

LENNOX

SINGLE PACKAGE AIR CONDITIONERS CHA8 SERIES HORIZONTAL & DOWN-FLO

*96,000 to 273,000 Btuh Total Cooling Capacity
36,200 to 288,700 Btuh Optional Electric Heat

* At ARI standard test conditions

ENGINEERING DATA
COOLING UNITS

PACKAGED

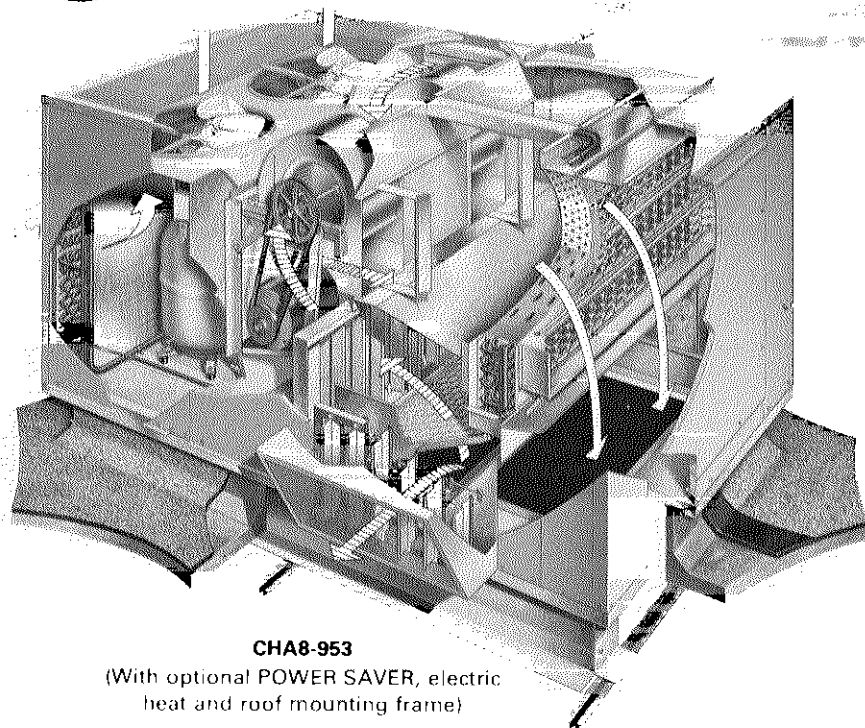
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October 15, 1979

Supersedes 10 1 75

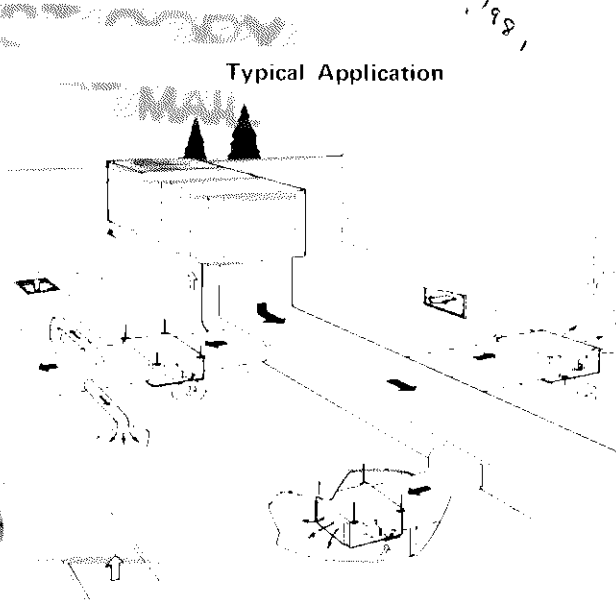


*See
April 1, 1981*



CHA8-953

(With optional POWER SAVER, electric heat and roof mounting frame)

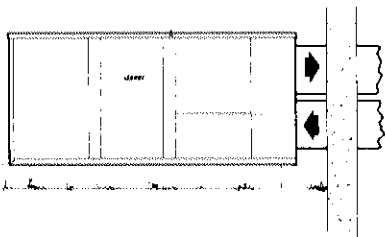


Typical Application

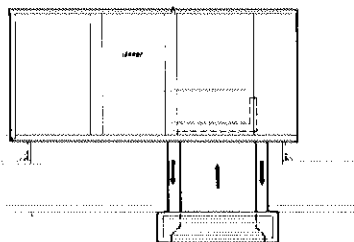
Rooftop Installation with Optional ZDB1 Blower Powered Mixing Damper Boxes.

Three Air Patterns Possible

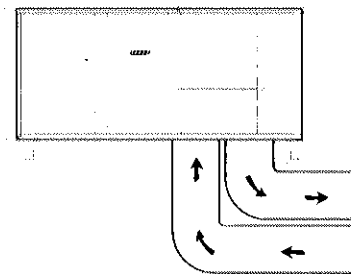
End panels fit bottom openings to give air pattern choice. Separate adapter required for combination ceiling supply and return application.



Installation thru the wall — Slab or Roof



Combination Supply and Return Air Ceiling Diffuser
Step-down or Flush Diffuser



Separate Supply and Return (Double) Duct

Single Package Rooftop Air Conditioner & Mounting Frame Saves Installation Costs & Floor Space

The CHA8 series DX air conditioning units, with bottom handling of conditioned air, are designed primarily for rooftop installation with the optional POWER SAVER™ and RMF3 roof mounting frame. The separate roof frame mates to the bottom of the CHA8 unit and when flashed into the roof it permits weatherproof duct connection and entry into the conditioned area. No additional roof curbing or flashing is required. The single package unit can also be installed on a slab at grade level with end handling of conditioned air. The insulated single cabinet houses highly efficient air cooled DX cooling, powerful belt drive blowers, air filters, optional electric heat and the optional POWER SAVER dampers which are shipped complete with all controls wired. Complete factory sealed refrigeration system consists of compressor(s), con-

denser coil and fans, evaporator coil and twin blowers, refrigerant drier, refrigerant lines connected and a full charge of refrigerant. Controls furnished consist of pressure switches, compressor relay, overload protection and timed-off cycle. Optional POWER SAVER equipment and controls reduce cooling operating costs and satisfy any local code fresh air requirements. An externally mounted OAD3 minimum fresh air damper (manual or auto) is also available. In addition optional ZDB1 series blower powered mixing damper boxes are available for zone control system installations. Units are shipped completely assembled wired and piped ready to install. Each unit is test operated at the factory insuring proper operation. Installer has only to set unit, connect ductwork, power supply and thermostat field wiring connections.

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

FEATURES

Thoroughly Tested And Approved — Units have been thoroughly tested in the Lennox environmental test room and rated at ARI Standard 210 conditions. In addition the CHA8-953 & 1353 models have been sound tested in the Lennox reverberant sound test room and rated according to ARI Standard 270. Units coming within the scope of this standard (135,000 Btuh or less) carry the ARI Certification Seal and are certified under the ARI Certification Program. Units and components within are bonded for grounding to meet safety standards for servicing required by U.L. and NEC. Units and optional electric heaters are U.L. Listed. Units are also CSA Approved.

Dependable Lennox Compressor(s) — The large casing, spring loaded discharge valve, high suction intake ports and crankcase heater result in effective "slugging" protection. Crankshaft is statically and dynamically balanced and has patented 3 mode oil pumping for positive pressure lubrication. Contoured piston for increased volumetric efficiency. 17 strategically located discharge mufflers result in extremely quiet operation. Motor is located within refrigerant flow pattern resulting in low motor winding temperatures. Twin internally mounted motor in-winding temperature sensing thermostats provide safe operation. High and low pressure controls (automatic reset) are provided and factory installed in compressor terminal box. A low ambient cut-out thermostat prevents compressor operation below 22°F. The entire running gear assembly is spring mounted within the sealed housing and the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation.

CHA8-953 and CHA8-1353 — Models have a single Lennox L2 compressor in a single refrigeration system giving single stage cooling operation.

CHA8-1853 And CHA8-2753 — Models have twin Lennox L2 compressors in separate refrigeration systems and two stage operation is controlled by the two stage cooling thermostat.

Lennox Coils — Extra large coils (condenser and evaporator) are constructed of ripple-edged aluminum fins machine fitted to copper tubes for maximum strength and heat transfer. Coils are pressure leak tested at 450 to 500 psi.

Efficient Condensing Section — Direct drive fans draw large air volumes through the extra large condenser coil(s) and discharges the air out the top. Condenser coil(s) have sub-cooling rows for increased efficiency. Condenser discharge grille is furnished.

Powerful Blowers — Twin resiliently mounted blowers deliver large air volumes with low power consumption. Rugged blower motor support allows quick belt adjustment and motor change over.

Cleanable Air Filters — Washable, vacuum cleanable polyurethane filter media is furnished as standard. Filters are easily accessible for cleaning and are coated with oil for increased efficiency. Use RP products filter coating No. 418 (P-8-5069) when reoilng. One inch frame filter is standard, filter rack will receive up to 2" filters.

Rugged Cabinet — Heavy gauge galvanized hot dipped steel cabinet panels. A five station wash metal preparation assures a perfect bonding surface for the finish coat of baked-on enamel. Large removable panels provide complete service access.

Thick Interior Insulation — All of the interior panels where conditioned air is handled and the entire bottom of unit is insulated with thick fiberglass insulation.

Optional POWER SAVER (Fresh Air) — Available factory or field installed. The Lennox POWER SAVER system consists of: mechanically linked outdoor air, recirculated air and exhaust air dampers. The positioning of these dampers is accomplished by a 24 volt modulating spring return damper motor and controlled by the room thermostat, adjustable mixed air controller, adjustable compressor monitor and enthalpy control. The enthalpy control senses the total heat content of the outdoor air. This unique control prevents excessive moisture laden outdoor air that will add to the cooling load from entering the unit and yet permits cool dry air capable of cooling to enter, thus taking full advantage of free outdoor air for cooling. For field installation the two damper sections simply slide in cavities provided in the unit cabinet. Equipment is shipped factory wired and only requires simple plug-in connection for operation. Fresh air intake section is furnished with cleanable polyurethane air filters. See Accessories table for ordering data.

Optional Low Ambient Controls — System will operate satisfactory down to 35F outdoor air temperature without additional controls. If air conditioning operation is required at outdoor air temperatures colder than 35F a field installed low ambient control kit is required. See Accessories table for ordering.

Optional Hot Gas Bypass Kit — CHA8-953 and 1353 models only. Contain necessary valves and fittings for adding hot gas bypass to refrigeration system. See Accessories table for ordering data.

Optional End Supply & Return Air Discharge Kit — Available for the CHA8-1853 and 2753 models for field conversion from bottom supply and return air handling to end supply and return air pattern. Kit contains divider panel(s), fasteners and instructions. See Accessories table for ordering data. CHA8-953 and 1353 models are converted by relocating bottom opening divider to end of unit.

Optional Thermostat — Thermostat is not furnished and must be ordered extra. For cooling only applications a single stage cooling thermostat is required for CHA8-953 and CHA8-1353 models; a two stage cooling thermostat is required for CHA8-1853 and CHA8-2753 models. When optional electric heat is ordered a heating-cooling thermostat is required. The heating portion may be two stage on most models. For two stage electric heat operation an additional relay (order no. P-8-3251) is required and must be ordered extra.

Optional Minimum Fresh Air Damper — Externally mounted OAD3 fresh air damper section complete with cleanable polyurethane air filters is available. See Accessories table for ordering. It can be either manually or automatically controlled with a damper motor.

Optional Electric Heat — Available factory or field installed. See Electric Heat table for capacities and models available. Electric heat section installs downstream from evaporator coil on the CHA8-953 and 1353 and upstream from the coil on the CHA8-1853 and 2753. The heating elements are helix wound nichrome wire exposed to the air stream for instant heat transfer, lower coil temperatures and longer heater life. The elements are accurately located and insulated from the plated supporting frame by high quality insulators.

Optional Combination Supply and Return Diffusers — Lennox offers two different styles of air diffusers. The RTD step-down model extends below the ceiling level and discharges conditioned air out through grilles on all four sides. The FD model installs almost flush with the ceiling and discharges air down and out through the outside vanes. Both models are equipped with adjustable vanes for distribution and diffusion of conditioned air. Return air enters through the center grille on both models.

Optional Nite Setback Controls — A nite thermostat (P-8-8899), subbase (P-8-8889) and adaptor plate (P-8-8954) (to adapt to vertical outlet box) is available. Two nite setback kits are provided: BM-4762 includes a manual nite setback switch and stainless steel mounting plate. Kit BM-4761 includes a manual set 12 hour nite setback timer and a stainless steel mounting plate. Mounting plate mounts to two standard electrical outlet boxes furnished by installer. An optional 24 hour skip day clock (P-8-3744 with carryover or P-8-4168 less carryover) to program the unit automatically is available. Clock is recommended to be used with the BM-4761 kit and is optional for use with kit BM-4762. In addition, a 7 day time clock (P-8-6858 less carryover or P-8-10213 with carryover) is also available as an option.

Optional Roof Mounting Frame — Durable and serviceable frame is 13 inches high. It sets on the roof support members and is actually built into the roof structure. The top mates to the CHA8 base. A securing bolt kit (BM-6909), containing bolts to secure unit to frame, is available as optional equipment and must be ordered extra.

Optional Remote Readout Panel — Readout Panel (BM2-5358) and Rough-in Box (BM1-5385) must be ordered extra. See bulletin (page 71) in Accessories Section. When panel is used for nite setback operation the following controls must be used and ordered extra; nite thermostat (P-8-8899), subbase (P-8-8889), adaptor plate (P-8-8954) and 24 hour skip-day clock (P-8-3744 with carryover or P-8-4168 less carryover). A 7 day time clock (P-8-6858 less carryover or P-8-10213 with carryover) is also available as an option.

Optional Blower Powered Mixing Damper Boxes — ZDB1 series mixing air boxes with a cfm range of 270 to 1900 are available for zone control system applications. Units install in the duct system within the structure. For data see Accessories section, page 7.

SPECIFICATIONS

Model No.		CHA8-953	CHA8-1353	CHA8-1853	CHA8-2753
*Cooling Capacity @ARI Standard Conditions	Total capacity (Btuh)	196,000	130,000	200,000	273,000
	Total unit watts	12,700	17,100	25,000	35,500
	Dehumidifying capacity	26%	28%	29%	26%
Refrigerant charge (R-22)		16 lbs.	17 lbs.	40 lbs.	48 lbs.
Blower wheel nom. diam. x wid. (in.)		(2) — 12 x 6	(2) — 15 x 9	(2) — 15 x 11	(2) — 15 x 15
Blower Motor Hp See Drive Selection Table	Minimum	2	3	3	5
	Maximum	3	5	5	7-1/2
Condenser Coil	Net face area (sq. ft.)	10.2	13.8	(2) 10.75 ea.	(2) 12.15 ea.
	Tube diam. (in.) & No. of rows	3/8 — 4	3/8 — 4	1/2 — 4	1/2 — 6
	Fins per inch	18	18	13	13
Condenser Fan	Diam. (in.) & No. of blades	(2) 22 — 5	(2) 22 — 5	(2) 25-1/2 — 6	(2) 25-1/2 — 6
	Air volume (cfm)	6000	7550	13,500	13,250
	Motor hp	(2) 1/2	(2) 3/4	(2) 1	(2) 1
	Watts input (total)	1100	1640	2820	2500
Evaporator Coil	Net face area (sq. ft.)	7.4	9.4	(2) 7.67 ea.	(2) 8.75 ea.
	Tube diam. (in.) & No. of rows	3/8 — 4	3/8 — 4	1/2 — 4	1/2 — 4
	Fins per inch	13	13	13	13
No. & size of filters (in.)		(1) 20 x 25 x 1 (2) 16 x 25 x 1	(6) 16 x 20 x 1	(4) 20 x 20 x 1 (4) 16 x 20 x 1	(8) 20 x 20 x 1
Condensate drain size MPT (in.)		3/4	1	1-1/4	1-1/4
Net weight of basic unit (lbs.)		1425	1860	2785	3280

*Rated in accordance with ARI Standard 210; 450 cfm (maximum) evaporator air volume per ton of cooling, 95F outdoor air temperature and 80db/67wb entering evaporator air.

†ARI Standard 210 ratings.

RATINGS

Unit Model No.	Evaporator Air 80F Dry Bulb		Outdoor Air Temperature Entering Condenser (F)											
	Entering Wet Bulb Degrees (F)	Total Air Volume (Cfm)	85			95			105			115		
			Total Cooling Capacity (Btuh)	Sensible to Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible to Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible to Total Ratio (S/T)	Comp. Motor Watts Input	Total Cooling Capacity (Btuh)	Sensible to Total Ratio (S/T)	Comp. Motor Watts Input
CHA8-953	63	3000	98,000	.91	8900	93,000	.94	9500	88,000	.96	10,200	83,000	1.00	11,200
		3375	100,000	.93	9000	95,000	.98	9600	89,000	1.00	10,300	84,000	1.00	11,300
		3750	102,000	.97	9100	96,000	1.00	9700	91,000	1.00	10,400	86,000	1.00	11,400
	67	3000	106,000	.73	9300	100,000	.74	9900	95,000	.77	10,700	89,000	.78	11,600
		3375	108,000	.75	9400	102,000	.76	10,000	96,000	.78	10,800	91,000	.80	11,800
		3750	109,000	.76	9500	104,000	.77	10,100	98,000	.80	10,900	92,000	.83	11,900
	71	3000	113,000	.57	9700	107,000	.58	10,300	102,000	.59	11,200	96,000	.60	12,100
		3375	115,000	.57	9800	109,000	.58	10,400	104,000	.60	11,300	98,000	.61	12,200
		3750	117,000	.58	9900	111,000	.59	10,500	105,000	.61	11,400	100,000	.62	12,300
CHA8-1353	63	4400	135,000	.84	12,200	129,000	.86	12,900	123,000	.89	13,800	115,000	.92	14,800
		4950	138,000	.87	12,300	131,000	.90	13,000	125,000	.92	13,900	117,000	.96	15,000
		5500	139,000	.90	12,400	133,000	.93	13,200	126,000	.96	14,000	118,000	1.00	15,100
	67	4400	143,000	.71	12,600	136,000	.72	13,400	129,000	.74	14,200	121,000	.77	15,300
		4950	145,000	.73	12,800	138,000	.75	13,500	131,000	.77	14,300	123,000	.80	15,400
		5500	146,000	.76	12,900	140,000	.77	13,600	133,000	.80	14,400	125,000	.82	15,500
	71	4400	150,000	.58	13,000	143,000	.59	13,800	136,000	.61	14,600	127,000	.63	15,700
		4950	152,000	.60	13,200	146,000	.61	14,000	138,000	.63	14,700	129,000	.65	15,800
		5500	155,000	.62	13,300	148,000	.63	14,200	141,000	.64	14,800	131,000	.67	15,900
CHA8-1853	63	6000	191,600	.84	17,000	181,400	.86	18,400	170,800	.90	19,900	160,100	.93	21,300
		6750	195,500	.87	17,100	185,000	.90	18,600	174,000	.93	20,100	162,900	.96	21,500
		7500	199,100	.89	17,300	188,300	.92	18,800	177,100	.95	20,300	165,700	.98	21,600
	67	6000	206,600	.67	17,800	195,800	.69	19,300	184,600	.71	20,800	173,100	.73	22,200
		6750	210,900	.69	18,000	199,800	.71	19,500	188,200	.73	21,000	176,300	.75	22,400
		7500	214,900	.71	18,200	203,400	.72	19,700	191,300	.74	21,200	179,200	.76	22,600
	71	6000	222,200	.52	18,600	210,600	.53	20,200	198,300	.54	21,600	186,100	.55	23,000
		6750	226,400	.53	18,900	214,500	.54	20,400	201,800	.55	22,000	189,100	.56	23,200
		7500	230,400	.54	19,100	218,100	.55	20,600	205,000	.56	22,000	192,000	.56	23,500
CHA8-2753	63	8800	261,000	.89	25,100	248,000	.92	26,600	235,000	.94	28,100	222,000	.98	30,000
		9900	266,500	.92	25,300	252,500	.95	26,800	239,200	.97	28,400	225,500	1.00	30,300
	67	8800	282,600	.70	26,000	268,000	.72	27,700	254,000	.74	29,400	239,400	.76	31,500
		9900	288,500	.73	26,400	273,000	.75	28,000	258,000	.76	29,700	242,700	.78	31,800
	71	8800	304,500	.54	27,300	288,000	.55	29,000	272,000	.56	30,800	255,800	.58	32,900
		9900	309,800	.55	27,600	292,600	.56	29,300	276,000	.58	31,200	259,500	.59	33,200

ACCESSORIES

Accessory Description	Accessory Order No. & Net Weight (lbs.)			
	CHA8-953	CHA8-1353	CHA8-1853	CHA8-2753
POWER SAVER and No. & size of filters (in.)	RD3-95 (275 lbs.) (2) 20 x 25 x 1	RD3-135 (360 lbs.) (4) 16 x 25 x 1	RD3-185 (510 lbs.) (3) 20 x 36 x 1	RD3-275 (606 lbs.) (4) 20 x 36 x 1
Minimum fresh air damper and No. & size of filters (in.)	OAD3-95 (38 lbs.) (1) 16 x 20 x 1	OAD3-135 (60 lbs.) (1) 20 x 20 x 1	OAD3-185 (101 lbs.) (1) 25 x 27 x 1	OAD3-275 (107 lbs.) (1) 26 x 31 x 1
Automatic Kit for OAD3 Damper	BM-5563 (9 lbs.)	BM-5563 (9 lbs.)	BM-5563 (9 lbs.)	BM-5563 (9 lbs.)
RP2-1 Remote Readout Panel	BM2-5358 (5 lbs.)	BM2-5358 (5 lbs.)	BM2-5358 (5 lbs.)	BM2-5358 (5 lbs.)
RP2-00-1 Rough-in Box	BM1-5358 (3 lbs.)	BM1-5358 (3 lbs.)	BM1-5358 (3 lbs.)	BM1-5358 (3 lbs.)
Remote Readout Panel Kit	BM-5893 (5 lbs.)	BM-5893 (5 lbs.)	BM-5893 (5 lbs.)	BM-5893 (5 lbs.)
Low Ambient Control Kit	LB-80249BB (8 lbs.)	LB-80249BB (8 lbs.)	LB-80249BA (8 lbs.)	LB-80249BA (8 lbs.)
Hot Gas Bypass Kit	BM-4310 (10 lbs.)	BM-4311 (10 lbs.)	----	----
Roof Mounting Frame	RMF3-95 (100 lbs.)	RMF3-135 (140 lbs.)	RMF3-185/275 (200 lbs.)	RMF3-185/275 (200 lbs.)
Combination Ceiling Supply and Return Kit	BM-3564 (20 lbs.)	BM-3565 (29 lbs.)	BM-3566 (40 lbs.)	BM-3567 (43 lbs.)
Combination Ceiling Supply And Return Step Down Diffuser	RTD-95 (60 lbs.)	RTD-135 (118 lbs.)	RTD-185/275 (172 lbs.)	RTD-185/275 (172 lbs.)
Combination Ceiling Supply And Return Flush Diffuser	FD-95 (50 lbs.) *FD-95-D (50 lbs.)	FD-135 (60 lbs.) *FD-135-D (60 lbs.)	FD-185 (64 lbs.) *FD-185-D (64 lbs.)	FD-275 (69 lbs.) *FD-275-D (69 lbs.)
End Supply & Return Air Discharge Kit	----	----	LB-44878CA (20 lbs.)	LB-44877CA (25 lbs.)
†Blower powered mixing damper boxes	ZDB1-400 (52 lbs.), ZDB1-800 (74 lbs.), ZDB1-1200 (103 lbs.), & ZDB1-1600 (114 lbs.)			

*Flush diffuser with adjustable baffle blades.

†See bulletin (Page 7) in Accessories Section for complete data.

CHA8-953 AND CHA8-1353 ELECTRIC HEAT DATA (Optional) (With various supply air blower motors)

CHA8 Model No.	Electric Heat Model No. & Net Weight (lbs.)	No. of Steps	Volts Input	Kw Input	Btuh Output	†Minimum Circuit Ampacity		
						2 hp	3 hp	5 hp
CHA8-953	ECH8-135-483 (70 lbs.)	1	208	10.6	36,200	51.8	55.7	----
			220	11.85	40,500			
			230	12.95	44,200			
			240	14.1	48,200			
	ECH8-135-483 (70 lbs.)	1	440	11.85	40,500	25.5	27.2	----
			480	14.1	48,200			
	*ECH8-135-963 (90 lbs.)	2	208	21.2	72,400	94.8	98.2	----
			220	23.7	80,900			
			230	25.9	88,400			
	*ECH8-135-963 (137 lbs.)	2	440	23.7	80,900	46.7	48.5	----
			480	28.2	96,300			
	*ECH8-135-1443 (142 lbs.)	3	208	31.8	108,500	136.8	140.7	----
220			35.6	121,500				
230			38.8	132,400				
*ECH8-135-1443 (137 lbs.)	3	440	35.6	121,500	68.0	69.7	----	
		480	42.3	144,400				
CHA8-1353	ECH8-135-483 (70 lbs.)	1	208	10.6	36,200	----	55.7	63.4
			220	11.85	40,500			
			230	12.95	44,200			
			240	14.1	48,100			
	ECH8-135-483 (70 lbs.)	1	440	11.85	40,500	----	27.2	30.7
			480	14.1	48,100			
	*ECH8-135-963 (90 lbs.)	2	208	21.2	72,400	----	98.2	105.9
			220	23.7	80,900			
			230	25.9	88,400			
	*ECH8-135-963 (137 lbs.)	2	440	23.7	80,900	----	48.5	52.0
			480	28.2	96,300			
	*ECH8-135-1443 (142 lbs.)	3	208	31.8	108,500	----	140.7	148.4
			220	35.6	121,500			
			230	38.8	132,400			
	*ECH8-135-1443 (137 lbs.)	3	440	35.6	121,500	----	69.7	73.2
			480	42.3	144,400			
	*ECH8-135-1923 (150 lbs.)	4	208	42.4	144,700	----	183.1	190.9
			220	47.4	161,800			
230			51.7	176,500				
240			56.4	192,500				
*ECH8-135-1923 (150 lbs.)	4	440	47.4	161,800	----	91.0	94.5	
		480	56.4	192,500				

NOTE — Cooling only or Heating-Cooling applications require only one disconnect switch. See field wiring diagram.

NOTE — Time fuses for sub-fusing of CHA8 unit not furnished.

†Refer to National Electric Code manual to determine wire, fuse and disconnect size requirements.

*May be two stage controlled.

ELECTRICAL DATA

CHA8-1853 AND CHA8-2753 ELECTRIC HEAT DATA

CHA8 Model No.	Electric Heat Model No. & Net Weight (lbs.)	No. of Steps	Volts Input	Kw Input	Btuh Output	†Minimum Circuit Ampacity
CHA8-1853	ECH8-275-963 (200 lbs.)	1	208	21.1	72,400	85.0
		1	220	23.7	80,900	
		1	230	25.9	88,400	
		1	240	28.2	96,300	
	ECH8-275-963 (196 lbs.)	1	440	23.7	80,900	42.5
		1	480	28.2	96,300	
	*ECH8-275-1923 (196 lbs.)	2	208	42.4	144,700	170.0
		2	220	47.4	161,800	
		2	230	51.7	176,800	
	*ECH8-275-1923 (195 lbs.)	2	440	47.4	161,800	85.0
		2	480	56.4	192,500	
	*ECH8-275-2883 (196 lbs.)	3	208	63.6	217,100	255.0
		3	220	71.1	242,700	
		3	230	77.7	265,200	
		3	240	84.6	288,700	
	*ECH8-275-2883 (195 lbs.)	3	440	71.1	242,700	127.5
3		480	84.6	288,700		
CHA8-2753	ECH8-275-963 (200 lbs.)	1	208	21.2	72,400	85.0
		1	220	23.7	80,900	
		1	230	25.9	88,400	
		1	240	28.2	96,300	
	ECH8-275-963 (196 lbs.)	1	440	23.7	80,900	42.5
		1	480	28.2	96,300	
	*ECH8-275-1923 (196 lbs.)	2	208	42.4	144,700	170.0
		2	220	47.4	161,800	
		2	230	51.7	176,800	
	*ECH8-275-1923 (195 lbs.)	2	440	47.4	161,800	85.0
		2	480	56.4	192,500	
	*ECH8-275-2883 (196 lbs.)	3	208	63.6	217,100	255.0
		3	220	71.1	242,700	
		3	230	77.7	265,200	
		3	240	84.6	288,700	
	*ECH8-275-2883 (195 lbs.)	3	440	71.1	242,700	127.5
3		480	84.6	288,700		

NOTE — Cooling only applications require one disconnect switch. Heating-cooling applications require two disconnect switches, connect main power supply to switch with the largest rating. See field wiring diagrams.
 †Refer to National Electric Code manual to determine wire, fuse and disconnect size requirements.
 *May be two stage controlled.

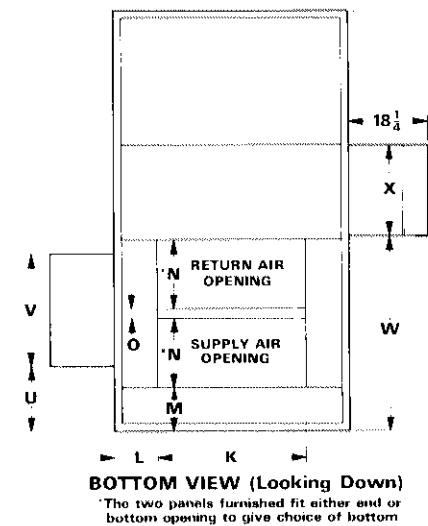
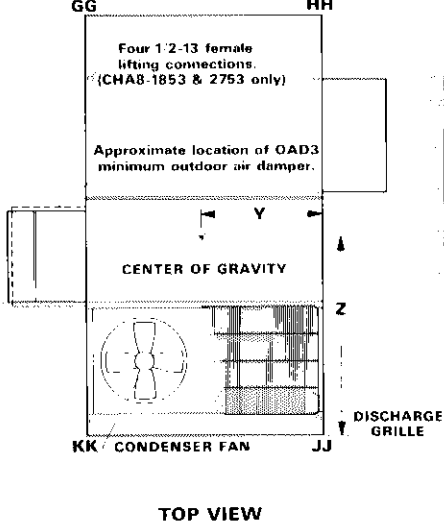
DIMENSIONS (inches)

CORNER WEIGHTS (lbs.)

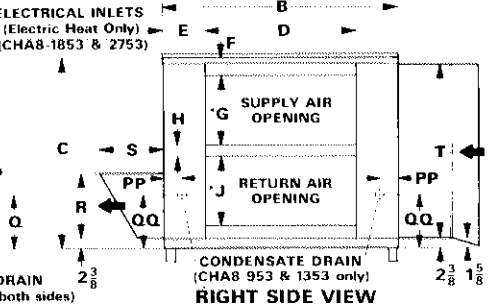
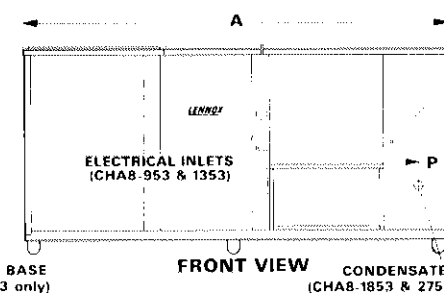
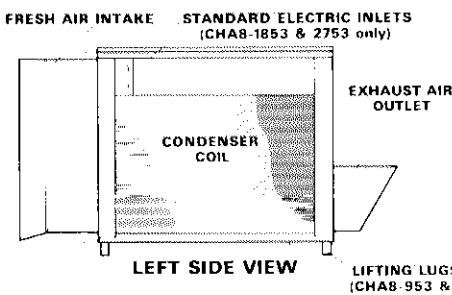
Model No.		GG	HH	KK	JJ
CHA8-953	With Power Saver	324	368	472	536
	Without Power Saver	239	327	362	497
CHA8-1353	With Power Saver	408	455	641	716
	Without Power Saver	301	406	490	663
CHA8-1853	With Power Saver	640	611	1047	997
	Without Power Saver	487	550	822	926
CHA8-2753	With Power Saver	773	702	1264	1147
	Without Power Saver	588	633	993	1066

CENTER OF GRAVITY (in.)

Model No.		Y	Z
CHA8-953	With Power Saver	25 1/2	39 1/2
	Without Power Saver	23	38 1/2
CHA8-1353	With Power Saver	30	45 1/2
	Without Power Saver	27	44 1/2
CHA8-1853	With Power Saver	42 1/2	52
	Without Power Saver	39	51
CHA8-2753	With Power Saver	43 1/2	52
	Without Power Saver	40	51



BOTTOM VIEW (Looking Down)
The two panels furnished fit either end or bottom opening to give choice of bottom or end handling of conditioned air.



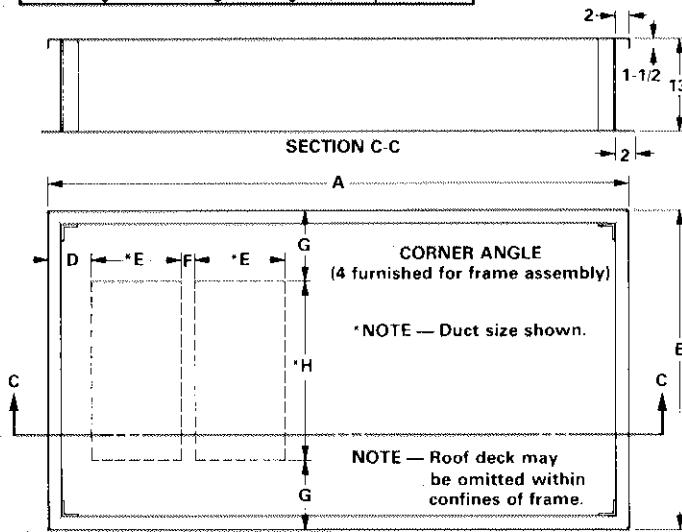
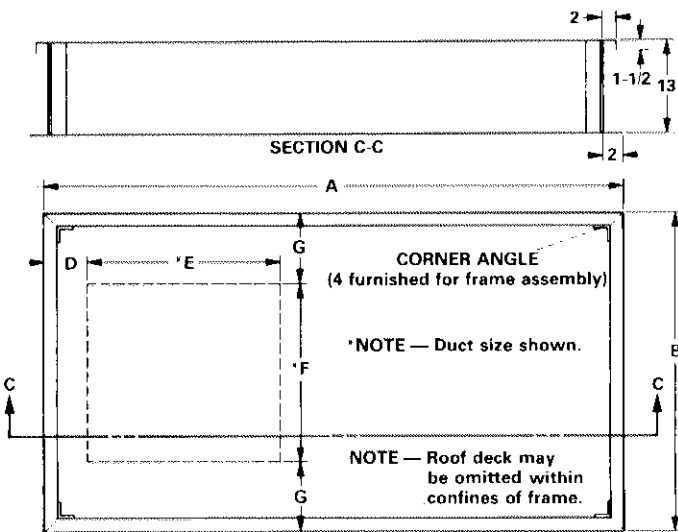
Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N
CHA8-953	97	54 1/2	44 5/8	34 5/8	9 15/16	5 1/2	15 3/4	2-1/8	15 3/4	34 1/16	9-7/8	10	16
CHA8-1353	117	63 1/2	50 5/8	40 5/8	11 7/16	4 5/8	19 1/2	2	19 1/2	40 1/16	11 3/8	12 5/8	20 1/16
CHA8-1853	137	83	52 5/8	51 3/8	15 7/8	1-1/2	23 3/8	1	23 3/8	51	16	12 5/8	24
CHA8-2753	137	83	62 5/8	51 3/8	15 7/8	2-3/8	24 3/8	6-3/8	24 3/8	51	16	12 5/8	24

Model No.	O	P	PP	Q	QQ	R	S	T	U	V	W	X
CHA8-953	2-1/8	---	3-3/4	---	17-5/8	14-7/8	14-5/8	40-3/4	15-1/8	25-7/8	45	21
CHA8-1353	2	---	3-5/16	---	17-13/16	14-7/8	14-5/8	46-3/4	18-3/8	36-1/2	55-1/2	31-1/2
CHA8-1853	3	15-1/2	---	17	---	15-3/4	15-5/16	48-3/4	28-1/2	35-1/2	64-1/4	37-1/2
CHA8-2753	3	16-3/16	---	22-5/16	---	24-1/8	20-1/8	58-3/4	28-1/2	35-1/2	64-1/4	37-1/2

RMF3 ROOF MOUNTING FRAME Frame Specifications

Roof Mounting frame is rigid enough to be spanned over its entire length or cantilevered if supported on either side of the center of gravity. The side joint plate must be welded to the RMF3-185/275 frame if it is spanned more than 80 inches or cantilevered more than 40 inches.

Mounting Frame Height	13 inches
Frame moment of inertia (I)	70 in. ⁴
Frame section modulus (I/C)	10.8 in. ³
Mounting frame weight (foot of length)	5.3
Mounting frame design strength (psi)	20,000

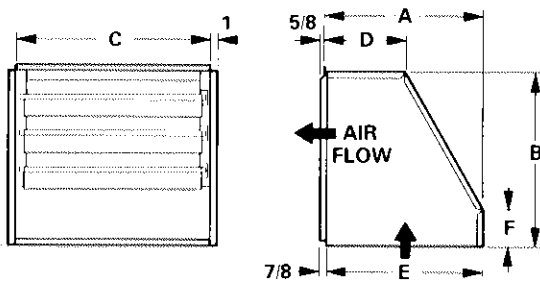


Model No.	Roof Mounting Frame	A	B	D	E	F	G
CHA8-953	RMF3-95	86-3/4	47-3/4	7	34-1/8	34	6-7/8
CHA8-1353	RMF3-135	106-1/4	56-3/4	9-5/8	42-1/8	40	8-3/8
CHA8-1853	RMF3-185/275	126-1/2	76-3/4	9-5/8	51	51	12-7/8
CHA8-2753							

Model No.	Roof Mounting Frame	A	B	D	E	F	G	H
CHA8-953	RMF3-95	86-3/4	47-3/4	7	16	2	6-7/8	34-1/8
CHA8-1353	RMF3-135	106-1/4	56-3/4	9-5/8	20	2	8-3/8	40
CHA8-1853	RMF3-185/275	126-1/2	76-3/4	9-5/8	24	3	12-7/8	51
CHA8-2753								

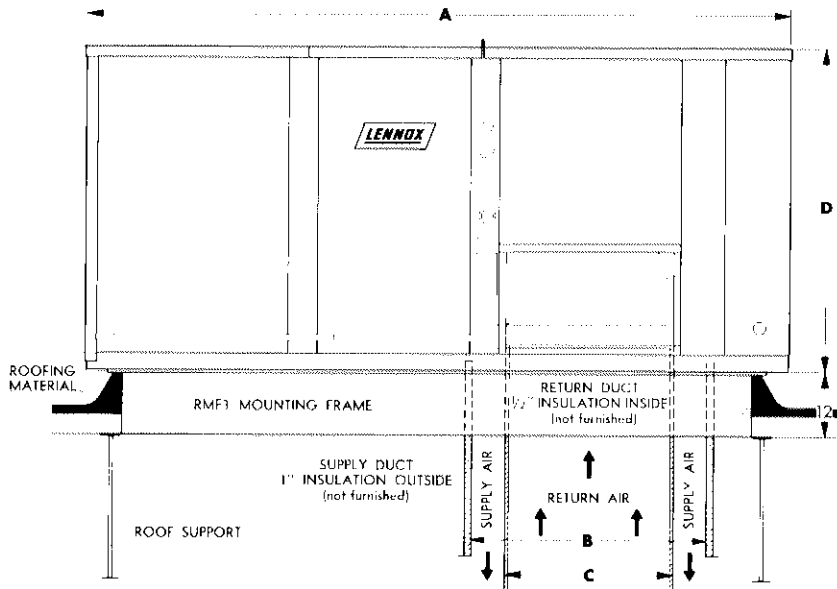
DIMENSIONS (inches)

OAD3 SERIES DAMPER ASSEMBLY (Optional)



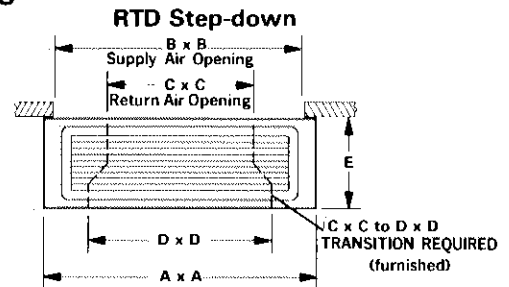
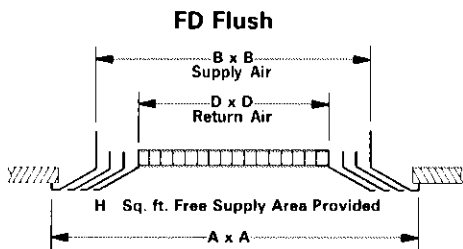
Unit	A	B	C	D	E	F
OAD3-95	17-1/8	17-3/4	21	10-1/8	16-7/8	5-3/4
OAD3-135	20-3/8	22-3/8	25	10-1/8	20-1/8	4-5/8
OAD3-185	22-1/4	27-1/2	29-7/8	12-1/8	22	10-3/4
OAD3-275	24-1/4	33-1/4	29-7/8	12-1/8	24	12-1/4

COMBINATION CEILING SUPPLY AND RETURN AIR DISTRIBUTION SYSTEM



Model No.	A	B	C	D
CHA8-953	97	34 x 33-7/8	22-7/8 x 22-7/8	44-5/8
CHA8-1353	117	42 x 39-7/8	28-7/8 x 28-7/8	50-5/8
CHA8-1853	137	50-7/8 x 50-7/8	35-7/8 x 35-7/8	52-5/8
CHA8-2753	137	50-7/8 x 50-7/8	35-7/8 x 35-7/8	62-5/8

CEILING DIFFUSERS



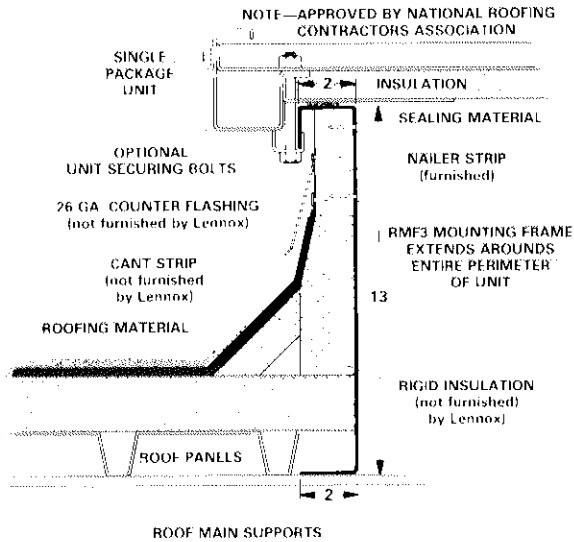
NOTE — Also available with adjustable baffle blades. Same dimensions as above.

- (4) F x G Supply Air Grilles Furnished
- (1) E x E Return Air Grille Furnished

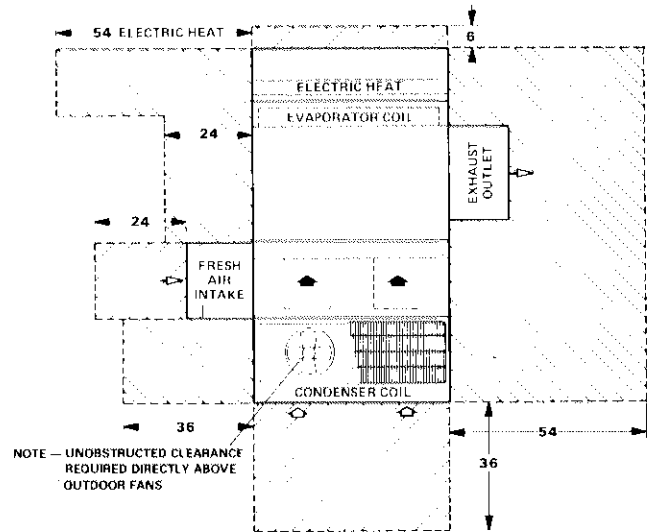
Unit Model No.	Supply and Return Air Grille Model No.	A	B	C	D	E	F	G	H
CHA8-953	RTD-95 step-down	41-1/2	36-1/2	23-1/8	29-1/4	10	36	6	---
	FD-95 Flush FD-95-D Flush (Adj. Baffle Blades)	47-3/4	42	---	30	---	---	---	6 sq. ft.
CHA8-1353	RTD-135 step-down	48	44-1/2	29-1/8	36	12	36	8	---
	FD-135 Flush FD-135-D Flush (Adj. Baffle Blades)	51-3/4	48	---	36	---	---	---	7 sq. ft.
CHA8-1853	RTD-185/275 step-down	60	56-1/2	36	42	15	48	12	---
	FD-185 Flush FD-185-D Flush (Adj. Baffle Blades)	56-3/4	51	---	36	---	---	---	9.06 sq. ft.
CHA8-2753	RTD-185/275 step-down	60	56-1/2	36	42	15	48	12	---
	FD-275 Flush FD-275-D Flush (Adj. Baffle Blades)	68-3/4	63	---	45	---	---	---	13.50 sq. ft.

DIMENSIONS — (inches)

RECOMMENDED FLASHING FOR RMF3 ROOF MOUNTING FRAME



INSTALLATION CLEARANCES — (inches)



ELECTRICAL DATA

Model No.		CHA8-953				CHA8-1353				CHA8-1853				CHA8-2753			
Line voltage (60 Hz — 3 ph)		208/230		460		208/230		460		208/240		440/480		208/240		440/480	
Compressor(s)	RLA (total)	31.8		14.6		46.7		22.8		64.6		29.2		85.6		41.2	
	LRA (total)	185.0		93.0		240.0		128.0		370.0		186.0		480.0		256.0	
	Power factor	.85		.85		.85		.85		.85		.85		.85		.85	
Condenser Fan motors (2)	FLA (total)	6.0		*3.0		8.0		*4.0		8.6		4.3		8.6		4.3	
	LRA (total)	19.0		19.0		19.0		19.0		43.2		21.6		43.2		21.6	
Evaporator Blower Motor	Horsepower	2	3	2	3	3	5	3	5	3	5	3	5	5	7-1/2	5	7-1/2
	FLA	6.2	10.0	3.1	5.0	10.0	14.6	5.0	7.3	9.4	14.6	4.7	7.3	14.6	21.0	7.3	10.5
	LRA	44.0	64.0	22.0	32.0	64.0	92.0	32.0	46.0	64.0	92.0	32.0	46.0	92.0	140.0	46.0	70.0
Recommended Maximum Fuse Size (amps)		80	80	35	40	110	125	60	60	110	125	50	50	150	150	70	80
†Minimum Circuit Ampacity		53.3	56.4	24.7	26.1	77.0	83.1	37.3	40.1	91.1	97.3	41.2	44	120.9	128.4	57.5	60.9

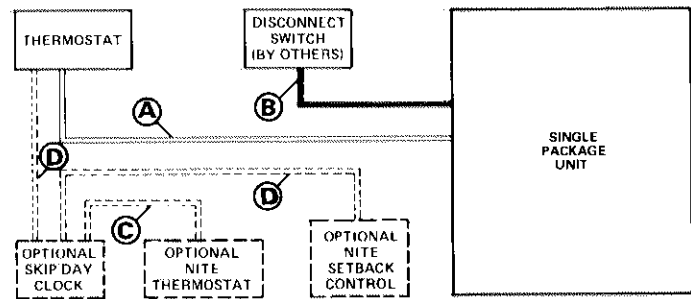
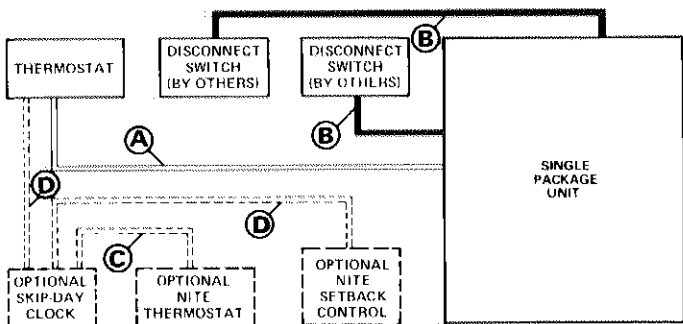
*Motors are rated at 230v, FLA shown is for step down transformer.

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

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

CHA8-1853 AND CHA8-2753 COOLING AND ELECTRIC HEAT

CHA8-953 AND CHA8-1353 COOLING AND ELECTRIC HEAT CHA8-1853 AND CHA8-2753 COOLING ONLY



NOTE — Connect main power supply to disconnect box with largest rating.

All wiring must conform to NEC and local electrical codes.

If local electrical code permits may be class 2 wiring.

- A — *Three wire low voltage (Single Stage Cool Only)
- *Four wire low voltage (Two Stage Cool Only)
- (Single Stage Cool and Single Stage Heat)
- *Five wire low voltage (Single Stage Cool and Two Stage Heat)
- (Two Stage Cool and Single Stage Heat)
- *Six wire low voltage (Two Stage Cool and Two Stage Heat)

*If POWER SAVER and Nite Setback controls are used one additional wire is required.

- B — Three wire power (See Electrical Data Table)
- C — Two wire low voltage
- D — Two wire low voltage (Without POWER SAVER)
- Three wire low voltage (With POWER SAVER)

Additional field wiring is not required when POWER SAVER is used. All wiring is provided in CHA8 and in POWER SAVER, simply make plug-on connections to complete job for field installations.

BLOWER DATA

CHA8-953 BLOWER PERFORMANCE CHART

Air Volume (Cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2600	700	.70	750	.80	795	.90	840	1.00	880	1.07	920	1.15	960	1.25	995	1.35	1030	1.45	1065	1.55	1100	1.70
2800	750	.90	800	1.00	845	1.10	885	1.20	925	1.30	960	1.40	1000	1.50	1035	1.60	1070	1.70	1100	1.80	1130	1.90
3000	810	1.10	850	1.20	890	1.30	930	1.40	970	1.50	1005	1.60	1040	1.75	1075	1.85	1110	1.95	1140	2.05	1170	2.15
3200	860	1.30	900	1.40	940	1.55	980	1.65	1015	1.75	1050	1.90	1080	2.00	1115	2.15	1145	2.25	1175	2.35	1210	2.50
3400	915	1.55	950	1.70	990	1.80	1025	1.95	1060	2.05	1090	2.15	1125	2.30	1150	2.40	1185	2.50	1215	2.65	1245	2.80
3600	970	1.85	1005	2.00	1045	2.15	1075	2.25	1105	2.40	1135	2.50	1165	2.65	1195	2.80	1225	2.90	1255	3.00	1285	3.15
3800	1020	2.20	1050	2.35	1085	2.45	1120	2.60	1150	2.75	1180	2.90	1210	3.05	1240	3.15	1270	3.30	1300	3.45	----	----

NOTE — All cfm data is measured external to the unit using standard return air opening and with filters in place.

CHA8-1353 BLOWER PERFORMANCE CHART

Air Volume (Cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3800	555	1.00	600	1.15	640	1.30	680	1.45	725	1.60	765	1.85	800	2.05	835	2.25	----	----	----	----	----	----
4000	585	1.20	625	1.35	665	1.50	705	1.65	745	1.85	780	2.00	815	2.20	850	2.45	890	2.65	----	----	----	----
4200	615	1.40	650	1.50	690	1.65	730	1.85	770	2.05	800	2.25	835	2.50	870	2.70	905	2.90	935	3.15	----	----
4400	645	1.60	680	1.75	720	1.90	755	2.10	790	2.30	825	2.55	855	2.70	890	2.90	925	3.20	955	3.45	985	3.65
4600	675	1.80	710	2.00	745	2.15	780	2.35	815	2.60	845	2.80	880	3.00	910	3.20	945	3.50	975	3.70	1005	3.95
4800	700	2.05	740	2.25	770	2.40	805	2.65	835	2.80	865	3.00	900	3.25	930	3.50	965	3.75	995	4.00	1020	4.25
5000	735	2.35	765	2.55	800	2.75	830	2.95	860	3.10	890	3.30	920	3.55	950	3.75	985	4.10	1015	4.30	1040	4.55
5200	765	2.65	795	2.85	825	3.05	855	3.25	885	3.45	915	3.60	945	3.85	975	4.15	1005	4.35	1035	4.60	1060	4.90
5400	795	2.95	820	3.15	850	3.35	880	3.55	910	3.75	940	4.00	965	4.25	995	4.45	1025	4.75	1050	5.00	1080	5.30
5600	825	3.30	850	3.45	880	3.70	905	3.90	930	4.10	960	4.30	990	4.50	1015	4.75	1045	5.05	1070	5.35	1095	5.60

NOTE — All cfm data is measured external to the unit using standard return air opening and with filters in place.

CHA8-1853 BLOWER PERFORMANCE CHART

Air Volume (Cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	490	.95	530	1.15	570	1.30	605	1.40	635	1.55	670	1.70	700	1.85	730	2.00	760	2.15	785	2.30	815	2.50
5500	540	1.30	575	1.45	615	1.65	645	1.80	675	1.95	705	2.10	735	2.25	765	2.40	790	2.60	820	2.80	840	2.95
6000	590	1.70	620	1.85	650	2.00	685	2.20	715	2.40	740	2.60	775	2.80	800	3.00	825	3.15	850	3.30	875	3.50
6500	640	2.15	670	2.35	700	2.55	725	2.70	750	2.85	780	3.05	810	3.30	835	3.50	860	3.65	885	3.85	910	4.10
7000	685	2.65	715	2.90	740	3.10	770	3.30	800	3.50	825	3.70	850	3.90	875	4.15	900	4.35	920	4.55	940	4.75
7500	735	3.25	765	3.45	790	3.70	815	3.95	840	4.15	865	4.35	890	4.60	910	4.80	930	5.00	955	5.25	980	5.55

NOTE — All cfm data is measured external to the unit using standard return air opening and with filters in place.

CHA8-2753 BLOWER PERFORMANCE CHART

Air Volume (Cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6500	530	1.40	570	1.60	605	1.80	640	1.95	675	2.15	705	2.35	730	2.55	760	2.75	785	2.95	810	3.10	835	3.30
7000	570	1.80	605	1.95	640	2.15	675	2.35	705	2.55	735	2.75	760	2.95	790	3.15	815	3.35	840	3.55	865	3.85
7500	615	2.20	645	2.40	675	2.60	705	2.80	735	3.00	765	3.20	795	3.45	820	3.65	845	3.90	870	4.10	895	4.35
8000	650	2.65	680	2.85	715	3.10	745	3.30	770	3.50	800	3.75	825	3.95	850	4.20	875	4.45	900	4.70	920	4.90
8500	690	3.15	720	3.40	750	3.65	780	3.85	805	4.10	830	4.30	855	4.55	880	4.80	905	5.10	930	5.35	950	5.55
9000	730	3.80	760	4.05	790	4.30	815	4.50	840	4.75	865	5.05	890	5.25	915	5.50	940	5.80	960	6.05	980	6.25
9500	775	4.55	800	4.75	825	5.00	850	5.20	875	5.45	900	5.75	925	6.05	950	6.30	970	6.55	990	6.80	1015	7.15
10,000	815	5.25	840	5.50	860	5.70	885	6.00	915	6.30	935	6.55	960	6.85	980	7.15	1000	7.40	1020	7.65	1040	7.95

NOTE — All cfm data is measured external to the unit using standard return air opening and with filters in place.

ACCESSORY PRESSURE DROP

Model No.	Air Volume (cfm)	Power Saver	Total Pressure Drop (inches water gauge)			FD Ceiling Supply & Return
			RTD Combination Ceiling Supply and Return			
			2 Sides	3 Sides	4 Sides	
			Open	Open	Open	
CHA8-953	2600	.08	.31	.28	.23	.19
	2800	.08	.38	.34	.29	.23
	3000	.09	.43	.39	.34	.26
	3200	.09	.49	.44	.38	.29
	3400	.09	.55	.49	.43	.32
	3600	.10	.62	.54	.48	.36
	3800	.10	.68	.59	.53	.40
CHA8-1353	3800	.03	.39	.31	.25	.18
	4000	.03	.43	.35	.28	.21
	4200	.03	.49	.40	.33	.25
	4400	.04	.55	.45	.38	.29
	4600	.04	.62	.51	.43	.34
	4800	.04	.70	.57	.49	.39
	5000	.05	.79	.66	.57	.46
CHA8-1853	5200	.05	.87	.73	.63	.51
	5400	.05	.93	.79	.68	.55
	5000	.02	.555	.465	.425	.22
	5500	.02	.64	.53	.475	.27
	6000	.03	.73	.605	.54	.32
	6500	.03	.84	.685	.60	.37
	7000	.04	.95	.78	.67	.42
*CHA8-2753	7500	.04	1.06	.86	.74	.47
	6500	.00	.45	.39	.35	.17
	7000	.00	.53	.44	.39	.20
	7500	.00	.64	.50	.44	.24
	8000	.00	.79	.58	.51	.29
	8500	.00	----	.69	.60	.24
	9000	.00	----	.85	.70	.38
9500	.00	----	----	.81	.43	
10,000	.00	----	----	.94	.49	

*NOTE — POWER SAVER has no appreciable pressure drop with CHA8-2753.
 NOTE — Pressure drop includes grille and 3' of ductwork.
 NOTE — ECH8 electric heaters have no appreciable pressure drop.

Model No.	Nominal Motor Hp	Maximum Usable Hp	Rpm Range Of All Available Drive Setups (at 1720 Rpm Motor Speed)
CHA8 953	2	2.30	860-1200
	3	3.45	990-1200
CHA8-1353	3	3.45	765-955
	5	5.75	893-1087
CHA8-1853	3	3.45	720-875
	5	5.75	815-970
CHA8-2753	5	5.75	740-890
	7-1/2	8.63	830-980

*Specify exact Bhp, Rpm and power characteristics required when ordering unit. In Canada nominal horsepower is maximum usable horsepower.

CEILING SUPPLY AIR THROW DATA

Model No.	Air Volume (cfm)	Radius of Diffusion (Feet)	
		*RTD Step Down	**Flush
CHA8-953	3000	33	20
	3375	37	22
	3750	41	25
CHA8-1353	4400	44	22
	4950	48	25
	5500	53	28
CHA8-1853	6000	40	30
	6750	44	34
	7500	47	38
CHA8-2753	8800	51	33
	9900	55	37

*Four sides open and terminates at a point where conditioned air reaches a velocity of 50 fpm at the ceiling.
 **Four sides open and terminates at a point where conditioned air reaches a velocity of 35 fpm at the ceiling.

FD CEILING DIFFUSER RECOMMENDED MAX. AIR FLOW

Ceiling Height (feet)	8	9	10	12	15	20
Air Flow (cfm) per side	200	350	550	900	1500	4000

NOTE This data is based on differentials between 15 and 25 degrees.

GUIDE SPECIFICATIONS

General — Furnish and install a one piece air to air DX mechanical cooling system complete with automatic controls. The installed weight shall not be more than lbs. 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 Mount 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 connecting and entry into the conditioned area.

Air Distribution — Equipment shall be capable of (end or bottom) handling of conditioned air.
 Furnish and install a (flush or stepdown) combination ceiling supply and return grille. It shall be capable of not less than ft. radius of effective throw.

Power Saver (Fresh Air Dampers) — Furnish and install complete with all controls an air mixing damper assembly including fresh air, recirculated air and exhaust air dampers. The fresh air section shall be equipped with cleanable air filters. The assembly shall mount within the confines of the CHA8 casing.

Cooling System — The total certified cooling capacity shall not be less than Btuh with air evaporator air volume of cfm, an entering wet bulb air temperature of F, an entering dry bulb air temperature of F and a condenser entering air temperature of F. The total compressor power input shall not exceed Kw at the above conditions. The coils shall be non-ferrous construction with aluminum fins mechanically bonded to seamless copper tubes. Condenser coil shall have sub-cooling rows.
 The compressor shall be resiliently mounted, have built-in 3 mode crankshaft lubrication, crankcase heater, discharge temperature limiter, current and temperature sensing motor overloads.
 The cooling system shall be protected by high and low pressure switches and a five minute compressor timed off cycle controller.

Heating System — Furnish and install a nichrome bare wire electric heat section of Kw capacity. They shall be equipped with fusible links. Sections having more than one circuit shall be step started in 40 second increments per circuit.

Air Movers — Twin centrifugal conditioned air blowers shall have permanently lubricated ball bearings, adjustable belt drives and be capable of delivering cfm at an external static pressure of inches water gauge requiring not more than bhp and rpm. The condenser fans shall be direct driven. All motors shall have inherent protection devices.

Frame and Casing — The frame shall be welded construction. The casing shall be of galvanized panels with a baked on outdoor enamel finish. The entire bottom of cabinet shall be insulated with 1" thick fiberglass insulation. Cabinet panels shall be insulated with not less than 1-1/2" thick fiberglass.

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

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

Blower Powered Mixing Damper Boxes — Shall be available for zone control system applications. Furnish and install complete with controls an air mixing blower powered unit including conditioned air dampers, recirculated air dampers and direct drive blower(s). Capable of delivering Cfm at an external static pressure of inches water gauge. The blower powered unit shall install in the duct system within the structure.