



The new degree of comfort.®

## Renaissance Xcede™ Series Commercial Package Air Conditioner 8-10.0 Ton



### EMRHR- High Efficiency Series

R410A, 50 Hz

Nominal Sizes [96960 BTU/HR  
114389 BTU/HR]



# 50Hz

Made in UAE



INTEGRATED AIR & WATER



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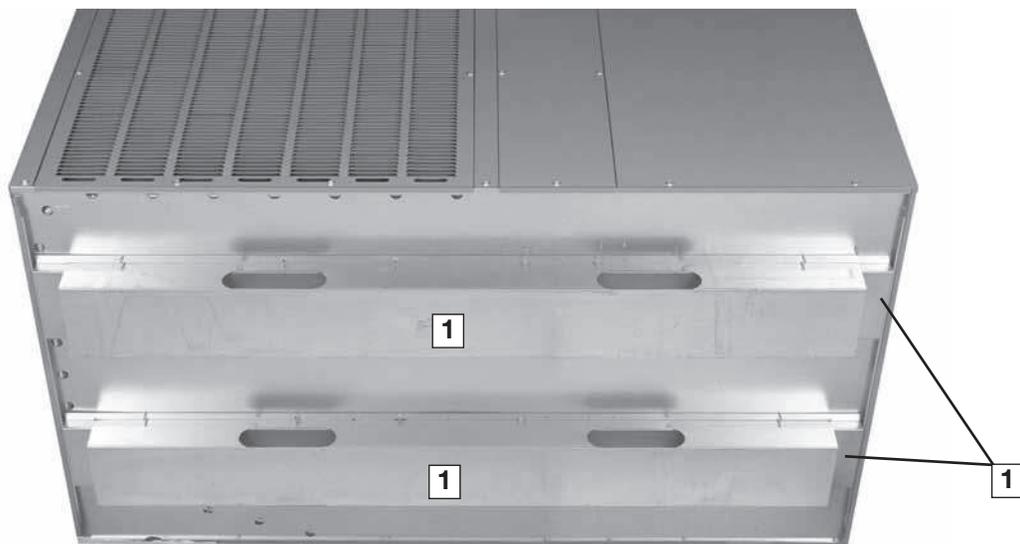


The EMRHR series of Package Air Conditioners is designed to be the most efficient, quickest to install, easiest to service, and most reliable units in the industry - while still maintaining an affordable price. This platform provides you with a nominal capacity of 3.5 to 10 Ton.

As with all units offered by Rheem, we started our design process with input from the customer. From fan grille to the base rails, Rheem has combined 30 years worth of package unit design experience with input from Dealers to meet the latest application requirements.

Starting at the bottom, the base rails (1) allow for separation between the unit base and the ground level, protecting the base from ground moisture and providing air circulation around the unit. Constructed from sturdy 14-gauge G-90 sheet metal, the base rails also allow for easier maneuverability during installation.

The 102 and 120 models employ a full perimeter base rail that integrate fork slots and rigging holes to save setup time on the job site.





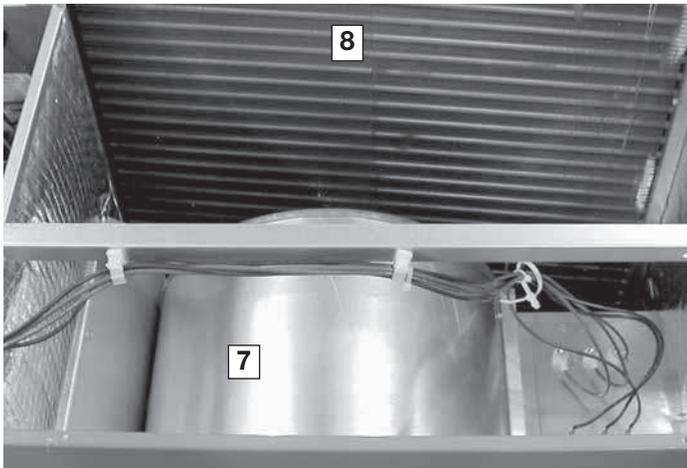
Rheem package equipment uses a pre paint system, rated at 1008 hour salt spray per ASTM B117.

This process also greatly diminishes and dulls sharp edges, reducing the occurrence of cuts and torn clothes.

Furthermore, the cabinet is 61.2" wide for larger chassis (8-10TR). Full-louver coil protection makes Rheem unique in the industry and also totally protects the outdoor coil from vandalism and weather extremes.

Keeping service technicians in mind, Rheem takes pride providing easy access to internal components. The outdoor-section top cover (3) is easily removed to allow access to the scroll compressor (4), outdoor fan motor (5), and refrigerant tubing (6).





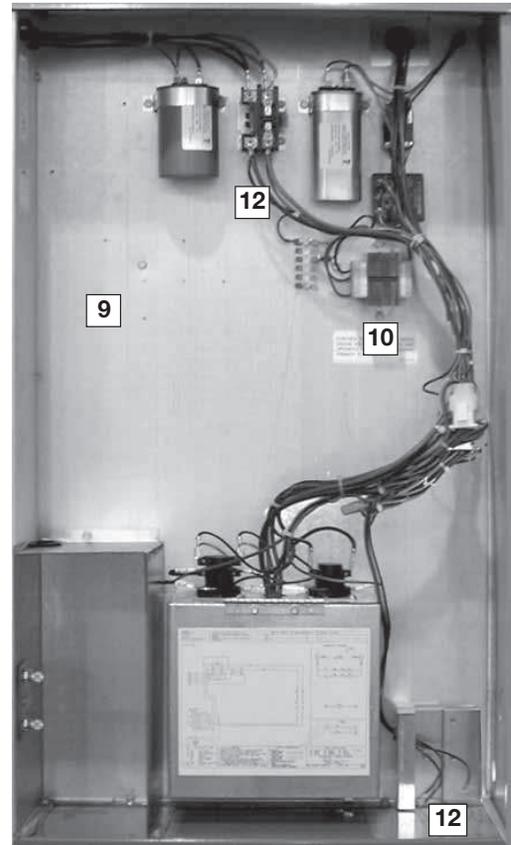
The indoor-section top cover also easily opens to access the removable blower housing and motor (7). This also gains total access to the indoor coil for cleaning and service (8).

The indoor motor and blower system will achieve nominal 400 CFM per ton up to a minimum of .8 inches of static pressure, which helps to eliminate customer dissatisfaction over poor air-flow brought about by high-static duct designs.

The supply and return are located along width of the unit. Models 102 and 120 has a high performance belt drive motor with variable pitch pulleys and quick-adjust belt system.



The controls are located in a large, easy-to-access control box (10), which provides plenty of space in which to troubleshoot. The transformer (11) is protected by an in-line fuse, which protects the transformer during a low-voltage electrical short. The low-voltage (12) and high-voltage (13) wiring connections are easily accessed and have ample room around which to maneuver. Troubleshooting is further aided with number- and color-coded wiring, which corresponds with the large, easy-to-read wiring diagram located on the inside of the control box access panel.





High and low refrigerant pressure can easily and accurately be measured using the two gauge ports (14)



Foil-faced fiberglass insulation is securely glued and captured to the cabinet of small chassis while foil-faced closed-cell insulation is used for the cabinet of larger chassis. On the base of the unit, closed-cell insulation is used to prevent moisture from being absorbed and help reduce mold content to provide better indoor air quality.

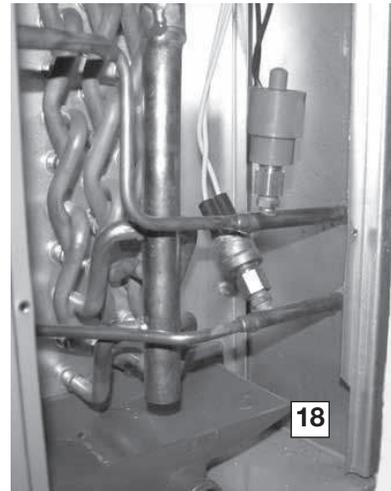
For reliability and long-lasting operation, Rheem uses 100% scroll compressor technology (17) on all package platforms. With over 18 years of history, the scroll compressor has proven to be reliable, efficient, and quiet during operation.



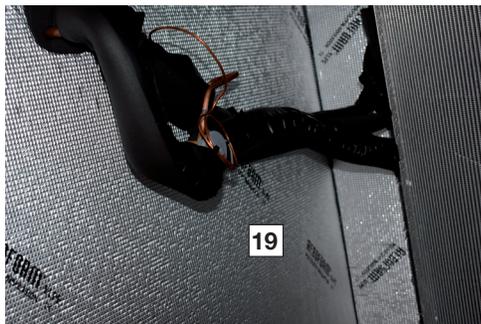
A small side panel grants access to a removable, sloped drain pan (15A) for smaller chassis and slide-out composite drain pan (15B) for larger chassis, which helps to ensure indoor air quality (IAQ) throughout the life of the unit. A 1" drain trap (16) assembly is provided for convenience.



High and low pressure controls are provided from factory (18).

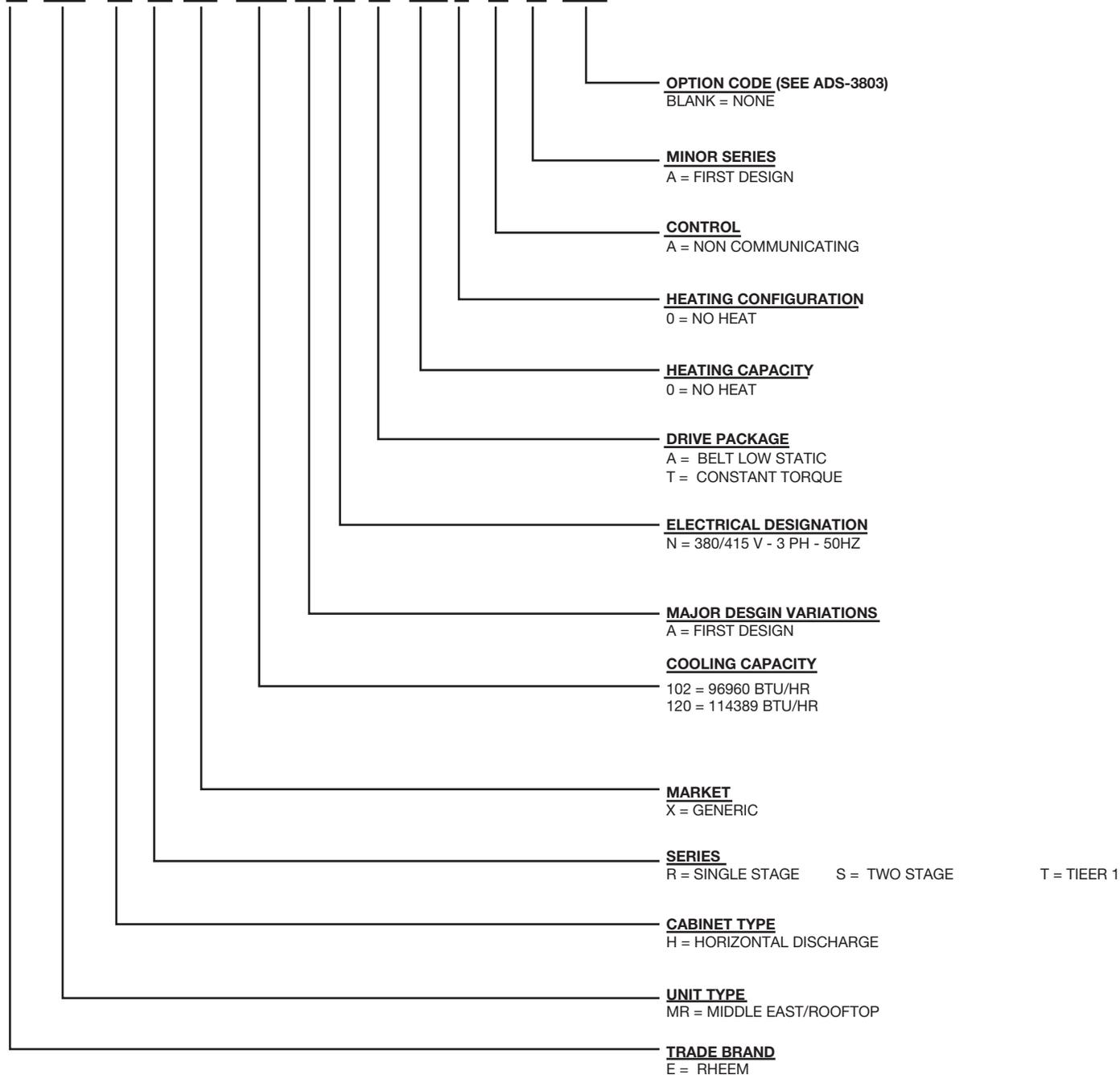


The smaller chassis units have the Copper tube/Aluminum Fin coils while the larger chassis units have aluminum Micro-Channel coil that uses the latest enhanced fin design for the most effective method of heat transfer with a reduction in refrigerant charge and unit weight. All units use TXVs (19) as refrigerant metering system.



# NOMENCLATURE

**E MR H R X 066 A N T 00 0 A A \*\*\***



[ ] Designates Metric Conversions

<b>Available Models 50Hz</b>
EMRHRX102ANA000AAAA0
EMRHRX120ANA000AAAA0

## GENERAL DATA - EMRHR MODELS NOMINAL SIZES 8 - 10 TONS

Model - EMRHR	X102ANA	X120ANA
<b>Compressor</b>		
No./Type	1/Scroll	1/Scroll
<b>Outdoor Sound Rating (dB)<sup>5</sup></b>	81	84
<b>Outdoor Coil - Fin Type</b>	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	0.81 [20.6]	1 [25.4]
Face Area sq. ft. [sq. m]	25.6 [2.38]	25.6 [2.38]
Rows / FPI [FPcm]	1 / 23 [9]	1 / 23 [9]
<b>Indoor Coil - Fin Type</b>	Louvered	Louvered
Tube Type	MicroChannel	MicroChannel
MicroChannel Depth in. [mm]	1.26 [32]	1.26 [32]
Face Area sq. ft. [sq. m]	10.9 [1.01]	10.9 [1.01]
Rows / FPI [FPcm]	1 / 20 [8]	1 / 20 [8]
Refrigerant Control	TX Valve	TX Valve
Drain Connection No./Size in. [mm]	1/0.75 [19.05]	1/0.75 [19.05]
<b>Outdoor Fan - Type</b>	Propeller	Propeller
No. Used/Diameter in. [mm]	2/24 [609.6]	2/24 [609.6]
Drive Type/No. Speeds	Direct/1	Direct/1
CFM [L/s]	8000 [3775]	9000 [4247]
No. Motors/HP	2 at 1/3 HP	2 at 3/4 HP
Motor RPM	900	900
<b>Indoor Fan - Type</b>	FC Centrifugal	FC Centrifugal
No. Used/Diameter in. [mm]	1/15x15 [381x381]	1/15x15 [381x381]
Drive Type	Belt (Adjustable)	Belt (Adjustable)
No. Speeds	Single	Single
No. Motors	1	1
Motor HP	3	3
Motor RPM	1425	1425
Motor Frame Size	56	56
<b>Filter - Type</b>	Permanent	Permanent
Furnished	Yes	Yes
(NO.) Size Recommended in. [mm x mm x mm]	(2) .875x18x24 [22x457x610]	(2) .875x18x24 [22x457x610]
<b>Refrigerant Charge Oz. [g]</b>	120 [3411]	128 [3629]
<b>Weights</b>		
Net Weight lbs. [kg]	993 [450]	993 [450]
Ship Weight lbs. [kg]	1032 [468]	1032 [468]

### NOTES:

1. Outdoor Sound Rating shown is tested in accordance with ARI Standard 270.
2. Standard 3/4" PVC P-Trap provided.

[ ] Designates Metric Conversions





Model	T1 (27/19 - 35°C)			T3 (29/19 - 46°C)		
	Rated Capacity (BTUH)	Rated PI (kW)	Rated EER	Rated Capacity (BTUH)	Rated PI (kW)	Rated EER
EMRHRX102ANA	96960.08	7.74	12.53	88960.00	9.50	9.36
EMRHRX120ANA	114389.74	9.61	11.91	102620.00	11.55	8.88



**COOLING PERFORMANCE DATA - EMRHRX102AN**

		Entering Indoor Air @ 80°F [26.7°C] dbE ①															
		71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			61°F [16.1°C]			59°F [15.0°C]			
wbE		4100 [1935]	3300 [1557]	2900 [1369]	4100 [1935]	3300 [1557]	2900 [1369]	4100 [1935]	3300 [1557]	2900 [1369]	4100 [1935]	3300 [1557]	2900 [1369]	4100 [1935]	3300 [1557]	2900 [1369]	
CFM [L/s]																	
DR ①		0.09	0.03	0.01	0.09	0.03	0.01	0.09	0.03	0.01	0.09	0.03	0.01	0.09	0.03	0.01	
Outdoor Dry Bulb Temperature	75°F [23.9°C]	Total BTUH [kW]	114.4 [33.5]	109.6 [32.1]	107.2 [31.4]	111.7 [32.7]	107 [31.4]	104.7 [30.7]	107.4 [31.5]	102.9 [30.1]	100.6 [29.5]	104.6 [30.7]	100.2 [29.4]	98 [28.7]	101.4 [29.7]	97.1 [28.5]	95 [27.8]
		Sens BTUH [kW]	81.7 [23.9]	73.4 [21.5]	69.2 [20.3]	91.7 [26.9]	82.3 [24.1]	77.7 [22.8]	99.2 [29.1]	89.1 [26.1]	84 [24.6]	102 [29.9]	91.6 [26.8]	86.4 [25.3]	101.4 [29.7]	93.6 [27.4]	88.3 [25.9]
		Power	6.4	6.3	6.2	6.4	6.2	6.2	6.3	6.2	6.1	6.3	6.1	6.1	6.2	6.1	6.0
	80°F [26.7°C]	Total BTUH [kW]	112.8 [33.1]	108 [31.7]	105.7 [31]	110.1 [32.3]	105.5 [30.9]	103.1 [30.2]	105.8 [31]	101.3 [29.7]	99.1 [29]	103 [30.2]	98.6 [28.9]	96.4 [28.3]	99.8 [29.2]	95.6 [28]	93.4 [27.4]
		Sens BTUH [kW]	81 [23.7]	72.8 [21.3]	68.7 [20.1]	91 [26.7]	81.8 [24]	77.1 [22.6]	98.5 [28.9]	88.5 [25.9]	83.5 [24.5]	101.3 [29.7]	91 [26.7]	85.9 [25.2]	99.8 [29.2]	93 [27.3]	87.7 [25.7]
		Power	6.7	6.5	6.4	6.6	6.4	6.4	6.5	6.4	6.3	6.5	6.4	6.3	6.5	6.3	6.2
	85°F [29.4°C]	Total BTUH [kW]	111 [32.5]	106.3 [31.2]	104 [30.5]	108.3 [31.7]	103.8 [30.4]	101.5 [29.7]	104 [30.5]	99.6 [29.2]	97.4 [28.5]	101.2 [29.7]	96.9 [28.4]	94.8 [27.8]	98 [28.7]	93.9 [27.5]	91.8 [26.9]
		Sens BTUH [kW]	80.3 [23.5]	72.1 [21.1]	68 [19.9]	90.3 [26.4]	81.1 [23.8]	76.5 [22.4]	97.7 [28.6]	87.8 [25.7]	82.8 [24.3]	100.6 [29.5]	90.3 [26.5]	85.2 [25]	98 [28.7]	92.3 [27.1]	87.1 [25.5]
		Power	6.9	6.7	6.7	6.8	6.7	6.6	6.7	6.6	6.5	6.7	6.6	6.5	6.7	6.5	6.5
	90°F [32.2°C]	Total BTUH [kW]	109.1 [32]	104.5 [30.6]	102.2 [30]	106.4 [31.2]	101.9 [29.9]	99.7 [29.2]	102.1 [29.9]	97.8 [28.7]	95.6 [28]	99.3 [29.1]	95.1 [27.9]	93 [27.3]	96.1 [28.2]	92 [27]	90 [26.4]
		Sens BTUH [kW]	79.4 [23.3]	71.4 [20.9]	67.3 [19.7]	89.4 [26.2]	80.3 [23.5]	75.8 [22.2]	96.9 [28.4]	87.1 [25.5]	82.1 [24.1]	99.3 [29.1]	89.6 [26.3]	84.5 [24.8]	96.1 [28.2]	91.6 [26.8]	86.4 [25.3]
		Power	7.1	7.0	6.9	7.0	6.9	6.8	7.0	6.8	6.8	6.9	6.8	6.7	6.9	6.8	6.7
95°F [35.0°C]	Total BTUH [kW]	107.1 [31.4]	102.6 [30.1]	100.3 [29.4]	104.4 [30.6]	100 [29.3]	97.8 [28.7]	100 [29.3]	95.8 [28.1]	93.7 [27.5]	97.3 [28.5]	93.1 [27.3]	91.1 [26.7]	94 [27.6]	90.1 [26.4]	88.1 [25.8]	
	Sens BTUH [kW]	78.5 [23]	70.5 [20.7]	66.5 [19.5]	88.5 [25.9]	79.5 [23.3]	75 [22]	96 [28.1]	86.2 [25.3]	81.3 [23.8]	97.3 [28.5]	88.8 [26]	83.7 [24.5]	94 [27.6]	90.1 [26.4]	85.6 [25.1]	
	Power	7.4	7.2	7.1	7.3	7.1	7.1	7.2	7.1	7.0	7.2	7.0	7.0	7.2	7.0	6.9	
100°F [37.8°C]	Total BTUH [kW]	104.9 [30.7]	100.5 [29.4]	98.3 [28.8]	102.2 [30]	97.9 [28.7]	95.7 [28.1]	97.9 [28.7]	93.7 [27.5]	91.7 [26.9]	95.1 [27.9]	91.1 [26.7]	89.1 [26.1]	91.9 [26.9]	88 [25.8]	86.1 [25.2]	
	Sens BTUH [kW]	77.5 [22.7]	69.6 [20.4]	65.7 [19.2]	87.5 [25.6]	78.6 [23]	74.1 [21.7]	95 [27.8]	85.3 [25]	80.5 [23.6]	95.1 [27.9]	87.8 [25.7]	82.9 [24.2]	91.9 [26.9]	88 [25.8]	84.7 [24.8]	
	Power	7.6	7.5	7.4	7.6	7.4	7.3	7.5	7.3	7.3	7.5	7.3	7.2	7.4	7.3	7.2	
105°F [40.6°C]	Total BTUH [kW]	102.6 [30.1]	98.3 [28.8]	96.1 [28.2]	99.9 [29.3]	95.7 [28]	93.6 [27.4]	95.6 [28]	91.5 [26.8]	89.5 [26.2]	92.8 [27.2]	88.9 [26]	86.9 [25.5]	89.6 [26.2]	85.8 [25.1]	83.9 [24.6]	
	Sens BTUH [kW]	76.4 [22.4]	68.6 [20.1]	64.7 [19]	86.4 [25.3]	77.6 [22.7]	73.2 [21.4]	93.8 [27.5]	84.3 [24.7]	79.5 [23.3]	92.8 [27.2]	86.8 [25.4]	81.9 [24]	89.6 [26.2]	85.8 [25.1]	83.8 [24.6]	
	Power	7.9	7.7	7.7	7.8	7.7	7.6	7.8	7.6	7.5	7.7	7.6	7.5	7.7	7.5	7.5	
110°F [43.3°C]	Total BTUH [kW]	100.2 [29.4]	95.9 [28.1]	93.8 [27.5]	97.5 [28.6]	93.4 [27.4]	91.3 [26.8]	93.1 [27.3]	89.2 [26.1]	87.2 [25.6]	90.3 [26.5]	86.5 [25.4]	84.6 [24.8]	87.1 [25.5]	83.5 [24.5]	81.6 [23.9]	
	Sens BTUH [kW]	75.2 [22]	67.5 [19.8]	63.7 [18.7]	85.2 [25]	76.5 [22.4]	72.2 [21.1]	92.7 [27.2]	83.2 [24.4]	78.5 [23]	90.3 [26.5]	85.8 [25.1]	80.9 [23.7]	87.1 [25.5]	83.5 [24.5]	81.6 [23.9]	
	Power	8.2	8.0	7.9	8.1	8.0	7.9	8.1	7.9	7.8	8.0	7.9	7.8	8.0	7.8	7.7	
115°F [46.1°C]	Total BTUH [kW]	97.6 [28.6]	93.5 [27.4]	91.4 [26.8]	94.9 [27.8]	90.9 [26.6]	88.9 [26.1]	90.6 [26.5]	86.7 [25.4]	84.8 [24.9]	87.8 [25.7]	84.1 [24.6]	82.2 [24.1]	84.6 [24.8]	81 [23.7]	79.2 [23.2]	
	Sens BTUH [kW]	73.9 [21.6]	66.4 [19.4]	62.6 [18.3]	83.9 [24.6]	75.3 [22.1]	71.1 [20.8]	90.6 [26.5]	82.1 [24.1]	77.4 [22.7]	87.8 [25.7]	84.1 [24.6]	79.8 [23.4]	84.6 [24.8]	81 [23.7]	79.2 [23.2]	
	Power	8.5	8.3	8.2	8.4	8.3	8.2	8.4	8.2	8.1	8.3	8.2	8.1	8.3	8.1	8.0	
118.4°F [48°C]	Total BTUH [kW]	95.8 [28.1]	91.7 [26.9]	89.7 [26.3]	93.1 [27.3]	89.1 [26.1]	87.2 [25.6]	88.8 [26]	84.9 [24.9]	83.1 [24.4]	86 [25.2]	82.3 [24.1]	80.5 [23.6]	82.8 [24.3]	79.2 [23.2]	77.5 [22.7]	
	Sens BTUH [kW]	72.9 [21.4]	65.5 [19.2]	61.8 [18.1]	82.9 [24.3]	74.5 [21.8]	70.3 [20.6]	88.8 [26]	81.2 [23.8]	76.7 [22.5]	86 [25.2]	82.3 [24.1]	79.1 [23.2]	82.8 [24.3]	79.2 [23.2]	77.5 [22.7]	
	Power	8.7	8.5	8.4	8.7	8.5	8.4	8.6	8.4	8.3	8.6	8.4	8.3	8.5	8.3	8.2	
120°F [48.9°C]	Total BTUH [kW]	94.9 [27.8]	90.9 [26.6]	88.9 [26]	92.2 [27]	88.3 [25.9]	86.4 [25.3]	87.9 [25.7]	84.1 [24.7]	82.3 [24.1]	85.1 [24.9]	81.5 [23.9]	79.7 [23.3]	81.9 [24]	78.4 [23]	76.7 [22.5]	
	Sens BTUH [kW]	72.5 [21.2]	65.1 [19.1]	61.4 [18]	82.5 [24.2]	74.1 [21.7]	69.9 [20.5]	87.9 [25.7]	80.8 [23.7]	76.3 [22.3]	85.1 [24.9]	81.5 [23.9]	78.7 [23]	81.9 [24]	78.4 [23]	76.7 [22.5]	
	Power	8.8	8.6	8.5	8.8	8.6	8.5	8.7	8.5	8.4	8.7	8.5	8.4	8.6	8.4	8.3	
125°F [51.7°C]	Total BTUH [kW]	92.1 [27]	88.2 [25.8]	86.2 [25.3]	89.4 [26.2]	85.6 [25.1]	83.7 [24.5]	85 [24.9]	81.4 [23.9]	79.6 [23.3]	82.2 [24.1]	78.8 [23.1]	77 [22.6]	79 [23.2]	75.7 [22.2]	74 [21.7]	
	Sens BTUH [kW]	71 [20.8]	63.8 [18.7]	60.2 [17.6]	81 [23.7]	72.8 [21.3]	68.7 [20.1]	85 [24.9]	79.5 [23.3]	75 [22]	82.2 [24.1]	78.8 [23.1]	77 [22.6]	79 [23.2]	75.7 [22.2]	74 [21.7]	
	Power	9.2	9.0	8.9	9.1	8.9	8.8	9.0	8.8	8.7	9.0	8.8	8.7	9.0	8.8	8.7	

**NOTES:**

dbE-Entering air dry bulb

wbE-Entering air wet bulb

Total-Total Cooling Capacity x 1000 BTUH

Sens-Sensible capacity x 1000 BTUH

Power-KW input (Compressor + OD motor)





COOLING PERFORMANCE DATA - EMRHRX120AN

		Entering Indoor Air @ 80°F [26.7°C] dbE ①															
wbE		71°F [21.7°C]			67°F [19.4°C]			63°F [17.2°C]			61°F [16.1°C]			59°F [15.0°C]			
CFM [L/s]		4800 [2265]	3800 [1793]	3200 [1510]	4800 [2265]	3800 [1793]	3200 [1510]	4800 [2265]	3800 [1793]	3200 [1510]	4800 [2265]	3800 [1793]	3200 [1510]	4800 [2265]	3800 [1793]	3200 [1510]	
DR ①		0.10	0.05	0.01	0.10	0.05	0.01	0.10	0.05	0.01	0.10	0.05	0.01	0.10	0.05	0.01	
Outdoor Dry Bulb Temperature	75°F [23.9°C]	Total BTUH [kW] Sens BTUH [kW] Power	132.4 [38.8] 95.6 [28] 7.7	126.4 [37] 85.1 [25] 7.6	122.7 [36] 78.9 [23.1] 7.5	129.7 [38] 105.7 [31] 7.7	123.8 [36.3] 94.1 [27.6] 7.5	120.2 [35.2] 87.2 [25.5] 7.4	125.4 [36.7] 113.2 [33.2] 7.6	119.6 [35.1] 100.9 [29.6] 7.4	116.2 [34.1] 93.4 [27.4] 7.3	122.6 [35.9] 116.1 [34] 7.6	117 [34.3] 103.4 [30.3] 7.4	113.6 [33.3] 95.8 [28.1] 7.3	119.3 [35] 118.3 [34.7] 7.5	113.9 [33.4] 105.4 [30.9] 7.4	110.6 [32.4] 97.6 [28.6] 7.3
	80°F [26.7°C]	Total BTUH [kW] Sens BTUH [kW] Power	130.8 [38.3] 94.9 [27.8] 8.0	124.8 [36.6] 84.5 [24.8] 7.8	121.2 [35.5] 78.3 [23] 7.7	128.1 [37.5] 105 [30.8] 7.9	122.2 [35.8] 93.5 [27.4] 7.7	118.7 [34.8] 86.6 [25.4] 7.6	123.7 [36.3] 112.6 [33] 7.8	118.1 [34.6] 100.3 [29.4] 7.6	114.7 [33.6] 92.9 [27.2] 7.5	120.9 [35.4] 115.4 [33.8] 7.8	115.4 [33.8] 102.8 [30.1] 7.6	112.1 [32.8] 95.2 [27.9] 7.5	117.7 [34.5] 118.3 [34.7] 7.7	112.3 [32.9] 104.8 [30.7] 7.6	109.1 [32] 97 [28.4] 7.5
	85°F [29.4°C]	Total BTUH [kW] Sens BTUH [kW] Power	129 [37.8] 94.2 [27.6] 8.2	123.1 [36.1] 83.9 [24.6] 8.0	119.6 [35] 77.7 [22.6] 7.9	126.3 [37] 104.2 [30.5] 8.1	120.5 [35.3] 92.8 [27.2] 7.9	117.1 [34.3] 86 [25.2] 7.8	121.9 [35.7] 111.8 [32.8] 8.0	116.4 [34.1] 99.6 [29.2] 7.9	113 [33.1] 92.2 [27] 7.7	119.1 [34.9] 114.7 [33.6] 8.0	113.7 [33.3] 102.1 [29.9] 7.8	110.4 [32.4] 94.6 [27.7] 7.7	115.9 [34] 115.9 [34] 8.0	110.6 [32.4] 104.1 [30.5] 7.8	107.4 [31.5] 96.4 [28.3] 7.7
	90°F [32.2°C]	Total BTUH [kW] Sens BTUH [kW] Power	127.1 [37.2] 93.3 [27.3] 8.4	121.3 [35.5] 83.1 [24.4] 8.2	117.8 [34.5] 77 [22.6] 8.1	124.4 [36.4] 103.4 [30.3] 8.3	118.7 [34.8] 92.1 [27] 8.2	115.3 [33.8] 85.3 [25] 8.0	120 [35.2] 111.3 [32.5] 8.3	114.5 [33.6] 98.8 [29] 8.1	111.3 [32.6] 91.5 [26.8] 8.0	117.2 [34.4] 113.8 [33.3] 8.2	111.9 [32.8] 101.4 [29.7] 8.1	108.7 [31.8] 93.9 [27.5] 7.9	114 [33.4] 114 [33.4] 8.2	108.8 [31.9] 103.3 [30.3] 8.0	105.7 [31] 95.7 [28] 7.9
	95°F [35.0°C]	Total BTUH [kW] Sens BTUH [kW] Power	125 [36.6] 92.4 [27.1] 8.7	119.3 [35] 82.3 [24.1] 8.5	115.9 [34] 76.2 [22.3] 8.3	122.3 [35.9] 102.5 [30] 8.6	116.8 [34.2] 91.3 [26.7] 8.4	113.4 [33.2] 84.5 [24.8] 8.3	118 [34.6] 110 [32.2] 8.5	112.6 [33] 98 [28.7] 8.3	109.4 [32] 90.8 [26.6] 8.2	115.2 [33.8] 112.9 [33.1] 8.5	109.9 [32.2] 100.5 [29.5] 8.3	106.8 [31.3] 93.1 [27.3] 8.2	112 [32.8] 112 [32.8] 8.5	106.8 [31.3] 102.5 [30] 8.3	103.8 [30.4] 94.9 [27.8] 8.2
	100°F [37.8°C]	Total BTUH [kW] Sens BTUH [kW] Power	122.9 [36] 91.4 [26.8] 8.9	117.3 [34.4] 81.4 [23.8] 8.7	113.9 [33.4] 75.4 [22.1] 8.6	120.2 [35.2] 101.4 [29.7] 8.9	114.7 [33.6] 90.3 [26.5] 8.7	111.4 [32.6] 83.7 [24.5] 8.5	115.8 [33.9] 109 [31.9] 8.8	110.5 [32.4] 97.1 [28.4] 8.6	107.3 [31.5] 89.9 [26.4] 8.5	113 [33.1] 111.8 [32.8] 8.8	107.8 [31.6] 99.6 [29.2] 8.6	104.7 [30.7] 92.3 [27] 8.4	109.8 [32.2] 109.8 [32.2] 8.7	104.8 [30.7] 101.6 [29.8] 8.5	101.8 [29.8] 94.1 [27.6] 8.4
	105°F [40.6°C]	Total BTUH [kW] Sens BTUH [kW] Power	120.6 [35.3] 90.2 [26.4] 9.2	115 [33.7] 80.4 [23.6] 9.0	111.7 [32.7] 74.4 [21.8] 8.9	117.8 [34.5] 100.3 [29.4] 9.1	112.5 [33] 89.3 [26.2] 8.9	109.2 [32] 82.8 [24.3] 8.8	113.5 [33.3] 107.9 [31.6] 9.1	108.3 [31.7] 96.1 [28.2] 8.9	105.2 [30.8] 89 [26.1] 8.7	110.7 [32.4] 110.7 [32.4] 9.0	105.6 [31] 98.6 [28.9] 8.8	102.6 [30.1] 91.3 [26.8] 8.7	107.5 [31.5] 107.5 [31.5] 9.0	102.6 [30.1] 100.6 [29.5] 8.8	99.6 [29.2] 93.2 [27.3] 8.7
	110°F [43.3°C]	Total BTUH [kW] Sens BTUH [kW] Power	118.1 [34.6] 89 [26.1] 9.5	112.7 [33] 79.3 [23.2] 9.3	109.5 [32.1] 73.5 [21.5] 9.2	115.4 [33.8] 99.1 [29] 9.4	110.1 [32.3] 88.3 [25.9] 9.2	107 [31.3] 81.8 [24] 9.1	111 [32.5] 106.7 [31.3] 9.4	106 [31.1] 95 [27.8] 9.1	102.9 [30.2] 88 [25.8] 9.0	108.2 [31.7] 108.2 [31.7] 9.3	103.3 [30.3] 97.5 [28.6] 9.1	100.3 [29.4] 90.3 [26.5] 9.0	105 [30.8] 105 [30.8] 9.3	100.2 [29.4] 99.5 [29.2] 9.1	97.3 [28.5] 92.2 [27] 9.0
	115°F [46.1°C]	Total BTUH [kW] Sens BTUH [kW] Power	115.5 [33.9] 87.7 [25.7] 9.8	110.2 [32.3] 78.1 [22.9] 9.6	107.1 [31.4] 72.4 [21.2] 9.4	112.8 [33.1] 97.8 [28.7] 9.7	107.7 [31.6] 87.1 [25.5] 9.5	104.6 [30.6] 80.7 [23.6] 9.4	108.5 [31.8] 105.4 [30.9] 9.7	103.5 [30.3] 93.8 [27.5] 9.4	100.5 [29.5] 86.9 [25.5] 9.3	105.7 [31] 105.7 [31] 9.6	100.8 [29.5] 96.4 [28.2] 9.4	97.9 [28.7] 89.3 [26.2] 9.3	102.4 [30] 102.4 [30] 9.6	97.8 [28.6] 97.8 [28.6] 9.4	95 [27.8] 91.1 [26.7] 9.3
	118.4°F [48°C]	Total BTUH [kW] Sens BTUH [kW] Power	113.7 [33.3] 86.7 [25.4] 10	108.5 [31.8] 77.3 [22.7] 9.8	105.4 [30.9] 71.6 [21] 9.7	111 [32.5] 96.8 [28.4] 10	105.9 [31] 86.3 [25.3] 9.7	102.9 [30.2] 79.9 [23.4] 9.6	106.6 [31.2] 104.4 [30.6] 9.9	101.7 [29.8] 93 [27.3] 9.7	98.8 [29] 86.2 [25.3] 9.5	103.8 [30.4] 103.8 [30.4] 9.9	99 [29] 95.5 [28] 9.6	96.2 [28.2] 88.5 [25.9] 9.5	100.6 [29.5] 100.6 [29.5] 9.8	96 [28.1] 96 [28.1] 9.6	93.2 [27.3] 90.4 [26.5] 9.5
	120°F [48.9°C]	Total BTUH [kW] Sens BTUH [kW] Power	112.8 [33.1] 86.3 [25.3] 10.1	107.7 [31.5] 76.9 [22.5] 9.9	104.6 [30.6] 71.2 [20.9] 9.8	110.1 [32.3] 96.4 [28.3] 10.1	105.1 [30.8] 85.9 [25.2] 9.8	102.1 [29.9] 79.5 [23.3] 9.7	105.7 [31] 104 [30.5] 10.0	100.9 [29.6] 92.6 [27.1] 9.8	98 [28.7] 85.8 [25.1] 9.6	102.9 [30.2] 102.9 [30.2] 10.0	98.2 [28.8] 95.1 [27.9] 9.7	95.4 [28] 88.1 [25.8] 9.6	99.7 [29.2] 99.7 [29.2] 9.9	95.2 [27.9] 95.2 [27.9] 9.7	92.4 [27.1] 90 [26.4] 9.6
	125°F [51.7°C]	Total BTUH [kW] Sens BTUH [kW] Power	110 [32.2] 84.9 [24.9] 10.5	104.9 [30.8] 75.6 [22.1] 10.2	101.9 [29.9] 70 [20.5] 10.1	107.3 [31.4] 94.9 [27.8] 10.4	102.4 [30] 84.6 [24.8] 10.2	99.4 [29.1] 78.3 [23] 10.0	102.9 [30.2] 102.5 [30] 10.3	98.2 [28.8] 91.3 [26.8] 10.1	95.4 [27.9] 84.6 [24.8] 9.9	100.1 [29.3] 100.1 [29.3] 10.3	95.5 [28] 93.8 [27.5] 10.1	92.8 [27.2] 86.9 [25.5] 9.9	96.9 [28.4] 96.9 [28.4] 10.3	92.5 [27.1] 92.5 [27.1] 10.0	89.8 [26.3] 88.7 [26] 9.9

NOTES:

dbE-Entering air dry bulb

wbE-Entering air wet bulb

Total-Total Cooling Capacity x 1000 BTUH

Sens-Sensible capacity x 1000 BTUH

Power-KW input (Compressor + OD motor)



# AIRFLOW PERFORMANCE

Air Flow		External Static Pressure - Inches of Water [kPa]																												
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5									
CFM [L/s]	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W								
2700 [1274]	—	—	—	497	588	532	633	567	685	601	743	634	809	668	880	683	925	713	967	743	1016	772	1072	801	1135	830	1205	859	1282	
2800 [1321]	—	—	—	505	617	539	664	573	717	607	777	640	844	672	918	686	955	715	999	745	1051	774	1110	802	1176	831	1249	859	1329	
2900 [1368]	—	—	—	512	648	546	696	580	752	613	814	645	882	677	958	689	986	718	1034	747	1088	776	1150	804	1219	832	1294	860	1377	
3000 [1416]	—	—	—	520	681	553	732	586	789	619	852	651	923	682	1000	692	1021	721	1071	749	1128	778	1193	806	1264	833	1343	861	1429	
3100 [1463]	—	—	494	672	528	717	561	769	593	828	625	893	657	965	688	1044	696	1057	724	1110	752	1170	780	1238	808	1312	835	1394	862	1482
3200 [1510]	—	—	503	708	536	575	568	809	600	870	632	937	663	1010	671	1048	699	1096	727	1152	755	1215	782	1285	810	1363	837	1447	864	1538
3300 [1557]	—	—	511	747	544	796	576	851	607	913	638	982	669	1058	675	1086	703	1138	731	1197	758	1262	785	1335	812	1415	839	1503	865	1597
3400 [1604]	—	—	520	788	552	839	583	896	614	960	645	1030	675	1107	679	1127	707	1182	734	1243	761	1312	788	1388	815	1471	841	1561	867	1658
3500 [1652]	497	786	529	832	560	884	591	943	622	1008	652	1081	681	1159	684	1171	711	1228	738	1293	765	1364	791	1443	817	1529	846	1621	869	1721
3600 [1699]	506	830	538	878	569	932	599	992	629	1059	659	1133	688	1214	689	1217	716	1277	742	1344	765	1419	795	1500	820	1589	846	1684	871	1787
3700 [1746]	516	877	547	926	577	981	607	1044	637	1113	666	1188	667	1210	694	1265	720	1328	746	1399	772	1476	798	1560	823	1651	849	1750	873	1855
3800 [1793]	526	926	556	976	586	1034	616	1098	645	1168	673	1246	673	1258	699	1316	725	1382	751	1455	776	1535	802	1622	827	1717	852	1818	—	—
3900 [1840]	536	977	566	1029	595	1088	624	1154	653	1226	681	1305	679	1308	704	1370	730	1438	756	1514	781	1597	806	1687	830	1784	855	1888	—	—
4000 [1888]	546	1030	576	1084	605	1145	633	1213	661	1287	659	1304	685	1361	710	1426	735	1497	760	1576	785	1661	810	1754	834	1854	858	1961	—	—
4100 [1935]	557	1086	585	1142	614	1204	642	1274	669	1349	665	1357	691	1417	716	1484	741	1558	765	1640	790	1728	814	1824	838	1926	862	2036	—	—

NOTE: A-Drive left of bold line and B-Drive right of bold line

Drive Package	A						B						
Motor H.P. [W]	3 [2237.1]						3 [2237.1]						
Blower Sheave	AK79H						AK79H						
Motor Sheave	1VP40*7/8						1VP50*7/8						
Belt	A59						A59						
Turns Open	0	1	2	3	4	5	0	1	2	3	4	5	6
RPM	680	645	608	572	533	496	868	836	802	766	730	692	649

- NOTES:
1. Factory sheave settings are shown in bold type.
  2. Do not set motor sheave below minimum or maximum turns open shown
  3. Re-adjustment of sheave required to achieve rated airflow at AHRI minimum External Static Pressure
  4. [ ] Designates Metric Conversions



# AIRFLOW PERFORMANCE

Air Flow CFM [L/s]		Voltage 380-415 / 3 phase / 50 Hz																																	
		External Static Pressure - Inches of Water [kPa]																																	
		[.07]		[.10]		[.12]		[.15]		[.17]		[.20]		[.22]		[.25]		[.27]		[.30]		[.32]		[.35]		[.40]		[.42]		[.45]					
		RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W	RPM	W				
3200	[1557]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
3300	[1604]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3400	[1652]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3500	[1699]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3600	[1746]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3700	[1793]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3800	[1840]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3900	[1888]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4000	[1935]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4200	[2029]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4300	[2076]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4400	[2123]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4500	[2171]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4600	[2218]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4700	[2265]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075
4800	[2312]	569	1019	597	1085	626	1157	654	1234	682	1316	710	1404	737	1498	765	1597	766	1668	791	1530	816	1597	841	1668	865	1743	890	1821	914	1902	937	1987	961	2075

NOTE: A-Drive left of bold line and B-Drive right of bold line

Drive Package	A						B						
Motor H.P. [W]	3 [2237.1]						! [2982.8]						
Blower Sheave	AK71H						AK84H						
Motor Sheave	1VP40*7/8						1VP60*1 1/8						
Belt	A57						A59						
Turns Open	0	1	2	3	4	5	0	1	2	3	4	5	6
RPM	758	722	683	642	599	558	966	932	896	861	826	790	752

- NOTES:
1. Factory sheave settings are shown in bold type.
  2. Do not set motor sheave below minimum or maximum turns open shown
  3. Re-adjustment of sheave required to achieve rated airflow at AHRl minimum External Static Pressure
  4. [ ] Designates Metric Conversions



## ELECTRICAL DATA

<b>ELECTRICAL DATA - EMRHR SERIES</b>			
		X102ANA	X120ANA
Unit Information	Unit Operating Voltage Range	342-456	342-456
	Volts	380-415	380-415
	Phase	3	3
	Hz	50	50
	Minimum Circuit Ampacity	26	30
	Minimum Overcurrent Protection Device Size	30	35
	Maximum Overcurrent Protection Device Size	40	45
Compressor Motor	No.	1	1
	Volts	380-415	380-415
	Phase	3	3
	RPM	2900	2900
	Amps (RLA), Comp. 1	14.7	16.0
	Amps (LRA), Comp. 1	128	139
	HP, Compressor 2	-	-
	Amps (RLA), Comp. 2	-	-
	Amps (LRA), Comp. 2	-	-
Condenser Motor	No.	2	2
	Volts	380-415	380-415
	Phase	1	1
	HP	1/3	3/4
	Amps (FLA, each)	1.0	2.3
	Amps (LRA, each)	1.8	4.9
Evaporator Fan	No.	1	1
	Volts	380-415	380-415
	Phase	3	3
	HP	3	3
	Amps (FLA, each)	5.3	5.3
	Amps (LRA, each)	38.1	38.1

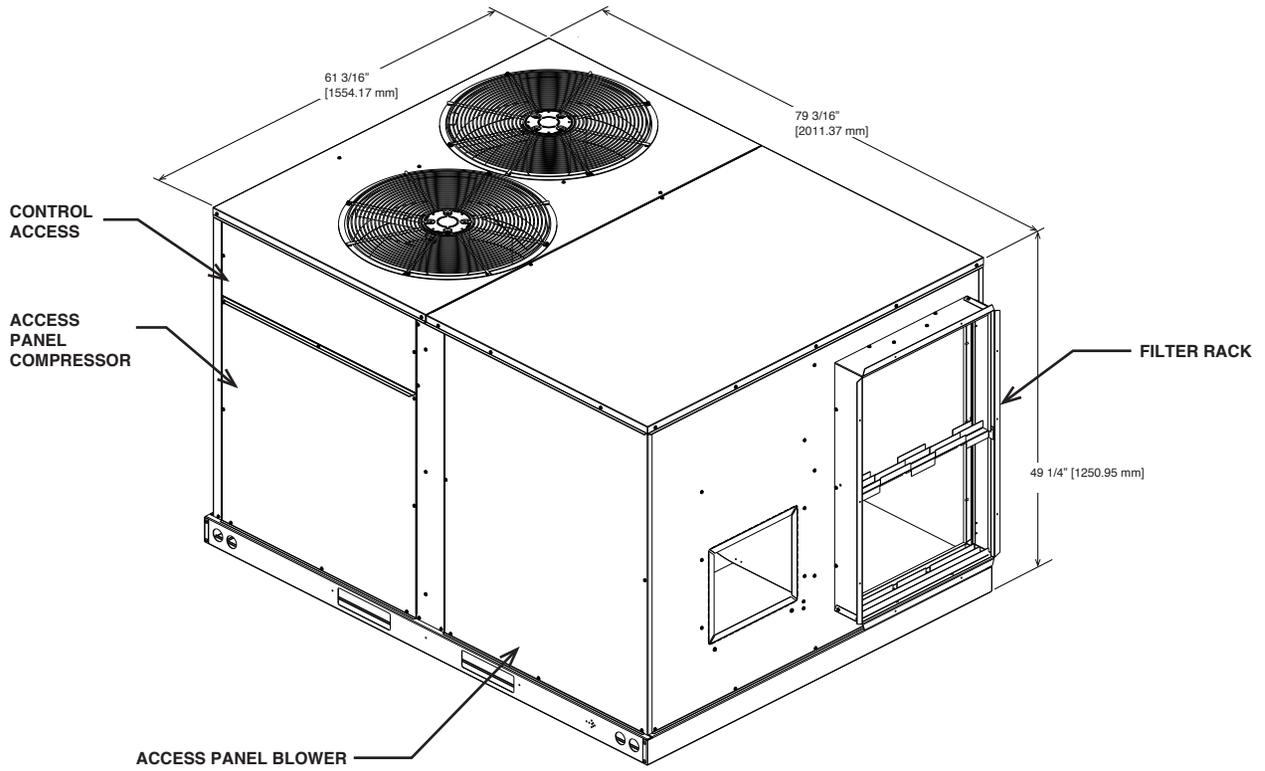
1. Amp Draw Per Motor. Multiply Value by Number of Motors to Determine Total Amps.

## SOUND DATA

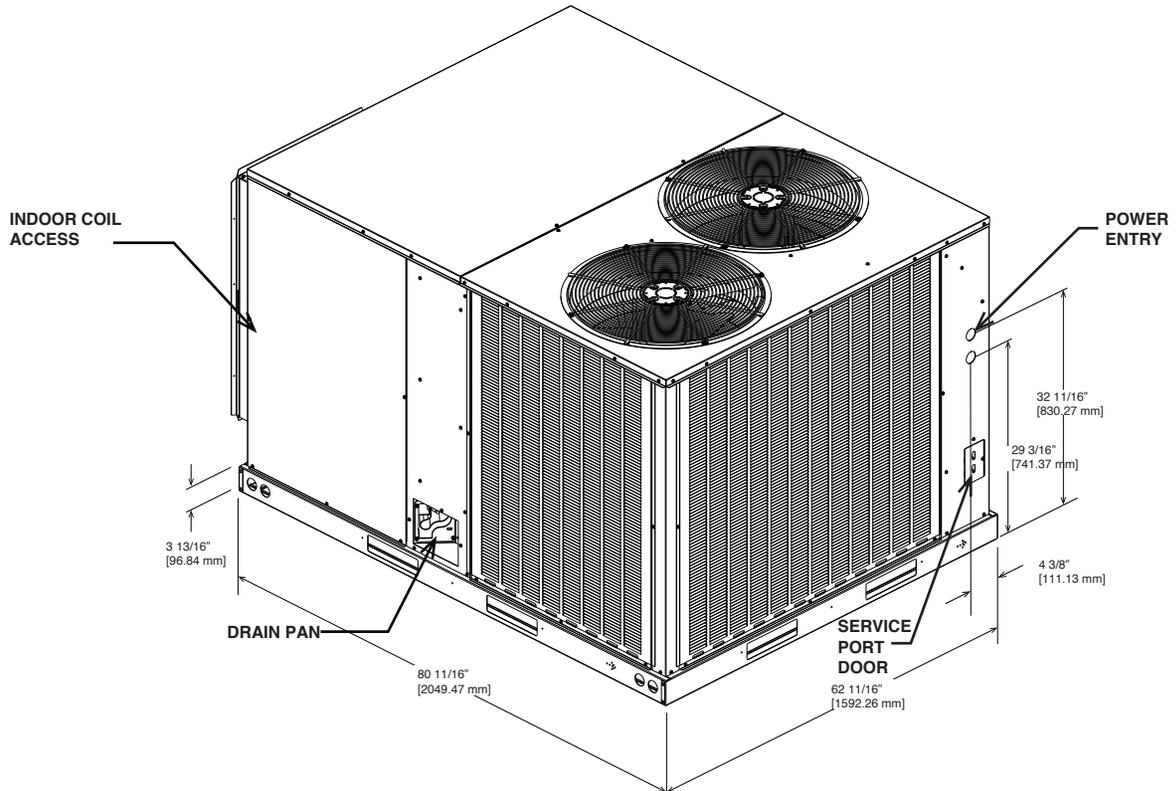
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EMRHRX120ANA	84 dB	N/A
EMRHRX102ANA	81 dB	N/A



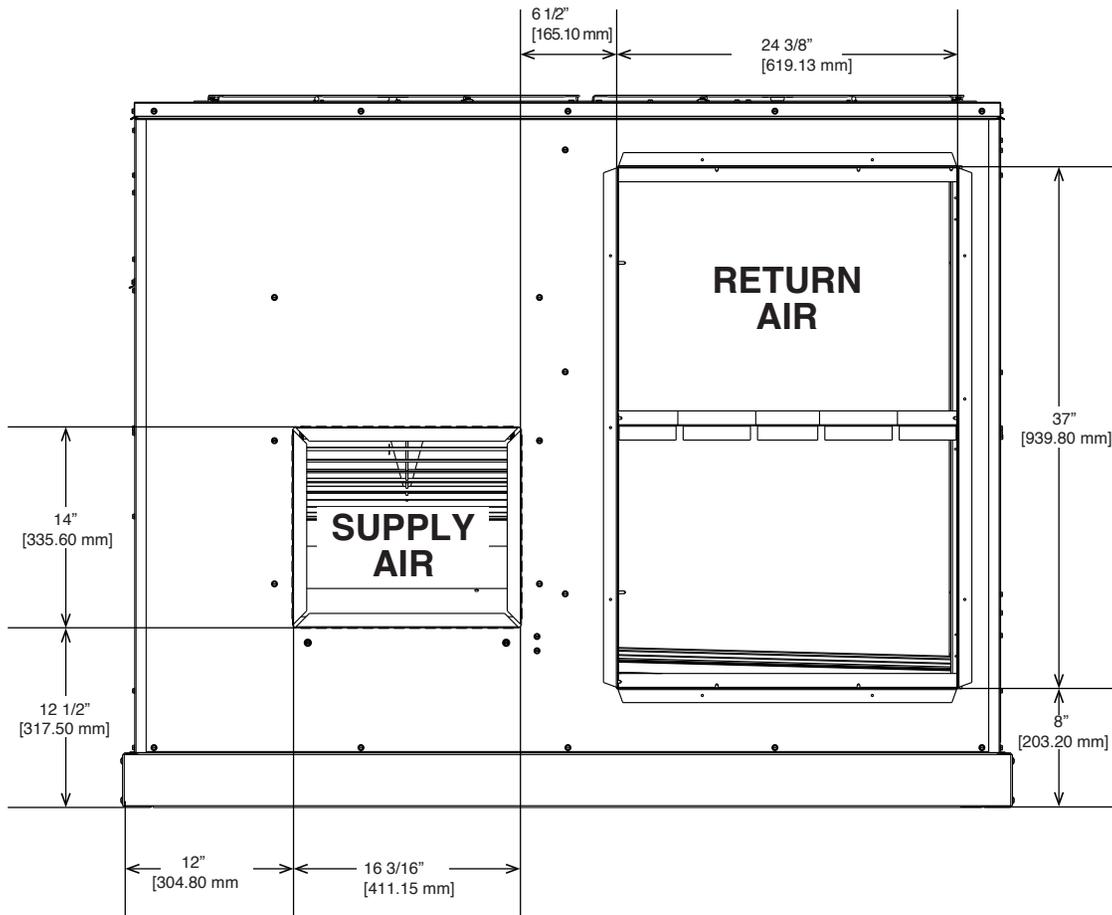
Model 102/120



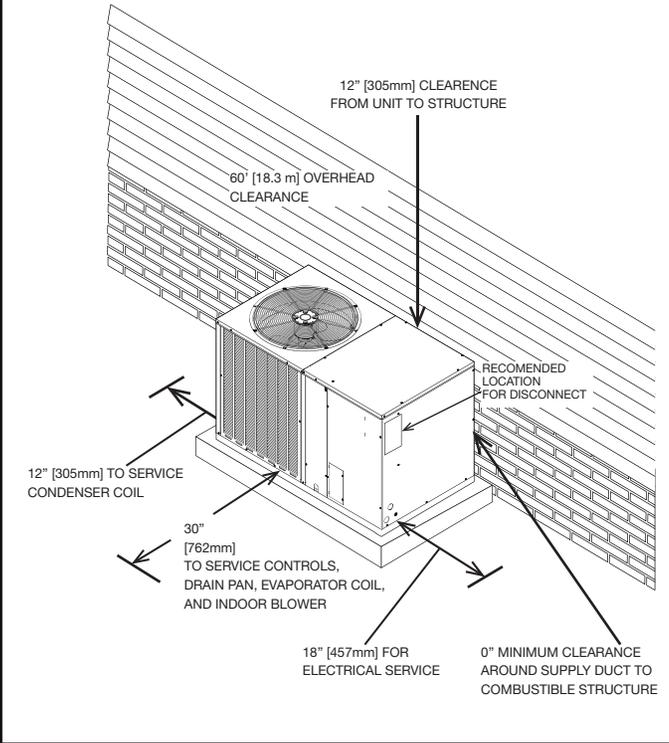
Model 102/120



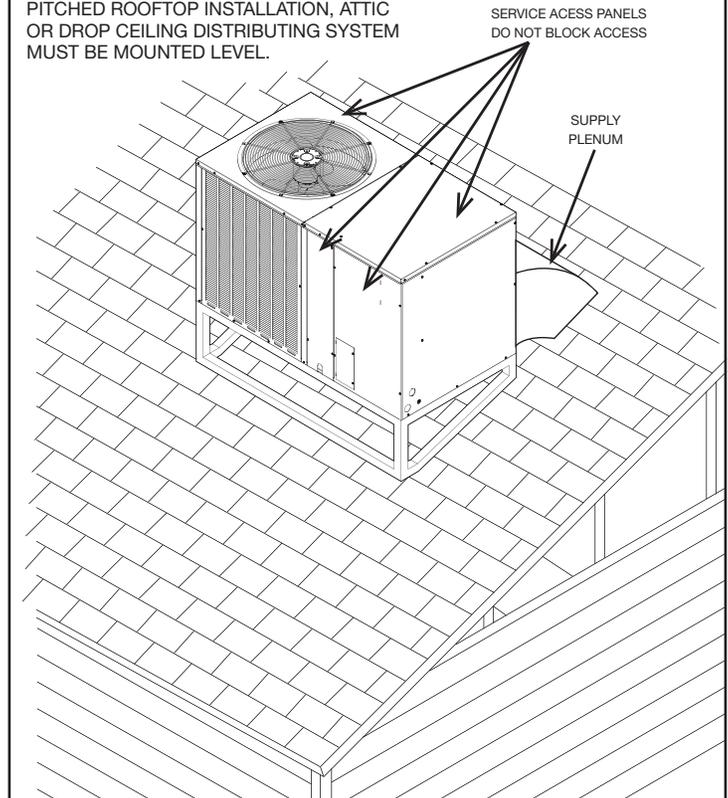
Model: 102/120



**FIGURE 1**  
**PACKAGE AIR CONDITIONER**  
OUTSIDE SLAB INSTALLATION, BASEMENT OR  
CRAWL SPACE DISTRIBUTION SYSTEM



**FIGURE 2**  
**PACKAGE AIR CONDITIONER**  
PITCHED ROOFTOP INSTALLATION, ATTIC  
OR DROP CEILING DISTRIBUTING SYSTEM  
MUST BE MOUNTED LEVEL.



## CLEARANCES

The following minimum clearances must be observed for proper unit performance and serviceability.

1. Provide 30" minimum clearance at the front and 18" on the right side of the unit for service access. Provide 12" minimum clearance on the left side of the unit for air inlet and 12" minimum clearance from unit to structure on back side.
2. Provide 60" minimum clearance from top of unit.
3. Unit is design certified for application on combustible flooring with 0" minimum clearance.
4. See Figure 1 for illustration of minimum installation-service clearances.

## ROOFTOP INSTALLATION

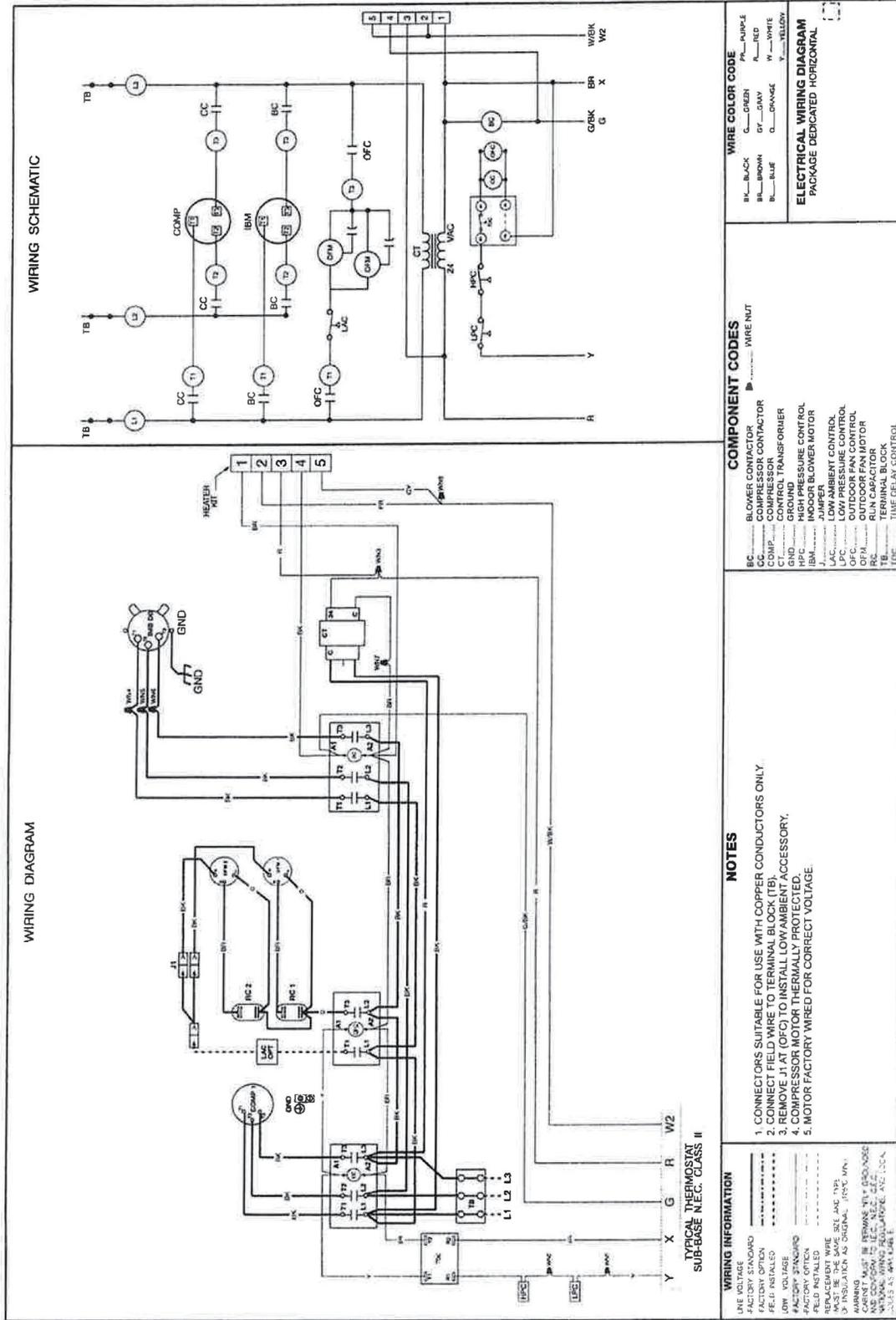
1. Before locating the unit on the roof, make sure that the strength of the roof and beams is adequate at that point to support the weight involved. (See specification sheet for weight of unit.) This is very important and user's responsibility.
2. The unit should be placed on a solid and level platform of adequate strength.
3. The location of the unit on the roof should be such as to provide proper access for inspection and servicing (Figure 2).

**IMPORTANT:** If unit will not be put into service immediately, cover supply and return openings to prevent excessive condensation.

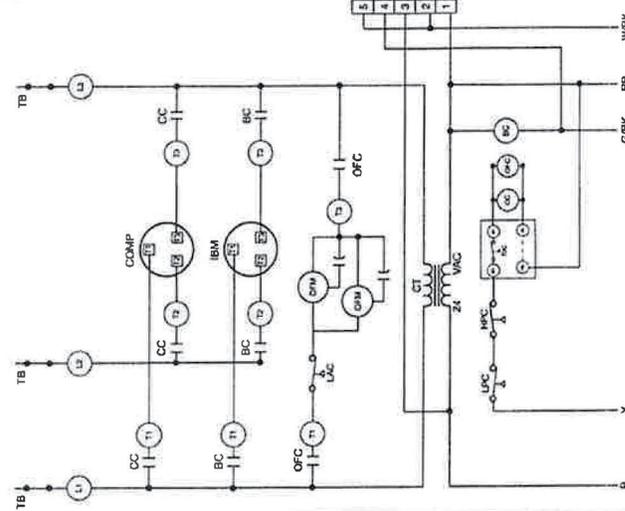
## DUCTWORK

Ductwork should be fabricated by the installing contractor in accordance with local codes and NFPA90A. Industry manuals may be used as a guide when sizing and designing the duct system.

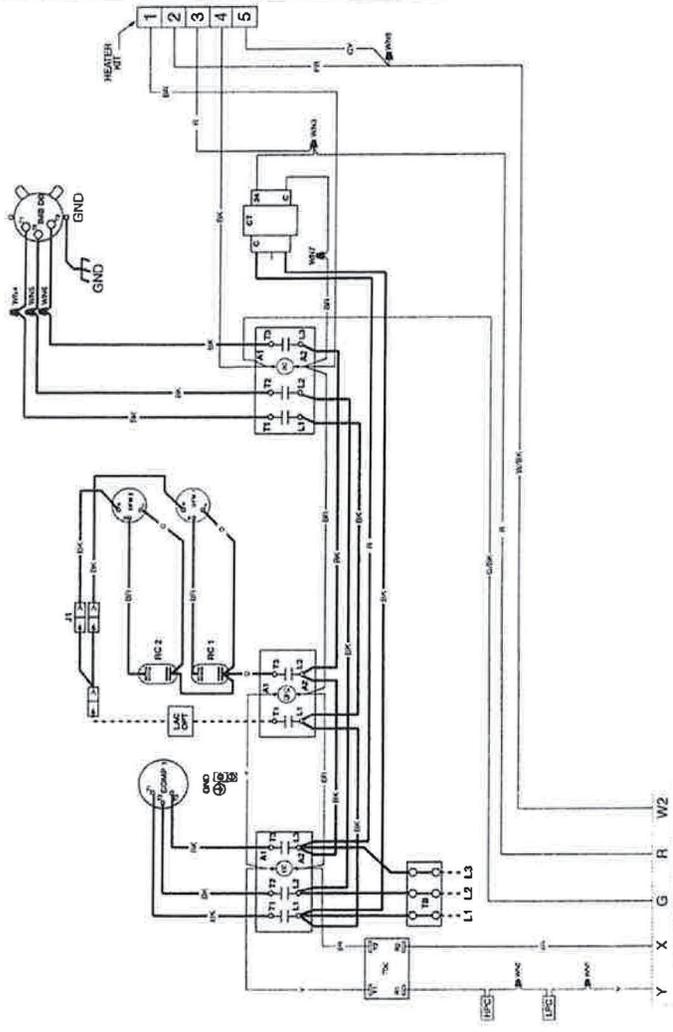
# EMRHR-102/120 Wiring Diagram



## WIRING SCHEMATIC



## WIRING DIAGRAM



WIRING INFORMATION	NOTES	COMPONENT CODES	WIRE COLOR CODE
<p>LINE VOLTAGE</p> <p>FACTORY STANDARD</p> <p>FIELD INSTALLED</p> <p>LOW VOLTAGE</p> <p>FACTORY STANDARD</p> <p>FACTORY OPTION</p> <p>FIELD INSTALLED</p> <p>MUST BE THE SAME SIZE AND TYPE</p> <p>INSULATION AS ORIGINAL (PVC UNLESS OTHERWISE SPECIFIED)</p> <p>CABINET MUST BE REMOVED TO DISCONNECT</p> <p>WIRING MUST BE IN ACCORDANCE WITH ALL APPLICABLE ELECTRICAL CODES AND REGULATIONS</p>	<p>1. CONNECTORS SUITABLE FOR USE WITH COPPER CONDUCTORS ONLY.</p> <p>2. CONNECT FIELD WIRE TO TERMINAL BLOCK (TB).</p> <p>3. REMOVE J1 AT (OFC) TO INSTALL LOW AMBIENT ACCESSORY.</p> <p>4. COMPRESSOR MOTOR THERMALLY PROTECTED.</p> <p>5. MOTOR FACTORY WIRED FOR CORRECT VOLTAGE.</p>	<p>BC.....BLOWER CONTACTOR</p> <p>CC.....COMPRESSOR CONTACTOR</p> <p>CDMP.....CONTROL TRANSFORMER</p> <p>GND.....GROUND</p> <p>IBM.....INDOOR BLOWER MOTOR</p> <p>J.....JUMPER</p> <p>LAC.....LOW AMBIENT CONTROL</p> <p>LFC.....LOW FREQUENCY CONTROL</p> <p>OFC.....OUTDOOR FAN CONTROL</p> <p>OFM.....OUTDOOR FAN MOTOR</p> <p>RC.....RUN CAPACITOR</p> <p>TB.....TERMINAL BLOCK</p> <p>TCC.....THERMISTOR CONTROL</p>	<p>BL.....BLACK</p> <p>BR.....BROWN</p> <p>BU.....BLUE</p> <p>GR.....GREEN</p> <p>DR.....DRAY</p> <p>OR.....ORANGE</p> <p>PK.....PURPLE</p> <p>RD.....RED</p> <p>WH.....WHITE</p> <p>YL.....YELLOW</p>

## GUIDE SPECIFICATIONS - EMRHR 102 thru 120

You may copy this document directly into your building specification. This specification is written to comply with the 2016 version of the “master format” as published by the Construction Specification Institute. [www.csinet.org](http://www.csinet.org).

### ELECTRIC HEAT PACKAGED ROOFTOP

#### HVAC Guide Specifications

##### Section Description

##### **23 06 80 Schedules for Decentralized HVAC Equipment**

23 06 80.13 Decentralized Unitary HVAC Equipment Schedule

23 06 80.13.A. Rooftop unit schedule

1. Schedule is per the project specification requirements.

##### **23 07 16 HVAC Equipment Insulation**

23 07 16.00.A Decentralized, Rooftop Units:

1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, cross linked polyolefin foam, density of 25 +/- 3Kg/m<sup>3</sup>, with aluminum foil facing on the air side.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

##### **23 09 13 Instrumentation and Control Devices for HVAC**

23 09 13.23 Sensors and Transmitters

23 09 13.23.A. Thermostats

1. Thermostat must
  - a. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
  - b. must include capability for occupancy scheduling.

##### **23 09 33 Electric and Electronic Control System for HVAC**

23 09 33.00.A. General:

1. Shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 100VA capabilities.
2. Shall utilize color-coded wiring.

23 09 33.00.B. Safeties:

1. Compressor over-temperature, over current.
2. Low-pressure switch.
3. High-pressure switch.
4. Automatic reset, motor thermal overload protector.

##### **23 09 93 Sequence of Operations for HVAC Controls**

23 09 93.00.A INSERT SEQUENCE OF OPERATION

##### **23 41 13 Panel Air Filters**

23 41 13.00.A. Standard filter section shall

1. Shall consist of factory-installed, low velocity, cleanable 1-in. thick aluminum filters of commercially available sizes.
2. Filters shall be accessible through an access panel as described in the unit cabinet section of this specification (23 81 19.13.H).

23 81 19 Self-Contained Air Conditioners

23 81 19.13 Small-Capacity Self-Contained Air Conditioners

23 81 19.13.A. General

1. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing a(n) hermetic scroll compressor(s) for cooling duty.
2. Factory assembled, single-piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field start-up.
3. Unit shall use environmentally sound R-410a refrigerant.
4. Unit shall be installed in accordance with the manufacturer's instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.

23 81 19.13.B. Quality Assurance

1. Unit meets applicable regional minimum efficiency requirements.
2. Unit shall be rated in accordance with AHRI Standards 340/360.
3. Unit shall be designed to conform to ASHRAE 15.
4. Unit shall be safety tested and certified in accordance with IEC-60335-1 & 2-40 Standards and UL-listed as a total package for safety requirements.
5. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

6. Unit casing shall be capable of withstanding 1000-hour salt spray exposure per ASTM B117 (scribed specimen).
  7. Unit shall be designed in accordance with ISO 9001:2000, and shall be manufactured in a facility registered by ISO 9001:2000.
  8. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
  10. Unit shall be designed in accordance with IEC-60335 standard including tested to withstand rain.
- 23 81 19.13.C. Delivery, Storage, and Handling
1. Unit shall be stored and handled per manufacturer's recommendations.
  2. Lifted by crane requires either shipping top panel or spreader bars.
  3. Unit shall only be stored or positioned in the upright position.
- 23 81 19.13.D. Project Conditions
1. As specified in the contract.
- 23 81 19.13.E. Operating Characteristics
1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 340/360 at ± 10% voltage.
  2. Compressor with standard controls shall be capable of operation from 40°F (4°C) , ambient outdoor temperatures. Accessory low ambient kit is necessary if mechanically cooling at ambient temperatures below 40°F (4°C).
  3. Unit shall discharge supply air horizontally as shown on contract drawings.
- 23 81 19.13.F . Electrical Requirements
1. Main power supply voltage, phase, and frequency must match those required by the manufacturer.
- 23 81 19.13.G. Unit Cabinet
1. Unit cabinet shall be constructed of galvanized pre-painted steel.
  2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, flat (per ASTM D523, 60°F): 60, Hardness: H-2H Pencil hardness.
  3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, cross linked polyolefin foam, density of 25 +/- 3Kg/m<sup>3</sup>, aluminum foil-faced on the air side.
  4. Base Rail
    - a. Unit shall have base rails on all sides.
    - b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
    - c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
    - d. Base rail shall be a minimum of 14 gauge thickness.
  5. Condensate pan and connections:
    - a. Shall be a sloped condensate drain pan made of a non-corrosive material.
    - b. Shall comply with ASHRAE Standard 62.
    - c. Shall use a 3/4" NPT drain connection, through the side of the drain pan. Connection shall be made per manufacturer's recommendations.
  6. Top panel:
    - a. Indoor section shall be a single piece top panel.
  7. Electrical Connections
    - a. All unit power wiring shall enter unit cabinet at a single, factory-prepared, knockout location.
  8. Component access panels (standard)
    - a. Cabinet panels shall be easily removable for servicing.
- 23 81 19.13.H. Coils
1. Standard Aluminum Micro Channel Coils: on all models.
    - a. Standard evaporator and condenser coils shall have aluminum micro channel coils.
    - b. Evaporator and Condenser coils shall be leak tested to 150 psig, pressure tested to 550 psig, and qualified to UL 1995 burst test at 2,200 psig.
- 23 81 19.13.I . Refrigerant Components
1. Refrigerant circuit shall include the following control, safety, and maintenance features:
    - a. Thermal Expansion Valve (TXV) with venturi type distributor .
    - b. Refrigerant filter drier.
    - c. External service gauge connections to unit suction and liquid lines.
  2. Compressors
    - a. Unit shall use one fully hermetic, scroll compressor for each independent refrigeration circuit.
    - b. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
    - d. Compressors shall be internally protected from high discharge temperature conditions.

- e. Compressors shall be protected from an over-temperature and over-ampereage conditions by an internal, motor overload device.
- f. Compressor shall be factory mounted on rubber grommets.
- g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
- h. Crankcase heaters shall not be required for normal operating range.

23 81 19.13.I. Filter Section

- 1. Filters access is specified in the unit cabinet section of this specification.
- 2. Filters shall be held in place by a sliding filter tray, facilitating easy removal and installation.
- 3. Shall consist of factory-installed, low velocity, cleanable 1-in. thick aluminum filters.
- 4. Filters shall be standard, commercially available sizes.
- 5. Filter face velocity shall not exceed 365 fpm at nominal airflows.

23 81 19.13.J. Evaporator Fan and Motor

- 1. Evaporator fan motor:
  - a. Shall have permanently lubricated bearings.
  - b. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
  - c. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.
- 2. Belt-driven Evaporator Fan:
  - a. Belt drive shall include an adjustable-pitch motor pulley.
  - b. Shall use sealed, permanently lubricated ball-bearing type.
  - c. Blower fan shall be double-inlet type with forward-curved blades.
  - d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.

23 81 19.13.K. Condenser Fans and Motors

- 1. Condenser fan motors:
  - a. Shall be a totally enclosed motor.
  - b. Shall use permanently lubricated bearings.
  - c. Shall have inherent thermal overload protection with an automatic reset feature.
  - d. Shall use a shaft-down design. Shaft-up designs including those with “rain-slinger devices” shall not be allowed.
- 2. Condenser Fans:
  - a. Shall be a direct-driven propeller type fan.
  - b. Shall have aluminum blades riveted to corrosion-resistant steel spiders and shall be dynamically balanced.

23 81 19.13.L. Special Features, Options and Accessories

- 1. Low Ambient Control Package
  - a. Controller shall control coil head pressure by condenser-fan cycling.
- 2. Condenser Coil Hail Guard Assembly
  - a. Shall protect against damage from hail.
  - b. Shall be louvered design.
- 3. Electric Heat:
  - a. Heating Section
    - (1.) Heater element open coil resistance wire, nickel-chrome alloy, strung through ceramic insulators mounted on metal frame. Coil ends are staked and welded to terminal screw slots.
    - (2.) Heater assemblies are provided with integral fusing for protection of internal heater circuits not exceeding 48 amps each. Auto reset thermo limit controls, magnetic heater contactors (24 v coil) and terminal block all mounted in electric heater control box (minimum 18 ga galvanized steel) attached to end of heater assembly.



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