

### KGA/KGB024 through 090

The KGA/KGB packaged gas units are available in standard cooling efficiency (024, 030, 036, 048 060, 072, 074 and 090). Cooling capacities range from 2 to 7-1/2 tons (7 to 26kW).

KGA/KGB024, 030, 036, 048, 060, 072, 074 units are available in 65,000 BTUH heat capacity. KGA/KGB036, 048, 060, 072, 074 and 090 units are available in 108,000 BTUH (105,000 BTUH in earlier built units ) heat capacity. KGA/KGB048, 060, 072, 074 and 090 units are available in 150,000 BTUH (44 kW) heat sizes. Two stage heat is available in units with 108,000 (105,000 in earlier built units) and 150,000 BTUH capacities. Gas heat sections are designed with aluminized steel tube heat exchangers.

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

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



### ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures

#### ⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions 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.

#### ⚠ 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.

#### ⚠ 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

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

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**OPTIONS / ACCESSORIES - KGA/KGB**

Item	Model No.	Catalog No.	Unit Model No.							
			KGB		KGA		KGA		KGA	
			024	030	036	048	060	072	074	090
<b>COOLING SYSTEM</b>										
Condensate Drain Trap	PVC - C1TRAP20AD2	<b>76W26</b>	X	X	X	X	X	X	X	X
	Copper - C1TRAP10AD2	<b>76W27</b>	X	X	X	X	X	X	X	X
Corrosion Protection			O	O	O	O	O	O	O	O
Drain Pan Overflow Switch	K1SNSR71AB1-	<b>74W42</b>	X	X	X	X	X	X	X	X
Low Ambient Kit	K1SNSR33AN2	<b>14D89</b>	X	X	X	X	X	X	X	X
Efficiency		High								O
		Standard	O	O	O	O	O	O	O	O
Refrigerant Type		R-410A	O	O	O	O	O	O	O	O
<b>HEATING SYSTEM</b>										
Bottom Gas Piping Kit	T1GPKT01AN1	<b>19W50</b>	X	X	X	X	X	X	X	X
Low Temperature Vestibule Heater	208/230V-1 or 3 ph - T1CWKT01AN1Y	<b>19W53</b>	X	X	X	X	X	X	X	X
	460V-3ph - T1CWKT01AN1G	<b>19W54</b>			X	X	X	X	X	X
	575V-3ph - T1CWKT01AN1J	<b>19W62</b>			X	X	X	X	X	X
Combustion Air Intake Extensions	T1EXTN10AN1	<b>19W51</b>	X	X	X	X	X	X	X	X
Gas Heat Input	Standard One-Stage - 65 kBtuh input	Factory	O	O	O	O	O	O	O	O
	Medium One-Stage - 108 kBtuh input	Factory			O	O	O	O	O	O
	Medium Two Stage - 81/108 kBtuh input	Factory			O	O	O	O	O	O
	High One-Stage - 150 kBtuh input	Factory				O	O	O	O	O
	High Two-Stage - 113/150 kBtuh input	Factory				O	O	O	O	O
LPG/Propane Conversion Kits	For one-stage models - C1PROP10AP2	<b>14N20</b>	X	X	X	X	X	X	X	X
	For two-stage models - C1PROP20AP2	<b>14N21</b>			X	X	X	X	X	X
Stainless Steel Heat Exchanger			O	O	O	O	O	O	O	O
Vertical Vent Extension	C1EXTN20FF1	<b>31W62</b>	X	X	X	X	X	X	X	X
<b>BLOWER - SUPPLY AIR</b>										
Motors	Direct Drive - 0.25 hp (208/230V-1ph)	Factory	O	O						
	Direct Drive - 0.5 hp (208/230V-1ph, 208/230V-3ph, 460V-3ph, 575V-3ph)	Factory			O	O				
	Direct Drive - 0.75 hp (208/230V-1ph, 208/230V-3ph, 460V-3ph, 575V-3ph)	Factory					O		O	
	Belt Drive - 0.75 hp (208/230V-1ph) Standard Efficiency	Factory			<sup>1</sup> O	<sup>1</sup> O	<sup>1</sup> O			
	Belt Drive - 1.5 hp (208/230V-1ph) Standard Efficiency	Factory			<sup>1</sup> O	<sup>1</sup> O	<sup>1</sup> O			
	Belt Drive - 1 hp (208/230V, 460V, 575V-3ph) Standard Efficiency	Factory			O	O	O	<sup>2</sup> O	<sup>2</sup> O	O
	Belt Drive - 2 hp (208/230V, 460V, 575V-3ph) Standard Efficiency	Factory			O	O	O	<sup>2</sup> O	<sup>2</sup> O	O
	Belt Drive - 3 hp (208/230V, 460V, 575V-3ph) Standard Efficiency	Factory								O
	Belt Drive - 1 hp (208/230V, 460V, 575V-3ph) ( 2 Speed)	Factory						<sup>3</sup> O	<sup>3</sup> O	
	Belt Drive - 2 hp (208/230V, 460V, 575V-3ph) (2 Speed)	Factory						<sup>3</sup> O	<sup>3</sup> 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 A04 - T1DRKT004-1 - 968-1340 rpm	Factory						<sup>2</sup> O	<sup>2</sup> 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 A08 - T1DRKT008-1 - 1193-1591 rpm	Factory						<sup>2</sup> O	<sup>2</sup> O	
	Kit AA01 - T1DRKT001AP1 - 522-784 rpm	Factory						<sup>3</sup> O	<sup>3</sup> O	O
	Kit AA02 - T1DRKT002AP1 - 632-875 rpm	Factory						<sup>3</sup> O	<sup>3</sup> O	O
	Kit AA03 - T1DRKT003AP1 - 798-1105 rpm	Factory						<sup>3</sup> O	<sup>3</sup> O	O
	Kit AA04 - T1DRKT004AP1 - 921-1228 rpm	Factory								O

<sup>1</sup> 1 phase belt drive blower motors are available for KCB models only.

<sup>2</sup> 072S and 074S Single Speed Belt Drive models only.

<sup>3</sup> 072H and 074H Two-Speed Belt Drive models only.

NOTE - The catalog and model numbers that appear here are for ordering field installed accessories only.

Ox - Field Installed or Configure to Order (factory installed)

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## OPTIONS / ACCESSORIES - KGA/KGB

Item	Model No.	Catalog No.	Unit Model No.							
			KGB 024	KGB 030	KGA KGB 036	KGA KGB 048	KGA KGB 060	KGA KGB 072	KGA KGB 074	KGA 090
<b>CABINET</b>										
Hinged Access Panels			O	O	O	O	O	O	O	O
<b>CONTROLS</b>										
Commercial Controls	L Connection® Building Automation System	---	X	X	X	X	X	X	X	X
BACnet® Thermostat with Display	K0SNSR01FF1	97W23	X	X	X	X	X	X	X	X
BACnet® Thermostat without Display	K0SNSR00FF1	97W24	X	X	X	X	X	X	X	X
Plenum Cable (75 ft.)	K0MISC00FF1	97W25	X	X	X	X	X	X	X	X
Smoke Detector - Supply or Return (Power board and one sensor)	C1SNSR44AP1	53W78	X	X	X	X	X	X	X	X
Smoke Detector - Supply and Return (Power board and two sensors)	C1SNSR43AP1	53W79	X	X	X	X	X	X	X	X
<b>ECONOMIZER</b>										
<b>Standard Economizer With Outdoor Air Hood (Sensible Control) (Not for Title 24)</b>										
Standard Economizer - Includes Barometric Relief Dampers and Exhaust Hood	K1ECON30A-3-	14D90	OX	OX	OX	OX	OX	OX	OX	OX
Standard Economizer - No Exhaust	Factory		O	O	O	O	O	O	O	O
<b>Standard Economizer Controls (Not for Title 24)</b>										
Single Enthalpy Control	C1SNSR64FF1	53W64	OX	OX	OX	OX	OX	OX	OX	OX
Differential Enthalpy Control (order 2)	C1SNSR64FF1	53W64	X	X	X	X	X	X	X	X
<b>High Performance Economizer With Outdoor Air Hood (Sensible Control) (Approved for California Title 24 Building Standards)</b>										
High Performance Economizer - Includes Barometric Relief Dampers and Exhaust Hood	K1ECON32A-2	14D91	OX	OX	OX	OX	OX	OX	OX	OX
<b>High Performance Economizer Controls (Not for Title 24)</b>										
Single Enthalpy Control	C1SNSR60FF1	10Z75	OX	OX	OX	OX	OX	OX	OX	OX
Differential Enthalpy Control (order 2)	C1SNSR60FF1	10Z75	X	X	X	X	X	X	X	X
<b>Economizer Accessories</b>										
Horizontal Economizer Conversion Kit	T1HECK00AN1	17W45	X	X	X	X	X	X	X	X
<b>OUTDOOR AIR</b>										
<b>Outdoor Air Dampers With Outdoor Air Hood</b>										
Motorized	K1DAMP21A-1	79W95	OX	OX	OX	OX	OX	OX	OX	OX
Manual	C1DAMP11A-1	53W34	OX	OX	OX	OX	OX	OX	OX	OX
<b>POWER EXHAUST FAN</b>										
Standard Static <i>NOTE - Order Barometric Relief Dampers with Exhaust Hood below if unit is ordered with factory installed Standard Economizer with "No Exhaust" option</i>	208/230V-1 or 3ph - C1PWRE10A-1P	79W87			X	X	X	X	X	X
	460V-3ph - C1PWRE10A-1G	79W88			X	X	X	X	X	X
	575V-3ph - C1PWRE10A-1J	79W89			X	X	X	X	X	X
<b><sup>1</sup> BAROMETRIC RELIEF</b>										
Barometric Relief Dampers with Exhaust Hood	C1DAMP50A-1-	74W38	X	X	X	X	X	X	X	X

<sup>1</sup> Required when Economizer is factory installed (no exhaust option) with field installed Power Exhaust Fan option.

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## OPTIONS / ACCESSORIES - KGA/KGB

Item	Model No.	Catalog No.	Unit Model No.						
			KGB	KGB	KGA	KGA	KGA	KGA	KGA
			024	030	036	048	060	072	074
<b>ELECTRICAL</b>									
Voltage 60 hz	208/230V - 1 phase		O	O	<sup>1</sup> O	<sup>1</sup> O	<sup>1</sup> O		
	208/230V - 3 phase				O	O	O	O	O
	460V - 3 phase				O	O	O	O	O
	575V - 3 phase				O	O	O	O	O
Disconnect	See Electrical Data Tables for selection		OX	OX	OX	OX	OX	OX	OX
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V only)	<b>74M70</b>	OX	OX	OX	OX	OX	OX	OX
	20 amp non-powered, field-wired (575V only)	C1GFCI20FF1 <b>67E01</b>	X	X	X	X	X	X	X
Weatherproof Cover for GFI	C1GFCI99FF1	<b>10C89</b>	X	X	X	X	X	X	X
<b>INDOOR AIR QUALITY</b>									
<b>Indoor Air Quality (CO<sub>2</sub>) Sensors</b>									
Sensor - Wall-mount, off-white plastic cover with LCD display	C0SNSR50AE1L	<b>77N39</b>	X	X	X	X	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	C0SNSR53AE1L	<b>87N54</b>	X	X	X	X	X	X	X
CO <sub>2</sub> Sensor Duct Mounting Kit - for downflow applications	C0MISC19AE1-	<b>85L43</b>	X	X	X	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO <sub>2</sub> sensor ( <b>77N39</b> )	C0MISC16AE1-	<b>90N43</b>	X	X	X	X	X	X	X
<b>UVC Germicidal Lamps</b>									
<sup>2</sup> Healthy Climate® UVC Light Kit (208/230v-1ph)	E1UVCL10AN1-	<b>50W90</b>	X	X	X	X	X	X	X
<b>CEILING DIFFUSERS</b>									
Step-Down - Order one	RTD9-65-R	<b>27G87</b>	X	X	X	X	X		
	RTD11-95	<b>29G04</b>						X	X
Flush - Order one	FD9-65-R	<b>27G86</b>	X	X	X	X	X		
	FD11-95	<b>29G08</b>						X	X
Transitions (Supply and Return) - Order one	T1TRAN10AN1	<b>17W53</b>	X	X	X	X	X		
	T1TRAN20N-1	<b>17W54</b>						X	X

<sup>1</sup> KGB models only.

<sup>2</sup> 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).

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**OPTIONS / ACCESSORIES - KGA/KGB**

Item	Model No.	Catalog No.	Unit Model No.							
			KGB				KGA			
			024	030	036	048	060	072	074	090
<b>ROOF CURBS</b>										
<b>Hybrid Roof Curbs, Downflow</b>										
8 in. height	C1CURB70A-1	11F50	X	X	X	X	X	X	X	<sup>1</sup> X
14 in. height	C1CURB71A-1	11F51	X	X	X	X	X	X	X	<sup>1</sup> X
18 in. height	C1CURB72A-1	11F52	X	X	X	X	X	X	X	<sup>1</sup> X
24 in. height	C1CURB73A-1	11F53	X	X	X	X	X	X	X	<sup>1</sup> X
<b>Hybrid Roof Curbs, Full Perimeter, Downflow</b>										
8 in. height	K1CURB70AP1	11S47								X
14 in. height	K1CURB71AP1	11S48								X
18 in. height	K1CURB72AP1	11T01								X
24 in. height	K1CURB73AP1	11T06								X
<b>Adjustable Pitch Curb</b>										
14 in. height	C1CURB55AT1	43W27	X	X	X	X	X	X		<sup>1</sup> X

<sup>1</sup> 090 models will fit smaller roof curbs with overhang. See dimension drawing.

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## OPTIONS / ACCESSORIES - KGA ONLY

Item	Model No.	Catalog No.	Unit Model No.				
			KGA 036	KGA 048	KGA 060	KGA 072	KGA 090
<b>COOLING SYSTEM</b>							
Compressor Crankcase Heater	208/230V-1 or 3ph - K1CCHT02A-2P	14D86	X	X			
	208/230V-1 or 3ph - T1CCHT01AN2P	14D83			X		
	460V-3ph - K1CCHT012A-2G	14D87	X	X			
	460V-3ph - T1CCHT01AN2G	14D84			X		
	575V-3ph - K1CCHT02A-2J	14D88	X	X			
	575V-3ph - T1CCHT01AN2J	14D85			X		

### CABINET

Combination Coil/Hail Guards	C1GARD51A-1	13R98	X	X	X		
	C1GARD51AT1	13T03				X	
	K1GARD50AP1	13T17					X

### CONTROLS

BACnet®	K0CTRL31A-1	96W14	OX	OX	OX		
	K0CTRL31AP1	12B99				OX	OX
Novar® 2051	K0CTRL30A-1	96W11	OX	OX	OX		
	K0CTRL30AP1	12B98				OX	OX

### INDOOR AIR QUALITY

#### Air Filters

Healthy Climate® High Efficiency Air Filters	MERV 8 (16 x 20 x 2) - C1FLTR15A-1-	54W20	X	X	X		
	MERV 13 (16 x 20 x 2) - T1FLTR40A-1-	52W37	X	X	X		
Order 4 per unit	MERV 8 (20 x 20 x 2) - C1FLTR15D-1-	54W21				X	X
	MERV 13 (20 x 20 x 2) - C1FLTR40D-1-	52W39				X	X

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## OPTIONS / ACCESSORIES - KGB ONLY

Item	Model No.	Catalog No.	Unit Model No.					
			KGB 024	KGB 030	KGB 036	KGB 048	KGB 060	KGB 072
<b>CABINET</b>								
Combination Coil/Hail Guards	C1GARD51A-1	13R98	X	X	X	X		
	C1GARD51AT1	13T03					X	X
<b>CONTROLS</b>								
BACnet®	K0CTRL31A-1	96W14	OX	OX	OX	OX		
	K0CTRL31AP1	12B99					OX	OX
Novar® 2051	K0CTRL30A-1	96W11	OX	OX	OX	OX		
	K0CTRL30AP1	12B98					OX	OX

### INDOOR AIR QUALITY

#### Air Filters

Healthy Climate® High Efficiency Air Filters	MERV 8 (16 x 20 x 2) - C1FLTR15A-1-	54W20	X	X	X	X		
	MERV 13 (16 x 20 x 2) - T1FLTR40A-1-	52W37	X	X	X	X		
Order 4 per unit	MERV 8 (20 x 20 x 2) - C1FLTR15D-1-	54W21					X	X
	MERV 13 (20 x 20 x 2) - C1FLTR40D-1-	52W39					X	X

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**SPECIFICATIONS - DIRECT DRIVE BLOWER - KGB**
**2 - 2.5 TON**

General Data		Nominal Tonnage	2 Ton	2.5 Ton
		Model No.	KGB024S4D	KGB030S4D
		Efficiency Type	Standard	Standard
		Blower Type	Multi-Speed Direct Drive	Multi-Speed Direct Drive
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		24,800	31,200
	<sup>1</sup> Net Cooling Capacity - Btuh		24,200	30,200
	AHRI Rated Air Flow - cfm		840	1010
	<sup>2</sup> Sound Rating Number (SRN) ((dBA)		74	74
	Total Unit Power - kW		1.9	2.4
	<sup>1</sup> SEER (Btuh/Watt)		14.0	14.0
	<sup>1</sup> EER (Btuh/Watt)		12.7	11.5
<b>Refrigerant</b>	Type		R-410A	R-410A
	Charge Furnished		4 lbs. 3 oz.	5 lbs. 1 oz.
<b>Gas Heating Options - See page 21</b>			<b>Standard (1 Stage)</b>	<b>Standard (1 Stage)</b>
<b>Compressor Type (one per unit)</b>			Scroll	Scroll
<b>Outdoor Coil</b>	Net face area - sq. ft.		11.7	11.7
	Number of rows		1	1
	Fins per inch		23	23
<b>Outdoor Coil Fan</b>	Motor - (No.) HP		(1) 1/4	(1) 1/4
	Motor rpm		825	825
	Total Motor Input - watts		250	250
	Diameter - (No.) in. / No. of blades		(1) 24 - 3	(1) 24 - 3
	Total air volume - cfm		3100	3100
<b>Indoor Coil</b>	Net face area - sq. ft.		7.8	7.8
	Tube diameter - in.		3/8	3/8
	Number of rows		2	3
	Fins per inch		14	14
	Drain Connection (no.) and size - in.		(1) 1 NPT	(1) 1 NPT
	Expansion device type		Balanced Port Thermostatic Expansion Valve, removable power head	
<b>Indoor Blower</b>	Nominal Motor HP		0.25 hp	0.25 hp
	Wheel nominal diameter x width - in.		(1) 10 x 10	(1) 10 x 10
<b>Filters</b>	Type		Disposable	
	Number and size - in.		(4) 16 x 20 x 2	
<b>Electrical Characteristics - 60 Hz</b>			208/230V 1 phase	208/230V 1 phase

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

<sup>1</sup> 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.

<sup>2</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.



<b>SPECIFICATIONS - DIRECT DRIVE BLOWER - KGB</b>			<b>3 - 5 TON</b>		
<b>General Data</b>		<b>Nominal Tonnage</b>	<b>3 Ton</b>	<b>4 Ton</b>	<b>5 Ton</b>
		<b>Model No.</b>	<b>KGB036S4D</b>	<b>KGB048S4D</b>	<b>KGB060S4D</b>
		<b>Efficiency Type</b>	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>
		<b>Blower Type</b>	<b>Multi-Speed Direct Drive</b>	<b>Multi-Speed Direct Drive</b>	<b>Multi-Speed Direct Drive</b>
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		38,500	49,700	61,900
	<sup>1</sup> Net Cooling Capacity - Btuh		37,200	47,500	59,500
	AHRI Rated Air Flow - cfm		1140	1600	1760
	<sup>2</sup> Sound Rating Number (SRN)((dBA)		74	74	79
	Total Unit Power - kW		2.9	4.1	5.0
	<sup>1</sup> SEER (Btuh/Watt)		14.0	14.0	14.0
	<sup>1</sup> EER (Btuh/Watt)		12.5	11.5	11.8
<b>Refrigerant</b>	Type		R-410A	R-410A	R-410A
	Charge Furnished		5 lbs. 9 oz.	5 lbs. 6 oz.	6 lbs. 13 oz.
<b>Gas Heating Options - See page 21</b>			<b>Standard (1 Stage) or Medium (1 or 2 Stage)</b>	<b>Standard (1 Stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)</b>	
<b>Compressor Type (one per unit)</b>			Scroll	Scroll	Scroll
<b>Outdoor Coil</b>	Net face area - sq. ft.		14.5	14.5	17.8
	Number of rows		1	1	1
	Fins per inch		23	23	23
<b>Outdoor Coil Fan</b>	Motor - (No.) HP		(1) 1/4	(1) 1/4	(1) 1/3
	Motor rpm		825	825	1075
	Total Motor Input - watts		250	250	370
	Diameter - (No.) in. / No. of blades		(1) 24 - 3	(1) 24 - 3	(1) 24 - 3
	Total air volume - cfm		3300	3300	4700
<b>Indoor Coil</b>	Net face area - sq. ft.		7.8	7.8	9.7
	Tube diameter - in.		3/8	3/8	3/8
	Number of rows		3	3	4
	Fins per inch		14	14	14
	Drain Connection (no.) and size - in.		(1) 1 NPT	(1) 1 NPT	(1) 1 NPT
	Expansion device type		Balanced Port Thermostatic Expansion Valve, removable power head		
<b>Indoor Blower</b>	Nominal Motor HP		0.5 hp	0.5 hp	0.75 hp
	Wheel nominal diameter x width - in.		(1) 10 x 10	(1) 10 x 10	(1) 11 x 10
<b>Filters</b>	Type		Disposable		
	Number and size - in.		(4) 16 x 20 x 2		(4) 20 x 20 x 2
<b>Electrical Characteristics - 60 Hz</b>			208/230V 1 phase	208/230V 1 phase	208/230V 1 phase
			208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase

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

<sup>1</sup> 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.

<sup>2</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.



**SPECIFICATIONS - BELT DRIVE BLOWER - KGB**

**3 - 5 TON**

General Data		Nominal Tonnage	3 Ton	4 Ton	5 Ton		
		Model No.	KGB036S4B	KGB048S4B	KGB060S4B		
		Efficiency Type	Standard	Standard	Standard		
		Blower Type	Single Speed Belt Drive	Single Speed Belt Drive	Single Speed Belt Drive		
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		38,500	49,700	61,900		
	<sup>1</sup> Net Cooling Capacity - Btuh		37,200	47,500	59,500		
	AHRI Rated Air Flow - cfm		1140	1600	1760		
	<sup>2</sup> Sound Rating Number (SRN) (dBA)		74	74	79		
	Total Unit Power - kW		2.9	4.1	5		
	<sup>1</sup> SEER (Btuh/Watt)		14.0	14.0	14.0		
	<sup>1</sup> EER (Btuh/Watt)		12.5	11.5	11.8		
<b>Refrigerant</b>	Type		R-410A	R-410A	R-410A		
	Charge Furnished		5 lbs. 9 oz.	5 lbs. 6 oz.	6 lbs. 13 oz.		
<b>Gas Heating Options - See page 21</b>			<b>Standard (1 Stage) or Medium (1 or 2 Stage)</b>	<b>Standard (1 Stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)</b>			
<b>Compressor Type (one per unit)</b>			Scroll	Scroll	Scroll		
<b>Outdoor Coil</b>	Net face area - sq. ft.		14.5	14.5	17.8		
	Number of rows		1	1	1		
	Fins / inch		23	23	23		
<b>Outdoor Coil Fan</b>	Motor - (No.) HP		(1) 1/4	(1) 1/4	(1) 1/3		
	Motor rpm		825	825	1075		
	Total Motor Input - watts		250	250	370		
	Diameter - (No.) in. / No. of blades		(1) 24 - 3	(1) 24 - 3	(1) 24 - 3		
	Total air volume - cfm		3300	3300	4700		
<b>Indoor Coil</b>	Net face area - sq. ft.		7.8	7.8	9.7		
	Tube diameter - in.		3/8	3/8	3/8		
	Number of rows		3	3	4		
	Fins per inch		14	14	14		
	Drain Connection (no.) and size - in.		(1) 1 NPT	(1) 1 NPT	(1) 1 NPT		
	Expansion device type		Balanced Port Thermostatic Expansion Valve, removable power head				
<sup>3</sup> <b>Indoor Blower &amp; Drive Selection</b>	Nominal Motor HP	208/230V-1ph	0.75 hp, 1.5 hp	0.75 hp, 1.5 hp	0.75 hp, 1.5 hp		
		All others voltages	1 hp, 2 hp	1 hp, 2 hp	1 hp, 2 hp		
	Maximum Usable Motor HP	208/230V-1ph	0.86 hp, 1.7 hp	0.86 hp, 1.7 hp	0.86 hp, 1.7 hp		
		All other voltages	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp		
	Available Drive Kits	A01	673 - 1010 rpm	A02	745 - 1117 rpm	A03	833 - 1250 rpm
		A05	897 - 1346 rpm	A06	1071 - 1429 rpm	A07	1212 - 1548 rpm
Wheel nominal diameter x width - in.		(1) 10 x 10	(1) 10 x 10	(1) 10 x 10	(1) 10 x 10		
<b>Filters</b>	Type	Disposable					
	Number and size - in.	(4) 16 x 20 x 2			(4) 20 x 20 x 2		
<b>Electrical Characteristics - 60 Hz</b>			208/230V 1 phase	208/230V, 1 phase	208/230V 1 phase		
			208/230V, 460V & 575V 3 phase	208/230V 460V & 575V 3 phase	208/230V 460V & 575V 3 phase		

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

<sup>1</sup> 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.

<sup>2</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.

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

**SPECIFICATIONS - BELT DRIVE BLOWER - KGB**
**6 TON**

General Data	Nominal Tonnage	6 Ton	6 Ton	6 Ton
	Model No.	KGB072H4B	KGB074H4T	KGB074S4T
	Efficiency Type	High	High	Standard
	Blower Type	Single Speed Belt Drive	Two Speed Belt Drive	Two Speed Belt Drive
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh	73,500	72,000	71,000
	<sup>1</sup> Net Cooling Capacity - Btuh	72,000	69,000	68,000
	AHRI Rated Air Flow - cfm	1920	2100	2100
	<sup>2</sup> Sound Rating Number (SRN) (dBA)	79	79	79
	Total Unit Power - kW	6.0	5.7	6.1
	<sup>1</sup> IEER	13.5	16.0	15.0
	<sup>1</sup> EER (Btuh/Watt)	12.0	12.0	11.2
<b>Refrigerant</b>	Type	R-410A	R-410A	R-410A
	Charge Furnished	7 lbs. 8 oz.	7 lbs. 2 oz.	7 lbs. 2 oz.
<b>Gas Heating Options - See page 21</b>		<b>Standard (1 stage), Medium (1 or 2 stage), or High (1 or 2 stage)</b>	<b>Standard (1 stage), Medium (1 or 2 stage), or High (1 or 2 stage)</b>	<b>Standard (1 stage), Medium (1 or 2 stage), or High (1 or 2 stage)</b>
<b>Compressor Type (one per unit)</b>		Scroll	Two-Stage Scroll	Two-Stage Scroll
<b>Outdoor Coil</b>	Net face area - sq. ft.	17.8	17.8	17.8
	Number of rows	1	1	1
	Fins / inch	23	23	23
<b>Outdoor Coil Fan</b>	Motor - (No.) HP	(1) 1/3	(1) 1/3	(1) 1/3
	Motor rpm	1075	1075	1075
	Total Motor Input - watts	410	375	375
	Diameter - (No.) in. / No. of blades	(1) 24 - 3	(1) 24 - 3	(1) 24 - 3
	Total air volume - cfm	4800	4700	4700
<b>Indoor Coil</b>	Net face area - sq. ft.	9.72	9.72	9.72
	Tube diameter - in.	3/8	3/8	3/8
	Number of rows	4	4	4
	Fins per inch	14	14	14
	Drain Connection (no.) and size - in.	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT
	Expansion device type	Balanced Port Thermostatic Expansion Valve, removable power head		
<sup>3</sup> <b>Indoor Blower &amp; Drive Selection</b>	Nominal Motor Output	1 hp, 2 hp	1 hp, 2 hp	1 hp, 2 hp
	Maximum Usable Motor Output (US Only)	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp
	Motor - Drive Kit Number	AA01 522-784 rpm	AA01 522-784 rpm	A04 968 - 1340 rpm
		AA02 632-875 rpm	AA02 632-875 rpm	A08 1193-1591 rpm
		AA03 798-1105 rpm	AA03 798-1105 rpm	
Wheel Nominal Diameter x Width - in.		(1) 15 x 9	(1) 15 x 9	(1) 10 x 10
<b>Filters</b>	Type	Disposable		
	Number and size - in.	(4) 20 x 20 x 2	(4) 20 x 20 x 2	(4) 20 x 20 x 2
<b>Electrical Characteristics - 60 Hz</b>		208/230V, 460V or 575V – 60 hertz – 3 phase		

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

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

<sup>2</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.

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

**SPECIFICATIONS - DIRECT DRIVE BLOWER- KGA**
**3 - 5 TON**

General Data		Nominal Tonnage	3 Ton	4 Ton	5 Ton
		Model No.	KGA036S4D	KGA048S4D	KGA060S4D
		Efficiency Type	Standard	Standard	Standard
		Blower Type	Multi-Speed Direct Drive	Multi-Speed Direct Drive	Multi-Speed Direct Drive
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		37,500	50,000	61,800
	<sup>1</sup> Net Cooling Capacity - Btuh		36,000	48,000	59,000
	AHRI Rated Air Flow - cfm		1200	1600	1800
	<sup>2</sup> Sound Rating Number (SRN)(dBA)		75	75	82
	Total Unit Power - kW		3.4	4.4	5.3
	<sup>1</sup> SEER (Btuh/Watt)		13.0	13.0	13.0
	<sup>1</sup> EER (Btuh/Watt)		10.7	11	11.2
<b>Refrigerant</b>	Type		R-410A	R-410A	R-410A
	Charge Furnished		7 lbs. 12 oz.	8 lbs. 12 oz.	12 lbs. 8 oz.
<b>Gas Heating Options - See page 21</b>			<b>Standard (1 Stage) or Medium (1 or 2 Stage)</b>	<b>Standard (1 Stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)</b>	
<b>Compressor Type (one per unit)</b>			Scroll	Scroll	Scroll
<b>Outdoor Coil</b>	Net face area - sq. ft.		15.6	15.6	15.6
	Tube diameter - in.		3/8	3/8	3/8
	Number of rows		1	1.5	2
	Fins per inch		20	20	20
<b>Outdoor Coil Fan</b>	Motor - (No.) HP		(1) 1/4	(1) 1/4	(1) 1/3
	Motor rpm		825	825	1075
	Total Motor Input - watts		250	250	370
	Diameter - (No.) in. / No. of blades		(1) 24 - 3	(1) 24 - 3	(1) 24 - 3
	Total air volume - cfm		3700	3500	4300
<b>Indoor Coil</b>	Net face area - sq. ft.		7.8	7.8	7.8
	Tube diameter - in.		3/8	3/8	3/8
	Number of rows		3	3	4
	Fins per inch		14	14	14
	Drain Connection (no.) and size - in.		(1) 1 NPT	(1) 1 NPT	(1) 1 NPT
	Expansion device type		Refrigerant Metering Orifice (RFC)		
<b>Indoor Blower</b>	Nominal Motor HP		0.5 hp	0.5 hp	0.75 hp
	Wheel nominal diameter x width - in.		(1) 10 x 10	(1) 10 x 10	(1) 11 x 10
<b>Filters</b>	Type		Disposable		
	Number and size - in.		(4) 16 x 20 x 2		
<b>Electrical Characteristics - 60 Hz</b>			208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase

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

<sup>1</sup> 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.

<sup>2</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.

**SPECIFICATIONS - BELT DRIVE BLOWER - KGA**

**3 - 7.5 TON**

General Data		Nominal Tonnage	3 Ton	4 Ton	5 Ton	6 Ton	7.5 Ton	
	Model No.		KGA036S4B	KGA048S4B	KGA060S4B	KGA072S4B	KGA090S4B	
	Efficiency Type		Standard	Standard	Standard	Standard	Standard	
	Blower Type		Single Speed Belt Drive	Single Speed Belt Drive	Single Speed Belt Drive	Single Speed Belt Drive	Single Speed Belt Drive	
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		37,500	50,000	61,800	72,500	92,000	
	Net Cooling Capacity - Btuh		<sup>1</sup> 36,000	<sup>1</sup> 48,000	<sup>1</sup> 59,000	<sup>2</sup> 69,000	<sup>2</sup> 90,000	
	AHRI Rated Air Flow - cfm		1200	1600	1800	2450	2430	
	<sup>3</sup> Sound Rating Number (SRN) (dBA)		75	75	82	79	79	
	Total Unit Power - kW		3.4	4.4	5.3	6.1	8.2	
	SEER (Btuh/Watt)		<sup>1</sup> 13.0	<sup>1</sup> 13.0	<sup>1</sup> 13.0	---	---	
	IEER (Btuh/Watt)		---	---	---	<sup>2</sup> 12.3	<sup>2</sup> 11.2	
EER (Btuh/Watt)		<sup>1</sup> 10.7	<sup>1</sup> 11.0	<sup>1</sup> 11.2	<sup>2</sup> 11.2	<sup>2</sup> 11.0		
<b>Refrigerant</b>	Type		R-410A	R-410A	R-410A	R-410A	R-410A	
	Charge Furnished		7 lbs. 12 oz.	8 lbs. 12 oz.	12 lbs. 8 oz.	7 lbs. 1 oz.	8 lbs. 8 oz.	
<b>Gas Heating Options - See page 21</b>			<b>Standard (1 Stage) or Medium (1 or 2 Stage)</b>	<b>Standard (1 Stage), Medium (1 or 2 Stage) or High (1 or 2 Stage)</b>			<b>Medium (1 or 2 Stage) or High (1 or 2 Stage)</b>	
<b>Compressor Type (one per unit)</b>			Scroll	Scroll	Scroll	Scroll	Scroll	
<b>Outdoor Coil</b>	Net face area - sq. ft.		15.6	15.6	15.6	17.8	24.2	
	Tube diameter - in.		3/8	3/8	3/8	---	---	
	Number of rows		1	1.5	2	1	1	
	Fins / inch		20	20	20	23	23	
<b>Outdoor Coil Fan</b>	Motor - (No.) HP		(1) 1/4	(1) 1/4	(1) 1/3	(1) 1/3	(1) 1/2	
	Motor rpm		825	825	1075	1075	1075	
	Total Motor Input - watts		250	250	370	370	520	
	Diameter - (No.) in. / No. of blades		(1) 24 - 3	(1) 24 - 3	(1) 24 - 3	(1) 24 - 3	(1) 24 - 4	
	Total air volume - cfm		3700	3500	4300	4700	5300	
<b>Indoor Coil</b>	Net face area - sq. ft.		7.8	7.8	7.8	9.7	9.7	
	Tube diameter - in.		3/8	3/8	3/8	3/8	3/8	
	Number of rows		3	3	4	4	4	
	Fins per inch		14	14	14	14	14	
	Drain Connection (no.) and size - in.		(1) 1 NPT	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT	(1) 1 NPT	
Expansion device type			Refrigerant Metering Orifice (RFC)					
<b><sup>4</sup> Indoor Blower &amp; Drive Selection</b>	Nominal Motor HP		1 hp, 2 hp	1 hp, 2 hp	1 hp, 2 hp	1 hp, 2 hp	1 hp	
	Maximum Usable Motor HP		1.15 hp, 2.3 hp	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp	1.15 hp, 2.3 hp	1.15 hp	
	Available Drive Kits	A01		A02		A03		AA01
		673 - 1010 rpm		745 - 1117 rpm		833 - 1250 rpm		968 - 1340 rpm
		A05		A06		A07		A08
	897 - 1346 rpm		1071 - 1429 rpm		1212 - 1548 rpm		1193 - 1591 rpm	
	Nominal Motor HP		---	---	---	---	2 hp	
	Maximum Usable Motor HP		---	---	---	---	2.3 hp	
	Available Drive Kits	---		---		---		AA02
		---		---		---		632 - 875 rpm
---			---		---		AA03	
---		---		---		798 - 1105 rpm		
---		---		---		3 hp		
---		---		---		3.45 hp		
---		---		---		AA04		
---		---		---		921 - 1228 rpm		
Wheel nominal diameter x width - in.		(1) 10 x 10	(1) 10 x 10	(1) 10 x 10	(1) 10 x 10	(1) 10 x 10	(1) 15 x 9	
<b>Filters</b>	Type		Disposable			Disposable		
	Number and size - in.		(4) 16 x 20 x 2			(4) 20 x 20 x 2		
<b>Electrical Characteristics - 60 Hz</b>			208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	208/230V, 460V & 575V 3 phase	

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

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

<sup>3</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ARI Standard 270-95.

<sup>4</sup> Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor hp required. Maximum usable hp of motors furnished are shown. In Canada, nominal motor hp is also maximum usable motor hp output. If motors of comparable hp are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

### SPECIFICATIONS - STANDARD GAS HEAT - THREE PHASE MODELS

Model No.	036, 048, 060, 072, 074	036, 048, 060, 072, 074	090	036, 048, 060, 072, 074	090	048, 060, 072, 074	090	048, 060, 072, 074	090
Heat Input Type	Standard (1 Stage)	Medium (1 Stage)		Medium (2 Stage)		High (1 Stage)		High (2 Stage)	
Input Btuh	1st Stage 65,000	108,000		81,000		150,000		113,000	
	2nd Stage ---	---		108,000		---		150,000	
Output Btuh	1st Stage 52,000	86,000		65,000		120,000		90,000	
	2nd Stage ---	---		86,000		---		120,000	
Temperature Rise Range - °F	1st stage 15 - 45	30 - 70	15 - 45	25 - 55	10 - 40	45 - 75	25 - 55	30 - 60	15 - 45
	2nd Stage ---	---	---	30 - 70	15 - 45	---	---	45 - 75	25 - 55
<sup>1</sup> Thermal Efficiency	Standard	80%	80%	80%	80%	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.								

<sup>1</sup> Thermal Efficiency at full input.

### SPECIFICATIONS - LOW NOX GAS HEAT - SINGLE AND THREE PHASE MODELS

Model No.	024, 030	036, 048, 060, 072, 074	036, 048, 060, 072, 074	090	036, 048, 060, 072, 074	090	048, 060, 072, 074	090	048, 060, 072, 074	090
Heat Input Type	Standard (1 Stage)	Medium (1 Stage)		Medium (2 Stage)		High (1 Stage)		High (2 Stage)		
Input Btuh	1st Stage 65,000	108,000		81,000		150,000		113,000		
	2nd Stage ---	---		108,000		---		150,000		
Output Btuh	1st Stage 52,000	87,000		66,000		121,000		92,000		
	2nd Stage ---	---		87,000		---		121,000		
Temperature Rise Range - °F	1st stage 35 - 65	15 - 45	30 - 70	15 - 45	25 - 55	10 - 40	45 - 75	25 - 55	30 - 60	15 - 45
	2nd Stage ---	---	---	---	30 - 70	15 - 45	---	---	45 - 75	25 - 55
<sup>1</sup> AFUE (single phase)	81%	81%	81%	---	81%	---	81%	---	81%	---
<sup>2</sup> Thermal Efficiency (three phase)	---	81%	81%	81%	81%	81%	81%	81%	81%	81%
Gas Supply Connections	1/2 in. NPT									
Rec. Gas Supply Pressure - Nat./ LPG	7 in.w.g. / 11 in.w.g.									

<sup>1</sup> Annual Fuel Utilization Efficiency based on U.S. DOE test procedures and FTC labeling regulations - 1 phase models only.

<sup>2</sup> Thermal Efficiency at full input.

### 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	100,000
Medium (2 stage)	2001 - 4500	3.0/1.7	9.0/5.1	100,000 / 75,000
High (1 stage)	2001 - 4500	3.0	9.0	139,000
High (2 stage)	2001 - 4500	3.0/1.7	9.0/5.1	139,000 / 104,000

## BLOWER DATA - DIRECT DRIVE - KGB024

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 (larger gas heat section, economizer, wet coil, etc.) See page 41.

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.) See page 41.

External Static Pressure (in. w.g.)	Air Volume (cfm) at Various Blower Speeds					
	208 VOLTS			230 VOLTS		
	High	Medium	Low	High	Medium	Low
<b>2 Ton Standard Efficiency (Downflow)</b>			<b>KGB024S</b>			
0.0	1275	979	878	1453	1140	926
0.1	1262	960	834	1440	1124	912
0.2	1243	938	790	1420	1096	884
0.3	1218	909	746	1396	1065	853
0.4	1186	866	710	1352	1033	822
0.5	1137	838	657	1316	986	774
0.6	1104	795	604	1263	954	727
0.7	1055	752	534	1210	906	680
0.8	990	694	463	1158	859	632
0.9	925	637	392	1070	764	538
1.0	794	523	290	928	669	477
<b>2 Ton Standard Efficiency (Horizontal)</b>			<b>KGB024S</b>			
0.0	1204	937	818	1370	1098	879
0.1	1186	913	788	1352	1066	864
0.2	1164	882	748	1327	1034	839
0.3	1137	860	710	1300	1001	809
0.4	1104	818	670	1263	968	768
0.5	1070	775	612	1227	925	728
0.6	1031	733	554	1190	881	688
0.7	991	690	500	1136	816	628
0.8	937	626	432	1081	751	557
0.9	804	566	362	1009	665	492
1.0	678	497	287	900	565	416

## BLOWER DATA - DIRECT DRIVE - KGB030

**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 (larger gas heat section, economizer, wet coil, etc.) See page 41.

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.) See page 41.

External Static Pressure (in. w.g.)	Air Volume (cfm) at Various Blower Speeds					
	208 VOLTS			230 VOLTS		
	High	Medium	Low	High	Medium	Low
<b>2.5 Ton Standard Efficiency (Downflow)</b>			<b>KGB030S</b>			
0.0	1211	949	852	1365	1097	916
0.1	1251	946	826	1422	1099	908
0.2	1241	952	794	1419	1112	893
0.3	1234	915	749	1419	1074	861
0.4	1213	880	702	1402	1038	824
0.5	1178	846	661	1366	1003	795
0.6	1118	790	585	1302	942	720
0.7	1054	751	518	1231	900	655
0.8	964	675	460	1130	815	600
0.9	882	626	368	1037	762	501
1.0	729	494	286	859	606	412
<b>2.5 Ton Standard Efficiency (Horizontal)</b>			<b>KGB030S</b>			
0.0	1163	930	815	1312	1075	875
0.1	1173	912	783	1333	1060	861
0.2	1169	888	746	1337	1037	839
0.3	1152	858	704	1325	1007	809
0.4	1122	822	657	1297	969	772
0.5	1079	779	606	1252	923	728
0.6	1023	730	549	1191	870	676
0.7	953	674	488	1114	808	617
0.8	871	613	422	1020	739	550
0.9	775	545	350	911	662	476
1.0	666	470	274	785	578	395



## BLOWER DATA - DIRECT DRIVE - KGA/KGB036, KGA/KGB048

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 (larger gas heat section, economizer, wet coil, etc.) See page 41.

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.) See page 41.

External Static Pressure (in. w.g.)	Air Volume (cfm) at Various Blower Speeds								
	208 VOLTS			230 VOLTS			460/575 VOLTS		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
<b>3 and 4 Ton Standard Efficiency (Downflow)</b>					<b>KGA/KGB036S and KGA/KGB048S</b>				
0.0	1873	1561	1123	2094	1783	1321	2064	1727	1216
0.1	1993	1601	1148	2168	1797	1338	2105	1744	1229
0.2	1913	1601	1137	2098	1803	1308	2050	1694	1198
0.3	1858	1527	1078	2036	1725	1261	1987	1638	1167
0.4	1801	1496	1046	1973	1679	1219	1905	1598	1148
0.5	1763	1467	987	1910	1647	1177	1862	1559	1108
0.6	1709	1414	897	1830	1560	1080	1781	1509	1057
0.7	1617	1368	806	1727	1519	986	1698	1449	982
0.8	1472	1269	730	1604	1419	918	1614	1389	920
0.9	1359	1162	487	1478	1363	706	1488	1346	792
1.0	961	922	370	1093	1083	590	1167	1099	703
<b>3 and 4 Ton Standard Efficiency (Horizontal)</b>					<b>KGA/KGB036S and KGA/KGB048S</b>				
0.0	1799	1530	1073	2012	1747	1263	2015	1756	1251
0.1	1868	1544	1088	2032	1733	1268	2071	1760	1279
0.2	1802	1494	1068	1976	1682	1228	2014	1700	1226
0.3	1735	1432	1014	1900	1618	1185	1937	1634	1187
0.4	1666	1397	980	1825	1568	1142	1878	1597	1174
0.5	1615	1350	904	1750	1516	1078	1801	1558	1124
0.6	1564	1305	842	1675	1440	1014	1743	1479	1060
0.7	1462	1228	758	1562	1364	928	1664	1415	982
0.8	1330	1151	670	1449	1287	842	1512	1335	865
0.9	1194	1011	464	1298	1185	671	1393	1297	733
1.0	878	878	355	998	1032	565	1060	1063	618

## BLOWER DATA - DIRECT DRIVE - KGA060

**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 (larger gas heat section, economizer, wet coil, etc.) See page 41.

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.) See page 41.

External Static Pressure (in. w.g.)	Air Volume (cfm) at Various Blower Speeds					
	208 VOLTS		230 VOLTS		460/575 VOLTS	
	High	Low	High	Low	High	Low
<b>5 Ton Standard Efficiency (Downflow)</b>						<b>KGA060S</b>
0.0	2200	1649	2411	1957	2241	1755
0.1	2256	1669	2417	2002	2221	1742
0.2	2202	1739	2396	1985	2193	1747
0.3	2170	1705	2328	1972	2144	1725
0.4	2158	1689	2293	1959	2104	1695
0.5	2130	1676	2279	1930	2086	1678
0.6	2056	1662	2158	1900	2008	1652
0.7	2032	1657	2089	1857	1975	1610
0.8	1963	1591	2077	1796	1941	1586
0.9	1887	1597	1876	1746	1855	1555
1.0	1695	1400	1746	1601	1778	1486
<b>5 Ton Standard Efficiency (Horizontal)</b>						<b>KGA060S</b>
0.0	2114	1615	2305	1880	2308	1890
0.1	2115	1610	2290	1876	2334	1906
0.2	2074	1622	2249	1870	2292	1890
0.3	2025	1599	2188	1841	2230	1859
0.4	1996	1577	2148	1812	2210	1846
0.5	1952	1542	2087	1768	2148	1817
0.6	1882	1534	2026	1739	2108	1786
0.7	1838	1488	1966	1680	2094	1743
0.8	1773	1443	1905	1622	1988	1682
0.9	1657	1389	1784	1534	1915	1679
1.0	1548	1335	1672	1462	1853	1506

## BLOWER DATA - DIRECT DRIVE - KGB060

**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 (larger gas heat section, economizer, wet coil, etc.) See page 41.

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.) See page 41.

External Static Pressure (in. w.g.)	Air Volume (cfm) at Various Blower Speeds					
	208 VOLTS		230 VOLTS		460/575 VOLTS	
	High	Low	High	Low	High	Low
<b>5 Ton Standard Efficiency (Downflow)</b>						<b>KGB060S</b>
0.0	1940	1581	2131	1788	2131	1788
0.1	1929	1566	2107	1784	2107	1784
0.2	1906	1552	2074	1774	2074	1774
0.3	1872	1546	2036	1752	2036	1752
0.4	1836	1526	1998	1708	1998	1708
0.5	1802	1486	1960	1679	1960	1679
0.6	1749	1447	1904	1635	1904	1635
0.7	1714	1407	1847	1576	1847	1576
0.8	1644	1347	1771	1518	1771	1518
0.9	1574	1245	1658	1430	1658	1430
1.0	1338	---	1506	---	1506	---
<b>5 Ton Standard Efficiency (Horizontal)</b>						<b>KGB060S</b>
0.0	1930	1575	2143	1764	2143	1764
0.1	1920	1573	2115	1761	2115	1761
0.2	1910	1576	2088	1751	2088	1751
0.3	1870	1552	2055	1746	2055	1746
0.4	1840	1524	2023	1704	2023	1704
0.5	1790	1495	1979	1675	1979	1675
0.6	1739	1466	1925	1633	1925	1633
0.7	1679	1428	1860	1590	1860	1590
0.8	1639	1371	1775	1534	1775	1534
0.9	1559	1270	1670	1421	1670	1421
1.0	1438	---	1539	1285	1539	1285

## BLOWER DATA - BELT DRIVE - KGA/KGB036

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, wet coil, etc.).

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

See page 41 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A01									
900	493	0.11	564	0.15	637	0.19	711	0.22	783	0.24	851	0.26	910	0.29	961	0.32
1000	517	0.14	588	0.18	660	0.22	733	0.24	804	0.26	868	0.29	924	0.32	974	0.35
1100	544	0.17	614	0.21	685	0.25	757	0.27	826	0.29	887	0.32	940	0.36	987	0.38
1200	574	0.2	643	0.24	712	0.28	782	0.31	849	0.33	906	0.36	956	0.39	1001	0.42
1300	613	0.23	679	0.28	745	0.31	811	0.34	873	0.36	926	0.40	973	0.43	1016	0.46
1400	662	0.26	722	0.30	781	0.34	841	0.37	897	0.41	944	0.44	989	0.48	1032	0.51
1500	710	0.29	763	0.33	816	0.38	869	0.41	919	0.45	963	0.49	1006	0.53	1049	0.56

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A01			Kit A05												
900	1008	0.34	1056	0.36	1104	0.39	1149	0.41	1190	0.44	1229	0.46	1267	0.49	1305	0.52
1000	1020	0.37	1067	0.40	1115	0.42	1159	0.45	1200	0.48	1239	0.51	1277	0.54	1314	0.57
1100	1032	0.41	1078	0.43	1124	0.46	1168	0.49	1210	0.52	1249	0.55	1286	0.58	1323	0.62
1200	1045	0.45	1090	0.47	1135	0.50	1178	0.53	1220	0.57	1259	0.60	1296	0.64	1332	0.67
1300	1060	0.49	1104	0.51	1148	0.55	1190	0.58	1230	0.62	1269	0.65	1306	0.69	1342	0.72
1400	1075	0.53	1119	0.56	1162	0.60	1203	0.63	1242	0.67	1280	0.71	1317	0.75	1352	0.78
1500	1093	0.58	1136	0.61	1177	0.65	1217	0.69	1255	0.73	1292	0.77	1328	0.80	1364	0.84

### 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A01									
900	465	0.09	531	0.14	600	0.17	670	0.20	740	0.22	808	0.24	869	0.27	925	0.30
1000	483	0.12	549	0.16	617	0.20	687	0.22	756	0.24	822	0.26	881	0.29	935	0.33
1100	504	0.14	570	0.19	637	0.22	706	0.25	773	0.27	837	0.29	894	0.32	946	0.36
1200	527	0.17	592	0.22	658	0.25	726	0.28	792	0.30	854	0.32	908	0.36	957	0.39
1300	552	0.20	617	0.25	682	0.29	748	0.31	812	0.33	871	0.36	923	0.40	970	0.43
1400	580	0.24	644	0.28	708	0.32	773	0.35	834	0.37	890	0.40	938	0.44	984	0.48
1500	611	0.28	674	0.32	736	0.35	799	0.38	857	0.41	908	0.44	954	0.49	998	0.52

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A01			Kit A05												
900	977	0.33	1028	0.36	1079	0.39	1127	0.42	1169	0.45	1208	0.48	1246	0.51	1282	0.54
1000	985	0.36	1036	0.39	1087	0.42	1135	0.45	1177	0.48	1216	0.52	1253	0.55	1290	0.58
1100	995	0.39	1044	0.42	1093	0.45	1140	0.49	1183	0.52	1223	0.56	1261	0.59	1297	0.62
1200	1005	0.43	1053	0.46	1100	0.49	1146	0.53	1190	0.56	1230	0.60	1268	0.63	1304	0.67
1300	1016	0.47	1063	0.50	1109	0.53	1154	0.57	1197	0.61	1237	0.64	1275	0.68	1311	0.72
1400	1029	0.51	1074	0.54	1120	0.58	1164	0.61	1205	0.65	1245	0.69	1282	0.73	1318	0.77
1500	1042	0.56	1087	0.59	1132	0.62	1174	0.66	1215	0.71	1253	0.75	1290	0.78	1326	0.82

## BLOWER DATA - BELT DRIVE - KGA/KGB048

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, wet coil, etc.).

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

See page 41 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A02									
1200	574	0.20	644	0.24	713	0.28	784	0.31	850	0.33	906	0.36	953	0.39	998	0.42
1300	608	0.24	677	0.28	744	0.31	813	0.34	874	0.37	925	0.40	969	0.43	1014	0.46
1400	645	0.28	712	0.31	778	0.35	842	0.38	898	0.41	944	0.44	986	0.48	1030	0.51
1500	684	0.31	749	0.35	811	0.38	871	0.42	921	0.45	963	0.49	1004	0.53	1048	0.56
1600	723	0.35	785	0.39	844	0.43	898	0.46	943	0.50	983	0.54	1024	0.58	1067	0.61
1700	761	0.40	819	0.44	875	0.48	924	0.52	965	0.56	1004	0.60	1045	0.63	1089	0.66
1800	798	0.45	853	0.49	905	0.54	950	0.58	990	0.62	1028	0.66	1069	0.69	1112	0.72
1900	834	0.51	885	0.55	934	0.60	977	0.64	1015	0.68	1054	0.72	1095	0.75	1137	0.79
2000	869	0.57	917	0.62	962	0.67	1004	0.71	1042	0.75	1081	0.78	1121	0.82	1162	0.86

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A02				Kit A06											
1200	1043	0.44	1090	0.47	1135	0.50	1179	0.53	1220	0.57	1259	0.60	1297	0.64	1333	0.67
1300	1058	0.49	1104	0.51	1148	0.55	1190	0.58	1231	0.62	1269	0.65	1306	0.69	1342	0.72
1400	1074	0.53	1119	0.56	1162	0.59	1203	0.63	1242	0.67	1280	0.71	1317	0.74	1352	0.78
1500	1092	0.58	1136	0.61	1177	0.65	1217	0.69	1255	0.73	1292	0.76	1328	0.80	1364	0.84
1600	1112	0.63	1154	0.67	1193	0.71	1232	0.75	1269	0.79	1306	0.83	1341	0.87	1377	0.91
1700	1132	0.69	1173	0.73	1211	0.77	1248	0.81	1285	0.86	1321	0.90	1356	0.94	1391	0.98
1800	1154	0.76	1194	0.80	1230	0.85	1266	0.89	1302	0.93	1338	0.98	1373	1.02	1408	1.06
1900	1178	0.83	1215	0.88	1250	0.93	1286	0.98	1321	1.02	1356	1.06	1391	1.10	1426	1.14
2000	1201	0.91	1237	0.97	1271	1.02	1307	1.07	1342	1.11	1376	1.15	1411	1.19	1446	1.23

### 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A02									
1200	540	0.18	606	0.22	673	0.26	748	0.29	816	0.30	870	0.33	914	0.37	961	0.40
1300	568	0.21	634	0.26	699	0.29	771	0.32	835	0.34	886	0.37	929	0.41	975	0.44
1400	599	0.25	664	0.29	728	0.33	795	0.35	855	0.38	903	0.41	946	0.45	991	0.49
1500	632	0.29	696	0.33	758	0.36	821	0.39	877	0.42	922	0.46	963	0.50	1008	0.54
1600	667	0.33	729	0.36	789	0.40	848	0.43	898	0.46	941	0.51	982	0.55	1026	0.59
1700	702	0.36	761	0.40	819	0.44	873	0.48	920	0.52	960	0.56	1001	0.61	1044	0.64
1800	737	0.41	794	0.45	848	0.49	898	0.53	941	0.58	981	0.62	1021	0.66	1064	0.70
1900	771	0.46	825	0.50	877	0.54	923	0.59	964	0.64	1002	0.68	1043	0.72	1085	0.76
2000	805	0.51	857	0.56	905	0.61	948	0.66	987	0.71	1025	0.75	1065	0.79	1107	0.82

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A02				Kit A06											
1200	1010	0.43	1061	0.46	1110	0.50	1156	0.53	1199	0.57	1239	0.61	1276	0.64	1312	0.68
1300	1024	0.47	1073	0.50	1120	0.54	1165	0.58	1207	0.62	1246	0.65	1284	0.69	1320	0.73
1400	1038	0.52	1086	0.55	1131	0.59	1175	0.62	1216	0.66	1255	0.70	1292	0.74	1328	0.78
1500	1054	0.57	1100	0.60	1144	0.64	1186	0.68	1226	0.72	1264	0.75	1301	0.79	1336	0.83
1600	1071	0.62	1116	0.65	1158	0.69	1198	0.73	1237	0.77	1274	0.81	1310	0.85	1345	0.89
1700	1089	0.67	1132	0.71	1172	0.75	1211	0.79	1249	0.83	1285	0.87	1321	0.91	1355	0.95
1800	1108	0.73	1149	0.77	1188	0.81	1225	0.85	1262	0.90	1298	0.94	1332	0.98	1366	1.01
1900	1128	0.79	1167	0.84	1204	0.88	1241	0.92	1276	0.97	1311	1.01	1345	1.05	1379	1.09
2000	1148	0.86	1186	0.91	1221	0.96	1257	1.00	1292	1.05	1326	1.09	1359	1.13	1393	1.17

## BLOWER DATA - BELT DRIVE - KGA060

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, wet coil, etc.).

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

See page 41 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A03									
1600	745	0.36	805	0.40	862	0.44	913	0.48	956	0.52	996	0.55	1037	0.59	1081	0.62
1700	783	0.41	840	0.45	893	0.49	940	0.53	980	0.57	1019	0.61	1061	0.64	1104	0.67
1800	820	0.47	873	0.51	923	0.55	967	0.60	1006	0.63	1045	0.67	1086	0.70	1129	0.73
1900	856	0.52	906	0.57	953	0.62	994	0.66	1032	0.70	1071	0.73	1112	0.76	1154	0.80
2000	891	0.59	937	0.64	982	0.69	1022	0.73	1060	0.76	1099	0.80	1140	0.84	1180	0.88
2100	924	0.66	968	0.71	1011	0.75	1051	0.79	1089	0.83	1128	0.87	1167	0.92	1206	0.97
2200	956	0.74	999	0.78	1041	0.83	1080	0.87	1119	0.91	1157	0.96	1196	1.02	1233	1.08
2300	990	0.81	1032	0.86	1072	0.91	1111	0.95	1149	1.00	1187	1.06	1225	1.13	1261	1.19
2400	1025	0.90	1066	0.95	1105	1.00	1143	1.05	1181	1.11	1218	1.17	1255	1.24	1290	1.30

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A03								Kit A07							
1600	1125	0.64	1167	0.68	1206	0.72	1244	0.76	1281	0.80	1317	0.84	1353	0.88	1388	0.92
1700	1147	0.70	1187	0.75	1224	0.79	1261	0.83	1298	0.87	1333	0.91	1369	0.95	1404	0.99
1800	1170	0.77	1208	0.82	1244	0.87	1280	0.91	1316	0.95	1351	0.99	1386	1.03	1422	1.07
1900	1194	0.85	1230	0.90	1265	0.95	1301	1.00	1336	1.04	1371	1.08	1406	1.12	1441	1.16
2000	1218	0.94	1253	1.00	1287	1.05	1323	1.09	1358	1.14	1392	1.17	1427	1.21	1463	1.25
2100	1243	1.03	1277	1.09	1311	1.15	1346	1.19	1381	1.23	1415	1.27	1450	1.31	1486	1.34
2200	1268	1.14	1302	1.20	1336	1.25	1371	1.29	1405	1.33	1439	1.37	1474	1.40	1511	1.44
2300	1295	1.25	1328	1.30	1362	1.35	1397	1.39	1431	1.43	1465	1.47	1500	1.50	1537	1.54
2400	1324	1.36	1356	1.41	1390	1.46	1424	1.50	1458	1.53	1492	1.57	1527	1.61	1563	1.64

### 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A03									
1600	690	0.33	751	0.37	810	0.40	865	0.44	912	0.48	955	0.52	997	0.56	1041	0.60
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
1800	761	0.42	816	0.46	868	0.50	916	0.55	957	0.59	997	0.64	1038	0.68	1081	0.71
1900	795	0.48	848	0.52	897	0.56	942	0.61	981	0.66	1020	0.70	1060	0.74	1103	0.77
2000	830	0.53	879	0.58	926	0.63	968	0.68	1006	0.73	1044	0.77	1084	0.80	1126	0.84
2100	863	0.60	910	0.65	954	0.70	994	0.75	1032	0.80	1070	0.83	1110	0.87	1150	0.91
2200	895	0.67	939	0.73	982	0.78	1021	0.83	1058	0.87	1096	0.91	1135	0.95	1174	1.00
2300	926	0.75	969	0.81	1009	0.86	1048	0.90	1085	0.94	1122	0.99	1160	1.04	1197	1.09
2400	957	0.84	998	0.89	1038	0.94	1076	0.98	1112	1.03	1149	1.08	1185	1.14	1221	1.20

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A03								Kit A07							
1600	1086	0.63	1129	0.66	1171	0.70	1211	0.74	1249	0.78	1286	0.82	1321	0.86	1356	0.90
1700	1104	0.68	1147	0.72	1186	0.76	1225	0.80	1262	0.84	1298	0.88	1333	0.92	1367	0.96
1800	1124	0.74	1165	0.79	1202	0.83	1240	0.87	1276	0.91	1311	0.95	1345	0.99	1380	1.03
1900	1145	0.81	1183	0.85	1220	0.90	1256	0.94	1291	0.99	1326	1.03	1360	1.07	1393	1.10
2000	1167	0.88	1203	0.93	1237	0.98	1273	1.03	1307	1.07	1341	1.11	1375	1.15	1408	1.18
2100	1188	0.96	1222	1.02	1256	1.07	1291	1.12	1324	1.16	1358	1.20	1391	1.23	1424	1.27
2200	1210	1.05	1243	1.11	1275	1.17	1309	1.21	1343	1.25	1376	1.29	1409	1.33	1442	1.36
2300	1232	1.16	1263	1.22	1295	1.27	1329	1.31	1362	1.35	1395	1.39	1428	1.42	1462	1.45
2400	1254	1.26	1284	1.32	1317	1.37	1350	1.41	1383	1.45	1415	1.48	1448	1.52	1483	1.55



## BLOWER DATA - BELT DRIVE - KGB060

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, wet coil, etc.).

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

See page 41 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A03									
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
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
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
1900	858	0.41	892	0.45	927	0.50	962	0.55	999	0.60	1036	0.65	1074	0.69	1112	0.73
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
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
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
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
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

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A03								Kit A07							
1600	1093	0.60	1133	0.63	1173	0.67	1214	0.70	1253	0.73	1288	0.77	1318	0.81	1351	0.85
1700	1111	0.65	1150	0.69	1190	0.72	1230	0.76	1268	0.79	1301	0.83	1331	0.87	1363	0.92
1800	1130	0.71	1169	0.75	1208	0.78	1247	0.82	1285	0.86	1317	0.90	1345	0.94	1377	0.98
1900	1150	0.77	1188	0.81	1227	0.85	1267	0.88	1303	0.92	1333	0.97	1361	1.02	1392	1.06
2000	1172	0.84	1210	0.88	1248	0.92	1286	0.96	1321	1.00	1350	1.05	1377	1.10	1409	1.14
2100	1195	0.91	1233	0.95	1269	1.00	1306	1.04	1339	1.09	1367	1.14	1395	1.19	1426	1.23
2200	1218	0.99	1255	1.03	1290	1.09	1324	1.14	1356	1.19	1385	1.24	1413	1.28	1444	1.32
2300	1242	1.07	1277	1.13	1310	1.20	1343	1.26	1374	1.30	1403	1.34	1432	1.38	1464	1.42
2400	1267	1.16	1300	1.23	1332	1.31	1364	1.37	1394	1.41	1423	1.45	1453	1.48	1484	1.53

### 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	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished						Kit A03									
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
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
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
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
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
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
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
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
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

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A03								Kit A07							
1600	1063	0.58	1101	0.61	1141	0.64	1181	0.67	1222	0.70	1261	0.73	1298	0.77	1333	0.81
1700	1078	0.63	1117	0.66	1156	0.69	1196	0.72	1235	0.75	1273	0.79	1309	0.83	1344	0.87
1800	1094	0.68	1133	0.72	1172	0.75	1211	0.78	1250	0.81	1287	0.85	1322	0.90	1355	0.94
1900	1112	0.74	1151	0.77	1190	0.81	1228	0.84	1265	0.88	1301	0.92	1335	0.97	1367	1.01
2000	1131	0.80	1170	0.83	1208	0.87	1245	0.91	1281	0.96	1316	1.00	1349	1.04	1380	1.09
2100	1151	0.87	1189	0.90	1227	0.94	1263	0.99	1298	1.04	1331	1.08	1363	1.13	1394	1.17
2200	1173	0.94	1210	0.98	1246	1.02	1281	1.07	1315	1.12	1347	1.17	1379	1.22	1409	1.26
2300	1195	1.02	1231	1.06	1266	1.11	1300	1.16	1333	1.22	1364	1.27	1395	1.32	1424	1.36
2400	1217	1.10	1252	1.15	1286	1.20	1319	1.26	1351	1.32	1382	1.38	1411	1.43	1440	1.48



## BLOWER DATA - BELT DRIVE - KGA072S/KGB074S - DOWNFLOW

**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, wet coil, etc.).

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

See page 41 for blower motors and drives and wet coil and options/accessory air resistance data.

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished								Kit A04							
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
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
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
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
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
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
2500	1002	0.85	1039	0.91	1075	0.97	1112	1.03	1148	1.08	1184	1.13	1220	1.17	1257	1.21
2600	1032	0.95	1068	1.01	1105	1.07	1141	1.13	1177	1.17	1213	1.22	1248	1.26	1284	1.31
2700	1062	1.05	1099	1.11	1136	1.17	1172	1.22	1207	1.27	1242	1.32	1277	1.37	1312	1.43
2800	1094	1.16	1131	1.22	1167	1.27	1202	1.32	1237	1.38	1271	1.43	1305	1.49	1339	1.56
2900	1127	1.26	1163	1.32	1198	1.38	1233	1.44	1267	1.50	1300	1.56	1334	1.64	1367	1.71

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A04												Kit A08			
1900	1150	0.77	1188	0.81	1227	0.85	1267	0.88	1303	0.92	1333	0.97	1360	1.02	1392	1.06
2000	1172	0.84	1210	0.88	1248	0.92	1286	0.96	1321	1.00	1350	1.05	1377	1.10	1409	1.14
2100	1195	0.91	1233	0.95	1269	1.00	1306	1.04	1339	1.09	1367	1.14	1395	1.19	1426	1.23
2200	1218	0.99	1255	1.03	1290	1.09	1324	1.14	1356	1.19	1385	1.24	1413	1.28	1444	1.32
2300	1242	1.07	1277	1.13	1310	1.20	1343	1.26	1374	1.30	1403	1.34	1432	1.38	1464	1.42
2400	1267	1.16	1300	1.23	1332	1.31	1364	1.37	1394	1.41	1423	1.45	1453	1.48	1484	1.53
2500	1292	1.26	1324	1.34	1355	1.42	1387	1.48	1417	1.52	1445	1.56	1475	1.59	1506	1.64
2600	1318	1.38	1350	1.46	1380	1.55	1411	1.60	1440	1.64	1469	1.68	1498	1.71	1529	1.76
2700	1345	1.51	1376	1.60	1406	1.68	1436	1.73	1465	1.77	1493	1.80	1523	1.84	1553	1.88
2800	1372	1.65	1403	1.74	1433	1.82	1462	1.86	1490	1.90	1519	1.93	1548	1.97	1578	2.01
2900	1399	1.80	1430	1.89	1460	1.96	1489	2.00	1516	2.03	1544	2.06	1573	2.10	1603	2.14

## BLOWER DATA - BELT DRIVE - KGA072S/KGB074S - HORIZONTAL

**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, wet coil, etc.).

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

See page 41 for blower motors and drives and wet coil and options/accessory air resistance data.

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Field Furnished										Kit A04					
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
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
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
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
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
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
2500	955	0.80	989	0.86	1024	0.92	1061	0.98	1097	1.03	1133	1.08	1170	1.11	1205	1.15
2600	981	0.90	1016	0.96	1052	1.01	1088	1.07	1124	1.12	1160	1.16	1195	1.20	1230	1.25
2700	1009	0.99	1044	1.05	1080	1.11	1116	1.16	1152	1.21	1187	1.26	1221	1.30	1254	1.35
2800	1038	1.10	1073	1.16	1109	1.21	1145	1.26	1180	1.31	1214	1.36	1247	1.40	1279	1.46
2900	1068	1.20	1104	1.26	1139	1.31	1174	1.36	1208	1.41	1240	1.47	1273	1.52	1304	1.58
Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Kit A04												Kit A08			
1900	1112	0.74	1151	0.77	1190	0.81	1228	0.84	1265	0.88	1301	0.92	1335	0.97	1367	1.01
2000	1131	0.80	1170	0.83	1208	0.87	1245	0.91	1281	0.96	1316	1.00	1349	1.04	1380	1.09
2100	1151	0.87	1189	0.90	1227	0.94	1263	0.99	1298	1.04	1331	1.08	1363	1.13	1394	1.17
2200	1173	0.94	1210	0.98	1246	1.02	1281	1.07	1315	1.12	1347	1.17	1379	1.22	1409	1.26
2300	1195	1.02	1231	1.06	1266	1.11	1300	1.16	1333	1.22	1364	1.27	1395	1.32	1424	1.36
2400	1217	1.10	1252	1.15	1286	1.20	1319	1.26	1351	1.32	1382	1.38	1411	1.43	1440	1.48
2500	1240	1.20	1274	1.25	1307	1.31	1339	1.37	1370	1.43	1400	1.49	1428	1.55	1457	1.59
2600	1264	1.30	1297	1.35	1329	1.42	1360	1.49	1389	1.55	1418	1.61	1446	1.67	1475	1.72
2700	1287	1.40	1319	1.47	1350	1.54	1380	1.61	1409	1.68	1437	1.74	1465	1.79	1493	1.84
2800	1311	1.52	1342	1.59	1373	1.66	1402	1.74	1430	1.8	1457	1.87	1485	1.92	1513	1.97
2900	1335	1.65	1366	1.72	1395	1.79	1424	1.87	1451	1.94	1478	2.00	1505	2.05	1533	2.09

## BLOWER DATA - BELT DRIVE - KGB072H/KGB074H - DOWNFLOW

**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 41 for blower motors and drives and wet coil and options/accessory air resistance data.

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
	Field Furnished				Drive Kit AA01															
1900	480	0.38	512	0.44	545	0.51	579	0.57	614	0.63	648	0.7	683	0.76	719	0.83	752	0.89	781	0.95
2000	493	0.43	525	0.49	558	0.56	592	0.62	626	0.68	659	0.75	693	0.81	728	0.88	759	0.94	788	1
2100	507	0.48	539	0.54	572	0.61	605	0.67	639	0.74	671	0.8	704	0.86	737	0.93	768	0.99	795	1.04
2200	522	0.53	554	0.6	587	0.66	619	0.73	652	0.79	684	0.86	716	0.92	747	0.98	777	1.04	803	1.1
2300	537	0.59	569	0.65	602	0.72	634	0.79	666	0.85	697	0.91	728	0.98	758	1.04	786	1.1	812	1.15
2400	553	0.65	585	0.71	617	0.78	649	0.85	680	0.91	711	0.98	740	1.04	769	1.1	796	1.15	821	1.21
2500	570	0.71	602	0.78	633	0.84	665	0.91	695	0.97	725	1.04	753	1.1	781	1.16	807	1.22	832	1.27
2600	588	0.77	619	0.84	650	0.91	680	0.97	710	1.04	739	1.1	767	1.16	793	1.22	818	1.28	842	1.33
2700	607	0.84	637	0.91	667	0.97	697	1.04	726	1.11	753	1.17	780	1.23	806	1.29	830	1.35	854	1.4
2800	626	0.91	655	0.97	684	1.04	713	1.11	741	1.18	768	1.24	794	1.3	819	1.36	842	1.42	866	1.47
2900	646	0.98	674	1.05	702	1.11	730	1.18	757	1.25	783	1.32	808	1.38	832	1.44	855	1.49	878	1.54

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
	Drive Kit AA02				Drive Kit AA03															
1900	807	1	832	1.04	857	1.07	883	1.11	912	1.14	941	1.17	968	1.21	993	1.25	1017	1.29	1039	1.34
2000	813	1.04	838	1.08	862	1.12	889	1.15	917	1.19	945	1.22	972	1.26	997	1.3	1020	1.35	1042	1.4
2100	820	1.09	844	1.13	869	1.17	895	1.21	923	1.24	951	1.28	977	1.32	1001	1.36	1024	1.41	1046	1.46
2200	828	1.14	852	1.18	877	1.22	903	1.26	930	1.3	957	1.33	983	1.37	1006	1.42	1028	1.47	1050	1.53
2300	836	1.2	861	1.24	885	1.28	911	1.31	938	1.35	964	1.39	989	1.43	1012	1.48	1033	1.54	1054	1.6
2400	846	1.25	870	1.29	895	1.33	920	1.37	947	1.41	972	1.45	996	1.5	1018	1.55	1039	1.61	1059	1.67
2500	856	1.31	880	1.35	905	1.39	930	1.43	956	1.47	980	1.52	1003	1.57	1024	1.63	1044	1.69	1064	1.76
2600	866	1.38	891	1.42	915	1.46	940	1.5	965	1.54	988	1.59	1010	1.65	1031	1.71	1050	1.78	1069	1.84
2700	878	1.44	902	1.48	926	1.52	950	1.57	974	1.61	997	1.67	1018	1.73	1037	1.8	1056	1.87	1075	1.93
2800	889	1.51	913	1.55	937	1.59	961	1.64	984	1.69	1006	1.75	1026	1.82	1044	1.89	1063	1.96	1081	2.03
2900	902	1.58	925	1.63	949	1.67	972	1.72	994	1.78	1015	1.84	1034	1.91	1052	1.99	1069	2.06	1087	2.13

## BLOWER DATA - BELT DRIVE - KGB072H/KGB074H - HORIZONTAL

**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 41 for blower motors and drives and wet coil and options/accessory air resistance data.

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	
	Field		Drive Kit AA01																		AA02
1900	507	0.55	538	0.58	571	0.6	604	0.63	639	0.66	673	0.7	707	0.74	740	0.78	772	0.82	802	0.86	
2000	522	0.59	554	0.62	586	0.64	620	0.67	653	0.71	687	0.74	720	0.78	752	0.82	783	0.87	812	0.91	
2100	539	0.63	571	0.66	603	0.69	636	0.72	669	0.75	702	0.79	734	0.83	765	0.88	795	0.92	823	0.97	
2200	557	0.68	588	0.71	620	0.74	652	0.77	685	0.81	717	0.84	748	0.89	778	0.93	807	0.98	834	1.03	
2300	576	0.73	607	0.76	638	0.79	670	0.83	701	0.86	733	0.9	763	0.95	792	0.99	820	1.04	846	1.09	
2400	596	0.79	626	0.82	657	0.85	688	0.89	718	0.92	749	0.96	778	1.01	806	1.06	833	1.11	858	1.16	
2500	616	0.85	645	0.88	676	0.91	706	0.95	736	0.99	765	1.03	794	1.08	821	1.13	847	1.18	871	1.23	
2600	636	0.91	665	0.94	695	0.98	724	1.02	754	1.06	782	1.1	809	1.15	836	1.2	861	1.25	885	1.3	
2700	657	0.97	685	1.01	714	1.04	743	1.08	771	1.13	799	1.17	826	1.22	851	1.27	875	1.32	899	1.37	
2800	677	1.03	706	1.07	734	1.11	762	1.16	790	1.2	816	1.25	842	1.3	867	1.35	890	1.4	913	1.45	
2900	698	1.1	726	1.14	754	1.19	781	1.23	808	1.28	834	1.33	859	1.38	883	1.43	906	1.48	928	1.54	

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
	Drive Kit AA02				Drive Kit AA03															
1900	830	0.91	857	0.95	883	0.99	910	1.04	937	1.09	964	1.13	991	1.18	1017	1.23	1042	1.28	1067	1.34
2000	839	0.96	865	1	891	1.05	917	1.09	944	1.14	970	1.19	996	1.24	1022	1.29	1047	1.34	1071	1.4
2100	849	1.02	874	1.06	900	1.11	926	1.15	952	1.2	978	1.25	1003	1.3	1028	1.35	1052	1.41	1075	1.46
2200	860	1.08	885	1.12	910	1.17	935	1.21	960	1.26	986	1.31	1010	1.36	1034	1.42	1058	1.48	1081	1.53
2300	871	1.14	895	1.19	920	1.23	945	1.28	969	1.33	994	1.38	1018	1.43	1042	1.49	1065	1.55	1087	1.61
2400	883	1.21	907	1.25	931	1.3	955	1.35	979	1.4	1003	1.45	1027	1.51	1050	1.57	1072	1.63	1094	1.69
2500	895	1.28	919	1.32	942	1.37	966	1.42	990	1.48	1013	1.53	1036	1.59	1059	1.65	1081	1.71	1102	1.78
2600	908	1.35	931	1.4	955	1.45	978	1.5	1001	1.56	1024	1.62	1046	1.68	1068	1.74	1089	1.8	1110	1.87
2700	922	1.43	945	1.48	967	1.53	990	1.59	1013	1.65	1035	1.71	1056	1.77	1078	1.84	1099	1.9	1119	1.96
2800	936	1.51	958	1.56	980	1.62	1003	1.68	1025	1.74	1046	1.8	1067	1.87	1088	1.93	1109	2	1129	2.06
2900	950	1.6	972	1.66	994	1.72	1016	1.78	1037	1.84	1058	1.91	1079	1.97	1099	2.04	1119	2.11	1139	2.17

## BLOWER DATA - BELT DRIVE - KGA090 - DOWNFLOW

**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, wet coil, etc.).

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

See page 41 for blower motors and drives and wet coil and options/accessory air resistance data.

Air Volume cfm	External Static - in. w.g.																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Drive Kit AA01										Drive Kit AA02						AA03			
2400	621	0.71	652	0.76	684	0.81	716	0.86	746	0.92	776	0.97	805	1.02	830	1.08	855	1.14	879	1.19
2500	642	0.77	673	0.82	704	0.87	734	0.93	764	0.98	793	1.04	820	1.09	845	1.15	868	1.21	892	1.27
2600	665	0.82	694	0.88	724	0.93	753	0.99	782	1.05	810	1.11	835	1.17	859	1.23	883	1.29	907	1.34
2700	688	0.89	716	0.94	744	1.00	773	1.06	800	1.13	827	1.19	851	1.25	875	1.31	898	1.37	922	1.42
2800	710	0.95	738	1.02	765	1.08	792	1.15	818	1.21	844	1.28	868	1.34	891	1.40	914	1.45	938	1.51
2900	733	1.03	759	1.10	785	1.17	811	1.24	836	1.30	861	1.37	885	1.43	908	1.49	931	1.54	954	1.59
3000	754	1.12	779	1.19	805	1.26	830	1.33	855	1.40	879	1.46	902	1.52	925	1.58	948	1.63	970	1.69
3100	775	1.22	800	1.29	824	1.36	849	1.43	873	1.50	897	1.56	920	1.62	942	1.67	964	1.73	987	1.78
3200	796	1.32	820	1.39	844	1.47	868	1.53	892	1.60	915	1.66	937	1.72	959	1.77	981	1.83	1002	1.88
3300	816	1.43	840	1.50	863	1.57	887	1.64	910	1.70	933	1.76	955	1.82	976	1.88	997	1.93	1018	1.99
3400	837	1.54	860	1.61	883	1.68	906	1.75	929	1.81	951	1.87	972	1.93	993	1.98	1013	2.05	1033	2.11
3500	858	1.66	881	1.73	903	1.79	926	1.86	948	1.92	969	1.98	990	2.04	1009	2.10	1029	2.17	1048	2.24
3600	879	1.77	901	1.84	923	1.91	945	1.97	966	2.04	987	2.10	1006	2.16	1025	2.23	1044	2.30	1062	2.38

Air Volume cfm	External Static - in. w.g.																			
	0.90		1.00		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Drive Kit AA03																	AA04		
2400	904	1.25	929	1.29	956	1.34	982	1.39	1008	1.43	1032	1.49	1056	1.55	1078	1.62	1099	1.68	1121	1.75
2500	917	1.32	942	1.37	968	1.41	994	1.46	1020	1.51	1044	1.57	1066	1.64	1088	1.70	1108	1.77	1130	1.84
2600	931	1.39	957	1.44	982	1.49	1008	1.54	1032	1.60	1055	1.66	1077	1.73	1098	1.80	1118	1.87	1139	1.94
2700	946	1.47	971	1.52	996	1.57	1021	1.63	1045	1.69	1067	1.76	1088	1.83	1108	1.91	1127	1.98	1148	2.05
2800	962	1.56	986	1.61	1011	1.66	1034	1.72	1057	1.79	1079	1.86	1099	1.94	1118	2.02	1137	2.09	1158	2.16
2900	978	1.65	1001	1.70	1025	1.75	1048	1.82	1069	1.89	1090	1.98	1109	2.06	1128	2.14	1147	2.22	1167	2.28
3000	993	1.74	1016	1.79	1039	1.86	1061	1.93	1081	2.01	1101	2.10	1120	2.18	1138	2.27	1157	2.34	1177	2.41
3100	1009	1.84	1031	1.90	1052	1.97	1073	2.05	1093	2.13	1112	2.22	1130	2.31	1148	2.40	1167	2.47	1187	2.53
3200	1024	1.94	1045	2.01	1065	2.09	1085	2.17	1104	2.26	1123	2.36	1141	2.45	1159	2.53	1178	2.60	1198	2.66
3300	1038	2.06	1058	2.13	1078	2.22	1097	2.31	1116	2.40	1134	2.49	1152	2.58	1170	2.66	1189	2.73	1209	2.79
3400	1053	2.19	1072	2.27	1091	2.35	1109	2.45	1127	2.54	1145	2.63	1163	2.72	1181	2.79	1200	2.86	1220	2.92
3500	1067	2.32	1085	2.41	1103	2.50	1121	2.59	1138	2.69	1156	2.78	1174	2.85	1192	2.93	1212	2.99	1231	3.05
3600	1081	2.46	1098	2.55	1116	2.64	1133	2.74	1151	2.83	1168	2.91	1186	2.99	1205	3.06	1224	3.12	1243	3.17

## BLOWER DATA - BELT DRIVE - KGA090 - HORIZONTAL

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, wet coil, etc.).

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

See page 41 for blower motors and drives and wet coil and options/accessory air resistance data.

Air Volume cfm	External Static - in. w.g.																			
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Drive Kit AA01																Drive Kit AA02			
2400	572	0.75	602	0.78	633	0.81	664	0.85	695	0.88	725	0.92	755	0.97	784	1.01	811	1.06	836	1.11
2500	591	0.80	620	0.83	650	0.87	680	0.90	711	0.94	740	0.98	769	1.03	797	1.08	823	1.13	847	1.18
2600	610	0.86	639	0.89	668	0.92	697	0.96	727	1.00	755	1.05	783	1.09	810	1.14	835	1.20	859	1.25
2700	630	0.91	658	0.95	686	0.98	715	1.02	743	1.07	771	1.11	798	1.16	824	1.22	848	1.27	872	1.32
2800	650	0.97	677	1.01	705	1.05	732	1.09	760	1.14	787	1.19	813	1.24	838	1.30	861	1.35	885	1.40
2900	670	1.03	697	1.07	724	1.11	750	1.16	777	1.21	803	1.27	828	1.32	852	1.38	876	1.44	898	1.49
3000	691	1.09	717	1.14	743	1.18	769	1.24	794	1.29	819	1.35	844	1.42	868	1.47	890	1.53	913	1.58
3100	712	1.16	737	1.21	762	1.27	787	1.32	812	1.39	836	1.45	860	1.51	883	1.57	906	1.63	928	1.68
3200	732	1.24	756	1.30	781	1.36	805	1.42	829	1.48	853	1.55	876	1.61	899	1.67	921	1.73	943	1.78
3300	752	1.33	776	1.39	799	1.46	823	1.52	847	1.59	870	1.65	893	1.71	916	1.77	937	1.83	959	1.88
3400	772	1.43	795	1.50	818	1.56	842	1.63	865	1.69	888	1.76	910	1.82	932	1.88	953	1.93	974	1.99
3500	792	1.54	815	1.61	838	1.67	861	1.74	883	1.80	906	1.87	928	1.93	949	1.98	970	2.04	990	2.10
3600	812	1.65	834	1.72	857	1.79	880	1.85	902	1.92	924	1.98	945	2.04	966	2.10	986	2.16	1005	2.22
Air Volume cfm	External Static - in. w.g.																			
	0.90		1.00		1.30		1.40		1.50		1.60		1.70		1.80		1.90		2.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
	Drive Kit AA02																Drive Kit AA03			
2400	861	1.16	886	1.21	911	1.26	937	1.30	963	1.35	988	1.41	1012	1.47	1034	1.53	1055	1.59	1076	1.65
2500	872	1.23	896	1.27	921	1.32	947	1.37	972	1.43	997	1.48	1019	1.55	1041	1.61	1061	1.68	1081	1.74
2600	883	1.30	908	1.35	933	1.40	958	1.45	982	1.50	1006	1.57	1027	1.63	1048	1.70	1068	1.77	1087	1.83
2700	895	1.37	920	1.42	944	1.47	969	1.53	992	1.59	1015	1.65	1036	1.72	1056	1.79	1075	1.86	1094	1.92
2800	908	1.45	932	1.50	956	1.56	980	1.62	1003	1.68	1025	1.75	1045	1.82	1064	1.89	1083	1.96	1102	2.02
2900	922	1.54	945	1.59	969	1.65	992	1.71	1014	1.78	1035	1.85	1055	1.92	1074	2.00	1092	2.07	1111	2.13
3000	936	1.63	959	1.68	982	1.74	1004	1.81	1026	1.88	1046	1.96	1065	2.03	1084	2.11	1102	2.18	1120	2.25
3100	950	1.73	973	1.78	995	1.85	1017	1.91	1037	1.99	1057	2.07	1076	2.15	1094	2.23	1112	2.31	1130	2.38
3200	965	1.83	987	1.89	1008	1.95	1029	2.03	1049	2.11	1068	2.19	1087	2.28	1105	2.36	1123	2.44	1141	2.51
3300	980	1.94	1001	2.00	1022	2.07	1042	2.15	1061	2.23	1080	2.32	1098	2.41	1116	2.50	1134	2.58	1152	2.65
3400	995	2.05	1015	2.12	1035	2.19	1054	2.28	1073	2.37	1092	2.46	1110	2.55	1128	2.64	1145	2.72	1163	2.79
3500	1010	2.17	1029	2.24	1048	2.32	1067	2.41	1086	2.51	1104	2.60	1122	2.70	1139	2.78	1157	2.86	1174	2.93
3600	1024	2.30	1043	2.38	1062	2.46	1080	2.55	1098	2.65	1116	2.75	1133	2.84	1151	2.93	1168	3.01	1186	3.08
	Drive Kit AA03																Drive Kit AA04			

## BLOWER DATA

### BELT DRIVE KIT SPECIFICATIONS - 036-072S

Model No.	Motor HP		No. of Speeds	Drive Kits and RPM Range							
	Nominal	Maximum		A01	A02	A03	A04	A05	A06	A07	A08
036	0.75	0.86	1	673-1010	---	---	---	897-1346	---	---	---
	1	1.15	1	673-1010	---	---	---	897-1346	---	---	---
	1.5	1.7	1	673-1010	---	---	---	897-1346	---	---	---
	2	2.3	1	673-1010	---	---	---	897-1346	---	---	---
048	0.75	0.86	1	---	745-1117	---	---	---	1071-1429	---	---
	1	1.15	1	---	745-1117	---	---	---	1071-1429	---	---
	1.5	1.7	1	---	745-1117	---	---	---	1071-1429	---	---
	2	2.3	1	---	745-1117	---	---	---	1071-1429	---	---
060	0.75	0.86	1	---	---	833-1250	---	---	---	1212-1548	---
	1	1.15	1	---	---	833-1250	---	---	---	1212-1548	---
	1.5	1.7	1	---	---	833-1250	---	---	---	1212-1548	---
	2	2.3	1	---	---	833-1250	---	---	---	1212-1548	---
072S	1	1.5	1	---	---	---	968-1340	---	---	---	1193-1591
	2	2.3	1	---	---	---	968-1340	---	---	---	1193-1591
074S	1	1.5	2	---	---	---	968-1340	---	---	---	1193-1591
	2	2.3	2	---	---	---	968-1340	---	---	---	1193-1591

### BELT DRIVE KIT SPECIFICATIONS - 072H/074H/090

Model No.	Motor HP		No. of Speeds	Drive Kits and RPM Range			
	Nominal	Maximum		AA01	AA02	AA03	AA04
072H	1	1.15	1	522-784	632-875	798-1105	---
	2	2.3	1	522-784	632-875	798-1105	---
074H	1	1.15	2	522-784	632-875	798-1105	---
	2	2.3	2	522-784	632-875	798-1105	---
090	1	1.15	1	522-784	---	---	---
	2	2.3	1	---	632-875	798-1105	---
	3	3.45	1	---	---	---	921-1228

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

### OPTIONS / ACCESSORIES AIR RESISTANCE FOR 024-074 MODELS - in. w.g.

Air Volume cfm	Wet Indoor Coil			Gas Heat		Economizer	Filters	
	036-048	060	072/074	Medium Input	High Input		MERV 8	MERV 13
800	0.01	0.01	0.01	0.02	0.02	0.04	0.04	0.05
1000	0.02	0.02	0.01	0.02	0.02	0.04	0.04	0.07
1200	0.03	0.04	0.02	0.02	0.02	0.04	0.04	0.07
1400	0.04	0.05	0.03	0.02	0.03	0.04	0.04	0.07
1600	0.05	0.06	0.04	0.03	0.04	0.04	0.04	0.07
1800	0.06	0.07	0.05	0.03	0.05	0.05	0.05	0.07
2000	0.08	0.09	0.06	0.04	0.06	0.05	0.05	0.08
2200	0.09	0.10	0.07	0.04	0.07	0.05	0.05	0.08
2400	0.10	0.12	0.08	0.05	0.08	0.05	0.05	0.08
2600	0.11	0.13	0.09	0.05	0.09	0.06	0.05	0.08
2800	0.13	0.15	0.10	0.06	0.10	0.06	0.05	0.08
3000	0.14	0.16	0.12	0.07	0.11	0.06	0.05	0.08

### OPTIONS / ACCESSORIES AIR RESISTANCE FOR 090 MODELS - in. w.g.

Air Volume cfm	Wet Indoor Coil	Gas Heat High Input	Economizer	Filters	
				MERV 8	MERV 13
2400	0.08	0.03	0.05	0.05	0.08
2600	0.09	0.04	0.06	0.05	0.08
2800	0.10	0.04	0.06	0.05	0.08
3000	0.11	0.04	0.06	0.05	0.08
3200	0.12	0.04	0.06	0.06	0.09
3400	0.14	0.05	0.06	0.06	0.09
3600	0.15	0.05	0.06	0.06	0.10



**ELECTRICAL DATA - KGB** **2 - 2.5 TON**

DIRECT DRIVE BLOWER		KGB024S	KGB030S
<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph	208/230V - 1 Ph
Compressor	Rated Load Amps	9.8	12.7
	Locked Rotor Amps	47	64
Outdoor Fan Motor	Full Load Amps	1.7	1.7
Service Outlet 115V GFI (amps)		15	15
Indoor Blower Motor	Horsepower	0.25	0.25
	Type	Direct	Direct
	Full Load Amps	1.8	1.8
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	25	30
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	16	20

**ELECTRICAL ACCESSORIES**

Disconnect	Standard Access	20W17	20W17
	Hinged Access	20W23	20W23

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.  
<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.  
<sup>2</sup> HACR type breaker or fuse.  
<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGB** **3 TON**

**KGB036S - DIRECT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	15.3	8.7	4	3.6
	Locked Rotor Amps	70	70	31	27
Outdoor Fan Motor	Full Load Amps	1.7	1.7	1.1	0.7
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	15	20
Indoor Blower Motor	Horsepower	0.5	0.5	0.5	0.5
	Type	Direct	Direct	Direct	Direct
	Full Load Amps	3.9	3.9	2	2
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	40	25	15	15
	with (1) 0.33 HP Power Exhaust	40	25	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	25	17	9	8
	with (1) 0.33 HP Power Exhaust	28	19	10	9

**ELECTRICAL ACCESSORIES**

Disconnect	Standard Access	20W17	20W17	20W17	20W17
	Hinged Access	20W23	20W23	20W23	20W23

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.  
<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.  
<sup>2</sup> HACR type breaker or fuse.  
<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGB****4 TON****KGB048S - DIRECT DRIVE BOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	20	11	5.5	4.7
	Locked Rotor Amps	99	86	37	34
Outdoor Fan Motor	Full Load Amps	1.7	1.7	1.1	0.7
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	1.3	1
Indoor Blower Motor	Horsepower	0.5	0.5	0.5	0.5
	Type	Direct	Direct	Direct	Direct
	Full Load Amps	3.9	3.9	2	2
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	30	15	15
	with (1) 0.33 HP Power Exhaust	50	30	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	31	20	10	9
	with (1) 0.33 HP Power Exhaust	33	22	12	10

**ELECTRICAL ACCESSORIES**

Disconnect	Standard Access	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>
	Hinged Access	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGB****5 TON****KGB060S - DIRECT DRIVE BOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph	208/230V - 3 Ph	460V - 3 Ph	575V - 3 Ph
Compressor	Rated Load Amps	22.1	13.5	8	5
	Locked Rotor Amps	125	109	59	40
Outdoor Fan Motor	Full Load Amps	2.4	2.4	1.3	1
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4	2.4	1.3	1
Service Outlet 115V GFI (amps)		15	15	15	20
Indoor Blower Motor	Horsepower	0.75	0.75	0.75	0.75
	Type	Direct	Direct	Direct	Direct
	Full Load Amps	4.9	4.9	2.5	2.5
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	35	20	15
	with (1) 0.33 HP Power Exhaust	50	40	20	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	35	25	14	10
	with (1) 0.33 HP Power Exhaust	38	27	16	11

**ELECTRICAL ACCESSORIES**

Disconnect	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGB****3 TON****KGB036S - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	15.3		8.7		4		3.6	
	Locked Rotor Amps	70		70		31		27	
Outdoor Fan Motor	Full Load Amps	1.7		1.7		1.1		0.7	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15		20	
Indoor Blower Motor	Horsepower	0.75	1.5	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	7.6	11	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	40	45	25	25	15	15	15	15
	with (1) 0.33 HP Power Exhaust	45	45	25	30	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	29	32	18	21	9	10	7	8
	with (1) 0.33 HP Power Exhaust	31	35	20	23	10	11	8	9

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>
	Hinged Access	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGB****4 TON****KGB048S - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	20		11		5.5		4.7	
	Locked Rotor Amps	99		86		37		34	
Outdoor Fan Motor	Full Load Amps	1.7		1.7		1.1		0.7	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15		20	
Indoor Blower Motor	Horsepower	0.75	1.5	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	7.6	11	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	50	30	30	15	15	15	15
	with (1) 0.33 HP Power Exhaust	50	60	30	35	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	35	38	21	23	11	12	9	10
	with (1) 0.33 HP Power Exhaust	37	41	23	26	12	13	10	11

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>
	Hinged Access	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGB****5 TON****KGB060S - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	22.1		13.5		8		5	
	Locked Rotor Amps	125		109		59		40	
Outdoor Fan Motor	Full Load Amps	2.4		2.4		1.3		1	
Power Exhaust (1) 0.33 HP	Full Load Amps	2.4		2.4		1.3		1	
Service Outlet 115V GFI (amps)		15		15		15		20	
Indoor Blower Motor	Horsepower	0.75	1.5	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	7.6	11	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	60	35	40	20	20	15	15
	with (1) 0.33 HP Power Exhaust	60	60	35	40	20	20	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	38	42	24	27	14	15	9	10
	with (1) 0.33 HP Power Exhaust	41	44	27	30	15	16	10	11

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGB****6 TON****KGB072H HIGH EFFICIENCY - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	19.6		8.2		6.6	
	Locked Rotor Amps	136		66.1		55.3	
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		20	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	50	20	20	15	15
	with (1) 0.33 HP Power Exhaust	50	50	20	20	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	32	32	13	14	10	11
	with (1) 0.33 HP Power Exhaust	34	35	14	15	11	12

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGB****6 TON****KGB074S STANDARD EFFICIENCY - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	17.6		8.5		6.3	
	Locked Rotor Amps	136		66.1		55.3	
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		20	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	45	45	20	20	15	15
	with (1) 0.33 HP Power Exhaust	45	50	20	25	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	29	32	15	16	11	12
	with (1) 0.33 HP Power Exhaust	32	35	16	17	12	13

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGB****6 TON****KGB074H HIGH EFFICIENCY - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	17.6		8.5		6.3	
	Locked Rotor Amps	136		66.1		55.3	
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		20	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	45	45	20	20	15	15
	with (1) 0.33 HP Power Exhaust	45	50	20	25	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	29	32	15	16	11	12
	with (1) 0.33 HP Power Exhaust	32	35	16	17	12	13

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGA****3 TON****KGA036S - DIRECT AND BELT DRIVE**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor	Rated Load Amps	8.7			4			3.6		
	Locked Rotor Amps	70			31			27		
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			20		
Indoor Blower Motor	Horsepower	0.5	1	2	0.5	1	2	0.5	1	2
	Type	Direct	Belt	Belt	Direct	Belt	Belt	Direct	Belt	Belt
	Full Load Amps	3.9	4.6	7.5	2	2.1	3.4	2	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	25	25	25	15	15	15	15	15	15
	with (1) 0.33 HP Power Exhaust	25	25	30	15	15	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	17	18	21	9	9	10	8	7	8
	with (1) 0.33 HP Power Exhaust	19	20	23	10	10	11	9	8	9

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>
	Hinged Access	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGA****4 TON****KGA048S - DIRECT AND BELT DRIVE**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor	Rated Load Amps	11			5.5			4.7		
	Locked Rotor Amps	86			37			34		
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)										
Indoor Blower Motor	Horsepower	0.5	1	2	0.5	1	2	0.5	1	2
	Type	Direct	Belt	Belt	Direct	Belt	Belt	Direct	Belt	Belt
	Full Load Amps	3.9	4.6	7.5	2	2.1	3.4	2	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	30	30	30	15	15	15	15	15	15
	with (1) 0.33 HP Power Exhaust	30	30	35	15	15	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	20	21	23	10	11	13	12	9	10
	with (1) 0.33 HP Power Exhaust	22	23	26	12	12	13	10	10	11

**ELECTRICAL ACCESSORIES**

<b>Disconnect</b>	Standard Access	<b>20W17</b>	<b>20W17</b>	<b>20W17</b>
	Hinged Access	<b>20W23</b>	<b>20W23</b>	<b>20W23</b>

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

**ELECTRICAL DATA - KGA****5 TON****KGA060S - DIRECT AND BELT DRIVE**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
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			20		
Indoor Blower Motor	Horsepower	0.75	1	2	0.75	1	2	0.75	1	2
	Type	Direct	Belt	Belt	Direct	Belt	Belt	Direct	Belt	Belt
	Full Load Amps	4.9	4.6	7.5	2.5	2.1	3.4	2.5	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	35	35	40	20	20	20	15	15	15
	with (1) 0.33 HP Power Exhaust	40	35	40	20	20	20	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	25	24	27	14	14	15	10	9	10
	with (1) 0.33 HP Power Exhaust	27	27	30	16	15	16	11	10	11

**ELECTRICAL ACCESSORIES**

Disconnect	Standard Access	<b>20W17</b>			<b>20W17</b>			<b>20W17</b>		
	Hinged Access	<b>20W23</b>			<b>20W23</b>			<b>20W23</b>		

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.**ELECTRICAL DATA - KGA****6 TON****KGA072S - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	19.6		8.2		6.6	
	Locked Rotor Amps	136		66.1		55.3	
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		20	
Indoor Blower Motor	Horsepower	1	2	1	2	1	2
	Type	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	4.6	7.5	2.1	3.4	1.7	2.7
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	50	20	20	15	15
	with (1) 0.33 HP Power Exhaust	50	50	20	20	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	32	35	14	15	11	12
	with (1) 0.33 HP Power Exhaust	34	37	15	17	12	13

**ELECTRICAL ACCESSORIES**

Disconnect Kit	Standard Access	<b>20W20</b>		<b>20W20</b>		<b>20W20</b>	
	Hinged Access	<b>20W26</b>		<b>20W26</b>		<b>20W26</b>	

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.



**ELECTRICAL DATA - KGA****7.5 TON****KGA090S - BELT DRIVE BLOWER**

<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Outdoor Fan Motors (1)	Full Load Amps (total)	2.4			1.3			1		
Power Exhaust (1) 0.33 HP	Full Load Amps (total)	2.4			1.3			1		
Service Outlet 115V GFI		15			15			20		
Indoor Blower Motor	Horsepower	1	2	3	1	2	3	1	2	3
	Type	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt	Belt
	Full Load Amps	4.6	7.5	10.6	2.1	3.4	4.8	1.7	2.7	3.9
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	60	60	60	30	30	30	20	20	25
	with (1) 0.33 HP Power Exhaust	60	60	70	30	30	30	20	20	25
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	39	42	45	19	20	22	14	15	17
	with (1) 0.33 HP Power Exhaust	41	44	47	20	22	23	15	16	18

**ELECTRICAL ACCESSORIES**

Disconnect Kit	Standard Access	<b>20W20</b>	<b>20W20</b>	<b>20W20</b>
	Hinged Access	<b>20W26</b>	<b>20W26</b>	<b>20W26</b>

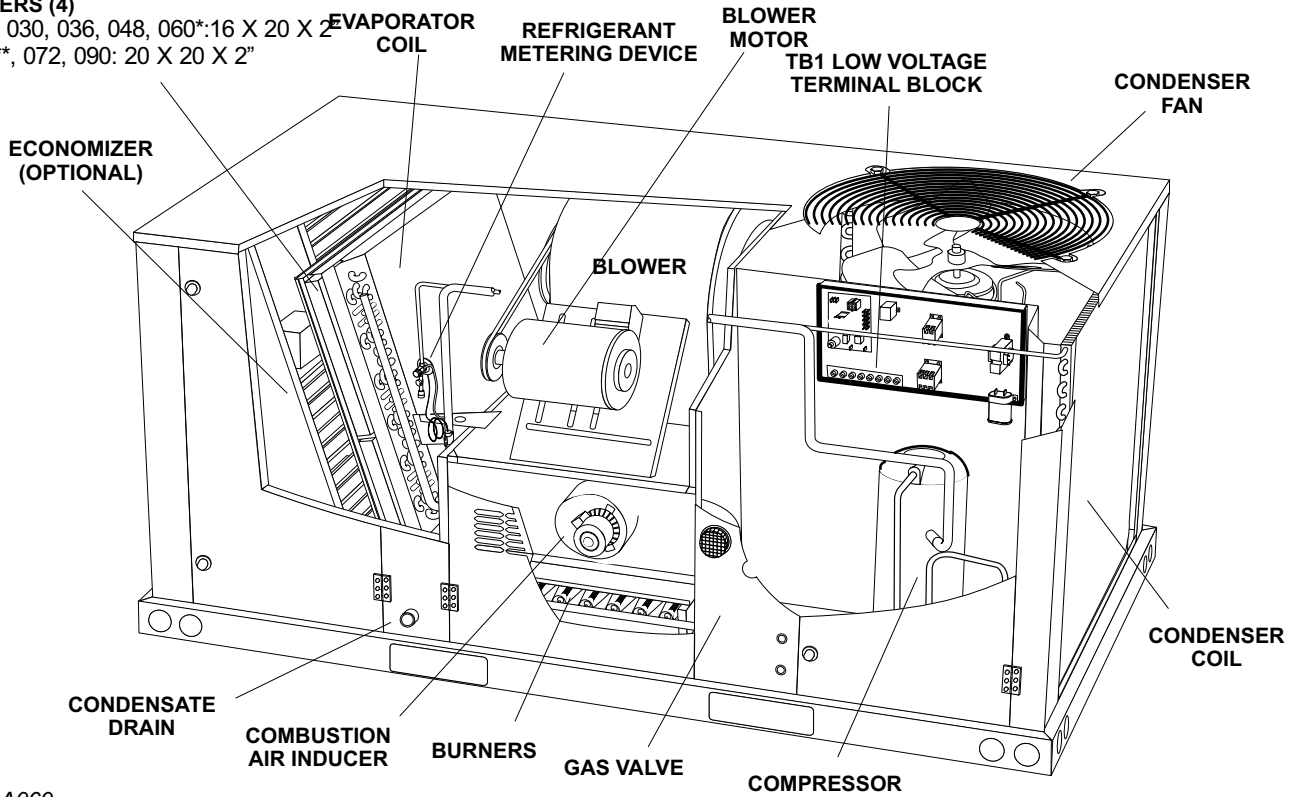
NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

## KGA/KGB PARTS ARRANGEMENT

**FILTERS (4)**

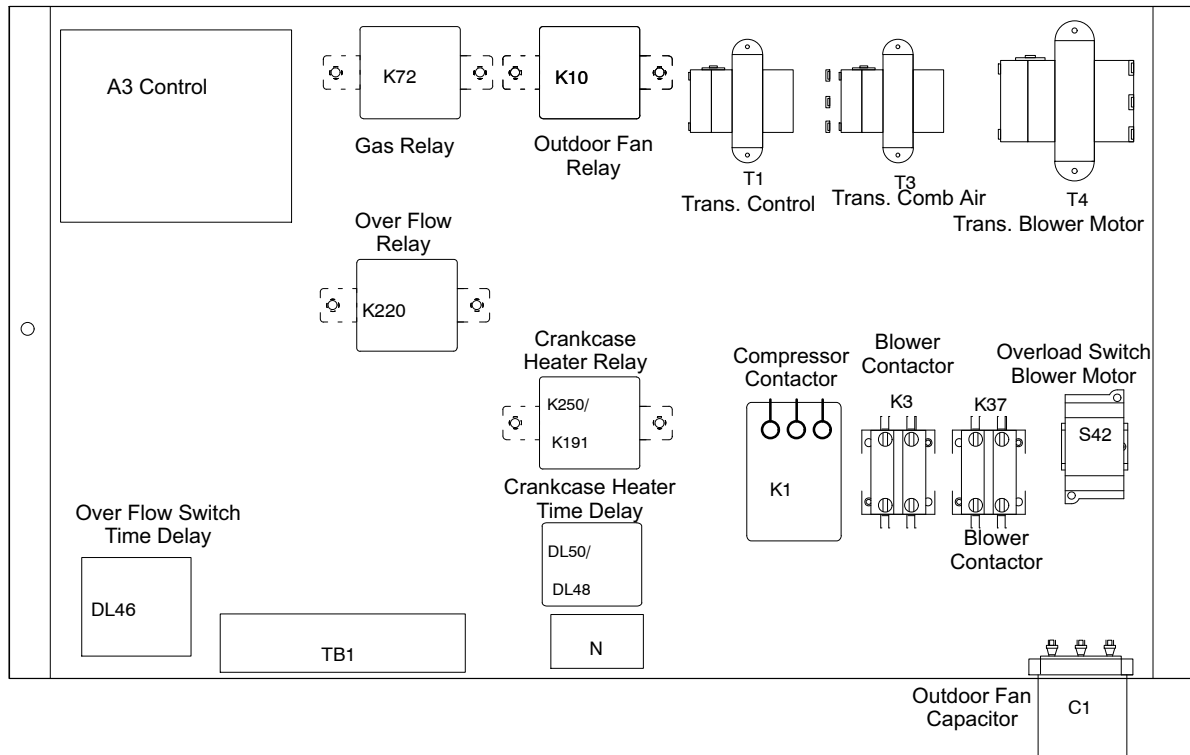
024, 030, 036, 048, 060\*: 16 X 20 X 2"  
 060\*\*, 072, 090: 20 X 20 X 2"



\*KGA060  
 \*\*KGB060

**FIGURE 1**

## KGA/KGB CONTROL BOX



**FIGURE 2**

## I-UNIT COMPONENTS

All 2 through 7-1/2 ton (7 through 21 kW) units are built to order units (BTO). The KGA/KGB 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

KGA/KGB 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.

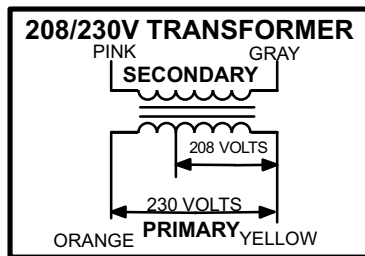


FIGURE 3

#### 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 (J voltage)

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

#### 4-Terminal Strip TB1

All indoor thermostat connections will be to TB1 located in the control box. Thermostats without "occupied" and "unoccupied" modes and installed with economizer or motorized outdoor air equipped units, should have a jumper across terminals "R" and "OC".

#### 5-Fan Capacitor C1 (three phase)

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

#### 6-Dual Capacitor C12 (single phase)

A single dual capacitor is used for both the outdoor fan and compressor (see unit diagram). The fan side and the compressor side have different MFD ratings. See side of capacitor for ratings.

#### 7-Compressor Contactor K1

In all KGA/KGB units, K1 energizes compressors B1 in response to thermostat 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.

#### 8-Blower Delay DL3 &DL50 -074 Only

When second stage heat demand is satisfied DL3 causes a 180 second blower off delay.

DL50 causes a 1.5 second delay switching from high speed to low speed.

#### 9-Relay K239 -074 Units Only

Relay K239 sends the Y1 demand "G" signal to K3 (through K250) to energize the blower on low speed and also sends the "W1" demand "G" signal to K37 (through K250) to energize the blower on high speed.

#### 10-Relay K250 -074 Units Only

Relay K250 passes the "G" signal to contactor K3 energizing the blower on low speed. On a Y2 call K250 passes the signal to K37 energizing the blower on high speed and internal solenoid L34 energizing the compressor on high speed.

#### 11-Blower Contactor K37 (074 only)

On two-speed operation K37 acts as the high speed blower contactor and K3 acts as the low speed contactor in response to blower demand.

#### 12-Blower Contactor K3

On three phase units, K3 is a two pole double-break contactor with a 24VAC coil and on single phase units is a single pole double break contactor with a 24 volt coil. K3 energizes the indoor blower motor B3 in response to blower demand.

#### 13-Condenser Fan Relay K10 (G, J voltage)

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

## 14-Crankcase Heater Delay DL48 & Crankcase Heater Relay K191

Delay DL48 and relay K191 keep crankcase heater de-energized during and immediately following compressor shut down. They ensure the crankcase heater is off while compressor is energized.

## 15-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.

## 16-Burner Control A3

<b>⚠ WARNING</b>	
	<b>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.</b>

The main control box (see figure 2) houses the burner control A3.

The ignition control provides four main functions: gas valve control, blower control, ignition, and flame sensing. The control has a green LED to show control status (table 1). 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 removing power from the control for more than 1 second or removing the thermostat call for heat for more than 1 second but no more than 20 seconds. 24 volt thermostat connections (P2) and heating component connections (J1) are made through separate jackplugs. See table 2 for thermostat terminations and table 3 for heating component terminations.

Flame rectification sensing is used on all 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.

**TABLE 1**

LED	STATUS
Slow Flash	Normal operation. No call for heat.
Fast Flash	Normal operation. Call for heat.
Steady Off	Internal Control Fault, No Power To Board or Gas Valve Relay Fault
Steady On	Control Internal Failure.
2 Flashes	Lockout. Failed to detect or sustain flame.
3 Flashes	Rollout switch open / Prove switch open or closed.
4 Flashes	Primary High Limit switch open.
5 Flashes	Flame sensed but gas valve not open.

**TABLE 2**

P2 TERMINAL DESIGNATIONS	
Pin #	Function
1	R 24 Volts to thermostat
2	W1 Heat Demand
3	Y Cool Demand
4	C Common
5	G Indoor Blower
6	BL OUT Indoor Blower Relay
7	W2 Second Stage Heat

**TABLE 3**

J1 TERMINAL DESIGNATIONS	
Pin #	Function
1	Limit Switch Out
2	Rollout Switch / Prove Switch Out
3	Gas Valve Common
4	Gas Valve Out
5	Rollout Switch / Prove Switch In
6	Limit Switch In

### Operation

On a heating demand, the ignition control checks for a closed limit switch and open combustion air prove 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. Once the gas valve is energized the non-adjustable 40 second indoor blower delay period begins. Sparking stops immediately after flame is sensed or at the end of the 8 second trial for ignition.

The 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 and the gas valve is de-energized, a combustion air inducer post purge period of 5 seconds begins along with a 120 second blower off delay.

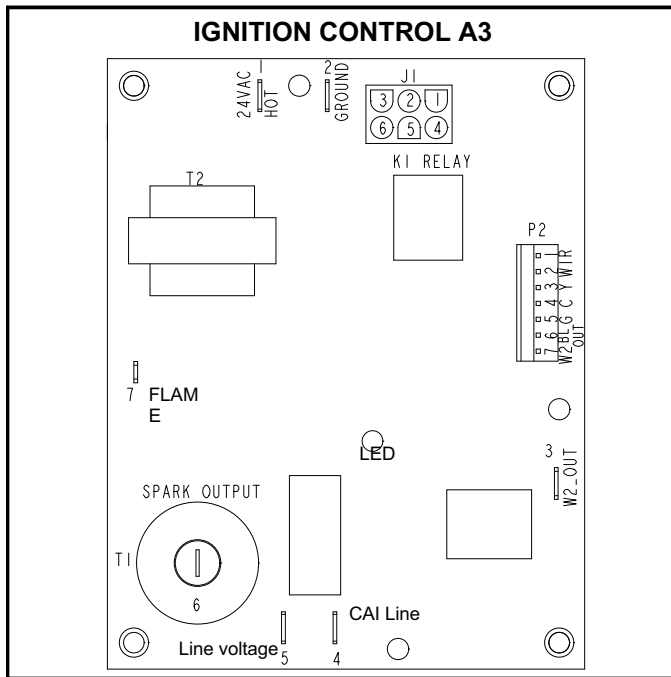


FIGURE 4

## B-Cooling Components

All units use independent cooling circuits consisting of separate compressor, condenser coil and evaporator coil. See figure 5. One draw-through type condenser fan is used in KGA/KGB024/090 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 or fixed orifice assembly 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 and a high pressure switch (S4) on the discharge line. See figure 5. A Low ambient switch (S11) is available as a field accessory for additional compressor protection.

## 1-Compressor B1

### ⚠ 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.

All KGA/KGB024/090 units use one scroll compressor. See “SPECIFICATIONS” and “ELECTRICAL DATA” (table of contents) or compressor nameplate for compressor specifications. The KGB074 is equipped with a two-stage compressor.

### ⚠ 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.

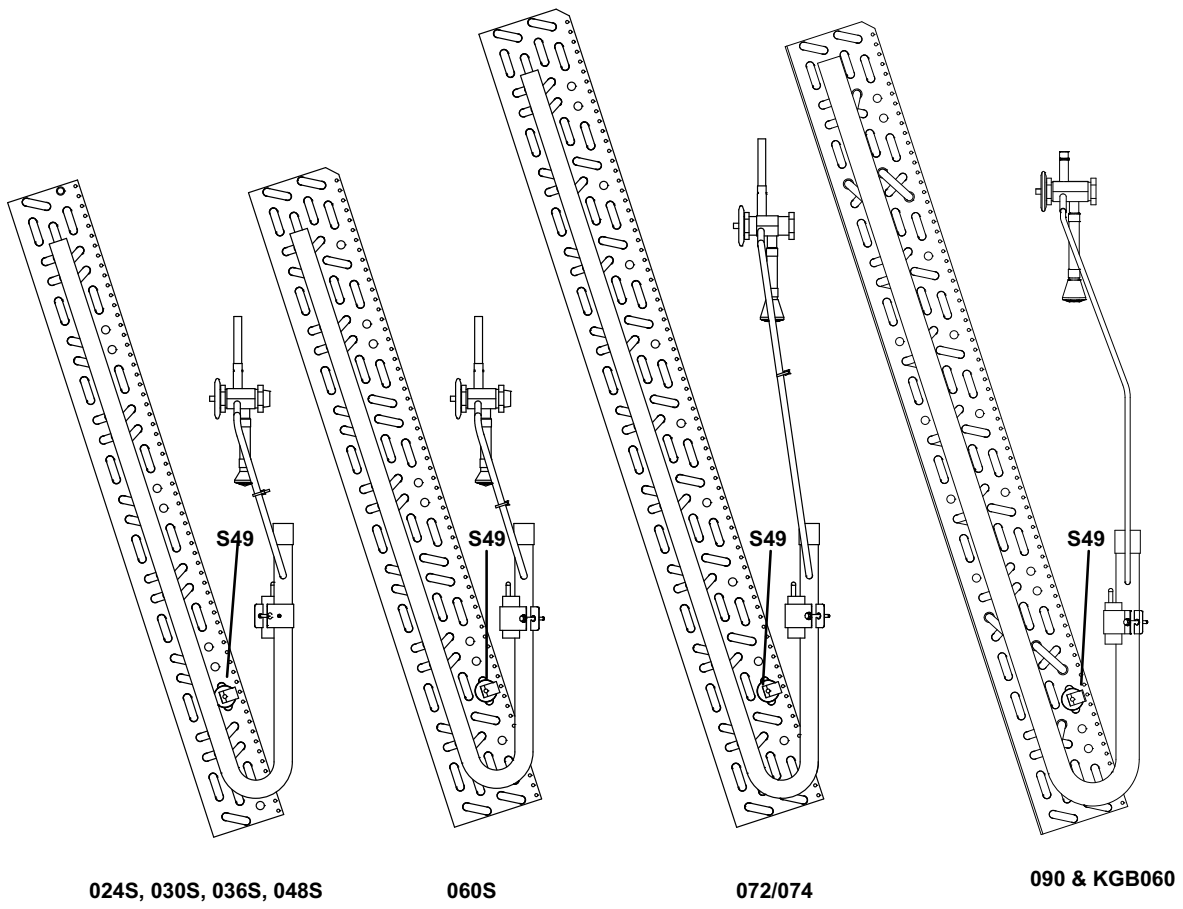
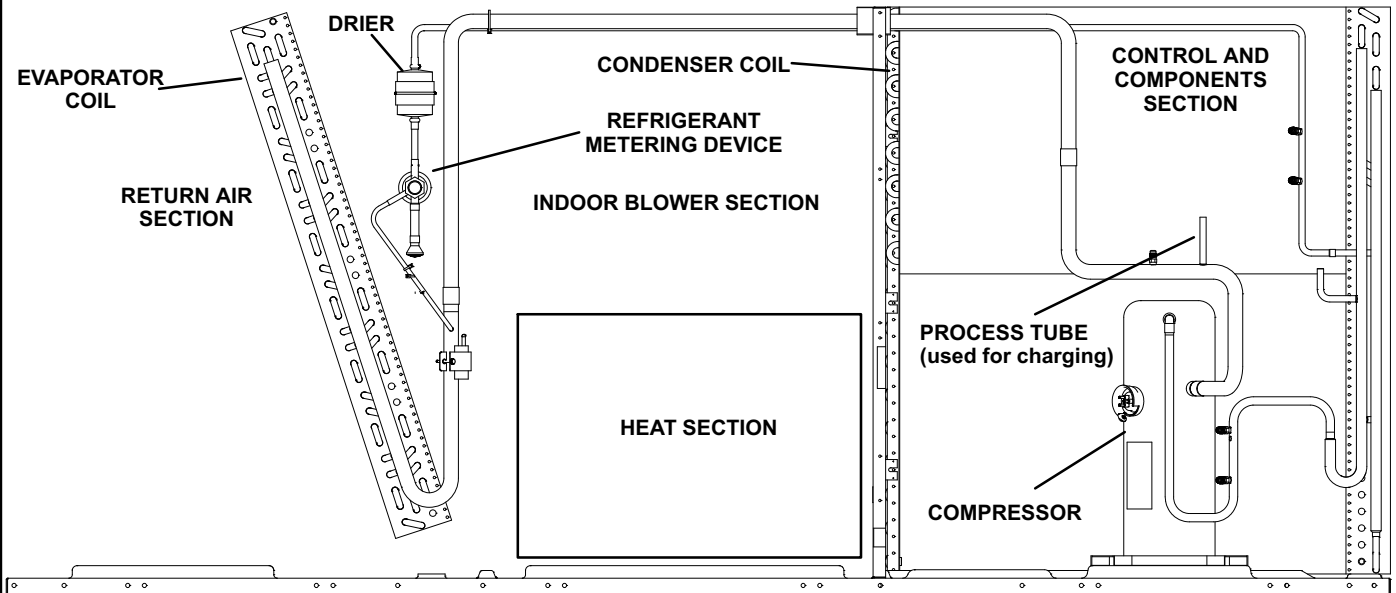
*NOTE-Refer to the wiring diagram section for specific unit operation.*

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

### ⚠ IMPORTANT

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

**KGA/KGB PLUMBING and S49 FREEZESTAT LOCATION**



**FIGURE 5**

## 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 in series with the compressor contactor K1. The freezestat is a SPST N.C. auto-reset switch which opens at  $29^{\circ}\text{F} \pm 3^{\circ}\text{F}$  ( $-1.7^{\circ}\text{C} \pm 1.7^{\circ}\text{C}$ ) on a temperature drop and closes at  $58^{\circ}\text{F} \pm 4^{\circ}\text{F}$  ( $14.4^{\circ}\text{C} \pm 2.2^{\circ}\text{C}$ ) 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 an auto reset SPST N.C. switch which opens on a pressure rise.

S4 is located in the compressor discharge line and wired in series with the compressor contactor coil.

When discharge pressure rises to  $640 \pm 20$  psig ( $4412 \pm 138$  kPa) (indicating a problem in the system) the switch opens and the respective compressor is de-energized (the economizer can continue to operate). When discharge pressure drops to  $475 \pm 30$  psig ( $3275 \pm 206$  kPa), the switch closes.

## 4-Low Ambient Switches S11 (optional)

The low ambient switch is an auto-reset SPST N.O. pressure switch which allows for mechanical cooling operation at low outdoor temperatures. In all models the switch is located in each liquid line prior to the indoor coil section and is wired in series with outdoor fan B4. When S11 opens B4 is de-energized.

In G, J and M voltage units, S11 is wired in series with outdoor fan relay K10 coil and when opened breaks 24 volts to the coil, de-energizing outdoor fan B4.

When liquid pressure rises to  $450 \pm 10$  psig ( $3102 \pm 69$  kPa), the switch closes and the condenser fan is energized. When discharge pressure in drops to  $240 \pm 10$  psig ( $1655 \pm 69$  kPa), the switch opens and the condenser fan is de-energized. This intermittent fan operation results in higher evaporating temperature allowing the system to operate without icing the evaporator coil and losing capacity.

## 5-Low Temperature Switch S3 (optional) (compressor monitor)

S3 is a SPST bimetal thermostat which opens on temperature drop. It is wired in line with the 24VAC compressor contactor. When outdoor temperature drops below  $40^{\circ}\text{F}$  ( $4.5^{\circ}\text{C}$ ) the switch opens and de-energizes the compressor. When the compressor is de-energized the cooling demand is handled by the economizer. The switch automatically resets when outdoor temperature rises to  $50^{\circ}\text{F}$  ( $10^{\circ}\text{C}$ ).



## C-Blower Compartment

KGA/KGB 036, 048 and 060 units are equipped with either direct drive or belt drive blowers. The KGA/KGB024 and 030 are equipped with direct drive blowers only and the KGA/KGB072, 074 and 090 are available with belt drive blowers only. See unit nameplate for blower type. The blower compartment in all KGA024/KGB090 units is located between the evaporator coil and the compressor compartment.

### 1-Blower Wheels

KGA/KGB036-072 belt drive units use 10" x 10" (254 mm x 254 mm) blower wheels. KGA090 belt drive units use 15" x 9" (381 mm x 229 mm) blower wheels. The KGA/KGB024, 030, 036 and 048 direct drive units use 10" x 10" (254 mm x 254 mm) blower wheels also. The KGA/KGB060 direct drive units use 11" x 10" (279 mm x 254 mm) blower wheels. KGB072H and KGB074 units use 15 x 9 blower wheels.

### 2-Indoor Blower Motor B3

All direct drive units use single phase PSC motors. Belt drive units use single or three phase motors (same as supply voltage). CFM adjustments on belt drive units are made by adjusting the motor pulley (sheave). CFM adjustments on direct drive units are made by changing speed taps. Motors are equipped with sealed ball bearings. All motor specifications are listed in the Specifications (table of contents) section 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.

### 3-Indoor Blower Motor Capacitor C4

All single phase blower motors are PSC and require a run capacitor located on the blower housing. Ratings may vary from each motor. See motor nameplate for capacitor ratings.

## ⚠ 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

Initiate blower demand at thermostat according to instructions provided with thermostat. Unit will cycle on thermostat demand. The following steps apply to applications using a typical electro-mechanical thermostat.

- 1- Blower operation is manually set at the thermostat sub-base fan switch. With fan switch in **ON** position, blowers will operate continuously.
- 2- With fan switch in **AUTO** position, the blowers will cycle with demand. Blowers and entire unit will be off when system switch is in **OFF** position.

### B-Determining Unit CFM - Direct Drive Blowers

- 1- The following measurements must be made with air filters in place and no cooling demand.

- 2- With all access panels in place, measure static pressure external to unit (from supply to return). Add any additional air resistance for options and accessories shown in air resistance tables in the Blower Data section.
- 3- Use figure 6 to determine the factory set blower speed.
- 4- Use the blower tables starting on Page 15, the measured static pressure, and the factory-set blower speed to determine CFM. If CFM is lower than the design specified CFM, move the lead from speed tap 3 or 4 to speed tap 2. See figure 7.

BLOWER SPEED FACTORY SETTINGS		
036 Units	024, 030, 048 Units	060 Units
<input type="checkbox"/> 1 Com	<input type="checkbox"/> 1 Com	<input type="checkbox"/> 1 Com
<input type="checkbox"/> 2 Hi	<input type="checkbox"/> 2 Hi	<input type="checkbox"/> 2 Hi
<input type="checkbox"/> 3 Med	<input type="checkbox"/> 3 <b>Med*</b>	<input type="checkbox"/> 3 <b>Low*</b>
<input type="checkbox"/> 4 <b>Low*</b>	<input type="checkbox"/> 4 Low	<input type="checkbox"/> 4 Unused

\*Factory Setting

FIGURE 6

- 5- Check and adjust belt alignment as needed. See figure 8.

*Note - Speed tap 3 can be used on 036 units if speed tap 2 delivers more CFM than required by design specification.*

For 460/575V units, remove the isolation lead from speed tap 2 before moving the wire to speed tap 2. Tape the exposed end of the isolation lead and secure away from other components.

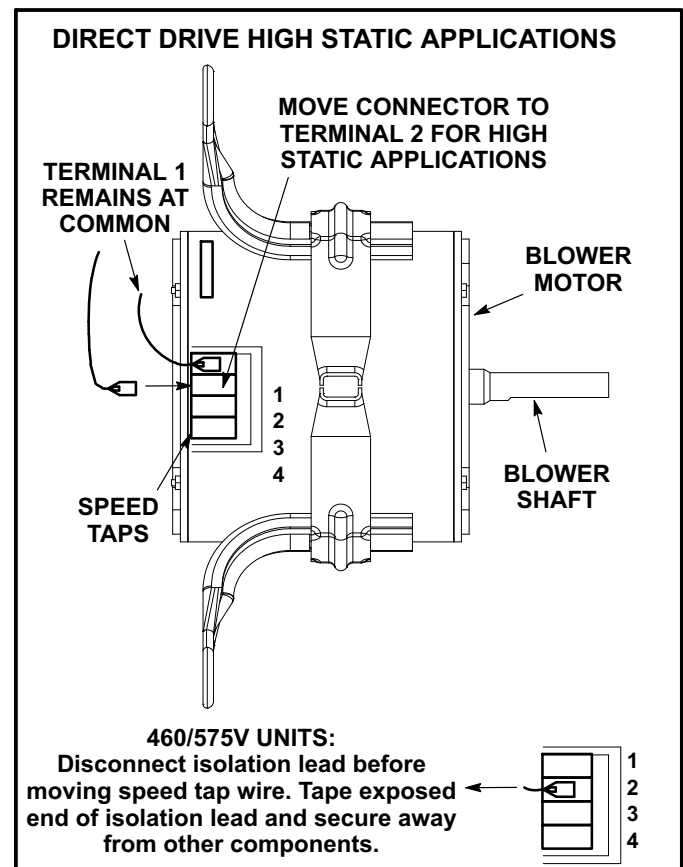
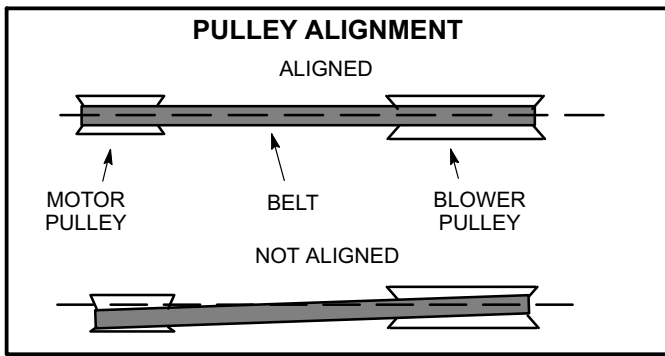


FIGURE 7



**FIGURE 8**

**C-Determining Unit CFM - Belt Drive Blowers**

**IMPORTANT** - KGB/KCB074 blower (G thermostat) **CFM MUST BE ADJUSTED IN HIGH SPEED.** Disconnect factory-installed J350 low speed connector from P350. Connectors are located near the bottom of the control box. Connect J351 high speed connector to P350. Once blower CFM is set, J350 can be reconnected to operate the blower on low during ventilation only demands. See table 4.

**TABLE 4  
TWO-SPEED BLOWER OPERATION  
KGB/KCB074 UNITS**

Thermostat	Blower Speed
G (P350/J350)*	Low
G (P350/J351)	High
W1	High
W2	High
Y1	Low
Y2	High

\*Factory-installed jack/plug connection.

- 1- The following measurements must be made with air filters in place and no cooling demand.
- 2- With all access panels in place, measure static pressure external to unit (from supply to return).
- 3- Measure the indoor blower wheel RPM.

- 4- Referring to the blower tables starting on Page 15 use static pressure and RPM readings to determine unit CFM. Use air resistance table when installing units with any of the options or accessories listed.
- 5- The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See figure 9. Do not exceed minimum and maximum number of pulley turns as shown in table 5.
- 6- *KGB/KCB074 Unit Only* - If low speed during ventilation is desired, replace J351 connector with J350.

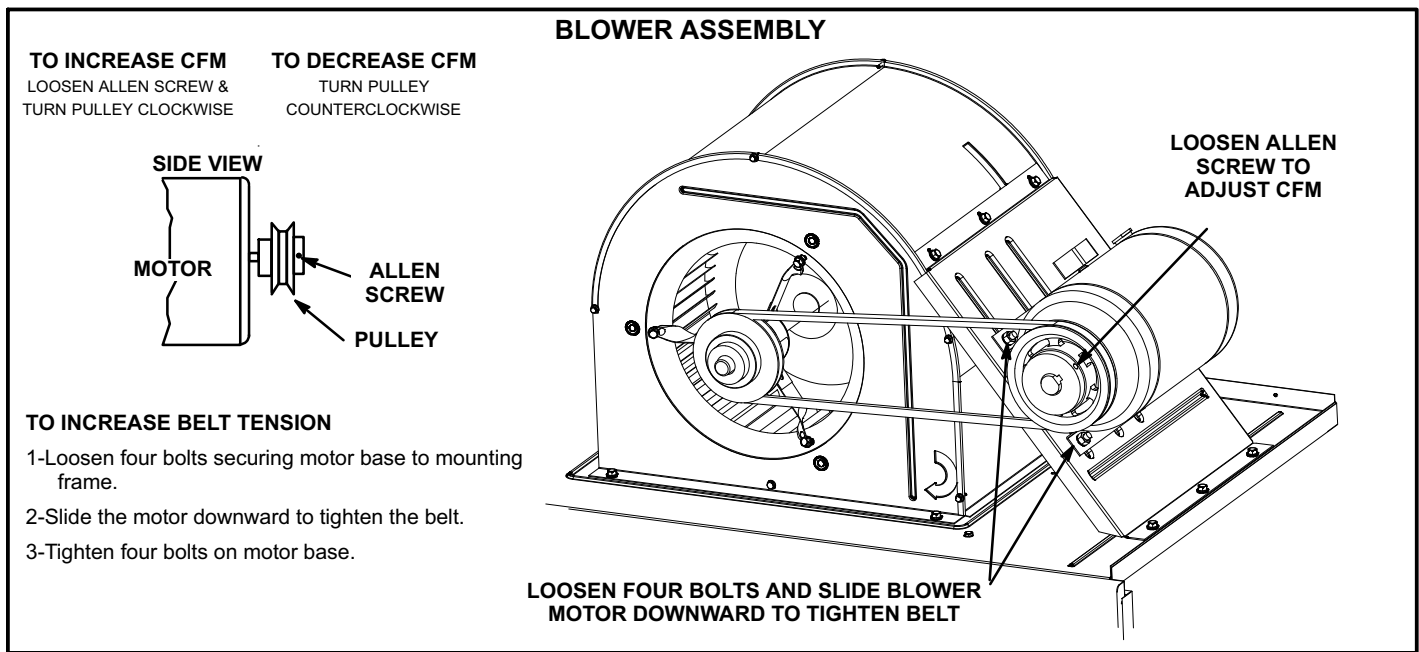
**TABLE 5  
MINIMUM AND MAXIMUM PULLEY ADJUSTMENT**

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

**D-Blower Belt Adjustment**

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24-48 hour period of operation. This will allow belt to stretch and seat grooves. Make sure blower and motor pulley are aligned as shown in figure 8.

- 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.

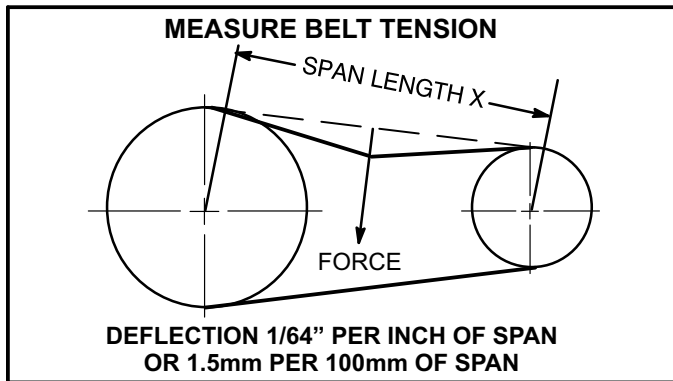


**FIGURE 9**

**E-Check Belt Tension**

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

- 1- Measure span length X. See figure 10.



**FIGURE 10**

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

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

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

- 3- Measure belt deflection force. For a used belt, the deflection force should be 5 lbs. (35kPa). A new belt deflection force should be 7 lbs. (48kPa).

A force below these values indicates an undertensioned belt. A force above these values indicates an overtensioned belt.

**F-Field-Furnished Blower Drives**

See blower data tables for field-furnished blower drives to determine BHP and RPM required. See drive kit table on Page 26 to determine the drive kit number

## D-GAS HEAT COMPONENTS

KGA/KGB024, 030, 036, 048, 060, 072, 074S units are available in 65,000 BTUH (19 kW) heat capacity. KG036, 048, 060, 072 074H and 090 units are available in 108,000 BTUH, (30.8 kW) heat capacity. KGA/KGB048, 060, 072 and 090 units are available in 150,000 BTUH (44 kW) heat sizes.

Two stage heat is available in units with 108,000 and 150,000 BTUH capacities.

KGA036, 048, 060, 072 and 090 units built prior to 01/01/2014 are equipped with 105,000 BTUH heating capacity.

Two stage heat units built prior to 01/01/2014 are equipped with 105,000 and 150,000 BTUH capacities. See Gas Heat Specifications on for more detail.

### 1-Heat Exchanger Figure 11

The KGA/KGB units use aluminized steel inshot burners with tubular aluminized 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.

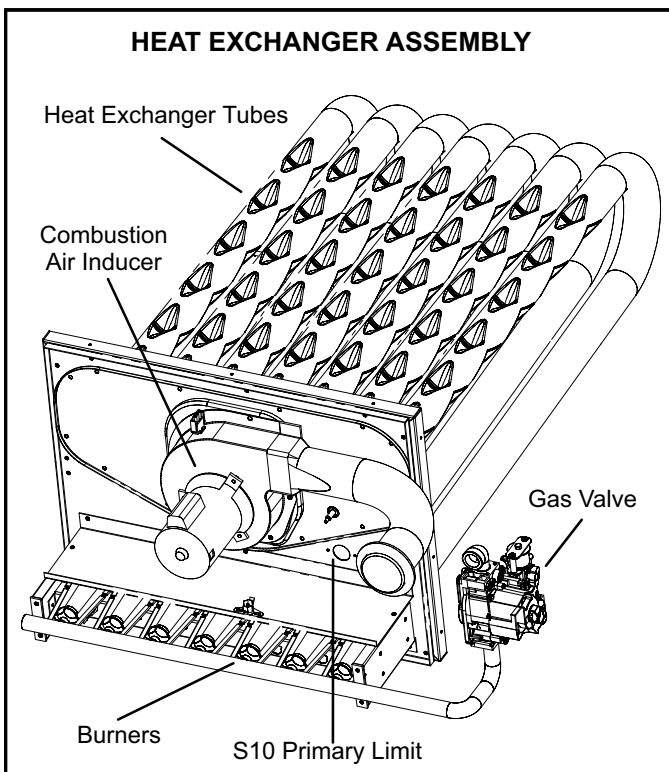


FIGURE 11

### 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.*

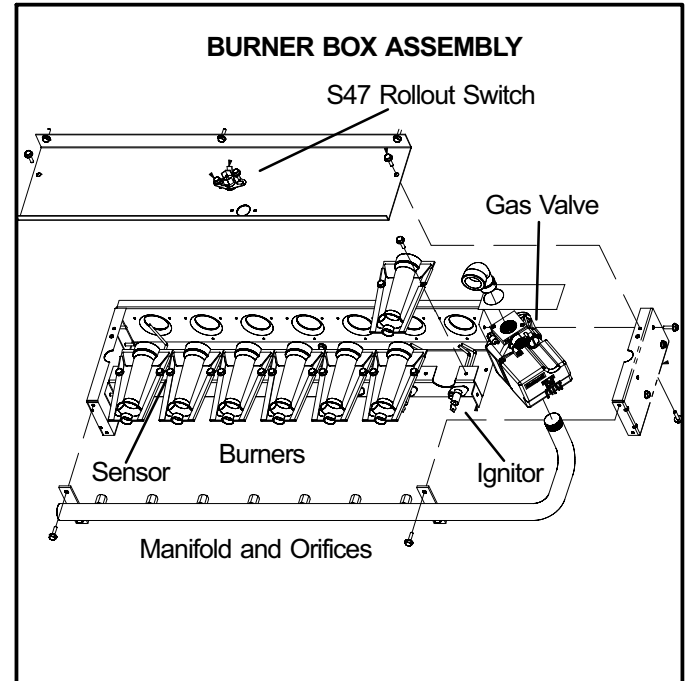


FIGURE 12

### 3-Primary High Temperature Limit S10

S10 is a SPST N.C. high temperature primary limit for gas heat in KGA/KGB024-090 units. S10 is located on the vestibule panel. See figure 11.

Primary limit S10 is wired to the ignition control A3. Its N.C. contacts open to de-energize the ignition control when excessive temperature is reached in the blower compartment. If the limit trips the blower relay coil K3 will be energized by ignition control A3. Limit set points are factory set and cannot be adjusted.

### 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 ignition control A3. When S47 senses flame rollout (indicating a blockage in the combustion air passages), the flame rollout limit trips, and the ignition control immediately closes the gas valve.

Limit S47 is factory preset to open at  $340^{\circ}\text{F} \pm 16^{\circ}\text{F}$  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*  $0.10''\text{W.C.} \pm 0.05''$  ( $24.8 \text{ Pa} \pm 12.4 \text{ Pa}$ ) 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. 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 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 ignition control activates the first stage operator of the gas valve (low fire), the spark and the flame sensing electrode. Sparking stops immediate-

ly 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 disassembled for cleaning.

### 7-Combustion Air Motor Capacitor C3

The combustion air inducer motors in all KGA/KGB 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

KGA/KGB036, 048, 060, 072 and 090 units are equipped with a single or two stage gas valve. KGA/KGB024 and 030 units use a single stage gas valve only. 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 A3. A manual shut-off knob is provided on the valve for shut-off. Manual shut-off knob 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 17 show gas valve components. Table 6 shows factory gas valve regulation for KGA/KGB series units.

TABLE 6

Operating Manifold Pressure				
Production Date	Natural		L.P.	
	Low	High	Low	High
Prior to 1-1-2014	$1.7 \pm 0.3''$ W.C.	$3.5 \pm 0.3''$ W.C.	$5.1'' \pm 0.3''$ W.C.	$10.5'' \pm 0.5''$ W.C.
After 1-1-2014	$2.0 \pm 0.3''$ W.C.	$3.5 \pm 0.3''$ W.C.	$5.9'' \pm 0.3''$ W.C.	$10.5'' \pm 0.5''$ W.C.

### 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.

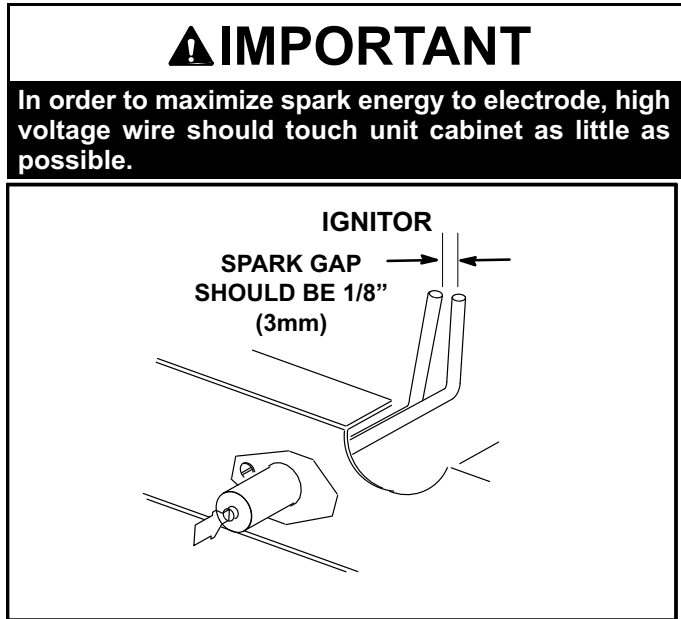


FIGURE 13

### 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.

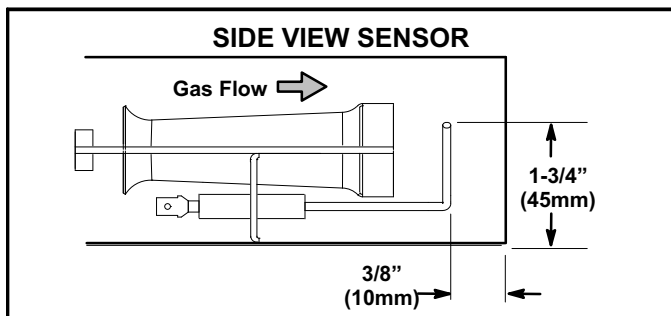


FIGURE 14

## 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 K1CURB-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

<b>⚠ WARNING</b>	
	<b>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.</b>

<b>⚠ WARNING</b>	
	<b>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.</b>

## ⚠ 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

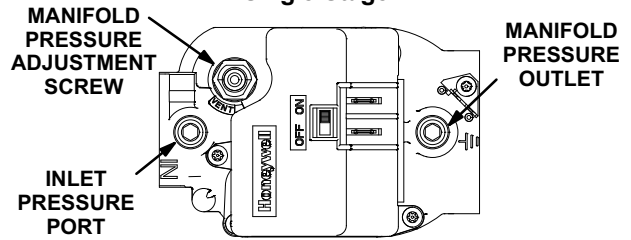


Danger of explosion and fire. Can cause injury or product or property damage. You must follow these instructions exactly.

### Gas Valve Operation (figures 15 and 17)

- 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.

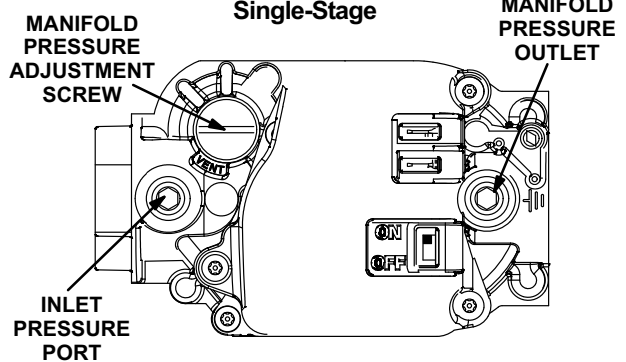
### Honeywell VR8205 Gas Valve with ON/OFF Lever Single-Stage



GAS VALVE SHOWN IN ON POSITION

FIGURE 15

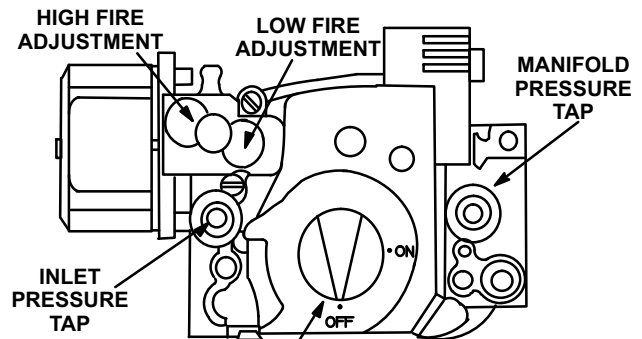
### HONEYWELL VR8215S GAS VALVE Single-Stage



Gas valve switch shown in ON position.

FIGURE 16

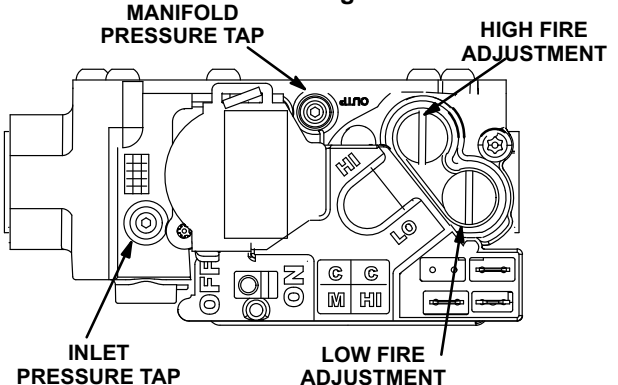
### Honeywell VR8205Q/VR8305Q Series Gas Valve Two-Stage



Gas valve knob is shown in OFF position.

FIGURE 17



### WHITE RODGERS 36J54 GAS VALVE Two-Stage



Gas valve switch is shown in OFF position.

FIGURE 18




- 5- *Honeywell VR8205 or VR8215S Gas Valve with ON/OFF Lever* - Switch gas valve lever to **OFF**. See figure 15 or 16 .
- 6- *Honeywell VR8205Q Gas Valve with Knob* - Turn knob on gas valve clockwise  to **OFF**. Do not force. See figure 17. *White Rodgers 36J54 Gas Valve with ON/OFF Lever* - Switch gas valve lever to **OFF**. See figure 18.
- 7- Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.
- 8- *Honeywell VR8205 or VR8215S Gas Valve with ON/OFF Lever* - Switch gas valve lever to **ON**. See figure 15 or 16 .
- 9- *Honeywell VR8205 Gas Valve with Knob* - Turn knob on gas valve counter clockwise  to **ON**. Do not force. See figure 17. *White Rodgers 36J54 Gas Valve with ON/OFF Lever* - Switch gas valve lever to **ON**. See figure 18.
- 10- Close or replace the heat section access panel.
- 11- Turn on all electrical power to appliance.
- 12- 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.*

- 13- 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, VR8215S, White Rodgers 36J54 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- **KGA/KGB024/090 No Economizer Installed in Unit** -A first-stage cooling demand (Y1) will energize compressor 1 and the condenser fan. An increased cooling demand (Y2) will not change operation.  
*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 compressor 1 and the condenser fan. When outdoor air

is not acceptable unit will operate as though no economizer is installed.

- 3- **KGB074 No Economizer Installed in Unit** -  
A first-stage cooling demand (Y1) will energize compressor 1 on low speed and the condenser fan. An increased cooling demand (Y2) will energize compressor 1 on high speed.  
*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 compressor 1 on low speed and the condenser fan. When outdoor air is not acceptable unit will operate as though no economizer is installed.
- 4- Units contain one refrigerant circuit or stage.
- 5- Unit is charged with R-410A refrigerant. See unit rating plate for correct amount of charge.
- 6- 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

#### A-Fin/Tube Coil KGA024/090

**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 7 through 16 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 7**

**KGA024S-1, -2 Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65°F	239	149
75°F	275	151
85°F	317	152
95°F	363	154
105°F	416	156
115°F	471	160

**TABLE 8**

**KGA030S-1, -2 Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65°F	255	140
75°F	292	141
85°F	332	150
95°F	377	152
105°F	427	156
115°F	482	159

**TABLE 9**

**KGA036S-1, -2, -3 Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	269	146
75° F	311	148
85° F	357	150
95° F	407	152
105° F	466	155
115° F	532	157

**TABLE 10**

**KGA 036S -4 & Later Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	275	137
75° F	312	139
85° F	353	142
95° F	399	146
105° F	450	149
115° F	506	150

**TABLE 11**

**KGA048S-1, -2, -3 Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	280	142
75° F	321	144
85° F	365	147
95° F	414	149
105° F	467	151
115° F	526	153

**TABLE 12**

**KGA 048S -4 & Later Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	279	132
75° F	319	136
85° F	360	140
95° F	404	144
105° F	454	147
115° F	506	148

**TABLE 13**

**KGA060S-1, -2, -3, -4 Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	265	136
75° F	302	137
85° F	344	139
95° F	391	142
105° F	442	146
115° F	499	148

**TABLE 14**

**KGA 060S -5 & Later Normal Operating Pressures**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65	279	130
75	317	135
85	359	139
95	404	143
105	454	143
115	508	143

**TABLE 15**

**KGA 072S-1 & -2 NORMAL OPERATING PRESSURES**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	270	132
75° F	310	133
85° F	353	135
95° F	400	137
105° F	450	140
115° F	525	147

**TABLE 16**  
**KGA 090S-1 & -2 NORMAL OPERATING PRESSURES**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ± 5 psig
65° F	298	133
75° F	330	134
85° F	368	135
95° F	412	137
105° F	461	139
115° F	575	142

**B-Refrigerant Charge and Check - All-Aluminum Coil KGA 072-3, 090-3 and All KGB024 / 090**

**WARNING-Do not exceed nameplate charge under any condition.**

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

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

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

**IMPORTANT - Charge unit in standard cooling mode.**

- 1- Make sure outdoor coil is clean. Attach gauge manifolds and operate unit at full CFM in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.
- 2- Compare the normal operating pressures (see tables 17 through 24) to the pressures obtained from the

gauges. Check unit components if there are significant differences.

- 3- Measure the outdoor ambient temperature and the suction pressure. Refer to the appropriate circuit charging curve to determine a target liquid temperature.

*Note - Pressures are listed for sea level applications.*

- 4- Use the same thermometer to accurately measure the liquid temperature (in the outdoor section).
  - If measured liquid temperature is higher than the target liquid temperature, add refrigerant to the system.
  - If measured liquid temperature is lower than the target liquid temperature, recover some refrigerant from the system.

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

- 6- Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.

- 7- Example KG 090: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 99°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

**TABLE 17**

<b>KGB024 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
118	224	119	259	121	297	121	342	122	390	124	442
125	227	127	262	129	301	130	343	131	391	134	441
141	232	144	267	149	306	151	347	153	393	154	444
159	236	164	273	168	311	171	354	173	400	176	449

**TABLE 18**

<b>KGB030 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
118	227	118	271	119	316	121	365	123	422	125	486
126	230	128	266	129	309	130	367	131	425	134	493
144	235	147	272	150	312	151	358	151	417	153	488
163	245	167	279	171	319	173	363	176	412	177	465

**TABLE 19**

<b>KGB036 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
114	237	115	271	117	317	119	369	122	426	124	503
122	238	123	269	126	318	128	366	130	422	133	492
141	246	144	277	146	321	148	369	149	425	152	489
162	254	165	287	168	330	171	377	173	428	176	497

**TABLE 20**

<b>KGB048 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
114	251	116	285	117	334	119	382	121	436	123	500
122	255	125	292	127	336	128	385	130	439	132	502
139	265	142	300	145	343	148	391	150	440	153	499
155	277	159	313	164	356	167	403	171	454	174	510

**TABLE 21**

<b>KGB060 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
110	239	112	284	114	329	116	379	118	437	120	532
118	242	121	286	123	329	125	379	127	433	130	495
136	252	139	294	141	337	144	382	147	435	152	488
153	265	158	304	161	345	163	390	165	442	173	494

**TABLE 22**

<b>KGA072-3 Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
106	250	111	288	115	329	118	375	121	428	124	482
110	256	116	295	122	338	126	383	129	434	132	490
124	254	130	309	135	351	141	398	146	449	149	508
138	289	145	329	151	373	157	422	163	473	169	527

**TABLE 23**

<b>KGB 074S &amp; H Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
112	257	113	298	114	348	116	403	118	476	121	602
120	261	122	301	123	347	124	403	127	466	129	556
136	271	140	310	143	354	145	401	145	460	147	525
154	290	157	327	161	370	165	416	168	468	171	526

**TABLE 24**

<b>KGA090-3 &amp; Later Normal Operating Pressures</b>											
Outdoor Coil Entering Air Temperature											
65 °F		75 °F		85 °F		95 °F		105 °F		115 °F	
Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)	Suct (psig)	Disc (psig)
107	268	109	309	113	357	116	403	118	449	123	503
115	275	118	314	120	358	123	406	126	458	130	513
131	286	134	327	137	376	140	421	144	477	147	537
147	307	151	344	154	390	158	441	162	495	167	558

**D-Charge Verification - Approach Method  
KGA Tube and Fin Only**

- Using the same thermometer, compare liquid temperature to outdoor ambient temperature.  
Approach Temperature = Liquid temperature (at condenser outlet) minus ambient temperature.
- See table 25 for approach temperature. An approach temperature greater than this value indicates an undercharge. An approach temperature less than this value indicates an overcharge.
- The approach method is not valid for grossly over or under charged systems. Use tables 7 through 16 as a guide for typical operating pressures.

**TABLE 25  
APPROACH TEMPERATURE**

Unit	Liquid Temp. Minus Ambient Temp.
<b>024S</b>	7
<b>030S</b>	9
<b>036S</b>	7
<b>048S</b>	11
<b>060S</b>	6
<b>072S</b>	6
<b>090S</b>	10

## V- SYSTEM SERVICE CHECKS

### A-Heating System Service Checks

All KGA/KGB 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 KGA/KGB Installation instruction for more information.

#### 1-Gas Piping

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

#### 2-Testing Gas Piping

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

When pressure testing gas lines, the gas valve must be disconnected and isolated. **Gas valves can be damaged if subjected to more than 0.5 psig [14"W.C. (3481 Pa)].** See figure 19.

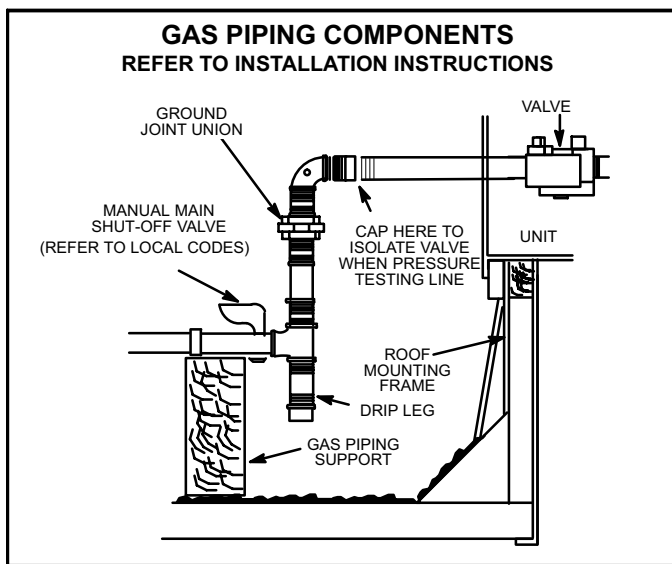


FIGURE 19

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 through 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 "underfire." High pressure can result in permanent damage to the gas valve or "overfire." For natural gas units, operating pressure at the unit gas connection must be between 4.5"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 figures 15 through 18 for location of pressure tap on the gas valve.

The manifold pressure is factory set and should not require adjustment. See table 6. If manifold pressure is incorrect and no other source of improper manifold pressure can be found, the valve must be replaced. See figure 15 through 18 for location of gas valve (manifold pressure) adjustment screw.

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

## CAUTION

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

#### Manifold Adjustment Procedure

- 1- Connect test gauge to the outlet pressure tap on the gas valve. Start the unit (call for second stage heat) and allow five minutes for the unit to reach steady state.
- 2- While waiting for the unit to stabilize, notice the flame. The flame should be stable without flashback and should not lift from the burner heads. Natural gas should burn basically blue with some clear streaks. L.P. gas should burn mostly blue with some clear yellow streaks.
- 3- After allowing the unit to stabilize for five minutes, record the manifold pressure and compare to the values given in table 6.

## 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 cu.ft. dial and gas value of 1000 btu/ft<sup>3</sup> for natural and 2500 btu/ft<sup>3</sup> 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
108,000	33	83
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

KGAKGB 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 7 through 16.*



## 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.**

### 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. Approved filters should be checked monthly and replaced when necessary. Take note of air flow direction marking on filter frame when reinstalling filters

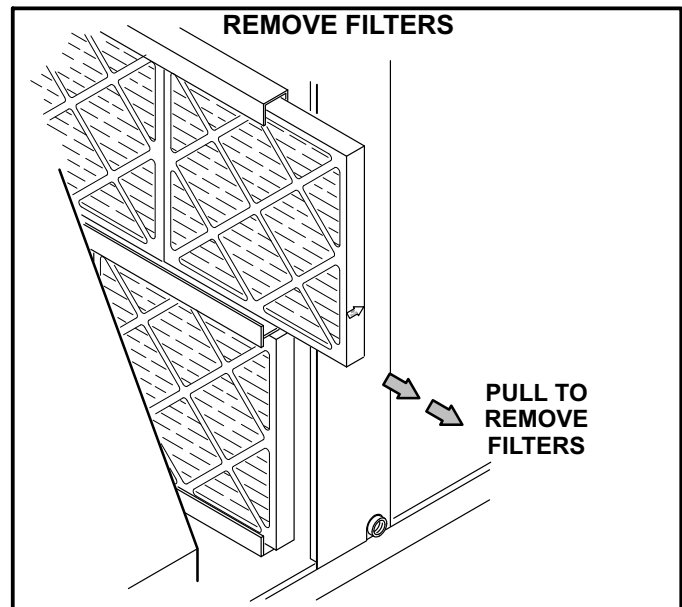
**TABLE 27**

Unit	Qty	Filter Size - inches (mm)
024, 030, 036, 048, 060*	4	16 X 20 X 2 (406 X 508 X 51)
072, 060**, 090	4	20 X 20 X 2 (508 X 508 X 51)

\*KGA060

\*\*KGB060

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



**FIGURE 20**

### B-Lubrication

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

### 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 re-assembly.

- 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-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.

## **G-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.

## H-Condenser Coil

All-Aluminum Environ Coils

KGB024/074 & KGA072/090-3 Units

Clean condenser coil annually with water and inspect monthly during the cooling season.

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

Fin/Tube Coils

KGA024/090 Units

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 21. Flush coils with water following cleaning.

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

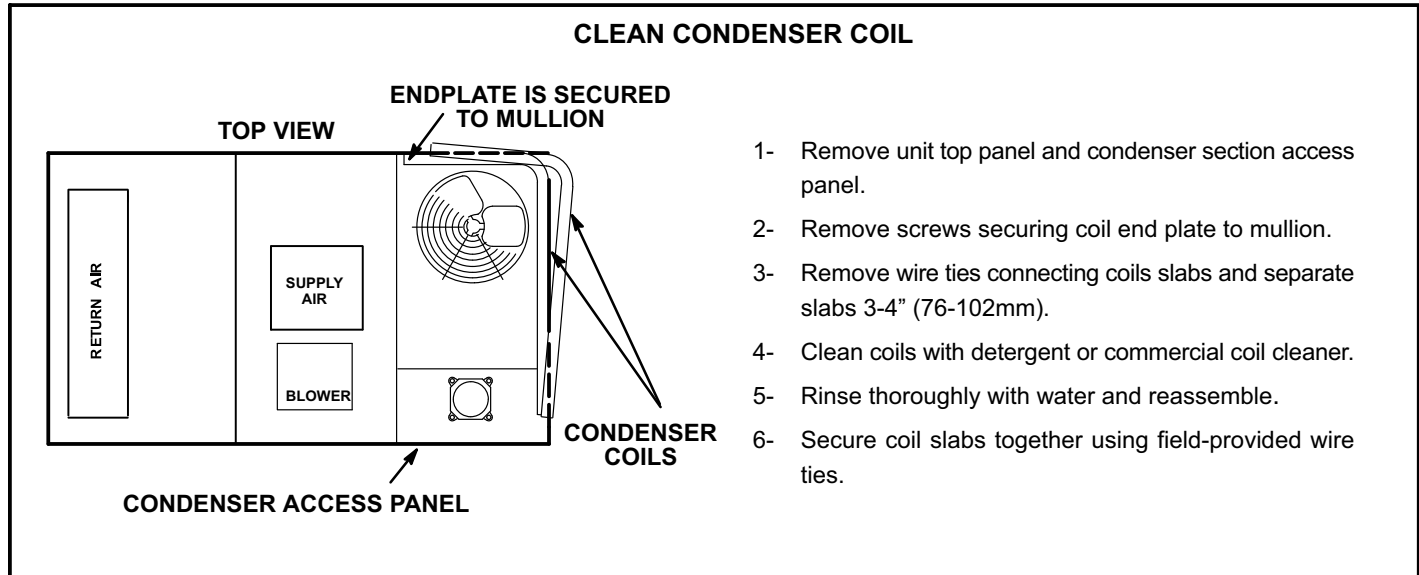


FIGURE 21

## VII-ACCESSORIES

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

### A-T1CURB / K1CURB

When installing the KGA/KGB units on a combustible surface for downflow discharge applications, the T1CURB / K1CURB 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 KGA/KGB 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 22. 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 23. Refer to the roof mounting frame installation instructions for proper plenum construction and attachment.

KGA090 units overhang the smaller (not full perimeter) roof mounting frame. See figure 24.

### B-Transitions

Optional supply/return transitions T1TRAN10AN1 is available for use with the KGA/KGB 2, 2.5, 3, 4 and 5 units and the T1TRAN20N-1 is available for the 6 and 7-1/2 ton units utilizing optional K1CURB roof mounting frames. Transition must be installed in the K1CURB mounting frame before mounting the unit to the frame. Refer to the manufacturer's instructions included with the transition for detailed installation procedures.

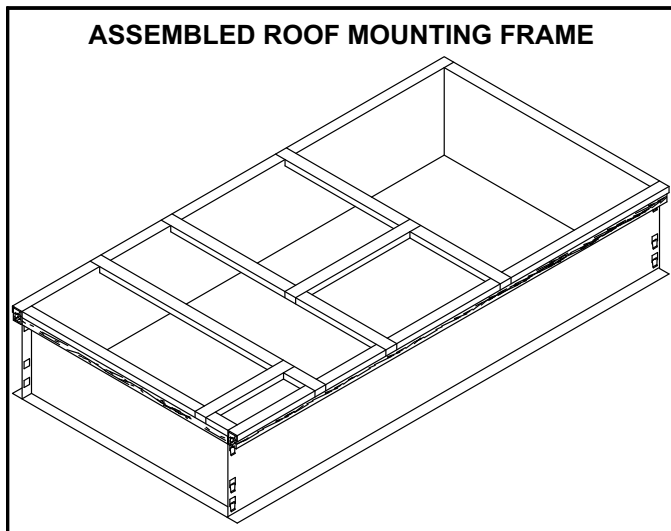


FIGURE 22

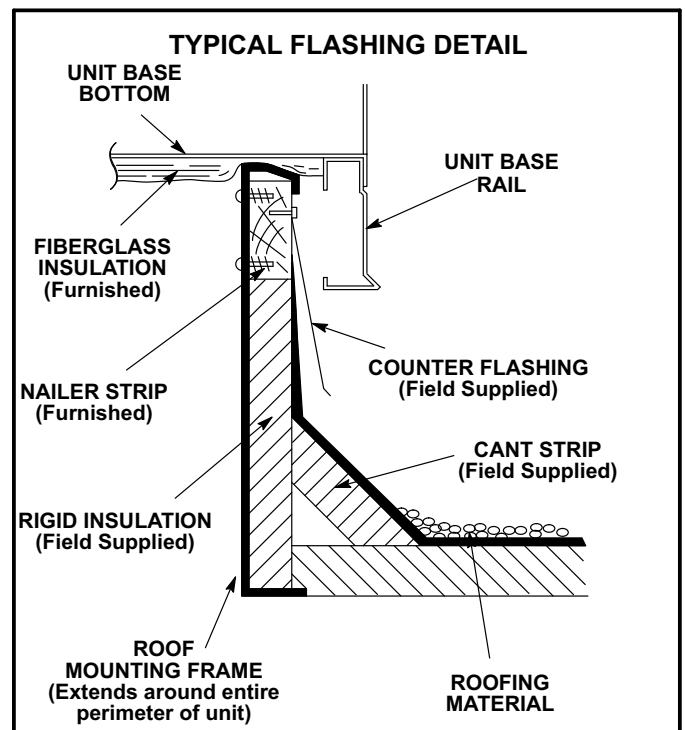


FIGURE 23

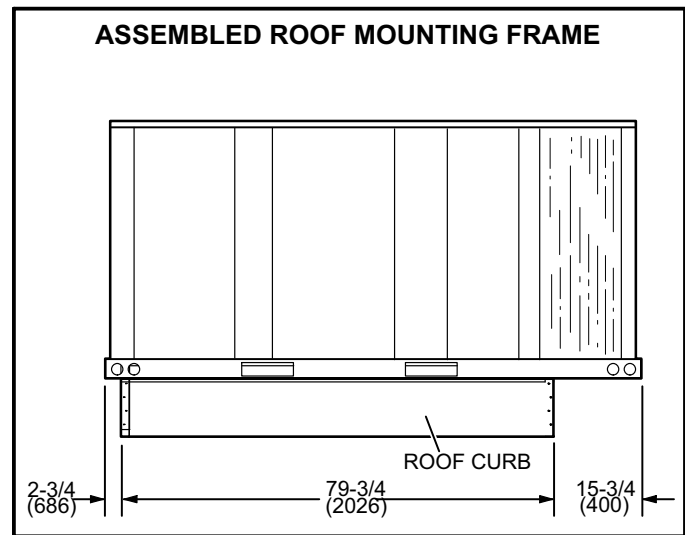


FIGURE 24

### C-Outdoor Air Dampers

T1DAMP11A-1 is available for KGA 2, 2.5, 3, 4 and 5 ton unit and T1DAMP11N-1 is available for the KGA/KGB 6 and 7-1/2 ton units. Both sets include the outdoor air hood. A motorized kit (T1DAMP21AN1) can be ordered separately for all KGA/KGB unit sizes. The dampers may be manually or motor (M) operated to allow up to 25 percent outside air into the system at all times (see figure 25). Washable filter supplied with the outdoor air dampers can be cleaned with water and a mild detergent. It should be sprayed with Filter Handicoater when dry prior to re-installation. Filter Handicoater is R.P. Products coating no. 418 and is available as Part No. P-8-5069.

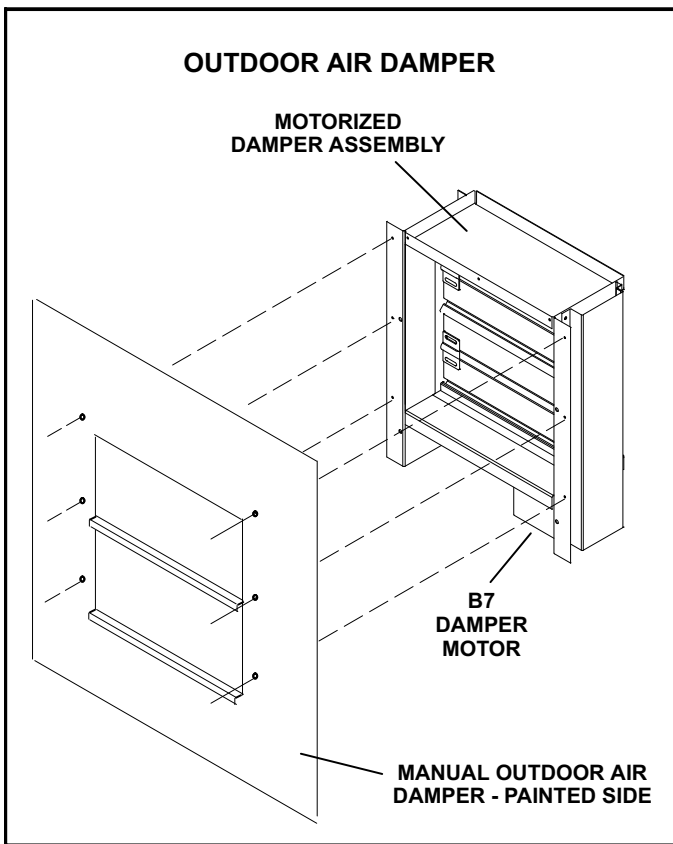


FIGURE 25

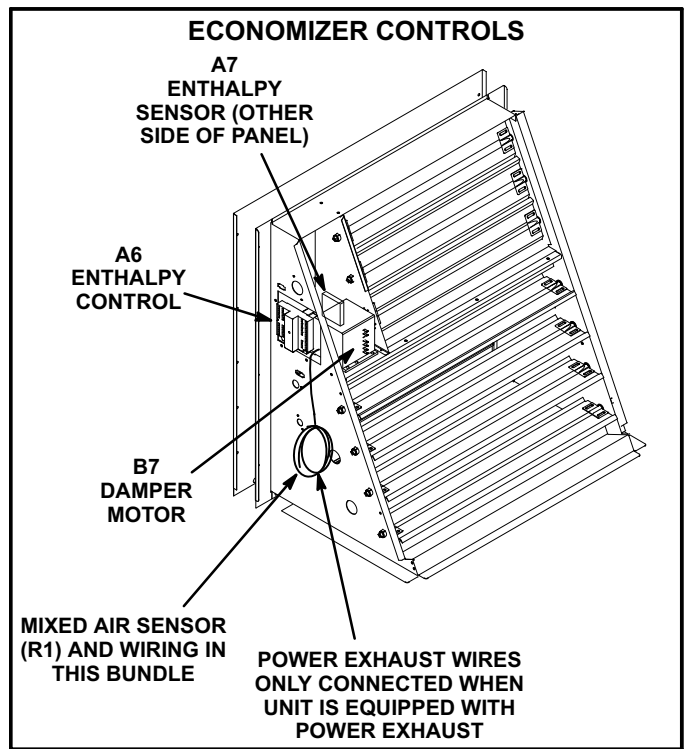


FIGURE 26

### D-Supply and Return Diffusers (all units)

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 KGA/KGB units. Refer to manufacturer's instructions included with transition for detailed installation procedures.

### E-Economizer (Field or Factory Installed)

Unit may contain an optional factory-installed economizer equipped with an A6 enthalpy control and an A7 outdoor enthalpy sensor. The modulating economizer opens fully to use outdoor air for free cooling when temperature is suitable and opens to minimum position during the occupied time period.

The A6 enthalpy control is located in the economizer access area. See figure 26. The A7 enthalpy sensor is located on the division panel between horizontal supply and return air sections.

### Optional Sensors

An optional differential sensor (A62) may be used with the A7 outdoor sensor to compare outdoor air enthalpy to return air enthalpy. When the outdoor air enthalpy is below the return air enthalpy, outdoor air is used for free cooling.

Mixed air sensor (R1) may be used to modulate dampers to 55°F (13°C) discharge air.

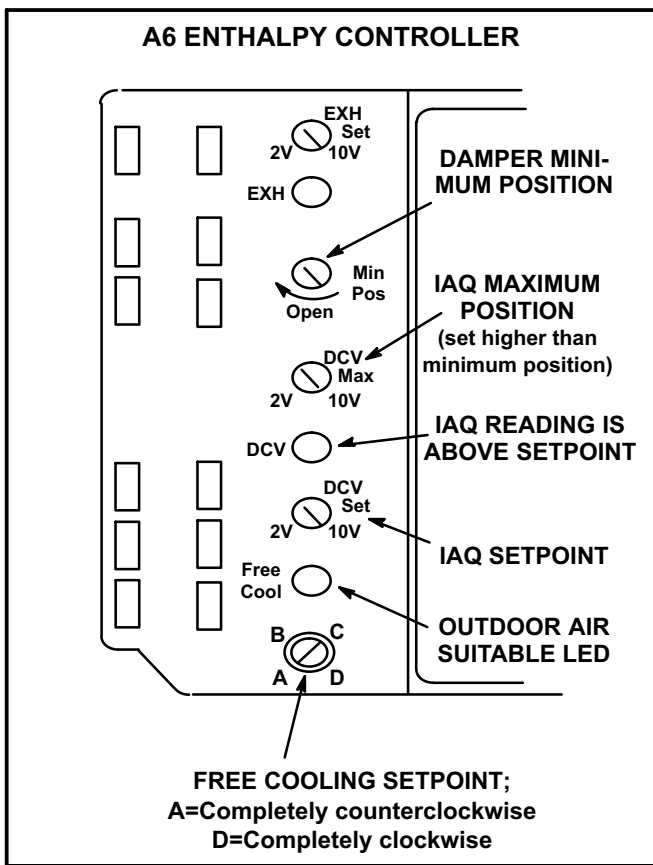
An optional IAQ sensor (A63) may be used to lower operating costs by controlling outdoor air based on CO<sub>2</sub> level or room occupancy (also called demand control ventilation or DCV). Damper minimum position can be set lower than traditional minimum air requirements; dampers open to traditional ventilation requirements when CO<sub>2</sub> level reaches DCV (IAQ) setpoint.

Refer to instructions provided with sensors for installation.

### A6 Enthalpy Control LEDs

A steady green Free Cool LED indicates that outdoor air is suitable for free cooling.

When an optional IAQ sensor is installed, a steady green DCV LED indicates that the IAQ reading is higher than setpoint requiring more fresh air. See figure 27.



**FIGURE 27**

**Free Cooling Setpoint**

Outdoor air is considered suitable when temperature and humidity are less than the free cooling setpoints shown in table 28. Setting A is recommended. See figure 27. At setting A, free cooling will be energized when outdoor air is approximately 73°F (23°C) and 50% relative humidity. If indoor air is too warm or humid, lower the setpoint to B. At setting B, free cooling will be energized at 70°F (21°C) and 50% relative humidity.

When an optional A62 differential sensor is installed, turn A6 enthalpy control free cooling setpoint potentiometer completely clockwise to position "D".

**TABLE 28  
ENTHALPY CONTROL SETPOINTS**

Control Setting	Free Cooling Setpoint At 50% RH
A	73° F (23° C)
B	70° F (21° C)
C	67° F (19° C)
D	63° F (17° C)

**Damper Minimum Position**

*NOTE - A jumper is factory-installed between TB1 R and OC terminals to maintain occupied status (allowing minimum fresh air). When using an electronic thermostat or energy management system with an occupied/unoccupied feature, remove jumper.*

1- Set thermostat to occupied mode if the feature is available. Make sure jumper is in place between TB1 terminals R and OC if using a thermostat which does not have the feature.

2- Rotate MIN POS SET potentiometer to approximate desired fresh air percentage.

*Note - Damper minimum position can be set lower than traditional minimum air requirements when an IAQ sensor is specified. Dampers will open to DCV MAX setting (if CO2 is above setpoint) to meet traditional ventilation requirements.*

3- Measure outdoor air temperature. Mark the point on the bottom line of chart 1 and label the point "A" (40°F, 4°C shown).

4- Measure return air temperature. Mark that point on the top line of chart 1 and label the point "B" (74°F, 23°C shown).

5- Measure mixed air (outdoor and return air) temperature. Mark that point on the top line of chart 1 and label point "C" (70°F, 21°C shown).

6- Draw a straight line between points A and B.

7- Draw a vertical line through point C.

8- Draw a horizontal line where the two lines meet. Read the percent of fresh air intake on the side.

9- If fresh air percentage is less than desired, adjust MIN POS SET potentiometer higher. If fresh air percentage is more than desired, adjust MIN POS SET potentiometer lower. Repeat steps 3 through 8 until calculation reads desired fresh air percentage.

**DCV Set and Max Settings**

Adjust settings when an optional IAQ sensor is installed.

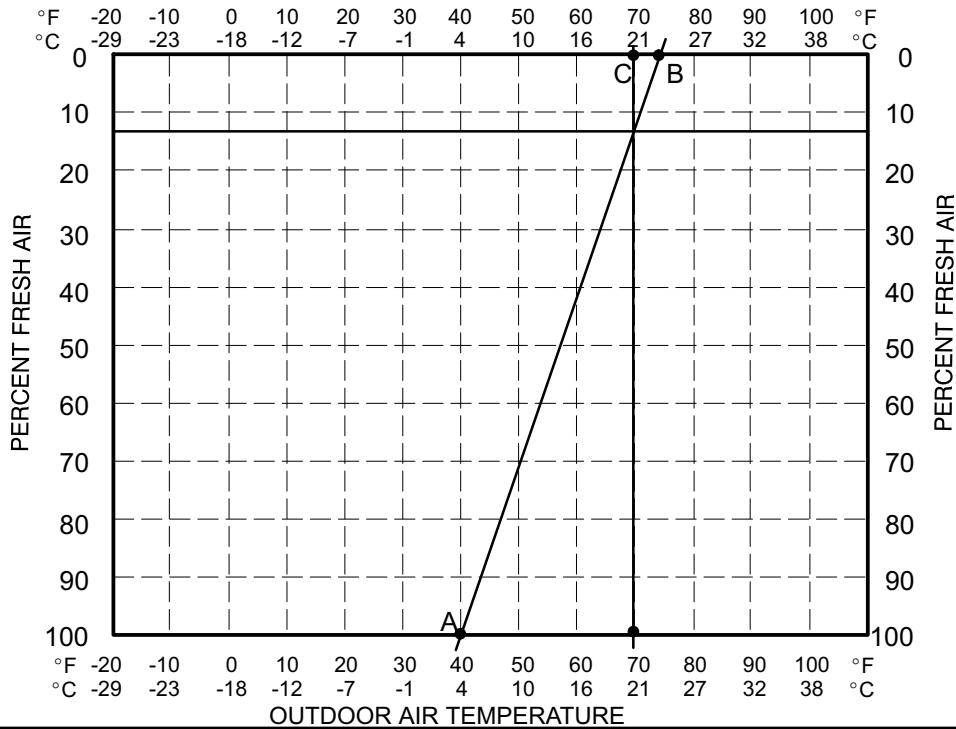
The DCV SET potentiometer is factory-set at approximately 50% of the potentiometer range. Using a standard 1-2000ppm CO<sub>2</sub> sensor, dampers will start to open when the IAQ sensor reads approximately 1000ppm. Adjust the DCV SET potentiometer to the approximate setting specified by the controls contractor. Refer to figure 27.

The DCV MAX potentiometer is factory-set at approximately 50% of the potentiometer range or 6VDC. Dampers will open approximately half way when CO<sub>2</sub> rises above setpoint. Adjust the DCV MAX potentiometer to the approximate setting specified by the controls contractor. Refer to figure 27.

*Note - DCV Max must be set higher than economizer minimum position setting for proper demand control ventilation.*

**CHART 1**

**CALCULATE MINIMUM FRESH AIR PERCENTAGE  
MIXED AND RETURN AIR TEMPERATURE**



**Economizer Operation**

The occupied time period is determined by the thermostat or energy management system.

**Outdoor Air Not Suitable:**

During the unoccupied time period dampers are closed.

During the occupied time period a cooling demand will open dampers to minimum position and mechanical cooling functions normally.

During the occupied time period dampers will open to DCV MAX when IAQ reading is above setpoint (regardless of thermostat demand or outdoor air suitability).

**Outdoor Air Suitable:**

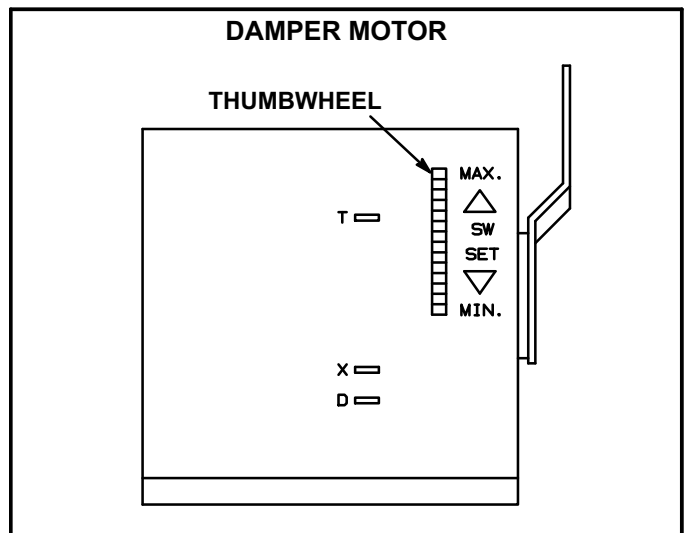
See table 29 for economizer operation with a standard two-stage thermostat.

During the occupied period, dampers will open to DCV MAX when IAQ reading is above setpoint (regardless of thermostat demand or outdoor air suitability). DCV MAX will NOT override damper full-open position. When an R1 mixed air sensor for modulating dampers is installed, DCV MAX may override damper free cooling position when occupancy is high and outdoor air temperatures are low. If R1 senses discharge air temperature below 45°F (7°C), dampers will move to minimum position until discharge air temperature rises to 48°F (9°C).

**B-Outdoor Air Dampers**

Optional manual and motorized outdoor air dampers provide fresh outdoor air. The motorized damper assembly opens to minimum position during the occupied time period and remains closed during the unoccupied period. Manual damper assembly is set at installation and remains in that position.

Set damper minimum position in the same manner as economizer minimum position. Adjust motorized damper position using the thumbwheel on the damper motor. See figure 28. Manual damper fresh air intake percentage can be determined in the same manner.



**FIGURE 28**

**TABLE 29**  
**ECONOMIZER OPERATION**

OUTDOOR AIR IS SUITABLE FOR FREE COOLING – FREE COOL LED “ON”

THERMOSTAT DEMAND	DAMPER POSITION		MECHANICAL COOLING
	UNOCCUPIED	OCCUPIED	
OFF	CLOSED	CLOSED	NO
G	CLOSED	MINIMUM	NO
Y1	OPEN*	OPEN*	NO
Y2	OPEN*	OPEN*	STAGE 1

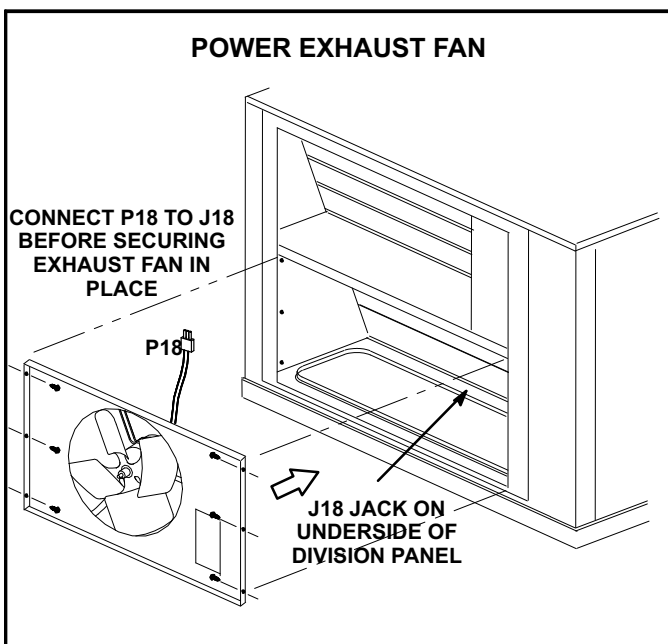
\*Dampers will modulate to maintain 55°F (13°C) supply air when an R1 mixed air sensor is installed.

### 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 KGA/KGB units equipped with the optional power exhaust dampers. K65 is energized by the economizer enthalpy control A6, after the economizer dampers reach 50% open (adjustable) When K65 closes, exhaust fan B10 is energized.

### G-Power Exhaust Fans

T1PWRE10A available for KGA/KGB 3, 4 and 5 ton units and T1PWRE10N available for 6 and 7-1/2 ton units, provide exhaust air pressure relief and also run when return air dampers are closed and supply air blowers are operating. See figure 29 and installation instructions for more detail.



**FIGURE 29**

### H-Optional Cold Weather Kit

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

The kit includes the following parts:

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

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

- a - Thermostat switch (S59) is an auto-reset SPST N.C. switch which opens on a temperature drop. The switch is wired in series with 24v power and the combustion air blower switch. When the temperature drops below -30° F (-35° C) the switch opens and the gas heat section is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (-12° C).
- b - Thermostat switch (S60) is an auto-reset SPST N.C. switch which opens on a temperature rise. The switch is wired in series with HR6. When the temperature rises above 20° F (-7° C) the switch opens and the electric heater is de-energized. The switch automatically resets when the heating compartment temperature reaches -10° F (23.3° C).
- c - Thermostat switch (S61) is an auto-reset SPST N.O. switch which closes on a temperature drop. The switch is wired in series with HR6. When temperature drops below 20° F (-7° C) the switch closes and electric heater is energized. The switch automatically opens when heating compartment temperature reaches 70° F (21° C).

### I-Control Systems

Three different types of control systems may be used with the KGA/KGB series units. All thermostat wiring is connected to TB1 located in the control box. Each thermostat has additional control options available. See thermostat installation instructions for more detail.

- 1- Electro-mechanical thermostat (13F06)  
The electro-mechanical thermostat is a two stage heat / two stage cool thermostat with dual temperature levers. A non-switching or manual system switch subbase may be used.
- 2- Electronic thermostat (see price book)  
Any two stage heat / two stage cool electronic thermostat may be used.
- 3- Honeywell T7300 thermostat (60L59)  
The Honeywell T7300 thermostat is a programmable, internal or optional remote temperature sensing thermostat. The T7300 provides occupied and unoccupied changeover control.



### **J-Smoke Detectors A17 and A64**

Photoelectric smoke detectors are a field installed option. The smoke detectors can be installed in the supply air duct (A64), return air section (A17), or in both the supply duct and return air section.

### **K-Dirty Filter Switch S27**

The dirty filter switch senses static pressure increase indicating a dirty filter condition. The switch is N.O. and closes at 1" W.C. (248.6 Pa) The switch is mounted in the filter section on the left unit mullion.

### **L-Indoor Air Quality (CO<sub>2</sub>) Sensor A63**

The indoor air quality sensor monitors CO<sub>2</sub> levels and reports the levels to the economizer enthalpy control A6. Controller A6 adjusts the economizer dampers according to the CO<sub>2</sub> levels. The sensor is mounted next to the indoor thermostat or in the return air duct. Refer to the indoor air quality sensor installation instructions for proper adjustment.

### **M-LP / Propane Kit**

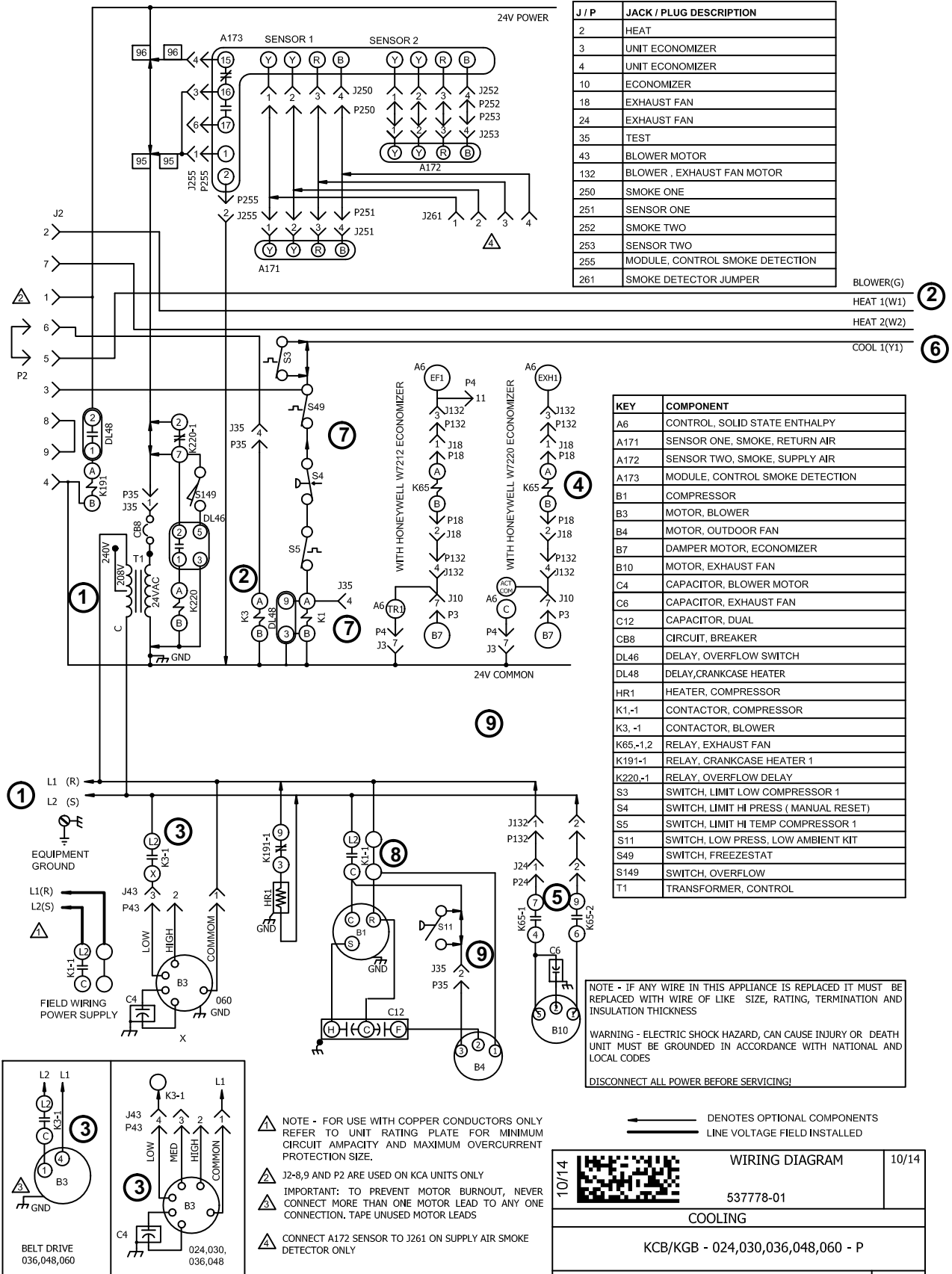
All units require a natural to LP /propane kit. The kit for single stage units include one LP spring , seven burner orifices, and three stickers. Two stage kits include the same but has a prove switch used to lock out first stage on the combustion air inducer. For more detail refer to the natural to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

### **N-Drain Pan Overflow Switch S149 (optional)**

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

# VIII-Wiring Diagrams and Sequence of Operation

## KGA/KGB024/060 P VOLTAGE UNIT DIAGRAM



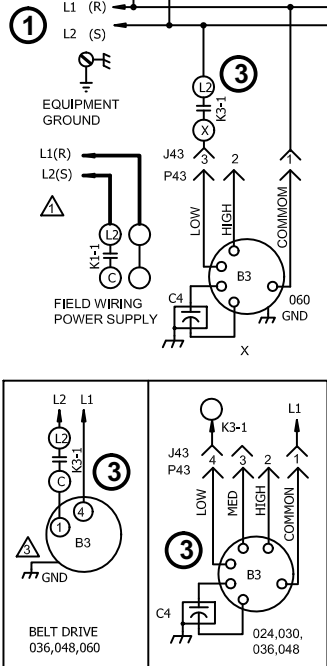
J / P	JACK / PLUG DESCRIPTION
2	HEAT
3	UNIT ECONOMIZER
4	UNIT ECONOMIZER
10	ECONOMIZER
18	EXHAUST FAN
24	EXHAUST FAN
35	TEST
43	BLOWER MOTOR
132	BLOWER , EXHAUST FAN MOTOR
250	SMOKE ONE
251	SENSOR ONE
252	SMOKE TWO
253	SENSOR TWO
255	MODULE, CONTROL SMOKE DETECTION
261	SMOKE DETECTOR JUMPER

KEY	COMPONENT
A6	CONTROL, SOLID STATE ENTHALPY
A171	SENSOR ONE, SMOKE, RETURN AIR
A172	SENSOR TWO, SMOKE, SUPPLY AIR
A173	MODULE, CONTROL SMOKE DETECTION
B1	COMPRESSOR
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN
B7	DAMPER MOTOR, ECONOMIZER
B10	MOTOR, EXHAUST FAN
C4	CAPACITOR, BLOWER MOTOR
C6	CAPACITOR, EXHAUST FAN
C12	CAPACITOR, DUAL
CB8	CIRCUIT, BREAKER
DL46	DELAY, OVERFLOW SWITCH
DL48	DELAY, CRANKCASE HEATER
HR1	HEATER, COMPRESSOR
K1,-1	CONTACTOR, COMPRESSOR
K3,-1	CONTACTOR, BLOWER
K65,-1,2	RELAY, EXHAUST FAN
K191-1	RELAY, CRANKCASE HEATER 1
K220,-1	RELAY, OVERFLOW DELAY
S3	SWITCH, LIMIT LOW COMPRESSOR 1
S4	SWITCH, LIMIT HI PRESS ( MANUAL RESET)
S5	SWITCH, LIMIT HI TEMP COMPRESSOR 1
S11	SWITCH, LOW PRESS, LOW AMBIENT KIT
S49	SWITCH, FREEZESTAT
S149	SWITCH, OVERFLOW
T1	TRANSFORMER, CONTROL

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

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

DISCONNECT ALL POWER BEFORE SERVICING!



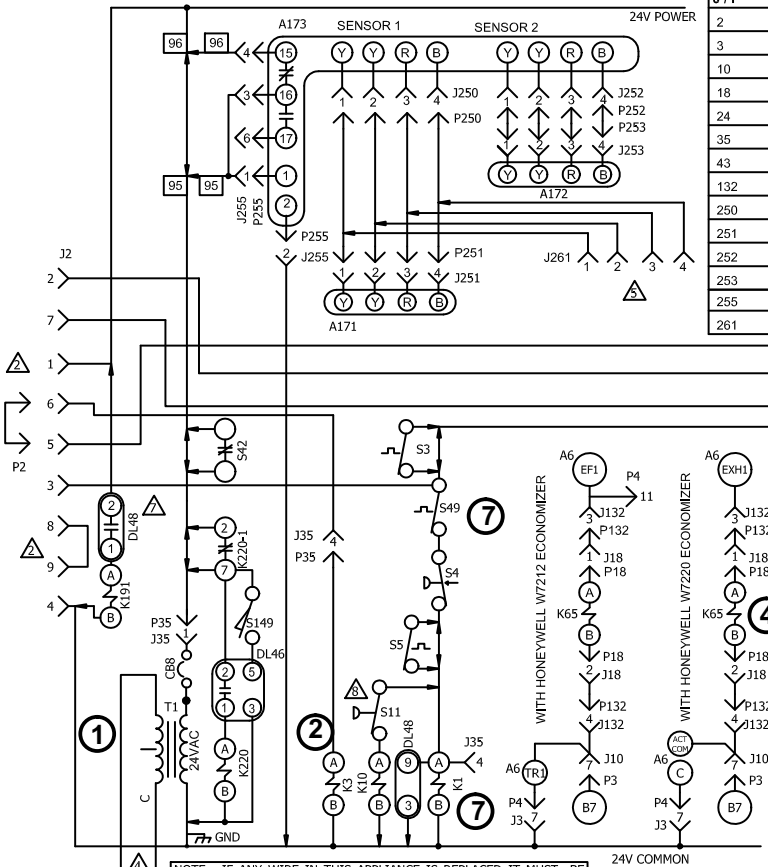
- ⚠ NOTE - FOR USE WITH COPPER CONDUCTORS ONLY REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
- ⚠ J2-8,9 AND P2 ARE USED ON KCA UNITS ONLY
- ⚠ IMPORTANT: TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION. TAPE UNUSED MOTOR LEADS
- ⚠ CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY

← DENOTES OPTIONAL COMPONENTS  
 — LINE VOLTAGE FIELD INSTALLED

10/14	WIRING DIAGRAM	10/14
537778-01		
COOLING		
KCB/KGB - 024,030,036,048,060 - P		
SECTION B		REV 0
Supersedes 537631-01	New Form No. 537778-01	

# KGA/KGB036/090 G, J, M & Y VOLTAGE UNIT DIAGRAM

J / P	JACK / PLUG DESCRIPTION
2	HEAT
3	UNIT ECONOMIZER
10	ECONOMIZER
18	EXHAUST FAN
24	EXHAUST FAN
35	TEST
43	BLOWER MOTOR
132	BLOWER , EXHAUST FAN MOTOR
250	SMOKE ONE
251	SENSOR ONE
252	SMOKE TWO
253	SENSOR TWO
255	MODULE, CONTROL SMOKE DETECTION
261	SMOKE DETECTOR JUMPER

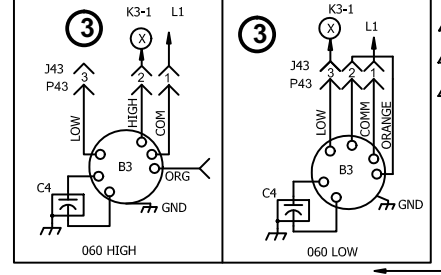
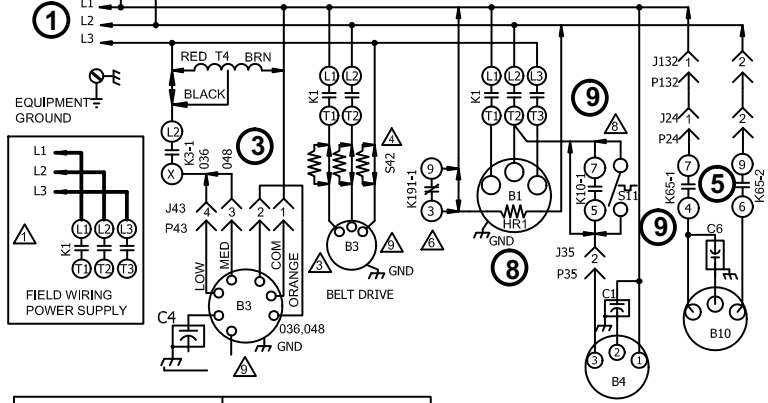


KEY	COMPONENT
A6	CONTROL, SOLID STATE ENTHALPY
A171	SENSOR ONE, SMOKE, RETURN AIR
A172	SENSOR TWO, SMOKE, SUPPLY AIR
A173	MODULE, CONTROL SMOKE DETECTION
B1	COMPRESSOR
B3	MOTOR, BLOWER
B4	MOTOR, OUTDOOR FAN
B7	DAMPER MOTOR, ECONOMIZER
B10	MOTOR, EXHAUST FAN
C1	CAPACITOR, OUTDOOR FAN
C4	CAPACITOR, BLOWER MOTOR
C6	CAPACITOR, EXHAUST FAN
CB8	CIRCUIT, BREAKER
DL46	DELAY, OVERFLOW SWITCH
DL48	DELAY, CRANKCASE HEATER
HR1	HEATER, COMPRESSOR
K1-1	CONTACTOR, COMPRESSOR
K3-1	CONTACTOR, BLOWER
K10-1	RELAY, OUTDOOR FAN 1
K65-1,2	RELAY, EXHAUST FAN
K191-1	RELAY, CRANKCASE HEATER 1
K220-1	RELAY, OVERFLOW DELAY
S3	SWITCH, LIMIT LOW COMPRESSOR 1
S4	SWITCH, LIMIT HI PRESS ( MANUAL RESET)
S5	SWITCH, LIMIT HI TEMP COMPRESSOR 1
S11	SWITCH, LOW PRESS, LOW AMBIENT KIT
S42	SWITCH, OVERLOAD RELAY BLOWER MOTOR
S49	SWITCH, FREEZESTAT
S149	SWITCH, OVERFLOW
T1	TRANSFORMER, CONTROL
T4	TRANSFORMER, BLOWER MOTOR

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

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

DISCONNECT ALL POWER BEFORE SERVICING!



- ⚠ DL48, K191 FACTORY INSTALLED KC,GB 036,048,060
- ⚠ S11 OPTION - Y VOLT K10-1 OPTION G,J VOLT
- ⚠ SEE SECTION E DIAGRAMS FOR 2 - SPEED BELT DRIVE SYSTEMS

- ⚠ NOTE - FOR USE WITH COPPER CONDUCTORS ONLY REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.
- ⚠ J2-8,9 AND P2 ARE USED ON KCA UNITS ONLY
- ⚠ IMPORTANT: TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION. TAPE UNUSED MOTOR LEADS
- ⚠ S42, N USED ON M VOLT UNITS
- ⚠ CONNECT A172 SENSOR TO J261 ON SUPPLY AIR SMOKE DETECTOR ONLY
- ⚠ HR1 FIELD OPTION ON KCA/KGA 036,048,060

⚡ DENOTES OPTIONAL COMPONENTS LINE VOLTAGE FIELD INSTALLED

08/15	WIRING DIAGRAM	08/15
	537777-01	
COOLING		
KCA,B/KGA,B-036,048,060,072,074,090- G,J,M,Y		
SECTION B		REV. 1
Supersedes 537630-01		New Form No. 537777-01

## **KGA/KGB024/090 P, Y, G, J & M Voltage Sequence of Operation**

### **Power:**

1. Line voltage from unit disconnect energizes transformer T1. T1 provides 24VAC power to terminal strip TB1. TB1 provides 24VAC to the unit cooling, heating and blower controls.

### **Blower Operation:**

2. Indoor thermostat terminal G energizes blower contactor K3 with 24VAC.
3. N.O. K3 closes, energizing blower B3.

### **Economizer Operation:**

4. The economizer control module receives a demand and energizes exhaust fan relay K65 with 24VAC at 50% outside air damper open (adjustable).
5. N.O. K65-1 and N.O. K65-2 both close, energizing exhaust fan motor B10.

### **Cooling Demand**

6. First stage cooling demand Y1 and G is energized by the thermostat. G energizes blower.
7. 24VAC is routed through TB1 to N.C. freezeestat S49, and optional N.C. high pressure switch S4. Compressor contactor K1 is energized.
8. N.O. K1-1 close energizing compressor B1.

### **9. *Single Phase P Voltage Units***

Optional N.O. low ambient switch S11 closes to energize condenser fan B4.

### ***Three Phase Y Voltage Units***

Optional N.O. low ambient switch S11 closes to energize condenser fan B4.

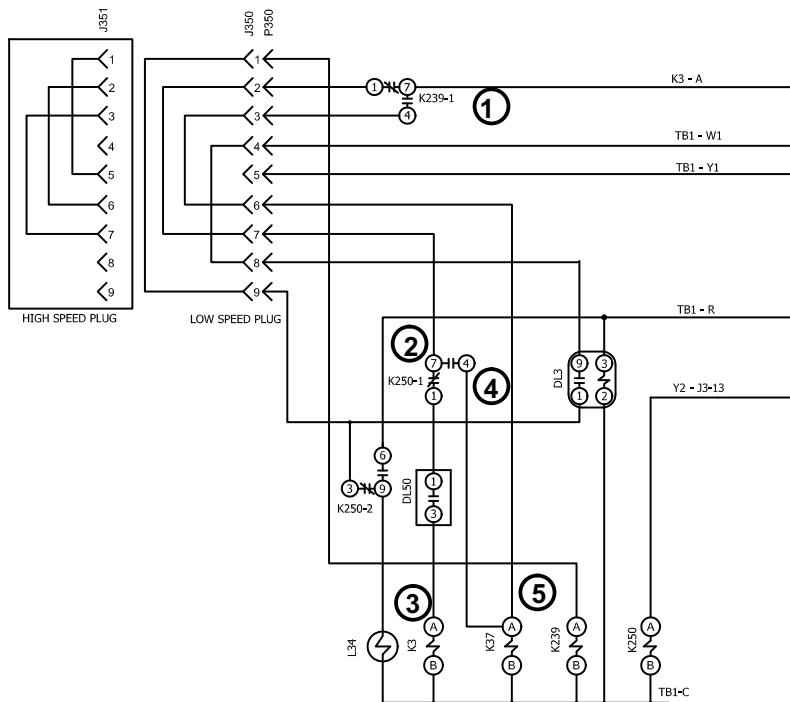
### ***Three Phase G, J & M Voltage Units***

Optional N.O. low ambient switch S11 closes to energize condenser fan relay K10.

N.O. contacts K10-1 close energizing condenser fan B4 .

### ***KGB-074 Two-Stage Units***

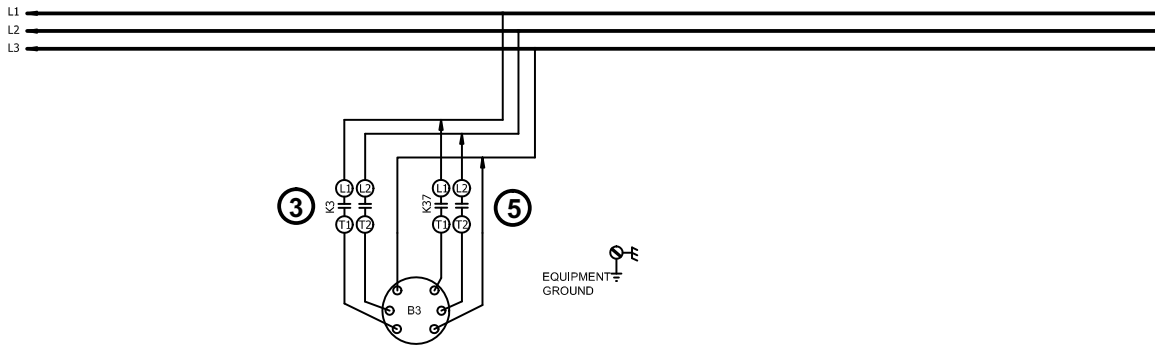
10. First-stage cooling demand Y1 and G is energized by the thermostat. G energizes blower.
11. *Following from step 7* K1 energizes compressor, condenser fan and blower B1 on low speed.
12. Second-stage cooling demand Y2 energizes compressor B1, condenser fan and blower B1 on high speed.



J / P	JACK / PLUG DESCRIPTION
350	BLOWER HI/LO MECHANICAL SWITCHING
351	BLOWER HI/LO MECHANICAL SWITCHING

KEY	COMPONENT
B3	MOTOR, BLOWER
DL3	DELAY, GAS 2.180 SEC DELAY ON BREAK
DL50	DELAY, 1.5 SEC. DELAY ON MAKE
K3, -1	CONTACTOR, BLOWER
K37	RELAY, BLOWER
K239	RELAY, Y1/W1 HI-LO SWITCHING RELAY
K250	RELAY, Y2 HIGH SPEED BLOWER
L34	SOLENOID, TWO STAGE COMPRESSOR

④ DENOTES OPTIONAL COMPONENTS  
LINE VOLTAGE FIELD INSTALLED

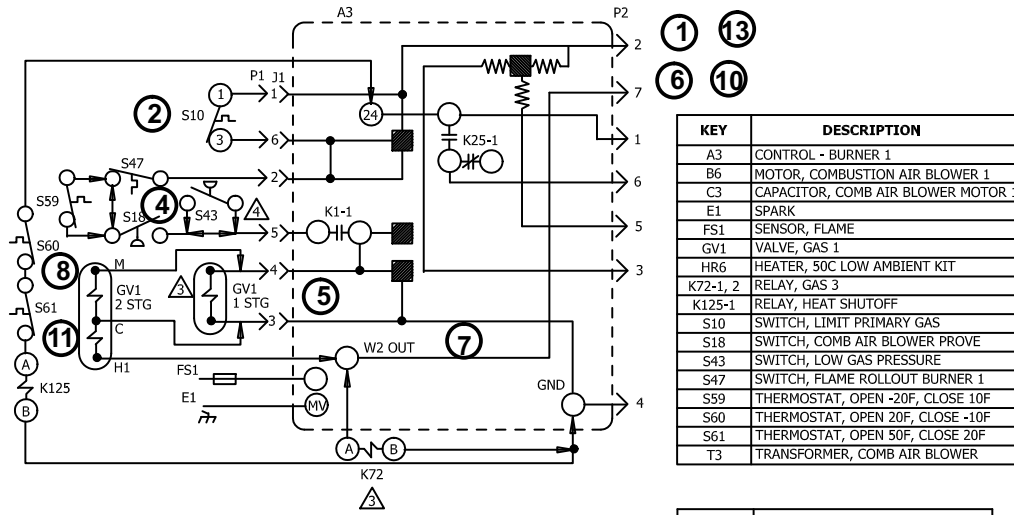


### KGB-074 Two-Stage Units

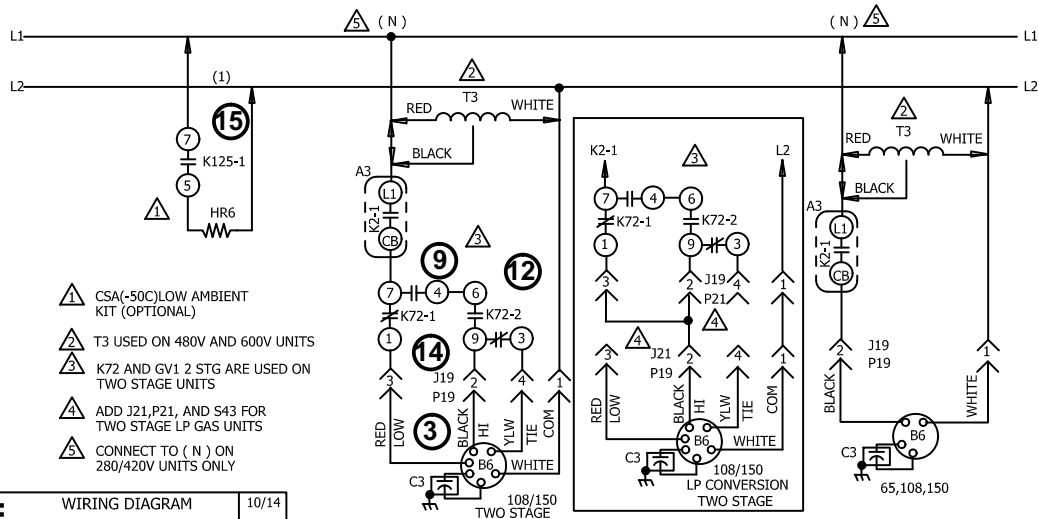
1. **First-stage cooling demand Y1** and G is energized by the thermostat. G energizes blower.
2. Relay K239 directs voltage through relay K250 to energize contactor K3.
3. Blower contactor K3 energizes blower B3 on low speed.
4. **Second-stage cooling demand Y2** energizes relay K250 to redirect voltage to contactor K37
5. Contactor K37 energizes blower B3 on high speed.

08/15		WIRING DIAGRAM	08/15
		537822-01	
COOLING			
2 SPEED A - BOX AND A+ - BOX - G,J,M,Y			
SECTION E			REV. 0
Supersedes		New Form No. 537822-01	

# GAS HEAT FOR KGA/KGB024/090 UNITS



J/P	JACK/PLUG DESCRIPTION
1	GAS LIMIT
2	HEAT
19	COMB AIR BLOWER
21	COMB AIR BLOWER 2



10/14	WIRING DIAGRAM	10/14
537776-01		
HEATING		
GAS HEAT - KGA, KGB - 65 THRU 150 UNITS		
SECTION A		REV. 0
Supersedes 537061-02	New Form No. 537776-01	

### First Stage Heat:

1. The thermostat initiates W1 heating demand.
2. 24VAC is routed from TB1 to ignition control A3. A3 proves N.C. primary limit S10 and N.C. rollout switch S47.
3. Combustion air inducer blower B6 is energized.
4. After the combustion air inducer B6 has reached full speed, the combustion air proving switch S18 contacts close.
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 ignition control A3.
8. A3 energizes gas valve GV1 on second stage.
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 W2 (second stage) is de-energized.
11. Second stage heat is de-energized on GV1 by ignition control A3.
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:

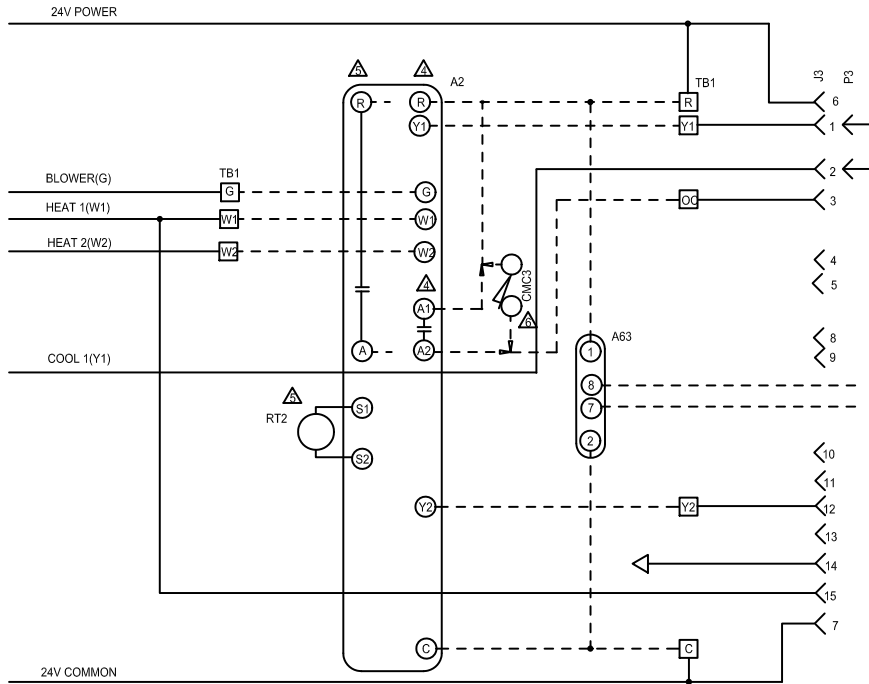
13. Heating demand is satisfied. Terminal W1 (first stage) is de-energized.
14. Ignition A3 is de-energized in turn de-energizing gas valve GV1 and combustion air inducer B6.

### 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



KEY	COMPONENT
A2	SENSOR-ELECTRONIC
A63	SENSOR-CO2
CMC3	CLOCK-TIME
J3	JACK-UNIT ECONOMIZER
P3	PLUG-LESS ECONOMIZER
RT2	SENSOR-REMOTE THERMOSTAT
TB1	TERMINAL STRIP-CLASS II VOLTAGE

- △ THERMOSTAT SUPPLIED BY USER
- △ REMOVE P3 WHEN ECONOMIZER IS USED
- △ J3 MAXIMUM LOAD 20VA 24VAC CLASS II
- △ T7300 THERMOSTAT
- △ T88220 TOUCHSCREEN THERMOSTAT
- △ TIME CLOCK CONTACTS (OPT) CLOSED OCCUPIED

DESIGNATES OPTIONAL WIRING  
 CLASS II FIELD WIRING

06/13	WIRING DIAGRAM	06/13
537637-01		
ACCESSORIES		
ELECTRONIC OR ELECTROMECHANICAL THERMOSTAT FOR K SERIES		
SECTION C		REV 0
Supersedes 537483-01	New Form No. 537637-01	

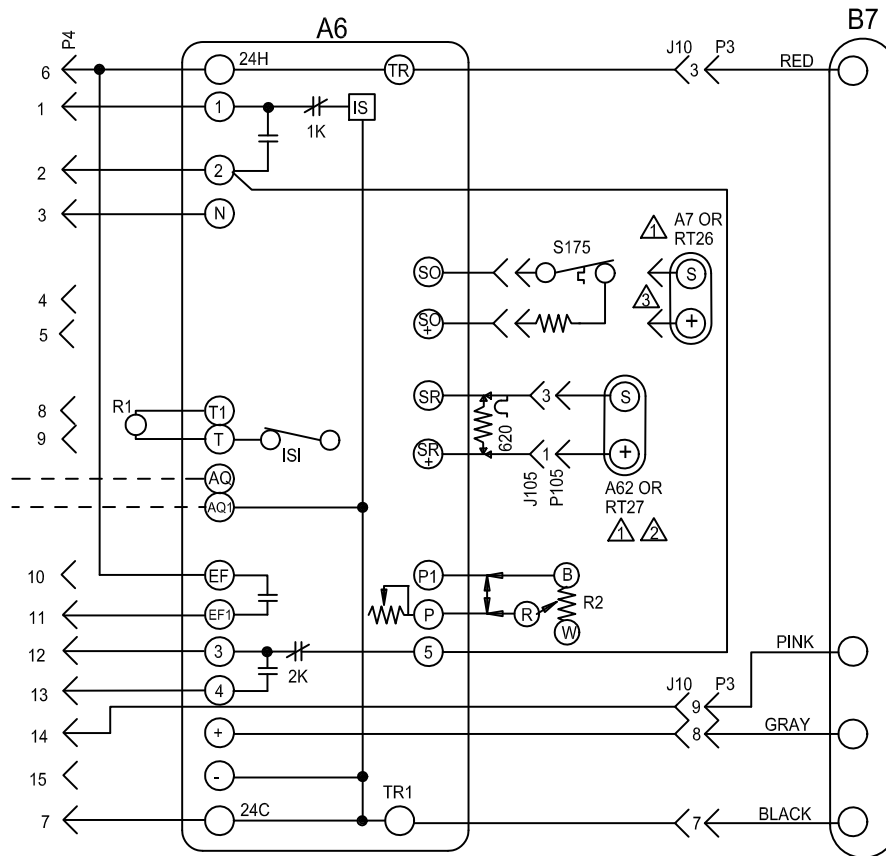
## POWER:

- Terminal strip TB1 found in the main control box supplies thermostat components with 24VAC.

## OPERATION:

- TB1 receives data from the electronic thermostat A2 (Y1, Y2, W1, W2, G) and energizes the appropriate components for heat or cool demand.

# ECONOMIZER




KEY	COMPONENT
A6	CONTROL-SOLID STATE ENTHALPY
A7	SENSOR-SOLID STATE ENTHALPY
A62	SENSOR-ENTHALPY, INDOOR
B7	MOTOR-DAMPER, ECONOMIZER
J10	JACK, ECONOMIZER
P3	PLUG, ECONOMIZER
P4	PLUG-ECONOMIZER
R1	SENSOR-MIXED AIR OR SUPPLY AIR
R2	POT-MINIMUM POSITION
RT26	SENSOR-OUTDOOR AIR TEMP
RT27	SENSOR-INDOOR AIR TEMP
S175	THERMOSTAT, SENSIBLE AIR

▲ RT26 AND RT27, TEMPERATURE SENSORS MAY BE USED INSTEAD OF A7 AND A62 ENTHALPY SENSORS

▲ A62 ENTHALPY SENSOR OR RT27 USED FOR DIFFERENTIAL SENSING

▲ OPTIONAL OUTDOOR AIR THERMOSTAT TO REPLACE RT26 SENSIBLE SENSOR

————— DESIGNATES OPTIONAL WIRING  
 - - - - - CLASS II FIELD WIRING

08/15		537620-01	08/15
<b>ACCESSORIES</b>			
ECONOMIZER LANDMARK A-BOX			
SECTION D1			REV 1
Supersedes Form No. 537484-01		New Form No. 537620-01	

## SEQUENCE OF OPERATION

### POWER:

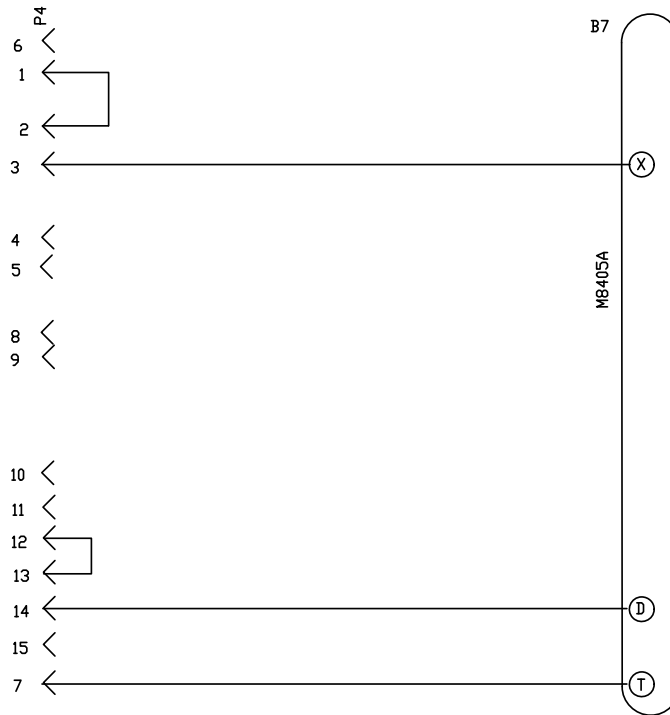
1. Terminal strip TB1 found in the main control panel energizes the economizer components with 24VAC.

### OPERATION:

2. Enthalpy sensor A7 and A62 (if differential enthalpy is used) communicates to the economizer control module A6 when to power the damper motor B7.
3. Economizer control module A6 supplies B7 with 0 - 10 VDC to control the positioning of economizer.
4. The damper actuator provides 2 to 10 VDC position feedback.



# OUTDOOR AIR DAMPER



KEY	DESCRIPTION
B7	MOTOR-DAMPER, ECONOMIZER
P4	PLUG-ECONOMIZER

DESIGNATES OPTIONAL WIRING  
 CLASS II FIELD WIRING

	WIRING DIAGRAM	11/07
ACCESSORIES		
MOTORIZED DAD FOR KCA/KGA,TCA/TGA UNITS		
ECONOMIZER SECTION D2		
Supersedes Form No.	New Form No. 534,489W	

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## SEQUENCE OF OPERATION

### OPERATION:

#### Occupied Mode

1. 24 volt signal from terminal "OC" on TB1 opens B7 dampers to minimum position.

#### Unoccupied Mode

2. Dampers remain closed.