



## ENGINEERING DATA

# SPLIT SYSTEM CONDENSING UNITS - 50HZ

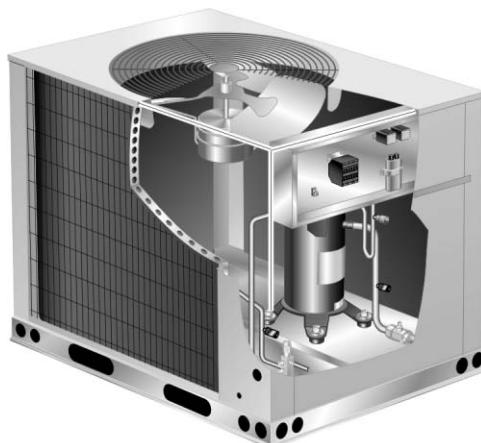
## HS29

### Nominal Cooling - 21 thru 70 kW (6 thru 20 Ton)

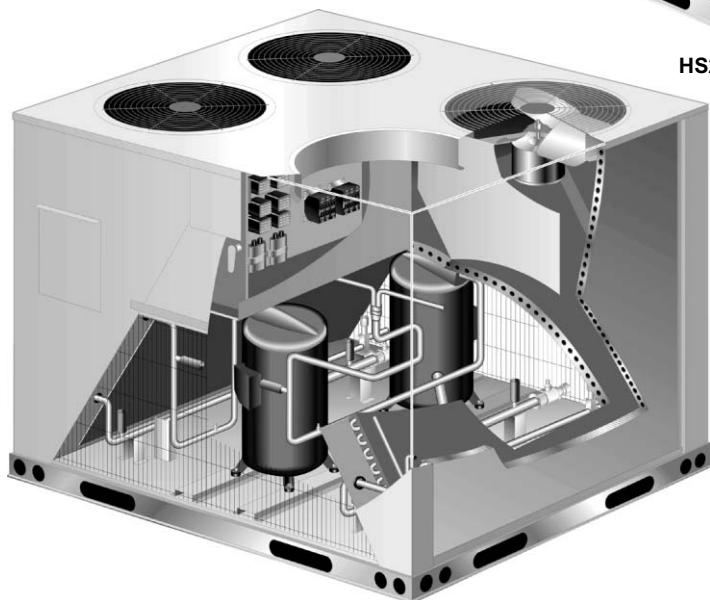
Bulletin No. 490100

September 2002

Supersedes January 2001



HS29-072, HS29-090



HS29-180, HS29-240

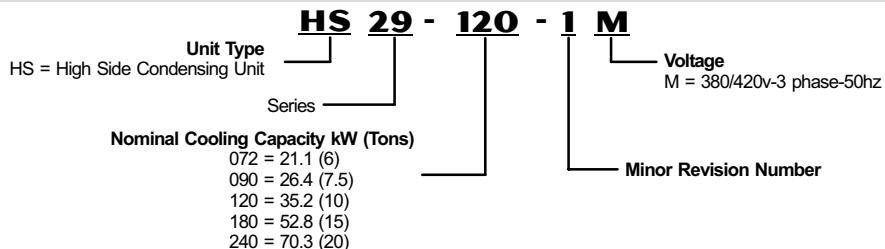


HS29-120

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## MODEL NUMBER IDENTIFICATION



## FEATURES

### Applications

- Condensing units available in 21.1, 26.4, 35.2, 52.8 and 70.3 kW (6, 7.5, 10, 15 and 20 ton) nominal sizes.
- Designed for applications with remotely located blower-coil unit or furnace with add-on evaporator coil.
- See rating tables for efficiencies and capacities.
- For blower-coil unit or evaporator 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.

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.

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## FEATURES

### 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.
- Condensing units with a capacity less than 19 kW (65 000 Btuh) are rated in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 210/240-94 while operating at rated voltages and air volumes.
- Condensing units with a capacity of 19 kW (65 000 Btuh) or greater are rated in accordance with 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).

### Compressors

- HS29-072, HS29-090 and HS29-120 feature a single scroll compressor.
- HS29-180 and HS29-240 have two scroll compressors.
- Compressor features high efficiency with uniform suction flow, constant discharge flow and high volumetric efficiency and quiet operation.
- 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 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.
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation.

### Crankcase Heater (All Models)

- Assures proper compressor lubrication at all times.

### 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.

### Control Box

- Control box located in separate compartment in unit cabinet (072, 090, 120 models).
- Hinged panel with quarter turn fastener for easy access.
- Slide out control box allows easy access to controls (180, 240 models).
- All controls are pre-wired at the factory.

### Outdoor Fan(s)

- HS29-072, HS29-090 units have one outdoor fan.
- HS29-120 units have two outdoor fans.
- HS29-180, HS29-240 units have four outdoor fans.
- Direct drive fan(s) moves large volumes of air uniformly through entire condenser 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.

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

- HS29-072 equipped with single "L" shaped coil.
- HS29-090 equipped with single "U" shaped coil.
- HS29-120 equipped with two slab coils.
- HS29-180, HS29-240 equipped with four slab coils.
- Lennox designed and fabricated coils constructed of precisely spaced ripple-edge aluminum fins machine fitted to seamless 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 ensure leakproof construction.
- Completely accessible for cleaning.

### Coil Guard

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

### Minimum Run Time Control

- Prevents compressor short cycling and assures oil return to compressor.
- 5 minute minimum run time regardless of cooling demand.

### 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.

### Hi-Capacity Drier

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

## FEATURES

### High Pressure Switch

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

### Low Pressure Switch

- Shuts off unit if suction pressure falls below setting.
- 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.

## 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 coils from damage. Field installed.
- See dimension drawings and Specification table.

### Hot Gas Bypass

- Available for HS29-072, HS29-090, HS29-120 only.
- Hot gas bypass to suction contains hot gas bypass valve and de-superheating valve for reduced capacity control of condensing units.
- Hot gas bypass to evaporator contains hot gas bypass valve for reduced capacity control of condensing units.

### Line Monitor

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

## SPECIFICATIONS

General Data	Model Number	HS29-072	HS29-090	HS29-120	HS29-180	HS29-240
	Nominal Size - kW (Tons)	21 (6)	26 (7.5)	35 (10)	53 (15)	70 (20)
Connections (sweat)	Liquid line (outside diameter) - mm (in.)	15.9 (5/8)	15.9 (5/8)	15.9 (5/8)	(2) 15.9 (5/8)	(2) 15.9 (5/8)
	Suction line (outside diameter) - mm (in.)	28.6 (1-1/8)	34.9 (1-3/8)	34.9 (1-3/8)	(2) 34.9 (1-3/8)	(2) 34.9 (1-3/8)
Condenser Coil	Net face area — m <sup>2</sup> (sq. ft.)	Outer coil 1.20 (12.92) Inner coil 1.17 (12.59)	2.09 (22.50) 2.02 (21.70)	2.73 (29.36) total ---	5.45 (58.68) total ---	5.45 (58.68) total ---
	Tube diameter - mm (in.)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)
	Number of rows	2	2	2	1	2
	Fins per m (inch)	787 (20)	787 (20)	787 (20)	787 (20)	630 (15)
Condenser Fan(s)	Number of fans	1	1	2	4	4
	Diameter — mm (in.)	610 (24)	610 (24)	610 (24)	610 (24)	610 (24)
	Number of blades	4	4	4	4	4
	Motor output — W (hp)	(1) 373 (1/2)	(1) 560 (3/4)	(2) 373 (1/2)	(4) 249 (1/3)	(4) 249 (1/3)
	m <sup>3</sup> /s (cfm) total air volume	1.77 (3750)	2.03 (4290)	3.84 (8130)	6.29 (13 300)	6.29 (13 300)
	Rev/min	900	880	920	900	900
	Motor input - W	600	570	1100 total	1250 total	1250 total
Refrigerant Holding Charge		dry air	dry air	dry air	dry air	dry air
Shipping weight — kg (lbs.) 1 package		145 (319)	198 (437)	257 (567)	453 (998)	539 (1189)
OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA						
Hail Guards		38M38	29M44	32M91	79K91	79K91
Hot Gas Bypass Kit	bypass to suction	28M73	79K90	89K84	not available	not available
	bypass to evaporator	28M72	93K77	93K78	not available	not available
Line Monitor		25J98	25J98	25J98	25J98	25J98

## ELECTRICAL DATA

General Data	Model Number	HS29-072	HS29-090	HS29-120	HS29-180	HS29-240
	Line voltage data - 50 hz 3 phase with neutral	380/420V	380/420V	380/420V	380/420V	380/420V
	Voltage range (minimum - maximum)	342 - 462V	342 - 462V	342 - 462V	342 - 462V	342 - 462V
	Recommended maximum fuse or circuit breaker size (amps)	20	30	40	50	60
	Minimum circuit ampacity	13	20	25	39	44
Compressors	Number of Compressors	1	1	1	2	2
	Rated load amps (total)	9	14.7	17.2	14.7 (29.4)	17.2 (34.4)
	Locked rotor amps (total)	75	95	125	95 (190)	125 (250)
Condenser Coil Fan Motor(s) (1 phase)	Full load amps (total)	1.5	1.9	1.5 (3.0)	1.3 (5.2)	1.3 (5.2)
	Locked rotor amps (total)	3	3.7	3.0 (6.0)	2.4 (9.6)	2.4 (9.6)

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

## RATINGS

Outdoor Unit Model No. Unit Size *Sound Rating Number		★Cooling Ratings									
		Total Cooling Capacity kW	Total Cooling Capacity Btuh	†Net Cooling Capacity kW	†Net Cooling Capacity Btuh	Total Power Input kW	Coefficient of Performance (Output/Input)	Energy Efficiency Ratio (Btuh/Watt)	Integrated Part Load Value	Evaporator Unit	**Expansion Valve
HS29-072 (86 dB)	Down-Flow Coils	16.9	57 700	16.3	55 700	6.07	2.7	9.2	---	CR26-60-F	LB-85663K (26K35)
	Horizontal Coils	18.1	61 900	17.5	59 700	6.25	2.8	9.6	---	CH23-68	LB-85663K (26K35)
	Blower Coil Units	17.2	58 700	16.4	56 100	6.26	2.6	9.0	---	CB29M-65 (Multi-position)	●Factory Installed
HS29-090 (84 dB)	Up-Flow Coils	20.2	68 900	19.6	66 900	6.36	3.1	10.5	---	CB17-95V (Up-Flow)	●Factory Installed
	Blower Coil Units	20.2	68 900	19.6	66 900	6.36	3.1	10.5	---	CBH17-95V (Horizontal)	●Factory Installed
	Blower Coil Units	27.0	92 200	25.9	88 500	8.57	3.0	10.3	---	C17-090/120	●Factory Installed
HS29-120 (90 dB)	Blower Coil Units	26.7	91 000	25.8	88 200	8.38	3.1	10.5	---	CB17-95V (Up-Flow)	●Factory Installed
	Blower Coil Units	26.7	91 000	25.8	88 200	8.38	3.1	10.5	---	CBH17-95V (Horizontal)	●Factory Installed
	Blower Coil Units	26.8	91 600	26.0	88 800	8.44	3.1	10.5	---	CB17-135V (Up-Flow)	●Factory Installed
HS29-180	Blower Coil Units	26.8	91 600	26.0	88 800	8.44	3.1	10.5	---	CBH17-135V (Horizontal)	●Factory Installed
	Blower Coil Units	48.6	166 000	47.4	162 000	16.0	3.0	10.1	10.5	CB17-185V (Up-Flow)	●Factory Installed
	Blower Coil Units	48.6	166 000	47.4	162 000	16.0	3.0	10.1	10.5	CBH17-185V (Horizontal)	●Factory Installed
HS29-240	Blower Coil Units	66.2	226 000	63.8	218 000	22.2	2.9	9.8	10.8	CB17-275V (Up-Flow)	●Factory Installed
	Blower Coil Units	66.2	226 000	63.8	218 000	22.2	2.9	9.8	10.8	CBH17-275V (Horizontal)	●Factory Installed

\*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 210/240 or □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 evaporator air (◇minimum external duct static pressure) with 7.5 m (25 feet) of connecting refrigerant lines.

●Furnished as standard with coil.

\*\* Kit is required and must be ordered extra, unless shown as factory installed.

†Net Cooling Capacity = Gross Cooling Capacity minus heat added by indoor blower motor [365 W per 1000 cfm (0.47 m<sup>3</sup>/s) or 3.413 Btu/W on blowerless coils].

## GUIDE SPECIFICATIONS

**Prepared for the guidance of architects, consulting engineers and mechanical contractors.**

### General

- Furnish and install an air cooled condensing unit.
- Unit shall be shipped completely factory assembled, piped and wired internally ready for field connections.
- Manufacturer shall test operate unit at the factory before shipment.
- Unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment.

### Compressor

- HS29-072, HS29-090 and HS29-120 shall have a single scroll compressor. HS29-180, HS29-240 shall have two scroll compressors.
- Compressors shall be resiliently mounted, suction cooled, overload protected, and have internal excessive current and temperature protection.
- All compressors shall have crankcase heater.

### Refrigerant System

- Shall include fully serviceable liquid and suction line service valves, gauge ports, hi-capacity driers (field installed), high pressure switch, low pressure switch and minimum run time control.
- Control options available shall include thermostat.

### Outdoor Coil(s)

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

### 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.

### Air Mover

- Shall be direct drive propeller type fan(s).
- Motor(s) shall have inherent protection devices and shall be protected from moisture.
- Fan(s) shall be protected with steel guard(s).

## OPTIONAL ACCESSORIES

### Hot Gas Bypass

- Available for HS29-072, HS29-090, HS29-120 models only.
- Furnish and field install hot gas bypass kit.
- Two kits shall be available: hot gas bypass to suction kit containing hot gas bypass valve and de-superheating valve or hot gas bypass to evaporator kit containing hot gas bypass valve.

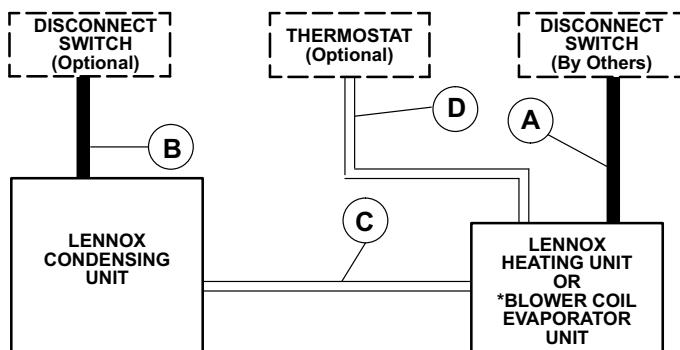
### Hail Guards

- Furnish and field install heavy duty coil guard 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.

## FIELD WIRING



- A — Three Phase With Neutral (not furnished)
- B — Three Phase With Neutral (not furnished) — See Electrical Data
- C — Two Wire 24V (not furnished)
- D — Four Wire 24V (not furnished)

NOTE - Field wiring not furnished by Lennox.

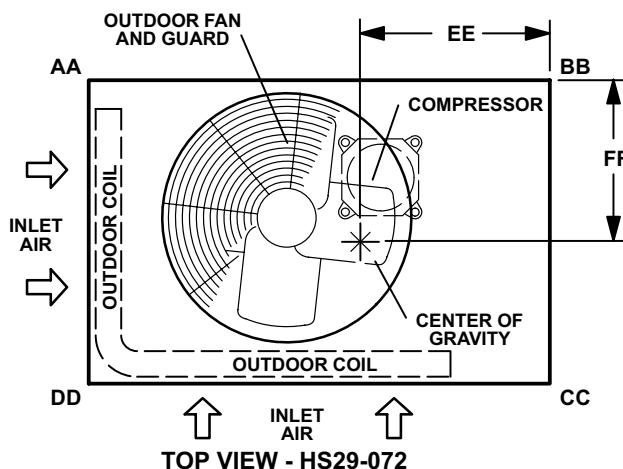
All wiring must conform to local electrical codes.

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

## DIMENSIONS - HS29-072-090

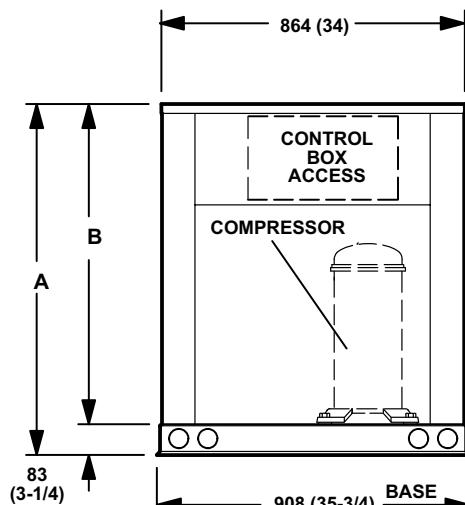
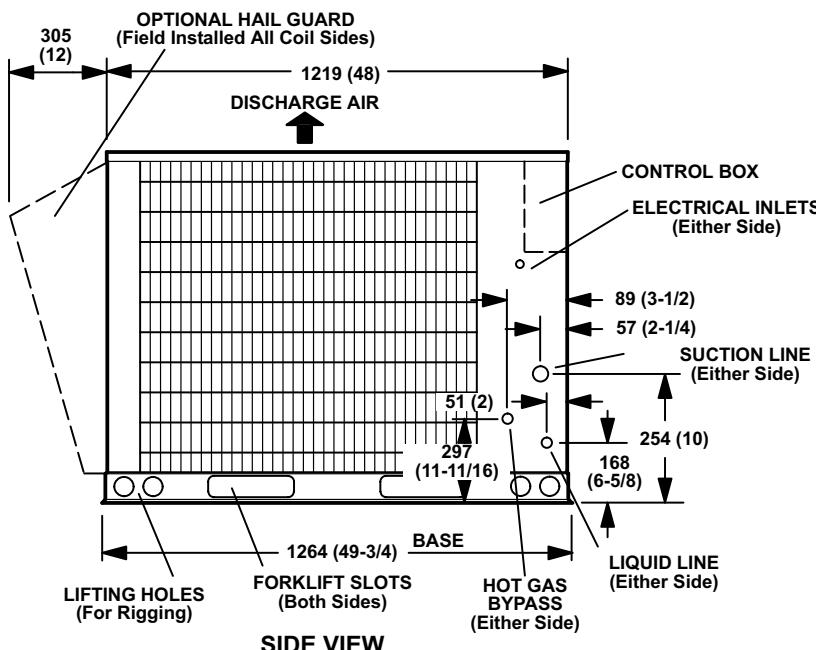
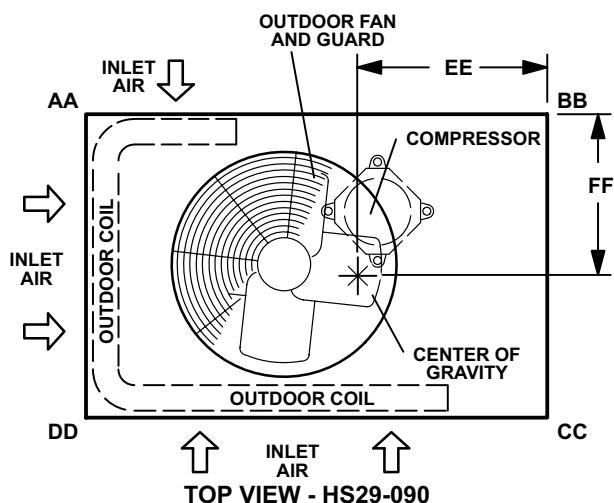
### CORNER WEIGHT

Model Number	AA kg	BB lbs.	CC kg	DD lbs.
HS29-072	30	66	35	78
HS29-090	39	87	42	93



### CENTER OF GRAVITY

Model Number	EE mm	EE inch	FF mm	FF inch
HS29-072	578	22-3/4	406	16
HS29-090	606	23-7/8	400	15-3/4



Model Number	A mm	A in.	B mm	B in.
HS29-072	889	35	800	31-1/2
HS29-090	1048	41-1/4	959	37-3/4

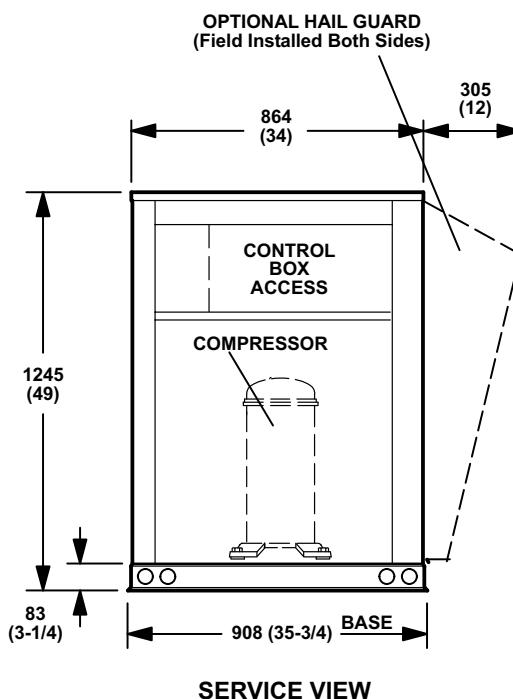
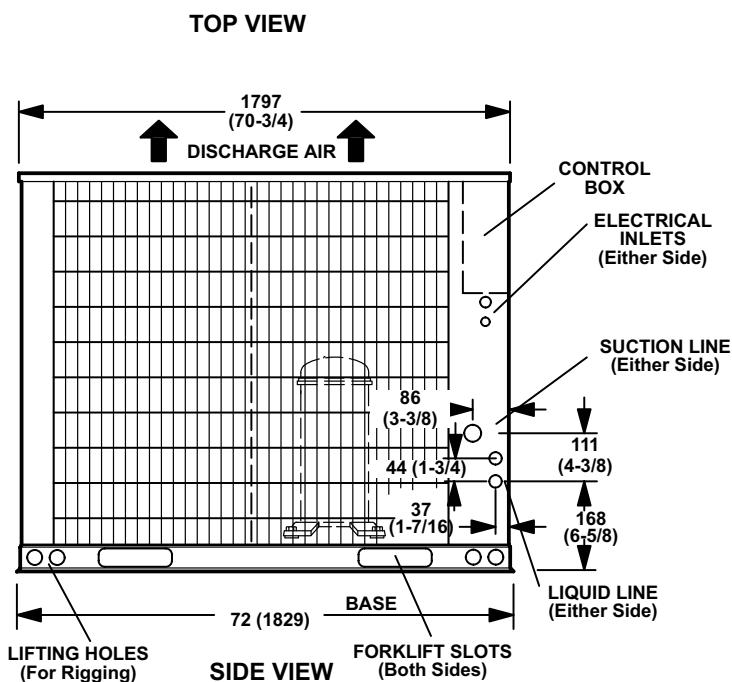
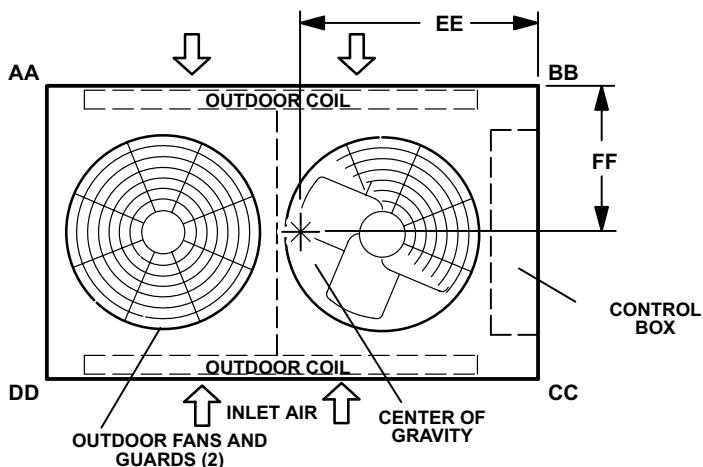
## DIMENSIONS - HS29-120

### CORNER WEIGHT

Model Number	AA kg	AA lbs.	BB kg	BB lbs.	CC kg	CC lbs.	DD kg	DD lbs.
HS29-120	54	118	73	161	73	161	54	118

### CENTER OF GRAVITY

Model Number	EE mm	EE inch	FF mm	FF inch
HS29-120	775	30-1/2	448	17-5/8



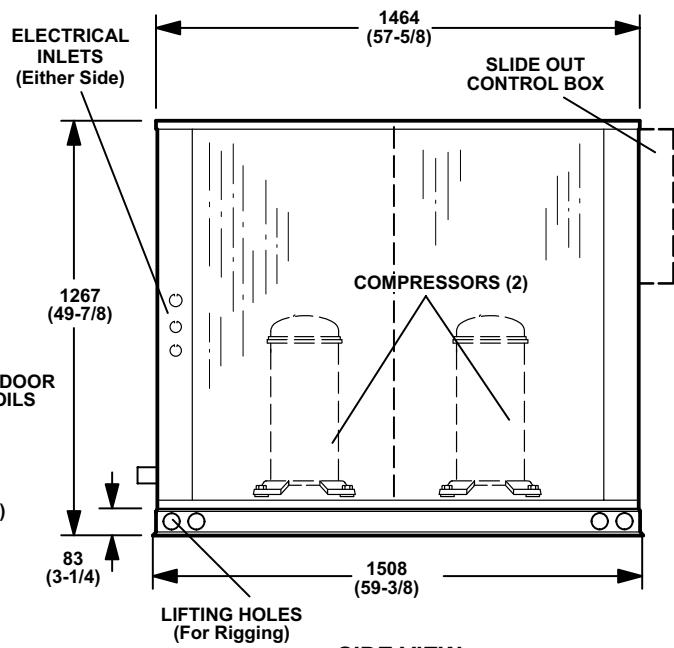
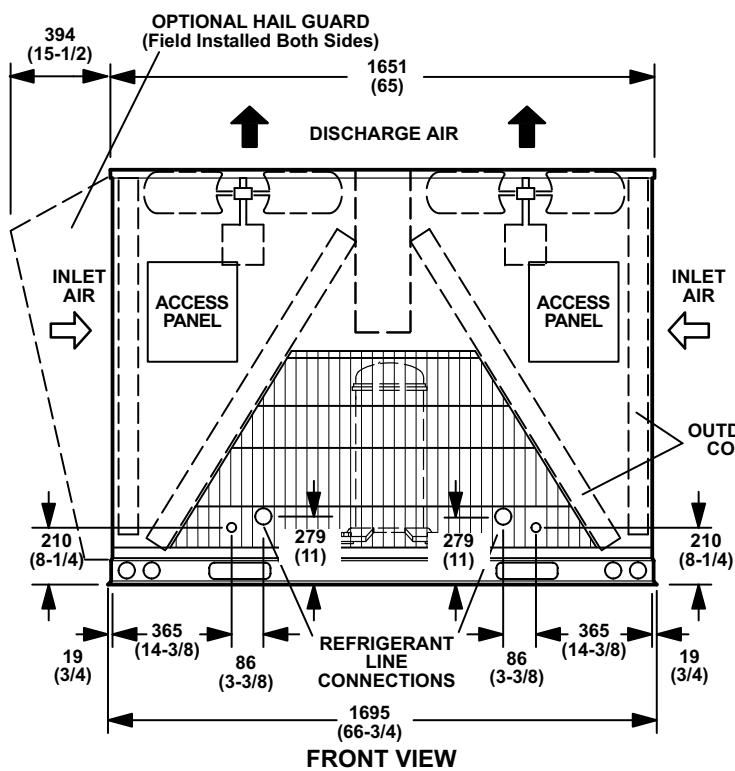
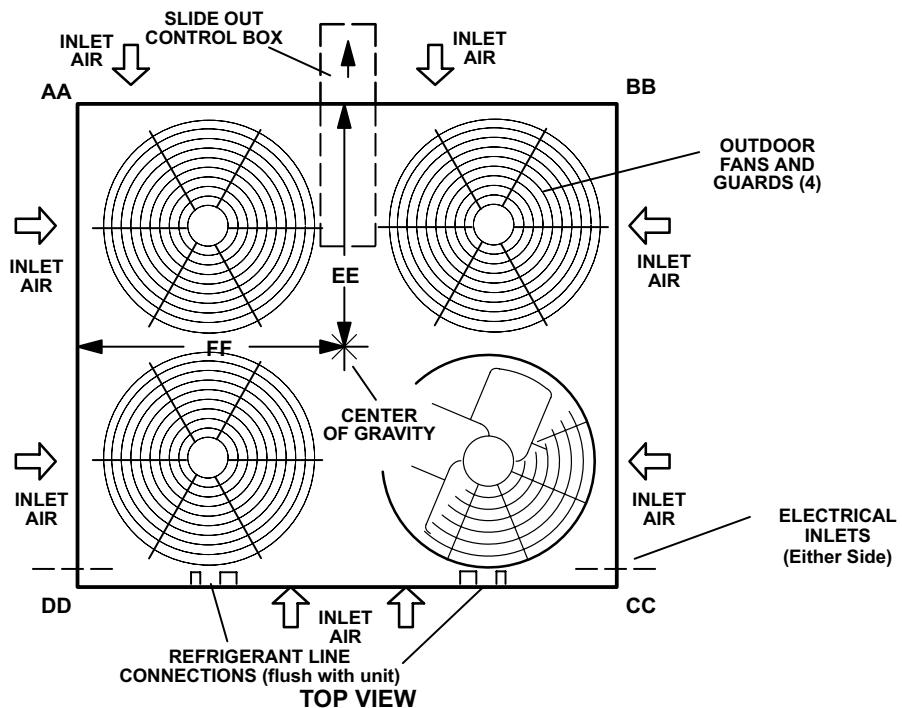
## DIMENSIONS - HS29-180-240

### CORNER WEIGHT

Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
HS29-180	105	232	103	227	103	227	105	232
HS29-240	130	287	130	287	122	268	122	268

### CENTER OF GRAVITY

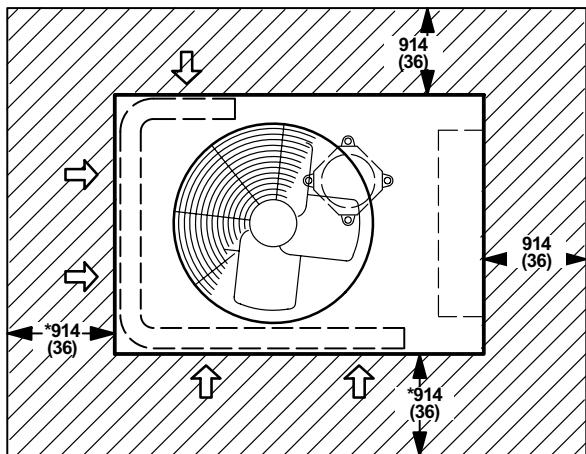
Model Number	EE	FF		
inch	mm	inch	mm	
HS29-180	29-1/4	743	33-1/4	845
HS29-240	28-1/2	724	33-1/4	845



SIDE VIEW

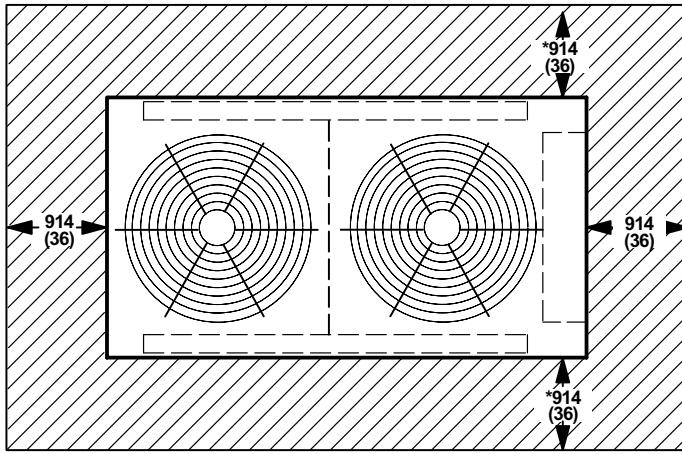
## INSTALLATION CLEARANCES

HS29-072 and HS29-090



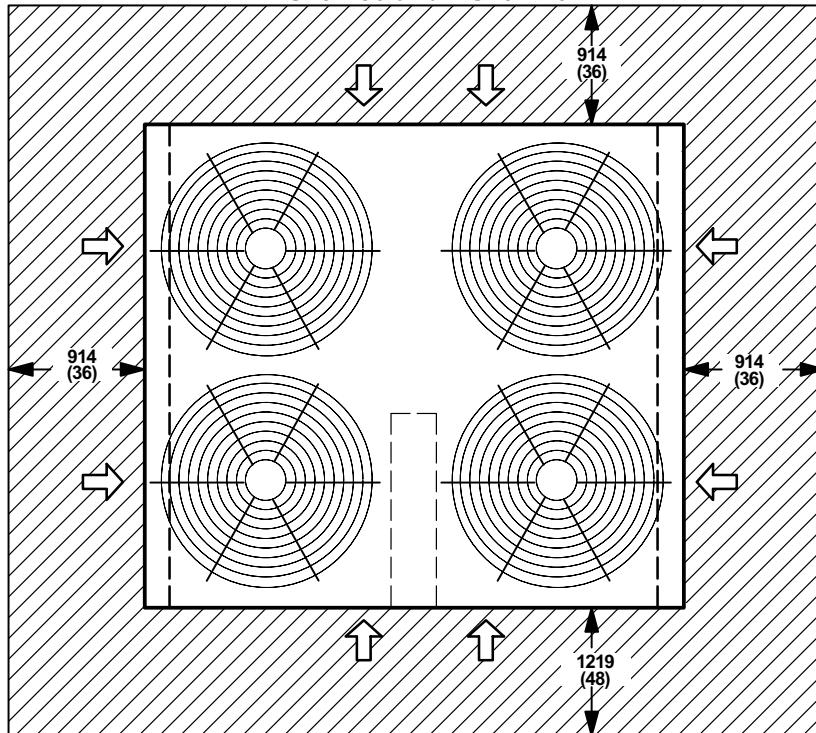
NOTE—1219 mm (48 inches) clearance required on top of unit.  
\*NOTE—One side of coil may be 305 mm (12 inches).

HS29-120



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

HS29-180 and HS29-240



NOTE— 1219 mm (48 inches) clearance required on top of unit.

## COOLING RATINGS

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

### HS29-072 — CR26-60-F COOLING CAPACITY

Entering Wet Bulb Tempera- ture	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil												46°C (115°F)					
			29°C (85°F)						35°C (95°F)						41°C (105°F)					
	m³/s	cfm	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.81	1300	15.9	54.1	4.36	.69	.80	.92	15.3	52.2	4.89	.70	.82	.93	14.7	50.2	5.50	.71	.83	.94
	.75	1600	16.5	56.2	4.41	.72	.86	.97	15.9	54.2	4.94	.73	.87	.99	15.3	52.1	5.55	.75	.89	1.00
	.89	1900	17.0	57.9	4.45	.76	.90	1.00	16.4	55.8	4.98	.77	.92	1.00	15.7	53.6	5.60	.79	.94	1.00
19°C (67°F)	.61	1300	16.9	57.8	4.44	.55	.66	.77	16.4	55.8	4.98	.55	.67	.78	15.7	53.6	5.59	.66	.68	.80
	.75	1600	17.6	59.9	4.49	.57	.70	.82	16.9	57.7	5.03	.58	.71	.84	16.2	55.4	5.64	.58	.72	.85
	.89	1900	18.0	61.3	4.53	.59	.74	.87	17.3	59.1	5.07	.60	.75	.89	16.6	56.7	5.67	.61	.76	.91
22°C (71°F)	.61	1300	18.1	61.7	4.54	.43	.53	.63	17.5	59.6	5.08	.43	.53	.64	16.8	57.3	5.69	.43	.54	.65
	.75	1600	18.7	63.8	4.59	.43	.55	.67	18.0	61.5	5.13	.43	.56	.68	17.3	59.1	5.74	.43	.56	.69
	.89	1900	19.1	65.3	4.63	.44	.57	.71	18.4	62.9	5.17	.44	.58	.72	17.7	60.4	5.78	.44	.59	.74

### HS29-072 — CH23-68 COOLING CAPACITY

Entering Wet Bulb Tempera- ture	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil												46°C (115°F)					
			29°C (85°F)						35°C (95°F)						41°C (105°F)					
	m³/s	cfm	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.75	1600	17.4	59.4	4.47	.72	.85	.97	16.8	57.2	5.01	.73	.86	.98	16.1	54.9	5.62	.74	.88	.99
	.85	1800	17.8	60.7	4.50	.74	.88	1.00	17.1	58.5	5.03	.75	.90	1.00	16.4	56.1	5.64	.77	.92	1.00
	.94	2000	18.1	61.8	4.53	.77	.92	1.00	17.5	59.6	5.06	.78	.93	1.00	16.7	57.1	5.67	.80	.95	1.00
19°C (67°F)	.75	1600	18.5	63.2	4.56	.56	.69	.81	17.8	60.8	5.09	.57	.70	.83	17.1	58.3	5.71	.57	.71	.85
	.85	1800	18.8	64.3	4.59	.58	.72	.85	18.1	61.9	5.13	.58	.73	.87	17.4	59.4	5.74	.59	.74	.89
	.94	2000	19.1	65.3	4.62	.60	.74	.89	18.4	62.9	5.15	.60	.76	.90	17.7	60.3	5.76	.61	.77	.92
22°C (71°F)	.75	1600	19.7	67.3	4.67	.42	.54	.66	19.0	64.9	5.20	.43	.55	.67	18.2	62.2	5.82	.43	.56	.69
	.85	1800	20.1	68.5	4.70	.43	.56	.69	19.3	65.9	5.24	.43	.57	.70	18.6	63.3	5.84	.43	.58	.72
	.94	2000	20.3	69.4	4.73	.44	.58	.72	19.6	66.8	5.26	.44	.59	.74	18.8	64.1	5.87	.44	.60	.75

### HS29-072 — CB29M-65 COOLING CAPACITY

Entering Wet Bulb Tempera- ture	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil												52°C (125°F)					
			27°C (80°F)						35°C (95°F)						43°C (110°F)					
	m³/s	cfm	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.77	1630	16.8	57.3	4.16	.72	.85	.96	15.9	54.4	4.95	.73	.87	.98	15.0	51.2	5.90	.75	.89	.99
	.86	1830	17.1	58.4	4.18	.74	.88	.98	16.3	55.5	4.98	.75	.90	1.00	15.3	52.2	5.92	.78	.92	1.00
	.96	2030	17.4	59.3	4.20	.76	.91	1.00	16.5	56.4	5.00	.78	.93	1.00	15.6	53.1	5.95	.80	.95	1.00
19°C (67°F)	.77	1630	17.8	60.9	4.23	.56	.69	.81	16.9	57.8	5.02	.57	.70	.83	15.9	54.4	5.98	.58	.72	.86
	.86	1830	18.1	61.9	4.26	.58	.71	.85	17.2	58.7	5.05	.58	.73	.87	16.2	55.2	6.00	.60	.75	.90
	.96	2030	18.4	62.7	4.27	.59	.74	.88	17.4	59.4	5.06	.60	.76	.90	16.4	55.8	6.02	.61	.78	.93
22°C (71°F)	.77	1630	19.0	64.8	4.32	.42	.54	.66	18.1	61.6	5.11	.43	.55	.68	17.0	58.0	6.07	.43	.56	.70
	.86	1830	19.3	65.8	4.34	.43	.56	.69	18.3	62.5	5.14	.43	.57	.71	17.2	58.7	6.10	.44	.58	.73
	.96	2030	19.5	66.6	4.36	.43	.57	.71	18.5	63.2	5.16	.44	.59	.73	17.4	59.4	6.11	.44	.60	.76

### HS29-072 — CB17/CBH17-95V COOLING CAPACITY

Entering Wet Bulb Tempera- ture	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil												52°C (125°F)					
			27°C (80°F)						35°C (95°F)						43°C (110°F)					
	m³/s	cfm	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh	Comp Motor kW Input	24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	.90	1920	18.9	64.5	4.09	.73	.89	1.00	17.8	60.9	4.83	.75	.92	1.00	16.7	57.1	5.72	.77	.96	1.00
	1.13	2400	19.6	67.0	4.15	.79	.99	1.00	18.6	63.6	4.89	.82	.90	1.00	17.6	60.1	5.79	.86	1.00	16.4
	1.36	2880	20.5	69.9	4.22	.87	1.00	1.00	19.5	66.4	4.96	.90	1.00	1.00	18.3	62.6	5.85	.94	1.00	17.1
19°C (67°F)	.90	1920	20.0	68.3	4.18	.57	.71	.85	18.9	64.5	4.91	.58	.73	.89	17.7	60.4	5.80	.59	.75	.92
	1.13	2400	20.6	70.4	4.23	.61	.77	.95	19.5	66.4	4.96	.62	.80	.98	18.2	62.0	5.85	.64	.83	1.00
	1.36	2880	21.0	71.8	4.27	.65	.85	1.00	19.9	67.8	5.00	.66	.88	1.00	18.6	63.4	5.89	.69	.92	1.00
22°C (71°F)	.90	1920	21.3	72.7	4.29	.42	.55	.68	20.1	68.7	5.02	.42	.56	.70	18.8	64.2	5.92	.43	.58	.73

## COOLING RATINGS

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

### HS29-090 — C17-090/120 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)						
			Total Cooling Capacity	Comp Motor kW	Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	
	m³/s	cfm	kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input			kW	kBtuh
17°C (63°F)	1.13	2400	26.1	88.9	5.83	.70	.84	.99	24.6	84.0	6.83	.72	.87	1.00	23.0	78.4	8.01	.74	.91	1.00	21.1	72.1	9.39	.77	.95	1.00	
	1.41	3000	27.1	92.4	5.91	.75	.93	1.00	25.6	87.4	6.91	.78	.96	1.00	24.0	81.8	8.10	.81	1.00	1.00	22.3	76.0	9.49	.85	1.00	1.00	
	1.70	3600	28.0	95.7	5.98	.82	1.00	1.00	26.7	91.0	6.99	.85	1.00	1.00	25.1	85.5	8.18	.88	1.00	1.00	23.3	79.4	9.57	.93	1.00	1.00	
19°C (67°F)	1.13	2400	27.7	94.6	5.96	.55	.67	.80	26.2	89.3	6.95	.56	.69	.83	24.4	83.3	8.14	.57	.71	.87	22.4	76.6	9.51	.59	.74	.91	
	1.41	3000	28.7	97.9	6.03	.58	.73	.89	27.0	92.2	7.03	.59	.75	.93	25.2	86.0	8.21	.61	.78	.97	23.1	78.8	9.58	.63	.83	1.00	
	1.70	3600	29.3	100.1	6.08	.61	.79	.97	27.6	94.2	7.08	.63	.82	1.00	25.7	87.8	8.26	.65	.86	1.00	23.6	80.6	9.62	.68	.91	1.00	
22°C (71°F)	1.13	2400	29.6	101.0	6.10	.41	.53	.65	28.0	95.4	7.10	.41	.54	.67	26.1	88.9	8.29	.42	.55	.69	23.9	81.7	9.66	.42	.57	.72	
	1.41	3000	30.5	104.0	6.17	.42	.57	.71	28.7	98.0	7.17	.43	.58	.73	26.8	91.3	8.35	.43	.60	.76	24.5	83.7	9.72	.44	.62	.80	
	1.70	3600	31.1	106.1	6.22	.44	.60	.77	29.3	99.9	7.22	.44	.62	.80	27.2	92.9	8.40	.45	.64	.84	24.9	85.1	9.76	.46	.67	.89	

### HS29-090 — CB17/CBH17-95V COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)						
			Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	
	m³/s	cfm	kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input			kW	kBtuh
17°C (63°F)	1.13	2400	25.8	88.0	5.91	.70	.85	.99	24.4	83.4	6.92	.72	.88	1.00	22.9	78.1	8.15	.74	.91	1.00	21.1	72.0	9.58	.77	.96	1.00	
	1.41	3000	26.8	91.5	5.98	.76	.94	1.00	25.4	86.7	7.00	.78	.96	1.00	23.8	81.3	8.23	.81	.99	1.00	22.2	75.6	9.66	.86	1.00	1.00	
	1.70	3600	27.7	94.6	6.05	.82	.99	1.00	26.3	89.9	7.08	.85	1.00	1.00	24.8	84.7	8.31	.89	1.00	1.00	23.1	78.7	9.74	.93	1.00	1.00	
19°C (67°F)	1.13	2400	27.3	93.3	6.02	.55	.68	.81	25.9	88.3	7.04	.56	.70	.84	24.2	82.6	8.26	.57	.72	.87	22.3	76.1	9.68	.59	.75	.92	
	1.41	3000	28.2	96.2	6.08	.58	.74	.90	26.7	91.0	7.11	.60	.76	.93	24.9	85.0	8.33	.61	.79	.97	22.9	78.2	9.74	.64	.83	1.00	
	1.70	3600	28.8	98.3	6.14	.62	.80	.97	27.2	92.9	7.16	.63	.83	.99	25.4	86.8	8.38	.66	.87	1.00	23.4	79.9	9.79	.68	.89	1.00	
22°C (71°F)	1.13	2400	29.1	99.4	6.15	.41	.53	.66	27.5	94.0	7.19	.41	.54	.67	25.8	87.9	8.40	.42	.56	.70	23.7	80.9	9.82	.43	.58	.73	
	1.41	3000	29.9	102.1	6.21	.42	.57	.72	28.3	96.5	7.25	.43	.58	.74	26.4	90.1	8.46	.43	.60	.77	24.3	82.8	9.87	.44	.63	.81	
	1.70	3600	30.5	104.0	6.26	.44	.61	.78	28.8	98.1	7.28	.44	.63	.81	26.8	91.6	8.50	.45	.65	.84	24.6	84.1	9.91	.47	.68	.89	

### HS29-090 — CB17/CBH17-135V COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)						
			Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	Total Cooling Capacity	Comp Motor kW	Sensible To Total Ratio (S/T) Dry Bulb	24°C 75°F	27°C 80°F	29°C 85°F	
	m³/s	cfm	kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input				kW	kBtuh	Input			kW	kBtuh
17°C (63°F)	1.13	2400	25.9	88.4	5.95	.74	.88	1.00	24.5	83.6	6.98	.76	.90	1.00	22.9	78.2	8.20	.78	.93	1.00	21.1	72.0	9.63	.81	.97	1.00	
	1.41	3000	26.9	91.9	6.04	.80	.95	1.00	25.5	87.0	7.06	.82	.98	1.00	23.9	81.5	8.28	.85	1.00	1.00	22.2	75.8	9.70	.89	1.00	1.00	
	1.70	3600	27.9	95.1	6.10	.86	1.00	1.00	26.5	90.4	7.13	.88	1.00	1.00	24.9	85.1	8.37	.91	1.00	1.00	23.2	79.0	9.79	.95	1.00	1.00	
19°C (67°F)	1.13	2400	27.5	94.0	6.08	.58	.71	.84	26.0	88.8	7.11	.59	.73	.87	24.3	82.9	8.32	.60	.75	.90	22.3	76.2	9.73	.62	.79	.94	
	1.41	3000	28.4	97.0	6.15	.61	.77	.92	26.8	91.6	7.17	.63	.80	.95	25.0	85.4	8.39	.64	.83	.98	23.0	78.4	9.80	.67	.86	1.00	
	1.70	3600	29.1	99.2	6.20	.65	.83	.99	27.4	93.5	7.22	.67	.86	1.00	25.6	87.2	8.44	.69	.89	1.00	23.5	80.2	9.85	.72	.84	1.00	
22°C (71°F)	1.13	2400	29.4	100.2	6.22	.43	.56	.69	27.8	94.7	7.25	.43	.57	.71	25.9	88.4	8.47	.44	.58	.73	23.8	81.3	9.88	.45	.60	.76	
	1.41	3000	30.2	103.1	6.29	.44	.60	.75	28.5	97.2	7.31	.45	.61	.77	26.6	90.6	8.53	.46	.63	.80	24.4	83.2	9.94	.47			

## COOLING RATINGS

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

### HS29-180 — CB17/CBH17-185V - ONE COMPRESSOR OPERATING

Entering Wet Bulb Tempera- ture	Total Air Volume		18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)					
			Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	
	m³/s	cfm	kW	kBtuh				kW	kBtuh				kW	kBtuh			kW	kBtuh				kW	kBtuh			
17°C (63°F)	2.26	4800	24.0	81.8	4.94	.75	.89	1.00	23.3	79.5	5.45	.76	.90	1.00	22.6	77.0	6.05	.77	.92	1.00	21.8	74.3	6.75	.78	.93	1.00
	2.83	6000	24.9	85.1	5.01	.81	.96	1.00	24.2	82.7	5.52	.82	.98	1.00	23.5	80.1	6.12	.83	.99	1.00	22.7	77.3	6.81	.85	1.00	1.00
	3.40	7200	25.8	87.9	5.06	.86	1.00	1.00	25.1	85.5	5.58	.87	1.00	1.00	24.3	82.9	6.18	.89	1.00	1.00	23.5	80.1	6.88	.91	1.00	1.00
19°C (67°F)	2.26	4800	25.5	87.0	5.04	.59	.73	.86	24.8	84.5	5.56	.59	.73	.87	24.0	81.8	6.15	.60	.75	.88	23.1	78.8	6.84	.61	.76	.90
	2.83	6000	26.3	89.8	5.10	.62	.78	.93	25.6	87.2	5.61	.63	.79	.94	24.7	84.3	6.22	.64	.81	.96	23.8	81.2	6.91	.65	.82	.98
	3.40	7200	26.9	91.9	5.14	.66	.84	1.00	26.1	89.2	5.66	.67	.85	1.00	25.3	86.2	6.26	.67	.87	1.00	24.4	83.1	6.95	.69	.89	1.00
22°C (71°F)	2.26	4800	27.2	92.8	5.16	.44	.57	.70	26.4	90.2	5.68	.44	.58	.71	25.6	87.3	6.28	.45	.58	.72	24.6	84.1	6.97	.45	.59	.73
	2.83	6000	28.0	95.6	5.21	.45	.61	.76	27.2	92.8	5.73	.46	.61	.77	26.3	89.7	6.33	.46	.62	.78	25.3	86.4	7.03	.46	.63	.80
	3.40	7200	28.6	97.5	5.25	.47	.65	.82	27.7	94.5	5.77	.47	.65	.83	26.8	91.4	6.38	.48	.66	.85	25.8	88.0	7.07	.48	.68	.86

### HS29-180 — CB17/CBH17-185V - BOTH COMPRESSORS OPERATING

Entering Wet Bulb Tempera- ture	Total Air Volume		27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)					
			Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	
	m³/s	cfm	kW	kBtuh				kW	kBtuh				kW	kBtuh			kW	kBtuh				kW	kBtuh			
17°C (63°F)	2.26	4800	47.0	160.5	10.99	.74	.88	1.00	44.7	152.5	12.92	.76	.90	1.00	41.9	143.1	15.25	.78	.93	1.00	38.9	132.7	17.92	.81	.97	1.00
	2.83	6000	48.9	166.8	11.13	.80	.95	1.00	46.5	158.6	13.03	.82	.97	1.00	43.8	149.3	15.37	.85	1.00	1.00	40.7	139.0	18.07	.88	1.00	1.00
	3.40	7200	50.5	172.4	11.22	.86	1.00	1.00	48.2	164.3	13.15	.88	1.00	1.00	45.5	155.1	15.50	.91	1.00	1.00	42.4	144.6	18.22	.94	1.00	1.00
19°C (67°F)	2.26	4800	50.0	170.5	11.19	.58	.72	.85	47.4	161.7	13.10	.59	.73	.87	44.4	151.6	15.43	.60	.76	.90	41.1	140.2	18.12	.62	.79	.94
	2.83	6000	51.5	175.8	11.29	.61	.78	.92	48.8	166.6	13.23	.63	.80	.95	45.8	156.2	15.53	.64	.82	.98	42.3	144.2	18.24	.67	.86	1.00
	3.40	7200	52.7	179.7	11.38	.65	.83	.98	49.9	170.3	13.30	.67	.86	1.00	46.8	159.6	15.62	.69	.89	1.00	43.2	147.4	18.33	.71	.93	1.00
22°C (71°F)	2.26	4800	53.3	181.8	11.41	.43	.56	.69	50.6	172.5	13.35	.44	.57	.71	47.4	161.7	15.67	.44	.59	.73	43.8	149.6	18.34	.45	.60	.76
	2.83	6000	54.8	186.9	11.52	.45	.60	.75	51.9	177.1	13.45	.45	.61	.78	48.6	166.0	15.76	.46	.63	.80	44.9	153.2	18.45	.47	.66	.84
	3.40	7200	55.8	190.4	11.59	.46	.64	.81	52.8	180.3	13.53	.47	.66	.84	49.5	168.8	15.83	.48	.68	.87	45.6	155.6	18.52	.49	.71	.91

### HS29-240 — CB17/CBH17-275V - ONE COMPRESSOR OPERATING

Entering Wet Bulb Tempera- ture	Total Air Volume		18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)					
			Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	Dry Bulb 27°C 80°F	Dry Bulb 29°C 85°F	Total Cooling Capacity	Comp Motor kW Input	Dry Bulb 24°C 75°F	
	m³/s	cfm	kW	kBtuh				kW	kBtuh				kW	kBtuh			kW	kBtuh				kW	kBtuh			
17°C (63°F)	3.02	6400	33.4	114.1	6.67	.69	.84	.97	32.5	110.8	7.33	.70	.85	.98	31.5	107.4	8.08	.71	.86	.99	30.4	103.7	8.93	.72	.88	1.00
	3.77	8000	34.8	118.6	6.77	.75	.91	1.00	33.8	115.2	7.43	.76	.93	1.00	32.7	111.6	8.18	.77	.95	1.00	31.6	107.8	9.03	.79	.96	1.00
	4.53	9600	35.8	122.3	6.86	.81	.98	1.00	34.9	119.0	7.51	.82	.99	1.00	33.8	115.4	8.26	.84	1.00	1.00	32.7	111.7	9.12	.85	1.00	1.00
19°C (67°F)	3.02	6400	35.5	121.2	6.82	.54	.67	.80	34.5	117.7	7.48	.55	.68	.81	33.4	113.8	8.23	.55	.69	.83	32.2	109.8	9.07	.56	.70	.85
	3.77	8000	36.7	125.1	6.91	.57	.72	.88	35.5	121.3	7.56	.58	.73	.90	34.4	117.3	8.31	.59	.75	.91	33.1	113.0	9.17	.60	.77	.93
	4.53	9600	37.5	127.9	6.97	.61	.78	.95	36.3	123.9	7.63	.61	.80	.96	35.1	119.8	8.38	.62	.81	.98	33.8	115.5	9.22	.63	.83	.99
22°C (71°F)	3.02	6400	37.9	129.2	7.00	.41	.53	.65	36.8	125.4	7.66	.41	.53	.65	35.5	121.3	8.40	.41	.54	.66	34.3	117.0	9.26	.41	.55	.68
	3.77	8000	38.9	132.9	7.09	.42	.56	.70	37.8	128.9	7.74	.42	.57	.71	36.5	124.6	8.49	.43								