LGH036 through 072

LGH036H, 048H, and 060H are high efficiency gas packaged units equipped with direct drive blowers. LGH036S, 048S, and 060S are standard efficiency gas packaged units equipped with two-speed, belt drive blowers. LGH072H is a high efficiency gas packaged unit equipped with a single-speed belt drive blower.

LGH036S & H units are available in 65,000 to 105,000 Btuh (19 to 31 kW) heating inputs. LGH048, 060 and 072 units are available in 65,000 to 150,000 Btuh (19 to 43.9 kW) heating inputs. Gas heat sections are designed with aluminized (stainless optional) steel tube heat exchangers. Cooling capacities range from 3 to 6 tons (7 to 21kW).

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

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

⚠WARNING

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

⚠IMPORTANT

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

⚠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.

ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures

⚠CAUTION

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the furnace, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

⚠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	Model Number	Catalog Number	Unit Model No 036	048	060	072
COOLING SYSTEM						
Condensate Drain Trap	PVC - C1TRAP20AD2	**76W26**	OX	OX	OX	OX
	Copper - C1TRAP10AD2	**76W27**	OX	OX	OX	OX
Drain Pan Overflow Switch	E1SNSR71AD1	**68W88**	OX	OX	OX	OX
Efficiency	Standard	Factory	O	O	O	
	High	Factory	O	O	O	O
Service valves (not for Humiditrol equipped units)		Factory	O	O	O	O
HEATING SYSTEM						
Bottom Gas Piping Kit	T1GPKT01AN1	**19W50**	OX	OX	OX	OX
Combustion Air Intake Extensions	T1EXTN10AN1	**19W51**	X	X	X	X
Gas Heat Input	Standard One-Stage - 65 kBtuh input	Factory	O	O	O	O
	Medium One-Stage - 105 kBtuh input	Factory	O	O	O	O
	Medium Two Stage - 73.5/105 kBtuh input	Factory	O	O	O	O
	High Two-Stage - 105/150 kBtuh input	Factory		O	O	O
	High One-Stage - 150 kBtuh input	Factory		O	O	O
Low Temperature Vestibule Heater	208/230V-1 or 3ph - E1LTVH10A-1Y	**54W23**	OX	OX	OX	OX
	460V-3ph - E1LTVH10A-1G	**54W24**	OX	OX	OX	OX
	575V-3ph - E1LTVH10A-1J	**54W25**	OX	OX	OX	OX
LPG/Propane	For one-stage models - C1PROP10AP1	**53W69**	X	X	X	X
Conversion Kits	For two-stage models - C1PROP20AP1	**53W70**		X	X	X
Stainless Steel Heat Exchanger		Factory	O	O	O	O
Vertical Vent Extension	C1EXTN20FF1	**31W62**	X	X	X	X
BLOWER - SUPPLY AIR						
Motors	Direct Drive - 0.50 hp	Factory	O			
	Direct Drive - 0.75 hp	Factory		O		
	Direct Drive - 1 hp	Factory			O	
	Belt Drive - 0.75 hp (2 Speed)	Factory	O	O		
	Belt Drive - 1 hp (2 Speed)	Factory	O		O	
	Belt Drive - 2 hp (2 Speed)	Factory		O	O	
	Belt Drive - 1 hp Standard Efficiency	Factory				O
	Belt Drive - 2 hp Standard Efficiency	Factory				O
	Belt Drive - 1 hp High Efficiency	Factory				O
	Belt Drive - 2 hp High Efficiency	Factory				O
Drive Kits	Kit A01 - T1DRKT001-1 - 673-1010 rpm	Factory	O			
See Blower Data Tables for selection	Kit A02 - T1DRKT002-1 - 745-1117 rpm	Factory		O		
	Kit A03 - T1DRKT003-1 - 833-1250 rpm	Factory			O	
	Kit A05 - T1DRKT005-1 - 897-1346 rpm	Factory	O			
	Kit A06 - T1DRKT006-1 - 1071-1429 rpm	Factory		O		
	Kit A07 - T1DRKT007-1 - 1212-1548 rpm	Factory			O	
	Kit AA01 - T1DRKT001AP1 - 522-784 rpm	Factory				O
	Kit AA02 - T1DRKT002AP1 - 632-875 rpm	Factory				O
	Kit AA03 - T1DRKT003AP1 - 798-1105 rpm	Factory				O
	Blower Belt Auto-Tensioner	Factory	O	O	O	O
CABINET						
Coil Guards	T1GARD20A-1	**17W87**	X	X		
	T1GARD20N-1	**17W88**			X	X
Hail Guards	T1GARD10A-1	**17W89**	X	X		
	T1GARD10N-1	**17W90**			X	X
Corrosion Protection (indoor coil / outdoor coil)		Factory	O	O	O	O

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
OX - Configure To Order (Factory Installed) or Fileld Installed
O = Configure To Order (Factory Installed)
X = Field Installed

OPTIONS / ACCESSORIES

Item	Model Number	Catalog Number	Unit Model No 036	048	060	072
CONTROLS						
Blower Proving Switch	C1SNSR35FF1	**53W65**	OX	OX	OX	OX
Commercial Controls	CPC Einstein Integration	Factory	O	O	O	O
	Prodigy® Control System - BACnet® Module - C0CTRL60AE1L	**59W51**	OX	OX	OX	OX
	Prodigy® Control System - LonTalk® Module - C0CTRL65FF1	**54W27**	OX	OX	OX	OX
	Novar® 5021 - E0CTRL30A1	**64W72**	OX	OX	OX	OX
	Novar® LSE	Factory	O	O	O	O
	L Connection® Building Automation System	- - -	X	X	X	X
Dirty Filter Switch	E1SNSR55AP1	**53W66**	OX	OX	OX	OX
Fresh Air Tempering	C1SNSR75AD1	**58W63**	OX	OX	OX	OX
Smoke Detector - Supply or Return (Power board and one sensor)	C1SNSR44AP1	**53W78**	OX	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)	C1SNSR43AP1	**53W79**	OX	OX	OX	OX
ELECTRICAL						
Voltage	208/230V - 1 phase	Factory	[1] O	[1] O	[1] O	
60 hz	208/230V - 3 phase	Factory	O	O	O	O
	460V - 3 phase	Factory	O	O	O	O
	575V - 3 phase	Factory	O	O	O	O
HACR Circuit Breakers		Factory	O	O	O	O
Disconnect Switch	80 amp - T1DISC080AH1	**20W23**	OX	OX		
	80 amp - T1DISC080NH1	**20W26**			OX	OX
GFI Service Outlets	LTAGFIK10/15	**74M70**	OX	OX	OX	OX
Phase/Voltage Detection - 3 Phase Models Only		Factory	O	O	O	O
ECONOMIZER						
Economizer With Outdoor Air Hood (Sensible Control)						
Economizer - With Barometric Relief Dampers and Exhaust Hood		Factory	O	O	O	O
Economizer - With Power Exhaust Fan and Barometric Relief Dampers with Exhaust Hood		Factory	O	O	O	O
Economizer - No Exhaust Option		Factory	O	O	O	O
Economizer - With Barometric Relief Damper with Hood	E1ECON30A-1-	**53W33**	X	X		
	E1ECON30AT1-	**53W36**			X	X
Horizontal Economizer Conversion Kit	T1HECK00AN1	**17W45**	X	X	X	X
Economizer Controls						
Differential Enthalpy	Order 2 - C1SNSR64FF1	**53W64**	OX	OX	OX	OX
Sensible Control	Sensor is Furnished	Factory	O	O	O	O
Single Enthalpy	C1SNSR64FF1	**53W64**	OX	OX	OX	OX
Global Control	Sensor Field Provided	Factory	O	O	O	O
OUTDOOR AIR						
Outdoor Air Dampers						
Damper Section - Manual, Includes Outdoor Air Hood	C1DAMP11A-1-	**53W34**	OX	OX		
	C1DAMP11AT1-	**53W37**			OX	OX
Damper Section - Motorized, Includes Outdoor Air Hood	E1DAMP21A-1-	**53W35**	OX	OX		
	E1DAMP21AT1-	**53W38**			OX	OX
POWER EXHAUST FAN						
Standard Static	208/230V-1 or 3ph - C1PWRE10A-1P	**79W87**	OX	OX		
Note - Includes Barometric Relief Dampers and Exhaust Hood when factory installed. Order Barometric Reilef Dampers and Exhaust Hood below when field installed.	460V-3ph - C1PWRE10A-1G	**79W88**	OX	OX		
	575V-3ph - C1PWRE10A-1J	**79W89**	OX	OX		
	208/230V-1 or 3ph - C1PWRE10AT1P	**79W90**			OX	OX
	460V-3ph - C1PWRE10AT1G	**79W91**			OX	OX
	575V-3ph - C1PWRE10AT1J	**79W92**			OX	OX
[2] BAROMETRIC RELIEF						
Barometric Relief Dampers with Exhaust	C1DAMP50A-1-	**74W38**	X	X		
Hood	C1DAMP50AT1-	**74W39**			X	X

[1] 208/230-1ph not available on belt drive units.

[2] Required when Economizer is factory installed (no exhaust option) with field installed Power Exhaust Fan option.

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
OX - Configure To Order (Factory Installed) or FileId Installed
O = Configure To Order (Factory Installed)
X = Field Installed

OPTIONS / ACCESSORIES

Item	Model Number	Catalog Number	Unit Model No 036	048	060	072
HUMIDITROL® CONDENSER REHEAT OPTION						
Humiditrol		Factory	O	O	O	O
Humidity Sensor Kit, Remote mounted (required)	COSNSR31AE-1	**17M50**	X	X	X	X
INDOOR AIR QUALITY						
Air Filters						
Healthy Climate® High Efficiency Air Filters Order 4 per unit	MERV 8 (16 x 20 x 2) - C1FLTR15A-1-	**54W20**	OX	OX		
	MERV 13 (16 x 20 x 2) - T1FLTR40A-1-	**52W37**	OX	OX		
	MERV 8 (20 x 20 x 2) - C1FLTR15D-1-	**54W21**			OX	OX
	MERV 13 (20 x 20 x 2) - C1FLTR40D-1-	**52W39**			OX	OX
Replaceable Media Filter With Metal Mesh Frame (includes non-pleated filter media)	16 x 20 x 2 (Order 4) - K1FLTR30A-1	**39W09**	X	X		
	20 x 20 x 2 (Order 4) - K1FLTR30A-2	**44N60**			X	X
Indoor Air Quality (CO_2) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display	C0SNSR50AE1L	**77N39**	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display	C0SNSR52AE1L	**87N53**	X	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting	C0SNSR51AE1L	**87N52**	X	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	C0MISC19AE1	**87N54**	X	X	X	X
CO_2 Sensor Duct Mounting Kit - for downflow applications	C0MISC19AE1-	**85L43**	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensors (**87N53** or **77N39**)	C0MISC16AE1-	**90N43**	X	X	X	X
UVC Germicidal Lamps						
[1] Healthy Climate® UVC Light Kit (208/230v-1ph)	C1UVCL10AN1-	**50W90**	OX	OX	OX	OX
ROOF CURBS - DOWNFLOW						
Clip Curb						
8 in. height	T1CURB23AN1	**16W93**	X	X	X	X
14 in. height	T1CURB20AN1	**16W94**	X	X	X	X
18 in. height	T1CURB21AN1	**16W95**	X	X	X	X
24 in. height	T1CURB22AN1	**16W96**	X	X	X	X
Hinged						
8 in. height	T1CURB30AN1	**17W46**	X	X	X	X
18 in. height	T1CURB32AN1	**17W47**	X	X	X	X
24 in. height	T1CURB33AN1	**17W48**	X	X	X	X
Standard						
14 in. height	T1CURB10AN1	**13W27**	X	X	X	X
Adjustable Pitched Curb						
14 in. height	C1CURB55AT1	**43W27**	X	X	X	X
Transition Curb						
Matches Energence® 036-072 Units to existing L Series® Curbs	E1CURB60A-1	**20W06**	X	X	X	X
CEILING DIFFUSERS						
Step-Down - Order one	RTD9-65-R	**27G87**	X	X	X	
	RTD11-95	**29G04**				X
	(Canada Only) RTD11-95S	**13K61**				X
Flush - Order one	FD9-65-R	**27G86**	X	X	X	
	FD11-95	**29G08**				X
	(Canada Only) FD11-95S	**13K56**				X
Transitions (Supply and Return) - Order one	T1TRAN10AN1	**17W53**	X	X	X	
	T1TRAN20N-1	**17W54**				X
Sunsource® Commercial Energy System						
Solar Power Entry with Disconnect		Factory	O	O	O	O
Envoy Communications Gateway with Communications Booster (internal)		**Y4263**	X	X	X	X
Line Communication Filter (external)		**COMSD**	X	X	X	X
[2] Transformer	E1TRFM10AD1Y (230 VAC Delta)	**80W91**	X	X	X	X
	E1TRFM10AD1G (460 VAC Delta)	**80W92**	X	X	X	X
	E1TRFM15AD1G (460 VAC Wye)	**80W93**	X	X	X	X

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

[2] 575V transformer is not available and must be field provided.

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
OX - Configure To Order (Factory Installed) or Fileld Installed
O = Configure To Order (Factory Installed)
X = Field Installed

SPECIFICATIONS - DIRECT DRIVE

General Data		3 Ton	4 Ton	5 Ton
	Model Number	**LGH036H4E**	**LGH048H4E**	**LGH060H4E**
	Efficiency Type	**High**	**High**	**High**
	Blower Type	Multi-Speed Direct Drive	Multi-Speed Direct Drive	Multi-Speed Direct Drive
Cooling Performance	Gross Cooling Capacity - Btuh	35,800	50,100	61,600
	[1] Net Cooling Capacity - Btuh	35,200	49,000	60,000
	AHRI Rated Air Flow - cfm	1200	1600	1750
	Total Unit Power - kW	2.8	3.8	4.7
	[1] SEER (Btuh/Watt) - 208/230V-1-3ph	18.0	17.6	17.1
	[1] SEER (Btuh/Watt) - 460V-3ph, 575V-3ph	17.0	17.0	17.0
	[1] EER (Btuh/Watt)	12.7	12.8	12.7
	Refrigerant Type	R-410A	R-410A	R-410A
	Refrigerant Charge Furnished	9 lbs. 1 oz.	11 lbs. 5 oz.	15 lbs. 8 oz.
	Refrigerant Charge Furnished with Humiditrol® Option	9 lbs. 12 oz.	12 lbs. 7 oz.	17 lbs. 8 oz.
Gas Heating Options Available - See page 7		**Standard (1 stage) or Medium (1 or 2 stage)**	**Standard (1 stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)**	**Standard (1 stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)**
Compressor Type (number)		Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coils	Net face area (total) - sq. ft.	15.60	15.60	19.30
	Tube diameter - in.	3/8	3/8	3/8
	Number of rows	1.5	2	2
	Fins per inch	20	20	20
Outdoor Coil Fans	Motor - (No.) horsepower	(1) 1/3 (ECM)	(1) 1/3 (ECM)	(1) 1/3 (ECM)
	Motor rpm	715-810	645-810	930-1100
	Total Motor Input - watts	112-160	89-165	230-350
	Diameter - (No.) in.	(1) 24	(1) 24	(1) 24
	Number of blades	3	3	3
	Total air volume - cfm	3400-3795	2910-3675	4315-4980
Indoor Coils	Net face area (total) - sq. ft.	7.78	7.78	9.72
	Tube diameter - in.	3/8	3/8	3/8
	Number of rows	3	4	4
	Fins per inch	14	14	14
	Drain connection (Number) and size - in.	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT
	Expansion device type	Balance port TXV, removable head		
[2] Indoor Blower	Nominal motor HP	0.50 (ECM)	0.75 (ECM)	1 (ECM)
	Blower wheel nominal diameter x width - in.	(1) 10 X 10	(1) 10 X 10	(1) 11 X 10
Filters	Type of filter	disposable		
	Number and size - in.	(4) 16 X 20 X 2		(4) 20 x 20 x 2
Electrical characteristics		208/230V - 60 hz - 1 phase 208/230V, 460V, or 575V - 60 hz -3 phase		

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

[1] AHRI Certified to AHRI Standard 210/240: 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

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

SPECIFICATIONS - BELT DRIVE

General Data		3 Ton	4 Ton	5 Ton	6 Ton
	Model Number	**LGH036S4T**	**LGH048S4T**	**LGH060S4T**	**LGH072H4B**
	Efficiency Type	**Standard**	**Standard**	**Standard**	**High**
	Blower Type	Two Speed Belt Drive	Two Speed Belt Drive	Two Speed Belt Drive	Single Speed Belt Drive
Cooling Performance	Gross Cooling Capacity - Btuh	35,800	50,100	61,600	73,500
	Net Cooling Capacity - Btuh	[1] 34,800	[1] 49,000	[1] 60,000	[2] 72,000
	AHRI Rated Air Flow - cfm	1200	1600	1750	1920
	Total Unit Power - kW	3.0	4.1	4.8	6.0
	SEER (Btuh/Watt)	[1] 15.0	[1] 15.0	[1] 15.5	- - -
	EER (Btuh/Watt)	[1] 11.6	[1] 12.5	[1] 12.5	[2] 12.0
	IEER (Btuh/Watt)	- - -	- - -	- - -	[2] 13.5
	Refrigerant Type	R-410A	R-410A	R-410A	R-410A
	Refrigerant Charge Furnished	9 lbs. 1 oz.	11 lbs. 5 oz.	15 lbs. 8 oz.	16 lbs. 5 oz.
	Refrigerant Charge Furnished with Humiditrol® Option	9 lbs. 12 oz.	12 lbs. 7 oz.	17 lbs. 8 oz.	16 lbs. 5 oz.
Gas Heating Options Available - See page 7		**Standard (1 stage) or Medium (1 or 2 stage)**	**Standard (1 stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)**	**Standard (1 stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)**	**Standard (1 stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)**
Compressor Type (number)		Scroll (1)	Scroll (1)	Scroll (1)	Scroll (1)
Outdoor Coils	Net face area (total) - sq. ft.	15.60	15.60	19.30	19.30
	Tube diameter - in.	3/8	3/8	3/8	3/8
	Number of rows	1.5	2	2	2
	Fins per inch	20	20	20	20
Outdoor Coil Fans	Motor - (No.) horsepower	(1) 1/6 (PSC)	(1) 1/4 (PSC)	(1) 1/3 (PSC)	(1) 1/3 (PSC)
	Motor rpm	825	825	1075	1075
	Total Motor Input - watts	168	230	410	410
	Diameter - (No.) in.	(1) 24	(1) 24	(1) 24	(1) 24
	Number of blades	3	3	3	3
	Total air volume - cfm	3,000	3,300	4,800	4,800
Indoor Coils	Net face area (total) - sq. ft.	7.78	7.78	9.72	9.72
	Tube diameter - in.	3/8	3/8	3/8	3/8
	Number of rows	3	4	4	4
	Fins per inch	14	14	14	14
	Drain connection (Number) and size - in.	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT
	Expansion device type	Balance port TXV, removable head			
[3] Indoor Blower and Drive Selection	No. of Speeds	2	2	2	1
	Nominal motor HP Low static	0.75	0.75	1	1
	High static	1	2	2	2
	Maximum usable motor output (US Only) Low static	0.86	0.86	1.15	1.15
	High static	1.15	2.3	2.3	2.30
	Motor - Drive kit number	A01 low 449-673 high 673-1010 A05 low 598-897 high 897-1346	A02 low 497-673 high 745-1117 A06 low 714-953 high 1071-1429	A03 low 555-833 high 833-1250 A07 low 808-1032 high 1212-1548	AA01 522 - 784 rpm AA02 632 - 875 rpm AA03 798 - 1105 rpm
	Blower wheel nominal diameter x width - in.	(1) 10 X 10	(1) 10 X 10	(1) 10 X 10	(1) 15 X 9
Filters	Type of filter	disposable			
	Number and size - in.	(4) 16 X 20 X 2		(4) 20 X 20 X 2	
Electrical characteristics		208/230V, 460V, or 575V - 60 hz -3 phase			

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

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

[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

Model No.		LGH036, LGH048, LGH060	LGH036, LGH048, LGH060	LGH072	LGH036, LGH048, LGH060	LGH072	LGH048, LGH060	LGH072	LGH048, LGH060	LGH072
Heat Input Type		Standard (1 Stage)	Medium (1 Stage)		Medium (2 Stage)		High (1 Stage)		High (2 Stage)	
Input Btuh	1st Stage	65,000	105,000		73,500		150,000		105,000	
	2nd Stage	- - -	- - -		105,000		- - -		150000	
Output Btuh	1st Stage	52,000	84,000		59,000		120,000		85,500	
	2nd Stage	- - -	- - -		84,000		- - -		120,000	
Temperature Rise	1st stage	20 - 50	25 - 70	20 - 50	15 - 55	10 - 40	40 - 85	30 - 60	25 - 65	20 - 50
	2nd Stage	- - -	- - -	- - -	25 - 70	20 - 50	- - -	- - -	40 - 85	30 - 60
[1] AFUE		80	80	80	80	80	80	80	80	80
Thermal Efficiency	1st Stage	80	80	80	80	80	80	80	81.5	81.5
	2nd Stage	- - -	- - -	- - -	80	80	- - -	- - -	80	80
Gas Supply Connections		1/2 in. NPT								
Rec. Gas Supply Pressure - Nat./ LPG		7 in.w.g. / 11 in.w.g.								

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

HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 2000 ft. above sea level without any modifications. At altitudes above 2000 ft. units must be derated to match information in the table shown. At altitudes above 4500 ft. unit must be derated 2% for each 1000 ft. above sea level.
NOTE - This is the only permissible derate for these units.

Heat Input Type	Altitude Feet	Gas Manifold Pressure in. w.g.		Input Rate (Btuh)
		Natural Gas	LPG/ Propane	
Standard (1 stage)	2001 - 4500	3.0	9.0	60,000
Medium (1 stage)	2001 - 4500	3.0	9.0	97,000
Medium (2 stage)	2001 - 4500	3.0/1.7	9.0/5.1	97,000 / 73,500
High (1 stage)	2001 - 4500	3.0	9.0	138,000
High (2 stage)	2001 - 4500	3.0/1.7	9.0/5.1	138,000/ 105,000

BLOWER DATA - DIRECT DRIVE - 3 TON

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

1 - Any factory installed options air resistance (heat section, economizer, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for wet coil and options/accessory air resistance data.

NOTE - Default Speed Settings (percentage of blower torque) - Low 28% / High 55%

DOWNFLOW

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	796	39	407	975	69	451	1154	98	494	1298	140	567	1442	181	639	1570	236	692	1697	292	744	1807	357	785	1917	422	825
0.1	719	44	482	915	76	523	1110	108	564	1257	151	626	1404	193	687	1537	248	733	1670	304	779	1784	369	815	1898	433	850
0.2	663	49	538	864	83	585	1064	117	633	1220	160	679	1375	203	725	1508	259	770	1641	316	815	1754	384	853	1866	452	891
0.3	593	55	607	806	91	651	1018	126	695	1174	171	737	1330	216	780	1471	272	815	1612	328	850	1724	398	890	1835	469	930
0.4	527	60	665	749	97	708	971	135	751	1136	180	783	1300	225	815	1435	285	858	1569	344	900	1689	413	930	1809	481	959
0.5	460	65	722	692	104	761	924	143	801	1090	190	833	1256	238	866	1398	296	899	1540	355	932	1662	424	960	1784	493	988
0.6	- - -	- - -	- - -	- - -	- - -	- - -	855	154	864	1033	202	889	1211	250	914	1361	308	939	1511	365	963	1629	437	995	1746	508	1028
0.7	- - -	- - -	- - -	- - -	- - -	- - -	808	161	898	995	209	922	1181	258	946	1325	319	976	1468	379	1007	1588	450	1036	1708	522	1065
0.8	- - -	- - -	- - -	- - -	- - -	- - -	743	170	942	940	220	966	1137	269	991	1281	331	1020	1425	392	1049	1548	463	1074	1670	533	1100
0.9	- - -	- - -	- - -	- - -	- - -	- - -	676	178	979	884	229	1006	1092	280	1033	1237	342	1061	1381	404	1088	1513	472	1105	1645	539	1121
1.0	- - -	- - -	- - -	- - -	- - -	- - -	605	187	1011	819	240	1049	1032	294	1087	1192	353	1100	1352	411	1112	1474	480	1137	1595	549	1161
1.1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	988	304	1124	1142	364	1141	1295	424	1158	1420	490	1177	1544	555	1195
1.2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	1251	433	1189	1373	495	1207	1494	558	1225

HORIZONTAL

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	807	44	372	982	65	431	1157	86	490	1299	126	546	1441	167	602	1565	214	647	1688	262	692	1795	328	734	1901	393	776
0.1	708	50	468	906	77	513	1103	104	559	1247	143	612	1391	183	666	1522	231	704	1652	280	742	1766	346	779	1879	413	815
0.2	634	56	541	841	88	583	1048	120	625	1206	156	663	1363	192	701	1491	243	742	1619	294	783	1731	361	820	1843	429	857
0.3	523	63	648	759	98	669	994	134	690	1150	171	729	1306	209	769	1446	258	796	1585	307	823	1696	376	860	1807	444	896
0.4	437	69	732	688	107	742	939	146	752	1101	183	785	1263	221	818	1399	273	849	1535	326	881	1653	392	908	1771	458	935
0.5	344	75	823	615	116	817	885	156	812	1053	194	838	1220	232	865	1361	285	892	1502	339	918	1614	406	949	1725	473	980
0.6	- - -	- - -	- - -	- - -	- - -	- - -	817	167	883	990	207	905	1162	246	927	1307	301	949	1451	356	971	1570	420	993	1689	484	1014
0.7	- - -	- - -	- - -	- - -	- - -	- - -	762	174	938	941	215	954	1119	256	971	1269	312	988	1418	367	1005	1536	430	1026	1653	494	1047
0.8	- - -	- - -	- - -	- - -	- - -	- - -	708	178	991	892	222	1002	1076	266	1013	1222	324	1034	1368	383	1054	1484	444	1073	1599	506	1092
0.9	- - -	- - -	- - -	- - -	- - -	- - -	645	182	1050	832	230	1059	1019	277	1068	1168	337	1084	1317	397	1100	1431	456	1117	1545	516	1134
1.0	- - -	- - -	- - -	- - -	- - -	- - -	584	184	1105	780	235	1106	976	285	1107	1122	348	1125	1267	411	1144	1379	467	1158	1491	522	1172
1.1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	923	295	1155	1070	359	1169	1217	423	1184	1327	475	1195	1436	526	1207
1.2	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	1166	434	1222	1265	481	1234	1364	527	1246

BLOWER DATA - DIRECT DRIVE - 4 TON

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

1 - Any factory installed options air resistance (heat section, economizer, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for wet coil and options/accessory air resistance data.

NOTE - Default Speed Settings (percentage of blower torque) - Low 40% / High 80%

DOWNFLOW

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	1048	80	507	1261	135	582	1473	190	657	1655	274	729	1836	359	801	1987	461	863	2137	563	924	2291	698	975	2445	832	1025
0.1	1000	88	560	1218	146	633	1436	204	706	1624	289	771	1812	374	836	1965	479	896	2118	583	956	2261	716	1004	2403	849	1052
0.2	944	97	624	1177	156	683	1409	214	743	1595	304	812	1781	393	881	1940	497	934	2098	602	986	2235	729	1032	2372	856	1077
0.3	906	104	666	1139	166	728	1372	228	790	1561	320	858	1750	412	925	1915	515	970	2079	619	1015	2210	741	1058	2341	863	1100
0.4	849	113	728	1093	177	783	1336	241	837	1531	333	897	1726	425	957	1889	532	1004	2052	639	1051	2177	754	1090	2302	869	1129
0.5	793	121	790	1047	188	837	1300	254	883	1501	346	935	1702	438	987	1864	548	1036	2026	657	1085	2145	766	1120	2263	874	1155
0.6	---	---	---	---	---	---	1263	267	929	1467	361	978	1671	454	1027	1836	564	1071	2000	673	1116	2116	775	1145	2232	876	1175
0.7	---	---	---	---	---	---	1226	280	974	1433	375	1019	1639	470	1065	1807	578	1104	1974	686	1144	2080	782	1173	2186	878	1203
0.8	---	---	---	---	---	---	1195	291	1012	1402	388	1057	1608	485	1101	1778	591	1135	1948	697	1169	2052	787	1195	2155	878	1220
0.9	---	---	---	---	---	---	1162	304	1060	1367	401	1097	1572	498	1134	1741	603	1168	1909	708	1202	2009	792	1223	2109	875	1244
1.0	---	---	---	---	---	---	1133	316	1104	1333	414	1136	1533	511	1167	1702	612	1198	1870	714	1229	1959	791	1251	2047	868	1272
1.1	---	---	---	---	---	---	---	---	---	---	---	---	1490	524	1200	1654	618	1228	1817	713	1256	1909	786	1273	2000	859	1289
1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1765	701	1272	1844	771	1293	1923	840	1314

HORIZONTAL

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	1025	80	472	1238	131	552	1450	182	632	1626	254	702	1802	326	771	1936	414	824	2071	502	878	2231	634	931	2391	767	983
0.1	978	85	546	1199	138	610	1420	191	675	1601	265	738	1781	339	801	1930	441	862	2079	544	923	2222	663	968	2365	783	1013
0.2	927	89	602	1157	145	661	1387	201	720	1568	279	783	1749	357	845	1906	458	897	2062	559	949	2205	679	993	2348	798	1038
0.3	851	98	684	1098	156	731	1344	214	777	1531	295	833	1717	375	888	1876	478	938	2035	581	988	2166	694	1030	2297	807	1072
0.4	801	105	738	1051	166	785	1300	227	832	1493	309	881	1685	392	930	1847	496	977	2009	600	1023	2128	707	1064	2247	813	1105
0.5	725	118	817	991	179	850	1256	239	883	1455	324	926	1653	408	970	1814	516	1019	1974	623	1068	2091	720	1099	2207	817	1130
0.6	---	---	---	---	---	---	1212	251	931	1417	337	969	1621	423	1008	1784	531	1053	1947	638	1098	2057	729	1126	2166	820	1154
0.7	---	---	---	---	---	---	1169	263	975	1380	350	1010	1590	437	1045	1756	544	1086	1921	651	1127	2014	736	1157	2106	821	1187
0.8	---	---	---	---	---	---	1114	277	1027	1331	366	1059	1547	454	1091	1717	560	1126	1886	666	1161	1976	743	1184	2066	821	1207
0.9	---	---	---	---	---	---	1062	290	1077	1283	380	1106	1504	470	1135	1669	575	1170	1833	680	1204	1919	749	1220	2005	817	1236
1.0	---	---	---	---	---	---	1007	304	1127	1240	392	1147	1473	481	1166	1627	584	1202	1780	687	1238	1853	748	1253	1925	809	1269
1.1	---	---	---	---	---	---	---	---	---	---	---	---	1429	497	1211	1569	590	1240	1709	683	1269	1787	741	1280	1864	799	1291
1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1604	651	1284	1684	714	1303	1763	777	1321

BLOWER DATA - DIRECT DRIVE - 5 TON

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

1 - Any factory installed options air resistance (heat section, economizer, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for wet coil and options/accessory air resistance data.

NOTE - Default Speed Settings (percentage of blower torque) - Low 36% / High 59%

DOWNFLOW

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	1132	79	438	1353	146	524	1575	212	610	1765	300	670	1954	388	730	2126	513	796	2298	638	861	2445	792	913	2591	946	965
0.1	1061	86	494	1305	155	568	1548	223	641	1743	315	702	1937	407	764	2110	531	823	2282	654	883	2426	808	935	2570	963	987
0.2	990	94	550	1253	165	614	1516	236	678	1716	330	735	1916	423	793	2088	549	851	2260	675	910	2405	827	959	2549	979	1009
0.3	920	102	606	1202	175	659	1484	248	713	1687	345	770	1890	442	828	2065	568	882	2239	694	937	2384	844	983	2528	994	1030
0.4	849	111	662	1151	185	705	1452	260	747	1658	360	804	1863	460	861	2041	586	911	2218	713	962	2363	861	1006	2508	1009	1050
0.5	779	121	718	1094	198	754	1410	275	790	1626	374	838	1842	473	886	2020	601	936	2197	730	987	2342	876	1028	2487	1023	1070
0.6	---	---	---	---	---	---	1368	289	830	1589	390	876	1810	492	921	1993	619	966	2176	746	1010	2316	895	1054	2456	1043	1099
0.7	---	---	---	---	---	---	1325	303	868	1552	406	911	1778	509	954	1966	635	993	2154	761	1033	2295	908	1075	2435	1055	1117
0.8	---	---	---	---	---	---	1261	321	920	1504	423	952	1746	524	984	1934	653	1024	2122	782	1064	2268	925	1100	2414	1067	1135
0.9	---	---	---	---	---	---	1211	337	964	1462	437	988	1714	538	1012	1902	669	1053	2090	801	1094	2237	942	1127	2383	1084	1161
1.0	---	---	---	---	---	---	1151	354	1013	1412	454	1029	1672	553	1045	1871	682	1078	2069	811	1112	2211	955	1149	2352	1099	1185
1.1	---	---	---	---	---	---	---	---	---	---	---	---	1629	566	1073	1828	698	1109	2027	830	1146	2174	971	1177	2321	1112	1208
1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1984	844	1175	2137	984	1202	2290	1124	1230

HORIZONTAL

External Static Press. in. w.g.	Percentage of Total Motor Torque																										
	20%			30%			40%			50%			60%			70%			80%			90%			100%		
	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM	Cfm	Watts	RPM
0	1127	82	426	1367	141	504	1607	200	582	1806	296	644	2005	391	706	2167	495	764	2328	599	822	2463	749	872	2598	899	922
0.1	1071	86	476	1326	148	543	1580	210	610	1781	311	675	1981	411	740	2145	516	795	2309	620	849	2456	775	898	2602	931	947
0.2	1010	91	529	1268	160	598	1525	229	668	1735	332	724	1945	434	781	2117	537	828	2289	640	875	2438	795	921	2587	949	967
0.3	930	100	597	1214	169	647	1497	239	696	1707	345	755	1917	452	814	2093	556	857	2269	660	900	2417	817	948	2565	975	995
0.4	869	109	646	1156	184	699	1442	258	751	1665	364	798	1888	469	845	2066	577	889	2243	685	933	2393	842	978	2543	998	1022
0.5	813	119	689	1114	193	734	1414	267	778	1637	376	827	1860	485	876	2039	597	920	2217	709	963	2373	861	1002	2528	1013	1040
0.6	---	---	---	---	---	---	1358	286	831	1595	394	868	1832	501	905	2012	616	949	2191	731	993	2349	882	1028	2506	1033	1064
0.7	---	---	---	---	---	---	1330	296	857	1560	409	903	1789	523	949	1977	638	985	2164	753	1020	2324	902	1054	2484	1052	1088
0.8	---	---	---	---	---	---	1275	315	908	1518	426	942	1761	536	977	1950	655	1011	2138	773	1046	2296	923	1081	2454	1073	1116
0.9	---	---	---	---	---	---	1233	329	946	1483	439	975	1732	549	1004	1922	670	1037	2112	792	1071	2272	939	1104	2432	1087	1136
1.0	---	---	---	---	---	---	1192	343	982	1441	455	1012	1690	567	1043	1881	692	1074	2072	818	1105	2237	960	1133	2402	1102	1161
1.1	---	---	---	---	---	---	---	---	---	---	---	---	1662	578	1068	1854	706	1097	2046	833	1126	2206	975	1157	2365	1117	1188
1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1994	861	1163	2165	993	1185	2336	1125	1206

BLOWER DATA - BELT DRIVE - 3 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

DOWNFLOW

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
700	453	0.07	523	0.11	596	0.14	679	0.17	762	0.18	828	0.21	878	0.24	927	0.26	979	0.29	1029	0.31
800	471	0.09	542	0.13	614	0.16	696	0.19	777	0.21	841	0.23	889	0.26	938	0.29	990	0.31	1042	0.34
900	493	0.11	563	0.15	634	0.19	715	0.21	793	0.23	854	0.26	902	0.29	950	0.32	1002	0.34	1054	0.36
1000	517	0.14	587	0.18	657	0.21	736	0.24	811	0.26	869	0.29	916	0.32	964	0.35	1015	0.37	1067	0.4
1100	544	0.17	613	0.21	683	0.24	759	0.27	831	0.3	886	0.32	931	0.36	978	0.38	1028	0.41	1078	0.43
1200	574	0.2	643	0.24	711	0.27	784	0.3	852	0.33	904	0.36	947	0.39	993	0.42	1042	0.45	1091	0.47
1300	608	0.24	676	0.28	743	0.31	812	0.34	875	0.37	923	0.4	964	0.44	1010	0.46	1057	0.49	1104	0.51
1400	645	0.28	711	0.31	776	0.35	842	0.38	898	0.41	942	0.44	983	0.48	1028	0.51	1074	0.53	1120	0.56

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
700	1078	0.33	1124	0.36	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
800	1091	0.36	1137	0.39	1180	0.41	1221	0.44	1260	0.47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
900	1105	0.39	1150	0.42	1192	0.45	1232	0.47	1270	0.5	1307	0.53	1345	0.56	1382	0.59	1420	0.62	- - -	- - -
1000	1117	0.42	1162	0.45	1203	0.48	1242	0.51	1279	0.54	1316	0.57	1353	0.6	1390	0.63	1427	0.66	1465	0.7
1100	1126	0.46	1171	0.49	1212	0.52	1251	0.56	1288	0.59	1325	0.62	1361	0.65	1397	0.68	1433	0.71	1470	0.75
1200	1137	0.5	1180	0.54	1222	0.57	1260	0.6	1298	0.64	1334	0.67	1369	0.7	1404	0.73	1440	0.77	1477	0.8
1300	1149	0.55	1191	0.58	1232	0.62	1270	0.65	1307	0.69	1343	0.72	1378	0.76	1413	0.79	1449	0.82	1486	0.86
1400	1163	0.6	1204	0.63	1243	0.67	1281	0.71	1317	0.74	1353	0.78	1388	0.82	1423	0.85	1459	0.89	1496	0.92

BLOWER DATA - BELT DRIVE - 3 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

HORIZONTAL

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
700	440	0.07	510	0.1	585	0.12	657	0.14	726	0.17	793	0.2	856	0.23	915	0.25	967	0.28	1016	0.31
800	456	0.08	526	0.11	600	0.14	672	0.16	739	0.19	804	0.22	866	0.25	923	0.28	975	0.31	1025	0.34
900	474	0.1	544	0.13	617	0.16	688	0.18	754	0.21	818	0.24	877	0.27	932	0.3	984	0.33	1034	0.36
1000	495	0.12	565	0.15	637	0.18	707	0.21	771	0.23	832	0.27	889	0.3	943	0.33	993	0.36	1043	0.39
1100	518	0.14	588	0.18	659	0.21	727	0.23	789	0.26	848	0.3	903	0.33	954	0.37	1003	0.4	1052	0.43
1200	544	0.17	613	0.21	682	0.24	748	0.27	809	0.29	866	0.33	918	0.37	967	0.4	1014	0.43	1062	0.46
1300	572	0.21	640	0.24	707	0.27	771	0.3	830	0.33	884	0.37	934	0.41	981	0.44	1027	0.47	1073	0.5
1400	602	0.24	669	0.28	733	0.31	795	0.34	851	0.37	903	0.41	950	0.45	995	0.49	1040	0.52	1086	0.55

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
700	1065	0.33	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
800	1075	0.36	1122	0.39	1164	0.42	1203	0.45	1241	0.47	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
900	1086	0.39	1133	0.42	1174	0.45	1213	0.48	1250	0.51	1286	0.54	1322	0.57	1357	0.6	1392	0.64	- - -	- - -
1000	1094	0.43	1142	0.46	1183	0.49	1222	0.52	1259	0.55	1295	0.58	1330	0.62	1365	0.65	1400	0.68	1435	0.71
1100	1102	0.46	1148	0.49	1191	0.53	1230	0.56	1267	0.6	1303	0.63	1338	0.66	1373	0.69	1408	0.73	1444	0.76
1200	1110	0.5	1156	0.53	1198	0.57	1238	0.61	1275	0.64	1311	0.68	1346	0.71	1381	0.74	1416	0.78	1452	0.81
1300	1120	0.54	1164	0.58	1207	0.62	1246	0.65	1283	0.69	1319	0.73	1354	0.76	1389	0.79	1424	0.83	1460	0.86
1400	1131	0.59	1175	0.63	1216	0.67	1255	0.7	1292	0.74	1327	0.78	1362	0.81	1397	0.84	1432	0.88	1468	0.91

BLOWER DATA - BELT DRIVE - 4 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

DOWNFLOW

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	502	0.12	573	0.15	644	0.19	725	0.22	802	0.24	861	0.26	908	0.29	957	0.32	1009	0.34	1061	0.37
1000	528	0.14	598	0.18	668	0.22	747	0.24	821	0.27	877	0.3	923	0.33	971	0.35	1022	0.38	1074	0.4
1100	557	0.17	626	0.21	695	0.25	772	0.28	841	0.3	894	0.33	939	0.36	986	0.39	1037	0.41	1087	0.44
1200	589	0.21	657	0.25	725	0.28	798	0.31	864	0.33	913	0.37	956	0.4	1003	0.43	1052	0.45	1100	0.48
1300	625	0.25	692	0.28	759	0.32	827	0.34	887	0.37	933	0.41	975	0.44	1021	0.47	1068	0.49	1115	0.52
1400	665	0.29	730	0.32	794	0.35	857	0.38	911	0.42	953	0.45	995	0.49	1040	0.52	1086	0.54	1131	0.57
1500	706	0.33	768	0.36	829	0.39	886	0.43	934	0.46	974	0.5	1015	0.54	1060	0.56	1105	0.59	1149	0.62
1600	746	0.37	805	0.4	862	0.44	914	0.48	957	0.52	996	0.55	1037	0.59	1081	0.62	1126	0.64	1167	0.68
1700	784	0.42	840	0.45	893	0.49	940	0.53	980	0.57	1019	0.61	1060	0.64	1104	0.67	1147	0.7	1187	0.74
1800	821	0.47	874	0.51	923	0.55	967	0.59	1006	0.63	1044	0.67	1085	0.7	1128	0.73	1170	0.77	1208	0.82
1900	857	0.53	906	0.57	952	0.62	994	0.66	1032	0.7	1071	0.73	1112	0.76	1154	0.8	1194	0.85	1230	0.9

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1111	0.39	1156	0.42	1197	0.45	1236	0.48	1275	0.51	1312	0.54	1349	0.56	1387	0.59	1424	0.62	- - -	- - -
1000	1124	0.43	1168	0.46	1209	0.49	1247	0.52	1285	0.55	1322	0.58	1358	0.61	1395	0.64	1432	0.67	1470	0.7
1100	1134	0.47	1178	0.5	1219	0.53	1258	0.56	1295	0.6	1331	0.63	1367	0.66	1403	0.69	1439	0.72	1477	0.75
1200	1146	0.51	1189	0.54	1230	0.58	1268	0.61	1305	0.65	1341	0.68	1376	0.71	1411	0.74	1447	0.77	1485	0.81
1300	1159	0.55	1201	0.59	1241	0.63	1279	0.66	1315	0.7	1351	0.73	1386	0.77	1421	0.8	1457	0.83	1495	0.87
1400	1173	0.61	1214	0.64	1253	0.68	1290	0.72	1327	0.75	1362	0.79	1397	0.82	1432	0.86	1468	0.89	1506	0.93
1500	1189	0.66	1228	0.7	1266	0.74	1303	0.78	1339	0.81	1374	0.85	1409	0.89	1445	0.92	1481	0.96	1519	1
1600	1206	0.72	1244	0.76	1281	0.8	1317	0.84	1353	0.88	1388	0.92	1423	0.96	1459	1	1496	1.04	1535	1.08
1700	1224	0.79	1261	0.83	1298	0.87	1334	0.91	1369	0.95	1404	0.99	1440	1.03	1476	1.07	1513	1.12	1552	1.16
1800	1244	0.86	1280	0.91	1316	0.95	1352	0.99	1387	1.03	1422	1.07	1457	1.11	1494	1.16	1532	1.2	1570	1.24
1900	1265	0.95	1301	1	1336	1.04	1371	1.08	1406	1.12	1441	1.16	1477	1.2	1515	1.24	1553	1.29	1592	1.33

BLOWER DATA - BELT DRIVE - 4 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

HORIZONTAL

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	483	0.1	554	0.13	627	0.16	699	0.19	765	0.22	826	0.24	882	0.27	935	0.3	986	0.33	1039	0.36
1000	505	0.12	576	0.16	648	0.19	719	0.21	784	0.24	842	0.27	896	0.3	947	0.33	998	0.37	1050	0.4
1100	530	0.15	601	0.18	671	0.21	741	0.24	804	0.27	860	0.3	912	0.34	961	0.37	1010	0.4	1060	0.43
1200	558	0.18	627	0.22	696	0.25	764	0.28	824	0.3	878	0.34	928	0.37	975	0.41	1023	0.44	1072	0.47
1300	588	0.22	656	0.25	723	0.28	788	0.31	846	0.34	897	0.38	945	0.42	990	0.45	1037	0.48	1084	0.51
1400	621	0.25	687	0.29	752	0.32	814	0.35	868	0.38	916	0.42	962	0.46	1006	0.5	1052	0.53	1098	0.56
1500	655	0.29	719	0.33	781	0.36	839	0.39	890	0.43	936	0.47	979	0.51	1023	0.55	1068	0.58	1113	0.61
1600	690	0.33	751	0.37	810	0.4	865	0.44	912	0.48	955	0.52	997	0.56	1041	0.6	1086	0.63	1129	0.66
1700	725	0.38	784	0.41	839	0.45	891	0.49	935	0.53	975	0.58	1017	0.62	1060	0.65	1104	0.68	1147	0.72
1800	761	0.42	816	0.46	868	0.5	916	0.55	957	0.59	997	0.64	1038	0.68	1081	0.71	1124	0.74	1165	0.79
1900	795	0.48	848	0.52	897	0.56	942	0.61	981	0.66	1020	0.7	1060	0.74	1103	0.77	1145	0.81	1183	0.85

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1091	0.4	1138	0.43	1180	0.46	1220	0.49	1257	0.53	1293	0.56	1329	0.59	1364	0.62	1400	0.65	1435	0.69
1000	1101	0.43	1149	0.46	1190	0.5	1229	0.53	1266	0.57	1302	0.6	1338	0.63	1373	0.66	1408	0.7	1444	0.73
1100	1110	0.46	1156	0.5	1199	0.54	1238	0.57	1275	0.61	1311	0.64	1346	0.67	1381	0.71	1416	0.74	1452	0.78
1200	1119	0.5	1165	0.54	1207	0.58	1247	0.62	1284	0.65	1319	0.69	1355	0.72	1389	0.75	1425	0.79	1460	0.82
1300	1130	0.55	1175	0.59	1216	0.63	1255	0.66	1292	0.7	1328	0.74	1363	0.77	1398	0.8	1433	0.84	1469	0.87
1400	1143	0.6	1186	0.63	1226	0.67	1265	0.71	1302	0.75	1337	0.79	1372	0.82	1406	0.85	1441	0.89	1477	0.93
1500	1156	0.65	1198	0.69	1237	0.73	1275	0.77	1311	0.8	1346	0.84	1381	0.88	1415	0.91	1450	0.95	1486	0.98
1600	1171	0.7	1211	0.74	1249	0.78	1286	0.82	1321	0.86	1356	0.9	1390	0.93	1425	0.97	1460	1.01	1496	1.05
1700	1186	0.76	1225	0.8	1262	0.84	1298	0.88	1333	0.92	1367	0.96	1401	1	1436	1.03	1471	1.07	1507	1.12
1800	1202	0.83	1240	0.87	1276	0.91	1311	0.95	1345	0.99	1380	1.03	1413	1.07	1448	1.11	1483	1.15	1520	1.19
1900	1220	0.9	1256	0.94	1291	0.99	1326	1.03	1360	1.07	1393	1.1	1427	1.14	1462	1.18	1497	1.22	1534	1.27

BLOWER DATA - BELT DRIVE - 5 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

DOWNFLOW

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1100	529	0.17	591	0.21	653	0.24	724	0.26	810	0.26	886	0.26	942	0.28	982	0.32	1022	0.36	1064	0.40
1200	553	0.20	615	0.24	677	0.27	747	0.30	829	0.30	902	0.30	955	0.33	994	0.36	1034	0.40	1075	0.44
1300	579	0.23	640	0.27	701	0.31	770	0.33	850	0.34	918	0.35	969	0.37	1007	0.41	1047	0.45	1088	0.49
1400	609	0.27	669	0.31	729	0.34	796	0.37	871	0.38	936	0.39	983	0.41	1022	0.45	1061	0.49	1102	0.53
1500	658	0.28	715	0.32	771	0.36	832	0.39	898	0.41	955	0.43	999	0.46	1037	0.50	1077	0.54	1117	0.58
1600	720	0.28	769	0.33	819	0.37	871	0.41	926	0.44	975	0.47	1016	0.51	1054	0.55	1093	0.60	1133	0.63
1700	779	0.30	822	0.35	864	0.39	908	0.44	953	0.48	995	0.52	1034	0.57	1072	0.61	1111	0.65	1150	0.69
1800	828	0.34	864	0.39	901	0.43	938	0.48	977	0.53	1015	0.58	1053	0.63	1091	0.67	1130	0.71	1169	0.75
1900	857	0.41	892	0.45	927	0.50	962	0.55	999	0.60	1036	0.65	1074	0.69	1112	0.73	1150	0.77	1188	0.81
2000	879	0.47	913	0.52	948	0.56	984	0.61	1020	0.67	1058	0.72	1096	0.76	1134	0.80	1172	0.84	1210	0.88
2100	900	0.53	935	0.58	970	0.63	1007	0.69	1044	0.74	1081	0.79	1119	0.84	1157	0.88	1195	0.91	1233	0.95
2200	922	0.60	958	0.65	994	0.71	1031	0.76	1068	0.82	1106	0.87	1143	0.91	1180	0.95	1218	0.99	1255	1.03
2300	947	0.67	983	0.73	1020	0.79	1057	0.85	1094	0.90	1131	0.95	1168	1.00	1205	1.03	1242	1.07	1277	1.13
2400	974	0.76	1010	0.82	1047	0.88	1084	0.94	1120	0.99	1157	1.04	1193	1.08	1230	1.12	1267	1.16	1300	1.23

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1100	1106	0.44	1151	0.47	1197	0.49	1238	0.52	1272	0.56	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
1200	1117	0.48	1161	0.51	1206	0.53	1245	0.57	1278	0.60	1312	0.64	1346	0.67	1380	0.71	- - -	- - -	- - -	- - -
1300	1129	0.52	1172	0.55	1216	0.58	1254	0.61	1287	0.65	1320	0.69	1354	0.72	1388	0.76	1421	0.79	1455	0.82
1400	1143	0.57	1185	0.60	1227	0.63	1264	0.66	1296	0.70	1329	0.74	1363	0.77	1397	0.81	1430	0.85	1464	0.88
1500	1157	0.62	1199	0.65	1239	0.68	1275	0.71	1306	0.75	1339	0.79	1373	0.83	1406	0.87	1440	0.90	1473	0.94
1600	1173	0.67	1214	0.70	1253	0.73	1288	0.77	1318	0.81	1351	0.85	1384	0.89	1417	0.93	1451	0.96	1484	1.00
1700	1190	0.72	1230	0.76	1268	0.79	1301	0.83	1331	0.87	1363	0.92	1396	0.95	1429	0.99	1462	1.03	1495	1.07
1800	1208	0.78	1247	0.82	1285	0.86	1317	0.90	1345	0.94	1377	0.98	1410	1.02	1442	1.06	1475	1.10	1508	1.14
1900	1227	0.85	1267	0.88	1303	0.92	1333	0.97	1360	1.02	1392	1.06	1424	1.10	1457	1.14	1489	1.18	1522	1.22
2000	1248	0.92	1286	0.96	1321	1.00	1350	1.05	1377	1.10	1409	1.14	1441	1.18	1473	1.22	1505	1.26	1537	1.30
2100	1269	1.00	1306	1.04	1339	1.09	1367	1.14	1395	1.19	1426	1.23	1458	1.27	1490	1.31	1522	1.35	1554	1.39
2200	1290	1.09	1324	1.14	1356	1.19	1385	1.24	1413	1.28	1444	1.32	1476	1.36	1508	1.41	1540	1.45	1572	1.49
2300	1310	1.20	1343	1.26	1374	1.30	1403	1.34	1432	1.38	1464	1.42	1495	1.46	1527	1.51	1559	1.55	1591	1.59
2400	1332	1.31	1364	1.37	1394	1.41	1423	1.45	1453	1.48	1484	1.53	1516	1.57	1547	1.61	1579	1.65	1612	1.70

BLOWER DATA - BELT DRIVE - 5 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

HORIZONTAL

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1100	503	0.14	569	0.17	636	0.20	703	0.23	769	0.26	842	0.28	909	0.30	964	0.33	1008	0.36	1049	0.40
1200	525	0.16	590	0.20	657	0.23	722	0.26	787	0.29	857	0.31	921	0.34	974	0.37	1016	0.40	1056	0.43
1300	548	0.19	613	0.23	679	0.26	743	0.29	806	0.32	873	0.35	934	0.37	984	0.41	1026	0.44	1065	0.47
1400	574	0.22	638	0.26	702	0.30	765	0.33	827	0.36	891	0.39	949	0.41	996	0.45	1037	0.48	1076	0.51
1500	609	0.25	671	0.29	733	0.33	793	0.36	851	0.39	911	0.42	965	0.46	1010	0.49	1049	0.53	1088	0.56
1600	654	0.28	712	0.32	769	0.36	825	0.39	879	0.43	933	0.47	982	0.50	1024	0.54	1063	0.58	1101	0.61
1700	703	0.31	756	0.35	807	0.39	858	0.43	906	0.47	955	0.51	999	0.55	1039	0.59	1078	0.63	1117	0.66
1800	752	0.34	798	0.38	844	0.43	889	0.48	933	0.52	977	0.57	1017	0.61	1056	0.65	1094	0.68	1133	0.72
1900	796	0.38	837	0.43	878	0.48	918	0.53	958	0.58	997	0.62	1036	0.67	1074	0.71	1112	0.74	1151	0.77
2000	833	0.43	870	0.48	907	0.54	943	0.59	980	0.64	1018	0.69	1055	0.73	1093	0.77	1131	0.80	1170	0.83
2100	864	0.50	897	0.55	931	0.60	966	0.65	1002	0.71	1038	0.76	1075	0.80	1113	0.83	1151	0.87	1189	0.90
2200	887	0.57	920	0.62	953	0.67	988	0.73	1024	0.78	1060	0.83	1097	0.87	1135	0.90	1173	0.94	1210	0.98
2300	909	0.64	942	0.70	976	0.75	1011	0.81	1046	0.86	1083	0.91	1120	0.95	1157	0.98	1195	1.02	1231	1.06
2400	931	0.72	965	0.78	999	0.83	1035	0.89	1071	0.94	1108	0.99	1144	1.03	1181	1.07	1217	1.10	1252	1.15

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1100	1090	0.42	1132	0.45	1175	0.47	1216	0.50	1257	0.53	1296	0.56	1334	0.59	1370	0.62	1405	0.65	1439	0.69
1200	1097	0.46	1139	0.49	1181	0.51	1222	0.54	1263	0.57	1301	0.60	1338	0.63	1374	0.67	1409	0.70	1443	0.74
1300	1106	0.50	1147	0.53	1189	0.55	1230	0.58	1270	0.61	1307	0.65	1344	0.68	1379	0.72	1414	0.75	1447	0.79
1400	1116	0.54	1157	0.57	1198	0.60	1239	0.63	1278	0.66	1315	0.70	1351	0.74	1385	0.77	1419	0.81	1452	0.85
1500	1128	0.59	1168	0.62	1209	0.64	1249	0.68	1287	0.71	1323	0.75	1358	0.79	1393	0.83	1426	0.87	1458	0.91
1600	1141	0.64	1181	0.67	1222	0.70	1261	0.73	1298	0.77	1333	0.81	1367	0.85	1401	0.89	1433	0.93	1465	0.97
1700	1156	0.69	1196	0.72	1235	0.75	1273	0.79	1309	0.83	1344	0.87	1377	0.91	1410	0.96	1442	1.00	1473	1.04
1800	1172	0.75	1211	0.78	1250	0.81	1287	0.85	1322	0.90	1355	0.94	1388	0.98	1420	1.02	1451	1.07	1482	1.11
1900	1190	0.81	1228	0.84	1265	0.88	1301	0.92	1335	0.97	1367	1.01	1399	1.05	1431	1.10	1462	1.14	1492	1.18
2000	1208	0.87	1245	0.91	1281	0.96	1316	1.00	1349	1.04	1380	1.09	1412	1.13	1443	1.18	1473	1.22	1503	1.26
2100	1227	0.94	1263	0.99	1298	1.04	1331	1.08	1363	1.13	1394	1.17	1425	1.22	1455	1.26	1485	1.31	1515	1.35
2200	1246	1.02	1281	1.07	1315	1.12	1347	1.17	1379	1.22	1409	1.26	1439	1.31	1469	1.36	1499	1.40	1529	1.45
2300	1266	1.11	1300	1.16	1333	1.22	1364	1.27	1395	1.32	1424	1.36	1454	1.41	1484	1.46	1513	1.50	1543	1.55
2400	1286	1.20	1319	1.26	1351	1.32	1382	1.38	1411	1.43	1440	1.48	1470	1.52	1499	1.57	1528	1.61	1558	1.66

BLOWER DATA - BELT DRIVE - 6 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

DOWNFLOW

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1900	510	0.45	544	0.5	579	0.55	614	0.6	649	0.65	684	0.7	718	0.74	752	0.79	784	0.83	812	0.88
2000	526	0.49	560	0.55	595	0.6	629	0.65	663	0.7	697	0.75	730	0.79	763	0.84	794	0.88	820	0.93
2100	542	0.54	576	0.59	610	0.65	644	0.7	678	0.75	711	0.8	743	0.84	775	0.89	804	0.94	830	0.98
2200	560	0.59	593	0.64	627	0.7	660	0.75	693	0.8	725	0.85	757	0.9	787	0.94	814	0.99	840	1.03
2300	578	0.64	610	0.7	644	0.75	676	0.81	709	0.86	740	0.91	770	0.95	799	1	826	1.05	851	1.09
2400	597	0.7	629	0.75	661	0.81	693	0.86	725	0.91	755	0.96	784	1.01	812	1.06	838	1.11	862	1.15
2500	617	0.76	648	0.81	679	0.87	710	0.92	741	0.97	770	1.03	799	1.08	825	1.13	850	1.17	875	1.22
2600	637	0.82	667	0.87	698	0.93	728	0.98	758	1.04	786	1.09	814	1.15	839	1.2	864	1.24	887	1.28
2700	658	0.88	687	0.94	717	1	746	1.05	775	1.11	802	1.16	829	1.22	853	1.27	877	1.31	901	1.36
2800	679	0.95	708	1.01	736	1.07	764	1.12	792	1.18	819	1.24	844	1.3	868	1.35	892	1.39	915	1.43
2900	701	1.02	728	1.08	756	1.14	783	1.2	809	1.26	835	1.32	860	1.38	884	1.43	907	1.47	930	1.52

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1900	837	0.92	861	0.96	886	1	913	1.04	939	1.07	966	1.11	992	1.16	1017	1.21	1041	1.27	1065	1.33
2000	845	0.97	870	1.01	895	1.05	921	1.09	948	1.12	974	1.17	999	1.22	1023	1.27	1047	1.33	1070	1.39
2100	855	1.02	879	1.06	904	1.1	930	1.14	956	1.18	982	1.22	1006	1.28	1030	1.34	1053	1.4	1075	1.46
2200	865	1.08	889	1.12	914	1.15	940	1.19	966	1.24	990	1.29	1014	1.34	1037	1.41	1059	1.47	1081	1.54
2300	875	1.13	900	1.17	925	1.21	951	1.25	976	1.3	999	1.35	1022	1.41	1044	1.48	1066	1.55	1087	1.62
2400	887	1.19	912	1.23	936	1.27	961	1.32	986	1.37	1009	1.43	1031	1.49	1052	1.57	1073	1.64	1094	1.71
2500	899	1.25	923	1.29	948	1.34	973	1.39	996	1.44	1018	1.51	1039	1.58	1060	1.65	1080	1.73	1101	1.8
2600	912	1.32	936	1.36	960	1.41	984	1.46	1007	1.52	1028	1.59	1049	1.67	1069	1.75	1089	1.82	1109	1.89
2700	925	1.4	949	1.44	973	1.49	996	1.55	1018	1.61	1038	1.69	1058	1.76	1078	1.84	1098	1.92	1118	1.99
2800	939	1.47	962	1.52	985	1.57	1008	1.64	1029	1.71	1049	1.79	1069	1.87	1088	1.94	1107	2.02	1127	2.09
2900	953	1.56	976	1.61	998	1.67	1020	1.73	1041	1.81	1060	1.89	1079	1.98	1098	2.06	1117	2.13	1137	2.21

BLOWER DATA - BELT DRIVE - 6 TON

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.
FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (heat section, economizer, etc.).
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

See page 19 for blower motors and drives and wet coil and options/accessory air resistance data.

HORIZONTAL

Air Volume (cfm)	External Static (in.w.g.)																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.9		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1900	485	0.55	516	0.57	549	0.59	583	0.62	618	0.65	654	0.69	689	0.73	724	0.77	758	0.82	790	0.86
2000	499	0.59	531	0.61	563	0.63	597	0.66	631	0.7	666	0.73	701	0.77	734	0.82	767	0.86	798	0.91
2100	514	0.63	546	0.65	578	0.68	611	0.71	645	0.74	679	0.78	712	0.82	745	0.86	777	0.91	806	0.96
2200	530	0.68	562	0.7	594	0.73	627	0.76	660	0.79	693	0.83	725	0.87	757	0.92	787	0.96	816	1.01
2300	548	0.73	579	0.75	610	0.78	643	0.81	675	0.85	707	0.88	738	0.93	769	0.97	798	1.02	826	1.06
2400	566	0.78	596	0.81	628	0.84	659	0.87	691	0.9	722	0.94	752	0.98	782	1.03	810	1.08	837	1.12
2500	585	0.84	615	0.86	645	0.9	676	0.93	707	0.96	737	1	767	1.05	795	1.09	822	1.14	848	1.19
2600	604	0.9	634	0.93	664	0.96	694	0.99	724	1.03	753	1.07	781	1.11	809	1.15	835	1.2	861	1.25
2700	624	0.96	653	0.99	682	1.02	712	1.06	741	1.09	769	1.13	796	1.18	823	1.22	849	1.27	873	1.32
2800	645	1.02	673	1.05	701	1.09	730	1.12	758	1.16	785	1.2	812	1.25	838	1.29	862	1.34	886	1.39
2900	665	1.09	693	1.12	721	1.16	748	1.19	775	1.23	802	1.27	827	1.32	852	1.36	877	1.41	900	1.46

Air Volume (cfm)	External Static (in.w.g.)																			
	1.1		1.2		1.3		1.4		1.5		1.6		1.7		1.8		1.9		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1900	819	0.9	846	0.94	871	0.98	897	1.02	922	1.05	948	1.09	974	1.13	999	1.18	1025	1.23	1050	1.28
2000	826	0.95	852	0.99	877	1.03	902	1.06	928	1.1	953	1.14	979	1.18	1004	1.23	1029	1.28	1054	1.34
2100	834	1	859	1.04	884	1.08	909	1.12	934	1.15	960	1.2	985	1.24	1010	1.29	1034	1.35	1058	1.4
2200	842	1.05	868	1.1	892	1.13	917	1.17	942	1.21	967	1.26	992	1.3	1016	1.36	1040	1.41	1063	1.47
2300	852	1.11	877	1.15	901	1.19	926	1.23	950	1.27	975	1.32	999	1.37	1023	1.42	1046	1.48	1069	1.54
2400	862	1.17	887	1.21	911	1.25	935	1.3	959	1.34	983	1.39	1007	1.44	1030	1.5	1053	1.56	1075	1.62
2500	873	1.23	897	1.28	921	1.32	945	1.36	969	1.41	992	1.46	1016	1.52	1038	1.58	1060	1.64	1082	1.7
2600	885	1.3	909	1.34	932	1.39	955	1.43	979	1.49	1002	1.54	1025	1.6	1047	1.66	1069	1.73	1090	1.79
2700	897	1.37	920	1.41	944	1.46	967	1.51	990	1.57	1012	1.62	1034	1.69	1056	1.75	1077	1.82	1098	1.89
2800	910	1.44	933	1.49	955	1.54	978	1.6	1001	1.65	1023	1.72	1044	1.78	1066	1.85	1086	1.92	1107	1.99
2900	923	1.52	945	1.57	968	1.63	990	1.68	1012	1.75	1034	1.81	1055	1.88	1076	1.95	1096	2.02	1116	2.09

BLOWER DATA

BELT DRIVE KIT SPECIFICATIONS - 036-060

Model No.	Motor HP		No. of Speeds	Drive Kits and RPM Range					
	Nominal	Maximum		A01	A02	A03	A05	A06	A07
036	0.75	0.86	2	low 449-673 high 673-1010	- - -	- - -	- - -	- - -	- - -
	1	1.15	2	- - -	- - -	- - -	low 598-897 high 897-1346	- - -	- - -
048	0.75	0.86	2	- - -	low 497-673 high 745-1117	- - -	- - -	- - -	- - -
	2	2.3	2	- - -	- - -	- - -	- - -	low 714-953 high 1071-1429	- - -
060	1	1.15	2	- - -	- - -	low 555-833 high 833-1250	- - -	- - -	- - -
	2	2.3	2	- - -	- - -	- - -	- - -	- - -	low 808-1032 high 1212-1548

BELT DRIVE KIT SPECIFICATIONS - 072

Model No.	Motor HP		No. of Speeds			
	Nominal	Maximum		AA01	AA02	AA03
072	1	1.15	1	522-784	- - -	- - -
	2	2.3	1	- - -	632-875	798-1105

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

Air Volume cfm	Wet Indoor Coil			Humiditrol Dehumidification Coil	Gas Heating		Economizer	Filters	
	036	048	060, 072		Medium Heat	High Heat		MERV 8	MERV 13
036-048 MODELS									
800	0.01	0.01	- - -	0.00	0.02	0.02	0.04	0.04	0.05
1000	0.02	0.02	- - -	0.00	0.02	0.02	0.04	0.04	0.07
1200	0.03	0.04	- - -	0.01	0.02	0.02	0.04	0.04	0.07
1400	0.04	0.05	- - -	0.02	0.02	0.03	0.04	0.04	0.07
1600	0.05	0.06	- - -	0.03	0.03	0.04	0.04	0.04	0.07
1800	0.06	0.07	- - -	0.04	0.04	0.05	0.05	0.04	0.07
2000	0.08	0.09	- - -	0.04	0.04	0.06	0.05	0.05	0.08
060-072 MODELS									
1000	- - -	- - -	0.02	0.00	0.02	0.02	0.04	0.03	0.05
1200	- - -	- - -	0.04	0.00	0.02	0.02	0.04	0.03	0.07
1400	- - -	- - -	0.05	0.01	0.02	0.03	0.04	0.04	0.07
1600	- - -	- - -	0.07	0.02	0.03	0.04	0.04	0.04	0.07
1800	- - -	- - -	0.08	0.02	0.03	0.05	0.05	0.05	0.07
2000	- - -	- - -	0.10	0.03	0.04	0.06	0.05	0.05	0.07
2200	- - -	- - -	0.11	0.04	0.04	0.07	0.05	0.05	0.08
2400	- - -	- - -	0.13	0.04	0.05	0.08	0.05	0.05	0.08
2600	- - -	- - -	0.15	0.05	0.05	0.09	0.06	0.05	0.08
2800	- - -	- - -	0.16	0.05	0.06	0.10	0.06	0.05	0.08
3000	- - -	- - -	0.18	0.06	0.07	0.11	0.06	0.05	0.08

POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure in. w.g.	Air Volume Exhausted cfm	Return Air System Static Pressure in. w.g.	Air Volume Exhausted cfm
036-048 MODELS		**060-072 MODELS**	
0.00	2000	0.00	3175
0.05	1990	0.05	2955
0.10	1924	0.10	2685
0.15	1810	0.15	2410
0.20	1664	0.20	2165
0.25	1507	0.25	1920
0.30	1350	0.30	1420
0.35	1210	0.35	1200

BLOWER DATA

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

Air Volume cfm	RTD9-65 Step-Down Diffuser			FD9-65 Flush Diffuser	RTD11-95 Step-Down Diffuser			FD11-95 Flush Diffuser
	2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open		2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open	
800	0.15	0.13	0.11	0.11	- - -	- - -	- - -	- - -
1000	0.19	0.16	0.14	0.14	- - -	- - -	- - -	- - -
1200	0.25	0.20	0.17	0.17	- - -	- - -	- - -	- - -
1400	0.33	0.26	0.20	0.20	- - -	- - -	- - -	- - -
1600	0.43	0.32	0.20	0.24	- - -	- - -	- - -	- - -
1800	0.56	0.40	0.30	0.30	0.13	0.11	0.09	0.09
2000	0.73	0.50	0.36	0.36	0.15	0.13	0.11	0.10
2200	0.95	0.63	0.44	0.44	0.18	0.15	0.12	0.12
2400	- - -	- - - -	- - -	- - -	0.21	0.18	0.15	0.14
2600	- - -	- - - -	- - -	- - -	0.24	0.21	0.18	0.17
2800	- - -	- - - -	- - -	- - -	0.27	0.24	0.21	0.20
3000	- - -	- - - -	- - -	- - -	0.32	0.29	0.25	0.25

CEILING DIFFUSER AIR THROW DATA

Air Volume - cfm	[1] Effective Throw - ft.	
Model No.	**RTD9-65**	**FD9-65**
800	10 - 17	14 - 18
1000	10 - 17	15 - 20
1200	11 - 18	16 - 22
1400	12 - 19	17 - 24
1600	12 - 20	18 - 25
1800	13 - 21	20 - 28
2000	14 - 23	21 - 29
2200	16 - 25	22 - 30
Model No.	**RTD11-95**	**FD11-95**
2600	24 - 29	19 - 24
2800	25 - 30	20 - 28
3000	27 - 33	21 - 29

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

3 TON HIGH EFFICIENCY (R-410A) LGH036H4

[1] Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	16.7	11.2	4.5	3.7
	Locked Rotor Amps	82	58	29	22.5
Outdoor Fan Motor	Full Load Amps	4.1	4.1	2.1	1.6
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	15	15
Indoor Blower Motor	Horsepower	0.5	0.5	0.5	0.5
	Full Load Amps	4.3	4.3	2.2	1.7
[2] Maximum Overcurrent Protection	Unit Only	45	30	15	15
	With (1) 0.33 HP Power Exhaust	45	35	15	15
[3] Minimum Circuit Ampacity	Unit Only	30	23	10	8
	With (1) 0.33 HP Power Exhaust	32	25	12	9

[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.

3 TON STANDARD EFFICIENCY (R-410A) LGH036S4

[1] Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	11.2		4.5		3.7	
	Locked Rotor Amps	58		29		22.5	
Outdoor Fan Motor	Full Load Amps	0.9		0.6		0.5	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15	
Indoor Blower Motor	Horsepower	0.75	1	0.75	1	0.75	1
	Full Load Amps	3.5	4.6	1.6	2.1	1.3	1.7
[2] Maximum Overcurrent Protection	Unit Only	25	30	15	15	15	15
	With (1) 0.33 HP Power Exhaust	30	30	15	15	15	15
[3] Minimum Circuit Ampacity	Unit Only	19	20	8	9	7	7
	With (1) 0.33 HP Power Exhaust	21	22	10	10	8	8

[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 TON HIGH EFFICIENCY (R-410A) LGH048H4

[1] Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	21.2	13.5	6.4	5
	Locked Rotor Amps	96	88	41	37.8
Outdoor Fan Motor	Full Load Amps	4.1	4.1	2.1	1.6
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	15	15
Indoor Blower Motor	Horsepower	0.75	0.75	0.75	0.75
	Full Load Amps	6.1	6.1	3.1	2.4
[2] Maximum Overcurrent Protection	Unit Only	50	40	15	15
	With (1) 0.33 HP Power Exhaust	60	40	20	15
[3] Minimum Circuit Ampacity	Unit Only	37	28	14	11
	With (1) 0.33 HP Power Exhaust	40	30	15	12

[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 TON STANDARD EFFICIENCY (R-410A) LGH048S4

[1] Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	13.5		6.4		5	
	Locked Rotor Amps	88		41		37.8	
Outdoor Fan Motor	Full Load Amps	1.7		1.1		0.7	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15	
Indoor Blower Motor	Horsepower	0.75	2	0.75	2	0.75	2
	Full Load Amps	3.5	7.5	1.6	3.4	1.3	2.7
[2] Maximum Overcurrent Protection	Unit Only	35	35	15	15	15	15
	With (1) 0.33 HP Power Exhaust	35	40	15	20	15	15
[3] Minimum Circuit Ampacity	Unit Only	23	27	11	13	9	10
	With (1) 0.33 HP Power Exhaust	25	29	12	14	10	11

[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.

5 TON HIGH EFFICIENCY (R-410A) LGH060H4

[1] Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	25.6	17.6	9	7.4
	Locked Rotor Amps	118	135	62	50
Outdoor Fan Motor	Full Load Amps	4.1	4.1	2.1	1.6
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	15	15
Indoor Blower Motor	Horsepower	1	1	1	1
	Full Load Amps	7.4	7.4	3.7	3
[2] Maximum Overcurrent Protection	Unit Only	60	50	25	20
	With (1) 0.33 HP Power Exhaust	70	50	25	20
[3] Minimum Circuit Ampacity	Unit Only	44	34	18	14
	With (1) 0.33 HP Power Exhaust	46	36	19	15

[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.

5 TON STANDARD EFFICIENCY (R-410A) LGH060S4

[1] Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	17.6		9		7.4	
	Locked Rotor Amps	135		62		50	
Outdoor Fan Motor	Full Load Amps	2.4		1.3		1	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
[2] Maximum Overcurrent Protection	Unit Only	45	45	20	20	15	20
	With (1) 0.33 HP Power Exhaust	45	50	20	25	20	20
[3] Minimum Circuit Ampacity	Unit Only	29	32	15	16	12	13
	With (1) 0.33 HP Power Exhaust	32	35	16	18	13	14

[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.

6 TON HIGH EFFICIENCY (R-410A) LGH072H4

[1] Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	19		9.7		7.4	
	Locked Rotor Amps	123		62		50	
Outdoor Fan Motor	Full Load Amps	2.4		1.3		1	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
[2] Maximum Overcurrent Protection	Unit Only	45	50	25	25	15	20
	With (1) 0.33 HP Power Exhaust	50	50	25	25	20	20
[3] Minimum Circuit Ampacity	Unit Only	31	34	16	17	12	13
	With (1) 0.33 HP Power Exhaust	34	37	17	19	13	14

[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.

LGH PARTS ARRANGEMENT

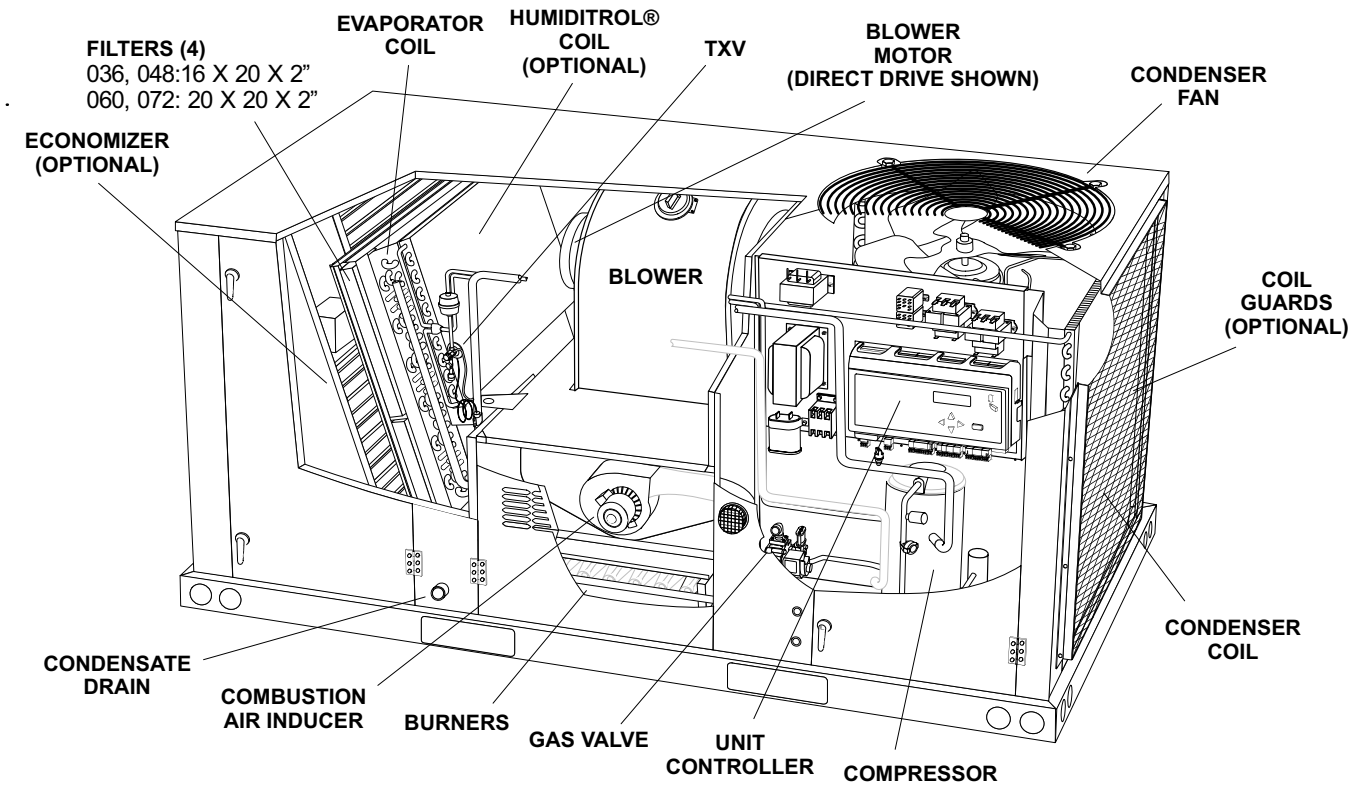


FIGURE 1

LGH CONTROL BOX

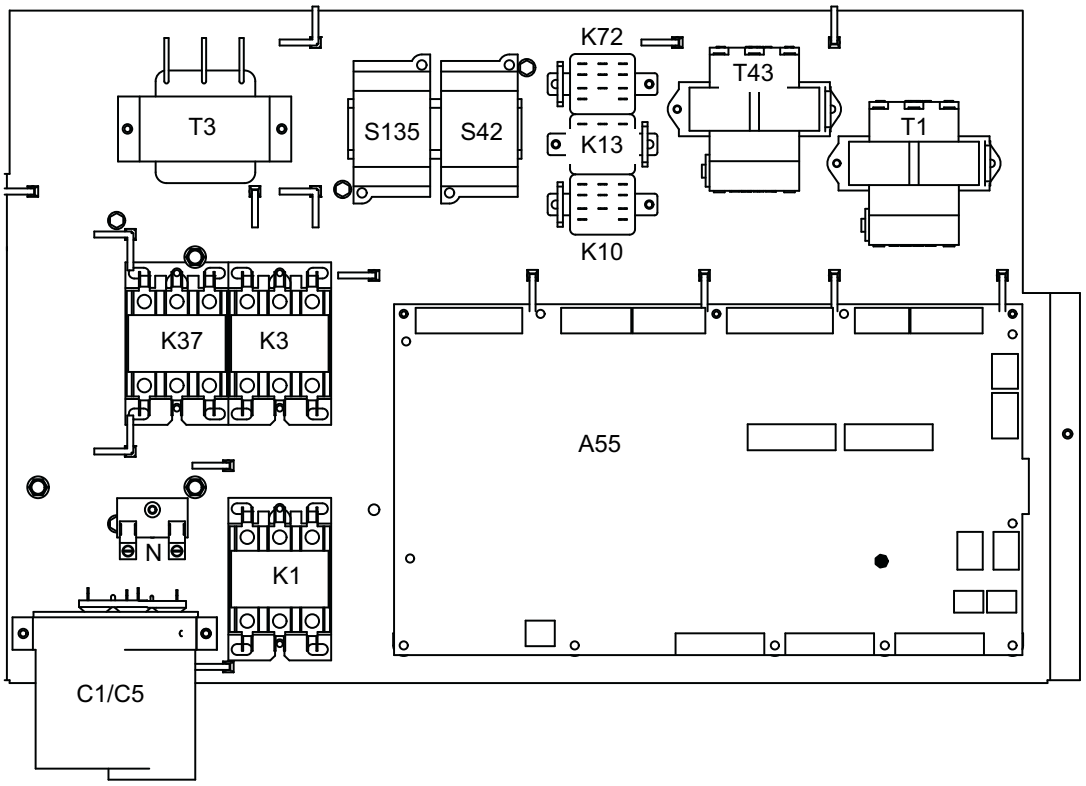


FIGURE 2

I-UNIT COMPONENTS

All 3 through 6 ton (7 through 21 kW) units are configure to order units (CTO). The LGH unit components are shown in figure 1. All units come standard with removable unit panels. All L1, L2, and L3 wiring is color coded; L1 is red, L2 is yellow, and L3 is blue.

A-Control Box Components

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

1-Control Transformer T1

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

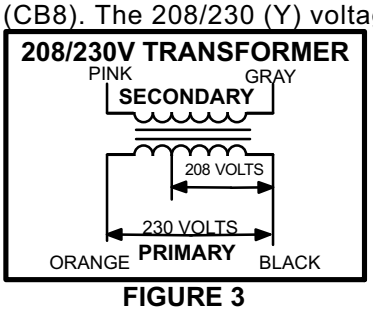


FIGURE 3

2-C. A. I. Transformers T3 (G, J voltage)

All (G) 460 and 575 (J) voltage units use transformer T3 mounted in the control box. The transformers have an output rating of 0.75A. T3 transformer supplies 230 VAC power to the combustion air inducer motor (B6).

3-Transformer T4 (G, J voltage)

All (G, J) 460, 575 voltage direct drive units use transformer T4 mounted in the control box. T4 is a line voltage to 230V transformer to power the indoor blower and outdoor fan motor. It is connected to line voltage and is powered at all times.

4-Transformer T43 (reheat units)

All reheat units and units with phase detection components are equipped with T43 located in the control box. Transformer is rated at 70VA. It is connected to line voltage and is powered at all times.

5-Unit Controller A55

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

Thermostat wires are connected to J297 on the Unit Controller.

6-Fan Capacitor C1 (three phase, belt drive)

Fan capacitor C1 is used to assist in the start up of condenser fan B4. Ratings will be on the side of capacitor or outdoor fan motor nameplate.

7-Compressor Capacitor C5

Compressor capacitor C5 is used to assist in the start up of compressor B1 in single phase units. Ratings will be on the side of capacitor or compressor nameplate.

8-Compressor Contactor K1

In all LGH units, K1 energizes compressor B1 in response to Unit Controller demand. Three phase units use three pole double break contactors with a 24 volt coil. Single phase units use single pole double break contactors with a 24 volt coil.

9-Blower Contactors K3, K37 (belt drive)

K3 and K37 are three-pole, double-break contactors with 24VAC coils. On 3-, 4-, and 5-ton units, K3 energizes the B3 indoor blower motor on low speed and K37 energizes the blower motor on high speed. On 6-ton units, K3 energizes the B3 single-stage blower motor in response to blower demand.

10-Blower Overloads S42, S135

S42 and S135 are three phase thermal overload relays. See figure 4 or 5. Switches are connected in line with the blower motor to monitor the current flow to the motor. When the relay senses current exceeds the operating limits of the motor, a set of normally closed contacts open to de-energize the blower. On 3-, 4- and 5-ton unit blowers, S42 is used on low speed and S135 is used on high speed. On 6-ton unit blowers, S42 is used on single speed. Overload should be set to the full load current ratings on the motor nameplate.

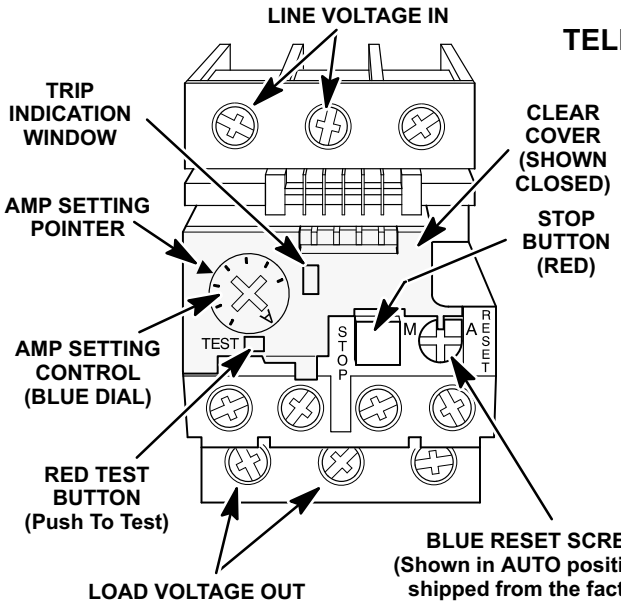
11-Condenser Fan Relay K10 (belt drive)

Outdoor fan relay K10 is an optional DPDT relay with a 24VAC coil. K10 energizes condenser fan B4.

12-Gas Relay K72 (two stage units)

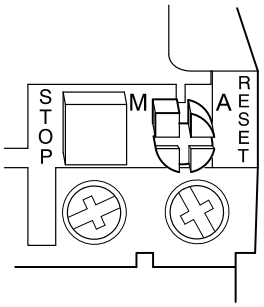
Relay K72 is normally closed and controls combustion air inducer B6. K72 switches the inducer B6 to high speed in response to two stage heat demand.

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.

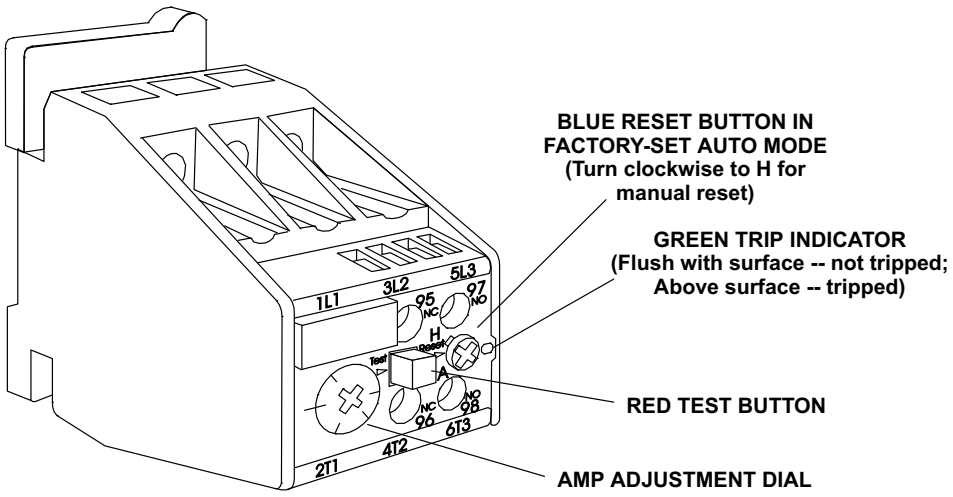
Cover must also be lifted to adjust control mode from automatic reset to manual reset (see detail above) and to test the control.

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



Adjust relay amp setting according to value given on the blower motor nameplate. Proper relay amp setting equals motor nameplate FLA X.

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

13-Burner Control A3

⚠WARNING

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

The main control box (figure 7) houses the burner control A3. The ignition control provides three main functions: gas valve control, ignition, and flame sensing. The control has a green LED to show control status (table 1).

TABLE 1

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.

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

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

Operation

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, 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, the ignition control will wait 5 minutes before attempting ignition again. The unit will usually ignite on the first trial and A3 allows three trials for ignition before locking out. The lockout time is 1 hour. After lockout, the ignition control automatically resets and provides three more attempts at ignition. Manual reset after lockout requires holding the A55 Unit Controller left arrow key until the Unit Controller resets. See the Unit Controller manual provided with the unit.

Once the flame is sensed, the ignition control then proceeds to “steady state” mode where all inputs are monitored to ensure the limit switch, rollout 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.

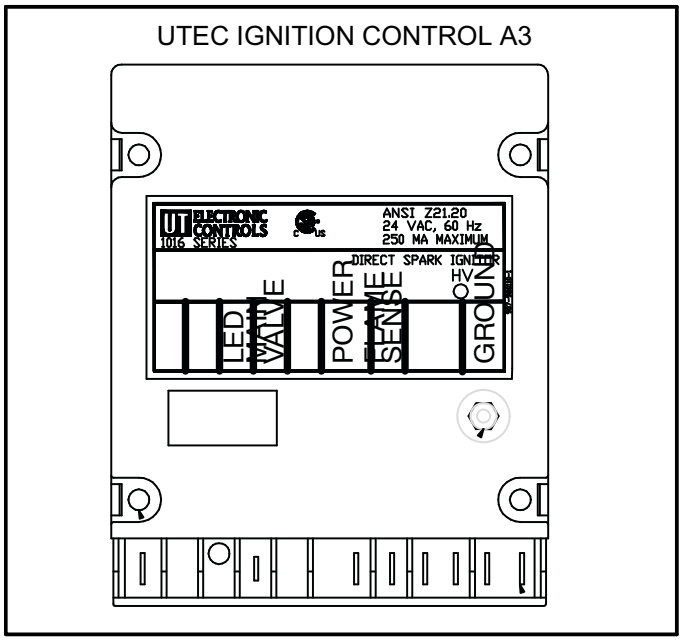


FIGURE 6

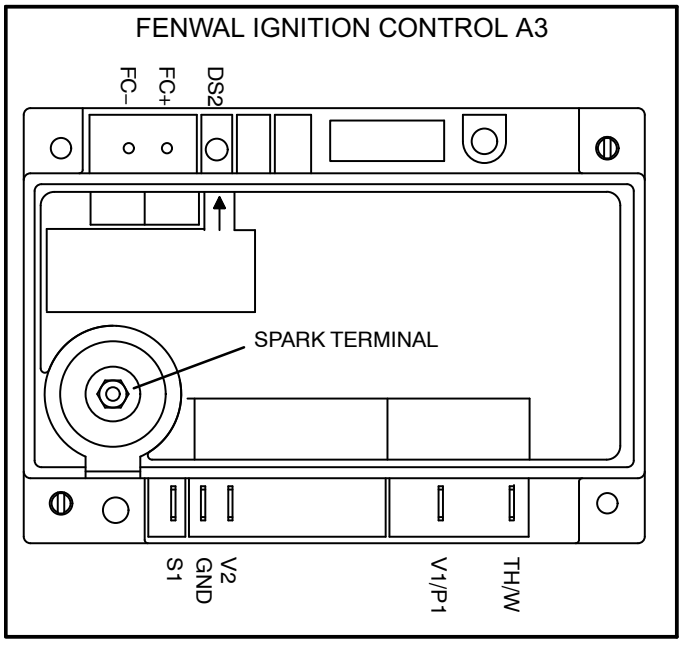


FIGURE 7

B-Cooling Components

All units use independent cooling circuits consisting of separate compressor, condenser coil and evaporator coil. See figure 8. One draw-through type condenser fan is used in LGH036/072 units. Units are equipped with belt-drive or direct drive blowers which draw air across the evaporator during unit operation.

Cooling may be supplemented by a factory- or field-installed economizer. The evaporator coil is slab type and uses a thermostatic expansion valve as the primary refrigerant metering device. Each evaporator is also equipped with enhanced fins and rifled tubing. In all units each compressor is protected by a freezestat (S49) on the evaporator coil, a high pressure switch (S4) on the discharge line, and a low pressure switch (S87) on the suction line. See figure 8. A low ambient switch (S11) is standard.

1-Compressor B1

All LGH036-060 units use one two-stage scroll compressor. LGH072 units use one single-stage scroll compressor. See “SPECIFICATIONS” and “ELECTRICAL DATA” (table of contents) or compressor nameplate for compressor specifications.

⚠ WARNING

Electrical shock hazard. Compressor must be grounded. Do not operate without protective cover over terminals. Disconnect power before removing protective cover. Discharge capacitors before servicing unit. Failure to follow these precautions could cause electrical shock resulting in injury or death.

Each compressor is energized by a corresponding compressor contactor.

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

2-Freezestat S49

Each unit is equipped with a low temperature switch (freezestat) located on a return bend of each evaporator coil.

The freezestat is wired to the A55 Unit Controller. The freezestat is a SPST N.C. auto-reset switch which opens at 29°F ± 3°F (-1.7°C ± 1.7°C) on a temperature drop and closes at 58°F ± 4°F (14.4°C ± 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 temperature rises.

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

3-High Pressure Switch S4

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

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

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

4-Low Ambient Switch S11

The low ambient switch is used to maintain cooling operation during low ambient temperatures. The switch opens to de-energize the outdoor fan (via A55) while mechanical cooling continues to operate. The reduced heat transfer across the outdoor coil results in higher refrigerant temperatures and prevents indoor coil icing.

The low ambient switch is an auto-reset SPST N.O. pressure switch and is located in the liquid line prior to the indoor coil section. The switch is wired to the A55 Unit Controller which uses the S11 input to control the outdoor fan when outdoor temperatures drop below 62°F. S11 opens when the liquid pressure drops below 240 ± 10 psig (1655 ± 69 kPa). S11 closes when the liquid pressure rises to 450 ± 10 psig (3102 ± 69 kPa) psig. The S11 switch will continue to cycle the outdoor fan until the outdoor temperature rises to 65°F.

Units Equipped With Direct Drive Blowers -
When the liquid pressure rises to 450 psig, the outdoor fan is energized at extra low RPM. This reduces the number of outdoor fan on/off cycles and refrigerant pressure fluctuations. The outdoor fan will continue to operate at extra low RPM until the outdoor temperature rises to 65°F.

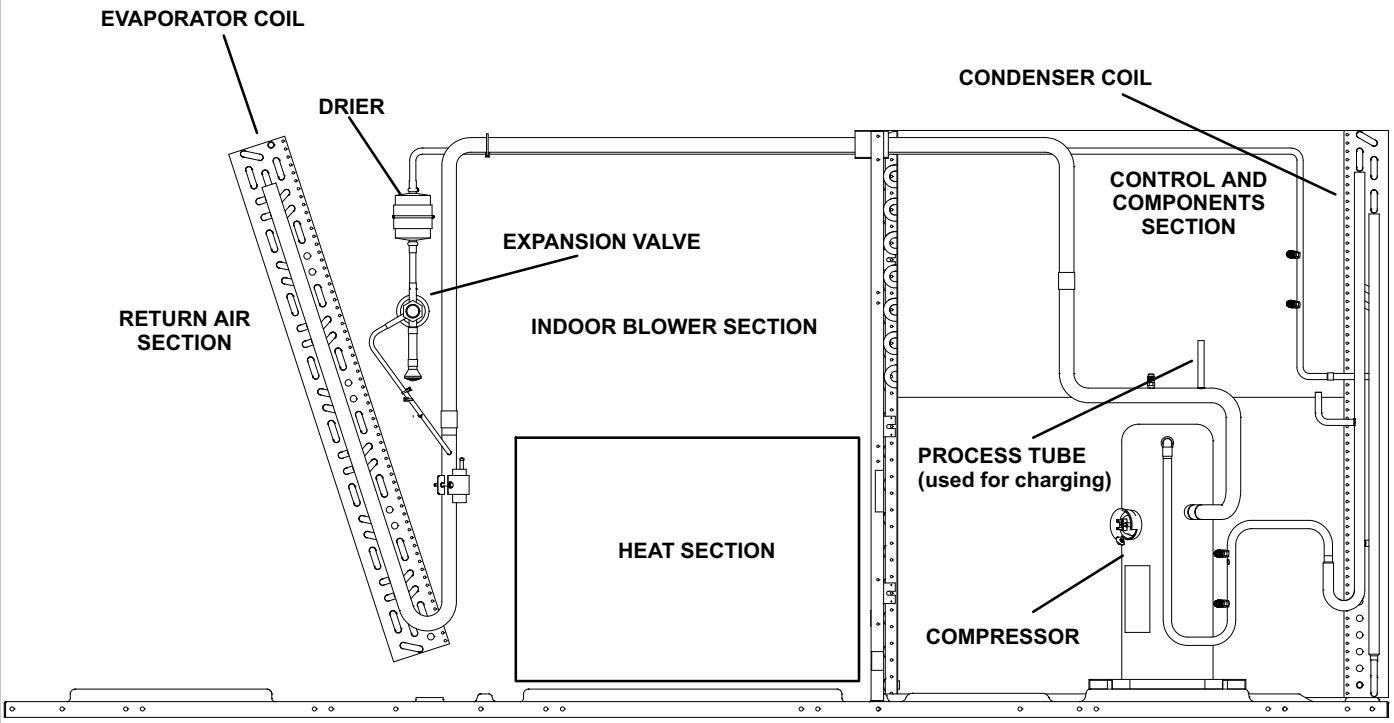
5-Low Pressure Switch S87

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

6-Crankcase Thermostat S40

Switch opens when discharge line temperature reaches 94°F±5 (34°C±3) and closes when temperature falls below 74°F±5 (23°C±3). Prevents crankcase heater operation in warm weather.

LGH PLUMBING and S49 FREEZESTAT LOCATION



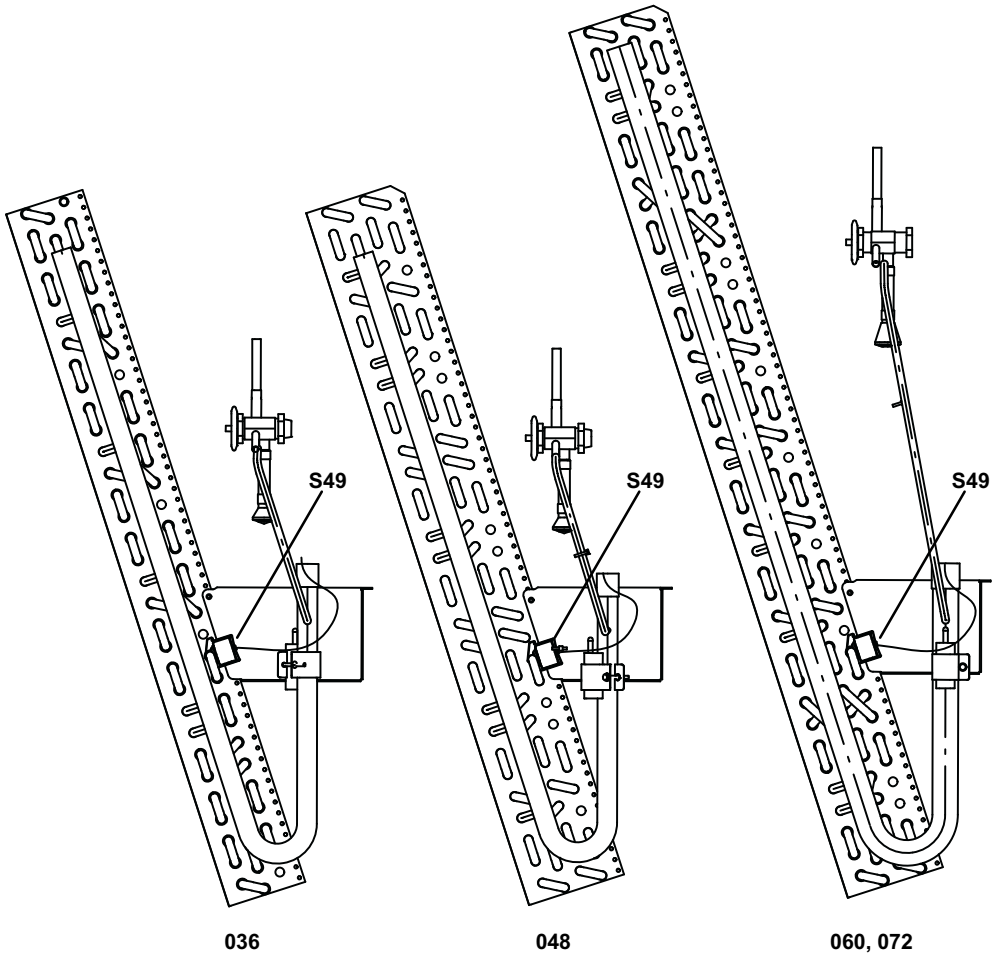


FIGURE 8

C-Blower Compartment

LGH036H, 048H, and 060H units are equipped with direct drive blowers. LGH036S, 048S, and 060S units are equipped with two-speed, belt drive blowers. LGH072H units are equipped with a single-speed belt drive blower. See unit nameplate for blower type. The blower compartment in all LGH036/072 units is located between the evaporator coil and the compressor compartment.

1-Blower Wheels

See table 2 for blower wheel type and size.

TABLE 2

BLOWER WHEELS		
LGH Unit	Type	Size - in. (mm)
036S, 048S, 060S	Belt	10 X 10 (254 X 254)
036H, 048H	Direct	
060H	Direct	11 X 10 (279 X 254)
072S	Belt	15 X 9 (381 X 229)

2-Indoor Blower Motor B3

All direct drive blower motors are electronically commutated, brushless, DC motors. Belt drive blower motors are single (6-ton) or two-speed (3, 4, 5 ton) integral motors. Low speed is approximately 2/3 of high speed. CFM adjustments on belt drive units are made by adjusting the motor pulley (sheave). CFM adjustments on direct drive units are made by changing ECTO parameters as shown in the Unit Controller manual provided with each unit. Motors are equipped with sealed ball bearings. All motor specifications are listed in the SPECIFICATIONS (table of contents) in the front of this manual. Units may be equipped with motors manufactured by various manufacturers, therefore electrical FLA and LRA specifications will vary. See unit rating plate for information specific to your unit.

⚠IMPORTANT

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

A-Blower Operation

Refer to the Unit Controller Installation and Setup Guide to energize blower. Use the menu navigation arrows and select button; see *Service - Test*.

B-Determining Unit CFM

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

IMPORTANT - On units equipped with direct drive blowers, determine and adjust high speed CFM before low speed CFM. Low speed CFM should be adjusted to 2/3 of high speed CFM. A low speed adjustment less than 2/3 of high speed will improve humidity removal; refer to product data for more information.

2- With all access panels in place, measure static pressure external to unit (from supply to return). Pressure tap locations should be approximately one foot from openings.

3- Measure the indoor blower wheel RPM. RPM can be read from the A55 Unit Controller display on direct drive blowers. See Unit Controller manual.

4- Referring to Page 11 through Page 18, use static pressure and RPM readings to determine unit CFM. Use Page 19 and Page 20 when installing units with any of the options or accessories listed.

C-Adjusting Unit CFM - Direct Drive Blowers

The supply CFM can be adjusted by changing Unit Controller settings; see the Unit Controller guide provided with the unit. Refer to table 3. Adjustments can also be made by using optional software. Record any CFM changes on the ECTO Settings label located on the inside of the compressor access panel.

D-Adjusting Unit CFM - Belt Drive Blowers

The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise in 1/2-turn increments to increase CFM. Turn counterclockwise in 1/2-turn increments to decrease CFM. See figure 9. Do not exceed minimum and maximum number of pulley turns as shown in table 4.

E-Blower Belt Adjustment - Belt Drive

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 10.

1- Loosen four bolts securing motor base to mounting frame. See figure 9.

2- *To increase belt tension -*
Slide blower motor downward to tighten the belt. This increases the distance between the blower motor and the blower housing.

3- *To loosen belt tension -*
Slide blower motor upward to loosen the belt. This decreases the distance between the blower motor and the blower housing.

4- Tighten four bolts securing motor base to the mounting frame.

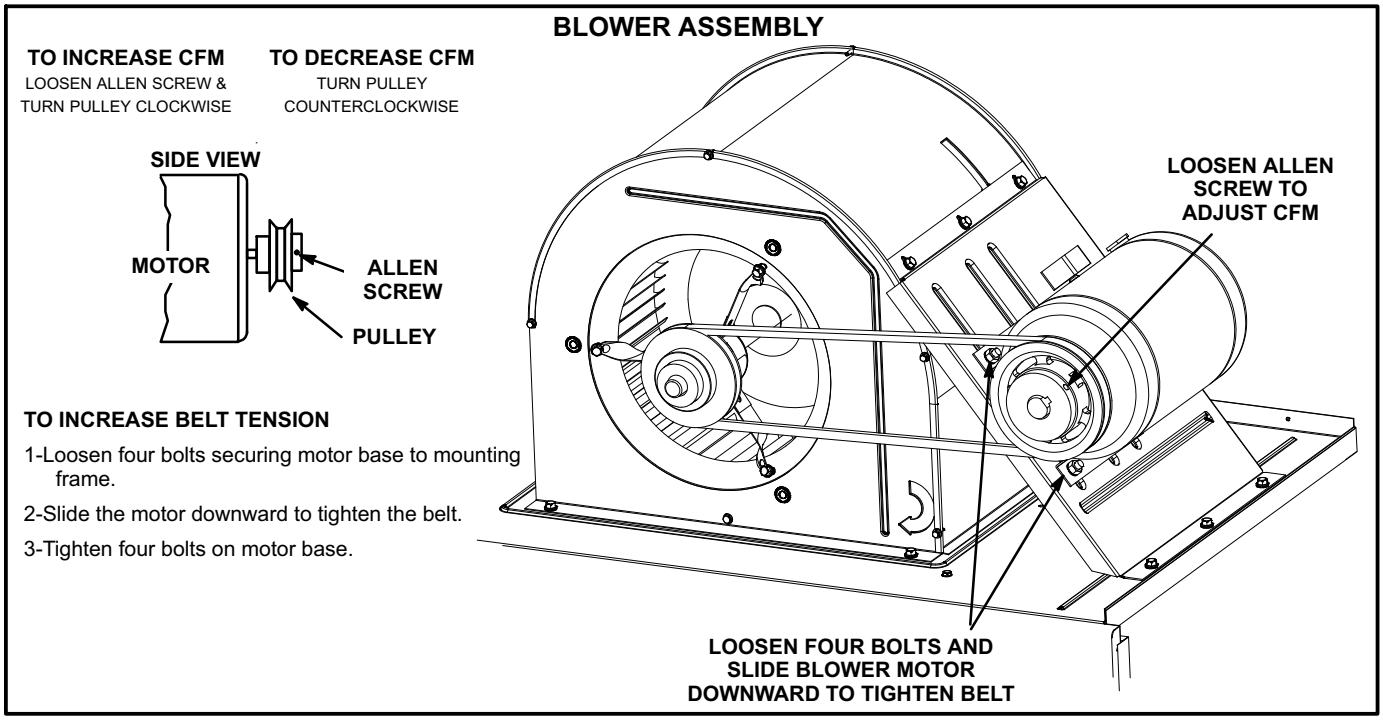


FIGURE 9

TABLE 3
ECTO SETTINGS

Unit Controller "SETTINGS-CONTROL-MSAV" Menu	ECTO	LGH/LCH Unit Factory Settings				Field Setting	Description
		036 H4E	048 H4E	060 H4E	036-060 S4T		
SMOKE SPEED	0.02	55	80	59	Not Applicable		% torque for indoor blower smoke speed.
HIGH SPEED	0.04	55	80	59	Not Applicable		% torque for indoor blower high speed.
LOW SPEED	0.05	28	40	36	Not Applicable		% torque for indoor blower low speed.
Unit Controller "SETTINGS-SETPOINTS-DAMPER" Menu	**ECTO**	**LGH/LCH Unit Factory Settings**				**Field Setting**	**Description**
		036 H4E	**048 H4E**	**060 H4E**	**036-060 S4T**		
MIN OCP BLOWER LOW	0.09	30	30	30	30		Damper minimum position during low indoor blower.
MIN OCP BLOWER HIGH*	5.24	101	101	101	101		Damper minimum position during high indoor blower.

*101 setting allows manual potentiometer control on the A55 Unit Controller.

Installer: Circle applicable unit model number and record any ECTO changes under "Field Setting" column. Settings need to be recorded by installer for use when unit controller is replaced or reprogrammed. Refer to unit controller guide "Setting" menu path or use optional software to change settings.

TABLE 4
MINIMUM AND MAXIMUM PULLEY ADJUSTMENT

Belt	Min. Turns Open	Maxi. Turns Open
A Section	No minimum	5

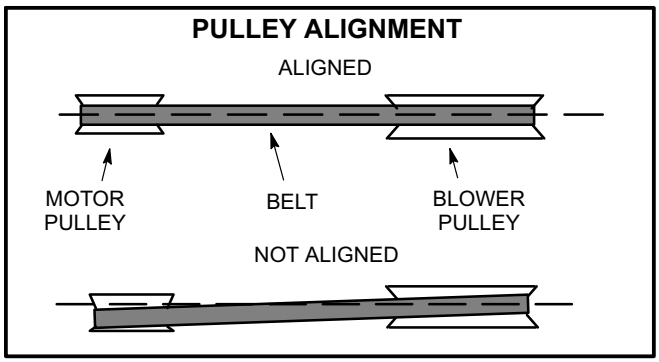


FIGURE 10

F-Blower Belt Adjustment - Units Equipped With An Optional Belt Tensioner

1- Remove blower belt.

2- Remove bracket from blower housing. See figure 11.

3- Remove the screw from the back side of the bracket.

4- Move the tensioner to the appropriate adjustment hole and reinstall screw.

5- Replace bracket.

6- Replace blower belt. See figure 12.

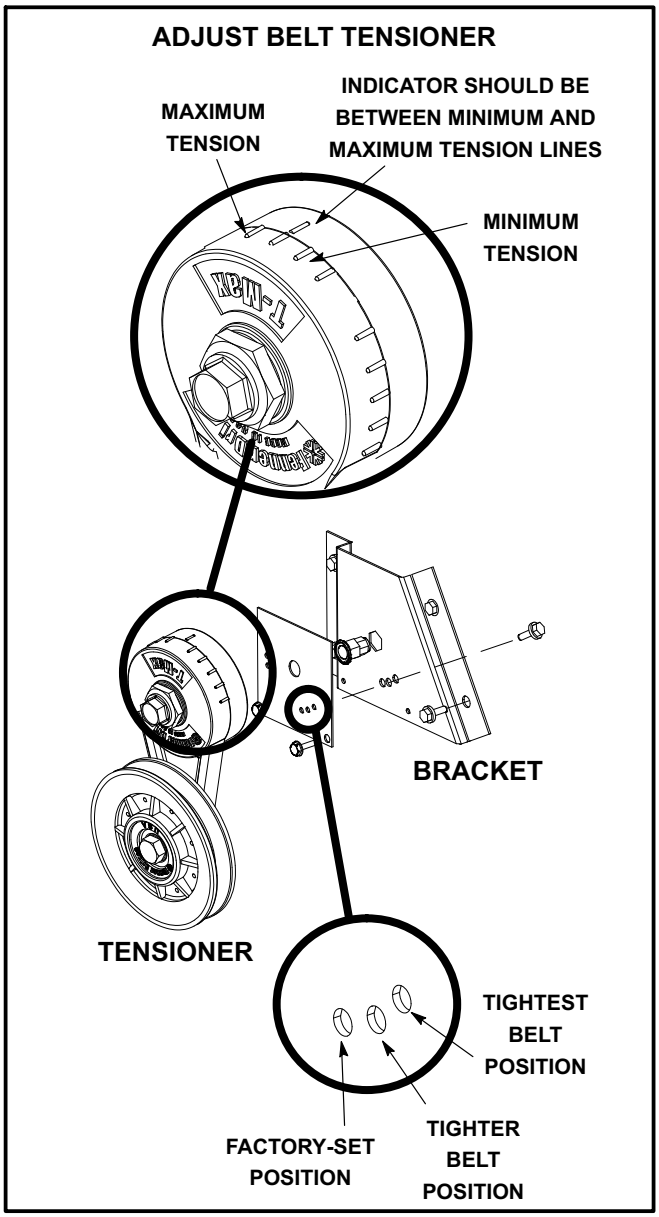


FIGURE 11

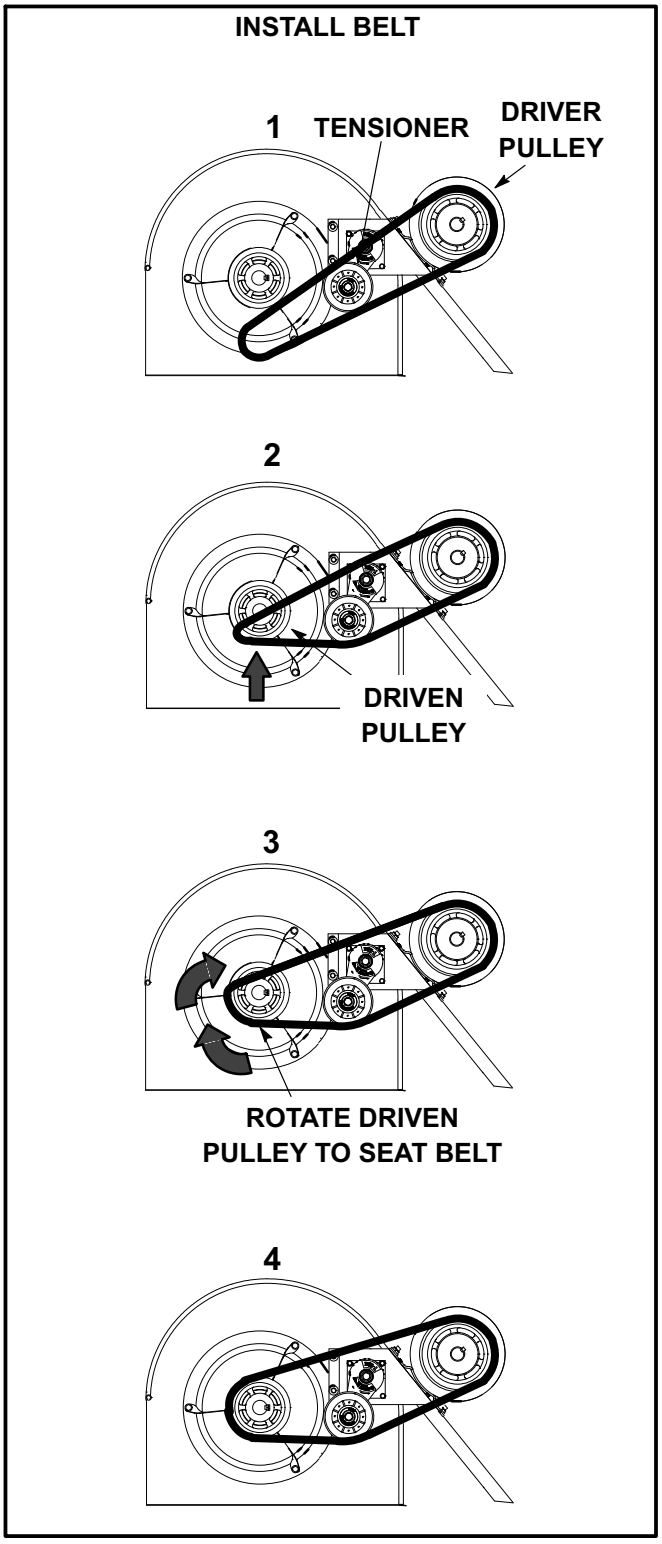


FIGURE 12

G-Check Belt Tension

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

1- Measure span length X. See figure 13.

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.

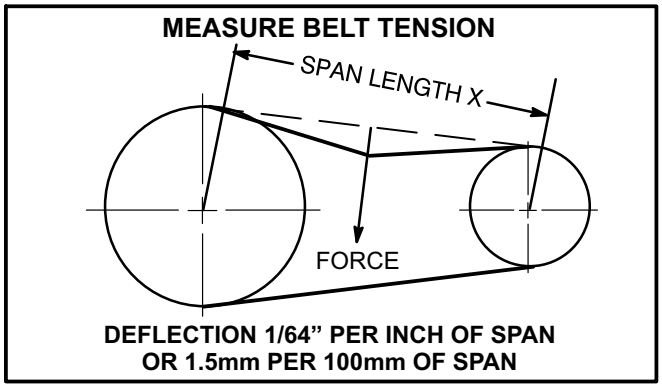


FIGURE 13

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.

H-Field-Furnished Blower Drives

For field-furnished blower drives, use Page 11 through Page 18 to determine BHP and RPM required. Reference figure 5 to determine the drive kit number.

TABLE 5
MANUFACTURER'S DRIVE COMPONENT NUMBERS

Drive No.	DRIVE COMPONENTS					
	Motor Pulley		Blower Pulley		Belt	
	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.	Supplier No.	OEM Part No.
A01	1VP34x7/8	31K6901	AK54 x 1	100244-19	A40	100245-17
A02	1VP34x7/8	31K6901	AK49 x 1	100244-18	A39	100245-16
A03	1VP34x7/8	31K6901	AK44 x 1	100244-16	A39	100245-16
A05	1VP34x7/8	31K6901	AK41 x 1	100244-15	A39	100245-16
A06	1VP44x7/8	P-8-1488	AK51 x 1	18L2201	A41	100245-18
A07	1VP50x7/8	P-8-2187	AK54 x 1	100244-19	AX43	73K8201
AA01	1VP34x7/8	31K6901	AK69 x 1	37L4701	AX51	13H0101
AA02	1VP40x7/8	79J0301	BK80H[1]	100788-03	A53	P-8-4951
AA03	1VP40x7/8	79J0301	AK59 x 1	31K6801	A50	100245-29
AA04	1VP44x7/8	P-8-1488	AK59 x 1	31K6801	AX51	13H0101
A01T[2]	1VP34x7/8	31K6901	AK54 x 1	100244-19	A41	100245-18
A02T[2]	1VP34x7/8	31K6901	AK49 x 1	100244-18	A40	100245-17
A03T[2]	1VP34x7/8	31K6901	AK44 x 1	100244-16	A40	100245-17
A05T[2]	1VP34x7/8	31K6901	AK41 x 1	100244-15	A41	100245-18
A06T[2]	1VP44x7/8	P-8-1488	AK51 x 1	18L2201	A41	100245-18
A07T[2]	1VP50x7/8	P-8-2187	AK54 x 1	100244-19	AX43	73K8201
AA01T[2]	1VP34x7/8	31K6901	AK69 x 1	37L4701	A50	100245-29
AA02T[2]	1VP40x7/8	79J0301	BK80H*	100788-03	A52	100245-30
AA03T[2]	1VP40x7/8	79J0301	AK59 x 1	31K6801	A49	100245-32
AA04T[2]	1VP44x7/8	P-8-1488	AK59 x 1	31K6801	A50	100245-29

NOTES: [1] Requires split taper bushing, Browning no. H1; OEM no. 100073-04 [2] Includes tension assembly, Fenner no. FS0590; OEM no. 101994-02

D-GAS HEAT COMPONENTS

LGH036 units are available in 65,000 BTUH (19 kW) and 105,000 BTUH (30.8 kW) heat sizes. LGH048, 060 and 072 are available in 65,000 BTUH (19 kW), 105,000 BTUH (30.8 kW) and 150,000 BTUH (44 kW) heat sizes.

Two stage heat is available in units with 105,000 BTUH (30.8 kW) and 150,000 BTUH capacities.

See Gas Heat Specifications on Page 7 for more detail.

1-Heat Exchanger Figure 11

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

The gas valves on two stage units accomplish staging by allowing more or less gas to the burners as called for by heating demand.

2-Burner Box Assembly Figure 12

The burner assembly consists of a spark electrode, flame sensing electrode and gas valve. Ignition board A3 controls all functions of the assembly.

Burners

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

Burners can be removed individually for service. Burner maintenance and service is detailed in the SERVICE CHECKS section of this manual.

Orifice

Each burner uses an orifice which is matched to the burner input. The orifice is threaded into the burner manifold. The burner is supported by the orifice and will easily slide off for service once the mounting screws are removed from the burners.

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. .

3-Primary High Temperature Limit S10

S10 is a SPST N.C. high temperature primary limit for gas heat in LGH036/072 units. S10 is located on the vestibule panel. See figure 11.

Primary limit S10 is wired to the A55 Unit Controller. Its N.C. contacts open to de-energize the ignition control when excessive temperature is reached in the blower compartment. If the limit trips three times, the Unit Controller will lock out heating operation and reset in one hour.

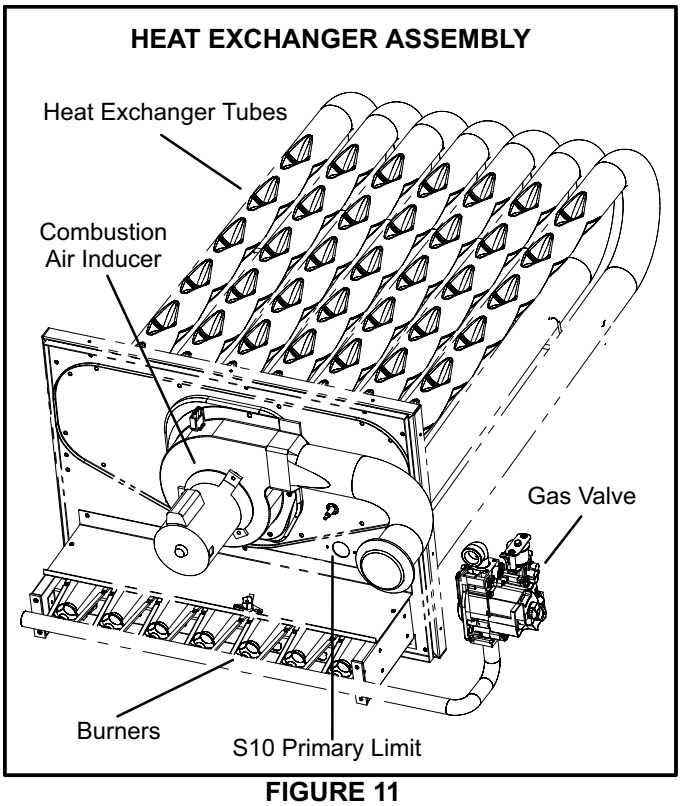


FIGURE 11

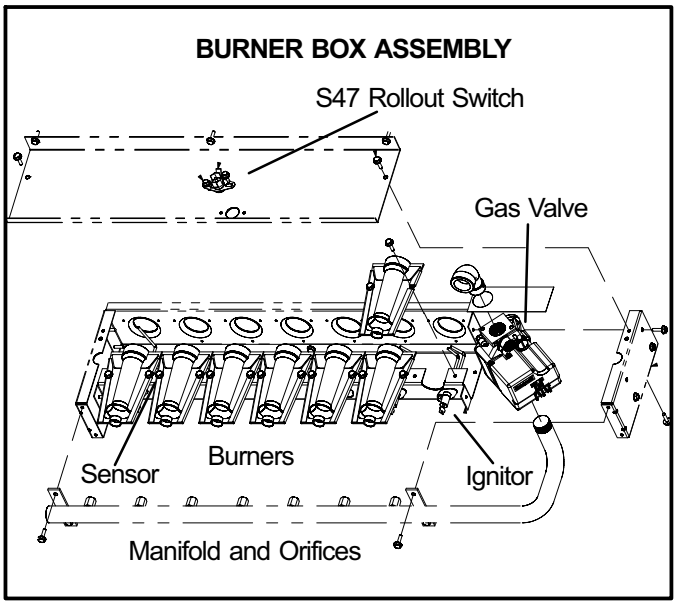


FIGURE 12

4-Flame Rollout Limit Switch S47

Flame rollout limit switch S47 is a SPST N.C. high temperature limit located just above the burner air intake opening in the burner enclosures (see figure 12). S47 is wired to the A55 Unit Controller. When S47 senses flame rollout (indicating a blockage in the combustion air passages), the flame rollout limit trips, and the Unit Controller immediately closes the gas valve.

Limit S47 is factory preset to open at 340°F ± 16°F on a temperature rise on all units. All flame rollout limits are manual reset.

5-Combustion Air Prove Switch S18

Prove switch S18 is a SPST N.O. switch located to the right of the induced draft assembly. S18 monitors combustion air inducer operation. Switch S18 is wired to the ignition control A3. The switch closes at *negative* 0.10"W.C. ± 0.05" (24.8 Pa ± 12.4 Pa) on pressure fall. This negative pressure fall and switch actuation allows the ignition sequence to continue (proves, by closing, that the combustion air inducer is operating before allowing the gas valve to open.) The combustion air prove switch is factory set and not adjustable.

6-Combustion Air Inducer B6

Combustion air inducers provide air to the corresponding burners while clearing the combustion chamber of exhaust gases. The inducer begins operating immediately upon receiving a thermostat demand and is de-energized when thermostat demand is satisfied.

The inducer uses a 208/230V single-phase PSC motor and a 5.24 in. x .96in. blower wheel. All motors operate at 3300RPM and are equipped with auto-reset overload protection. Two-speed units have reduced RPM for low speed. Inducers are supplied by various manufacturers. Ratings may vary by manufacturer. Specific inducer electrical ratings can be found on the unit rating plate.

On a heating demand (W1), the A55 Unit Controller through the ignition control A3 initiates the heating cycle. A3 then allows 30 to 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 sequence to continue. When the combustion air prove switch is closed and the delay is over, the A55 Unit Controller through the ignition control activates the appropriate stage operator of the gas valve, the spark and the flame sensing electrode. Sparking stops immediately after flame is sensed or at the end of the eight second trial for ignition.

On two stage natural gas units the inducer will operate on low speed for first stage heat (W1) and ramp up to high speed for second stage heat (W2).

All combustion air inducer motors are sealed and cannot be oiled. The inducer cannot be adjusted but can be removed from the heat section for cleaning.

7-Combustion Air Motor Capacitor C3

The combustion air inducer motors in all LGH units require run capacitors. Capacitor C3 is connected to combustion air inducer B6. Ratings will be on side of capacitor or combustion air motor nameplate.

8-Gas Valves GV1

Units are equipped with a single or two stage gas valve. Both type valves are manufactured by Honeywell. 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 Unit Controller. A manual shut-off knob/switch is provided on the valve for shut-off. Manual shut-off knob/switch immediately closes both stages without delay. On both valves first stage (low fire) is quick opening (on and off in less than 3 seconds).

The Honeywell valve is adjustable for both low fire and high fire. Figures 15 and 16 show gas valve components. Table 9 shows factory gas valve regulation for LGH series units.

TABLE 9

Operating Manifold Pressure			
Natural		L.P.	
Low	High	Low	High
1.7 ± 0.3" W.C.	3.5 ± 0.3" W.C.	5.1" ± 0.3" W.C	10.5" ± 0.5" W.C.

The gas manifold pressure should be adjusted when the unit is instaled at altitudes higher than 2000 feet . See table 10 for the proper setting.

TABLE 10
HIGH ALTITUDE DERATE

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

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

9-Spark Electrode (Ignitor) Figure 13

An electrode assembly is used for ignition spark. The electrode is mounted through holes under the right most burner location. 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 13) and ignites the right 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 both ends of the wire.

NOTE - If electrode wire must be replaced, wire and suppression must be same type cable

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

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

Spark gap may be checked with appropriately sized twist drills or feeler gauges. Disconnect power to the unit and remove electrode assembly. The gap should be between 0.125" ± 0.015" (3.2 mm ± .4 mm). See figure 13.

⚠IMPORTANT

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

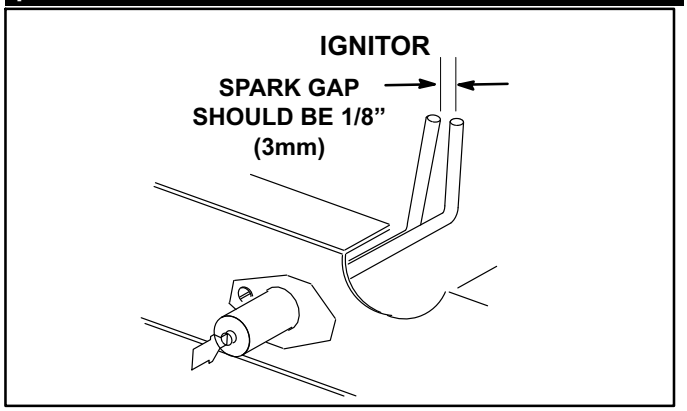


FIGURE 13

10-Flame Sensor Figure 14

A flame sensor is located under the left most side burner. The sensor is mounted through a hole in the burner support and the tip protrudes into the flame envelope of the left 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 or after the eight second trial for ignition. 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.

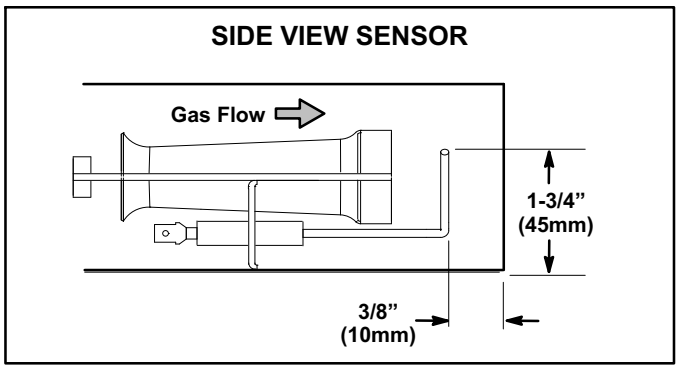


FIGURE 14

II-PLACEMENT AND INSTALLATION

Make sure the unit is installed in accordance with the installation instructions and all applicable codes. See accessories section for conditions requiring use of the optional roof mounting frame (T1CURB-AN or C1CURB-AN).

III-START UP - OPERATION

A-Preliminary and Seasonal Checks

1- Make sure the unit is installed in accordance with the installation instructions and applicable codes.

2- Inspect all electrical wiring, both field and factory installed for loose connections. Tighten as required. Refer to unit diagram located on inside of unit compressor access panel.

3- Check to ensure that refrigerant lines are in good condition and do not rub against the cabinet or other refrigerant lines.

4- Check voltage at the disconnect switch. Voltage must be within the range listed on the nameplate. If not, consult the power company and have the voltage corrected before starting the unit.

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

6- Inspect and adjust blower belt (see section on Blower Compartment - Blower Belt Adjustment).

B-Heating Start up

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠WARNING

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

⚠WARNING

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

⚠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

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.

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.

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

⚠WARNING

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

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

A-Placing Unit In Operation

⚠WARNING

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

Gas Valve Operation (figures 15 and 16)

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.

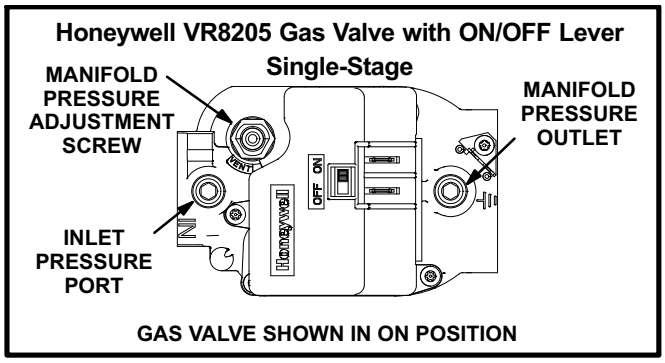


FIGURE 15

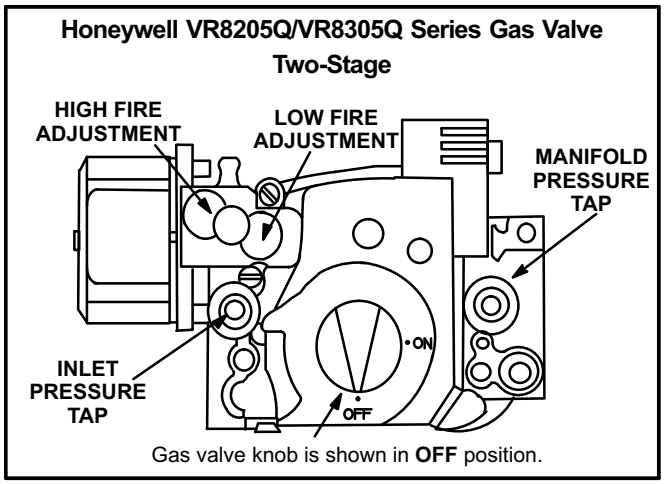


FIGURE 16

5- *Honeywell VR8205 Gas Valve with ON/OFF Lever* - Switch gas valve lever to **OFF**. See figure 15.
Honeywell VR8205 Gas Valve with Knob - Turn knob on gas valve clockwise ↷ to **OFF**. Do not force. See figure 16.

6- *Honeywell VR8205 Gas Valve with ON/OFF Lever* - Switch gas valve lever to **ON**. See figure 15.
Honeywell VR8205 Gas Valve with Knob - Turn knob on gas valve counterclockwise ↶ to **ON**. Do not force. See figure 16.

7- Close or replace the heat section access panel.

8- Turn on all electrical power to appliance.

9- Set thermostat to desired setting.

NOTE - When unit is initially started, steps 1 through 9 may need to be repeated to purge air from gas line.

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

Turning Off Gas to Unit

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

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

3- Open or remove the heat section access panel.

4- *Honeywell VR8205 Gas Valve with ON/OFF Lever* - Switch gas valve lever to **OFF**.
Honeywell VR8205 Gas Valve with Knob - Turn knob on gas valve clockwise to **OFF**. Do not force.

5- Close or replace the heat section access panel.

C-Cooling Start up

Operation

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

2- *No Economizer Installed in Unit* -
A first-stage cooling demand (Y1) will energize first-stage compressor and the condenser fan (low speed on direct drive blowers). An increased cooling demand (Y2) will energize second stage compressor and condenser fan (high speed on units with direct drive blowers).
Units Equipped With Economizer -
When outdoor air is acceptable, a first-stage cooling demand (Y1) will energize the economizer. An increased cooling demand (Y2) will energize first-stage compressor and and the condenser fan (low speed on units with direct drive blowers). When outdoor air is not acceptable unit will operate as though no economizer is installed.

3- Units contain one refrigerant circuit.

4- Unit is charged with R-410A 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.

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 K1 contactor. 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.

D-Safety or Emergency Shutdown

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

IV-CHARGING

WARNING-Do not exceed nameplate charge under any condition.

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

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

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

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

2- Use a thermometer to accurately measure the outdoor ambient temperature.

3- Apply the outdoor temperature to tables 11 through 24 to determine normal operating pressures. Pressures are listed for sea level applications at 80° F dry bulb and 67° F wet bulb return air.

4- Compare the normal operating pressures to the pressures obtained from the gauges. Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system. **Correct any system problems before proceeding.**

5- If discharge pressure is high, remove refrigerant from the system. If discharge pressure is low, add refrigerant to the system.

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

6- Use the following approach method along with the normal operating pressures to confirm readings.

TABLE 11
LGH036S NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	267	138
75° F	305	140
85° F	350	142
95° F	398	146
105° F	451	147
115° F	507	150

TABLE 12
LGH036S REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	261	138
75° F	300	141
85° F	342	144
95° F	387	148
105° F	437	150
115° F	490	153

TABLE 13
LGH036H NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	262	142
75° F	293	145
85° F	345	147
95° F	389	149
105° F	439	152
115° F	493	155

TABLE 14
LGH036H REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	262	139
75° F	299	141
85° F	342	144
95° F	388	147
105° F	437	150
115° F	491	153

TABLE 15
LGH048S NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	259	129
75° F	299	138
85° F	343	146
95° F	390	148
105° F	442	157
115° F	497	160

TABLE 16
LGH048S REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	259	139
75° F	298	143
85° F	340	145
95° F	388	148
105° F	439	151
115° F	495	154

TABLE 17
LGH048H NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	256	122
75° F	299	132
85° F	342	139
95° F	388	145
105° F	437	150
115° F	493	153

TABLE 18
LGH048H REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	261	138
75° F	299	142
85° F	342	144
95° F	389	147
105° F	441	150
115° F	497	153

TABLE 19
LGH060S NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	264	136
75° F	303	138
85° F	346	140
95° F	395	142
105° F	445	145
115° F	500	148

TABLE 20
LGH060S REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	267	135
75° F	307	137
85° F	350	139
95° F	399	142
105° F	451	144
115° F	507	147

TABLE 21
LGH060H NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	253	136
75° F	291	137
85° F	334	139
95° F	380	142
105° F	427	145
115° F	479	148

TABLE 22
LGH060H REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	256	136
75° F	295	138
85° F	337	140
95° F	384	143
105° F	432	146
115° F	488	147

TABLE 23
LGH072H NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	271	136
75° F	312	139
85° F	357	141
95° F	405	144
105° F	458	147
115° F	515	151

TABLE 24
LG072H REHEAT NORMAL OPERATING PRESSURES

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	272	137
75° F	312	139
85° F	356	140
95° F	403	142
105° F	453	145
115° F	507	148

D-Charge Verification - Approach Method - AHRI Testing

1- Using the same thermometer, compare liquid temperature to outdoor ambient temperature.

Approach Temperature = Liquid temperature (at condenser outlet) minus ambient temperature.

2- Approach temperature should match values in table 25. An approach temperature greater than value shown indicates an undercharge. An approach temperature less than value shown indicates an overcharge.

3- The approach method is not valid for grossly over or undercharged systems. Use tables 11 through 24 as a guide for typical operating pressures.

TABLE 25
APPROACH TEMPERATURE

LGH/LCH Unit	Liquid Temp. Minus Ambient Temp.
036S & H Std. **036S & H Reheat** **048H Std.** **060S & H Reheat** **060H Std.** **072H Std.**	6°F ± 1 (3.3°C ± 0.5)
048H Reheat **072H Reheat**	7°F ± 1 (3.9°C ± 0.5)
048S Std. **060S Std.**	8°F ± 1 (4.4°C ± 0.5)
048S Reheat	9°F ± 1 (5.0°C ± 0.5)

V- SYSTEMS SERVICE CHECKS

A-Heating System Service Checks

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

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

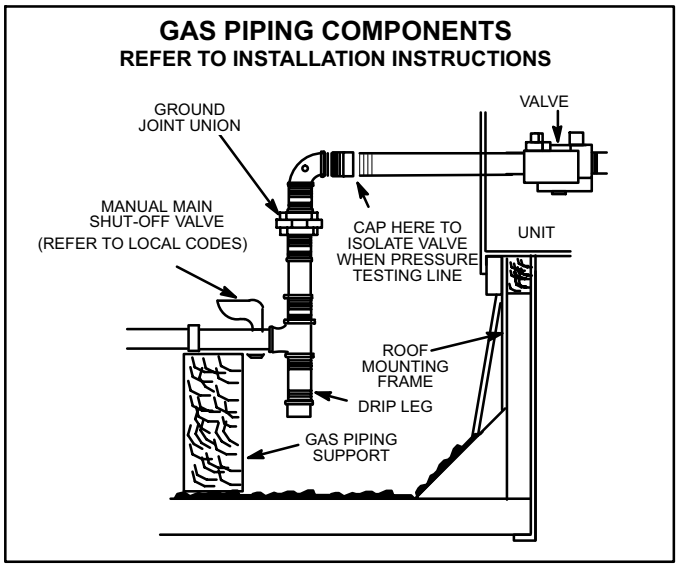


FIGURE 17

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 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 17.

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 located on unit gas valve GV1. 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 "under fire." High pressure can result in permanent damage to the gas valve or "over fire." For natural gas units, operating pressure at the unit gas connection must be between 4.5"W.C. and 10.5"W.C. For L.P. gas units, operating pressure at the unit gas connection must be between 10.5"W.C. and 13.0"W.C.

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 figure 15 or 16 for location of pressure tap on the gas valve.

The manifold pressure is factory set and should not require adjustment. See table 9. If manifold pressure is incorrect and no other source of improper manifold pressure can be found, the valve must be replaced. See figure 15 or 16 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/switch can be used to immediately shut off gas supply.

⚠ CAUTION

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

Manifold Adjustment Procedure

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

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

3- After allowing the unit to stabilize for five minutes, record the manifold pressure and compare to the values given in table 9. On two-stage units, check low fire, make adjustments, and recheck high fire before recording values.

Combustion gases

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

5-Proper Gas Flow

Furnace should operate at least 5 minutes before checking gas flow. Determine time in seconds for two revolutions of gas through the meter. (Two revolutions assures a more accurate time.) Divide by two and compare to time in table 26. Seconds in table 26 are based on a 1 ft.^{3}. dial and gas value of 1000 Btu/ft^3 for natural and 2500 Btu/ft$^{3'}$ for LP. Adjust manifold pressure on gas valve to match time needed.

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

TABLE 26

Unit Input Rate	Seconds for Natural	Seconds for Propane
65,000	55	138
105,000	34	86
150,000	24	60

⚠ IMPORTANT

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

6-Heat Exchanger

To Access or Remove Heat Exchanger From Unit:

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

7-Flame Sensing

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

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

1- Disconnect power to unit.
2- Remove lead from sensing electrode and install a 0-50DC microamp meter in series between the sensing electrode and the sensing lead.
3- Reconnect power and adjust thermostat for heating demand.
4- When flame is established, microamp reading should be 0.5 to 1.0. Do not bend electrodes.
Drop out signal is .09 or less.
5- Disconnect power to unit before disconnecting meter. Make sure sensor wire is securely reconnected before reconnecting power to unit.

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

B-Cooling System Service Checks

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

NOTE-When unit is properly charged discharge line pressures should approximate those in tables 11 through 24.

VI-MAINTENANCE

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

⚠WARNING

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

⚠CAUTION

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

⚠WARNING

Product contains fiberglass wool.
Disturbing the insulation in this product during installation, maintenance, or repair will expose you to fiberglass wool. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)
Fiberglass wool may also cause respiratory, skin, and eye irritation.
To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown on unit nameplate or contact your supervisor.

A-Filters

Units are equipped with temporary filters which must be replaced prior to building occupation. See table 27 for correct filter size. Refer to local codes or appropriate jurisdiction for approved filters.

TABLE 27

Unit	Qty	Filter Size - inches (mm)
036, 048	4	16 X 20 X 2 (406 X 508 X 51)
060, 072	4	20 X 20 X 2 (508 X 508 X 51)

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

B-Lubrication

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

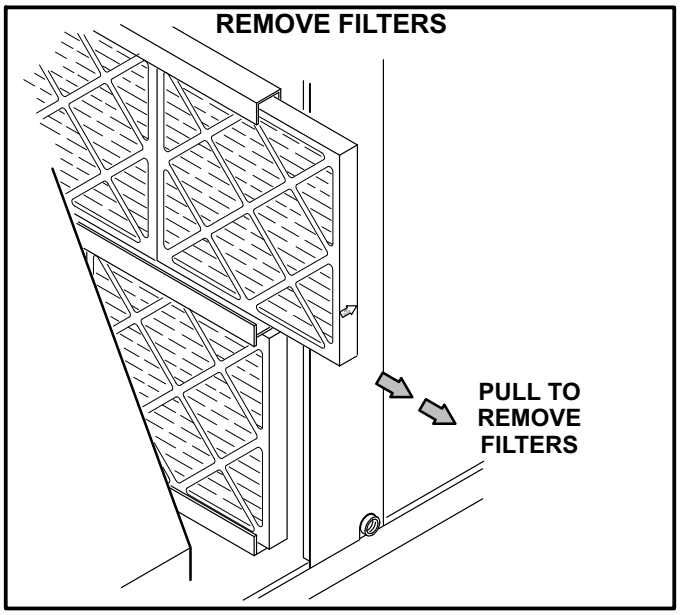


FIGURE 18

C-Burners

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

Clean burners as follows:

1- Turn off both electrical power and gas supply to unit.
2- Remove burner compartment access panel.
3- Remove top burner box panel.
4- Remove two screws securing burners to burner support and lift the burners from the orifices. See figure 12. Clean as necessary.

⚠WARNING

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

D-Combustion Air Inducer

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

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

Clean combustion air inducer as follows:

1- Shut off power supply and gas to unit.
2- Remove the mullion on the right side of the heat section.
3- Disconnect pressure switch air tubing from combustion air inducer port.

4- Remove and retain screws securing combustion air inducer to flue box. Remove vent connector. See figure 11.

5- Clean inducer wheel blades with a small brush and wipe off any dust from housing. Take care not to damage exposed fan blades. Clean accumulated dust from front of flue box cover.

6- Return combustion air inducer motor and vent connector to original location and secure with retained screws. It is recommended that gaskets be replaced during reassembly.

7- Replace mullion.

8- Clean combustion air inlet louvers on heat access panel using a small brush.

E-Flue Passageway and Flue Box

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

F-Evaporator Coil

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

G-Condenser Coil

Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season.

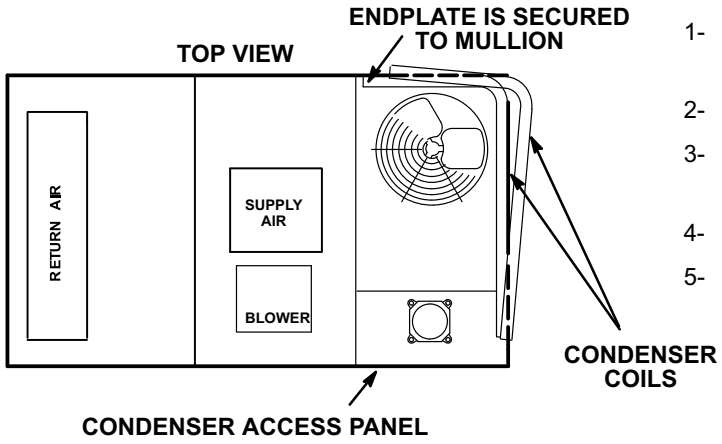
Condenser coils are made of single and two formed slabs. On units with two slabs, dirt and debris may become trapped between the slabs. To clean between slabs, carefully separate coil slabs and wash them thoroughly. See figure 19. Flush coils with water following cleaning.

Note - Remove all screws and gaskets prior to cleaning procedure and replace upon completion.

H-Supply Blower Wheel

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

CLEAN CONDENSER COIL



1- Remove unit top panel and condenser section access panel.

2- Remove screws securing coil end plate to mullion.

3- Remove wire ties connecting coils slabs and separate slabs 3-4” (76-102mm).

4- Clean coils with detergent or commercial coil cleaner.

5- Rinse thoroughly with water and reassemble. Use field-provided wire ties to connect coil slabs.

FIGURE 19

VII-ACCESSORIES

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

A-C1/T1CURB

When installing the LGH units on a combustible surface for downflow discharge applications, the C1/T1CURB 8 inch, 14-inch, 18 inch or 24-inch height roof mounting frame is used. The roof mounting frames are recommended in all other applications but not required. If the LGH units are not mounted on a flat (roof) surface, they MUST be supported under all edges and under the middle of the unit to prevent sagging. The units MUST be mounted level within 1/16” per linear foot or 5mm per meter in any direction.

The assembled mounting frame is shown in figure 20. Refer to the roof mounting frame installation instructions for details of proper assembly and mounting. The roof mounting frame MUST be squared to the roof and level before mounting. Plenum system MUST be installed before the unit is set on the mounting frame. Typical roof curbing and flashing is shown in figure 21. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

B-Transitions

Optional supply/return transitions T1TRAN10AN1 is available for use with the LGH 3, 4 and 5 ton units and the T1TRAN20N-1 is available for the 6 ton units utilizing optional T1CURB roof mounting frames. Transition must be installed in the C1/T1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

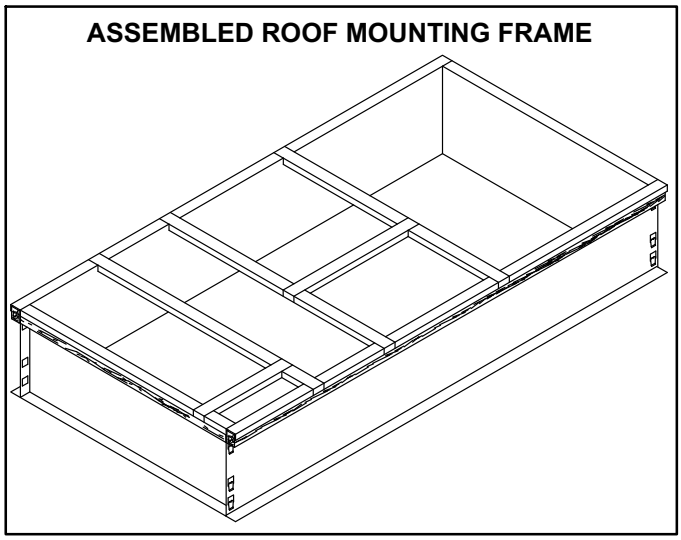


FIGURE 20

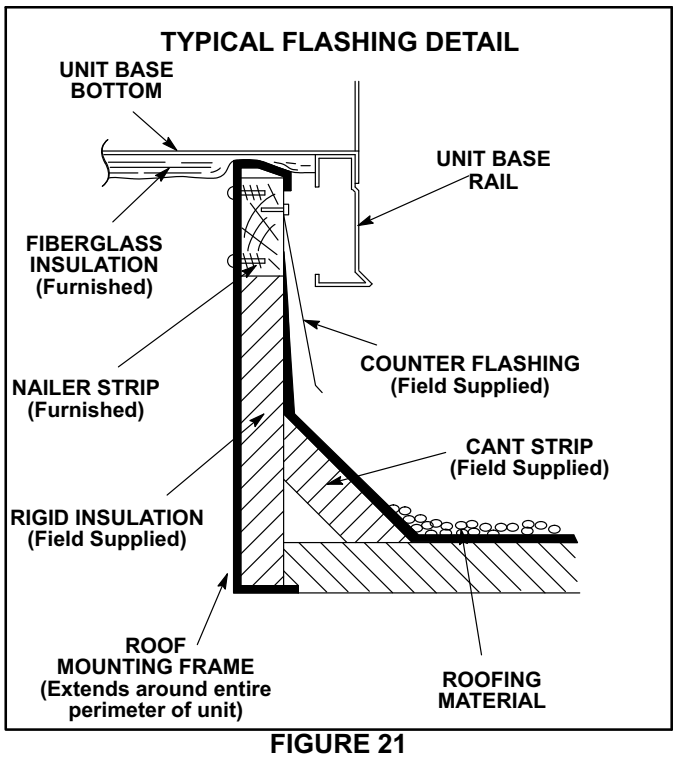


FIGURE 21

C-Outdoor Air Dampers

E1DAMP11A-1 manually operated outdoor air damper and E1DAMP21A-1 motorized outdoor air damper is available for LGH 3 and 4 ton units (see figure 22 or 23). E1DAMP11AT-1 manually operated outdoor air damper and E1DAMP21AT-1 motorized outdoor air damper is available for LGH 5 and 6 ton units. Both sets include the outdoor air hood. The manual damper is set at a fixed point

to bring outside air into the building anytime the blower is operating. The motorized damper opens when the blower is operating and the thermostat is sending an occupied signal to the Unit Controller. If the thermostat signal is unoccupied, the motorized damper will not open. Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to reinstallation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

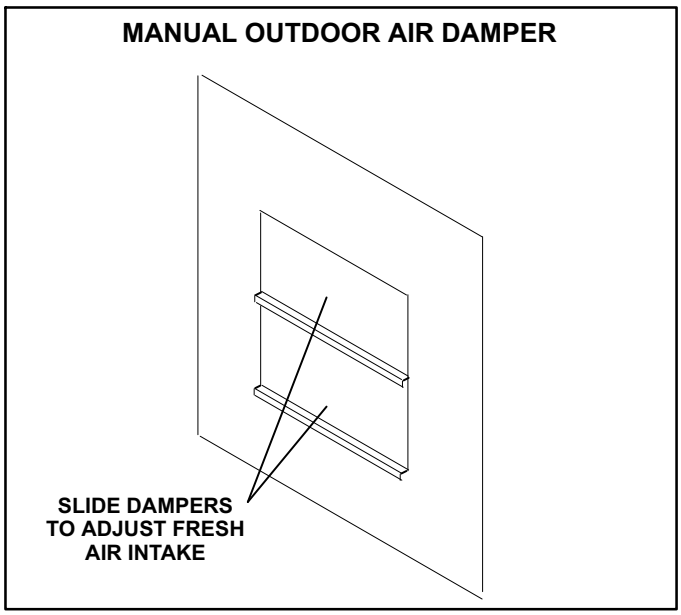


FIGURE 22

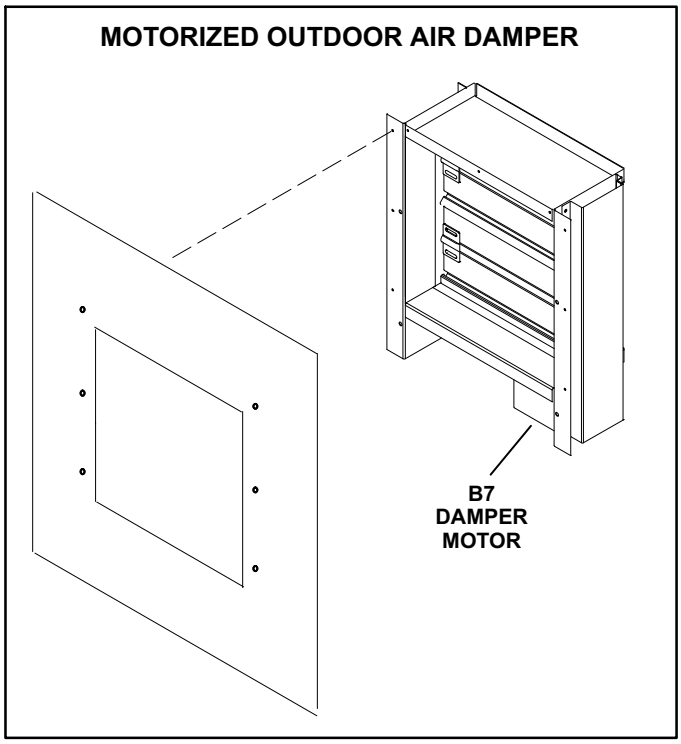


FIGURE 23

D-Supply and Return Diffusers

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

E-Economizer

(Field- or Factory-Installed)

Unit may contain an optional economizer. See figure 24. The economizer uses outdoor air for free cooling when the temperature is suitable.

Outdoor Air Suitability

Sensors or a global input are used to determine outdoor air suitability for free cooling. See table 28. Once outdoor air suitability is enabled, the factory-installed discharge air temperature sensor (RT6) is used to modulate dampers to 55°F (13°C) discharge air. See the Unit Controller guide to adjust this setpoint.

NOTE - Free cooling can also be enabled by a message from an energy management system (EMS). These systems may require additional field-provided sensors; refer to manufacturers instructions.

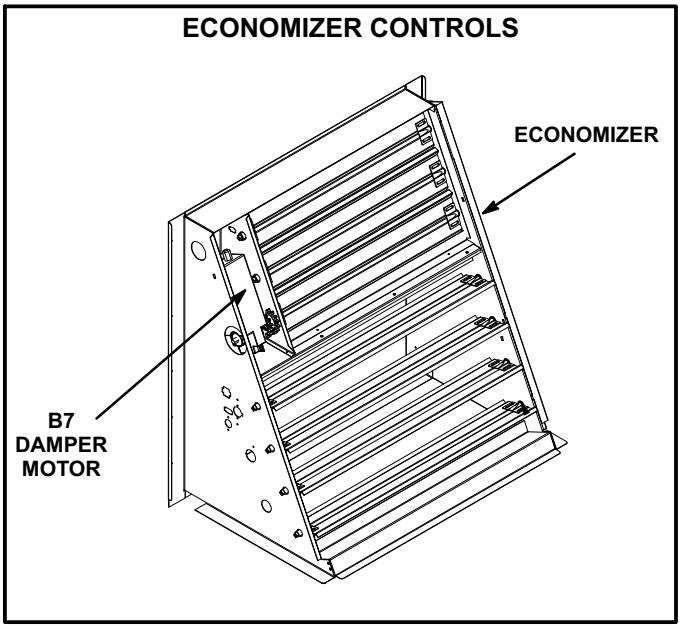


FIGURE 24

Sensors

The appropriate sensors are provided when the economizer is factory-installed. When the economizer is field-installed, the ODE mode requires additional field-provided sensor(s). See table 28. The TEMP mode uses sensors provided with all units.

DIP Switches

Damper mode is selected using the Unit Controller at unit start-up. Refer to the Unit Controller guide provided with each unit. See figure 25 for switch location and figure 26 for DIP switch settings.

TABLE 28

Mode	DIP Switch	Outdoor air is suitable for free cooling when:
TEMP (offset)	TEMP	Outdoor air temperature (RT17) is less than return air temperature (RT16) minus the offset value (0 to 40°F).
TEMP (setpoint)	TEMP	Outdoor air temperature (RT17) is less than the setpoint value (41 to 70°F).
ENTH (differential)	ODE	Outdoor air enthalpy* (A7) is less than return air enthalpy (A62). Enthalpy setpoint potentiometer is set to DIFF
ENTH (setpoint)	ODE	Outdoor air enthalpy (A7) is less than enthalpy setpoint potentiometer position A, B, C, or D.
GLOBAL	GLO	Global input is energized by (P297-9). This setting is also used for outdoor air damper applications. Global input also brings on the blower. (This mode is NOT used when OAS signal is provided via network connection. GLO is only used when a 24VAC signal is used to energize the P297-9 GLO input.)
*Enthalpy includes effects of both temperature and humidity.		

Outdoor Air Suitability LED

A yellow LED which is labeled OAS provides economizer status. A steady yellow LED indicates that outdoor air is suitable for free cooling. A flashing yellow OAS light indicates the IAQ sensor requires outdoor air. (A flashing yellow LED can also mean that the economizer dampers are open to bring in fresh air while a compressor is on.) If the economizer is already operating, a flashing yellow OAS light indicates the IAQ sensor requires more outdoor air than is suitable for free cooling. See figure 25.

Optional Sensor

An optional IAQ sensor (A63) may be used to lower operating costs by controlling outdoor air based on CO_2 level or room occupancy (also called demand control ventilation or DCV). Damper minimum position can be set lower than traditional minimum air requirements; dampers open to traditional ventilation requirements when CO_2 level reaches DCV (IAQ) setpoint.

Refer to instructions provided with sensors for installation.

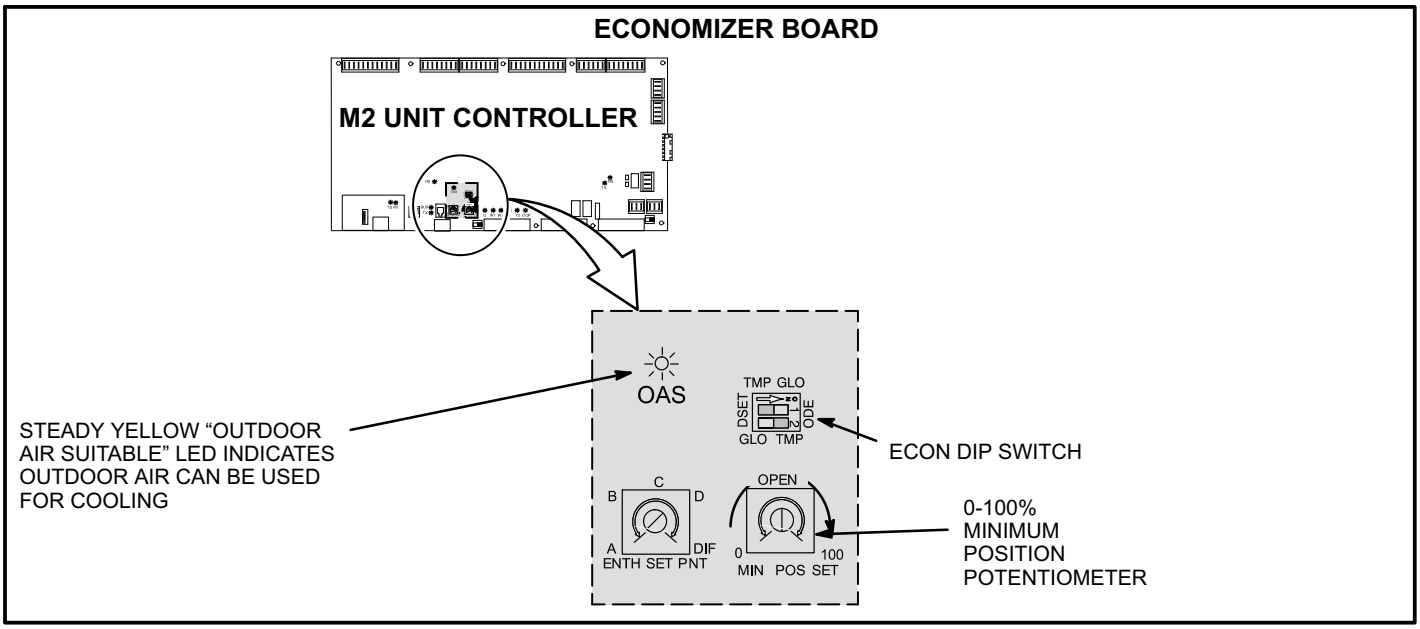
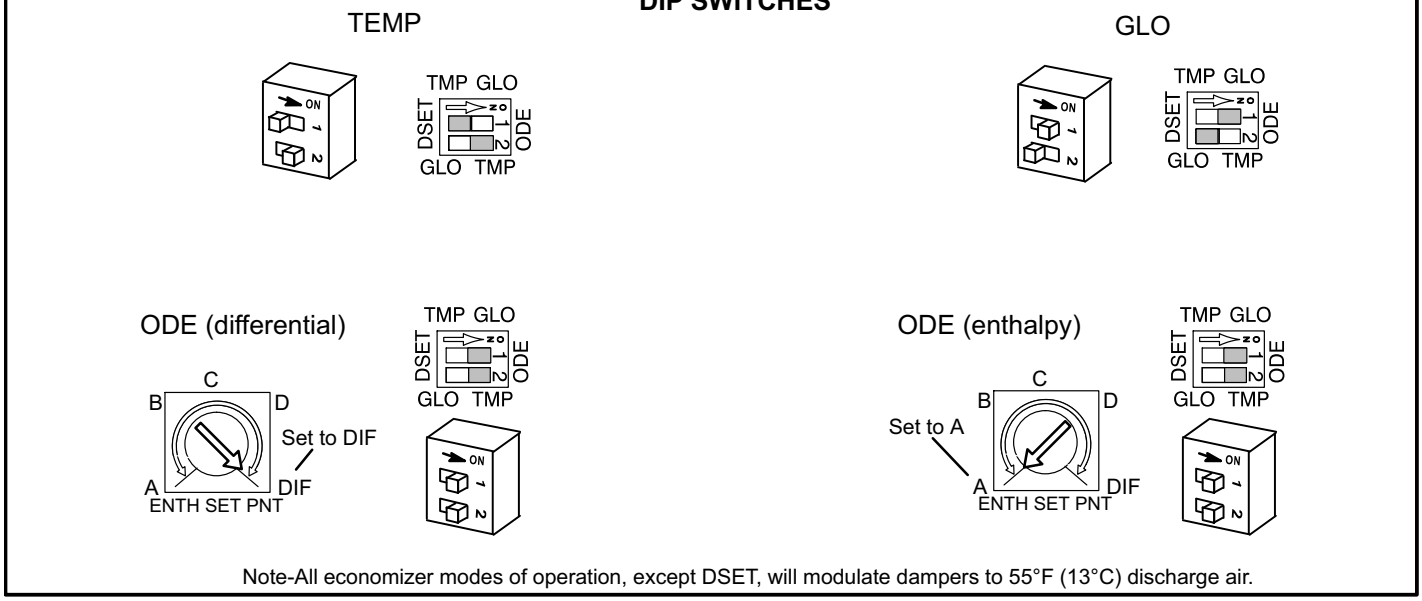


FIGURE 25

DIP SWITCHES



Note-All economizer modes of operation, except DSET, will modulate dampers to 55°F (13°C) discharge air.

FIGURE 26

DIRECT DRIVE AND BELT DRIVE SYSTEM OPERATION (3 THROUGH 5 TONS):

Note: Direct drive units feature ECM condenser fans that are staged to match the compressor's capacity. When the compressor is operating at first stage, the condenser fan is operating at low speed. The condenser fan switches to high speed when the compressor switches to second stage to match operation.

Modulating Outdoor Air Damper:

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

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

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

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

[1]Outdoor Air is Suitable

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

Cooling - Thermostat or Zone Sensor Mode (Up to 3 stages Y1, Y2, Y3)

Y1 demand:

1st-Compressor is off, supply fan is on low speed, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting)

2nd-After 5 minutes (default unit controller setting), supply fan switches to high speed. Economizer continues modulating with supply fan on high speed to maintain 55°F supply air temperature

Y2 demand:

1st-Compressor is off, supply fan is on high speed, and economizer modulates to maintain 55°F supply air temperature

2nd-Economizer opens to maximum. If economizer stays at maximum open for 3 minutes (default unit controller setting) compressor is energized and operates at first stage while supply fan stays on high speed.

[1]Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third party controller and provided to the RTU via a network connection.

Y3 demand:

1st-Economizer is at maximum open and compressor operates at first stage. If economizer stays at maximum open for 3 minutes (default unit controller setting) compressor switches to second stage operation while supply fan stays on high speed

SINGLE STAGE UNIT OPERATION (6 TON):

Modulating Outdoor Air Damper:

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

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

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

[1]Outdoor Air is Suitable

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

Cooling - Thermostat or Zone Sensor (Up to 2 stages Y1, Y2)

Y1 demand:

1st-Compressor is off, supply fan is on, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting)

Y2 demand:

1st-Economizer goes to maximum open position and if the damper stays open for three minutes (default unit controller setting) the compressor is energized.

F-Power Exhaust Relay K65 (power exhaust units)

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

G-Power Exhaust Fans

E1PWRE10A available for LGH 3 and 4 ton units and ET1PWRE10N available for 5 and 6 ton units, provide exhaust air pressure relief. See figure 27 and installation instructions for more detail.

H-Optional UVC Lights

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

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

Germicidal lamps are NOT intended to be used for removal of active mold growth. Existing mold growth must be appropriately removed PRIOR to installation of the germicidal lamp. Refer closely to UVC light installation instruction warnings when servicing units.

I-Optional Cold Weather Kit

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

The kit includes the following parts:

1- The strip heater (HR6) is located as close as possible to the gas valve. The strip heater is rated at 500 Watts

2- A thermostat mounting box is installed on the wall of the compressor compartment. Included in the box are the following thermostat switches:

a - Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -30° F (-35° C) the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (-12° C).

b - Thermostat switch (S60) is an auto-reset SPST N.C. switch which opens on a temperature rise. The switch is wired in series with HR6. When the temperature rises above 20° F (-7° C) the switch opens and the electric heater is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (23.3° C).

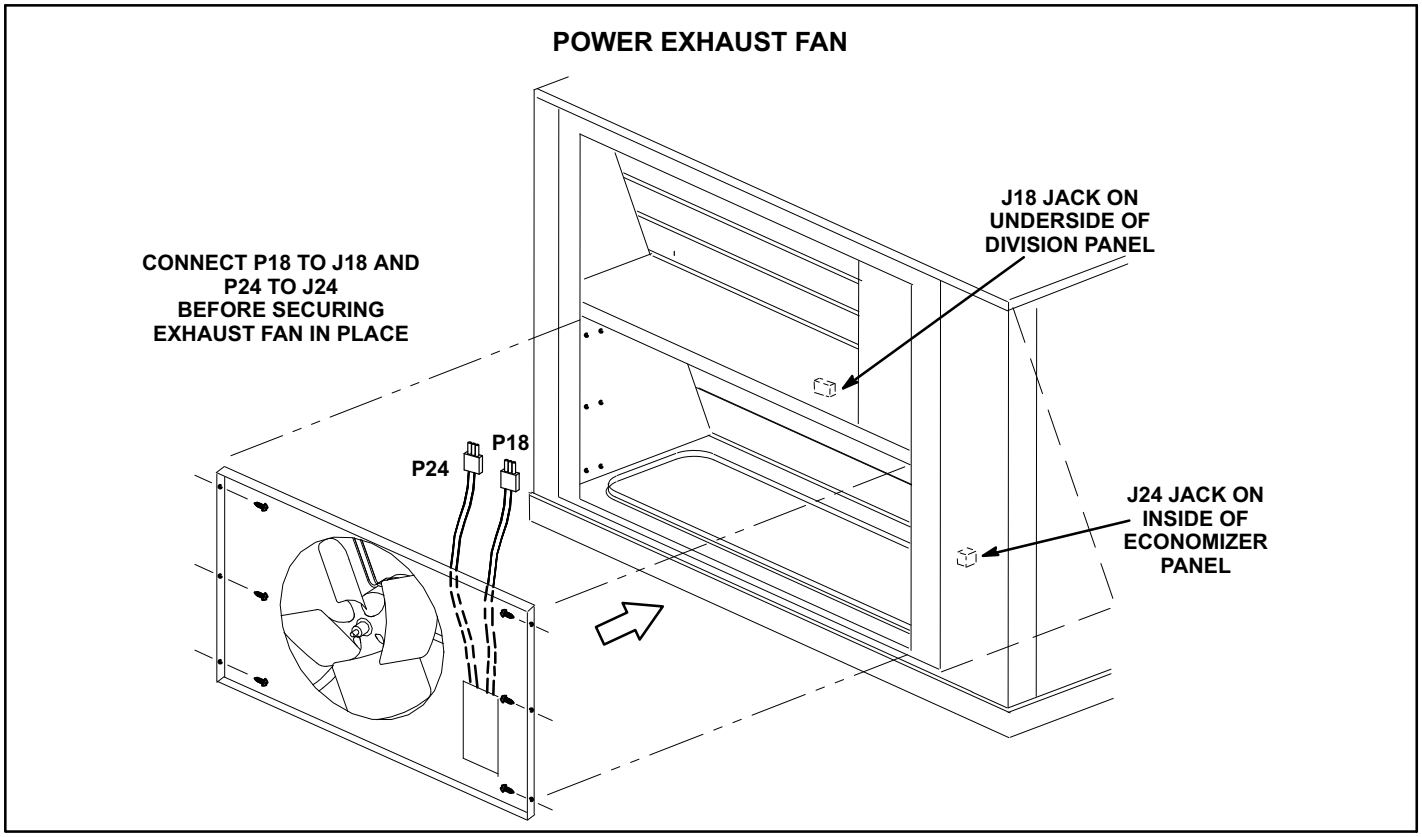


FIGURE 27

c -Thermostat switch (S61) is an auto-reset SPST N.O. switch which closes on a temperature drop. The switch is wired in series with HR6. When temperature drops below 20° F (-7° C) the switch closes and electric heater is energized. The switch automatically opens when heating compartment temperature reaches 70° F (21° C).

J-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.

K-Smoke Detectors A171 and A172

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

L-Dirty Filter Switch S27

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 1" W.C. (248.6 Pa) The switch is mounted in the supply air section on the evaporator coil seal.

M-Indoor Air Quality (CO_2) Sensor A63

The indoor air quality sensor monitors CO_2 levels and reports the levels to the Unit Controller. The Unit Controller 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.

N-LP / Propane Kit

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

O-Drain Pan Overflow Switch S149 (optional)

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

P-SunSource® Commercial Energy System

LGH036-072 packaged units are available with optional factory-installed components which make them SunSource® Solar-Ready. These specially-equipped units can be matched with solar modules and other optional equipment so that they can become part of a SunSource® Commercial Energy System.

Solar energy is first used to meet cooling/heating demands. When the unit is not operating, the system powers lighting, appliances and other electronic devices in the building. Any surplus power is sent back to the utility company for a possible credit (check your local utility company for policies).

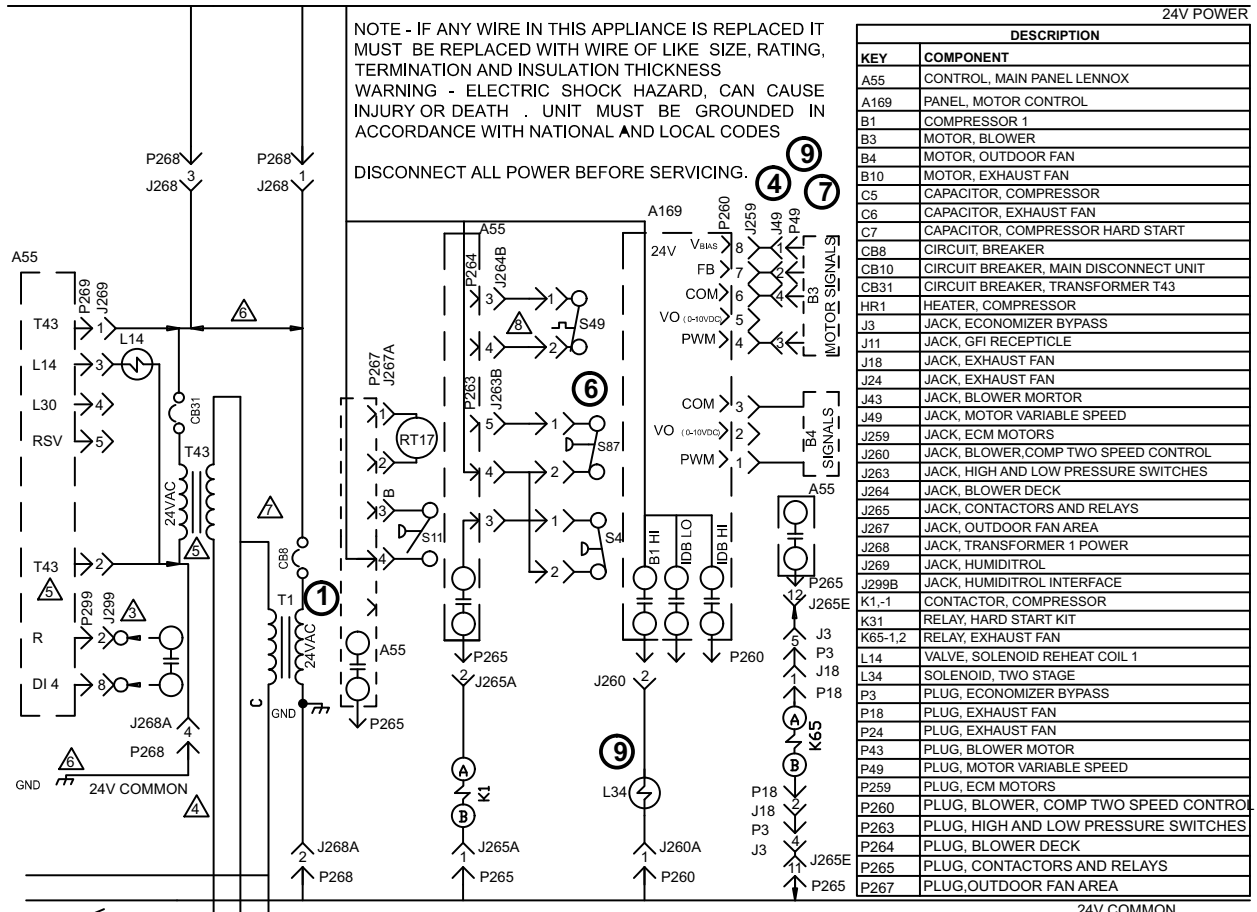
The SunSource® Commercial Energy System consists of the following components:

- Energence® 3-6 ton SunSource® Solar-Ready packaged electric/electric (LCH036-072) HVAC units.
- Solar modules (1 to 21 may be used to vary the amount of electricity generated on three-phase units; 15 modules maximum on single-phase units).
- Envoy Communications Gateway monitors solar power performance.

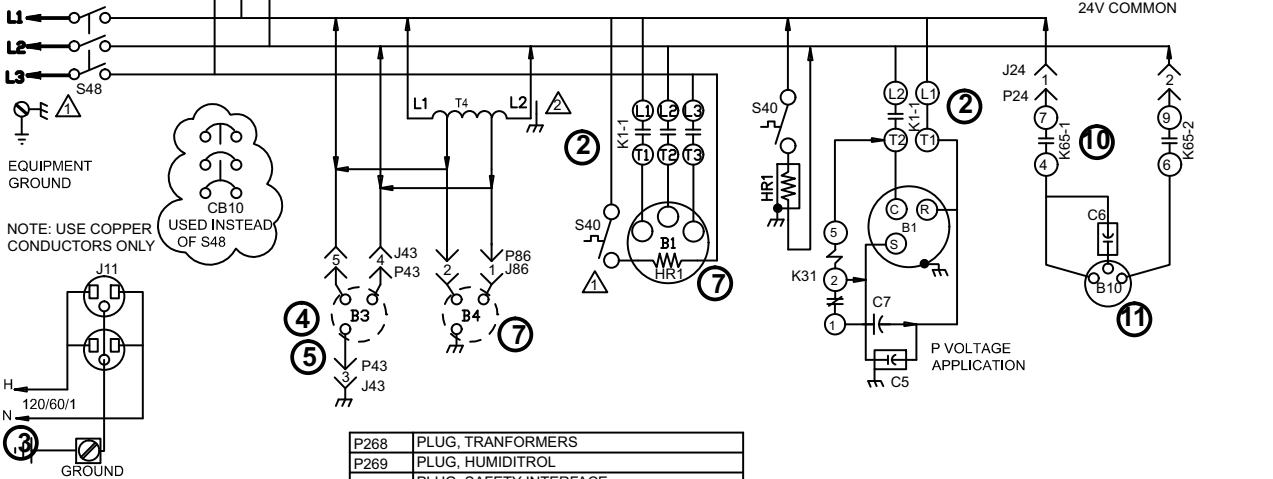
All components must be ordered separately.

Wiring runs from the roof-mounted solar modules to the unit. From there, power travels to the electrical service panel using the existing HVAC unit power wiring.

LGH036/060 DIRECT DRIVE G, J, P, Y VOLTAGE UNIT DIAGRAM



DESCRIPTION	
KEY	COMPONENT
A55	CONTROL, MAIN PANEL LENNOX
A169	PANEL, MOTOR CONTROL
B1	COMPRESSOR 1
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN
B10	MOTOR, EXHAUST FAN
C5	CAPACITOR, COMPRESSOR
C6	CAPACITOR, EXHAUST FAN
C7	CAPACITOR, COMPRESSOR HARD START
CB8	CIRCUIT, BREAKER
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB31	CIRCUIT BREAKER, TRANSFORMER T43
HR1	HEATER, COMPRESSOR
J3	JACK, ECONOMIZER BYPASS
J11	JACK, GFI RECEPTICLE
J18	JACK, EXHAUST FAN
J24	JACK, EXHAUST FAN
J43	JACK, BLOWER MORTOR
J49	JACK, MOTOR VARIABLE SPEED
J259	JACK, ECM MOTORS
J260	JACK, BLOWER,COMP TWO SPEED CONTROL
J263	JACK, HIGH AND LOW PRESSURE SWITCHES
J264	JACK, BLOWER DECK
J265	JACK, CONTACTORS AND RELAYS
J267	JACK, OUTDOOR FAN AREA
J268	JACK, TRANSFORMER 1 POWER
J269	JACK, HUMIDITROL
J299B	JACK, HUMIDITROL INTERFACE
K1,-1	CONTACTOR, COMPRESSOR
K31	RELAY, HARD START KIT
K65-1,2	RELAY, EXHAUST FAN
L14	VALVE, SOLENOID REHEAT COIL 1
L34	SOLENOID, TWO STAGE
P3	PLUG, ECONOMIZER BYPASS
P18	PLUG, EXHAUST FAN
P24	PLUG, EXHAUST FAN
P43	PLUG, BLOWER MOTOR
P49	PLUG, MOTOR VARIABLE SPEED
P259	PLUG, ECM MOTORS
P260	PLUG, BLOWER, COMP TWO SPEED CONTROL
P263	PLUG, HIGH AND LOW PRESSURE SWITCHES
P264	PLUG, BLOWER DECK
P265	PLUG, CONTACTORS AND RELAYS
P267	PLUG,OUTDOOR FAN AREA
P268	PLUG, TRANFORMERS
P269	PLUG, HUMIDITROL
P299	PLUG, SAFETY INTERFACE
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS
S11	SWITCH, LOW PRESS, LOW AMBIENT KIT
S40	THERMOSTAT, CRANKCASE
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZESTAT
S87	SWITCH, LOW PRESS, COMPRESSOR 1
T1	TRANSFORMER, CONTROL
T4	TRANSFORMER, BLOWER MOTOR
T43	TRANSFORMER, REHEAT

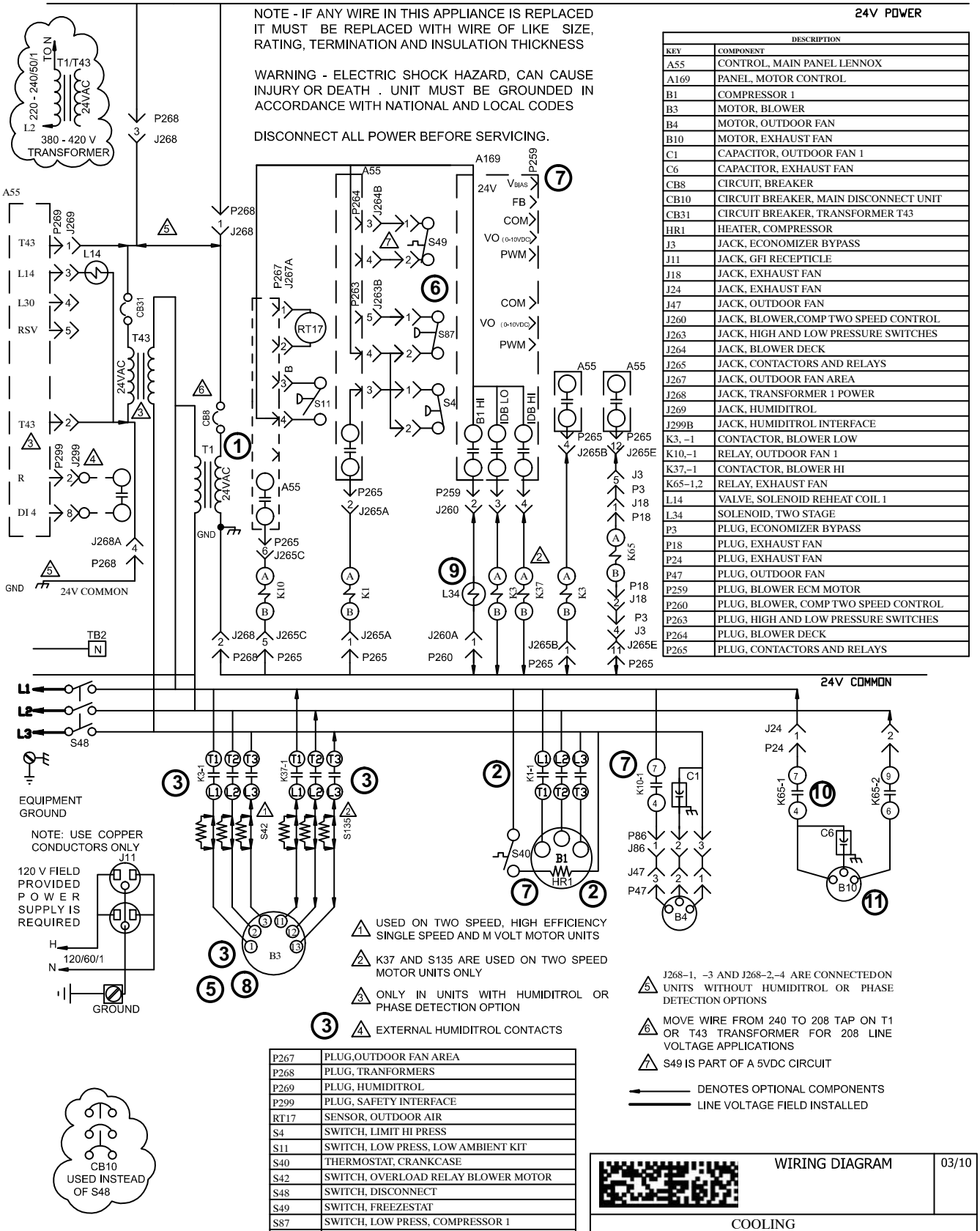


1. USED ON G, J AND Y VOLTAGE APPLICATIONS
2. T4 USED ONLY ON G AND VOLTAGE UNITS
3. EXTERNAL HUMIDITROL CONTACTS
4. CONNECT TO L2 ON SINGLE PHASE UNITS.
5. ONLY IN UNITS WITH HUMIDITROL OR PHASE DETECTION OPTION
6. J268-1, -3 AND J268-2, -4 ARE CONNECTED ON UNITS WITHOUT HUMIDITROL OR PHASE DETECTION OPTIONS
7. MOVE WIRE FROM 240 TO 208 TAP ON T1 OR T43 TRANSFORMER FOR 208 LINE VOLTAGE APPLICTIONS
8. S49 IS PART OF A 5VDC CIRCUIT

DENOTES OPTIONAL COMPONENTS
LINE VOLTAGE FIELD INSTALLED

WIRING DIAGRAM	01/10
COOLING	
LCH,LGH 036H, 048H, 060H - G,J,P,Y	
SECTION B	REV. 4.0
Supersedes	New Form No. 537177-01

LGH036/072 BELT DRIVE G, J, M, Y VOLTAGE UNIT DIAGRAM



DESCRIPTION	
KEY	COMPONENT
A55	CONTROL, MAIN PANEL LENNOX
A169	PANEL, MOTOR CONTROL
B1	COMPRESSOR 1
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN
B10	MOTOR, EXHAUST FAN
C1	CAPACITOR, OUTDOOR FAN 1
C6	CAPACITOR, EXHAUST FAN
CB8	CIRCUIT, BREAKER
CB10	CIRCUIT BREAKER, MAIN DISCONNECT UNIT
CB31	CIRCUIT BREAKER, TRANSFORMER T43
HR1	HEATER, COMPRESSOR
J3	JACK, ECONOMIZER BYPASS
J11	JACK, GFI RECEPTICLE
J18	JACK, EXHAUST FAN
J24	JACK, EXHAUST FAN
J47	JACK, OUTDOOR FAN
J260	JACK, BLOWER,COMP TWO SPEED CONTROL
J263	JACK, HIGH AND LOW PRESSURE SWITCHES
J264	JACK, BLOWER DECK
J265	JACK, CONTACTORS AND RELAYS
J267	JACK, OUTDOOR FAN AREA
J268	JACK, TRANSFORMER 1 POWER
J269	JACK, HUMIDITROL
J299B	JACK, HUMIDITROL INTERFACE
K3, –1	CONTACTOR, BLOWER LOW
K10,–1	RELAY, OUTDOOR FAN 1
K37,–1	CONTACTOR, BLOWER HI
K65–1,2	RELAY, EXHAUST FAN
L14	VALVE, SOLENOID REHEAT COIL 1
L34	SOLENOID, TWO STAGE
P3	PLUG, ECONOMIZER BYPASS
P18	PLUG, EXHAUST FAN
P24	PLUG, EXHAUST FAN
P47	PLUG, OUTDOOR FAN
P259	PLUG, BLOWER ECM MOTOR
P260	PLUG, BLOWER, COMP TWO SPEED CONTROL
P263	PLUG, HIGH AND LOW PRESSURE SWITCHES
P264	PLUG, BLOWER DECK
P265	PLUG, CONTACTORS AND RELAYS

P267	PLUG,OUTDOOR FAN AREA
P268	PLUG, TRANFORMERS
P269	PLUG, HUMIDITROL
P299	PLUG, SAFETY INTERFACE
RT17	SENSOR, OUTDOOR AIR
S4	SWITCH, LIMIT HI PRESS
S11	SWITCH, LOW PRESS, LOW AMBIENT KIT
S40	THERMOSTAT, CRANKCASE
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S48	SWITCH, DISCONNECT
S49	SWITCH, FREEZESTAT
S87	SWITCH, LOW PRESS, COMPRESSOR 1
S135	SWITCH, OVERLOAD BLOWER MOTOR
T1	TRANSFORMER, CONTROL
T43	TRANSFORMER, REHEAT

	WIRING DIAGRAM	03/10
COOLING		
LCH, LGH 036S, 048S, 060S, 072H - G,J,M,Y		
SECTION B		REV. 4.0
Supersedes	New Form No. 537178-01	

LGH036/072 G, J, P, M, & Y Voltage Sequence of Operation

Power:

1. Line voltage from unit disconnect energizes transformer T1. T1 provides 24VAC power to the A55 Unit Controller. A55 provides 24VAC to the unit cooling, heating and blower controls.

2 Line voltage from unit disconnect provides voltage to compressor crankcase heaters HR1 (through discharge line thermostat) and compressor contactor K1.

A-Belt Drive Units - Voltage is distributed to blower motor contactors K3 (single & two speed systems) and K37 (two speed systems) and condenser fan relay K10.

B-Direct Drive Units: Voltage is distributed directly to blower motor B3 and outdoor fan motor B4.

Blower Operation:

The A55 Unit Controller receives a demand from thermostat terminal G. A55 energizes blower motor circuit follows:

3 Belt Drive:

A-Single-Speed Systems (6-ton units): A55 energizes blower contactor K3 with 24VAC. N.O. contacts K3-1 close energizing blower B3.

B-Two-Speed Systems (3-, 4-, and 5-ton units): A55, through motor control board A169, energizes blower low speed contactor K3 with 24VAC. N.O. contacts, K3-1, close energizing blower B3 on low speed (default). A55 can be programmed to direct 24VAC to blower high speed contactor K37 to energize blower B3 on high speed.

4 Direct Drive:

A-A55, through motor control board A169, energizes blower B3 via programmed motor settings. Motor settings are field-adjustable.

First-Stage Cooling

5 A55 Unit Controller receives a Y1 and G cooling demand and energizes blower B3 (low speed on two-speed belt and direct drive blowers).

6 After A55 proves n.c. low pressure switch S87, n.c. freezestat S49, and n.c. high pressure switch S4, compressor contactor K1 is energized.

7 N.O. contacts K1-1 close energizing the compressor B1. On two-speed systems (3, 4, and 5 tons) compressor is energized on low speed.

A-Belt Drive Blowers - S11 n.o contacts close below 62ºF. A55 energizes n.o. contacts K10-1 closed to start condenser fan B4.

B-Direct Drive Blowers - S11 n.o. contact close below 62ºF. A55, through motor control board A169, energizes outdoor fan motor B4 on low speed.

Second-Stage Cooling

8 A55 receives a Y2 and G cooling demand and energizes blower B3 (high speed on two-speed belt and direct drive blowers).

9 On two-speed systems (3, 4, and 5 ton), A55 via motor control board A169, energizes compressor solenoid L34, switching compressor to high speed.

A-Direct Drive Blowers - A55, via motor control board A169, energizes outdoor fan motor B3 on high speed.

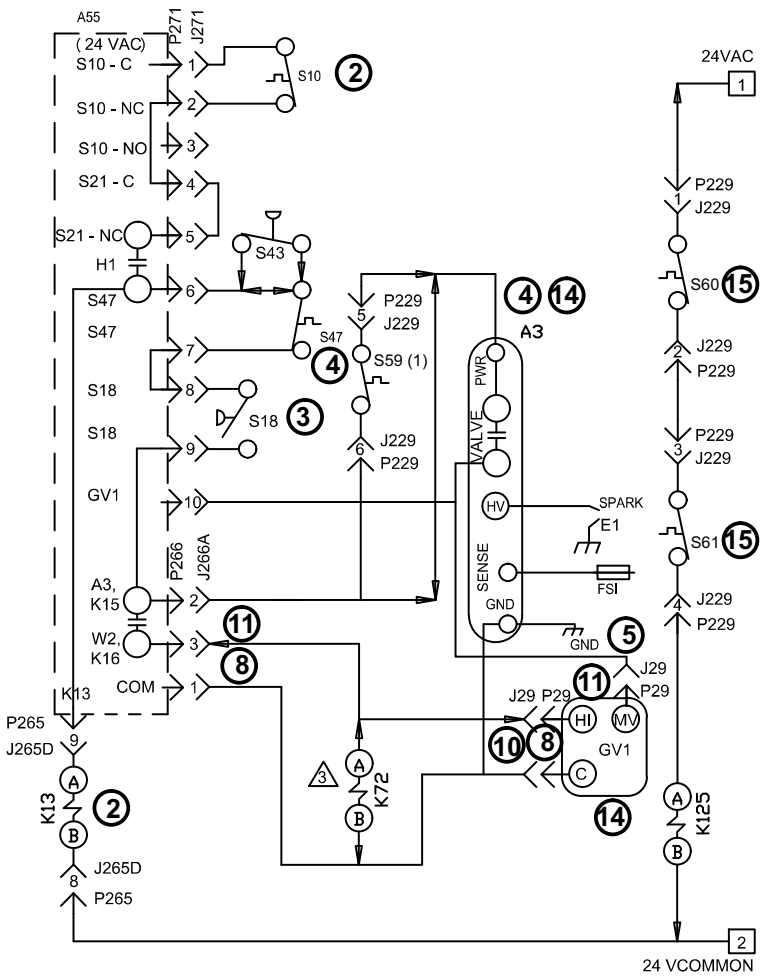
Power Exhaust Fan Operation

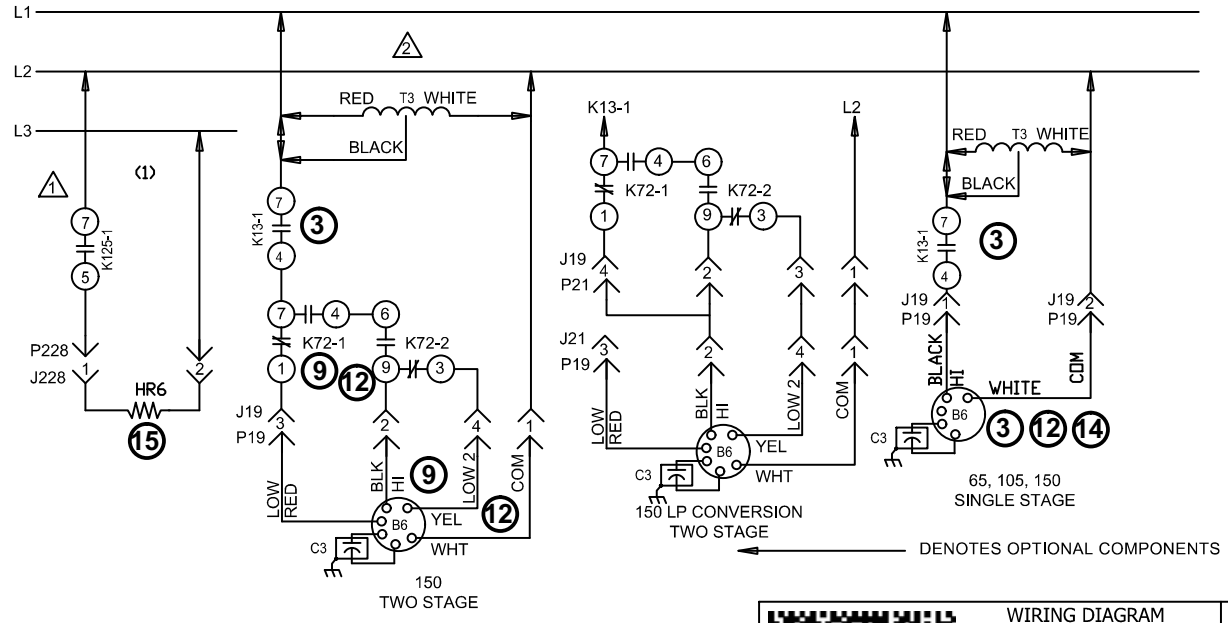
10 A55 receives a position feedback signal from the economizer damper motor and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).

11 N.O. contact K65-1 & 2 close, energizing exhaust fan motor B10.

GAS HEAT FOR LGH036/072 UNITS

DESCRIPTION	
KEY	**DESCRIPTION**
A3	CONTROL, BURNER 1
A55	CONTROL, MAIN BOARD LENNOX
B6	MOTOR, COMBUSTION AIR BLOWER
C3	CAPACITOR, COMB AIR BLOWER 1
E1	SPARK
FS1	SENSOR, FLAME
GV1	VALVE, GAS 1
HR6	HEATER, -50C LOW AMBIENT KIT
J19	JACK, COMBUSTION AIR BLOWER 1
J21	JACK, COMBUSTION AIR BLOWER 2
J29	JACK, VALVE HONEYWELL
J228	JACK, VESTIBULE HEATER
J229	JACK, VESTIBULE HEATER CONTROL 1
J265C	JACK, CONTACTOR RELAY
J266A	JACK, HEATING CONTROL STG 1
J271A,B	JACK, HEATING SENSORS STG 1
K13,-1	RELAY, COMBUSTION AIR BLOWER
K72,-1,2	RELAY, GAS 3
K125,-1	RELAY, HEAT SHUT OFF
P19	PLUG, COMBUSTION AIR BLOWER 1
P21	PLUG, COMBUSTION AIR BLOWER 2
P29	PLUG, VALVE HONEYWELL
P228	PLUG, VESTIBULE HEATER
P229	PLUG, VESTIBULE HEATER CONTROL 1
P265	PLUG, CONTACTOR RELAY
P266	PLUG, HEATING CONTROL
P271	PLUG, HEATING SENSORS STG 1
S10	SWITCH, LIMIT PRIMARY GAS
S18	SWITCH, COMBUSTION AIR PROVE 1
S43	SWITCH, LOW GAS PRESSURE
S47	SWITCH FLAME ROLLOUT BURNER
S59	TSTAT, OPEN -20F, CLOSE 10F
S60	TSTAT, OPEN 20F, CLOSE -10F
S61	TSTAT, OPEN 50F, CLOSE 20F
T3	TRANSFORMER COMB AIR BWR 1





1. CSA (-50C) LOW AMBIENT KIT (OPTIONAL)
2. T3 USED ON 460V AND 575 V UNITS ONLY
3. K72 AND GV1 2STG ARE USED ON TWO STAGE UNITS.

	WIRING DIAGRAM	11/09
HEATING		
GAS HEAT LGH 65 -150		
SECTION A		REV. 2.0
Supersedes	New Form No. 537179-01	

GAS HEAT SEQUENCE OF OPERATION

First Stage Heat:

1. The thermostat initiates W1 heating demand.
2. 24VAC is routed to 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 voltage to energize combustion air inducer B6. After B6 has reached full speed, the combustion air blower proving switch S18 contact close.
4. A55 routes 24VAC through n.c. burner flame rollout switch S47 and the closed contacts of combustion air proving switch S18 to energize the ignition module A3.
5. After a 30 second delay A3 energizes the ignitor and gas valve GV1 on first stage.

Second Stage Heat:

6. With first stage heat operating, an additional heating demand from the thermostat initiates W2.
7. A second stage heating demand is received by A55.
8. A55 energizes HI terminal (high fire) of gas valve.
9. Relay K72-1 terminals 1 and 7 open, 7 and 4 close. K72-2 terminals 6 and 9 close and 9 and 3 open, energizing combustion air inducer B6 on high speed.

End of Second Stage Heat:

10. Heating demand is satisfied. Terminal HI (second stage) is de-energized.
11. Second stage heat is de-energized on GV1 A55.
12. K72 terminals 4 and 7 open and 1 and 7 close. K72 terminals 6 and 9 open, 9 and 3 close. Combustion air inducer B6 is now on low speed.

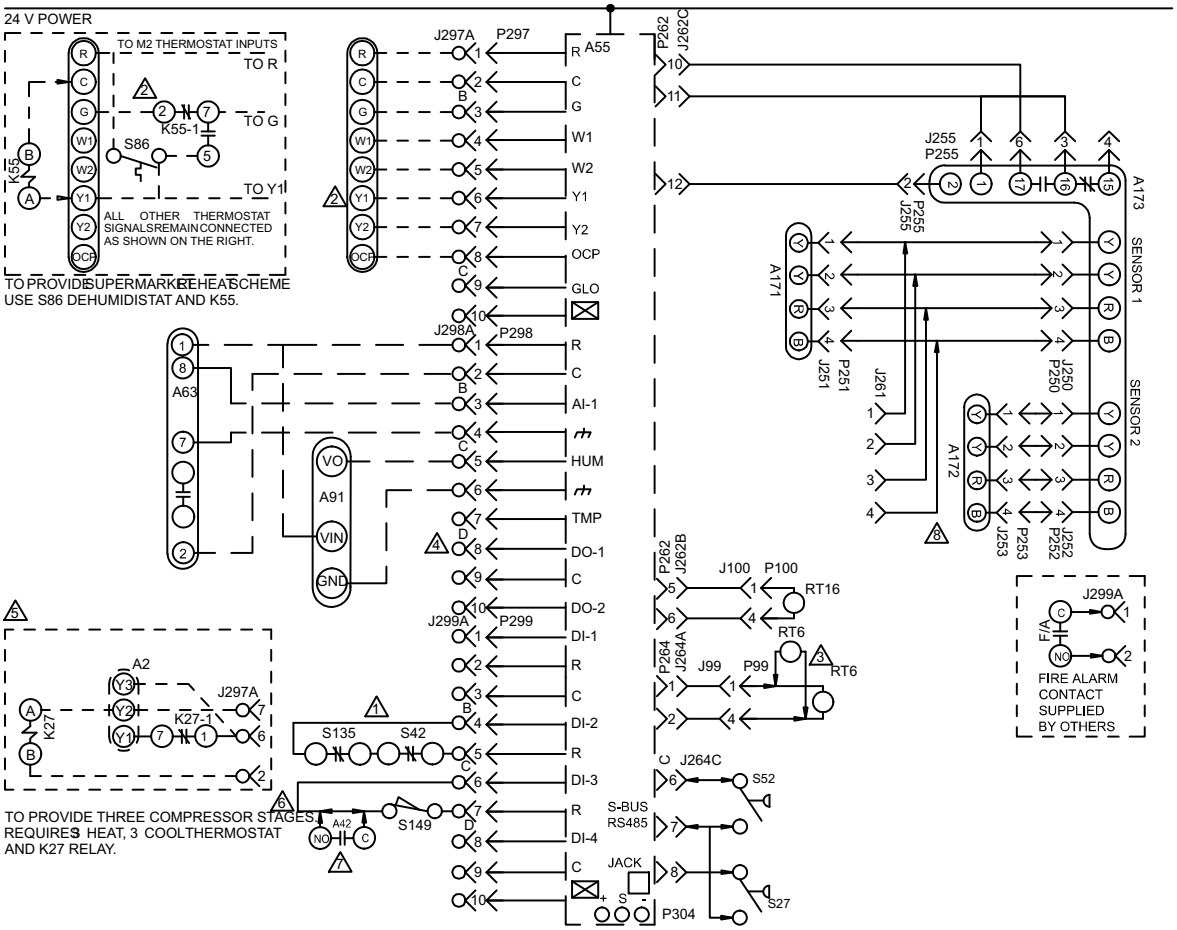
End of First Stage Heat:

13. Heating demand is satisfied. Terminal W1 (first stage) is de-energized.
14. Ignition A3 is de-energized in turn de-energizing gas valve GV1 and combustion air inducer B6.

Optional Low Ambient Kit:
(C.S.A. -50° C Low Ambient Kit)

15. Line voltage is routed through the N.C. low ambient kit thermostats S60 and S61, to energize low ambient kit heater HR6.

ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT



DESCRIPTION	
KEY	COMPONENT
A2	SENSOR, ELECTRONIC THERMOSTAT
A42	MONITOR, PHASE PROTECTOR
A55	PANEL, 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
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
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 L
S86	SWITCH, DEHUMIDISTAT
S135	SWITCH, OVERLOAD RELAY BLOWER MOTOR H
S149	SWITCH, OVERFLOW

1. FOR MOTORS WITH S42 AND S135 EXTERNAL OVERLOAD LES INVERTER, SEE INVERTER WITH BY PASS FOR S42 HOOK UP
2. USE S86 DEHUMIDISTAT AND K55 FOR OPTIONAL SUPERMARKET REHEAT SCHEME, M2 PARAMETERS NEED TO MODIFIED UNDER THE SETTINGS MENU OR VIA UCS 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 M2 BOARD (A55).
6. M2 SETTINGS MUST BE MODIFIED WHEN A42, S42, S52, S135 OR S149 ARE INSTALLED
7. A42 USED ON 036 THROUGH 72 UNITS ONLY
8. CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

	WIRING DIAGRAM	11/09
ACCESSORIES		
ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT FOR ENERGENCE™		
SECTION C		REV. 3.0
Supersedes	New Form No. 537108-01	

POWER:

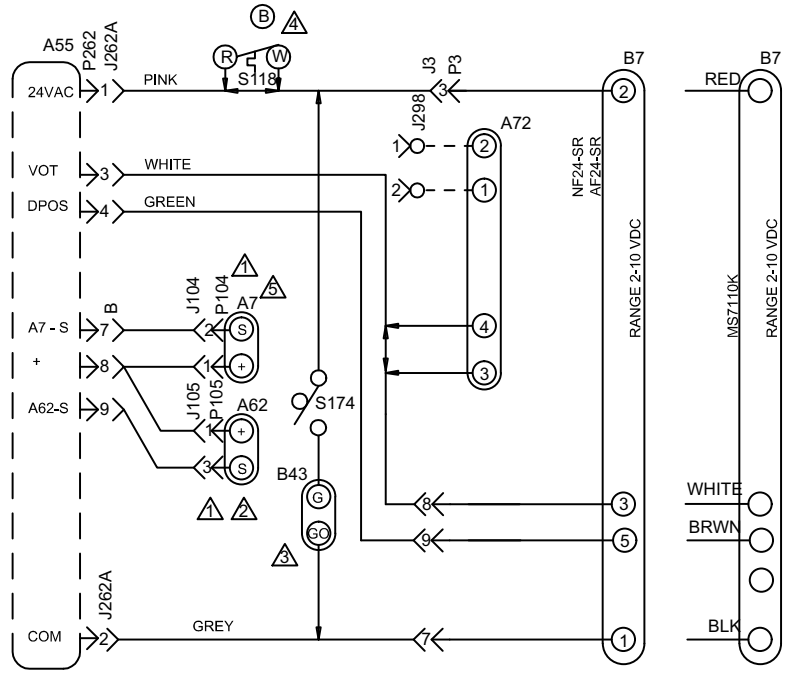
1. A55 Unit Controller, located in the main control box, supplies thermostat components with 24VAC.

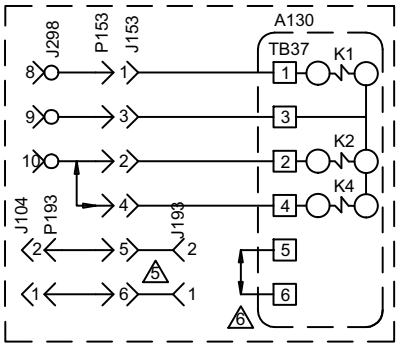
OPERATION:

2. A55 receives data from the electronic thermostat A2 (Y1, Y2, W1, W2, G) and energizes the appropriate components for heat or cool demand.

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

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

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

DESIGNATES OPTIONAL WIRING
CLASS II FIELD WIRING

WIRING DIAGRAM	09/09
ACCESSORIES	
ENERGENCE™ SERIES ECONOMIZER AND MOTORIZED OAD PIVOTING WHEEL ENERGY RECOVERY SYSTEM OPTION	
SECTION D	
Supersedes	New Form No. 537189-01

SEQUENCE OF OPERATION

POWER:

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

OPERATION:

2. Sensor(s), a global input, or a communication signal communicates to A55 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.