MODEL: RAWL

High-Efficiency Condensing Units

FORM NO. ARR-209 REV. 3

Russell™ By Rheem
High-Efficiency Condensing Units

RAWL
- Nominal Sizes 10 & 12.5 Ton [35.2 & 44.0 kW]

RAWL
- Nominal Size 15 Ton [52.8 kW]

TABLE OF CONTENTS

STANDARD UNIT FEATURES

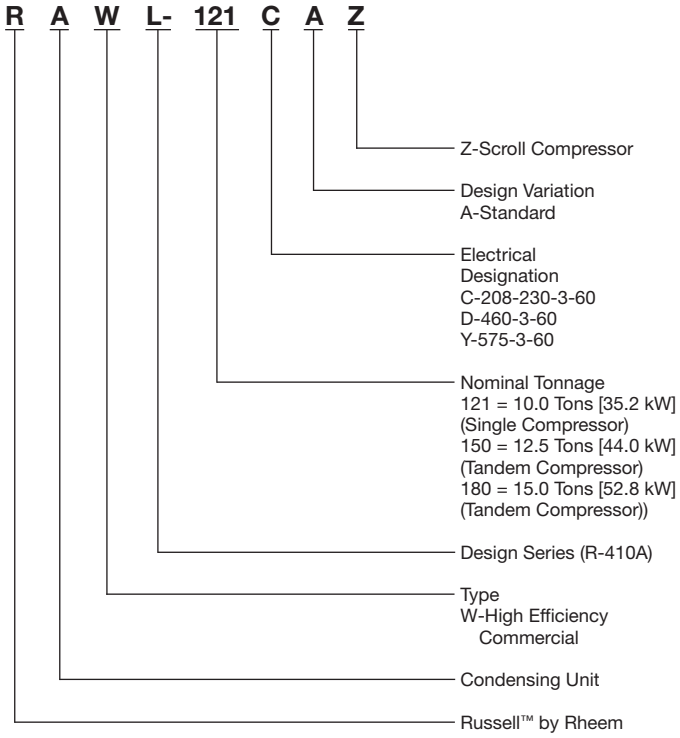
- **CABINET**—Galvanized steel with a durable finish. Stamped louvered panels offer 100% protection for the condenser coil.
- **COMPRESSOR**—The Scroll Compressor is hermetically sealed with internal overload protection and durable insulation on motor windings. The entire compressor is mounted on rubber grommets to reduce vibration and noise.
- **CONDENSER COIL**—Constructed with copper tubes and aluminum fins mechanically bonded to the tubes for maximum heat transfer capabilities.
- **BASE PAN**—Galvanized steel.
- **REFRIGERANT CONNECTIONS**—Field piping connections are made through a fixed panel. This allows removal of access panels after piping connections have been made.
- **CRANKCASE HEATERS**—Standard, all models. Prevents refrigerant migration to compressor(s).
- **LOW AMBIENT CONTROL**—A pressure sensitive fan cycling control to allow unit operation down to 0°F [–17.8°C] is standard.
- **SERVICE VALVES**—Standard on liquid and suction lines. Allows outdoor section to be isolated from indoor coil.
- **SERVICE ACCESS**—Control box as well as the compressor and other refrigerant controls are accessible through access panels. Control box may be open without affecting the normal operation of the unit. Condenser fan motors are accessible by removing wire grilles.
- **FILTER DRIER**—Standard (uninstalled) on all models. Helps ensure refrigerant cleanliness.
- **TRANSFORMER**—Step-down type, line to 24 volts. Provides control circuit voltage.
- **CONTACTOR**—The contactor is an electrical switch which operates the compressor and condenser fans.
- **HIGH PRESSURE CONTROL**—Opens the contactor circuit on high refrigerant pressure; manual reset.
- **LOW PRESSURE CONTROL**—Stops compressor operation in the event of loss of refrigerant.
- **CONDENSER FAN MOTOR** (Direct Drive)—Ball bearing 1075 RPM motors are mounted to minimize vibration and noise problems. These are permanent split capacitor types. ECM fan motor (10 Ton)
- **TESTING**—All units are run tested at the factory prior to shipment. Units are shipped with a holding charge of nitrogen.
- **EXTERNAL GAUGE PORTS**—Allows pressures to be checked without removing access panel.
- **COIL LOUVERS**—Helps prevent damage to outdoor coils.
- **TIME DELAY**—Supplied on tandem compressor models to provide a delay between stages.
- **EQUIPMENT GROUND**—Lug for field connection of ground wire.

[ ] Designates Metric Conversions

WHY USE A HIGH EFFICIENCY, AIR COOLED SPLIT SYSTEM?

- The size ranges offered by Russell™ by Rheem allow you to mix or match components to meet actual job requirements, thus eliminating the need to use oversized or undersized equipment. Equipment sized to meet the actual load will provide better operating economy, better humidity control, and longer equipment life.
- With an air cooled system, you have no water or sewer connections to make, and no troublesome and costly water treatment problems.
- Since the condensing unit is located outside the building, and the low profile air handling unit can be installed in the drop ceiling or in the conditioned space, you will not need a separate equipment room which takes up valuable building space.
- Remote mounting of the already quiet condensing unit keeps the compressor and condenser fan noise outside, and the vertical discharge fans carry the sound up and away from the surrounding area.
- Because of the simple design of the Russell™ by Rheem condensing unit, installation is quick and simple, and very little maintenance is required.

MODEL IDENTIFICATION



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CONDENSING UNIT ACCESSORIES

ACCESSORY DESCRIPTION	MODEL NUMBER	SIZES USED ON
Sight Glass	RXAG-A048	121
Sight Glass	RXAG-A020	180
Liquid Line Solenoid Valve*	RXAV-CD120	121, 150
Liquid Line Solenoid Valve*	RXAV-CD180	180

*Cannot be used as a pump down solenoid.

CONDENSING UNIT — GROSS CAPACITY AND POWER

RAWL-121						
°F [°C] OUTDOOR AMBIENT TEMPERATURE	SATURATED EVAPORATOR TEMPERATURE °F [°C]					
	40 [4.4]		45 [7.2]		50 [10.0]	
	MBH [kW]	KW	MBH [kW]	KW	MBH [kW]	KW
75 [24]	112.3	6.8	122.3	6.9	133.0	7.0
80 [27]	110.3	7.1	120.3	7.3	130.9	7.4
85 [29]	107.9	7.5	117.6	7.6	128.0	7.8
90 [32]	104.5	7.9	114.6	8.0	124.6	8.1
95 [35]	101.3	8.3	110.7	8.4	120.8	8.5
100 [38]	97.4	8.7	106.8	8.8	116.8	8.9
105 [41]	93.5	9.2	102.7	9.2	111.9	9.4
110 [43]	89.3	9.6	98.4	9.7	107.7	9.8
115 [46]	87.0	10.1	94.3	10.2	101.3	10.3

RAWL-150						
°F [°C] OUTDOOR AMBIENT TEMPERATURE	SATURATED EVAPORATOR TEMPERATURE °F [°C]					
	40 [4.4]		45 [7.2]		50 [10.0]	
	MBH [kW]	KW	MBH [kW]	KW	MBH [kW]	KW
75 [24]	151.6 [44.42]	9.5	164.3 [48.13]	9.6	177.2 [51.90]	9.7
80 [27]	147.0 [43.06]	10.0	159.4 [46.69]	10.1	172.0 [50.39]	10.3
85 [29]	142.3 [41.70]	10.6	154.5 [45.26]	10.7	166.8 [48.88]	10.8
90 [32]	137.7 [40.33]	11.1	149.5 [43.82]	11.2	161.7 [47.36]	11.3
95 [35]	133.0 [38.97]	11.6	144.6 [42.38]	11.7	156.5 [45.85]	11.9
100 [38]	128.3 [37.61]	12.1	139.7 [40.94]	12.3	151.3 [44.34]	12.4
105 [41]	123.7 [36.24]	12.7	134.8 [39.50]	12.8	146.2 [42.82]	12.9
110 [43]	119.0 [34.88]	13.2	129.9 [38.07]	13.3	141.0 [41.31]	13.4
115 [46]	114.4 [33.51]	13.7	125.0 [36.63]	13.8	135.8 [39.80]	14.0

KW — Condensing Unit Power (Compressor + Fan)
MBH — Gross Capacity x 1000 BTUH [kW]

NOTES: 1. All values at approximately 20°F [11.1°C] subcooling
2. Data includes 25 feet [7.62 m] of recommended vapor and liquid lines

[ ] Designates Metric Conversions

CONDENSING UNIT— GROSS CAPACITY AND POWER (cont.)

RAWL-180						
°F [°C] OUTDOOR AMBIENT TEMPERATURE	SATURATED EVAPORATOR TEMPERATURE °F [°C]					
	40 [4.4]		45 [7.2]		50 [10.0]	
	MBH [kW]	KW	MBH [kW]	KW	MBH [kW]	KW
75 [24]	200.8 [58.84]	11.4	216.3 [63.38]	11.8	222.7 [65.24]	12.2
80 [27]	194.3 [56.94]	12.2	209.8 [61.47]	12.6	217.8 [63.82]	12.9
85 [29]	187.8 [55.03]	13.0	203.3 [59.56]	13.3	213.0 [62.40]	13.7
90 [32]	181.3 [53.12]	13.8	196.7 [57.64]	14.1	208.1 [60.98]	14.5
95 [35]	174.8 [51.22]	14.5	190.2 [55.73]	14.8	203.3 [59.56]	15.2
100 [38]	168.3 [49.31]	15.3	183.7 [53.82]	15.6	198.4 [58.14]	16.0
105 [41]	161.8 [47.40]	16.1	177.1 [51.90]	16.3	193.6 [56.72]	16.7
110 [43]	155.3 [45.50]	16.9	170.6 [49.99]	17.1	188.7 [55.30]	17.5
115 [46]	148.8 [43.59]	17.6	164.1 [48.08]	17.8	183.9 [53.88]	18.2

KW — Condensing Unit Power (Compressor + Fan)
MBH — Gross Capacity x 1000 BTUH [kW]

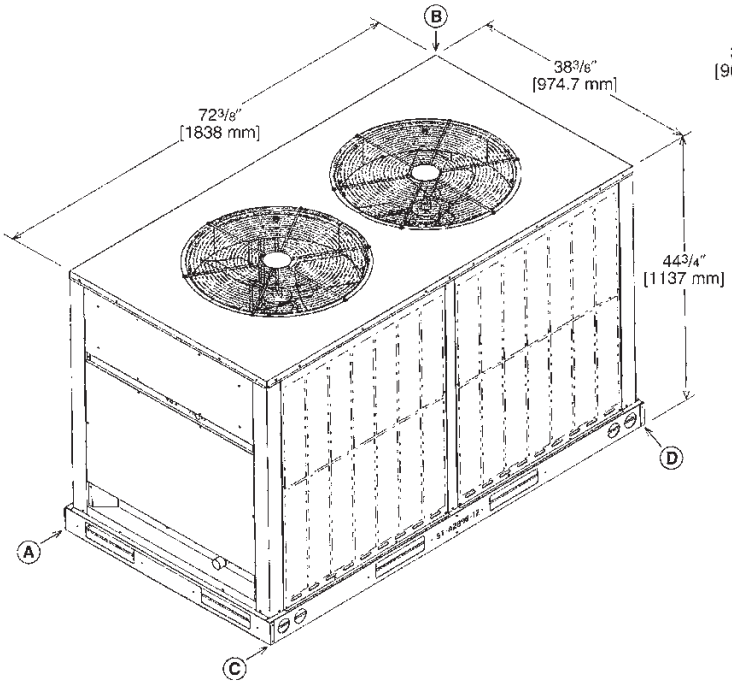
NOTES: 1. All values at approximately 20°F [11.1°C] subcooling
2. Data includes 25 feet [7.62 m] of recommended vapor and liquid lines

[ ] Designates Metric Conversions

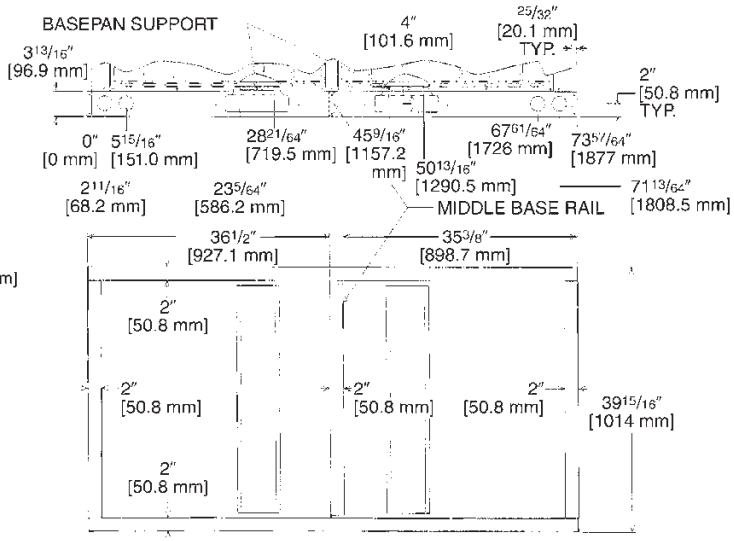
UNIT DIMENSIONS AND WEIGHTS

MODEL	TOTAL WEIGHT LBS. [kg]	Corner Weights, Lbs. [kg]			
		A	B	C	D
RAWL-121	557 [253]	137 [62]	148 [67]	131 [59]	142 [64]
RAWL-150	650 [295]	160 [72]	171 [78]	154 [70]	165 [75]
RAWL-180	746 [338]	183 [83]	196 [89]	177 [80]	189 [86]

10-12.5 TON [35.2-44 kW]

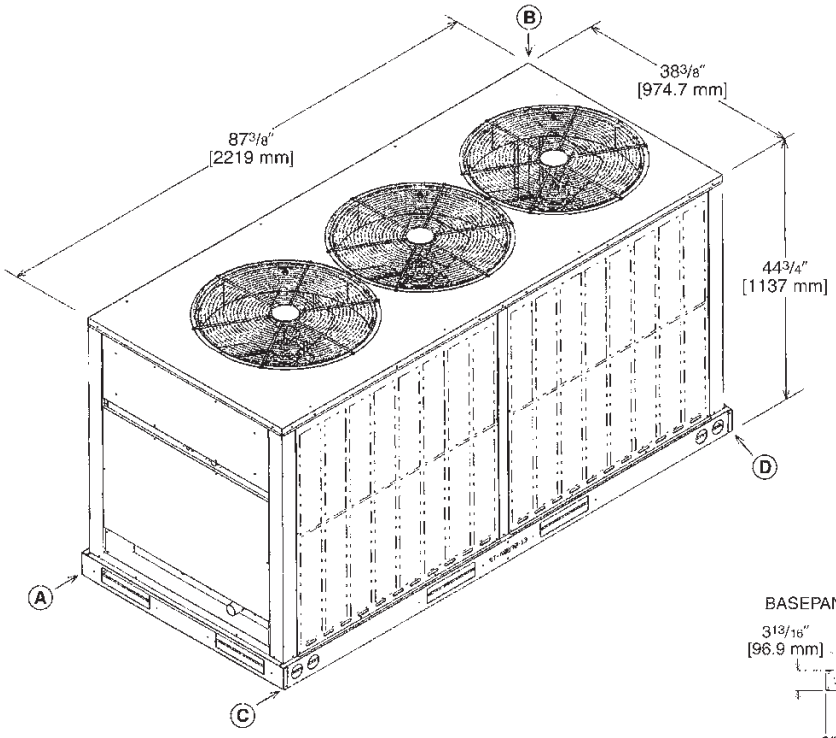


BOTTOM VIEW



UNIT DIMENSIONS (cont.)

15 TON [52.8 kW]



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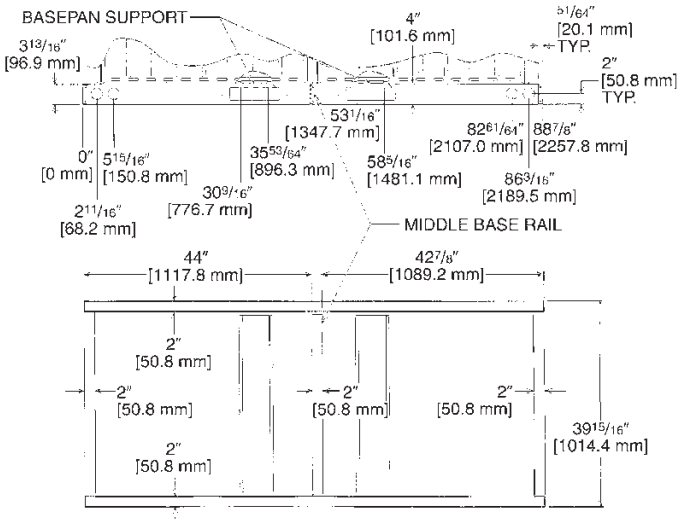
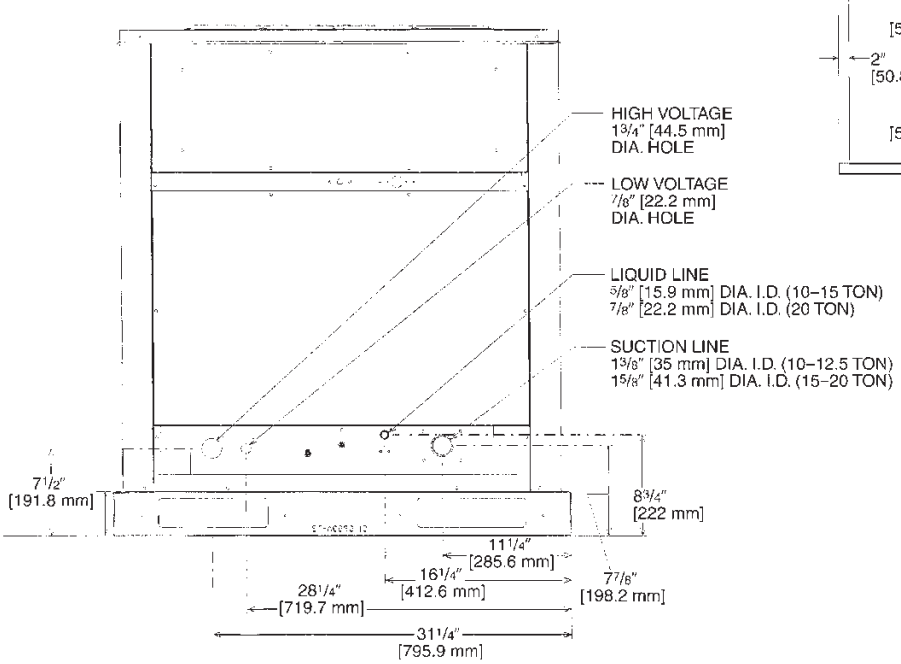


CONTROL ACCESS SIDE VIEW



[ ] Designates Metric Conversions

ALL MODELS

ELECTRICAL & PHYSICAL DATA: RAWL

Model Number RAWL-	ELECTRICAL							PHYSICAL					
	Phase Frequency (Hz) Voltage (Volts)	Compressor		Full Load Amperes (FLA)	Minimum Circuit Ampacity Amperes	Fuse or HACR Circuit Breaker		Outdoor Coil			Refrig. Per Circuit Oz. [g]	Weight	
		Rated Load Amperes (RLA)	Locked Rotor Amperes (LRA)	Fan Motor		Minimum Amperes	Maximum Amperes	Face Area Sq. Ft. [m²]	No. Rows	CFM [L/s]		Net Lbs. [kg]	Shipping Lbs. [kg]
121CAZ	3-60-208/230	32.6/32.6	240	3.5	44/48	60/60	80/80	32.88 [3.05]	2	8000 [3775]	437 [12389]	557 [253.0]	597 [271.0]
121DAZ	3-60-460	14.8/14.8	130	1.6	26	30	40	32.88 [3.05]	2	8000 [3775]	437 [12389]	557 [253.0]	597 [271.0]
150CAZ	3-60-208/230	22.4/22.4	149	4.8	56/56	70/70	70/70	32.88 [3.05]	2	8000 [3775]	378 [10716]	650 [294.8]	690 [313.0]
150DAZ	3-60-460	10.6	75	2.8	27	30	35	32.88 [3.05]	2	8000 [3775]	378 [10716]	650 [294.8]	690 [313.0]
150YAZ	3-60-575	7.7	54	2	20	25	25	32.88 [3.05]	2	8000 [3775]	378 [10716]	650 [294.8]	690 [313.0]
180CAZ	3-60-208/230	25/25	164	7.2	64/64	70/70	80/80	40.38 [3.75]	2	12000 [5663]	506 [14345]	746 [338.4]	786 [356.5]
180DAZ	3-60-460	12.2	100	4.2	32	35	40	40.38 [3.75]	2	12000 [5663]	506 [14345]	746 [338.4]	786 [356.5]
180YAZ	3-60-575	9	78	3	24	30	30	40.38 [3.75]	2	12000 [5663]	506 [14345]	746 [338.4]	786 [356.5]
240YAZ	3-60-575	12.8	80	2.4	32	35	40	40.38 [3.75]	3	12000 [5663]	655 [18569]	952 [431.8]	992 [450.0]

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PERFORMANCE DATA @ AHRI STANDARD CONDITIONS — COOLING: RAWL

Model Numbers		80°F [26.5°C] DB 67°F [19.5°C] WB Indoor Air 95°F [35°C] DB Outdoor Air					Sound Rating	Rated Indoor CFM [L/s]
Outdoor Unit RAWL-	Indoor Coil And/Or Air Handler	Total Capacity BTU/H [kW]	Net Sensible BTU/H [kW]	Net Latent BTU/H [kW]	EER	IEER		
121CAZ	RHGN-H120CR	110,000 [32.2]	80,100 [23.5]	29,900 [8.7]	11.20	12.90	88	3,735 [1762]
121DAZ	RHGN-H120CR	110,000 [32.2]	80,100 [23.5]	29,900 [8.7]	11.20	12.90	88	3,735 [1762]
150CAZ	RHGL-180Z	142,000 [41.6]	108,000 [31.7]	34,000 [10.0]	10.32	12.40	88	5,000 [2360]
150DAZ	RHGL-180Z	146,000 [42.8]	112,000 [32.8]	34,000 [10.0]	10.32	14.60	88	5,000 [2360]
150YAZ	RHGL-180Y	146,000 [42.8]	112,000 [32.8]	34,000 [10.0]	10.18	12.00	88	5,000 [2360]
180CAZ	RHGL-180Z	174,000 [51.0]	121,000 [35.5]	53,000 [15.5]	11.00	13.00	88	5,100 [2407]
180DAZ	RHGL-180Z	174,000 [51.0]	121,000 [35.5]	53,000 [15.5]	11.00	13.00	88	5,100 [2407]
180YAZ	RHGL-180Y	174,000 [51.0]	121,000 [35.5]	53,000 [15.5]	10.28	13.00	88	5,100 [2407]
240YAZ	RHGL-240Y	240,000 [70.34]	165,000 [48.36]	75,000 [22.0]	10.00	11.60	88	6900 [3256]

① Highest sales volume tested combination required by D.O.E. test procedures.
N/A = Not applicable

[ ] Designates Metric Conversions

COOLING PERFORMANCE DATA

CONDENSING UNIT **RAWL-150** WITH COOLING COIL **RHGL-180**

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]		
CFM [L/s]			6000 [2832]	5000 [2360]	4000 [1888]	6000 [2832]	5000 [2360]	4000 [1888]	6000 [2832]	5000 [2360]	4000 [1888]
DR ①			.06	.01	.14	.06	.01	.14	.06	.01	.14
OUTDOOR DRY BULB TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	159.8 [46.8]	154.2 [45.2]	148.6 [43.6]	164.1 [48.1]	158.3 [46.4]	152.6 [44.7]	157.5 [46.2]	152.0 [44.5]	146.5 [42.9]
		Sens BTUH [kW]	108.4 [31.8]	93.5 [27.4]	79.7 [23.4]	135.8 [39.8]	118.4 [34.7]	102.2 [30.0]	151.0 [44.3]	132.6 [38.9]	115.2 [33.8]
		Power	10.5	10.3	10.1	11.5	11.3	11.1	12.4	12.2	12.0
	80 [26.7]	Total BTUH [kW]	159.9 [46.9]	154.3 [45.2]	148.7 [43.6]	164.2 [48.1]	158.4 [46.4]	152.7 [44.8]	157.7 [46.2]	152.1 [44.6]	146.6 [43.0]
		Sens BTUH [kW]	108.8 [31.9]	93.9 [27.5]	80.1 [23.5]	136.2 [39.9]	118.8 [34.8]	102.5 [30.0]	151.5 [44.4]	133.0 [39.0]	115.6 [33.9]
		Power	11.1	10.9	10.7	12.0	11.8	11.6	13.0	12.8	12.6
	85 [29.4]	Total BTUH [kW]	159.0 [46.6]	153.5 [45.0]	147.9 [43.3]	163.3 [47.9]	157.6 [46.2]	151.9 [44.5]	156.8 [46.0]	151.3 [44.3]	145.8 [42.7]
		Sens BTUH [kW]	108.6 [31.8]	93.8 [27.5]	80.0 [23.5]	136.0 [39.9]	118.7 [34.8]	102.5 [30.0]	151.3 [44.4]	132.9 [39.0]	115.5 [33.9]
		Power	11.7	11.5	11.3	12.7	12.5	12.2	13.7	13.4	13.2
	90 [32.2]	Total BTUH [kW]	157.2 [46.1]	151.7 [44.5]	146.1 [42.8]	161.4 [47.3]	155.8 [45.7]	150.1 [44.0]	154.9 [45.4]	149.5 [43.8]	144.0 [42.2]
		Sens BTUH [kW]	107.7 [31.6]	93.0 [27.3]	79.2 [23.2]	135.0 [39.6]	117.9 [34.6]	101.7 [29.8]	150.3 [44.1]	132.1 [38.7]	114.8 [33.7]
		Power	12.4	12.1	11.9	13.3	13.1	12.9	14.3	14.1	13.8
	95 [35]	Total BTUH [kW]	154.3 [45.2]	148.9 [43.6]	143.5 [42.1]	158.6 [46.5]	153.0 [44.8]	147.5 [43.2]	152.0 [44.5]	146.7 [43.0]	141.4 [41.4]
		Sens BTUH [kW]	106.1 [31.1]	91.6 [26.9]	78.2 [22.9]	133.5 [39.1]	116.5 [34.2]	100.6 [29.5]	148.7 [43.6]	130.7 [38.3]	113.7 [33.3]
		Power	13.1	12.8	12.6	14.0	13.8	13.5	15.0	14.8	14.5
	100 [37.8]	Total BTUH [kW]	150.5 [44.1]	145.2 [42.6]	139.9 [41.0]	154.7 [45.3]	149.3 [43.8]	143.9 [42.2]	148.2 [43.4]	143.0 [41.9]	137.8 [40.4]
		Sens BTUH [kW]	103.8 [30.4]	89.6 [26.3]	76.4 [22.4]	131.1 [38.4]	114.5 [33.6]	98.9 [29.0]	146.4 [42.9]	128.7 [37.7]	112.0 [32.8]
		Power	13.8	13.5	13.3	14.8	14.5	14.3	15.7	15.5	15.2
	105 [40.6]	Total BTUH [kW]	145.6 [42.7]	140.5 [41.2]	135.4 [39.7]	149.9 [43.9]	144.6 [42.4]	139.4 [40.9]	143.3 [42.0]	138.3 [40.5]	133.3 [39.1]
		Sens BTUH [kW]	100.7 [29.5]	87.0 [25.5]	74.3 [21.8]	128.1 [37.6]	111.9 [32.8]	96.7 [28.3]	143.3 [42.0]	126.1 [37.0]	109.8 [32.2]
		Power	14.6	14.3	14.1	15.5	15.3	15.0	16.5	16.2	15.9
	110 [43.3]	Total BTUH [kW]	139.8 [41.0]	134.9 [39.5]	130.0 [38.1]	144.1 [42.2]	139.0 [40.7]	133.9 [39.2]	137.5 [40.3]	132.7 [38.9]	127.9 [37.5]
		Sens BTUH [kW]	97.1 [28.5]	83.9 [24.6]	71.6 [21.0]	124.4 [36.5]	108.7 [31.9]	93.9 [27.5]	137.5 [40.3]	123.0 [36.1]	107.2 [31.4]
		Power	15.4	15.1	14.8	16.4	16.1	15.8	17.3	17.0	16.7
	115 [46.1]	Total BTUH [kW]	133.0 [39.0]	128.3 [37.6]	123.6 [36.2]	137.2 [40.2]	132.4 [38.8]	127.6 [37.4]	130.7 [38.3]	126.1 [37.0]	121.5 [35.6]
		Sens BTUH [kW]	92.7 [27.2]	80.1 [23.5]	68.4 [20.1]	119.9 [35.1]	104.9 [30.8]	90.8 [26.6]	130.7 [38.3]	119.1 [34.9]	103.8 [30.4]
		Power	16.2	15.9	15.7	17.2	16.9	16.6	18.2	17.9	17.6

CONDENSING UNIT **RAWL-180** WITH COOLING COIL **RHGL-180**

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]		
CFM [L/s]			6120 [2888]	5100 [2407]	4080 [1926]	6120 [2888]	5100 [2407]	4080 [1926]	6120 [2888]	5100 [2407]	4080 [1926]
DR ①			.01	.07	.14	.01	.07	.14	.01	.07	.14
OUTDOOR DRY BULB TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	238.4 [69.9]	230.0 [67.4]	221.6 [64.9]	217.6 [63.8]	210.0 [61.5]	202.4 [59.3]	210.9 [61.8]	203.5 [59.6]	196.1 [57.5]
		Sens BTUH [kW]	148.4 [43.5]	127.3 [37.3]	107.8 [31.6]	164.2 [48.1]	142.6 [41.8]	122.4 [35.9]	180.8 [53.0]	158.0 [46.3]	136.5 [40.0]
		Power	15.8	15.6	15.3	14.5	14.2	14.0	13.1	12.9	12.6
	80 [26.7]	Total BTUH [kW]	232.3 [68.1]	224.1 [65.7]	216.0 [63.3]	211.5 [62.0]	204.1 [59.8]	196.7 [57.6]	204.8 [60.0]	197.6 [57.9]	190.4 [55.8]
		Sens BTUH [kW]	145.6 [42.7]	125.0 [36.6]	106.0 [31.1]	161.5 [47.3]	140.3 [41.1]	120.5 [35.3]	178.1 [52.2]	155.7 [45.6]	134.6 [39.5]
		Power	16.4	16.1	15.9	15.0	14.8	14.5	13.7	13.4	13.2
	85 [29.4]	Total BTUH [kW]	226.4 [66.4]	218.5 [64.0]	210.5 [61.7]	205.7 [60.3]	198.5 [58.2]	191.2 [56.0]	198.9 [58.3]	192.0 [56.3]	185.0 [54.2]
		Sens BTUH [kW]	142.9 [41.9]	122.8 [36.0]	104.1 [30.5]	158.8 [46.5]	138.0 [40.5]	118.5 [34.7]	175.3 [51.4]	153.4 [45.0]	132.7 [38.9]
		Power	17.0	16.7	16.4	15.7	15.4	15.1	14.3	14.0	13.8
	90 [32.2]	Total BTUH [kW]	220.8 [64.7]	213.0 [62.4]	205.3 [60.2]	200.0 [58.6]	193.0 [56.6]	186.0 [54.5]	193.3 [56.7]	186.5 [54.7]	179.7 [52.7]
		Sens BTUH [kW]	140.1 [41.1]	120.3 [35.3]	102.1 [29.9]	155.9 [45.7]	135.6 [39.8]	116.6 [34.2]	172.5 [50.6]	151.0 [44.3]	130.7 [38.3]
		Power	17.7	17.4	17.1	16.3	16.0	15.7	14.9	14.7	14.4
	95 [35]	Total BTUH [kW]	215.3 [63.1]	207.8 [60.9]	200.2 [58.7]	194.6 [57.0]	187.7 [55.0]	180.9 [53.0]	187.8 [55.0]	181.2 [53.1]	174.7 [51.2]
		Sens BTUH [kW]	137.1 [40.2]	117.9 [34.6]	100.0 [29.3]	153.1 [44.9]	133.1 [39.0]	114.5 [33.6]	169.6 [49.7]	148.5 [43.5]	128.7 [37.7]
		Power	18.4	18.1	17.7	17.0	16.7	16.4	15.6	15.4	15.1
	100 [37.8]	Total BTUH [kW]	210.1 [61.6]	202.7 [59.4]	195.3 [57.2]	189.3 [55.5]	182.7 [53.5]	176.1 [51.6]	182.6 [53.5]	176.2 [51.6]	169.8 [49.8]
		Sens BTUH [kW]	134.2 [39.3]	115.3 [33.8]	97.8 [28.7]	150.0 [44.0]	130.6 [38.3]	112.4 [33.0]	166.5 [48.8]	145.9 [42.8]	126.5 [37.1]
		Power	19.1	18.8	18.4	17.7	17.4	17.1	16.4	16.1	15.8
	105 [40.6]	Total BTUH [kW]	205.1 [60.1]	197.9 [58.0]	190.7 [55.9]	184.3 [54.0]	177.9 [52.1]	171.4 [50.2]	177.6 [52.0]	171.4 [50.2]	165.1 [48.4]
		Sens BTUH [kW]	131.1 [38.4]	112.7 [33.0]	95.7 [28.1]	146.9 [43.1]	128.0 [37.5]	110.2 [32.3]	163.5 [47.9]	143.3 [42.0]	124.2 [36.4]
		Power	19.9	19.5	19.2	18.5	18.2	17.9	17.1	16.8	16.5
	110 [43.3]	Total BTUH [kW]	200.3 [58.7]	193.3 [56.7]	186.2 [54.6]	179.5 [52.6]	173.2 [50.8]	166.9 [48.9]	172.8 [50.6]	166.7 [48.9]	160.7 [47.1]
		Sens BTUH [kW]	127.9 [37.5]	110.0 [32.2]	93.3 [27.4]	143.8 [42.2]	125.2 [36.7]	107.8 [31.6]	160.4 [47.0]	140.6 [41.2]	122.0 [35.8]
		Power	20.7	20.3	20.0	19.3	19.0	18.6	17.9	17.6	17.3
	115 [46.1]	Total BTUH [kW]	195.7 [57.4]	188.8 [55.3]	182.0 [53.3]	175.0 [51.3]	168.8 [49.5]	162.7 [47.7]	168.2 [49.3]	162.3 [47.6]	156.4 [45.8]
		Sens BTUH [kW]	124.6 [36.5]	107.1 [31.4]	90.9 [26.7]	140.6 [41.2]	122.4 [35.9]	105.4 [30.9]	157.1 [46.1]	137.8 [40.4]	119.6 [35.1]
		Power	21.5	21.1	20.8	20.1	19.8	19.4	18.8	18.4	18.1

DR —Depression ratio
dbE —Entering air dry bulb
wbE—Entering air wet bulb

Total —Total capacity x 1000 BTUH
Sens —Sensible capacity x 1000 BTUH
Power—KW input

NOTES:
① When the entering air dry bulb is other than 80°F [27°C], adjust the sensible capacity from the table by adding [1.10 x CFM x (1 – DR) x (dbE – 80)].
② Data includes 25 feet [7.62 m] of recommended suction/liquid lines.

[ ] Designates Metric Conversions

COOLING PERFORMANCE DATA

CONDENSING UNIT **RAWL-180** WITH AIR HANDLER **RHGL-240**

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]		
CFM [L/s]			8040 [3794]	6700 [3162]	5360 [2530]	8040 [3794]	6700 [3162]	5360 [2530]	8040 [3794]	6700 [3162]	5360 [2530]
DR ①			.06	.01	.13	.06	.01	.13	.06	.01	.13
OUTDOOR DRY BULB TEMPERATURE °F [°C]	75 [23.9]	Total BTUH [kW]	251.1 [73.6]	242.3 [71.0]	233.5 [68.4]	230.4 [67.5]	222.3 [65.1]	214.2 [62.8]	223.7 [65.6]	215.8 [63.2]	208.0 [61.0]
		Sens BTUH [kW]	172.1 [50.4]	148.6 [43.6]	126.8 [37.2]	188.1 [55.1]	163.9 [48.0]	141.3 [41.4]	204.7 [60.0]	179.3 [52.6]	155.5 [45.6]
		Power	16.2	15.9	15.6	14.8	14.6	14.3	13.4	13.2	13.0
	80 [26.7]	Total BTUH [kW]	245.1 [71.8]	236.5 [69.3]	227.9 [66.8]	224.3 [65.7]	216.4 [63.4]	208.6 [61.1]	217.6 [63.8]	209.9 [61.5]	202.3 [59.3]
		Sens BTUH [kW]	169.5 [49.7]	146.4 [42.9]	124.9 [36.6]	185.3 [54.3]	161.6 [47.4]	139.4 [40.9]	201.9 [59.2]	177.0 [51.9]	153.6 [45.0]
		Power	16.8	16.5	16.2	15.4	15.1	14.9	14.0	13.8	13.5
	85 [29.4]	Total BTUH [kW]	239.2 [70.1]	230.8 [67.6]	222.4 [65.2]	218.4 [64.0]	210.8 [61.8]	203.1 [59.5]	211.7 [62.0]	204.3 [59.9]	196.8 [57.7]
		Sens BTUH [kW]	166.7 [48.9]	144.1 [42.2]	123.0 [36.1]	182.5 [53.5]	159.3 [46.7]	137.4 [40.3]	199.1 [58.4]	174.7 [51.2]	151.6 [44.4]
		Power	17.4	17.1	16.8	16.0	15.7	15.5	14.6	14.4	14.1
	90 [32.2]	Total BTUH [kW]	233.5 [68.4]	225.3 [66.0]	217.1 [63.6]	212.8 [62.4]	205.3 [60.2]	197.9 [58.0]	206.0 [60.4]	198.8 [58.3]	191.6 [56.2]
		Sens BTUH [kW]	163.8 [48.0]	141.6 [41.5]	120.9 [35.4]	179.7 [52.7]	156.9 [46.0]	135.5 [39.7]	196.3 [57.5]	172.3 [50.5]	149.7 [43.9]
		Power	18.0	17.7	17.4	16.7	16.4	16.1	15.3	15.0	14.8
	95 [35]	Total BTUH [kW]	228.1 [66.8]	220.1 [64.5]	212.1 [62.2]	207.3 [60.8]	200.1 [58.6]	192.8 [56.5]	200.6 [58.8]	193.6 [56.7]	186.5 [54.7]
		Sens BTUH [kW]	160.9 [47.2]	139.2 [40.8]	119.0 [34.9]	176.8 [51.8]	154.5 [45.3]	133.5 [39.1]	193.4 [56.7]	169.9 [49.8]	147.6 [43.3]
		Power	18.7	18.4	18.1	17.4	17.1	16.8	16.0	15.7	15.4
	100 [37.8]	Total BTUH [kW]	222.9 [65.3]	215.0 [63.0]	207.2 [60.7]	202.1 [59.2]	195.0 [57.1]	187.9 [55.1]	195.4 [57.3]	188.5 [55.2]	181.7 [53.3]
		Sens BTUH [kW]	158.0 [46.3]	136.6 [40.0]	116.8 [34.2]	173.8 [50.9]	151.9 [44.5]	131.3 [38.5]	190.4 [55.8]	167.2 [49.0]	145.4 [42.6]
		Power	19.5	19.1	18.8	18.1	17.8	17.5	16.7	16.4	16.1
	105 [40.6]	Total BTUH [kW]	217.8 [63.8]	210.2 [61.6]	202.6 [59.4]	197.1 [57.8]	190.2 [55.7]	183.3 [53.7]	190.4 [55.8]	183.7 [53.8]	177.0 [51.9]
		Sens BTUH [kW]	154.8 [45.4]	134.0 [39.3]	114.6 [33.6]	170.8 [50.1]	149.3 [43.8]	129.1 [37.8]	187.3 [54.9]	164.6 [48.2]	143.2 [42.0]
		Power	20.2	19.9	19.5	18.9	18.5	18.2	17.5	17.2	16.9
	110 [43.3]	Total BTUH [kW]	213.1 [62.5]	205.6 [60.3]	198.1 [58.1]	192.3 [56.4]	185.6 [54.4]	178.8 [52.4]	185.6 [54.4]	179.1 [52.5]	172.6 [50.6]
		Sens BTUH [kW]	151.8 [44.5]	131.3 [38.5]	112.2 [32.9]	167.6 [49.1]	146.6 [43.0]	126.8 [37.2]	184.2 [54.0]	162.0 [47.5]	141.0 [41.3]
		Power	21.0	20.7	20.3	19.7	19.3	19.0	18.3	18.0	17.6
	115 [46.1]	Total BTUH [kW]	208.5 [61.1]	201.2 [59.0]	193.8 [56.8]	187.7 [55.0]	181.2 [53.1]	174.6 [51.2]	181.0 [53.0]	174.6 [51.2]	168.3 [49.3]
		Sens BTUH [kW]	148.5 [43.5]	128.5 [37.7]	109.8 [32.2]	164.3 [48.2]	143.8 [42.2]	124.4 [36.5]	180.9 [53.0]	159.1 [46.6]	138.5 [40.6]
		Power	21.9	21.5	21.1	20.5	20.1	19.8	19.1	18.8	18.4

DR —Depression ratio
dbE —Entering air dry bulb
wbE—Entering air wet bulb

Total —Total capacity x 1000 BTUH
Sens —Sensible capacity x 1000 BTUH
Power—KW input

[ ] Designates Metric Conversions

NOTES:

① When the entering air dry bulb is other than 80°F [27°C], adjust the sensible capacity from the table by adding [1.10 x CFM x (1 – DR) x (dbE – 80)].

② Data includes 25 feet [7.62 m] of recommended suction/liquid lines.

RIGGING

ROOFTOP INSTALLATION

If rooftop installation is required, make certain that the building construction is adequate for the weight of the unit. (Refer to physical data chart.) Before placing the unit on the roof, make certain that the nylon rigging slings are of sufficient length to maintain equilibrium of the unit when lifting. Under no circumstances should the unit be lifted by only one corner for rooftop installation.

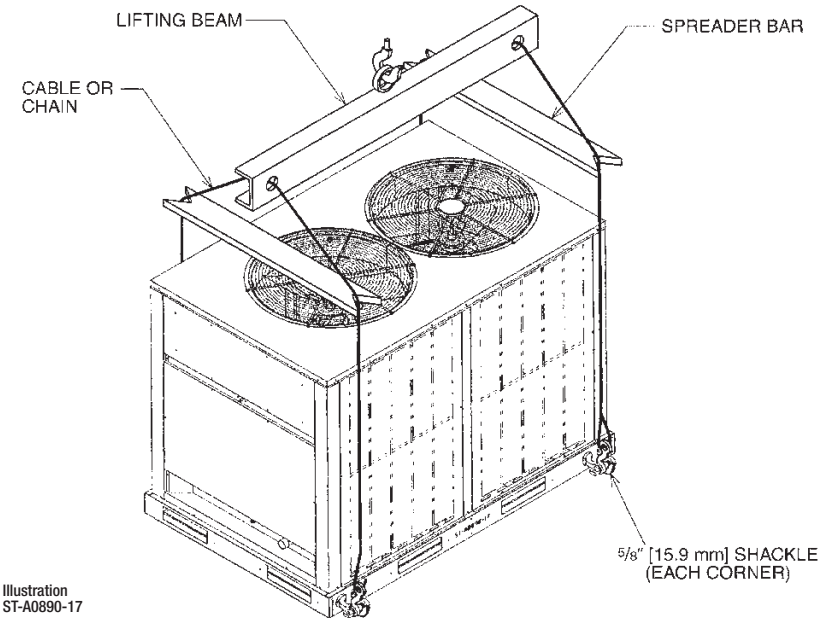


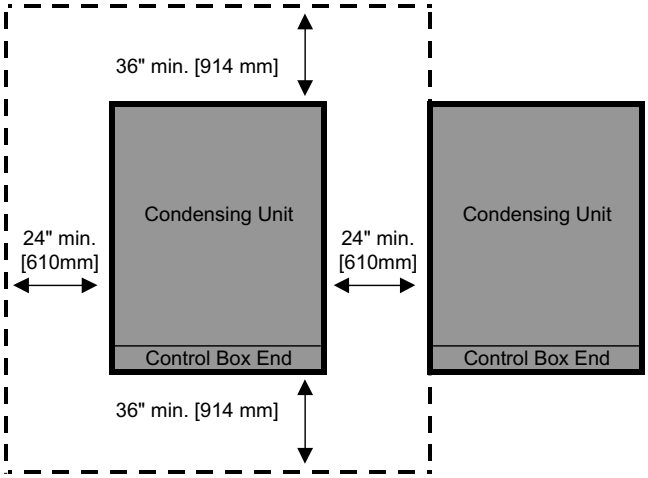
Illustration ST-A0890-17

GENERAL INSTALLATION

The condensing unit should be installed outdoors. It should be located as near as possible to the evaporator section to keep connecting refrigerant tubing lengths to a minimum. The unit must be installed to allow a free air flow to the condenser coils.

If several units are installed adjacent to each other, care must be taken to avoid recirculation of air from one condenser to another. In all installations, adequate space must be provided for installation and servicing.

CLEARANCES



SLAB INSTALLATION

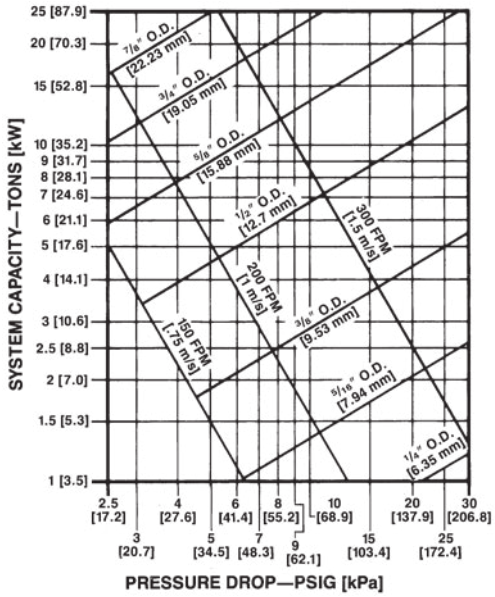
Condensing units should be set on a solid level foundation. When installed at ground level, the unit should be placed on a cement slab. If the pad is formed at the installation site, do not pour the pad tight against the structure, otherwise vibration will be transmitted from the unit through the pad.

The unit must not be connected to any duct work. Do not locate unit under a roof drip; if necessary, install gutters, etc., to prevent water run-off from hitting the unit. To prevent air recirculation, it is recommended that the unit not be installed under an overhang, but if necessary **allow a minimum of 60 inches [1524 mm] above the unit for air discharge.**

[ ] Designates Metric Conversions

EQUIVALENT LENGTH (FT.) [m] OF STRAIGHT TYPE "L" TUBING FOR NON-FERROUS VALVES & FITTINGS (BRAZED)						
TUBE SIZE, INCHES [mm] O.D.	SOLENOID VALVE	ANGLE VALVE	SHORT RADIUS ELL	LONG RADIUS ELL	TEE LINE FLOW	TEE BRANCH FLOW
1/2 [13.00]	12 [3.7]	8.3 [2.5]	1.6 [0.5]	1.0 [0.3]	1.0 [0.3]	3.1 [0.9]
5/8 [16.00]	15 [4.6]	10.4 [3.2]	1.9 [0.6]	1.2 [0.4]	1.2 [0.4]	3.6 [1.1]
3/4 [19.00]	18 [5.5]	12.5 [3.8]	2.1 [0.7]	1.4 [0.4]	1.4 [0.4]	4.2 [1.3]
7/8 [22.00]	21 [6.4]	14.6 [4.4]	2.4 [0.7]	1.6 [0.5]	1.6 [0.5]	4.8 [1.5]
1 1/8 [29.00]	12 [3.7]	18.8 [5.7]	3.0 [0.9]	2.0 [0.6]	2.0 [0.6]	6.0 [1.8]
1 3/8 [35.00]	15 [4.6]	22.9 [7.0]	3.6 [1.1]	2.4 [0.7]	2.4 [0.7]	7.2 [2.2]
1 5/8 [41.00]	18 [5.5]	27.1 [8.3]	4.2 [1.3]	2.8 [0.8]	2.8 [0.8]	8.4 [2.6]
2 5/8 [54.00]	21 [6.4]	35.4 [10.8]	5.3 [1.6]	3.5 [1.1]	3.5 [1.1]	10.7 [3.3]

LIQUID LINE PRESSURE DROP PER 100 FEET [30.48 m] EQUIVALENT LENGTH (TYPE L COPPER TUBING)



NOTES:

1) When evaporator coil is above condenser, the pressure drop due to vertical lift (.5 PSIG per foot of lift) [1.05 kPa per meter] **must** be added to the pressure drop derived from this curve.
2) Size liquid line for **no more** than 10°F [5.6°C] loss (approximately 50 PSIG [206.8 kPa] total pressure drop).
3) **Do not oversize liquid line.** Oversized liquid lines add significantly to the amount of refrigerant required to charge the system.
4) The maximum recommended velocity with solenoid valves or other quick closing devices in the liquid line is 300 FPM [1.5 m/s].

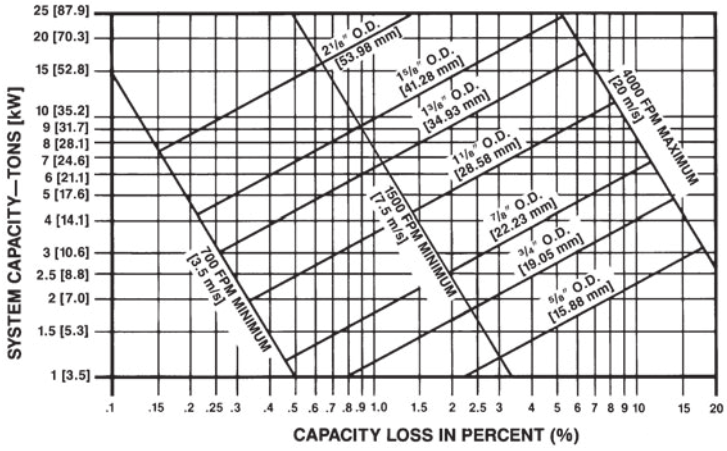
[ ] Designates Metric Conversions

RECOMMENDED VAPOR AND LIQUID LINE SIZES TO VARIOUS LENGTH OF RUN		
EQUIVALENT LENGTH TO EVAPORATOR (FT.) [m]	LIQUID LINE O.D. (IN.) [mm]	VAPOR LINE O.D. (IN.) [mm]
	COOLING MODEL	COOLING MODEL
	121	121
1-15 [1-4.57]	5/8 [15.9]	1 3/8 [34.9]
16-50 [4.88-15.24]	5/8 [15.9]	1 3/8 [34.9]
51-100 [15.54-30.48]	5/8 [15.9]	1 3/8 [34.9]
101-150 [30.78-45.72]	5/8 [15.9]	1 5/8 [41.3]

RECOMMENDED VAPOR AND LIQUID LINE SIZES TO VARIOUS LENGTH OF RUN				
EQUIVALENT LENGTH TO EVAPORATOR (FT.) [m]	LIQUID LINE O.D. (IN.) [mm]		VAPOR LINE O.D. (IN.) [mm]	
	COOLING MODEL		COOLING MODEL	
	150	180	150	180
1-15 [1-4.57]	5/8 [15.9]	5/8 [15.9]	1 3/8 [34.9]	1 5/8 [41.3]
16-50 [4.88-15.24]	5/8 [15.9]	5/8 [15.9]	1 5/8 [41.3]	1 5/8 [41.3]
51-100 [15.54-30.48]	5/8 [15.9]	3/4 [19.1]	1 5/8 [41.3]	1 5/8 [41.3]
101-150 [30.78-45.72]	5/8 [15.9]	3/4 [19.1]	2 1/8 [53.9]	2 1/8 [53.9]

NOTE: Runs between condenser and evaporator not to exceed an equivalent length greater than 150 [45.7 m] feet.

VAPOR LINE SYSTEM CAPACITY LOSS IN PERCENT PER 100 FEET [30.48 m] EQUIVALENT LENGTH (TYPE L COPPER TUBING)



NOTES:

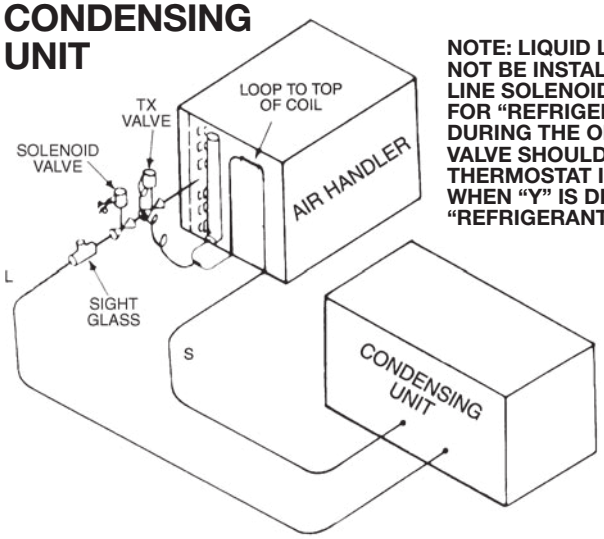
1) The minimum velocity line (700 fpm) [3.6 m/s] is recommended.
2) For vapor pressure drop (PSIG) [6.9 kPa], multiply percent (%) loss by 1.18.
3) Size vapor lines for no more than 2°F [1.1°C] loss which corresponds to approximately 5 PSIG [20.7 kPa] pressure drop.
4) Pitch all horizontal vapor lines downward in the direction of flow (1/2" [12.7 mm] to10' [3.0 m] run).

WARNING

Do not use oxygen to purge lines or pressure system for leak test. Oxygen reacts violently with oil, which can cause an explosion resulting in severe personal injury or death.

TYPICAL REFRIGERANT PIPING RECOMMENDATIONS (cont.)

COIL ABOVE CONDENSING UNIT



NOTE: LIQUID LINE SOLENOID VALVE MUST NOT BE INSTALLED FOR PUMP DOWN. LIQUID LINE SOLENOID VALVE MAY BE INSTALLED FOR "REFRIGERANT ISOLATION" ONLY DURING THE OFF-CYCLE. THE SOLENOID VALVE SHOULD BE CLOSED WHEN THE THERMOSTAT IS SATISFIED (VALVE CLOSED WHEN "Y" IS DE-ENERGIZED) FOR EFFECTIVE "REFRIGERANT ISOLATION".

REQUIRED OZS. [g] R410A CHARGE PER FT. [m] OF TUBING

TUBE SIZE O.D. (IN.) [mm]	LIQUID (OZ.) [g]	VAPOR (OZ.) [g]
1/2 [12.7]	1.06 [30.0]	.04 [1.13]
5/8 [15.88]	1.65 [46.7]	.07 [1.98]
3/4 [19.05]	2.46 [69.7]	.10 [2.83]
7/8 [22.23]	3.28 [92.9]	.13 [3.68]
1 1/8 [28.58]		.22 [6.23]
1 3/8 [34.93]		.34 [9.63]
1 5/8 [41.28]		.48 [13.60]
2 1/8 [53.98]		.84 [23.81]

Quantities based on 110°F liquid and 45°F vapor.

BASIC SYSTEM CHARGE*

RAWL-121	RAWL-150	RAWL-180
437 oz. [12389 g]	378 oz. [10716 g]	506 oz. [14345 g]

*System with 0 feet [m] of tubing.

[ ] Designates Metric Conversions

SEQUENCE OF OPERATION
RAWL-121, Two Speed

1. When the room thermostat is set on “Cool”, “Fan Auto”, and the temperature is higher than the thermostat setting, the thermostat “Y1” circuit closes and energizes the first speed of the compressor by energizing compressor contactor (CC1). Power to the crankcase heater (CCH) will be de-energized by the auxiliary contacts (AUX).
2. Simultaneously, the “G” circuit provides power to the indoor blower motor circuit and starts indoor air circulation through the evaporator coil.
3. When the discharge pressure increases to 450 psig, the contacts on the low ambient control (LAC) will allow supply power to start the outdoor fan motors (ODF) which begins to pull air through the condenser coils. The system is now in the first stage cooling, operating at near sixty percent of full load capacity.
4. If the temperature at the thermostat continues to increase, the thermostat “Y2” circuit closes and energizes the both speeds of the compressor which is now full load capacity.
5. The system will continue cooling at maximum capacity, as long as the room thermostat is demanding full load and all safety device contacts are closed. The low ambient control (LAC) will open and close, allowing the outdoor fans to maintain discharge pressure between 250 and 450 psig.
6. As the temperature at the thermostat drops enough to satisfy “Y2”, the circuit will open and de-energize the second compressor speed and continues operating on the first speed of the compressor.
7. When continued cooling satisfies the “Y1” circuit, it will open and de-energize the compressor contactor (CC1), stopping the compressor operation and closing the auxiliary contacts (AUX), which energizes the crankcase heater (CH).
8. The thermostat “G” circuit will stop blower operation.

SEQUENCE OF OPERATION
RAWL-150, 180, Two-Stage

1. When the room thermostat is set on “Cool”, “Fan Auto”, and the temperature is higher than the thermostat setting, the thermostat “Y1” circuit closes and energizes the number one compressor contactor (CC1) through the closed cooling relay (R) contacts. Power to the crankcase heater (CCH1) will be de-energized by the auxiliary contacts (AUX-1).
2. Simultaneously, the “G” circuit provides power to the indoor blower motor circuit and starts indoor air circulation through the evaporator coil.
3. When the discharge pressure increases to 450 psig, the contacts on the low ambient control (LAC) will allow supply power to start the outdoor fan motors (ODF) which begin to pull air through the condenser coils. The system is now in first stage cooling, operating at near fifty percent of full load capacity.
4. If the temperature at the thermostat continues to increase, the thermostat “Y2” circuit closes and after a 30 second delay, power passes through the time delay control (TDC) and energizes the number two compressor contactor (CC2) through the second set of closed cooling relay (R) contacts. Power to the crankcase heater (CCH2) will be de-energized by the auxiliary contacts (AUX-2).
5. The system will continue cooling at maximum capacity, as long as the room thermostat is demanding full load and all safety device contacts are closed. The low ambient control (LAC) will open and close, allowing the outdoor fans to maintain discharge pressure between 250 and 450 psig.
6. As the temperature at the thermostat drops enough to satisfy “Y2”, the circuit will open and de-energize the compressor contactor (CC2), stopping compressor operation and closing the auxiliary contacts (AUX-2), which energizes the crankcase heater (CCH2).
7. When continued cooling satisfies the “Y1” circuit, it will open and de-energize the compressor contactor (CC1), stopping compressor operation and closing the auxiliary contacts (AUX-1), which energizes the crankcase heater (CCH1).
8. The thermostat “G” circuit will stop blower operation.

[ ] Designates Metric Conversions

SAMPLE SPECIFICATIONS

Furnish and install as shown on the drawing Russell™ by Rheem Model_____ air cooled condensing unit suitable for outdoor application.

COMPRESSOR—Unit shall have scroll compressor(s). It shall be externally mounted on rubber grommets to reduce vibration transmission and noise to surrounding area. Maximum power input shall not be more than _____ at conditions specified.

LOW AMBIENT CONTROL—All units shall have standard head pressure controls that cycle the condenser fan motors to maintain condensing pressures for operation down to 0°F [–17.8°C] ambient (12.5 and 15 ton [44.0 and 52.8 kW] models only.)

CAPACITY—Capacity shall be _____ BTU/H when operating at _____ °F [°C] saturated suction temperature.

MOTORS & FANS—Each unit shall have 1075 RPM sleeve bearing, permanently lubricated motor(s) fixed with direct-drive, dual bladed fan(s). Motor(s) shall be equipped with inherent overload protection. Motor(s) & fan(s) shall be mounted on top panel for easy access. Condenser air shall discharge vertically.

COILS—Coils shall be fabricated of 3/8" [9.53 mm] O.D. seamless copper tubing and aluminum fins with die-formed collars mechanically bonded to tubes arranged in a staggered pattern. All coils shall be submitted to a pressure test after fabrication and dehydrated. Units shall be shipped with a dry nitrogen holding charge. Airflow shall be drawn through design providing uniform air distribution across the coil surface.

[ ] Designates Metric Conversions

CASINGS—Casings shall make unit suitable for outdoor installation. Casing, base pan and framework shall be manufactured of galvanized sheet metal, capable of withstanding a 1000-HR salt spray test per ASTM B 117. Units shall have stamped louver panels offering 100% protection of the condenser coil. Openings shall be provided for power. Dimensions of entire assembly shall be not more than ____ inches [mm] high, ____ inches [mm] long and ____ inches [mm] wide.

REFRIGERATION CIRCUIT—Shall include the compressor, the condenser coils, all internal refrigerant piping and liquid and suction line service valves. Refrigerant stubs shall be extended through the cabinet for external field connection without affecting accessibility to compressor compartment.

CONTROL PANEL—The panel shall be designed for single power source to the compressor and fan motor(s) and shall include fan cycling control, and compressor contactor.

SAFETY CONTROLS—Manual reset high pressure and automatic reset low pressure control shall be provided.

FACTORY TESTING—All units shall be test run at the factory.

GENERAL TERMS OF LIMITED WARRANTY*

Rheem® 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.

Compressor .....Five (5) Years
Any Other Part .....One (1) Year

***For Complete Details of the Limited Warranty, Including Applicable Terms and Conditions, See Your Local Installer or Contact the Manufacturer for a Copy.**

Russell™ By Rheem
5600 Old Greenwood Road, Fort Smith, AR 72908

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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