



Endeavor® Line *Ultra*™ Series Side-Discharge Universal Heat Pump



This product meets a stringent set of our internally defined sustainability standards



RD18AY

Cooling Efficiencies up to: 19 SEER2 / 13 EER2

Heating Efficiencies up to: 10 HSPF2

Nominal Sizes: 2 to 5 Tons [7.0 to 17.6 kW]

Cooling & Heating Capacities: 22.8 to 53.0 kBTU [6.7 to 16.1 kW]

Refrigerant Type: R-454B



¹Proper sizing and installation of equipment is critical to achieve optimal performance. Split system air conditioners and heat pumps must be matched with appropriate coil components to meet ENERGY STAR®. Ask your Contractor for details or visit www.energystar.gov.

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Features and Benefits

- **Flexible and Universal Install Compatibility:**
 - Works with nearly any R-454B HVAC System—including Ruud EcoNet® Enabled systems and non-communicating systems
 - Install with any indoor system component via a Ruud algorithm
(**IMPORTANT:** the indoor system component CFM must match the requirement of the outdoor system component)
 - Install as a Universal Replacement with minimal alterations (**R-454B coil only**—with TXV)
- **Space Saver Solution:** The RD18AY—with footprint options as low as 36.6" tall and 19.8" wide—is ideal for when installation locations are constrained; but is also perfect for any system or replacement option where an efficient, streamlined look is desired
- **Quiet Operation as low as 50dBA¹:** Offers sound dampening features such as a sound blanket, refrigerant tubing design, fan blade approach and innovative compressor and drive technologies—ensure that as efficiency goes up, sound levels stay low
- **EcoNet® Enabled²:** Automatic system configuration and optimization
- **PlusOne® Diagnostics & Bluetooth®^{3, 4} Connectivity:** With the Ruud Contractor & EcoNet® Apps, built-in technology makes advanced set-up, monitoring, troubleshooting, and repairing the product easier than ever before
- **PlusOne® Variable Speed Twin Rotary Compressor & Inverter Drive:**
 - Features variable speed operation from 45 to 100% capacity with the EcoNet® Smart Thermostat or with legacy and other thermostats when the utility 1 & 2 jumpers are installed or using the Ruud algorithm⁵
 - Provides precise temperature control, advanced humidity control and greater efficiency
- **Brushless DC Condenser Motors (BLDC):** Enhances reliability and allows for easier serviceability
- **Swept Wing Fan Technology:** Features quieter operation and improved unit acoustics
- **7mm Condenser Copper Coil:** Requires less refrigerant allowing for a smaller and lighter footprint while enhancing reliability
- **Optional Base Pan Heater:** Utilizes a built-in thermostat to regulate the heating operation to prevent ice build-up on the base pan during extreme cold weather conditions
- **Traditional Refrigerant Piping:** Allows for use of existing refrigerant line sets for further ease of replacement installation flexibility
- **10-Year Conditional Parts Warranty (registration required):** Coverage when installed as a heat pump only or as part of a system—with no AHRI matched system requirement
- **Qualifies for Federal Incentives (conditions apply):**
 - Federal Tax Credit compliant system combinations across all product tonnages (effective through 12/31/32)—up to \$2000 for qualified heat pumps
 - Visit Ruud.com/Federal-Incentives
- **PlusOne® Refrigerant Detection System™⁶:** An integrated one-box, patented design featuring the A2L sensor and mitigation board, offering easier commissioning with a single component and simplified wiring configuration, compatibility with the any 24V thermostat application and system protection by automatically pausing outdoor unit operation—if excess refrigerant is detected
- **Designing for Sustainability with Low GWP:** For 2025, the Environmental Protection Agency (EPA) has set a global warming potential (GWP) limit of 700 for refrigerant used in heating and cooling systems. This new requirement will result in a 78%⁷ lower GWP than previous-generation refrigerants—with only minimal changes to system installation. For us, this is another step toward our continued sustainability goal of reducing greenhouse gas emissions, while still delivering an exceptional level of energy efficient, dependable comfort

¹Based on Internal R&D Testing, 2023 Sound levels are also dependent on proper installation and location of outdoor product. ²When installed as part of a complete AHRI-matched, Ruud EcoNet® Enabled system. ³The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Ruud® is under license. Other trademarks and trade names are those of their respective owners. ⁴When installed as part of a complete Ruud system where both the outdoor & indoor components feature Bluetooth® Technology. ⁵Two-Stage (70% & 100% capacity) operation when installed with legacy and other thermostats when the utility 1 & 2 jumpers are not installed. The 2-Ton model features a single rotary compressor. ⁶Factory or field installed in the furnace coil or air handler and is applicable to the complete heating and cooling system featuring Low GWP Refrigerant (A2L). ⁷When comparing the GWP of R-454B to R-410A refrigerant.

Heat Pumps

<u>R</u>	<u>D</u>	<u>18</u>	<u>A</u>	<u>Y</u>	<u>24</u>	<u>A</u>	<u>J</u>	<u>V</u>	<u>C</u>	<u>A</u>
Brand	Product Category	SEER2	Region	Refrigerant	Capacity	Major Series	Voltage	Type	Controls	Minor Series
R - Ruud	D - Side-Discharge Heat Pump	18 - 18 SEER2	A - All Regions	Y - R-454B	24 - 24,000 [7.03 kW] 36 - 36,000 [10.55 kW] 48 - 48,000 [14.07 kW] 60 - 60,000 [17.58 kW]	A - 1st Design	J - 208/230/1/60	V - Fully Variable	C - Communicating, EcoNet®, Bluetooth®	A - 1st Series

[] Designates Metric Conversions

AVAILABLE MODELS	DESCRIPTION
RD18AY24AJVCA	Endeavor® Line <i>Ultra</i> ™ Series 2 Ton R-454B Inverter Driven Variable Speed Universal Heat Pump
RD18AY36AJVCA	Endeavor® Line <i>Ultra</i> ™ Series 3 Ton R-454B Inverter Driven Variable Speed Universal Heat Pump
RD18AY48AJVCA	Endeavor® Line <i>Ultra</i> ™ Series 4 Ton R-454B Inverter Driven Variable Speed Universal Heat Pump
RD18AY60AJVCA	Endeavor® Line <i>Ultra</i> ™ Series 5 Ton R-454B Inverter Driven Variable Speed Universal Heat Pump

NOTE: RD18AY models are communicating when installed as part of a complete AHRI-matched, Ruud EcoNet® Enabled System

STANDARD EQUIPMENT
R-454B Refrigerant
Rotary Compressor
Field Installed Filter Drier
Low Ambient Control
Compressor Sound Cover
Low Pressure Control
Front Seating Service Valves
Internal Pressure Relief Valve
Built-In Low Ambient with EcoNet®
Easy Access to Internal Components
Optimized Venturi Airflow
Powder Coated Paint
Rust Resistant Screws
QR Code
External Gauge Ports
Base Pan Heating Element ¹

¹Heating element commissioning requires purchase and field installment of base pan heater kit (item 45-110492-01).

General Data				
MODEL NO.	RD18AY24AJVCA	RD18AY36AJVCA	RD18AY48AJVCA	RD18AY60AJVCA
Nominal Tonnage	2.0T	3.0T	4.0T	5.0T
Valve Connections				
Liquid Line O.D. – in.	3/8	3/8	3/8	3/8
Suction Line O.D. – in.	3/4	3/4	7/8	7/8
Refrigerant (R-454B) furnished oz. ¹	76	141	194	222
Compressor Type				
Outdoor Coil				
Net face area – Outer Coil (Sq. Ft.)	11	15.1	17.2	17.2
Net face area – Inner Coil (Sq. Ft.)	11	15.1	17.2	17.2
Tube diameter – in.	0.276	0.276	0.276	0.276
Number of rows	1	2	3	3
Fins per inch	18	18	16	16
Outdoor Fan				
Diameter – in.	26	28	24	24
Number of blades	3	3	3	3
Motor hp	1/2	1/2	1/3	1/3
Nos	1	1	2	2
CFM	3175	2820	4350	5400
RPM	550	450	550	675
Watts	115	106	191	327
Shipping weight – lbs.	204	272	347	354
Operating weight – lbs.	177	230	296	306

Electrical Data				
Line Voltage Data (Volts-Phase-Hz)	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
Maximum overcurrent protection (amps) ²	20.0	30.0	40.0	45.0
Minimum circuit ampacity ³	19.0	26.0	38.0	43.0
Compressor				
Rated load amps	7.1	8.4	6.1	6.1
Locked rotor amps	18	52	61	61
Condenser Fan Motor				
Full load amps	3.0	3.0	2.5	2.5
Locked rotor amps	6.4	6.4	4.1	4.1

¹Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the installation instructions for information about set length and additional refrigerant charge required.

²HACR type circuit breaker or fuse.

³Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.

Accessories

MODEL NO.		RD18AY24AJVCA	RD18AY36AJVCA	RD18AY48AJVCA	RD18AY60AJVCA
Compressor crankcase heater		44-103663-15	44-103663-15	44-103663-15	44-103663-15
Base pan heater connector kit ¹		45-110492-01	45-110492-01	45-110492-01	45-110492-01
Low ambient control		Included Standard	Included Standard	Included Standard	Included Standard
Compressor sound cover		Included Standard	Included Standard	Included Standard	Included Standard
Compressor hard start kit		N/A	N/A	N/A	N/A
Low pressure control		Included Standard	Included Standard	Included Standard	Included Standard
High pressure control		Included Standard	Included Standard	Included Standard	Included Standard
Liquid Line Solenoid (24 VAC, 50/60 Hz)	Solenoid Valve	200RD2T3TVLC	200RD2T3TVLC	200RD2T3TVLC	200RD2T3TVLC
	Solenoid Coil	61-AMG24V	61-AMG24V	61-AMG24V	61-AMG24V
Liquid Line Solenoid (120/240 VAC, 50/60 Hz)	Solenoid Valve	200RD2T3TVLC	200RD2T3TVLC	200RD2T3TVLC	200RD2T3TVLC
	Solenoid Coil	61-AMG120/240V	61-AMG120/240V	61-AMG120/240V	61-AMG120/240V

¹Required for heating element commissioning.

Weighted Sound Power Level (dBA)

UNIT SIZE - VOLTAGE, SERIES	SOUND PRESSURE AS LOW AS	SOUND POWER AS LOW AS	TYPICAL OCTAVE BAND SPECTRUM (dBA WITHOUT TONE ADJUSTMENT)						
			125	250	500	1000	2000	4000	8000
RD18AY24AJVCA	53	61	45.0	54.7	57.5	58.2	53.9	46.7	38.1
RD18AY36AJVCA	50	58	44.7	60.8	62.3	57.2	53.9	54.5	44.8
RD18AY48AJVCA	54	61	54.0	58.6	63.8	64.9	60.4	54.8	44.9
RD18AY60AJVCA	55	63	53.5	59.0	62.6	63.3	57.9	50.4	44.8

NOTE: Tested in accordance with AHRI Standard 270-08 (not listed in AHRI)

Unit Dimensions

MODEL NO.	OPERATING						SHIPPING					
	H (Height)		L (Length)		W (Width)		H (Height)		L (Length)		W (Width)	
	INCHES	cm	INCHES	cm	INCHES	cm	INCHES	cm	INCHES	cm	INCHES	cm
RD18AY24AJVCA	36.6	93.0	40.4	102.6	19.8	50.3	43.31	110.0	48.43	123.0	22.05	56.0
RD18AY36AJVCA	46.4	117.8	42.3	107.4	22.8	57.8	53.94	137.0	50.00	127.0	25.00	63.5
RD18AY48AJVCA	58.0	147.3	40.4	102.6	19.8	50.3	65.16	165.5	48.43	123.0	22.05	56.0
RD18AY60AJVCA	58.0	147.3	40.4	102.6	19.8	50.3	65.16	165.5	48.43	123.0	22.05	56.0

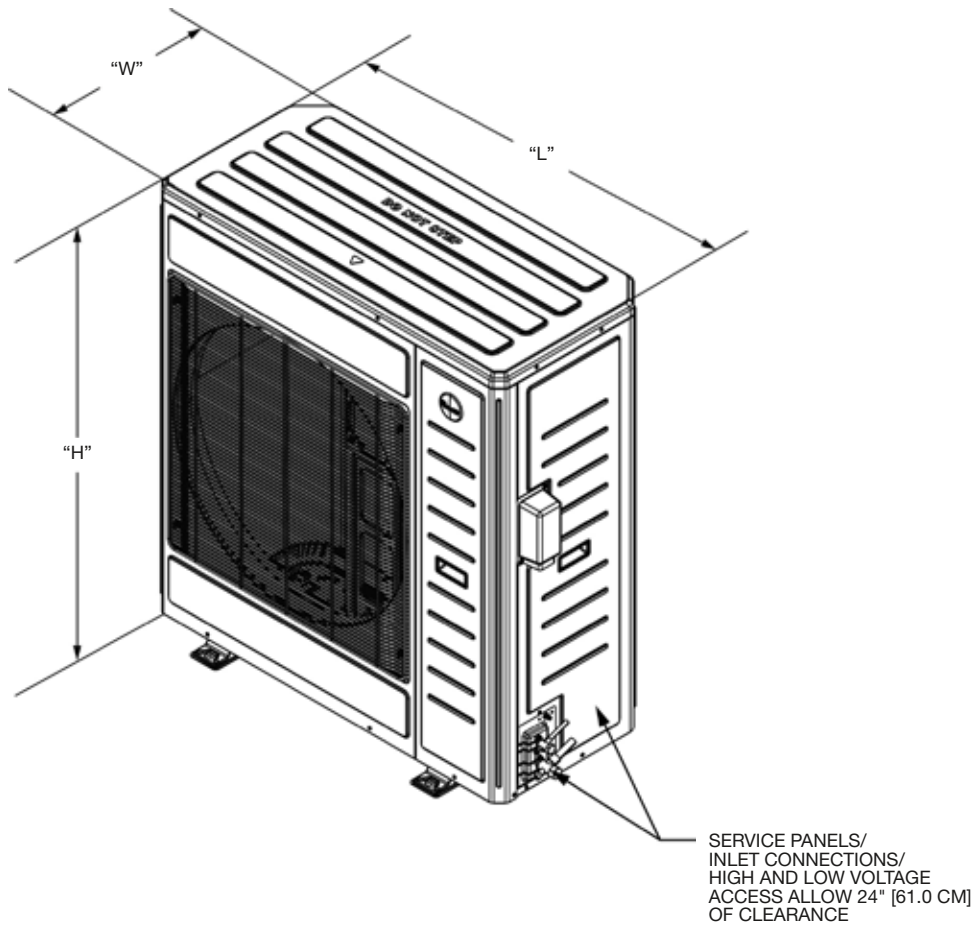


Illustration
A1345-02-00

[] Designates Metric Conversions

Allowable Clearances

Single Unit Installations

RD18AY24, RD18AY36				
	OBSTRUCTION MIN. CLEARANCE (IN.)			
	REAR	COIL SIDE	FRONT	SERVICE PANEL
Open Space Above	4	12	48	10
	12	4	48	10
	12	12	24	10
	4	12	24	10
Obstruction Above, Less Than 40"	12	12	48	10
	20	4	24	10

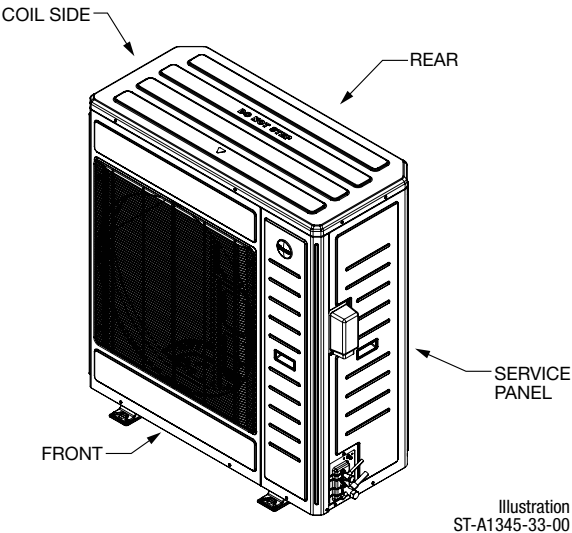


Illustration
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RD18AY48, RD18AY60				
	OBSTRUCTION MIN. CLEARANCE (IN.)			
	REAR	COIL SIDE	FRONT	SERVICE PANEL
Open Space Above	6	8	60	10
	12	8	60	10
	12	12	40	10
	6	12	40	10
Obstruction Above, Less Than 40"	12	12	48	10
	20	4	60	10

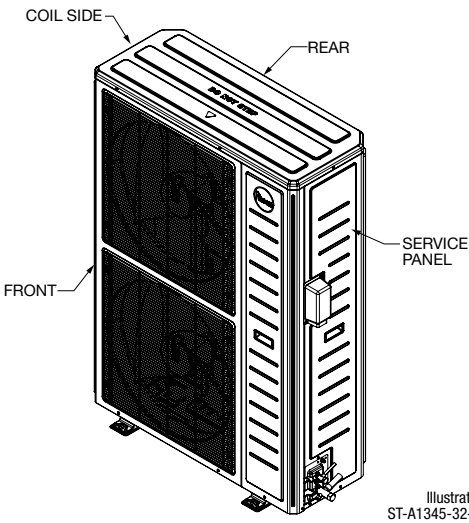


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Multiple Unit Installations

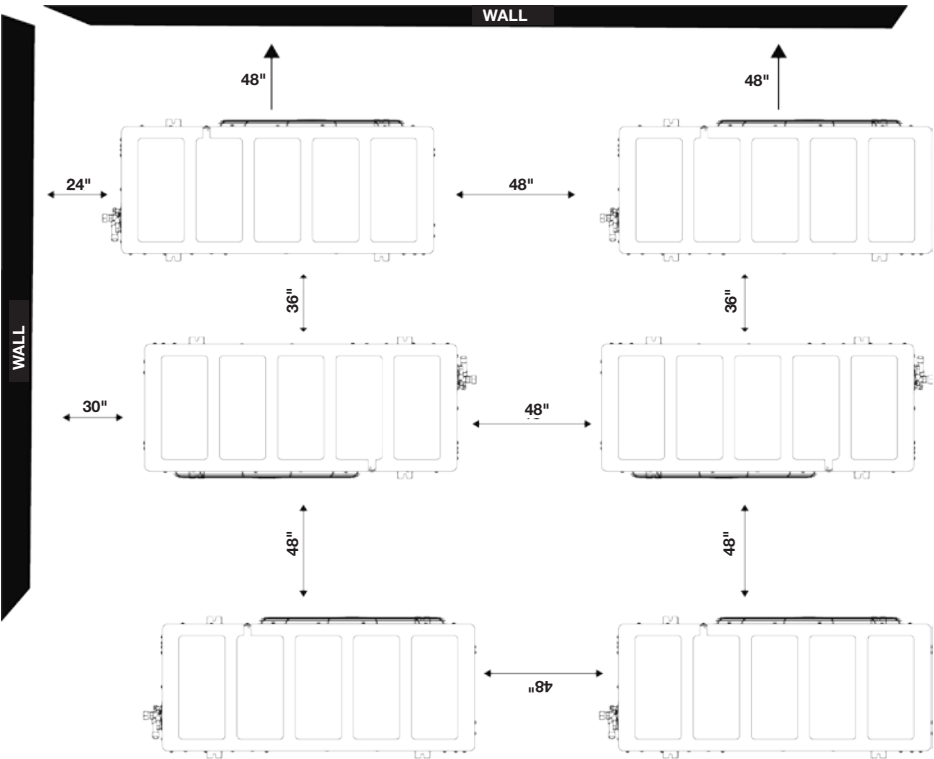


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IMPORTANT: Consult local and national building codes and ordinances for special installation requirements. Following location information will provide longer life and simplified servicing of the outdoor heat pump.

NOTICE: These units must be installed outdoors. No ductwork can be attached, or other modifications made, to the discharge grille. Modifications will affect performance or operation.

Refrigerant Line Size Information

18 SEER2 VARIABLE SPEED HEAT PUMPS								
UNIT SIZE	ALLOWABLE LIQUID LINE SIZE	ALLOWABLE VAPOR LINE SIZE	OUTDOOR UNIT ABOVE OR BELOW INDOOR UNIT EQUIVALENT LENGTH (FEET)					
			< 25	26-50	51-75	76-100	101-125	126-150
			MAXIMUM VERTICAL SEPARATION/CAPACITY MULTIPLIER					
2.0 TON *SEE NOTE 3	1/4"	5/8"	25/1.00	50/0.99	33/0.98	60/0.97	NR	NR
	5/16"	5/8"	25/1.00	50/0.99	50/0.98	50/0.97	50/0.96	50/0.95
	3/8"	5/8"	25/1.00	50/0.99	50/0.98	50/0.97	50/0.96	50/0.95
	1/4"	3/4"	25/1.00	50/1.00	33/0.99	60/0.99	NR	NR
	5/16"	3/4"	25/1.00	50/1.00	50/0.99	50/0.99	50/0.99	50/0.98
	3/8"	3/4"	25/1.00	50/1.00	50/0.99	50/0.99	50/0.99	50/0.98
3 TON	5/16"	5/8"	25/0.99	50/0.97	50/0.95	50/0.93	36/0.91	NR
	3/8"	5/8"	25/0.99	50/0.97	50/0.95	50/0.93	50/0.91	NR
	5/16"	3/4"	25/1.00	50/0.99	50/0.99	50/0.98	36/0.97	20/0.96
	3/8"	3/4"	25/1.00	50/0.99	50/0.99	50/0.98	50/0.97	50/0.96
	1/2"	3/4"	25/1.00	50/0.99	50/0.99	50/0.98	50/0.97	50/0.96
4 TON	3/8"	3/4"	25/0.99	50/0.98	50/0.96	50/0.95	50/0.93	50/0.92
	1/2"	3/4"	25/0.99	50/0.98	50/0.96	50/0.95	50/0.93	50/0.92
	3/8"	7/8"	25/1.00	50/0.99	50/0.99	50/0.98	50/0.98	50/0.97
	1/2"	7/8"	25/1.00	50/0.99	50/0.99	50/0.98	50/0.98	50/0.97
5 TON	3/8"	3/4"	25/0.98	50/0.97	50/0.95	50/0.93	46/0.91	NR
	1/2"	3/4"	25/0.98	50/0.97	50/0.95	50/0.93	50/0.91	NR
	3/8"	7/8"	25/0.99	50/0.99	50/0.98	50/0.97	50/0.96	38/0.95
	1/2"	7/8"	25/0.99	50/0.99	50/0.98	50/0.97	50/0.96	50/0.95
	3/8"	1-1/8"	25/1.00	50/1.00	50/1.00	50/0.99	50/0.99	38/0.99
	1/2"	1-1/8"	25/1.00	50/1.00	50/1.00	50/0.99	50/0.99	50/0.99

NOTES:

- Do not exceed 150 ft. linear line length.
- Do not exceed 50 ft. vertical separation between indoor and outdoor units.
- *3/4" vapor line should only be used for 2 ton systems if outdoor unit is below or at same level as indoor unit to assure proper oil return.
- **1-1/8" vapor line should only be used for 5 ton systems if outdoor unit is below or at same level as indoor unit to assure proper oil return.
- Always use the smallest liquid line allowable to minimize refrigerant charge.
- Applications shaded in light gray indicate capacity multipliers between 0.90 and 0.96 which are not recommended, but are allowed.
- Applications shaded in dark gray are not recommended due to excessive liquid or suction pressure drop.

Refrigerant Line Size Information (Con't.)

18 SEER2 VARIABLE SPEED HEAT PUMPS								
UNIT SIZE	ALLOWABLE LIQUID LINE SIZE	ALLOWABLE VAPOR LINE SIZE	OUTDOOR UNIT ABOVE OR BELOW INDOOR UNIT EQUIVALENT LENGTH (METERS)					
			< 8	9-15	16-23	24-30	31-38	39-46
			MAXIMUM VERTICAL SEPARATION/CAPACITY MULTIPLIER					
7.0 kW [2.0 TON] *SEE NOTE 3	6.35 [1/4]	15.88 [5/8]	8/1.00	15/0.99	10/0.98	20/0.97	NR	NR
	7.94 [5/16]	15.88 [5/8]	8/1.00	15/0.99	15/0.98	15/0.97	15/0.96	15/0.95
	9.53 [3/8]	15.88 [5/8]	8/1.00	15/0.99	15/0.98	15/0.97	15/0.96	15/0.95
	6.35 [1/4]	19.05 [3/4]	8/1.00	15/0.99	10/0.99	20/0.99	NR	NR
	7.94 [5/16]	19.05 [3/4]	8/1.00	15/0.99	15/0.99	15/0.99	15/0.99	15/0.98
	9.53 [3/8]	19.05 [3/4]	8/1.00	15/0.99	15/0.99	15/0.99	15/0.99	15/0.98
10.6 kW [3 TON]	7.94 [5/16]	15.88 [5/8]	8/0.99	15/0.97	15/0.95	15/0.93	11/0.91	NR
	9.53 [3/8]	15.88 [5/8]	8/0.99	15/0.97	15/0.95	15/0.93	15/0.91	NR
	7.94 [5/16]	19.05 [3/4]	8/1.00	15/0.99	15/0.99	15/0.98	11/0.97	6/0.96
	9.53 [3/8]	19.05 [3/4]	8/1.00	15/0.99	15/0.99	15/0.98	15/0.97	15/0.96
	12.70 [1/2]	19.05 [3/4]	8/1.00	15/0.99	15/0.99	15/0.98	15/0.97	15/0.96
14.1 kW [4 TON]	9.53 [3/8]	19.05 [3/4]	8/0.99	15/0.98	15/0.96	15/0.95	15/0.93	15/0.92
	12.70 [1/2]	19.05 [3/4]	8/0.99	15/0.98	15/0.96	15/0.95	15/0.93	15/0.92
	9.53 [3/8]	22.23 [7/8]	8/1.00	15/0.99	15/0.99	15/0.98	15/0.98	15/0.97
	12.70 [1/2]	22.23 [7/8]	8/1.00	15/0.99	15/0.99	15/0.98	15/0.98	15/0.97
17.6 kW [5 TON]	9.53 [3/8]	19.05 [3/4]	8/0.98	15/0.97	15/0.95	15/0.93	14/0.91	NR
	12.70 [1/2]	19.05 [3/4]	8/0.98	15/0.97	15/0.95	15/0.93	15/0.91	NR
	9.53 [3/8]	22.23 [7/8]	8/0.99	15/0.99	15/0.98	15/0.97	15/0.96	12/0.95
	12.70 [1/2]	22.23 [7/8]	8/0.99	15/0.99	15/0.98	15/0.97	15/0.96	15/0.95
	9.53 [3/8]	28.58 [1-1/8]**	8/1.00	15/0.99	15/0.98	15/0.99	15/0.99	12/0.99
	12.70 [1/2]	28.58 [1-1/8]**	8/1.00	15/0.99	15/0.98	15/0.99	15/0.99	15/0.99

NOTES:

- 1) Do not exceed 46 meters linear line length.
- 2) Do not exceed 15 meters vertical separation between indoor and outdoor units.
- 3) *19.05 mm [3/4 in.] vapor line should only be used for 2 ton systems if outdoor unit is below or at same level as indoor unit to assure proper oil return.
- 4) **28.58 mm [1-1/8 in.] vapor line should only be used for 5 ton systems if outdoor unit is below or at same level as indoor unit to assure proper oil return.
- 5) Always use the smallest liquid line allowable to minimize refrigerant charge.
- 6) Applications shaded in light gray indicate capacity multipliers between 0.90 and 0.96 which are not recommended, but are allowed.
- 7) Applications shaded in dark gray are not recommended due to excessive liquid or suction pressure drop.

Performance Data @ AHRI Standard Conditions – Cooling

DESIGNATED TESTED COMBINATION (DTC)												
OUTDOOR UNIT	COIL	TOTAL CAPACITY BTU/H [KW]	NET SENSIBLE BTU/H [KW]	NET LATENT BTU/H [KW]	SEER2	EER2	INDOOR CFM [L/S]	47 DEGREE HEATING CAPACITY BTU/H [KW]	47 DEGREE COP	17 DEGREE HEATING CAPACITY BTU/H [KW]	17 DEGREE COP	REGION IV HSPF2
RD18AY24AJVCA	RH2VY3617STACNJ	21,200 [6.2]	16,400 [4.8]	4,800 [1.4]	18.0	11.7	760 [359.0]	21,200 [6.2]	3.6	18,200 [5.3]	2.4	9.5
RD18AY36AJVCA	RH2VY3621MTACNJ	33,000 [9.7]	24,400 [7.2]	8,600 [2.5]	19.0	13.0	1,050 [495.0]	33,000 [9.7]	3.9	30,200 [8.9]	2.6	10.0
RD18AY48AJVCA	RH2VY6024STACNJ	42,000 [12.3]	31,000 [9.1]	11,000 [3.2]	18.0	12.0	1,430 [675.0]	42,000 [12.3]	3.7	37,500 [11.0]	2.6	9.5
RD18AY60AJVCA	RH2VY6024STACNJ	51,500 [15.1]	37,000 [10.8]	14,500 [4.2]	18.0	11.7	1,650 [779.0]	51,500 [15.1]	3.6	45,000 [13.2]	2.4	10.0

NOTE: This data includes DTC (Designated Test Combination) ratings and is for reference purposes only. A full listing of official ratings and system match-ups, along with downloadable certificates, can be accessed from the AHRI website: www.ahridirectory.org.

[] 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 period stated, in accordance with the terms of the limited warranty.

***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.**

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

Applies to a heat pump only or system installation. Does not require the heat pump to be part of a properly matched system as specified by the Manufacturer and the Air Conditioning Heating & Refrigeration Institute (AHRI).

Before proceeding with installation, refer to installation instructions packaged with each model, as well as complying with all Federal, State, Provincial, and Local codes, regulations, and practices.

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

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