

# WE MAKE INDOOR AIR BETTER



**THERMOPLUS<sup>®</sup>**  
**AIR INC.**

## Water-Cooled Heat Pumps & Air Conditioners 3/4-Ton to 60-Tons

- Various voltages/phases
- Suitable for duct connections
- Ideal for use with free air supply plenum (2-axis adjustable louvered grill)
- Complete with hanger rails/ rubber isolators (horizontal model)
- Removable drain pan
- Factory-mounted water-regulating valve (A/C model only)
- Low-voltage (24V) exterior terminal block for thermostat connection
- Baked-enamel powder-paint finish
- Excellent serviceability
- Factory tested, fully operational units



## DESIGN FEATURES

### COMPRESSOR

High efficiency, suction cooled hermetic type, mounted outside the air stream in an insulated compartment to reduce noise level. Internal spring and external rubber isolation provides vibration-free operation.

### REVERSING VALVE

Factory installed and piped, activated by cooling or heating demand from room thermostat (H/P model only).

### WATER REGULATING VALVE

Factory installed and adjusted to provide a regulated water flow thus keeping the condensing pressure constant in the system (A/C model only).

### REFRIGERANT METERING

Capillary tube refrigerant distribution and control (009 - 140) TX valve for larger models.

### COILS

Fabricated from 3/8" O.D. copper tube mechanically bonded to aluminum fins. Sized for maximum heat transfer efficiency and fin spacing to optimize air pressure drops, reducing energy consumption.

### BLOWER MOTOR

Multi-speed, permanent split capacitor motors, permanently lubricated, mounted on the blower casing on resilient mounts to prevent vibration. Models KAC-009 to KAC-060 are driven by direct drive 3-speed motors; the larger models, KAC-096 to KAC-140 are belt driven.

### COAXIAL CONDENSER

Tube-in-tube type water-cooled condenser with convoluted inner tube to enhance surface area for efficient heat transfer.

### AIR SUPPLY ARRANGEMENTS

- Horizontal units (std) air supply is HB (back)
- Optional: Side air supply (HS). (Field convertible by installer).
- Vertical units (std) air supply is VT (top)
- Optional back air supply (VB). Must be ordered.

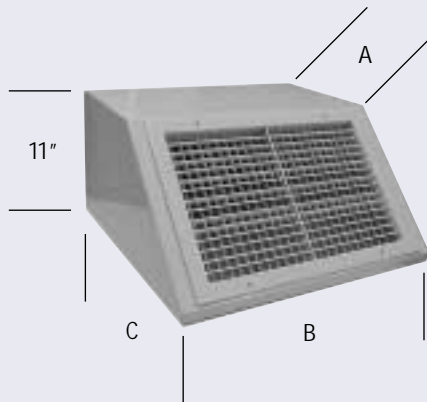
### DRAIN PAN

Constructed of galvanized steel to prevent corrosion. Unique Feature: Pan is external to the unit, therefore allowing for ease of removability and cleaning.

## ACCESSORIES

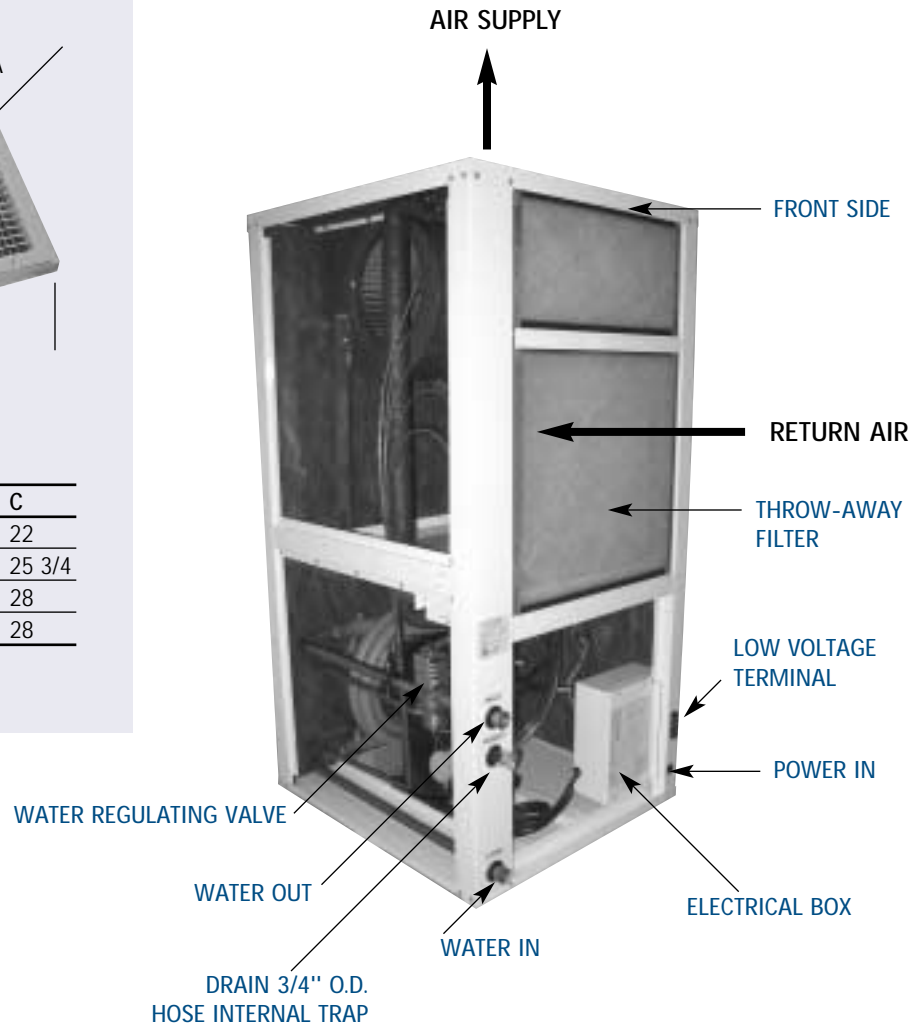
## PLENUM

## VERTICAL TOP AIR SUPPLY



DIMENSIONS (inches)

MODEL	A	B	C
009 to 030	12	22	22
036	15 3/4	25 3/4	25 3/4
048	18	25 3/4	28
060 to 070	18	30	28



## DESIGN FEATURES

### WATER-FLOW CONSUMPTION DATA

This table provides the various USGPM water flow rates for different water temperatures (EWT) from 40°F to 80°F, in steps of 5°F. Data is based on 80°F EDB / 67°F EWB entering air and 105°F condensing (with water regulating valve) for the factory connected medium speed taps, giving the nominal capacity of the unit.

#### NOTE:

To reduce water consumption (KAC units with water regulating valve) use the coldest water available.

### CAPACITY DATA TABLE

This table provides the unit cooling capacity BTUH. The column "Q TOT" indicates an entering water temperature (EWT) fixed at 60°F, with different entering air wet bulb temperatures (EWB).

The sensible cooling capacity ratios (i.e. QS 75, QS 80, QS 85, QS 90) provide the sensible cooling capacity of the unit computed as follows: e.g. for a KAC-012 @ 60°F EWT, EWB = 67, CFM = 335 (low speed).

$$QS\ 75 = 0.522 \text{ (from table)}$$

$$QS\ 75 = Q\ TOT \times 0.522$$

$$QS\ 75 = 12,967 \times 0.522 = 6,769 \text{ BTUH}$$

#### NOTE:

- The 3 different CFMs are for the low, medium and high-speed taps. The standard factory connected tap is the medium speed. E.g. for a KAC-012, the medium tap delivers 415 CFM.
- IMPORTANT: Technical data is for A/C units with a water regulating valve.

### WATER FLOW (USGPM) FOR DIFFERENT ENTERING WATER TEMPERATURES

MODEL	EWT (°F)																			
	40		45		50		55		60		65		70		75		80		85	
	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD	GPM	WPD
KAC-009	0.6	1.8	0.7	2.2	0.7	2.2	0.8	2.4	0.8	2.4	0.9	2.7	1.1	3.1	1.6	4.5	2.2	7.5	2.4	8.9
KAC-012	0.5	1.5	0.6	1.9	0.6	1.9	0.7	2.4	0.8	2.7	0.9	3.0	1.7	5.7	2.0	7.6	3.1	16.5	3.2	17.8
KAC-015	0.6	1.3	0.7	1.7	0.7	1.7	0.8	2.1	1.0	2.6	1.0	2.6	1.1	3.3	1.4	4.2	1.8	5.7	2.0	6.6
KAC-018	1.0	2.6	1.0	2.6	1.1	3.3	1.2	3.6	1.2	3.6	1.7	5.7	2.5	9.0	3.0	11.9	3.3	14.2	5.3	31.2
KAC-024	1.0	1.8	1.1	2.3	1.2	2.5	1.3	2.7	1.4	2.9	2.0	3.6	2.9	6.5	4.3	7.7	5.0	9.6	6.0	14.2
KAC-030	1.3	2.6	1.4	3.1	1.6	3.4	1.8	3.7	2.0	4.0	2.4	4.9	4.2	9.1	5.0	12.2	6.5	19.3	7.5	27.4
KAC-036	1.9	3.2	2.0	3.3	2.1	3.4	2.2	3.5	2.3	3.7	2.8	4.2	3.2	4.6	3.4	4.8	3.9	5.4	9.3	29.2
KAC-048	2.3	3.8	2.5	4.0	3.1	4.7	3.1	4.7	4.0	5.6	4.4	6.7	5.0	8.1	5.8	11.5	7.0	14.7	12.3	54.3
KAC-060	2.6	3.8	2.9	4.3	3.1	4.8	3.4	5.3	4.3	5.6	4.4	5.6	4.9	6.1	5.8	6.9	7.0	7.8	16.0	33.0
KAC-070	4.4	3.3	4.7	3.4	4.9	3.8	5.0	4.0	5.1	4.3	6.1	4.8	6.9	5.7	7.5	6.4	11.1	11.6	18.0	38.2
KAC-096	5.2	2.4	5.5	2.6	6.2	3.2	6.5	3.4	7.8	4.0	8.8	4.7	10.2	6.1	13.6	9.0	14.0	10.1	24.6	27.0
KAC-108	6.8	3.0	6.8	3.0	6.9	3.0	7.2	3.3	7.4	3.4	9.8	4.5	12.4	5.9	13.4	7.1	15.4	8.9	28.4	20.4
KAC-120	7.8	5.0	8.0	5.4	8.4	5.5	8.8	5.6	9.0	5.9	12.0	6.5	13.6	7.5	14.8	8.1	19.4	13.4	32.6	25.0
KAC-140	8.4	3.1	8.6	3.3	9.3	3.7	9.8	4.3	10.4	4.5	14.0	5.4	14.6	5.8	15.2	6.3	22.6	11.2	40.8	29.0

Note: WPD = Water pressure drop, ft. of water

### CAPACITY DATA WITH DIFFERENT SENSIBLE COOLING RATIOS

MODEL	GPM	EER	CFM	Q TOT	WATT	Q REJ	QS 75	QS 80	QS 85	QS 90
KAC-009	0.8	15.0	350	9,724	649	11,981	0.548	0.699	0.850	0.989
KAC-012	0.8	14.6	415	13,316	913	16,449	0.542	0.682	0.823	0.951
KAC-015	1.0	16.0	475	15,952	997	19,362	0.533	0.663	0.791	0.924
KAC-018	1.2	13.6	650	20,940	1,545	25,979	0.546	0.690	0.838	0.966
KAC-024	1.4	13.4	825	24,059	1,796	30,330	0.542	0.683	0.825	0.961
KAC-030	2.0	13.1	1,005	30,236	2,304	38,260	0.553	0.706	0.855	1.000
KAC-036	2.3	14.3	1,160	36,405	2,573	45,421	0.552	0.693	0.847	0.977
KAC-048	4.0	14.3	1,500	50,888	3,583	63,023	0.534	0.667	0.803	0.931
KAC-060	4.4	15.1	1,825	61,150	4,090	75,668	0.539	0.673	0.811	0.941
KAC-070	5.2	15.7	2,200	73,242	4,591	88,621	0.540	0.679	0.816	0.945
KAC-096	7.8	13.6	3,200	99,746	7,334	124,644	0.532	0.668	0.805	0.933
KAC-108	7.4	13.7	3,800	115,124	8,432	144,220	0.551	0.700	0.850	0.979
KAC-120	9.0	15.5	4,100	126,938	8,182	154,764	0.548	0.695	0.842	0.975
KAC-140	10.4	15.2	4,600	144,944	9,554	178,186	0.545	0.689	0.829	0.962

"KAC" UNIT with WATER VALVE - EAT 80/67°F								Sensible Cooling Capacity			
MODEL	EWT	GPM	EER	CFM	Q TOT	WATT	Q REJ	QS 75	QS 80	QS 85	QS 90
KAC-009	60	0.8	15.3	300	9,585	626	11,686	0.533	0.666	0.801	0.935
	60	0.8	15.0	350	9,724	649	11,981	0.548	0.699	0.850	0.989
	60	0.8	14.7	390	9,869	671	12,109	0.557	0.717	0.883	1.000
KAC-012	60	0.8	14.6	335	12,967	828	15,784	0.522	0.639	0.759	0.877
	60	0.8	14.6	415	13,316	913	16,449	0.542	0.682	0.823	0.951
	60	0.9	14.4	470	13,490	937	16,761	0.555	0.709	0.862	1.000
KAC-015	60	0.9	16.0	390	15,481	969	18,646	0.519	0.630	0.743	0.857
	60	1.0	16.0	475	15,952	997	19,362	0.533	0.663	0.791	0.924
	60	1.0	16.3	570	16,368	1,002	19,898	0.544	0.702	0.850	0.987
KAC-018	60	1.2	13.7	570	20,395	1,493	25,479	0.537	0.671	0.805	0.927
	60	1.2	13.6	650	20,940	1,545	25,979	0.546	0.690	0.838	0.966
	60	1.3	13.4	730	21,269	1,586	26,636	0.558	0.718	0.875	1.000
KAC-024	60	1.4	13.6	750	23,718	1,742	29,855	0.536	0.669	0.799	0.932
	60	1.4	13.4	825	24,059	1,796	30,330	0.542	0.683	0.825	0.961
	60	1.5	13.2	875	24,260	1,835	30,552	0.545	0.691	0.840	0.979
KAC-030	60	2.0	13.1	985	29,970	2,283	37,887	0.547	0.694	0.837	0.972
	60	2.0	13.1	1,005	30,236	2,304	38,260	0.553	0.706	0.855	1.000
	60	2.0	13.0	1,040	30,357	2,335	38,442	0.556	0.712	0.865	1.000
KAC-036	60	2.3	14.1	1,055	35,873	2,548	44,551	0.539	0.674	0.815	0.942
	60	2.3	14.3	1,160	36,405	2,573	45,421	0.552	0.693	0.847	0.977
	60	2.4	14.6	1,300	37,985	2,600	45,163	0.566	0.703	0.884	1.000
KAC-048	60	3.7	14.5	1,200	49,249	3,393	60,723	0.521	0.635	0.750	0.864
	60	4.0	14.3	1,500	50,888	3,583	63,023	0.534	0.667	0.803	0.931
	60	4.1	13.1	1,630	51,139	3,874	64,032	0.535	0.679	0.825	0.958
KAC-060	60	4.3	15.6	1,665	61,197	3,916	75,325	0.538	0.668	0.795	0.917
	60	4.4	15.1	1,825	61,150	4,090	75,668	0.539	0.673	0.811	0.941
	60	4.5	14.1	1,980	61,971	4,382	77,042	0.544	0.690	0.838	0.971
KAC-070	60	5.0	15.9	1,980	71,975	4,516	87,186	0.534	0.661	0.787	0.912
	60	5.2	15.7	2,200	73,242	4,591	88,621	0.540	0.679	0.816	0.945
	60	5.2	15.2	2,350	73,656	4,876	88,343	0.543	0.682	0.830	0.964
KAC-096	60	7.6	14.0	2,817	99,290	7,086	123,374	0.530	0.659	0.790	0.914
	60	7.8	13.6	3,200	99,746	7,334	124,644	0.532	0.668	0.805	0.933
	60	7.8	13.1	3,443	100,398	7,676	125,006	0.533	0.671	0.820	0.952
KAC-108	60	7.0	13.9	3,285	113,340	8,170	144,484	0.536	0.667	0.803	0.930
	60	7.4	13.7	3,800	115,124	8,432	144,220	0.551	0.700	0.850	0.979
	60	7.4	13.2	4,015	115,628	8,774	144,930	0.552	0.706	0.864	1.000
KAC-120	60	8.6	15.8	3,690	125,640	7,938	151,796	0.538	0.672	0.809	0.940
	60	9.0	15.5	4,100	126,938	8,182	154,764	0.548	0.695	0.842	0.975
	60	9.0	15.4	4,400	129,602	8,434	154,952	0.551	0.699	0.859	1.000
KAC-140	60	10.2	15.5	4,400	144,608	9,318	176,980	0.543	0.681	0.818	0.947
	60	10.4	15.2	4,600	144,944	9,554	178,186	0.545	0.689	0.829	0.962
	60	10.4	14.9	4,800	146,242	9,808	178,302	0.546	0.690	0.839	0.973

For larger models (see page 21).

## WATER SOURCE HEAT PUMP SYSTEM (CLOSED LOOP)

Thermoplus Air heat pumps are quiet, efficient units that can be used in any multi-room building by interconnecting them in a closed pipe loop and maintaining the water temperature between 60°F and 90°F.

### ADVANTAGES

#### Lower Operating Cost

The Thermoplus Air system economically redistributes heat from areas in a building that need cooling to areas that need heating. The system utilizes energy that would normally be wasted. Auxiliary components operate only as needed.

#### Lower Installation Cost

The system consists of factory-built modules as its main components, thus reducing field labor when compared to built-up systems.

#### Lower Noise Level

Each unit is acoustically lined in the factory for minimum noise levels.

### Reduced Maintenance

Maintenance can potentially be a significant part of owner costs. With a Thermoplus Air system, maintenance is limited to periodic filter changes. The water loop, being a closed circuit, generally needs no maintenance.

### Flexibility

Thermoplus Air systems provide flexibility both in operation and installation. The units operate independently of each other so that if an employee is working at night, or during the weekend, he can retain air conditioning even though units in other areas of the building are turned off.

### Simplicity

The Thermoplus Air system consists of individual packaged units, a water loop, and a means of preventing the water from becoming too hot or too cold.

### HOW DOES IT WORK?

A series of combination heating and cooling heat pump units are located throughout a building. The units are served by a common loop of uninsulated piping through which water at 60°F to 90°F is continuously circulated. When the units are in the cooling mode, heat is transferred from the conditioned space to the water loop. Refer to Figure 1.

When they are in the heating mode, heat is transferred from the water loop to the conditioned space. Refer to Figure 2. Because the water is recirculating, the recovered heat may then either be transferred to other parts of the building for immediate use, or stored in the heat storage tank to be recycled at night to meet building requirements throughout the nighttime hours. As illustrated, the system does not wastefully exhaust excess heat into the atmosphere as other systems do, but continues to recycle the recovered energy within the building through the day, thus lowering energy costs substantially. This recovered heat may be generated by a variety of sources including people, lights, appliances, computers, solar heat gains through the windows, etc. Also, to ensure that the 60°F to 90°F water temperature is maintained, a heat rejector and an auxiliary heater are added to the common loop. This auxiliary heater may utilize any form of energy, including solar collector panels.

#### FIGURE 1

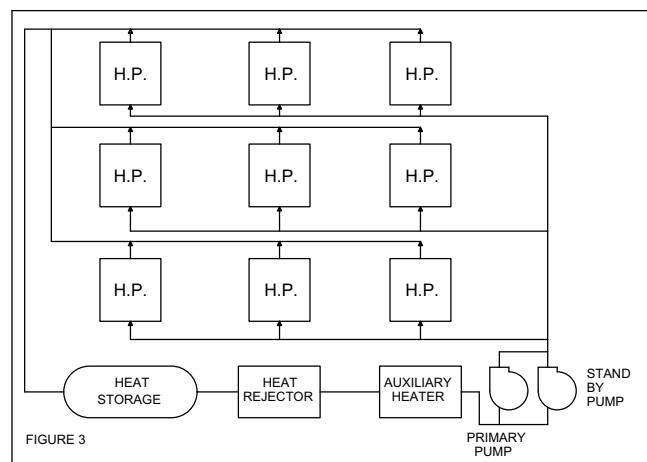
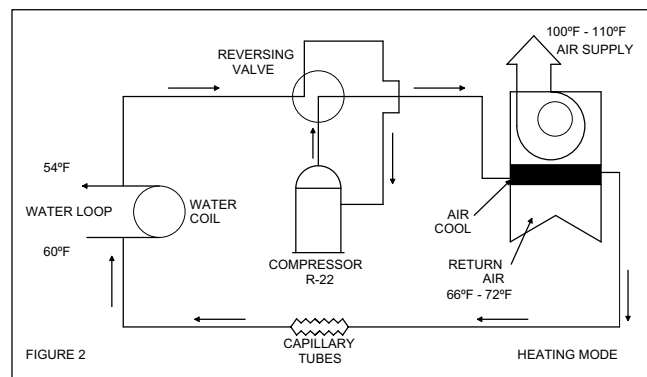
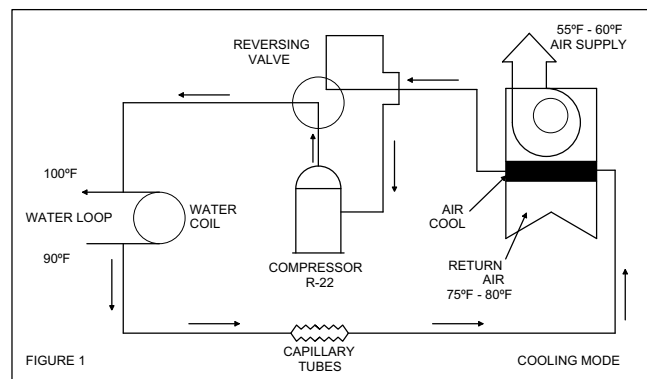
In the cooling mode, cold refrigerant flows through the air coil, supplying cool air to the conditioned space. The heat removed from the room air is transferred to the water loop.

#### FIGURE 2

In the heating mode, hot refrigerant flows through the air coil, supplying warm air to the conditioned space. The heat added to the room air is extracted from the water loop.

#### FIGURE 3

In Figure 3, the system is simultaneously heating and cooling as it transfers energy from one space to another as required. When individual thermostats are satisfied, the heat pump neither heats nor cools, and water loop temperature remains between 60°F and 90°F with no auxiliary heat input for days or weeks. Only when the building has a net deficiency and water temperature falls to 60°F does the auxiliary heater automatically begin to add heat to the system.



## SIZING THE WATER COOLED UNIT

As with any mechanical equipment, proper sizing is most important for efficient operation. In warm climates, the units should be selected based on the cooling capacity and checked for heating output. In cold climates, the reverse should be done.

### SELECTION PROCEDURE

1. Knowing the desired dry bulb and wet bulb conditions, determine the required heating and cooling loads for the application.
2. Certain design criteria is required to properly select the equipment: Required air volume in CFM, entering water temperature in °F, the flow rate of the water in GPM, and the design wet bulb and dry bulb temperatures. An average of 400 CFM/ton can be assumed.
3. Select a unit from the tables (p. 7-13) based on the total and sensible cooling capacities at ARI conditions. Remember to select a unit close to, but not larger than your actual load.
4. With the design water flow and water temperature, read the total and sensible cooling capacity of your selected unit.
5. Use the correction factors associated with the variable factors of dry bulb, wet bulb and CFM to compare the corrected capacities to your load requirements.  
**Corrected Total Cooling = total cooling (from tables) x CFM correction x wet bulb correction**  
**Corrected Sensible Cooling = sensible cooling (from tables) x CFM correction x wet / dry bulb correction**
6. The selection is complete if the capacity (corrected) is within 10% of the required load of your application. If not, then examine the consequences of changing one or more of the design criteria to achieve your selection.

### EXAMPLE SELECTION

The example below is based on the following requirements:

#### For a Cooling Selection:

Total cooling required:	35,100 BTUH
Sensible Cooling required:	24,750 BTUH
Entering air temp.	80°F DB/64°F WB

We have also established the following design criteria:

GPM = 6.6 (based on a 12°F rise in temperature)	
Entering Water Temperature	70°
CFM	1050

With our first selection (KHP036), we read the table at the design water flow and water temperature as follows:

Total Cooling	36,861 BTUH
Sensible Cooling	25,670 BTUH

We then proceed in determining our correction factors:

$$\text{Corrected Total Cooling} = 36,861 \times .982 \times .936 = 33,880$$

$$\text{Corrected Sensible Cooling} = 25,670 \times .953 \times 1.13 = 27,644$$

$$\text{Actual Temp. Rise} = \frac{\text{correction of heat of rejection}}{\text{GPM} \times 500}$$

$$= \frac{45,619 \times .947}{6.6 \times 500} = 13.09^\circ\text{F}$$

By comparing the Corrected Total Cooling and Corrected Sensible Cooling results with the required cooling loads, we see that the selection is within 10% of the actual load requirement. Also, we notice that the Corrected Total Cooling is undersized (RECOMMENDED).

**Final Selection: KHP-036**

## PERFORMANCE DATA

### MODEL KHP 009 Horizontal and Vertical

			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.0)				EAT 70°F (COP=4.3)		
GPM	WPD	EWTF	TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
1.1	1.2	60	9,909	6,862	12,049	623	8,884	7,190	671
1.7	2.9	60	10,094	6,935	12,136	595	9,430	7,744	692
2.4	5.7	60	10,197	6,978	12,193	578	9,870	8,195	709
3.0	8.6	60	10,236	6,998	12,222	571	10,057	8,387	716
1.1	1.2	70	9,583	6,726	11,878	675	10,297	8,634	725
1.7	2.9	70	9,775	6,796	11,955	647	10,942	9,325	751
2.4	5.7	70	9,852	6,843	12,030	630	<b>11,438</b>	<b>9,845</b>	<b>770</b>
3.0	8.6	70	9,906	6,861	12,048	623	11,678	10,074	779
1.1	1.2	80	9,203	6,590	11,734	734	11,684	10,081	781
1.7	2.9	80	9,400	6,659	11,805	704	12,419	10,857	808
2.4	5.7	80	9,498	6,705	11,867	686	13,009	11,486	831
3.0	8.6	80	9,542	6,725	11,893	678	13,265	11,760	842
1.1	1.2	85	9,047	6,516	11,638	763	12,367	10,803	806
1.7	2.9	85	9,216	6,594	11,738	732	13,147	11,634	837
2.4	5.7	85	<b>9,321</b>	<b>6,635</b>	<b>11,785</b>	<b>715</b>	13,776	12,309	863
3.0	8.6	85	9,386	6,659	11,810	705	14,046	12,601	874
1.1	1.2	90	8,863	6,445	11,559	794			
1.7	2.9	90	9,045	6,520	11,645	762			
2.4	5.7	90	9,146	6,562	11,695	745			
3.0	8.6	90	9,217	6,586	11,720	734			
1.1	1.2	95	8,672	6,375	11,487	826			
1.7	2.9	95	8,866	6,447	11,562	794			
2.4	5.7	95	8,930	6,500	11,644	776			
3.0	8.6	95	9,015	6,517	11,651	765			

Bold Face = ARI Conditions

### MODEL KHP 012 Horizontal and Vertical

			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.7)				EAT 70°F (COP=4.2)		
GPM	WPD	EWTF	TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
11.8	4.4	60	13,945	9,335	16,724	803	12,160	9,875	928
2.5	8.3	60	14,176	9,415	16,794	771	12,659	10,377	949
3.2	13.4	60	14,232	9,450	16,851	758	12,940	10,662	961
4.0	20.6	60	14,292	9,480	16,893	747	13,251	10,979	974
1.8	4.4	70	13,500	9,154	16,536	880	14,071	11,820	1,009
2.5	8.3	70	13,683	9,232	16,622	847	14,674	12,439	1,035
3.2	13.4	70	13,764	9,263	16,652	834	<b>15,007</b>	<b>12,785</b>	<b>1,050</b>
4.0	20.6	70	13,836	9,293	16,683	821	15,370	13,163	1,065
1.8	4.4	80	13,054	8,970	16,342	960	15,946	13,764	1,090
2.5	8.3	80	13,227	9,046	16,429	927	16,642	14,535	1,123
3.2	13.4	80	13,330	9,082	16,456	911	17,034	14,910	1,138
4.0	20.6	80	13,382	9,108	16,489	900	17,448	15,349	1,157
1.8	4.4	85	12,811	8,876	16,252	1,002	16,876	14,742	1,131
2.5	8.3	85	13,021	8,950	16,312	969	17,589	15,543	1,165
3.2	13.4	85	<b>13,084</b>	<b>8,989</b>	<b>16,370</b>	<b>953</b>	18,029	15,968	1,183
4.0	20.6	85	13,141	9,017	16,405	941	18,471	16,441	1,202
1.8	4.4	90	12,565	8,773	16,131	1,045			
2.5	8.3	90	12,767	8,854	16,225	1,012			
3.2	13.4	90	12,841	8,895	16,280	995			
4.0	20.6	90	12,905	8,922	16,308	983			
1.8	4.4	95	12,307	8,675	16,039	1,091			
2.5	8.3	95	12,500	8,756	16,127	1,054			
3.2	13.4	95	12,594	8,791	16,160	1,038			
4.0	20.6	95	12,649	8,819	16,196	1,027			

Bold Face = ARI Conditions

### Rated Air Flow 350 CFM

#### Correction Factors

##### For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.908	0.832	1.053	*	*	*	0.909
64	0.951	0.696	0.917	1.133	*	*	0.949
67	1.000	0.559	0.779	1.000	1.218	*	1.000
70	1.058	0.400	0.641	0.862	1.083	1.299	1.049
73	1.123		0.503	0.723	0.943	1.161	1.098

#### Heating Corrections

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.023	1.018	0.910
65	1.012	1.011	0.955
70	1.000	1.000	0.001
75	0.991	0.987	1.048
80	0.982	0.976	1.100

#### For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
245	0.943	0.847	0.952	0.985	0.962	0.969	1.110
300	0.976	0.929	0.980	0.993	0.984	0.988	1.042
350	1.000	1.000	1.000	1.000	1.000	1.000	1.000
390	1.015	1.054	1.012	1.004	1.004	1.011	0.975
475	1.038	1.161	1.032	1.010	1.009	1.015	0.936

### Rated Air Flow 415 CFM

#### Correction Factors

##### For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.903	0.842	1.049	1.256	*	*	0.911
64	0.944	0.714	0.921	1.128	1.338	*	0.953
67	1.000	0.586	0.792	1.000	1.205	1.417	1.000
70	1.057	0.439	0.663	0.870	1.076	1.280	1.049
73	1.118		0.532	0.739	0.946	1.150	1.102

#### Heating Corrections

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.023	1.012	0.905
65	1.011	1.008	0.951
70	1.000	1.000	1.000
75	0.989	0.970	1.050
80	0.978	0.961	1.104

#### For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
300	0.942	0.862	0.950	0.983	0.986	0.957	1.110
335	0.966	0.905	0.965	0.993	0.991	0.989	1.067
415	1.000	1.000	1.000	1.000	1.000	1.000	1.000
470	1.021	1.060	1.014	1.006	1.003	1.020	0.968
525	1.035	1.118	1.027	1.010	1.007	1.036	0.943

**PERFORMANCE DATA**

**MODEL KHP 015 Horizontal and Vertical**

**Rated Air Flow 475 CFM**

GPM WPD EWT°F			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=14.2)				EAT 70°F (COP=4.4)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
2.0	3.9	60	16,519	10,827	19,661	913	15,838	13,305	1,126
2.8	7.5	60	16,706	10,903	19,757	887	16,372	13,832	1,147
3.8	13.9	60	16,841	10,962	19,820	862	16,873	14,372	1,170
5.0	23.9	60	16,919	11,002	19,877	847	17,462	14,597	1,194
2.0	3.9	70	15,944	10,597	19,414	1,002	18,173	15,698	1,225
2.8	7.5	70	16,116	10,667	19,493	975	18,795	16,349	1,252
<b>3.8</b>	<b>13.9</b>	<b>70</b>	<b>16,273</b>	<b>10,735</b>	<b>19,576</b>	<b>949</b>	<b>19,405</b>	<b>16,992</b>	<b>1,279</b>
5.0	23.9	70	16,371	10,774	19,618	934	20,057	17,682	1,308
2.0	3.9	80	15,705	10,340	18,856	1,089	20,466	18,117	1,326
2.8	7.5	80	15,540	10,433	19,235	1,068	21,165	18,864	1,357
3.8	13.9	80	15,704	10,501	19,312	1,041	21,856	19,605	1,388
5.0	23.9	80	15,801	10,541	19,356	1,025	22,593	20,401	1,422
2.0	3.9	85	15,091	10,247	19,026	1,144	21,594	19,323	1,376
2.8	7.5	85	15,265	10,314	19,095	1,116	22,339	20,126	1,410
<b>3.8</b>	<b>13.9</b>	<b>85</b>	<b>15,415</b>	<b>10,383</b>	<b>19,181</b>	<b>1,088</b>	23,065	20,912	1,443
5.0	23.9	85	15,510	10,423	19,227	1,072	23,846	21,762	1,480
2.0	3.9	90	14,838	10,130	18,890	1,194			
2.8	7.5	90	14,936	10,199	18,996	1,166			
3.8	13.9	90	15,125	10,263	19,046	1,137			
5.0	23.9	90	15,214	10,305	19,101	1,121			
2.0	3.9	95	14,506	10,011	18,782	1,246			
2.8	7.5	95	14,676	10,082	18,858	1,215			
3.8	13.9	95	14,832	10,143	18,918	1,188			
5.0	23.9	95	14,919	10,185	18,970	1,171			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.895	0.849	1.048	1.247	*	*	0.909
64	0.948	0.725	0.925	1.125	1.323	*	0.955
67	1.000	0.601	0.801	1.000	1.200	1.399	1.000
70	1.059	0.454	0.675	0.874	1.074	1.271	1.048
73	1.118		0.548	0.747	0.947	1.146	1.102

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.022	1.021	0.906
65	1.011	1.010	0.951
70	1.000	1.000	1.000
75	0.989	0.988	1.052
80	0.982	0.974	1.107

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
300	0.913	0.819	0.924	0.974	0.957	0.963	1.215
390	0.967	0.916	0.970	0.989	0.981	0.981	1.074
475	1.000	1.000	1.000	1.000	1.000	1.000	1.000
570	1.035	1.086	1.021	1.007	1.009	1.014	0.948
650	1.050	1.157	1.040	1.014	1.018	1.020	0.914

**MODEL KHP 018 Horizontal and Vertical**

**Rated Air Flow 650 CFM**

GPM WPD EWT°F			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.3)				EAT 70°F (COP=4.0)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
2.5	6.0	60	22,737	15,254	27,949	1,510	17,477	13,623	1,425
3.8	13.9	60	24,014	15,792	29,302	1,512	18,098	14,391	1,456
5.3	26.6	60	24,807	16,100	30,050	1,520	18,816	15,081	1,485
6.0	33.0	60	25,041	16,211	30,355	1,524	19,135	15,270	1,494
2.5	6.0	70	20,926	14,506	26,173	1,544	19,810	16,113	1,526
3.8	13.9	70	21,870	14,909	27,128	1,520	20,838	16,992	1,562
<b>5.3</b>	<b>26.6</b>	<b>70</b>	<b>22,438</b>	<b>15,141</b>	<b>27,685</b>	<b>1,512</b>	<b>21,642</b>	<b>17,851</b>	<b>1,595</b>
6.0	33.0	70	22,643	15,226	27,891	1,510	21,790	18,077	1,603
2.5	6.0	80	19,331	13,874	24,808	1,618	22,293	18,598	1,623
3.8	13.9	80	20,073	14,191	25,495	1,577	23,303	19,651	1,662
5.3	26.6	80	20,512	14,368	25,888	1,558	24,168	20,589	1,697
6.0	33.0	80	20,656	14,428	26,024	1,553	24,436	20,843	1,706
2.5	6.0	85	18,610	13,604	24,271	1,665	23,468	19,824	1,669
3.8	13.9	85	19,112	13,962	25,091	1,622	24,524	20,936	1,709
<b>5.3</b>	<b>26.6</b>	<b>85</b>	<b>19,663</b>	<b>14,035</b>	<b>25,166</b>	<b>1,597</b>	25,428	21,926	1,745
6.0	33.0	85	19,793	14,098	25,288	1,590	25,853	22,215	1,754
2.5	6.0	90	17,965	13,358	23,785	1,715			
3.8	13.9	90	18,579	13,614	24,304	1,666			
5.3	26.6	90	18,903	13,736	24,546	1,644			
6.0	33.0	90	19,010	13,786	24,652	1,636			
2.5	6.0	95	17,364	13,122	23,349	1,766			
3.8	13.9	95	17,948	13,348	23,777	1,717			
5.3	26.6	95	18,219	13,461	23,996	1,694			
6.0	33.0	95	18,348	13,534	24,152	1,682			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.947	0.816	1.036	*	*	*	0.921
64	0.933	0.692	0.908	1.129	*	*	0.944
67	1.000	1.000	1.000	1.000	1.000	1.000	1.000
70	1.181	0.434	0.654	0.872	1.09	1.310	1.062
73	1.166		0.526	0.744	0.963	1.178	1.125

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.020	1.071	0.931
65	1.005	1.032	0.963
70	1.000	1.000	1.000
75	0.994	0.981	1.039
80	0.984	0.959	1.081

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
500	0.951	0.87	0.948	0.986	0.997	0.964	1.058
570	0.974	0.933	0.978	0.994	0.995	0.978	1.026
650	1.000	1.000	1.000	1.000	1.000	1.000	1.000
730	1.023	1.042	1.014	1.004	1.007	1.007	0.979
800	1.037	1.118	1.031	1.008	1.013	1.014	0.966

## PERFORMANCE DATA

### MODEL KHP 024 Horizontal and Vertical

Rated Air Flow 825 CFM

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.5)				EAT 70°F (COP=4.1)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
3.0	2.0	60	25,692	17,053	31,443	1,677	22,497	18,076	1,748
4.5	4.2	60	26,233	17,285	31,855	1,627	23,374	19,096	1,790
6.0	7.2	60	26,534	17,406	32,056	1,601	24,272	19,866	1,824
7.5	11.3	60	26,711	17,484	32,198	1,585	24,783	20,384	1,846
3.0	2.0	70	24,654	16,534	30,393	1,778	26,012	21,681	1,901
4.5	4.2	70	25,037	16,799	31,016	1,732	27,182	22,875	1,953
<b>6.0</b>	<b>7.2</b>	<b>70</b>	<b>25,322</b>	<b>16,923</b>	<b>31,242</b>	<b>1,706</b>	<b>28,135</b>	<b>23,807</b>	<b>1,994</b>
7.5	11.3	70	25,545	17,008	31,392	1,689	28,730	24,418	2,021
3.0	2.0	80	23,310	16,079	29,736	1,893	29,520	25,232	2,058
4.5	4.2	80	23,829	16,308	30,161	1,843	30,869	26,625	2,121
6.0	7.2	80	24,109	16,429	30,382	1,816	31,817	27,818	2,176
7.5	11.3	80	24,293	16,503	30,512	1,799	32,625	28,446	2,205
3.0	2.0	85	22,688	15,830	29,301	1,950	31,272	27,118	2,144
4.5	4.2	85	23,263	16,064	29,717	1,897	32,753	28,597	2,213
<b>6.0</b>	<b>7.2</b>	<b>85</b>	<b>23,482</b>	<b>16,178</b>	<b>29,944</b>	<b>1,874</b>	<b>33,829</b>	<b>29,699</b>	<b>2,265</b>
7.5	11.3	85	23,714	16,269	30,103	1,852	34,569	30,470	2,302
3.0	2.0	90	22,026	15,580	28,871	2,009			
4.5	4.2	90	22,580	15,822	29,327	1,957			
6.0	7.2	90	22,876	15,924	29,488	1,931			
7.5	11.3	90	23,082	16,021	29,676	1,911			
3.0	2.0	95	21,338	15,336	28,453	2,071			
4.5	4.2	95	21,910	15,561	28,864	2,018			
6.0	7.2	95	22,328	15,642	28,922	1,987			
7.5	11.3	95	22,441	15,769	29,233	1,970			

Bold Face = ARI Conditions

### Correction Factors

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.892	0.827	1.037	1.162	*	*	0.908
64	0.937	0.705	0.914	1.122	1.333	*	0.942
67	1.000	0.582	0.791	1.000	1.208	1.419	1.000
70	1.069	0.433	0.666	0.875	1.084	1.291	1.057
73	1.151		0.543	0.751	0.958	1.165	1.116

### Heating Corrections

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.020	1.041	0.925
65	1.010	1.026	0.962
70	1.000	1.000	1.000
75	0.985	0.977	1.042
80	0.982	0.953	1.086

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
600	0.936	0.862	0.945	0.980	0.974	0.964	1.084
750	0.982	0.956	0.984	0.994	0.991	0.991	1.022
<b>825</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
875	1.011	1.028	1.009	1.003	1.080	1.013	0.988
1000	1.037	1.095	1.027	1.009	1.112	1.018	0.963

### MODEL KHP 030 Horizontal and Vertical

Rated Air Flow 1005 CFM

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.1)				EAT 70°F (COP=4.1)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
3.8	4.4	60	31,962	21,997	39,378	2,151	28,254	22,565	2,206
5.6	9.6	60	32,565	22,249	39,838	2,097	29,578	23,894	2,260
7.5	16.9	60	32,954	22,391	40,071	2,064	30,442	24,764	2,296
9.3	26.2	60	33,243	22,514	40,298	2,039	31,195	25,525	2,327
3.8	4.4	70	30,682	21,365	38,130	2,279	32,293	26,638	2,373
5.6	9.6	70	31,082	21,653	38,776	2,230	33,825	28,197	2,438
<b>7.5</b>	<b>16.9</b>	<b>70</b>	<b>31,436</b>	<b>21,794</b>	<b>39,026</b>	<b>2,197</b>	<b>34,828</b>	<b>29,233</b>	<b>2,481</b>
9.3	26.2	70	31,737	21,917	39,249	2,170	35,574	30,215	2,522
3.8	4.4	80	29,011	20,810	37,257	2,423	36,034	30,691	2,543
5.6	9.6	80	29,576	21,041	37,674	2,369	38,007	32,506	2,621
7.5	16.9	80	29,902	21,192	37,964	2,337	39,153	33,674	2,672
9.3	26.2	80	30,194	21,311	38,180	2,310	40,166	34,724	2,718
3.8	4.4	85	28,219	20,493	36,678	2,494	38,263	32,831	2,635
5.6	9.6	85	28,821	20,736	37,123	2,439	40,048	34,677	2,716
<b>7.5</b>	<b>16.9</b>	<b>85</b>	<b>29,154</b>	<b>20,878</b>	<b>37,391</b>	<b>2,408</b>	<b>41,296</b>	<b>35,897</b>	<b>2,770</b>
9.3	26.2	85	29,420	20,999	37,618	2,381	42,375	37,020	2,821
3.8	4.4	90	27,350	20,188	36,140	2,569			
5.6	9.6	90	28,023	20,428	36,570	2,511			
7.5	16.9	90	28,345	20,650	36,812	2,481			
9.3	26.2	90	28,613	20,689	37,064	2,455			
3.8	4.4	95	26,579	19,863	35,529	2,640			
5.6	9.6	95	27,191	20,109	35,987	2,585			
7.5	16.9	95	27,549	20,242	36,077	2,553			
9.3	26.2	95	27,804	20,395	36,540	2,525			

Bold Face = ARI Conditions

### Correction Factors

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.959	0.820	1.044	*	*	*	0.946
64	0.935	0.69	0.91	1.132	*	*	0.947
67	1.000	0.559	0.78	1.000	1.221	*	1.000
70	1.072	0.427	0.647	0.868	1.087	1.308	1.057
73	1.167		0.531	0.74	0.949	1.161	1.099

### Heating Corrections

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.019	1.036	0.928
65	1.009	1.021	0.963
70	1.000	1.000	1.000
75	0.991	0.975	1.040
80	0.983	0.957	1.084

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
780	0.951	0.870	0.948	0.986	0.997	0.964	1.058
905	0.982	0.956	0.984	0.994	0.991	0.991	1.022
<b>1005</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
1100	1.023	1.042	1.014	1.004	1.007	1.007	0.979
1200	1.037	1.095	1.027	1.009	1.112	1.018	0.963

**PERFORMANCE DATA**

**MODEL KHP 036 Horizontal and Vertical**

			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.6)				EAT 70°F (COP=4.2)		
GPM	WPD	EWTF	TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
4.5	2.7	60	38,028	26,130	46,419	2,430	32,324	25,970	2,521
6.6	5.4	60	38,644	26,365	46,814	2,376	34,981	28,448	2,624
9.3	10.9	60	39,058	26,537	47,123	2,338	36,231	29,708	2,676
12.0	17.7	60	39,352	26,675	47,390	2,310	36,824	30,581	2,710
4.5	2.7	70	36,281	25,435	45,202	2,590	37,512	31,005	2,730
6.6	5.4	70	36,861	25,670	45,619	2,536	40,422	33,983	2,853
<b>9.3</b>	<b>10.9</b>	<b>70</b>	<b>37,273</b>	<b>25,839</b>	<b>45,919</b>	<b>2,497</b>	<b>41,891</b>	<b>35,471</b>	<b>2,916</b>
12.0	17.7	70	37,604	25,973	46,159	2,467	42,866	36,473	2,959
4.5	2.7	80	34,540	24,735	43,953	2,753	42,448	36,043	2,941
6.6	5.4	80	35,073	24,960	44,366	2,702	45,785	39,482	3,089
9.3	10.9	80	35,471	25,132	44,682	2,663	47,468	41,225	3,165
12.0	17.7	80	35,806	25,262	44,912	2,632	48,598	42,398	3,218
4.5	2.7	85	33,568	24,385	43,348	2,839	44,906	38,573	3,049
6.6	5.4	85	34,133	24,603	43,738	2,788	48,440	42,234	3,210
<b>9.3</b>	<b>10.9</b>	<b>85</b>	<b>34,636</b>	<b>24,777</b>	<b>44,031</b>	<b>2,744</b>	<b>50,231</b>	<b>44,097</b>	<b>3,294</b>
12.0	17.7	85	34,893	24,903	44,279	2,718	51,430	45,347	3,352
4.5	2.7	90	32,659	24,011	42,660	2,924			
6.6	5.4	90	33,217	24,227	43,047	2,873			
9.3	10.9	90	33,648	24,418	43,410	2,831			
12.0	17.7	90	33,939	24,539	43,632	2,804			
4.5	2.7	95	31,702	23,636	41,973	3,012			
6.6	5.4	95	32,240	23,876	42,426	2,959			
9.3	10.9	95	32,687	24,045	42,732	2,919			
12.0	17.7	95	32,974	24,168	42,965	2,892			

Bold Face = ARI Conditions

**MODEL KHP 048 Horizontal and Vertical**

			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.6)				EAT 70°F (COP=4.1)		
GPM	WPD	EWTF	TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
6.0	4.8	60	52,217	34,970	65,053	3,396	43,973	34,979	3,512
8.8	10.3	60	53,942	35,390	65,246	3,251	46,231	37,234	3,612
12.3	19.8	60	54,737	35,702	65,697	3,167	48,124	39,137	3,695
14.0	25.6	60	54,985	35,812	65,878	3,139	48,414	39,430	3,707
6.0	4.8	70	50,383	33,857	62,763	3,656	50,572	41,618	3,802
8.8	10.3	70	51,522	34,343	63,547	3,527	53,214	44,316	3,918
<b>12.3</b>	<b>19.8</b>	<b>70</b>	<b>52,223</b>	<b>34,673</b>	<b>64,126</b>	<b>3,442</b>	<b>55,395</b>	<b>46,560</b>	<b>4,013</b>
14.0	25.6	70	52,481	34,778	64,287	3,413	55,752	46,928	4,029
6.0	4.8	80	47,878	32,853	61,191	3,929	57,042	48,263	4,086
8.8	10.3	80	49,097	33,346	61,980	3,797	59,662	51,396	4,220
12.3	19.8	80	48,772	33,639	62,467	3,719	62,524	53,986	4,328
14.0	25.6	80	49,958	33,752	62,697	3,693	62,924	54,406	4,346
6.0	4.8	85	46,620	32,346	60,368	4,063	60,246	51,728	4,233
8.8	10.3	85	47,833	32,833	61,159	3,934	63,415	54,923	4,368
<b>12.3</b>	<b>19.8</b>	<b>85</b>	<b>48,490</b>	<b>33,156</b>	<b>61,755</b>	<b>3,856</b>	<b>66,044</b>	<b>57,701</b>	<b>4,486</b>
14.0	25.6	85	48,744	33,229	61,830	3,832	66,465	58,147	4,505
6.0	4.8	90	45,258	31,840	59,566	4,199			
8.8	10.3	90	46,549	32,318	60,321	4,070			
12.3	19.8	90	47,279	32,622	60,833	3,992			
14.0	25.6	90	47,447	32,740	61,086	3,968			
6.0	4.8	95	44,005	31,319	58,651	4,326			
8.8	10.3	95	45,234	31,798	59,461	4,205			
12.3	19.8	95	45,982	32,100	59,974	4,129			
14.0	25.6	95	46,219	32,200	60,144	4,103			

Bold Face = ARI Conditions

**Rated Air Flow 1160 CFM**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.902	0.821	1.041	*	*	0.917	
64	0.936	0.694	0.911	1.130	*	0.947	
67	1.000	0.565	0.783	1.000	1.218	1.000	
70	1.067	0.434	0.652	0.870	1.086	1.059	
73	1.140		0.520	0.738	0.956	1.121	

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.020	1.039	0.899
65	1.006	1.021	0.962
70	1.000	1.000	1.000
75	0.991	0.981	1.044
80	0.983	0.962	1.087

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
905	0.952	0.833	0.961	0.986	0.963	0.967	1.062
1055	0.982	0.953	0.986	0.995	0.982	0.986	1.021
1160	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1300	1.012	1.060	1.016	1.007	1.009	1.010	0.978
1435	1.036	1.115	1.026	1.010	1.021	1.018	0.961

**Rated Air Flow 1500 CFM**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.894	0.836	1.044	1.254	*	0.907	
64	0.949	0.712	0.917	1.121	1.328	0.942	
67	1.000	0.587	0.793	1.000	1.206	1.000	
70	1.064	0.443	0.667	0.873	1.08	1.053	
73	1.133	-	0.539	0.746	0.952	1.108	

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.017	1.023	0.923
65	1.01	1.009	0.962
70	1.000	1.000	1.000
75	0.989	0.982	1.041
80	0.982	0.968	1.086

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
1200	0.972	0.896	0.946	0.984	0.975	0.977	1.056
1350	0.989	0.945	0.952	0.986	0.984	0.987	1.024
1500	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1630	1.085	1.029	0.951	0.985	1.012	1.014	0.983
1800	1.127	1.078	0.951	0.986	1.027	1.026	0.964

**PERFORMANCE DATA**

**MODEL KHP 060 Horizontal and Vertical**

**Rated Air Flow 1825 CFM**

GPM WPD EWT°F			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.8)				EAT 70°F (COP=4.3)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
8.0	4.7	60	64,754	43,170	77,325	3,636	53,697	43,599	4,035
11.5	9.1	60	65,983	43,667	77,994	3,477	55,964	45,874	4,131
16.0	17.3	60	66,689	43,963	78,397	3,381	57,830	48,008	4,218
20.0	25.1	60	67,006	44,121	78,564	3,332	59,261	49,210	4,268
8.0	4.7	70	61,880	42,006	75,663	3,995	62,005	52,011	4,383
11.5	9.1	70	63,085	42,498	76,385	3,845	64,660	54,739	4,493
<b>16.0</b>	<b>17.3</b>	<b>70</b>	<b>63,798</b>	<b>42,791</b>	<b>76,810</b>	<b>3,756</b>	<b>66,995</b>	<b>57,154</b>	<b>4,590</b>
20.0	25.1	70	64,269	42,990	77,102	3,695	68,505	58,722	4,653
8.0	4.7	80	59,059	40,834	73,842	4,334	70,138	60,425	4,721
11.5	9.1	80	60,143	41,315	74,635	4,200	73,146	63,576	4,847
16.0	17.3	80	60,830	41,609	75,107	4,116	75,884	66,489	4,964
20.0	25.1	80	61,328	41,805	75,394	4,058	77,536	68,207	5,033
8.0	4.7	85	57,553	40,242	72,926	4,504	74,152	64,742	4,894
11.5	9.1	85	58,742	40,706	73,661	4,373	77,353	68,014	5,025
<b>16.0</b>	<b>17.3</b>	<b>85</b>	<b>59,345</b>	<b>41,000</b>	<b>74,160</b>	<b>4,292</b>	<b>80,184</b>	<b>71,108</b>	<b>5,147</b>
20.0	25.1	85	59,845	41,200	74,468	4,235	82,004	72,958	5,226
8.0	4.7	90	56,085	39,626	71,907	4,671			
11.5	9.1	90	57,178	40,131	72,791	4,540			
16.0	17.3	90	57,855	40,393	73,201	4,466			
20.0	25.1	90	58,303	40,600	73,556	4,410			
8.0	4.7	95	54,523	39,021	70,936	4,840			
11.5	9.1	95	55,681	39,510	71,765	4,710			
16.0	17.3	95	56,338	39,772	72,190	4,637			
20.0	25.1	95	56,751	39,991	72,598	4,584			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Cooling Corrections * Sensible equals Total						Heat of Rejection
	Total Cooling Capacity	Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.896	0.632	1.046	1.257	*	*	0.911
64	0.944	0.713	0.912	1.127	1.338	*	0.951
67	1.000	0.586	0.793	1.000	1.207	1.418	1.000
70	1.063	0.459	0.666	0.873	1.081	1.286	1.053
73	1.129		0.538	0.745	0.952	1.157	1.109

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.021	1.039	0.916
65	1.010	1.018	0.957
70	1.000	1.000	1.000
75	0.991	0.981	1.045
80	0.981	0.965	1.092

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
1500	0.965	0.911	0.970	0.992	0.987	0.991	1.054
1665	0.985	0.957	0.986	0.996	0.994	0.994	1.023
1825	1.000	1.000	1.000	1.000	1.000	1.000	1.000
1980	1.014	1.041	1.012	1.003	1.004	1.009	0.981
2100	1.024	1.073	1.020	1.006	1.009	1.015	0.969

**MODEL KHP 070 Horizontal and Vertical**

**Rated Air Flow 2200 CFM**

GPM WPD EWT°F			Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.8)				EAT 70°F (COP=4.3)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
9.9	3.7	60	74,748	50,321	89,832	4,378	65,565	54,293	4,850
14.4	7.0	60	75,709	50,721	90,525	4,287	68,863	57,240	4,975
18.0	10.5	60	76,024	50,851	90,752	4,260	70,321	58,724	5,036
24.0	16.3	60	76,534	51,051	91,093	4,218	71,977	60,416	5,106
9.9	3.7	70	72,029	49,224	88,032	4,651	76,287	64,946	5,294
14.4	7.0	70	73,204	49,705	88,825	4,528	79,636	68,314	5,433
<b>18.0</b>	<b>10.5</b>	<b>70</b>	<b>73,578</b>	<b>49,870</b>	<b>89,113</b>	<b>4,489</b>	<b>81,521</b>	<b>70,274</b>	<b>5,515</b>
24.0	16.3	70	74,212	50,130	89,548	4,425	83,119	72,368	5,606
9.9	3.7	80	68,947	47,963	85,973	4,986	86,367	75,339	5,728
14.4	7.0	80	70,140	48,489	86,872	4,848	89,931	79,570	5,915
18.0	10.5	80	70,576	48,676	87,189	4,759	92,209	81,485	5,992
24.0	16.3	80	71,429	48,967	87,595	4,716	94,428	83,830	6,095
9.9	3.7	85	67,219	47,293	84,926	5,174	91,368	80,598	5,933
14.4	7.0	85	68,498	47,824	85,799	5,030	95,511	84,976	6,146
<b>18.0</b>	<b>10.5</b>	<b>85</b>	<b>68,925</b>	<b>48,017</b>	<b>86,129</b>	<b>4,978</b>	<b>97,788</b>	<b>87,388</b>	<b>6,254</b>
24.0	16.3	85	69,715	48,328	86,622	4,892	99,451	89,687	6,369
9.9	3.7	90	65,295	46,581	83,832	5,382			
14.4	7.0	90	66,827	47,127	84,646	5,219			
18.0	10.5	90	67,183	47,322	85,014	5,171			
24.0	16.3	90	67,980	47,658	85,572	5,080			
9.9	3.7	95	63,374	45,874	82,738	5,593			
14.4	7.0	95	65,031	46,414	83,505	5,421			
18.0	10.5	95	65,477	46,585	83,777	5,372			
24.0	16.3	95	66,194	46,949	84,433	5,279			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Cooling Corrections * Sensible equals Total						Heat of Rejection
	Total Cooling Capacity	Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.898	0.839	1.047	1.259	*	*	0.913
64	0.944	0.712	0.919	1.127	*	*	0.952
67	1.000	0.584	0.792	1.000	1.207	1.419	1.000
70	1.066	0.457	0.664	0.872	1.08	1.284	1.047
73	1.136		0.536	0.744	0.950	1.154	1.096

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.018	1.045	0.913
65	1.011	1.021	0.955
70	1.000	1.000	1.000
75	0.989	0.979	1.050
80	0.98	0.961	1.105

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
1800	0.964	0.91	0.970	0.992	0.971	0.970	1.064
1980	0.982	0.951	0.984	0.996	0.982	0.977	1.032
2200	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2350	1.013	1.031	1.007	1.002	1.031	1.028	0.983
2500	1.025	1.064	1.016	1.004	1.050	1.041	0.968

**PERFORMANCE DATA**

**MODEL KHP 096 Horizontal and Vertical**

**Rated Air Flow 3000 CFM**

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.1)				EAT 70°F (COP=4.0)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
12.0	4.7	60	101,138	68,628	129,846	6,964	88,580	69,956	7,258
17.2	9.6	60	105,394	69,090	128,736	6,676	92,894	74,260	7,452
24.6	19.6	60	107,098	69,734	129,614	6,500	96,892	78,276	7,632
28.0	25.2	60	107,602	69,946	129,948	6,444	97,474	78,862	7,658
12.0	4.7	70	98,590	66,158	123,982	7,460	101,780	83,224	7,852
17.2	9.6	70	100,914	67,012	125,150	7,214	106,812	88,356	8,080
<b>24.6</b>	<b>19.6</b>	<b>70</b>	<b>102,216</b>	<b>67,724</b>	<b>126,530</b>	<b>7,040</b>	<b>111,436</b>	<b>91,106</b>	<b>8,288</b>
28.0	25.2	70	102,706	67,928	126,848	6,984	112,146	93,838	8,320
12.0	4.7	80	93,794	64,188	120,848	7,994	114,726	96,504	8,438
17.2	9.6	80	96,002	65,096	122,310	7,750	119,880	102,742	8,714
24.6	19.6	80	97,412	65,706	123,318	7,588	125,762	108,016	8,942
28.0	25.2	80	97,782	65,926	123,766	7,536	126,516	108,802	8,976
12.0	4.7	85	91,310	63,182	119,210	8,260	121,178	103,512	8,746
17.2	9.6	85	93,474	64,092	120,736	8,024	126,526	109,770	9,026
<b>24.6</b>	<b>19.6</b>	<b>85</b>	<b>94,864</b>	<b>64,764</b>	<b>121,952</b>	<b>7,856</b>	<b>132,200</b>	<b>115,798</b>	<b>9,292</b>
28.0	25.2	85	95,382	64,916	122,120	6,808	133,634	116,308	9,308
12.0	4.7	90	88,758	62,200	117,630	8,522			
17.2	9.6	90	90,920	63,088	119,134	8,294			
24.6	19.6	90	92,482	63,726	120,188	8,126			
28.0	25.2	90	92,834	63,946	120,642	8,080			
12.0	4.7	95	86,256	61,210	115,996	8,786			
17.2	9.6	95	88,358	62,078	117,462	8,558			
24.6	19.6	95	89,948	62,696	118,478	8,396			
28.0	25.2	95	90,424	62,892	118,810	8,348			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.899	0.632	1.044	1.248	*	*	0.897
64	0.945	0.708	0.917	1.125	1.336	*	0.947
67	1.000	0.581	0.791	1.000	1.209	1.420	1.000
70	1.065	0.436	0.663	0.872	1.081	1.288	1.054
73	1.134		0.534	0.742	0.951	1.159	1.108

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.017	1.031	0.925
65	1.010	1.019	0.963
70	1.000	1.000	1.000
75	0.990	0.982	1.041
80	0.975	0.966	1.085

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
2700	0.991	0.945	0.959	0.988	0.981	0.986	1.024
2817	0.997	0.963	0.960	0.989	0.993	0.993	1.028
3000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3200	1.075	1.020	0.952	0.986	1.014	1.013	0.987
3500	1.097	1.063	0.964	0.990	1.021	1.024	0.970

**MODEL KHP 108 Horizontal and Vertical**

**Rated Air Flow 3800 CFM**

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=12.3)				EAT 70°F (COP=3.8)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
14.4	4.4	60	121,574	83,170	148,196	7,706	96,988	75,450	8,046
20.0	8.4	60	124,162	84,244	149,950	7,420	101,118	79,460	8,244
28.4	16.7	60	125,916	84,918	150,988	7,240	104,872	83,132	8,420
32.0	21.2	60	126,214	85,076	151,288	7,202	105,564	83,812	8,454
14.4	4.4	70	115,728	80,734	144,262	8,382	110,736	88,922	8,692
20.0	8.4	70	117,988	81,724	145,188	8,108	115,526	93,698	8,910
<b>28.4</b>	<b>16.7</b>	<b>70</b>	<b>119,552</b>	<b>82,388</b>	<b>146,992</b>	<b>7,926</b>	<b>119,284</b>	<b>98,080</b>	<b>9,106</b>
32.0	21.2	70	119,926	82,528	147,202	7,886	120,628	98,836	9,138
14.4	4.4	80	109,700	78,340	140,564	9,094	124,194	102,456	9,296
20.0	8.4	80	111,726	78,348	142,550	8,818	129,534	107,922	9,526
28.4	16.7	80	113,300	79,894	143,078	8,644	134,330	112,874	9,730
32.0	21.2	80	113,618	80,042	143,338	8,604	135,242	113,822	9,768
14.4	4.4	85	106,326	77,142	138,738	9,456	130,744	109,166	9,578
20.0	8.4	85	108,976	78,086	140,184	9,172	136,362	114,986	9,814
<b>28.4</b>	<b>16.7</b>	<b>85</b>	<b>110,370</b>	<b>78,676</b>	<b>141,160</b>	<b>9,008</b>	<b>141,430</b>	<b>120,286</b>	<b>10,024</b>
32.0	21.2	85	110,608	78,848	141,508	8,970	142,400	121,308	10,064
14.4	4.4	90	103,234	75,916	136,724	9,806			
20.0	8.4	90	105,822	76,838	138,168	9,530			
28.4	16.7	90	106,898	77,540	139,510	9,366			
32.0	21.2	90	107,562	77,544	139,328	9,330			
14.4	4.4	95	100,260	74,666	134,596	10,144			
20.0	8.4	95	102,642	75,592	136,132	9,884			
28.4	16.7	95	104,082	76,194	137,146	9,718			
32.0	21.2	95	104,310	76,354	137,454	9,684			

**Bold Face = ARI Conditions**

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Total Cooling Capacity	Cooling Corrections * Sensible equals Total					Heat of Rejection
		Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.897	0.826	1.046	*	*	*	0.913
64	0.939	0.695	0.913	1.133	*	*	0.951
67	1.000	0.564	0.782	1.000	1.401	*	1.000
70	1.07	0.433	0.65	0.866	1.084	1.301	1.048
73	1.19		0.543	0.743	0.943	1.143	1.063

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.027	1.039	0.915
65	1.016	1.024	0.957
70	1.000	1.000	1.000
75	0.993	0.978	1.045
80	0.983	0.961	1.091

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
3200	0.97	0.918	0.974	0.993	0.983	0.985	1.039
3500	0.987	0.959	0.986	0.996	0.991	0.993	1.017
3800	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3950	1.015	1.016	1.001	1.001	1.009	1.004	0.992
4100	1.017	1.036	1.004	1.003	1.012	1.009	0.984

**PERFORMANCE DATA**

**MODEL KHP 120 Horizontal and Vertical**

Rated Air Flow 4100 CFM

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.3)				EAT 70°F (COP=4.1)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
15.6	4.4	60	130,608	89,852	157,262	7,702	111,656	86,832	8,736
25.0	10.3	60	134,134	91,134	158,912	7,274	117,948	92,832	9,008
32.6	16.9	60	135,006	91,588	159,676	7,136	121,252	96,000	9,152
40.0	24.6	60	135,604	91,894	160,188	7,042	123,772	98,424	9,260
15.6	4.4	70	125,086	87,422	153,398	8,422	129,110	103,576	9,492
25.0	10.3	70	127,988	88,804	155,722	8,030	136,484	110,732	9,812
<b>32.6</b>	<b>16.9</b>	<b>70</b>	<b>129,002</b>	<b>89,240</b>	<b>156,408</b>	<b>7,898</b>	<b>140,370</b>	<b>114,522</b>	<b>9,982</b>
40.0	24.6	70	129,718	89,526	156,824	7,808	143,342	117,428	10,112
15.6	4.4	80	118,930	85,134	149,972	9,112	146,332	120,358	10,246
25.0	10.3	80	121,924	86,406	152,064	8,754	154,768	128,652	10,622
32.6	16.9	80	122,918	86,854	152,818	8,630	159,088	133,350	10,844
40.0	24.6	80	123,870	87,232	153,404	8,516	162,630	136,418	10,982
15.6	4.4	85	115,878	83,916	147,976	9,456	154,836	128,718	10,626
25.0	10.3	85	118,844	85,192	150,138	9,110	163,838	138,090	11,066
<b>32.6</b>	<b>16.9</b>	<b>85</b>	<b>119,892</b>	<b>85,624</b>	<b>150,848</b>	<b>8,986</b>	<b>168,436</b>	<b>142,684</b>	<b>11,284</b>
40.0	24.6	85	120,776	86,024	151,528	8,876	172,018	145,894	11,432
15.6	4.4	90	112,726	82,664	145,872	9,794			
25.0	10.3	90	114,654	84,244	149,018	9,470			
32.6	16.9	90	116,740	84,396	148,872	9,340			
40.0	24.6	90	117,638	84,806	149,588	9,232			
15.6	4.4	95	109,808	81,344	143,538	10,126			
25.0	10.3	95	112,498	82,760	146,148	9,794			
32.6	16.9	95	113,732	83,114	146,672	9,682			
40.0	24.6	95	114,522	83,540	147,462	9,580			

Bold Face = ARI Conditions

**MODEL KHP 140 Horizontal and Vertical**

Rated Air Flow 4600 CFM

GPM	WPD	EWT°F	Cooling Performance - EAT 80/67°F				Heating Performance		
			(EER=13.4)				EAT 70°F (COP=4.3)		
			TOTAL BTUH	SENSIBLE BTUH	HEAT OF REJECTION BTUH	POWER INPUT WATTS	HEATING BTUH	HEAT OF ABSORPTION BTUH	POWER INPUT WATTS
20.4	3.7	60	149,642	101,538	180,894	9,112	133,002	109,188	10,018
27.6	6.0	60	151,196	102,212	182,108	8,962	138,276	113,784	10,208
40.8	12.3	60	152,358	102,678	182,920	8,862	143,744	119,362	10,432
48.0	16.3	60	152,984	102,968	183,484	8,804	145,144	120,796	10,488
20.4	3.7	70	143,988	99,358	177,364	9,662	154,192	130,114	10,858
27.6	6.0	70	145,988	100,164	178,704	9,458	159,732	135,858	11,086
<b>40.8</b>	<b>12.3</b>	<b>70</b>	<b>147,398</b>	<b>100,748</b>	<b>179,702</b>	<b>9,314</b>	<b>166,116</b>	<b>142,514</b>	<b>11,350</b>
48.0	16.3	70	148,310	101,106	180,292	9,224	167,752	144,224	11,418
20.4	3.7	80	137,886	96,822	173,094	10,336	174,440	151,240	11,700
27.6	6.0	80	139,796	97,692	174,644	10,108	180,762	157,900	11,972
40.8	12.3	80	141,460	98,352	175,724	9,930	188,126	165,688	12,294
48.0	16.3	80	142,468	98,784	176,466	9,818	189,954	167,918	12,392
20.4	3.7	85	134,394	95,472	170,976	10,712	184,504	161,854	12,134
27.6	6.0	85	136,534	96,336	172,366	10,474	191,198	168,948	12,430
<b>40.8</b>	<b>12.3</b>	<b>85</b>	<b>138,078</b>	<b>97,042</b>	<b>173,624</b>	<b>10,290</b>	<b>198,608</b>	<b>177,898</b>	<b>12,832</b>
48.0	16.3	85	139,162	97,498	174,392	10,168	201,028	179,404	12,876
20.4	3.7	90	130,820	94,044	168,652	11,112			
27.6	6.0	90	132,958	95,000	170,298	10,856			
40.8	12.3	90	134,648	95,648	171,334	10,774			
48.0	16.3	90	135,686	96,136	172,192	10,546			
20.4	3.7	95	127,194	92,562	166,206	11,526			
27.6	6.0	95	129,384	93,542	167,898	11,266			
40.8	12.3	95	131,008	94,202	168,978	11,080			
48.0	16.3	95	132,070	94,714	169,886	10,946			

Bold Face = ARI Conditions

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Cooling Corrections * Sensible equals Total						Heat of Rejection
	Total Cooling Capacity	Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.906	0.632	1.047	*	*	*	0.908
64	0.942	0.695	0.914	1.134	*	*	0.951
67	1.000	0.562	0.781	1.000	1.219	*	1.000
70	1.065	0.430	0.646	0.866	1.083	1.303	1.053
73	1.130		0.513	0.730	0.949	1.165	1.109

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.016	1.034	0.862
65	1.009	1.021	0.893
70	1.000	1.000	1.000
75	0.982	0.979	1.003
80	0.974	0.966	1.007

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
3500	0.973	0.924	0.977	0.994	0.988	0.986	0.958
3690	0.982	0.948	0.985	0.996	0.994	0.992	0.948
4100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4400	1.012	1.036	1.008	1.002	1.007	1.005	0.918
4600	1.019	1.060	1.014	1.004	1.015	1.009	0.911

**Correction Factors**

For Variations In Entering Air Temperatures

Entering Air °F WB	Cooling Corrections * Sensible equals Total						Heat of Rejection
	Total Cooling Capacity	Sensible Cooling Capacity Ent. Air					
		70°DB	75°DB	80°DB	85°DB	90°DB	
61	0.899	0.834	1.048	*	*	*	0.914
64	0.944	0.704	0.918	1.132	*	*	0.953
67	1.000	0.573	0.787	1.000	1.213	*	1.000
70	1.065	0.441	0.655	0.868	1.08	1.242	1.049
73	1.127		0.523	0.736	0.949	1.158	1.104

**Heating Corrections**

Entering Air °F DB	Heating Capacity	Heat of Absorption	Power Input Watts
60	1.018	1.039	0.917
65	1.011	1.021	0.957
70	1.000	1.000	1.000
75	0.992	0.976	1.048
80	0.982	0.961	1.102

For Variations In Entering Air Flow

CFM	Cooling Corrections				Heating Corrections		
	Total Cooling Capacity	Sensible Cooling Capacity	Heat of Rejection	Power Input Watts	Heating Capacity	Heat of Absorption	Power Input Watts
4100	0.981	0.945	0.983	0.996	0.988	0.989	1.031
4400	0.993	0.978	0.993	0.998	0.995	0.996	1.012
4600	1.000	1.000	1.000	1.000	1.000	1.000	1.000
4800	1.007	1.020	1.005	1.001	1.006	1.006	0.989
5100	1.017	1.052	1.014	1.003	1.013	1.012	0.977

## FAN PERFORMANCE (CFM VS ESP)

### EXTERNAL STATIC PRESSURE (in. w.g.) BASED ON COOLING (Wet Coil) & CLEAN FILTER

MODEL	SPEED	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65
KAC-009	HIGH			475	440	420	390	375	360	335	325	305	290	
	MED.	430	420	405	385	365	350	330	310	290	270			
	LOW	390	375	355	335	320	300	280	260	245				
KAC-012	HIGH			525	510	490	470	450	425	410	380	345	315	
	MED.	485	475	465	445	430	415	405	375	345	320			
	LOW	415	405	390	375	355	335	320	300					
KAC-015	HIGH			630	605	590	570	545	525	500	470	440	415	370
	MED.	560	545	530	515	495	475	460	440	425	405	360		
	LOW	460	445	435	420	405	390	365						
KAC-018	HIGH			800	770	750	730	700	675	650	630	615	600	560
	MED.	760	745	730	700	675	650	630	610	590	570	550	530	
	LOW	700	670	650	635	615	590	570	550	535	520			
KAC-024	HIGH	985	975	950	930	905	875	840	795	765	710	660	610	
	MED.	925	920	895	865	845	825	800	760	710	650	605		
	LOW	800	790	780	770	765	750	715	680	650	610			
KAC-030	HIGH	1180	1155	1125	1100	1070	1040	1015	970	920	870	820	760	700
	MED.	1135	1115	1095	1065	1035	1005	970	930	890	840	790	720	
	LOW	1095	1085	1065	1035	1005	985	945	905	860	800	740		
KAC-036	HIGH	1435	1410	1395	1365	1335	1300	1250	1215	1150	1100	1040	980	920
	MED.		1280	1250	1225	1200	1160	1125	1095	1060	1025	980	925	
	LOW			1100	1085	1070	1055	1040	1025	1010	985	945	905	
KAC-048	HIGH		1860	1830	1800	1770	1730	1695	1660	1625	1585	1545	1500	1420
	MED.	1520	1505	1495	1475	1455	1435	1415	1395	1370	1350	1325	1300	
	LOW	1270	1250	1235	1220	1210	1200							
KAC-060	HIGH	2200	2155	2110	2065	2025	1980	1930	1880	1830	1780	1720	1670	1620
	MED.	2005	1985	1945	1905	1865	1825	1780	1740	1690	1645	1600		
	LOW	1785	1770	1750	1725	1700	1665	1635	1600					

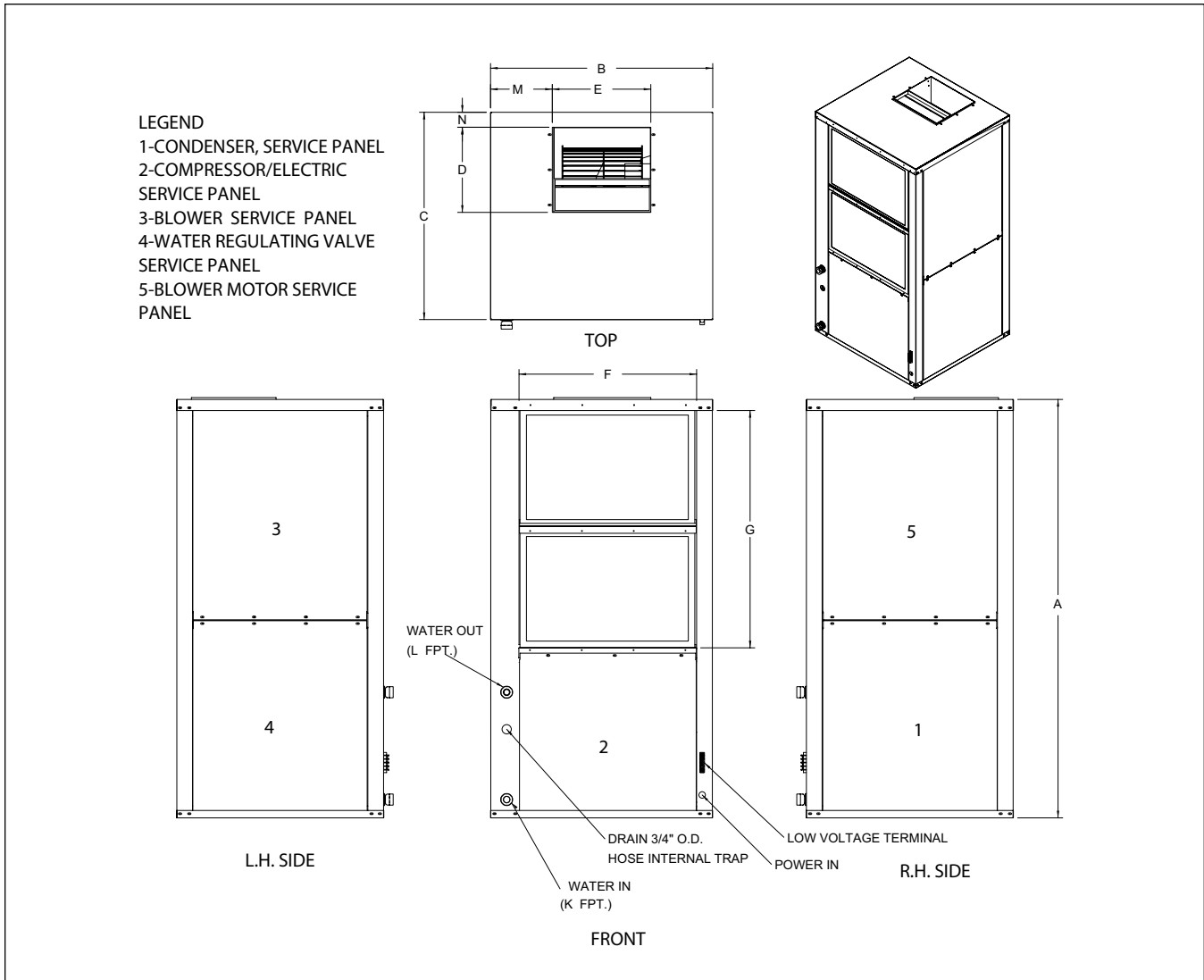
EXT. STAT. PRESS. in. w.g.		0.1			0.3		0.5		0.7		0.9		1.1		
MODEL	CFM	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP	RPM	HP
KAC-070	1800	860	1.0	949	1.0	1,036	1.0	1,120	1.0	1,194	1.0	1,261	1.0		
	2000	883	1.0	967	1.0	1,048	1.0	1,126	1.0	1,203	1.0	1,276	1.5		
	2200	911	1.0	990	1.0	1,065	1.0	1,139	1.0	1,211	1.5	1,281	1.5		
	2400	940	1.0	1,016	1.0	1,088	1.5	1,157	1.5	1,224	1.5	1,291	1.5		
	2600	971	1.0	1,045	1.5	1,114	1.5	1,180	1.5	1,243	1.5	1,307	1.5		
KAC-096	2700	850	1.0	930	1.5	1,000	1.5	1,090	1.5	1,165	2.0	1,220	2.0		
	2900	865	1.5	945	1.5	1,015	1.5	1,100	2.0	1,180	2.0	1,235	2.0		
	3100	890	1.5	960	1.5	1,030	2.0	1,115	2.0	1,195	2.0	1,250	2.0		
	3300	915	1.5	980	2.0	1,050	2.0	1,127	2.0	1,210	3.0	1,265	3.0		
	3500	940	2.0	1,110	2.0	1,075	2.0	1,140	3.0	1,225	3.0	1,285	3.0		
KAC-108	3200	595	1.0	660	1.0	720	1.0	770	1.5	825	1.5	875	1.5		
	3350	605	1.0	670	1.0	730	1.5	780	1.5	833	1.5	885	1.5		
	3500	620	1.0	682	1.5	740	1.5	790	1.5	840	1.5	895	2.0		
	3650	631	1.5	695	1.5	750	1.5	800	1.5	852	2.0	905	2.0		
	3800	642	1.5	703	1.5	765	1.5	810	2.0	860	2.0	915	2.0		
	3950	655	1.5	715	1.5	775	1.5	820	2.0	870	2.0	920	2.0		
KAC-120	4100	680	1.5	725	1.5	785	2.0	830	2.0	880	2.0	925	2.0		
	3650	625	1.5	690	1.5	740	1.5	790	1.5	850	2.0	895	2.0		
	3800	636	1.5	703	1.5	751	1.5	800	2.0	860	2.0	910	2.0		
	3950	650	1.5	715	1.5	765	1.5	810	2.0	870	2.0	922	2.0		
	4100	670	1.5	725	1.5	775	2.0	820	2.0	880	2.0	930	3.0		
	4250	685	1.5	736	2.0	785	2.0	830	2.0	890	3.0	935	3.0		
	4400	695	2.0	745	2.0	794	2.0	840	3.0	895	3.0	943	3.0		
4550	705	2.0	757	2.0	800	3.0	850	3.0	900	3.0	950	3.0			
KAC-140	4350	640	1.5	700	1.5	750	2.0	790	2.0	845	3.0	890	3.0		
	4500	660	2.0	720	2.0	760	2.0	810	2.0	855	3.0	900	3.0		
	4650	690	2.0	735	2.0	780	2.0	825	3.0	870	3.0	915	3.0		
	4800	700	2.0	750	2.0	800	3.0	835	3.0	880	3.0	925	3.0		
	4950	720	2.0	765	3.0	810	3.0	850	3.0	895	3.0	940	3.0		
	5100	735	2.0	780	3.0	830	3.0	870	3.0	905	3.0	960	3.0		
	5250	750	3.0	795	3.0	845	3.0	885	3.0	920	3.0	980	5.0		

## ELECTRICAL DATA

### KAC/KHP SERIES - HORIZONTAL & VERTICAL MODELS

MODEL	ELECTRICALS Volts/Ph/Hz	COMPRESSOR		BLOWER		UNIT FLA	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION	NOMINAL COOLING CAPACITY	EXT STATIC PRESS.
		RLA	LRA	FLA	HP					
KAC-009-1	115/1/60	7.0	40.0	1.4	1/10	8.4	11	15	9,730	0.30"
KAC-009-4	208/230/1/60	3.5	20.0	0.8	1/10	4.3	6			0.30"
KAC-012-4	208/230/1/60	5.8	31.0	0.8	1/10	6.6	9	15	13,320	0.30"
KAC-015-4	208/230/1/60	5.5	31.2	0.8	1/10	6.3	8	15	15,960	0.30"
KAC-018-4	208/230/1/60	7.2	43.0	1.5	1/5	8.7	11	15	20,940	0.30"
KAC-018-5	208/230/3/60	4.7	51.0	1.5	1/5	6.2	8			0.30"
KAC-024-4	208/230/1/60	9.3	52.0	1.5	1/5	10.8	14	20	24,060	0.30"
KAC-024-5	208/230/3/60	5.8	51.0	1.5	1/5	7.3	9	15		0.30"
KAC-030-4	208/230/1/60	10.4	60.0	2.5	1/3	12.9	16	25	30,240	0.30"
KAC-030-5	208/230/3/60	6.6	50.0	2.5	1/3	9.1	11	15		0.30"
KAC-030-7	460/3/60	3.3	25.0	1.2	1/3	4.5	6			0.30"
KAC-036-4	208/230/1/60	12.8	73.0	2.5	1/3	15.3	19	30	36,410	0.30"
KAC-036-5	208/230/3/60	7.6	63.4	2.5	1/3	10.1	12	20		0.30"
KAC-036-7	460/3/60	4.1	36.0	1.2	1/3	5.3	7	15		0.30"
KAC-036-8	575/3/60	3.5	26.0	1.6	1/2	5.1	6			0.30"
KAC-048-4	208/230/1/60	19.7	107.4	3.5	1/2	23.2	29	45	50,890	0.30"
KAC-048-5	208/230/3/60	12.0	74.0	3.5	1/2	15.5	19	30		0.30"
KAC-048-7	460/3/60	5.4	46.0	2.7	3/4	8.1	10	15		0.30"
KAC-048-8	575/3/60	4.7	37.0	1.6	1/2	6.3	8			0.30"
KAC-060-4	208/230/1/60	20.5	110.0	3.5	1/2	24.0	30	50	61,150	0.30"
KAC-060-5	208/230/3/60	13.5	92.0	3.5	1/2	17.0	21	30		0.30"
KAC-060-7	460/3/60	6.7	46.0	2.7	3/4	9.4	12	15		0.30"
KAC-060-8	575/3/60	5.0	44.0	2.2	3/4	7.2	9			0.30"
KAC-070-4	208/230/1/60	30.5	165.0	6.4	1	36.9	45	70	73,250	REFER TO FAN and MOTOR PERFORMANCE DATA
KAC-070-5	208/230/3/60	18.0	126.0	3.4	1	21.4	26	40		
KAC-070-7	460/3/60	9.0	42.0	1.7	1	10.7	13	20		
KAC-070-8	575/3/60	7.0	30.0	1.7	1	8.7	11	15		
KAC-096-51	208/230/3/60	2 x 12.0	74.0	4.8	1.5	28.8	32	40	99,750	REFER TO FAN and MOTOR PERFORMANCE DATA
KAC-096-52				6.6	2	30.6	34	45		
KAC-096-71	460/3/60	2 x 5.4	46.0	2.4	1.5	13.2	15	20		
KAC-096-72				3.3	2	14.1	16			
KAC-096-81	575/3/60	2 x 4.7	37.0	1.8	1.5	11.2	13	15		
KAC-096-82				2.3	2	11.7	13			
KAC-108-51	208/230/3/60	2 x 13.3	92.0	4.8	1.5	31.4	35	45	115,130	REFER TO FAN and MOTOR PERFORMANCE DATA
KAC-108-52				6.6	2	33.2	37	50		
KAC-108-71	460/3/60	2 x 6.6	46.0	2.4	1.5	15.6	18	20		
KAC-108-72				3.3	2	16.5	19	25		
KAC-108-81	575/3/60	2 x 5.4	44.0	1.8	1.5	12.6	14	15		
KAC-108-82				2.3	2	13.1	15	20		
KAC-120-52	208/230/3/60	2 x 13.5	92.0	6.6	2	33.6	37	50	126,940	REFER TO FAN and MOTOR PERFORMANCE DATA
KAC-120-53				8.4	3	35.4	39			
KAC-120-72	460/3/60	2 x 6.7	46.0	3.3	2	16.7	19	25		
KAC-120-73				4.2	3	17.6	20			
KAC-120-82	575/3/60	2 x 5.0	44.0	2.3	2	12.3	14	15		
KAC-120-83				3.3	3	13.3	15	20		
KAC-140-52	208/230/3/60	2 x 18.0	126.0	6.6	2	42.6	48	60	144,950	REFER TO FAN and MOTOR PERFORMANCE DATA
KAC-140-53				8.4	3	44.4	49			
KAC-140-72	460/3/60	2 x 9.0	42.0	3.3	2	21.3	24	30		
KAC-140-73				4.2	3	22.2	25			
KAC-140-82	575/3/60	2 x 5.3	30.0	2.3	2	12.9	15	20		
KAC-140-83				3.3	3	13.9	16			

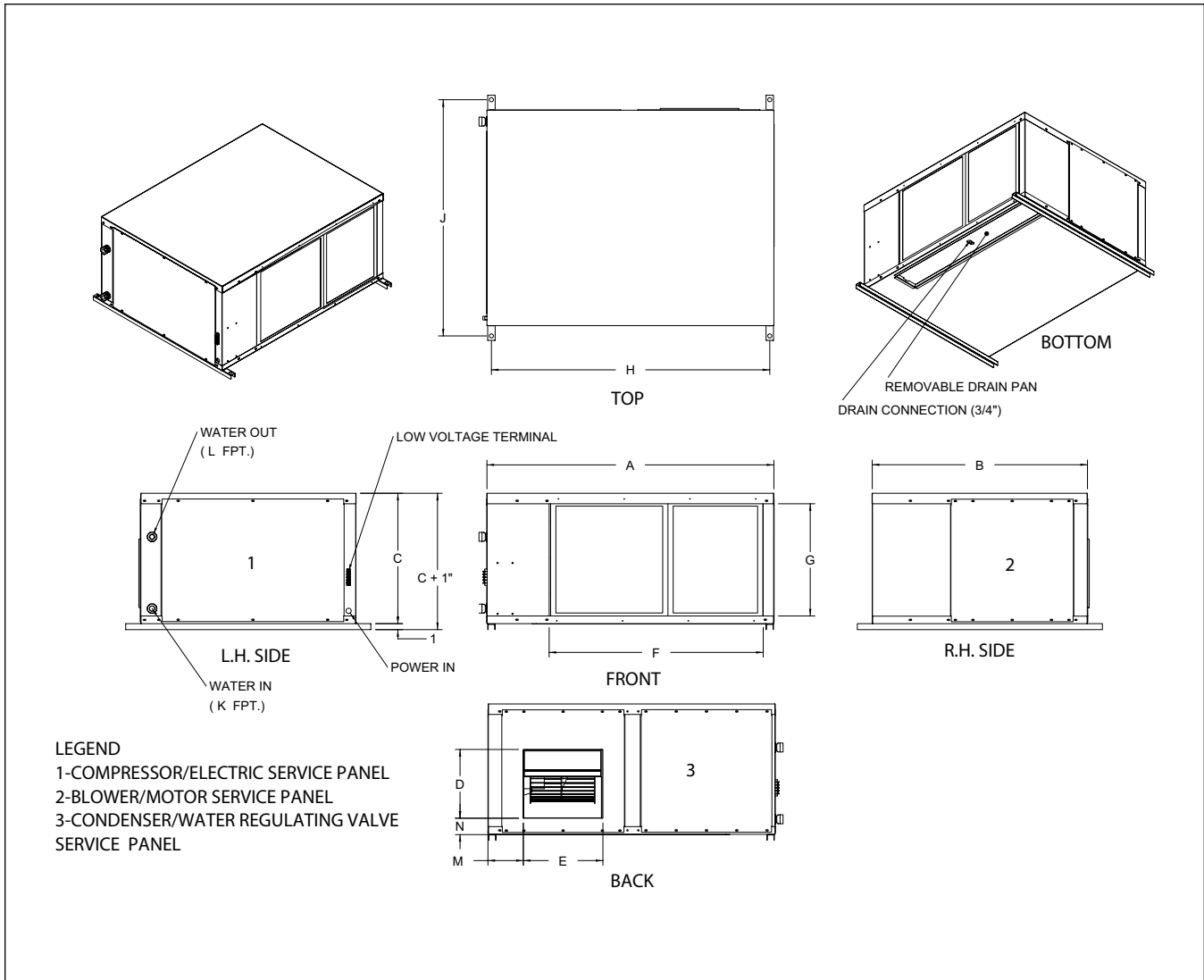
## KAC DIMENSIONAL DATA – VERTICAL MODELS



### VERTICAL MODELS

MODEL	DIMENSIONS (inches)												WEIGHT lb.
	A	B	C	Supply Air		Return Air		FPT Conn.		M	N	FILTERS	
				D	E	F	G	K	L				
KAC-009V	36 1/2	22	22	8	6 7/8	16	20	1/2	1/2	7 9/16	5	(1) 16 x 20	130
KAC-012V	36 1/2	22	22	8	6 7/8	16	20	1/2	1/2	7 9/16	5	(1) 16 x 20	130
KAC-015V	40 1/2	22	22	8	6 7/8	16	20	3/4	3/4	7 9/16	5	(1) 16 x 20	175
KAC-018V	40 1/2	22	22	10 1/2	8 1/2	16	20	3/4	3/4	7 9/16	5	(1) 16 x 20	175
KAC-024V	40 1/2	22	22	10 1/2	8 1/2	16	20	3/4	3/4	6 7/8	2 3/4	(1) 16 x 20	175
KAC-030V	46 1/2	22	22	9 3/4	9 1/4	16	24	3/4	3/4	6 7/8	4	(1) 16 x 24	195
KAC-036V	46 1/2	25 3/4	25 3/4	9 3/4	9 1/4	20	24	3/4	3/4	8 5/16	4	(1) 20 x 24	230
KAC-048V	52 1/2	25 3/4	28	11 3/8	13 1/8	20	30	3/4	3/4	6 5/16	4 3/4	(1) 10 x 20 (1) 20 x 20	250
KAC-060V	56 1/2	30	28	11 3/8	13 1/8	24	32	1	1	8 7/16	4 3/4	(2) 16 x 24	320
KAC-070V	56 1/2	30	28	11 3/8	13 1/8	24	32	1	1	8 7/16	4 3/4	(2) 16 x 24	350
KAC-096V	66 1/2	31 1/2	29	13 1/2	18 5/8	25	40	1 1/4	1 1/4	6 7/16	2 1/2	(2) 20 x 25	650
KAC-108V	66 1/2	38 1/2	32	15 7/8	18 5/8	32	40	1 1/4	1 1/4	9 15/16	2 1/2	(4) 16 x 20	660
KAC-120V	66 1/2	42 1/2	32	15 7/8	18 5/8	36	40	1 1/4	1 1/4	11 15/16	2 1/2	(2) 16 x 20 (2) 20 x 20	710
KAC-140V	66 1/2	42 1/2	32	15 7/8	18 5/8	36	40	1 1/4	1 1/4	11 15/16	2 1/2	(2) 16 x 20 (2) 20 x 20	710

## KAC DIMENSIONAL DATA – HORIZONTAL MODELS

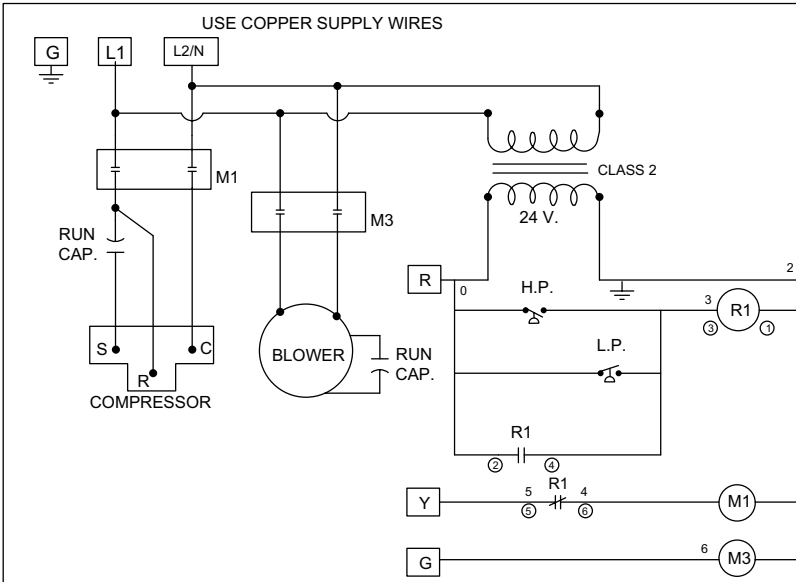


### HORIZONTAL MODELS

MODEL	DIMENSIONS (inches)														WEIGHT lb.
	A	B	C	Supply Air		Return Air		Mounting		FPT Conn.		M	N	FILTERS	
				D	E	F	G	H	J	K	L				
KAC-009H	34	23	11 3/4	6 7/8	8	20	10	32 1/2	26 1/2	1/2	1/2	3 1/4	2 1/8	(1) 16 x 20	130
KAC-012H	34	23	11 3/4	6 7/8	8	20	10	32 1/2	26 1/2	1/2	1/2	3 1/4	2 1/8	(1) 16 x 20	130
KAC-015H	34	27	17 3/4	8	6 7/8	20	16	32 1/2	30 1/2	3/4	3/4	4 3/4	2 1/4	(1) 16 x 20	175
KAC-018H	34	27	17 3/4	10 1/2	8 1/2	20	16	32 1/2	30 1/2	3/4	3/4	4 3/4	2 1/4	(1) 16 x 20	175
KAC-024H	38	27	17 3/4	10 1/2	8 1/2	20	16	36 1/2	30 1/2	3/4	3/4	4 1/4	2 1/4	(1) 16 x 20	175
KAC-030H	38	27	17 3/4	9 3/4	9 1/4	24	16	36 1/2	30 1/2	3/4	3/4	4 1/4	2 1/4	(1) 16 x 24	195
KAC-036H	39	30	21 3/4	9 3/4	9 1/4	25	20	37 1/2	33 1/2	3/4	3/4	5 1/2	3 1/2	(1) 20 x 25	230
KAC-048H	43	30	21 3/4	11 3/8	13 1/8	26	20	41 1/2	33 1/2	3/4	3/4	4 5/8	2 3/4	(1) 10 x 20 (1) 20 x 20	250
KAC-060H	48	36	21 3/4	11 3/8	13 1/8	36	20	46 1/2	39 1/2	1	1	6	2 3/4	(2) 16 x 24	320
KAC-070H	48	36	21 3/4	11 3/8	13 1/8	36	20	46 1/2	39 1/2	1	1	6	2 3/4	(2) 16 x 24	350
KAC-096H	60	44	21 3/4	13 1/2	18 5/8	50	25	58	47 1/2	1 1/4	1 1/4	6 3/4	1 7/8	(2) 20 x 25	650
KAC-108H	62	44	25 3/4	15 7/8	18 5/8	32	24	60	47 1/2	1 1/4	1 1/4	6 1/2	1 1/4	(4) 16 x 20	660
KAC-120H	70	44	25 3/4	15 7/8	18 5/8	60	24	60	47 1/2	1 1/4	1 1/4	10 1/2	1 1/4	(2) 16 x 20 (2) 20 x 20	710
KAC-140H	70	44	25 3/4	15 7/8	18 5/8	60	24	60	47 1/2	1 1/4	1 1/4	10 1/2	1 1/4	(2) 16 x 20 (2) 20 x 20	710

# ELECTRICAL WIRING DIAGRAMS KAC MODELS

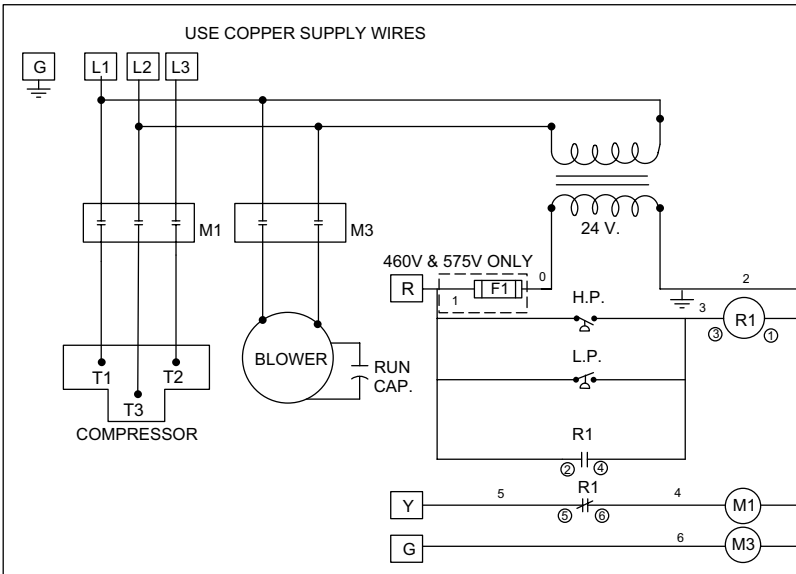
SINGLE COMPRESSOR  
SINGLE PHASE



	N.O. CONTACT
	CONTACT CLOSE PRES. RISE H.P.
	CONTACT CLOSE PRES. DROP L.P.
	N.C. CONTACT
R1	CONTROL RELAY COMP. 1
M1	CONTACTOR COMP. 1
M3	CONTACTOR BLOWER MOTOR

COLOR	MOTOR SPEED
BLACK	HI SPEED
BLUE	MEDIUM SPEED
RED	MEDIUM LOW SPEED
PURPLE	LOW SPEED
YELLOW	COMMON
BROWN	CAPACITOR

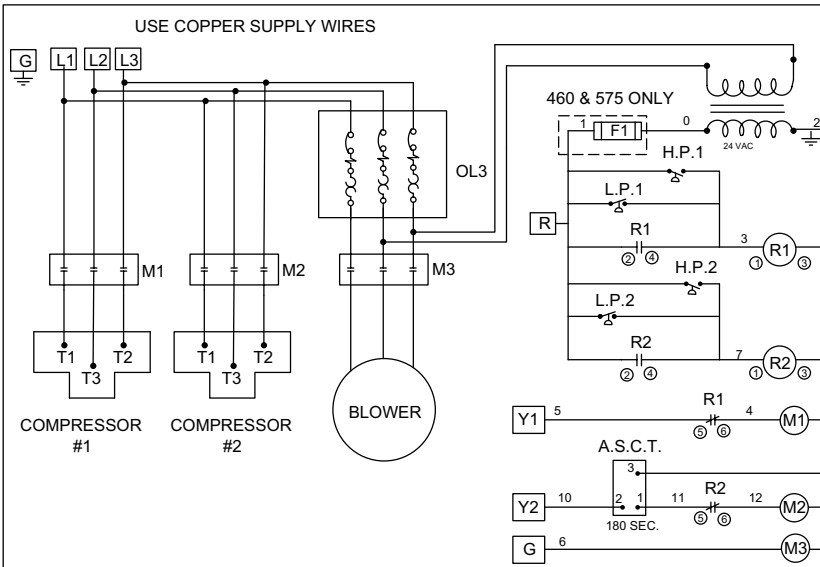
SINGLE COMPRESSOR  
THREE PHASE



	N.O. CONTACT
	CONTACT CLOSE PRES. RISE H.P.
	CONTACT CLOSE PRES. DROP L.P.
	N.C. CONTACT
R1	CONTROL RELAY COMP. 1
M1	CONTACTOR COMP. 1
M3	CONTACTOR BLOWER MOTOR
F1	FUSE

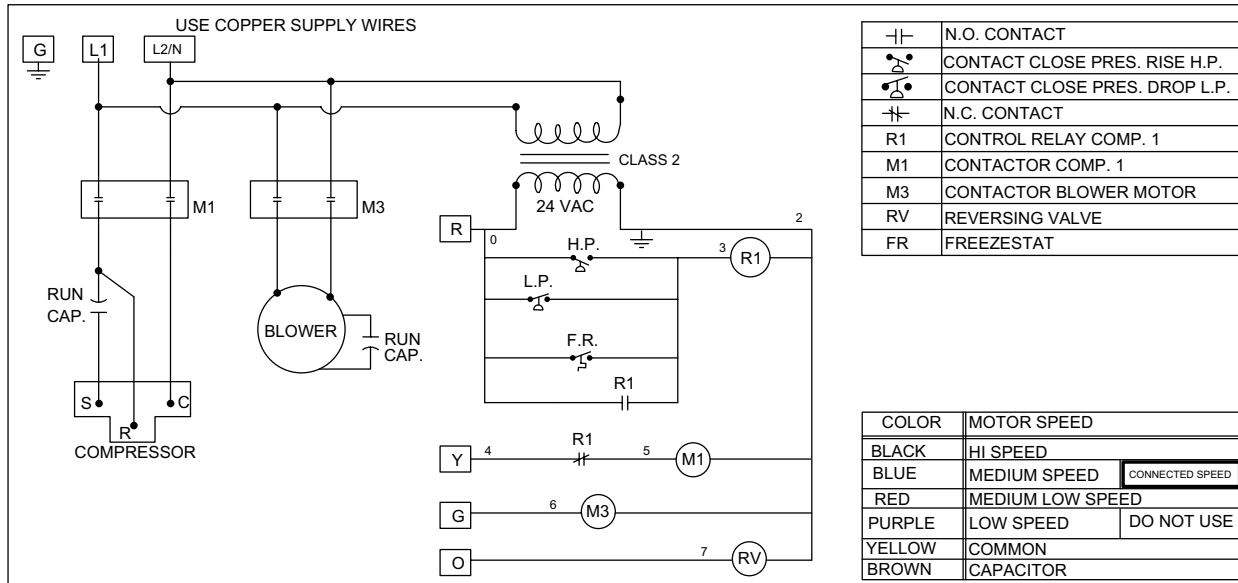
COLOR	MOTOR SPEED
BLACK	HI SPEED
BLUE	MEDIUM SPEED
RED	MEDIUM LOW SPEED
PURPLE	LOW SPEED
YELLOW	COMMON
BROWN	CAPACITOR

TWIN COMPRESSORS  
THREE PHASE

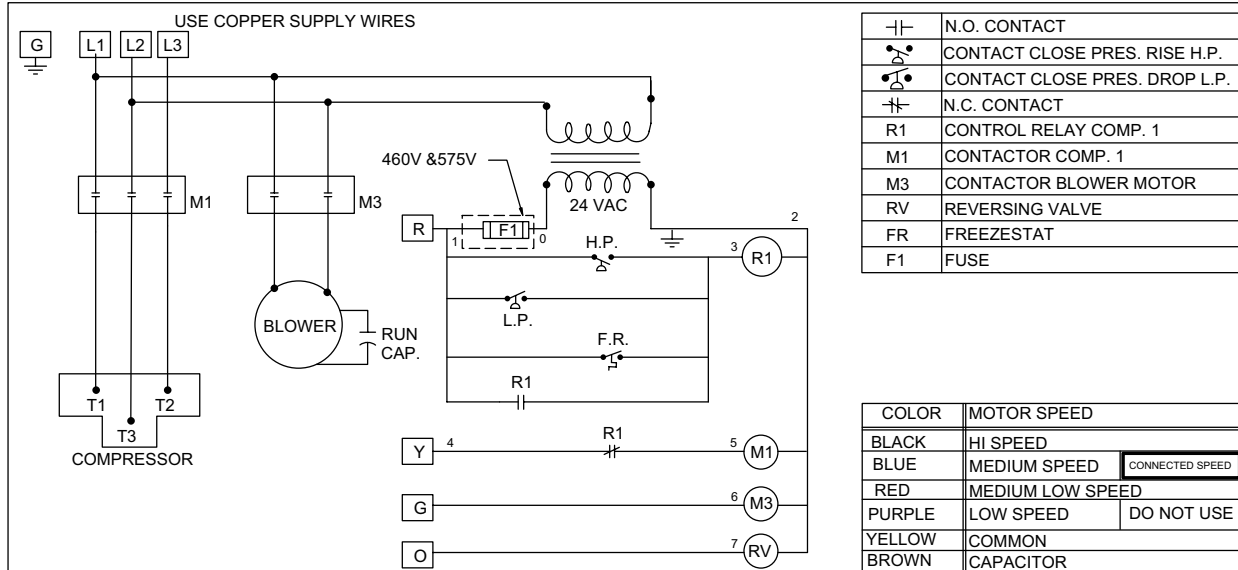


	N.O. CONTACT
	CONTACT CLOSE PRES. RISE H.P.
	CONTACT CLOSE PRES. DROP L.P.
	N.C. CONTACT
OL3	BLOWER OVERLOAD
R1	CONTROL RELAY COMP. 1
R2	CONTROL RELAY COMP. 2
M1	CONTACTOR COMP. 1
M2	CONTACTOR COMP. 2
M3	CONTACTOR BLOWER MOTOR
ASCT	TIME DELAY N.O. CONTACT
F1	FUSE

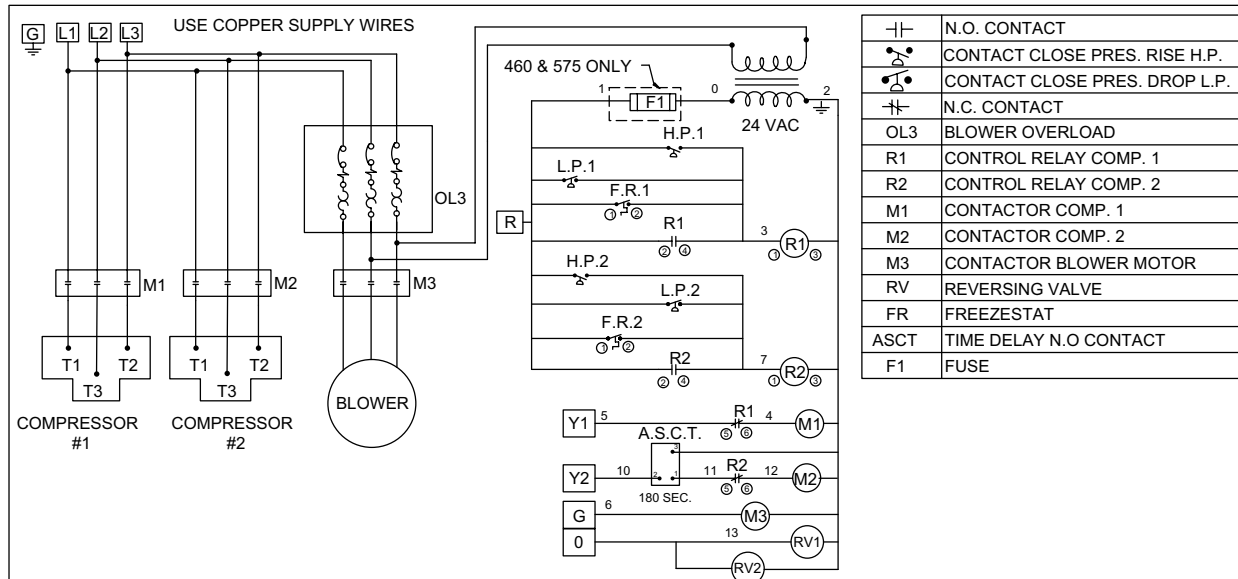
# ELECTRICAL WIRING DIAGRAMS KHP MODELS



SINGLE COMPRESSOR  
SINGLE PHASE



SINGLE COMPRESSOR  
THREE PHASE



TWIN COMPRESSORS  
THREE PHASE

## MODELS 009-140 SPECIFICATIONS

### 1. GENERAL

The Thermoplus Air Water-Cooled Air Conditioner or Heat Pump is a heavy-duty, self-contained unit for use in residential or commercial air conditioning applications and offers high cooling efficiencies (EER's) as it operates at constant condensing temperatures. It is completely assembled, piped, wired, and factory tested. The unit includes the following minimum parts and components: compressor, evaporator coil, condenser coaxial coil, blower, blower motor, refrigeration valves, and electrical controls. A complete line of units is offered in horizontal and vertical configurations, ranging from 9,000 BTUH to 140,000 BTUH, handling from 350 to 4,600 CFM. As well as excellent serviceability, all units feature a factory-mounted water-regulating valve (A/C models) or reversing valve (HP models) inside the unit, 3-available fan motor tap speeds (009 to 060), a low voltage (24V) exterior terminal block for thermostat connection, and a baked-enamel powder-paint finish.

**1.1 VERTICAL MODEL:** Fourteen (14) sizes available ranging from 9,000 BTUH to 140,000 BTUH in different voltages/phases. Suitable for duct connections, or for use with free-air discharge plenum (2-axis adjustable louvered grill).

**1.2 HORIZONTAL MODEL:** Fourteen (14) sizes ranging from 9,000 BTUH to 140,000 BTUH in different voltages/phases and are suitable for duct connections. Unit is complete with hanger rails and rubber isolation for suspension. Special Feature: Easy-to-remove drain pan.

### 2.0 UNIT DESCRIPTION

**2.1 ENCLOSURE:** The frame, panels, removable access panels, and top panel shall be constructed of heavy gauge steel. The base panel shall be constructed of heavy gauge steel with welded steel channel supports for maximum rigidity. Removable panels shall allow easy access to internal parts within each section. The electrical control panel shall be in its own separate compartment.

**2.2 PAINT AND FINISH:** Prior to painting, all metal parts shall be pretreated with a five-stage power wash to remove oils and dirt and shall be rinsed with treated water. Painting shall be by a powder-coat technique to assure positive adherence with a high-impact finish.

### 2.3 EVAPORATOR COIL:

**FINES:** Fins shall be constructed of die-formed, collared, self-spacing aluminum plate fins and copper tubes staggered in the direction of the air flow and mechanically bonded to give metal-to-metal contact for maximum heat transfer.

**TUBES:** Coil shall be fabricated from 3/8" OD seamless drawn copper. The tubes shall be hydraulically expanded into the fins to form a permanent metal-to-metal bond for maximum heat transfer and stability.

**TESTING:** Coils shall be leak tested at 400 psig.

**2.4 CONDENSER (COAXIAL):** Tube-in-tube type water-cooled condenser with convoluted inner tube to enhance surface area for efficient heat transfer. The inner tube (hydraulic circuit) shall be of copper material designed for 350 psig. The exterior tube (refrigerant circuit) shall be of steel for a design working pressure of 450 psig.

**APPROVAL/LISTINGS:** The coil shall be designed and certified in accordance with CSA and/or UL standards.

**COIL PROTECTION (OPTIONAL):** The coating shall be Thermoguard, and shall meet 3,000 hours of salt spray test per A.S.T.M. specification B117.

**2.5 REFRIGERANT CIRCUIT:** A) All air conditioners shall be completely factory piped, tested, dehydrated and charged with R22 refrigerant. The refrigerant circuit shall include compressor, water coaxial coil, evaporator, capillary tubes, water regulating and access service valves on the low and high pressure sides. The refrigerant circuit shall be rated for 150 psig (low side) and a design working

pressure of 300 psig (high side). All units shall be equipped with low and high pressure cut-out switches (reset by stopping and starting the unit manually).

B) All heat pumps shall be completely factory piped, tested, dehydrated and charged with R22 refrigerant. The refrigerant circuit shall include compressor, water coaxial coil, evaporator, capillary tubes, reversing valve, freeze-stat and access service valves on the low and high pressure sides. The refrigerant circuit shall be rated for 150 psig (low side) and a design working pressure of 300 psig (high side). All units shall be equipped with low and high pressure cut-out switches (reset by stopping and starting the unit manually).

**2.6 COMPRESSOR:** High efficiency, suction cooled hermetic type, mounted outside the air stream in an insulated compartment to reduce noise level. Internal spring and internal isolation shall provide vibration-free operation.

Models 096 and larger shall be designed with twin compressors, providing single or dual stage cooling.

**2.7 WATER REGULATING VALVE:** Factory installed and adjusted to provide a regulated water flow thus keeping the condensing pressure constant in the system (on air conditioners only).

**2.7A REFRIGERANT REVERSING VALVE:** Factory installed and piped, activated by cooling or heating demand from room thermostat (Heat Pump model only).

**2.8 ELECTRICAL CONTROL PANEL:** The electrical control panel shall be easily accessed from one side of the unit so that all service can be performed adequately. The electrical components shall include: compressor contactor, a 24V transformer for the control circuit and a relay for the blower motor. The units shall be controlled by a 24V wall-mounted thermostat (supplied by others).

**2.9 CONDENSATE DRAIN PAN:** Constructed of galvanized steel to prevent corrosion. Unique feature: Pan shall be accessible from the exterior of the unit (horizontal models) or from below the evaporator (vertical models) allowing for easy removal and cleaning.

**3.0 BLOWER ASSEMBLY:** The blower shall be a double inlet type with centrifugal forward curved wheel, statically and dynamically balanced. The wheel shall be mounted directly on the motor shaft.

**3.1 BLOWER MOTOR:** Multi-speed, permanent split capacitor motors with permanently lubricated sleeve bearings, mounted on the blower casing on resilient mounts to prevent vibration. Models KAC-009 to KAC-060 are driven by direct drive 3-speed motors; the larger models KAC-096 to KAC-140 are belt driven.

### 4.0 AIR SUPPLY ARRANGEMENTS:

- Horizontal units (std) air supply shall be HB (back)
- Optional: Side air supply (HS). (Field convertible by installer).
- Vertical units (std) air supply shall be VT (top)
- Optional back air supply (VB). **Must be ordered.**

**4.1 AIR FILTERS:** The air filters shall be 1-inch disposable type suitable for commercial application to handle average dust loading. Initial resistance at 100% R.A.F. of 0.08 inch W.G. and average arrestance efficiency of 80% based on 500 fpm air velocity.

**5.0 WARRANTY:** All units shall have a limited warranty for one full year from start-up or 18 months from shipment, whichever comes first.

**6.0 APPROVAL/LISTINGS:** All units shall be certified by Intertek (ETL) to the requirements of the binational Standard CSA C22.2 No. 236 / UL 1995.

**7.0 UNIT MANUFACTURER:** The unit shall be manufactured by THERMOPLUS AIR INC., St. Jérôme, Québec, Canada. The manufacturer of the packaged water-cooled air-conditioning system shall have a minimum of five years of experience in the production of these systems.

## VERTICAL PACKAGED LARGE WATER-COOLED HEAT PUMPS & AIR CONDITIONERS



Also available as Heat Pump Models

### FEATURES

1. Multiple independent refrigeration circuits
2. Aluminum fin / copper tube evaporator
3. Stainless steel drain pan
4. Coaxial condenser(s)
5. Water regulating valve(s) (A/C Models)  
Reversing valves (Heat Pump Models)
6. Basic electrical controls as required
7. FPT water connections (copper)
8. Access panels on three sides of unit
9. Single inlet for water supply

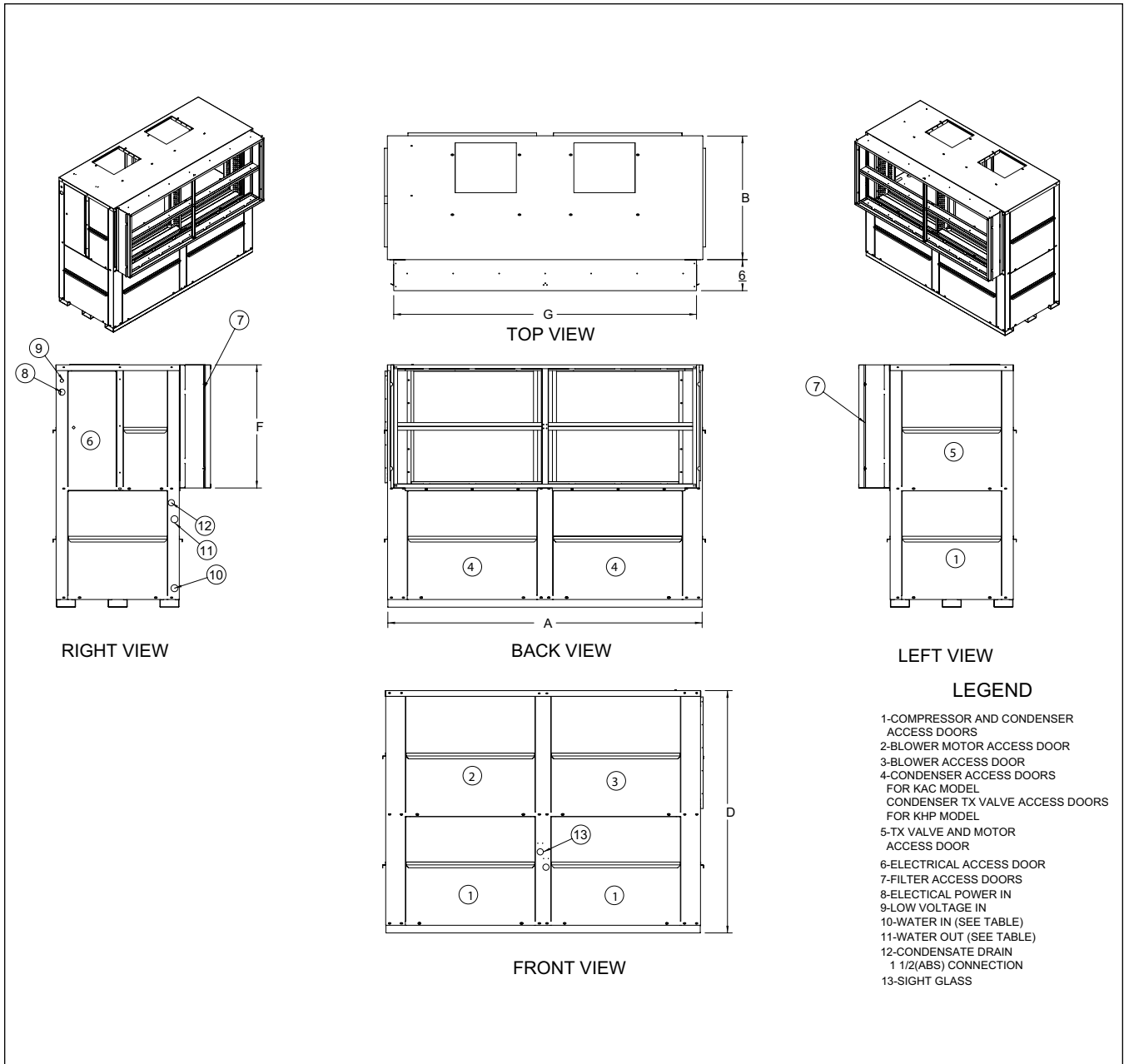
### OPTIONAL ACCESSORIES

1. Copper or HyPoxy®-coated fin for evaporator
2. Shell and tube condensers
3. Cupronickel condensers
4. Flexibility on capacities, HP and ESP
5. Horizontal configurations available
6. Water economizer coil
7. Custom dimensions available to meet size restrictions

### UNIT PERFORMANCE DATA

MODEL NUMBER	KAC-160	KAC-180	KAC-240	KAC-300	KAC-360	KAC-420	KAC-480	KAC-600	KAC-720
CAPACITY (TONS)	13	15	20	25	30	35	40	50	60
NET CAPACITY BTUH									
80°F DB, 67°F WB, 50% RH									
TOTAL	166,380	182,380	243,230	301,330	362,120	427,000	519,500	631,260	736,800
SENSIBLE	124,430	132,780	182,750	223,665	269,920	323,290	383,090	463,190	556,290
75°F DB, 62.5°F WB, 50% RH									
TOTAL	123,220	138,182	192,640	228,290	276,420	365,170	376,420	478,260	478,260
SENSIBLE	108,425	118,291	166,520	196,040	232,140	301,643	314,420	412,580	412,580
STANDARD CFM	5,000	6,000	8,000	10,000	12,000	13,500	16,000	20,000	24,000
MOTOR HP	3	3	5	7.5	7.5	10	10	15	20
ESP	0.5"	0.5"	0.5"	0.5"	1.0"	1.0"	1.0"	1.0"	1.0"
BLOWER	(2) 10"	(2) 12"	(2) 12"	(2) 15"	(2) 15"	(2) 18"	(2) 18"	(2) 18"	(2) 20"
COIL FACE AREA	11.7 sq. ft.	14.6 sq. ft.	19 sq. ft.	25.3 sq. ft.	25.3 sq. ft.	28 sq. ft.	32 sq. ft.	40 sq. ft.	49 sq. ft.

**VERTICAL PACKAGED LARGE A/C WATER-COOLED UNITS (HEAT PUMP ALSO AVAILABLE)**



DIMENSIONAL DATA inches	MODEL								
	KAC-160	KAC-180	KAC-240	KAC-300	KAC-360	KAC-420	KAC-480	KAC-600	KAC-720
LENGTH "A"	82	82	82	86	86	112	112	112	140
WIDTH "B" (+ filter section)	32 (+6")	32 (+6")	32 (+6")	38 (+6")	38 (+6")	42 (+6")	42 (+6")	44 (+6")	54 (+6")
TOTAL HEIGHT "D"	58	64	69	87	87	81	85	97	95
RETURN AIR HEIGHT "F"	25	32	36	50	50	40	46	60	54
RETURN AIR LENGTH "G"	79	79	79	79	79	103.625	103.625	103.625	138
WATER IN # "10"	1 1/4	1 1/4	1 1/2	2	2	2	2 1/2	2 1/2	3
WATER OUT # "11"	1 1/4	1 1/4	1 1/2	2	2	2	2 1/2	2 1/2	3

Note: Actual units may differ from the dimensional drawing above depending on required features.

## VERTICAL PACKAGED LARGE A/C WATER-COOLED UNITS (HEAT PUMP ALSO AVAILABLE)

MODEL	ELECTRICALS Volts/Ph/Hz	COMPRESSOR		BLOWER		UNIT FLA	MINIMUM CIRCUIT AMPACITY	MAXIMUM OVERCURRENT PROTECTION	NOMINAL COOLING CAPACITY	EXT STATIC PRESS.
		RLA	LRA	FLA	HP					
KAC-160-5	208-230/3/60	2 x 18.8	2 x 124	8.4	3	46.0	51	70	166,380	0.75"
KAC-160-7	460/3/60	2 x 9.2	2 x 64	4.2	3	22.6	25	30		
KAC-160-8	575/3/60	2 x 7.4	2 x 51	3.7	3	18.5	21	25		
KAC-180-5	208-230/3/60	2 x 24.9	2 x 157.5	8.4	3	58.2	65	80	182,380	0.75"
KAC-180-7	460/3/60	2 x 11.2	2 x 95	4.2	3	26.6	30	40		
KAC-180-8	575/3/60	2 x 9.0	2 x 69	3.7	3	21.7	24	30		
KAC-240-5	208-230/3/60	2 x 31.7	2 x 241	12.6	5	76.0	84	110	243,230	0.75"
KAC-240-7	460/3/60	2 x 14.9	2 x 118	6.3	5	36.1	40	50		
KAC-240-8	575/3/60	2 x 12.4	2 x 92	5.0	5	29.8	33	45		
KAC-300-5	208-230/3/60	1 x 62.2 1 x 42.2	1 x 376 1 x 251	19.2	7.5	123.6	140	200	301,330	0.75"
KAC-300-7	460/3/60	1 x 27.6 1 x 18.4	1 x 178 1 x 117	9.6	7.5	55.6	63	90		
KAC-300-8	575/3/60	1 x 22.1 1 x 14.8	1 x 143 1 x 94	8.2	7.5	45.1	51	70		
KAC-360-5	208-230/3/60	2 x 62.2	2 x 376	19.2	7.5	143.6	160	200		
KAC-360-7	460/3/60	2 x 27.6	2 x 178	9.6	7.5	64.8	72	90	357,200	0.75"
KAC-360-8	575/3/60	2 x 22.1	2 x 143	8.2	7.5	51.9	58	80		
KAC-420-5	208-230/3/60	3 x 42.2	3 x 251	25.8	10	152.4	163	200	427,700	1.0"
KAC-420-7	460/3/60	3 x 18.4	3 x 117	12.9	10	68.1	73	90		
KAC-420-8	575/3/60	3 x 14.8	3 x 94	10.3	10	54.7	59	70		
KAC-480-5	208-230/3/60	1 x 42.2 2 x 62.2	1 x 251 2 x 376	25.8	10	192.4	208	250	519,500	1.0"
KAC-480-7	460/3/60	1 x 18.4 2 x 27.6	1 x 117 2 x 178	12.9	10	86.5	94	110		
KAC-480-8	575/3/60	1 x 14.8 2 x 22.1	1 x 94 2 x 143	10.3	10	69.3	75	90		
KAC-600-5	208-230/3/60	3 x 62.2	3 x 376	37.6	15	224.2	240	300		
KAC-600-7	460/3/60	3 x 27.6	3 x 178	18.8	15	101.6	109	125	620,000	1.25"
KAC-600-8	575/3/60	3 x 22.1	3 x 143	15.0	15	81.3	87	100		
KAC-720-5	208-230/3/60	4 x 62.2	4 x 376	50.0	20	298.8	315	350	736,800	1.5"
KAC-720-7	460/3/60	4 x 27.6	4 x 178	25.0	20	135.4	143	150		
KAC-720-8	575/3/60	4 x 22.1	4 x 143	20.0	20	108.4	114	125		

www.thermoplus.com



## WE MAKE INDOOR AIR BETTER

*For more than twenty years we have provided our customers with quality, innovative, high performance products carefully engineered for better indoor air. Our unique product lines offer heating, cooling, dehumidification, filtration and energy recovery solutions for commercial, residential and industrial applications.*

**USA & CANADA 1.888.336.PLUS (7587)**

262 Scott Street, Saint-Jérôme, Quebec Canada J7Z 1H1  
Tel.: 450.436.7555 Fax: 450.436.5970

© Copyright 2005

Thermoplus® Air Inc. is a subsidiary of Dectron Internationale Inc.

*Thermoplus® Air Inc. reserves the right to make any changes in the design or specifications of any product at any time without notice.*