



HP29-120

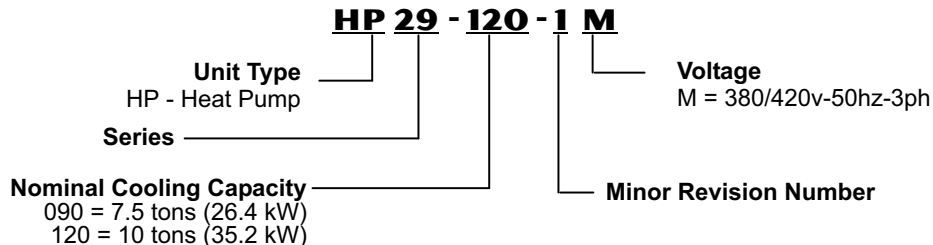


HP29-090

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### MODEL NUMBER IDENTIFICATION



### FEATURES

#### Applications

- Heat pump units available in 26.4 and 35.2 kW (7.5 and 10 ton) nominal sizes.
- Designed for applications with remotely located blower-coil unit.
- See rating tables for efficiencies and capacities. For blower coil unit data, see bulletins indexed in tab section Coils-Blower Coil Units.
- All units shipped factory assembled, piped and wired.
- Test operated at factory to ensure dependable operation.

#### Completely Tested

- All models are tested in Lennox Research Laboratory environmental test rooms which meet American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 37 requirements.
- Rated in accordance with the Unitary Large Equipment (ULE) certification program, which is based on Air Conditioning and Refrigeration Institute (ARI) Standard 340/360-2000 while operating at rated voltages and air volumes.
- Sound tested in Lennox reverberant sound test room in accordance with test conditions included in Air Conditioning and Refrigeration Institute (ARI) Standard 270-95.
- Units and components within are bonded for grounding to meet safety standards for servicing required by Underwriter's Laboratories (UL) and the International Electrotechnical Commission (IEC).

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency.

## FEATURES

### Copeland Scroll™ Compressor

- Compressor features high efficiency with uniform suction flow, constant discharge flow and high volumetric efficiency.
- Scroll compressor technology eliminates need for start capacitor and start relay.
- Compressor consists of two involute spiral scrolls matched together to generate a series of crescent shaped gas pockets between them.
- During compression, one scroll remains stationary while the other scroll orbits around it.
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates.
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls. Volume between the pockets is simultaneously reduced.
- When pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scroll.
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle.
- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency.
- Scroll compressor is tolerant to the effects of slugging and contaminants. If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged.
- Low gas pulses during compression reduces operational sound levels.
- Compressor motor is internally protected from excessive current and temperature.
- Muffler in discharge line reduces operating sound levels.
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation.

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### Crankcase Heater (All Models)

- Assures proper compressor lubrication at all times.

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### Cabinet

- Heavy-gauge, pre-painted steel cabinet provides superior rust and corrosion protection.
- Removeable panels allow access for unit servicing. See dimension drawings.
- Heavy duty steel base channels raise the unit off of mounting surface away from damaging moisture.
- Unit lifting holes and forklift slots furnished in base rails. See dimension drawings.

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### Control Box

- Control box located in separate compartment in unit cabinet.
- Hinged panel with quarter turn fastener for easy access.
- All controls are pre-wired at the factory.

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### Copper Tube/Enhanced Fin Coil(s)

- HP29-090 equipped with single "U" shaped coil.
- HP29-120 equipped with two slab coils.
- Lennox designed and fabricated coils constructed of precisely spaced ripple-edge aluminum fins machine fitted to copper tubes.
- Lanced fins provide maximum exposure of fin surface to air stream resulting in excellent heat transfer.
- Fins equipped with collars that grip tubing for maximum contact area.
- Flared shoulder tubing connections and silver soldering provide tight, leakproof joints.
- Long life copper tubing is corrosion-resistant and easy to field service.
- Thoroughly factory tested under high pressure to insure leakproof construction.
- Completely accessible for cleaning.

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### Coil Guard

- Corrosion resistant polyvinyl chloride (PVC) coated steel wire guard(s) furnished as standard.

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### Outdoor Fan(s)

- HP29-090 units have one outdoor fan.
- HP29-120 units have two outdoor fans.
- Direct drive fan(s) moves large volumes of air uniformly through entire outdoor coil(s) for high refrigerant cooling capacity.
- Upward discharge of air reduces operating sound levels and prevents damage to lawns, shrubs and walkways.
- Fan motors are totally enclosed, inherently protected and equipped with a rain shield.
- Fan service access is accomplished by removal of fan guards.

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### Reversing Valve

- Factory installed 4-way reversing valve provides rapid change in refrigerant flow direction resulting in quick changeover from cooling to heating and vice-versa.
- Valve operates on pressure differential between outdoor unit and indoor unit.

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### Refrigerant Lines and Service Valves

- Sweat connections.
- Fully serviceable liquid and suction line service valves provide complete service access to refrigerant system. Suction valve can be fully shut off, while liquid valve can be front seated to manage refrigerant charge while servicing system.
- Refrigerant lines and field wiring inlets are located in one central area of the unit cabinet.

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### Hi-Capacity Drier

- Furnished for field installation. Drier traps any moisture or dirt that could contaminate the refrigerant system.

## FEATURES

### Defrost Control/Timed-Off Control

- Solid-state time/temperature defrost control is furnished as standard equipment.
- Control initiates a defrost cycle every 30, 60 or 90 minutes of compressor "on" time at outdoor temperatures below 2°C (35°F) (factory setting 60 minutes).
- Maximum defrost cycle 14 minutes.
- Defrost thermostat mounted on liquid line determines when defrost cycle is required.
- Pressure switch mounted on discharge line determines when defrost cycle is terminated.
- Timed off function prevents compressor short cycling.
- Provides 5 minute delay between compressor shutoff and start-up.
- Allows suction and discharge pressure to equalize, permitting compressor to start in unloaded condition.
- Automatic reset.
- Connections for ambient compensating thermistor and service light thermostat.

### High Pressure Switch

- Shuts off unit if abnormal operating conditions cause discharge pressure to rise above setting.
- Protects the compressor from excessive condensing pressure.
- Automatic reset.

### Loss of Charge Switch

- Provides loss of charge and freeze-up protection.
- Automatic reset.

### Low Ambient Operation

- Units will operate satisfactorily down to -18°C (0°F) outdoor air temperature without any additional controls.
- Low ambient pressure switch cycles the fan to optimize condensing pressure.

## OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

### Thermostat

- Thermostat is not furnished with unit and must be ordered extra.
- See Lennox Price Book.

### Hail Guard Protection

- Heavy-duty sheet metal and metal mesh enclosures protect coil from damage. Field installed.
- See Dimension drawings and Specifications table.

### Line Monitor

- Protects units from phase reversal, single phasing, low voltage and voltage unbalance.

## SPECIFICATIONS

General Data		Model Number	HP29-090	HP29-120
		Nominal Size - kW (Tons)	26 (7.5)	35 (10)
Connections (sweat)	Liquid line (outside diameter) — mm (in.)		15.9 (5/8)	15.9 (5/8)
	Vapor line (outside diameter) — mm (in.)		34.9 (1-3/8)	34.9 (1-3/8)
Refrigerant charge			dry air holding charge	dry air holding charge
Outdoor Coil	Net face area — m <sup>2</sup> (sq. ft.)	Outer coil	2.79 (30.0)	3.59 (38.67)
		Inner coil	2.69 (28.94)	---
	Tube diameter - mm (in.) and number of rows		9.5 (3/8) - 2	9.5 (3/8) - 2
		Fins per m (inch)	787 (20)	787 (20)
Outdoor Coil Fan(s)	Diameter — mm (in.) and number of blades		(1) 610 (24) - 4	(2) 610 (24) - 4
	Motor output — W (hp)		(1) 560 (3/4)	(2) 373 (1/2)
	Total air volume - m <sup>3</sup> /s (cfm)		2.12 (4500)	4.09 (8670)
	Rev/min		900	920
	Motor input - W		460	820
Shipping weight — kg (lbs.) 1 package			230 (506)	306 (675)

## OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

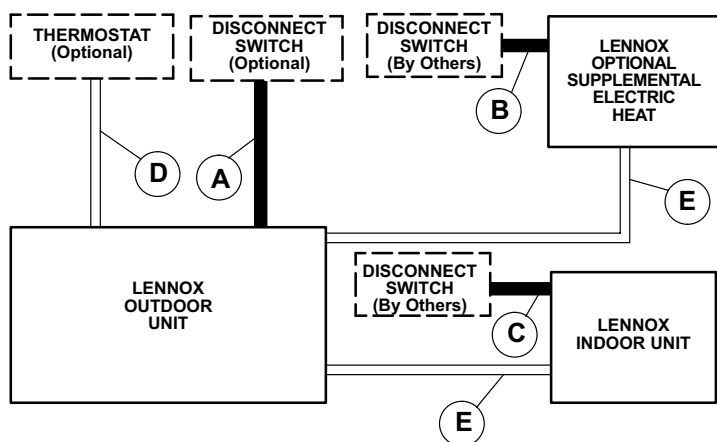
Hail Guards	29M45	32M92
Line Monitor	25J98	25J98

## ELECTRICAL DATA

General Data	Model Number	HP29-090	HP29-120
Line voltage data — 50 hz 3 phase with neutral		380/420V	380/420V
Voltage range (minimum - maximum)		342 - 462V	342 - 462V
Recommended maximum fuse or circuit breaker size (amps)		30	40
Minimum circuit ampacity		20	25
<b>Compressor (1)</b>	Rated load amps	14.7	17.2
	Locked rotor amps	95	125
<b>Outdoor Coil Fan Motor(s) (1 phase)</b>	Full load amps (total)	1.9	1.5 (3.0)
	Locked rotor amps (total)	3.7	3.0 (6.0)

NOTE - Refer to local electrical codes to determine wire, fuse and disconnect size requirements.

## FIELD WIRING - BASIC UNIT



- A - Three Phase with neutral (see Electrical Data)
- B - Three Phase with neutral (size to heater capacity)
- C - Three Phase with neutral (size to indoor coil blower motor)
- D - Seven Wire 24V - with Electric Heat
- E - Four Wire 24V

- Field Wiring Not Furnished -

All wiring must conform to local electrical codes.

\*CB17/CBH17 applications without electric heat require a separate 70VA (minimum rating) transformer.

## RATINGS

### ★Cooling and Heating Ratings

Outdoor Unit Model Number (*Sound Rating Number)	Total Cooling Capacity		†Net Cooling Capacity		High Temperature Heating Capacity		Low Temperature Heating Capacity		Cooling			High Temperature Heating		Low Temperature Heating		Lennox Indoor Unit	Check and Expansion Kit Required
	kW	Btuh	kW	Btuh	kW	Btuh	kW	Btuh	†Total Power Input kW	Coefficient Performance (Output/Input) (Btuh/Watt)	Ratio Efficiency Energy	†Total Power Input kW	Coefficient Performance (Output/Input)	†Total Power Input kW	Coefficient of Performance (Output/Input)		
HP29-090 (83 dB)	24.8	84 700	24.0	82 000	22.5	76 700	14.7	50 300	8.01	3.0	10.2	6.7	3.33	6.3	2.31	CB17-95V CBH17-95V	
HP29-120 (90 dB)	33.2	113 300	31.9	108 900	31.8	108 400	20.9	71 500	10.7	3.0	10.2	9.6	3.33	8.6	2.43	CB17-135V CBH17-135V	†53F21

\*Sound rating number rated at test conditions for Air-Conditioning and Refrigeration Institute (ARI) Standard 270.

★The rating test conditions are those included in Air-Conditioning and Refrigeration Institute (ARI) Standard 340/360 while operating at rated voltage and air volumes;

**Cooling Ratings** — 35°C (95°F) outdoor air temperature, 26.7°C (80°F) dry bulb and 19.4°C (67°F) wet bulb entering indoor coil air.

**High Temperature Heating Ratings** — 8.3°C (47°F) dry bulb, 6.1°C (43°F) wet bulb outdoor air temperature and 21.1°C (70°F) entering indoor coil air.

**Low Temperature Heating Ratings** — minus 8.3°C (17°F) dry bulb, minus 9.4°C (15°F) wet bulb outdoor air temperature and 21.1°C (70°F) entering indoor coil air.

†Kit contains 2 valves.

†Net Cooling Capacity = Gross Cooling Capacity minus heat added by indoor blower motor.

## GUIDE SPECIFICATIONS

### General

- Furnish and install an air cooled heat pump outdoor unit.
- The unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment.
- The unit shall be shipped completely factory assembled, piped and wired internally ready for field connections.
- Unit shall be test operated at factory prior to shipment.

### Refrigerant System

- Shall include fully serviceable liquid and vapor line service valves, gauge ports, hi-capacity driers, high pressure switch, loss of charge switch, suction line accumulator, expansion valve, reversing valve and defrost/timed-off control.
- All models shall have low ambient cooling operation down to 0°F (-18°C).
- Control options available shall include thermostat and outdoor thermostat.

### Outdoor Coil(s)

- Shall be non-ferrous construction with aluminum enhanced fins mechanically bonded to enhanced copper tubes.
- Coil(s) shall be pressure leak tested.

### Compressor

- Shall have single speed scroll compressor.
- Compressor shall be resiliently mounted, suction cooled, overload protected, and have internal excessive current and temperature protection.
- Compressor shall have crankcase heater.

### Cabinet

- Shall be constructed of galvanized steel which has been through a metal wash preparation and have a pre-painted finish.
- Openings shall be provided for refrigerant lines and power connection entry.

### Outdoor Coil Fans

- Shall be direct drive blade type fan(s).
- Motor(s) shall have inherent protection devices and shall be protected from moisture.
- Fan(s) shall have a safety guard.

## OPTIONAL ACCESSORIES

### Hail Guards

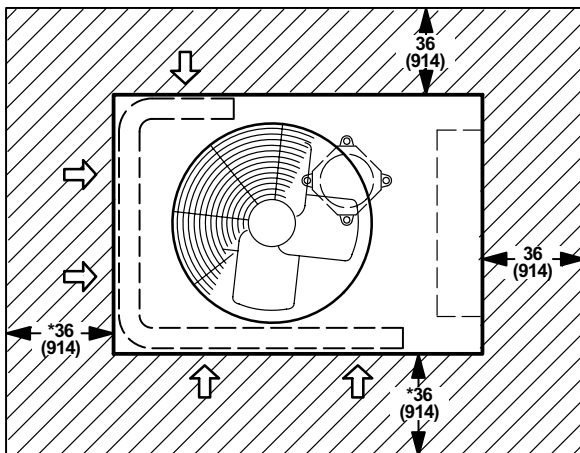
- Furnish and field install heavy duty coil guards to protect coils.

### Line Monitor

- Furnish and field install a line monitor to protect unit from phase reversal, single phasing, low voltage, and voltage unbalance.

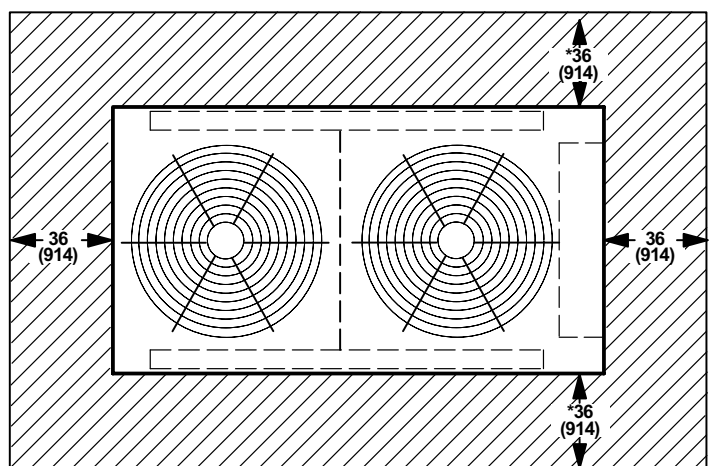
## INSTALLATION CLEARANCES

HP29-090



NOTE—1219 mm (48 inches) clearance required on top of unit.  
\*NOTE—One side of coil may be 305 mm (12 inches).

HP29-120



NOTE— 1219 mm (48 inches) clearance required on top of unit.  
\*NOTE— One side of coil may be 305 mm (12 inches).

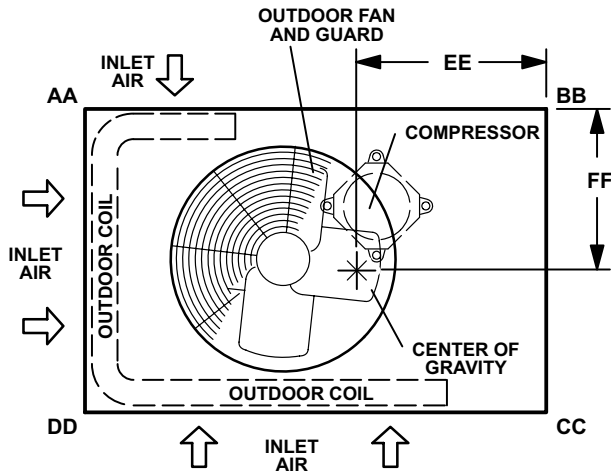
# DIMENSIONS - HP29-090

## CORNER WEIGHT

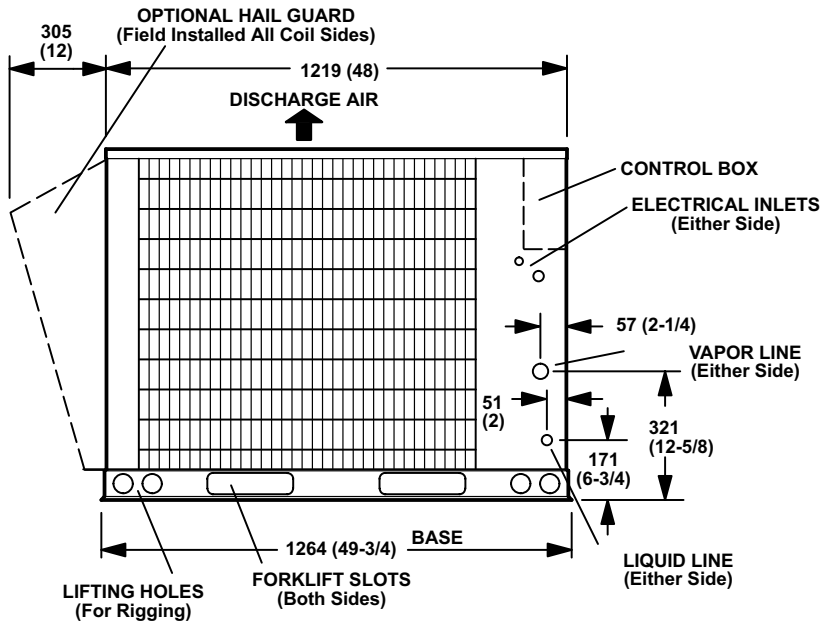
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
HP29-090	46	101	51	113	65	143	58	128

## CENTER OF GRAVITY

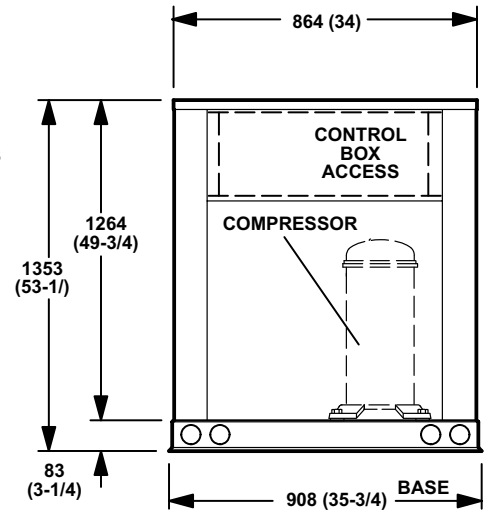
Model Number	EE		FF	
	mm	inch	mm	inch
HP29-090	597	23-1/2	400	15-3/4



TOP VIEW



SIDE VIEW



SERVICE VIEW

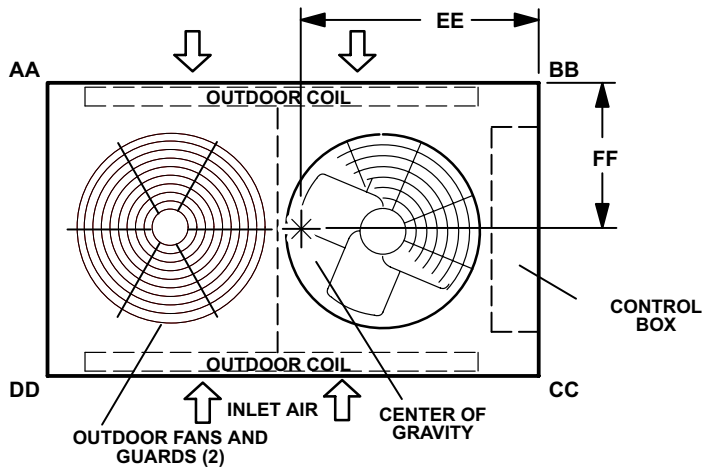
# DIMENSIONS - HP29-120

## CORNER WEIGHT

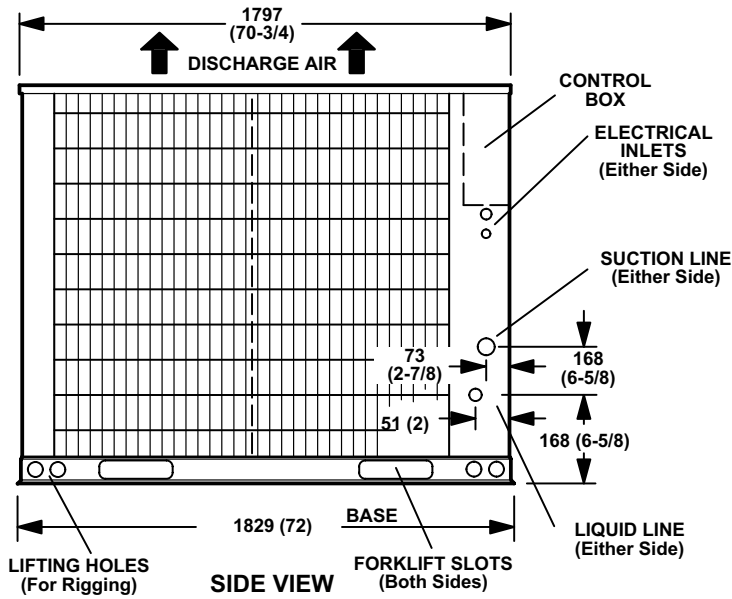
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
HP29-120	61	135	87	192	87	192	61	135

## CENTER OF GRAVITY

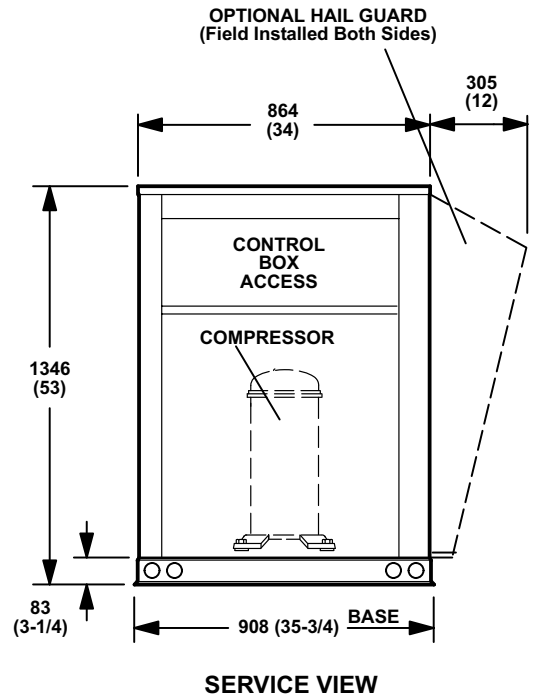
Model Number	EE		FF	
	mm	inch	mm	inch
HP29-120	756	29-3/4	448	17-5/8



TOP VIEW



SIDE VIEW



SERVICE VIEW

# COOLING AND HEATING RATINGS

NOTE — For Temperatures and Capacities not shown in tables, see bulletin — Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data section.

## HP29-090 — CB17/CBH17-95V - COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	1.13	2400	24.3	82.8	5.65	.73	.87	.99	23.0	78.6	6.62	.75	.90	1.00	21.6	73.8	7.79	.77	.92	1.00	20.0	68.2	9.18	.80	.96	1.00
	1.27	2700	24.8	84.6	5.68	.76	.91	1.00	23.5	80.3	6.66	.78	.94	1.00	22.1	75.3	7.84	.80	.97	1.00	20.5	69.8	9.22	.84	1.00	1.00
	1.41	3000	25.2	86.1	5.71	.79	.95	1.00	24.0	81.8	6.69	.81	.97	1.00	22.5	76.9	7.87	.84	.99	1.00	21.0	71.7	9.25	.88	1.00	1.00
19°C (67°F)	1.13	2400	25.8	87.9	5.75	.57	.71	.84	24.4	83.3	6.73	.58	.72	.86	22.9	78.1	7.89	.59	.74	.89	21.1	72.1	9.27	.61	.78	.93
	1.27	2700	26.2	89.5	5.78	.59	.74	.88	24.8	84.7	6.76	.60	.76	.90	23.3	79.4	7.93	.61	.78	.94	21.5	73.2	9.30	.63	.81	.97
	1.41	3000	26.6	90.7	5.81	.61	.77	.92	25.2	85.9	6.78	.62	.79	.94	23.6	80.4	7.96	.63	.82	.97	21.7	74.1	9.33	.66	.85	1.00
22°C (71°F)	1.13	2400	27.5	93.8	5.87	.43	.55	.68	26.1	88.9	6.84	.43	.56	.70	24.4	83.2	8.02	.43	.58	.72	22.5	76.9	9.39	.44	.60	.75
	1.27	2700	27.9	95.3	5.90	.43	.57	.71	26.4	90.2	6.88	.44	.58	.73	24.7	84.4	8.05	.44	.60	.76	22.8	77.9	9.42	.45	.62	.79
	1.41	3000	28.3	96.4	5.92	.44	.59	.74	26.8	91.3	6.90	.44	.61	.76	25.0	85.4	8.07	.45	.62	.79	23.1	78.7	9.44	.46	.65	.83

## HP29-090 - CB17/CBH17-95V - HEATING CAPACITY

Indoor Coil Air Volume 21°C db (70°F db)		Air Temperature Entering Outdoor Coil														
		18°C (65°F)		7°C (45°F)		minus 4°C (25°F)		minus 15°C (5°F)		minus 28°C (minus 15°F)						
		Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input					
m³/s	cfm	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	
1.14	2400	26.8	91.6	5.89	21.7	73.9	5.62	16.5	56.2	5.32	11.2	38.3	4.89	5.5	18.9	3.58
1.28	2700	27.1	92.6	5.72	22.0	74.9	5.45	16.8	57.2	5.15	11.5	39.3	4.72	5.8	19.9	3.41
1.42	3000	27.4	93.4	5.59	22.2	75.7	5.31	17.0	58.0	5.02	11.8	40.1	4.58	6.1	20.7	3.27

## HP29-120 — CB17/CBH17-135V - COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																							
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
			kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtu/h		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	1.51	3200	32.0	109.3	7.24	.71	.87	1.00	30.4	103.8	8.38	.73	.90	1.00	28.7	97.8	9.79	.75	.93	1.00	26.7	91.1	11.49	.78	.97	1.00
	1.89	4000	33.4	113.9	7.32	.77	.96	1.00	31.7	108.3	8.46	.80	.98	1.00	30.0	102.4	9.86	.83	1.00	1.00	28.1	95.9	11.60	.87	1.00	1.00
	2.26	4800	34.7	118.3	7.39	.84	1.00	1.00	33.1	112.8	8.54	.87	1.00	1.00	31.3	106.7	9.95	.91	1.00	1.00	29.2	99.8	11.69	.95	1.00	1.00
19°C (67°F)	1.51	3200	34.0	116.1	7.36	.55	.69	.83	32.3	110.1	8.49	.56	.71	.86	30.3	103.4	9.89	.58	.73	.89	28.1	95.9	11.62	.59	.76	.94
	1.89	4000	35.1	119.6	7.43	.59	.75	.93	33.2	113.3	8.56	.60	.77	.95	31.2	106.4	9.95	.62	.80	.99	28.9	98.7	11.67	.64	.85	1.00
	2.26	4800	35.8	122.3	7.48	.63	.82	.99	34.0	115.9	8.61	.64	.85	1.00	31.9	108.8	10.00	.66	.88	1.00	29.5	100.8	11.73	.69	.93	1.00
22°C (71°F)	1.51	3200	36.3	124.0	7.50	.41	.54	.67	34.4	117.5	8.63	.41	.55	.68	32.3	110.3	10.02	.42	.56	.70	30.0	102.3	11.75	.42	.58	.73
	1.89	4000	37.3	127.3	7.57	.42	.58	.73	35.3	120.4	8.69	.43	.59	.75	33.1	113.0	10.08	.43	.61	.78	30.7	104.6	11.80	.44	.63	.82
	2.26	4800	38.0	129.5	7.61	.44	.62	.79	35.9	122.5	8.74	.45	.64	.82	33.6	114.8	10.12	.45	.66	.86	31.2	106.3	11.84	.46	.68	.91

## HP29-120 - CB17/CBH17-135 - HEATING CAPACITY

Indoor Coil Air Volume 21°C db (70°F db)		Air Temperature Entering Outdoor Coil														
		18°C (65°F)		7°C (45°F)		minus 4°C (25°F)		minus 15°C (5°F)		minus 28°C (minus 15°F)						
		Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input	Total Heating Capacity	Comp. Motor kW Input					
m³/s	cfm	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	kW	kBtu/h	
1.51	3200	37.7	128.5	8.44	30.4	103.8	7.81	23.2	79.0	7.16	15.8	54.0	6.33	7.7	26.4	4.74
1.89	4000	38.2	130.5	8.02	31.0	105.8	7.38	23.7	81.0	6.73	16.4	56.0	5.91	8.3	28.4	4.31
2.27	4800	38.7	132.1	7.75	31.5	107.4	7.11	24.2	82.6	6.46	16.9	57.6	5.64	8.8	30.0	4.04