

AIR COOLED CONDENSERS

Technical Guide



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OVERVIEW

The Chandler VSEC and 3-Phase A/C Series of direct drive air-cooled condensers incorporate the latest condenser technology to provide the quietest and most efficient condensers in the industry.

VSEC Series

Optimized sound and energy performance.

The VSEC Series of condensers by Chandler offers the optimum solution for sound and energy performance. The VSEC Series utilizes variable speed EC (VSEC) motor technology, which provides unmatched sound and energy performance and is the perfect solution for those applications where low noise levels and significant energy savings are essential for success.



Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.

3-Phase A/C Series

Excellence in sound, energy and capacity solutions.

The 3-Phase A/C Series of condensers by Chandler is designed specifically with the growing needs of the supermarket and grocery industry in mind. This series utilizes 830 and 540 RPM motors and incorporates advanced features that further improve sound levels and energy efficiencies, as well as provide increased capacity in a smaller footprint. In addition, there are new features designed to improve serviceability, resulting in reduced maintenance costs.

The 3-Phase A/C Series is a perfect fit for applications requiring low sound and energy levels and optimized capacities.

1140 Series

Chandler continues to offer the 1140 RPM Series for customers seeking the most economical solution for their capacity requirements.

Chandler condensers now incorporate a broader product range with capacities ranging from 11 to 265 nominal tons to address all applications.

All Chandler condenser coils incorporate the Floating Tube coil design, which virtually eliminates the possibility of tube sheet leaks. Condenser coils are designed for maximum heat transfer and are designed to operate with most common refrigerants.

OVERVIEW (continued)

As with all Chandler products, extensive testing of the condenser ensures long and trouble-free service life.

The condensers are designed for outdoor applications with housings available in aluminum finish and painted or unpainted galvanized steel.

The condensers are available in either single or double wide fan configurations.

The condenser design incorporates the features most desired in air-cooled condensers. An extensive list of options and fan cycle control panels complement the condenser design and allow the condenser to match the most rigid application requirements.



Venturi Mounted VSEC Series with VSEC Motor Technology



The Floating Tube Coil Design
Dramatically Reduces Tube Sheet Leaks

FEATURES

The Chandler air-cooled condenser is available in multiple product tiers and is designed with features to meet specific customer requirements.

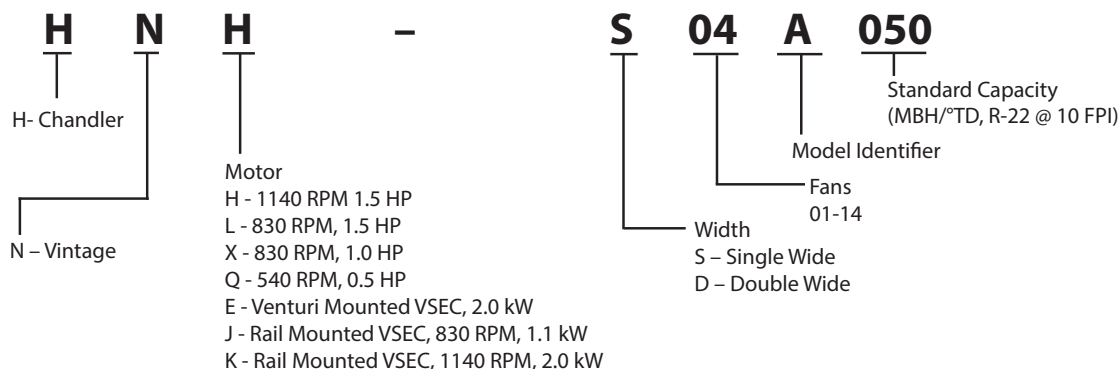
Chandler Venturi Mounted VSEC Series of Condensers

Customers seeking optimum sound and energy performance can select the Chandler VSEC Series of condensers with variable speed EC motor technology. VSEC motors provide unparalleled sound and energy performance.

Features include:

- VSEC motor, swept fan blade and Venturi incorporating integrated variable speed technology
- Broad capacity range from 16 to 264 tons
- Aluminum housing for an attractive appearance and corrosion protection, with painted galvanized steel, or galvanized steel available as an option
- Side access panels allow for ease of cleaning coils

NOMENCLATURE



Chandler 3-Phase A/C Series of Condensers

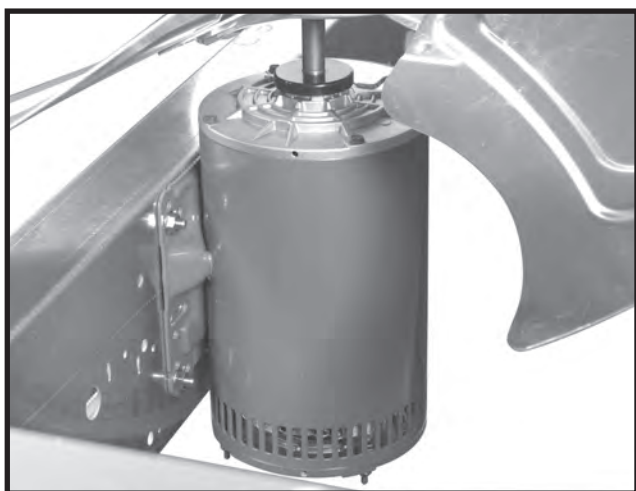
The 3-Phase A/C Series by Chandler is designed specifically with the growing needs of the supermarket and grocery industry in mind. This series utilizes 830 and 540 RPM motors and incorporates advanced features that further improve sound levels and energy efficiencies, as well as provide increased capacity in a smaller footprint. In addition, there are new features designed to improve serviceability, resulting in reduced maintenance costs. The 3-Phase A/C Series is a perfect fit for applications requiring low sound and energy levels and optimized capacities.

Features include:

- Direct drive fan motors in 830 or 540 RPM
- The patented QuietEdge fan blade provides an unprecedented sound level of 49.6 dBA (540 RPM @ 10 ft.)
- Chandler's patented (#7, 210, 661) ServiceEase motor mount feature allows for ease of motor service and reduces likelihood of damage to the coils during servicing
- Chandler condenser coils incorporate the latest coil technology to provide maximum capacity
- Broader product range to address all applications. Capacities ranging from 11 to 225 nominal tons
- Galvanized steel cabinet with the option for aluminum or painted galvanized steel
- High efficiency, three-phase fan motors with ball bearings and internal overload protection

1140 Series

For customers seeking an economical solution to their capacity needs, Chandler now offers the 1140 RPM Series with enhancements to improve capacity and serviceability.



ServiceEase Motor Mount System



Chandler's Patented QuietEdge Fan Blade for Improved Sound Performance

Features include:

- Direct drive fan motors
- Chandler's patented (#7, 210, 661) ServiceEase™ motor mount
- High efficiency condenser coil designed for optimum performance
- Expanded product range from 15 to 249 nominal tons
- Galvanized steel as a standard housing, with an option for aluminum or painted galvanized steel
- High efficiency, three-phase fan motors with ball bearings and internal overload protection

All Standard Condensers

- 10 fins per inch spacing
- Modular design with models in both single and double wide fan configurations
- All Chandler condensers incorporate the Floating Tube coil design, which virtually eliminates tube sheet leaks
- Internal baffles provided between all fan cells
- Condensers up to 3 fans in length use 3/8" diameter tube to minimize refrigerant charge. Condensers 4 or more fans in length use 1/2" diameter tube to minimize refrigerant pressure drop
- Coated steel fan guards
- Weatherproof control panel with factory-mounted door interrupt disconnect switch
- UL and UL listed for Canada

Available Options:

- Multi-circuiting at no additional charge
- Optional 8, 12 or 14 FPI spacing
- Fan-cycle control panels
- Alternate coil construction including ChandlerGuard coated fins, epoxy or phenolic coated fins and copper fins
- Hinged fan panels for ease of servicing (3-Phase A/C and 1140 Series only)
- Side access panels
- Extended condenser legs for increased ground clearance
- Sealtite wiring
- Frame for shipping

Four Solutions Tailored To Fit Your Unique Needs

Choose from Fixed Speed, Rail Mounted VSEC, or Venturi Mounted VSEC series of air-cooled condensers by Chandler. Choosing the Venturi Mounted VSEC Series means that you are selecting the ultimate in capacity, sound, and efficiency. The Rail Mounted VSEC option offers all of the benefits of variable speed in a conventional condenser package, while the fixed speed options continue to provide proven performance and capacity.

FEATURE	1140 RPM FIXED SPEED	830 & 540 RPM FIXED SPEED	RAIL MOUNTED VSEC	VENTURI MOUNTED VSEC
Motors				
Standard Motor	1140 RPM	830, 540 RPM	Variable Speed EC Motors	Variable Speed EC Motors
P66 Motor Option	✓	✓		
Cabinet				
Standard Cabinet	Galvanized	Galvanized	Galvanized	Aluminum
Galvanized Option	(standard)	(standard)	(standard)	✓
Pre-Painted Galvanized Option	✓	✓	✓	✓
Aluminum Option	✓	✓	✓	(standard)
Venturi Cover				
Standard Venturi	Removable	Removable	Removable	EC Tall Optimized
Hinged Option	✓	✓	✓	-
Fan Blades				
Standard Blade	Standard	QuietEdge™	Standard/QuietEdge™	EC Optimized
Motor Mounted				
Standard Motor Mounted	Service Ease™	Service Ease™	Service Ease™	EC Optimized
Warranty				
Two-Year Warranty	✓	✓	✓	✓
Two-Year Warranty - Rail Mounted VSEC Motors	-	-	✓	-
Three-Year Warranty - Venturi Mounted VSEC Motors	-	-	-	✓
Five-Year Warranty - Floating Tube™ Coil Design	✓	✓	✓	✓

Condenser Selection

Capacity for air-cooled condensers are based on Total Heat of Rejection (THR) at the condenser. Total heat of rejection is equal to net refrigeration at the evaporator (compressor capacity) plus the energy input into the refrigerant by the compressor (heat of compression). The heat of compression will vary depending on the compressor manufacturer, type of compressor and the operating conditions of the compressor. Whenever possible, it is recommended that you obtain the heat of compression value from the compressor manufacturer.

If this is not available, the THR can be estimated using the following formula:

$$\text{THR} = (\text{Compressor Capacity}) * (\text{Heat of Compression Factor, Tables 1 \& 2})$$

Table 1 contains heat of compression factors for suction cooled compressors and Table 2 contains factors for open drive compressors. For refrigeration systems beyond the range of Tables 1 and 2, use the following equations to estimate THR:

Open Compressors:

$$\text{THR} = \text{Compressor Capacity (BTUH)} + (2545) * (\text{Brake Horsepower, BHP})$$

Suction Cooled Compressors:

$$\text{THR} = \text{Compressor Capacity (BTUH)} + (3413 * \text{KW})$$

The compressor capacity is effected by its altitude. If the condenser location is above sea level, an additional correction is required to the THR, as follows:

$$\text{THR (altitude)} = \text{THR} * \text{Altitude Correction Factor, Table 3}$$

Selection Example

Compressor capacity: 350,000
Evaporator temperature: +25° F
Condensing temperature: 115° F
Ambient temperature: 95° F
Refrigerant: R-22
Compressor type: Semi-hermetic, suction cooled
Condenser type: 540 RPM, one row of fans
Condenser altitude: 1,000 feet

Step 1: Estimate Condenser THR

From Table 1 for suction cooled compressors, at +25° F suction, we need to determine the heat of compression factor for 115° F condensing temperature (NOT shown in table).

Therefore, select the condensing temperatures and heat of compression factor for +25° F suction temperatures as follows:

From Table 1:

110°	115°	120°	Condensing Temperature
1.31	X	1.36	Heat of Compression Factor

To determine X: (Heat of Compression Factor)

$$X = \frac{115-110}{120-110} * (1.36 - 1.31) + 1.31$$

$$X = \frac{5}{10} * (0.05) + 1.31X = (0.025) + 1.31$$

$$X = 1.335$$

Therefore heat of compression factor at 115° F condensing temperature is 1.335

$$\begin{aligned}\text{THR} &= \text{Compressor Capacity} * \text{Heat of Compression Factor} \\ &= 350,000 * 1.335 \\ &= 467,250\end{aligned}$$

Step 2: Correct for Altitude

From Table 3 obtain an altitude correction factor of 1.02 for 1,000 feet.

$$\begin{aligned}\text{THR} &= \text{THR (from step 1)} * \text{Altitude Correction Factor (design)} \\ &= 467,250 * 1.02 \\ &= 476,595\end{aligned}$$

Step 3: Calculate Design Condenser T.D.

$$\begin{aligned}\text{Design Condenser T.D.} &= \text{Condensing Temp} - \text{Ambient Temp} \\ &= 115 - 95 \\ &= 20^\circ \text{T.D.}\end{aligned}$$

Step 4: Condenser Selection

Condenser capacities for condensers at 540 RPM are located in Table 7. These capacities are given in MBH/°TD. Convert the THR calculated in step 2 to MBH/°TD by dividing by 1,000 to get THR in MBH. Then divide the THR by the design TD to get MBH/°TD.

$$\text{THR (MBH)} = 476,595 / 1,000 = 476.6$$

$$\text{THR (MBH/°TD)} = 476.6 / 20 = 23.83$$

Locate the 10 FPI column for R-22 refrigerant and read down until you locate a value equal to or just larger than 23.83. This value is 25.9. Read horizontally to the left to obtain a condenser model of HNQ-S05-A026.

Step 5: Calculate Actual T.D. and Condensing Temperature

The actual condenser T.D. can be calculated by dividing the design THR by the condenser rating.

$$\begin{aligned}\text{Actual T.D.} &= \text{THR (Design)} / (\text{Rating @ } 1^\circ \text{ T.D.}) \\ &= 476.6 / 25.9 \\ &= 18.4^\circ \text{F T.D.}\end{aligned}$$

The actual condensing temperature is the actual T.D. plus the ambient temperature. Actual Condensing Temperature = (Actual T.D.) + (Ambient)
= 18.4 + 95
= 113.4° F.

Table 1. Heat of Compression Factor for Suction Cooled Compressors

Suction Temp. °F	Condensing Temperature °F				
	90°	100°	110°	120°	130°
-40°	1.56	1.63	1.72	1.81	1.94
-30°	1.49	1.55	1.62	1.7	1.8
-20°	1.43	1.49	1.55	1.62	1.7
-10°	1.38	1.43	1.49	1.55	1.63
0°	1.34	1.38	1.43	1.49	1.56
5°	1.31	1.36	1.41	1.48	1.55
10°	1.29	1.34	1.39	1.44	1.52
15°	1.26	1.31	1.36	1.41	1.48
20°	1.24	1.28	1.33	1.38	1.44
25°	1.22	1.26	1.31	1.36	1.42
30°	1.2	1.24	1.28	1.33	1.39
40°	1.17	1.2	1.24	1.28	1.33
50°	1.13	1.16	1.2	1.24	1.28

Table 2. Heat of Compression Factor for Open Drive Compressors

Evaporator Temp. °F	Condensing Temperature °F					
	90°	100°	110°	120°	130°	140°
-30°	1.37	1.42	1.47	—	—	—
-20°	1.33	1.37	1.42	1.47	—	—
-10°	1.28	1.32	1.37	1.42	1.47	—
0°	1.24	1.28	1.32	1.37	1.41	1.47
5°	1.23	1.26	1.3	1.35	1.39	1.45
10°	1.21	1.24	1.28	1.32	1.36	1.42
15°	1.19	1.22	1.26	1.3	1.34	1.4
20°	1.17	1.2	1.24	1.28	1.32	1.37
25°	1.16	1.19	1.22	1.26	1.3	1.35
30°	1.14	1.17	1.2	1.24	1.27	1.32
40°	1.12	1.15	1.17	1.2	1.23	1.28
50°	1.09	1.12	1.14	1.17	1.2	1.24

Table 3. Altitude Correction Factors

Altitude	Correction Factor
0	1.00
1,000	1.02
2,000	1.05
3,000	1.07
4,000	1.10
5,000	1.12
6,000	1.15
7,000	1.17

Multi-Circuiting Selection

Multi-Circuiting Selection Procedure

The air-cooled condensers are available with more than one refrigerant circuit. The condenser will be factory assembled with the condenser coil divided into individual refrigerant circuits, each sized

for its own specific application. Each circuit is supplied with its own inlet and outlet connections, individually labeled.

Multi-Circuit Condenser Selection

Given four suction cooled compressors with conditions shown in Table 4. The condenser shall have 830 RPM, 1.0 HP fan motors,

with two rows of fans. The condenser location is at 3,000 ft. and the design ambient is 95°F.

Selection Procedure

Step 1: Input customer data in Table 4 in columns 1, 2, 3, 4 and 5.

Step 2: From Table 1, select the heat of compression factor for suction cooled compressors and input into Column #6.

Step 3: From Table 3 obtain the altitude correction factor and input into Column #7.

Step 4: From Table 5 obtain the refrigerant capacity factor and input into Column #8.

Step 5: Calculate the design T.D. for each circuit by subtracting the ambient temperature from the circuit design condensing temperature and input into Column #9.

T.D. = Design Condensing Temperature - Ambient Temperature

Step 6: Calculate the design THR / °T.D. for each circuit. Multiply Column #5 by Column #6 and Column #7 to calculate the THR for each circuit. Divide the result by the refrigerant correction factor, Column #8 to convert the capacities to a common refrigerant. Divide the result by the design T.D., Column #9 to calculate the design THR / °T.D. and input into Column #10.

$$\text{Design THR} / ^\circ\text{T.D.} = \frac{\text{Compressor Capacity (\#5)} * \text{Heat of Compressor Factor (\#6)} * \text{Altitude Factor (\#7)}}{\text{Refrigerant Capacity Factor (\#8)} * \text{Design T.D. (\#9)}}$$

Example for Circuit #1:

$$\begin{aligned}\text{Design THR} / ^\circ\text{T.D.} &= \frac{235,000 * 1.31 * 1.07}{1.02 * 15} \\ &= 21,529 \text{ BTUH} / ^\circ\text{T.D.}\end{aligned}$$

Step 7: Add the design THR / °T.D. for each circuit in column #10, to get a total of 39,578 BTUH / °T.D. Divide this total by 1,000 to get 39.6 MBH / °T.D.

Step 8: From Table 11 for two rows of condenser fans with 830 RPM, 1.0 HP fan motors, locate the column for R-404A capacity with 10 FPI. Read down the column until you get to a capacity equal to or greater than 39.6 MBH / °T.D. This value is 44.5 which corresponds to a HNX-D06-A045. From Table 14 obtain the total number of feeds available as 56.

Multi-Circuiting Condenser

Table 4. Condenser Multi-Circuit Selection

1	2	3	4	5	X	6	X	7	÷	8	÷	9	=	10	11	12	13
Circuit Name	Evap. Temp. °F	Design Cond. Temp. °F	Comp. Refrig. Type	Cap. BTUH	X	Heat of Comp. Factor	X	Altitude Factor	÷	Refrig. Cap. Factor	÷	Design Cond. T.D.	=	Design THR/°TD	No. of Feeds Per Circ.	Actual Cond. T.D.	Actual Cond. Temp. °F
1	25	110	22	235,000	X	1.31	X	1.07	÷	1.02	÷	15	=	21,529	31	13.1	108.1
2	20	110	134a	61,000	X	1.33	X	1.07	÷	.97	÷	15	=	5,966	8	14.1	109.1
3	-10	105	22	31,000	X	1.46	X	1.07	÷	1.02	÷	10	=	4,748	7	8.5	103.5
4	-20	105	22	46,000	X	1.52	X	1.07	÷	1.02	÷	10	=	7,335	10	9.2	104.2
TOTAL														= 39,578	56		
														39,578 / 1,000 = 39.6 MBH/°TD			

Step 9: Determine the number of feeds per circuit. Divide the design THR / °T.D. in Column #10 by the total capacity required (39,578) and multiply this result by the number of feeds available, which is 56. Round this value to the nearest integer and place in Column #11. Add the individual feeds per circuit to get a total number of feeds for the condenser. This total must equal the total number of feeds available for the condenser (56).

$$\text{Number of feeds/circuit} = \frac{\text{Design THR} / ^\circ\text{T.D.}(\#10) * \text{Number of Circuits Available (56)}}{\text{Total Capacity Required (39,578)}}$$

Step 10: Calculate actual condensing T.D., (ATD):

$$\text{ATD} = \frac{\text{Design T.D.}(\#9) * \text{Design THR} / ^\circ\text{T.D.}(\#10) * \text{Number of Feeds Available (56)}}{\text{Number Feeds} / \text{CIR}(\#11) * \text{Condenser Capacity} / ^\circ\text{T.D.}(\text{Step } \#8) * 1,000}$$

Example for Circuit #1:

$$\text{ATD} = \frac{15 * 21,529 * 56}{31 * 44.5 * 1,000} = 13.1^\circ\text{F.}$$

Input these T.D. values in column #12.

Step 11: Calculate the actual condensing temperature. Actual condensing temperature is equal to the actual condensing T.D., Column #12 plus the design ambient (95°). Input these values in Column #13. If the actual condensing temperature for each circuit is too high, it may be necessary to adjust the number of feeds per circuit or to select the next larger condenser size and recalculate the number of feeds per circuit.

Table 5. Refrigerant Capacity Factor

Refrigerant	Capacity Factor
R-22	1.02
R-134A	0.99
R-404A	1.00
R-407A	0.98
R-407C	0.94
R-407F	0.98
R-448A	0.96
R-449A	0.99
R-410A	1.02
R-507A	1.00

Table 6. Voltage Frequency Capacity Factor

Frequency	Capacity Factor
60 Hz	1.0
50 Hz (H, L, X, Q)	0.92
50 Hz (E)	1.0

CONDENSER CAPACITY

HNQ 540 830 VSEC 1140

Table 7. HNQ Models, 540 RPM, 0.5 HP, 30" Fan Diameter

Model	R22 / R410A MBH / 1° TD				R404A/R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNQ-S01-A005	4.6	5.2	5.6	5.9	4.6	5.1	5.5	5.8
HNQ-S01-A006	5.5	6.1	6.4	6.6	5.4	5.9	6.2	6.5
HNQ-S02-A008	7.2	8.0	8.7	9.1	7.0	7.8	8.5	8.9
HNQ-S02-A010	9.4	10.3	10.8	11.8	9.2	10.1	10.6	11.6
HNQ-S02-A011	10.8	11.5	11.9	12.3	10.6	11.2	11.7	12.0
HNQ-S03-A016	14.1	15.6	16.2	16.9	13.8	15.2	15.9	16.6
HNQ-S03-A017	16.2	17.2	17.9	19.8	15.9	16.9	17.5	19.4
HNQ-S04-A021	18.8	20.7	21.6	23.5	18.4	20.3	21.2	23.0
HNQ-S04-A023	21.6	22.9	23.8	24.5	21.2	22.4	23.3	24.0
HNQ-S05-A026	23.5	25.9	27.0	29.3	23.1	25.4	26.4	28.8
HNQ-S05-A029	27.0	28.6	29.8	30.7	26.5	28.1	29.2	30.1
HNQ-S06-A034	32.4	34.4	35.7	36.8	31.8	33.7	35.0	36.1
HNQ-S07-A042	38.4	41.6	42.8	44.3	37.7	40.7	41.9	43.4
HNQ-D04-A016	14.3	16.0	17.3	18.2	14.0	15.6	16.9	17.9
HNQ-D04-A021	18.8	20.7	21.6	23.6	18.4	20.3	21.2	23.2
HNQ-D04-A023	21.6	22.9	23.8	24.5	21.2	22.4	23.3	24.0
HNQ-D06-A031	28.2	31.0	32.4	33.8	27.6	30.4	31.8	33.1
HNQ-D06-A034	32.4	34.4	35.7	39.5	31.8	33.7	35.0	38.7
HNQ-D08-A041	37.6	41.4	43.2	47.0	36.9	40.6	42.3	46.1
HNQ-D08-A046	43.2	45.8	47.6	49.0	42.4	44.9	46.7	48.1
HNQ-D10-A052	47.0	51.8	54.0	58.7	46.1	50.7	52.9	57.5
HNQ-D10-A057	54.0	57.3	59.5	61.3	53.0	56.1	58.3	60.1
HNQ-D12-A069	64.8	68.7	71.4	73.6	63.6	67.3	70.0	72.1
HNQ-D14-A083	76.8	83.1	85.5	88.6	75.3	81.5	83.8	86.8

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNQ 540 830 VSEC 1140

Table 8. HNQ Models, 540 RPM, 0.5 HP, 30" Fan Diameter

Model	R407A / R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNQ-S01-A005	4.5	5.0	5.4	5.7	4.3	4.8	5.2	5.5
HNQ-S01-A006	5.3	5.8	6.1	6.3	5.1	5.6	5.9	6.1
HNQ-S02-A008	6.9	7.6	8.3	8.7	6.6	7.3	8.0	8.4
HNQ-S02-A010	9.0	9.9	10.4	11.3	8.7	9.5	10.0	10.9
HNQ-S02-A011	10.4	11.0	11.4	11.8	10.0	10.6	11.0	11.3
HNQ-S03-A016	13.5	14.9	15.6	16.2	13.0	14.3	14.9	15.6
HNQ-S03-A017	15.6	16.5	17.1	19.0	14.9	15.8	16.4	18.2
HNQ-S04-A021	18.1	19.9	20.8	22.6	17.3	19.1	19.9	21.6
HNQ-S04-A023	20.8	22.0	22.9	23.6	19.9	21.1	21.9	22.6
HNQ-S05-A026	22.6	24.9	25.9	28.2	21.7	23.8	24.9	27.0
HNQ-S05-A029	25.9	27.5	28.6	29.5	24.9	26.4	27.4	28.3
HNQ-S06-A034	31.1	33.0	34.3	35.3	29.9	31.7	32.9	33.9
HNQ-S07-A042	36.9	39.9	41.1	42.5	35.4	38.3	39.4	40.8
HNQ-D04-A016	13.8	15.3	16.6	17.5	13.2	14.7	15.9	16.8
HNQ-D04-A021	18.1	19.9	20.7	22.7	17.3	19.1	19.9	21.8
HNQ-D04-A023	20.8	22.0	22.9	23.6	19.9	21.1	21.9	22.6
HNQ-D06-A031	27.1	29.8	31.1	32.5	26.0	28.6	29.9	31.1
HNQ-D06-A034	31.1	33.0	34.3	38.0	29.9	31.7	32.9	36.4
HNQ-D08-A041	36.1	39.8	41.5	45.1	34.6	38.1	39.8	43.3
HNQ-D08-A046	41.5	44.0	45.7	47.1	39.8	42.2	43.9	45.2
HNQ-D10-A052	45.2	49.7	51.9	56.4	43.3	47.7	49.7	54.1
HNQ-D10-A057	51.9	55.0	57.2	58.9	49.8	52.8	54.8	56.5
HNQ-D12-A069	62.3	66.0	68.6	70.7	59.7	63.3	65.8	67.8
HNQ-D14-A083	73.8	79.9	82.2	85.1	70.8	76.6	78.8	81.6

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNQ 540 830 VSEC 1140

Table 9. HNQ Models, 540 RPM, 0.5 HP, 30" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNQ-S01-A005	4.5	5.1	5.4	5.8
HNQ-S01-A006	5.3	5.9	6.2	6.4
HNQ-S02-A008	6.9	7.7	8.4	8.8
HNQ-S02-A010	9.1	10.0	10.5	11.5
HNQ-S02-A011	10.5	11.1	11.5	11.9
HNQ-S03-A016	13.7	15.1	15.7	16.4
HNQ-S03-A017	15.7	16.7	17.3	19.2
HNQ-S04-A021	18.2	20.1	21.0	22.8
HNQ-S04-A023	21.0	22.2	23.1	23.8
HNQ-S05-A026	22.8	25.1	26.2	28.5
HNQ-S05-A029	26.2	27.8	28.9	29.8
HNQ-S06-A034	31.5	33.3	34.6	35.7
HNQ-S07-A042	37.3	40.3	41.5	43.0
HNQ-D04-A016	13.9	15.5	16.8	17.7
HNQ-D04-A021	18.2	20.1	20.9	22.9
HNQ-D04-A023	21.0	22.2	23.1	23.8
HNQ-D06-A031	27.3	30.1	31.5	32.8
HNQ-D06-A034	31.5	33.3	34.6	38.3
HNQ-D08-A041	36.5	40.2	41.9	45.6
HNQ-D08-A046	41.9	44.5	46.2	47.6
HNQ-D10-A052	45.6	50.2	52.4	56.9
HNQ-D10-A057	52.4	55.6	57.7	59.5
HNQ-D12-A069	62.9	66.7	69.3	71.4
HNQ-D14-A083	74.6	80.7	83.0	85.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNQ 540 830 VSEC 1140

Table 10. HNQ Models, 540 RPM, 0.5 HP, 30" Fan Diameter

Model	CFM	208-230/3/60			460/3/60			Unit kW	Conn. (in.)	Max. No. of Feeds	Approx. Net Weight (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD				
HNQ-S01-A005	5,400	3.5	15.0	15	1.8	15.0	15	0.4	1 3/8	7	330
HNQ-S01-A006	5,200	3.5	15.0	15	1.8	15.0	15	0.4	1 3/8	14	360
HNQ-S02-A008	11,200	7.0	15.0	15	3.6	15.0	15	0.9	1 3/8	14	580
HNQ-S02-A010	10,800	7.0	15.0	15	3.6	15.0	15	0.9	1 5/8	21	630
HNQ-S02-A011	10,400	7.0	15.0	15	3.6	15.0	15	0.9	2 1/8	28	680
HNQ-S03-A016	16,100	10.5	15.0	20	5.4	15.0	15	1.3	2 1/8	21	930
HNQ-S03-A017	15,600	10.5	15.0	20	5.4	15.0	15	1.3	2 1/8	28	1,000
HNQ-S04-A021	21,500	14.0	15.0	20	7.2	15.0	15	1.7	2 1/8	21	1,210
HNQ-S04-A023	20,800	14.0	15.0	20	7.2	15.0	15	1.7	2 5/8	28	1,310
HNQ-S05-A026	26,900	17.5	20.0	25	9.0	15.0	15	2.2	2 5/8	21	1,510
HNQ-S05-A029	26,000	17.5	20.0	25	9.0	15.0	15	2.2	2 5/8	28	1,640
HNQ-S06-A034	31,200	21.0	21.9	30	10.8	15.0	15	2.6	2 5/8	28	1,950
HNQ-S07-A042	36,400	24.5	25.4	35	12.6	15.0	15	3.1	2 @ 2 5/8	28	2,240
HNQ-D04-A016	22,300	14.0	15.0	20	7.2	15.0	15	1.7	2 @ 1 3/8	28	1,240
HNQ-D04-A021	21,500	14.0	15.0	20	7.2	15.0	15	1.7	2 @ 1 5/8	42	1,340
HNQ-D04-A023	20,800	14.0	15.0	20	7.2	15.0	15	1.7	2 @ 2 1/8	56	1,440
HNQ-D06-A031	32,300	21.0	21.9	30	10.8	15.0	15	2.6	2 @ 2 1/8	42	1,990
HNQ-D06-A034	31,200	21.0	21.9	30	10.8	15.0	15	2.6	2 @ 2 1/8	56	2,140
HNQ-D08-A041	43,000	28.0	28.9	35	14.4	15.0	20	3.5	2 @ 2 1/8	42	2,630
HNQ-D08-A046	41,600	28.0	28.9	35	14.4	15.0	20	3.5	2 @ 2 5/8	56	2,830
HNQ-D10-A052	53,700	35.0	35.9	45	18.0	20.0	20	4.4	2 @ 2 5/8	42	3,290
HNQ-D10-A057	52,100	35.0	35.9	45	18.0	20.0	20	4.4	2 @ 2 5/8	56	3,540
HNQ-D12-A069	62,500	42.0	42.9	50	21.6	22.1	25	5.2	2 @ 2 5/8	56	4,230
HNQ-D14-A083	72,900	49.0	49.9	60	25.2	25.7	30	6.1	4 @ 2 5/8	56	4,910

CONDENSER CAPACITY

HNX 540 830 VSEC 1140

Table 11. HNX Models, 830 RPM, 1.0 HP, 30" Fan Diameter

Model	R22/R410A MBH / 1° TD				R404A/R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNX-S01-A006	5.6	6.4	7.0	7.4	5.5	6.2	6.8	7.3
HNX-S01-A008	6.8	7.5	8.0	8.4	6.6	7.4	7.9	8.3
HNX-S02-A010	8.8	9.8	10.6	11.2	8.6	9.6	10.4	11.0
HNX-S02-A013	12.0	13.1	13.8	14.8	11.8	12.8	13.6	14.5
HNX-S02-A015	14.0	15.1	15.7	16.0	13.7	14.8	15.3	15.7
HNX-S03-A020	18.0	19.7	20.8	21.8	17.7	19.3	20.4	21.4
HNX-S03-A023	21.0	22.7	23.5	25.3	20.5	22.3	23.0	24.8
HNX-S04-A026	24.1	26.3	27.7	29.3	23.6	25.7	27.1	28.7
HNX-S04-A030	27.9	30.3	31.3	32.0	27.4	29.7	30.7	31.4
HNX-S05-A033	30.1	32.8	34.6	36.7	29.5	32.1	33.9	36.0
HNX-S05-A038	34.9	37.8	39.2	40.1	34.2	37.1	38.4	39.3
HNX-S06-A045	41.9	45.4	47.0	48.1	41.1	44.5	46.0	47.1
HNX-S07-A052	47.7	52.0	54.8	56.1	46.8	51.0	53.7	55.0
HNX-D04-A020	17.5	19.6	21.2	22.5	17.2	19.2	20.8	22.0
HNX-D04-A026	24.1	26.2	27.7	29.7	23.6	25.7	27.1	29.1
HNX-D04-A030	27.9	30.3	31.3	32.0	27.4	29.7	30.7	31.4
HNX-D06-A039	36.1	39.4	41.5	43.7	35.4	38.6	40.7	42.8
HNX-D06-A045	41.9	45.4	47.0	50.6	41.1	44.5	46.0	49.6
HNX-D08-A052	48.1	52.5	55.4	58.6	47.1	51.4	54.3	57.5
HNX-D08-A061	55.9	60.6	62.7	64.1	54.8	59.3	61.4	62.8
HNX-D10-A066	60.1	65.6	69.2	73.5	58.9	64.3	67.8	72.0
HNX-D10-A076	69.9	75.7	78.3	80.1	68.4	74.2	76.8	78.5
HNX-D12-A091	83.8	90.8	94.0	96.1	82.1	89.0	92.1	94.2
HNX-D14-A104	95.5	104.1	109.6	112.2	93.6	102.0	107.5	110.0

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNX 540 830 VSEC 1140

Table 12. HNX Models, 830 RPM, 1.0 HP, 30" Fan Diameter

Model	R407A / R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNX-S01-A006	5.4	6.1	6.7	7.1	5.2	5.9	6.4	6.8
HNX-S01-A008	6.5	7.2	7.7	8.1	6.2	6.9	7.4	7.8
HNX-S02-A010	8.4	9.4	10.2	10.8	8.1	9.0	9.8	10.4
HNX-S02-A013	11.6	12.6	13.3	14.3	11.1	12.1	12.7	13.7
HNX-S02-A015	13.4	14.5	15.0	15.4	12.9	13.9	14.4	14.8
HNX-S03-A020	17.3	18.9	19.9	21.0	16.6	18.1	19.1	20.1
HNX-S03-A023	20.1	21.8	22.5	24.3	19.3	20.9	21.6	23.3
HNX-S04-A026	23.1	25.2	26.6	28.2	22.2	24.2	25.5	27.0
HNX-S04-A030	26.8	29.1	30.1	30.8	25.7	27.9	28.9	29.5
HNX-S05-A033	28.9	31.5	33.2	35.3	27.7	30.2	31.9	33.9
HNX-S05-A038	33.5	36.3	37.6	38.5	32.2	34.8	36.1	36.9
HNX-S06-A045	40.2	43.6	45.1	46.1	38.6	41.8	43.3	44.3
HNX-S07-A052	45.9	50.0	52.7	53.9	44.0	47.9	50.5	51.7
HNX-D04-A020	16.8	18.8	20.4	21.6	16.1	18.0	19.6	20.7
HNX-D04-A026	23.1	25.2	26.6	28.5	22.2	24.2	25.5	27.3
HNX-D04-A030	26.8	29.1	30.1	30.8	25.7	27.9	28.9	29.5
HNX-D06-A039	34.7	37.8	39.9	41.9	33.2	36.3	38.3	40.2
HNX-D06-A045	40.2	43.6	45.1	48.6	38.6	41.8	43.3	46.6
HNX-D08-A052	46.2	50.4	53.2	56.3	44.3	48.4	51.0	54.0
HNX-D08-A061	53.7	58.1	60.2	61.5	51.5	55.8	57.7	59.0
HNX-D10-A066	57.8	63.0	66.5	70.6	55.4	60.4	63.8	67.7
HNX-D10-A076	67.1	72.7	75.2	76.9	64.3	69.7	72.1	73.8
HNX-D12-A091	80.5	87.2	90.3	92.3	77.2	83.7	86.6	88.5
HNX-D14-A104	91.7	100.0	105.3	107.8	88.0	95.9	101.0	103.4

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNX 540 830 VSEC 1140

Table 13. HNX Models, 830 RPM, 1.0 HP, 30" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNX-S01-A006	5.5	6.2	6.7	7.2
HNX-S01-A008	6.6	7.3	7.8	8.2
HNX-S02-A010	8.5	9.5	10.3	10.9
HNX-S02-A013	11.7	12.7	13.4	14.4
HNX-S02-A015	13.6	14.7	15.2	15.6
HNX-S03-A020	17.5	19.1	20.1	21.2
HNX-S03-A023	20.3	22.0	22.8	24.5
HNX-S04-A026	23.3	25.5	26.8	28.5
HNX-S04-A030	27.1	29.4	30.4	31.1
HNX-S05-A033	29.2	31.8	33.6	35.7
HNX-S05-A038	33.9	36.7	38.0	38.9
HNX-S06-A045	40.7	44.1	45.6	46.6
HNX-S07-A052	46.3	50.5	53.2	54.5
HNX-D04-A020	17.0	19.0	20.6	21.8
HNX-D04-A026	23.3	25.5	26.9	28.8
HNX-D04-A030	27.1	29.4	30.4	31.1
HNX-D06-A039	35.0	38.2	40.3	42.4
HNX-D06-A045	40.7	44.1	45.6	49.1
HNX-D08-A052	46.7	50.9	53.7	56.9
HNX-D08-A061	54.2	58.7	60.8	62.1
HNX-D10-A066	58.3	63.7	67.2	71.3
HNX-D10-A076	67.8	73.4	76.0	77.7
HNX-D12-A091	81.3	88.1	91.2	93.2
HNX-D14-A104	92.6	101.0	106.4	108.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNX 540 830 VSEC 1140

Table 14. 3-Phase A/C HNX Models, 830 RPM, 1.0 HP, 30" Fan Diameter

Model	CFM	208-230/3/60			460/3/60			Unit kW	Conn. (in.)	Max. No. of Feeds	Approx. Net Wt. (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD				
HNX-S01-A006	7,600	4.8	15.0	15	2.4	15.0	15	1.1	1 3/8	7	330
HNX-S01-A008	7,300	4.8	15.0	15	2.4	15.0	15	1.1	1 3/8	14	360
HNX-S02-A010	15,900	9.6	15.0	20	4.8	15.0	15	2.2	1 3/8	14	580
HNX-S02-A013	15,200	9.6	15.0	20	4.8	15.0	15	2.2	1 5/8	21	630
HNX-S02-A015	14,700	9.6	15.0	20	4.8	15.0	15	2.2	2 1/8	28	680
HNX-S03-A020	22,900	14.4	20.0	25	7.2	15.0	15	3.4	2 1/8	21	930
HNX-S03-A023	22,000	14.4	20.0	25	7.2	15.0	15	3.4	2 1/8	28	1,000
HNX-S04-A026	29,800	19.2	20.4	30	9.6	15.0	15	4.5	2 1/8	21	1,210
HNX-S04-A030	28,400	19.2	20.4	30	9.6	15.0	15	4.5	2 5/8	28	1,310
HNX-S05-A033	37,300	24.0	25.2	35	12.0	15.0	15	5.6	2 5/8	21	1,510
HNX-S05-A038	35,500	24.0	25.2	35	12.0	15.0	15	5.6	2 5/8	28	1,640
HNX-S06-A045	42,600	28.8	30.0	40	14.4	15.0	20	6.7	2 5/8	28	1,950
HNX-S07-A052	49,700	33.6	34.8	45	16.8	20.0	20	7.8	2 @ 2 5/8	28	2,240
HNX-D04-A020	31,700	19.2	20.4	30	9.6	15.0	15	4.5	2 @ 1 3/8	28	1,240
HNX-D04-A026	30,500	19.2	20.4	30	9.6	15.0	15	4.5	2 @ 1 5/8	42	1,340
HNX-D04-A030	29,300	19.2	20.4	30	9.6	15.0	15	4.5	2 @ 2 1/8	56	1,440
HNX-D06-A039	45,700	28.8	30.0	40	14.4	15.0	20	6.7	2 @ 2 1/8	42	1,990
HNX-D06-A045	44,000	28.8	30.0	40	14.4	15.0	20	6.7	2 @ 2 1/8	56	2,140
HNX-D08-A052	59,700	38.4	39.6	50	19.2	20.0	25	8.9	2 @ 2 1/8	42	2,630
HNX-D08-A061	56,800	38.4	39.6	50	19.2	20.0	25	8.9	2 @ 2 5/8	56	2,830
HNX-D10-A066	74,600	48.0	49.2	60	24.0	24.6	30	11.2	2 @ 2 5/8	42	3,290
HNX-D10-A076	71,000	48.0	49.2	60	24.0	24.6	30	11.2	2 @ 2 5/8	56	3,540
HNX-D12-A091	85,200	57.6	58.8	70	28.8	29.4	35	13.4	2 @ 2 5/8	56	4,230
HNX-D14-A104	99,400	67.2	68.4	80	33.6	34.2	40	15.6	4 @ 2 5/8	56	4,910

CONDENSER CAPACITY

HNL 540 830 VSEC 1140

Table 15. HNL Models, 830 RPM, 1.5 HP, 30" Fan Diameter

Model	R22 / R410A MBH / 1° TD				R404A/R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNL-S01-A007	5.9	6.7	7.3	7.9	5.8	6.6	7.2	7.7
HNL-S01-A008	7.2	8.0	8.6	9.0	7.0	7.8	8.4	8.8
HNL-S02-A010	9.1	10.1	11.0	11.7	8.9	9.9	10.8	11.4
HNL-S02-A014	12.6	13.9	14.9	15.7	12.4	13.6	14.6	15.4
HNL-S02-A016	15.0	16.1	16.8	17.6	14.7	15.8	16.5	17.3
HNL-S03-A021	18.9	20.9	22.3	23.4	18.6	20.5	21.8	23.0
HNL-S03-A024	22.5	24.2	25.2	26.9	22.0	23.8	24.7	26.3
HNL-S04-A028	25.3	27.8	29.7	31.2	24.8	27.3	29.1	30.6
HNL-S04-A032	30.0	32.3	33.6	35.2	29.4	31.7	32.9	34.5
HNL-S05-A035	32.1	35.5	37.4	39.0	31.4	34.7	36.6	38.2
HNL-S05-A042	38.4	41.6	43.4	44.7	37.7	40.8	42.5	43.8
HNL-S06-A050	46.1	49.9	52.1	53.6	45.2	48.9	51.0	52.6
HNL-S07-A055	50.5	55.0	58.0	60.2	49.5	53.9	56.8	59.0
HNL-D04-A020	18.1	20.2	22.0	23.3	17.7	19.8	21.5	22.9
HNL-D04-A028	25.3	27.8	29.7	31.4	24.8	27.3	29.1	30.7
HNL-D04-A032	30.0	32.3	33.6	35.2	29.4	31.7	32.9	34.5
HNL-D06-A042	37.9	41.8	44.5	46.9	37.2	40.9	43.7	45.9
HNL-D06-A048	45.0	48.4	50.4	53.7	44.1	47.5	49.4	52.7
HNL-D08-A056	50.6	55.7	59.4	62.4	49.6	54.6	58.3	61.1
HNL-D08-A065	60.0	64.6	67.2	70.4	58.8	63.3	65.8	69.0
HNL-D10-A071	64.2	70.9	74.7	78.0	62.9	69.5	73.2	76.5
HNL-D10-A083	76.9	83.1	86.8	89.4	75.3	81.5	85.0	87.6
HNL-D12-A100	90.4	99.8	104.1	107.3	92.2	97.8	102.0	105.1
HNL-D14-A110	101.1	110.0	116.0	120.3	99.1	107.9	113.7	117.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNL 540 830 VSEC 1140

Table 16. HNL Models, 830 RPM, 1.5 HP, 30" Fan Diameter

Model	R407A / R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNL-S01-A007	5.7	6.5	7.0	7.6	5.5	6.2	6.8	7.2
HNL-S01-A008	6.9	7.7	8.2	8.6	6.6	7.3	7.9	8.3
HNL-S02-A010	8.7	9.7	10.6	11.2	8.3	9.3	10.1	10.8
HNL-S02-A014	12.1	13.4	14.3	15.1	11.6	12.8	13.7	14.4
HNL-S02-A016	14.4	15.5	16.1	16.9	13.8	14.9	15.5	16.2
HNL-S03-A021	18.2	20.1	21.4	22.5	17.5	19.2	20.5	21.6
HNL-S03-A024	21.6	23.3	24.2	25.8	20.7	22.3	23.2	24.8
HNL-S04-A028	24.3	26.7	28.5	30.0	23.3	25.6	27.4	28.7
HNL-S04-A032	28.8	31.0	32.3	33.8	27.6	29.8	31.0	32.4
HNL-S05-A035	30.8	34.0	35.9	37.5	29.6	32.7	34.4	35.9
HNL-S05-A042	36.9	39.9	41.7	42.9	35.4	38.3	40.0	41.2
HNL-S06-A050	44.3	47.9	50.0	51.5	42.5	45.9	48.0	49.4
HNL-S07-A055	48.5	52.8	55.7	57.8	46.6	50.7	53.4	55.4
HNL-D04-A020	17.4	19.4	21.1	22.4	16.7	18.6	20.2	21.5
HNL-D04-A028	24.3	26.7	28.5	30.1	23.3	25.6	27.4	28.9
HNL-D04-A032	28.8	31.0	32.3	33.8	27.6	29.8	30.9	32.4
HNL-D06-A042	36.4	40.1	42.8	45.0	34.9	38.5	41.0	43.2
HNL-D06-A048	43.2	46.5	48.4	51.6	41.4	44.6	46.4	49.5
HNL-D08-A056	48.6	53.5	57.1	59.9	46.6	51.3	54.8	57.5
HNL-D08-A065	57.6	62.1	64.5	67.6	55.3	59.5	61.9	64.8
HNL-D10-A071	61.6	68.1	71.8	74.9	59.1	65.3	68.9	71.9
HNL-D10-A083	73.8	79.8	83.3	85.8	70.8	76.6	79.9	82.3
HNL-D12-A100	90.4	95.8	99.9	103.0	86.7	91.9	95.9	98.8
HNL-D14-A110	97.1	105.7	111.4	115.6	93.1	101.4	106.9	110.9

BOLD indicates standard model capacity.

*Data based on mid point condensing temperature

CONDENSER CAPACITY

HNL 540 830 VSEC 1140

Table 17. HNL Models, 830 RPM, 1.5 HP, 30" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNL-S01-A007	5.8	6.5	7.1	7.6
HNL-S01-A008	7.0	7.7	8.3	8.7
HNL-S02-A010	8.8	9.8	10.7	11.3
HNL-S02-A014	12.3	13.5	14.4	15.2
HNL-S02-A016	14.6	15.7	16.3	17.1
HNL-S03-A021	18.4	20.3	21.6	22.7
HNL-S03-A024	21.8	23.5	24.4	26.1
HNL-S04-A028	24.5	27.0	28.8	30.3
HNL-S04-A032	29.1	31.4	32.6	34.1
HNL-S05-A035	31.1	34.4	36.3	37.9
HNL-S05-A042	37.3	40.4	42.1	43.4
HNL-S06-A050	44.8	48.4	50.5	52.0
HNL-S07-A055	49.0	53.4	56.3	58.4
HNL-D04-A020	17.6	19.6	21.3	22.6
HNL-D04-A028	24.5	27.0	28.8	30.4
HNL-D04-A032	29.1	31.4	32.6	34.1
HNL-D06-A042	36.8	40.5	43.2	45.5
HNL-D06-A048	43.6	47.0	48.9	52.2
HNL-D08-A056	49.1	54.0	57.7	60.5
HNL-D08-A065	58.2	62.7	65.2	68.3
HNL-D10-A071	62.2	68.8	72.5	75.7
HNL-D10-A083	74.6	80.7	84.2	86.7
HNL-D12-A100	91.3	96.8	101.0	104.1
HNL-D14-A110	98.1	106.8	112.6	116.8

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNL 540 830 VSEC 1140

Table 18. HNL Models, 830 RPM, 1.5 HP, 30" Fan Diameter

Model	CFM	208-230/3/60			460/3/60			575/3/60			Unit kW	Conn. (in.)	Max. No. of Feeds	Approx. Net Weight (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD	FLA	MCA	MOPD				
HNL-S01-A007	8,400	6.6	15.0	25	3.3	15.0	15	2.6	15.0	15	1.4	1 3/8	7	330
HNL-S01-A008	8,000	6.6	15.0	25	3.3	15.0	15	2.6	15.0	15	1.4	1 3/8	14	360
HNL-S02-A010	17,500	13.2	15.0	30	6.6	15.0	15	5.2	15.0	15	2.7	1 3/8	14	580
HNL-S02-A014	16,700	13.2	15.0	30	6.6	15.0	15	5.2	15.0	15	2.7	1 5/8	21	630
HNL-S02-A016	16,100	13.2	15.0	30	6.6	15.0	15	5.2	15.0	15	2.7	2 1/8	28	680
HNL-S03-A021	25,100	19.8	21.5	35	9.9	15.0	15	7.8	15.0	15	4.1	2 1/8	21	930
HNL-S03-A024	24,100	19.8	21.5	35	9.9	15.0	15	7.8	15.0	15	4.1	2 1/8	28	1,000
HNL-S04-A028	32,800	26.4	28.1	45	13.2	15.0	20	10.4	15.0	15	5.4	2 1/8	21	1,210
HNL-S04-A032	31,200	26.4	28.1	45	13.2	15.0	20	10.4	15.0	15	5.4	2 5/8	28	1,310
HNL-S05-A035	41,000	33.0	34.7	50	16.5	20.0	25	13.0	15.0	20	6.8	2 5/8	21	1,510
HNL-S05-A042	39,100	33.0	34.7	50	16.5	20.0	25	13.0	15.0	20	6.8	2 5/8	28	1,640
HNL-S06-A050	46,900	39.6	41.3	50	19.8	20.6	25	15.6	20.0	20	8.1	2 5/8	28	1,950
HNL-S07-A055	54,700	46.2	47.9	60	23.1	23.9	30	18.2	20.0	25	9.5	2 @ 2 5/8	28	2,240
HNL-D04-A020	35,000	26.4	28.1	45	13.2	15.0	20	10.4	15.0	15	5.4	2 @ 1 3/8	28	1,240
HNL-D04-A028	33,500	26.4	28.1	45	13.2	15.0	20	10.4	15.0	15	5.4	2 @ 1 5/8	42	1,340
HNL-D04-A032	32,100	26.4	28.1	45	13.2	15.0	20	10.4	15.0	15	5.4	2 @ 2 1/8	56	1,440
HNL-D06-A042	50,200	39.6	41.3	50	19.8	20.6	25	15.6	20.0	20	8.1	2 @ 2 1/8	42	1,990
HNL-D06-A048	48,200	39.6	41.3	50	19.8	20.6	25	15.6	20.0	20	8.1	2 @ 2 1/8	56	2,140
HNL-D08-A056	65,600	52.8	54.5	70	26.4	27.2	35	20.8	21.5	25	10.8	2 @ 2 1/8	42	2,630
HNL-D08-A065	62,500	52.8	54.5	70	26.4	27.2	35	20.8	21.5	25	10.8	2 @ 2 5/8	56	2,830
HNL-D10-A071	82,000	66.0	67.7	80	33.0	33.8	40	26.0	26.7	30	13.5	2 @ 2 5/8	42	3,290
HNL-D10-A083	78,100	66.0	67.7	80	33.0	33.8	40	26.0	26.7	30	13.5	2 @ 2 5/8	56	3,540
HNL-D12-A100	93,700	79.2	80.9	90	39.6	40.4	45	31.2	31.9	35	16.2	2 @ 2 5/8	56	4,230
HNL-D14-A110	109,300	92.4	94.1	110	46.2	47.0	50	36.4	37.1	40	18.9	4 @ 2 5/8	56	4,910

CONDENSER CAPACITY

HNH

540 830 VSEC 1140

Table 19. HNH Models, 1140 RPM, 1.5 HP, 30" Fan Diameter

Model	R22 / R410A MBH / 1° TD				R404A/R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNH-S01-A007	6.4	7.3	8.0	8.6	6.3	7.2	7.9	8.5
HNH-S01-A009	7.8	8.7	9.5	10.0	7.6	8.6	9.3	9.8
HNH-S02-A011	9.6	10.7	11.7	12.4	9.4	10.5	11.5	12.1
HNH-S02-A015	13.1	14.5	15.6	16.3	12.8	14.2	15.3	16.0
HNH-S02-A017	15.7	17.1	18.1	19.2	15.3	16.7	17.7	18.8
HNH-S03-A022	19.7	21.8	23.4	24.5	19.3	21.4	22.9	24.0
HNH-S03-A026	23.5	25.7	27.1	29.9	23.1	25.2	26.6	29.3
HNH-S04-A029	26.2	29.1	31.2	32.6	25.7	28.5	30.5	32.0
HNH-S04-A034	31.4	34.2	36.1	38.3	30.7	33.5	35.4	37.6
HNH-S05-A037	33.6	37.1	39.3	41.3	32.9	36.4	38.5	40.5
HNH-S05-A044	40.5	44.0	46.1	48.6	39.7	43.1	45.1	47.6
HNH-S06-A053	48.6	52.8	55.3	58.3	47.7	51.7	54.1	57.1
HNH-S07-A061	55.4	61.0	64.7	67.5	54.3	59.8	63.5	66.2
HNH-D04-A021	19.2	21.4	23.4	24.8	18.8	21.0	22.9	24.3
HNH-D04-A029	26.2	29.1	31.2	32.6	25.7	28.5	30.6	32.0
HNH-D04-A034	31.4	34.2	36.1	38.3	30.7	33.5	35.4	37.6
HNH-D06-A044	39.4	43.6	46.7	48.9	38.6	42.8	45.8	47.9
HNH-D06-A051	47.0	51.3	54.2	59.8	46.1	50.3	53.1	58.7
HNH-D08-A058	52.5	58.2	62.3	65.3	51.4	57.0	61.1	63.9
HNH-D08-A068	62.7	68.4	72.3	76.7	61.5	67.1	70.8	75.1
HNH-D10-A074	67.1	74.2	78.5	82.6	65.7	72.7	76.9	80.9
HNH-D10-A088	81.0	88.0	92.1	97.2	79.4	86.2	90.2	95.2
HNH-D12-A106	97.2	105.6	110.5	116.6	95.3	103.5	108.3	114.2
HNH-D14-A122	110.8	121.9	129.5	135.0	108.6	119.5	126.9	132.4

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNH 540 830 VSEC 1140

Table 20. HNH Models, 1140 RPM, 1.5 HP, 30" Fan Diameter

Model	R407A/R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNH-S01-A007	6.1	7.0	7.7	8.3	5.9	6.7	7.4	8.0
HNH-S01-A009	7.5	8.4	9.1	9.6	7.2	8.1	8.7	9.2
HNH-S02-A011	9.2	10.3	11.2	11.9	8.8	9.9	10.8	11.4
HNH-S02-A015	12.6	14.0	15.0	15.7	12.1	13.4	14.4	15.0
HNH-S02-A017	15.0	16.4	17.4	18.4	14.4	15.7	16.6	17.6
HNH-S03-A022	18.9	21.0	22.4	23.5	18.1	20.1	21.5	22.5
HNH-S03-A026	22.6	24.6	26.0	28.8	21.7	23.6	25.0	27.6
HNH-S04-A029	25.2	28.0	29.9	31.3	24.1	26.8	28.7	30.1
HNH-S04-A034	30.1	32.9	34.7	36.8	28.9	31.5	33.3	35.3
HNH-S05-A037	32.2	35.6	37.7	39.7	30.9	34.2	36.2	38.0
HNH-S05-A044	38.9	42.3	44.2	46.7	37.3	40.5	42.4	44.8
HNH-S06-A053	46.7	50.7	53.1	56.0	44.8	48.6	50.9	53.7
HNH-S07-A061	53.2	58.6	62.2	64.9	51.1	56.2	59.7	62.2
HNH-D04-A021	18.4	20.5	22.4	23.8	17.7	19.7	21.5	22.8
HNH-D04-A029	25.2	28.0	29.9	31.3	24.1	26.8	28.7	30.1
HNH-D04-A034	30.1	32.9	34.7	36.8	28.9	31.5	33.3	35.3
HNH-D06-A044	37.8	41.9	44.9	47.0	36.3	40.2	43.1	45.1
HNH-D06-A051	45.2	49.3	52.0	57.5	43.3	47.3	49.9	55.2
HNH-D08-A058	50.4	55.9	59.9	62.7	48.3	53.6	57.4	60.1
HNH-D08-A068	60.2	65.7	69.4	73.6	57.8	63.0	66.6	70.6
HNH-D10-A074	64.4	71.2	75.4	79.3	61.8	68.3	72.3	76.0
HNH-D10-A088	77.8	84.5	88.4	93.3	74.6	81.1	84.8	89.5
HNH-D12-A106	93.4	101.4	106.1	112.0	89.6	97.3	101.8	107.4
HNH-D14-A122	106.5	117.1	124.4	129.7	102.1	112.3	119.3	124.4

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNH 540 830 VSEC 1140

Table 21. HNH Models, 1140 RPM, 1.5 HP, 30" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNH-S01-A007	6.2	7.1	7.8	8.4
HNH-S01-A009	7.6	8.5	9.2	9.7
HNH-S02-A011	9.3	10.4	11.3	12.0
HNH-S02-A015	12.7	14.1	15.1	15.8
HNH-S02-A017	15.2	16.6	17.5	18.6
HNH-S03-A022	19.1	21.2	22.7	23.7
HNH-S03-A026	22.8	24.9	26.3	29.0
HNH-S04-A029	25.4	28.2	30.2	31.7
HNH-S04-A034	30.4	33.2	35.1	37.2
HNH-S05-A037	32.6	36.0	38.1	40.1
HNH-S05-A044	39.3	42.7	44.7	47.1
HNH-S06-A053	47.2	51.2	53.6	56.5
HNH-S07-A061	53.8	59.2	62.8	65.5
HNH-D04-A021	18.6	20.8	22.7	24.0
HNH-D04-A029	25.4	28.2	30.3	31.7
HNH-D04-A034	30.4	33.2	35.1	37.2
HNH-D06-A044	38.2	42.3	45.3	47.5
HNH-D06-A051	45.6	49.8	52.6	58.1
HNH-D08-A058	50.9	56.5	60.5	63.3
HNH-D08-A068	60.9	66.4	70.1	74.4
HNH-D10-A074	65.1	72.0	76.2	80.1
HNH-D10-A088	78.6	85.4	89.3	94.3
HNH-D12-A106	94.3	102.4	107.2	113.1
HNH-D14-A122	107.5	118.3	125.7	131.1

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNH 540 830 VSEC 1140

Table 22. HNH Models, 1140 RPM, 1.5 HP, 30" Fan Diameter

Model	CFM	208-230/3/60			460/3/60			575/3/60			Unit kW	Conn. (in.)	Max. No. of Feeds	Approx. Net Wt. (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD	FLA	MCA	MOPD				
HNH-S01-A007	9,900	7.0	15.0	25	3.5	15.0	15	2.8	15.0	15	1.9	1 3/8	7	330
HNH-S01-A009	9,500	7.0	15.0	25	3.5	15.0	15	2.8	15.0	15	1.9	1 3/8	14	360
HNH-S02-A011	20,500	14.0	20.0	35	7.0	15.0	15	5.6	15.0	15	3.8	1 3/8	14	580
HNH-S02-A015	19,800	14.0	20.0	35	7.0	15.0	15	5.6	15.0	15	3.8	1 5/8	21	630
HNH-S02-A017	19,000	14.0	20.0	35	7.0	15.0	15	5.6	15.0	15	3.8	2 1/8	28	680
HNH-S03-A022	29,700	21.0	22.8	40	10.5	15.0	20	8.4	15.0	15	5.8	2 1/8	21	930
HNH-S03-A026	28,500	21.0	22.8	40	10.5	15.0	20	8.4	15.0	15	5.8	2 1/8	28	1,000
HNH-S04-A029	38,600	28.0	29.8	45	14.0	15.0	20	11.2	15.0	15	7.7	2 1/8	21	1,210
HNH-S04-A034	37,000	28.0	29.8	45	14.0	15.0	20	11.2	15.0	15	7.7	2 5/8	28	1,310
HNH-S05-A037	48,300	35.0	36.8	50	17.5	20.0	25	14.0	15.0	20	9.6	2 5/8	21	1,510
HNH-S05-A044	46,200	35.0	36.8	50	17.5	20.0	25	14.0	15.0	20	9.6	2 5/8	28	1,640
HNH-S06-A053	55,400	42.0	43.8	60	21.0	21.9	30	16.8	20.0	25	11.5	2 5/8	28	1,950
HNH-S07-A061	64,700	49.0	50.8	70	24.5	25.4	35	19.6	20.3	25	13.5	2 @ 2 5/8	28	2,240
HNH-D04-A021	41,000	28.0	29.8	45	14.0	15.0	20	11.2	15.0	15	7.7	2 @ 1 3/8	28	1,240
HNH-D04-A029	39,600	28.0	29.8	45	14.0	15.0	20	11.2	15.0	15	7.7	2 @ 1 5/8	42	1,340
HNH-D04-A034	38,100	28.0	29.8	45	14.0	15.0	20	11.2	15.0	15	7.7	2 @ 2 1/8	56	1,440
HNH-D06-A044	59,400	42.0	43.8	60	21.0	21.9	30	16.8	20.0	25	11.5	2 @ 2 1/8	42	1,990
HNH-D06-A051	57,100	42.0	43.8	60	21.0	21.9	30	16.8	20.0	25	11.5	2 @ 2 1/8	56	2,140
HNH-D08-A058	77,200	56.0	57.8	70	28.0	28.9	35	22.4	23.1	30	15.4	2 @ 2 1/8	42	2,630
HNH-D08-A068	73,900	56.0	57.8	70	28.0	28.9	35	22.4	23.1	30	15.4	2 @ 2 5/8	56	2,830
HNH-D10-A074	96,500	70.0	71.8	90	35.0	35.9	45	28.0	28.7	35	19.2	2 @ 2 5/8	42	3,290
HNH-D10-A088	92,400	70.0	71.8	90	35.0	35.9	45	28.0	28.7	35	19.2	2 @ 2 5/8	56	3,540
HNH-D12-A106	110,900	84.0	85.8	100	42.0	42.9	50	33.6	34.3	40	23.1	2 @ 2 5/8	56	4,230
HNH-D14-A122	129,400	98.0	99.8	110	49.0	49.9	60	39.2	39.9	45	26.9	4 @ 2 5/8	56	4,910

Chandler Venturi Mounted VSEC Series Selection Tables

The Chandler Venturi Mounted VSEC Series of air-cooled condensers incorporates Venturi Mounted VSEC motor technology to provide the quietest and most efficient condensers in the industry, using integrated variable speed technology.

Simplicity: Variable speed without the complexity

The Chandler VSEC Series is a complete system that incorporates an VSEC motor, integrated drive and control electronics, optimized swept motor blade and venturi panel in one simple package. Variable speed is accomplished without the complexities typically associated with Variable Frequency Drives (VFD).

Flexibility: Maximum efficiency, minimum sound, capacity when you need it

The Venturi Mounted VSEC Series condensers' integrated variable speed capability allows optimization to your operating conditions; at higher speeds on hot summer afternoons to maintain capacity or at lower speeds at night to meet a local sound ordinance. Whatever your requirements, the Chandler VSEC Series can be selected and programmed to your specific needs; whether it is lower energy costs, lower sound or both.

Reliability: The highest quality backed by industry-leading warranties

We are so confident in the reliability of the VSEC motor that

we are providing an unprecedented 3-year warranty on the VSEC motor (2-year warranty on the unit) so you can be assured of worry-free operation.

Protection at every level

The VSEC motors have several built-in features that protect against locked-rotors, under-voltage and phase failure.

Variable Speed Operation

The Venturi Mounted VSEC Series condensers provide variable speed operation automatically; providing dramatically lower sound and energy levels than would be observed with condensers using traditional AC motors.

Typical performance of a Venturi Mounted VSEC Series condenser at various loads versus a 540 RPM, 830 RPM or 1140 RPM condenser is shown in the chart on the next page.

Model Selection

Selecting the right Chandler VSEC Series unit for your needs is easier than you think, and is just as easy as selecting a standard unit.

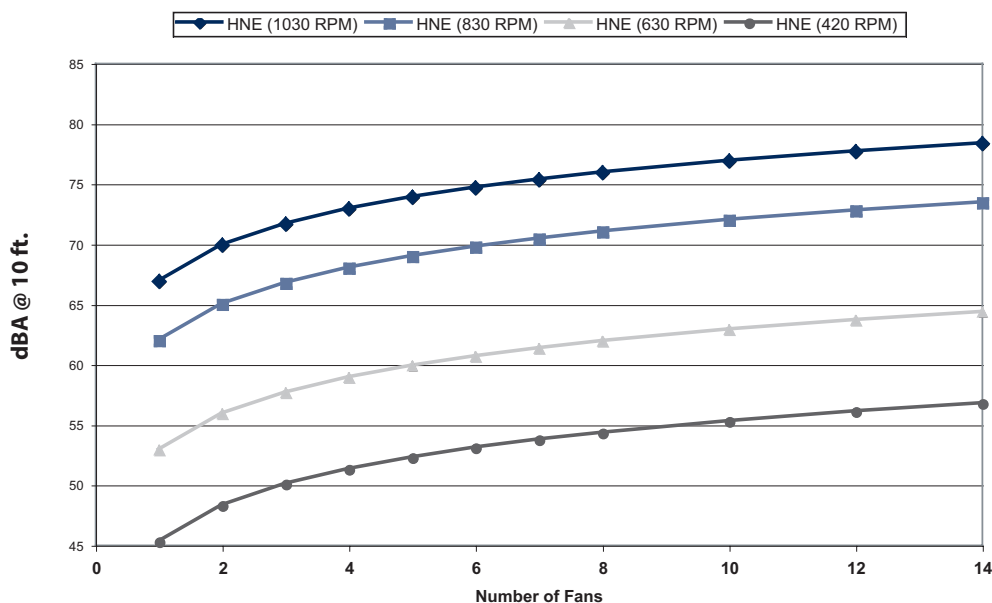
Simply use Tables 31-33 to find the model and fins per inch required to meet your capacity needs.

Selecting condensers with specific sound or energy levels

The variable speed nature allows selection to meet maximum sound or energy usage levels.

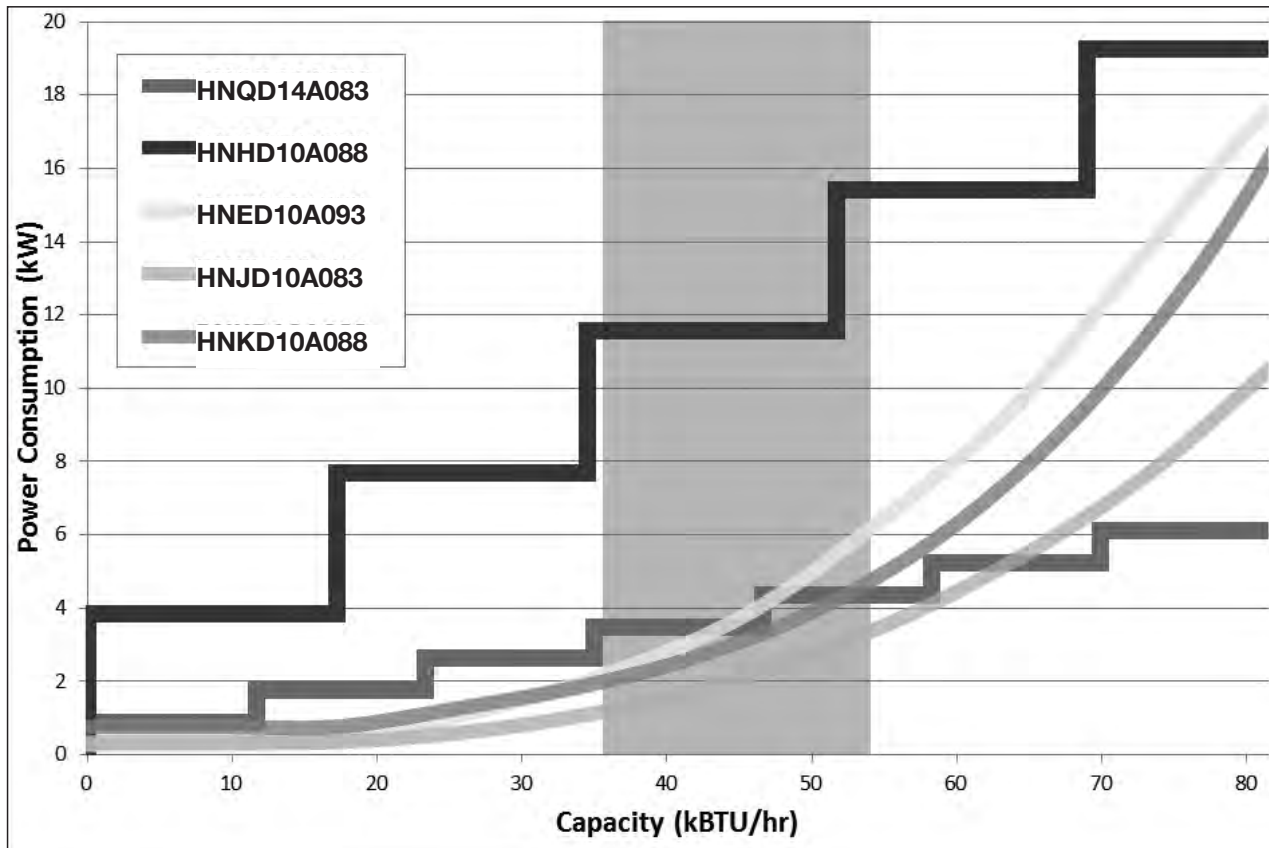
To select condensers with these goals in mind, please contact your sales representative. They will be able to help you select the appropriate model for your specific requirements.

EC Sound Data (dBA @ 10 ft.)



Fans	HNE 1030 RPM	HNE 830 RPM	HNE 630 RPM	HNE 420 RPM
1	66.9	62.0	52.9	45.3
2	69.9	65.0	55.9	48.3
3	71.7	66.8	57.7	50.1
4	72.9	68.0	58.9	51.3
5	73.9	69.0	59.9	52.3
6	74.7	69.8	60.7	53.1
7	75.4	70.5	61.4	53.8
8	75.9	71.0	61.9	54.3
10	76.9	72.0	62.9	55.3
12	77.7	72.8	63.7	56.1
14	78.4	73.5	64.4	56.8

Power Consumption & Variable Speed Operation Chandler VSEC vs. 540 and 1140 Series



10 Fan EC Motor Sound Production at Various Loads

Percent of Max. Load	30%	40%	50%	60%	70%	80%	90%	100%
RPM	215	313	407	511	630	748	892	1030
dBA @ 10 ft	49.5	51.8	55	58.4	62.9	67.8	74.8	76.9

CONDENSER CAPACITY

HNJ 540 830 VSEC 1140

Table 23. HNJ Models, 830 RPM, 1.1 kW, 30" Fan Diameter

Model	R22/R410A MBH / 1° TD				R404A / R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNJ-S01-A007	5.9	6.7	7.3	7.9	5.8	6.6	7.2	7.7
HNJ-S01-A008	7.2	8.0	8.6	9.0	7.0	7.8	8.4	8.8
HNJ-S02-A010	9.1	10.1	11.0	11.7	8.9	9.9	10.8	11.4
HNJ-S02-A014	12.6	13.9	14.9	15.7	12.4	13.6	14.6	15.4
HNJ-S02-A016	15.0	16.1	16.8	17.6	14.7	15.8	16.5	17.3
HNJ-S03-A021	18.9	20.9	22.3	23.4	18.6	20.5	21.8	23.0
HNJ-S03-A024	22.5	24.2	25.2	26.9	22.0	23.8	24.7	26.3
HNJ-S04-A028	25.3	27.8	29.7	31.2	24.8	27.3	29.1	30.6
HNJ-S04-A032	30.0	32.3	33.6	35.2	29.4	31.7	32.9	34.5
HNJ-S05-A035	32.1	35.5	37.4	39.0	31.4	34.7	36.6	38.2
HNJ-S05-A042	38.4	41.6	43.4	44.7	37.7	40.8	42.5	43.8
HNJ-S06-A050	46.1	49.9	52.1	53.6	45.2	48.9	51.0	52.6
HNJ-S07-A055	50.5	55.0	58.0	60.2	49.5	53.9	56.8	59.0
HNJ-D04-A020	18.1	20.2	22.0	23.3	17.7	19.8	21.5	22.9
HNJ-D04-A028	25.3	27.8	29.7	31.4	24.8	27.3	29.1	30.7
HNJ-D04-A032	30.0	32.3	33.6	35.2	29.4	31.7	32.9	34.5
HNJ-D06-A042	37.9	41.8	44.5	46.9	37.2	40.9	43.7	45.9
HNJ-D06-A048	45.0	48.4	50.4	53.7	44.1	47.5	49.4	52.7
HNJ-D08-A056	50.6	55.7	59.4	62.4	49.6	54.6	58.3	61.1
HNJ-D08-A065	60.0	64.6	67.2	70.4	58.8	63.3	65.8	69.0
HNJ-D10-A071	64.2	70.9	74.7	78.0	62.9	69.5	73.2	76.5
HNJ-D10-A083	76.9	83.1	86.8	89.4	75.3	81.5	85.0	87.6
HNJ-D12-A100	90.4	99.8	104.1	107.3	92.2	97.8	102.0	105.1
HNJ-D14-A110	101.1	110.0	116.0	120.3	99.1	107.9	113.7	117.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNJ 540 830 VSEC 1140

Table 24. HNJ Models, 830 RPM, 1.1 kW, 30" Fan Diameter

Model	R407A / R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNJ-S01-A007	5.7	6.5	7.0	7.6	5.5	6.2	6.8	7.2
HNJ-S01-A008	6.9	7.7	8.2	8.6	6.6	7.3	7.9	8.3
HNJ-S02-A010	8.7	9.7	10.6	11.2	8.3	9.3	10.1	10.8
HNJ-S02-A014	12.1	13.4	14.3	15.1	11.6	12.8	13.7	14.4
HNJ-S02-A016	14.4	15.5	16.1	16.9	13.8	14.9	15.5	16.2
HNJ-S03-A021	18.2	20.1	21.4	22.5	17.5	19.2	20.5	21.6
HNJ-S03-A024	21.6	23.3	24.2	25.8	20.7	22.3	23.2	24.8
HNJ-S04-A028	24.3	26.7	28.5	30.0	23.3	25.6	27.4	28.7
HNJ-S04-A032	28.8	31.0	32.3	33.8	27.6	29.8	31.0	32.4
HNJ-S05-A035	30.8	34.0	35.9	37.5	29.6	32.7	34.4	35.9
HNJ-S05-A042	36.9	39.9	41.7	42.9	35.4	38.3	40.0	41.2
HNJ-S06-A050	44.3	47.9	50.0	51.5	42.5	45.9	48.0	49.4
HNJ-S07-A055	48.5	52.8	55.7	57.8	46.6	50.7	53.4	55.4
HNJ-D04-A020	17.4	19.4	21.1	22.4	16.7	18.6	20.2	21.5
HNJ-D04-A028	24.3	26.7	28.5	30.1	23.3	25.6	27.4	28.9
HNJ-D04-A032	28.8	31.0	32.3	33.8	27.6	29.8	30.9	32.4
HNJ-D06-A042	36.4	40.1	42.8	45.0	34.9	38.5	41.0	43.2
HNJ-D06-A048	43.2	46.5	48.4	51.6	41.4	44.6	46.4	49.5
HNJ-D08-A056	48.6	53.5	57.1	59.9	46.6	51.3	54.8	57.5
HNJ-D08-A065	57.6	62.1	64.5	67.6	55.3	59.5	61.9	64.8
HNJ-D10-A071	61.6	68.1	71.8	74.9	59.1	65.3	68.9	71.9
HNJ-D10-A083	73.8	79.8	83.3	85.8	70.8	76.6	79.9	82.3
HNJ-D12-A100	90.4	95.8	99.9	103.0	86.7	91.9	95.9	98.8
HNJ-D14-A110	97.1	105.7	111.4	115.6	93.1	101.4	106.9	110.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNJ 540 830 VSEC 1140

Table 25. HNJ Models, 830 RPM, 1.1 kW, 30" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNJ-S01-A007	5.8	6.5	7.1	7.6
HNJ-S01-A008	7.0	7.7	8.3	8.7
HNJ-S02-A010	8.8	9.8	10.7	11.3
HNJ-S02-A014	12.3	13.5	14.4	15.2
HNJ-S02-A016	14.6	15.7	16.3	17.1
HNJ-S03-A021	18.4	20.3	21.6	22.7
HNJ-S03-A024	21.8	23.5	24.4	26.1
HNJ-S04-A028	24.5	27.0	28.8	30.3
HNJ-S04-A032	29.1	31.4	32.6	34.1
HNJ-S05-A035	31.1	34.4	36.3	37.9
HNJ-S05-A042	37.3	40.4	42.1	43.4
HNJ-S06-A050	44.8	48.4	50.5	52.0
HNJ-S07-A055	49.0	53.4	56.3	58.4
HNJ-D04-A020	17.6	19.6	21.3	22.6
HNJ-D04-A028	24.5	27.0	28.8	30.4
HNJ-D04-A032	29.1	31.4	32.6	34.1
HNJ-D06-A042	36.8	40.5	43.2	45.5
HNJ-D06-A048	43.6	47.0	48.9	52.2
HNJ-D08-A056	49.1	54.0	57.7	60.5
HNJ-D08-A065	58.2	62.7	65.2	68.3
HNJ-D10-A071	62.2	68.8	72.5	75.7
HNJ-D10-A083	74.6	80.7	84.2	86.7
HNJ-D12-A100	91.3	96.8	101.0	104.1
HNJ-D14-A110	98.1	106.8	112.6	116.8

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNJ 540 830 VSEC 1140

Table 26. HNJ Models, 1.1 kW, 30" Fan Diameter

Model	CFM	230/3/60			460/3/60			Unit kW	Conn. (in)	Max. No. of Feeds	Approx. Net. Wt. (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD				
HNJ-S01-A007	8400	6.6	15.0	25.0	3.3	15.0	15.0	1.1	1 3/8	7	340
HNJ-S01-A008	8000	6.6	15.0	25.0	3.3	15.0	15.0	1.1	1 3/8	14	370
HNJ-S02-A010	17500	13.2	15.0	30.0	6.6	15.0	15.0	2.1	1 3/8	14	600
HNJ-S02-A014	16700	13.2	15.0	30.0	6.6	15.0	15.0	2.1	1 5/8	21	650
HNJ-S02-A016	16100	13.2	15.0	30.0	6.6	15.0	15.0	2.1	2 1/8	28	700
HNJ-S03-A021	25100	19.8	21.5	35.0	9.9	15.0	15.0	3.2	2 1/8	21	960
HNJ-S03-A024	24100	19.8	21.5	35.0	9.9	15.0	15.0	3.2	2 1/8	28	1030
HNJ-S04-A028	32800	26.4	28.1	45.0	13.2	15.0	20.0	4.2	2 1/8	21	1250
HNJ-S04-A032	31200	26.4	28.1	45.0	13.2	15.0	20.0	4.2	2 5/8	28	1350
HNJ-S05-A035	41000	33.0	34.7	50.0	16.5	20.0	25.0	5.2	2 5/8	21	1570
HNJ-S05-A042	39100	33.0	34.7	50.0	16.5	20.0	25.0	5.2	2 5/8	28	1700
HNJ-S06-A050	46900	39.6	41.3	50.0	19.8	20.6	25.0	6.3	2 5/8	28	2020
HNJ-S07-A055	54700	46.2	47.9	60.0	23.1	23.9	30.0	7.3	2 @ 2 5/8	28	2320
HNJ-D04-A020	35000	26.4	28.1	45.0	13.2	15.0	20.0	4.2	2 @ 1 3/8	28	1280
HNJ-D04-A028	33500	26.4	28.1	45.0	13.2	15.0	20.0	4.2	2 @ 1 5/8	42	1380
HNJ-D04-A032	32100	26.4	28.1	45.0	13.2	15.0	20.0	4.2	2 @ 2 1/8	56	1480
HNJ-D06-A042	50200	39.6	41.3	50.0	19.8	20.6	25.0	6.3	2 @ 2 1/8	42	2060
HNJ-D06-A048	48200	39.6	41.3	50.0	19.8	20.6	25.0	6.3	2 @ 2 1/8	56	2210
HNJ-D08-A056	65600	52.8	54.5	70.0	26.4	27.2	35.0	8.4	2 @ 2 1/8	42	2720
HNJ-D08-A065	62500	52.8	54.5	70.0	26.4	27.2	35.0	8.4	2 @ 2 5/8	56	2920
HNJ-D10-A071	82000	66.0	67.7	80.0	33.0	33.8	40.0	10.4	2 @ 2 5/8	42	3400
HNJ-D10-A083	78100	66.0	67.7	80.0	33.0	33.8	40.0	10.4	2 @ 2 5/8	56	3650
HNJ-D12-A100	93700	79.2	80.9	90.0	39.6	40.4	45.0	12.5	2 @ 2 5/8	56	4360
HNJ-D14-A110	109300	92.4	94.1	110.0	46.2	47.0	50.0	14.6	4 @ 2 5/8	56	5060

CONDENSER CAPACITY

HNK 540 830 VSEC 1140

Table 27. HNK Models, 1140 RPM, 2.0 kW, 30" Fan Diameter

Model	R22/R410A MBH / 1° TD				R404A / R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNK-S01-A007	6.4	7.3	8.0	8.6	6.3	7.2	7.9	8.5
HNK-S01-A009	7.8	8.7	9.5	10.0	7.6	8.6	9.3	9.8
HNK-S02-A011	9.6	10.7	11.7	12.4	9.4	10.5	11.5	12.1
HNK-S02-A015	13.1	14.5	15.6	16.3	12.8	14.2	15.3	16.0
HNK-S02-A017	15.7	17.1	18.1	19.2	15.3	16.7	17.7	18.8
HNK-S03-A022	19.7	21.8	23.4	24.5	19.3	21.4	22.9	24.0
HNK-S03-A026	23.5	25.7	27.1	29.9	23.0	25.1	26.6	29.3
HNK-S04-A029	26.2	29.1	31.2	32.6	25.7	28.5	30.5	32.0
HNK-S04-A034	31.4	34.2	36.1	38.3	30.7	33.5	35.4	37.6
HNK-S05-A037	33.6	37.1	39.3	41.3	32.9	36.4	38.5	40.5
HNK-S05-A044	40.5	44.0	46.0	48.6	39.7	43.1	45.1	47.6
HNK-S06-A053	48.6	52.8	55.2	58.3	47.7	51.7	54.1	57.1
HNK-S07-A061	55.4	61.0	64.7	67.5	54.3	59.8	63.5	66.2
HNK-D04-A021	19.2	21.4	23.4	24.8	18.8	21.0	22.9	24.3
HNK-D04-A029	26.2	29.1	31.2	32.6	25.7	28.5	30.6	32.0
HNK-D04-A034	31.4	34.2	36.1	38.3	30.7	33.5	35.4	37.6
HNK-D06-A044	39.4	43.6	46.7	48.9	38.6	42.8	45.8	47.9
HNK-D06-A051	47.0	51.3	54.2	59.8	46.1	50.3	53.1	58.7
HNK-D08-A058	52.5	58.2	62.3	65.3	51.4	57.0	61.1	63.9
HNK-D08-A068	62.7	68.4	72.3	76.7	61.5	67.1	70.8	75.1
HNK-D10-A074	67.1	74.2	78.5	82.6	65.7	72.7	76.9	80.9
HNK-D10-A088	81.0	88.0	92.1	97.2	79.4	86.2	90.2	95.2
HNK-D12-A106	97.2	105.6	110.5	116.6	95.3	103.5	108.3	114.2
HNK-D14-A122	110.8	121.9	129.5	135.0	108.6	119.5	126.9	132.4

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNK 540 830 VSEC 1140

Table 28. HNK Models, 1140 RPM, 2.0 kW 30" Fan Diameter

Model	R407A/407F* MBH / 1° TD				407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNK-S01-A007	6.1	7.0	7.7	8.3	5.9	6.7	7.4	8.0
HNK-S01-A009	7.5	8.4	9.1	9.6	7.2	8.1	8.7	9.2
HNK-S02-A011	9.2	10.3	11.2	11.9	8.8	9.9	10.8	11.4
HNK-S02-A015	12.6	14.0	15.0	15.7	12.1	13.4	14.4	15.0
HNK-S02-A017	15.0	16.4	17.4	18.4	14.4	15.7	16.6	17.6
HNK-S03-A022	18.9	21.0	22.4	23.5	18.1	20.1	21.5	22.5
HNK-S03-A026	22.6	24.6	26.0	28.8	21.7	23.6	25.0	27.6
HNK-S04-A029	25.2	28.0	29.9	31.3	24.1	26.8	28.7	30.1
HNK-S04-A034	30.1	32.9	34.7	36.8	28.9	31.5	33.3	35.3
HNK-S05-A037	32.2	35.6	37.7	39.7	30.9	34.2	36.2	38.0
HNK-S05-A044	38.9	42.3	44.2	46.7	37.3	40.5	42.4	44.8
HNK-S06-A053	46.7	50.7	53.1	56.0	44.8	48.6	50.9	53.7
HNK-S07-A061	53.2	58.6	62.2	64.9	51.1	56.2	59.7	62.2
HNK-D04-A021	18.4	20.5	22.4	23.8	17.7	19.7	21.5	22.8
HNK-D04-A029	25.2	28.0	29.9	31.3	24.1	26.8	28.7	30.1
HNK-D04-A034	30.1	32.9	34.7	36.8	28.9	31.5	33.3	35.3
HNK-D06-A044	37.8	41.9	44.9	47.0	36.3	40.2	43.1	45.1
HNK-D06-A051	45.2	49.3	52.0	57.5	43.3	47.3	49.9	55.2
HNK-D08-A058	50.4	55.9	59.9	62.7	48.3	53.6	57.4	60.1
HNK-D08-A068	60.2	65.7	69.4	73.6	57.8	63.0	66.6	70.6
HNK-D10-A074	64.4	71.2	75.4	79.3	61.8	68.3	72.3	76.0
HNK-D10-A088	77.8	84.5	88.4	93.3	74.6	81.1	84.8	89.5
HNK-D12-A106	93.4	101.4	106.1	112.0	89.6	97.3	101.8	107.4
HNK-D14-A122	106.5	117.1	124.4	129.7	102.1	112.3	119.3	124.4

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

HNK 540 830 VSEC 1140

Table 29. HNK Models, 1140 RPM, 2.0 kW, 30" Fan Diameter

Model	R448A / R449A* MBH/ 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNK-S01-A007	6.2	7.1	7.8	8.4
HNK-S01-A009	7.6	8.5	9.2	9.7
HNK-S02-A011	9.3	10.4	11.3	12.0
HNK-S02-A015	12.7	14.1	15.1	15.8
HNK-S02-A017	15.2	16.6	17.5	18.6
HNK-S03-A022	19.1	21.2	22.7	23.7
HNK-S03-A026	22.8	24.9	26.3	29.0
HNK-S04-A029	25.4	28.2	30.2	31.7
HNK-S04-A034	30.4	33.2	35.1	37.2
HNK-S05-A037	32.6	36.0	38.1	40.1
HNK-S05-A044	39.3	42.7	44.7	47.1
HNK-S06-A053	47.2	51.2	53.6	56.5
HNK-S07-A061	53.8	59.2	62.8	65.5
HNK-D04-A021	18.6	20.8	22.7	24.0
HNK-D04-A029	25.4	28.2	30.3	31.7
HNK-D04-A034	30.4	33.2	35.1	37.2
HNK-D06-A044	38.2	42.3	45.3	47.5
HNK-D06-A051	45.6	49.8	52.6	58.1
HNK-D08-A058	50.9	56.5	60.5	63.3
HNK-D08-A068	60.9	66.4	70.1	74.4
HNK-D10-A074	65.1	72.0	76.2	80.1
HNK-D10-A088	78.6	85.4	89.3	94.3
HNK-D12-A106	94.3	102.4	107.2	113.1
HNK-D14-A122	107.5	118.3	125.7	131.1

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNK 540 830 VSEC 1140

Table 30. HNK Models, 1140 RPM, 2.0 kW, 30" Fan Diameter

Model	CFM	230/3/60			460/3/60			Unit kW	Conn. (in)	Max. No. of Feeds	Approx. Net. Wt. (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD				
HNK-S01-A007	9900	6.6	15.0	25.0	3.3	15.0	15.0	2.0	1 3/8	7	340
HNK-S01-A009	9500	6.6	15.0	25.0	3.3	15.0	15.0	2.0	1 3/8	14	370
HNK-S02-A011	20500	13.2	15.0	30.0	6.6	15.0	15.0	3.9	1 3/8	14	600
HNK-S02-A015	19800	13.2	15.0	30.0	6.6	15.0	15.0	3.9	1 5/8	21	650
HNK-S02-A017	19000	13.2	15.0	30.0	6.6	15.0	15.0	3.9	2 1/8	28	700
HNK-S03-A022	29700	19.8	21.5	35.0	9.9	15.0	15.0	5.9	2 1/8	21	960
HNK-S03-A026	28500	19.8	21.5	35.0	9.9	15.0	15.0	5.9	2 1/8	28	1030
HNK-S04-A029	38600	26.4	28.1	45.0	13.2	15.0	20.0	7.8	2 1/8	21	1250
HNK-S04-A034	37000	26.4	28.1	45.0	13.2	15.0	20.0	7.8	2 5/8	28	1350
HNK-S05-A037	48300	33.0	34.7	50.0	16.5	20.0	25.0	9.7	2 5/8	21	1570
HNK-S05-A044	46200	33.0	34.7	50.0	16.5	20.0	25.0	9.7	2 5/8	28	1700
HNK-S06-A053	55400	39.6	41.3	50.0	19.8	20.6	25.0	11.7	2 5/8	28	2020
HNK-S07-A061	64700	46.2	47.9	60.0	23.1	23.9	30.0	13.6	2 @ 2 5/8	28	2320
HNK-D04-A021	41000	26.4	28.1	45.0	13.2	15.0	20.0	7.8	2 @ 1 3/8	28	1280
HNK-D04-A029	39600	26.4	28.1	45.0	13.2	15.0	20.0	7.8	2 @ 1 5/8	42	1380
HNK-D04-A034	38100	26.4	28.1	45.0	13.2	15.0	20.0	7.8	2 @ 2 1/8	56	1480
HNK-D06-A044	59400	39.6	41.3	50.0	19.8	20.6	25.0	11.7	2 @ 2 1/8	42	2060
HNK-D06-A051	57100	39.6	41.3	50.0	19.8	20.6	25.0	11.7	2 @ 2 1/8	56	2210
HNK-D08-A058	77200	52.8	54.5	70.0	26.4	27.2	35.0	15.5	2 @ 2 1/8	42	2720
HNK-D08-A068	73900	52.8	54.5	70.0	26.4	27.2	35.0	15.5	2 @ 2 5/8	56	2920
HNK-D10-A074	96500	66.0	67.7	80.0	33.0	33.8	40.0	19.4	2 @ 2 5/8	42	3400
HNK-D10-A088	92400	66.0	67.7	80.0	33.0	33.8	40.0	19.4	2 @ 2 5/8	56	3650
HNK-D12-A106	110900	79.2	80.9	90.0	39.6	40.4	45.0	23.3	2 @ 2 5/8	56	4360
HNK-D14-A122	129400	92.4	94.1	110.0	46.2	47.0	50.0	27.2	4 @ 2 5/8	56	5060

CONDENSER CAPACITY

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Table 31. HNE Models, 2.0 kW, 31.5" Fan Diameter

Model	R22 / R-410A MBH / 1° TD				R404/R507 MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNE-S01-A008	6.8	7.7	8.5	9.1	6.6	7.6	8.3	9.0
HNE-S01-A009	8.3	9.3	10.0	10.6	8.1	9.1	9.8	10.4
HNE-S02-A011	10.2	11.3	12.4	13.1	10.0	11.1	12.1	12.9
HNE-S02-A015	13.9	15.4	16.5	17.3	13.6	15.1	16.2	17.0
HNE-S02-A018	16.6	18.1	19.2	20.3	16.3	17.8	18.8	19.9
HNE-S03-A023	20.9	23.1	24.8	25.9	20.4	22.7	24.3	25.4
HNE-S03-A027	24.9	27.2	28.7	31.7	24.4	26.7	28.2	31.1
HNE-S04-A031	27.8	30.8	33.0	34.6	27.2	30.2	32.4	33.9
HNE-S04-A036	33.2	36.3	38.3	40.6	32.6	35.5	37.5	39.8
HNE-S05-A039	35.6	39.3	41.6	43.8	34.9	38.5	40.8	42.9
HNE-S05-A047	43.0	46.6	48.8	51.5	42.1	45.7	47.8	50.5
HNE-S06-A056	51.6	56.0	58.6	61.8	50.5	54.8	57.4	60.5
HNE-S07-A065	58.7	64.6	68.6	71.6	57.6	63.3	67.3	70.2
HNE-D04-A023	20.4	22.7	24.8	26.2	19.9	22.2	24.3	25.7
HNE-D04-A031	27.8	30.8	33.1	34.6	27.2	30.2	32.4	33.9
HNE-D04-A036	33.2	36.3	38.3	40.6	32.6	35.5	37.5	39.8
HNE-D06-A046	41.7	46.2	49.5	51.9	40.9	45.3	48.6	50.8
HNE-D06-A054	49.8	54.4	57.4	63.4	48.8	53.3	56.3	62.2
HNE-D08-A062	55.6	61.7	66.1	69.2	54.5	60.5	64.7	67.8
HNE-D08-A073	66.5	72.5	76.6	81.3	65.2	71.1	75.1	79.7
HNE-D10-A079	71.1	78.6	83.2	87.5	69.7	77.0	81.6	85.8
HNE-D10-A093	85.9	93.3	97.6	103.0	84.2	91.4	95.7	100.9
HNE-D12-A112	103.1	111.9	117.1	123.6	101.0	109.7	114.8	121.1
HNE-D14-A129	117.5	129.2	137.2	143.1	115.2	126.7	134.5	140.3

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

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Table 32. HNE Models, 2.0 kW, 31.5" Fan Diameter

Model	R407A/R407F* MBH / 1° TD				R407C* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI	8 FPI	10 FPI	12 FPI	14 FPI
HNE-S01-A008	6.5	7.4	8.2	8.8	6.2	7.1	7.8	8.4
HNE-S01-A009	7.9	8.9	9.6	10.2	7.6	8.5	9.2	9.7
HNE-S02-A011	9.8	10.9	11.9	12.6	9.4	10.4	11.4	12.1
HNE-S02-A015	13.3	14.8	15.9	16.6	12.8	14.2	15.2	15.9
HNE-S02-A018	15.9	17.4	18.4	19.5	15.3	16.7	17.6	18.7
HNE-S03-A023	20.0	22.2	23.8	24.9	19.2	21.3	22.8	23.9
HNE-S03-A027	23.9	26.1	27.6	30.5	23.0	25.1	26.5	29.2
HNE-S04-A031	26.7	29.6	31.7	33.2	25.6	28.4	30.4	31.9
HNE-S04-A036	31.9	34.8	36.8	39.0	30.6	33.4	35.3	37.4
HNE-S05-A039	34.2	37.8	40.0	42.0	32.8	36.2	38.3	40.3
HNE-S05-A047	41.3	44.8	46.9	49.5	39.6	43.0	45.0	47.5
HNE-S06-A056	49.5	53.8	56.2	59.3	47.5	51.6	53.9	56.9
HNE-S07-A065	56.4	62.1	65.9	68.8	54.1	59.5	63.2	66.0
HNE-D04-A023	19.5	21.8	23.8	25.2	18.8	20.9	22.8	24.2
HNE-D04-A031	26.7	29.6	31.7	33.2	25.6	28.4	30.5	31.9
HNE-D04-A036	31.9	34.8	36.8	39.0	30.6	33.4	35.3	37.4
HNE-D06-A046	40.1	44.4	47.6	49.8	38.4	42.6	45.6	47.8
HNE-D06-A054	47.9	52.2	55.2	61.0	45.9	50.1	52.9	58.5
HNE-D08-A062	53.4	59.2	63.4	66.4	51.2	56.8	60.9	63.7
HNE-D08-A073	63.9	69.7	73.6	78.1	61.3	66.8	70.6	74.9
HNE-D10-A079	68.3	75.5	79.9	84.0	65.5	72.4	76.7	80.6
HNE-D10-A093	82.5	89.6	93.7	98.9	79.1	85.9	89.9	94.9
HNE-D12-A112	99.0	107.5	112.5	118.7	94.9	103.1	107.9	113.8
HNE-D14-A129	112.8	124.1	131.9	137.5	108.2	119.1	126.5	131.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER CAPACITY

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Table 33. HNE Models, 2.0 kW, 31.5" Fan Diameter

Model	R448A / R449A* MBH / 1° TD			
	8 FPI	10 FPI	12 FPI	14 FPI
HNE-S01-A008	6.6	7.5	8.3	8.9
HNE-S01-A009	8.0	9.0	9.7	10.3
HNE-S02-A011	9.9	11.0	12.0	12.7
HNE-S02-A015	13.5	14.9	16.0	16.8
HNE-S02-A018	16.1	17.6	18.6	19.7
HNE-S03-A023	20.2	22.4	24.0	25.2
HNE-S03-A027	24.2	26.4	27.9	30.8
HNE-S04-A031	27.0	29.9	32.0	33.6
HNE-S04-A036	32.3	35.2	37.2	39.4
HNE-S05-A039	34.5	38.2	40.4	42.5
HNE-S05-A047	41.7	45.2	47.4	50.0
HNE-S06-A056	50.0	54.3	56.8	59.9
HNE-S07-A065	57.0	62.7	66.6	69.5
HNE-D04-A023	19.7	22.0	24.0	25.5
HNE-D04-A031	27.0	29.9	32.1	33.6
HNE-D04-A036	32.3	35.2	37.2	39.4
HNE-D06-A046	40.5	44.9	48.1	50.3
HNE-D06-A054	48.4	52.8	55.7	61.6
HNE-D08-A062	54.0	59.9	64.1	67.1
HNE-D08-A073	64.5	70.4	74.3	78.9
HNE-D10-A079	69.0	76.3	80.7	84.9
HNE-D10-A093	83.3	90.5	94.7	99.9
HNE-D12-A112	100.0	108.6	113.6	119.9
HNE-D14-A129	114.0	125.4	133.2	138.9

BOLD indicates standard model capacity.

* Data based on mid point condensing temperature

CONDENSER SPECIFICATIONS

HNE 540 830 VSEC 1140

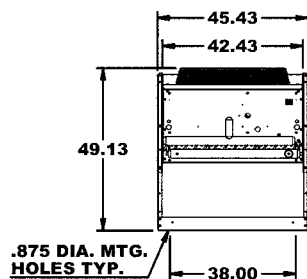
Table 34. HNE Models, 2.0 kW, 31.5" Fan Diameter

Model	CFM	208-230/3/60			460/3/60			Unit kW	Conn. (in.)	Max. Number of Feeds	Approx. Net Weight (lbs)
		FLA	MCA	MOPD	FLA	MCA	MOPD				
HNE-S01-A008	11,000	7.0	15.0	25	3.5	15.0	15	2.0	1 3/8	7	330
HNE-S01-A009	10,500	7.0	15.0	25	3.5	15.0	15	2.0	1 3/8	14	360
HNE-S02-A011	23,400	14.0	20.0	35	7.0	15.0	15	4.0	1 3/8	14	590
HNE-S02-A015	22,000	14.0	20.0	35	7.0	15.0	15	4.0	1 5/8	21	640
HNE-S02-A018	20,900	14.0	20.0	35	7.0	15.0	15	4.0	2 1/8	28	690
HNE-S03-A023	33,100	21.0	22.8	40	10.5	15.0	20	6.0	2 1/8	21	930
HNE-S03-A027	31,400	21.0	22.8	40	10.5	15.0	20	6.0	2 1/8	28	1,010
HNE-S04-A031	42,600	28.0	29.8	45	14.0	15.0	20	8.0	2 1/8	21	1,220
HNE-S04-A036	40,000	28.0	29.8	45	14.0	15.0	20	8.0	2 5/8	28	1,320
HNE-S05-A039	53,200	35.0	36.8	50	17.5	20.0	25	10.0	2 5/8	21	1,520
HNE-S05-A047	50,000	35.0	36.8	50	17.5	20.0	25	10.0	2 5/8	28	1,650
HNE-S06-A056	60,000	42.0	43.8	60	21.0	21.9	30	12.0	2 5/8	28	1,960
HNE-S07-A065	70,000	49.0	50.8	70	24.5	25.4	35	14.0	2 @ 2 5/8	28	2,260
HNE-D04-A023	46,700	28.0	29.8	45	14.0	15.0	20	8.0	2 @ 1 3/8	28	1,290
HNE-D04-A031	44,100	28.0	29.8	45	14.0	15.0	20	8.0	2 @ 1 5/8	42	1,390
HNE-D04-A036	41,800	28.0	29.8	45	14.0	15.0	20	8.0	2 @ 2 1/8	56	1,490
HNE-D06-A046	66,100	42.0	43.8	60	21.0	21.9	30	12.0	2 @ 2 1/8	42	2,060
HNE-D06-A054	62,700	42.0	43.8	60	21.0	21.9	30	12.0	2 @ 2 1/8	56	2,210
HNE-D08-A062	85,100	56.0	57.8	70	28.0	28.9	35	16.0	2 @ 2 1/8	42	2,730
HNE-D08-A073	80,000	56.0	57.8	70	28.0	28.9	35	16.0	2 @ 2 5/8	56	2,930
HNE-D10-A079	106,400	70.0	71.8	90	35.0	35.9	45	20.0	2 @ 2 5/8	42	3,410
HNE-D10-A093	100,100	70.0	71.8	90	35.0	35.9	45	20.0	2 @ 2 5/8	56	3,660
HNE-D12-A112	120,100	84.0	85.8	100	42.0	42.9	50	24.0	2 @ 2 5/8	56	4,370
HNE-D14-A129	140,100	98.0	99.8	110	49.0	49.9	60	28.0	4 @ 2 5/8	56	5,070

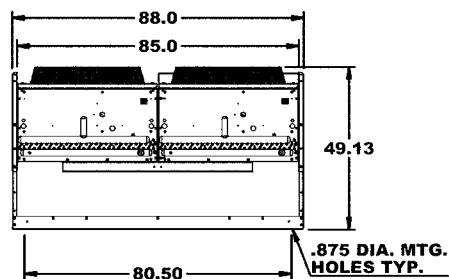
CONDENSER DIMENSIONS

End Views

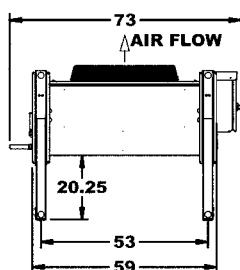
Single Row of Fans



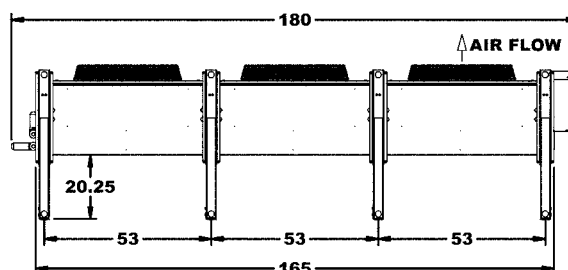
Double Row of Fans



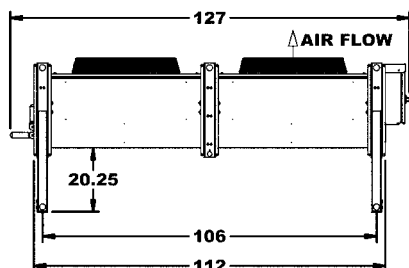
Side Views



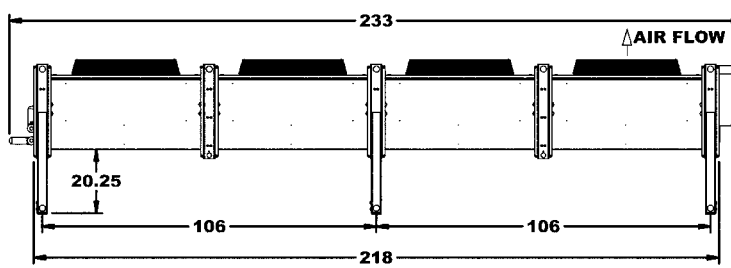
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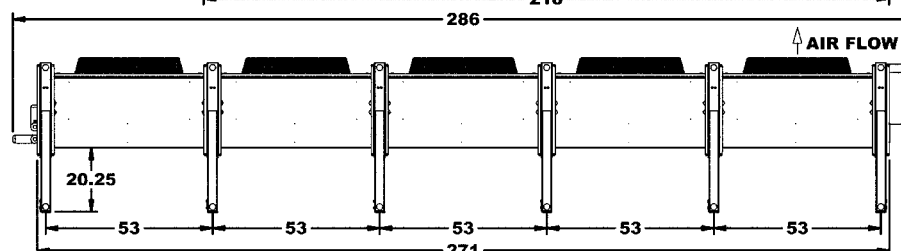
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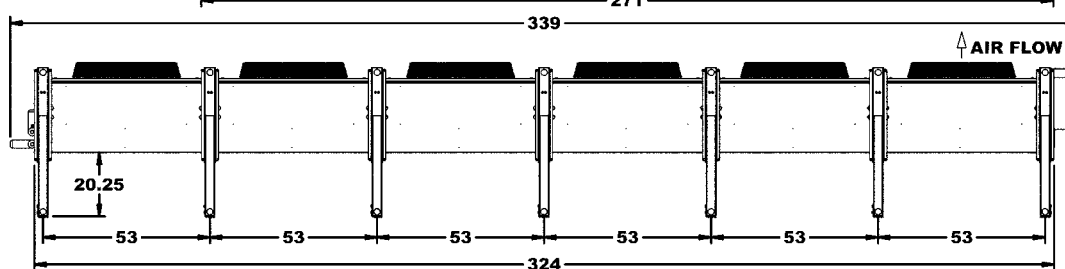
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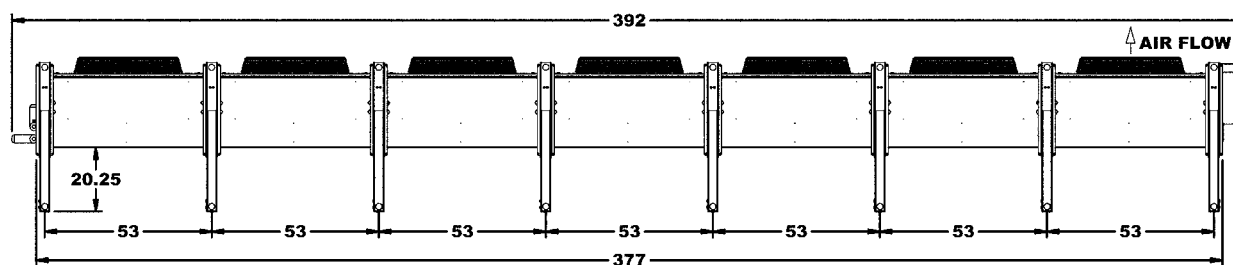
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1 x 5
2 x 5



1 x 6
2 x 6



1 x 7
2 x 7

Fan Cycle Control Panels

Fan cycling panels are available to cycle fans on ambient temperature or condensing pressure or custom built control panels can be factory installed to interface with electronic refrigeration controllers.

- All fans are cycled with contactors.
- Condensers with a single row of fans cycle fans separately with one contactor per fan.
- Condensers with two rows of fans are typically cycled in pairs, with one contactor per pair of fans.
- Fans closest to the header end of the unit are wired to run continuously.

- Standard control circuit voltage is 230 volts. Control circuits with 24 or 115 volts are available on request.
- Control circuits are factory wired to a control circuit terminal board for convenient single point field wiring.
- Standard control circuits require an external power supply for powering control circuit (by others).
- A control circuit transformer is available on 460 volt condensers as a factory mounted option to provide power to the control circuit.

Ambient Fan Cycle

Condenser fans are controlled by ambient temperature using electronic temperature controls. Ambient fan cycling is recommended for multi-circuited condensers or single circuit condensers where there is little variation in condenser load.

Ambient fan cycling is limited in its ability to control head pressure to mild ambient conditions, see Table 35 for minimum ambients for fan cycling. Full year head pressure control can be obtained by combining ambient fan cycling with another means of head

pressure control, such as condenser flooding controls or variable speed. Combining these controls with ambient fan cycling has the additional advantage of reducing the amount of refrigerant required to flood the condenser.

See Table 36 for typical settings for ambient thermostats.

Pressure Fan Cycling

Condenser fans are controlled by pressure switches which monitor condenser pressure. Pressure fan cycling is ideal for those condensers which see a significant change in condenser load. Since the controls sense condensing pressure, they can cycle fans at any ambient temperature, in response to a change in condensing pressure.

An additional pressure switch is available as an option to cycle the fan closest to the header end of the condenser. This option is only recommended for condensers with large variations in condenser load caused by heat reclaim, hot gas defrost or a high percentage of compressor unloading.

Table 35. Minimum Ambient for Fan Cycling

Number of Fans		Design T.D.*				
Single Row	Double Row	30	25	20	15	10
2	4	35	45	55	60	70
3	6	15	30	40	55	65
4	8	0	15	30	45	60
5	10	0	10	20	35	55
6/7	12/14	0	0	10	30	50

*Based on maintaining 90° F minimum condensing temperature.

Table 36. Fan Cycling Thermostat Settings

Number of Fans		Design T.D.	Thermostat Setting				
Single Row	Double Rows		1	2	3	4	5
2	4	30	60				
		25	65				
		20	70				
		15	75				
		10	80				
3	6	30	60	40			
		25	65	55			
		20	70	60			
		15	75	65			
		10	80	75			
4	8	30	60	50	30		
		25	65	55	40		
		20	70	65	50		
		15	75	70	60		
		10	80	75	70		
5	10	30	60	55	45	30	
		25	65	60	50	35	
		20	70	65	60	40	
		15	75	70	65	55	
		10	80	75	70	65	
6/7	12/14	30	55	50	40	30	25
		25	65	60	55	45	35
		20	70	65	60	50	40
		15	75	70	65	60	50
		10	80	75	70	65	60

Variable Speed

Condenser head pressure control is provided by varying the air flow through the condenser by changing the RPM of the condenser fan. This control package is offered in combination with ambient fan cycling. The fan motor next to the header end of the condenser is the variable speed fan. The remainder of the fans are constant speed and are cycled separately using ambient sensing thermostats. On condensers with two rows of fans, two variable speed fans are provided (one per row) and the remainder of the fans are constant speed and are cycled in pairs. The variable speed control package consists of a special variable speed motor (1140 RPM, single phase) and an electronic speed control which controls the speed of the motor in response to condensing pressure. Fan motor, speed control and all related components are all factory mounted and wired. Two speed controls are provided on units with two rows of fans to allow for separate control of each fan motor.

Splitting Controls

Additional head pressure can be provided by valving off a portion of the condenser circuit and removing that portion from the refrigeration circuit, or splitting the condenser. In addition to providing a means of head pressure control, this control will reduce the amount of refrigerant required to operate the condenser with a flooded head pressure control. Condenser splitting is recommended as a seasonal adjustment controlled by ambient temperature. A pressure switch is also provided as a backup control to prevent high head pressures from occurring during heavy load conditions. On condensers with a single row of fans the control package consists of an ambient sensing thermostat, a pressure switch sensing condensing pressure and a splitting relay. The splitting relay provides a set of dry contacts to control the valves required to split the condenser (valves supplied by others). On condensers with double rows of fans, additional controls and contactors are provided to cycle all of the fans on the side of the condenser which has been split off. Except as noted above, the splitting packages do not control fan cycling. It is recommended that fan cycling be controlled by combining the splitting package with pressure fan cycling.

Control Panels for Electronic Controllers

Custom control panels can often be fabricated to interface with many of the microprocessor based electronic refrigeration controls. These panels often include individual motor fusing, individual fan motor contactors, splitting relays and printed circuit boards to interface with the microprocessor control. Contact the factory with your specific requirements.

Condenser Refrigerant Charge

The normal summer operating charge for condensers is shown in Table 37. This charge can also be used in condensers with fan cycling kits, since added refrigerant is not required for mild weather control. Table 37 also contains the additional refrigerant charge required when using flooded style head pressure controls.

Combining fan cycling with flooded head pressure controls significantly reduces the amount of winter charge required to flood the condenser. Table 39 shows the refrigerant charge required when fan cycling is used in conjunction with a flooded style head pressure control.

Table 37. Refrigerant Charge, Lbs. R404A for Flooded Condenser

Model*	Refrigerant R404A Charge for summer Operation, Lbs.	Additional Refrigerant R404A Charge Required for Flooded Condenser Operation Lbs. For 20°F TD Minimum Ambient at Condenser				
		+60	+40	+20	+0	-20
1	7	7	9	10	10	10
2	9	9	12	13	14	14
3	9	9	12	13	13	14
4	14	13	17	19	19	20
5	18	17	23	26	27	28
6	21	19	25	28	29	30
7	28	25	33	37	38	40
8	47	44	59	65	68	70
9	65	57	76	84	88	91
10	59	55	73	81	84	87
11	80	72	96	106	111	115
12	95	87	115	128	133	139
13	109	102	136	151	157	163
14	18	17	23	25	27	28
15	27	26	34	38	40	41
16	37	34	45	50	52	54
17	40	39	52	57	60	62
18	53	52	69	77	80	83
19	97	86	114	127	132	138
20	130	114	152	169	176	183
21	116	110	147	163	170	176
22	160	144	192	212	221	230
23	186	176	234	260	271	281
24	219	204	271	301	313	326

* See Model Cross Reference Table #40

Table 38. Flooded Charge Temperature Difference Factor

Ambient	Design T.D.				
	30°F	25°F	20°F	15°F	10°F
60°F	—	0.29	1.00	1.71	2.43
40°F	0.60	0.80	1.00	1.20	1.40
20°F	0.77	0.88	1.00	1.12	1.23
0°F	0.84	0.92	1.00	1.08	1.16
-20°F	0.87	0.94	1.00	1.06	1.13

Table 39. Refrigerant Charge for Fan Cycling plus Flooded Condenser (lbs. R-404A)

Model*	Summer Charge	25° TD				20° TD				15° TD				10° TD			
		40°F	20°F	0°F	-20°F	40°F	20°F	0°F	-20°F	40°F	20°F	0°F	-20°F	40°F	20°F	0°F	-20°F
1	7	5	7	8	8	6	8	9	9	7	9	10	10	8	10	11	10
2	9	7	10	11	12	9	11	12	13	11	12	13	14	13	14	14	15
3	9	0	5	7	9	3	7	9	10	6	9	11	12	9	12	13	13
4	14	0	6	10	12	4	9	12	14	8	12	14	16	12	15	17	18
5	18	0	9	14	17	5	13	17	20	10	17	21	23	16	22	24	26
6	21	0	0	7	12	0	6	12	16	0	12	17	20	0	18	22	24
7	28	0	0	10	16	0	8	16	22	0	16	23	28	0	23	29	33
8	47	0	0	4	17	0	0	18	29	0	0	32	41	0	0	47	53
9	65	0	0	5	22	0	0	23	37	0	0	41	52	0	0	59	67
10	59	0	0	0	9	0	0	10	26	0	0	29	43	0	0	47	60
11	80	0	0	0	12	0	0	12	33	0	0	34	54	0	0	57	76
12	95	0	0	0	0	0	0	0	26	0	0	0	53	0	0	0	81
13	109	0	0	0	0	0	0	0	16	0	0	0	46	0	0	0	77
14	18	0	9	14	16	5	13	17	19	10	17	21	22	16	22	24	25
15	27	0	13	20	25	7	19	25	29	14	26	30	33	22	32	35	37
16	37	0	17	26	33	10	25	33	38	21	34	40	44	31	42	46	49
17	40	0	1	15	25	0	13	25	34	0	26	35	43	0	38	45	51
18	53	0	1	20	34	0	18	34	46	0	35	48	58	0	53	61	70
19	97	0	0	7	33	0	0	34	56	0	0	61	79	0	0	88	102
20	130	0	0	10	44	0	0	46	74	0	0	82	104	0	0	119	135
21	116	0	0	0	18	0	0	19	51	0	0	54	84	0	0	90	117
22	160	0	0	0	24	0	0	25	67	0	0	72	110	0	0	118	154
23	186	0	0	0	0	0	0	0	53	0	0	0	109	0	0	0	165
24	219	0	0	0	0	0	0	0	31	0	0	0	90	0	0	0	149

* See Model Cross Reference Table #40

Refrigerant	Multiply charge by:
R404A	1.00
R407A	1.04
R407C	1.05
R407F	1.07
R448A	1.05
R449A	1.05
R410A	1.07
R507A	1.00

Note: For other refrigerants, use the table at the right. For alternate T.D.s, multiply by flooded charge T.D. factors in Table 38.

Table 40. Model Cross Reference

Model Reference	HNH	HNK	HNL	HNJ	HNX	HNQ	HNE
1	HNH-S01-A007	HNK-S01-A007	HNL-S01-A007	HNJ-S01-A007	HNX-S01-A006	HNQ-S01-A005	HNE-S01-A008
2	HNH-S01-A009	HNK-S01-A009	HNL-S01-A008	HNJ-S01-A008	HNX-S01-A008	HNQ-S01-A006	HNE-S01-A009
3	HNH-S02-A011	HNK-S02-A011	HNL-S02-A010	HNJ-S02-A010	HNX-S02-A010	HNQ-S02-A008	HNE-S02-A011
4	HNH-S02-A015	HNK-S02-A015	HNL-S02-A014	HNJ-S02-A014	HNX-S02-A013	HNQ-S02-A010	HNE-S02-A015
5	HNH-S02-A017	HNK-S02-A017	HNL-S02-A016	HNJ-S02-A016	HNX-S02-A015	HNQ-S02-A011	HNE-S02-A018
6	HNH-S03-A022	HNK-S03-A022	HNL-S03-A021	HNJ-S03-A021	HNX-S03-A020	HNQ-S02-A016	HNE-S03-A023
7	HNH-S03-A026	HNK-S03-A026	HNL-S03-A024	HNJ-S03-A024	HNX-S03-A023	HNQ-S03-A017	HNE-S03-A027
8	HNH-S04-A029	HNK-S04-A029	HNL-S04-A028	HNJ-S04-A028	HNX-S04-A026	HNQ-S04-A021	HNE-S04-A031
9	HNH-S04-A034	HNK-S04-A034	HNL-S04-A032	HNJ-S04-A032	HNX-S04-A030	HNQ-S04-A023	HNE-S04-A036
10	HNH-S05-A037	HNK-S05-A037	HNL-S05-A035	HNJ-S05-A035	HNX-S05-A033	HNQ-S05-A026	HNE-S05-A039
11	HNH-S05-A044	HNK-S05-A044	HNL-S05-A042	HNJ-S05-A042	HNX-S05-A038	HNQ-S05-A029	HNE-S05-A047
12	HNH-S06-A053	HNK-S06-A053	HNL-S06-A050	HNJ-S06-A050	HNX-S06-A045	HNQ-S06-A034	HNE-S06-A056
13	HNH-S07-A061	HNK-S07-A061	HNL-S07-A055	HNJ-S07-A055	HNX-S07-A052	HNQ-S07-A042	HNE-S07-A065
14	HNH-D04-A021	HNK-D04-A021	HNL-D04-A020	HNJ-D04-A020	HNX-D04-A020	HNQ-D04-A016	HNE-D04-A023
15	HNH-D04-A029	HNK-D04-A029	HNL-D04-A028	HNJ-D04-A028	HNX-D04-A026	HNQ-D04-A021	HNE-D04-A031
16	HNH-D04-A034	HNK-D04-A034	HNL-D04-A032	HNJ-D04-A032	HNX-D04-A030	HNQ-D04-A023	HNE-D04-A036
17	HNH-D06-A044	HNK-D06-A044	HNL-D06-A042	HNJ-D06-A042	HNX-D06-A039	HNQ-D06-A031	HNE-D06-A046
18	HNH-D06-A051	HNK-D06-A051	HNL-D06-A048	HNJ-D06-A048	HNX-D06-A045	HNQ-D06-A034	HNE-D06-A054
19	HNH-D08-A058	HNK-D08-A058	HNL-D08-A056	HNJ-D08-A056	HNX-D08-A052	HNQ-D08-A041	HNE-D08-A062
20	HNH-D08-A068	HNK-D08-A068	HNL-D08-A065	HNJ-D08-A065	HNX-D08-A061	HNQ-D08-A046	HNE-D08-A073
21	HNH-D10-A074	HNK-D10-A074	HNL-D10-A071	HNJ-D10-A071	HNX-D10-A066	HNQ-D10-A052	HNE-D10-A079
22	HNH-D10-A088	HNK-D10-A088	HNL-D10-A083	HNJ-D10-A083	HNX-D10-A076	HNQ-D10-A057	HNE-D10-A093
23	HNH-D12-A106	HNK-D12-A106	HNL-D12-A100	HNJ-D12-A100	HNX-D12-A091	HNQ-D12-A069	HNE-D12-A112
24	HNH-D14-A122	HNK-D14-A122	HNL-D14-A110	HNJ-D14-A110	HNX-D14-A104	HNQ-D14-A083	HNE-D14-A129

Calculate Refrigerant Charge

Refrigeration operating charges are located in Table 37 for flooded condenser and Table 39 for fan cycling plus flooded condenser.

Charge for flooded condenser = summer charge (Table 37) + additional flooding charge (Table 37) * flooded charge T.D. factor (Table 38)

Charge for fan cycling + flooding = summer charge (Table 39) + additional charge for fan cycling (Table 39)

Example:

Obtain the summer charge for a HNH-S05-A037. What is the flooding charge required to operate this condenser at 0° ambient at a 20°T.D. with R-404A refrigerant? What is the reduction in operating charge if fan cycling is combined with flooding?

Procedure:

From Table 40, obtain the model reference for HNH-S05-A037 as model 10. From Table 37, obtain the summer operating charge for model 10 at 59 lbs. The charge for winter operation with flooded controls is equal to the summer operating charge of 59 lbs. plus the additional charge at 0° ambient (Table 37) of 84 lbs., times the flooded charge T.D. factor (Table 38) of 1.0 for 20°T.D.

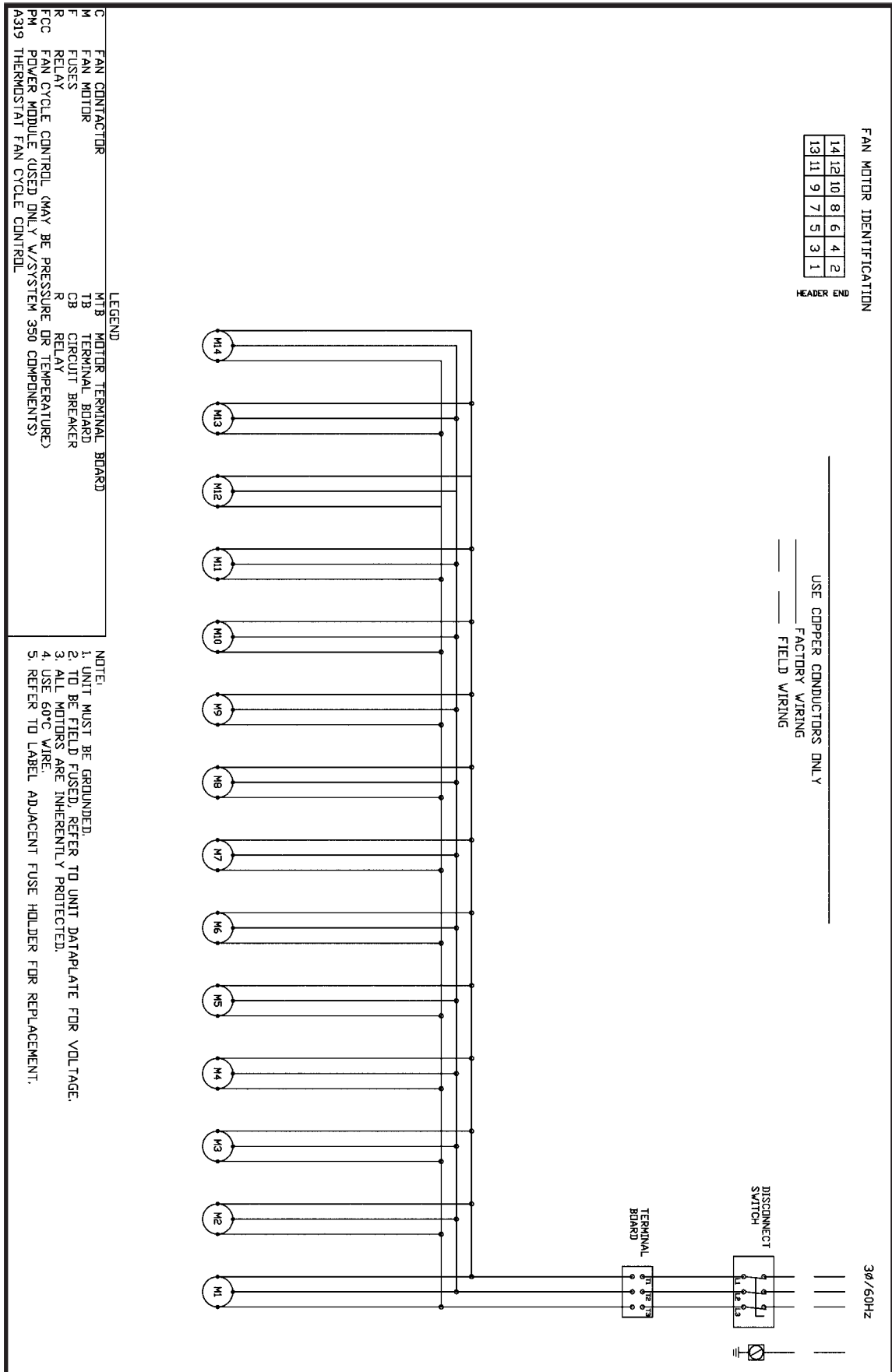
$$\begin{aligned}\text{Charge for flooded condenser} &= 59 + (84) * 1.0 \\ &= 143 \text{ lbs.}\end{aligned}$$

The charge for fan cycling plus flooded condenser is obtained using Table 39. Using this table obtain the additional charge for 20°T.D. at 0° ambient, which is 10 lbs. The total charge is the summer charge (59 lbs.) plus the additional charge.

$$\begin{aligned}\text{Charge for fan cycle + flooding} &= 59 + 10 \\ &= 69 \text{ lbs.}\end{aligned}$$

$$\begin{aligned}\text{The savings in refrigerant charge} &= 143 - 69 \\ &= 74 \text{ lbs.}\end{aligned}$$

Diagram 1. Typical Condenser Wiring Diagram With No Fan Cycle Controls

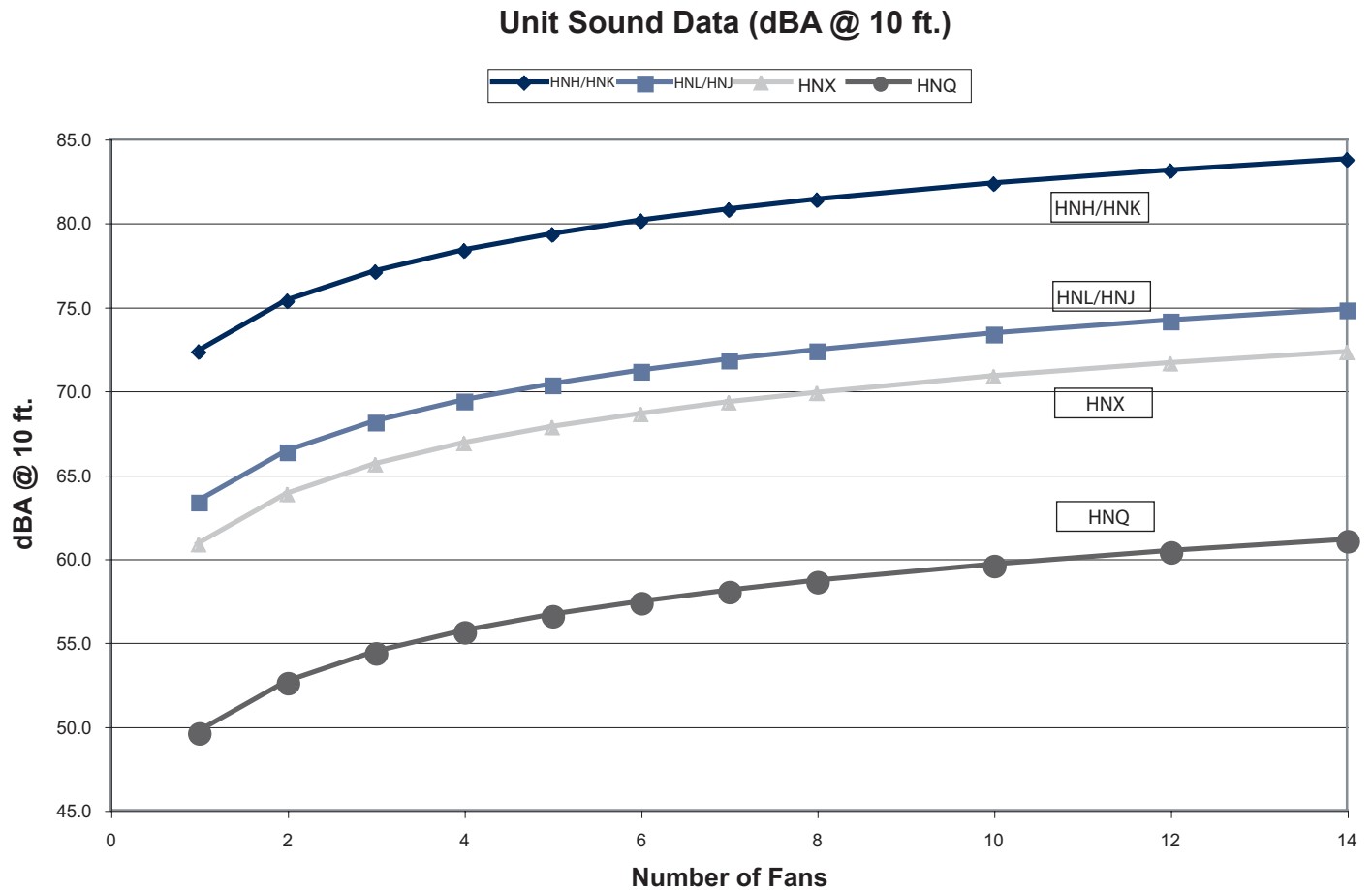




Responsibility	Percentage
Current government	85%
Previous government	15%



Sound Data for 3-Phase A/C , 1140 Series and Rail Mounted VSEC



Unit Sound Data (dBA @ 10 ft.)

Fans	HNH/HNK	HNL/HNJ	HNX	HNQ
1	72.3	63.4	60.8	49.6
2	75.3	66.4	63.8	52.6
3	77.1	68.1	65.6	54.4
4	78.3	69.4	66.8	55.6
5	79.3	70.3	67.8	56.6
6	80.1	71.1	68.6	57.4
7	80.8	71.8	69.3	58.1
8	81.3	72.4	69.8	58.6
10	82.3	73.4	70.8	59.6
12	83.1	74.1	71.6	60.4
14	83.8	74.8	72.3	61.1



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Since product improvement is a continuing effort, we reserve the right to make changes in specifications without notice.

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