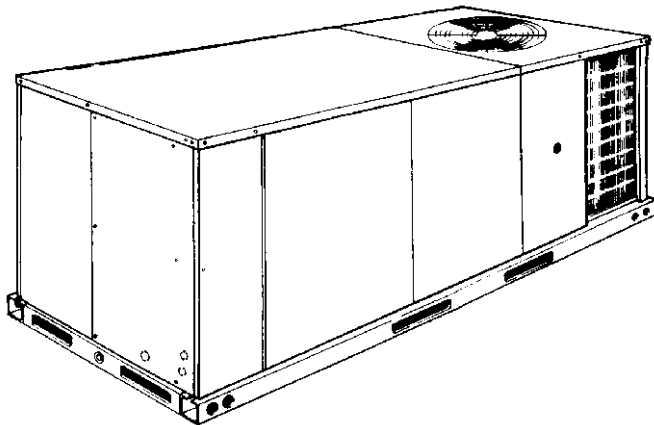


## TECHNICAL GUIDE



### DESCRIPTION

YORK Sunline 2000 Heat Pumps are convertible single package units with a common cabinet and common roof curb for the 3, 4 and 5 ton sizes. The units were designed for residential and light commercial applications. They can easily be installed on a roof curb, slab, roof jack or frame.

All units are self-contained and assembled on rigid full perimeter base rails allowing for 3-way fork lift access and overhead rigging. Every unit is completely charged, wired, piped and tested at the factory to provide for a quick and easy field installation.

The units are available with supplemental electric heaters as field-installed accessories.

Both down and side discharge airflows are available without having to swap panels. The installer simply removes the duct covers for the desired configuration. Economizers may be used on either side or down discharge applications with no modifications required.

All models include a 1-year limited warranty on the complete unit. Compressors and electric heater elements each carry an additional 4-year warranty.

### FEATURES

**CONTROLS** -- These heat pumps utilize a unique time-temperature defrost circuit which adjusts the time between defrost cycles based on the outdoor temperature to provide optimal comfort control and ensure reliable operation. The ambient-modified, time-temperature defrost control extends the time below 35°F and shortens the time above 35°F. The nominal defrost times are field adjustable to 50, 80 and 110 minutes. The defrost time is initiated and terminated by a liquid line control with a 10 minute override limit built into the defrost control.

**COMMON FOOTPRINT/COMMON CABINET** -- The 3, 4 and 5 ton units all share the exact same cabinet -- and therefore the same roof curb. You now have the flexibility of setting one curb and, after the internal load has been determined, placing the proper tonnage unit on that curb.

**HIGH EFFICIENCY** -- All units have a minimum SEER of 10, a COP of 3.0 (high) and 2.0 (low) and an HSPF as high as 7.3. These efficiencies exceed all legislated minimum levels and provide low operating costs.



### SINGLE PACKAGE AIR-TO-AIR HEAT PUMPS

B3CH 036, 048 & 060 (208/230, 460V)  
B5CH 036 & 060 (575V), B6CH 048  
3, 4 AND 5 NOMINAL TONS  
(10 SEER)

### SUNLINE 2000™

**CONVERTIBLE AIRFLOW DESIGN** -- Both the side and bottom duct openings are covered when they leave the factory. If a side supply/side return is desired, you simply remove the two side duct covers from the outside of the unit and discard them. If a bottom supply/return is desired, you simply remove the two bottom duct covers and discard them. No panel cutting or swapping is required! Convertible airflow design allows maximum field flexibility and minimum inventory.

**FACTORY-INSTALLED OPTIONS** -- Economizers can be installed at the factory. They are shipped installed and wired. The outdoor air hood needs only to be field assembled and installed.

Adjustable belt-drive blowers are available on most models from the factory for complete air flow flexibility.

**FIELD-INSTALLED ACCESSORIES** -- Accessories were designed for quick and easy installation. The motorized damper and economizers simply slide in and electrical connections are made by modular plugs. Electric heaters mount easily and knockouts are provided in the internal partitions to connect the elements to the control box single point kit.

The motorized air damper includes a slid-in/plug-in damper assembly with a rainhood and filters. The outdoor air dampers open when the indoor fan motor is energized. The damper is capable of providing 0% through 100% of outdoor return air opening.

The manual outdoor damper provides 0% through 35% or 0% through 100% of return air opening (field adjustable). Designed for duct mounted side or bottom supply/return applications. Includes rain hood assembly and filter.

The 14" high roof curb is shipped knocked down. A roof curb deck is not required because the bottom of the unit is insulated.

**WIDE RANGE OF INDOOR AIRFLOWS** -- All models operate over a wide range of design conditions with a 3-speed direct-drive fan motor. Belt-drive blowers are also available on all models.

**FULL PERIMETER BASE RAILS** -- The permanently attached base rails provide a solid foundation for the entire unit and protect the unit during shipment. The rails provide fork lift access from 3 sides and rigging holes are also provided so that an overhead crane can be used to place the units on a roof.

## FEATURES - CONT'D.

**SYSTEM PROTECTION** -- Crankcase heaters and internal compressor protection are standard on all compressors. Every unit has a liquid line filter--drier, low pressure switch, high pressure switch and high temperature switch to protect all system components. A suction line freeze-stat is supplied on all three--phase units to protect against loss of charge and coil frosting due to low economizer outdoor air temperature while the compressor is running. All units will provide cooling at ambient temperatures down to 45°F.

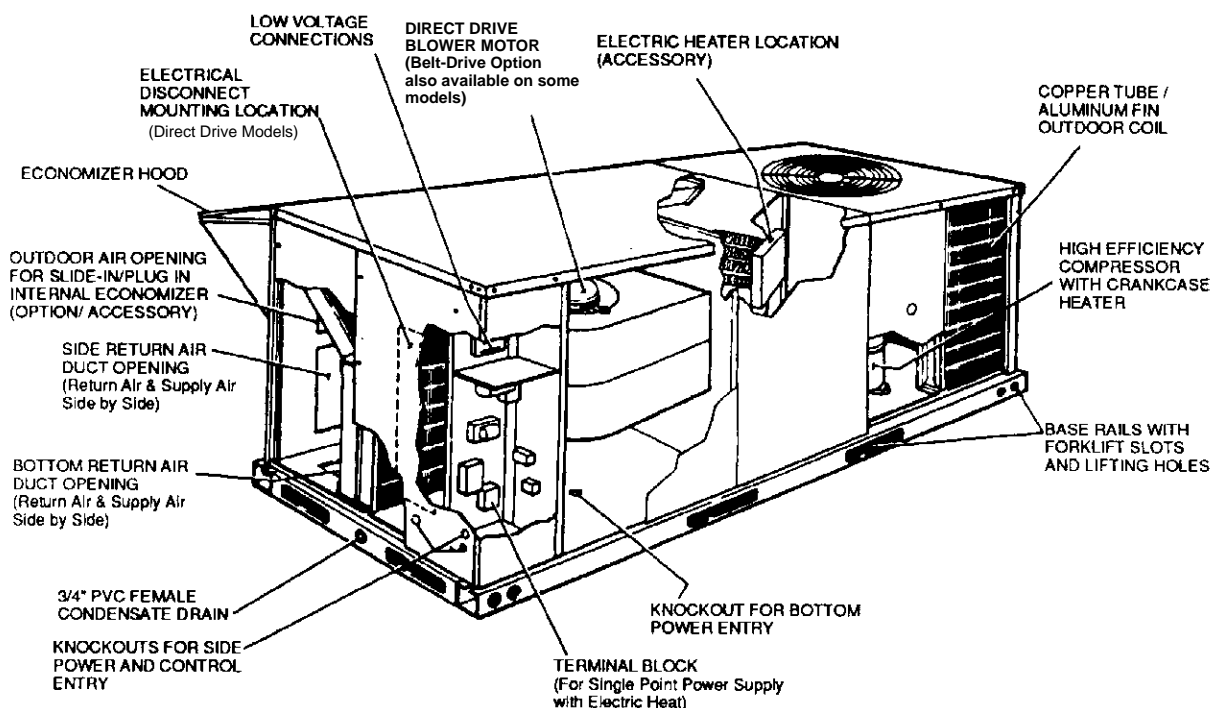
**UTILITY CONNECTIONS MADE EASY** -- Electric utility knockouts are provided in the unit underside as well as the side of the unit. A clearly identified location is provided to mount a

field supplied electrical disconnect switch. Utility connections can be made quickly and with a minimum amount of field labor.

**SIMPLE CONTROL CIRCUIT** -- Mate--n--lock plug connectors are used where line and low voltage wires pass thru internal bulkheads. This allows for easier troubleshooting and component replacement. The electrical control box is not located in the compressor compartment so the access cover can be removed for troubleshooting without affecting the normal system operating pressures.

**AIR FILTERS** -- Units come standard with 1" throwaway filters. The unit filter racks can accommodate 1" or 2" filters without any modifications.

## SUNLINE 2000™ Heat Pump



### TABLE OF CONTENTS

Description .....	1	Heater / CFM Limitations .....	10
Features .....	1	Field Wiring .....	10
Ratings .....	3	Electrical Data - Basic Units (Direct-Drive) .....	11
Physical Data.....	3	Elec. Data-Ht. Pump/Elec.Ht. 3 Ton (Direct-Drive) .....	11
Cooling Capacities - 3 Ton.....	4	Elec. Data-Ht. Pump/Elec.Ht. 4 & 5 Ton (Direct-Drive).....	12
Cooling Capacities - 4 Ton.....	5	Electrical Data - Basic Units (Belt-Drive) .....	13
Cooling Capacities - 5 Ton.....	6	Elec. Data-Ht. Pump/Elec.Ht. 3 Ton (Belt-Drive) .....	13
Heating Capacities .....	7	Elec. Data-Ht. Pump/Elec.Ht. 4 & 5 Ton (Belt-Drive) .....	14
Supply Air Blower Perf. - 3 & 4 Ton w/Belt-Drive.....	8	Unit Dimensions .....	15
Supply Air Blower Perf. - 5 Ton w/Belt-Drive .....	9	Roof Curb Dimensions .....	17
Supply Air Blower Perf. - 3, 4 & 5 Ton w/Direct-Drive.....	9	Factory Installed Options / Field-Installed Accessories .....	18
Motor and Drive Data .....	9	Typical Applications.....	19
Static Resistances .....	10		

# RATINGS

## CAPACITY RATINGS

MODEL BCH	ARI RATINGS (SEE NOTE 1)									NOMINAL ELECTRIC HEAT CAPACITY (SEE NOTE 3) KW		
	COOLING PERFORMANCE			SOUND RATING (SEE NOTE 2) bels	HSPF	HEATING CAPACITY						
	MBH	SEER	EER			47°F		17°F		240V	480V	600V
036	39	10.00	9.20	8.6	7.3	39.0	3.0	23.0	2.1	5, 7, 10, 15 & 20	7, 10, 15 & 20	10, 15 & 20
048	48	10.20	9.25	8.6	6.7	48.0	3.0	26.4	2.0	5, 7, 10, 15 & 20	7, 10, 15 & 20	10, 15 & 20
060	59	10.00	9.20	8.4	7.0	59.0	3.0	36.0	2.1	5, 7, 10, 15, 20 & 30	7, 10, 15, 20 & 30	10, 15, 20 & 30

NOTE: 1. Certified in accordance with the Unitary Small Equipment certification program, which is based on ARI Standard 210/240.

2. Rated in accordance with ARI Standard 270.

3. Heaters available as accessories - all with single point power supply.

SEER = Seasonal Energy Efficiency Ratio - the total cooling output in BTU's during a normal annual usage period for cooling divided by the total electric power input in watt-hours during the same period.

EER = Energy Efficiency Ratio - the cooling capacity in BTU's per hour (BTUH) divided by the power input in watts at any given set of rating conditions, expressed in BTUH per watt (BTUH/watt).

COP = Coefficient of Performance - the total heating capacity provided by the refrigeration system, including circulating fan heat but excluding supplementary resistance (BTU's per hour) divided by the total electric input (watts) x 3.412.

## SOUND POWER RATINGS

Unit Size	CFM	ESP	Blower		Sound Power (dB 10 <sup>-12</sup> Watts)									SWL dB(A)	dB(A) @ 10 ft*
					Octave Band Centerline Frequency (Hz)										
					IWG	Speed	KW	63	125	250	500	1000	2000		
038	1200	0.60	LOW	0.60	84	84	74	67	69	62	57	52	74	41	
048	1600	0.55	HIGH	0.80	85	85	75	68	70	63	58	53	75	42	
060	2000	0.45	HIGH	1.00	86	86	76	69	71	64	59	54	76	43	

\*At a distance of 10 ft from the blower

NOTE: These values have been accessed using a model of sound propagation from a point source into the hemispheric free field. The dBA values provided are to be used for reference only. Calculation of dBA values cover matters of system design and the fan manufacturer has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value or sound data in any other form than sound power level ratings.

## PHYSICAL DATA BASIC UNITS

MODELS		BCH		
		036	048	060
SUPPLY AIR BLOWER	CENTRIFUGAL BLOWER (Dia. x Wd. in.)	12 x 10	12 x 10	12 x 10
	FAN MOTOR HP (DIRECT-DRIVE)	½	¾	1
	FAN MOTOR HP (BELT-DRIVE)	1.5	1.5	1.5
INDOOR COIL	ROWS DEEP	4	3	3
	FINS PER INCH	16	15	15
	FACE AREA (Sq. Ft.)	4.3	5.1	5.1
OUTDOOR FAN	PROPELLER DIA. (in.)	22	22	24
	FAN MOTOR HP	⅓	½	½
	NOM. CFM TOTAL	4300	4200	4500
OUTDOOR COIL	ROWS DEEP	1	1	1
	FINS PER INCH	20	20	20
	FACE AREA (Sq. Ft.)	17.1	17.1	17.1
AIR FILTERS (SEE NOTE)	QUANTITY PER UNIT (15" x 20" x 1")	2	2	2
	QUANTITY PER UNIT (14" X 25" X 1")	1	1	1
	TOTAL FACE AREA (sq. ft.)	6.6	6.6	6.6
CHARGE	REFRIGERANT 22 (lbs./oz.)	7/12	9/2	8/4
COMPRESSOR	HERMETIC, RECIPROCATING (Qty)	1	1	1

NOTE: Filter racks can accommodate 1" or 2" thick filters.

# COOLING CAPACITIES - 3 TON (BCH036)

Air On Indoor Coil		Temperature of Air on Outdoor Coil																	
		85 °F								95 °F									
		Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH						Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
				Entering Dry Bulb, °F								Entering Dry Bulb, °F							
CFM	WB °F	86	83	80	77	74	71	68	86	83	80	77	74	71	68				
1750	72	51	3.4	37	32	28	24	19	-	-	47	3.7	34	29	25	22	17	-	-
	67	46	3.4	40	40	36	31	26	21	16	44	3.7	38	38	34	29	24	20	15
	62	42	3.3	42	42	41	39	34	29	24	38	3.6	38	38	37	35	30	26	21
	57	42	3.3	42	42	42	40	35	30	25	37	3.6	37	37	37	35	30	26	22
1500	72	49	3.4	35	30	26	22	18	-	-	46	3.7	32	28	24	20	16	-	-
	67	45	3.4	39	37	33	29	24	20	15	42	3.7	36	34	30	27	22	18	14
	62	41	3.3	41	41	40	37	32	28	24	37	3.6	37	37	36	33	28	25	21
	57	41	3.3	41	41	41	38	34	29	25	36	3.6	36	36	36	33	29	25	21
1400	72	48	3.4	33	29	24	20	16	-	-	45	3.7	30	27	22	18	15	-	-
	67	44	3.3	39	36	32	28	23	20	15	41	3.7	36	33	29	26	21	18	13
	62	40	3.3	40	39	38	34	30	26	22	36	3.6	36	35	34	30	27	23	19
	57	40	3.3	40	40	39	35	31	27	23	36	3.5	36	36	35	31	27	24	20
1200	72	47	3.4	31	27	24	20	16	-	-	44	3.7	29	25	22	18	14	-	-
	67	41	3.3	36	32	29	25	22	18	14	39	3.6	34	30	27	23	20	17	13
	62	38	3.3	38	37	36	32	29	25	21	35	3.6	35	34	33	29	26	23	19
	57	37	3.3	37	37	36	33	30	26	22	35	3.5	35	35	34	31	28	24	20
1050	72	45	3.3	28	25	22	19	16	-	-	42	3.6	26	23	20	17	14	-	-
	67	41	3.3	34	30	27	24	20	17	14	38	3.6	31	27	25	22	18	15	12
	62	36	3.3	36	35	33	30	27	24	21	34	3.5	34	33	31	28	25	22	19
	57	36	3.3	36	36	34	31	28	25	22	33	3.5	33	33	31	28	25	22	20
900	72	45	3.3	26	24	20	17	15	-	-	40	3.6	23	21	17	15	13	-	-
	67	39	3.3	31	28	25	22	19	17	14	35	3.6	27	25	22	19	17	15	12
	62	35	3.2	35	34	32	29	25	23	20	32	3.5	32	30	28	25	22	20	17
	57	35	3.2	35	35	32	30	26	24	21	31	3.5	31	31	28	26	23	21	18

Air On Indoor Coil		Temperature of Air on Outdoor Coil																	
		105 °F								115 °F									
		Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH						Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
				Entering Dry Bulb, °F								Entering Dry Bulb, °F							
CFM	WB °F	86	83	80	77	74	71	68	86	83	80	77	74	71	68				
1750	72	44	4.0	31	27	24	20	16	-	-	42	4.2	30	26	23	19	15	-	-
	67	40	4.0	34	34	31	26	22	18	13	36	4.1	31	31	28	24	20	16	12
	62	35	3.9	35	35	34	32	28	24	20	34	4.1	34	34	33	31	27	23	19
	57	35	3.9	35	35	35	33	29	25	20	33	4.1	33	33	33	31	27	23	19
1500	72	43	4.0	30	26	22	19	15	-	-	41	4.2	29	25	21	18	15	-	-
	67	38	4.0	32	31	27	24	20	16	12	35	4.1	30	28	25	22	18	15	11
	62	34	3.9	34	34	33	30	26	23	19	33	4.1	33	33	32	29	25	22	19
	57	34	3.9	34	34	34	31	28	24	20	32	4.1	32	32	32	29	26	22	19
1400	72	42	4.0	28	25	21	17	14	-	-	39	4.2	26	23	19	16	13	-	-
	67	37	4.0	32	30	26	23	19	16	12	34	4.1	30	27	24	21	17	15	11
	62	33	3.9	33	32	31	28	24	21	18	32	4.1	32	31	30	27	24	20	17
	57	32	3.8	32	32	31	28	24	21	18	32	4.0	32	32	31	28	24	21	18
1200	72	41	4.0	27	23	20	17	13	-	-	37	4.2	24	21	18	15	12	-	-
	67	35	3.9	30	27	24	21	18	15	11	32	4.1	28	24	22	19	17	14	10
	62	32	3.9	32	31	30	26	24	21	17	30	4.1	30	29	28	25	22	19	16
	57	31	3.8	31	31	31	27	25	21	18	29	4.0	29	29	29	25	23	20	17
1050	72	40	3.9	24	22	19	16	14	-	-	35	4.1	21	19	17	14	12	-	-
	67	34	3.9	28	24	22	19	16	14	11	31	4.0	25	22	20	18	15	12	10
	62	30	3.8	30	29	27	25	22	20	17	29	4.0	29	28	26	24	21	19	16
	57	30	3.8	30	30	28	25	23	20	18	28	4.0	28	28	26	24	21	19	17
900	72	38	3.9	21	20	16	14	12	-	-	34	4.1	19	18	15	12	11	-	-
	67	32	3.9	25	22	20	18	15	13	11	29	4.0	23	20	18	16	14	12	10
	62	29	3.8	29	27	25	23	20	18	16	27	4.0	27	25	24	21	18	17	15
	57	29	3.8	29	29	26	24	21	19	17	26	4.0	26	26	23	22	19	17	15

<sup>1</sup>These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

<sup>2</sup>These ratings include the compressor and the outdoor fan motors but not the supply air blower motor. The total outdoor fan motor power input is 0.35 KW. Refer to the Blower Performance Table for the KW of the supply air blower motor.

  NOMINAL RATING

  ALL SENSIBLE CAPACITY

### COOLING CAPACITIES - 4 TON (BCH048)

Air On Indoor Coil		Temperature of Air on Outdoor Coil																					
		85 °F								95 °F													
		CFM	WB °F	Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH								Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
						Entering Dry Bulb, °F										Entering Dry Bulb, °F							
				86	83	80	77	74	71	68					86	83	80	77	74	71	68		
2000	72	56	4.1	42	36	31	26	-	-	-	53	4.5	40	35	29	24	-	-	-	-	-		
	67	53	4.0	48	47	41	36	30	25	-	51	4.4	46	45	41	35	30	24	-	-	-		
	62	49	4.0	49	49	48	44	38	33	28	46	4.3	46	46	45	41	35	30	24	-	-		
	57	49	3.9	49	49	49	44	38	33	28	46	4.3	46	46	46	41	35	30	24	-	-		
1800	72	55	4.0	40	35	30	25	-	-	-	53	4.4	38	33	28	23	-	-	-	-	-		
	67	52	4.0	47	44	39	34	29	24	-	51	4.4	44	44	39	34	29	24	-	-	-		
	62	48	3.9	48	48	47	43	38	33	28	47	4.3	47	47	45	40	36	31	26	-	-		
	57	48	3.9	48	48	48	43	38	33	28	45	4.2	45	45	45	40	35	30	25	-	-		
1600	72	53	4.0	37	33	28	24	-	-	-	52	4.4	36	32	27	23	-	-	-	-	-		
	67	51	4.0	46	42	37	33	28	24	-	50	4.3	44	43	38	34	29	25	-	-	-		
	62	47	3.9	47	47	46	41	37	32	28	45	4.2	45	45	44	40	36	31	27	-	-		
	57	47	3.9	47	47	47	42	38	33	29	44	4.1	44	44	44	40	36	31	27	-	-		
1400	72	52	4.0	34	30	26	22	-	-	-	49	4.3	33	29	25	21	-	-	-	-	-		
	67	49	3.9	42	38	34	30	26	22	-	47	4.2	42	38	34	30	26	22	-	-	-		
	62	46	3.8	46	45	42	38	34	30	26	43	4.1	43	42	40	36	32	28	24	-	-		
	57	45	3.8	45	45	43	39	35	31	27	42	4.1	42	42	40	36	32	28	24	-	-		
1200	72	50	3.9	31	27	24	20	-	-	-	47	4.2	29	25	22	18	-	-	-	-	-		
	67	47	3.9	38	35	31	28	24	21	-	45	4.2	37	34	30	27	23	20	-	-	-		
	62	44	3.8	44	42	39	35	32	28	25	40	4.1	40	39	36	32	29	25	22	-	-		
	57	44	3.7	44	43	39	36	32	29	25	40	4.0	40	39	36	32	29	25	22	-	-		

Air On Indoor Coil		Temperature of Air on Outdoor Coil																					
		105 °F								115 °F													
		CFM	WB °F	Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH								Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
						Entering Dry Bulb, °F										Entering Dry Bulb, °F							
				86	83	80	77	74	71	68					86	83	80	77	74	71	68		
2000	72	51	4.9	40	35	29	24	-	-	-	49	5.2	39	34	29	23	-	-	-	-	-		
	67	46	4.7	42	42	39	34	28	23	-	41	5.0	40	40	37	32	26	21	-	-	-		
	62	43	4.6	43	43	42	37	32	27	21	40	4.9	40	40	39	34	29	23	18	-	-		
	57	43	4.6	43	43	43	38	32	28	22	40	4.8	40	40	40	34	30	24	19	-	-		
1800	72	50	4.8	38	33	28	23	-	-	-	47	5.1	37	32	27	22	-	-	-	-	-		
	67	45	4.7	41	41	37	32	27	22	-	40	4.9	37	36	35	30	25	20	-	-	-		
	62	42	4.6	42	42	41	37	32	27	22	39	4.8	39	39	37	34	29	24	19	-	-		
	57	42	4.5	42	42	42	37	33	27	23	38	4.7	38	38	38	33	30	25	20	-	-		
1600	72	49	4.8	35	31	26	22	-	-	-	46	5.1	34	29	25	20	-	-	-	-	-		
	67	44	4.6	40	40	35	31	26	22	-	39	4.9	36	36	32	28	23	19	-	-	-		
	62	41	4.5	41	41	40	35	32	27	23	37	4.7	37	37	36	33	28	24	19	-	-		
	57	41	4.4	41	41	41	36	32	28	23	37	4.7	37	37	37	34	28	25	20	-	-		
1400	72	47	4.7	32	28	24	20	-	-	-	44	5.0	31	27	23	19	-	-	-	-	-		
	67	42	4.5	38	36	32	28	24	20	-	37	4.8	36	34	30	26	21	17	-	-	-		
	62	39	4.4	39	38	37	33	28	25	20	36	4.7	36	35	34	30	26	22	18	-	-		
	57	39	4.4	39	39	37	33	29	25	21	36	4.6	36	36	34	31	26	23	19	-	-		
1200	72	44	4.6	28	25	21	18	-	-	-	42	4.9	28	24	21	17	-	-	-	-	-		
	67	40	4.5	36	32	29	25	22	18	-	36	4.7	34	31	27	24	20	17	-	-	-		
	62	38	4.4	38	36	34	29	27	22	20	35	4.6	35	34	30	28	24	20	17	-	-		
	57	37	4.3	37	37	34	30	27	23	20	35	4.6	35	35	31	29	24	21	18	-	-		

<sup>1</sup>These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

<sup>2</sup>These ratings include the compressor and the outdoor fan motors but not the supply air blower motor. The total outdoor fan motor power input is 0.35 KW. Refer to the Blower Performance Table for the KW of the supply air blower motor.

NOMINAL RATING       ALL SENSIBLE CAPACITY

# COOLING CAPACITIES - 5 TON (BCH060)

Air On Indoor Coil		Temperature of Air on Outdoor Coil																					
		85 °F								95 °F													
		CFM	WB °F	Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH								Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
						Entering Dry Bulb, °F										Entering Dry Bulb, °F							
		86 83 80 77 74 71 68																					
2500	72	68	5.7	51	44	38	31	-	-	-	67	6.0	51	45	38	31	-	-	-				
	67	65	5.6	58	56	50	43	37	30	-	64	5.9	56	56	50	43	37	30	-				
	62	61	5.6	61	61	59	53	46	39	33	59	5.9	59	59	57	50	44	38	31				
	57	60	5.5	60	60	59	53	47	40	33	58	5.8	58	58	57	51	44	39	32				
2250	72	67	5.6	48	42	36	30	-	-	-	66	5.9	48	42	36	30	-	-	-				
	67	64	5.6	57	54	48	42	36	30	-	63	5.9	55	54	48	42	35	29	-				
	62	60	5.5	60	60	57	51	45	39	33	57	5.8	57	57	55	50	44	38	32				
	57	59	5.5	59	59	58	52	46	40	34	57	5.8	57	57	56	50	45	39	33				
2000	72	66	5.6	45	40	34	29	-	-	-	65	5.9	45	40	34	29	-	-	-				
	67	63	5.5	56	51	45	40	35	29	-	61	5.9	55	51	45	40	34	29	-				
	62	59	5.4	59	59	55	50	44	39	33	56	5.8	56	56	54	49	44	38	33				
	57	58	5.4	58	58	57	52	46	41	36	56	5.7	56	56	55	50	44	39	34				
1750	72	64	5.5	42	37	32	27	-	-	-	62	5.9	43	38	33	28	-	-	-				
	67	61	5.5	52	47	42	37	33	28	-	59	5.8	53	48	44	39	34	29	-				
	62	57	5.4	57	56	51	46	41	37	32	54	5.7	54	54	52	48	43	38	33				
	57	57	5.4	57	57	53	48	44	39	34	54	5.7	54	54	53	49	43	39	34				
1500	72	62	5.5	38	34	30	25	-	-	-	60	5.8	41	36	32	28	-	-	-				
	67	59	5.5	48	43	39	35	31	26	-	57	5.8	51	46	42	38	34	29	-				
	62	55	5.4	55	52	47	43	39	35	30	52	5.7	52	52	50	46	42	38	34				
	57	55	5.3	55	54	49	45	41	37	32	52	5.6	52	52	51	47	42	39	35				

Air On Indoor Coil		Temperature of Air on Outdoor Coil																					
		105 °F								115 °F													
		CFM	WB °F	Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH								Total Cap. <sup>1</sup> MBH	Power Input <sup>2</sup> KW	Sensible Capacity <sup>1</sup> , MBH							
						Entering Dry Bulb, °F										Entering Dry Bulb, °F							
		86 83 80 77 74 71 68																					
2500	72	64	6.0	51	44	38	31	-	-	-	60	6.9	50	43	37	30	-	-	-				
	67	59	5.9	51	51	49	42	36	29	-	54	6.6	54	53	47	41	34	27	-				
	62	54	5.9	54	54	51	46	40	33	26	49	6.5	49	49	48	42	35	28	22				
	57	54	5.8	54	54	52	46	41	33	26	49	6.5	49	49	49	43	35	28	23				
2250	72	63	5.9	48	42	36	30	-	-	-	60	6.8	47	41	35	29	-	-	-				
	67	58	5.9	51	51	46	40	34	28	-	54	6.6	47	47	45	39	32	26	-				
	62	53	5.8	53	53	52	46	40	34	28	49	6.5	49	49	47	42	36	30	24				
	57	53	5.8	53	53	52	46	41	35	27	49	6.4	49	49	48	43	37	31	25				
2000	72	62	5.9	45	39	34	28	-	-	-	59	6.8	44	38	33	27	-	-	-				
	67	57	5.9	51	49	44	38	33	27	-	53	6.5	45	45	42	36	31	26	-				
	62	52	5.8	52	52	51	46	40	35	30	48	6.4	48	48	46	42	36	31	25				
	57	52	5.7	52	52	51	46	40	36	31	47	6.4	47	47	46	43	36	32	25				
1750	72	60	5.9	41	37	32	27	-	-	-	56	6.7	40	35	30	25	-	-	-				
	67	55	5.8	48	46	41	36	31	26	-	51	6.5	43	43	38	33	29	24	-				
	62	50	5.7	50	50	48	43	39	34	29	46	6.4	46	46	43	38	33	28	24				
	57	50	5.7	50	50	48	43	39	34	30	45	6.3	45	45	43	38	33	28	25				
1500	72	57	5.8	38	34	30	25	-	-	-	53	6.6	36	31	27	23	-	-	-				
	67	53	5.8	47	43	38	34	30	26	-	48	6.4	41	39	35	30	26	22	-				
	62	48	5.7	48	48	45	41	37	32	28	44	6.3	44	44	39	35	30	26	22				
	57	48	5.6	48	48	45	41	38	32	28	43	6.2	43	43	40	36	30	26	23				

<sup>1</sup>These capacities are gross ratings. For net capacity, determine the KW of the supply air blower motor from the Blower Performance Table, multiply this value by 3.415 MBH / KW to determine the motor heat, and deduct this heat from the gross capacity of the unit.

<sup>2</sup>These ratings include the compressor and the outdoor fan motors but not the supply air blower motor. The total outdoor fan motor power input is 0.35 KW. Refer to the Blower Performance Table for the KW of the supply air blower motor.

  NOMINAL RATING

  ALL SENSIBLE CAPACITY

# HEATING CAPACITIES

<b>BCH036</b>										
CFM	RET. AIR °F	CAP & KW	OUTDOOR AIR TEMPERATURE, °F (72% RH)							
			-10	0	10	20	30	40	50	60
1750	55	MBH	13.1	16.4	23.5	29.1	30.2	41.7	47.0	48.2
		KW	2.9	3.0	3.2	3.3	3.5	3.7	3.8	3.9
	70	MBH	11.9	15.0	21.5	26.7	27.7	38.2	43.1	44.1
		KW	3.0	3.1	3.4	3.4	3.6	3.8	3.9	4.1
	80	MBH	10.9	13.6	19.6	24.3	25.2	34.8	39.3	40.2
		KW	3.1	3.2	3.4	3.5	3.8	3.9	4.1	4.2
1400	55	MBH	12.4	15.5	22.5	27.7	28.7	39.6	44.7	45.8
		KW	2.7	2.9	3.0	3.1	3.3	3.5	3.6	3.7
	70	MBH	11.4	14.1	20.3	25.2	26.1	36.1	40.7	41.6
		KW	2.9	3.0	3.2	3.3	3.5	3.7	3.8	3.9
	80	MBH	10.4	13.1	18.0	23.2	24.2	33.3	37.6	38.5
		KW	3.0	3.1	3.2	3.4	3.6	3.8	3.9	4.0
1200	55	MBH	11.8	14.8	21.3	26.5	27.5	37.8	42.7	43.7
		KW	2.7	2.8	3.0	3.1	3.3	3.4	3.5	3.6
	70	MBH	10.8	13.5	19.4	24.0	24.9	34.4	38.8	39.7
		KW	2.9	3.0	3.1	3.3	3.4	3.6	3.7	3.8
	80	MBH	9.9	12.4	17.8	22.0	22.9	31.5	35.6	36.5
		KW	2.9	3.1	3.2	3.4	3.5	3.7	3.8	3.9
1050	55	MBH	11.2	14.1	20.3	25.2	26.1	35.9	40.6	41.6
		KW	2.6	2.7	2.9	3.0	3.3	3.3	3.5	3.5
	70	MBH	10.2	12.8	18.5	22.8	23.6	32.7	36.9	37.8
		KW	2.8	2.9	3.0	3.2	3.3	3.5	3.6	3.7
	80	MBH	9.3	11.7	16.7	20.7	21.5	29.8	33.6	34.4
		KW	2.8	3.0	3.1	3.3	3.4	3.6	3.7	3.8
<b>BCH048</b>										
2000	55	MBH	12.3	17.3	22.5	28.2	36.3	44.5	53.8	61.6
		KW	3.4	3.5	3.6	3.6	3.8	4.0	4.6	5.2
	70	MBH	11.8	16.6	21.6	27.1	34.9	42.8	51.7	59.2
		KW	3.5	3.6	3.8	3.8	4.0	4.2	4.8	5.4
	80	MBH	10.9	15.3	19.9	24.9	32.1	39.4	47.6	54.5
		KW	3.6	3.7	4.0	4.0	4.1	4.4	5.0	5.7
1600	55	MBH	12.1	17.0	22.0	27.7	34.5	42.3	51.2	58.6
		KW	3.3	3.4	3.5	3.6	3.6	3.8	4.4	5.0
	70	MBH	11.6	16.3	21.2	26.6	33.2	40.7	49.2	56.3
		KW	3.4	3.5	3.6	3.7	3.8	4.0	4.6	5.2
	80	MBH	10.7	15.0	19.5	24.5	30.5	37.4	45.3	51.8
		KW	3.5	3.6	3.8	3.9	4.0	4.2	4.8	5.4
1200	55	MBH	10.9	15.3	19.9	24.9	31.7	38.9	47.0	53.8
		KW	3.1	3.2	3.3	3.4	3.5	3.7	4.2	4.8
	70	MBH	10.5	14.7	19.1	24.0	30.5	37.4	45.2	51.7
		KW	3.2	3.3	3.4	3.5	3.6	3.8	4.4	5.0
	80	MBH	9.6	13.5	17.6	22.0	28.1	34.4	41.6	47.6
		KW	3.3	3.4	3.5	3.6	3.8	4.0	4.6	5.2
<b>BCH060</b>										
2500	55	MBH	18.2	24.7	31.1	38.4	45.6	55.4	64.7	75.6
		KW	5.0	5.1	5.2	5.3	5.3	5.6	5.9	6.5
	70	MBH	17.5	23.7	29.9	37.0	43.9	53.3	62.2	72.7
		KW	5.2	5.3	5.4	5.5	5.6	5.9	6.2	6.8
	80	MBH	16.1	21.8	27.5	34.0	40.4	49.0	57.2	66.9
		KW	5.4	5.6	5.7	5.8	5.9	6.0	6.5	7.2
2000	55	MBH	18.0	24.4	30.8	38.1	45.0	54.7	63.9	74.7
		KW	4.7	4.8	4.9	5.0	5.3	5.5	5.8	6.4
	70	MBH	17.3	23.5	29.6	36.6	43.3	52.6	61.4	71.8
		KW	4.9	5.0	5.1	5.2	5.5	5.8	6.1	6.7
	80	MBH	15.9	21.6	27.2	33.7	39.8	48.4	56.5	66.1
		KW	5.1	5.3	5.4	5.5	5.8	6.1	6.4	7.0
1500	55	MBH	16.2	22.0	27.8	34.3	41.4	50.2	58.7	68.6
		KW	4.5	4.6	4.7	4.8	5.0	5.3	5.5	6.1
	70	MBH	15.6	21.2	26.7	33.0	39.8	48.3	56.4	66.0
		KW	4.7	4.8	4.9	5.0	5.2	5.5	5.8	6.4
	80	MBH	14.4	19.5	24.6	30.4	36.6	44.5	51.9	60.7
		KW	4.9	5.0	5.1	5.2	5.5	5.8	6.1	6.7

# SUPPLY AIR BLOWER PERFORMANCE - BCH036 & 048 with Belt-Drive

## BCH036 - SIDE DUCT APPLICATIONS (230/460/575 VOLTS)

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
036	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
036	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

NOTE: FOR 208 VOLTS, MULTIPLY VALUES BY 0.95.

\*INCLUDES ALLOWANCES FOR A WET INDOOR COIL AND 1" FILTERS. REFER TO THE STATIC RESISTANCES TABLE FOR RESISTANCE VALUES ON APPLICATIONS OTHER THAN HEAT PUMP UNITS WITH SIDE DUCT AIRFLOWS.

## BCH048 - SIDE DUCT APPLICATIONS (230/460/575 VOLTS)

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
048	2000	843	860	880	925	919	1005	956	1065	993	1145	1030	1195	1067	1235
	1900	817	775	854	850	893	920	930	995	970	1065	1008	1125	1046	1170
	1800	790	700	828	760	867	840	906	905	944	980	985	1040	1025	1100
	1700	-	-	802	670	840	745	881	815	920	900	961	970	1001	1030
	1600	-	-	-	-	818	665	858	740	898	820	940	890	980	950
	1500	-	-	-	-	-	-	842	695	882	755	922	835	962	895
	1400	-	-	-	-	-	-	833	650	867	705	904	765	942	820
	1300	-	-	-	-	-	-	-	-	858	665	893	725	932	785
	1200	-	-	-	-	-	-	-	-	847	640	880	680	916	730

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
048	2000	1103	1270	-	-	-	-	-	-	-	-	-	-	-	-
	1900	1085	1210	-	-	-	-	-	-	-	-	-	-	-	-
	1800	1064	1145	1102	1180	-	-	-	-	-	-	-	-	-	-
	1700	1040	1075	1081	1115	1121	1140	-	-	-	-	-	-	-	-
	1600	1020	1005	1060	1050	1100	1085	-	-	-	-	-	-	-	-
	1500	1003	945	1044	995	1086	1035	-	-	-	-	-	-	-	-
	1400	982	880	1024	920	1067	965	1107	1000	-	-	-	-	-	-
	1300	970	835	1010	870	1053	920	1099	960	-	-	-	-	-	-
	1200	953	780	992	815	1034	855	1080	905	-	-	-	-	-	-

NOTE: FOR 208 VOLTS, MULTIPLY VALUES BY 0.95.

\*INCLUDES ALLOWANCES FOR A WET INDOOR COIL AND 1" FILTERS. REFER TO THE STATIC RESISTANCES TABLE FOR RESISTANCE VALUES ON APPLICATIONS OTHER THAN HEAT PUMP UNITS WITH SIDE DUCT AIRFLOWS.



**SUPPLY AIR BLOWER PERFORMANCE - BCH060 with Belt-Drive****BCH060 - SIDE DUCT APPLICATIONS (230/460/575 VOLTS)**

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
060	2500	1059	1560	1077	1590	1095	1630	1114	1650	1134	1660	1158	1685	1181	1720
	2400	1032	1405	1054	1470	1074	1525	1094	1560	1116	1595	1140	1620	1167	1640
	2300	1005	1260	1024	1275	1049	1370	1069	1440	1090	1475	1116	1505	1142	1535
	2200	980	1160	1002	1170	1022	1190	1044	1250	1066	1350	1090	1410	1117	1440
	2100	930	1060	957	1070	983	1080	1010	1100	1039	1160	1064	1260	1092	1340
	2000	877	950	908	975	941	1000	976	1020	1009	1050	1040	1100	1070	1225
	1900	-	-	-	-	894	885	940	940	980	980	1014	1020	1047	1095
	1800	-	-	-	-	855	815	903	860	950	905	988	940	1022	970
	1700	-	-	-	-	-	-	884	815	925	850	964	880	1001	910
	1600	-	-	-	-	-	-	864	770	908	805	948	835	987	870
1500	-	-	-	-	-	-	-	-	882	740	926	780	965	830	

MODEL BCH	AIR FLOW CFM	Available External Static Pressure - IWG*													
		0.90		1.00		1.10		1.20		1.30		1.40		1.50	
		RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts	RPM	Watts
060	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2400	1193	1665	-	-	-	-	-	-	-	-	-	-	-	-
	2300	1170	1580	1202	1620	-	-	-	-	-	-	-	-	-	-
	2200	1148	1480	1180	1530	-	-	-	-	-	-	-	-	-	-
	2100	1121	1385	1155	1425	1190	1475	-	-	-	-	-	-	-	-
	2000	1100	1285	1133	1340	1169	1385	1205	1445	-	-	-	-	-	-
	1900	1079	1180	1110	1240	1143	1280	1178	1330	1222	1375	-	-	-	-
	1800	1058	1060	1090	1135	1122	1190	1158	1240	1196	1295	-	-	-	-
	1700	1035	960	1071	1030	1103	1100	1134	1140	1164	1175	1197	1205	-	-
	1600	1020	900	1056	965	1088	1035	1118	1065	1145	1105	1170	1130	1198	1150
1500	1004	860	1038	880	1070	925	1101	980	1130	1045	1158	1075	1184	1110	

NOTE: FOR 208 VOLTS, MULTIPLY VALUES BY 0.95.

\*INCLUDES ALLOWANCES FOR A WET INDOOR COIL AND 1" FILTERS. REFER TO THE STATIC RESISTANCES TABLE FOR RESISTANCE VALUES ON APPLICATIONS OTHER THAN HEAT PUMP UNITS WITH SIDE DUCT AIRFLOWS.

**SUPPLY AIR BLOWER PERFORMANCE - BCH036, 048 & 060 with Direct-Drive****230 / 460 / 575 VOLTS - SIDE DUCT APPLICATIONS**

MODEL BCH	MOTOR SPEED	Available External Static Pressure - IWG*																	
		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90		1.00	
		CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts	CFM	Watts
036	HI	-	-	-	-	-	-	1720	825	1665	795	1600	765	1540	735	1490	700	1380	670
	MED	1660	850	1630	820	1590	780	1550	750	1500	720	1450	690	1400	665	1360	650	1270	610
	LOW	1470	750	1440	725	1410	700	1370	675	1330	650	1290	625	1250	610	1220	600	1130	560
048	HI	-	-	-	-	2000	1010	1950	975	1905	945	1840	910	1770	825	1660	825	1530	775
	MED	1810	910	1780	880	1740	850	1700	825	1665	800	1620	775	1560	740	1480	700	1390	660
	LOW	1635	810	1610	780	1580	760	1555	740	1540	730	1510	715	1460	690	1400	660	1300	615
060	HI	-	-	-	-	2500	1400	2420	1350	2340	1300	2260	1250	2160	1190	2060	1135	1925	1065
	MED	2390	1350	2350	1300	2300	1255	2245	1210	2190	1165	2130	1120	2065	1075	1990	1030	1900	970
	LOW	2270	1320	2230	1270	2190	1220	2145	1170	2090	1110	2030	1070	1960	1020	1890	970	1810	920

NOTE: FOR 208 VOLTS, MULTIPLY VALUES BY 0.95.

\*INCLUDES ALLOWANCES FOR A WET INDOOR COIL AND 1" FILTERS. REFER TO THE STATIC RESISTANCES TABLE FOR RESISTANCE VALUES ON APPLICATIONS OTHER THAN HEAT PUMP UNITS WITH SIDE DUCT AIRFLOWS.

**MOTOR AND DRIVE DATA - Belt-Drive Blower**

MODEL	BLOWER RANGE (RPM)	MOTOR*				ADJUSTABLE MOTOR PULLEY		FIXED BLOWER PULLEY		BELT	
		HP	RPM	FRAME SIZE	SERVICE FACTOR	PITCH DIA. (in.)	BORE (in.)	PITCH DIA. (in.)	BORE (in.)	PITCH LENGTH (in.)	DESIG- NATION
BCH 036	790 - 1120	1-1/2	1725	56	1.15	2.4 - 3.4	7/8	5.7	1	37.3	A36
BCH 048	790 - 1120	1-1/2	1725	56	1.15	2.4 - 3.4	7/8	5.7	1	37.3	A36
BCH 060	850 - 1220	1-1/2	1725	56	1.15	2.4 - 3.4	7/8	5.2	1	37.3	A36

\*All motors have solid bases and are inherently protected. These motors can be selected to operate into their service factor because they are located in the moving air, upstream of any heating device.

# STATIC RESISTANCES

DESCRIPTION	EXTERNAL STATIC PRESSURE DROP									
	RESISTANCE, IWG									
	CFM									
Economizer <sup>1,2</sup>		1000	1200	1400	1600	1800	2000	2200	2400	2600
Electric Heaters <sup>1</sup>	5 - 15 KW	0.04	0.05	0.06	0.07	0.08	0.10	0.12	0.14	0.16
	20 - 30 KW	0.06	0.07	0.08	0.09	0.11	0.13	0.15	0.17	0.20
Bottom Duct Connections <sup>1</sup>		0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.14	0.16

<sup>1</sup>Deduct these resistance values from the available external static pressure shown in the respective Blower Performance Table.  
<sup>2</sup>The pressure thru the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct system is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

# HEATER / CFM LIMITATIONS

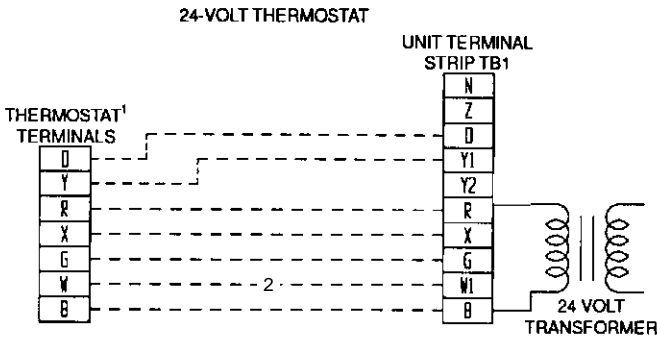
HEATER SIZE NOM. KW	VOLTAGE <sup>1</sup>	UNIT MODEL SIZE, NOMINAL TONS		
		3	4	5
		MINIMUM SUPPLY AIR CFM		
5	208 / 230-1-60	1,100	1,300	1,600
7		1,100	1,300	1,600
10		1,200	1,300	1,600
15		1,200	1,300	1,600
20		1,300 <sup>2</sup>	1,300 <sup>2</sup>	1,600
30		-	-	1,600
5	208 / 230-3-60	1,100	1,300	1,600
7		1,100	1,300	1,600
10		1,200	1,300	1,600
15		1,200	1,300	1,600
20		1,300 <sup>2</sup>	1,300 <sup>2</sup>	1,600
30		-	-	1,600

HEATER SIZE NOM. KW	VOLTAGE <sup>1</sup>	UNIT MODEL SIZE, NOMINAL TONS		
		3	4	5
		MINIMUM SUPPLY AIR CFM		
7	460-3-60	1,100	1,300	1,600
10		1,200	1,300	1,600
15		1,200	1,300	1,600
20		1,300	1,300	1,600
30		-	-	1,600
10		575-3-60	1,200	1,300
15	1,200		1,300	1,600
20	1,300		1,400	1,600
30	-		-	1,800

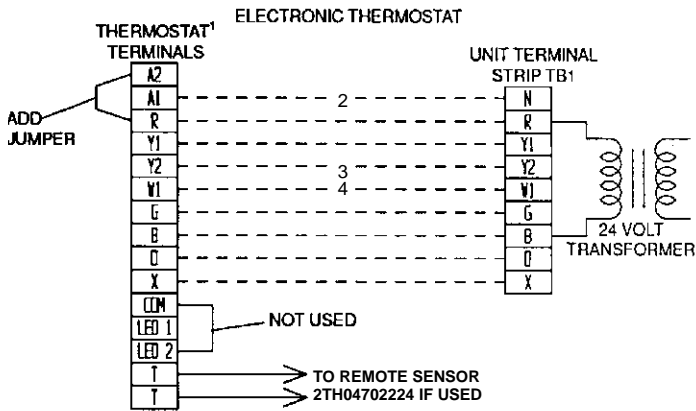
<sup>1</sup>208/230 and 460 volt heaters are UL approved.  
<sup>2</sup>208/230 and 575 volt heaters are CGA approved.  
<sup>2</sup>CGA minimum is 1,400 CFM.

# FIELD WIRING

# CONTROL WIRING

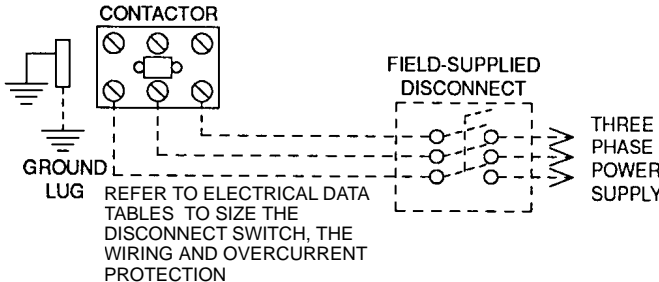
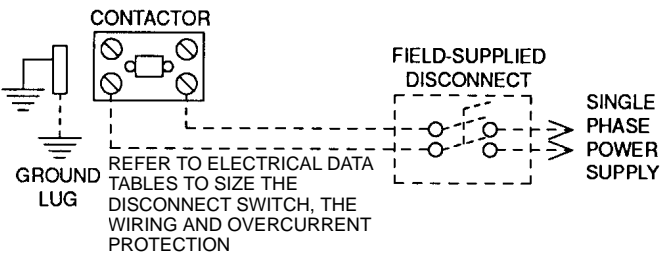


<sup>1</sup> 24-volt thermostat with subbase:  
 —2TH11700224 for manual changeover.  
 —2TH11704124 for automatic changeover.  
<sup>2</sup> Only required on units with supplemental electric heat.



<sup>1</sup> Electronic programmable Thermostat 2ET04700324 with subbase for both manual and automatic changeover.  
<sup>2</sup> Only required on units with economizer. Remove jumper J2 from terminals 4 and 9 on jumper plug P7. The outdoor air intake dampers will return to their fully closed position when the thermostat switches to the "unoccupied" mode.  
<sup>3</sup> Second stage cooling is only required on units with economizer. Remove jumper J1 from terminals 8 and 10 on jumper plug connector P7.  
<sup>4</sup> Only required on units with supplemental electric heat.

# POWER WIRING



**ELECTRICAL DATA - Basic Unit (Direct-Drive)**

MODEL BCH	POWER SUP- PLY	VOLTAGE LIMITATIONS (SEE NOTE 1)		COMPRESSOR		OUTDOOR FAN MOTOR, FLA	SUPPLY AIR BLOWER MOTOR, FLA	MINIMUM CIRCUIT AMPACITY	MAX. FUZE SIZE, (SEE NOTE 2) AMPS	MAX. HACR BREAKER SIZE, AMPS
		MIN.	MAX.	RLA	LRA					
036	208/230-1-60	187	253	19.0	105	1.7	4.4	29.9	45	45
	208/230-3-60	187	253	11.9	85	1.7	4.4	21.0	30	30
	460-3-60	414	504	5.9	42	1.0	2.2	10.6	15	15
	575-3-60	518	630	4.8	34	1.0	2.2	10.2	15	15
048	208/230-1-60	187	253	25.0	105	2.3	5.0	38.6	50	60
	208/230-3-60	187	253	14.7	130	2.3	5.0	25.7	40	40
	460-3-60	414	504	7.7	64	1.4	2.2	13.2	20	20
	575-3-60	518	630	6.4	52	1.4	2.2	11.6	15	15
060	208/230-1-60	187	253	32.1	169	2.3	6.6	49.0	80	80
	208/230-3-60	187	253	19.3	123	2.3	6.6	33.0	50	50
	460-3-60	414	504	10.0	62	1.4	3.3	17.2	25	25
	575-3-60	518	630	7.9	50	1.4	3.3	14.6	20	20

NOTES: 1. Rated in accordance with ARI Standard 110, utilization range "A".  
2. Dual element, time delay type.

**ELECTRICAL DATA - Heat Pump with Supplemental Electric Heat (Direct-Drive)**

MODEL BCH	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			MINIMUM CIRCUIT AMPACITY	MAX. FUZE SIZE <sup>1</sup> AMPS	MAX. SIZE HACR <sup>2</sup> BREAKER AMPS
				KW	STAGES	TOTAL AMPS			
036	208-1-60	2CE04500506	4.4	4.0	1	19.1	53.8	60	60
		2CE04500706		5.6	1	27.1	63.7	70	70
		2CE04501006		8.0	1	38.3	77.7	80	80
		2CE04501506		11.9	2	57.4	101.6	110	110
		2CE04502006		15.9	2	76.6	125.5	150	150
	230-1-60	2CE04500506	4.4	5.3	1	22.1	57.5	70	70
		2CE04500706		7.5	1	31.2	68.9	80	80
		2CE04501006		10.6	1	44.2	85.1	90	90
		2CE04501506		15.9	2	66.2	112.7	125	125
		2CE04502006		21.2	2	88.3	140.3	150	150
	208-3-60	2CE04500525*	4.4	4.0	1	11.0	34.8	40	40
		2CE04500725*		5.6	1	15.6	40.5	45	45
		2CE04501025		8.0	1	22.1	48.6	50	50
		2CE04501525		11.9	2	33.1	62.4	70	70
		2CE04502025		15.9	2	44.2	76.2	80	80
	230-3-60	2CE04500525*	4.4	5.3	1	12.7	36.9	45	45
		2CE04500725*		7.5	1	18.0	43.5	50	50
		2CE04501025		10.6	1	25.5	52.8	60	60
		2CE04501525		15.9	2	38.2	68.8	70	70
		2CE04502025		21.2	2	51.0	84.7	90	90
	460-3-60	2CE04500746*	2.2	6.8	1	8.2	21.2	25	25
		2CE04501046*		10.1	1	12.1	26.4	30	30
		2CE04501546*		13.6	1	16.4	31.9	35	35
		2CE04502046*		19.5	2	23.5	41.2	45	45
575-3-60	2CE04501058	2.2	10.6	1	10.2	15.5	20	20	
	2CE04501558		15.9	1	15.3	21.9	25	25	
	2CE04502058		21.2	1	20.4	28.2	30	30	

<sup>1</sup> Dual element, time delay type

<sup>2</sup> Standard circuit breakers may be used in Canada and on applications over 60 amps where the heaters are separately fused.

\* These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code (eg., Chicago), the following fuse block accessories are available for field installation.

Electric Heat Correction Factors	Nominal Voltage	Voltage	KW Cap Multiplier
	208	208	1.00
	240	230	0.92
	480	460	0.92
	600	575	0.92

Fuse Block	2FB04700425	208/240 Volts
		2FB04700546

**ELECTRICAL DATA - Heat Pump with Supplemental Electric Heat (Direct-Drive)**

MODEL BCH	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			MINIMUM CIRCUIT AMPACITY	MAX. FUSE SIZE <sup>1</sup> AMPS	MAX. SIZE HACR <sup>2</sup> BREAKER AMPS
				KW	STAGES	TOTAL AMPS			
048	208-1-60	2CE04500506	5.0	4.0	1	19.1	62.6	80	80
		2CE04500706		5.6	1	27.1	72.2	90	90
		2CE04501006		8.0	1	38.3	86.6	100	100
		2CE04501506		11.9	2	57.4	110.1	125	125
		2CE04502006		15.9	2	76.6	134.1	150	150
	230-1-60	2CE04500506	5.0	5.3	1	22.1	66.2	80	80
		2CE04500706		7.5	1	31.2	77.6	90	90
		2CE04501006		10.6	1	44.2	93.8	100	100
		2CE04501506		15.9	2	66.2	121.4	125	125
		2CE04502006		21.2	2	88.3	149.0	150	150
	208-3-60	2CE04500525*	5.0	4.0	1	11.0	39.5	50	50
		2CE04500725*		5.6	1	15.6	45.3	50	50
		2CE04501025		8.0	1	22.1	53.4	60	60
		2CE04501525		11.9	2	33.1	67.2	70	70
		2CE04502025		15.9	2	44.2	81.0	90	90
	230-3-60	2CE04500525*	5.0	5.3	1	12.7	41.7	50	50
		2CE04500725*		7.5	1	18.0	48.3	50	50
		2CE04501025		10.6	1	25.5	57.6	60	60
2CE04501525		15.9		2	38.2	73.5	80	80	
2CE04502025		21.2		2	51.0	89.5	90	90	
460-3-60	2CE04500746*	2.2	6.8	1	8.2	23.4	25	25	
	2CE04501046*		10.1	1	12.1	28.4	30	30	
	2CE04501546*		13.6	1	16.4	33.7	35	35	
	2CE04502046*		19.5	2	23.5	42.5	45	45	
575-3-60	2CE04501058	2.2	10.6	1	10.2	24.9	25	25	
	2CE04501558		15.9	1	15.3	30.7	30	30	
	2CE04502058		21.2	2	20.4	37.1	40	40	
060	208-1-60	2CE04500506	8.6	4.0	1	19.1	72.9	100	100
		2CE04500706		5.6	1	27.1	82.9	100	100
		2CE04501006		8.0	1	38.3	96.9	110	110
		2CE04501506		11.9	2	57.4	120.8	125	125
		2CE04502006		15.9	2	76.6	144.7	150	150
		2CE04503006		22.2	2	106.9	182.6	200	200
	230-1-60	2CE04500506	8.6	5.3	1	22.1	76.6	100	100
		2CE04500706		7.5	1	31.2	88.1	110	110
		2CE04501006		10.6	1	44.2	104.2	125	125
		2CE04501506		15.9	2	66.2	131.8	150	150
		2CE04502006		21.2	2	88.3	159.4	175	175
		2CE04503006		29.6	2	123.3	203.2	225	225
	208-3-60	2CE04500525*	6.6	4.0	1	11.0	46.8	60	60
		2CE04500725*		5.6	1	15.6	52.6	60	60
		2CE04501025		8.0	1	22.1	60.6	70	70
		2CE04501525		11.9	2	33.1	74.5	80	80
		2CE04502025		15.9	2	44.2	88.3	90	90
		2CE04503025		22.2	2	61.7	110.2	125	125
230-3-60	2CE04500525*	6.6	5.3	1	12.7	49.0	60	60	
	2CE04500725*		7.5	1	18.0	55.6	70	70	
	2CE04501025		10.6	1	25.5	64.9	70	70	
	2CE04501525		15.9	2	38.2	80.0	90	90	
	2CE04502025		21.2	2	51.0	96.8	100	100	
	2CE04503025		29.6	2	71.2	122.0	125	125	
460-3-60	2CE04500746*	3.3	6.8	1	8.2	27.4	35	35	
	2CE04501046*		10.1	1	12.1	32.3	35	35	
	2CE04501546*		13.6	1	16.4	37.6	40	40	
	2CE04502046*		19.5	2	23.5	46.5	50	50	
	2CE04503046*		28.8	2	34.6	60.5	70	70	
575-3-60	2CE04501058	3.3	10.6	1	10.2	27.3	30	30	
	2CE04501558		15.9	1	15.3	33.6	35	35	
	2CE04502058		21.2	2	20.4	40.1	45	45	
	2CE04503058		30.4	2	29.3	51.1	60	60	

(See Notes on Page 11)

**ELECTRICAL DATA - Basic Unit (Belt-Drive)**

MODEL BCH	POWER SUPPLY	VOLTAGE LIMITATIONS (SEE NOTE 1)		COMPRESSOR		OUTDOOR FAN MOTOR, FLA	SUPPLY AIR BLOWER MOTOR, FLA	MINIMUM CIRCUIT AMPACITY	MAX. FUSE SIZE, (SEE NOTE 2) AMPS	MAX. HACR BREAKER SIZE, AMPS
		MIN.	MAX.	RLA	LRA					
036	208/230-1-60	187	253	19.0	105	1.7	5.3	34.1	50	50
	208/230-3-60	187	253	11.9	85	1.7	5.3	21.9	30	30
	460-3-60	414	504	5.9	42	1.0	3.1	11.5	15	15
	575-3-60	518	630	4.8	34	1.0	3.1	11.1	15	15
048	208/230-1-60	187	253	25.0	105	2.3	8.6	38.6	60	60
	208/230-3-60	187	253	14.7	130	2.3	5.2	25.9	40	40
	460-3-60	414	504	7.7	64	1.4	2.6	13.6	20	20
	575-3-60	518	630	6.4	52	1.4	2.0	11.4	15	15
060	208/230-1-60	187	253	32.1	169	2.3	8.6	51.4	80	80
	208/230-3-60	187	253	19.3	123	2.3	6.0	32.4	50	50
	460-3-60	414	504	10.0	62	1.4	3.0	16.9	25	25
	575-3-60	518	630	7.9	50	1.4	2.4	13.7	20	20

NOTES: 1. Utilization Range "A" in accordance with ARI Standard 110.  
2. Dual element, time delay type.

**ELECTRICAL DATA - Heat Pump with Supplemental Electric Heat (Belt-Drive)**

MODEL BCH	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			MINIMUM CIRCUIT AMPACITY	MAX. FUSE SIZE <sup>1</sup> AMPS	MAX. SIZE HACR <sup>2</sup> BREAKER AMPS
				KW	STAGES	TOTAL AMPS			
036	208-1-60	2CE04500506	8.6	4.0	1	19.1	58.0	70	70
		2CE04500706		5.6	1	27.1	67.9	80	80
		2CE04501006		8.0	1	38.3	81.9	90	90
		2CE04501506		11.9	2	57.4	105.8	110	110
		2CE04502006		15.9	2	76.6	129.7	150	150
		2CE04500506		5.3	1	22.1	61.7	70	70
	230-1-60	2CE04500706	7.5	1	31.2	73.1	80	80	
		2CE04501006	10.6	1	44.2	89.3	90	90	
		2CE04501506	15.9	2	66.2	116.9	125	125	
		2CE04502006	21.2	2	88.3	144.5	150	150	
		208-3-60	2CE04500525*	4.0	1	11.0	35.7	40	40
			2CE04500725*	5.6	1	15.6	41.4	45	45
2CE04501025	8.0		1	22.1	49.5	50	50		
2CE04501525	11.9		2	33.1	63.3	70	70		
2CE04502025	15.9		2	44.2	77.1	80	80		
2CE04500525*	5.3		1	12.7	37.8	45	45		
230-3-60	2CE04500725*	7.5	1	18.0	44.4	50	50		
	2CE04501025	10.6	1	25.5	53.7	60	60		
	2CE04501525	15.9	2	38.2	69.7	70	70		
	2CE04502025	21.2	2	51.0	85.6	90	90		
	460-3-60	2CE04500746*	6.8	1	8.2	21.7	25	25	
		2CE04501046*	10.1	1	12.1	26.7	30	30	
2CE04501546*		13.6	1	16.4	31.9	35	35		
2CE04502046*		19.5	2	23.5	40.8	45	45		
575-3-60	2CE04501058	10.6	1	10.2	16.6	20	20		
	2CE04501558	15.9	1	15.3	23.0	25	25		
	2CE04502058	21.2	1	20.4	29.4	30	30		

<sup>1</sup> Dual element, time delay type

<sup>2</sup> Standard circuit breakers may be used in Canada and on applications over 60 amps where the heaters are separately fused.

\* These electric heaters DO NOT include a fuse box. If a fuse box is required to meet a local code ((eg., Chicago), the following fuse block accessories are available for field installation.

Electric Heat Correction Factors	Nominal Voltage	Voltage	KW Cap Multiplier
	208	208	1.00
	240	230	0.92
	480	460	0.92
	600	575	0.92

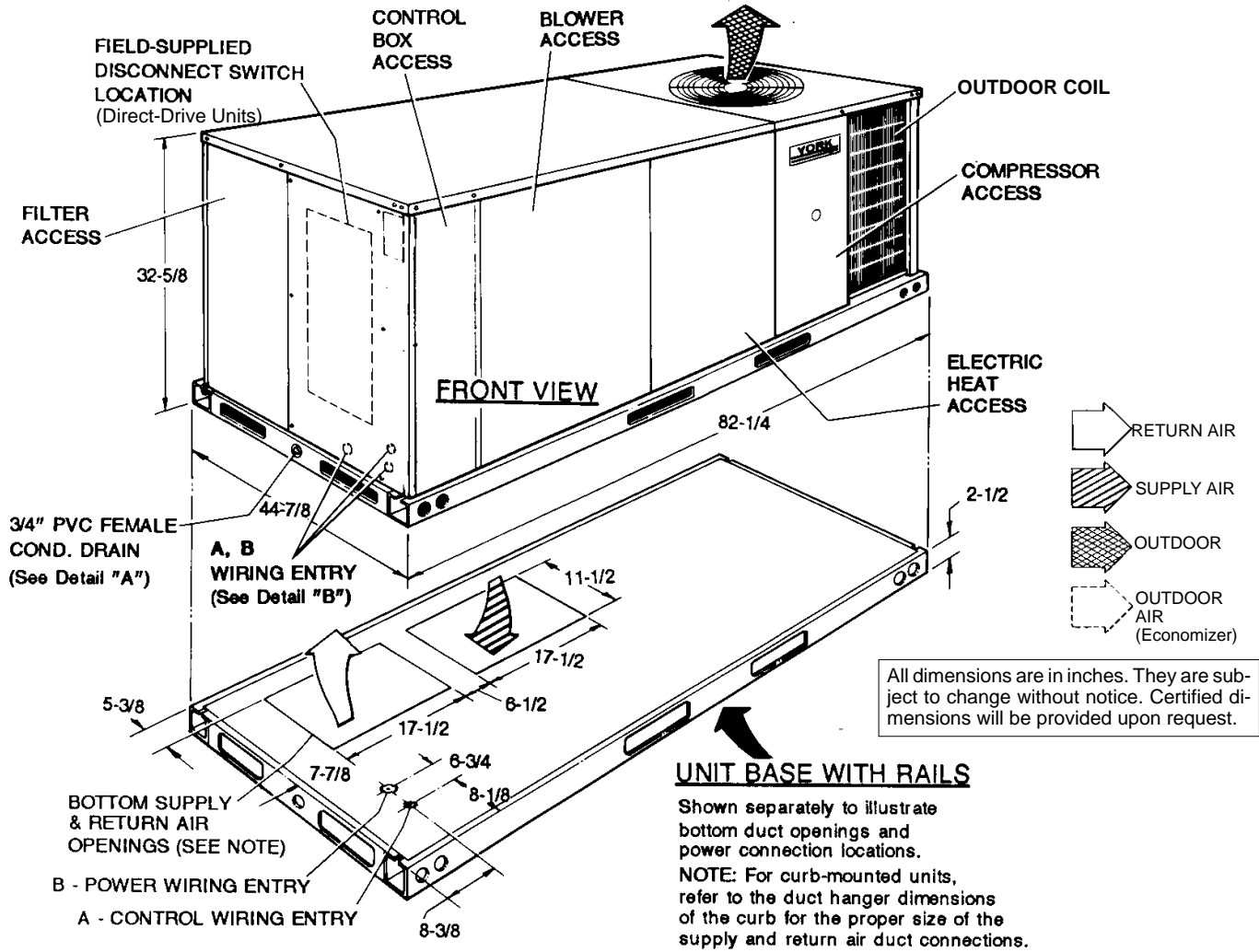
Fuse Block	2FB04700425	208/240 Volts
	2FB04700546	460 Volts

**ELECTRICAL DATA - Heat Pump with Supplemental Electric Heat (Belt-Drive)**

MODEL BCH	POWER SUPPLY	HEATER ACCESSORY MODEL NUMBER	SUPPLY AIR BLOWER MOTOR FLA	ELECTRIC HEATERS			MINIMUM CIRCUIT AMPACITY	MAX. FUSE SIZE <sup>1</sup> AMPS	MAX. SIZE HACR <sup>2</sup> BREAKER AMPS
				KW	STAGES	TOTAL AMPS			
048	208-1-60	2CE04500525*	8.6	4.0	1	19.1	65.2	80	80
		2CE04500725*		5.6	1	27.1	74.8	90	90
		2CE04501025		8.0	1	38.3	89.2	100	100
		2CE04501525		11.9	2	57.4	112.7	125	125
		2CE04502025		15.9	2	76.6	136.7	150	150
	230-1-60	2CE04500525*	8.6	5.3	1	22.1	68.8	80	80
		2CE04500725*		7.5	1	31.3	80.2	90	90
2CE04501025		10.6		1	44.2	96.4	100	100	
2CE04501525		15.9		2	66.3	124.0	125	125	
2CE04502025	21.2	2	88.3	151.6	175	175			
208-3-60	2CE04500525*	5.2	4.0	1	11.0	39.7	50	50	
	2CE04500725*		5.6	1	15.6	45.5	50	50	
	2CE04501025		8.0	1	22.1	53.6	60	60	
	2CE04501525		11.9	2	33.1	67.4	70	70	
2CE04502025	15.9	2	44.2	81.2	90	90			
230-3-60	2CE04500525*	5.2	5.3	1	12.7	41.9	50	50	
	2CE04500725*		7.5	1	18.0	48.5	50	50	
	2CE04501025		10.6	1	25.5	57.8	60	60	
	2CE04501525		15.9	2	38.2	73.7	80	80	
2CE04502025	21.2	2	51.0	89.7	90	90			
460-3-60	2CE04500746*	2.6	6.8	1	8.2	23.8	25	25	
	2CE04501046*		10.1	1	12.1	28.8	30	30	
	2CE04501546*		13.6	1	16.4	34.1	35	35	
	2CE04502046*		19.5	2	23.5	42.9	45	45	
575-3-60	2CE04501058	2.6	10.6	1	10.2	24.2	25	25	
	2CE04501558		15.9	1	15.3	30.5	35	35	
	2CE04502058		21.2	2	20.4	36.9	40	40	
060	208-1-60	2CE04500525*	8.6	4.0	1	19.1	74.9	100	100
		2CE04500725*		5.6	1	27.1	84.9	110	110
		2CE04501025		8.0	1	38.3	98.6	110	110
		2CE04501525		11.9	2	57.4	122.8	125	125
		2CE04502025		15.9	2	76.6	146.7	150	150
	2CE04503025	22.2	2	106.9	184.6	200	200		
	230-1-60	2CE04500525*	8.6	5.3	1	22.1	78.6	100	100
2CE04500725*		7.5		1	31.3	90.1	110	110	
2CE04501025		10.6		1	44.2	106.2	125	125	
2CE04501525		15.9		2	66.3	133.8	150	150	
2CE04502025		21.2		2	88.3	161.4	175	175	
2CE04503025	29.6	2	123.3	205.2	225	225			
208-3-60	2CE04500525*	6.0	4.0	1	11.0	46.2	60	60	
	2CE04500725*		5.6	1	15.6	52.0	60	60	
	2CE04501025		8.0	1	22.1	60.0	70	70	
	2CE04501525		11.9	2	33.1	73.9	80	80	
	2CE04502025		15.9	2	44.2	87.7	90	90	
2CE04503025	22.2	2	61.7	109.6	110	110			
230-3-60	2CE04500525*	6.0	5.3	1	12.7	48.4	60	60	
	2CE04500725*		7.5	1	18.0	55.0	60	60	
	2CE04501025		10.6	1	25.5	64.3	70	70	
	2CE04501525		15.9	2	38.2	80.2	90	90	
	2CE04502025		21.2	2	51.0	96.2	100	100	
2CE04503025	29.6	2	71.2	121.4	125	125			
460-3-60	2CE04500746*	3.0	6.8	1	8.2	27.1	35	35	
	2CE04501046*		10.1	1	12.1	32.1	35	35	
	2CE04501546*		13.6	1	16.4	37.3	40	40	
	2CE04502046*		19.5	2	23.5	46.2	50	50	
2CE04503046*	28.8	2	34.6	60.2	70	70			
575-3-60	2CE04501058	2.4	10.6	1	10.2	26.4	30	30	
	2CE04501558		15.9	1	15.3	32.8	35	35	
	2CE04502058		21.2	2	20.4	39.2	40	40	
	2CE04503058		30.4	2	29.3	50.2	60	60	

(See Notes on Page 13)

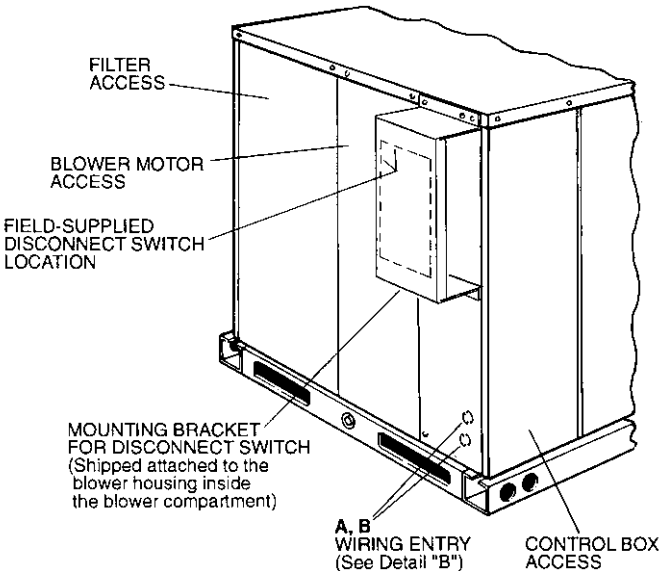
# UNIT DIMENSIONS (BCH - 3, 4 & 5 TON)



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

### UNIT BASE WITH RAILS

Shown separately to illustrate bottom duct openings and power connection locations.  
 NOTE: For curb-mounted units, refer to the duct hanger dimensions of the curb for the proper size of the supply and return air duct connections.



### DISCONNECT SWITCH LOCATION AND MOTOR ACCESS PANEL FOR UNIT WITH "BELT-DRIVE" OPTION

### UTILITIES ENTRY DATA

HOLE	KNOCKOUT SIZE (DIA.)	USED FOR
A	7/8" *	Control Wiring (Side or Bottom)**
B	2" *	Power Wiring (Side or Bottom)

\*Knockouts in the bottom of the unit can be located by the slice in the insulation.  
 \*\*Do not remove the 2" knockout ring.

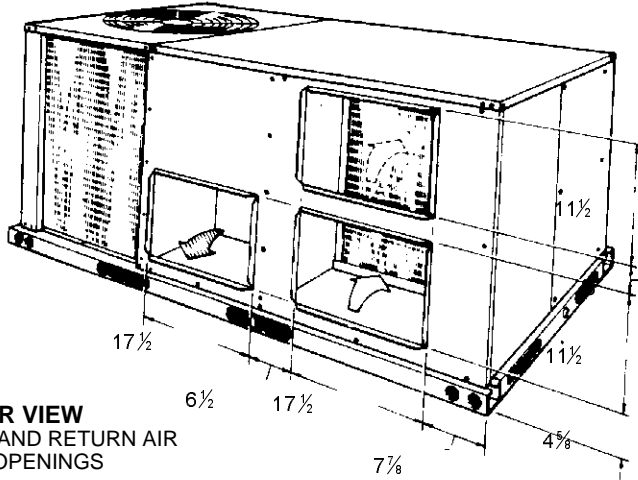
### CLEARANCES

Front	24"
Back	12" (Less Economizer) 36" (With Economizer or Fixed Air/Motorized Air Damper)
Left Side (Filter Access)	24" (Less Economizer) 36" (With Economizer)
Right Side (OD Coil)	24"
Below Unit <sup>1</sup>	0"
Above Unit <sup>2</sup>	72" (For Outdoor Air Discharge)

NOTE:  
 Units and ductwork are approved for zero clearance to combustible materials when equipped with electric heaters.

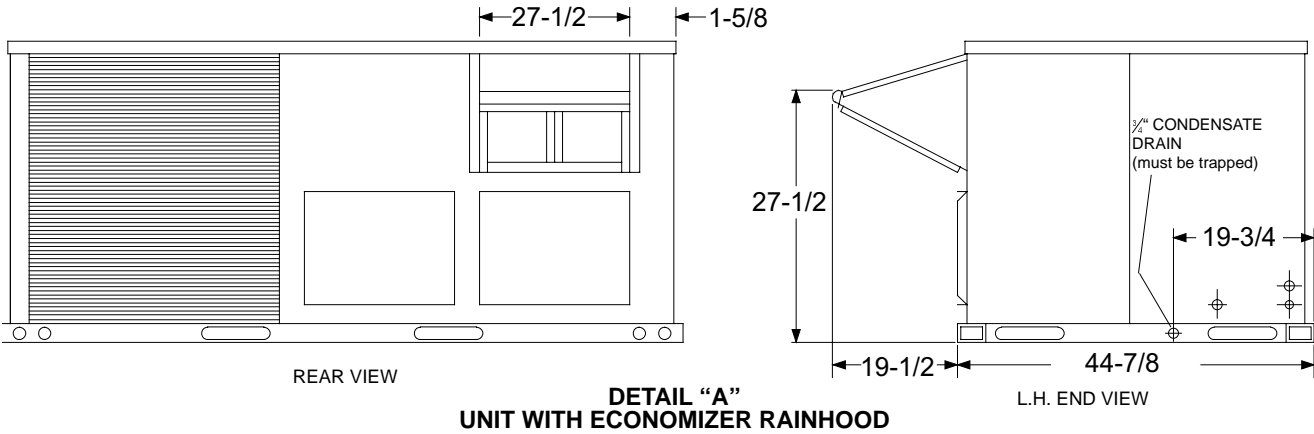
<sup>1</sup>Units may be installed on combustible floors made from wood or class A, B or C roof covering material.  
<sup>2</sup>Units must be installed outdoors. Overhanging structures or shrubs should not obstruct outdoor air discharge outlet.

**UNIT DIMENSIONS - CONT'D. (BCH - 3, 4 & 5 TON)**

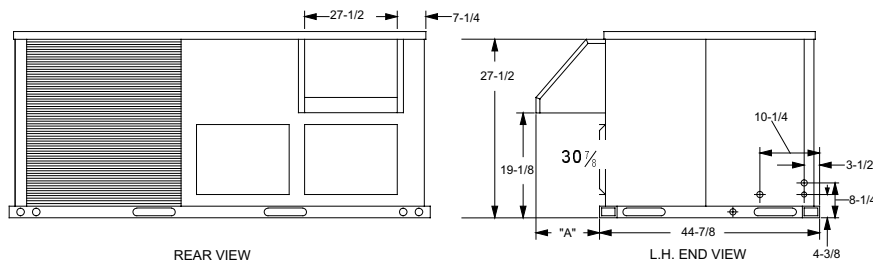


**REAR VIEW**  
SIDE SUPPLY AND RETURN AIR  
DUCT OPENINGS

**DUCT COVERS** - Units are shipped with all air duct openings covered.  
**For side duct applications;**  
 1. Remove and discard the supply and return air duct covers.  
 2. Connect ductwork to duct flanges on the rear of the unit.  
**For bottom duct applications;**  
 1. Remove the side supply air duct cover to gain access to the bottom supply air knockout panel.  
 2. Remove and discard the bottom knockout panel.  
 3. Replace the side duct cover.  
 4. With filter section access panel removed from the unit, remove and discard the bottom return air knockout panel.



**DETAIL "A"**  
**UNIT WITH ECONOMIZER RAINHOOD**

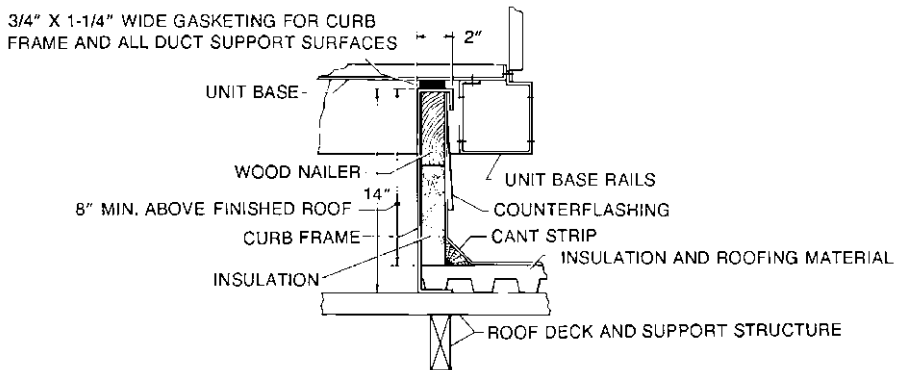
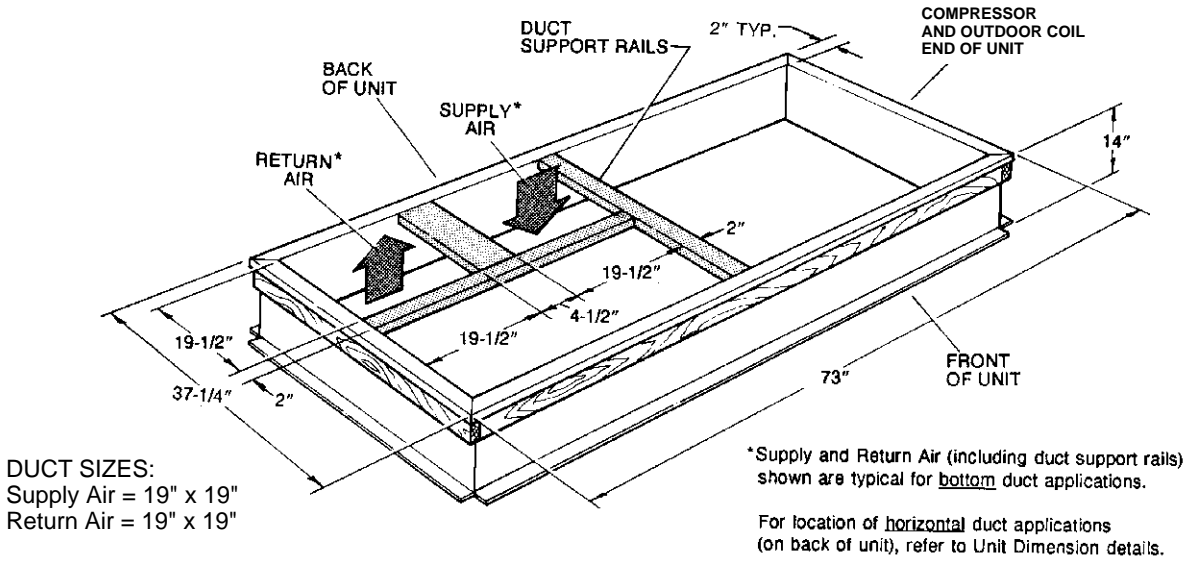


DIMENSION "A"	
FIXED OUTDOOR AIR DAMPER	12
MOTORIZED DAMPER	16-1/2

**DETAIL "B"**  
**UNIT WITH FIXED OUTDOOR AIR/MOTORIZED DAMPER RAINHOOD**



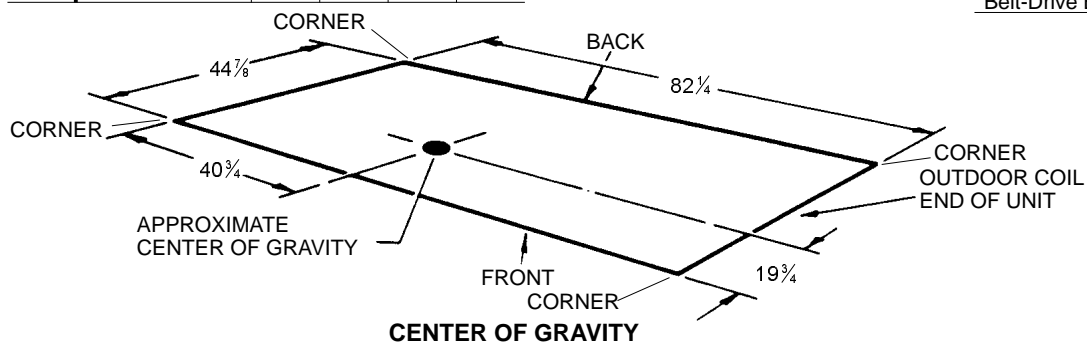
# ROOF CURB DIMENSIONS BCH - 3, 4 & 5 TON



## COMPONENT WEIGHTS AND CENTER OF GRAVITY

BASIC UNIT					
BCH	UNIT WEIGHT* (lbs.)	CORNER WEIGHTS* (location, lbs.)			
		"A"	"B"	"C"	"D"
036	628	178	174	137	139
048	668	189	185	146	148
060	693	196	192	151	154

OPTIONS / ACCESSORIES		
Electric Heat (Nominal KW)	5 - 7 KW	18
	10 - 15 KW	23
	20 - 30 KW	28
Economizer		50
Motorized Outdoor Air Damper		26
Barometric Relief/Fixed Outdoor Air Intake Damper		10
Roof Mounting Curb		92
Belt-Drive Blower		5



## FACTORY INSTALLED OPTIONS

**ECONOMIZERS** - Units equipped with the factory-installed economizer option have dampers that are positioned by a spring return, fully modulating damper actuator capable of introducing up to 100% outdoor air. As the outdoor air intake dampers open, the return air dampers close. The changeover from mechanical refrigeration to economizer operation is determined by a single input electronic enthalpy control or by a dual input electronic enthalpy control. Simultaneous compressor and economizer operation is also possible.

The single enthalpy system contains a sensor that monitors the outdoor air which automatically operates the damper actuator allowing the dampers to open or close.

The dual enthalpy system contains a second sensor that monitors the return air in addition to monitoring the outdoor air described above for a single enthalpy system. The logic module compares these two values and modulates the dampers providing the maximum efficiency of the economizer system.

The economizer is completely installed and wired at the factory. Only the outdoor air hood, including its filters, need be assembled and installed in the field.

**BELT-DRIVE BLOWERS** - Adjustable belt-drive blowers, providing maximum flexibility to handle many airflow requirements, are available on all models.

---

## FIELD--INSTALLED ACCESSORIES

**SINGLE INPUT ELECTRONIC ENTHALPY ECONOMIZER** -- Includes a slide-in/plug-in damper assembly with fully modulating spring return motor actuator capable of introducing up to 100% outdoor air, one outdoor air electronic enthalpy sensor and a rainhood with filters. The rainhood is painted to match the basic unit and must be field-assembled before installation. Economizer dampers are 2% low leakage type.

**DUAL INPUT ELECTRONIC ENTHALPY ECONOMIZER** -- Includes the same damper system and rainhood with filters as described for a single enthalpy economizer above except this accessory contains two enthalpy sensors. It uses a differential enthalpy control that compares the outdoor air versus the return air. The logic module then optimizes the economizer operation for additional savings over the single input economizer.

**MOTORIZED AIR DAMPER** -- Includes a slid-in/plug-in damper assembly with a rainhood and filters. The outdoor air dampers open when the indoor fan motor is energized. The damper is capable of providing 0% through 100% of outdoor return air opening.

**MANUAL OUTDOOR DAMPER** -- Provides 0% through 35% or 0% through 100% of return air opening (field adjustable). Designed for duct mounted side or bottom supply/return applications. Includes rain hood assembly and filter.

**ELECTRIC HEATERS** -- Include nickel chromium elements, a terminal block, fuses (where required by UL), all the necessary connectors and hardware. All heaters utilize single point power supply hookup. Capacities from 5 KW thru 30 KW heating are available.

**FUSE BLOCK KITS** -- These kits have a fuse box with a fuse block and fuses. They're available for all 460--3--60 volt heaters and 208/230--3--60 volt heaters 7 KW and smaller.

**ROOF CURB** -- This 14" high full perimeter roof curb is knocked down for field assembly and contains duct supports that can easily be shifted for the desired unit duct arrangement. No deck is required because the unit underside is insulated.

**START ASSIST KIT (Standard on 4 ton units)** -- Provides increased starting torque for 3 and 5 ton single phase units in areas with low voltage conditions. It contains a 12.5 OHM PTCR temperature resistor with a support clip and hardware for mounting.

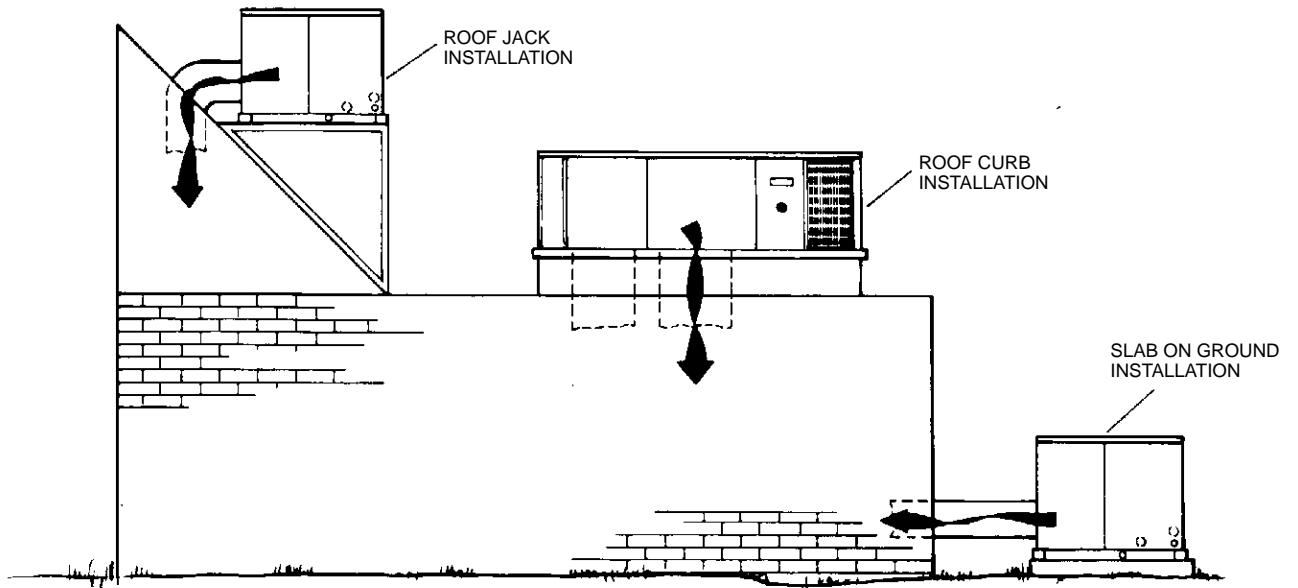
**ANTI--RECYCLE TIMER** -- A timer to prevent the unit compressor from short cycling. It assures 5 minutes off time between compressor cycles.

**OUTDOOR COIL GUARD** -- Consists of grille--type sections for assembling over the outdoor coil to protect it from damage.

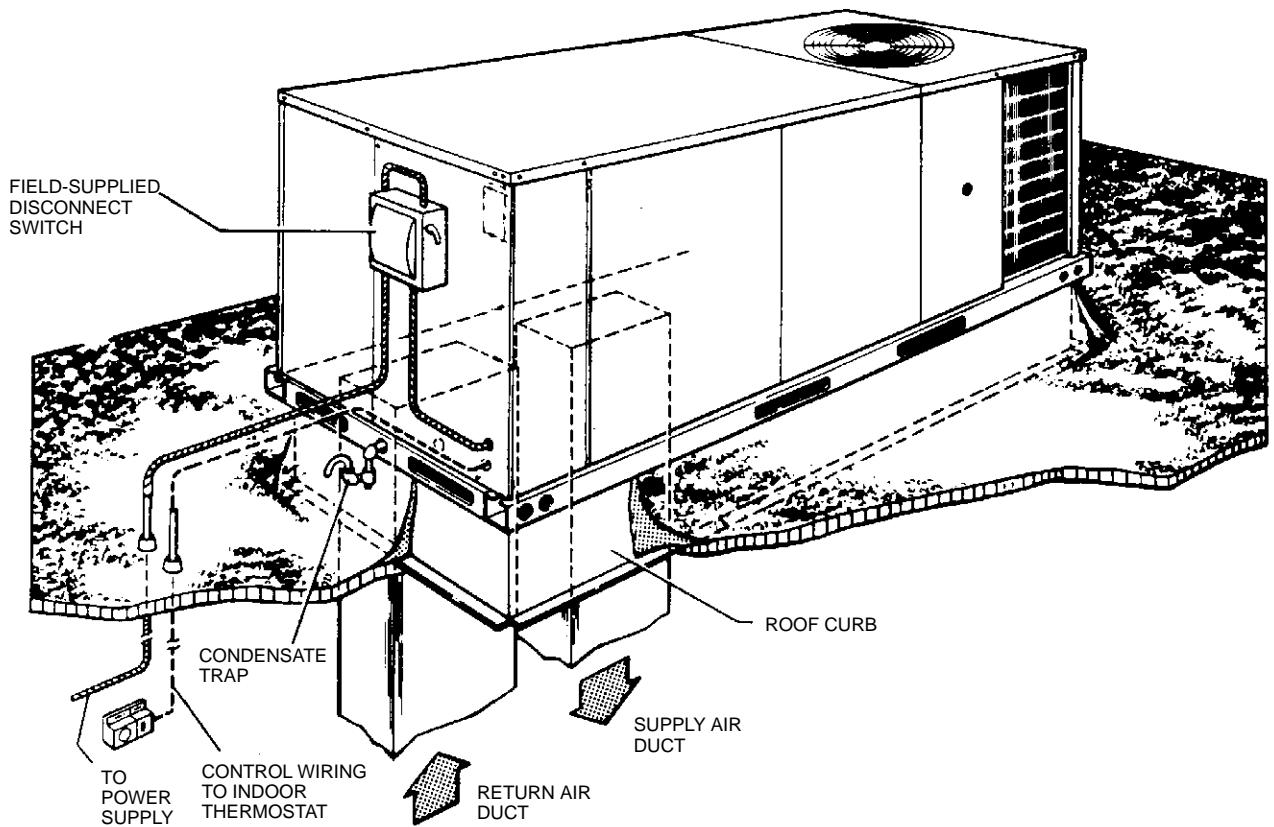
**WALL THERMOSTAT** -- The units are designed to operate with 24--volt electronic and electro--mechanical thermostats. All units can operate with single stage heat/single stage cool thermostats -- with or without the economizer. To obtain maximum economizer operating savings, a two stage cooling thermostat should be used. To obtain two stage cooling operation, a jumper wire must be removed on the low voltage relay board. (See unit wiring diagram.)

**OUTDOOR THERMOSTAT** -- A 24--volt thermostat providing two stages of control for units equipped with supplemental electric heaters.

# TYPICAL APPLICATIONS



## TYPICAL ROOF-TOP INSTALLATION



## MECHANICAL SPECIFICATIONS

### GENERAL DESCRIPTION

Units shall be factory-assembled, single packaged Heat Pumps, designed for outdoor mounted installation. Units shall have minimum SEER ratings of 10.0. They shall have built in field convertible duct connections for down discharge supply/return or horizontal discharge supply/return, and be available with factory installed options or field installed accessories.

The units shall be factory wired, piped, charged with R-22 refrigerant and factory tested prior to shipment. All unit wiring shall be both numbered and color coded. Enclosed in each unit shall be a factory test log sheet consisting of the unit tested pressures, temperatures and amps, as tested prior to shipment.

All units shall be manufactured in a facility certified to ISO 9001 standards, and the cooling & heating performance shall be rated in accordance with DOE and ARI test procedures. Units shall be listed under UL 1995/CAN/CSA No. 236-M90 conditions.

### UNIT CABINET

- Unit cabinet shall be constructed of G90 galvanized steel, with exterior surfaces coated with a non-chalking, powered paint finish, certified at 750 hours salt spray test per ASTM-B117 standards.
- Indoor blower section shall be insulated with up to 1" thick insulation, coated on the air side. Aluminum foil faced insulation shall be used in the furnace compartment and be fastened with ridged fasteners to prevent insulation from entering the air stream.
- Cabinet panels shall be "large" size, easily removable for servicing and maintenance.
- Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging, fork truck access and proper sealing on roof curb applications.
- Disposable 1" filters shall be furnished and be accessible through a removable access door, sealed air tight. Units filter track shall be designed to accommodate either 1" or 2" filters.
- Fan performance measuring ports shall be provided on the outside of the cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating air by-pass of the coils.
- Units vertical discharge and return duct configuration shall be designed to fit between standard 24" O.C. beams without modification to building structure, duct work and base unit.
- Condensate pan shall be internally sloped and conform to ASHARE 62-89 self-draining standards. Condensate connection shall be a minimum of 3/4" I.D. female and be a ridged mount connection.

### INDOOR (SUPPLY) FAN ASSEMBLY

- Fan shall be direct drive, multi-speed, or a factory installed belt drive, adjustable-pitch motor pulley option. Job site selected (BHP) brake horse power shall not exceed the motors nameplate horse power rating, plus the service factor. Units shall be designed not to operate above service factor.

- Fan wheel shall be double-inlet type with forward-curved blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant air volume.
- Bearings shall be sealed and permanently lubricated for longer life and no maintenance.

### OUTDOOR FAN ASSEMBLY

- The outdoor fan shall be of the direct-driven propeller type, discharge air vertically, have aluminum blades riveted to corrosion resistant steel spider bracket and shall be dynamically balanced for smooth operation.
- The outdoor fan motor shall be totally enclosed with permanently lubricated bearings and internally protected against overload conditions.

### REFRIGERANT COMPONENTS

- Compressors:
  - Shall be fully hermetic type, direct drive, internally protected with internal high-pressure relief and over temperature protection. The hermetic motor shall be suction gas cooled and have a voltage range of + or - 10% of the unit nameplate voltage.
  - Shall have internal isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.
- Coils:
  - Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally-enhanced copper tubes with all joints brazed. Special Phenolic coating shall be available as a factory option.
  - Evaporator and Condenser coils shall be of the direct expansion, draw-thru design.
- Refrigerant Circuit and Refrigerant Safety Components shall include:
  - Independent fixed-orifice expansion devices.
  - Filter drier/strainer to eliminate any moisture or foreign matter.
  - Accessible service gage connections on both suction and discharge lines to charge, evacuate, and measure refrigerant pressure during any necessary servicing or troubleshooting, without losing charge.
  - The refrigeration system shall provide at least 15° F of liquid sub-cooling at design conditions.
  - Unit shall have a suction line accumulator.
- Unit Controls:
  - Unit shall be complete with self contained low-voltage control circuit protected by a resettable circuit breaker fuse on the 24 volt transformer side.
  - Unit shall incorporate a lock-out circuit which provides reset capability at the space thermostat or base unit, should any of the following standard safety devices trip and shut off compressor:

- (1) -- Loss-of-charge/Low-pressure switch.
- (2) -- High-pressure switch.

If any of the above safety devices trip, an LED (light emitting diode) indicator shall illuminate.

- C. Unit shall incorporate "AUTO RESET" compressor over-temperature, over-current protection.
- D. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.
- E. Unit shall have freeze-protection thermostat on evaporator coil.
- F. Unit shall incorporate an ambient compensated, time and temperature defrost control.

(1) -- Defrost shall be initiated on the basis of time and liquid line temperature.

(2) -- A 50/80/110-minute timer shall activate defrost cycle only if liquid line temperature is low enough to indicate a heavy frost condition.

(3) -- Defrost cycle shall terminate when liquid line sensor is satisfied and shall have a positive termination time of 10 minutes.

#### **ELECTRIC HEATING SECTION**

1. An electric heating section, with nickel chromium elements, shall be provided in a range of 5 thru 30 KW, offering two stages of capacity -- 16 KW and above on 208/230 volt heaters and 20 KW and above on 460 and 575 volt heaters.
2. The heating section shall have a primary limit control(s) and automatic reset, to prevent the heating element system from operating at an excessive temperature.
3. The Heating Section assembly shall slide out of the unit for easy maintenance and service.
4. Units with Electric Heating Sections shall be wired for a single point power supply with branch circuit fusing (where required).

#### **UNIT OPERATING CHARACTERISTICS**

1. Unit shall be capable of starting and cooling at 125° F outdoor temperature, exceeding maximum load criteria of ARI Standard 210/240.
2. The compressor, with standard controls, shall be capable of cooling down to 45° F outdoor temperature.

#### **ELECTRICAL REQUIREMENTS**

All unit power wiring shall enter unit cabinet at a single factory provided location and be capable of side or bottom entry, to minimize roof penetrations and avoid unit field modifications. Separate side and bottom openings shall be provided for the control wiring.

#### **STANDARD LIMITED WARRANTIES**

- Compressor-- 5 Years
- Elect. Heat. Elem.-- 5 Years
- Parts -- 1 Year

#### **OPTIONAL OUTDOOR AIR (Shall be made available by either/or):**

1. **ELECTRONIC ENTHALPY AUTOMATIC ECONOMIZER** -- Outdoor and return air dampers that are interlocked and positioned by a fully-modulating, spring-return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit-mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in CFM of outdoor air to meet the minimum ventilation requirement of the conditioned space during normal operation. During economizer operation, a mixed-air temperature control shall modulate the outdoor and return air damper assembly to prevent the supply air temperature from dropping below 55°F. Changeover from compressor to economizer operation shall be provided by an integral electronic enthalpy control that feeds input into the basic module. The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided. Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.
2. **DUAL INPUT DIFFERENTIAL ELECTRONIC ENTHALPY AUTOMATIC ECONOMIZER** -- Outdoor and return air dampers that are interlocked and positioned by a fully-modulating, spring-return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in the design CFM of outdoor air to meet the minimum ventilation requirement of the conditioned space during normal operation. During economizer operation, a mixed-air temperature control shall modulate the outdoor and return air damper assembly to prevent the supply air temperature from dropping below 55°F. Changeover from compressor to economizer operation shall be provided by two integral electronic enthalpy controls -- one that senses outdoor air and one that senses indoor air. Both enthalpy sensors supply input to the logic module which modulates both sets of dampers for maximum economizer savings. The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided. Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

#### **OTHER PRE-ENGINEERED ACCESSORIES AVAILABLE**

1. **ROOF CURB** -- 14" AND 8" high, full perimeter knock-down curb with hinged design for quick assembly.
2. **MANUAL OUTDOOR DAMPER** -- Provides 0% through 35% or 0% through 100% outdoor air capability (field adjustable). Designed for duct mounted side supply/return applications. Includes a hood and a screen assembly.
3. **OUTDOOR COIL GUARD** -- Prevents coil damage.
4. **BAROMETRIC RELIEF DAMPER** -- Contains a rain hood, air inlet screen, exhaust damper and mounting hardware. Used to relieve internal air pressure through the unit during economizer operation.
5. **BURGLAR BARS** -- Designed to work with above roofcurbs. Fits duct openings of curb supply and return air openings.

6. THERMOSTATS -- Multiple models available from A.C.O., M.C.O., Electronic or Electrical Mechanical versions.
7. ANTI--RECYCLE TIMER -- Assures 5--minute off--time between compressor cycles.
8. ELECTRIC HEAT -- Slide--in design, provides single point power and ranges from 5 to 30 KW.

**OTHER FACTORY INSTALLED OPTIONS**

1. HIGH PERFORMANCE BELT DRIVE MOTOR
2. TECHNICOAT PHENOLIC COATED COND. COIL
3. ELECTRONIC ENTHALPY ECONOMIZER
4. DUAL INPUT ELECTRONIC ENTHALPY ECONOMIZER





**YORK**<sup>®</sup>

Heating and Air Conditioning

Unitary Products Group  
5005 York Drive, Norman, Oklahoma 73069  
Subject to change without notice. Printed in U.S.A.  
Copyright ©2004 by York International Corporation. All Rights Reserved.

035-21564-002-A-0404  
Supersedes: 036-21564-001-A-0204