



## Ruud High Efficiency Air Handler

### RBHP- Series X-13 (ECM) Motor Efficiencies up to 16 SEER



- Industry Standard R-410A Refrigerant Applications
- Models featuring Electric Heat without Indoor Cooling Coil
- Quiet and efficient X-13 (ECM) motor technology
- Only 35" tall and 4-way convertible for all those tight spaces
- Available from factory in upflow and horizontal configurations
- Nominal airflow up to 0.5" external static pressure with reduced airflow up to 1.0" external static pressure
- Factory installed MultiFlex® coils
- Sturdy steel construction with 1 inch [25.4 mm] of foil faced insulation for excellent sound and insulating characteristics
- Permanent, easily accessible and washable filter furnished standard
- Circuit breaker (standard on units with more than 11 kW) meets U.L. and cUL requirements for service disconnect
- Factory installed auxiliary electric heat provides exact heat for indoor comfort over a variety of applications
- Fan settings for selectable, customized cooling airflow over a wide variety of applications
- Cabinet air leakage less than 2% at 1 inch H<sub>2</sub>O when tested in accordance with ASHRAE standard 193

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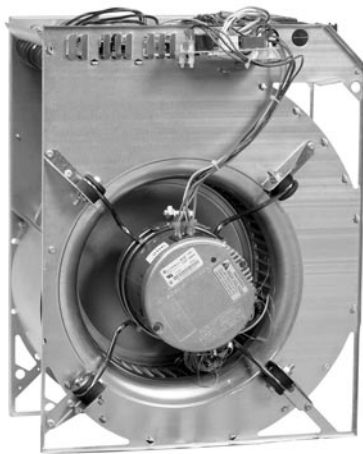
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## Engineering Features

### RBHP- Series

- Quiet, efficient X-13 (ECM) motor technology providing nominal airflow to 0.5 inch [12 kPa] of external static pressure.
- Field selectable airflow to meet the requirements of particular applications.
- Low continuous fan speed.
- The most compact unit design available.
- Attractive pre-painted cabinet exterior.
- Rugged steel cabinet construction, designed for added strength and versatility.
- 1" foil faced insulation mechanically retained in blower compartment.
- Four leg rubber insulated wire motor mount.
- Circuit breakers standard on all models with electric heat.
- Models supplied with circuit breakers meet UL and cUL requirements as a service disconnect switch.
- Provisions for field electrical connections from either side of air handler cabinet.
- Tab lock blower housing with integrated electric heaters, controls, motor and blower. Slide out design for service and maintenance convenience.
- Exclusive dependable Incoloy sheath type electric heating elements located in the blower housing provide mixed warm air.
- Field convertible for vertical upflow, vertical downflow, horizontal left hand or right hand air supply.
- Durable framed cleanable air filter provided as standard in unit filter rack.
- MultiFlex® indoor coil design provides low air side pressure drop, high performance and extremely compact size. All coils come with PVC condensate elbow standard.
- All indoor coils have tinned copper tubing and aluminum fins.
- Molded polymer corrosion resistant condensate drain pan is provided on all indoor coils.
- Both supply and return duct flanges provided as standard on air handler cabinet.
- Connection points for both high voltage and low voltage control wiring inside air handler cabinet.
- Concentric knockouts are provided for power connection to cabinet. Installer may pull desired hole size up to 2 inches [51 mm] for 1½ inch [38 mm] conduit.
- Internal checked TX valves are used on the RCHL indoor coil for more quiet refrigerant metering.
- Front refrigerant and drain connections.

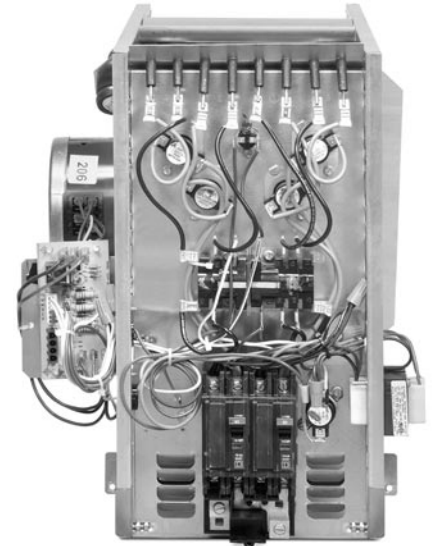
[ ] Designates Metric Conversions



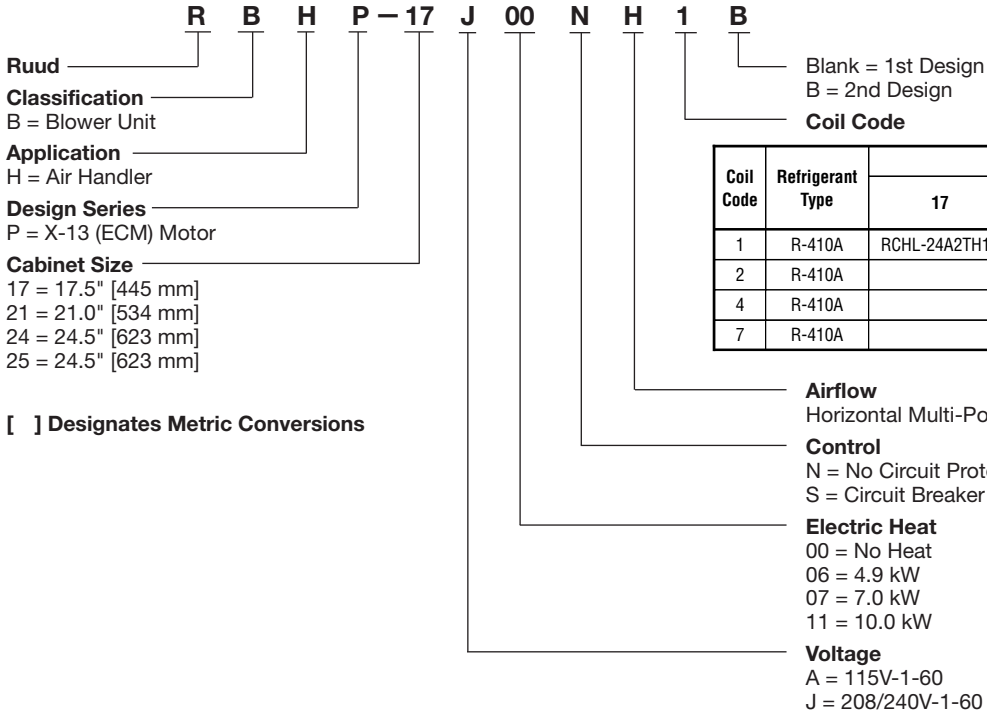
**BLOWER SECTION**



**CONSTANT TORQUE ECM**



## Model Number Identification

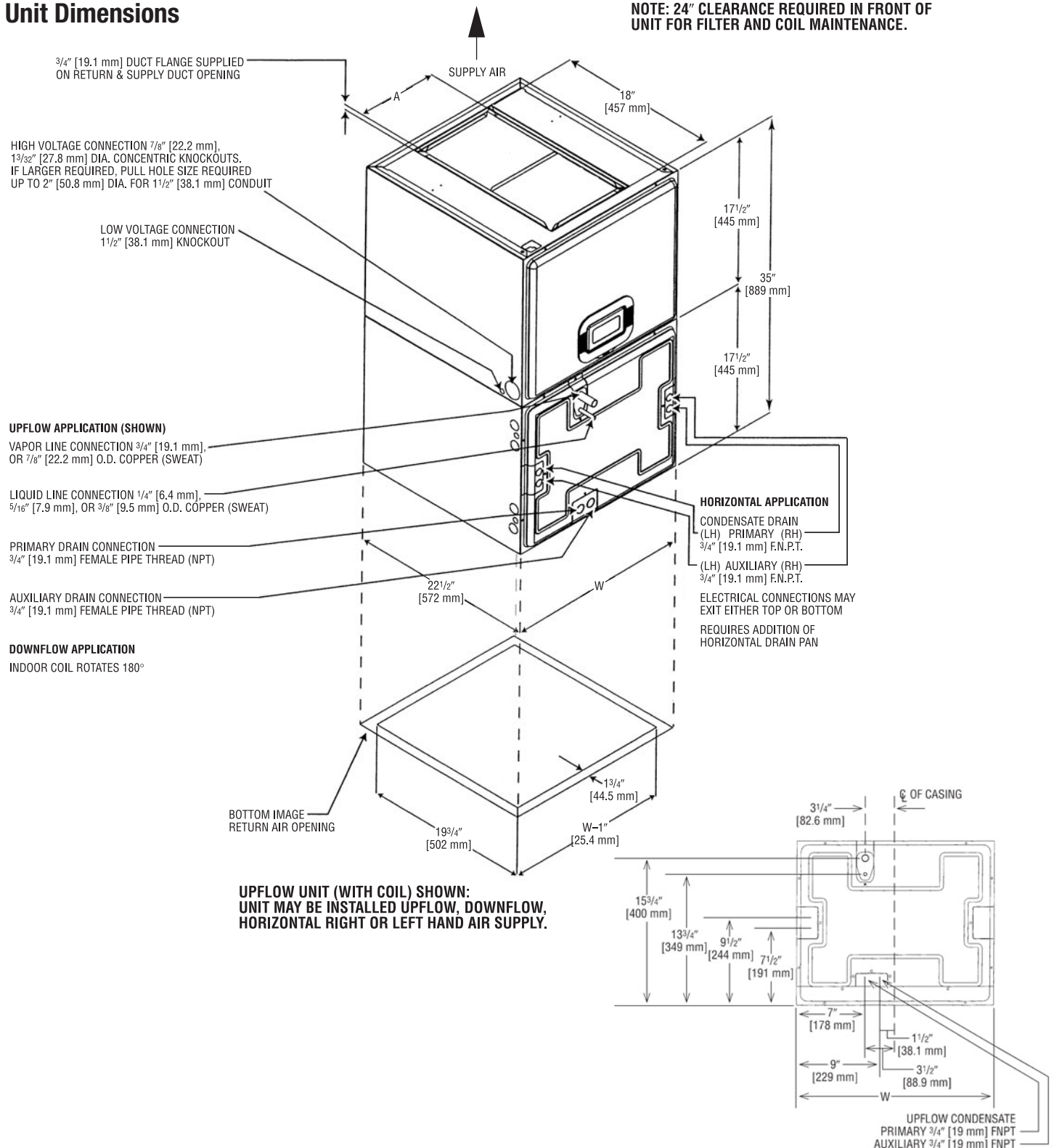


## Available SKUs

Models Available
RBHP-17J06SH1B
RBHP-17J07SH1B
RBHP-21J06SH2B
RBHP-21J07SH2B
RBHP-21J11SH2B
RBHP-24J06SH4B
RBHP-24J07SH4B
RBHP-24J11SH4B
RBHP-25J11SH7B
RBHP-17A00NH1
RBHP-21A00NH2
RBHP-24A00NH4
RBHP-25A00NH7

# Unit Dimensions

**NOTE: 24" CLEARANCE REQUIRED IN FRONT OF UNIT FOR FILTER AND COIL MAINTENANCE.**

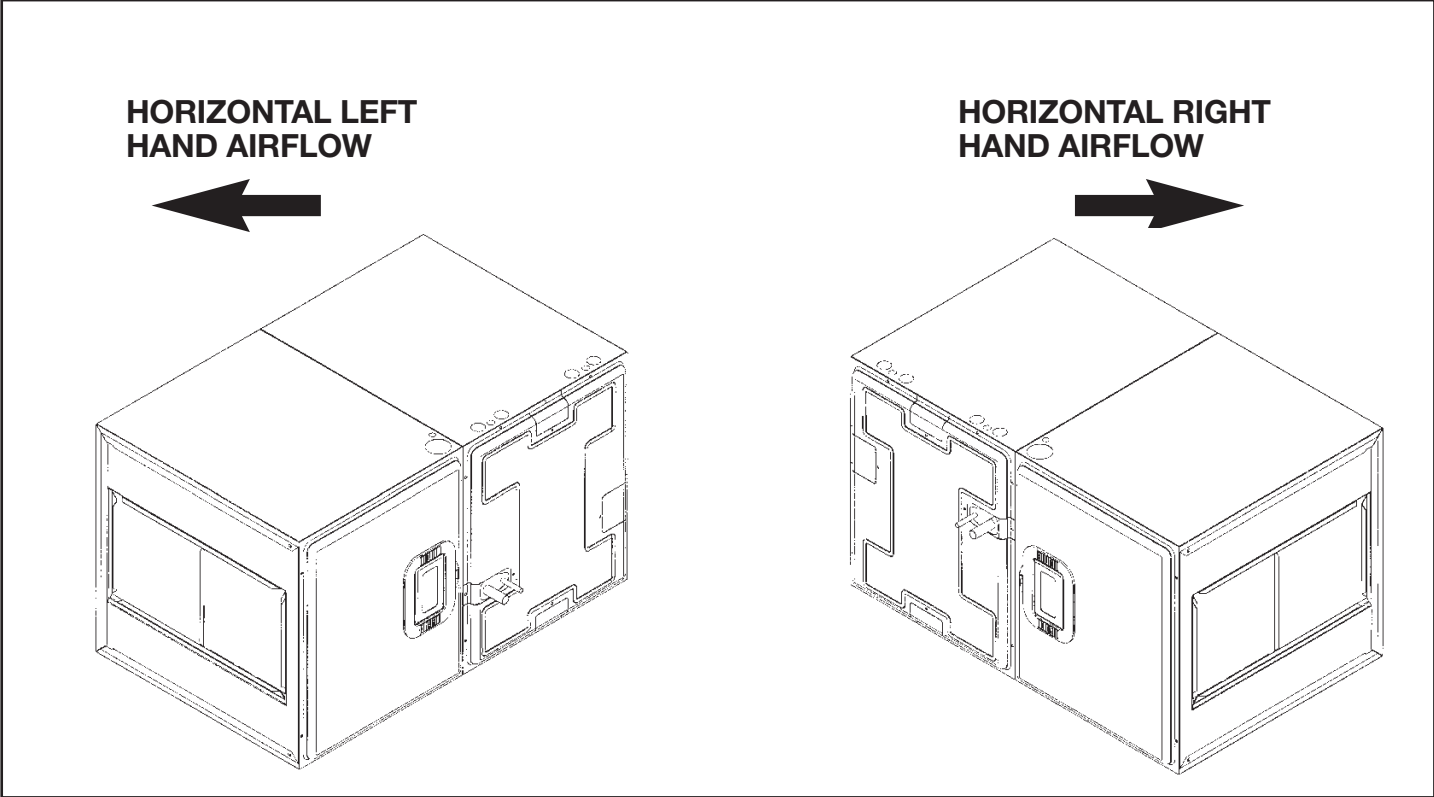
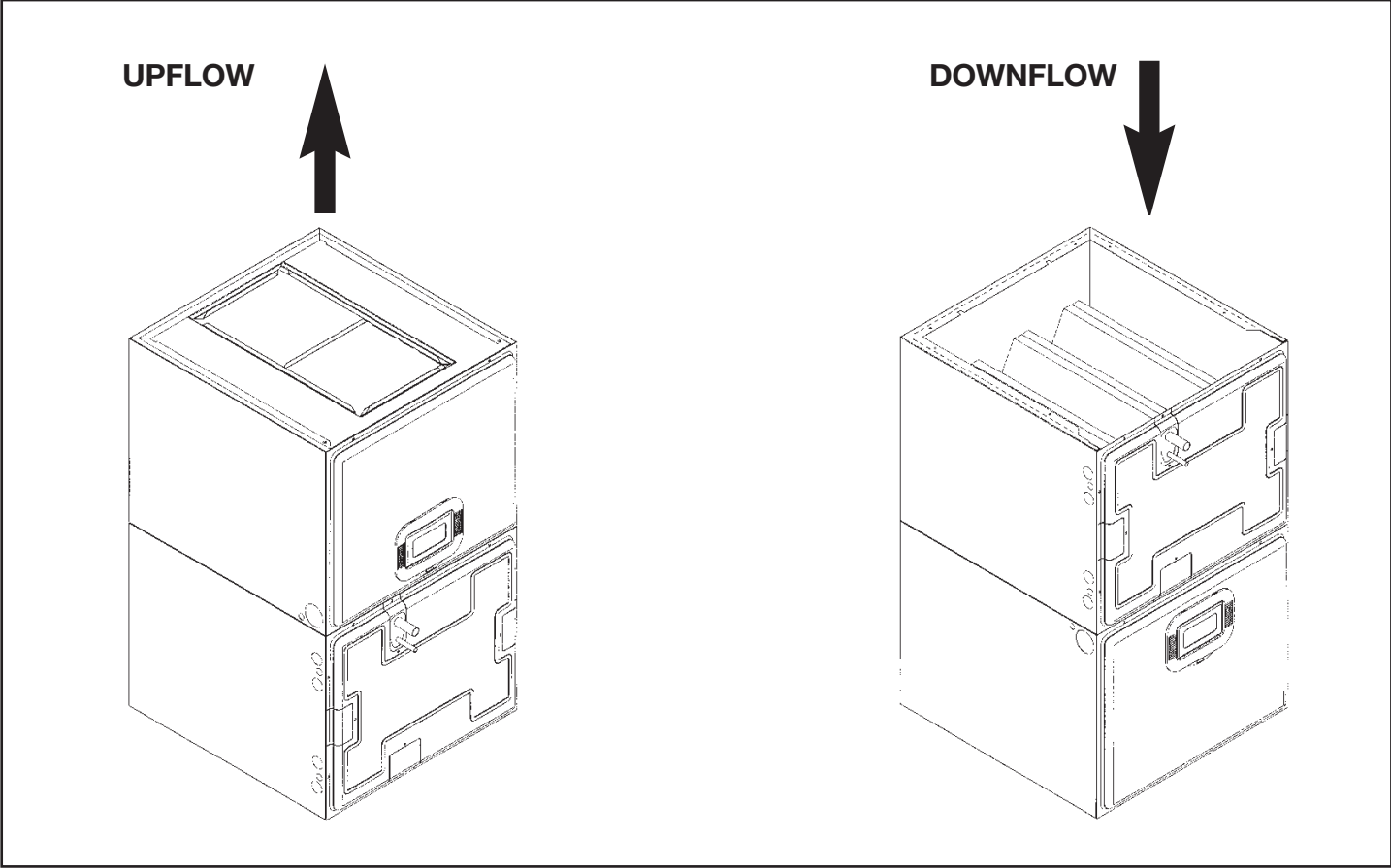


## Unit Dimensions & Weights

Model Number Cabinet Size	Unit Width "W" In. [mm]	Supply Duct "A" In. [mm]	Unit Weight/Shipping Weight (Lbs.) [kg]	
			Unit With Coil (Max. kW)	Unit Without Coil (Max. kW)
17	17 1/2 [445]	79/16 [192]	92/99 [42/45]	66/75 [30/31]
21	21 [533]	97/16 [240]	109/117 [49/53]	79/87 [36/39]
24	24 1/2 [623]	11 3/4 [298]	125/134 [57/61]	88/97 [40/44]
25	24 1/2 [623]	11 3/4 [298]	125/134 [57/61]	88/97 [40/44]

[ ] Designates Metric Conversions

### Airflow Directional Data



**NOTE:** Coil and blower section are always in a draw through configuration.

## Airflow Performance

**Airflow performance data is based on cooling performance with a coil and filter in place.** Select performance table for appropriate unit size, voltage and number of electric heaters to be used. Make sure external static applied to unit allows operation within the minimum and maximum limits shown in table below for both cooling and electric heat operation. For optimum blower performance, operate the unit in the .2" to .5" in.

W.C. external static range. In general, the indoor motor speed tap should be as shown in table for the appropriate cooling capacity shown. Always check to make sure proper motor speed tap is connected as units are shipped from the factory connected for high speed operation (Speed Tap 5).

## Airflow Operating Limits

Model Cabinet Size	17		21		24		25	
Cooling BTUH Cooling Tons Nominal	18,000 1.5	24,000 2	30,000 2.5	36,000 3	42,000 3.5	48,000 4	60,000 5	60,000 5
Heat Pump or Air Conditioning Maximum Heat/Cool CFM [L/s] (37.5 CFM [18 L/s]/1,000 BTUH) (450 CFM [212 L/s]/Ton Nominal)	675 [319]	900 [425]	1125 [531]	1350 [637]	1575 [743]	1800 [850]	2025 [956]	2250 [1062]
Heat Pump or Air Conditioning Nominal Heat/Cool CFM [L/s] (33.3 CFM [16 L/s]/1,000 BTUH) (400 CFM [189 L/s]/Ton Nominal)	600 [283]	800 [378]	1000 [472]	1200 [566]	1400 [661]	1600 [755]	1800 [850]	2000 [944]
Heat Pump or Air Conditioning Minimum Heat/Cool CFM [L/s] (30.0 CFM [14 L/s]/1,255 BTUH) (360 CFM [170 L/s]/Ton Nominal)	540 [255]	720 [330]	900 [425]	1080 [510]	1260 [595]	1440 [680]	1620 [765]	1800 [850]
Maximum KW Electric Heating & Minimum Electric Heat CFM [L/s]	11 560 [264]	11 560 [264]	14 900 [425]	14 900 [425]	18 1220 [576]	18 1220 [576]	21 1460 [689]	21 1460 [689]
Maximum Electric Heat Rise °F [°C]	85 [29]	85 [29]	70 [21]	70 [21]	65 [18]	65 [18]	65 [18]	65 [18]

**NOTE:** See Airflow Performance Data for Recommended Blower Motor Speed.

[ ] Designates Metric Conversions



## Airflow Performance Data

Model Cabinet Size	Tonnage	Electric Heaters	Blower Motor		CFM [L/s] (Watts)/External Static Pressure—Inches W.C. [kPa] with filter and Indoor Coil									
			Nominal Speed Tap	Volts	.10 [.02]	.20 [.05]	.30 [.07]	.40 [.10]	.50 [.12]	.60 [.15]	.70 [.17]	.80 [.20]	.90 [.23]	1.0 [.25]
-17	1.5 Ton Air Flow	none	2	208/240	659 [311] (74)	625 [294] (80)	581 [274] (84)	539 [254] (88)	—	—	—	—	—	—
		none	3	208/240	790 [372] (98)	759 [358] (105)	722 [340] (113)	687 [324] (119)	650 [306] (126)	615 [290] (131)	573 [270] (139)	552 [260] (145)	507 [239] (150)	460 [217] (155)
		3 (max.)	2	208/240	649 [306] (79)	615 [290] (84)	571 [269] (88)	529 [249] (92)	—	—	—	—	—	—
		3 (max.)	3	208/240	773 [365] (110)	736 [347] (113)	699 [330] (118)	677 [320] (126)	640 [302] (132)	605 [286] (141)	563 [266] (146)	542 [256] (154)	497 [235] (157)	450 [212] (162)
		none	2	115	651 [307] (76)	627 [295] (82)	583 [275] (86)	541 [255] (90)	—	—	—	—	—	—
		none	3	115	776 [366] (105)	743 [351] (109)	724 [342] (118)	687 [324] (122)	658 [311] (131)	617 [291] (136)	595 [281] (144)	555 [262] (148)	517 [244] (152)	460 [217] (162)
	2.0 Ton Air Flow	none	4	208/240	844 [398] (141)	819 [386] (146)	799 [377] (155)	764 [360] (160)	—	—	—	—	—	—
		none	5	208/240	958 [452] (162)	934 [440] (172)	914 [431] (176)	888 [419] (186)	855 [403] (189)	816 [380] (210)	785 [370] (204)	760 [358] (214)	708 [334] (223)	672 [317] (226)
		3 (max.)	4	208/240	834 [393] (146)	809 [831] (150)	789 [372] (159)	754 [355] (164)	—	—	—	—	—	—
		3 (max.)	5	208/240	946 [446] (179)	922 [435] (189)	902 [426] (193)	876 [413] (203)	843 [398] (206)	804 [380] (216)	773 [365] (221)	748 [353] (231)	696 [328] (240)	660 [311] (243)
		none	4	115	846 [399] (143)	821 [387] (148)	801 [378] (157)	766 [361] (162)	—	—	—	—	—	—
		none	5	115	964 [455] (167)	945 [446] (178)	914 [431] (181)	888 [419] (191)	861 [406] (196)	821 [387] (205)	787 [372] (210)	761 [359] (218)	726 [342] (220)	690 [326] (230)
-21	2.5 Ton Air Flow	none	2	208/240	1068 [504] (138)	1041 [491] (147)	1001 [472] (153)	972 [458] (161)	—	—	—	—	—	—
		none	3	208/240	1187 [560] (180)	1162 [548] (188)	1125 [530] (192)	1099 [518] (200)	1058 [499] (208)	1013 [478] (215)	982 [463] (223)	951 [448] (232)	899 [424] (234)	855 [403] (237)
		4 (max.)	2	208/240	1035 [488] (143)	1007 [475] (152)	966 [455] (158)	936 [441] (169)	—	—	—	—	—	—
		4 (max.)	3	208/240	1157 [546] (182)	1132 [534] (192)	1095 [517] (198)	1069 [505] (209)	1028 [485] (218)	983 [464] (228)	952 [449] (239)	921 [435] (250)	869 [410] (255)	825 [389] (262)
		none	2	115	1070 [504] (138)	1043 [492] (147)	1004 [473] (153)	974 [459] (161)	—	—	—	—	—	—
		none	3	115	1138 [537] (175)	1113 [525] (186)	1075 [507] (191)	1053 [497] (203)	1004 [474] (210)	957 [451] (216)	932 [440] (226)	901 [425] (231)	855 [404] (242)	800 [378] (252)
	3.0 Ton Air Flow	none	4	208/240	1269 [598] (207)	1236 [583] (219)	1174 [554] (226)	1149 [542] (236)	—	—	—	—	—	—
		none	5	208/240	1397 [659] (287)	1377 [649] (307)	1346 [635] (317)	1318 [622] (320)	1291 [609] (322)	1264 [596] (319)	1234 [582] (312)	1190 [561] (326)	1155 [545] (351)	1126 [531] (368)
		4 (max.)	4	208/240	1241 [585] (222)	1208 [570] (234)	1174 [554] (241)	1149 [542] (251)	—	—	—	—	—	—
		4 (max.)	5	208/240	1366 [645] (302)	1346 [635] (313)	1315 [621] (323)	1287 [608] (331)	1260 [595] (341)	1233 [582] (346)	1203 [568] (358)	1159 [547] (371)	1124 [530] (381)	1095 [517] (387)
		none	4	115	1269 [598] (207)	1236 [583] (219)	1174 [554] (226)	1149 [542] (236)	—	—	—	—	—	—
		none	5	115	1370 [646] (292)	1343 [634] (302)	1309 [618] (309)	1285 [607] (319)	1258 [594] (330)	1221 [576] (336)	1182 [558] (348)	1147 [542] (357)	1117 [527] (366)	1080 [510] (375)

**NOTES:**

X-13 (ECM) NOTES (X-13 (ECM) Motor Speed Changes)

X-13 (ECM) Motors require no voltage change between 208 and 240 volts.

If application exceeds 0.5" of static, adjust the motor speed to the high static speed as described below:

All X-13 (ECM) motors have 5 speed tabs. Speed tab 1 is for continuous fan. Speed 2 (Low Static) and speed tab 3 (High Static) are lower tonnage. Speed tab 4 (Low Static) and Speed tab 5 (High Static) are for higher tonnage.

The lower static speed 2 (lower tonnage) and speed tab 4 (Higher tonnage) are used for external static below 0.5".

For external static exceeding 0.5", move the blue wire from the X-13 (ECM) motor to appropriate high static speed tab 3 (Lower tonnage) or speed tab 5 (Higher tonnage)

[ ] Designates Metric Conversions



## Airflow Performance Data (con't.)

Model Cabinet Size	Tonnage	Electric Heaters	Blower Motor		CFM [L/s] (Watts)/External Static Pressure—Inches W.C. [kPa] with filter and Indoor Coil										
			Nominal Speed Tap	Volts	.10 [.02]	.20 [.05]	.30 [.07]	.40 [.10]	.50 [.12]	.60 [.15]	.70 [.17]	.80 [.20]	.90 [.23]	1.0 [.25]	
-24	3.5 Ton Air Flow	none	2	208/240	1438 [678] (205)	1409 [664] (217)	1375 [648] (229)	1341 [632] (252)	—	—	—	—	—	—	
		none	3	208/240	1568 [740] (279)	1538 [725] (290)	1507 [711] (303)	1471 [694] (313)	1435 [677] (333)	1403 [662] (338)	1362 [642] (358)	1318 [622] (365)	1287 [607] (374)	1250 [589] (405)	
		5 (max.)	2	208/240	1414 [667] (230)	1384 [653] (242)	1350 [637] (254)	1315 [620] (277)	—	—	—	—	—	—	
		5 (max.)	3	208/240	1548 [730] (304)	1518 [716] (316)	1487 [701] (328)	1451 [684] (338)	1415 [667] (358)	1383 [653] (368)	1342 [633] (388)	1298 [612] (395)	1267 [597] (409)	1230 [580] (455)	
		none	2	115	1448 [683] (205)	1419 [669] (217)	1385 [653] (229)	1351 [637] (252)	—	—	—	—	—	—	
		none	3	115	1559 [735] (294)	1527 [720] (308)	1497 [706] (322)	1466 [691] (335)	1431 [675] (349)	1378 [650] (367)	1349 [636] (379)	1306 [606] (393)	1271 [599] (406)	1250 [589] (417)	
	4.0 Ton Air Flow	none	4	208/240	1640 [773] (311)	1604 [757] (326)	1587 [748] (335)	1559 [735] (376)	—	—	—	—	—	—	
		none	5	208/240	1789 [844] (413)	1762 [831] (427)	1731 [816] (433)	1699 [801] (449)	1667 [786] (462)	1635 [771] (482)	1602 [756] (498)	1546 [729] (516)	1515 [715] (529)	1465 [691] (542)	
		5 (max.)	4	208/240	1613 [761] (331)	1574 [742] (346)	1557 [734] (355)	1529 [721] (396)	—	—	—	—	—	—	
		5 (max.)	5	208/240	1759 [830] (433)	1732 [817] (447)	1701 [802] (453)	1669 [787] (469)	1637 [772] (482)	1605 [757] (502)	1572 [741] (518)	1516 [715] (536)	1485 [700] (549)	1435 [677] (562)	
		none	4	115	1642 [774] (311)	1606 [757] (326)	1589 [749] (335)	1561 [736] (376)	—	—	—	—	—	—	
		none	5	115	1811 [854] (423)	1791 [845] (436)	1760 [830] (451)	1730 [816] (464)	1700 [802] (479)	1669 [787] (492)	1606 [757] (516)	1573 [742] (529)	1538 [725] (542)	1462 [689] (555)	
	-25	5.0 Ton Air Flow	none	2	208/240	1872 [883] (373)	1837 [866] (393)	1798 [848] (407)	1763 [832] (419)	—	—	—	—	—	—
			none	3	208/240	2075 [979] (497)	2036 [960] (511)	2017 [951] (533)	1984 [936] (553)	1944 [917] (563)	1910 [901] (582)	1889 [891] (599)	1846 [871] (617)	1805 [851] (626)	1783 [841] (638)
5 (max.)			2	208/240	1831 [854] (393)	1795 [847] (413)	1756 [828] (427)	1720 [811] (439)	—	—	—	—	—	—	
5 (max.)			3	208/240	2043 [964] (517)	2004 [945] (531)	1985 [936] (553)	1951 [920] (573)	1912 [901] (583)	1878 [886] (602)	1857 [876] (619)	1814 [856] (637)	1773 [836] (646)	1751 [826] (658)	
none			2	115	1872 [883] (373)	1837 [866] (393)	1798 [848] (407)	1763 [832] (419)	—	—	—	—	—	—	
none			3	115	2075 [979] (497)	2036 [960] (511)	2017 [951] (533)	1984 [936] (553)	1944 [917] (563)	1910 [901] (582)	1889 [891] (599)	1846 [871] (617)	1805 [851] (626)	1783 [841] (638)	
none			4 or 5	208/240	2102 [992] (550)	2072 [977] (568)	2042 [963] (584)	2011 [949] (593)	1974 [931] (610)	1949 [919] (631)	1916 [904] (644)	1884 [889] (662)	1851 [873] (669)	1810 [854] (692)	
5 (max.)			4 or 5	208/240	2070 [976] (560)	2040 [962] (578)	2010 [948] (594)	1979 [933] (613)	1942 [916] (620)	1917 [904] (641)	1884 [889] (654)	1852 [874] (672)	1819 [858] (679)	1778 [839] (702)	
none			4 or 5	115	2102 [992] (550)	2072 [977] (568)	2042 [963] (584)	2011 [949] (593)	1974 [931] (610)	1949 [919] (631)	1916 [904] (644)	1884 [889] (662)	1851 [873] (669)	1810 [854] (692)	

**NOTES:**

X-13 (ECM) NOTES (X-13 (ECM) Motor Speed Changes)

X-13 (ECM) Motors require no voltage change between 208 and 240 volts.

If application exceeds 0.5" of static, adjust the motor speed to the high static speed as described below:

All X-13 (ECM) motors have 5 speed tabs. Speed tab 1 is for continuous fan. Speed 2 (Low Static) and speed tab 3 (High Static) are lower tonnage. Speed tab 4 (Low Static) and Speed tab 5 (High Static) are for higher tonnage.

The lower static speed 2 (lower tonnage) and speed tab 4 (Higher tonnage) are used for external static below 0.5".

For external static exceeding 0.5", move the blue wire from the X-13 (ECM) motor to appropriate high static speed tab 3 (Lower tonnage) or speed tab 5 (Higher tonnage)

[ ] Designates Metric Conversions

## Blower Motor Electrical Data: A Voltage (115V)

Model Size/Elec. Designation	Voltage	Phase	Hertz	HP [W]	RPM	Speeds	Circuit Amps.	Minimum Circuit Ampacity	Maximum Circuit Protector
RBHP-17A00NH*	115	1	60	1/3 [249]	300-1100	5	3.3	5.0	15
RBHP-21A00NH*	115	1	60	1/2 [373]	300-1100	5	5.0	7.0	15
RBHP-24A00NH*	115	1	60	3/4 [559]	300-1100	5	5.8	8.0	15
RBHP-25A00NH*	115	1	60	3/4 [559]	300-1100	5	7.7	10.0	15

## Blower Motor Electrical Data: J Voltage (208/240V)

Model Size/Elec. Designation	Voltage	Phase	Hertz	HP [W]	RPM	Speeds	Circuit Amps.	Minimum Circuit Ampacity	Maximum Circuit Protector
RBHP-17A00NH*	115	1	60	1/3 [249]	300-1100	5	3.3	5.0	15
RBHP-21A00NH*	115	1	60	1/2 [373]	300-1100	5	5.0	7.0	15
RBHP-24A00NH*	115	1	60	3/4 [559]	300-1100	5	5.8	8.0	15
RBHP-25A00NH*	115	1	60	3/4 [559]	300-1100	5	7.7	10.0	15

## Electric Heat Electrical Data

Model Elec./KW Designation	Heater KW Volts 208/240	PH/HZ	Heater No./KW & 240V	Type Supply Circuit Single Circuit Multiple Circuit	Circuit Amps.	Minimum Circuit Ampacity	Maximum Circuit Protector
RBHP-17J06SH*	3.7/4.9	1/60	2/2.5	Single Circuit	19.8/22.4	25/29	25/30
RBHP-17J07SH*	5.3/7.0	1/60	2/3.5	Single Circuit	27.5/31.2	35/39	40/40
RBHP-21J06SH*	3.7/4.9	1/60	2/2.5	Single Circuit	20.9/23.5	27/30	30/30
RBHP-21J07SH*	5.3/7.0	1/60	2/3.5	Single Circuit	28.6/32.3	36/41	40/45
RBHP-21J11SH*	7.5/10.0	1/60	3/3.3	Single Circuit	39.2/44.8	49/56	50/60
RBHP-24J06SH*	3.7/4.9	1/60	2/2.5	Single Circuit	22.0/24.6	28/31	30/35
RBHP-24J07SH*	5.3/7.0	1/60	2/3.5	Single Circuit	29.7/33.4	38/42	40/45
RBHP-24J11SH*	7.5/10.0	1/60	3/3.3	Single Circuit	40.3/45.9	51/58	60/60
RBHP-25J11SH*	7.5/10.0	1/60	3/3.3	Single Circuit	41.8/47.4	53/60	60/60

Supply circuit protective devices may be fuses or "HACR" type circuit breakers. Largest motor load is included in single circuit and circuit 1 multiple circuit. If non-standard fuse size is specified, use next size larger standard fuse size.

[ ] Designates Metric Conversions

## Electrical Wiring

### Power Wiring

- Field wiring must comply with the National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.
- Supply wiring must be 75°C minimum copper conductors only.
- See electrical data for product Ampacity rating and Circuit Protector requirement.

### Grounding

- This product must be sufficiently grounded in accordance with National Electrical Code (C.E.C. in Canada) and any applicable local ordinance.
- A grounding lug is provided.

## ACCESSORIES

- **External Auxiliary Horizontal Drain Pan. RXBM-AA06**— Fits all models.
- **Replacement Filters**

<u>Model Cabinet Size</u>	<u>Filter Size In. [mm]</u>	<u>Part Number</u>
17	16.25 x 21 [413 x 533]	54-23217-02
21	19.75 x 21 [502 x 533]	54-23217-03
24	23.25 x 21 [591 x 533]	54-23217-04
25	23.25 x 21 [591 x 533]	54-23217-04

[ ] Designates Metric Conversions

**GENERAL TERMS OF LIMITED WARRANTY\***

Ruud will furnish a replacement for any part of this product which fails in normal use and service within the applicable periods stated, in accordance with the terms of the limited warranty.

Conditional Parts (Registration Required) .....Ten (10) Years

**\*For complete details of the Limited and Conditional Warranties, including applicable terms and conditions, contact your local contractor or the Manufacturer for a copy of the product warranty certificate.**











*In keeping with its policy of continuous progress and product improvement, Ruud reserves the right to make changes without notice.*

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