	2.80	730	2.90	755	3.00	775	3.10	795	3.20	820	3.35	840	3.45	865	3.55	885	3.65	910	3.80	930	3.90

POWER EXHAUST - 100% HIGH STATIC OPERATION

Air Volume cfm	RETURN DUCT NEGATIVE STATIC PRESSURE - In. w.g.																					
	0		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8500	475	1.30	500	1.30	525	1.40	550	1.50	585	1.60	625	1.75	670	1.90	710	2.10	745	2.30	780	2.50	815	2.70
9000	520	1.55	535	1.60	550	1.65	570	1.70	605	1.85	640	1.95	685	2.15	720	2.35	760	2.55	790	2.75	825	3.00
9500	550	1.80	560	1.85	575	1.90	600	2.00	620	2.10	655	2.20	695	2.40	735	2.60	770	2.80	800	3.00	835	3.25
10,000	575	2.10	590	2.15	605	2.20	620	2.30	645	2.40	675	2.50	710	2.65	745	2.85	780	3.05	815	3.30	845	3.50
10,500	605	2.45	615	2.45	625	2.50	645	2.60	670	2.75	690	2.80	725	3.00	755	3.15	790	3.35	825	3.60	855	3.80
11,000	630	2.80	645	2.85	660	2.95	675	3.00	685	3.05	715	3.20	740	3.30	770	3.50	805	3.70	835	3.90	870	4.20
11,500	665	3.25	675	3.30	680	3.30	695	3.40	715	3.50	735	3.60	755	3.70	785	3.85	815	4.05	850	4.30	880	4.50
12,000	685	3.60	700	3.70	710	3.75	725	3.85	740	3.95	755	4.00	780	4.15	805	4.30	830	4.45	860	4.65	890	4.90
12,500	720	4.10	730	4.20	740	4.25	750	4.30	765	4.40	780	4.50	800	4.60	820	4.75	845	4.90	875	5.10	905	5.35
13,000	745	4.60	750	4.65	765	4.75	780	4.85	790	4.90	805	5.00	820	5.10	840	5.25	865	5.40	890	5.60	915	5.80
13,500	775	5.15	785	5.25	795	5.35	805	5.40	815	5.50	830	5.60	845	5.70	865	5.80	880	5.95	905	6.10	930	6.30
14,000	805	5.80	810	5.80	820	5.90	830	6.00	845	6.10	855	6.20	870	6.30	885	6.40	905	6.55	925	6.70	- - -	- - -

HIGH STATIC POWER EXHAUST WITH CONSTANT AIR VOLUME − DRIVE KIT SPECIFICATIONS

Power Exhaust Model No.	Motor HP	Drive Kit Number	RPM Range
LAPEB30/36A (50%)	(2) 2 hp	1	406 - 533
LAPEB30/36B (50%)	(2) 2 hp	2	531 - 731
LAPEB30/36C (50%)	(2) 2 hp	3	731 - 932
LAPEB30/36D (100%)	(3) 2 hp	1	406 - 533
LAPEB30/36E (100%)	(3) 2 hp	2	531 - 731
LAPEB30/36F (100%)	(3) 2 hp	3	731 - 932

NOTE – Using total air volume and system static pressure requirements, determine from blower performance tables rpm and motor output required.

CEILING DIFFUSER AIR RESISTANCE - in. w.g.

Air Volume cfm	Step-Down Diffuser			Flush Diffuser
	LARTD30/36S			LAFD30/36S
	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open	
7500	0.37	0.31	0.25	0.29
8000	0.42	0.36	0.29	0.34
8500	0.48	0.41	0.34	0.39
9000	0.55	0.47	0.39	0.44
9500	0.62	0.53	0.45	0.51
10,000	0.70	0.60	0.51	0.57
10,500	0.78	0.68	0.58	0.65
11,000	0.87	0.76	0.65	0.72
11,500	0.97	0.85	0.73	0.81
12,000	1.08	0.94	0.82	0.9
12,500	1.19	1.04	0.91	0.99
13,000	1.30	1.15	1.00	1.10
13,500	1.43	1.26	1.10	1.20
14,000	1.56	1.38	1.20	1.31
14,500	1.69	1.50	1.31	1.43
15,000	1.84	1.63	1.43	1.56

CEILING DIFFUSER AIR THROW DATA - ft.

Air Volume cfm	[1] Effective Throw Range - ft.	
	Step-Down	Flush
9000	40 - 47	29 - 35
9500	43 - 50	33 - 41
10,000	46 - 54	37 - 46
10,500	50 - 58	42 - 51
11,000	53 - 61	46 - 56
11,500	55 - 64	50 - 61
12,000	58 - 67	54 - 66
12,500	61 - 71	58 - 71
13,000	64 - 74	62 - 75
13,500	67 - 77	66 - 79

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

20 TON HIGH EFFICIENCY - VARIABLE AIR VOLUME (VAV) LCH242H4V

[1] Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 2	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 3	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 4	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.4 (14.4)			1.3 (7.8)			1 (6)		
Standard Power Exhaust (3) 0.33 HP	Full Load Amps (total)	2.4 (7.2)			1.3 (3.9)			1 (3)		
50% High Static Power Exhaust (2) 2 HP	Full Load Amps (total)	7.5 (15)			3.4 (6.8)			2.7 (5.4)		
100% High Static Power Exhaust (3) 2 HP	Full Load Amps (total)	7.5 (22.5)			3.4 (10.2)			2.7 (8.1)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
[2] Maximum Overcurrent Protection	Unit Only	100	110	125	50	60	70	35	45	50
	With (3) 0.33 HP Standard Power Exhaust	110	125	125	60	60	70	40	45	50
	With 50% High Static Power Exhaust (2) 2 HP	110	125	150	60	70	70	45	50	50
	With 100% High Static Power Exhaust (3) 2 HP	125	125	150	60	70	80	45	50	50
[3] Minimum Circuit Ampacity	Unit Only	90	99	107	50	54	58	34	38	40
	With (3) 0.33 HP Standard Power Exhaust	97	106	115	54	58	62	37	41	43
	With 50% High Static Power Exhaust (2) 2 HP	105	114	122	57	61	65	40	43	46
	With 100% High Static Power Exhaust (3) 2 HP	112	122	130	60	64	68	42	46	48

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.

20 TON HIGH EFFICIENCY - VARIABLE AIR VOLUME (VAV) LCH242H4V

[1] Voltage - 60hz - 3 phase			208/230V - 3 Ph						460V - 3 Ph			575V - 3 Ph		
Indoor Blower Motor Horsepower			5		7.5		10		5	7.5	10	5	7.5	10
	Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
[2] Maximum Overcurrent Protection	Unit+ Electric Heat	30 kW	[4] 100	125	[4] 110	125	[4] 125	150	60	60	70	45	50	50
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	90	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	[4] 110	125	[4] 125	150	150	150	60	70	70	50	60	60
		45 kW	[4] 150	175	175	175	[4] 175	200	90	90	100	70	70	80
		60 kW	175	175	[4] 175	200	[4] 175	200	90	100	100	70	80	80
		90 kW	[4] 225	250	[4] 250	[4] 300	[4] 250	[4] 300	125	150	150	100	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	[4] 125	150	150	150	150	150	70	70	80	60	60	60
		45 kW	175	175	[4] 175	200	[4] 175	200	90	90	100	70	80	80
		60 kW	[4] 175	200	[4] 175	200	[4] 200	225	100	100	100	80	80	80
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	[4] 250	[4] 300	150	150	150	110	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	350	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	150	150	150	150	[4] 150	175	70	80	80	60	60	60
		45 kW	[4] 175	200	200	200	[4] 200	225	90	100	100	80	80	80
		60 kW	[4] 175	200	[4] 200	225	[4] 200	225	100	100	110	80	80	90
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	300	[4] 300	150	150	150	110	110	125
		120 kW	[4] 300	[4] 350	350	[4] 350	[4] 350	[4] 400	175	175	175	150	150	150
[3] Minimum Circuit Ampacity	Unit+ Electric Heat	30 kW	100	112	109	121	117	129	55	59	63	44	48	50
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
		120 kW	272	310	281	319	289	328	154	159	162	124	127	130
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	109	121	118	130	126	138	60	64	68	48	52	54
		45 kW	148	166	157	175	165	183	83	87	91	66	70	72
		60 kW	155	175	165	184	173	192	87	91	95	70	73	76
		90 kW	218	247	227	256	236	265	123	127	131	98	102	105
		120 kW	281	319	290	328	298	337	159	163	167	127	131	133
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	118	130	128	140	136	148	64	68	72	51	55	57
		45 kW	157	175	167	185	175	193	86	90	94	69	73	75
		60 kW	165	184	175	194	183	202	91	95	99	73	76	79
		90 kW	228	257	237	266	245	274	127	131	135	101	105	108
		120 kW	290	329	300	338	308	346	163	167	171	130	134	136
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	128	140	137	149	145	157	68	72	76	54	58	60
		45 kW	167	185	176	194	184	202	90	95	98	72	76	79
		60 kW	175	194	184	203	192	211	95	99	103	76	80	82
		90 kW	237	266	247	275	255	284	131	135	139	105	108	111
		120 kW	300	338	309	348	317	356	167	171	175	134	137	140

[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.

25 TON HIGH EFFICIENCY - CONSTANT AIR VOLUME (CAV) LCH300H4B

[1] Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 2	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 3	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 4	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.4 (14.4)			1.3 (7.8)			1 (6)		
Standard Power Exhaust (3) 0.33 HP	Full Load Amps (total)	2.4 (7.2)			1.3 (3.9)			1 (3)		
50% High Static Power Exhaust (2) 2 HP	Full Load Amps (total)	7.5 (15)			3.4 (6.8)			2.7 (5.4)		
100% High Static Power Exhaust (3) 2 HP	Full Load Amps (total)	7.5 (22.5)			3.4 (10.2)			2.7 (8.1)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
[2] Maximum Overcurrent Protection	Unit Only	150	150	150	70	70	80	50	50	60
	With (3) 0.33 HP Standard Power Exhaust	150	150	150	70	70	80	60	60	60
	With 50% High Static Power Exhaust (2) 2 HP	150	150	175	70	80	80	60	60	60
	With 100% High Static Power Exhaust (3) 2 HP	150	175	175	80	80	90	60	60	60
[3] Minimum Circuit Ampacity	Unit Only	127	135	143	61	64	68	45	49	51
	With (3) 0.33 HP Standard Power Exhaust	128	134	142	62	65	68	46	48	52
	With 50% High Static Power Exhaust (2) 2 HP	142	150	158	68	71	75	51	54	56
	With 100% High Static Power Exhaust (3) 2 HP	149	157	165	71	75	78	53	57	59

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.

25 TON HIGH EFFICIENCY - CONSTANT AIR VOLUME (CAV) LCH300H4B

[1] Voltage - 60hz - 3 phase			208/230V - 3 Ph						460V - 3 Ph			575V - 3 Ph		
Indoor Blower Motor Horsepower			5		7.5		10		5	7.5	10	5	7.5	10
	Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
[2] Maximum Overcurrent Protection	Unit+ Electric Heat	30 kW	150	150	150	150	150	150	70	70	80	50	50	60
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	90	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	4 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	150	150	150	150	150	150	70	70	70	50	50	60
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	100	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	150	150	150	150	175	175	70	80	80	60	60	60
		45 kW	175	175	[4] 175	200	[4] 175	200	90	90	100	70	80	80
		60 kW	[4] 175	200	[4] 175	200	[4] 200	225	100	100	100	80	80	80
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	[4] 250	[4] 300	150	150	150	110	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	350	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	150	150	175	175	175	175	80	80	90	60	60	60
		45 kW	[4] 175	200	200	200	[4] 200	225	90	100	100	80	80	80
		60 kW	[4] 175	200	[4] 200	225	[4] 200	225	100	100	110	80	80	90
		90 kW	[4] 250	[4] 300	[4] 250	4 300	300	[4] 300	150	150	150	110	110	125
		120 kW	[4] 300	[4] 350	350	4 350	[4] 350	[4] 400	175	175	175	150	150	150
[3] Minimum Circuit Ampacity	Unit+ Electric Heat	30 kW	127	127	135	135	143	143	61	64	68	45	49	51
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
		120 kW	272	310	281	319	289	328	154	159	162	124	127	130
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	128	128	134	134	142	142	62	65	68	46	48	52
		45 kW	140	158	148	166	157	175	79	83	87	63	66	70
		60 kW	148	167	155	175	165	184	84	87	91	67	70	73
		90 kW	210	239	218	247	227	256	120	123	127	96	98	102
		120 kW	273	311	281	319	290	328	156	159	163	125	127	131
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	142	142	150	150	158	158	68	71	75	51	55	57
		45 kW	157	175	167	185	175	193	86	90	94	69	73	75
		60 kW	165	184	175	194	183	202	91	95	99	73	76	79
		90 kW	228	257	237	266	245	274	127	131	135	101	105	108
		120 kW	290	329	300	338	308	346	163	167	171	130	134	136
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	149	149	157	157	165	165	71	75	78	54	58	60
		45 kW	167	185	176	194	184	202	90	95	98	72	76	79
		60 kW	175	194	184	203	192	211	95	99	103	76	80	82
		90 kW	237	266	247	275	255	284	131	135	139	105	108	111
		120 kW	300	338	309	348	317	356	167	171	175	134	137	140

[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.

25 TON HIGH EFFICIENCY - VARIABLE AND MULTI-STAGE AIR VOLUME LCH300H4V,M

[1] Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 2	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 3	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Compressor 4	Rated Load Amps	22.4			10.6			7.7		
	Locked Rotor Amps	149			75			54		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.4 (14.4)			1.3 (7.8)			1 (6)		
Standard Power Exhaust (3) 0.33 HP	Full Load Amps (total)	2.4 (7.2)			1.3 (3.9)			1 (3)		
50% High Static Power Exhaust (2) 2 HP	Full Load Amps (total)	7.5 (15)			3.4 (6.8)			2.7 (5.4)		
100% High Static Power Exhaust (3) 2 HP	Full Load Amps (total)	7.5 (22.5)			3.4 (10.2)			2.7 (8.1)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
[2] Maximum Overcurrent Protection	Unit Only	150	150	150	70	70	80	50	50	60
	With (3) 0.33 HP Standard Power Exhaust	150	150	175	70	70	80	50	60	60
	With 50% High Static Power Exhaust (2) 2 HP	150	150	175	70	80	80	60	60	60
	With 100% High Static Power Exhaust (3) 2 HP	150	175	175	80	80	90	60	60	60
[3] Minimum Circuit Ampacity	Unit Only	127	135	143	61	64	68	45	49	51
	With (3) 0.33 HP Standard Power Exhaust	134	142	150	65	68	72	48	52	54
	With 50% High Static Power Exhaust (2) 2 HP	142	150	158	68	71	75	51	54	56
	With 100% High Static Power Exhaust (3) 2 HP	149	157	165	71	75	78	53	57	59

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.

25 TON HIGH EFFICIENCY - VARIABLE AND MULTI-STAGE AIR VOLUME LCH300H4V,M

[1] Voltage - 60hz - 3 phase			208/230V - 3 Ph						460V - 3 Ph			575V - 3 Ph		
Indoor Blower Motor Horsepower			5		7.5		10		5	7.5	10	5	7.5	10
	Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
[2] Maximum Overcurrent Protection	Unit+ Electric Heat	30 kW	150	150	150	150	150	150	70	70	80	50	50	60
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	90	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	150	150	150	150	175	175	70	70	80	50	60	60
		45 kW	[4] 150	175	175	175	[4] 175	200	90	90	100	70	70	80
		60 kW	175	175	[4] 175	200	[4] 175	200	90	100	100	70	80	80
		90 kW	[4] 225	250	[4] 250	[4] 300	[4] 250	[4] 300	125	150	150	100	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	150	150	150	150	175	175	70	80	80	60	60	60
		45 kW	175	175	[4] 175	200	[4] 175	200	90	90	100	70	80	80
		60 kW	[4] 175	200	[4] 175	200	[4] 200	225	100	100	100	80	80	80
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	[4] 250	4 300	150	150	150	110	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	350	4 350	175	175	175	150	150	150
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	150	150	175	175	175	175	80	80	90	60	60	60
		45 kW	[4] 175	200	200	200	[4] 200	225	90	100	100	80	80	80
		60 kW	[4] 175	200	[4] 200	225	[4] 200	225	100	100	110	80	80	90
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	300	[4] 300	150	150	150	110	110	125
		120 kW	[4] 300	[4] 350	350	[4] 350	[4] 350	[4] 400	175	175	175	150	150	150
[3] Minimum Circuit Ampacity	Unit+ Electric Heat	30 kW	127	127	135	135	143	143	61	64	68	45	49	51
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
		120 kW	272	310	281	319	289	328	154	159	162	124	127	130
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	134	134	142	142	150	150	65	68	72	48	52	54
		45 kW	148	166	157	175	165	183	83	87	91	66	70	72
		60 kW	155	175	165	184	173	192	87	91	95	70	73	76
		90 kW	218	247	227	256	236	265	123	127	131	98	102	105
		120 kW	281	319	290	328	298	337	159	163	167	127	131	133
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	142	142	150	150	158	158	68	71	75	51	55	57
		45 kW	157	175	167	185	175	193	86	90	94	69	73	75
		60 kW	165	184	175	194	183	202	91	95	99	73	76	79
		90 kW	228	257	237	266	245	274	127	131	135	101	105	108
		120 kW	290	329	300	338	308	346	163	167	171	130	134	136
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	149	149	157	157	165	165	71	75	78	54	58	60
		45 kW	167	185	176	194	184	202	90	95	98	72	76	79
		60 kW	175	194	184	203	192	211	95	99	103	76	80	82
		90 kW	237	266	247	275	255	284	131	135	139	105	108	111
		120 kW	300	338	309	348	317	356	167	171	175	134	137	140

[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.

30 TON HIGH EFFICIENCY - CONSTANT AIR VOLUME (CAV) LCH360H4B

[1] Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 2	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 3	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 4	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.4 (14.4)			1.3 (7.8)			1 (6)		
Standard Power Exhaust (3) 0.33 HP	Full Load Amps (total)	2.4 (7.2)			1.3 (3.9)			1 (3)		
50% High Static Power Exhaust (2) 2 HP	Full Load Amps (total)	7.5 (15)			3.4 (6.8)			2.7 (5.4)		
100% High Static Power Exhaust (3) 2 HP	Full Load Amps (total)	7.5 (22.5)			3.4 (10.2)			2.7 (8.1)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
[2] Maximum Overcurrent Protection	Unit Only	150	150	175	70	80	80	60	60	60
	With (3) 0.33 HP Standard Power Exhaust	150	175	175	80	80	90	60	60	60
	With 50% High Static Power Exhaust (2) 2 HP	175	175	175	80	80	90	60	60	70
	With 100% High Static Power Exhaust (3) 2 HP	175	175	200	80	90	90	60	70	70
[3] Minimum Circuit Ampacity	Unit Only	138	145	153	68	71	75	51	54	56
	With (3) 0.33 HP Standard Power Exhaust	145	153	161	72	75	78	54	57	59
	With 50% High Static Power Exhaust (2) 2 HP	153	160	168	75	78	81	56	59	62
	With 100% High Static Power Exhaust (3) 2 HP	160	168	176	78	81	85	59	62	64

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.

30 TON HIGH EFFICIENCY - CONSTANT AIR VOLUME (CAV) LCH360H4B

[1] Voltage - 60hz - 3 phase			208/230V - 3 Ph						460V - 3 Ph			575V - 3 Ph		
Indoor Blower Motor Horsepower			5		7.5		10		5	7.5	10	5	7.5	10
	Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
[2] Maximum Overcurrent Protection	Unit+ Electric Heat	30 kW	150	150	150	150	175	175	70	80	80	60	60	60
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	90	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	150	150	175	175	175	175	80	80	90	60	60	60
		45 kW	[4] 150	175	175	175	[4] 175	200	90	90	100	70	70	80
		60 kW	175	175	[4] 175	200	[4] 175	200	90	100	100	70	80	80
		90 kW	[4] 225	250	[4] 250	[4] 300	[4] 250	[4] 300	125	150	150	100	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	175	175	175	175	175	175	80	80	90	60	60	70
		45 kW	175	175	[4] 175	200	[4] 175	200	90	90	100	70	80	80
		60 kW	[4] 175	200	[4] 175	200	[4] 200	225	100	100	100	80	80	80
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	[4] 250	[4] 300	150	150	150	110	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	350	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	175	175	175	175	200	200	80	90	90	60	70	70
		45 kW	[4] 175	200	200	200	[4] 200	225	90	100	100	80	80	80
		60 kW	[4] 175	200	[4] 200	225	[4] 200	225	100	100	110	80	80	90
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	300	[4] 300	150	150	150	110	110	125
		120 kW	[4] 300	[4] 350	350	[4] 350	[4] 350	[4] 400	175	175	175	150	150	150
[3] Minimum Circuit Ampacity	Unit+ Electric Heat	30 kW	138	138	145	145	153	153	68	71	75	51	54	56
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
		120 kW	272	310	281	319	289	328	154	159	162	124	127	130
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	145	145	153	153	161	161	72	75	78	54	57	59
		45 kW	148	166	157	175	165	183	83	87	91	66	70	72
		60 kW	155	175	165	184	173	192	87	91	95	70	73	76
		90 kW	218	247	227	256	236	265	123	127	131	98	102	105
		120 kW	281	319	290	328	298	337	159	163	167	127	131	133
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	153	153	160	160	168	168	75	78	81	56	59	62
		45 kW	157	175	167	185	175	193	86	90	94	69	73	75
		60 kW	165	184	175	194	183	202	91	95	99	73	76	79
		90 kW	228	257	237	266	245	274	127	131	135	101	105	108
		120 kW	290	329	300	338	308	346	163	167	171	130	134	136
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	160	160	168	168	176	176	78	81	85	59	62	64
		45 kW	167	185	176	194	184	202	90	95	98	72	76	79
		60 kW	175	194	184	203	192	211	95	99	103	76	80	82
		90 kW	237	266	247	275	255	284	131	135	139	105	108	111
		120 kW	300	338	309	348	317	356	167	171	175	134	137	140

[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.

30 TON HIGH EFFICIENCY - VARIABLE AND MULTI-STAGE AIR VOLUME LCH360H4V,M

[1] Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 2	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 3	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Compressor 4	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.4 (14.4)			1.3 (7.8)			1 (6)		
Standard Power Exhaust (3) 0.33 HP	Full Load Amps (total)	2.4 (7.2)			1.3 (3.9)			1 (3)		
50% High Static Power Exhaust (2) 2 HP		7.5 (15)			3.4 (6.8)			2.7 (5.4)		
100% High Static Power Exhaust (3) 2 HP		7.5 (22.5)			3.4 (10.2)			2.7 (8.1)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
[2] Maximum Overcurrent Protection	Unit Only	150	150	175	70	80	80	60	60	60
	With (3) 0.33 HP Standard Power Exhaust	150	175	175	80	80	90	60	60	60
	With 50% High Static Power Exhaust (2) 2 HP	175	175	175	80	80	90	60	60	70
	With 100% High Static Power Exhaust (3) 2 HP	175	175	200	80	90	90	60	70	70
[3] Minimum Circuit Ampacity	Unit Only	138	145	153	68	71	75	51	54	56
	With (3) 0.33 HP Standard Power Exhaust	145	153	161	72	75	78	54	57	59
	With 50% High Static Power Exhaust (2) 2 HP	153	160	168	75	78	81	56	59	62
	With 100% High Static Power Exhaust (3) 2 HP	160	168	176	78	81	85	59	62	64

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.

30 TON HIGH EFFICIENCY - VARIABLE AND MULTI-STAGE AIR VOLUME LCH360H4V,M

[1] Voltage - 60hz - 3 phase			208/230V - 3 Ph						460V - 3 Ph			575V - 3 Ph		
Indoor Blower Motor Horsepower			5		7.5		10		5	7.5	10	5	7.5	10
	Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
[2] Maximum Overcurrent Protection	Unit+ Electric Heat	30 kW	150	150	150	150	175	175	70	80	80	60	60	60
		45 kW	[4] 150	175	[4] 150	175	175	175	80	90	90	70	70	70
		60 kW	[4] 150	175	175	175	[4] 175	200	90	90	90	70	70	80
		90 kW	[4] 225	250	[4] 225	250	[4] 250	[4] 300	125	125	150	100	100	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	125	150	150
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	150	150	175	175	175	175	80	80	90	60	60	60
		45 kW	[4] 150	175	175	175	[4] 175	200	90	90	100	70	70	80
		60 kW	175	175	[4] 175	200	[4] 175	200	90	100	100	70	80	80
		90 kW	[4] 225	250	[4] 250	[4] 300	[4] 250	[4] 300	125	150	150	100	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	[4] 300	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	175	175	175	175	175	175	80	80	90	60	60	70
		45 kW	175	175	[4] 175	200	[4] 175	200	90	90	100	70	80	80
		60 kW	[4] 175	200	[4] 175	200	[4] 200	225	100	100	100	80	80	80
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	[4] 250	[4] 300	150	150	150	110	110	110
		120 kW	[4] 300	[4] 350	[4] 300	[4] 350	350	[4] 350	175	175	175	150	150	150
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	175	175	175	175	200	200	80	90	90	60	70	70
		45 kW	[4] 175	200	200	200	[4] 200	225	90	100	100	80	80	80
		60 kW	[4] 175	200	[4] 200	225	[4] 200	225	100	100	110	80	80	90
		90 kW	[4] 250	[4] 300	[4] 250	[4] 300	300	[4] 300	150	150	150	110	110	125
		120 kW	[4] 300	[4] 350	350	[4] 350	[4] 350	[4] 400	175	175	175	150	150	150
[3] Minimum Circuit Ampacity	Unit+ Electric Heat	30 kW	138	138	145	145	153	153	68	71	75	51	54	56
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
		120 kW	272	310	281	319	289	328	154	159	162	124	127	130
	Unit+ Electric Heat and Standard Power Exhaust (3) 0.33 HP	30 kW	145	145	153	153	161	161	72	75	78	54	57	59
		45 kW	148	166	157	175	165	183	83	87	91	66	70	72
		60 kW	155	175	165	184	173	192	87	91	95	70	73	76
		90 kW	218	247	227	256	236	265	123	127	131	98	102	105
		120 kW	281	319	290	328	298	337	159	163	167	127	131	133
	Unit+ Electric Heat and 50% High Static Power Exhaust (2) 2 HP	30 kW	153	153	160	160	168	168	75	78	81	56	59	62
		45 kW	157	175	167	185	175	193	86	90	94	69	73	75
		60 kW	165	184	175	194	183	202	91	95	99	73	76	79
		90 kW	228	257	237	266	245	274	127	131	135	101	105	108
		120 kW	290	329	300	338	308	346	163	167	171	130	134	136
	Unit+ Electric Heat and 100% High Static Power Exhaust (3) 2 HP	30 kW	160	160	168	168	176	176	78	81	85	59	62	64
		45 kW	167	185	176	194	184	202	90	95	98	72	76	79
		60 kW	175	194	184	203	192	211	95	99	103	76	80	82
		90 kW	237	266	247	275	255	284	131	135	139	105	108	111
		120 kW	300	338	309	348	317	356	167	171	175	134	137	140

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

[2] HACR type breaker or fuse.

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

[4] Factory installed circuit breaker not available.

ELECTRIC HEAT CAPACITIES

Volts Input	30 kW			45 kW			60 kW			90 kW			120 kW		
	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages
208	22.5	76,800	1	33.8	115,300	2	45.0	153,600	2	67.6	230,700	2	90.2	307,800	2
220	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2	100.8	344,000	2
230	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2	110.2	376,100	2
240	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2	120.0	409,500	2
440	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2	100.8	344,000	2
460	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2	110.2	376,100	2
480	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2	120.0	409,500	2
550	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2	100.8	344,000	2
575	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2	110.2	376,100	2
600	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2	120.0	409,500	2

LGH/LCH PARTS ARRANGEMENT

Note: LGH shown; LCH will have electric heat in the same location as gas heat.

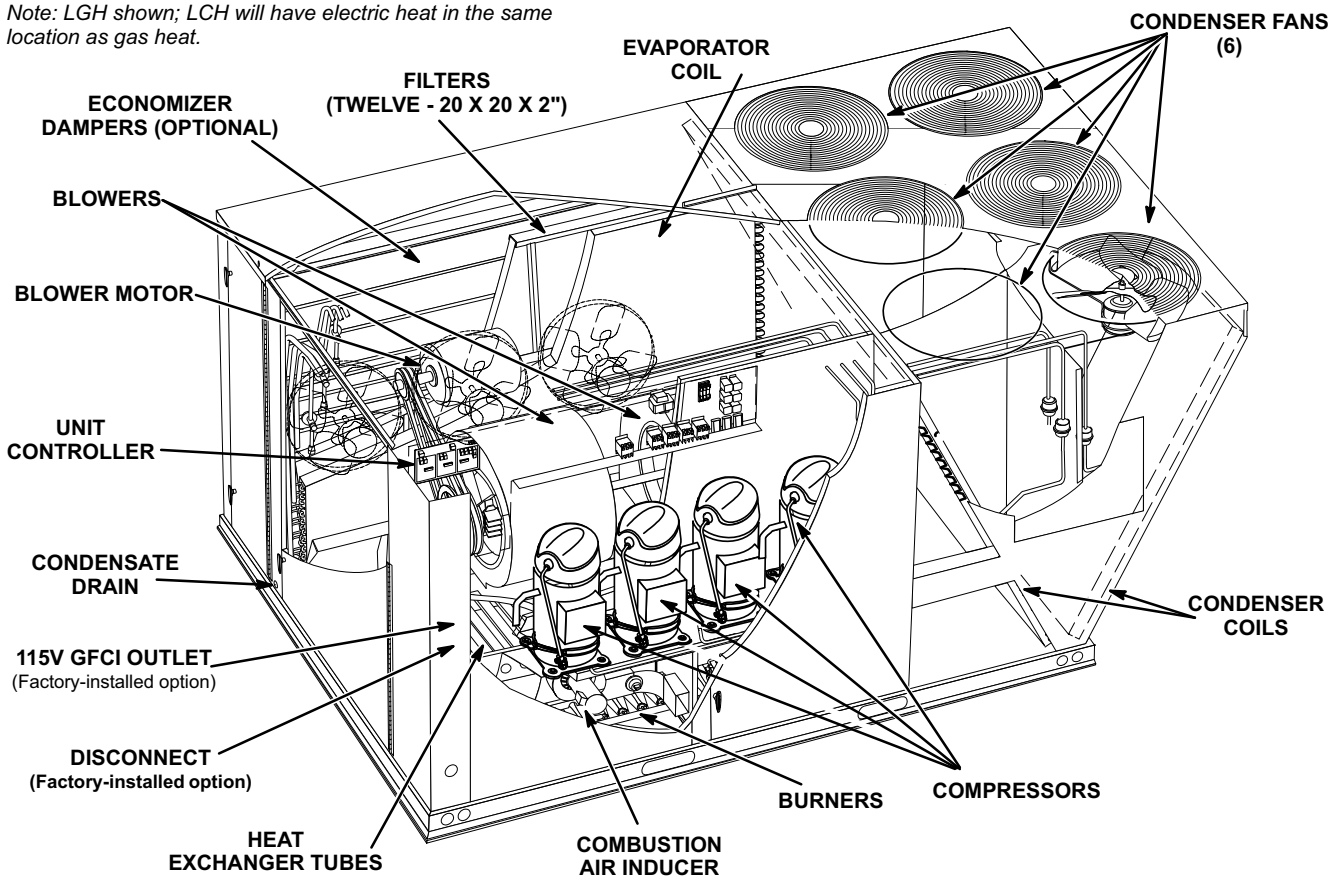


FIGURE 1

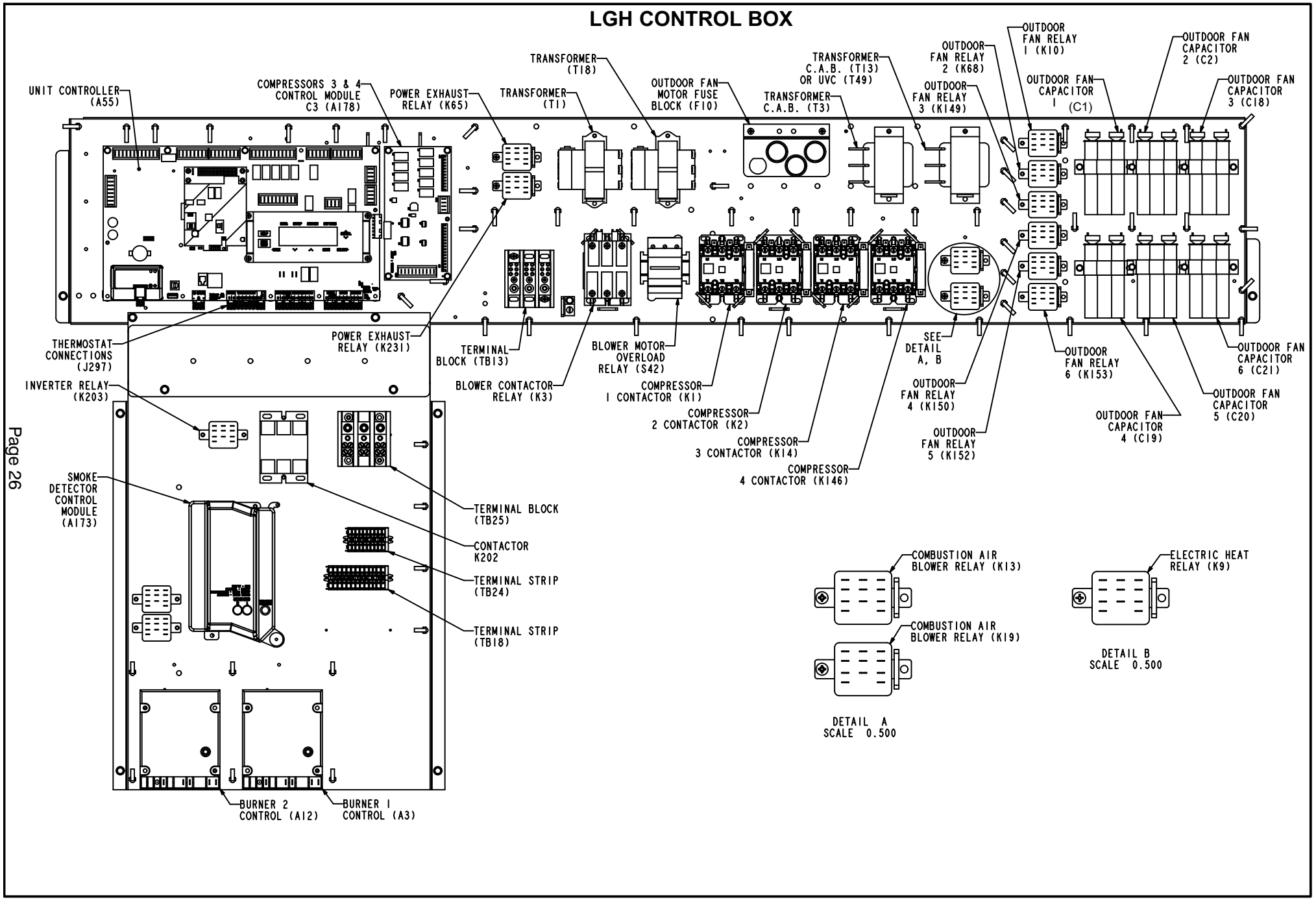

LGH CONTROL BOX
UNIT CONTROLLER (A55)
COMPRESSORS 3 & 4 CONTROL MODULE C3 (A178)
POWER EXHAUST RELAY (K65)
TRANSFORMER (T18)
TRANSFORMER (T1)
OUTDOOR FAN MOTOR FUSE BLOCK (F10)
TRANSFORMER C.A.B. (T3)
TRANSFORMER C.A.B. (T13) OR UVC (T49)
OUTDOOR FAN RELAY 3 (K149)
OUTDOOR FAN RELAY 2 (K68)
OUTDOOR FAN RELAY 1 (K10)
OUTDOOR FAN CAPACITOR 1 (C1)
OUTDOOR FAN CAPACITOR 2 (C2)
OUTDOOR FAN CAPACITOR 3 (C18)
THERMOSTAT CONNECTIONS (J297)
INVERTER RELAY (K203)
POWER EXHAUST RELAY (K231)
TERMINAL BLOCK (TB13)
BLOWER CONTACTOR RELAY (K3)
BLOWER MOTOR OVERLOAD RELAY (S42)
COMPRESSOR 1 CONTACTOR (K1)
COMPRESSOR 2 CONTACTOR (K2)
COMPRESSOR 3 CONTACTOR (K14)
COMPRESSOR 4 CONTACTOR (K146)
SEE DETAIL A, B
OUTDOOR FAN RELAY 4 (K150)
OUTDOOR FAN RELAY 5 (K152)
OUTDOOR FAN RELAY 6 (K153)
OUTDOOR FAN CAPACITOR 4 (C19)
OUTDOOR FAN CAPACITOR 5 (C20)
OUTDOOR FAN CAPACITOR 6 (C21)
SMOKE DETECTOR CONTROL MODULE (A173)
TERMINAL BLOCK (TB25)
CONTACTOR K202
TERMINAL STRIP (TB24)
TERMINAL STRIP (TB18)
BURNER 2 CONTROL (A12)
BURNER 1 CONTROL (A3)
COMBUSTION AIR BLOWER RELAY (K13)
COMBUSTION AIR BLOWER RELAY (K19)
DETAIL A
SCALE 0.500
ELECTRIC HEAT RELAY (K9)
DETAIL B
SCALE 0.500

FIGURE 2

I-UNIT COMPONENTS

ELECTROSTATIC DISCHARGE (ESD)

Precautions and Procedures

⚠ CAUTION

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

Units are configure to order units (CTO). Unit components are shown in figures 1. All units come standard with hinged unit panels. The unit panels may be held open with the door rod located inside the unit. All L1, L2, and L3 wiring is color coded; L1 is red, L2 is yellow, and L3 is blue.

A-Control Box Components

Control box components are shown in figure 2, The control box is located in the upper left portion of the compressor compartment.

1-Disconnect Switch S48 (Optional all units)

All units may be equipped with an optional disconnect switch S48. Other factory or field installed optional circuit breakers may be used, such as CB10. S48 and CB10 are toggle or twist-style switches, which can be used by the service technician to disconnect power to the unit.

2-Transformer T1 (all units)

All units use a single line voltage to 24VAC transformer mounted in the control box. Transformer supplies power to control circuits in the unit. The transformer is rated at 70VA and is protected by a 3.5 amp circuit breaker (CB8). The 208/230 (Y) voltage transformers use two primary voltage taps as shown in figure 3, while 460 (G) and 575 (J) voltage transformers use a single primary voltage tap.

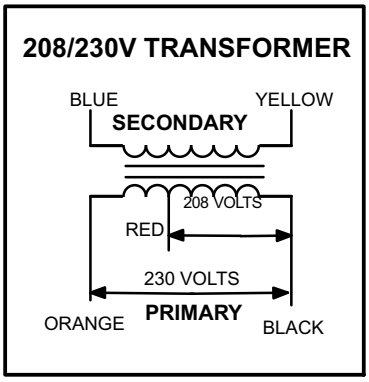


FIGURE 3

3-Transformer T18

T18 is a single line voltage to 24VAC transformer used in all units. Transformer T18 is protected by a 3.5 amp circuit breaker (CB18). T18 is identical to transformer T1. The transformer supplies 24VAC power to the contactors.

4-C. A. B. Transformers T3 & T13 (575V)

All LGH 575 (J) voltage units use transformer T3 and T13. The auto voltage to 230VAC transformers are located in the control box. The transformers have an output rating of 0.75A. T3 transformer supplies 230VAC power to combustion air blower motor (B6) while T13 transformer supplies power to combustion air blower motor (B15) in all units. T3 and T13 also provide 230VAC to optional ultraviolet germicidal (UVC) lamps.

5-Terminal Block TB13

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

6-Terminal Block TB2

When unit is not equipped with an optional S48 disconnect switch, supply power is connected to TB2.

7-Outdoor Fan Motor Fuse Block & Fuses F10 and Power Exhaust Fan Motor Fuse Block and Fuses F6 (240 & 300 Y Volt Only)

Three line voltage fuses, F10, provide overcurrent protection to all condenser fans. Two line voltage fuses, F6, provide overcurrent protection to the two optional power exhaust fans. The fuses are rated at 30A in 208/230V units.

8-Fuses F4

Fuse F4 is used only with single point power supply. F4 provides overcurrent protection to the compressor and other cooling components.

Note - F4, S48 and TB2 are located inside a sheet metal enclosure in the unit front left corner mullion.

9-Outdoor Fan Capacitors C1, C2, C18, C19,C20, C21

Fan capacitors C1, C2, C18, C19, C20 and C21 are 370V / 10 MFD capacitors used to assist in the start up of condenser fans B4, B5, B21, B22, B23 and B24. respectively.

10-Compressor Contactors K1, K2, K14, K146

All compressor contactors are three pole double break contactors with a 24VAC coil. In all units, K1, K2, K14 and K146 energize compressors B1, B2, B13, and B20 respectively.

11-Blower Contactor K3

Blower contactor K3, is a three-pole-double-break contactor with a 24VAC coil used to energize the indoor blower motor B3 in response to blower demand.

12-Outdoor Fan Relay K10, K68, K149, K150, K152, K153

Outdoor fan relays K10, K68, K149, K150, K152 and K153 used in all units, are DPDT relays with a 24VAC coil. In all units, K10 energizes fan 1 (B4), K68 energizes fan 2 (B5), K149 energizes fan 3 (B21), K150 energizes fan 4 (B22), K152 energizes fan 5 (B23) and K153 energizes fan 6 (B24).

13-Combustion Air Inducer Relay K13 (LGH units - first burner section)

Combustion air inducer relay K13, used in all LGH units, is a DPDT relay with a 24VAC coil. K13 is energized by the Unit Controller A55 after a first stage heating demand from the thermostat. K13 remains energized throughout the heating demand. When energized, K13 N.O. contacts close to energize combustion air blower and begin a heating sequence. Prove switch S18, located in the compressor compartment, closes as combustion air static pressure falls to “prove" combustion air inducer operation. When S18 closes, the ignition controls and gas valves are energized to begin a heating sequence.

14-Combustion Air Inducer Relay K19 (LGH units - second burner section)

Combustion air inducer relay K19, used in all LGH units, is a DPDT relay with a 24 VAC coil. K19 is energized by A178 Unit Controller after a first stage heating demand from the thermostat. K19 remains energized throughout the first stage heating demand. When energized, K19 N.O. contacts close to energize the second heat section combustion air blower and begin second section heating sequence. Prove switch S45, located in the compressor compartment, closes as combustion air static pressure falls to "prove" combustion air blower operation. When S45 closes, the second section of the ignition control and gas valve are energized to begin the second section heating sequence.

15-Burner Controls A3 & A12 (LGH units)

All LGH units have two burner controls. A3 controls gas heat section one, while A12 controls gas heat section two. The first gas heat section and the second gas heat section burner controls are identical. Both burner controls are factory set and are not adjustable. The control makes three attempts at ignition and then locks out the system if ignition is not obtained after the third trial. Reset after lockout requires only breaking and remaking thermostat demand. The control shuts off gas flow immediately in the event of a gas or power failure. Upon restoration of gas and power, the control will restart the ignition sequence and continue until flame is established or system locks out. For a more detailed description see the Gas Heat Components section.

16-Power Exhaust Relay K65 (PEF units)

Power exhaust relay K65 is a N.O. DPDT relay with a 24VAC coil. K65 is used in all units equipped with optional power exhaust fans. K65 is energized by the Unit Controller (A55).

17-Blower Motor Overload Relay S42

The blower motor overload relay is used in all units equipped with M-volt unit blower motors manufactured before Dec. 19, 2010 as well as units with standard efficiency motors of 10 HP. The relay (S42) is connected in line with the blower motor to monitor the current flow to the motor. When the relay senses an overload condition, a set of normally closed contacts open to de-energize pin #4 in plug P299 of the A55 Unit Controller. A55 de-energizes all outputs. Units will be equipped with a relay manufactured by Telemecanique figure 4 or Siemens figure 5.

18-Ultraviolet Germicidal Lamp (UVC) Transformer T49

UVC transformer T49 is used by units of all voltages except 208/230V LGH/LCH and 575V LGH which are equipped with a UVC. The auto voltage to 230VAC transformer is installed in the control box. The transformer has an output rating of 0.75 amps. T49 transformer supplies 230VAC power to the UVC lamp.

ELECTRIC HEAT CONTROL SECTION (30 - 120 kW electric heat only)

19-Electric Heat Relay K9

All unit equipped with optional electric heat use an electric heat relay K9. K9 is a N.O. SPST pilot relay intended to electrically interlock operation of left and right side electric heat sections. K9 is energized by the A55 Unit Controller.

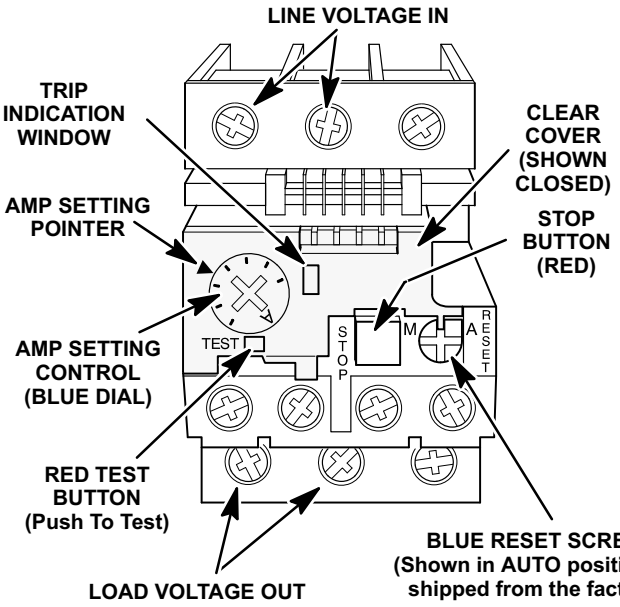
20-Unit Controller A55 (all units)

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

21-Compressor 3 & 4 Control Module A178 (all units)

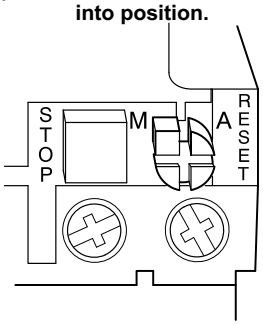
The compressor 3 & 4 control module A178 controls two additional compressor stages. A178 includes all inputs and outputs required for compressor and fan control, compressor stage diagnostics, and low ambient control.

TELEMECANIQUE OVERLOAD RELAY



DETAIL SHOWING RESET BUTTON ADJUSTED TO MANUAL POSITION

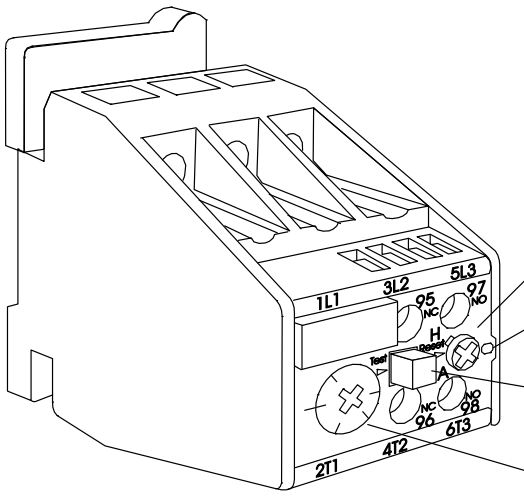
Lift clear cover and turn adjustment screw counterclockwise. Reset screw will pop out when pointer is in M (manual position). Close cover to lock reset screw into position.



Lift clear cover to adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.
Cover must also be lifted to adjust control mode from automatic reset to manual reset (see detail above) and to test the control.
Control must be in the manual reset mode to perform a test. Use a pointed object to press the small red test button. A yellow marker should appear in the trip indication window to the right of the amp setting control. Press the blue reset screw to reset the relay.
The red STOP button opens the normally closed contacts which power the blower motor. This button stops blower motor operation as long as it is pressed in.

FIGURE 4

SIEMENS OVERLOAD RELAY



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

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

RED TEST BUTTON

AMP ADJUSTMENT DIAL

Adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X service factor of 1.15 X .95.
Use small slotted screwdriver to adjust control mode from automatic reset (A) to manual reset (H). Control must be in the manual reset mode (H) to perform a test. Press the red test button. Green trip indicator should pop out. Press the blue reset screw to reset the relay.

FIGURE 5

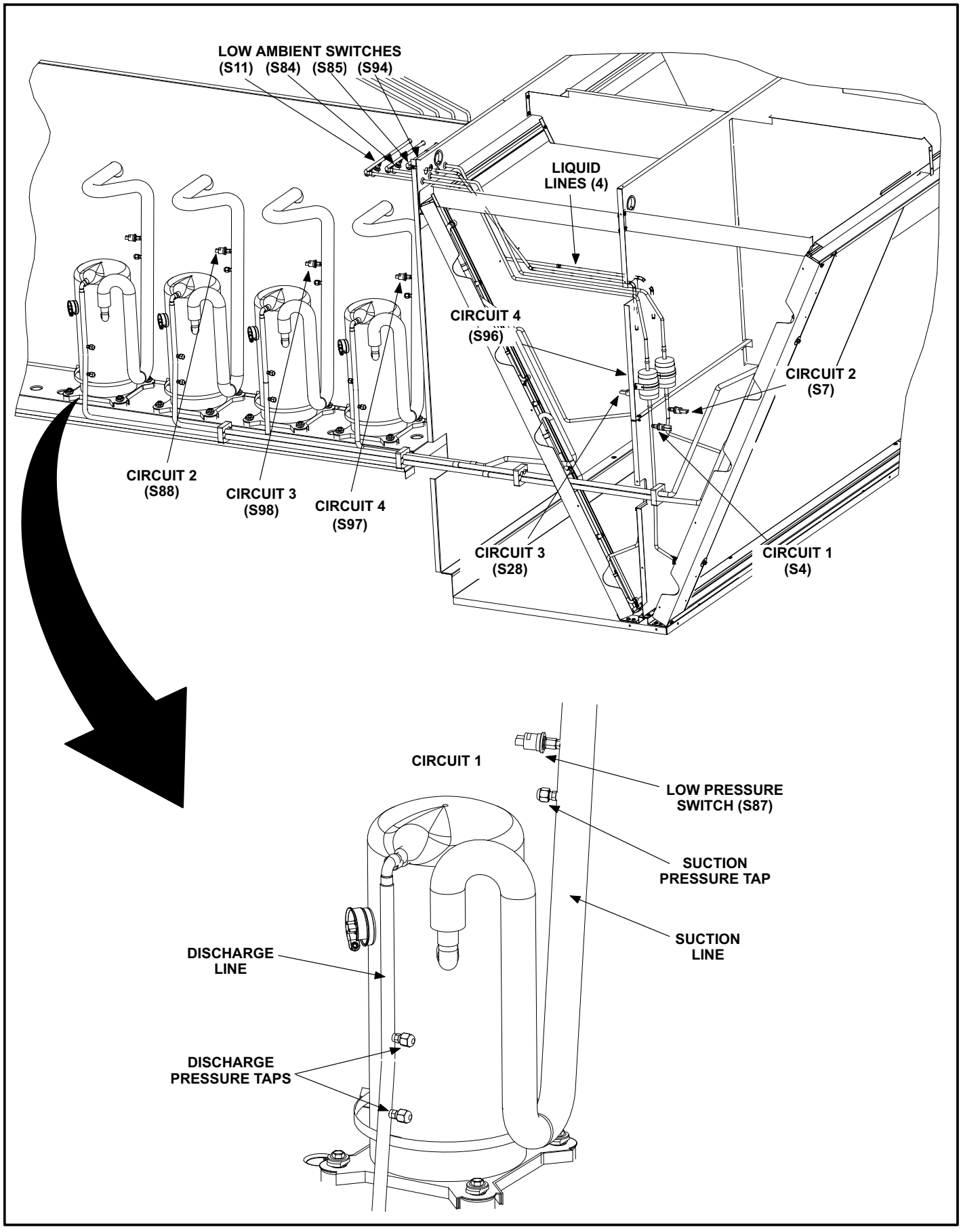

LOW AMBIENT SWITCHES
(S11) (S84) (S85) (S94)
LIQUID
LINES (4)
CIRCUIT 4
(S96)
CIRCUIT 2
(S7)
CIRCUIT 2
(S88)
CIRCUIT 3
(S98)
CIRCUIT 4
(S97)
CIRCUIT 3
(S28)
CIRCUIT 1
(S4)
CIRCUIT 1
LOW PRESSURE
SWITCH (S87)
SUCTION
PRESSURE TAP
SUCTION
LINE
DISCHARGE
LINE
DISCHARGE
PRESSURE TAPS

FIGURE 6

B-Cooling Components Figure 6

All units use independent cooling circuits (figure 8) consisting of separate compressors, condenser coils and evaporator coils. Six draw-through type condenser fans are used in all units. All units are equipped with belt-drive blowers which draw air across the evaporator during unit operation.

Cooling may be supplemented by a factory- or field-installed economizer. The evaporators are slab type and are stacked. Each evaporator uses a thermostatic expansion valve as the primary expansion device. Each evaporator is also equipped with enhanced fins and rifled tubing. In all units each compressor is protected by a crankcase heater, high pressure switch and low pressure switch. Additional protection is provided by low ambient switches and freezestats (on each evaporator).

1-Compressors B1, B2, B13, B20

⚠ 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.

All units use four scroll compressors. See figure 6. Compressor capacity may vary from stage to stage. In all cases, the capacity of each compressor is added to reach the total capacity of the unit. Compressor electrical specifications can be found in the SPECIFICATIONS section in this manual. Each compressor is energized by a corresponding compressor contactor.

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

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

⚠ IMPORTANT

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

2-Crankcase Heaters HR1, HR2, HR5, HR11

All units use bellyband-type crankcase heaters. Heater HR1 is installed around compressor B1, heater HR2 compressor B2, HR5 compressor B13, and HR11 compressor B20. Crankcase heater wattage varies by compressor size.

⚠ IMPORTANT

Pressure switch settings are significant higher on R410A charged units than R22 charged units.

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

The high pressure switch is an auto-reset SPST N.C. switch which opens on a pressure rise. All units are equipped with this switch. The switch is located in the liquid line and is wired in series with the compressor contactor coil through A55 Unit Controller or A178 Compressor 3 and 4 Controller.

S4 (first circuit), S7 (second circuit), S28 (third circuit), and S96 (fourth circuit) are wired in series with the respective compressor contactor coils.

When liquid pressure rises to 610 ± 15 psig (4206 ± 103 kPa) (indicating a problem in the system) the switch opens and the respective compressor is de-energized (the economizer can continue to operate). When liquid pressure drops to 475 ± 15 psig (3275 ± 103 kPa) the pressure switch will close.

Unit Controller A55 has a three-strike counter before locking out the particular compressor circuit. This means the control allows three high pressure trips per one thermostat demand. The control can be reset by breaking and remaking the thermostat demand or manually resetting the control.

4-Low Ambient Switches S11, S84, S85, S94

The low ambient switch is an auto-reset SPST N.O. pressure switch which allows for mechanical cooling operation at low outdoor temperatures. All units are equipped with this switch. In all models a switch is located in each liquid line prior to the indoor coil section.

In all units, S11 (compressor one) and S84 (compressor 2) are wired in parallel to the A55 Unit Controller. S85 (compressor 3) and S94 (compressor four) are wired in parallel to the Unit Controller. A178 Compressor 3 & 4 Controller will cycle outdoor fan 3 (B21) via K149. A178 Compressor 3 & 4 controller will also cycle outdoor fan 4 (B22) via K150.

Units charged with R410A

When liquid pressure rises to 450 ± 10 psig (3102 ± 69 kPa), the switch closes and the Unit Controller will energized condenser fan associated with that refrigerant circuit. When liquid pressure drops to 240 ± 10 psig (1655 ± 69 kPa), the switch opens and the Unit Controller will de-energized condenser fan associated with that refrigerant circuit. This intermittent fan operation results in higher evaporating temperature allowing the system to operate without icing the evaporator coil and losing capacity.

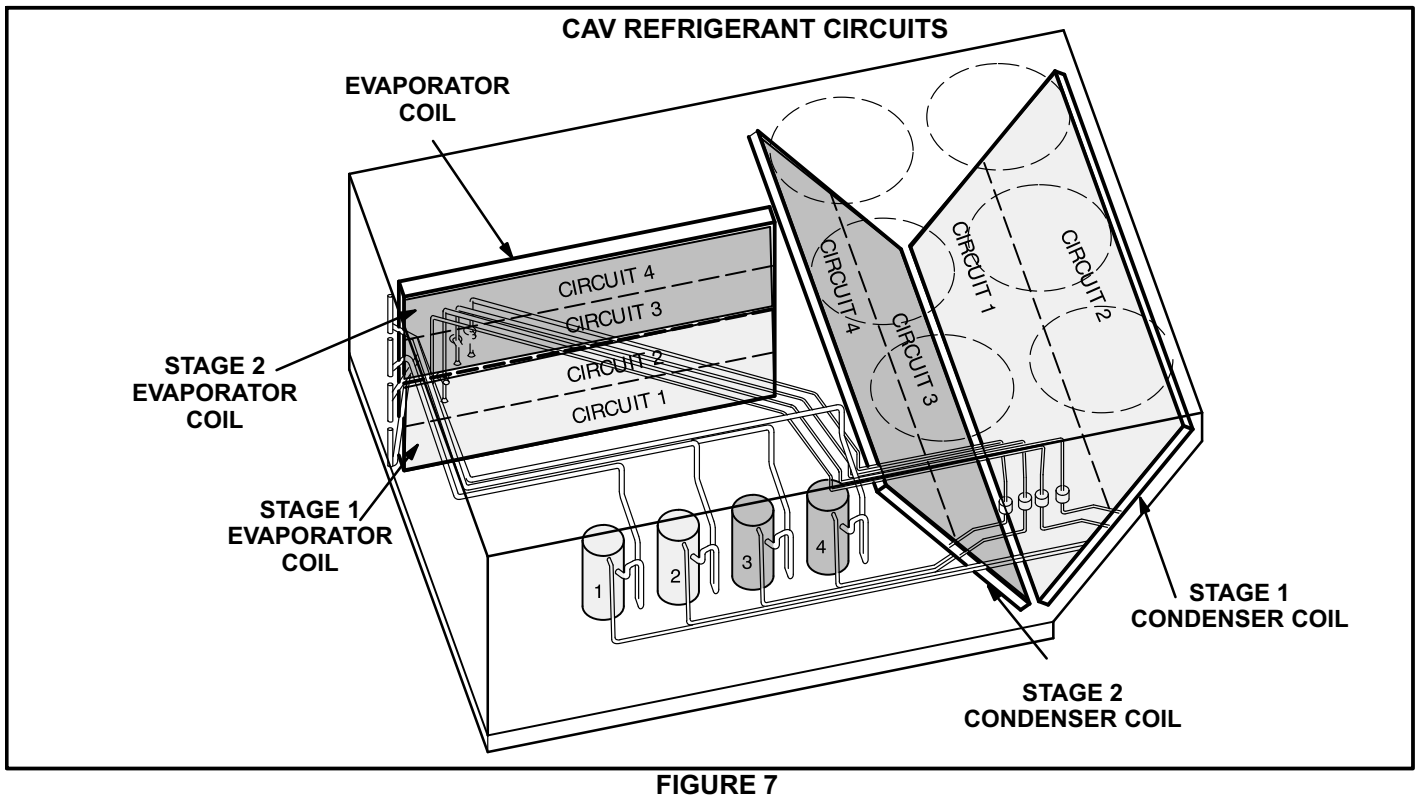


FIGURE 7

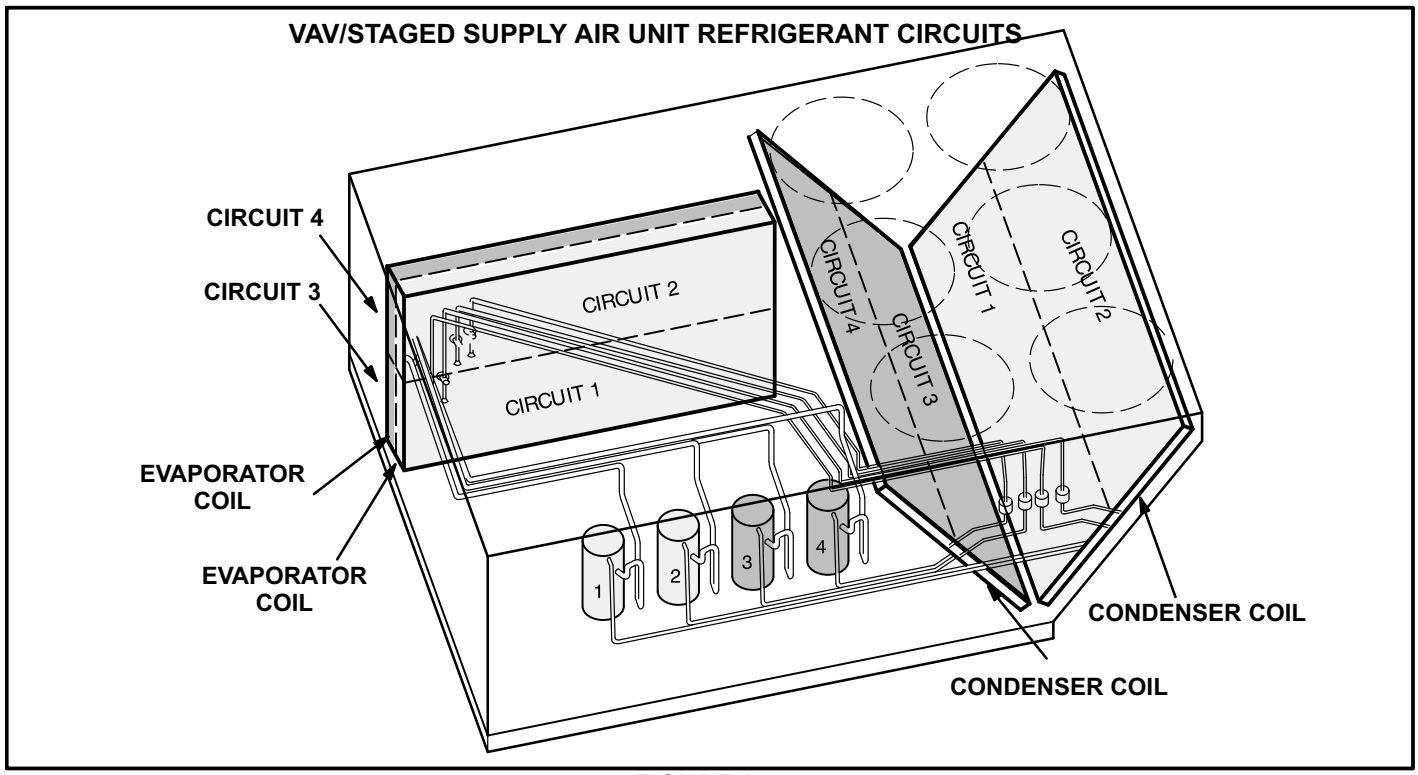


FIGURE 8

5-Low Pressure Switches S87, S88, S98, S97

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

S87 (compressor one), S88 (compressor two), S98 (compressor three), and S97 (compressor four) are wired in series with the contactor coils through the A55 Unit Controller.

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

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

6-Filter Drier (all units)

All units have a filter drier located in the liquid line of each refrigerant circuit at the exit of each condenser coil. The drier removes contaminants and moisture from the system.

7-Freezestats S49, S50, S53, S95

Each unit is equipped with a low temperature switch (freezestat) located on the return bend of each evaporator coil. S49 (first circuit), S50 (second circuit), S53 (third circuit), and S95 (fourth circuit) are located on the corresponding evaporator coils.

Each freezestat is wired in series with the compressor contactor coil through the unit control box to the A55 Unit Controller. Each freezestat is a SPST N.C. auto-reset switch which opens at 29°F $\pm$ 3°F (-1.7°C $\pm$ 1.7°C) on a temperature drop and closes at 58°F $\pm$ 4°F (14.4°C $\pm$ 2.2°C) on a temperature rise. To prevent coil icing, freezestats open during compressor operation to temporarily disable the respective compressor until the coil warms sufficiently to melt any accumulated frost.

If the freezestats are tripping frequently due to coil icing, check the unit charge, airflow and filters before allowing unit back in operation. Make sure to eliminate conditions which might promote evaporator ice buildup.

8-Condenser Fans B4, B5, B21, B22, B23, B24

See Specifications section in this manual for specifications of condenser fans. All condenser fans used have single-phase motors. All units are equipped with six condenser fans. The complete fan assembly may be removed for servicing and cleaning by removing the fan grill and turning the complete assembly until the motor brackets line up with the notches in the top panel. Lift the fan assembly out of the unit and disconnect the jack plug located on the motor.

C-Blower Compartment

The blower compartment in all units is located between the evaporator coil and the compressor / control section on the opposite side of the condenser coil. The blower assembly is accessed by disconnecting the blower motor wiring (and all other plugs) and removing the screws on either side of the sliding base. The base pulls out as shown in figure 9.

1-Blower Wheels (all units)

All units have two 18 in. x 15 in. (457 mm x 381 mm) blower wheels. Both wheels are driven by one motor.

2-Indoor Blower Motor B3 (all units)

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

⚠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

NOTE-The following is a generalized procedure and does not apply to all thermostat control systems.

1- Blower operation is dependent on the thermostat control system option that has been installed in the units. Refer to operation sequence of the control system installed for detailed descriptions of blower operation.

2- Generally, blower operation is set at the thermostat fan switch. With the fan switch in "ON" position and the **OCP** input is **"ON"**, the blower operates continuously. With the fan switch in "AUTO" position, the blower cycles with demand.

3- In most cases, the blower and entire unit will be off when the system switch is in the "OFF" position. The only exception is immediately after a heating demand when the blower control keeps the blower on until all heat is extracted from the heat exchanger.

B-Blower Access

1- Disconnect wiring connected to heating limit switches and mixed air sensor in units with an economizer. Disconnect blower harness at K3 contactor (CAV) or A96 inverter (VAV/Staged). Failure to do so could damage harness or components.

2- Remove screws on either side of blower assembly sliding base. See figure 9.

3- Pull base toward outside of unit.

C-Determining Unit CFM

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

2- With all access panels in place, measure static pressure external to unit (from supply to return). Blower performance data is based on static pressure readings taken in locations shown in figure 10.

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

3- Referring to blower tables in the front of this manual, use static pressure and RPM readings to determine unit CFM. Use table "FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE" when installing units with any of the optional accessories listed.

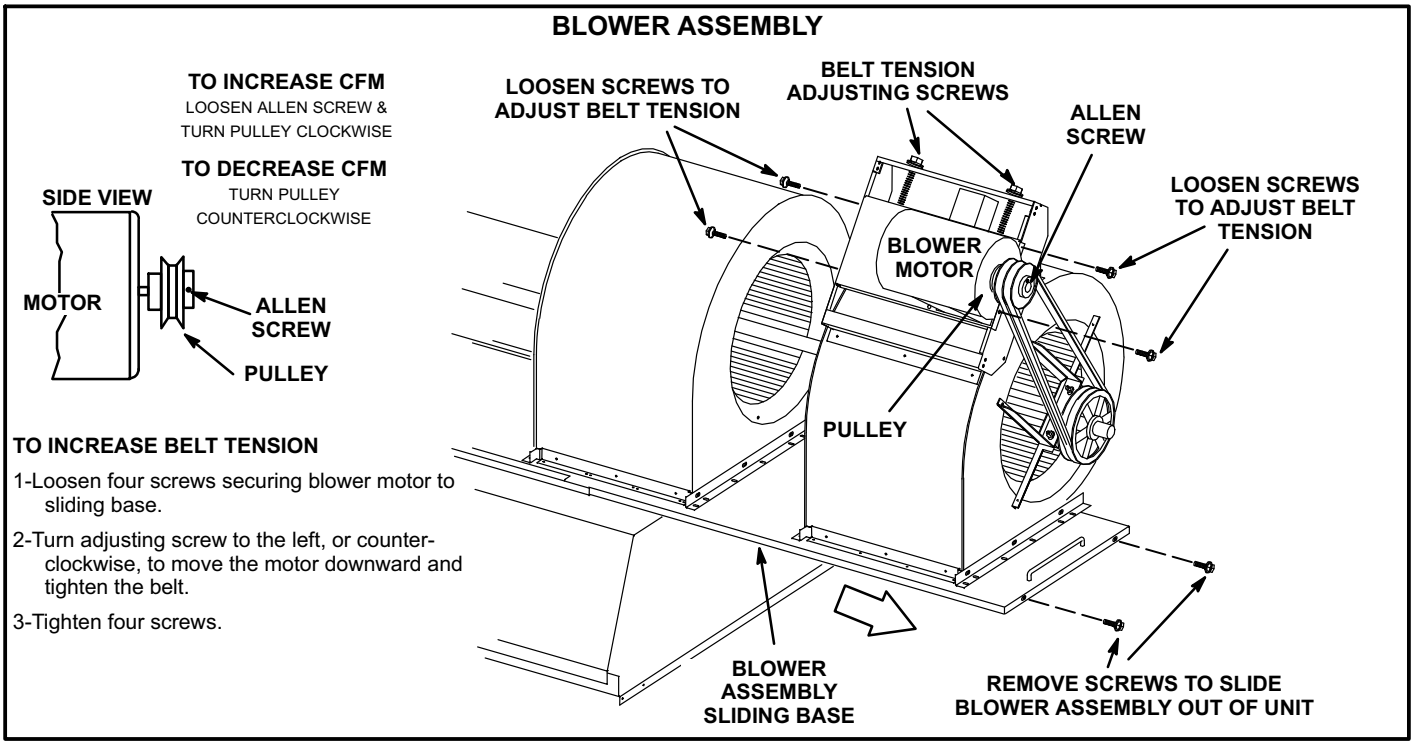


FIGURE 9

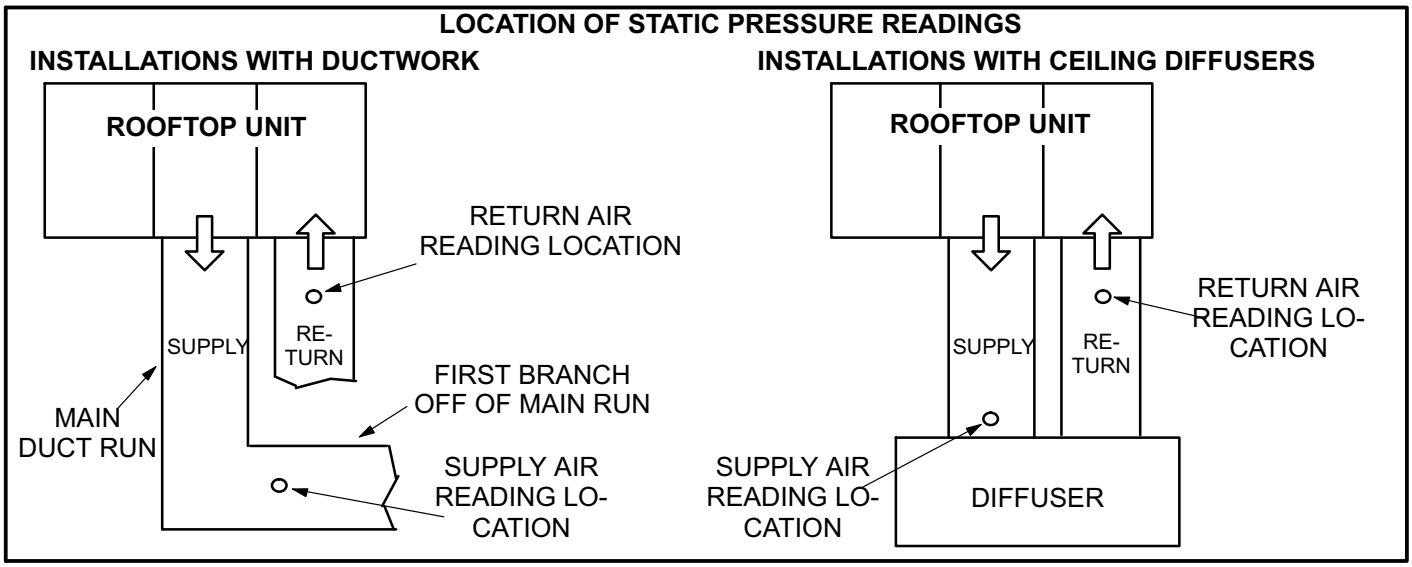


FIGURE 10

TABLE 1
MINIMUM AND MAXIMUM PULLEY ADJUSTMENT

Belt	Minimum Turns Open	Maximum Turns Open
A Section	No minimum	5
B Section	1*	6

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

4- *Constant Air Volume (CAV) Supply Air Blowers* - The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See figure 9. Do not exceed minimum and maximum number of pulley turns as shown in table 1.

5- *Variable Air Volume (VAV) Supply Air Blowers* - Adjust motor pulley to set-up maximum blower RPM and CFM at 60 HZ. Do not exceed brake horse power of the motor. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See figure 9. Do not exceed minimum and maximum number of pulley turns as shown in table 1.

After setting up the maximum CFM at 60HZ, the supply CFM can be adjusted at the Unit Controller or by using optional software. This value is adjusted through unit Parameter 390.

In default mode, the Unit Controller is set to drive the blower to maximum CFM output (100% or 60Hz). To

decrease the CFM, reduce the VAV maximum output. This output is adjusted through unit parameter 390.

For default blower maximum and minimum CFM output, refer to unit labels. To adjust the minimum blower output and the VAV minimum output refer to parameters 27 and 28.

D-Blower Belt Adjustment

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24-48 hour period of operation. This will allow belt to stretch and seat grooves. Make sure blower and motor pulley are aligned as shown in figure 11 for standard blowers and figure 12 for blowers equipped with an optional belt tensioner.

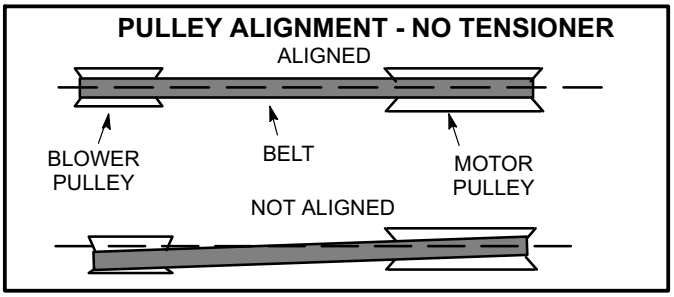


FIGURE 11

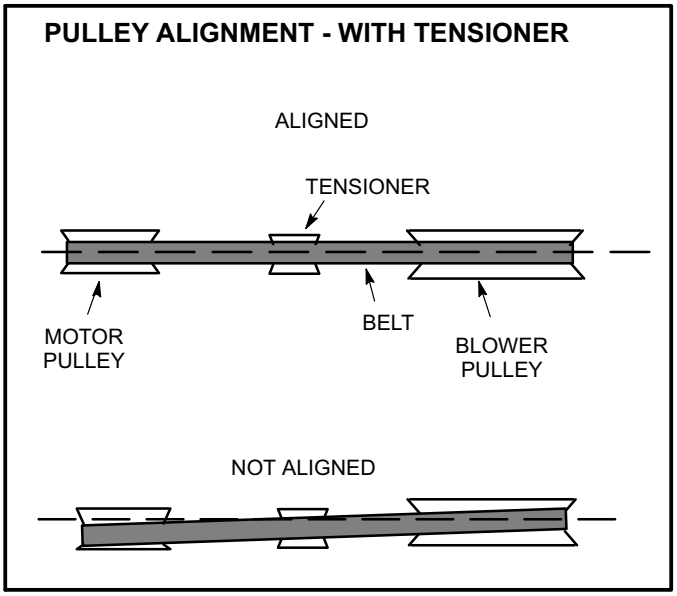


FIGURE 12

Standard Blowers

1- Loosen four screws securing blower motor to sliding base. See figure 9.

2- *To increase belt tension -*
Turn belt tension adjusting screw to the left, or counterclockwise, to tighten the belt. This increases the distance between the blower motor and the blower housing.

To loosen belt tension -
Turn the adjusting screw to the right, or clockwise to loosen belt tension.

3- Tighten four screws securing blower motor to sliding base once adjustments have been made.

Blowers Equipped With Belt Tensioner

1- Loosen the bolt in the center of the tensioner. See figure 13.

2- Place belt over all three pulleys as shown in blower assembly figure 13. Tensioner pulley must be oriented toward blower, not motor.

3- Using a 15/16" wrench on the tensioner body nut, turn the tensioner nut until marks align as shown in figure 13 (3rd mark).

4- Hold the tensioner with marks aligned and tighten the bolt to 22 ft.lbs. using the 9/16" wrench.

5- If tensioner pulley is past 7 o'clock when secured, turn belt tension adjusting screw to the left, or counterclockwise, to tighten the belt. This increases the distance between the blower motor and the blower housing.

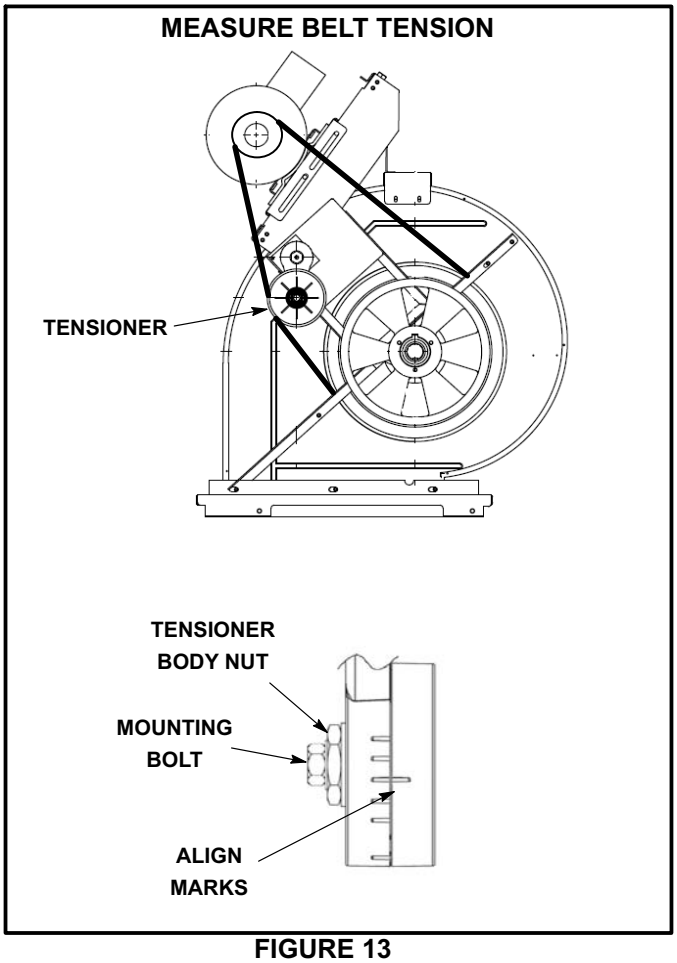


FIGURE 13

E-Check Belt Tension

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

1- Measure span length X. See figure 14.

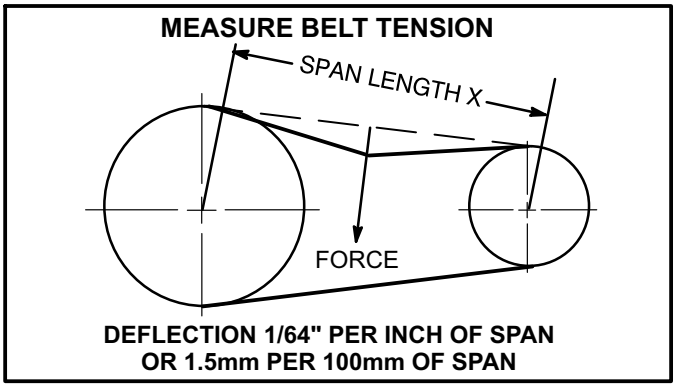


FIGURE 14

2- Apply perpendicular force to center of span (X) with enough pressure to deflect belt 1/64" for every inch of span length or 1.5mm per 100mm of span length.

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

   Example: Deflection distance of a 400mm span would be 6mm.

3- Measure belt deflection force. For a used belt, the deflection force should be 5 lbs. (35kPa). A new belt deflection force should be 7 lbs. (48kPa). A force below these values indicates an undertensioned belt. A force above these values indicates an overtensioned belt.

F-Furnished Blower Drives

For field furnished blower drives, see BLOWER DATA (table of contents) for CFM and RPM. The BLOWER DATA section also has tables for drive numbers and manufacturer's model numbers. Reference the manufacturer's model numbers in table 2.

TABLE 2
MANUFACTURER'S NUMBERS (60 HZ)

Drive No.	DRIVE COMPONENTS									
	ADJUSTABLE SHEAVE		FIXED SHEAVE		BELTS		BELTS W/ TENSIONER		SPLIT BUSHING	
	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.
1	1VP71x1-3/8	100239-06	BK140H	100788-13	BX78	100245-44	BX77	100245-43	H - 1-7/16	49M6201
2	1VP71x1-1/8	100239-06	BK120H	100788-07	BX75	31K9801	BX73	100245-41	H - 1-7/16	49M6201
3	1VP65x1-3/8	78M7101	BK130H	100788-08	BX75	31K9801	BX74	100245-42	H - 1-7/16	49M6201
4	1VP60x1-3/8	78L5501	BK110H	100788-06	BX71	31K9701	BX71	31K9701	H - 1-7/16	49M6201
5	1VP56x1-1/8	P-8-1492	BK120H	100788-07	BX71	31K9701	BX71	31K9701	H - 1-7/16	49M6201
6	1VP60x1-1/8	41C1301	BK110H	100788-06	BX70	31K9601	BX70	31K9601	H - 1-7/16	49M6201
7	1VP50x1-1/8	P-8-1977	BK120H	100788-07	BX70	31K9601	BX70	31K9601	H - 1-7/16	49M6201
8	1VP44x1-1/8	36C0701	BK120H	100788-07	BX70	31K9601	BX70	31K9601	H - 1-7/16	49M6201
9	1VP44x1-1/8	36C0701	BK140H	100788-13	BX73	100245-41	BX72	100245-14	H - 1-7/16	49M6201

D-GAS HEAT COMPONENTS (LGH Units)

Units are available in 260,000 Btuh (76.2 kW) standard gas heat, 360,000 Btuh (105.5 kW) medium gas heat and 480,000 Btuh (140.6 kW) high gas heat sizes. See unit nameplate for capacities. All units are equipped with two identical gas heat sections (gas heat section one and gas heat section two). Flexible pipe will feed supply gas to both sections. If for service the flexible connection must broken, hand tighten, then using a wrench turn additional 1/4 turn for metal to metal seal *(do not over tighten).*

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

1-Control Box Components A3, A12, A55, A178, T3, T13, K13 and K19

The main control box (see figure 2) houses the burner controls A3 and A12, Unit Controller A55 and A178, combustion air inducer transformers T3 and T13, combustion air inducer relay K13, and second heat section relay K19. For a description of the components see section I-A. A more detailed description of burner controls A3 and A12 is given below.

Burner Ignition Control A3 and A12

The ignition controls are located in the control box and are manufactured by Utec. See table 3 for LED codes.

The ignition control provides three main functions: gas valve control, ignition, and flame sensing.

On a heating demand, the ignition control checks for a closed limit switch. Once this check is complete and conditions are correct, the ignition control then allows 30 seconds for the combustion air inducer to vent exhaust gases from the burners. When the combustion air inducer is purging the exhaust gases, the combustion air prove switch closes proving that the combustion air inducer is operating before allowing the ignition control to energize. When the combustion air prove switch is closed and the delay is over, the ignition control activates the gas valve(s), the spark electrode and the flame sensing electrode. At the start of the ignition sequence, the adjustable 40 second (default) indoor blower delay period begins. Sparking stops immediately after flame is sensed or at the end of the 8 second trial for ignition. If flame is not sensed, A3 or A12 will wait 5 minutes before attempting ignition again. If the third trial fails, A3 or A12 will lock-out for one hour. The A55 counts this as a **first** strike. After the first lock-out hour elapses, A3 or A12 will attempt ignition three more times. If flame is still not sensed, A3 or A12 will lock-out for the second hour. A55 counts this as the **second** strike. After the second lockout hour, A3 or A12 will attempt ignition three more times. If ignition fails, A55 considers this the **third** strike and will lock-out unit operation. Service relay contacts close and alarm 59 or 69 is displayed. The unit will remain in lock-out until:

1-A55 is reset

or

2-The alarm condition is cleared **AND** the alarm status is read through the SBUS command.

Once the flame is sensed, the ignition control then proceeds to “steady state” mode where all inputs are monitored to ensure the limit switch, roll-out switch and prove switch are closed as well as flame is present. When the heat call is satisfied the gas valve and combustion air inducer are de-energized. An adjustable 120-second (default) blower off delay begins.

TABLE 3

UTEC	
LED Flashes	Indicates
Steady Off	No power or control hardware fault.
Steady On	Power applied. Control OK.
3 Flashes	Ignition lockout from too many trials.
4 Flashes	Ignition lockout from too many flame losses within single call for heat.
5 Flashes	Control hardware fault detected.

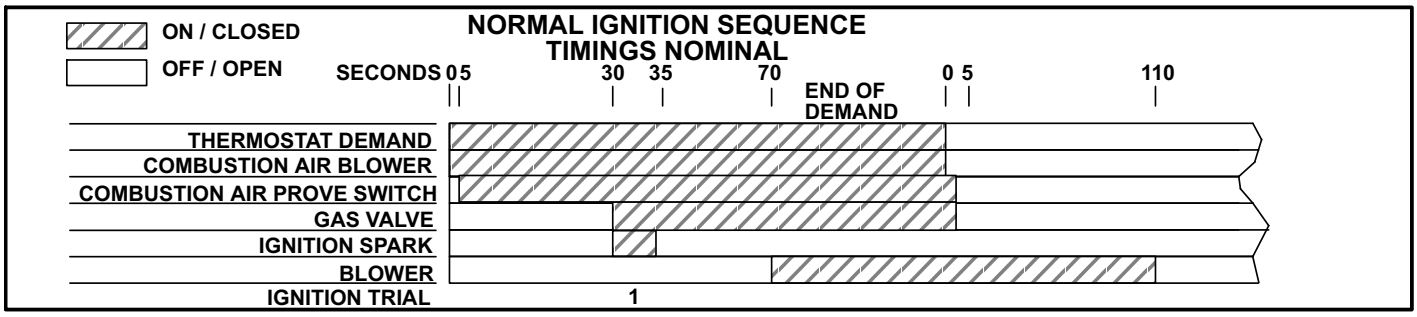


FIGURE 15

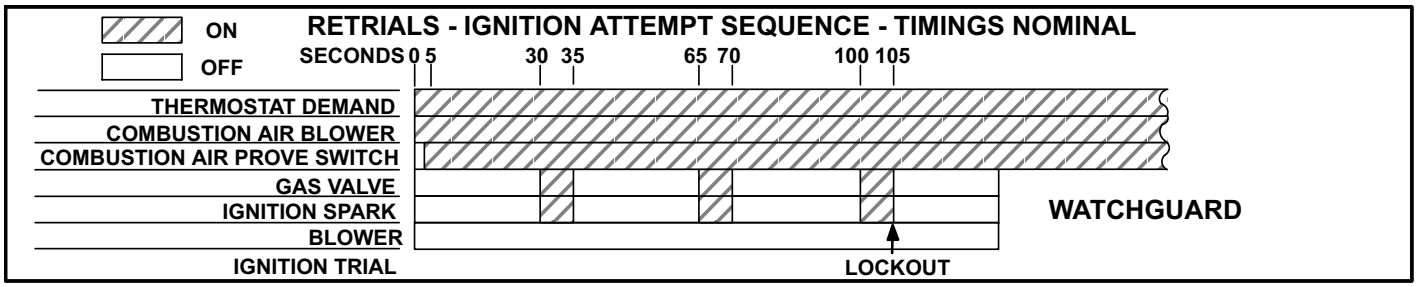


FIGURE 16

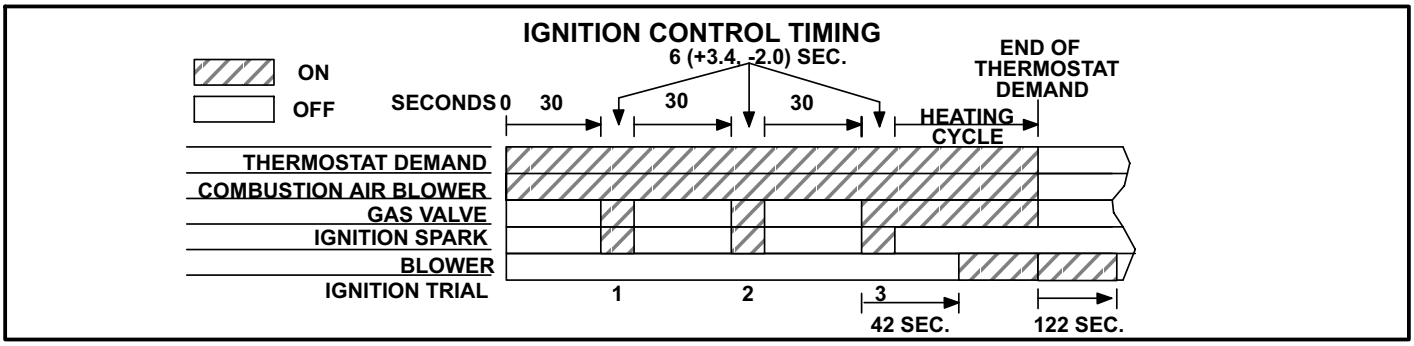


FIGURE 17

⚠ 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 THE CONTROL IS INOPERABLE, SIMPLY REPLACE THE ENTIRE CONTROL.

2-Heat Exchanger (Figures 18 and 19)
Two Styles used

The LGH units use aluminized steel inshot burners with matching tubular aluminized steel (stainless steel is an option) heat exchangers and two-stage redundant gas valves. LGH uses two eleven-tube/burners for high heat, two nine-tube burners for medium heat (if applicable, see unit nameplate) and two six-tube/burners for standard heat. Each burner uses a burner venturi to mix gas and air for proper combustion. Combustion takes place at each tube entrance. As hot combustion gases are drawn upward through each tube by the combustion air blower, exhaust gases are drawn out the top and fresh air/gas mixture is drawn in at the bottom. Heat is transferred to the air stream from all surfaces of the heat exchanger tubes. The supply air blowers, controlled by the Unit Controller A55, force air across all surfaces of the tubes to extract the heat of combustion. The shape of the tubes ensures maximum heat transfer.

The gas valves accomplish staging by providing more or less gas to the burners as required by heating demand.

3-Burner Assembly (Figure 20)

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

Burners

All units use inshot burners (see figures 20 and 21). Burners are factory set and do not require adjustment. A peep hole with cover is furnished in the heating access panel for flame viewing. Always operate the unit with the access panel in place. Burners can be removed individually for service. Burner maintenance and service is detailed in the SERVICE CHECKS sections of this manual.

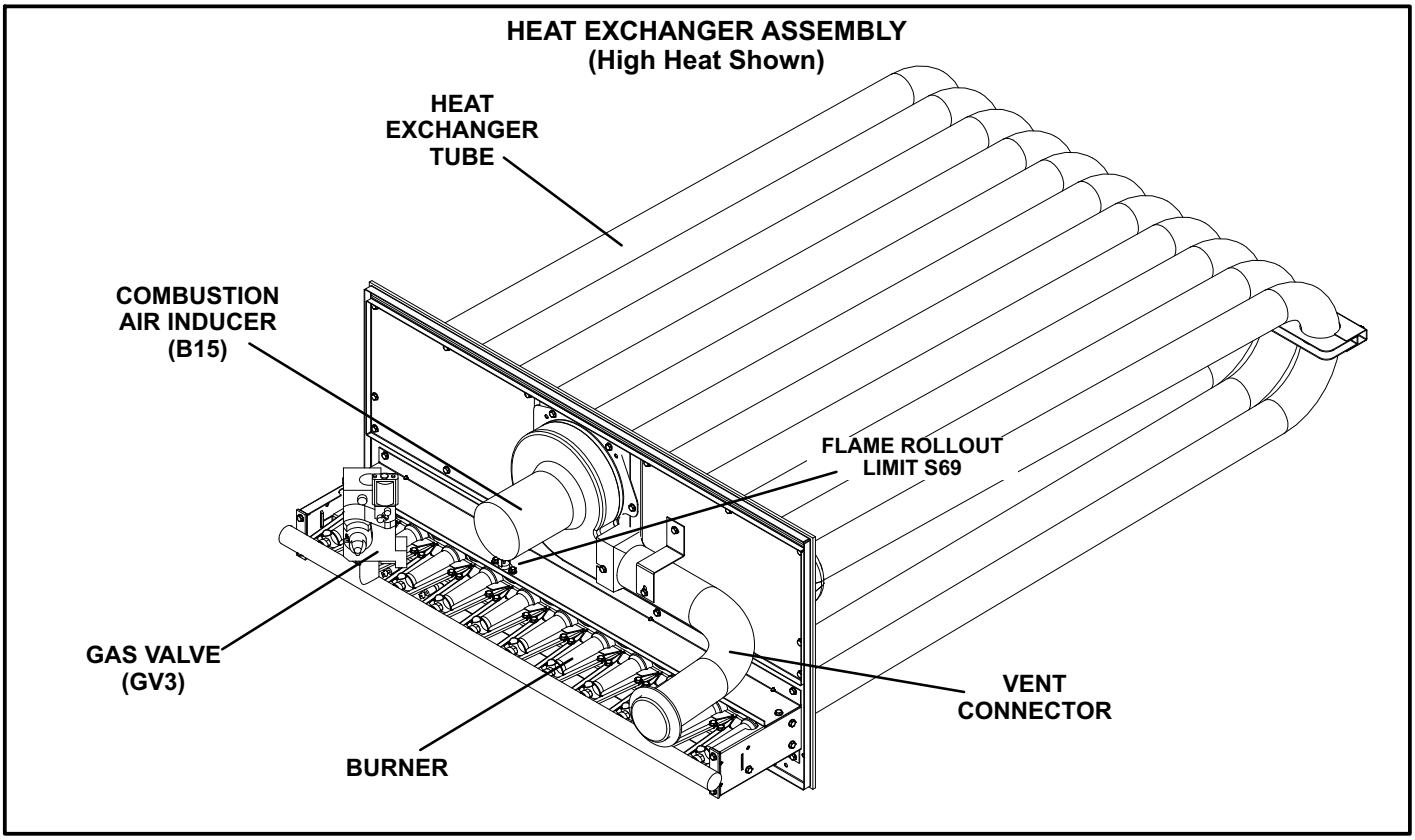


FIGURE 18

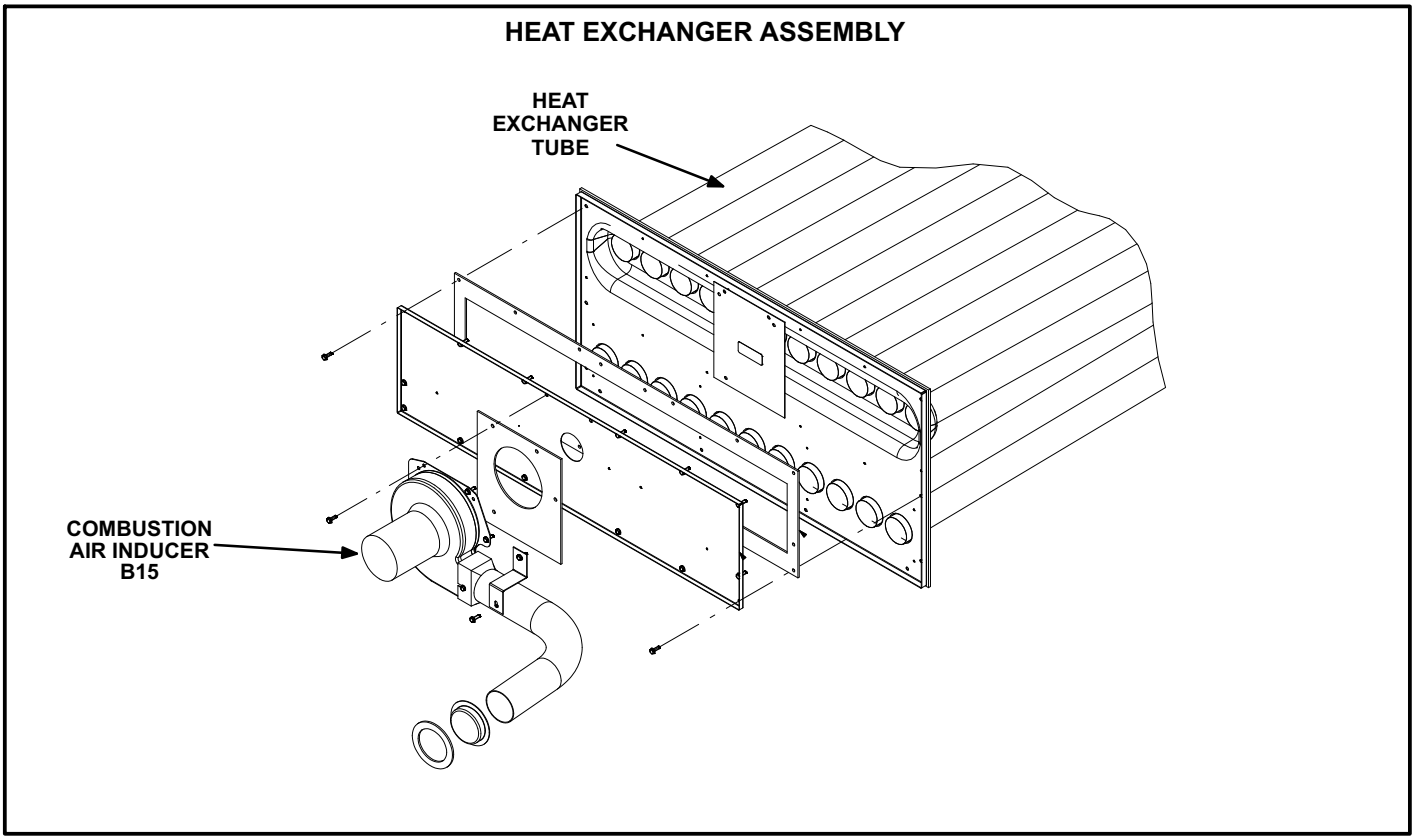


FIGURE 19

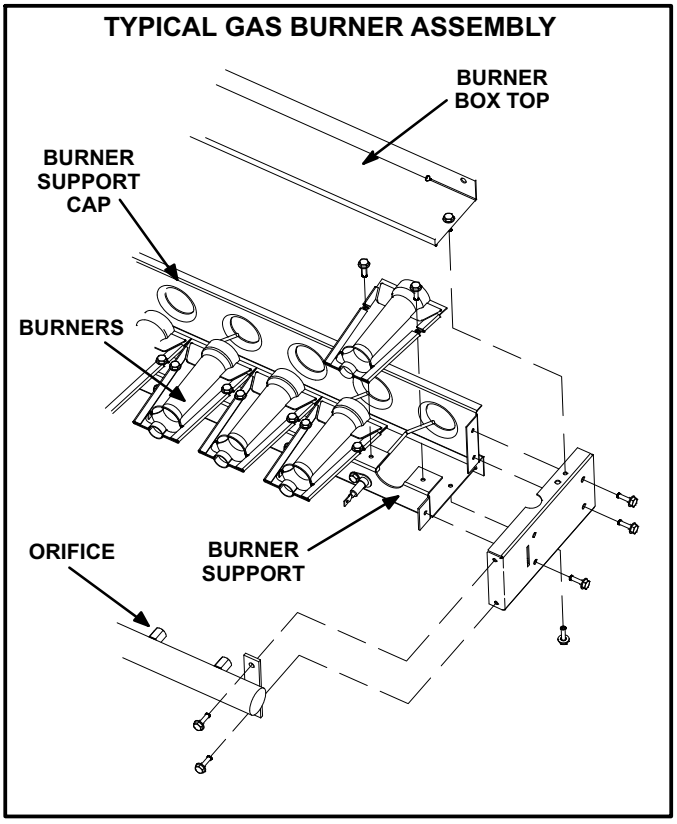


FIGURE 20

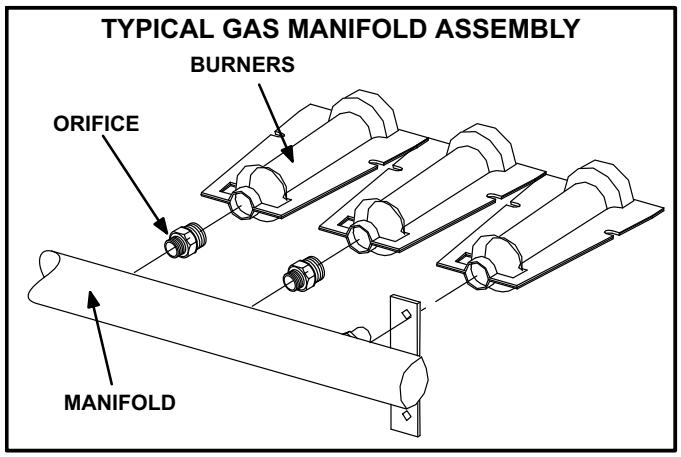


FIGURE 21

Orifice

Each burner uses an orifice which is precisely matched to the burner input. See figure 22 for the two types of orifices; install only orifices with the same threads. The orifice is threaded into the burner manifold. The burner is supported by the orifice and will easily slide off for service.

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

Each orifice and burner are sized specifically to the unit.

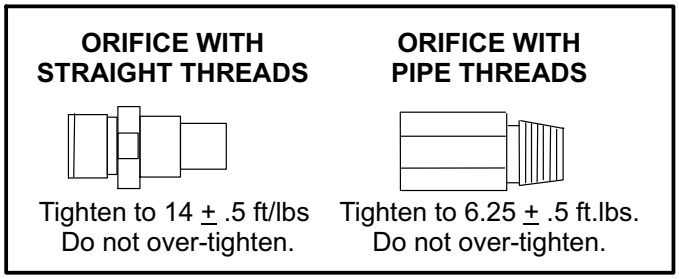


FIGURE 22

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

4-Primary High Temperature Limits S10 & S99

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

Figure 23 shows the location of S10 and S99 on the drip shield behind the blower housing. In this location, S10 and S99 serve as both primary and secondary limit.

Primary limit S10 is wired to the Unit Controller A55 which energizes burner 1 control (A3), while primary limit S99 is wired to the Unit Controller A178 which energizes burner 2 control (A12). Its N.C. contacts open to de-energize the ignition control when excessive temperature is reached in the blower compartment. At the same time, the N.O. contacts of S10 and S99 close energizing the blower relay coil K3 through control A55. If either limit trips the blower will be energized. Limit setpoints are factory-set and cannot be adjusted. If limit must be replaced, same type and setpoint must be used.

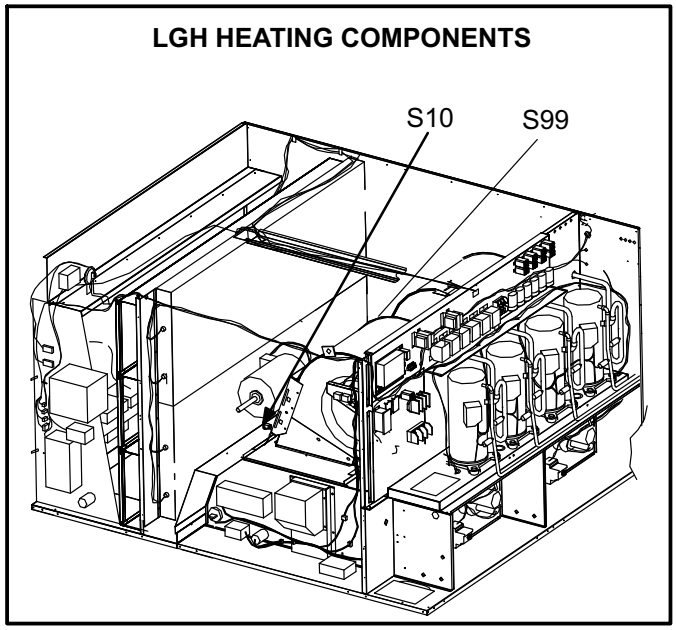


FIGURE 23

5-Flame Rollout Limits S47 and S69

Flame rollout limits S47 (first heat section) and S69 (second heat section) are SPST N.C. high temperature limits located just above the burner air intake opening in the burner enclosures (see figure 19). S47 and S69 are wired to the Unit Controller A55. When S47 or S69 senses flame rollout (indicating a blockage in the combustion air passages), the corresponding flame rollout limit trips, and the ignition control immediately closes the gas valve.

Limit S47 and S69 are factory preset to open at 290°F ± 12°F (143.3°C ± 6.7°C) on a temperature rise. All flame rollout limits are manual reset.

6-Combustion Air Prove Switches S18 & S45

Prove switches S18 (first heat section) and S45 (second heat section) are located in the compressor compartment. Switches are identical, SPST N.O. and monitor combustion air inducer operation. Switch S18 and S45 are wired to the Unit Controller A55. When the combustion air inducer is operating, a negative pressure is created in the compressor compartment. The switches close (on a pressure fall) allowing power to the heating sequence. When the combustion air inducer is not operating, the pressure builds in the compressor compartment. Switches open (on a pressure rise) to interrupt power to the heating sequence. The combustion air prove switches are factory-set and are not adjustable. Table 4 shows prove switch settings.

TABLE 4
S18 & S45 PROVE SWITCH SETTINGS

Close "wc (Pa)	Open "wc (Pa)
0.25 ± .05 (62.3 ± 12.4)	0.10 ± .05 (24.8 ± 12.4)

7-Combustion Air Inducers B6 and B15

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

Combustion air inducers use a 208/230V or 460V single-phase PSC motor and a 4.81in. x 1.25in. (122mm x 32mm) blower wheel. All motors operate at 3200 or 3450 RPM and are equipped with auto-reset overload protection. Inducers are supplied by various manufacturers. Ratings may vary by manufacturer. Specific inducer electrical ratings can be found on the unit rating plate.

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

8-Combustion Air Motor Capacitors C3 & C11

The combustion air inducer motors in all LGH units require run capacitors. Capacitor C3 is connected to combustion air inducer B6 and C11 is connected to combustion air inducer B15. Both capacitors are rated at 3 or 4 MFD for 208/230V inducers and 4 MFD for 460V inducers.

9-Gas Valves GV1 and GV3

Gas valves GV1 and GV3 are identical. The gas valves are two-stage redundant valves. Units are equipped with valves manufactured by Honeywell. Both first-stage (low fire) and second-stage (high fire) are quick opening (on and off in less than 3 seconds). On a call for first stage heat (low fire), the valve is energized by the ignition control simultaneously with the spark electrode. On a call for second stage heat (high fire), the second stage operator is energized directly from A55 (GV1) and (GV3). The valve is adjustable for both low fire and high fire. A manual shut-off knob is provided on the valve for shut-off. Manual shut-off knob immediately closes both stages without delay. Table 5 shows factory gas valve regulation for LGH series units. See table 6 for high altitude operating pressures.

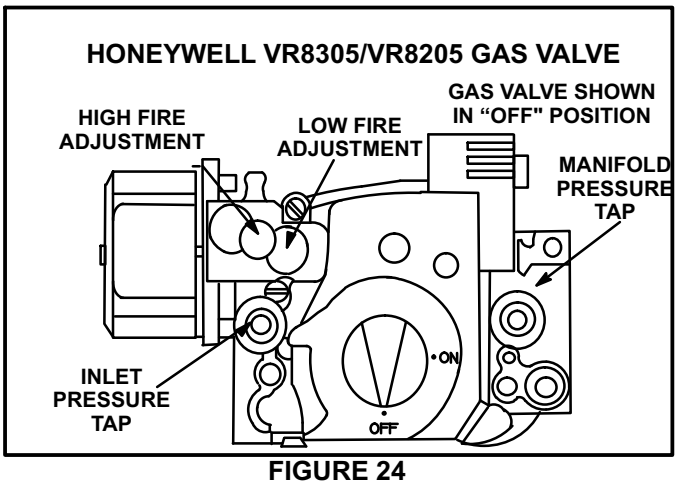


FIGURE 24

TABLE 5
GAS VALVE REGULATION FOR LGH UNITS

Operating Pressure (outlet) Factory Setting			
Natural		L.P.	
Low	High	Low	High
1.6±0.2"W.C. 398±50Pa	**3.7±0.3"W.C. 920±75Pa**	**5.5±0.3"W.C. 1368±75Pa**	**10.5±0.5"W.C. 2611±125Pa**

TABLE 6
HIGH ALTITUDE DERATE

Altitude Ft.*	Gas Manifold Pressure
2000-4500	See Unit Nameplate
4500 And Above	Derate 2% / 1000 Ft. Above Sea Level

*Units installed at 0-2000 feet do not need to be modified.

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

10-Spark Electrodes

An electrode assembly is used for ignition spark. Two identical electrodes are used (one for each gas heat section). The electrode is mounted through holes on the left-most end of the burner support. The electrode tip protrudes into the flame envelope of the adjacent burner. The electrode assembly is fastened to burner supports and can be removed for service without removing any part of the burners.

During ignition, spark travels through the spark electrode (figure 25) and ignites the left burner. Flame travels from burner to burner until all are lit.

The spark electrode is connected to the ignition control by a 8 mm silicone-insulated stranded high voltage wire. The wire uses 1/4" (6.35 mm)female quick connect on the electrode end and female spark plug-type terminal on the ignition control end.

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

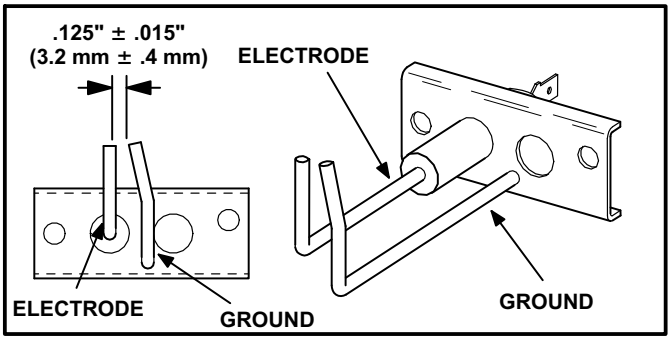


FIGURE 25

11-Flame Sensors

A flame sensor is located on the right side of each burner support. The sensor is mounted through a hole in the burner support and the tip protrudes into the flame envelope of the right most burner. The sensor assembly is fastened to burner supports and can be removed for service without removing any part of the burners. When flame is sensed by the flame sensor (indicated by microamp signal through the flame) sparking stops immediately. During operation, flame is sensed by current passed along the ground electrode (located on the spark electrode), through the flame and into the sensing electrode. The ignition control allows the gas valve to stay open as long as a flame signal (current passed through the flame) is sensed.

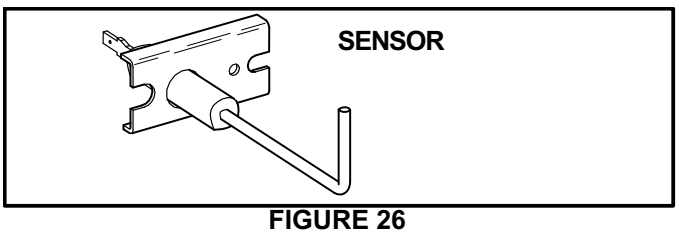


FIGURE 26

E-Optional Electric Heat Components

See ELECTRICAL/ELECTRIC HEAT DATA tables for possible LCH to EHA match-ups and electrical ratings.

EHA parts arrangement is shown in figures 27 and 28. All electric heat sections consist of electric heating elements exposed directly to the air stream. Two electric heat sections (first section and second section) are used in all 30kW through 120kW heaters. See figure 29. Multiple-stage elements are sequenced on and off in response to thermostat demand.

1-Main Control Box Components

A55, K9, A178

The main control box (see figure 2) houses the A55, A178 Unit Controller and the K9 electric heat relay. For a description of the components see section I-A.

2-Terminal Block TB3

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

3-Contactors K15, K16, K17 and K18

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

4-High Temperature Limits S15 and S107 (Primary)

S15 and S107 are SPST N.C. auto-reset thermostats located on the back panel of the electric heat section below the heating elements. S15 is the high temperature limit for the first electric heat section, while S107 is the high temperature limit for the second electric heat section. Both thermostats are identical and are wired to the A55 Unit Controller. When either S15 or S107 opens, indicating a problem in the system, contactor K15 is de-energized. When K15 is de-energized, first stage and all subsequent stages of heat are de-energized. The thermostats used on EHA360-45-2 Y/G/J volt are factory set to open at 200°F ± 5°F (93.3 C ± 2.8°C) on a temperature rise and automatically reset at 160°F ± 6°F (71.14°C ± 3.3°C) on a temperature fall. All other electric heat sections thermostats are factory-set to open at 170°F ± 5°F (76.7°C ± 2.8°C) on a temperature rise and automatically reset at 13°F ± 6°F (54.4°C ± 3.3°C) on a temperature fall. The thermostats are not adjustable.

5-Heating Elements HE1 through HE14

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

6-Fuse F3

Fuse F3 are housed in a fuse block which holds three fuses. Each F3 fuse is connected in series with each leg of electric heat. Figure 28 and table 7 show the fuses used with each electric heat section. For simplicity, the service manual labels the fuses F3 - 1 through F3 - 8.

EHA 30, 45, 60, 90 and 120 KW
ELECTRIC HEAT SECTION PARTS ARRANGEMENT

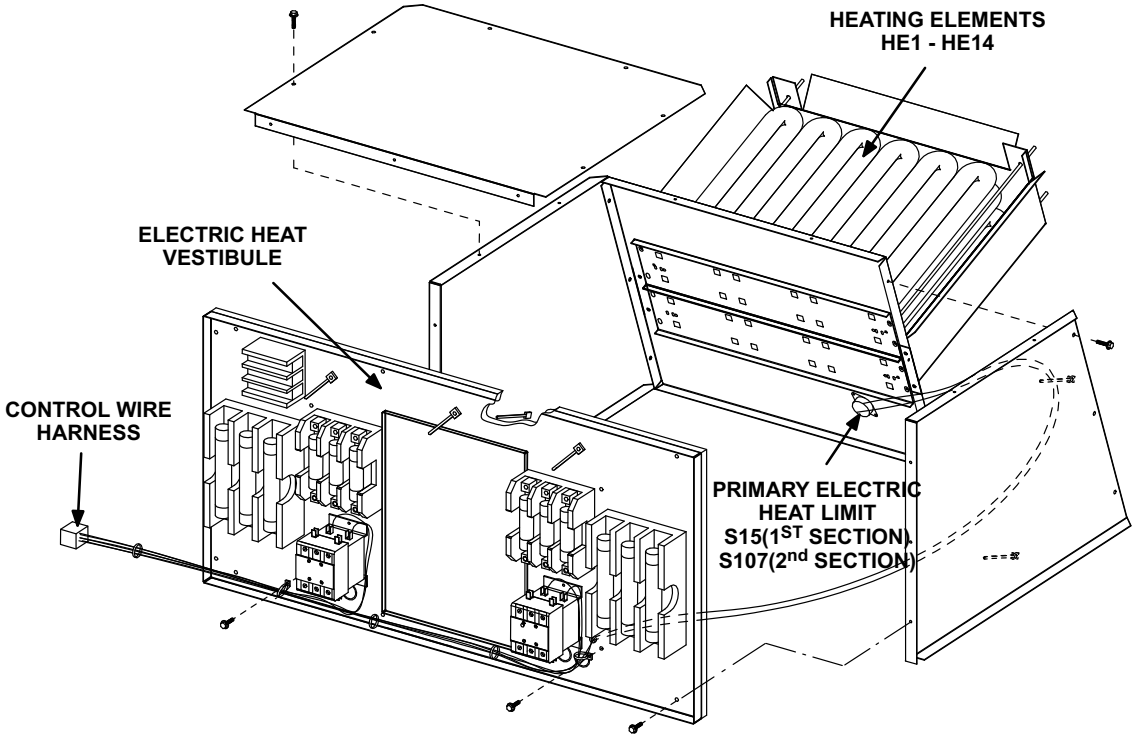
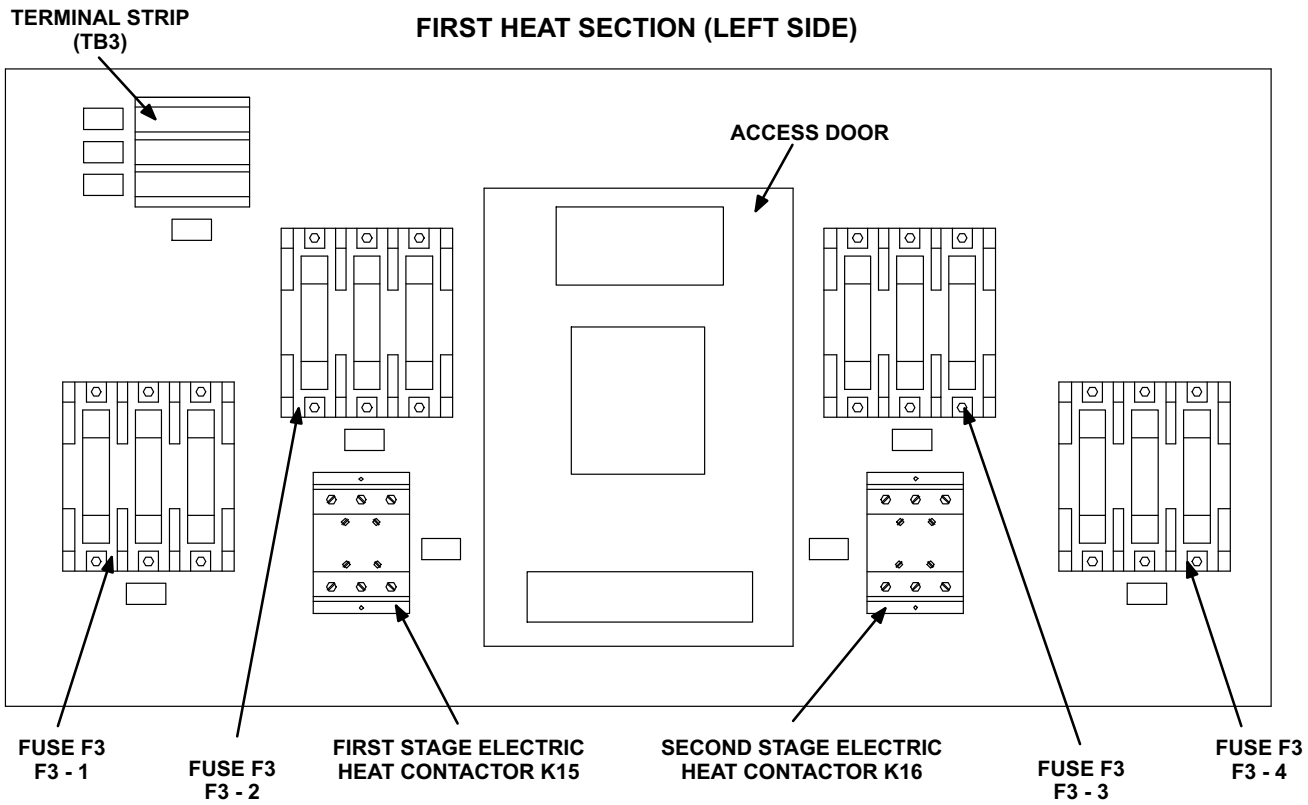


FIGURE 27

ELECTRIC HEAT VESTIBULE PARTS ARRANGEMENT



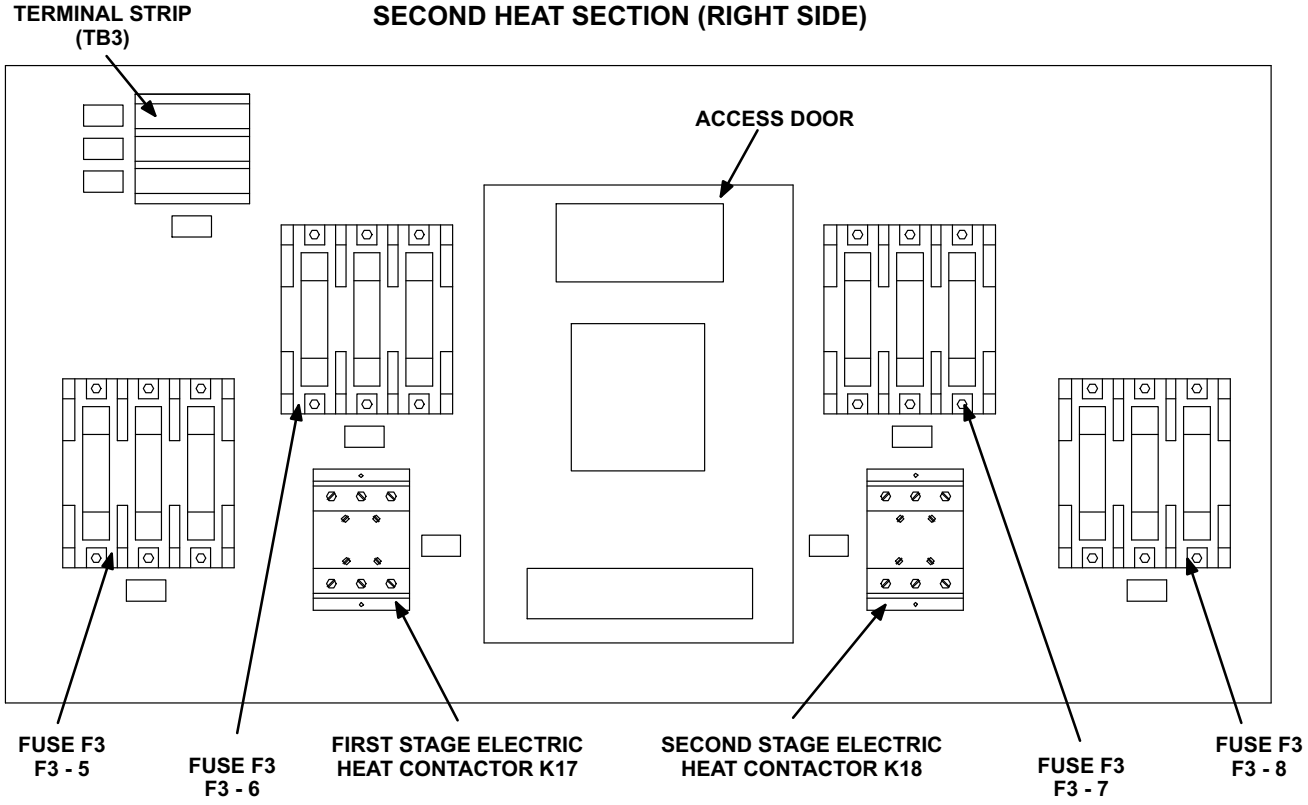


FIGURE 28

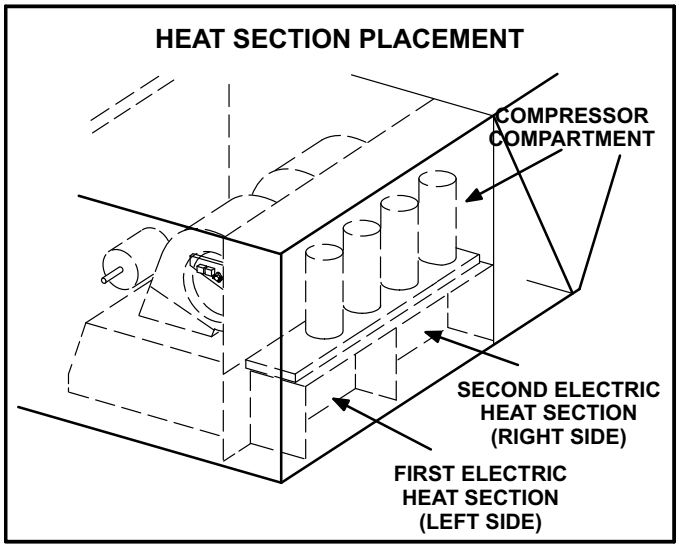


FIGURE 29

TABLE 7

LCH ELECTRIC HEAT SECTION FUSE RATING									
EHA QUANTITY & SIZE	**VOLTAGES**	**FUSE (3 each)**							
		F3 - 1	**F3 - 2**	**F3 - 3**	**F3 - 4**	**F3 - 5**	**F3 - 6**	**F3 - 7**	**F3 - 8**
(1) EHA360-15 & (1) EHA360S-15 (30 kW Total) or (1) EHA156-15 & (1) EHA156S-15	208/230V	60 Amp 250V	60 Amp 250V	-----	-----	-----	-----	-----	-----
	460V	50 Amp 600V	-----	-----	-----	-----	-----	-----	-----
	575V	40 Amp 600V	-----	-----	-----	-----	-----	-----	-----
(2) EHA360-22.5 (45 kW Total) or (2) EHA156-22.5	208/230V	50 Amp 250V	-----	-----	25 Amp 250V	50 Amp 250V	-----	-----	25 Amp 250V
	460V	25 Amp 600V	-----	-----	15 Amp 600V	25 Amp 600V	-----	-----	15 Amp 600V
	575V	20 Amp 600V	-----	-----	10 Amp 600V	20 Amp 600V	-----	-----	10 Amp 600V
(2) EHA150-30 (60 kW Total) or (2) EHA156-30	208/230V	50 Amp 250V	-----	-----	50 Amp 250V	50 Amp 250V	-----	-----	50 Amp 250V
	460V	25 Amp 600V	-----	-----	25 Amp 600V	25 Amp 600V	-----	-----	25 Amp 600V
	575V	20 Amp 600V	-----	-----	20 Amp 600V	20 Amp 600V	-----	-----	20 Amp 600V
(2) EHA360-45 (90 kW Total)	208/230V	50 Amp 250V	-----	60 Amp 250V	60 Amp 250V	50 Amp 250V	-----	60 Amp 250V	60 Amp 250V
	460V	25 Amp 600V	-----	-----	50 Amp 600V	25 Amp 600V	-----	-----	50 Amp 600V
	575V	20 Amp 600V	-----	-----	40 Amp 600V	20 Amp 600V	-----	-----	40 Amp 600V
(2) EHA150-60 (120 kW Total)	208/230V	60 Amp 250V	60 Amp 250V	60 Amp 250V	60 Amp 250V	60 Amp 250V	60 Amp 250V	60 Amp 250V	60 Amp 250V
	460V	50 Amp 600V	-----	-----	50 Amp 600V	50 Amp 600V	-----	-----	50 Amp 600V
	575V	40 Amp 600V	-----	-----	40 Amp 600V	40 Amp 600V	-----	-----	40 Amp 600V

II-PLACEMENT AND INSTALLATION

Make sure the unit is installed in accordance with the installation instructions and all applicable codes. See accessories section for conditions requiring use of the optional roof mounting frame (LARMF18/36 or LARMFH30/36).

III-STARTUP - OPERATION - CHARGING

IMPORTANT-The crankcase heater must be energized for 24 hours before attempting to start compressor. Set thermostat so there is no demand to prevent compressors from cycling.

⚠ WARNING

Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.

Failure to follow this warning may result in personal injury or death.

NOTE - These units must not be used as a "construction heater" at any time during any phase of construction. Very low return air temperatures, harmful vapors, and misplacement of the filters will damage the unit and its efficiency. Additionally, a unit which will be subject to cold temperatures when not in operation must have a vapor barrier installed to seal the duct connections. Failure to protect the unit from moisture laden air or harmful vapors (generated from the construction process and temporary combustion heating equipment) will cause corrosive condensation within the unit. Failure to properly protect the unit in this situation will cause electrical and electronic component failure and could affect the unit warranty status.

A-Preliminary Checks

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 in place before start-up.

B-Cooling Start-Up

1- Initiate first and second stage cooling demands according to instructions provided with thermostat.

2- First-stage thermostat demand will energize compressors 1 and 2. Second-stage thermostat demand will energize compressors 3 and 4. On units with an economizer, when outdoor air is acceptable, a first-stage demand will energize the economizer; a second-stage demand will energize compressors 1 and 2.

3- Units contain four refrigerant circuits or systems. Evaporator and condenser coil refrigerant circuits 1 and 2 make up stage 1 cooling. Evaporator and condenser refrigerant circuits 3 and 4 make up stage 2 cooling. See figures 7 and 8.

4- Each refrigerant circuit is separately charged with R410A refrigerant. See unit rating plate for correct amount of charge.

5- Refer to Cooling Operation and Adjustment section for proper method to check refrigerant charge.

Three Phase Scroll Compressor Voltage Phasing

Three phase scroll compressors must be phased sequentially to ensure correct compressor and blower* rotation and operation. Compressor and blower are wired in phase at the factory. Power wires are color-coded as follows: line 1-red, line 2-yellow, line 3-blue.

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

2- Suction pressure must drop, discharge pressure must rise, and blower rotation must match rotation marking.

If pressure differential is not observed or blower rotation is not correct:

3- Disconnect all remote electrical power supplies.

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

5- Make sure the connections are tight.

Discharge and suction pressures should operate at their normal start-up ranges.

*Supply air VFD motors should always rotate in the correct direction regardless of voltage phasing. Verify scroll compressor rotation separately. Contact technical support if the VFD blower is rotating incorrectly.

R410A Refrigerant

Units charged with R410A refrigerant operate at much higher pressures than R22. The expansion valve and liquid line drier provided with the unit are approved for use with R410A. Do not replace them with components designed for use with R22.

R410A refrigerant is stored in a pink cylinder.

⚠IMPORTANT

Mineral oils are not compatible with R410A. If oil must be added, it must be a polyol ester oil.

Manifold gauge sets used with systems charged with R410A refrigerant must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 0-800 on the high side and a low side of 30" vacuum to 250 psi with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psi of pressure with a 4000 psi burst rating.

Turn off power to the unit.

C-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.*

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:

IMPORTANT - Charge unit in standard cooling mode.

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- Check each system separately with all stages operating. Compare the normal operating pressures (see tables 8 - 12) 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 appropriate circuit 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 (near the liquid service tap).

- 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 LGH/LCH242H Circuit 1: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 98°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

TABLE 8

LGH/LCH242 VAV Normal Operating Pressures												
	Outdoor Coil Entering Air Temperature											
	65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	97	232	99	268	102	309	104	358	104	407	109	465
	106	234	109	269	111	310	113	358	116	409	118	467
	129	241	126	275	129	318	132	363	134	416	139	469
	148	247	152	283	148	325	152	372	154	422	158	475
Circuit 2	103	225	104	263	107	303	108	353	108	407	113	471
	110	227	113	262	116	305	117	354	119	407	122	473
	133	236	130	267	133	313	135	358	138	414	141	475
	151	243	155	275	152	319	155	366	158	420	160	478
Circuit 3	117	237	118	273	120	321	122	370	123	422	125	478
	126	239	128	272	130	322	131	371	133	422	135	479
	149	245	148	280	149	328	151	376	153	430	157	483
	169	254	173	288	170	335	173	383	176	435	179	485
Circuit 3	118	234	120	271	122	313	124	361	124	409	129	471
	127	236	129	270	131	317	133	364	136	411	139	475
	150	244	149	277	150	325	153	370	156	421	159	476
	169	254	172	289	172	331	174	379	178	428	180	482

TABLE 9

LGH/LCH300H CAV Normal Operating Pressures												
	Outdoor Coil Entering Air Temperature											
	65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	103	243	105	282	108	327	110	377	112	429	114	489
	112	244	114	283	116	327	119	378	121	432	124	489
	131	251	133	289	136	334	138	383	140	434	143	496
	147	259	154	299	157	342	160	390	163	444	167	499
Circuit 2	105	251	108	291	109	337	112	391	113	456	115	552
	114	254	116	293	118	339	120	392	122	453	125	537
	135	258	137	297	138	343	140	394	142	449	144	520
	150	268	158	306	161	351	165	399	167	455	168	513
Circuit 3	107	237	109	277	111	323	112	379	114	434	117	494
	116	239	118	280	120	324	122	377	124	432	126	495
	136	245	138	285	140	330	142	381	144	431	146	499
	151	250	159	295	161	339	164	387	166	443	169	502
Circuit 4	102	252	105	293	108	328	110	393	112	449	114	523
	109	256	114	297	116	345	118	399	121	455	123	529
	130	261	133	303	135	348	137	402	139	456	141	525
	148	266	156	312	158	358	161	407	163	464	166	526

TABLE 10

LGH/LCH300H VAV/STAGED SUPPLY AIR Normal Operating Pressures												
	Outdoor Coil Entering Air Temperature											
	65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	91	273	96	304	99	354	102	400	106	451	114	505
	102	278	107	315	110	356	112	404	114	455	119	509
	120	287	124	323	127	368	130	409	132	460	138	522
	140	297	142	332	146	372	151	422	154	467	158	525
Circuit 2	100	264	105	306	104	345	107	393	109	450	112	514
	107	269	111	306	113	348	116	395	118	452	121	515
	125	276	128	312	131	357	134	399	137	451	140	517
	146	284	148	318	151	359	155	410	158	456	161	520
Circuit 3	114	279	117	317	120	366	122	417	125	475	129	539
	124	282	128	323	130	370	132	420	134	478	137	539
	144	294	146	332	149	378	151	423	153	478	158	542
	151	298	167	339	170	383	174	436	177	484	181	546
Circuit 4	116	268	122	311	121	349	123	397	125	452	128	508
	125	270	128	309	130	353	132	400	135	454	136	512
	143	283	145	319	148	364	151	405	154	455	156	519
	151	288	165	327	169	369	173	419	176	466	179	525

TABLE 11

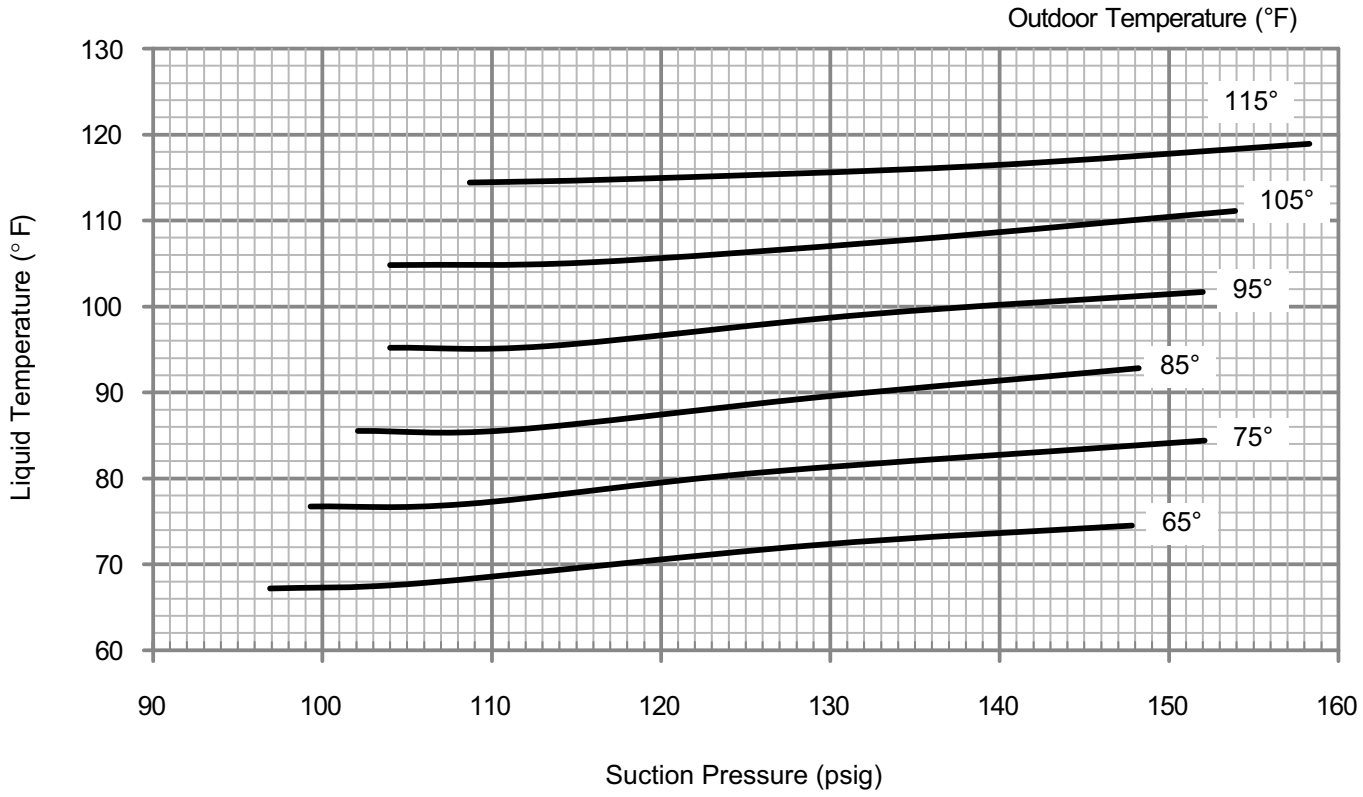
LGH/LCH360 CAV Normal Operating Pressures												
	Outdoor Coil Entering Air Temperature											
	65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	96	254	102	295	105	338	107	393	107	446	111	511
	106	260	111	298	112	345	115	395	117	448	120	508
	126	267	131	307	133	356	135	399	137	456	140	511
	144	275	151	318	154	360	157	412	159	462	162	525
Circuit 2	98	255	104	301	106	349	108	405	109	477	113	563
	108	262	112	305	114	353	116	408	118	468	121	547
	129	272	133	313	135	363	136	407	138	468	141	532
	146	279	154	326	156	369	159	423	160	474	162	540
Circuit 3	99	253	108	299	110	345	112	400	113	452	116	525
	110	256	116	302	118	348	120	398	122	452	125	518
	132	266	137	314	139	362	140	405	142	460	145	522
	148	281	156	326	159	372	162	425	164	478	166	537
Circuit 4	102	258	104	313	106	359	110	414	110	471	114	544
	112	267	112	320	115	366	116	418	118	471	121	539
	130	287	133	330	136	378	137	422	138	479	142	541
	148	298	153	345	157	392	159	444	162	497	163	558

TABLE 12

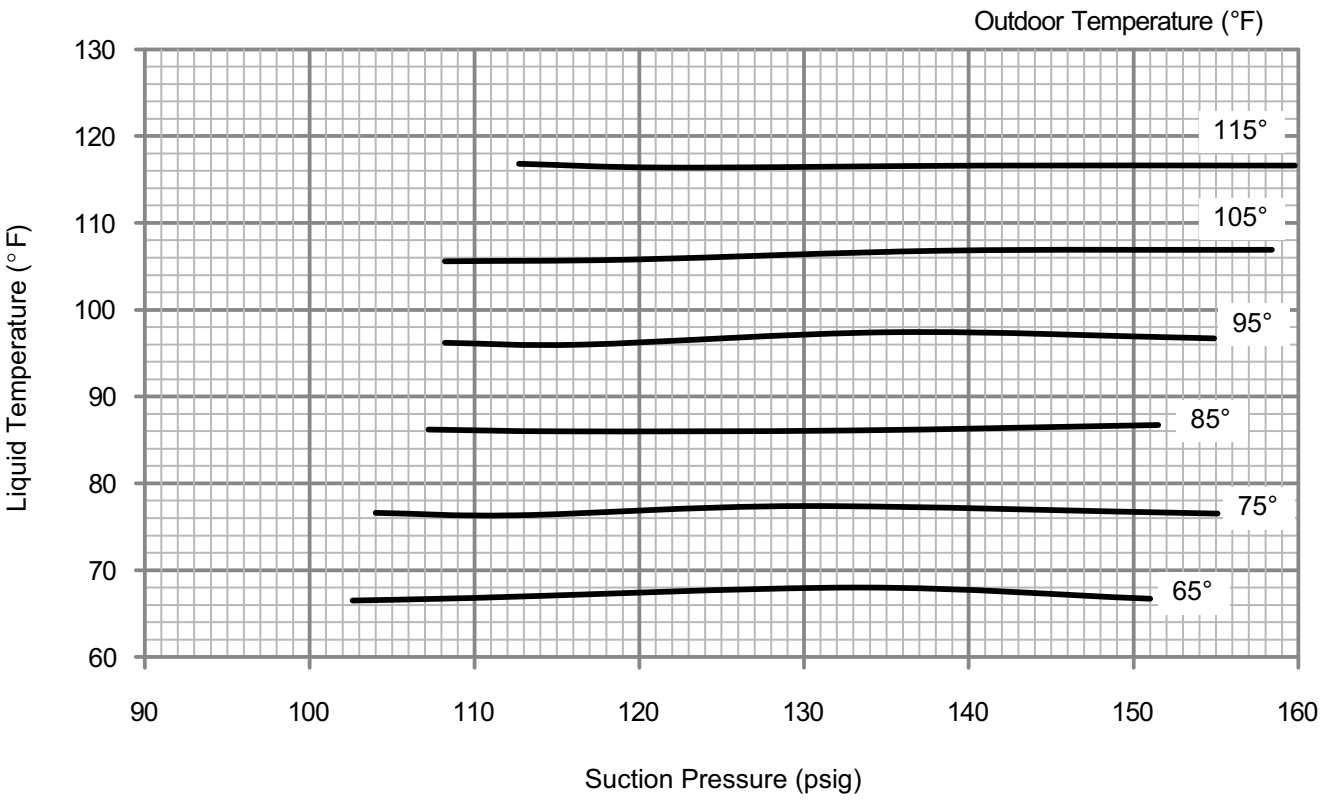
LGH/LCH360 VAV/STAGED SUPPLY AIR Normal Operating Pressures

	Outdoor Coil Entering Air Temperature											
	65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
Circuit 1	88	252	90	301	97	351	98	388	102	450	104	516
	100	255	102	305	105	355	107	403	111	456	113	523
	115	268	119	314	123	361	125	403	129	463	129	527
	133	282	137	327	140	371	144	425	147	473	152	544
Circuit 2	97	257	100	303	102	349	104	385	106	447	107	524
	104	256	107	305	110	353	112	399	115	451	117	523
	121	270	125	313	128	355	130	397	134	454	134	521
	135	280	140	322	145	364	148	416	151	464	154	535
Circuit 3	106	272	110	319	115	366	116	404	118	469	120	537
	118	266	120	320	123	375	124	422	127	472	130	545
	137	285	139	332	142	379	144	418	147	477	148	544
	155	294	158	344	161	393	164	443	167	492	172	563
Circuit 4	113	258	115	304	117	349	119	384	121	445	123	511
	119	253	122	305	125	356	128	399	130	450	132	520
	138	280	142	320	145	359	147	400	149	456	151	521
	156	293	159	333	163	374	166	424	169	471	173	539

LGH/LCH242 VAV Circuit 1 Charging Curve



LGH/LCH242 VAV Circuit 2 Charging Curve



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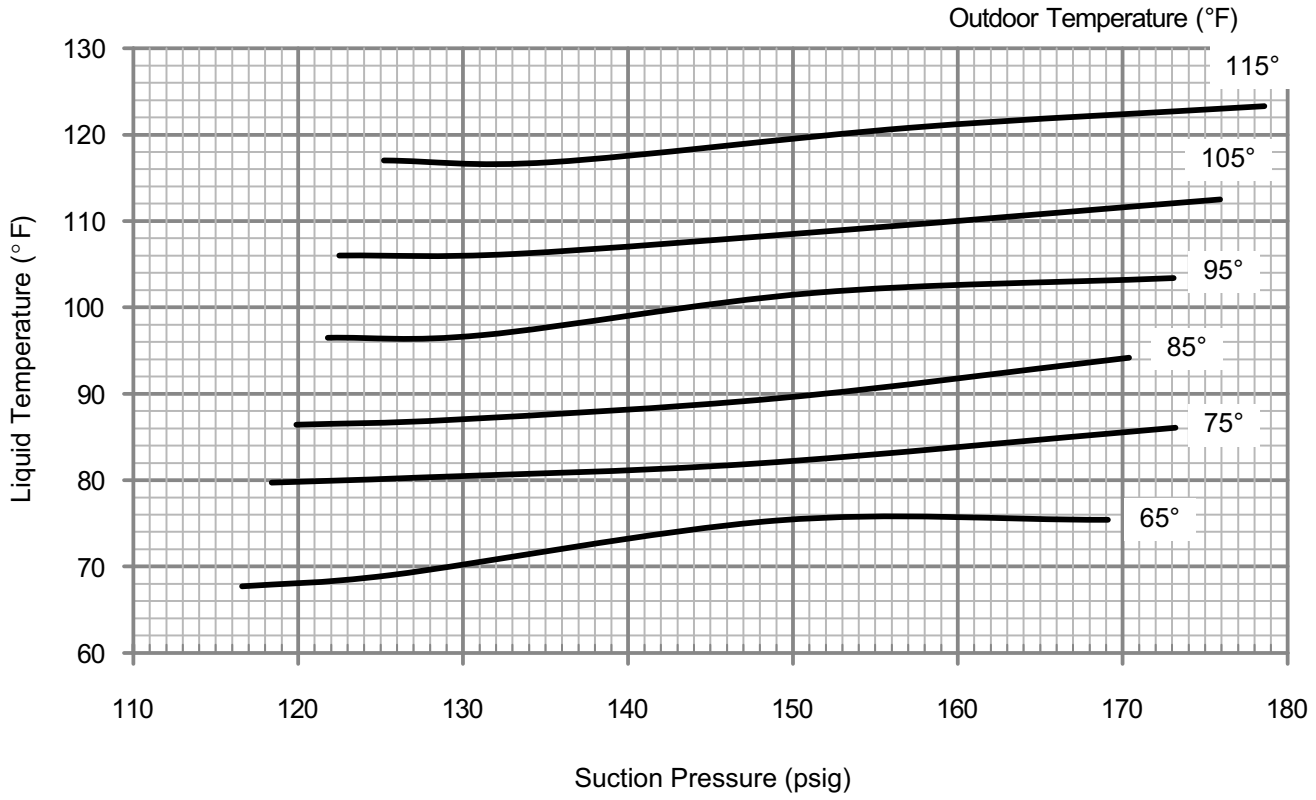

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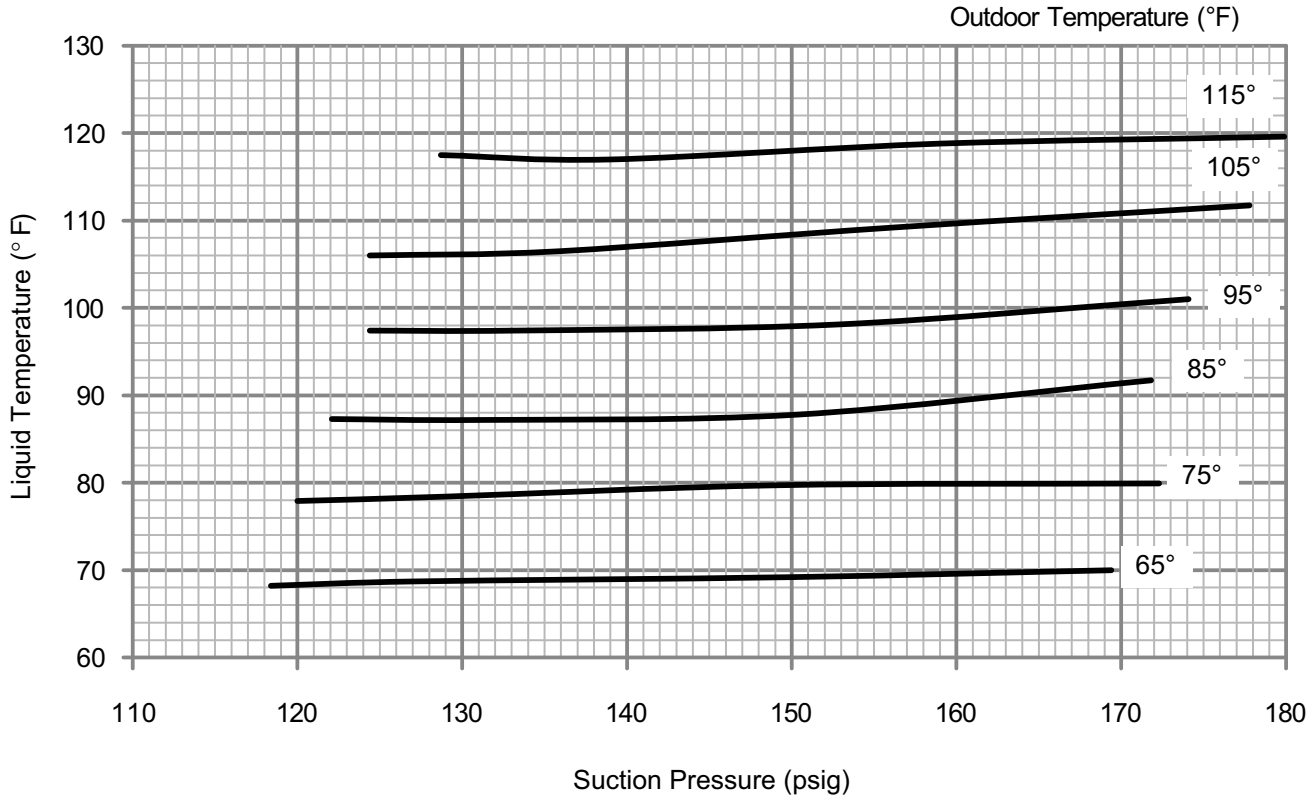
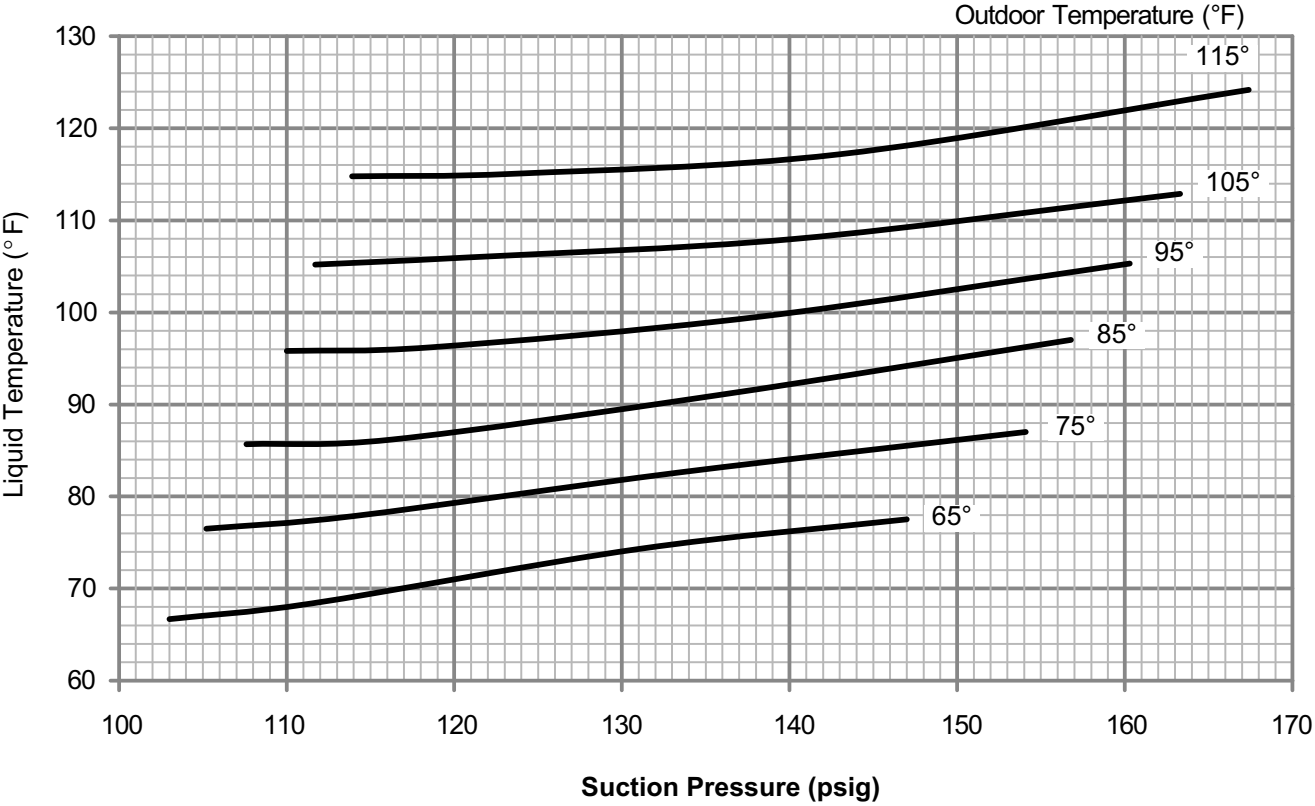


LGH/LCH300H CAV Circuit 1 Charging Curve



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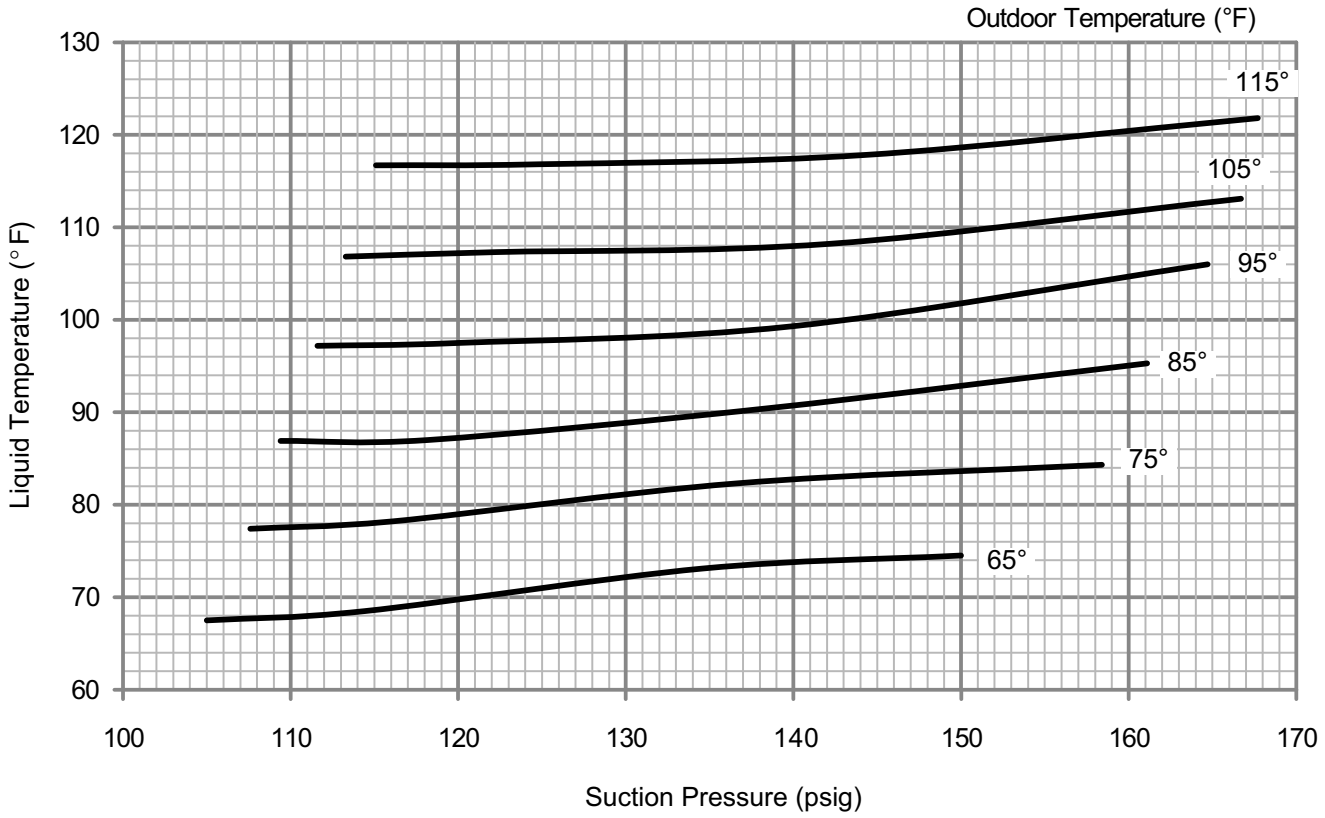

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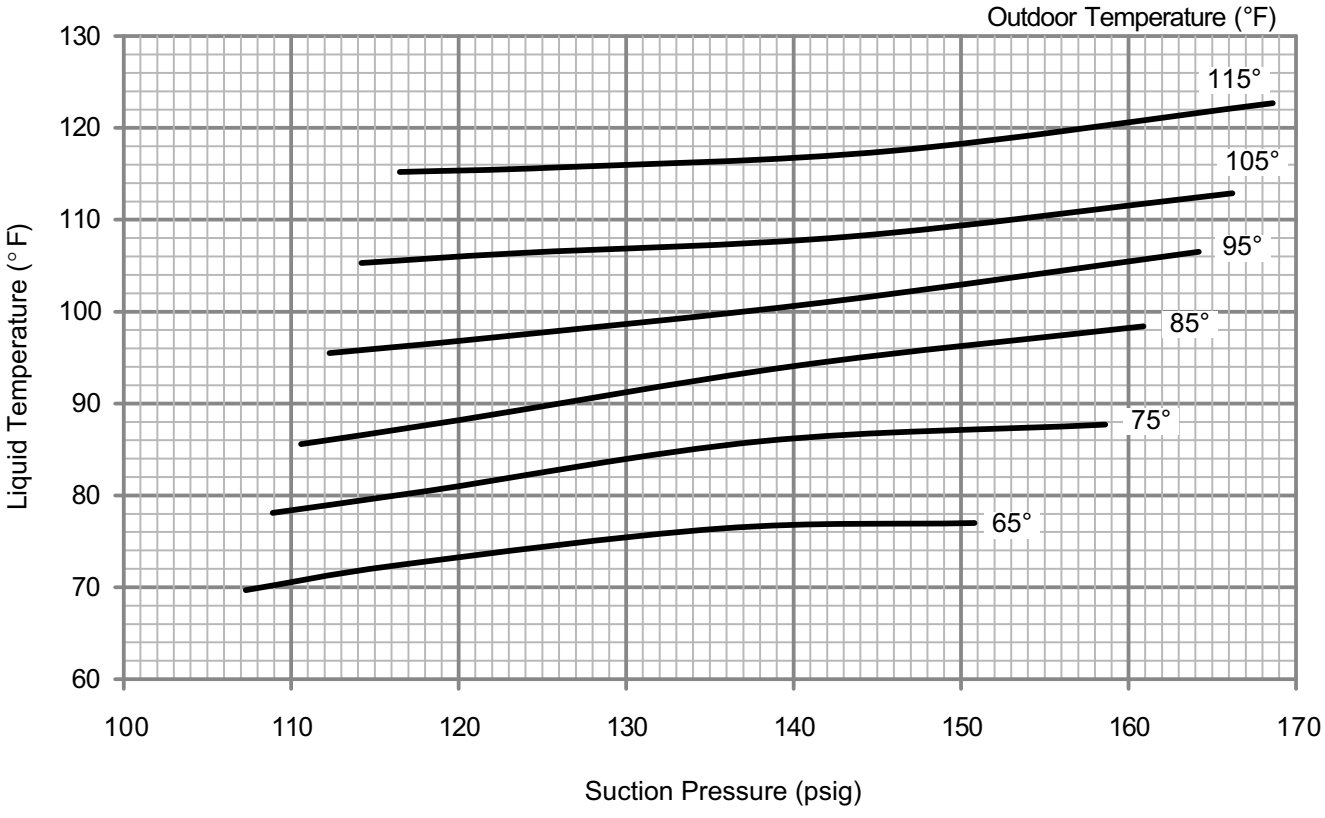

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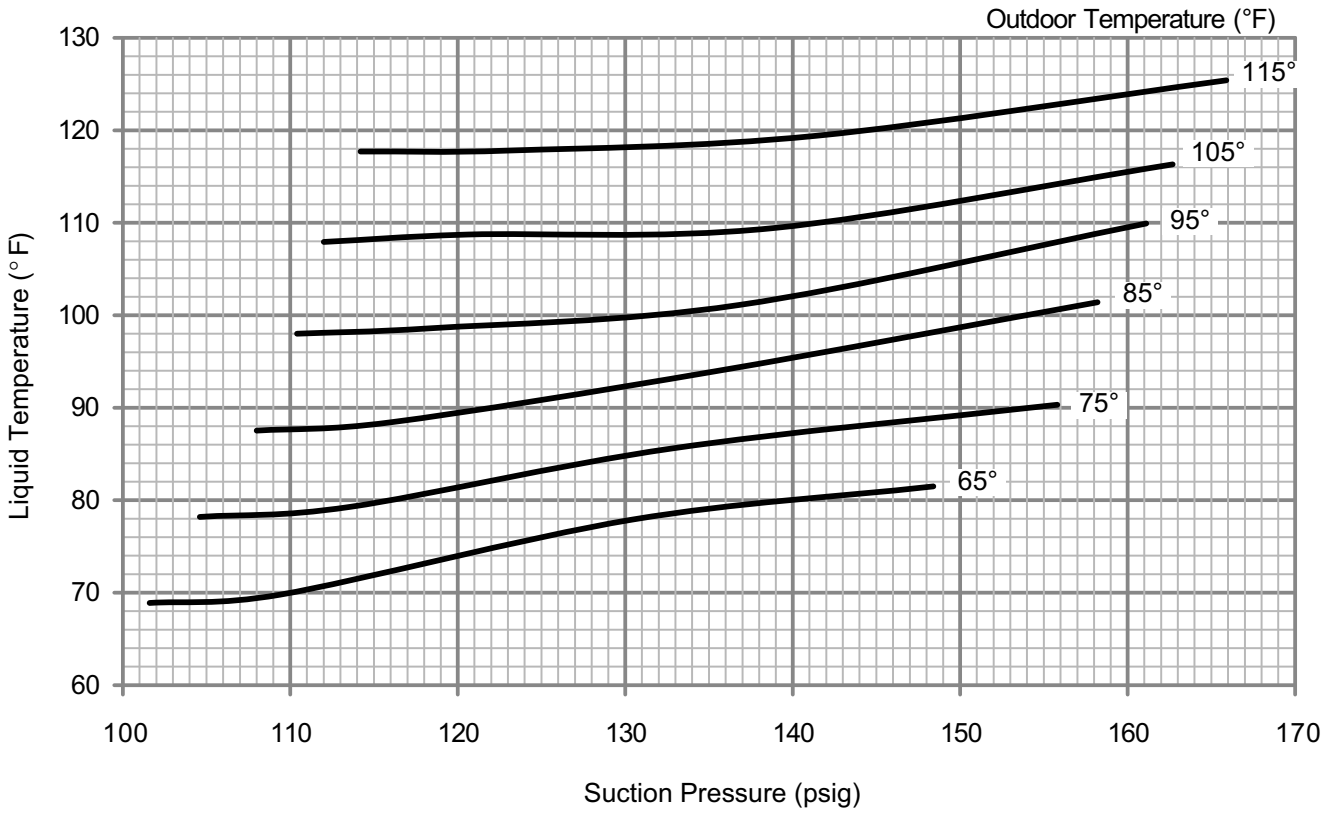
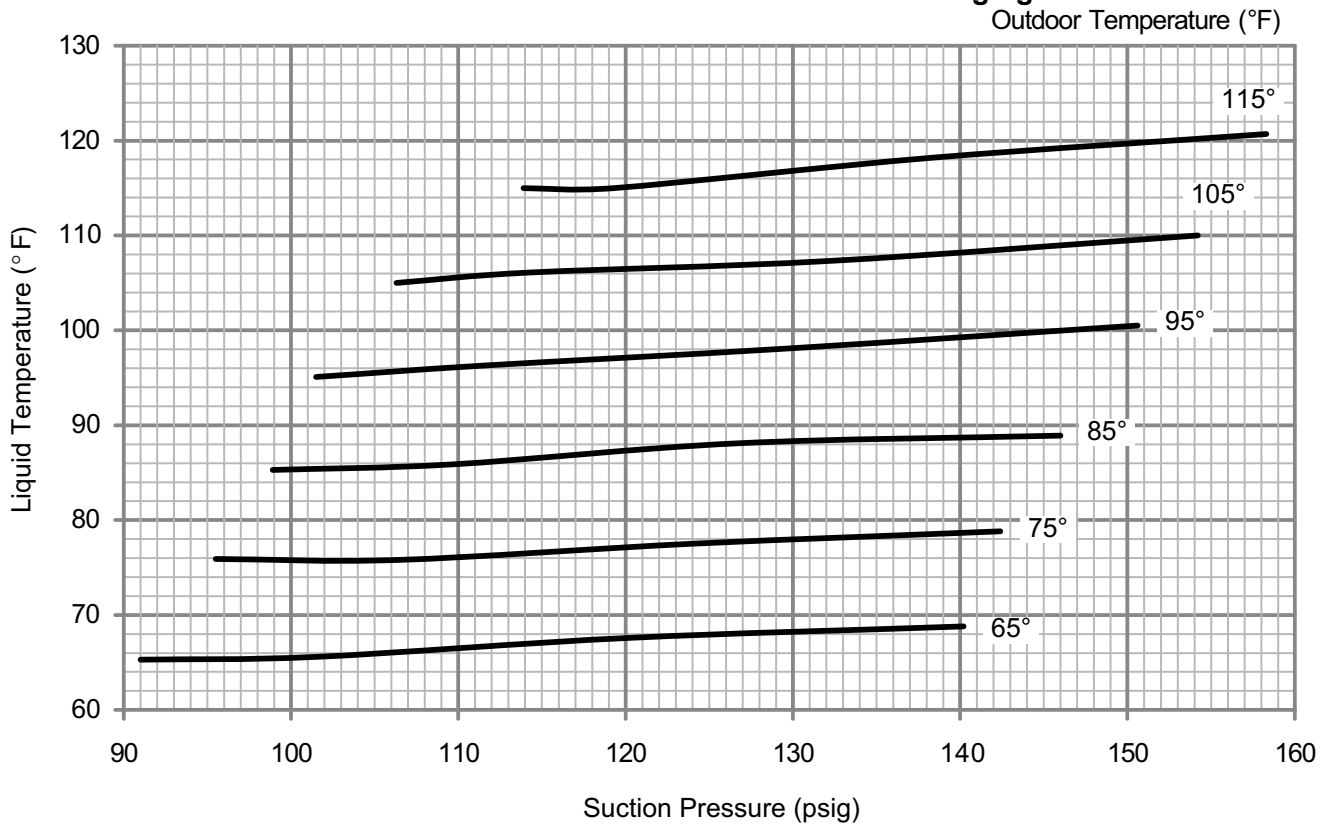


LGH/LCH300H VAV/STAGED SUPPLY AIR Circuit 1 Charging Curve



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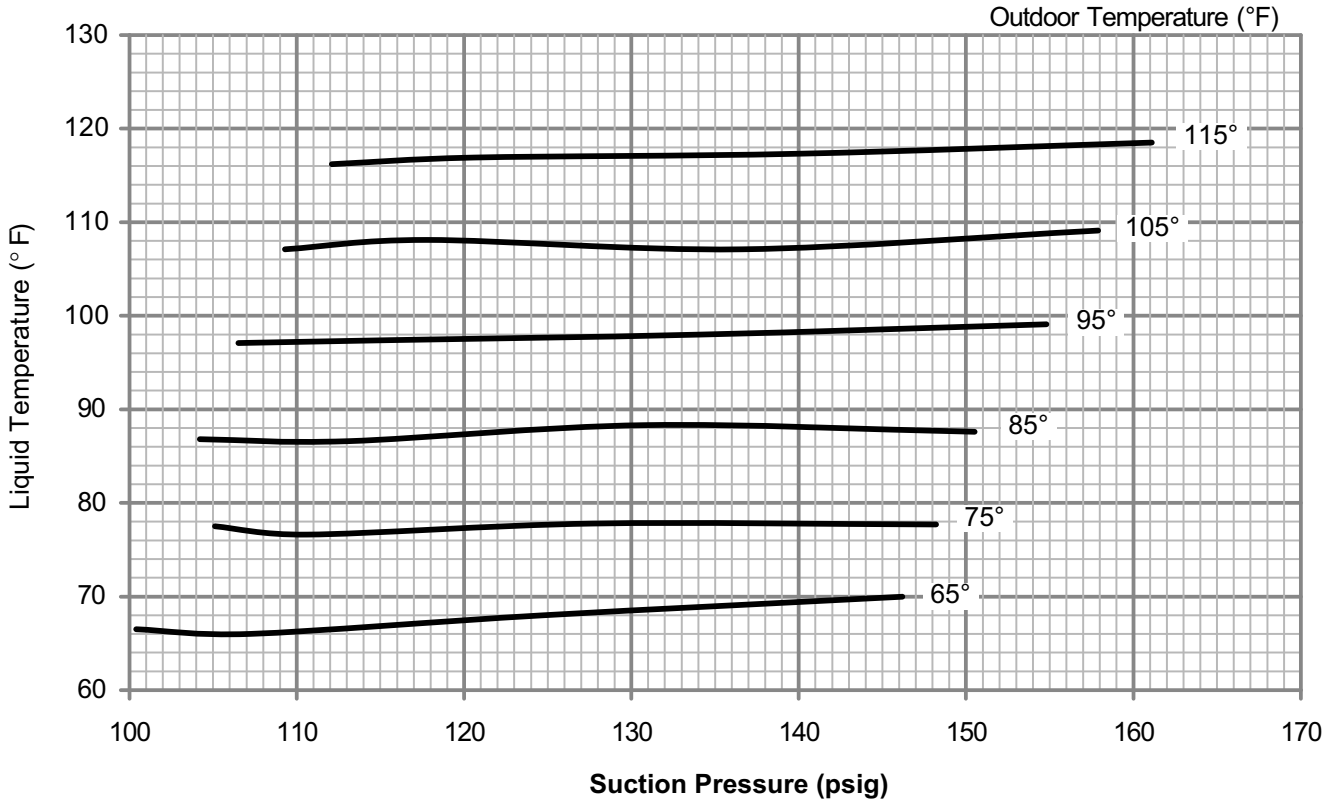
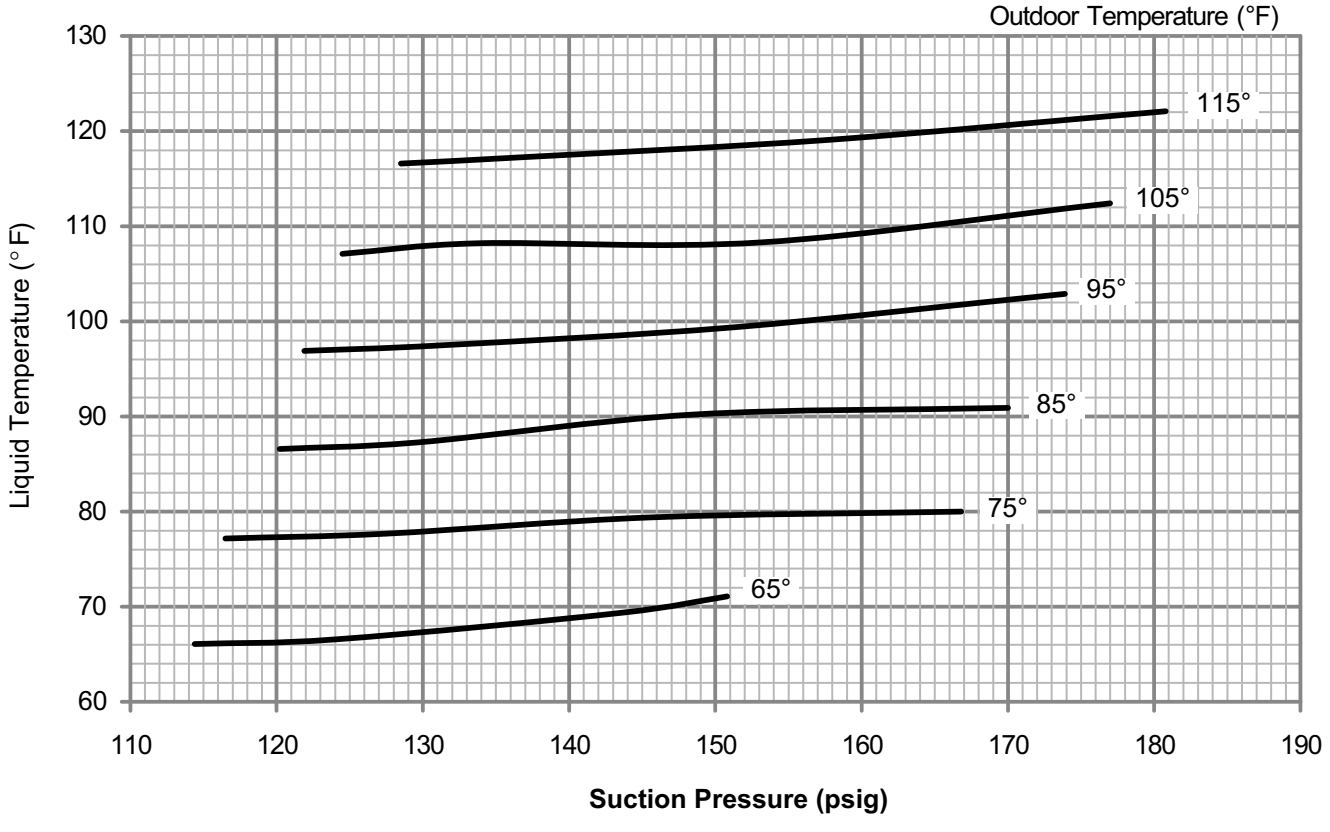
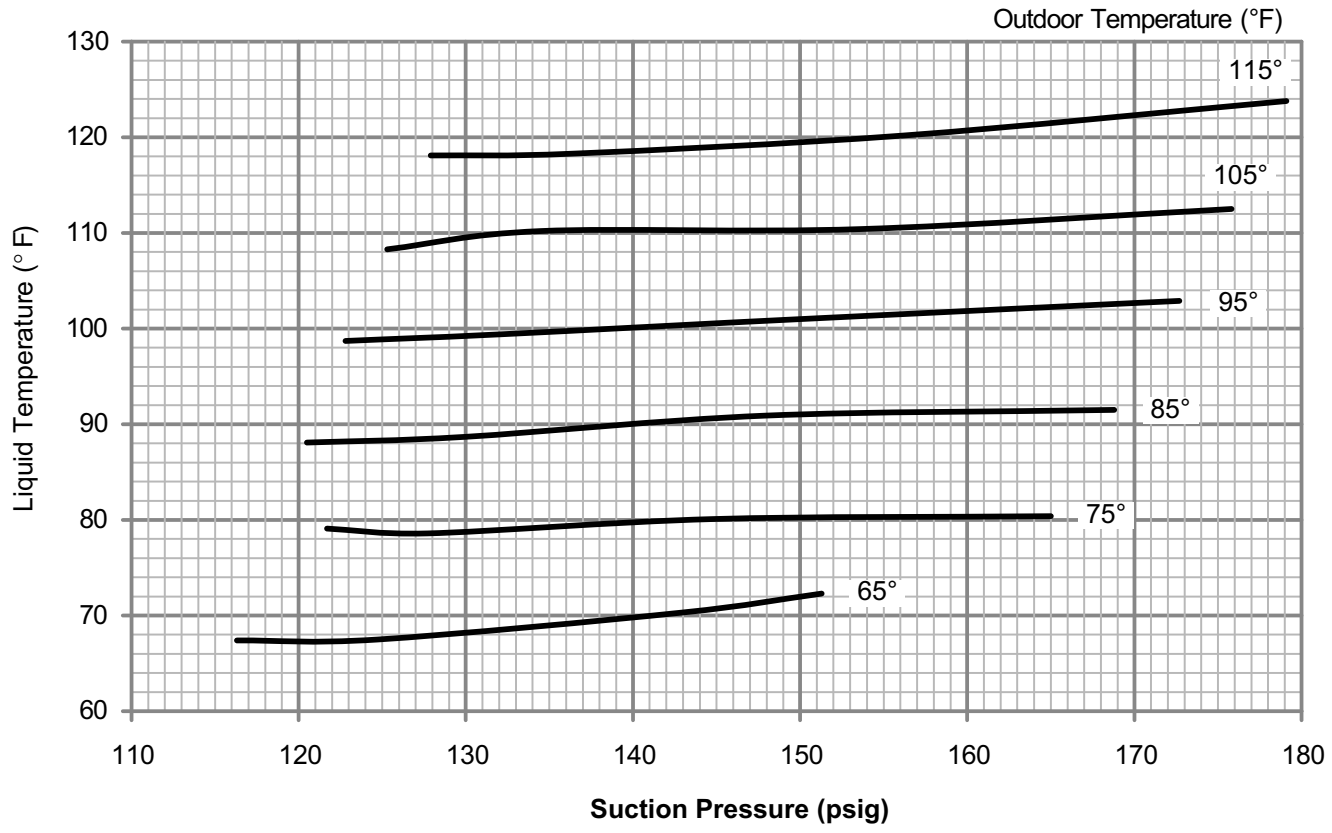


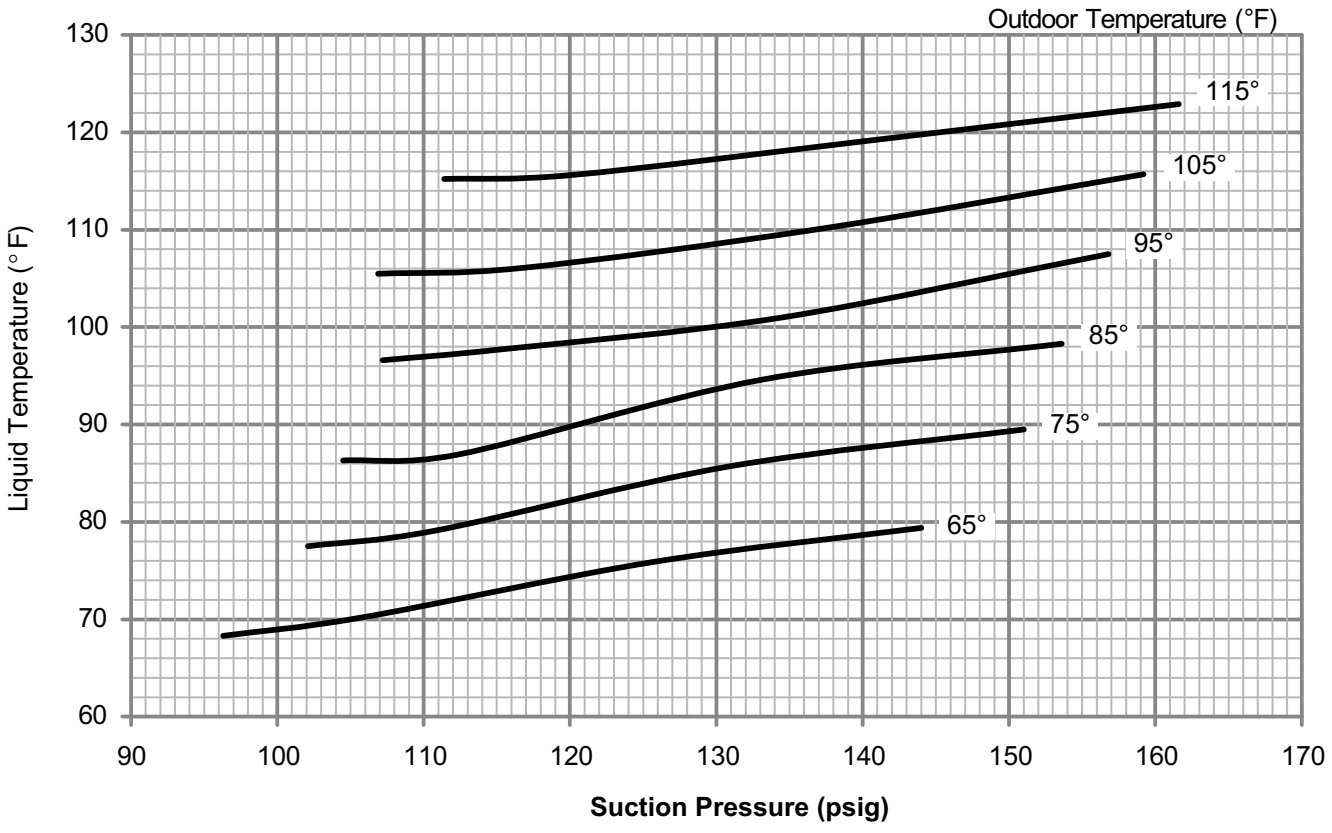
LGH/LCH300H VAV/STAGED SUPPLY AIR Circuit 3 Charging Curve



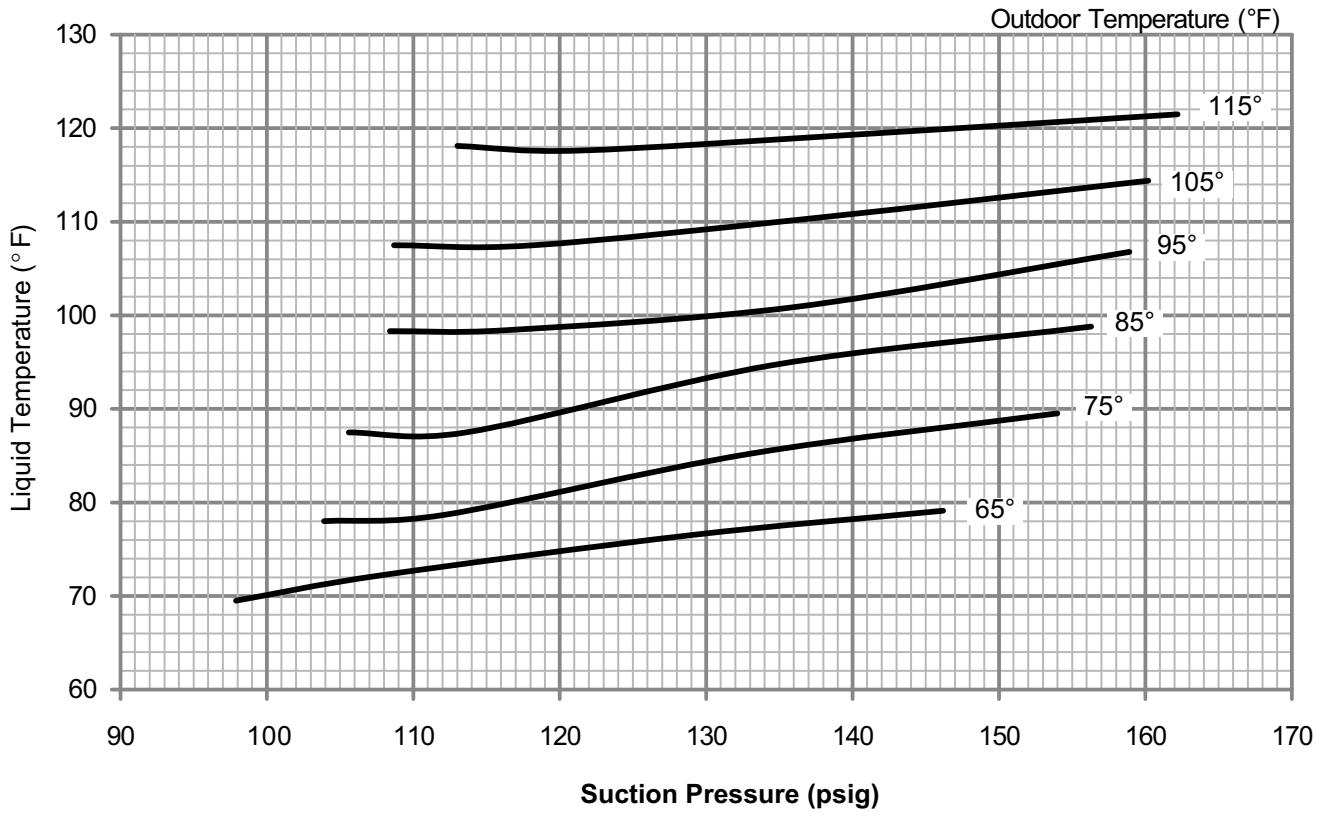
LGH/LCH300H VAV/STAGED SUPPLY AIR Circuit 4 Charging Curve



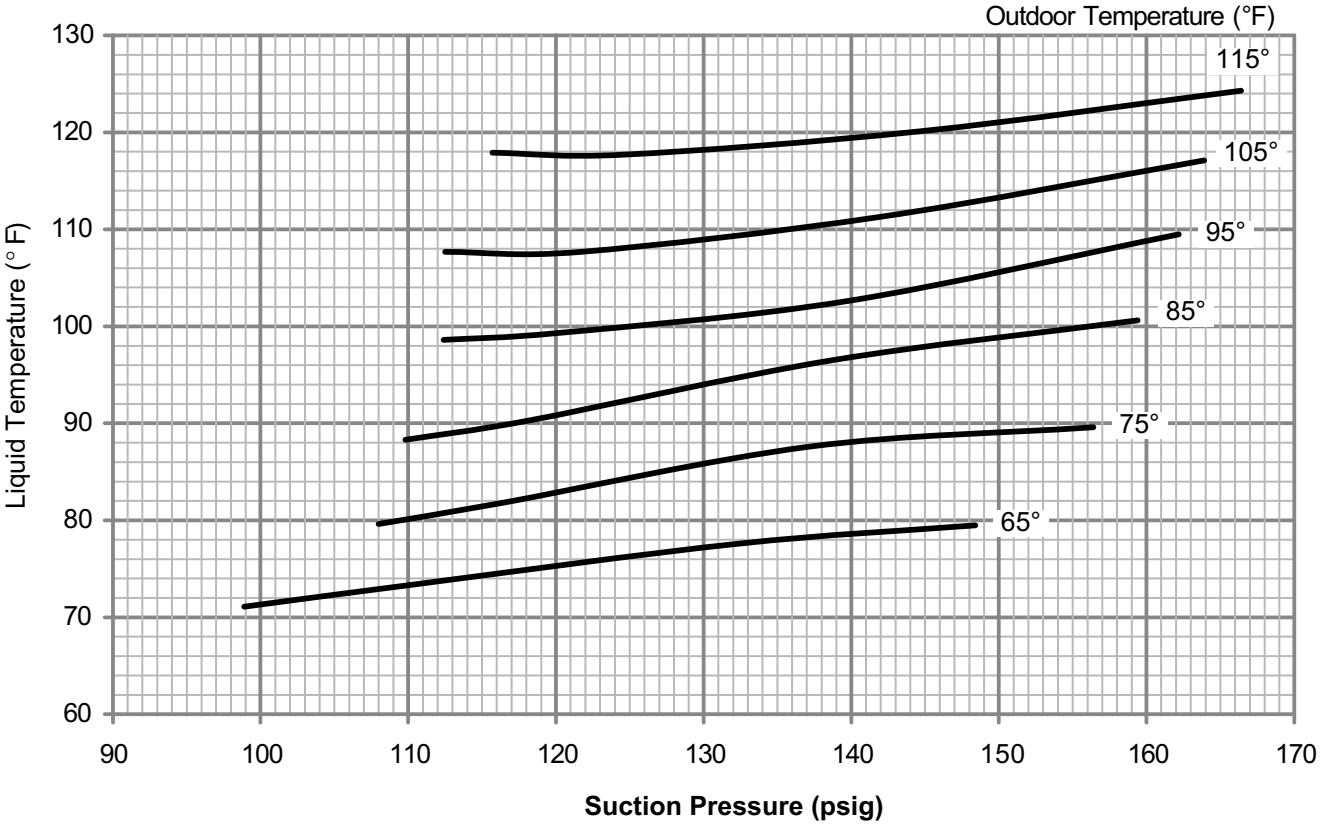
LGH/LCH360 CAV Circuit 1 Charging Curve



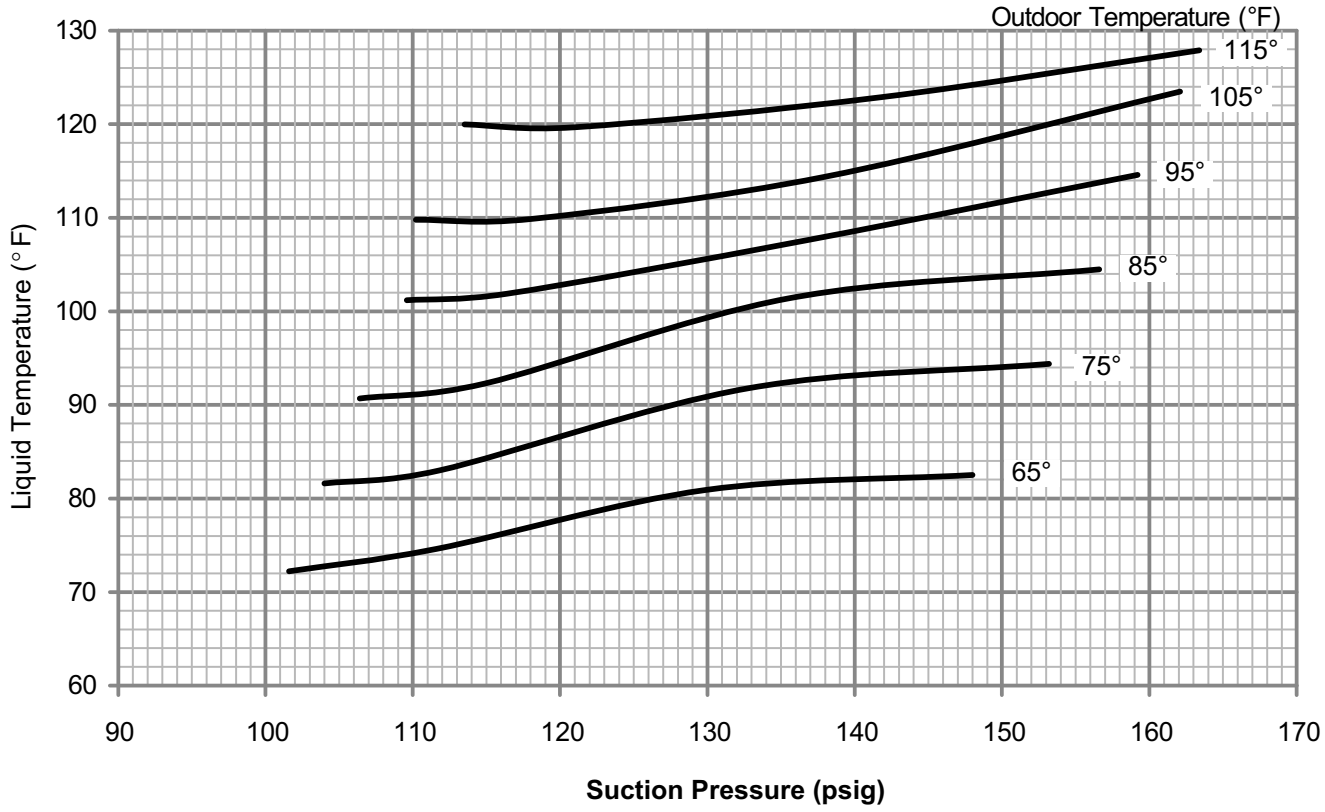
LGH/LCH360 CAV Circuit 2 Charging Curve



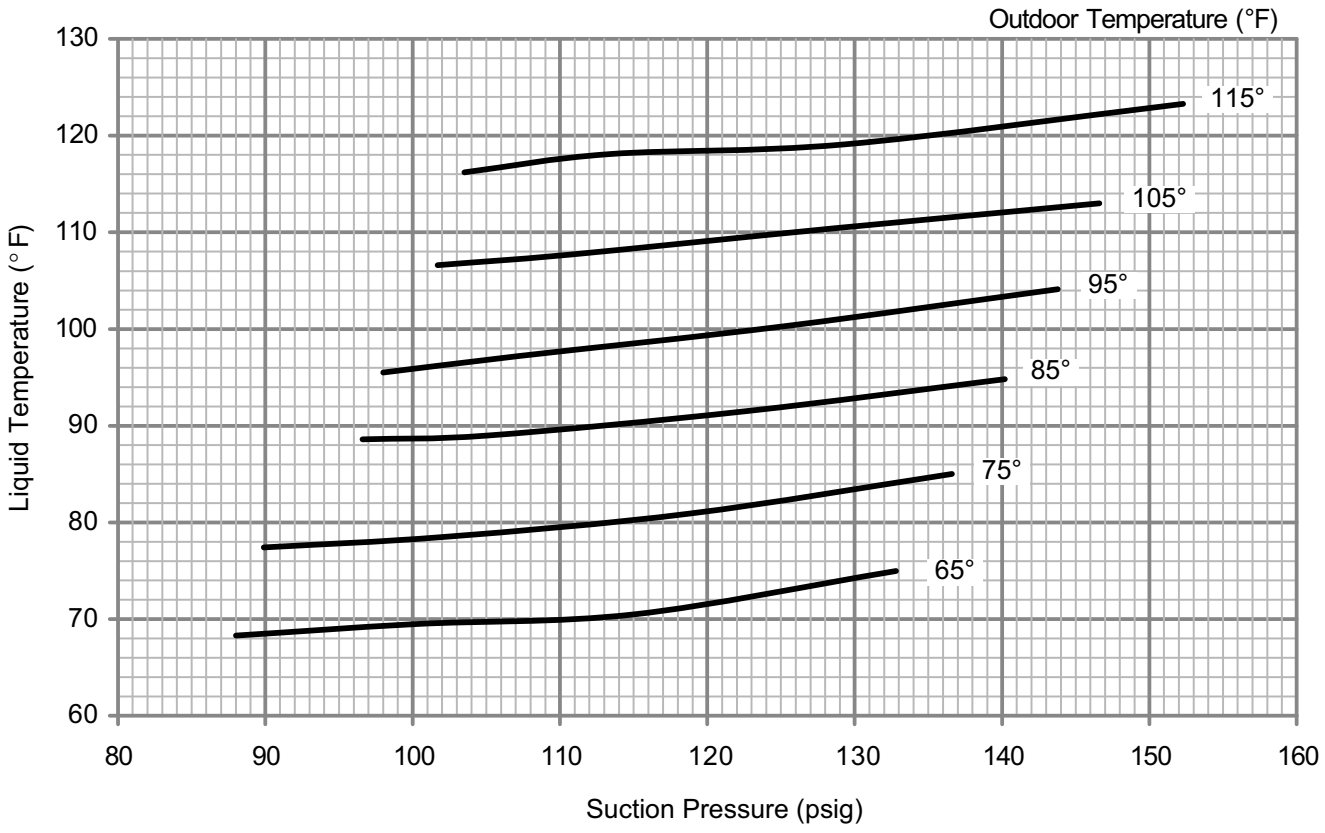
LGH/LCH360 CAV Circuit 3 Charging Curve



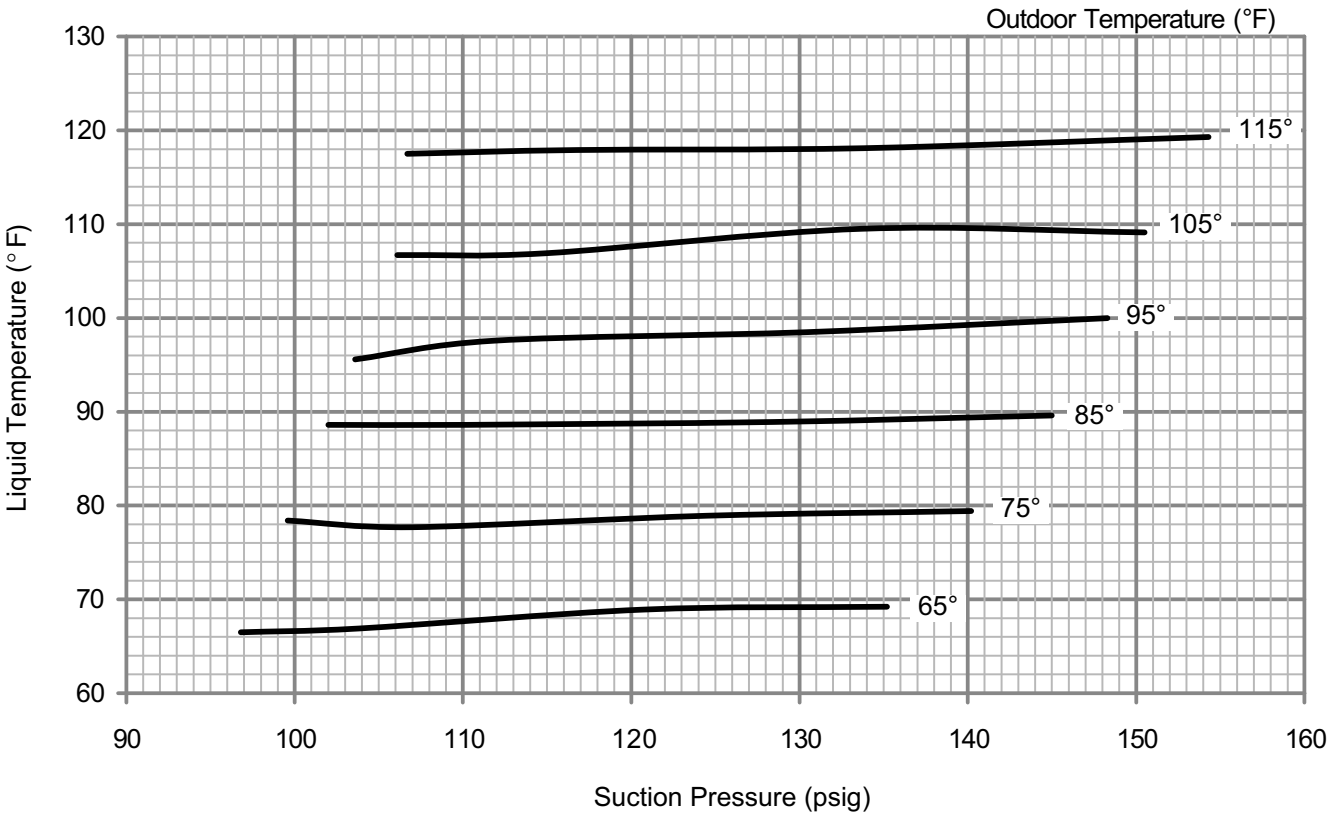
LGH/LCH360 CAV Circuit 4 Charging Curve



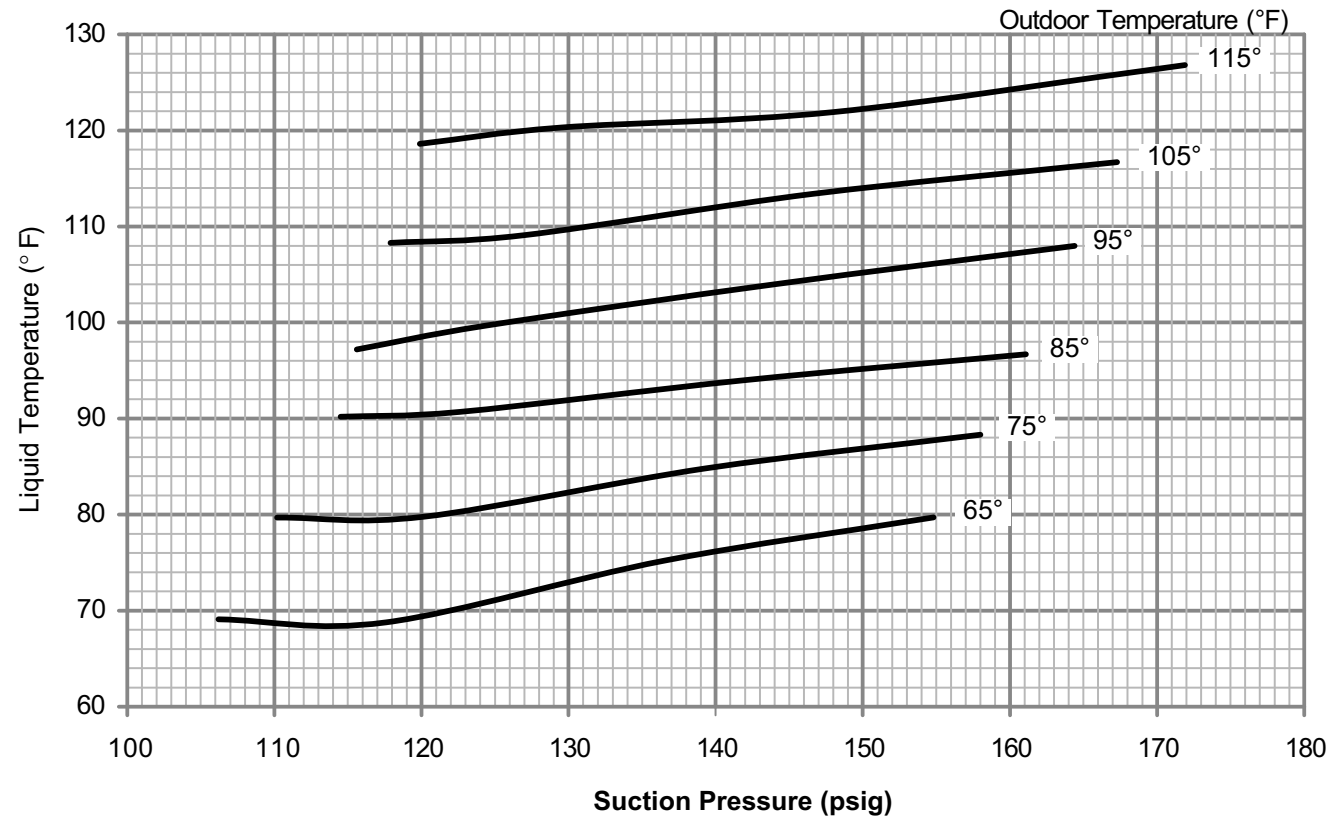
LGH/LCH360 VAV/STAGED SUPPLY AIR Circuit 1 Charging Curve

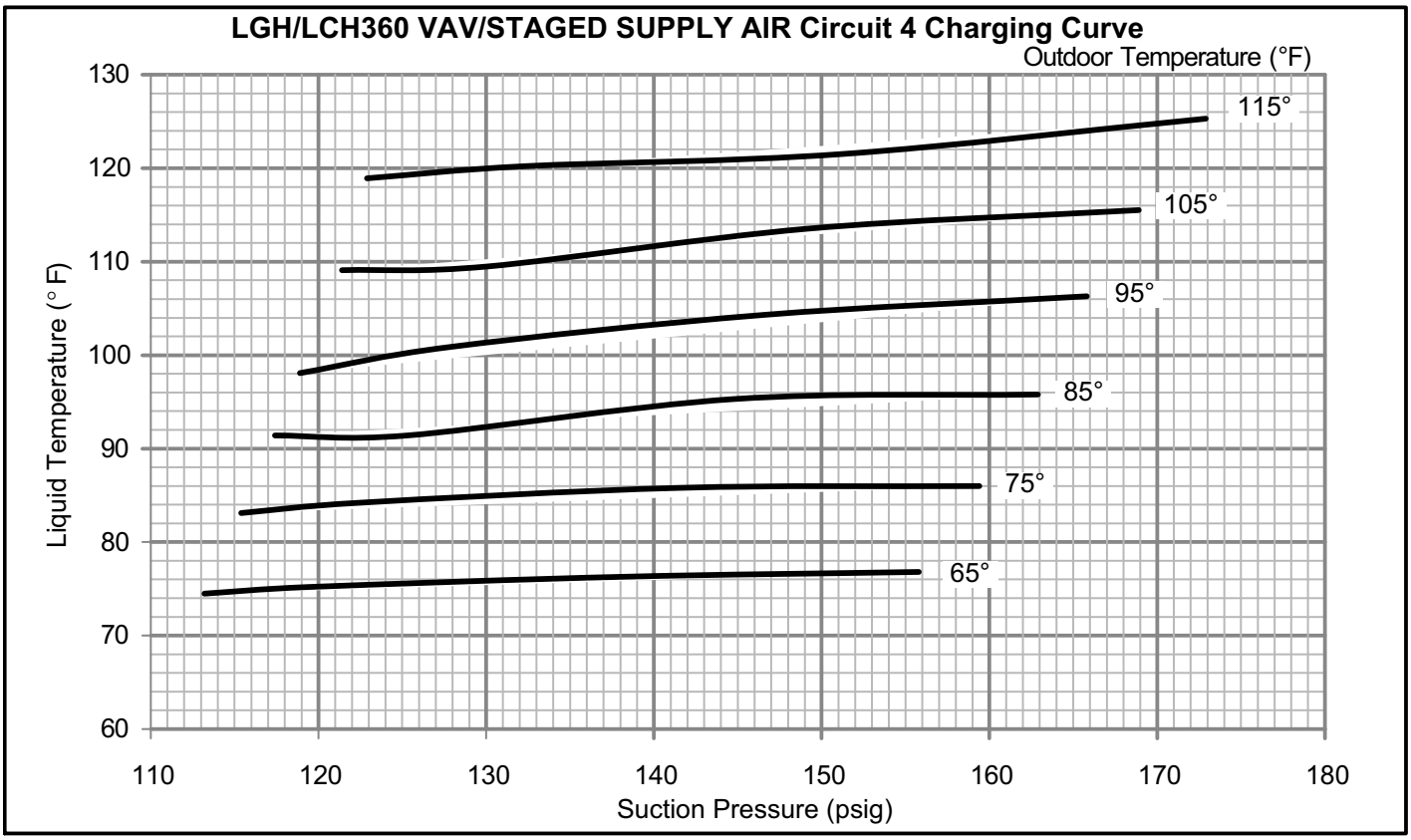


LGH/LCH360 VAV/STAGED SUPPLY AIR Circuit 2 Charging Curve



LGH/LCH360 VAV/STAGED SUPPLY AIR Circuit 3 Charging Curve





D-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.

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

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

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.

⚠WARNING

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

⚠WARNING

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

⚠WARNING

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.

⚠WARNING

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

Placing Unit In Operation

Gas Valve Operation (Figure 30)

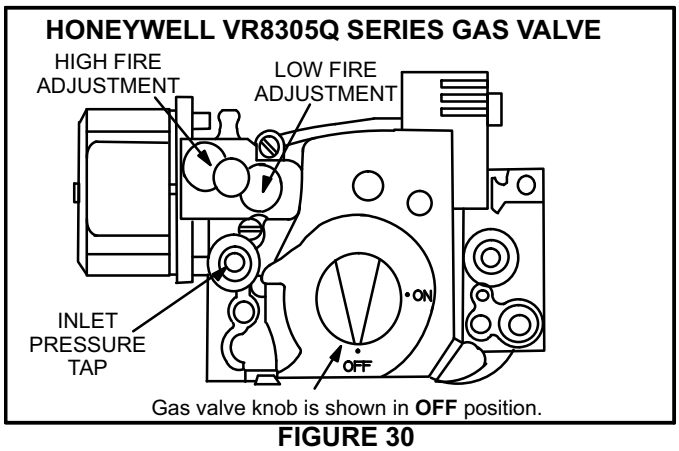


FIGURE 30

1- Set thermostat to lowest setting.

2- Turn off all electrical power to appliance.

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

4- Open or remove the heat section access panel.

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

6- Wait five 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- Turn the knob on the gas valve counterclockwise ↶ to **ON**. Do not force.

8- Close or replace the heat section access panel.

9- Turn on all electrical power to unit.

10- Set thermostat to desired setting.

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

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

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

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

Turning Off Gas to Unit

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

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

3- Open or remove the heat section access panel.

4- Turn the knob on the gas valve clockwise ↷ to **OFF**. Do not force.

5- Close or replace the heat section access panel.

E-Safety or Emergency Shutdown

Turn off power to unit.

IV- SYSTEMS SERVICE CHECKS

A-LGH Heating System Service Checks

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

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

1-Gas Piping

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.

2-Testing Gas Piping

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

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig [14"W.C. (3481 Pa)]. See figure 31.

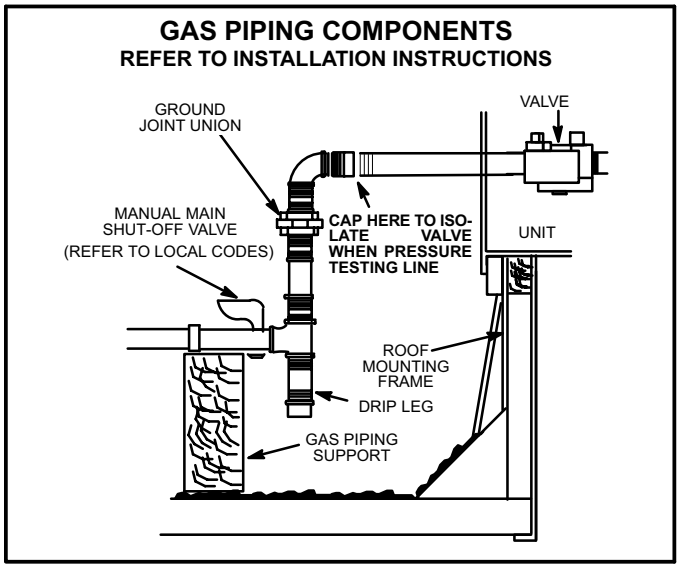


FIGURE 31

When checking piping connection for gas leaks, use the preferred means. Common kitchen detergents can cause harmful corrosion on various metals used in gas piping. The use of specialty Gas Leak Detector is strongly recommended. It is available under part number 31B2001. See CORP 8411-L10, for further details.

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

3-Testing Gas Supply Pressure

When testing gas supply pressure, connect test gauge to the inlet pressure tap on the gas valve (figure 30). Test supply gas pressure with unit firing at maximum rate (both stages energized). Make sure the reading falls within the range of the following values. Low pressure may result in erratic operation or “underfire." High pressure can result in permanent damage to the gas valve or “overfire." For natural gas units, operating pressure at the unit gas connection must be between 4.7"W.C. and 10.5"W.C. (1168 Pa and 2610 Pa). For L.P. gas units, operating pressure at the unit gas connection must be between 10.8"W.C. and 13.0"W.C. (2685 Pa and 3232 Pa).

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

4-Check and Adjust Manifold Pressure

After line pressure has been checked and adjusted, check manifold pressure. Move test gauge to the outlet pressure tap located on unit gas valve GV1. See table 5 in GAS HEAT COMPONENT section for proper manifold pressure and figure 30 for location of pressure tap on the gas valve.

The manifold pressure is factory set and should not require adjustment. If manifold pressure is incorrect and no other source of improper manifold pressure can be found, the valve must be replaced. Refer to figure 30 for location of gas valve (manifold pressure) adjustment screw.

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

⚠ CAUTION

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

Manifold Adjustment Procedure

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

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

3- After allowing the unit to stabilize for five minutes, record the manifold pressure and compare to the values given for gas supply pressure in table 5.

Combustion gases

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

⚠ CAUTION

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

5-Proper Gas Flow

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

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

6-Inshot Burner

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

Figure 32 shows how to remove burner assembly.

1- Turn off power to unit and shut off gas supply.

2- Remove screws holding the burner support cap.

3- Slide each burner off its orifice.

4- Clean and reassemble (reverse steps 1-3).

5- Be sure to secure all wires and check plumbing.

6- Turn on power to unit. Follow lighting instructions attached to unit and operate unit in heating mode. Check burner flames. They should be blue with yellow streaks.

7-Spark Electrode Gap

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

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

Spark gap may be checked with appropriately sized twist drills or feeler gauges. Disconnect power to the unit and remove electrode assembly. The gap should be between 0.125" ± 0.015" (3.2 mm ± .4 mm). See figure 25.

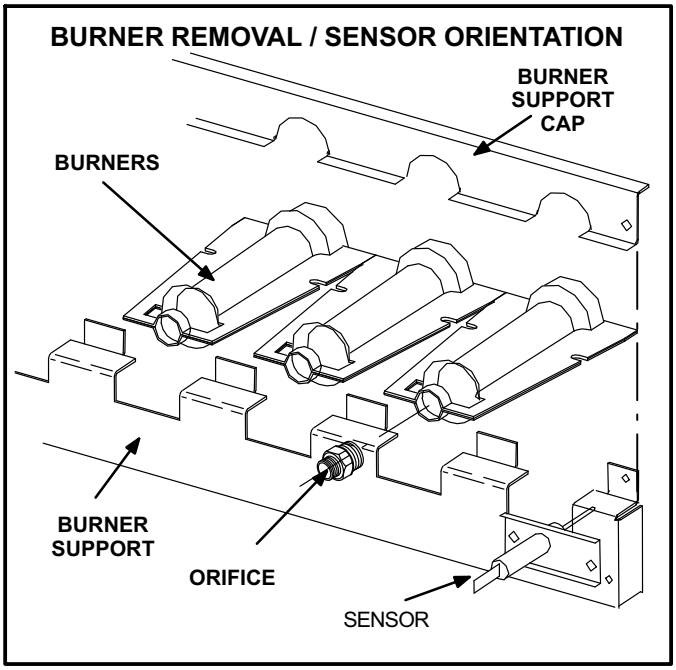


FIGURE 32

8-Heat Exchanger

To Access or Remove Heat Exchanger From Unit:

1- Turn off gas and electric power.

2- Remove access panel(s) and unit center mullion.

3- Remove gas valve, manifold assembly and burners.

4- Remove combustion air blower and flue box. Pay careful attention to the order in which gaskets and orifice are removed.

5- Support heat exchanger (to prevent it from falling when final screws are removed.)

6- Remove screws supporting heat exchanger and slide out.

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. (155.7 N) to ensure proper operation.

9-Flame Sensing

Flame current is an electrical current which passes from the ignition control through the sensor electrode during unit operation. The current passes from the sensor through the flame to the ground electrode (located on the flame electrode) to complete a safety circuit. See table 13 for flame signal range. The electrodes should be located so the tips are at least 1/2" (12.7 mm) inside the flame envelope. Do not bend electrodes. To measure flame current, follow the procedure below:

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

1- Disconnect power to unit.

2- Remove lead from sensing electrode and install a 0-50DC microamp meter in series between the sensing electrode and the sensing lead.

3- Reconnect power and adjust thermostat for heating demand.

4- When flame is established compare reading to table 13. Do not bend electrodes.

5- Disconnect power to unit before disconnecting meter. Make sure sensor wire is securely reconnected before reconnecting power to unit.

TABLE 13

Manufacturer	Nominal Signal	Drop Out
UTEC	0.5-1.0	.09
FENWAL	1.7-3.6	0.7

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

10-Combustion Air Inducer

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

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

11-High Altitude Derate

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

At altitudes above 2000 feet, units must be derated to match gas manifold pressures shown in table 14.

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.

TABLE 14
HIGH ALTITUDE DERATE - 2000-4500 FT.

Gas Heat Type	Altitude - ft.	Gas Manifold Pressure - in. w.g.		Input Rate Natural Gas or LPG / Propane - Btuh	
		Natural	LPG/Propane	1st Stage	2nd Stage
Std.	2001 - 4500	3.4	9.6	169,000	249,000
Med.	2001 - 4500	3.4	9.6	234,000	345,000
High	2001 - 4500	3.4	9.6	312,000	460,000

B-Cooling System Service Checks

All units are factory charged and require no further adjustment; however, charge should be checked periodically using the normal operating pressure method.

1-Gauge Manifold Attachment

Attach high pressure line to discharge line Schrader port and the low pressure line to the suction line Schrader port.

NOTE-When unit is properly charged discharge line pressures should approximate those in Refrigerant Check and Charge section.

V-MAINTENANCE

⚠ CAUTION

Electrical shock hazard. Turn off power to unit before performing any maintenance, cleaning or service operation on the unit.

A-Filters

All units are equipped with twelve 20" x 20" x 2" (508mm x 508mm x 51mm) pleated throw-away type filters. Filters may be accessed through the economizer / filter access door (left of the blower door). All filters are removed by pulling on the pull tab, located on the bottom of each row of filters. Filters should be checked monthly (or more frequently in severe use) and cleaned or replaced regularly. Take note of the “AIR FLOW DIRECTION" marking on the filter frame when re-installing.

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

⚠ CAUTION

Be careful when servicing unit to avoid accidental contact with sharp metallic edges which may cause personal injury.

B-Lubrication

All motors and blower wheels used are prelubricated; no further lubrication is required.

C-Supply Air Blower Wheel

Annually inspect supply air blower wheel for accumulated dirt or dust. Turn off power before attempting to remove access panel or to clean blower wheel. If balancing clips are removed, make sure they are reinstalled in the same location when cleaning is completed.

NOTE-Do not lose balancing clips.

D-Evaporator Coil

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

E-Condenser Coil

Clean condenser coil annually with water and inspect monthly during the cooling season. Access panels are provided on front and back of condenser section.

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-If owner complains of insufficient cooling, the unit should be gauged and refrigerant charge checked. Refer to Gauge Manifold Attachment and Charging sections in this manual.

F-Electrical

1- Check all wiring for loose connections.

2- Check for correct voltage at unit (unit operating).

3- Check amp-draw on both condenser fan motor and blower motor.
Fan Motor Rating Plate ____ Actual _____
Indoor Blower Motor Rating Plate____ Actual____

VI-ACCESSORIES

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

A-LARMF18/36-14, 24 or LARMFH30/36-30, 41 Mounting Frames

When installing the LGH/ LCH units on a combustible surface for downflow discharge applications, the LARMF18/36 14-inch or 24-inch (356 mm or 610mm) height roof mounting frame is used. For horizontal discharge applications, use LARMFH30/36 30-inch or 41-inch (762mm or 1041mm) height roof mounting frame. This frame converts unit from down-flow to horizontal air flow. The 14 and 24 inch (356 and 610mm) downflow and 41 inch (1041mm) horizontal frame meets National Roof-

ing Code requirements. The roof mounting frames are recommended in all other applications but not required. If the 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 LARMF18/36 mounting frame is shown in figure 33. 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 34. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

B-Control Systems

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

C-Transitions

Optional supply/return transitions LASRT30/36 are available for use with LGH/LCH series units utilizing optional LARMF18/36 roof mounting frame. Transition must be installed in the LARMF18/36 mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

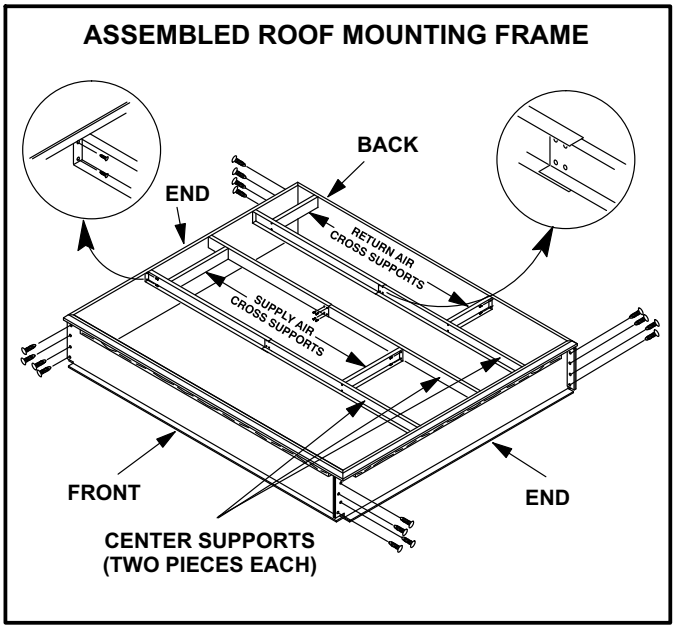


FIGURE 33

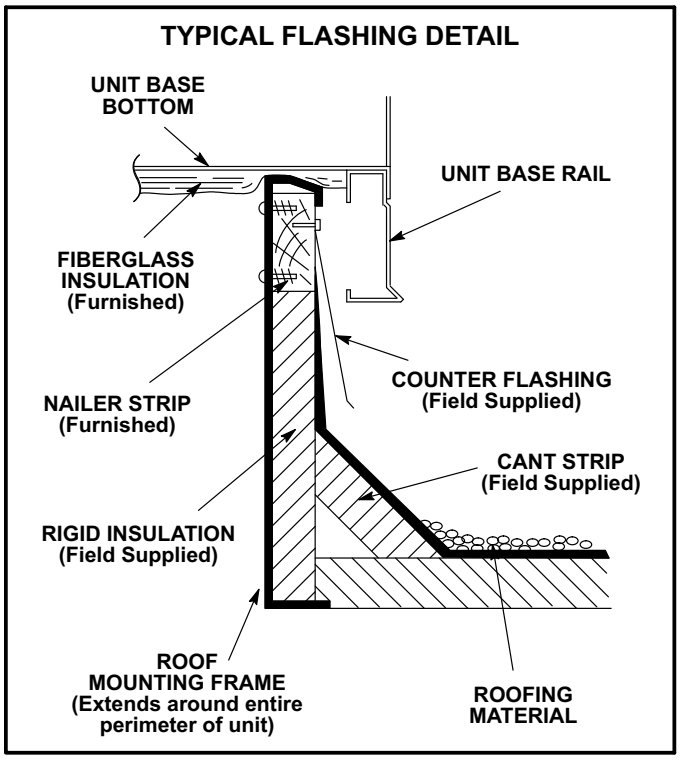


FIGURE 34

D-Supply and Return Diffusers

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

E-E1DAMP25D-1 & E1DAMO15D-1 Outdoor Air Dampers

E1DAMP25D-1- & E1DAMO15D-1 consists of a set of dampers which may be manually or motor operated to allow up to 25 percent outside air into the system at all times (see figure 35). Either air damper can be installed in LGH/LCH units. Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to reinstallation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

F-E1ECON15D-1 Economizer

(Field or Factory Installed)

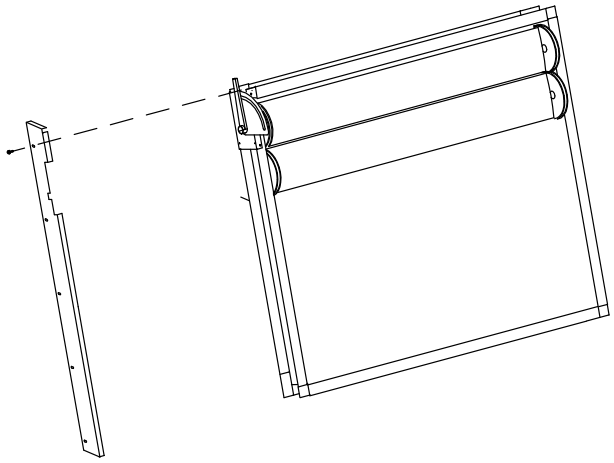
The optional economizer can be used with LGH/LCH units in downflow and horizontal air discharge applications. The economizer uses outdoor air for free cooling when temperature and/or humidity is suitable. An economizer hood is furnished with the economizer.

NOTE - Gravity exhaust dampers are required with power exhaust.

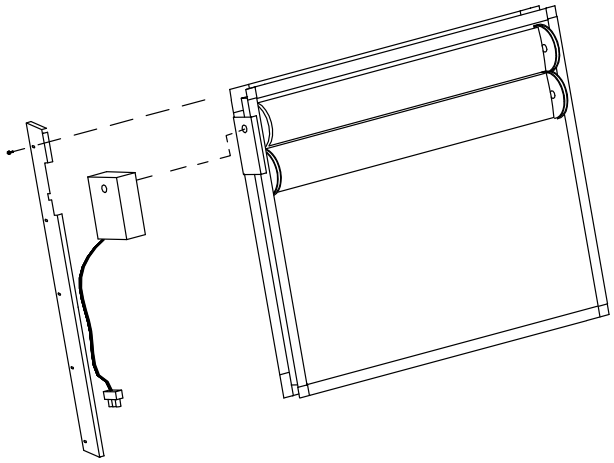
The economizer is controlled by the A55 Unit Controller.

The economizer will operate in one of four modes.These settings are available through the main menu at SETUP > TEST & BALANCE > DAMPER Each mode also requires different sensors.

E1DAMP15D-1 MANUAL OUTDOOR AIR DAMPER



E1DAM025D-1 MOTORIZED OUTDOOR AIR DAMPER



FILTER BRACKET SIDE VIEW

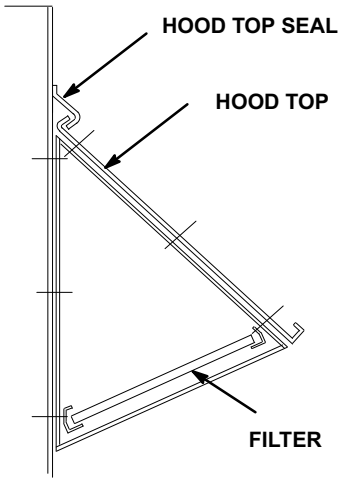


FIGURE 35

1-"TMP" MODE (SENSIBLE TEMPERATURE)

In the "TMP" mode, the A55 Unit Controller uses input from the factory installed RT6 Supply Air Sensor, RT16 Return Air Sensor, and RT17 Outdoor Air Sensor to determine suitability of outside air and economizer damper operation. When outdoor sensible temperature is less than return air sensible temperature, outdoor air is used for cooling. This may be supplemented by mechanical cooling to meet comfort demands. This application does not require additional optional sensors.

2-"ODE" MODE (OUTDOOR ENTHALPY)

The "ODE" or outdoor enthalpy mode requires a factory or field-provided and -installed Honeywell C7400 enthalpy sensor (53W64). The sensor monitors outdoor air temperature and humidity (enthalpy). When outdoor air enthalpy is below the enthalpy control setpoint, the economizer modulates to allow outdoor air for free cooling.

3-"DIF" MODE (DIFFERENTIAL ENTHALPY)

The "DIF" or differential enthalpy mode requires two factory or field-provided and -installed Honeywell C7400 enthalpy sensors (53W64). One sensor is installed in the outside air opening and the other sensor is installed in the return air opening. When the outdoor air enthalpy is below the return air enthalpy, the economizer opens to bring in outdoor air for free cooling.

4-"GLO" MODE (GLOBAL)

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

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

NOTE - All economizer modes of operation will modulate dampers to 55° F (13° C) supply air.

G-Gravity Exhaust Dampers

E1DAMP60D-1 dampers are used in downflow and LAGEDH30/36 are used in horizontal air discharge applications. E1DAMP60D-1 dampers are installed in the return air compartment of the unit (see figure 36). LAGEDH30/36 gravity exhaust dampers are installed in the return air plenum. The dampers must be used any time an economizer or power exhaust fans are applied to LGH/LCH series units. An exhaust hood is furnished with any type of gravity exhaust damper.

Gravity exhaust dampers allow exhaust air to be discharged from the system when an economizer and/or power exhaust is operating. Gravity exhaust dampers also prevent outdoor air infiltration during unit off cycle. See installation instructions for more detail. LAGED(H)30/36 dampers are used with LGH/LCH series units. See installation instructions for more detail.

H-LP / Propane Kit

Two natural to LP / propane gas changeover kits are required for gas conversion on LGH units (one for each gas heat section). The kit includes one gas valve, eleven burner orifices and three stickers. For more detail refer to the natural to LP gas changeover kit installation instructions.

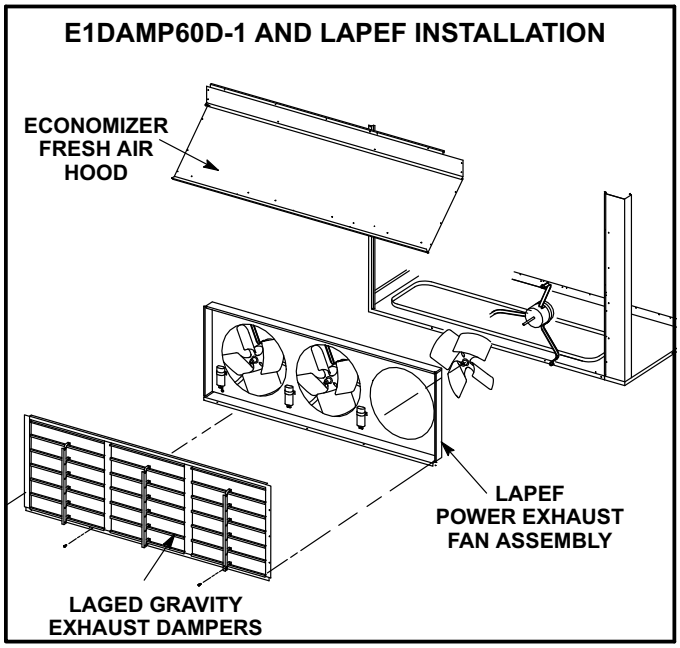


FIGURE 36

I- E1PWRE40D-1 Power Exhaust Fans

Power exhaust fans are used with LGH/LCH in downflow applications only. E1PWRE40D-1 power exhaust fans require optional E1DAMP60D-1 downflow gravity exhaust dampers and E1ECON15D-1 economizer. Power exhaust fans provide exhaust air pressure relief and run when return air dampers are closed and supply air blowers are operating. Figure 36 shows location of the power exhaust fans. See installation instructions for more detail.

J-Smoke Detectors A171, A172, A173

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

K-Blower Proving Switch S52

The blower proving switch monitors blower operation and locks out the unit in case of blower failure. The switch is N.O. and closes at 0.15" W.C. (37.4 Pa) The switch is mounted on the middle left corner of the blower support panel. Wiring for the blower proving switch is shown on the temperature control section (C) wiring diagram in back of this manual.

L-Dirty Filter Switch S27

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 0.85" W.C. (211.7 Pa). The switch is mounted on the top corner of the economizer. Wiring for the dirty filter switch is shown on the temperature control section (C) wiring diagram in back of this manual. Actuation of this switch does not affect unit operation.

M-Optional Cold Weather Kit (Canada only)

Electric heater is available to automatically control the minimum temperature in the gas burner compartment. Heater is C.G.A. certified to allow cold weather operation of unit down to -60° F (-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 vestibule of the heating compartment. Included in the box are the following thermostat switches:

a - Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -20° F (-28.9° C) the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches 10° F (-12.2° 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 K125 coil. When the temperature rises above 20° F (-6.7° C) the switch opens and the electric heater is de-energized through K125. 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 K125 coil. When temperature drops below 20° F (-6.7° C) the switch closes and electric heater is energized through K125. The switch automatically opens when heating compartment temperature reaches 50° F (10° C).

N-Indoor Air Quality (CO_2) Sensor A63

The indoor air quality sensor monitors CO_2 levels and reports the levels to the Unit Controller A55. The board adjusts the economizer dampers according to the CO_2 levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment. Wiring for the indoor air quality switch is shown on the temperature control section (C) wiring diagram in back of this manual.

O-Supply Air Variable Frequency Drive (VAV units only)

VAV units contain a supply air blower equipped with a variable frequency drive A96 (VFD) which varies supply air CFM. As duct static increases, the supply air volume will decrease. As duct static decreases, the supply air volume will increase.

In VAV units, the Unit Controller uses input from a field-installed pressure transducer (A30) to maintain a 1.0" w.c. (default) static pressure. Refer to the Unit Controller manual parameter 388 and 389 to adjust the static pressure setpoint.

The pressure transducer is shipped in a box in the blower compartment. Install the transducer according to manufacturer's instructions.

Note -Make sure the transducer is installed in the main duct at least 2/3 of the distance away from the unit.

The supply air VFD (A96) is located near the compressors. See figure 37.

The Unit Controller will lock-out the unit for 5 minutes(default) if static pressure exceeds 2.0"w.c. for 20 seconds. The Unit Controller will permanently shut down the unit after three occurrences. Use the following parameters to adjust the default values:
Parameter 110; Error time off delay.
Parameter 42; Air Supply Static Shutdown Set Point.
Parameter 43; Static Pressure Lockout Counter Set Point.

VAV By-Pass Operation (Optional)

IMPORTANT - All dampers must be open to prevent damage to duct work and dampers.

1- Turn off all power to unit.

2- Locate K3, K203, J248 and J249 connectors near the VFD. See figure 41.

3- Disconnect J248 from P248 and connect connect P248 jumper plug to J248. P248 jumper plug is attached to the J248 wire harness near the J248 jack connector. See figure 40.

4- Disconnect P247 from J247 and connect J249 to P247. See figure 39.

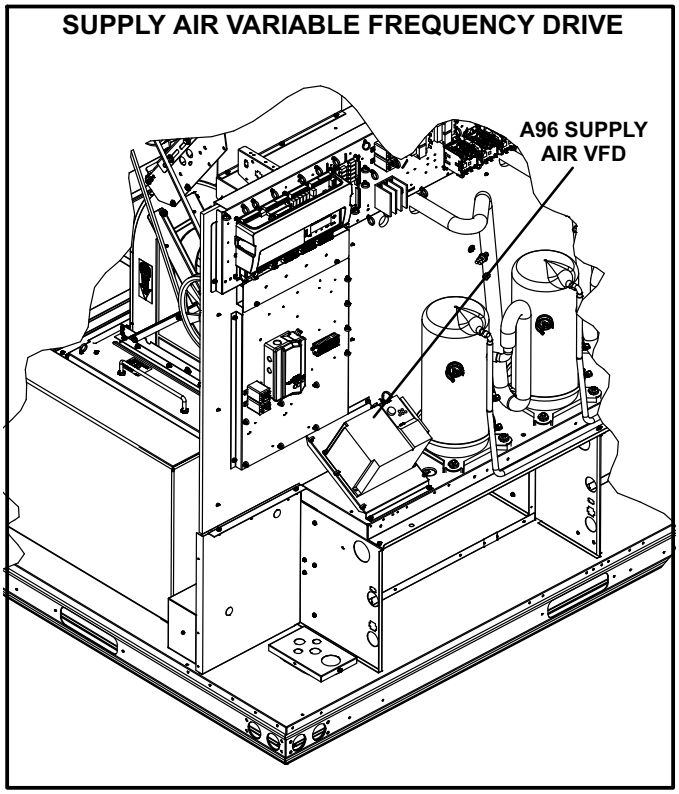


FIGURE 37

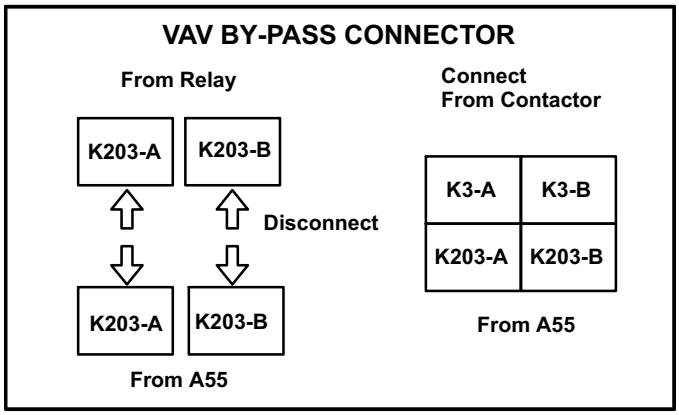


FIGURE 38

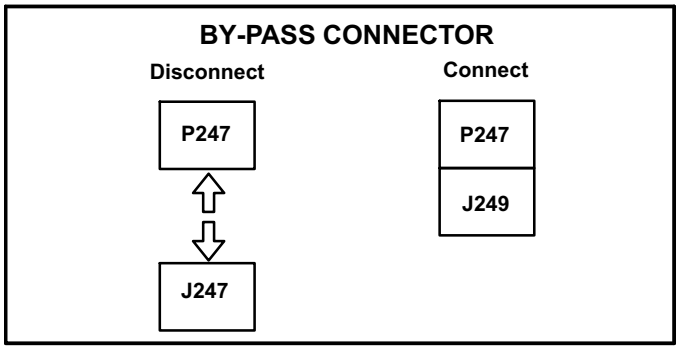


FIGURE 39

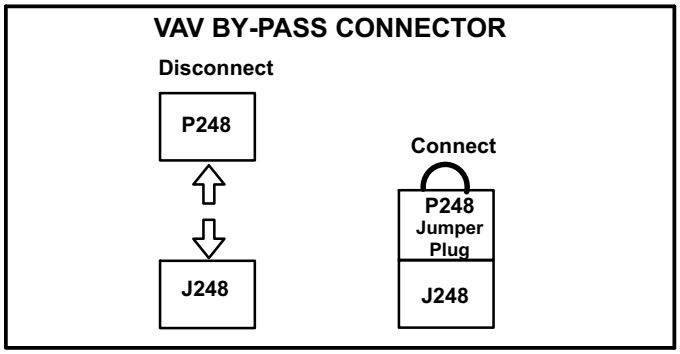


FIGURE 40

5- Locate VFD control relay K203 on the lower control panel. See figure 41.

6- Disconnect wires marked K203-A and K203-B

7- Connect K3-A (female terminal) to K203-A (male terminal) and K3-B (female terminal) to K3-B (male terminal)

8- Restore power to unit. Blower will operate in constant air volume (CAV) mode.

9- Check the indoor blower motor nameplate for full load amperage (FLA) value. Measure the amp readings from the indoor blower motor operating in bypass mode. If measured amps are higher than nameplate FLA value, decrease the CFM by opening (turning counterclockwise) the motor pulley. Refer to the Indoor Blower Motor section. Do not exceed minimum and maximum number of pulley turns as shown in table 1.

P-Drain Pan Overflow Switch S149 (optional)

The overflow switch is used to interrupt cooling operation when excessive condensate collects in the drain pan. The N.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 the 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.

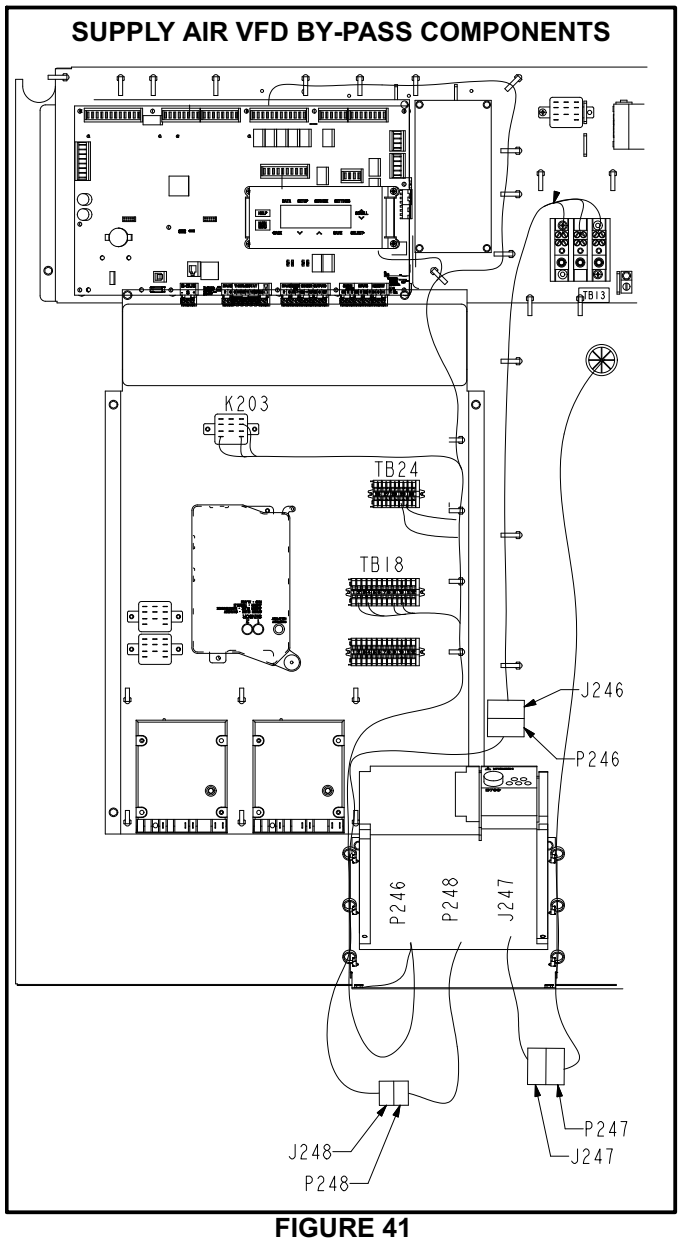
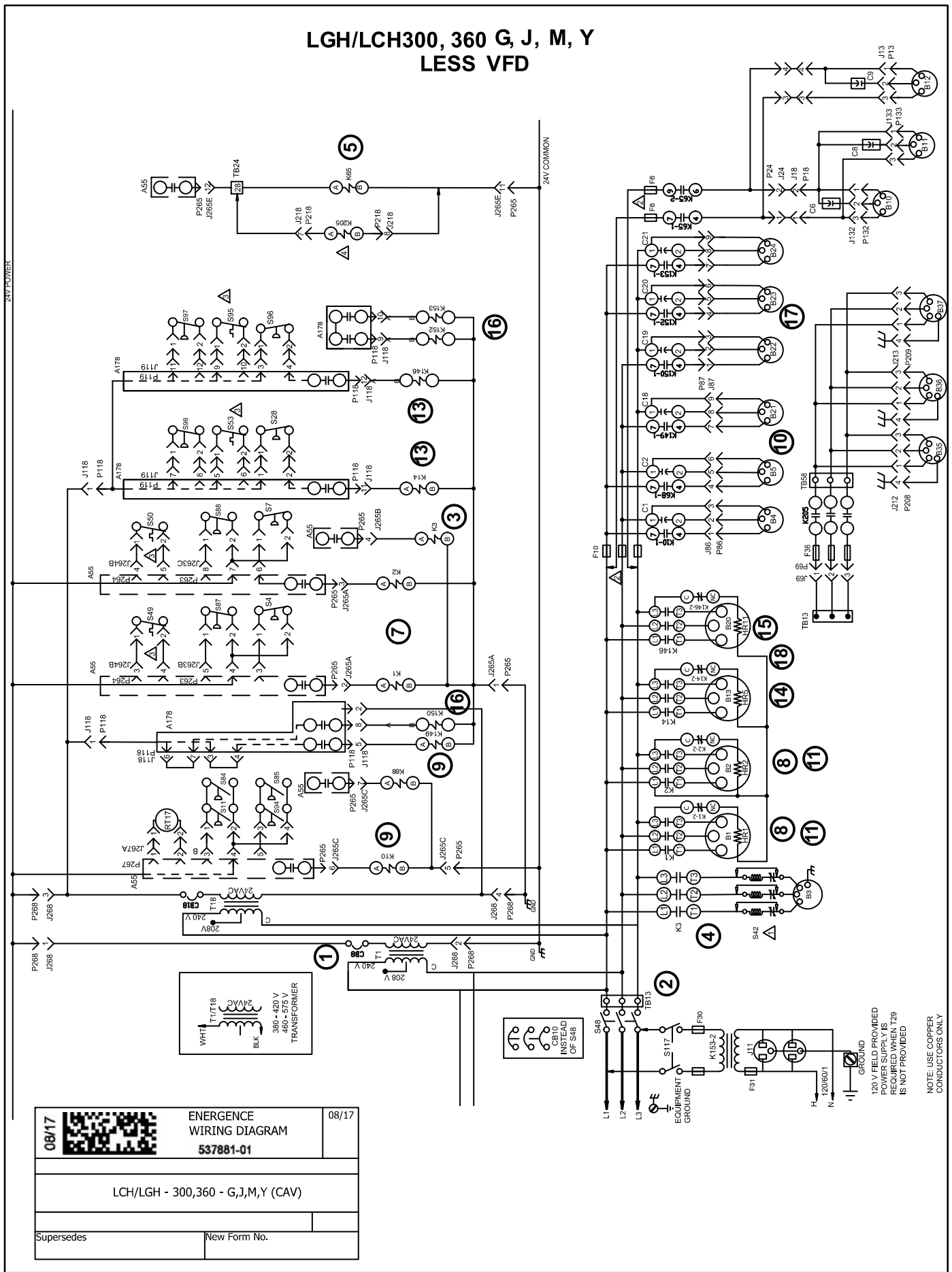


FIGURE 41

VII-WIRING DIAGRAMS AND OPERATION SEQUENCE

The following pages contain the wiring diagrams for LGH/LCH242/300/360 series units. An economizer and thermostat are also shown. Each wiring diagram is followed by a sequence of operation.


LGH/LCH300, 360 G, J, M, Y
LESS VFD
24V POWER
24V COMMON
ENERGENCE
WIRING DIAGRAM
537881-01
08/17
LCH/LGH - 300,360 - G,J,M,Y (CAV)
Supersedes
New Form No.
380 - 420 V
460 - 575 V
TRANSFORMER
CB10
INSTEAD
OF S48
120 V FIELD PROVIDED
POWER SUPPLY IS
REQUIRED WHEN T29
IS NOT PROVIDED
NOTE: USE COPPER
CONDUCTORS ONLY
EQUIPMENT
GROUND
GROUND

KEY	
A55	CONTROL BOARD, MAIN
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN 1
B5	MOTOR, OUTDOOR FAN 2
B10	MOTOR, EXHAUST FAN 1
B11	MOTOR, EXHAUST FAN 2
B12	MOTOR, EXHAUST FAN 3
B13	COMPRESSOR 3
B20	COMPRESSOR 4
B21	MOTOR, OUTDOOR FAN 3
B22	MOTOR, OUTDOOR FAN 4
B23	MOTOR, OUTDOOR FAN 5
B24	MOTOR, OUTDOOR FAN 6
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
C1	CAPACITOR, OUTDOOR FAN 1
C2	CAPACITOR, OUTDOOR FAN 2
C6	CAPACITOR, EXHAUST FAN 1
C8	CAPACITOR, EXHAUST FAN 2
C9	CAPACITOR, EXHAUST FAN 3
C18	CAPACITOR, OUTDOOR FAN 3
C19	CAPACITOR, OUTDOOR FAN 4
C20	CAPACITOR, OUTDOOR FAN 5
C21	CAPACITOR, OUTDOOR FAN 6
CB8	CIRCUIT, BREAKER T1
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB18	CIRCUIT, BREAKER T18
F6	FUSE, EXHAUST FAN
F10	FUSE, OUTDOOR FAN MOTOR
F30	FUSE, TRANSFORMER T29 PRIMARY
F31	FUSE, TRANSFORMER T29 SECONDARY
F36	FUSE, INVERTER

HR1	HEATER COMPRESSOR 1
HR2	HEATER COMPRESSOR 2
HR5	HEATER COMPRESSOR 3
HR11	HEATER COMPRESSOR 4
K1	CONTACTOR, COMPRESSOR 1
K2	CONTACTOR, COMPRESSOR 2
K3	CONTACTOR, BLOWER
K10	RELAY, OUTDOOR FAN 1
K14	CONTACTOR, COMPRESSOR 3
K65	RELAY, EXHAUST FAN
K68	RELAY, OUTDOOR FAN 2
K146	CONTACTOR, COMPRESSOR 4
K149	RELAY, OUTDOOR FAN 3
K150	RELAY, OUTDOOR FAN 4
K152	RELAY, OUTDOOR FAN 5
K153	RELAY, OUTDOOR FAN 6
K205	CONTACTOR, P.E. BLOWER
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS COMPRESS 1
S7	SWITCH, LIMIT HI PRESS COMPRESS 2
S11	SWITCH, LOW PRESS, LOW AMBIENT COMP 1
S28	SWITCH, LIMIT HI PRESS COMPRESS 3
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZE STAT COMPRESS 1
S50	SWITCH, FREEZE STAT COMPRESS 2
S53	SWITCH, FREEZE STAT COMPRESS 3
S84	SWITCH, LOW PRESS, LOW AMBIENT COMP 2
S85	SWITCH, LOW PRESS, LOW AMBIENT COMP 3
S87	SWITCH, LOW PRESS, COMP 1
S88	SWITCH, LOW PRESS, COMP 2
S94	SWITCH, LOW PRESS, LOW AMBIENT COMP 4
S95	SWITCH, FREEZE STAT COMPRESS 4
S96	SWITCH, LIMIT HI PRESS COMPRESS 4
S97	SWITCH, LOW PRESS, COMP 4
S98	SWITCH, LOW PRESS, COMP 3
S117	SWITCH, GFI
T1	TRANSFORMER, CONTROL
T18	TRANSFORMER, CONTACTOR
T29	TRANSFORMER, GFI
TB13	TERMINAL BLOCK, POWER DISTRIBUTION
TB24	TERMINAL STRIP, UNIT ADDER
TB58	TERMINAL BLOCK, EXHAUST BLOWERS

J/P	JACK/PLUG DESCRIPTION
11	GFI, RECEPTACLE
18	EXHAUST FAN COMP
24	EXHAUST FAN
69	INTERFACE,POWER EXHAUST
86	OUTDOOR FAN INTERFACE
87	OUTDOOR FAN INTERFACE 2
118	COMPRESSOR 3 AND 4, CONTROL
119	COMPRESSOR 3 AND 4, INPUT
132	EXHAUST FAN MOTOR 1
133	EXHAUST FAN MOTOR 2
134	EXHAUST FAN MOTOR 3
208	MOTOR, EXH BLO, B35
209	MOTOR, EXH BLO, B36
210	MOTOR, EXH BLO, B37
212	MOTOR, EXH BLO B35
213	MOTOR, EXH BLO B36
214	MOTOR, EXH BLO B37
218	POWER EXHAUST CONTROL
263	HIGH AND LOW PRESSURE SWITCHES
264	BLOWER DECK
265	CONTACTORS AND RELAYS
267	OUTDOOR FAN AREA
268	24V POWER FROM TRANSFORMER

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

WARNING - ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES. DISCONNECT ALL POWER BEFORE SERVICING.

△ S42 USED ON "M" VOLTAGE UNITS AND UNITS WITH HIGH EFFICIENCY MOTORS AND MOTORS LESS INTERNAL OVERLOAD PROTECTION

△2 F6 AND F10 FUSES ARE USED ON

△3 S49,S50,S53 AND S95 ARE PART OF 5VDC CIRCUIT

△4 K205 AND P218 ARE A PART OF RRS ASSEMBLY

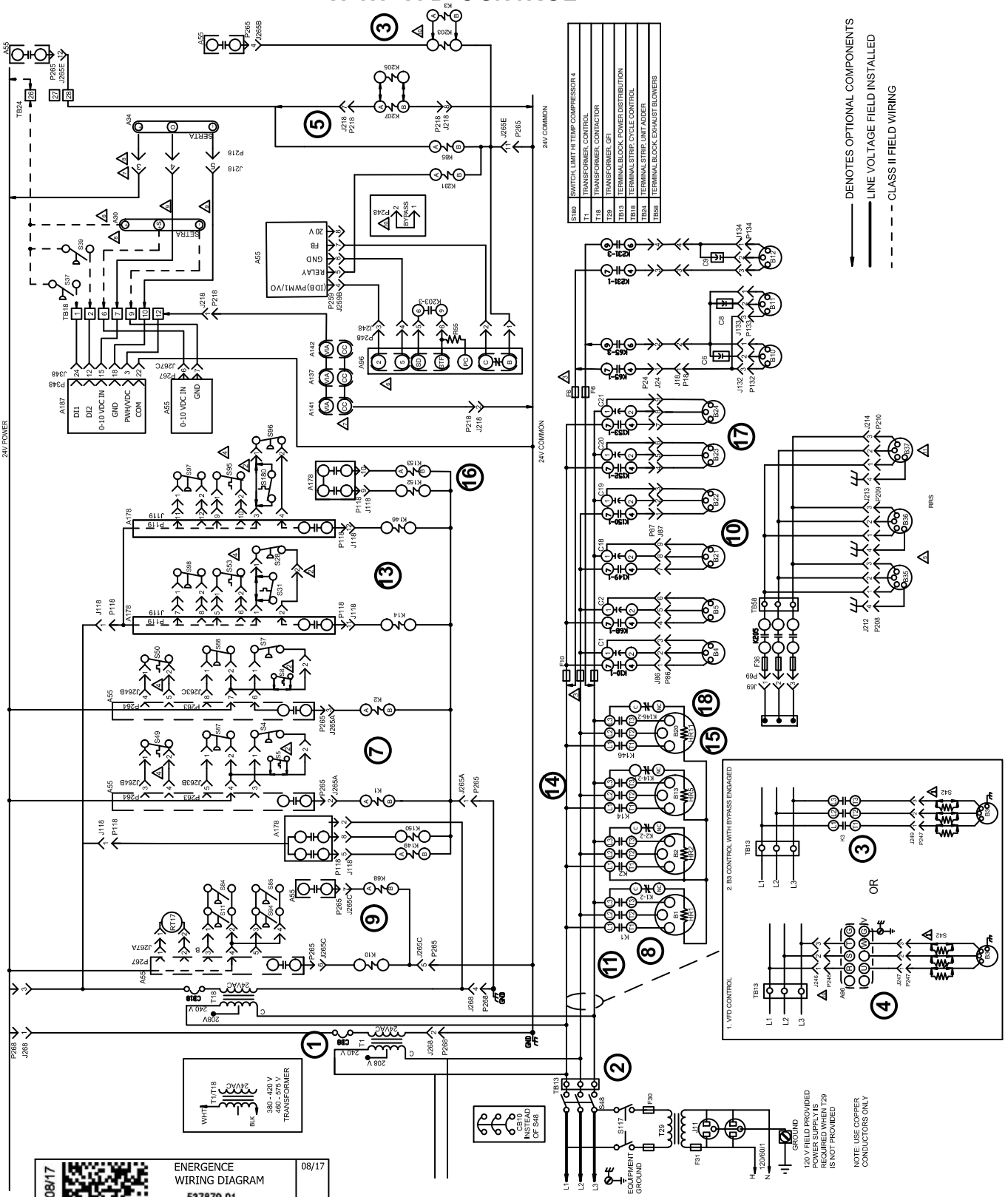
△5 B37 BLOWER MAY NOT BE USED

← DENOTES OPTIONAL COMPONENTS

LINE VOLTAGE FIELD INSTALLED

08/17	ENERGENCE WIRING DIAGRAM 537881-01	08/17
COOLING		
LCH/LGH - 300,360 - G,J,M,Y (CAV)		
Supersedes 537369-01	New Form No. 537881-01	

LGH/LCH242, 300, 360 G, J, Y
WITH VFD CONTROL



08/17	ENERGENCE WIRING DIAGRAM 537879-01	08/17
	LCH/LGH - 242,300,360 - G,J,Y (VAV)	
	SECTION B	
Supersedes	New Form No. 537879-01	

LGH/LCH242, 300, 360 G, J, Y WITH VFD CONTROL

KEY	COMPONENT
A30	DUCT STATIC PRESS
A34	DIFFERENTIAL PRESSURE TRANSDUCER
A55	CONTROL BOARD, MAIN
A96	CONTROL INVERTER
A137	INVERTER, EXHAUST 1
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
A187	CONTROL, GENERAL PURPOSE GP3
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN 1
B5	MOTOR, OUTDOOR FAN 2
B10	MOTOR, EXHAUST FAN 1
B11	MOTOR, EXHAUST FAN 2
B12	MOTOR, EXHAUST FAN 3
B13	COMPRESSOR 3
B20	COMPRESSOR 4
B21	MOTOR, OUTDOOR FAN 3
B22	MOTOR, OUTDOOR FAN 4
B23	MOTOR, OUTDOOR FAN 5
B24	MOTOR, OUTDOOR FAN 6
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
C1	CAPACITOR, OUTDOOR FAN 1
C2	CAPACITOR, OUTDOOR FAN 2
C6	CAPACITOR, EXHAUST FAN 1
C8	CAPACITOR, EXHAUST FAN 2
C9	CAPACITOR, EXHAUST FAN 3
C18	CAPACITOR, OUTDOOR FAN 3
C19	CAPACITOR, OUTDOOR FAN 4
C20	CAPACITOR, OUTDOOR FAN 5
C21	CAPACITOR, OUTDOOR FAN 6
CB8	CIRCUIT, BREAKER T1
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB18	CIRCUIT, BREAKER T18
F6	FUSE, EXHAUST FAN
F10	FUSE, OUTDOOR FAN MOTOR
F30	FUSE, TRANSFORMER T29 PRIMARY
F31	FUSE, TRANSFORMER T29 SECONDARY
F36	FUSE, P.E. BLOWERS
HR1	HEATER COMPRESSOR 1
HR2	HEATER COMPRESSOR 2
HR5	HEATER COMPRESSOR 3
HR11	HEATER COMPRESSOR 4

K1	CONTACTOR, COMPRESSOR 1
K2	CONTACTOR, COMPRESSOR 2
K3	CONTACTOR, BLOWER
K10	RELAY, OUTDOOR FAN 1
K14	CONTACTOR, COMPRESSOR 3
K65	RELAY, EXHAUST FAN
K68	RELAY, OUTDOOR FAN 2
K146	CONTACTOR, COMPRESSOR 4
K149	RELAY, OUTDOOR FAN 3
K150	RELAY, OUTDOOR FAN 4
K152	RELAY, OUTDOOR FAN 5
K153	RELAY, OUTDOOR FAN 6
K203	RELAY INVERTER CONTROL
K205	CONTACTOR, POWER EXHAUST
K207	RELAY, EXHAUST BLOWER
K231	SENSOR, OUTDOOR AIR
R55	RESISTOR, VFD LOADING, A96
RT17	RELAY, EXHAUST FAN 2
S4	SWITCH, LIMIT HI PRESS COMPRESS 1
S5	SWITCH, LIMIT HI TEMP COMPRESSOR 1
S7	SWITCH, LIMIT HI PRESS COMPRESS 2
S8	SWITCH, LIMIT HI TEMP COMPRESSOR 2
S11	SWITCH, LOW PRESS, LOW AMBIENT COMP 1
S28	SWITCH, LIMIT HI PRESS COMPRESS 3
S31	SWITCH, LIMIT HI TEMP COMPRESSOR 3
S37	SWITCH, PRESS, EXH
S39	SWITCH, EXHAUST FAN
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZE STAT COMPRESS 1
S50	SWITCH, FREEZE STAT COMPRESS 2
S53	SWITCH, FREEZE STAT COMPRESS 3
S84	SWITCH, LOW PRESS, LOW AMBIENT COMP 2
S85	SWITCH, LOW PRESS, LOW AMBIENT COMP 3
S87	SWITCH, LOW PRESS, COMP 1
S88	SWITCH, LOW PRESS, COMP 2
S94	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 4
S95	SWITCH, FREEZE STAT COMPRESS 4
S96	SWITCH, LIMIT HI PRESS COMPRESS 4
S97	SWITCH, LOW PRESS, COMP 4
S98	SWITCH, LOW PRESS, COMP 3
S117	SWITCH, GFI

J/P	JACK/PLUG DESCRIPTION
11	GFI, RECEPTACLE
18	EXHAUST FAN COMP
24	EXHAUST FAN
69	INTERFACE
86	OUTDOOR FAN INTERFACE
87	OUTDOOR FAN INTERFACE 2
118	CONTROL FOR COMPRESSOR 3 AND 4
119	COMPRESSOR 3 AND 4, INPUT
132	EXHAUST FAN MOTOR 1
133	EXHAUST FAN MOTOR 2
134	EXHAUST FAN MOTOR 3
208	MOTOR, EXH BLO, B35
209	MOTOR, EXH BLO, B36
210	MOTOR, EXH BLO, B37
212	MOTOR, EXH BLO, B35
213	MOTOR, EXH BLO, B36
214	MOTOR, EXH BLO, B37
218	POWER EXHAUST CONTROL
246	POWER TO VFD
247	VFD TO MOTOR
248	VFD TO CONTROL
249	CONTACTOR BYPASS
259	BLOWER ECM MOTOR
263	HIGH AND LOW PRESSURE SWITCHES
264	BLOWER DECK
265	CONTACTORS AND RELAYS
267	OUTDOOR FAN AREA
268	24V POWER FROM TRANSFORMERS
348	CONTROL, GENERAL PURPOSE GP3

NOTES

1. S42 USED ON UNITS WITH VFD CONTROL WITH BYPASS OPTION, UNITS WITH HIGH EFFICIENCY MOTORS AND UNITS WITH MOTORS LESS INTERNAL OVERLOAD PROTECTION
2. USED ONLY ON 242 UNITS WITH INTERLINK COMPRESSORS
3. F6 AND F10 FUSES ARE USED ON "Y" VOLTAGE UNITS ONLY
4. S49,S50,S53 AND S95 ARE A PART OF 5VDC CIRCUIT
5. FOR P.E. INVERTER WIRING, REFER TO RRS ASSEMBLY
6. A30 SENSOR AND A96
7. A34 SENSOR AND A137, A141, A142 INVERTER CONTROL FOR B35, B36, B37 EXHAUST AIR BLOWER (RRS)
8. A30 MAY BE USED WITH OR WITHOUT A34 A34 MAY BE USED WITH OR WITHOUT A30
9. SHIELDED WIRE
10. TO TRANSFER B3 BLOWER MOTOR FROM A96 VFD TO K3 CONTACTOR, TURN OFF POWER

    1.DISCONNECT WIRES MARKED K203–A AND K203–B AND CONNECT WIRE K203–A

    2.UNPLUG J247 FROM P247, PLUG J249 TO P247

    3.UNPLUG P248, PLUG IN P248 BYPASS JUMPER IF ALARM CONTACTS C AND B ON A96 ARE OPEN
11. B37 BLOWER MAY NOT BE USED

08/17

ENERGENCE WIRING DIAGRAM 537879-01

08/17

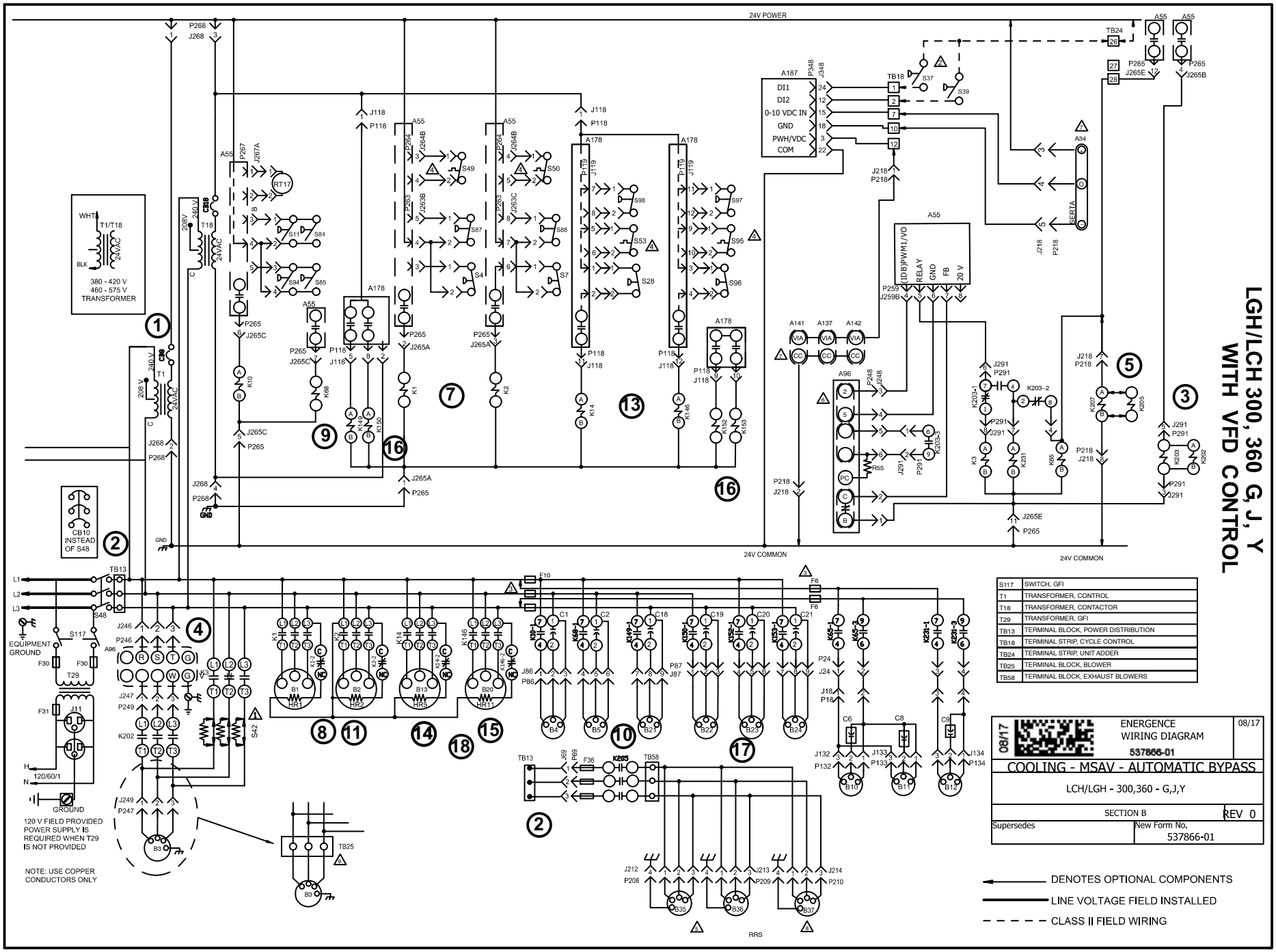
LCH/LGH - 242,300,360 - G,J,Y (VAV)

SECTION B

Supersedes

New Form No. 537879-01

LGH/LCH 300, 360 G, J, Y WITH VFD CONTROL



S117	SWITCH, GFI
T1	TRANSFORMER, CONTROL
T18	TRANSFORMER, CONTACTOR
T29	TRANSFORMER, GFI
TB13	TERMINAL BLOCK, POWER DISTRIBUTION
TB18	TERMINAL STRIP, CYCLE CONTROL
TB24	TERMINAL STRIP, UNIT ADDER
TB25	TERMINAL BLOCK, BLOWER
TB58	TERMINAL BLOCK, EXHAUST BLOWERS

08/17	ENERGENCE WIRING DIAGRAM 537866-01	08/17
	COOLING - MSAV - AUTOMATIC BYPASS	
	LCH/LGH - 300,360 - G,J,Y	
	SECTION B	REV 0
Supersedes	New Form No. 537866-01	

DENOTES OPTIONAL COMPONENTS

LINE VOLTAGE FIELD INSTALLED

CLASS II FIELD WIRING

KEY	COMPONENT
A34	DIFFERENTIAL PRESSURE TRANSDUCER
A55	CONTROL BOARD, MAIN
A96	CONTROL INVERTER
A137	INVERTER, EXHAUST 1
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
A187	CONTROL, GENERAL PURPOSE GP3
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN 1
B5	MOTOR, OUTDOOR FAN 2
B10	MOTOR, EXHAUST FAN 1
B11	MOTOR, EXHAUST FAN 2
B12	MOTOR, EXHAUST FAN 3
B13	COMPRESSOR 3
B20	COMPRESSOR 4
B21	MOTOR, OUTDOOR FAN 3
B22	MOTOR, OUTDOOR FAN 4
B23	MOTOR, OUTDOOR FAN 5
B24	MOTOR, OUTDOOR FAN 6
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
C1	CAPACITOR, OUTDOOR FAN 1
C2	CAPACITOR, OUTDOOR FAN 2
C6	CAPACITOR, EXHAUST FAN 1
C8	CAPACITOR, EXHAUST FAN 2
C9	CAPACITOR, EXHAUST FAN 3
C18	CAPACITOR, OUTDOOR FAN 3
C19	CAPACITOR, OUTDOOR FAN 4
C20	CAPACITOR, OUTDOOR FAN 5
C21	CAPACITOR, OUTDOOR FAN 6
CB8	CIRCUIT, BREAKER T1
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB18	CIRCUIT, BREAKER T18
F6	FUSE, EXHAUST FAN
F10	FUSE, OUTDOOR FAN MOTOR
F30	FUSE, TRANSFORMER T29 PRIMARY
F31	FUSE, TRANSFORMER T29 SECONDARY
F36	FUSE,P.E. BLOWERS

HR1	HEATER COMPRESSOR 1
HR2	HEATER COMPRESSOR 2
HR5	HEATER COMPRESSOR 3
HR11	HEATER COMPRESSOR 4
K1	CONTACTOR, COMPRESSOR 1
K2	CONTACTOR, COMPRESSOR 2
K3	CONTACTOR, BLOWER
K10	RELAY, OUTDOOR FAN 1
K14	CONTACTOR, COMPRESSOR 3
K65	RELAY, EXHAUST FAN
K68	RELAY, OUTDOOR FAN 2
K146	CONTACTOR, COMPRESSOR 4
K149	RELAY, OUTDOOR FAN 3
K150	RELAY, OUTDOOR FAN 4
K152	RELAY, OUTDOOR FAN 5
K153	RELAY, OUTDOOR FAN 6
K202	CONTACTOR, INVERTER
K203	RELAY INVERTER CONTROL
K205	CONTACTOR,POWER EXHAUST
K207	RELAY, EXHAUST BLOWER
K231	RELAY, EXHAUST FAN 2
R55	RESISTOR, VFD LOADING, A96
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS COMPRESS 1
S7	SWITCH, LIMIT HI PRESS COMPRESS 2
S11	SWITCH, LOW PRESS, LOW AMBIENT COMP 1
S31	SWITCH, LIMIT HI TEMP COMPRESSOR 3
S37	SWITCH, PRESS, EXH
S39	SWITCH, EXHAUST FAN
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZE STAT COMPRESS 1
S50	SWITCH, FREEZE STAT COMPRESS 2
S53	SWITCH, FREEZE STAT COMPRESS 3
S84	SWITCH, LOW PRESS, LOW AMBIENT COMP 2
S85	SWITCH, LOW PRESS, LOW AMBIENT COMP 3
S87	SWITCH, LOW PRESS, COMP 1
S88	SWITCH, LOW PRESS, COMP 2
S94	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 4
S95	SWITCH, FREEZE STAT COMPRESS 4
S96	SWITCH, LIMIT HI PRESS COMPRESS 4
S97	SWITCH, LOW PRESS, COMP 4
S98	SWITCH, LOW PRESS, COMP 3

J/P	JACK/PLUG DESCRIPTION
11	GFI, RECEPTACLE
18	EXHAUST FAN COMP
24	EXHAUST FAN
69	INTERFACE
86	OUTDOOR FAN INTERFACE
87	OUTDOOR FAN INTERFACE 2
118	CONTROL FOR COMPRESSOR 3 AND 4
119	COMPRESSOR 3 AND 4, INPUT
132	EXHAUST FAN MOTOR 1
133	EXHAUST FAN MOTOR 2
134	EXHAUST FAN MOTOR 3
208	MOTOR, EXH BLO, B35
209	MOTOR, EXH BLO, B36
210	MOTOR, EXH BLO, B37
212	MOTOR, EXH BLO, B35
213	MOTOR, EXH BLO, B36
214	MOTOR, EXH BLO, B37
218	POWER EXHAUST CONTROL
246	POWER TO VFD
247	VFD TO MOTOR
248	VFD TO CONTROL
249	CONTACTOR BYPASS
259	BLOWER ECM MOTOR
263	HIGH AND LOW PRESSURE SWITCHES
264	BLOWER DECK
265	CONTACTORS AND RELAYS
268	24V POWER FROM TRANSFORMERS
291	VFD BYPASS LOW VOLTAGE
348	CONTROL, GENERAL PURPOSE GP3

NOTES

1. S42 USED ON UNITS WITH VFD CONTROL WITH BYPASS OPTION, UNITS WITH HIGH EFFICIENCY MOTORS AND UNITS WITH MOTORS LESS INTERNAL OVERLOAD PROTECTION
2.
3. F6 AND F10 FUSES ARE USED ON "Y" VOLTAGE UNITS ONLY
4. S49,S50,S53 AND S95 ARE A PART OF 5VDC CIRCUIT
5. FOR P.E. INVERTER WIRING, REFER TO RRS ASSEMBLY
6.
7. A34 SENSOR AND A137, A141, A142 INVERTER CONTROL FOR B35, B36, B37 EXHAUST AIR BLOWER (RRS)
8. B37 BLOWER MAY NOT BE USED
9. TB25 USED IN PLACE OF P247/J249 ON Y VOLT UNITS

LGH/LCH 300, 360 G, J, Y WITH VFD CONTROL

08/17

ENERGENCE
WIRING DIAGRAM
537866-01

08/17

COOLING - MSAV - AUTOMATIC BYPASS

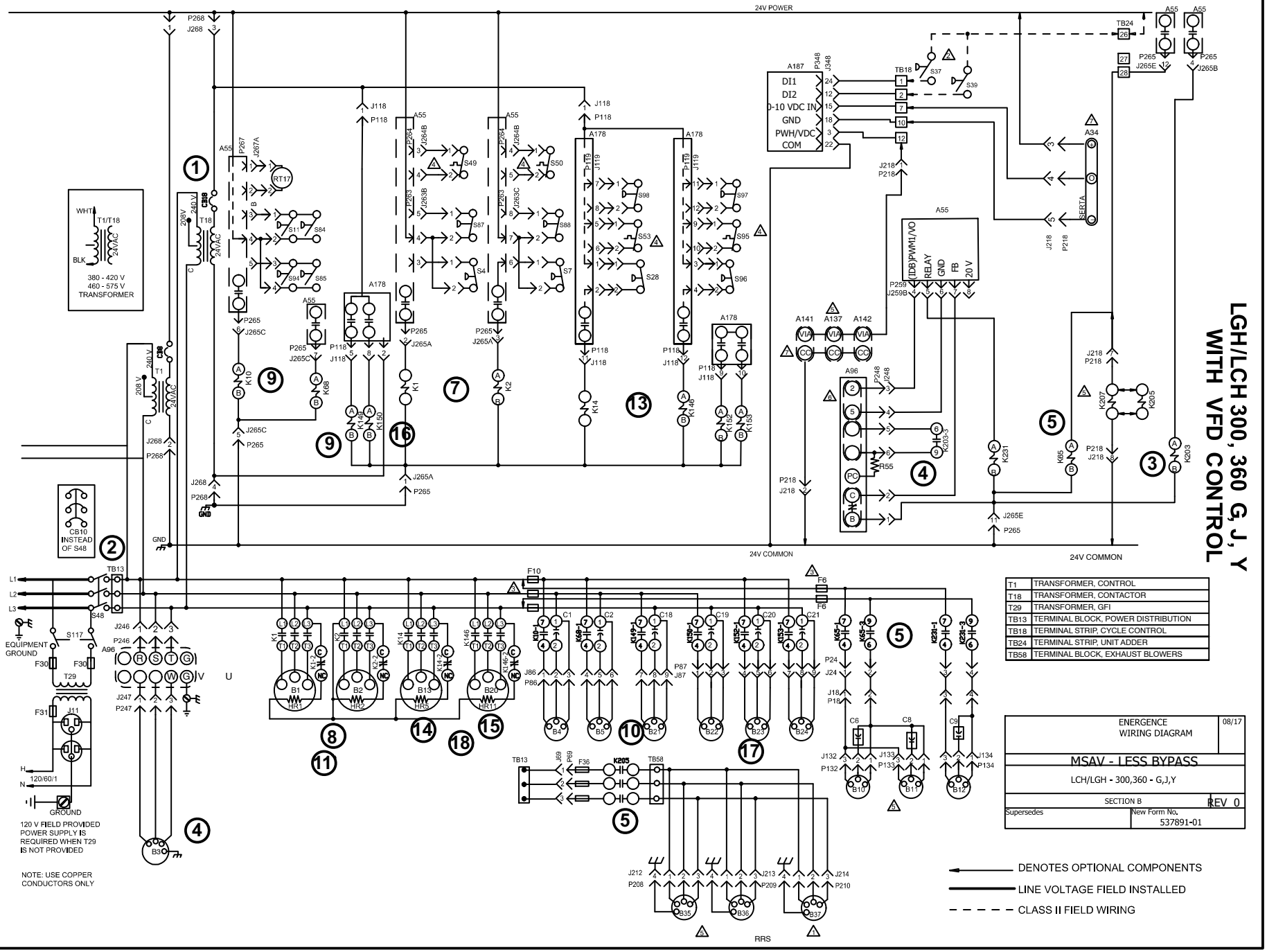
LCH/LGH - 300,360 - G,J,Y

SECTION B

REV 0

Supersedes

New Form No.
537866-01


LGH/LCH 300, 360 G, J, Y
WITH VFD CONTROL
24V POWER
24V COMMON
24V COMMON
380 - 420 V
460 - 575 V
TRANSFORMER
CB10
INSTEAD
OF S48
EQUIPMENT
GROUND
120/60/1
GROUND
120 V FIELD PROVIDED
POWER SUPPLY IS
REQUIRED WHEN T29
IS NOT PROVIDED
NOTE: USE COPPER
CONDUCTORS ONLY
RRS
DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED
CLASS II FIELD WIRING
T1 TRANSFORMER, CONTROL
T18 TRANSFORMER, CONTACTOR
T29 TRANSFORMER, GFI
TB13 TERMINAL BLOCK, POWER DISTRIBUTION
TB18 TERMINAL STRIP, CYCLE CONTROL
TB24 TERMINAL STRIP, UNIT ADDER
TB58 TERMINAL BLOCK, EXHAUST BLOWERS
ENERGENCE
WIRING DIAGRAM
08/17
MSAV - LESS BYPASS
LCH/LGH - 300,360 - G,J,Y
SECTION B
REV 0
Supersedes
New Form No.
537891-01

LGH/LCH 300, 360 G, J, Y
WITH VFD CONTROL

KEY	COMPONENT
A34	DIFFERENTIAL PRESSURE TRANSDUCER
A55	CONTROL BOARD, MAIN
A96	CONTROL INVERTER
A137	CONTROL, INVERTER, RETURN
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
A187	CONTROL, GENERAL PURPOSE GP3
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN 1
B5	MOTOR, OUTDOOR FAN 2
B10	MOTOR, EXHAUST FAN 1
B11	MOTOR, EXHAUST FAN 2
B12	MOTOR, EXHAUST FAN 3
B13	COMPRESSOR 3
B20	COMPRESSOR 4
B21	MOTOR, OUTDOOR FAN 3
B22	MOTOR, OUTDOOR FAN 4
B23	MOTOR, OUTDOOR FAN 5
B24	MOTOR, OUTDOOR FAN 6
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
C1	CAPACITOR, OUTDOOR FAN 1
C2	CAPACITOR, OUTDOOR FAN 2
C6	CAPACITOR, EXHAUST FAN 1
C8	CAPACITOR, EXHAUST FAN 2
C9	CAPACITOR, EXHAUST FAN 3
C18	CAPACITOR, OUTDOOR FAN 3
C19	CAPACITOR, OUTDOOR FAN 4
C20	CAPACITOR, OUTDOOR FAN 5
C21	CAPACITOR, OUTDOOR FAN 6
CB8	CIRCUIT, BREAKER T1
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB18	CIRCUIT, BREAKER T18

F6	FUSE, EXHAUST FAN
F10	FUSE, OUTDOOR FAN MOTOR
F30	FUSE, TRANSFORMER T29 PRIMARY
F31	FUSE, TRANSFORMER T29 SECONDARY
F36	FUSE, P.E.BLOWERS
HR1	HEATER COMPRESSOR 1
HR2	HEATER COMPRESSOR 2
HR5	HEATER COMPRESSOR 3
HR11	HEATER COMPRESSOR 4
K1	CONTACTOR, COMPRESSOR 1
K2	CONTACTOR, COMPRESSOR 2
K10	RELAY, OUTDOOR FAN 1
K14	CONTACTOR, COMPRESSOR 3
K65	RELAY, EXHAUST FAN
K68	RELAY, OUTDOOR FAN 2
K146	CONTACTOR, COMPRESSOR 4
K149	RELAY, OUTDOOR FAN 3
K150	RELAY, OUTDOOR FAN 4
K152	RELAY, OUTDOOR FAN 5
K153	RELAY, OUTDOOR FAN 6
K203	RELAY INVERTER CONTROL
K205	CONTACTOR,POWER EXHAUST
K207	RELAY, EXHAUST BLOWER
K231	RELAY, EXHAUST FAN 2
R55	RESISTOR, VFD LOADING, A96
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS COMPRESS 1
S7	SWITCH, LIMIT HI PRESS COMPRESS 2
S11	SWITCH, LOW PRESS, LOW AMBIENT COMP 1
S31	SWITCH, LIMIT HI TEMP COMPRESSOR 3
S37	SWITCH, PRESS, EXH
S39	SWITCH, EXHAUST FAN
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZE STAT COMPRESS 1
S50	SWITCH, FREEZE STAT COMPRESS 2
S53	SWITCH, FREEZE STAT COMPRESS 3
S84	SWITCH, LOW PRESS, LOW AMBIENT COMP 2
S85	SWITCH, LOW PRESS, LOW AMBIENT COMP 3
S87	SWITCH, LOW PRESS, COMP 1
S88	SWITCH, LOW PRESS, COMP 2
S94	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 4
S95	SWITCH, FREEZE STAT COMPRESS 4
S96	SWITCH, LIMIT HI PRESS COMPRESS 4
S97	SWITCH, LOW PRESS, COMP 4
S98	SWITCH, LOW PRESS, COMP 3
S117	SWITCH, GFI

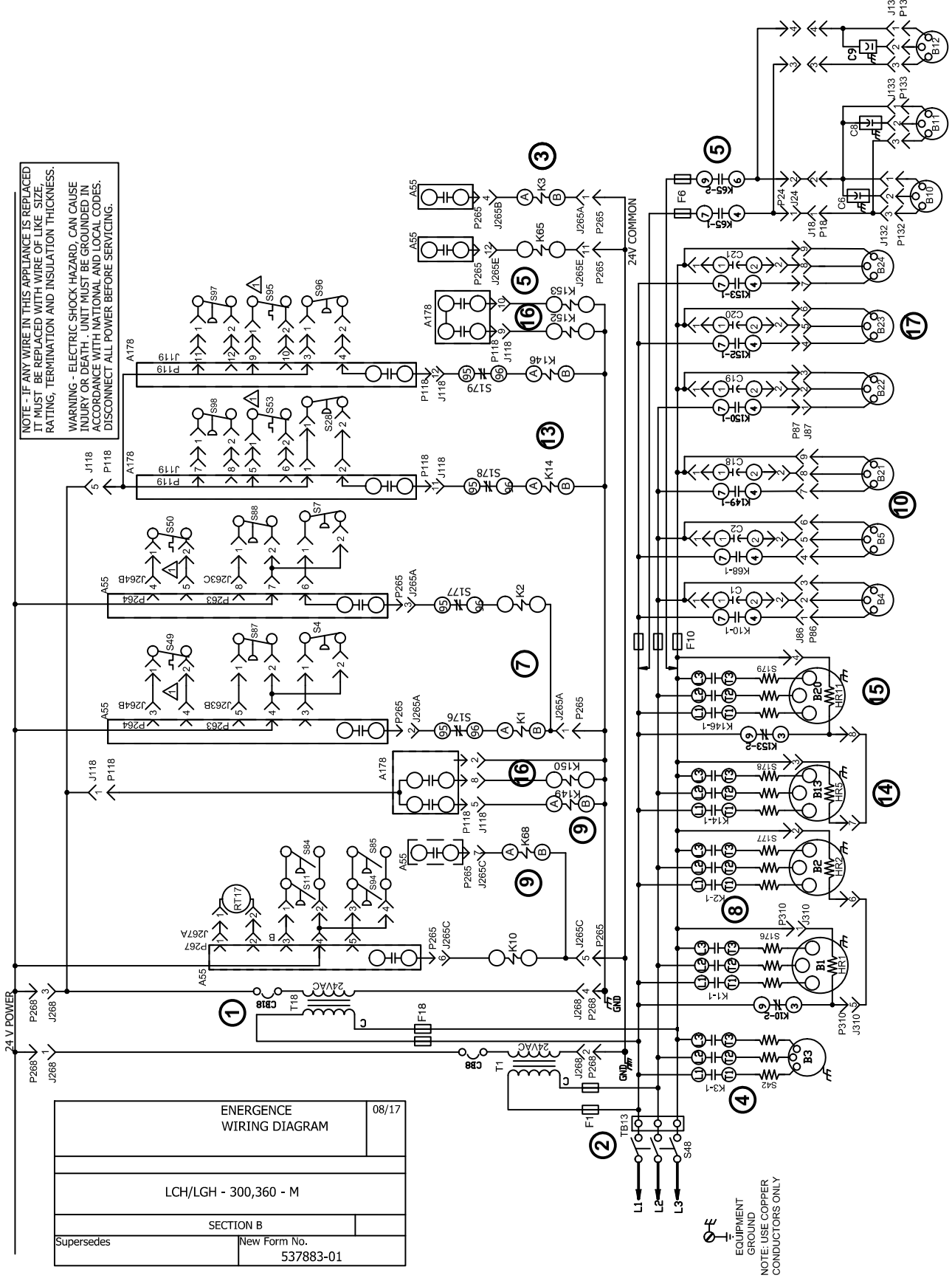
J/P	JACK/PLUG DESCRIPTION
11	GFI, RECEPTACLE
18	EXHAUST FAN COMP
24	EXHAUST FAN
69	POWER EXHAUST POWER
86	OUTDOOR FAN INTERFACE
87	OUTDOOR FAN INTERFACE 2
118	CONTROL FOR COMPRESSOR 3 AND 4
119	COMPRESSOR 3 AND 4, INPUT
132	EXHAUST FAN MOTOR 1
133	EXHAUST FAN MOTOR 2
134	EXHAUST FAN MOTOR 3
208	MOTOR, EXH BLO, B35
209	MOTOR, EXH BLO, B36
210	MOTOR, EXH BLO, B37
212	MOTOR, EXH BLO, B35
213	MOTOR, EXH BLO, B36
214	MOTOR, EXH BLO, B37
218	POWER EXHAUST CONTROL
246	POWER TO VFD
247	VFD TO MOTOR
248	VFD TO CONTROL
259	BLOWER ECM MOTOR
263	HIGH AND LOW PRESSURE SWITCHES
264	BLOWER DECK
265	CONTACTORS AND RELAYS
268	24V POWER FROM TRANSFORMERS
348	CONTROL, GENERAL PURPOSE GP3

NOTES

1. B37 BLOWER MAY NOT BE USED
2. S37 AND S39 PRESSURE SWITCH CONTROL FOR POWER EXHAUST
3. F6 AND F10 FUSES ARE USED ON "Y" VOLTAGE UNITS ONLY
4. S49,S50,S53 AND S95 ARE A PART OF 5VDC CIRCUIT
5. FOR POWER EXHAUST INVERTER WIRING, REFER TO RRS ASSEMBLY
6. A96 INVERTER CONTROL FOR B3 SUPPLY AIR BLOWER
7. A34 SENSOR AND A137, A141, A142 INVERTER CONTROL FOR B35, B36, B37 EXHAUST AIR BLOWER (RRS)

ENERGENCE WIRING DIAGRAM	08/17
MSAV - LESS BYPASS	
LCH/LGH - 300,360 - G,J,Y	
SECTION B	REV 0
Supersedes	New Form No. 537891-01

LGH/LCH300, 360 M LESS VFD



KEY	COMPONENT DESCRIPTION
A55	CONTROL BOARD, MAIN
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
B1	COMPRESSOR 1
B2	COMPRESSOR 2
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN 1
B5	MOTOR, OUTDOOR FAN 2
B10	MOTOR, EXHAUST FAN 1
B11	MOTOR, EXHAUST FAN 2
B12	MOTOR, EXHAUST FAN 3
B13	COMPRESSOR 3
B20	COMPRESSOR 4
B21	MOTOR, OUTDOOR FAN 3
B22	MOTOR, OUTDOOR FAN 4
B23	MOTOR, OUTDOOR FAN 5
B24	MOTOR, OUTDOOR FAN 6
C1	CAPACITOR, OUTDOOR FAN 1
C2	CAPACITOR, OUTDOOR FAN 2
C6	CAPACITOR, EXHAUST FAN 1
C8	CAPACITOR, EXHAUST FAN 2
C9	CAPACITOR, EXHAUST FAN 3
C18	CAPACITOR, OUTDOOR FAN 3
C19	CAPACITOR, OUTDOOR FAN 4
C20	CAPACITOR, OUTDOOR FAN 5
C21	CAPACITOR, OUTDOOR FAN 6
CB8	CIRCUIT, BREAKER T1
CB18	CIRCUIT, BREAKER T18
F1	FUSE, TRANSFORMER, T1
F6	FUSE, EXHAUST FAN
F10	FUSE, OUTDOOR FAN MOTOR
F18	FUSE, TRANSFORMER, T18
HR1	HEATER COMPRESSOR 1
HR2	HEATER COMPRESSOR 2
HR5	HEATER COMPRESSOR 3
HR11	HEATER COMPRESSOR 4
K1,–1	CONTACTOR, COMPRESSOR 1
K2,–1	CONTACTOR, COMPRESSOR 2
K3-1	CONTACTOR, BLOWER
K10,–1,2	RELAY, OUTDOOR FAN 1
K14-01	CONTACTOR, COMPRESSOR 3
K65-1,2	RELAY, EXHAUST FAN
K68,–1	RELAY,OUTDOOR FAN 2
K146-1	CONTACTOR, COMPRESSOR 4
K149-1	RELAY, OUTDOOR FAN 3
K150,–1	RELAY, OUTDOOR 4
K152-1	RELAY, OUTDOOR 5
K153-1, -2	RELAY, OUTDOOR FAN 6
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS COMPRESS 1
S7	SWITCH, LIMIT HI PRESS COMPRESS 2
S11	SWITCH, LOW PRESS, LOW AMBIENT COMP 1
S28	SWITCH, LIMIT HI PRESS COMPRESS 3
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZE STAT COMPRESS 1
S50	SWITCH, FREEZE STAT COMPRESS 2
S53	SWITCH, FREEZE STAT COMPRESS 3
S84	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 2
S85	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 3
S87	SWITCH, LOW PRESS, COMP 1
S88	SWITCH, LOW PRESS, COMP 2
S94	SWITCH, LOW PRESS, LOW AMBIENT KIT COMP 4
S95	SWITCH, FREEZE STAT COMPRESS 4
S96	SWITCH, LIMIT HI PRESS COMPRESS 4
S97	SWITCH, LOW PRESS, COMP 4
S98	SWITCH, LOW PRESS, COMP 3
S176	SWITCH, OVERLOAD COMPRESSOR 1
S177	SWITCH, OVERLOAD COMPRESSOR 2
S178	SWITCH, OVERLOAD COMPRESSOR 3
S179	SWITCH, OVERLOAD COMPRESSOR 4
T1	TRANSFORMER, CONTROL
T18	TRANSFORMER, CONTACTOR
TB13	TERMINAL STRIP, POWER DISTRIBUTION

J/P	JACK/PLUG DESCRIPTION
18	EXHAUST FAN COMP
24	EXHAUST FAN
86	OUTDOOR FAN INTERFACE
87	OUTDOOR FAN INTERFACE 2
118	COMPRESSOR 3 AND 4, CONTROL
119	COMPRESSOR 3 AND 4, INPUT
132	EXHAUST FAN MOTOR 1
133	EXHAUST FAN MOTOR 2
134	EXHAUST FAN MOTOR 3
263	HIGH AND LOW PRESSURE SWITCHES
264	BLOWER DECK
265	CONTACTORS AND RELAYS
267	OUTDOOR FAN AREA
268	T1 TRANSFORMER
310	CRANKCASE HEATERS

⚠1 S49,S50,S53 AND S95 ARE PART OF 5VDC CIRCUIT

← DENOTES OPTIONAL COMPONENTS

LINE VOLTAGE FIELD INSTALLED

ENERGENCE WIRING DIAGRAM	08/17
LCH/LGH - 300,360 - M	
SECTION B	
Supersedes	New Form No. 537883-01

Sequence of Operation LGH/LCH242/300/360

POWER:

1- Line voltage from TB2, unit disconnect S48, or other factory or field installed optional power disconnects, such as CB10, energizes transformer T1 and T18. Transformer T1 provides 24VAC power to the A55 Unit Controller and T18 provides 24VAC power to A178 Compressor 3 and 4 Controller. The two controllers provide 24VAC power to the unit cooling, heating and blower controls and thermostat.

2- Terminal block TB13 is also energized when the unit disconnect closes. TB13 supplies line voltage to compressor crankcase heaters, compressors, blower motors and fan motors.

BLOWER OPERATION (OCP INPUT MUST BE ON):

3- The A55 Unit Controller receives a demand from thermostat terminal G. A55 energizes blower contactor K3 with 24VAC. On VFD units, A55 energizes relay K203.

4- N.O. K3-1 closes, energizing blower B3. On VFD units, N.O. K203-2 closes, sending a signal to the inverter, A96, to start forward rotation. P259 pin #4 sends a 0 -10VDC signal to A96 to control blower B3 speed.

POWER EXHAUST FANS/BLOWERS:

5- The A55 Unit Controller receives a demand and energizes exhaust fan relay K65 OR exhaust blower contactor K205 or exhaust blower relay K207.

1ST STAGE COOLING (BOTH COMPRESSORS B1 AND B2 ARE ENERGIZED):

6- First stage cooling demand energizes Y1 and G in the thermostat. G energizes blower, if blower is not already running (see step 3).

7- 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. low pressure switch S87 and S88, N.C. freezestat S49 and S50 and N.C. high pressure switch S4 and S7, compressor contactors K1 and K2 are energized.

8- N.O. contacts K1-1 and K2-1 close energizing compressor B1 and B2.

9- A55 Unit Controller and A178 Controller energize fan contactor K10, K68, and K149 based on low ambient switch S11 and S84 inputs and predefined control logic.

10- N.O. contact K10-1, K68-1, K149-1 close energizing fan B4, B5 and B21 respectively.

11- N.C. Contacts K1-2 and K2-2 open de-energizing compressor 1 and 2 crankcase heater HR1 and HR2.

2ND STAGE COOLING:

12- Second stage cooling demand energizes Y2.

13-24VAC is routed to A178 Compressor 3 and 4 Controller. After A178 proves N.C. low pressure switches S98 and S97, N.C. freezestats S53 and S95 and N.C. high pressure switches S28 and S96, compressor contactors K14 and K146 are energized.

14- N.O. contacts K14-1 close energizing compressor B13.

15- N.O. contacts K146-1 close energizing compressor B20.

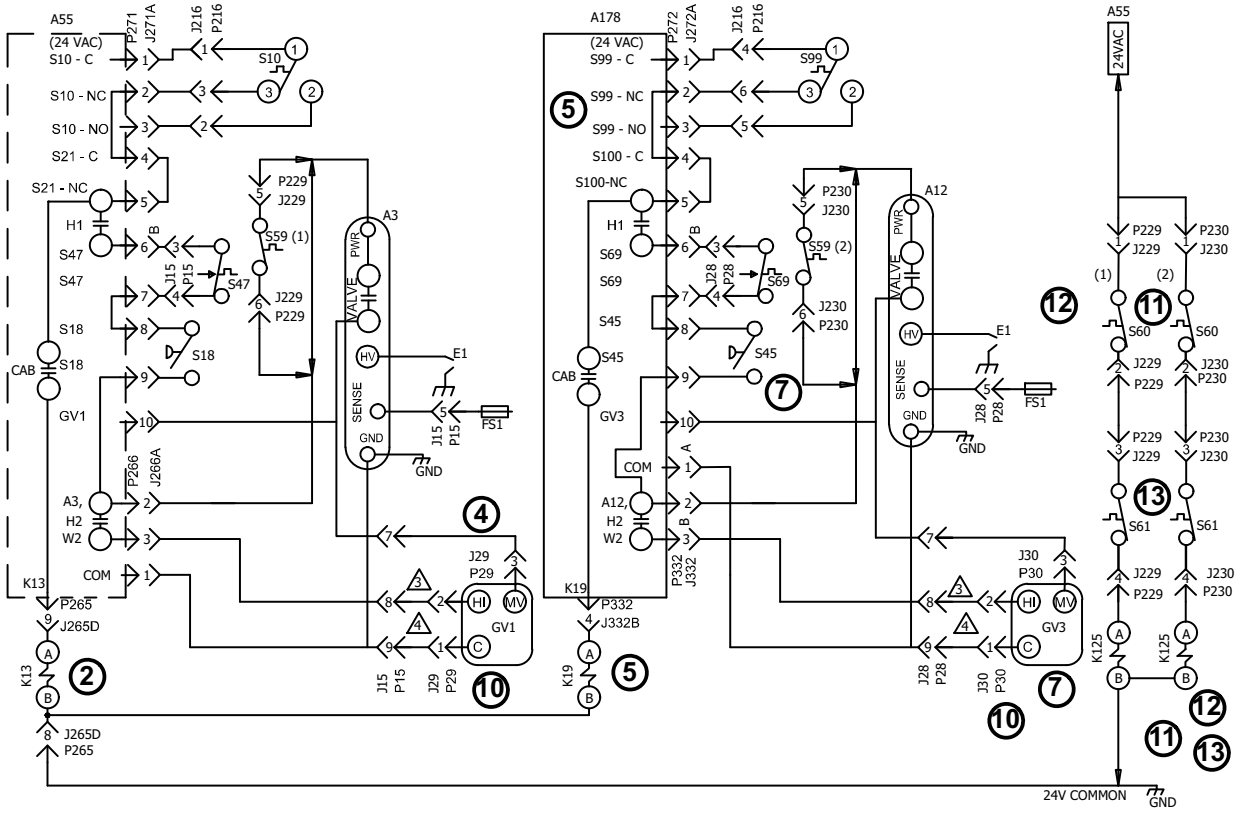
16- A178 Controller energizes fan contactor K150, K152, K153 based on low ambient switch S85 and S94 inputs and predefined control logic.

17-N.O. contacts K150-1, K152-1 and K153-1 close energizing condenser fan B22, B23 and B24 respectively.

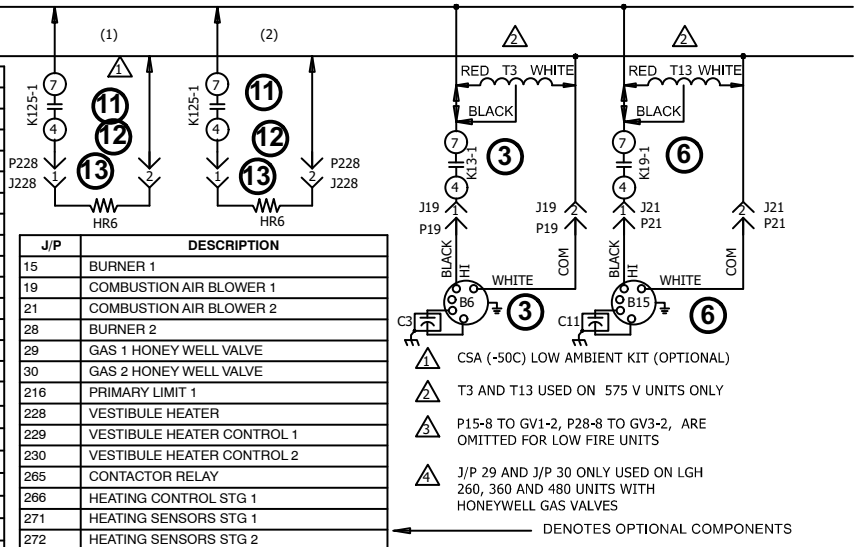
18-N.C contacts K14-2 and K146-2 open de-energizing compressor 3 and 4 crankcase heater HR5 and HR11.

GAS HEAT FOR LGH242/300/360

NOTE - On single stage heat, terminal H1 on gas valve GV1 and GV3 is not connected to terminal H2 on A55 Unit Controller.



DESCRIPTION	
KEY	**DESCRIPTION**
A3	CONTROL, BURNER 1
A12	CONTROL, BURNER 2
A55	CONTROL BOARD, MAIN
A178	BOARD, COMP 3 & 4, 2ND STAGE HEAT – C3
B6	MOTOR COMBUSTION AIR BLOWER 1
B15	MOTOR COMBUSTION AIR BLOWER 2
C3	CAPACITOR, COMB AIR BLOWER 1
C11	CAPACITOR, COMB AIR BLOWER 2
E1	SPARK
FS1	SENSOR, FLAME
GV1	VALVE, GAS 1
GV3	VALVE, GAS 2
HR6	HEATER, –50C LOW AMBIENT KIT
K13,–1	RELAY, COMBUSTION AIR BLOWER 1
K19,–1	RELAY, COMBUSTION AIR BLOWER 2
K125,–1	RELAY, HEAT SHUT OFF
S10	SWITCH, LIMIT PRIMARY GAS
S18	SWITCH, COMB AIR BLOWER 1 PROOF
S45	SWITCH, COMB AIR BLOWER 2 PROOF
S47	SWITCH, FLAME ROLLOUT BURNER
S59	TSTAT, OPEN –20F, CLOSE 10F
S60	TSTAT, OPEN 20F, CLOSE –10F
S61	TSTAT, OPEN 50F, CLOSE 20F
S69	SWITCH, FLAME ROLLOUT 2
S99	SWITCH, LIMIT PRIMARY BURNER 2
T3	TRANSFORMER, COMB AIR BLOWER 1
T13	TRANSFORMER, COMB AIR BLOWER 2



J/P	DESCRIPTION
15	BURNER 1
19	COMBUSTION AIR BLOWER 1
21	COMBUSTION AIR BLOWER 2
28	BURNER 2
29	GAS 1 HONEY WELL VALVE
30	GAS 2 HONEY WELL VALVE
216	PRIMARY LIMIT 1
228	VESTIBULE HEATER
229	VESTIBULE HEATER CONTROL 1
230	VESTIBULE HEATER CONTROL 2
265	CONTACTOR RELAY
266	HEATING CONTROL STG 1
271	HEATING SENSORS STG 1
272	HEATING SENSORS STG 2
332	HEATING CONTROL STG 2

08/17	WIRING DIAGRAM 537695-03	08/17
HEATING		
GAS HEAT FOR ENERGENCE 169,260,360 AND 480		
SECTION A		REV. 0
Supersedes	New Form No. 537695-03	

SEQUENCE OF OPERATION
GAS HEAT FOR LGH242/300/360 UNITS

FIRST STAGE HEAT:

1 - Heating demand initiates at W1 in thermostat.

2 - 24VAC is routed to the A55 Unit Controller. After A55 proves N.C. primary limit S10, the combustion air blower relay K13 is energized.

3 - N.O. K13-1 contacts close allowing line voltage (or transformer T3 in 575V only) to energize combustion air blower B6.

4 - After the combustion air blower B6 has reached full speed, the combustion air proving switch (S18) contacts close. The A55 routes 24VAC through N.C. burner 1 flame rollout switch S47 and the closed contacts of the combustion air proving switch (S18) to energize the ignition module A3. After a 30 second delay A3 energizes the gas valve GV1 on low fire.

5 - As steps 2, 3 and 4 occur, A178 proves N.C. primary gas heat limit S99 and the combustion air blower relay K19 is energized.

6 - N.O. K19-1 contacts close allowing line voltage (or transformer T13 in 575V only) to energize combustion air blower B15.

7 - After the combustion air blower B15 has reached full speed, the combustion air proving switch (S45) contacts close. The A178 routes 24VAC through N.C. burner 2 flame rollout switch S69 and the closed contacts of the combustion air proving switch (S45) to energize the ignition module A12. After a 30 second delay A12 energizes gas valve GV3 on low fire.

SECOND STAGE HEAT:

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

9 - A second stage heating demand is received by A55.

10 - A55 will energize the corresponding gas valves GV1 and GV3 on high fire.

OPTIONAL LOW AMBIENT KIT (C.G.A. -50° C LOW AMBIENT KIT):

11 - When heat section temperature drops below -20°F, S59 opens and de-energized A3 and A12 ignition controls. At the same temperature, S60 closes and energizes K125. K125-1 contacts close energizing HR6 Cold Weather Kit electric heat.

12 - When heat section temperature rises to 10°F, S59 closes allowing power to A3 and A12 ignition controls. At the same temperature, S60 opens and de-energizes K125. K125-1 contacts open de-energizing HR6 Cold Weather Kit electric heat.

13 - If heat section temperature rises above 50°F, S61 will open and de-energize K125. K125-1 contacts will open and de-energize HR6 Cold Weather Kit electric heat. If heat section temperature drops to 20°F, S61 will close and allow power to K125.

END OF SECOND STAGE HEAT:

14 - Heating demand is satisfied. Terminal W2 is de-energized.

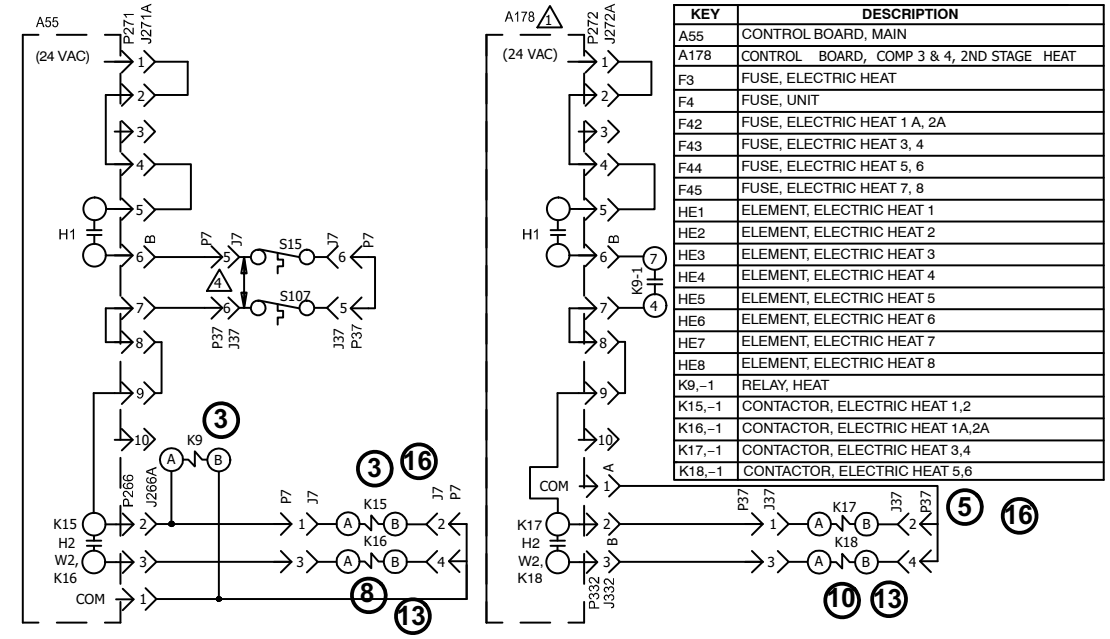
15 - High fire on GV1 and GV3 are de-energized by the A55.

END OF FIRST STAGE HEAT:

16 - Heating demand is satisfied. Terminal W1 is de-energized.

17 - Ignition module A3 is de-energized by A55 in turn de-energizing GV1. Combustion blower relay K13 is also de-energized. At the same instant, ignition module A12 is de-energized by A55 in turn de-energizing GV3. K19 combustion air blower relay is also de-energized.

ELECTRIC HEAT DIAGRAM



KEY	DESCRIPTION
A55	CONTROL BOARD, MAIN
A178	CONTROL BOARD, COMP 3 & 4, 2ND STAGE HEAT
F3	FUSE, ELECTRIC HEAT
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 1 A, 2A
F43	FUSE, ELECTRIC HEAT 3, 4
F44	FUSE, ELECTRIC HEAT 5, 6
F45	FUSE, ELECTRIC HEAT 7, 8
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
HE6	ELEMENT, ELECTRIC HEAT 6
HE7	ELEMENT, ELECTRIC HEAT 7
HE8	ELEMENT, ELECTRIC HEAT 8
K9,–1	RELAY, HEAT
K15,–1	CONTACTOR, ELECTRIC HEAT 1,2
K16,–1	CONTACTOR, ELECTRIC HEAT 1A,2A
K17,–1	CONTACTOR, ELECTRIC HEAT 3,4
K18,–1	CONTACTOR, ELECTRIC HEAT 5,6

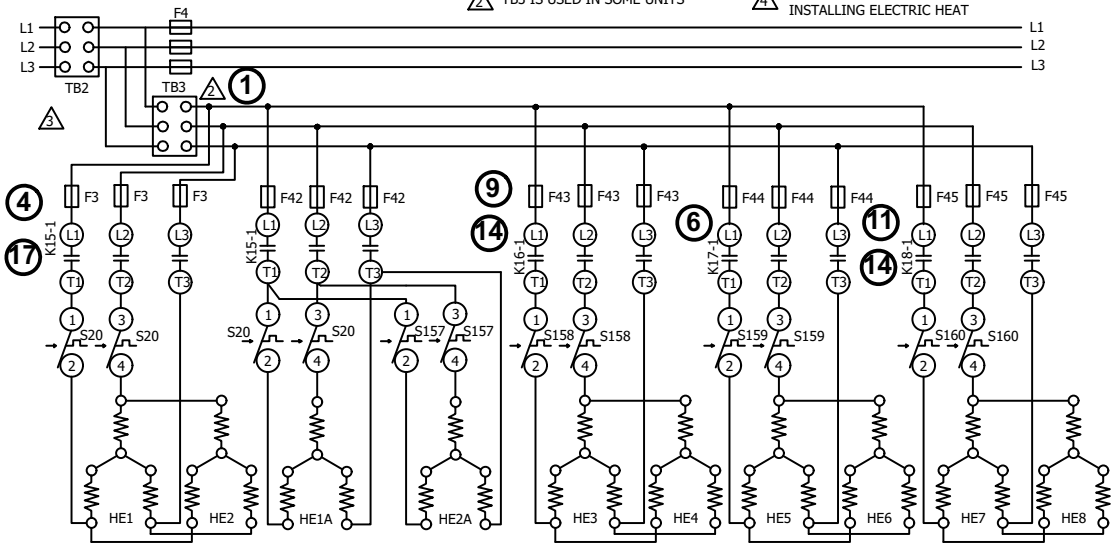
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S20	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2
S107	SWITCH, PRIMARY ELECTRIC HEAT
S157	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1A
S158	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2A
S159	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3,4
S160	SWITCH, LIMIT SECONDARY ELECTRIC HEAT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

J/P	DESCRIPTION
7	ELECTRIC HEAT CONTROL
37	ELECTRIC HEAT CONTROL
266	HEATING CONTROL STG 1
271	HEATING SENSORS STG 1
272	HEATING SENSORS STG 2
332	HEATING CONTROL STG 2

DESIGNATION	VOLTAGE
G	460/60/3
J	575/60/3
M	380–420/50/3

C UNITS 156 TO 300
D UNITS 242 TO 360

1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. TB2, S48 OR CB10 MAY BE USED
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT



	KW	HE1	HE2	HE1A	HE2A	HE3	HE4	HE5	HE6	HE7	HE8
C	15			7.5	7.5						
D	30			15	15						
	45	15				7.5		15		7.5	
	60	15				15		15		15	
	90	15				15	15	15		15	15
C	120	15	15			15	15	15	15	15	15
D	11.5			5.7	5.7						
	23			11.5	11.5						
	34.5	11.5				5.7		11.5		5.7	
	45.9	11.5				11.5		11.5		11.5	
	68.9	11.5				11.5	11.5	11.5		11.5	11.5
	91.8	11.5	11.5			11.5	11.5	11.5	11.5	11.5	11.5

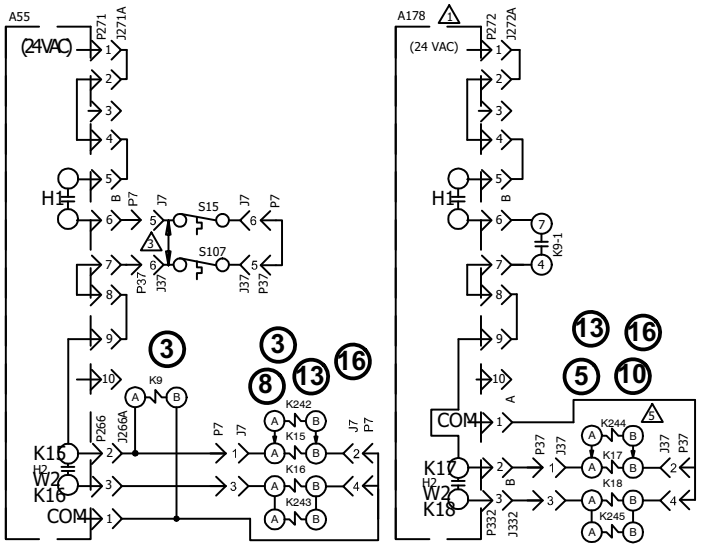
DENOTES OPTIONAL COMPONENTS

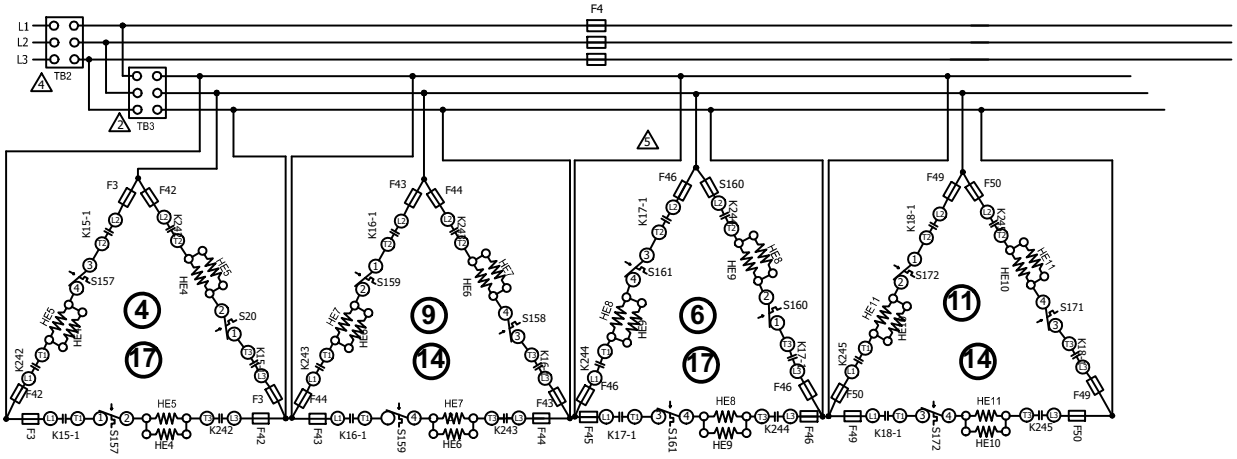
08/17	WIRING DIAGRAM ENERGENCE 537754-02	08/17
ELECTRIC HEATING		
E1EH,EHA-15,30,45,60,90,120 - G, J E1EH,EHA-11.5,23,34.5,45.9,68.9,91.8 - M		
SECTION A		REV.0
Supersedes 537356-03,537184-04	New Form No. 537754-02	

ELECTRIC HEAT DIAGRAM

J/P	JACK/PLUG
7	ELECTRIC HEAT CONTROL
37	ELECTRIC HEAT CONTROL
266	HEATING CONTROL STG 1
271	HEATING SENSORS STG 1
272	HEATING SENSORS STG 2
332	HEATING CONTROL STG 2

KEY	DESCRIPTION
A55	CONTROL BOARD, MAIN
A178	CONTROL, COMP 3 & 4, 2ND STAGE HEAT – C3
F3	FUSE, ELECTRIC HEAT
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 1 A, 2A
F43	FUSE, ELECTRIC HEAT 3
F44	FUSE, ELECTRIC HEAT 4
F45	FUSE, ELECTRIC HEAT 5
F46	FUSE, ELECTRIC HEAT 6
F49	FUSE, ELECTRIC HEAT 7
F50	FUSE, ELECTRIC HEAT 8
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
HE6	ELEMENT, ELECTRIC HEAT 6
HE7	ELEMENT, ELECTRIC HEAT 7
HE8	ELEMENT, ELECTRIC HEAT 8
HE9	ELEMENT, ELECTRIC HEAT 9
HE10	ELEMENT, ELECTRIC HEAT 10
HE11	ELEMENT, ELECTRIC HEAT 11
HE12	ELEMENT, ELECTRIC HEAT 12
HE13	ELEMENT, ELECTRIC HEAT 13
HE14	ELEMENT, ELECTRIC HEAT 14
K9,–1	RELAY, HEAT
K15,–1	CONTACTOR, ELECTRIC HEAT 1,2
K16,–1	CONTACTOR, ELECTRIC HEAT 1A,2A
K17,–1	CONTACTOR, ELECTRIC HEAT 3,4
K18,–1	CONTACTOR, ELECTRIC HEAT 5,6
K242	CONTACTOR, ELECTRIC HEAT 1
K243	CONTACTOR, ELECTRIC HEAT 2
K244	CONTACTOR, ELECTRIC HEAT 3
K245	CONTACTOR, ELECTRIC HEAT 4
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S20	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2
S107	SWITCH, PRIMARY ELECTRIC HEAT
S157	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2
S158	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3
S159	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 4
S160	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 5
S161	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 6
S171	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 7
S172	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 8
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRIC HEAT





DESIGNATION	VOLTAGE
Y	208–230/60/3

C UNITS 156 TO 300
D UNITS 242 TO 360

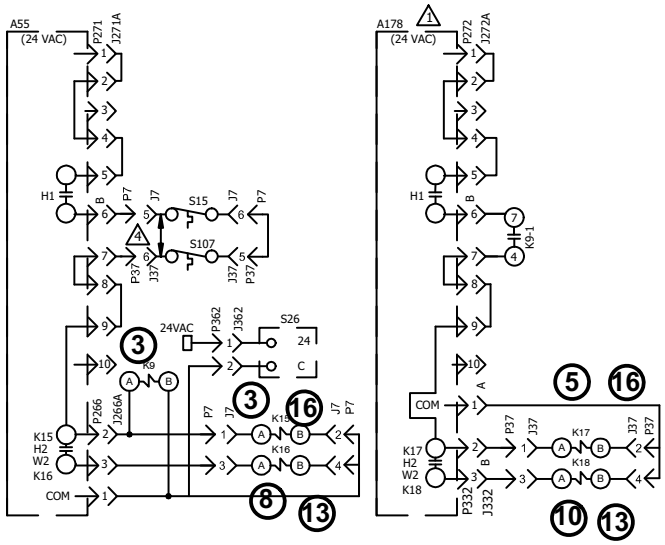
1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. REMOVE PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
4. TB2, CB10 OR S48 MAY BE USED
5. ONLY USED ON 120KW D BOX UNITS

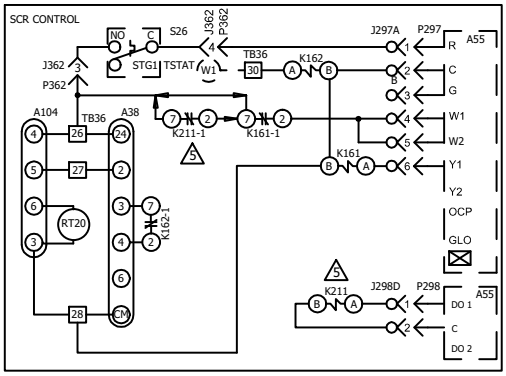
DENOTES OPTIONAL COMPONENTS

	KW	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14
C	15	7.5	7.5												
	30				15	15									
	45	15											7.5	15	7.5
	60	15											15	15	15
D	90	15		15			15	15			15	15			
	120				15	15	15	15	15	15	15	15			

08/17	WIRING DIAGRAM ENERGENCE 537755-02	08/17
	ELECTRIC HEATING	
	E1EH, EHA - 15, 30, 45, 60, 90, 120 - Y	
	SECTION A	REV 0
Supersedes 537755-01,537188-04	New Form No. 537755-02	

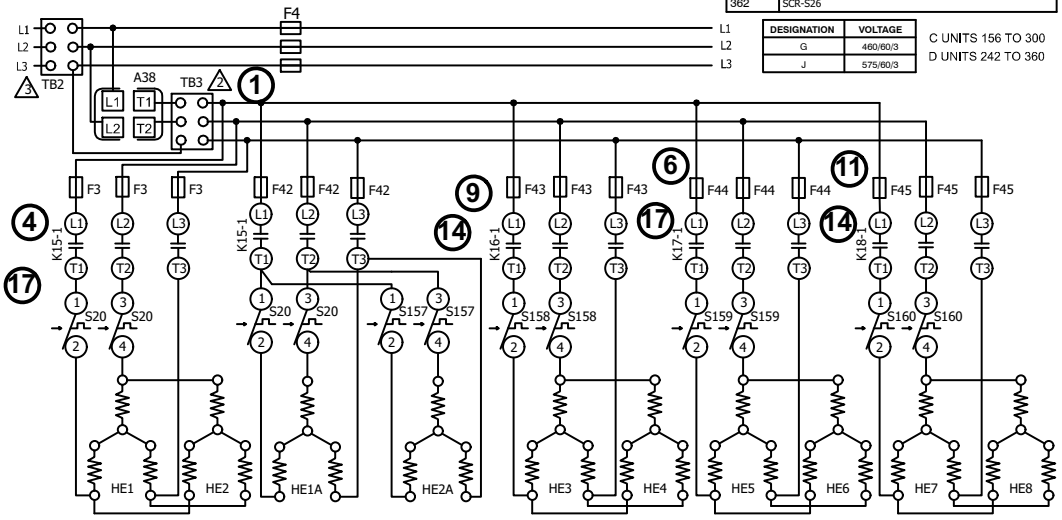
ELECTRIC HEAT DIAGRAM





KEY	DESCRIPTION
A38	CONTROL, SCR ELECTRIC HEAT
A55	CONTROL, BOARD LENNOX
A104	THERMOSTAT, SUPPLY AIR
A178	BOARD, COMP 3 & 4, C3 2nd STAGE HEAT
F3	FUSE, ELECTRIC HEAT
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 1 A, 2A
F43	FUSE, ELECTRIC HEAT 3, 4
F44	FUSE, ELECTRIC HEAT 5
F45	FUSE, ELECTRIC HEAT 6, 7
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
HE6	ELEMENT, ELECTRIC HEAT 6
HE7	ELEMENT, ELECTRIC HEAT 7
HE8	ELEMENT, ELECTRIC HEAT 8
K9,–1	RELAY, HEAT
K15,–1	CONTACTOR, ELECTRIC HEAT 1,2
K16,–1	CONTACTOR, ELECTRIC HEAT 1A,2A
K17,–1	CONTACTOR, ELECTRIC HEAT 3,4
K18,–1	CONTACTOR, ELECTRIC HEAT 5,6
K161–1	RELAY, SCR INTERRUPT
K162–1	CONTACTOR, SCR HIGH OUTPUT
K211–1	RELAY, HEAT LOCKOUT
RT20	SENSOR, DISCHARGE, SCR
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S26	THERMOSTAT, AMBIENT
S20	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1,2
S107	SWITCH, PRIMARY ELECTRIC HEAT
S157	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 1A
S158	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 2A
S159	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 3,4
S160	SWITCH, LIMIT SECONDARY ELECTRIC HEAT 5,6
TB2	TERMINAL STRIP, UNIT
TB3	TERMINAL STRIP, ELECTRIC HEAT
TB36	TERMINAL STRIP, SCR

J/P	JACK/PLUG DESCRIPTION
7	ELECTRIC HEAT CONTROL
37	ELECTRIC HEAT CONTROL
266	HEATING CONTROL STG 1
271	HEATING SENSORS STG 1
272	HEATING SENSORS STG 2
297	THERMOSTAT DDC INTERFACE
298	IAQ INTERFACE
332	HEATING CONTROL STG. 2
362	SCR-S26



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

C UNITS 156 TO 300
D UNITS 242 TO 360

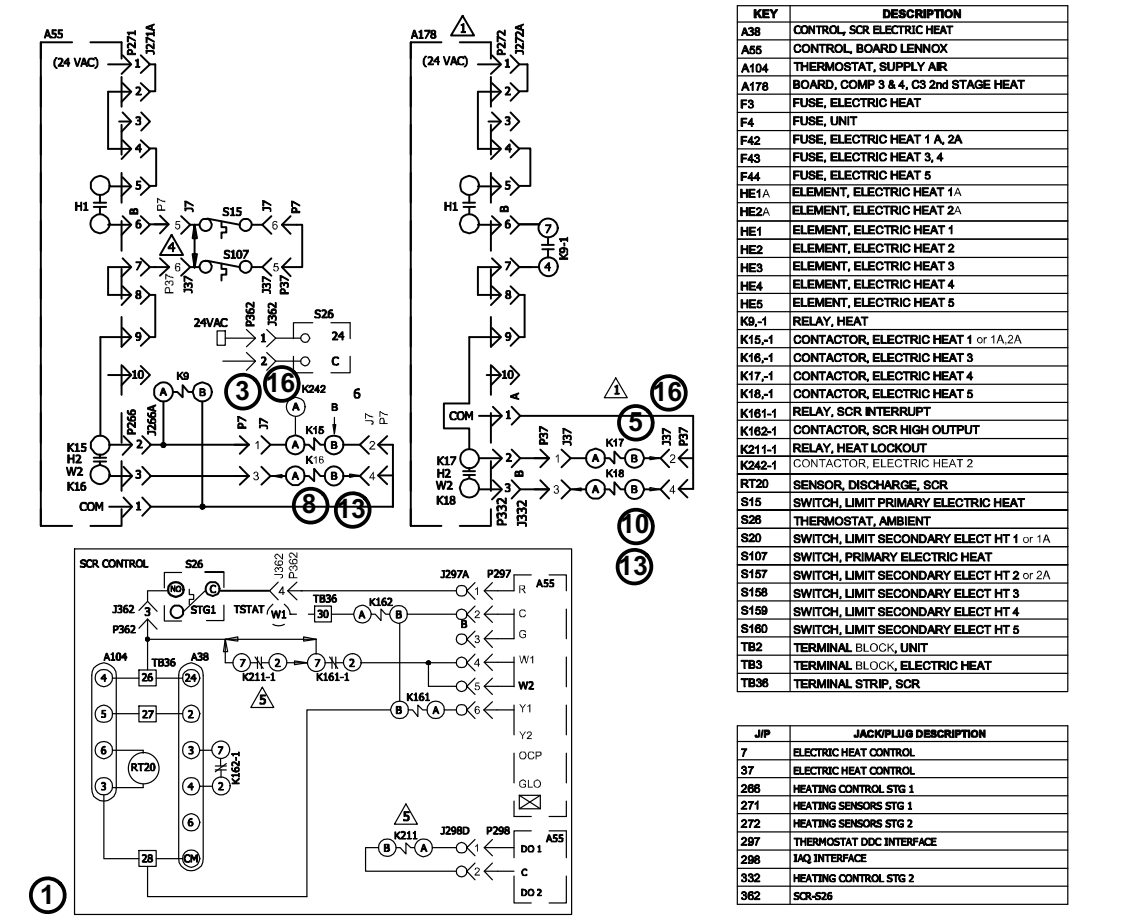
1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. TB2, S48 OR CB10 MAY BE USED
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTRIC HEAT
5. K211 USED WITH HUMIDITROL CONTROL

DENOTES OPTIONAL COMPONENTS

											SCR	AMPS
C	KW	HE1	HE2	H1A	H2A	HE3	HE4	HE5	HE6	HE7	HE8	480	600
D	15			7.5	7.5							30	15
	30			15	15							40	40
	45	15				7.5		15		7.5		75	50
	60	15				15		15		15		90	75
	90	15				15	15	15		15	15	135	135

WIRING DIAGRAM	08/17
HEATING - SCR	
SCR ELECTRIC HEAT CONTROL - STAND ALONE 15, 30, 45, 60, 90 - G, J	
SECTION A	REV 0
Supersedes 537263-01	New Form No. 537756-02

ELECTRIC HEAT DIAGRAM

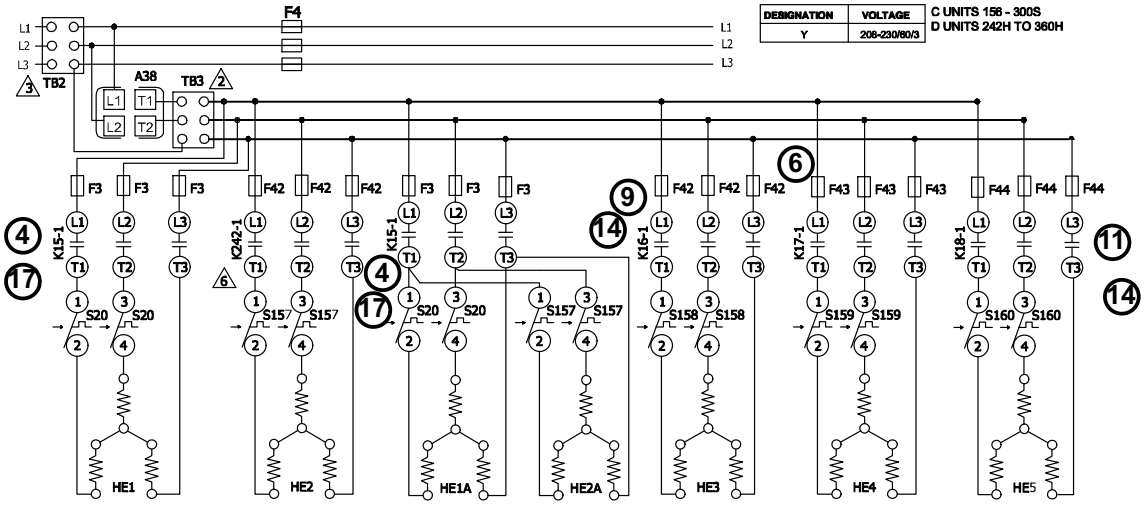


KEY	DESCRIPTION
A38	CONTROL, SCR ELECTRIC HEAT
A55	CONTROL, BOARD LENNOX
A104	THERMOSTAT, SUPPLY AIR
A178	BOARD, COMP 3 & 4, C3 2nd STAGE HEAT
F3	FUSE, ELECTRIC HEAT
F4	FUSE, UNIT
F42	FUSE, ELECTRIC HEAT 1 A, 2A
F43	FUSE, ELECTRIC HEAT 3, 4
F44	FUSE, ELECTRIC HEAT 5
HE1A	ELEMENT, ELECTRIC HEAT 1A
HE2A	ELEMENT, ELECTRIC HEAT 2A
HE1	ELEMENT, ELECTRIC HEAT 1
HE2	ELEMENT, ELECTRIC HEAT 2
HE3	ELEMENT, ELECTRIC HEAT 3
HE4	ELEMENT, ELECTRIC HEAT 4
HE5	ELEMENT, ELECTRIC HEAT 5
K9,-1	RELAY, HEAT
K15,-1	CONTACTOR, ELECTRIC HEAT 1 or 1A,2A
K16,-1	CONTACTOR, ELECTRIC HEAT 3
K17,-1	CONTACTOR, ELECTRIC HEAT 4
K18,-1	CONTACTOR, ELECTRIC HEAT 5
K161-1	RELAY, SCR INTERRUPT
K162-1	CONTACTOR, SCR HIGH OUTPUT
K211-1	RELAY, HEAT LOCKOUT
K242-1	CONTACTOR, ELECTRIC HEAT 2
RT20	SENSOR, DISCHARGE, SCR
S15	SWITCH, LIMIT PRIMARY ELECTRIC HEAT
S26	THERMOSTAT, AMBIENT
S20	SWITCH, LIMIT SECONDARY ELECT HT 1 or 1A
S107	SWITCH, PRIMARY ELECTRIC HEAT
S157	SWITCH, LIMIT SECONDARY ELECT HT 2 or 2A
S158	SWITCH, LIMIT SECONDARY ELECT HT 3
S159	SWITCH, LIMIT SECONDARY ELECT HT 4
S160	SWITCH, LIMIT SECONDARY ELECT HT 5
TB2	TERMINAL BLOCK, UNIT
TB3	TERMINAL BLOCK, ELECTRIC HEAT
TB36	TERMINAL STRIP, SCR

J/P	JACK/PLUG DESCRIPTION
7	ELECTRIC HEAT CONTROL
37	ELECTRIC HEAT CONTROL
268	HEATING CONTROL STG 1
271	HEATING SENSORS STG 1
272	HEATING SENSORS STG 2
297	THERMOSTAT DDC INTERFACE
298	IAQ INTERFACE
332	HEATING CONTROL STG 2
362	SCR-S26

DESIGNATION	VOLTAGE
Y	208-230/60/3

C UNITS 156 - 300S
D UNITS 242H TO 360H



1. NOT USED ON 15 AND 30KW UNITS
2. TB3 IS USED IN SOME UNITS
3. TB2, S48 OR CB10 MAY BE USED
4. REMOVE JUMPER PLUG WHEN FIELD INSTALLING ELECTIC HEAT
5. K211 USED WITH HUMIDITROL
6. K242 USED ON 30KW UNITS ONLY

DENOTES OPTIONAL COMPONENTS

	KW	HE1A	HE2A	HE1	HE2	HE3	HE4	HE5	SCR AMPS 208	SCR AMPS 240
C	15	7.5	7.5						30	40
D	30			15	15				75	75
	45			15		7.5	15	7.5	135	135

09/17	WIRING DIAGRAM 537757-02	09/17
HEATING - SCR		
SCR ELECTRIC HEAT CONTROL - STAND ALONE 15, 30, 45 KW - Y		
SECTION A		REV 0
Supersedes 537757-01	New Form No. 537757-02	

SEQUENCE OF OPERATION
EHA-30, 45, 60, 90, 120 - Y
EHA-30, 45, 60, 90, -120 - G, J and M

The Y voltage diagram use elements configured in a Wye. The G and J voltage diagram use elements configured in a Delta. Both diagrams follow the following sequence of operation:

NOTE:Two electric heat sections are used in all 30kW through 120kW heaters. The heat sections are labelled first electric heat section (left side) and second electric heat section (right side). See figure 29.

NOTE: In the case of EHA30kW, the second heat section (right side) is a slave (only has electric heat elements and a limit). Line voltage is supplied to elements in both heat section one (left side) and two (right side) by the contactors in heat section one (left side).

HEATING ELEMENTS:

1 - Terminal block TB3 is energized when the unit disconnect closes. TB3 supplies line voltage to electric heat elements HE1 through HE14. Each heating element is protected by fuse F3.

FIRST STAGE HEAT:

2 - Heating demand initiates at W1 in thermostat.

3 - 24VAC is routed to the main control module A55. After A55 proves N.C. primary limits S15 (heat section one, left side), S107 (heat section two, right side), the electric heat contactor K15 and heat relay K9 are energized.

4 - N.O. contact K15-1 closes allowing the first bank of elements in heat section one (left side) to be energized.

5 - At the same time, N.O. contacts K9-1 close. A N.O. contact in A55 closes, energizing electric heat relay K17.

6 - N.O. contacts K17-1 close allowing the first set of elements in heat section two (right side) to be energized.

SECOND STAGE HEAT:

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

8 - 24VAC is routed through the main control module A55, which in turn energizes the electric heat contactor K16.

9 - N.O. contacts K16-1 close allowing the second set of elements in heat section one (left side) to be energized.

10 - Simultaneous with step eight, a N.O. contact in the A178 Unit controller closes, allowing 24VAC to energize electric heat contactor K18.

11 - N.O. contacts K18-1 close allowing the second set of elements in heat section two (right side) to be energized.

END OF SECOND STAGE HEAT:

12 - Heating demand is satisfied. Terminal W2 in the thermostat is de-energized.

13 - Electric heat contactors K16 and K18 are de-energized.

14 - The second set of electric heat elements in heat sections one (left side) and two (right side) are de-energized.

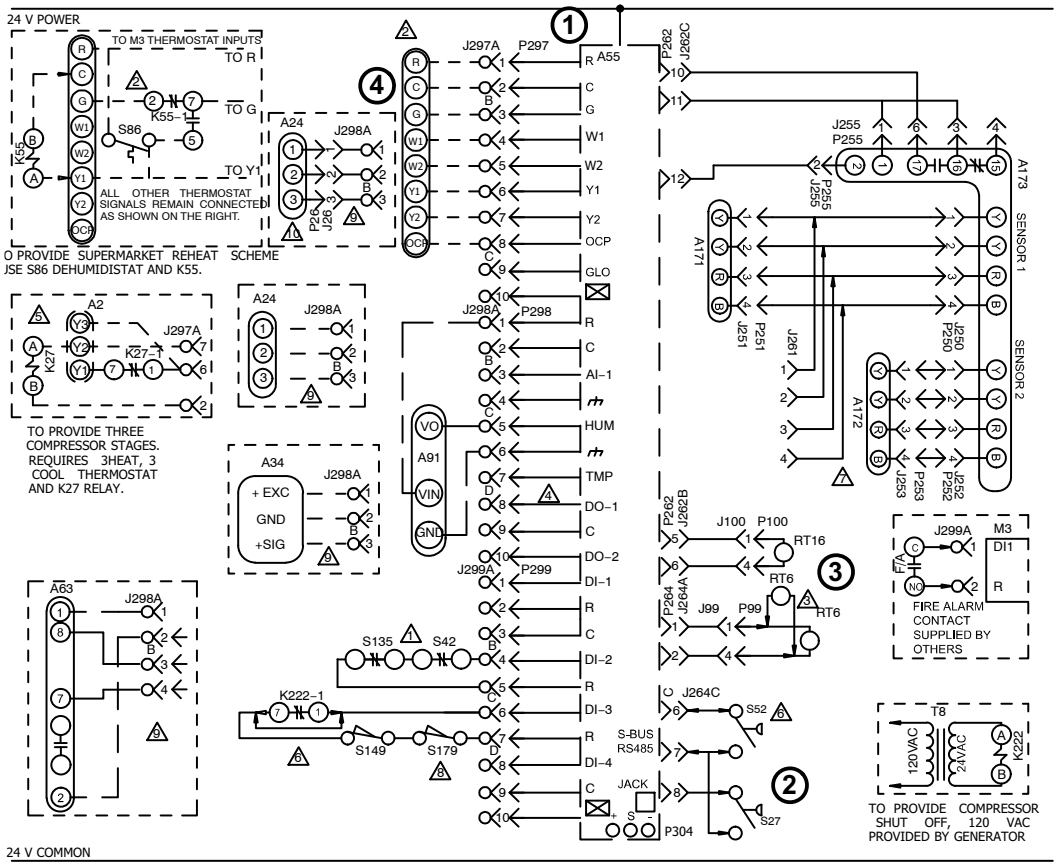
END OF FIRST STAGE HEAT:

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

16 - Electric heat contactors K15 and K17 are de-energized.

17 - The first set of electric heat elements in heat sections one (left side) and two (right side) are de-energized.

ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT



DESCRIPTION	
KEY	COMPONENT
A2	SENSOR, ELECTRONIC THERMOSTAT
A24	CONTROL, OUTDOOR AIR CFM FLOW
A34	DIFFERENTIAL PRESSURE TRANSDUCER
A55	CONTROLBOARD, MAIN
A63	SENSOR, CO2 (IAQ) OPTIONAL
A91	SENSOR, HUMIDITY
A171	SENSOR ONE, SMOKE, RETURN AIR
A172	SENSOR TWO, SMOKE, SUPPLY AIR
A173	MODULE, CONTROL SMOKE DETECTION
J26	JACK, AIR FLOW CONTROL
J99	JACK, RT16 RETURN AIR SENSOR
J100	JACK, RT6 SUPPLY AIR SENSOR
J250	JACK, SMOKE DETECTOR ONE
J251	JACK, SMOKE DETECTOR ONE
J252	JACK, SMOKE DETECTOR TWO
J253	JACK, SMOKE DETECTOR TWO
J255	JACK, MODULE, CONTROL SMOKE DETECTION
J261	JACK, SUPPLY SMOKE DETECTOR JUMPER
J262	JACK, ECONOMIZER
J264	JACK, BLOWER DECK
J297	JACK, THERMOSTAT – DDC INTERFACE
J298	JACK, IAQ INTERFACE
J299	JACK, SAFETY INTERFACE
K27, –1	RELAY, TRANSFER
K55,–1	RELAY, BLOWER
K222, –1	RELAY, COMPRESSOR LOCKOUT
P26	PLUG, AIR FLOW CONTROL
P99	PLUG, RT16 RETURN AIR SENSOR
P100	PLUG, RT6 SUPPLY AIR SENSOR
P250	PLUG, SMOKE DETECTOR ONE
P251	PLUG, SMOKE DETECTOR ONE
P252	PLUG, SMOKE DETECTOR TWO
P253	PLUG, SMOKE DETECTOR TWO
P255	PLUG, MODULE, CONTROL SMOKE DETECTION
P262	PLUG, ECONOMIZER
P264	PLUG, BLOWER DECK
P297	PLUG, THERMOSTAT – DDC INTERFACE
P298	PLUG, IAQ INTERFACE
P299	PLUG, SAFETY INTERFACE
P304	PLUG, SYS BUS
RT6	SENSOR, SUPPLY AIR TEMP
RT16	SENSOR, RETURN AIR TEMP
S27	SWITCH, FILTER
S52	SWITCH, AIRFLOW
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S86	SWITCH, DEHUMIDISTAT
S135	OVERLOAD, BLOWER MOTOR SUPPLY
S149	SWITCH, OVERFLOW ONE
S179	SWITCH, OVERFLOW TWO
T8	TRANSFORMER, 120 V GENERATOR POWERED

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

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 NEE TO BE MODIFIED UNDER THE SETTINGS MENU OR VIA UC SOFTWARE FOR SIMULTANEOUS HEATING AND COOLING.

3 REMOTE LOCATION OF RT6

4 P298-8 (DO-1) IS SERVICE RELAY OUTPUT (24VAC) IF USED CONNECT TO AN INDICATOR LIGHT

5 THERMOSTAT HOOKUP FOR PROGRAMMABLE CONFIGURATIO OF THE BOARD (A55).

6 PRODIGY SETTINGS MUST BE MODIFIED WHEN K222, S42, S52, S149 OR S179 ARE INSTALLED

7 CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY

8 S179, OVERFLOW SWITCH USED ON LGH/LCH 420-600 UNITS ONLY

9 A63, A34 & A24 ARE MUTUALLY EXCLUSIVE

10 FACTORY INSTALLED OPTION FOR LGH/LCH 242-600 UNITS ONLY

08/17	WIRING DIAGRAM 537108-03	08/17
ACCESSORIES		
ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT FOR ENERGENCE		
SECTION C		REV. 3
Supersedes	New Form No. 537108-03	

POWER:

1 - Terminal block P297 on the A55 Unit Controller energizes the thermostat components with 24VAC.

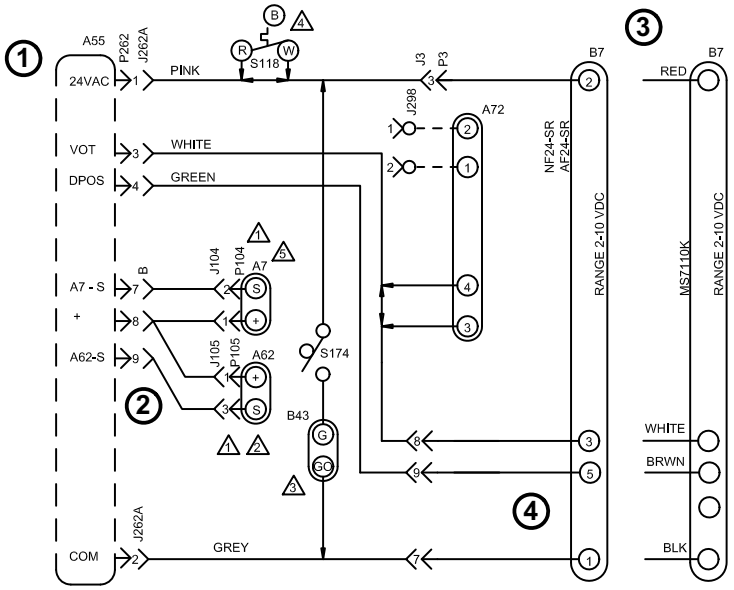
OPERATION:

2 - The A55 Unit Controller proves the optional N.O. filter switch S27 (indicates dirty filter when closed) and optional N.O. air flow switch S52 (indicates no air [i.e. broken belt] system shuts down).

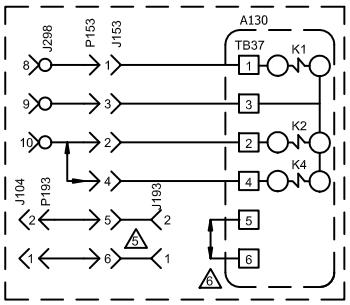
3 - The A55 receives data from the supply and return smoke detectors A171 and A172, blower motor overload relay S42, discharge sensor RT6 and return air sensor RT16.

4 - The A55 receives data from the electronic thermostat A2 (Y1, Y2, W1, W2, G, OCP) and the CO_2 sensor (if economizer is used) via terminal block P297. A55 energizes the appropriate components.

ECONOMIZER



DESCRIPTION	
KEY	COMPONENT
A7	SENSOR, SOLID STATE ENTHALPY
A130	CONTROL, ERS
A55	CONTROL, MAIN PANEL LENNOX
A62	SENSOR, ENTHALPY INDOOR
A72	CONTROL, REMOTE MIN POS (OPT)
B7	MOTOR, DAMPER ECONOMIZER
B43	MOTOR, EXHAUST DAMPER
J3	JACK, UNIT ECONOMIZER
J104	JACK, SENSOR OUTDOOR ENTHALPY
J105	JACK, SENSOR RETURN AIR ENTHALPY
J153	JACK, ENTHALPY / DAMPER MOTOR
J193	JACK, ENTHALPY SENSOR
J298A	JACK, IAQ INTERFACE
J262A	JACK, DAMPER MOTOR
J262B	JACK, ENTHALPY SENSORS
P3	PLUG, ECONOMIZER BYPASS
P153	PLUG, ENTHALPY / DAMPER MOTOR
P193	PLUG, ENTHALPY SENSOR
P262	PLUG, ECONOMIZER OUTPUT
S118	THERMOSTAT, DESICANT DEFROST
S174	SWITCH, EXHAUST DAMPER



ENERGY RECOVERY WHEEL HOOK UP

NOTE - THIS DIAGRAM USED ONLY WHEN ECONOMIZER OR MOTORIZED OUTDOOR AIR DAMPERS ARE INSTALLED.

1. DELETE A7 AND A62 (IF USED) FOR EITHER GLOBAL ENTHALPY OR SENSIBLE TEMPERATURE CONTROL
2. FOR UNIT DIFFERENTIAL ENTHALPY CONTROL, ADD A62 RETURN AIR ENTHALPY SENSOR
3. OPTIONAL EXHAUST DAMPER ACTUATOR TO HOLD EXHAUST DAMPER CLOSED WHEN OUTSIDE AIR DAMPER IS CLOSED
4. S118 USED ON 35 TO 50 TON ENERGENCE UNITS WITH ENERGY RECOVERY WHEEL (ERW)
5. REPOSITION A7 ENTHALPY SENSOR FROM ROOFTOP UNIT ECONOMIZER INTO INTAKE HOOD OF THE ERW ROOFTOP UNIT
6. REMOVE JUMPER WHEN INSTALLING OPTIONAL LOW AMBIENT SWITCH

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

04/14	WIRING DIAGRAM 537189-01	04/14
ACCESSORIES		
ENERGENCE SERIES ECONOMIZER AND MOTORIZED OAD PIVOTING WHEEL ENERGY RECOVERY SYSTEM OPTION		
SECTION D		REV 2
Supersedes	New Form No. 537189-01	

ECONOMIZER SEQUENCE OF OPERATION

POWER:

1 - A55 Unit Controller energizes the economizer components with 24VAC.

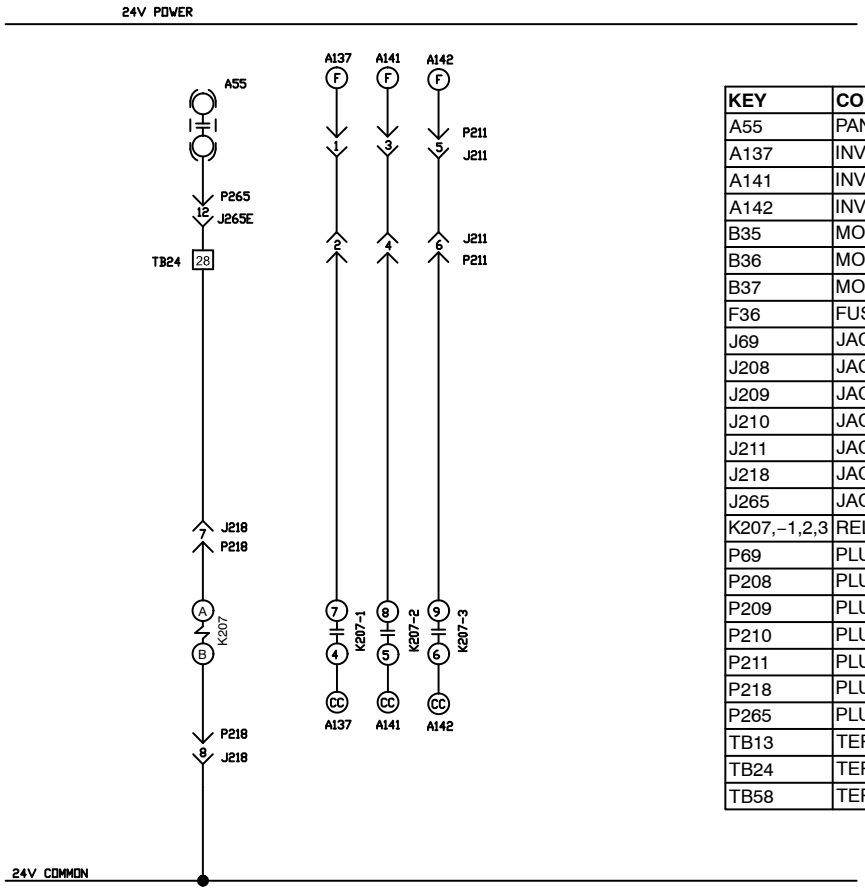
OPERATION:

2 - The A55 along with outdoor enthalpy sensor A7 and indoor enthalpy sensor A62 (if differential enthalpy is used) determine when to power the damper motor B7.

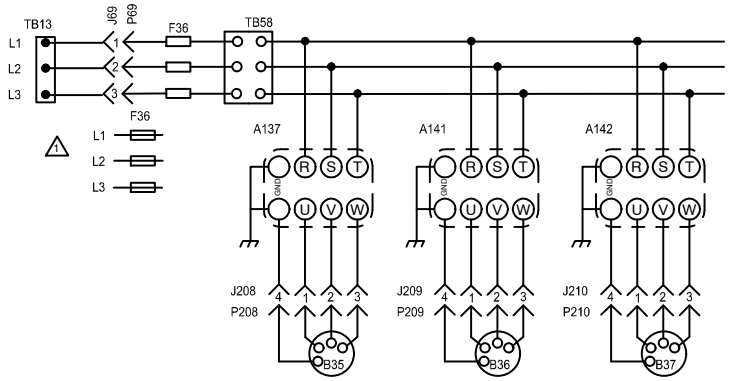
3 - A55 supplies B7 with 0 - 10 VDC to control the positioning of economizer.

4 - The damper actuator provides 2 to 10 VDC position feedback.

RSI PEB INVERTER LESS BYPASS



KEY	COMPONENT
A55	PANEL, MAIN
A137	INVERTER,EXHAUST 1
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
F36	FUSE, INVERTER
J69	JACK, INTERFACE
J208	JACK, MOTOR, EXH BLO B35
J209	JACK, MOTOR, EXH BLO B36
J210	JACK, MOTOR, EXH BLO B37
J211	JACK, INVERTER EXH BLO, AUX
J218	JACK, CONTROL, INVERTER
J265	JACK, CONTACTORS AND RELAYS
K207,–1,2,3	RELAY, EXH BLO, ADDER
P69	PLUG, INTERFACE
P208	PLUG, MOTOR, EXH BLO, B35
P209	PLUG, MOTOR, EXH BLO, B36
P210	PLUG, MOTOR, EXH BLO, B37
P211	PLUG, INVERTER, EXH BLO, AUX
P218	PLUG, CONTROL, INVERTER
P265	PLUG, CONTACTORS AND RELAYS
TB13	TERMINAL STRIP, POWER DISTRIBTION
TB24	TERMINAL STRIP, UNIT ADDER
TB58	TERMINAL STRIP, INVERTER

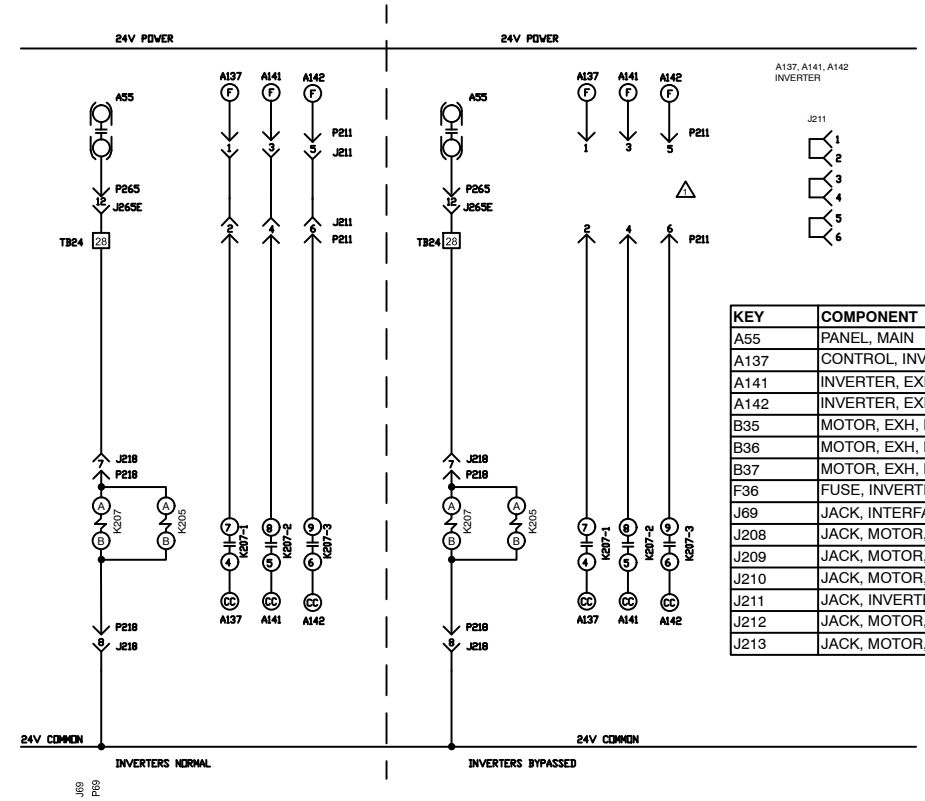


DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED NEC/CEC CLASS I
NOTE-ALL REMAINING WIRES FACTORY INSTALLED

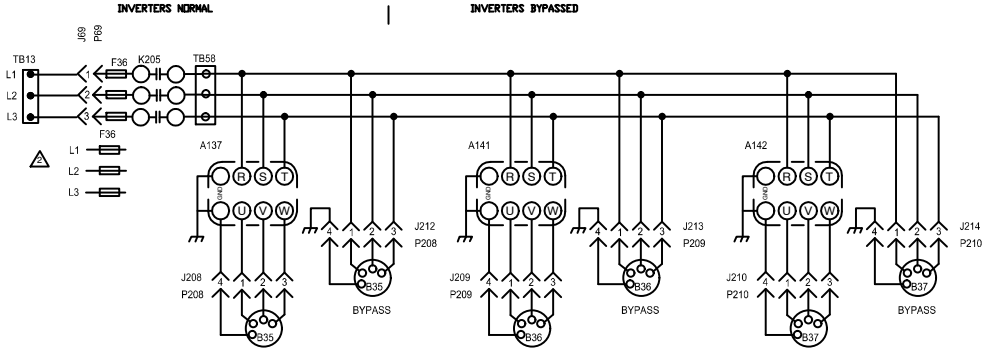
1 SEPARATE DISCONNECT WIRING WHEN NOT FACTORY INSTALLED

WIRING DIAGRAM	02/17
POWER EXHAUST	
RSI D BOX PEB INVERTERS LESS BYPASS	
SECTION 5B	REV 1
Supersedes 534,752W	New Form No. 537376-01

RSI PEB INVERTER WITH BYPASS



KEY	COMPONENT
A55	PANEL, MAIN
A137	CONTROL, INVERTER, RETURN
A141	INVERTER, EXHAUST 2
A142	INVERTER, EXHAUST 3
B35	MOTOR, EXH, BLO 1
B36	MOTOR, EXH, BLO 2
B37	MOTOR, EXH, BLO 3
F36	FUSE, INVERTER
J69	JACK, INTERFACE
J208	JACK, MOTOR, EXH BLO B35
J209	JACK, MOTOR, EXH BLO B36
J210	JACK, MOTOR, EXH BLO B37
J211	JACK, INVERTER EXH BLO, AUX
J212	JACK, MOTOR, EXH BLO B35, BYPASS
J213	JACK, MOTOR, EXH BLO B36, BYPASS



J214	JACK, MOTOR, EXH BLO B37, BYPASS
J218	JACK, CONTROL, INVERTER
J265	JACK, CONTACTORS AND RELAYS
K205	CONTACTOR, BYPASS, EXH.
K207,-1,2,3	RELAY, EXH BLO, ADDER
P69	PLUG, INTERFACE
P208	PLUG, MOTOR, EXH BLO, B35
P209	PLUG, MOTOR, EXH BLO, B36
P210	PLUG, MOTOR, EXH BLO, B37
P211	PLUG, INVERTER, EXH BLO, AUX
P218	PLUG, CONTROL, INVERTER
P265	PLUG, CONTACTORS AND RELAYS
TB13	TERMINAL STRIP, POWER DISTRIBTION
TB24	TERMINAL STRIP, UNIT ADDER
TB58	TERMINAL STRIP, INVERTER BYPASS

⚠1 TO BYPASS INVERTERS, UNPLUG J211 FROM P211

⚠2 SEPARATE DISCONNECT WIRING WHEN NOT FACTORY INSTALLED

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED NEC/CEC CLASS I
NOTE-ALL REMAINING WIRES FACTORY INSTALLED

WIRING DIAGRAM	03/17
POWER EXHAUST	
RSI D BOX PEB w/ INVERTERS w/ BYPASS	
SECTION 5B	REV 1
Supersedes 534,754W	New Form No. 537377-01