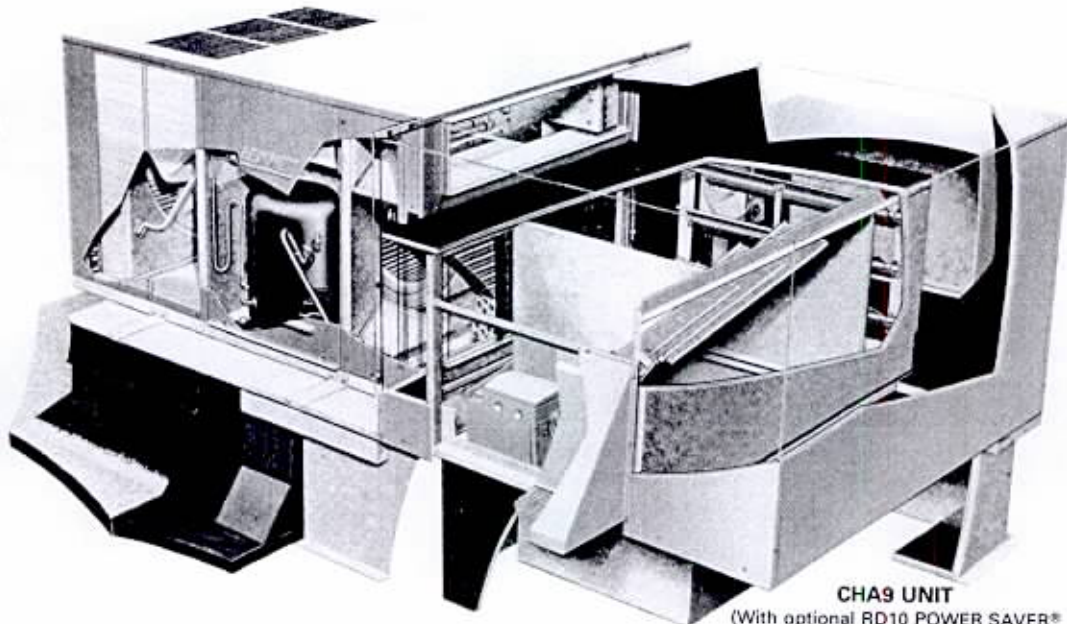




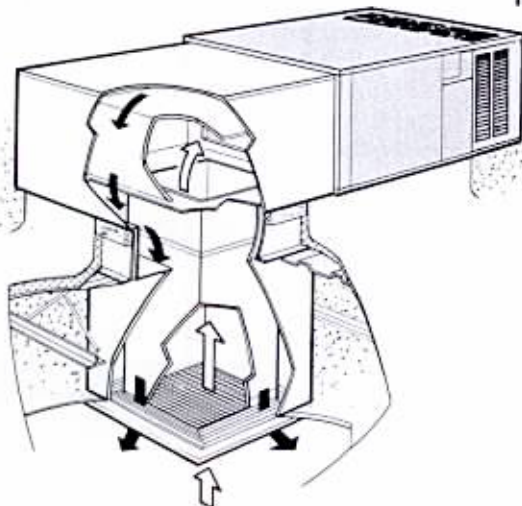
**CHA9 & CHA10-650 SERIES — HORIZONTAL
 SINGLE PACKAGE AIR CONDITIONERS**
 *24,600 to 58,000 Btuh (7.2 to 17.0 kW) Total Cooling Capacity
 11,900 to 112,700 Btuh (3.5 to 33.0 kW) Optional Electric Heat

*ARI Standard 210 Certified Ratings

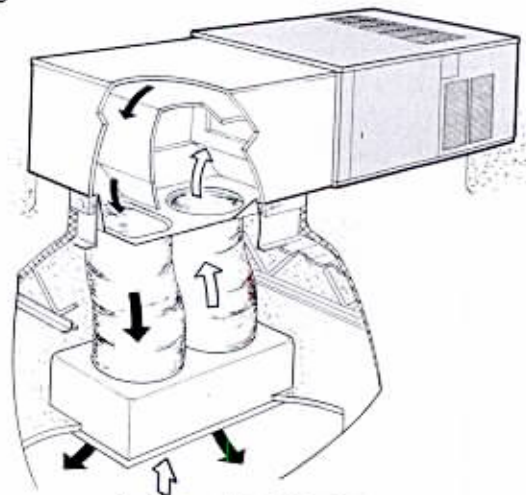


CHA9 UNIT
 (With optional RD10 POWER SAVER*
 and mounting frame)

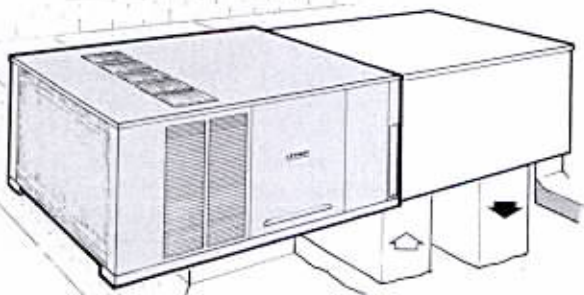
Typical Applications



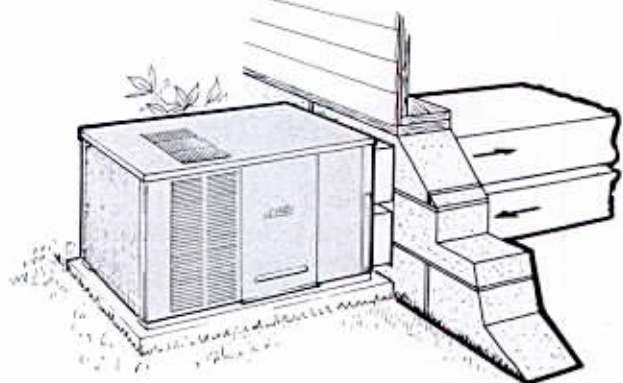
Rooftop Installation With Optional
 Duct Enclosure, SRP9-65 Plenum and
 FD-41 or 65 Combination Supply and Return Diffuser



Rooftop Installation With Optional
 Duct Enclosure, SRT10-65 Transition, and
 FD9-65 Combination Supply and Return Diffuser



Rooftop double duct installation
 with optional RT10 duct enclosure



Unit on slab at grade level.

NOTE — Specifications, Ratings and Dimensions subject to change without notice.

FEATURES

Applications — Lennox single package CHA9 series and CHA10-650 air conditioning units are designed for residential or small commercial installations. Several models are available with a wide and varied cooling capacity range. Units can be installed with ducts extended through a wall in a crawl space, basement, utility room or attic. Installation on a slab at grade level or on a rooftop will save valuable interior floor space.

Rugged Cabinet — Constructed of heavy gauge galvanized steel. A five station wash metal preparation assures a perfect bonding surface for the finish coat of baked-on outdoor enamel. Removable panels permit complete service access to interior of cabinet. Conditioned air section of cabinet is lined with thick fiberglass insulation. Supply and return air openings have flanges for ease of duct connection. Heavy gauge steel support rails under base elevates unit above mounting surface. Drainage holes are provided in condenser coil section of the base for moisture removal. Electrical inlets are furnished in cabinet for wiring entry. Optional coil guards LB-34491B (3 per unit) are available for CHA10-650 model only.

Refrigeration System — Complete factory sealed refrigeration system consists of: compressor, condenser coil and fan(s), evaporator coil and blower, suction and discharge line service gauge ports, liquid line strainer, low pressure switch-automatic reset (CHA9-510 & CHA10-650 models), and a full operating refrigerant charge.

Compressor and Controls Compartment — Compressor and control box are located in a separate compartment of the cabinet, isolating them from the weather. Control box is conveniently located for service access with all controls factory installed and wired. Cabinet access panel removal permits complete access to the compartment.

Dependable and Quiet Compressor — Rugged and reliable compressor is hermetically sealed. Suction cooled, overload protected, and equipped with internal pressure relief valve. Internally protected from excessive current and temperature. The entire running gear is spring mounted within the sealed housing. In addition, the compressor is installed on resilient rubber mounts in the unit, assuring quiet and vibration free operation. CHA10-651-653 model is equipped with Lennox compressor.

Large Evaporator and Condenser Coils — Lennox designed and fabricated coils are constructed of precisely spaced ripple-edged aluminum fins machine fitted to copper tubes. Design of coil provides large surface and contact area for maximum efficiency. Fins are strengthened to resist bending which can restrict air flow and reduce efficiency. Fins are equipped with collars that grip tubing for maximum contact area resulting in excellent heat transfer. Flared shoulder tubing joints and silver soldering provide tight leak proof joints. Copper tubing construction provides maximum coil life and ease of service. Coil is thoroughly tested under pressure to insure leak proof construction.

Drain Pan — Evaporator coil drain pan is constructed of heavy gauge galvanized steel. Equipped with a galvanized pipe (mpt) drain outlet extended outside of the cabinet.

Condenser Fan(s) — Direct drive fan(s) moves large air volumes uniformly through the entire coil resulting in high refrigerant cooling capacity. CHA9-261 thru 410 models are equipped with a single fan. CHA9-510 models employ dual fans. Air enters unit through louvered top and both side panels and is discharged out through the coil.

The CHA10-650 model is equipped with a single direct drive fan. Air is drawn through the coil at both sides and end of the unit and discharged out vertically through the top panel. Corrosion resistant PVC coated steel wire fan guard is furnished as standard.

Powerful Evaporator Blower — Units are equipped with quiet operating direct drive blowers that deliver large air volumes with low power consumption. Each blower is statically and dynamically balanced as an assembly before it is installed in the unit. Multispeed motor is isolated on rubber mounts. A choice of blower speeds is available on each blower. See blower performance charts. Change in blower speed is easily accomplished by a simple change in wiring.

Cleanable Air Filter — One inch (25 mm) frame filters are furnished as standard equipment. Media is washable or vacuum cleanable polyurethane, coated with oil for increased efficiency. Use RP products filter coating No. 418 (order no. 30165) for reoilng. Separate filter access cabinet panel provides quick and easy removal for servicing.

Thermostat (Optional) — Thermostat is not furnished and must be ordered extra. For cooling only applications a single stage cooling thermostat is required. When optional additive electric heat is ordered a heating-cooling thermostat will be required.

Additive Electric Heat (Optional) — Available for factory installation in 3.5 thru 32.7 kw sizes. See Electric Heat tables. The helix wound nichrome heating elements are exposed directly in the air stream resulting in instant heat transfer, lower coil temperatures and long service life. The elements are accurately located and insulated from the heavy gauge steel support frame by high quality insulators. Heaters, except 575 volt models, are equipped with circuit breakers to provide overload and short circuit protection. Circuit breakers are current sensitive and temperature compensated to shutoff heater if current draw is excessive. Must be reset manually. Each set of heating elements is equipped with a accurately located limit control with fixed temperature off setting and automatic reset. In addition, elements have supplemental thermal cutoff safety fuses providing positive protection in case of hazardous overheating. Cutoff fuses are mounted external to the element face plate for quick and easy replacement. Thermal time delay relay brings the heating elements on and off the line, in sequence and equal increments, with a time delay between each element. Control box and access cover are constructed of heavy gauge galvanized steel. Electrical inlet holes are provided in the box. Electric heaters are completely factory assembled with all controls installed and wired.

Timed-Off Control (Optional) — Timed-off control (LB-50709BA) is available as optional equipment for field installation. Prevents compressor short-cycling and also allows time for suction and discharge pressure to equalize, permitting the compressor to start in an unloaded condition. Automatic reset control will shut the compressor off and hold it off for 5 minutes.

Low Ambient Control (Optional) — For low ambient temperature operation, a low ambient control kit (LB-50352BA) can be added in the field.

Crankcase Heaters — Compressor crankcase heater is furnished as standard equipment on CHA10-651-653 models. Crankcase heater is not furnished for the CHA9 models and must be ordered extra for field installation. Order number P-8-8852. Heaters prevent migration of liquid refrigerant into the compressor and ensures proper compressor lubrication at all times.

Start Controls — Furnished as standard on the CHA9-511 and CHA10-651. Start controls are not furnished on CHA9-261, 311, 411 model and must be ordered extra if required. Provides assistance for compressor start under loaded conditions or in the event of low voltage. Specify complete unit model number when ordering.

Completely Tested and Certified — Units have been thoroughly tested in the Lennox Research Laboratory environmental test room and accurately rated according to Air-Conditioning And Refrigeration Institute (ARI) Standard 210-81 conditions. In addition, units have been sound tested in the Lennox reverberant sound test room and rated according to ARI Standard 270-75. Units coming within the scope of the ARI standard (135,000 Btu/h 40 kW or less) are Certified under the ARI Certification Program. Air conditioning equipment and optional electric heaters are C.S.A. Listed. Units and components within are bonded for grounding to meet safety standards for servicing required by C.S.A. and C.E.C. Blower data is from unit tests conducted in the Lennox Laboratory air test chamber.

ROOFTOP ACCESSORY EQUIPMENT

Optional Duct Enclosure — The RT10 duct enclosure is required for installation of the unit with the RMF9-65 roof mounting frame. The duct enclosure is also furnished as a standard component of the RD10-65 POWER SAVER assembly. Duct enclosure is completely insulated with a baked-on enamel finish and is shipped knocked down for field assembly. Supply and return air openings are located in the bottom of the enclosure. Field assembled return air plenum is furnished with enclosure. Insulated plenum connects to unit return air opening segregating return air within the enclosure.

Optional POWER SAVER® — The complete RD10-65 POWER SAVER and control system is shipped factory assembled and wired and field installs in the duct enclosure. The Lennox POWER SAVER system consists of: RT10-65 duct enclosure (field assembled), mechanically linked outdoor air and recirculated air dampers with pressure operated exhaust air dampers. The positioning of these dampers is accomplished by a 24 volt 3 position spring return damper motor with adjustable minimum damper positioner and controlled by the room thermostat, adjustable mixed air controller, adjustable compressor monitor and adjustable enthalpy control. The enthalpy control allows 0 to 100% outdoor air to be used for "free cooling" when outdoor humidity and temperature are acceptable. The Lennox POWER SAVER will co-operate with any heating-cooling thermostat. An outdoor air intake hood is furnished and field installs over the outdoor air dampers. Shipped knocked down, it is easily field assembled. A cleanable polyurethane media frame filter is furnished with the hood providing extra air filtering and bird screen protection.

Optional RT10 Adapter Kit — Adapter kit (LB-29475BB) includes filler panels and securing brackets to mate the duct enclosure and roof mounting frame to CHA9-261, CHA9-311 and CHA9-410 models.

Optional Roof Mounting Frame — The RMF9-65 roof mounting frame mates to the unit and duct enclosure providing an automatic weather sealed installation. A mounting frame deck enclosure is furnished to provide a weatherproof deck for mounting the unit on the roof mounting frame. Approved by National Roofing Contractors Association.

Optional Minimum Fresh Air Damper — OAD3-46/65 minimum fresh air damper mounts external to the RT10-65 duct enclosure. Equipped with manually operated damper and fittings for installing.

Optional SP11 Remote Status Panel — The operation of the unit can be checked on the Remote Status Panel (12F83) located within the conditioned area. Signal lights on the panel indicate "Cool Mode," "Heat Mode," "Compressor 1," "Compressor 2," "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates cooling operation. Heat Mode light is green and reflects heating operation and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicate a requirement for service. Additional controls are required for use with the Status Panel and must be specified when ordering. Wiring Junction Box (14F92) is required to interface status panel with unit operation. Box field installs in unit. Filter switch kit (97C85) is used in conjunction with the Filter light. Operation of No Heat light with electric heat requires a Current Sensing Relay (29F79).

SPECIFICATIONS

Model No.		CHA9-261	CHA9-311	CHA9-411 CHA9-413	CHA9-511 CHA9-513	CHA10-651 CHA10-653
★ARI Standard 270 SRN (bels)		8.0	8.2	8.4	8.6	8.6
*ARI Standard 210 Ratings	Total cooling capacity — Btuh (kW)	24,600 (7.2)	29,400 (8.6)	35,000 (10.3)	50,000 (14.7)	58,000 (17.0)
	Total unit watts	3650	4350	5700	7500	8400
	EER — Btuh/Watt (C.O.P.)	6.75	6.75	6.15	6.65	6.90
	Dehumidifying capacity	24%	21%	23%	21%	24%
Refrigerant (R-22) charge lbs. — oz. (kg)		2 — 10 (1.19)	4 — 2 (1.87)	3 — 14 (1.76)	6 — 6 (2.89)	7 — 12 (3.52)
Evaporator Coil	Net face area — sq. ft. (m ²)	3.0 (0.28)	3.0 (0.28)	3.0 (0.28)	4.5 (0.42)	4.5 (0.42)
	Tube diameter — in. (mm) & No. of rows	3/8 (10) — 2	3/8 (10) — 3	3/8 (10) — 3	3/8 (10) — 3	3/8 (10) — 4
	Fins per inch (m)	16 (630)	16 (630)	16 (630)	16 (630)	14 (551)
Evaporator Blower	Wheel nominal diam. x width — in. (mm)	9x9 (229x229)	10x9 (254x229)	11x9 (279x229)	12x12 (305x305)	10x10 (254x254)
	Motor horsepower (W)	1/4 (187)	1/3 (249)	1/2 (373)	3/4 (560)	1 (746)
Condenser Coil	Net face area — sq. ft. (m ²)	4.5 (0.42)	4.5 (0.42)	4.5 (0.42)	6.57 (0.63)	15.3 (1.42)
	Tube diameter — in. (mm) & No. of rows	3/8 (10) — 2	3/8 (10) — 3	3/8 (10) — 3	3/8 (10) — 3	3/8 (10) — 2
	Fins per inch (m)	16 (630)	15 (590)	15 (590)	15 (590)	15 (590)
Condenser Fan	Diameter — in. (mm) & No. of blades	(1)20 (508) — 4	(1)20 (508) — 4	(1)20 (508) — 4	(2)18 (457) — 5	(1)24 (610) — 4
	Air volume cfm (L/s) (factory setting)	2300 (1085)	2500 (1180)	2500 (1180)	3200 (1510)	5400 (2550)
	RPM (factory setting)	1040	1080	1080	1050	1060
	Motor horsepower (W)	(1) 1/6 (124)	(1) 1/4 (187)	(1) 1/4 (187)	(2) 1/6 (124)	(1) 1/2 (373)
	Motor watts (factory setting)	290	420	420	570	600
Condensate drain size mpt — in. (mm)		3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)
No. & size of filters	inches	(1) 16 x 25 x 1	(1) 16 x 25 x 1	(1) 16 x 25 x 1	(2) 16 x 20 x 1	(2) 16 x 20 x 1
	mm	(1) 406x635x25	(1) 406x635x25	(1) 406x635x25	(2) 406x508x25	(2) 406x508x25
Shipping Weight (1 package) — lbs. (kg)		282 (128)	291 (132)	319 (145)	448 (203)	478 (217)
RT10/RD10 Adaptor Kit (Shipping Weight)		LB-29475BB (8 lbs.) (4 kg)			---	
Optional Combination Ceiling Supply and Return Diffusers (Shipping Weight)	Step-down	RTD9-65 (72 lbs.) (33 kg)				
	Flush	FD9-65 (42 lbs.) (19 kg)				
	Transition	SRT10-65 (20 lbs.) (9 kg)				
	Step-down	RTD-41 (36 lbs.) (16 kg)		RTD-65 (75 lbs.) (34 kg)		
	Flush	FD-41 (30 lbs.) (15 kg)		FD-65 (26 lbs.) (12 kg)		
	Flush w/adjustable blades	**FD-41-D (42 lbs.) (19 kg)		**FD-65-D (35 lbs.) (16 kg)		
Plenum		SRP9-65 (34 lbs.) (15 kg)				
Optional Roof Mounting Frame (Shipping Weight)		RMF9-65 (118 lbs.) (54 kg)				
Optional Duct Enclosure (Shipping Weight)		RT10-65 (88 lbs.) (40 kg)				
Optional POWER SAVER (Shipping Weight)		RD10-65 (180 lbs.) (82 kg)				
No. & size of filter — in. (mm)		1 — 20 x 25 x 1 (1 — 508 x 635 x 25)				
Optional Minimum Fresh Air Damper (Shipping Weight)		OAD3-46/65 (8 lbs.) (4 kg)				

* Sound Rating Number in accordance with ARI Standard 270.

** Rated in accordance with ARI Standard 210; 450 cfm (maximum) evaporator air volume per ton (60 L/s per kW) of cooling capacity, 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19.5°C) wb entering evaporator air.

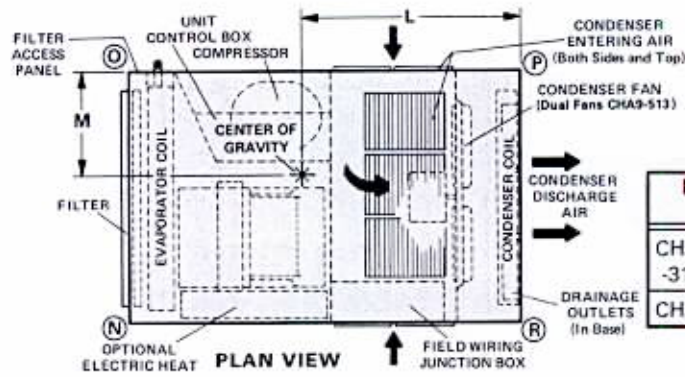
** Flush diffuser with adjustable baffle blades.

DIMENSIONS (inches) mm

CHA9 SERIES

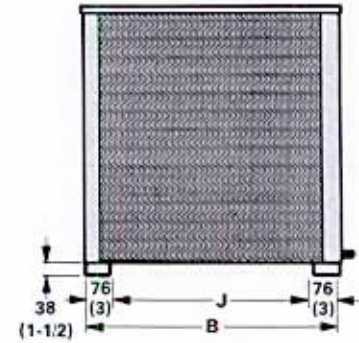
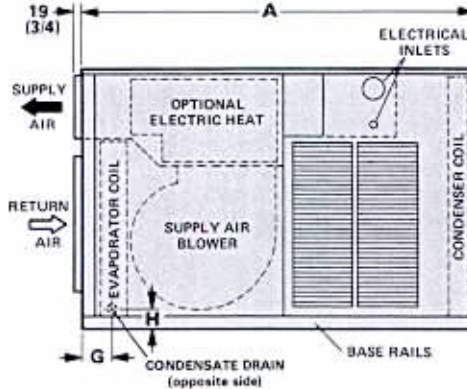
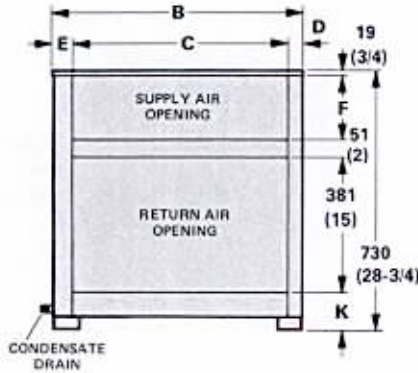
CORNER WEIGHTS

Model No.		N	O	P	R
CHA9-261	lbs.	64	89	82	60
	kg	29	40	37	27
CHA9-311	lbs.	71	98	90	66
	kg	32	44	41	30
CHA9-411	lbs.	72	99	91	66
CHA9-413	kg	33	45	41	30
CHA9-511	lbs.	127	158	111	92
CHA9-513	kg	58	72	50	42



CENTER OF GRAVITY

Model No.	L		M	
	in.	mm	in.	mm
CHA9-261 -311-410	22-1/4	565	11-3/4	298
CHA9-510	29	737	18-1/8	460



EVAPORATOR COIL END VIEW

SIDE VIEW

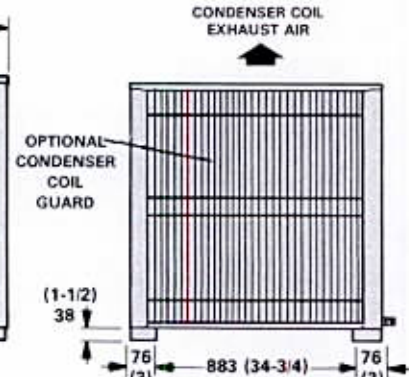
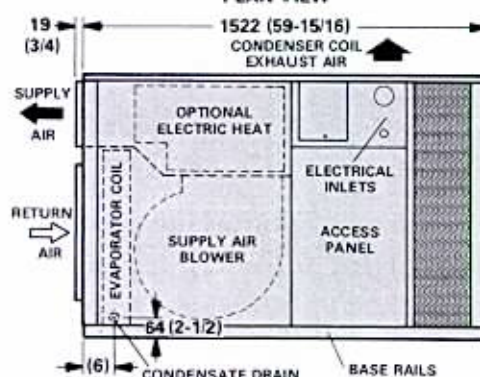
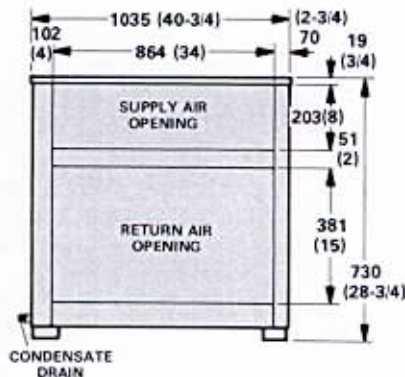
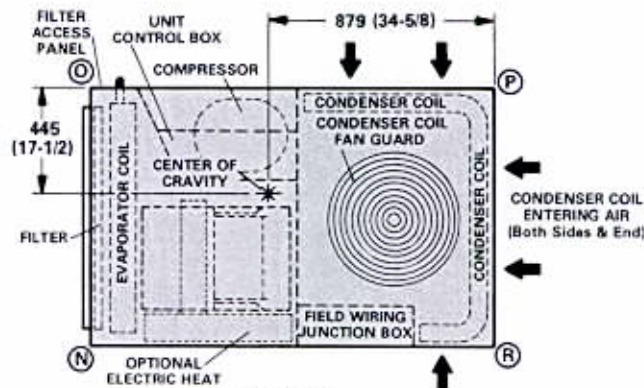
CONDENSER COIL END VIEW

Model No.	A		B		C		D		E		F		G		H		J		K	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA9-261-311-410	42-3/4	1086	28	711	24	610	1-13/16	46	2-3/16	56	7	178	4-7/8	124	2-3/8	60	22	559	4	102
CHA9-510	49-3/4	1264	40-3/4	1035	34	864	2-3/4	70	4	102	8	203	6	152	2-1/2	64	34-3/4	883	3	76

CHA10-651-653 SERIES

CORNER WEIGHTS

Model No.		N	O	P	R
CHA10-651	lbs.	135	178	131	99
	kg	61	81	59	45
CHA10-653	kg	61	81	59	45



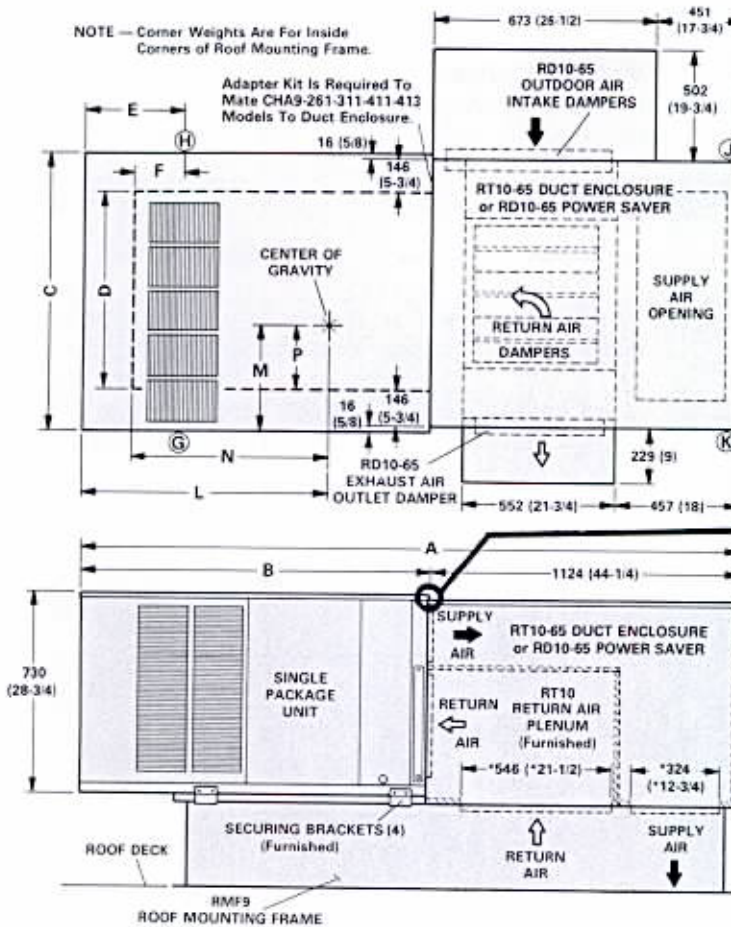
EVAPORATOR COIL END VIEW

SIDE VIEW

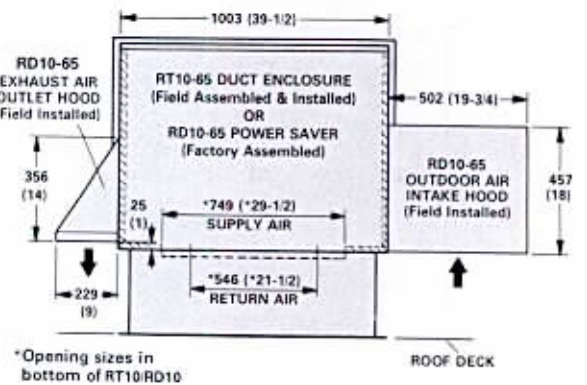
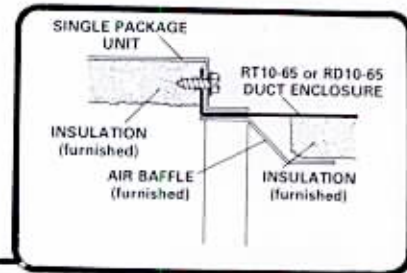
CONDENSER COIL END VIEW

OPTIONAL ROOFTOP ACCESSORIES – DIMENSIONS (inches) mm

NOTE — Corner Weights Are For Inside Corners of Roof Mounting Frame.



Model No.		A	B	C	D	E	F
CHA9-261-311 411-413	in.	87	42-3/4	----	28	----	8
	mm	2210	1086	----	711	----	203
CHA9-511-513	in.	94	49-3/4	40-3/4	----	14	----
	mm	2388	1264	1035	----	356	----
CHA10-651-653	in.	104-3/16	59-15/16	40-3/4	----	24	----
	mm	2646	1522	1035	----	610	----



CORNER WEIGHTS

Model No.	G		H		J		K	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA9-261	197	89	181	82	109	49	118	54
CHA9-311	206	94	190	86	115	52	124	56
CHA9-411-413	207	94	191	87	115	52	125	57
CHA9-511-513	330	150	224	102	98	44	146	66
CHA10-651-653	372	169	253	115	90	41	138	63

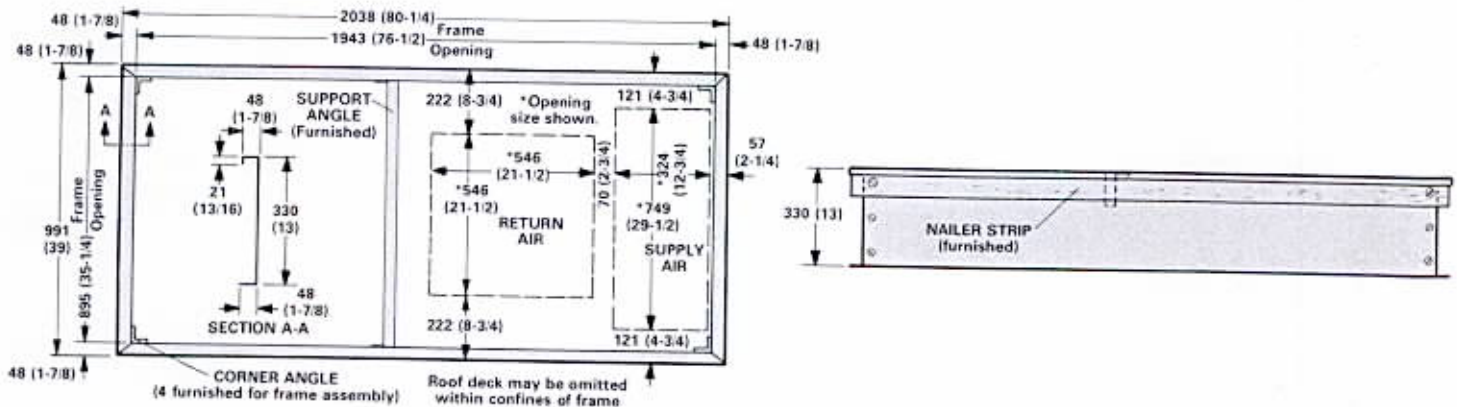
NOTE — Corner weight of basic unit with SRT10-65 or SRP9-65, RD10-65, RMF9-65 and electric heat.

CENTER OF GRAVITY

Model No.	L		M		N		P	
	in.	mm	in.	mm	in.	mm	in.	mm
CHA9-261	----	----	----	----	37-1/2	953	13-1/4	337
CHA9-311	----	----	----	----	37-1/2	953	13-1/4	337
CHA9-411-413	----	----	----	----	37-1/2	953	13-1/4	337
CHA9-511-513	38	965	17	432	----	----	----	----
CHA10-651-653	45-1/8	1146	16-5/8	422	----	----	----	----

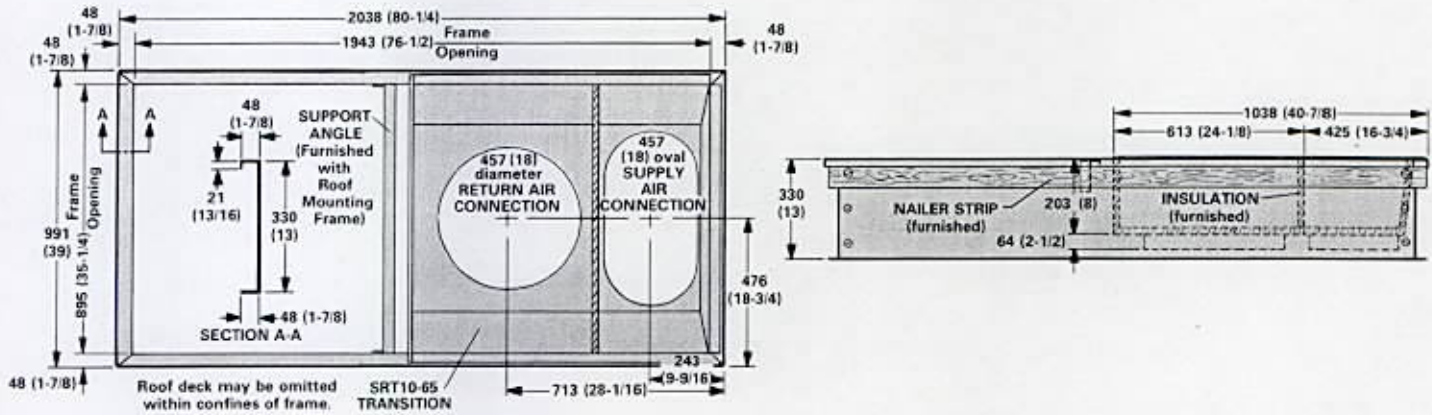
ROOF MOUNTING FRAME

RMF9-65 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING

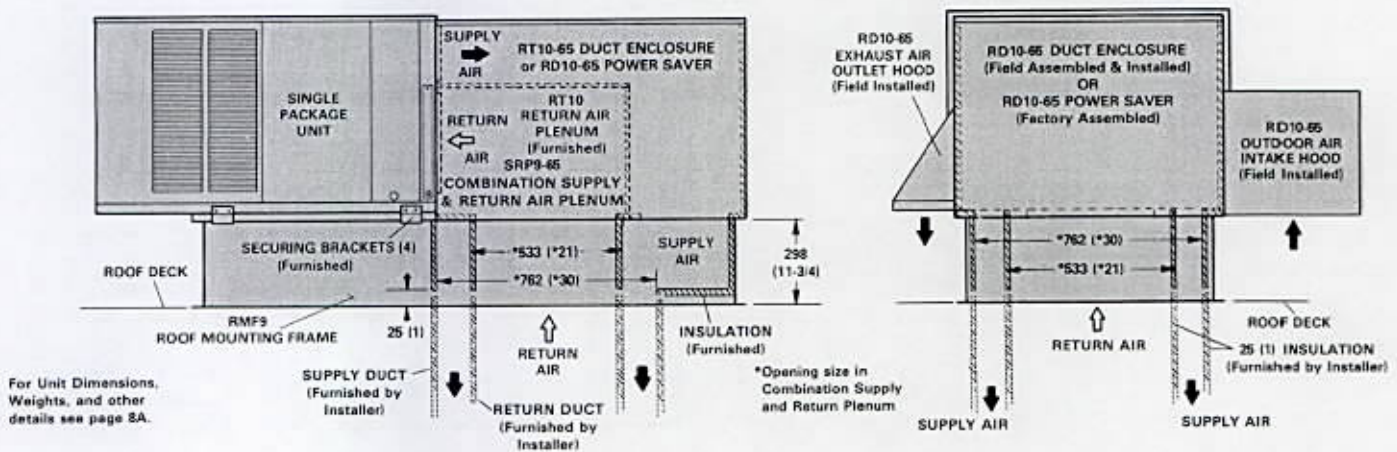


DIMENSION (inches) mm

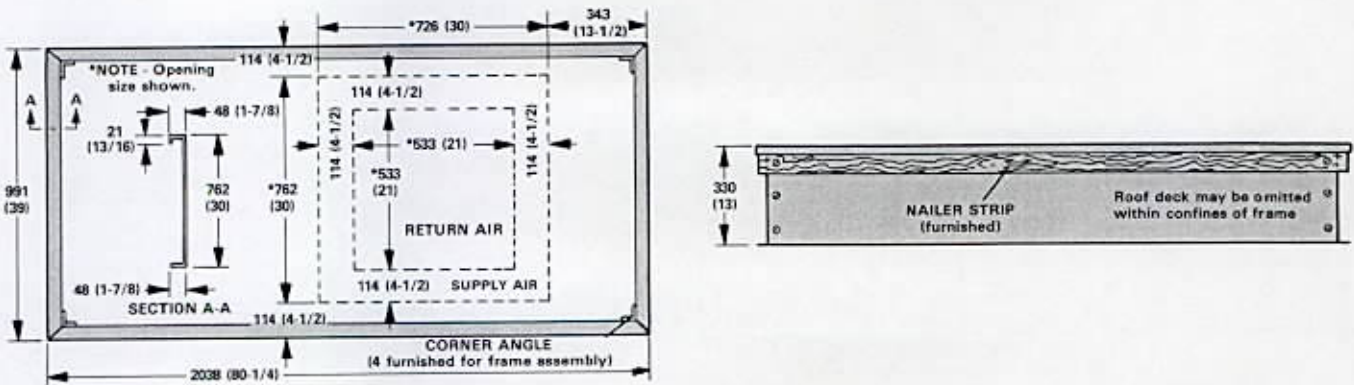
RMF9-65 ROOF MOUNTING FRAME WITH COMBINATION SUPPLY AND RETURN TRANSITION FOR RTD9-65 & FD9-65 DIFFUSERS



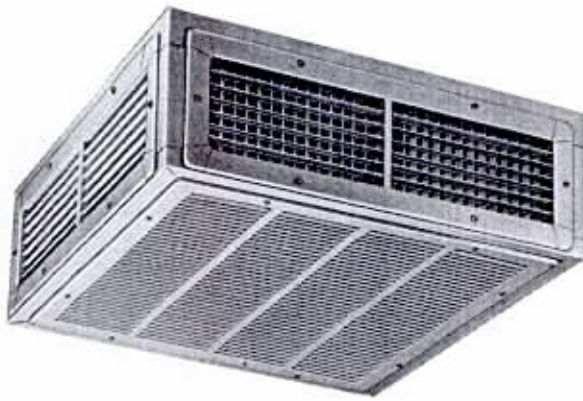
RTD AND FD COMBINATION CEILING SUPPLY AND RETURN AIR DISTRIBUTION



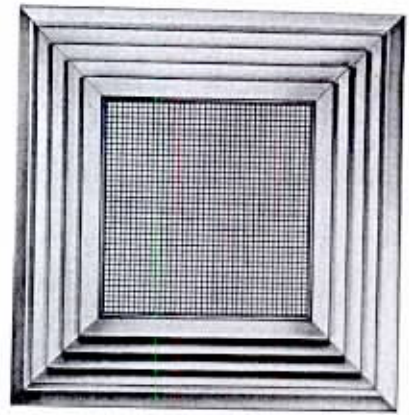
RMF9-65 ROOF MOUNTING FRAME WITH SUPPLY AND RETURN AIR OPENINGS FOR RTD & FD DIFFUSERS



RTD-41, RTD-65 AND FD-41, FD-65 COMBINATION SUPPLY AND RETURN DIFFUSERS



Optional RTD-41 & 65 Combination Ceiling Supply and Return Diffusers — RTD-41 and RTD-65 step-down mount diffuser extends slightly below ceiling level when installed and discharges conditioned air out through grilles on all four sides. Grilles are fitted with double deflection louvers for precise directional control of air flow. Return air enters through the large center grille. Diffusers are completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings.

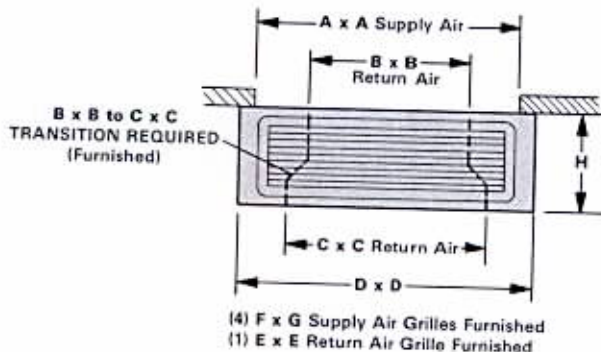


Optional FD-41 & 65 Combination Ceiling Supply and Return Diffusers — FD-41 and FD-65 flush mount diffuser installs almost flush with the ceiling level and discharges conditioned air out through fixed blade louvers on all four sides. Fixed blade louvers insure that air flow will be evenly distributed. FD-41-D and FD-65-D models are equipped with adjustable blade louvers for precise directional control of air flow. Diffusers are completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings.

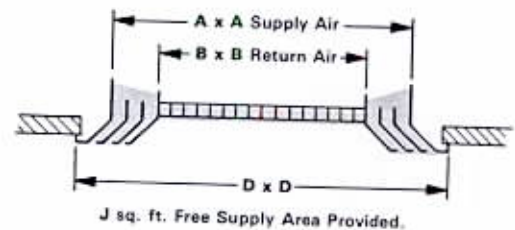
Optional SRP9-65 Combination Supply And Return Plenum — The SRP9-65 combination supply and return plenum adapts the RT10 duct enclosure to combination ceiling supply and return applications. The insulated plenum is field assembled and installs to bottom of the duct enclosure. Connecting duct from the plenum to the diffuser is not furnished and must be provided by the installer.

DIMENSIONS (inches) mm

RTD STEP-DOWN DIFFUSERS



FD FLUSH DIFFUSERS

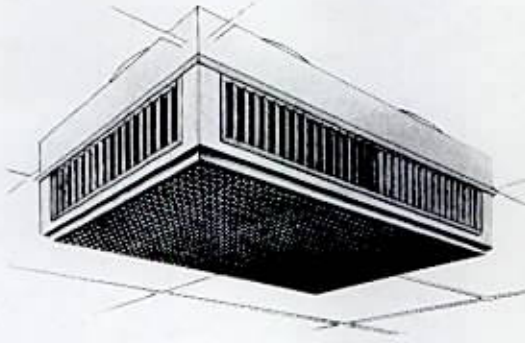


NOTE — Also available with adjustable baffle blades. Same dimensions as above.

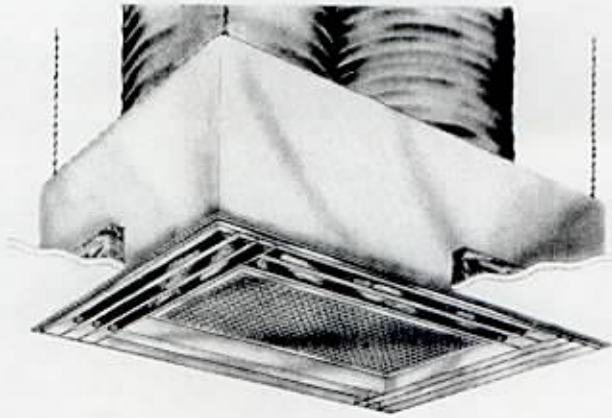
Unit Model No.	Supply & Return Air Grille Model No.	A		B		C		D		E		F		G		H		J	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	sq.ft.	m ²
CHA9-261	RTD-41 Step-down	22	559	16	406	20	508	24	610	20	508	5	127	20	508	8	203	---	---
CHA9-311	FD-41 Flush	24	610	18	457	---	---	29-3/4	756	---	---	---	---	---	---	---	---	1.75	0.16
CHA9-410	*FD-41-D Flush	30	762	20	508	24	610	36	914	24	610	6	152	30	762	10	254	---	---
CHA9-510	RTD-65 Step-down	30	762	20	508	24	610	36	914	24	610	6	152	30	762	10	254	---	---
CHA9-650	FD-65 Flush	30	762	21	553	---	---	35-3/4	908	---	---	---	---	---	---	---	---	3.18	0.30
	*FD-65-D Flush	30	762	21	553	---	---	35-3/4	908	---	---	---	---	---	---	---	---	3.18	0.30

*Equipped with adjustable baffle blades.

RTD9-65 AND FD9-65 COMBINATION SUPPLY AND RETURN DIFFUSERS



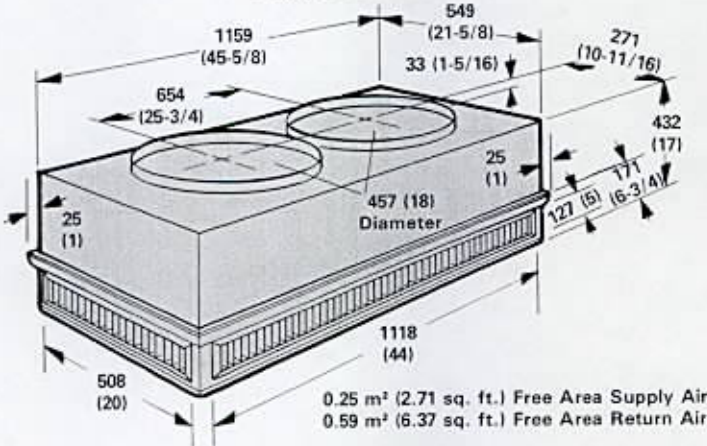
Optional RTD9-65 Combination Supply and Return Diffuser Assembly — RTD9-65 step-down mount diffuser extends slightly below ceiling level when installed and discharges conditioned air out through grilles on all four sides. Aluminum grilles are fitted with double deflection louvers for precise directional control of air flow. Return air enters through the large center grille. Assembly also includes insulated diffuser box with connection collars for round duct connection, hanging rings for suspending and molded fiberglass interior transition to insure low static and even air flow on all four sides. Transition is sealed internally to prevent recirculation. Diffuser assembly is completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings.



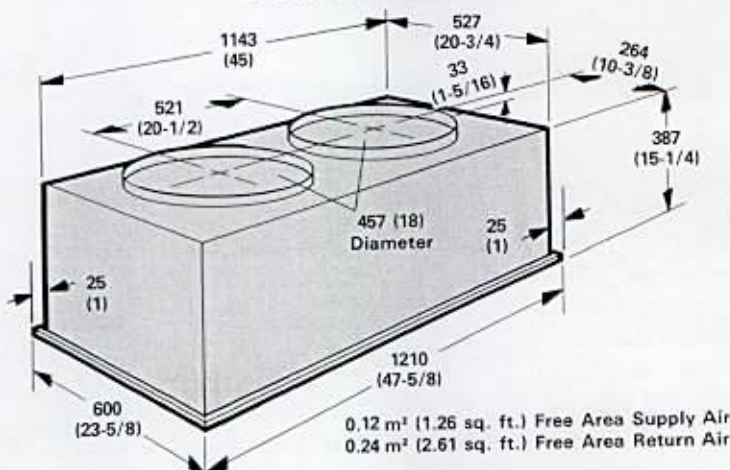
Optional FD9-65 Combination Ceiling Supply and Return Diffuser Assembly — FD9-65 flush mount diffuser installs almost flush with the ceiling level and discharges conditioned air out through fixed blade louvers on all four sides. Fixed blade louvers insure that air flow will be evenly distributed. Return air enters through large center grille. Assembly also includes insulated diffuser box with connection collars for round duct connection, support hanger eyelets at the top corners for secure installation and molded fiberglass interior transition to insure low static and even air flow on all four sides. Transition is sealed internally to prevent recirculation. Diffuser assembly is completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings.

DIMENSIONS (inches) mm

RTD9-65 STEP-DOWN CEILING DIFFUSER

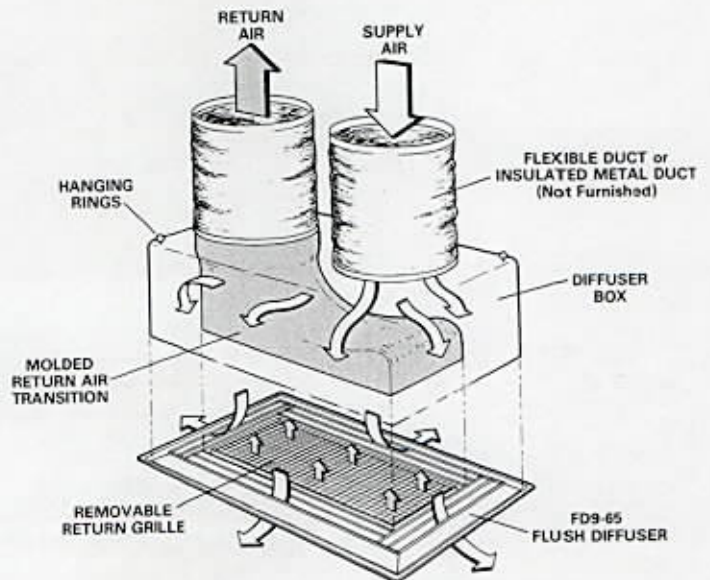


FD9-65 FLUSH CEILING DIFFUSER

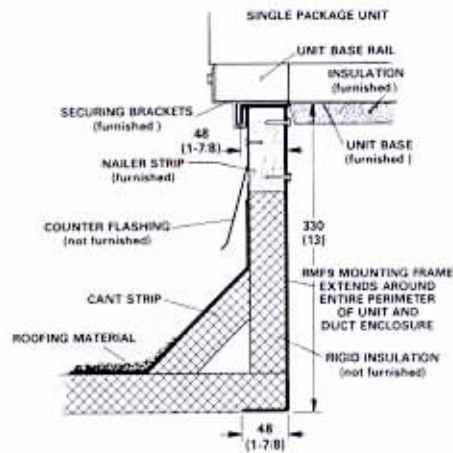


Optional SRT10-65 Supply and Return Transition — Transition field installs in the roof mounting frame and provides segregated and simple duct connections to supply and return diffuser. Completely insulated galvanized steel transition has collars for round duct connection. Round duct from the transition to the diffuser is not furnished and must be provided by the installer. Transition is completely factory assembled and easily field installs in the roof mounting frame with minimum costs and labor requirement.

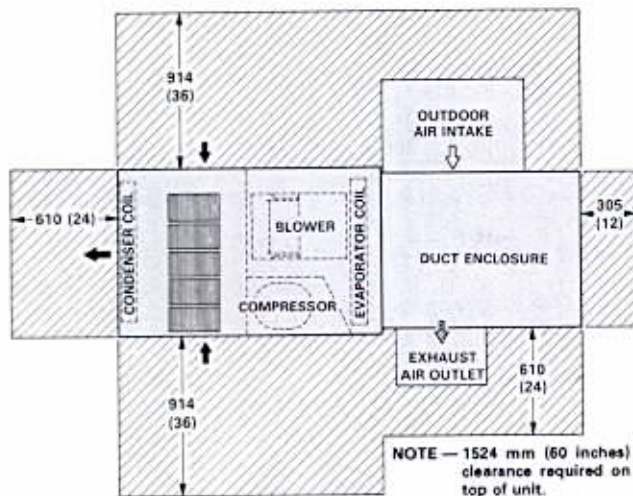
DIFFUSER AIR PATTERN



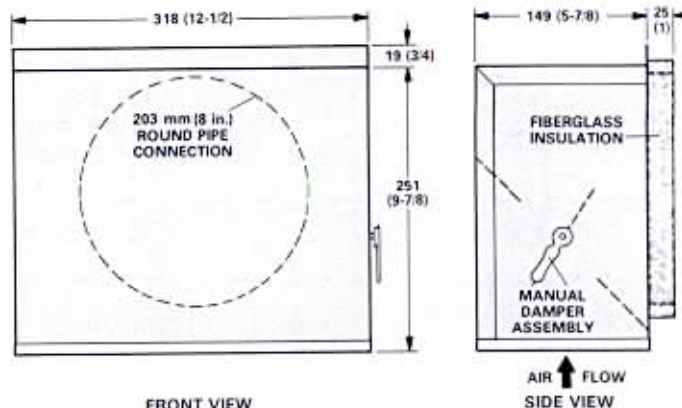
TYPICAL FLASHING FOR RMF9 ROOF MOUNTING FRAME (inches) mm



INSTALLATION CLEARANCES (inches) mm

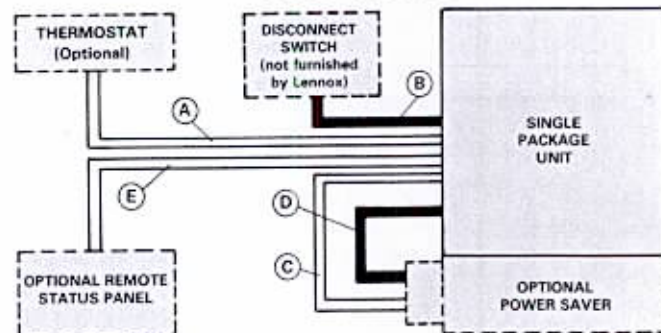


OPTIONAL OAD3-46/65 MINIMUM FRESH AIR DAMPER (inches) mm



FRONT VIEW

FIELD WIRING



- A — Three wire low voltage (Cooling only installation)
Four wire low voltage (All season installation)
- B — Two or Three wire power (See electrical data table)
- C — Four wire low voltage (Power Saver installation)
- D — Two wire power (Cooling only Power Saver installation)
Three wire power (All season Power Saver installation)
- E — Seven wire low voltage

— NOTE — Field Wiring Not Furnished —

All wiring must conform to CEC and local electrical codes.

ELECTRICAL DATA

CHA9-261, CHA9-311, CHA9-411-413 and CHA9-511 MODELS

Model No.		CHA9-261	CHA9-311	CHA9-411	CHA9-413	CHA9-511
Line voltage data		†208/230v 60hz — 1ph	†208/230v 60hz — 1ph	†208/230v 60hz — 1ph	††208/230v 60hz — 3ph	†208/230v 60hz — 1ph
Compressor	Rated load amps	14.9	17.3	22.5	13.5	29.2
	Locked rotor amps	74.0	85.0	111.0	77.0	132.0
Condenser Coil Fan	Full load amps	1.4	2.6	2.6	2.6	3.2
	Locked rotor amps	2.9	5.4	5.4	5.4	5.8
Evaporator Coil Blower	Full load amps	2.2	2.3	3.9	3.9	6.0
	Locked rotor amps	4.5	5.4	9.5	9.5	14.7
Recommended fuse size (amps)		35	45	50	30	70
Unit power factor		.95	.97	.95	.86	.97
*Minimum circuit ampacity		22.2	26.5	34.6	23.8	45.7

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements.

†Extremes of operating range are plus 10% and minus 5% of line voltage.

††Extremes of operating range are plus and minus 10% of line voltage.

CHA9-513 and CHA10-651-653 MODELS

Model No.		CHA9-513	CHA10-651	CHA 10-653		
Line voltage data		††208/230v 60hz — 3ph	††575v 60hz — 3ph	†208/230v 60hz — 1ph	††208/230v 60hz — 3ph	††575v 60hz — 3ph
Compressor	Rated load amps	18.3	6.0	32.2	21.0	7.3
	Locked rotor amps	103.0	30.0	159.0	126.0	50.0
Condenser Coil Fan	Full load amps	3.2	**3.2	3.0	3.0	**3.0
	Locked rotor amps	5.8	**5.8	6.2	6.2	**6.2
Evaporator Coil Blower	Full load amps	6.0	**6.0	7.1	7.1	**7.1
	Locked rotor amps	14.7	**14.7	13.6	13.6	**13.6
Recommended fuse size (amps)		50	15	80	50	20
Unit power factor		.84	.87	.97	.89	.88
*Minimum circuit ampacity		32.0	12.0	50.4	36.4	15.8

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements.

†Extremes of operating range are plus 10% and minus 5% of line voltage.

††Extremes of operating range are plus and minus 10% of line voltage.

**Motors are rated at 230 volts. FLA shown are for step-down transformer output.

ELECTRIC HEAT DATA

CHA9-261 ELECTRIC HEAT DATA
(Factory Installed)

Model No.	Optional Electric Unit Model No. & Net Weight	No. of Steps	Volts Input	Htg. Capacity		*Minimum Circuit Ampacity
				kW	Btuh	
CHA9-261	ECH9-41-161 14 lbs. (6 kg)	1	208	3.5	11,900	24.0
			220	3.9	13,300	27.0
			230	4.2	14,300	
			240	4.6	15,700	
	ECH9-41-261 14 lbs. (6 kg)	1	208	5.7	19,500	37.0
			220	6.4	21,900	42.0
			230	7.0	23,900	
			240	7.6	25,900	
	ECH9-41-311 14 lbs. (6 kg)	1	208	6.9	23,600	44.0
			220	7.7	26,300	51.0
			230	8.4	28,700	
			240	9.2	31,400	
	ECH9-41-471 15 lbs. (7 kg)	1	208	10.4	35,500	65.0
			220	11.6	39,600	75.0
			230	12.7	43,400	
			240	13.8	47,100	

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements.

CHA9-311 ELECTRIC HEAT DATA
(Factory Installed)

Model No.	Optional Electric Unit Model No. & Net Weight	No. of Steps	Volts Input	Htg. Capacity		*Minimum Circuit Ampacity
				kW	Btuh	
CHA9-311	ECH9-41-161 14 lbs. (6 kg)	1	208	3.5	11,900	28.0
			220	3.9	13,300	28.0
			230	4.2	14,300	
			240	4.6	15,700	
	ECH9-41-261 14 lbs. (6 kg)	1	208	5.7	19,500	37.0
			220	6.4	21,900	43.0
			230	7.0	23,900	
			240	7.6	25,900	
	ECH9-41-311 14 lbs. (6 kg)	1	208	6.9	23,600	44.0
			220	7.7	26,300	51.0
			230	8.4	28,700	
			240	9.2	31,400	
	ECH9-41-471 15 lbs. (7 kg)	1	208	10.4	35,500	65.0
			220	11.6	39,600	75.0
			230	12.7	43,400	
			240	13.8	47,100	

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements.

CHA9-411-413 ELECTRIC HEAT DATA
(Factory Installed)

Model No.	Optional Electric Unit Model No. & Net Weight	No. of Steps	Volts Input	Htg. Capacity		*Minimum Circuit Ampacity	
				kW	Btuh		
CHA9-411	ECH9-41-261 14 lbs. (6 kg)	1	208	5.7	19,500	39.0	
			220	6.4	21,900	45.0	
			230	7.0	23,900		
			240	7.6	25,900		
	ECH9-41-311 14 lbs. (6 kg)	1	208	6.9	23,600	46.0	
			220	7.7	26,300	53.0	
			230	8.4	28,700		
			240	9.2	31,400		
	ECH9-41-471 15 lbs. (7 kg)	1	208	10.4	35,500	67.0	
			220	11.6	39,600	77.0	
			230	12.7	43,400		
			240	13.8	47,100		
	†ECH9-41-631 16 lbs. (7 kg)	2	208	13.8	47,100	88.0	
			220	15.5	52,900	101.0	
			230	16.9	57,700		
			240	18.4	62,800		
CHA9-413	ECH9-41-313 15 lbs. (7 kg)	1	208	6.8	23,200	29.0	
			220	7.6	25,900	32.0	
			230	8.3	28,300		
	ECH9-41-473 15 lbs. (7 kg)	1	208	10.4	35,500	41.0	
			220	11.6	39,600	46.0	
			230	12.7	43,400		
	ECH9-41-563 15 lbs. (7 kg)	1	208	12.4	42,300	48.0	
			220	13.9	47,500	55.0	
			230	15.2	51,900		
				240	16.5	56,300	

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements.

†May be used with two stage control.

ELECTRIC HEAT DATA

**CHA9-511-513 ELECTRIC HEAT DATA
(Factory Installed)**

Model No.	Optional Electric Unit Model No. & Net Weight	No. of Steps	Volts Input	Htg. Capacity		*Minimum Circuit Ampacity
				kW	Btuh	
CHA9-511	ECH9-46-381 20 lbs. (9 kg)	1	208	8.3	28,300	59.0
			220	9.2	31,400	66.0
			230	10.1	34,500	
			240	11.0	37,600	
	ECH9-46-561 23 lbs. (10 kg)	1	208	12.4	42,300	84.0
			220	13.9	47,500	95.0
			230	15.2	52,000	
			240	16.5	56,300	
	†ECH9-46-751 24 lbs. (11 kg)	2	208	16.5	56,300	109.0
			220	18.5	63,200	123.0
			230	20.2	69,000	
			240	22.0	75,100	
†ECH9-46-941 26 lbs. (12 kg)	2	208	20.7	70,700	134.0	
		220	23.1	78,900	152.0	
		230	25.3	86,400		
		240	27.5	93,900		
CHA9-513	ECH9-46-313 23 lbs. (10 kg)	1	208	6.8	23,200	33.0
			220	7.6	26,000	36.0
			230	8.3	28,300	
			240	9.0	30,700	
	TECH9-51/65-10 24 lbs. (11 kg)	1	550	9.2	31,200	16.1
			575	10.0	34,100	
			600	10.9	37,200	
	ECH9-46-563 23 lbs. (10 kg)	1	208	12.4	42,300	52.0
			220	13.9	47,500	58.0
			230	15.2	51,900	
			240	16.5	56,300	
	†TECH9-51/65-15 24 lbs. (11 kg)	2	550	13.7	46,800	22.6
			575	15.0	51,200	
			600	16.3	55,600	
	†ECH9-46-783 28 lbs. (13 kg)	2	208	17.1	58,400	69.0
			220	19.2	65,600	77.0
			230	20.9	71,400	
			240	22.8	77,900	
†TECH9-51/65-20 28 lbs. (13 kg)	2	550	18.3	62,500	29.2	
		575	20.0	68,300		
		600	21.8	74,400		
†ECH9-46-943 28 lbs. (13 kg)	2	208	20.7	70,700	81.0	
		220	23.2	79,200	92.0	
		230	25.3	86,400		
		240	27.6	94,200		
†TECH9-51/65-25 28 lbs. (13 kg)	2	550	22.9	78,200	35.7	
		575	25.0	85,300		
		600	27.2	92,800		

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75°C (167°F).
†May be used with two stage control.

**CHA10-651-653 ELECTRIC HEAT DATA
(Factory Installed)**

Model No.	Optional Electric Unit Model No. & Net Weight	No. of Steps	Volts Input	Htg. Capacity		*Minimum Circuit Ampacity
				kW	Btuh	
CHA10-651	ECH9-65-381 20 lbs. (9 kg)	1	208	8.3	28,300	58.5
			220	9.2	31,400	66.2
			230	10.1	34,500	
			240	11.0	37,600	
	ECH9-65-561 23 lbs. (10 kg)	1	208	12.4	42,300	83.4
			220	13.9	47,500	94.9
			230	15.2	52,000	
			240	16.5	56,300	
	†ECH9-65-751 24 lbs. (11 kg)	2	208	16.5	56,300	108.1
			220	18.5	63,200	123.5
			230	20.2	69,000	
			240	22.0	75,100	
†ECH9-65-941 26 lbs. (12 kg)	2	208	20.7	70,700	133.0	
		220	23.1	78,900	152.1	
		230	25.3	86,400		
		240	27.5	93,900		
CHA10-653	ECH9-65-313 23 lbs. (10 kg)	1	208	6.8	23,200	34.5
			220	7.6	26,000	36.0
			230	8.3	28,300	
			240	9.0	30,700	
	TECH9-51/65-10 24 lbs. (11 kg)	1	550	9.2	31,200	16.7
			575	10.0	34,100	
			600	10.9	37,200	
	ECH9-65-563 23 lbs. (10 kg)	1	208	12.4	42,300	51.9
			220	13.9	47,500	58.5
			230	15.2	51,900	
			240	16.5	56,300	
	†TECH9-51/65-15 24 lbs. (11 kg)	2	550	13.7	46,800	23.2
			575	15.0	51,200	
			600	16.3	55,600	
	†ECH9-65-783 28 lbs. (13 kg)	2	208	17.1	58,400	68.3
			220	19.2	65,600	77.5
			230	20.9	71,400	
			240	22.8	77,900	
†TECH9-51/65-20 28 lbs. (13 kg)	2	550	18.3	62,500	29.8	
		575	20.0	68,300		
		600	21.8	74,400		
†ECH9-65-943 28 lbs. (13 kg)	2	208	20.7	70,700	80.8	
		220	23.2	79,200	91.9	
		230	25.3	86,400		
		240	27.6	94,200		
†TECH9-51/65-25 28 lbs. (13 kg)	2	550	22.9	78,200	36.3	
		575	25.0	85,300		
		600	27.2	92,800		
†TECH9-65-30 28 lbs. (13 kg)	2	550	27.5	93,700	42.9	
		575	30.0	102,400		
		600	32.7	111,600		

*Refer to Canadian Electric Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 75°C (167°F).
†May be used with two stage control.

COOLING RATINGS

NOTE - To determine sensible capacity, leaving wet bulb and dry bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 11.

CHA9-261 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)					95°F (35°C)					105°F (41°C)							
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C				
63°F (17.2°C)	283	600	6.9	23,700	2690	.71	.81	.91	6.6	22,500	2810	.73	.83	.93	6.2	21,300	2960	.74	.85	.96
	378	800	7.3	25,000	2760	.77	.89	.99	7.0	23,800	2900	.79	.91	.99	6.6	22,400	3080	.81	.94	.99
	472	1000	7.6	26,000	2810	.83	.96	.99	7.2	24,500	2950	.85	.99	.99	6.8	23,200	3160	.88	.99	.99
67°F (19.4°C)	283	600	7.5	25,500	2790	.57	.66	.75	7.1	24,200	2930	.58	.67	.77	6.7	22,800	3120	.59	.69	.79
	378	800	7.8	26,700	2850	.60	.71	.83	7.4	25,300	3010	.61	.73	.85	6.9	23,700	3210	.63	.76	.88
	472	1000	8.1	27,500	2890	.64	.77	.90	7.6	25,900	3060	.65	.79	.92	7.1	24,300	3270	.67	.82	.96
71°F (21.7°C)	283	600	8.0	27,400	2880	.44	.53	.61	7.6	25,900	3060	.44	.53	.62	7.2	24,400	3280	.45	.54	.64
	378	800	8.4	28,500	2950	.45	.56	.66	7.9	27,000	3140	.46	.57	.68	7.4	25,300	3380	.46	.58	.70
	472	1000	8.6	29,300	2980	.47	.59	.71	8.1	27,600	3180	.47	.61	.74	7.6	25,800	3430	.48	.62	.76

CHA9-311 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)					95°F (35°C)					105°F (41°C)							
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C				
63°F (17.2°C)	354	750	8.5	28,900	3060	.74	.85	.95	8.1	27,500	3320	.75	.87	.97	7.6	26,000	3550	.77	.89	1.00
	472	1000	8.9	30,500	3150	.79	.92	1.00	8.5	28,900	3370	.82	.96	1.00	8.1	27,400	3600	.85	.99	1.00
	590	1250	9.2	31,500	3210	.88	1.00	1.00	8.8	30,100	3480	.91	1.00	1.00	8.4	28,600	3720	.94	1.00	1.00
67°F (19.4°C)	354	750	9.0	30,800	3180	.59	.69	.79	8.6	29,300	3430	.59	.70	.80	8.1	27,600	3660	.61	.72	.83
	472	1000	9.4	32,100	3250	.63	.75	.88	8.9	30,400	3500	.64	.77	.90	8.4	28,700	3720	.66	.80	.93
	590	1250	9.7	33,000	3290	.68	.82	.96	9.1	31,200	3540	.69	.85	.99	8.6	29,400	3770	.71	.88	1.00
71°F (21.7°C)	354	750	9.6	32,900	3290	.45	.54	.64	9.1	31,200	3540	.45	.55	.65	8.6	29,400	3770	.46	.56	.67
	472	1000	10.0	34,100	3360	.47	.58	.70	9.5	32,300	3600	.47	.60	.72	8.9	30,400	3830	.48	.61	.74
	590	1250	10.2	34,900	3390	.49	.63	.77	9.7	33,000	3640	.50	.65	.79	9.1	31,000	3860	.51	.66	.82

CHA9-411-413 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)					95°F (35°C)					105°F (41°C)							
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C				
63°F (17.2°C)	496	1050	10.6	36,300	4220	.76	.87	.98	10.1	34,400	4440	.78	.89	1.00	9.5	32,400	4640	.80	.92	1.00
	661	1400	11.1	38,000	4290	.84	.97	1.00	10.5	35,800	4520	.86	1.00	1.00	10.0	34,000	4740	.89	1.00	1.00
	826	1750	11.6	39,500	4350	.91	1.00	1.00	11.0	37,600	4610	.94	1.00	1.00	10.5	35,700	4850	.97	1.00	1.00
67°F (19.4°C)	496	1050	11.3	38,500	4310	.60	.71	.81	10.7	36,500	4550	.61	.72	.83	10.1	34,400	4770	.62	.74	.86
	661	1400	11.7	40,000	4370	.65	.78	.91	11.1	37,800	4620	.66	.80	.94	10.4	35,600	4850	.68	.83	.97
	826	1750	12.2	41,500	4430	.72	.81	1.00	11.6	39,600	4710	.74	.91	1.00	10.9	37,300	4940	.76	.91	1.00
71°F (21.7°C)	496	1050	12.0	41,000	4420	.45	.55	.66	11.4	38,900	4680	.46	.56	.67	10.7	36,600	4920	.46	.58	.69
	661	1400	12.4	42,400	4470	.47	.60	.73	11.8	40,100	4740	.48	.61	.75	11.0	37,700	4990	.49	.63	.77
	826	1750	12.7	43,200	4510	.50	.65	.80	12.0	40,800	4780	.51	.66	.82	11.3	38,400	5030	.52	.69	.85

COOLING RATINGS

NOTE - To determine sensible capacity, leaving wet bulb and dry bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 11.

CHA9-511-513 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	Input	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	Input	76°F 24°C	80°F 27°C	84°F 29°C		
63°F (17.2°C)	566	1200	14.6	49,700	5110	.72	.82	.92	13.8	47,100	5410	.74	.84	.94	13.0	44,300	5750	.75	.86	.97
	755	1600	15.3	52,300	5310	.79	.91	1.00	14.5	49,400	5620	.81	.93	1.00	13.6	46,500	5980	.83	.97	1.00
	944	2000	15.9	54,200	5450	.85	.99	1.00	15.0	51,100	5780	.88	1.00	1.00	14.2	48,300	6190	.91	1.00	1.00
67°F (19.4°F)	566	1200	15.5	53,000	5370	.58	.67	.76	14.7	50,100	5680	.58	.68	.78	13.8	47,100	6050	.59	.70	.80
	755	1600	16.2	55,200	5540	.61	.73	.85	15.3	52,100	5870	.63	.75	.87	14.3	48,900	6250	.64	.78	.90
	944	2000	16.6	56,700	5650	.66	.79	.93	15.6	53,400	5990	.67	.82	.96	14.7	50,100	6370	.69	.85	.99
71°F (21.7°C)	566	1200	16.5	56,400	5630	.44	.53	.62	16.2	55,300	5980	.45	.54	.64	14.7	50,100	6380	.45	.55	.65
	755	1600	17.2	58,600	5800	.46	.57	.68	16.2	55,300	6150	.47	.58	.70	15.2	51,800	6560	.47	.60	.72
	944	2000	17.6	59,900	5900	.48	.61	.74	16.5	56,400	6260	.49	.63	.77	15.5	52,800	6670	.50	.65	.79

CHA10-651-653 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	Input	76°F 24°C	80°F 27°C	84°F 29°C	kW	Btuh	Input	76°F 24°C	80°F 27°C	84°F 29°C		
63°F (17.2°C)	708	1500	18.0	61,500	5740	.73	.83	.93	17.1	58,500	6150	.74	.85	.96	16.3	55,600	6550	.76	.87	.98
	944	2000	19.0	64,800	5920	.80	.92	1.00	18.1	61,700	6330	.82	.95	1.00	17.2	58,700	6740	.84	.97	1.00
	1180	2500	19.6	67,000	6030	.86	1.00	1.00	18.8	64,100	6470	.89	1.00	1.00	17.9	61,200	6910	.92	1.00	1.00
67°F (19.4°C)	708	1500	19.3	65,800	5970	.58	.68	.77	18.3	62,600	6390	.59	.69	.79	17.4	59,500	6790	.60	.71	.81
	944	2000	20.2	68,800	6110	.62	.74	.86	19.1	65,300	6540	.63	.76	.88	18.1	61,900	6950	.65	.78	.91
	1180	2500	20.7	70,600	6210	.66	.81	.94	19.6	67,000	6630	.68	.83	.97	18.6	63,600	7040	.70	.85	1.00
71°F (21.7°C)	708	1500	20.6	70,400	6200	.45	.50	.63	19.6	67,000	6630	.45	.54	.64	18.7	63,700	7050	.45	.55	.65
	944	2000	21.4	73,200	6330	.46	.58	.69	20.4	69,600	6770	.47	.59	.71	19.3	66,000	7190	.47	.60	.73
	1180	2500	21.9	74,900	6420	.48	.62	.75	20.9	71,200	6850	.49	.63	.77	19.8	67,500	7270	.50	.65	.80

BLOWER DATA

CHA9-261 BLOWER PERFORMANCE

External Static Pressure		Air Volume @ Various Speeds					
		High		Medium - Low		Low	
Pa	in. wg.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	555	1175	455	960	365	770
13	.05	545	1150	440	930	355	750
25	.10	530	1120	425	900	340	725
37	.15	510	1085	410	865	330	700
50	.20	495	1050	390	830	320	675
62	.25	470	1000	375	800	305	650
75	.30	450	950	360	760	295	625
100	.40	400	850	320	680	270	570
125	.50	350	740	280	595	235	500
150	.60	290	620	240	505	---	---

NOTE - All air volume data is measured external to unit with air filter in place.

CHA9-261 ELECTRIC HEAT AIR RESISTANCE

Air Volume		Total Resistance							
		Electric Heaters							
		ECH9-41-161		ECH9-41-261 ECH9-41-311		ECH9-41-313 ECH9-41-471		ECH9-41-473 ECH9-41-563	
cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa		
600	283	.03	7	.04	10	.06	15		
700	330	.04	10	.06	15	.07	17		
800	378	.06	15	.07	17	.09	22		
900	425	.07	17	.09	22	.11	27		
1000	472	.08	20	.11	27	.13	32		
1100	519	.10	25	.13	32	.15	37		
1200	566	.12	30	.15	37	.18	45		
1300	613	.14	35	.18	45	.21	52		

BLOWER DATA

CHA9-311 BLOWER PERFORMANCE

External Static Pressure		Air Volume @ Various Speeds							
		High		Medium-High		Medium-Low		Low	
Pa	in. wg.	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm
0	0	655	1390	625	1325	555	1175	490	1040
13	.05	640	1355	610	1295	545	1150	480	1015
25	.10	625	1325	595	1265	530	1125	470	995
37	.15	610	1295	580	1235	520	1100	460	970
50	.20	595	1265	570	1205	505	1075	450	950
62	.25	580	1235	555	1175	495	1050	435	925
75	.30	565	1200	540	1145	485	1025	425	905
100	.40	540	1140	510	1085	460	970	405	860
125	.50	505	1070	480	1020	420	895	----	----

NOTE — All air volume data is measured external to unit with air filter in place.

CHA9-311 ELECTRIC HEAT AIR RESISTANCE

Air Volume		Total Resistance Electric Heaters					
		ECH9-41-161		ECH9-41-261 ECH9-41-311		ECH9-41-313 ECH9-41-471	ECH9-41-473 ECH9-41-563
cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
800	378	.06	15	.07	17	.09	22
900	425	.07	17	.09	22	.11	27
1000	472	.08	20	.11	27	.13	32
1100	519	.10	25	.13	32	.15	37
1200	566	.12	30	.15	37	.18	45
1300	613	.14	35	.18	45	.21	52
1400	661	.17	42	.21	52	.24	60

CHA9-411-413 BLOWER PERFORMANCE

External Static Pressure		Air Volume @ Various Speeds					
		High		Medium - Low		Low	
Pa	in. wg.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	770	1630	645	1365	510	1080
13	.05	755	1600	635	1345	505	1070
25	.10	740	1570	625	1320	500	1060
37	.15	725	1540	615	1300	495	1050
50	.20	710	1510	600	1275	490	1035
62	.25	695	1475	590	1250	480	1020
75	.30	680	1440	580	1230	475	1005
100	.40	640	1360	555	1175	455	965
125	.50	595	1265	525	1115	435	925
150	.60	550	1170	495	1050	----	----
175	.70	495	1050	----	----	----	----

NOTE — All air volume data is measured external to unit with air filter in place.

CHA9-411-413 ELECTRIC HEAT AIR RESISTANCE

Air Volume		Total Resistance Electric Heaters							
		ECH9-41-141		ECH9-41-261 ECH9-41-311		ECH9-41-313 ECH9-41-471	ECH9-41-473 ECH9-41-563	ECH9-41-631	
cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
900	425	.07	17	.09	22	.11	27	.12	30
1000	472	.08	20	.11	27	.13	32	.14	35
1100	519	.10	25	.13	32	.15	37	.17	42
1200	566	.12	30	.15	37	.18	45	.20	50
1300	613	.14	35	.18	45	.21	52	.24	60
1400	661	.17	42	.21	52	.24	60	.28	70

BLOWER DATA

CHA9-511-513 BLOWER PERFORMANCE

External Static Pressure		Air Volume @ Various Speeds									
		High		Medium-High		Medium		Medium-Low		Low	
Pa	in. wg.	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm
0	0	1170	2480	1105	2340	1015	2150	890	1885	770	1630
13	.05	1150	2435	1085	2300	1000	2120	875	1850	755	1600
25	.10	1130	2395	1070	2265	985	2085	860	1820	740	1570
37	.15	1110	2355	1060	2225	965	2045	845	1785	725	1535
50	.20	1095	2315	1035	2190	950	2010	830	1755	710	1500
62	.25	1075	2275	1015	2150	930	1975	810	1720	695	1470
75	.30	1055	2235	995	2110	915	1940	795	1685	675	1435
100	.40	1015	2155	960	2035	880	1860	765	1620	640	1360
125	.50	970	2055	925	1955	845	1785	730	1545	610	1290
150	.60	925	1955	880	1865	805	1705	695	1470	575	1215
175	.70	880	1860	835	1770	765	1620	650	1380	535	1135

NOTE — All air volume data is measured external to unit with air filter in place.

CHA9-511-513 ELECTRIC HEAT AIR RESISTANCE

Air Volume		Total Resistance									
		Electric Heaters									
		ECH9-46-381		ECH9-46-561 ECH9-46-313		ECH9-46-563 TECH9-51/65-15		ECH9-46-751 TECH9-51/65-10		ECH9-46-941	
cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
1200	566	.11	27	.14	35	.17	42	.21	52	.23	57
1300	613	.12	30	.16	40	.19	47	.23	57	.26	65
1400	661	.13	32	.17	42	.21	52	.26	65	.28	70
1500	708	.13	32	.18	45	.23	57	.28	70	.31	77
1600	755	.14	35	.20	50	.25	62	.30	75	.34	85
1700	802	.15	37	.22	55	.27	67	.33	82	.37	92
1800	849	.16	40	.24	60	.29	72	.35	87	.40	99
1900	897	.17	42	.25	62	.32	80	.38	94	.43	107
2000	944	.18	45	.27	67	.34	85	.41	102	.47	117

CHA10-651-653 BLOWER PERFORMANCE

External Static Pressure		Air Volume @ Various Speeds					
		High		Medium		Low	
Pa	in. wg.	L/s	cfm	L/s	cfm	L/s	cfm
0	0	1110	2350	975	2070	850	1805
13	.05	1100	2325	970	2050	845	1785
25	.10	1090	2305	960	2030	835	1765
37	.15	1080	2285	950	2015	825	1750
50	.20	1070	2265	940	1995	815	1730
62	.25	1060	2245	930	1975	810	1715
75	.30	1050	2220	920	1955	800	1700
100	.40	1030	2180	905	1920	785	1660
125	.50	1010	2140	890	1880	765	1625
150	.60	990	2095	870	1840	750	1590
175	.70	970	2050	850	1800	735	1555
200	.80	950	2010	830	1760	715	1520
225	.90	925	1960	790	1675	700	1480

NOTE — All air volume data is measured external to unit with air filter in place.

CHA10-651-653 ELECTRIC HEAT AIR RESISTANCE

Air Volume		Total Resistance									
		Electric Heaters									
		ECH9-65-381		ECH9-65-313 ECH9-65-561 ECH9-65-563		ECH9-46/65-313 ECH9-46/65-563 TECH9-51/65-15		ECH9-65-751		ECH9-65-941	
cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
1500	708	.13	32	.18	45	.23	57	.28	70	.31	77
1600	755	.14	35	.20	50	.25	62	.30	75	.34	85
1700	802	.15	37	.22	55	.27	67	.33	82	.37	92
1800	849	.16	40	.24	60	.29	72	.35	87	.40	99
1900	897	.17	42	.25	62	.32	80	.38	94	.43	107
2000	944	.18	45	.27	67	.34	85	.41	102	.47	117
2100	991	.20	50	.29	72	.37	92	.44	109	.50	124
2200	1038	.22	55	.32	80	.39	97	.47	117	.53	132
2300	1085	.23	57	.34	85	.42	104	.51	127	.57	142

BLOWER DATA

**RTD-41 AND RTD-65 STEP DOWN CEILING DIFFUSER
AIR THROW DATA**

RTD Model No.	Air Volume		*Effective Throw						
			Horizontal Vanes 180° Straight		Horizontal Vanes 22° Down		Horizontal Vanes 22° Down		
			ft.	m	ft.	m	ft.	m	
RTD-41	Two Sides Open	800	380	39	12.0	34	10.5	23	7.8
		1000	470	43	13.0	38	11.5	26	8.0
		1200	565	48	14.5	42	13.0	29	9.0
		1400	660	54	16.5	48	14.5	33	10.0
	Three Sides Open	800	380	27	8.0	24	7.5	17	5.0
		1000	470	30	9.0	27	8.0	19	6.0
		1200	565	34	10.5	30	9.0	21	6.5
		1400	660	39	12.0	34	10.5	24	7.5
	Four Sides Open	800	380	22	6.5	20	6.0	14	4.5
		1000	470	24	7.5	22	6.5	15	4.5
		1200	565	27	8.0	24	7.5	17	5.0
		1400	660	30	9.0	26	8.0	19	6.0
RTD-65	Two Sides Open	1200	565	41	12.5	37	11.0	27	8.0
		1600	755	45	13.5	41	12.5	29	9.0
		2000	945	51	15.5	45	13.5	31	9.5
		2250	1060	56	17.0	50	15.0	34	10.5
	Three Sides Open	1200	565	29	9.0	27	8.0	18	5.5
		1600	755	31	9.5	29	9.0	20	6.0
		2000	945	35	10.5	31	9.5	22	6.5
		2250	1060	40	12.0	35	10.5	25	7.5
	Four Sides Open	1200	565	22	6.5	20	6.0	15	4.5
		1600	755	25	7.5	22	6.5	16	5.0
		2000	945	28	8.5	25	7.5	17	5.0
		2250	1060	30	9.0	27	8.0	18	5.5

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. (15m) per minute.

**RTD9-65 STEP DOWN CEILING DIFFUSER
AIR THROW DATA**

RTD Model No.	Air Volume		*Effective Throw							
			Horizontal Vanes 180° Straight		Horizontal Vanes 22° Down		Horizontal Vanes 22° Down			
			ft.	m	ft.	m	ft.	m		
RTD9-65	2 Ends Open	800	380	22	6.5	21	6.5	15	4.5	
		1000	470	24	7.5	22	6.5	16	5.0	
		1200	565	25	7.5	23	7.0	17	5.0	
		1400	660	27	8.0	25	7.5	18	5.5	
		1600	755	29	9.0	26	8.0	19	6.0	
		1800	850	31	9.5	27	8.0	20	6.0	
		2000	945	33	10.0	28	8.5	21	6.5	
		2200	1040	35	10.5	30	9.0	22	6.5	
		1 Side 2 Ends Open	800	380	16	5.0	15	4.5	9	2.5
			1000	470	17	5.0	16	5.0	10	3.0
			1200	565	18	5.5	17	5.0	11	3.5
			1400	660	19	6.0	18	5.5	12	3.5
	1600		755	20	6.0	18	5.5	12	3.5	
	1800		850	21	6.5	19	6.0	13	4.0	
	All Ends And Sides Open	800	380	12	3.5	11	3.5	8	2.5	
		1000	470	13	4.0	12	3.5	8	2.5	
		1200	565	14	4.5	13	4.0	9	2.5	
		1400	660	15	4.5	14	4.5	9	2.5	
		1600	755	16	5.0	14	4.5	10	3.0	
		1800	850	17	5.0	15	4.5	10	3.0	
		2000	945	18	5.5	16	5.0	11	3.5	
		2200	1040	19	6.0	17	5.0	12	3.5	

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. (15m) per minute.

**FD-41 AND FD-65 FLUSH CEILING DIFFUSER
AIR THROW DATA**

FD Model No.	Air Volume		*Effective Throw	
	cfm	L/s	ft.	m
FD-41 and FD-41-D	800	380	12	3.5
	1000	470	14	4.5
	1200	565	16	5.0
	1400	660	18	5.5
FD-65 and FD-65-D	800	380	8	2.5
	1000	470	9	2.5
	1200	565	11	3.5
	1400	660	12	3.5
	1600	755	14	4.5
	1800	850	16	5.0
	2000	945	18	5.5
	2200	1040	20	6.0

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. (15m) per minute.

**FD9-65 FLUSH CEILING DIFFUSER
AIR THROW DATA**

FD Model No.	Air Volume		*Effective Throw	
	cfm	L/s	ft.	m
FD9-65	800	380	8	2.5
	1000	470	8	2.5
	1200	565	9	2.5
	1400	660	9	2.5
	1600	755	10	3.0
	1800	850	11	3.5
	2000	945	12	3.5
	2200	1040	12	3.5

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. (15m) per minute.

BLOWER DATA

RTD-41-65 AND FD-41-65 CEILING DIFFUSER AIR RESISTANCE

Model No.	Air Volume		Total Air Resistance															
			RTD-41 Diffuser						FD-41		RTD-65 Diffuser						FD-65	
			2 Sides Open		3 Sides Open		4 Sides Open		FD-41-D Diffuser		2 Sides Open		3 Sides Open		4 Sides Open		FD-65-D Diffuser	
			cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
CHA9-261 CHA9-311 CHA9-410	600	285	.09	22	.06	15	.04	10	.04	10	----	----	----	----	----	----	----	----
	800	380	.12	30	.09	22	.07	17	.07	17	----	----	----	----	----	----	----	----
	1000	470	.15	37	.12	30	.10	25	.10	25	----	----	----	----	----	----	----	----
	1200	565	.18	45	.15	37	.13	32	.13	32	----	----	----	----	----	----	----	----
	1400	660	.23	57	.19	47	.16	40	.16	40	----	----	----	----	----	----	----	----
	1600	755	.28	70	.23	57	.19	47	.19	47	----	----	----	----	----	----	----	----
CHA9-510 CHA10-650	1000	470	----	----	----	----	----	----	----	----	.07	17	.05	12	.03	7	.10	25
	1200	565	----	----	----	----	----	----	----	----	.12	30	.06	15	.04	10	.14	35
	1400	660	----	----	----	----	----	----	----	----	.15	37	.08	20	.05	12	.17	42
	1600	755	----	----	----	----	----	----	----	----	.19	47	.10	25	.07	17	.21	52
	1800	850	----	----	----	----	----	----	----	----	.23	57	.12	30	.09	22	.26	65
	2000	945	----	----	----	----	----	----	----	----	.29	72	.15	37	.11	27	.32	80
	2200	1040	----	----	----	----	----	----	----	----	.35	87	.18	45	.13	32	.39	97
	2400	1135	----	----	----	----	----	----	----	----	.41	102	.21	52	.15	37	.45	112

RTD9-65 AND FD9-65 CEILING DIFFUSER AND RD10-65 POWER SAVER AIR RESISTANCE

Model No.	Air Volume		Total Air Resistance									
			RD10 Power Saver		RTD9-65 Diffuser						FD9-65 Diffuser	
					2 Ends Open		1 End, 2 Sides Open		All Ends and Sides Open			
			cfm	L/s	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa	in. wg.	Pa
CHA9-261 CHA9-311 CHA9-410	600	285	.09	23	.11	28	.10	25	.09	23	.09	23
	800	380	.12	30	.15	38	.13	33	.11	28	.11	28
	1000	470	.14	35	.19	47	.16	40	.14	35	.14	35
	1200	565	.16	40	.25	63	.20	50	.17	42	.17	42
	1400	660	.18	45	.33	83	.25	63	.20	50	.20	50
	1600	755	.21	52	.43	107	.32	80	.24	60	.24	60
CHA9-510 CHA10-650	1200	565	.16	40	.25	63	.20	50	.17	42	.17	42
	1400	660	.18	45	.33	83	.25	63	.20	50	.20	50
	1600	755	.21	52	.43	107	.32	80	.24	60	.24	60
	1800	850	.24	60	.56	139	.40	100	.30	75	.30	75
	2000	945	.27	67	.73	182	.50	124	.36	90	.36	90
	2200	1040	.30	75	.95	238	.63	157	.44	109	.44	109
	2400	1130	.32	80	1.08	269	.71	177	.48	119	.48	119

NOTE — RT10 Duct Enclosure has no appreciable air resistance.

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

General — Furnish and install a single package air to air DX mechanical cooling system complete with automatic controls. The single package unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment. The manufacturer shall have parts and service available throughout Canada.

The installed weight shall not be more than lbs. (kg). Entire unit shall have a width of not more than inches (mm), a depth of not more than inches (mm) and an overall height of not more than inches (mm). The equipment shall be shipped completely factory assembled, precharged, piped and wired internally ready for field connections. In addition, manufacturer shall test operate system at the factory before shipment.

Roof Mounting Frame — Furnish and install a steel roof mounting frame. It shall mate to the bottom perimeter of the equipment. When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of a roofing contractor. Frame shall be approved by National Roofing Contractors Association.

Air Distribution — Equipment shall be capable of end or bottom handling of conditioned air. All air distribution ducts shall be fiberglass or ga. galvanized steel insulated with inch (mm) thick lb./ft³ (kg/m³) density fiberglass or equivalent.

Furnish and install a (flush or stepdown) optional combination ceiling supply and return air grille. It shall be capable of not less than ft. (m) radius of effective throw.

Cooling System — The total certified cooling capacity shall not be less than Btuh (kW) with an evaporator air volume of cfm (L/s), an entering wet bulb air temperature of F (C), an entering dry bulb air temperature of F (C) and a condenser entering temperature of F (C). The compressor power input shall not exceed kW at these conditions.

The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than sq. ft. (m²) (evaporator) and sq. ft. (m²) (condenser).

The compressor shall be resiliently mounted, have overload protection, internal pressure relief and crankcase heater. The refrigeration system shall have suction and discharge line service gauge ports, liquid line strainer, low pressure switch and full refrigerant charge. Control options available shall consist of timed off control, low ambient control and start controls. Shall comply with ARI Standard 210 test conditions.

Additive Electric Heaters — The certified total heating capacity output shall be Btuh (kW) with kW input at volts power supply.

Approvals — Single package unit shall be listed by a certified agency. All wiring shall be in compliance with CEC.

Optional electric heaters shall be factory installed. Heating elements shall be nichrome bare wired exposed directly to the air stream. Thermal time delay relay shall bring the elements on and off in sequence with a time delay between each element. Circuit breakers shall provide overload and short circuit protection. Safety devices shall consist of limit controls and thermal cutoff safety fuses. Heaters shall be C.S.A. Listed.

Cabinet — Shall be of galvanized steel with a baked-on outdoor enamel paint finish. Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connection entry. Base shall elevate unit off mounting surface.

Service Access — All components, wiring and inspection areas shall be completely accessible through removable panels.

Air Movers — Centrifugal conditioned air blower shall be direct driven by a multi-speed motor and be capable of delivering cfm (L/s) at an external static pressure of inches water gauge (Pa) requiring not more than bhp (kW) and rpm. Blowers shall be statically and dynamically balanced.

Propeller type condenser fan shall be direct driven by a hp (kW) motor. Fan motor shall be permanently lubricated and inherently protected.

Air Filters — Cleanable filters furnished shall have not less than sq. ft. (m²) of free area.

Duct Enclosure — Furnish and install an optional field assembled duct enclosure. Enclosure shall attach to the single package unit and mate to the roof mounting frame providing weatherproof duct connection and entry into the conditioned area. Brackets shall be provided to secure unit to frame. Enclosure shall be of galvanized steel with a baked-on outdoor enamel finish and shall be completely insulated.

POWER SAVER — Furnish and install complete with controls an optional duct enclosure with air mixing damper assembly including outdoor air and recirculated air dampers with pressure operated exhaust air dampers. The assembly shall mount within the confines of the duct enclosure and provide for the introduction of outside air for minimum ventilation and free cooling. Outdoor air intake hood shall include air filter. Damper motor shall be 24 volt, 3 position spring return. Controls shall include adjustable mixed air controller, adjustable compressor monitor and adjustable enthalpy control.

Minimum Fresh Air Damper — Optional fresh air damper shall be available to provide outdoor air requirements. Damper box field installs external to duct enclosure and shall be manually operated.

Remote Status Panel — Shall be available for installation within the conditioned area to observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor, No Heat and Filter.