LENNOX

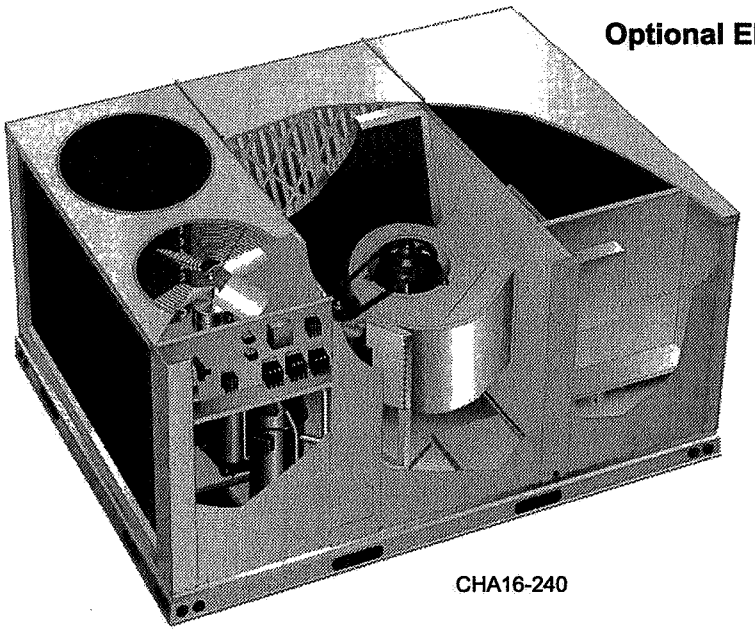
ENGINEERING DATA

PACKAGED COOLING - 50HZ

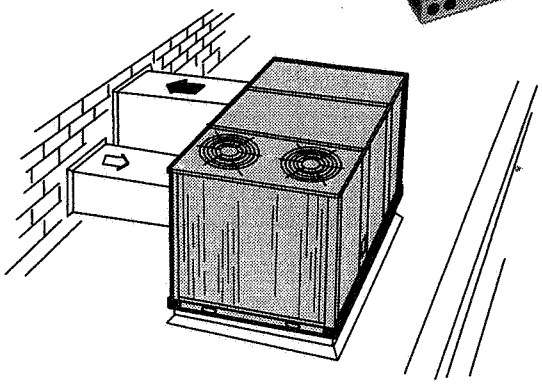
CHA16-180-240

52.8 and 70.3 kW (15 and 20 ton)
Cooling Capacity - 46.8 to 57.4 kW (160 000 and 196 000 Btuh) (48 000 and 58 800 kcal)
Optional Electric Heat - 15 to 75 kW (12 900 to 64 500 kcal)

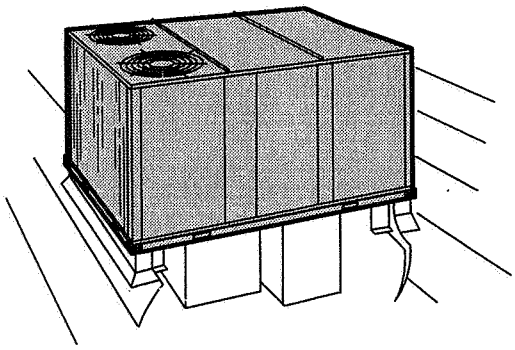
Bulletin No. 490095
July 2000



CHA16-240



Horizontal (Side) Supply and Return Air Installation
With RMF16 Roof Mounting Frame.



Down-Flow Supply and Return Air Installation
With RMF16 Roof Mounting Frame.

MODEL NUMBER IDENTIFICATION

CHA 16 - 180 - 3HP - 1 M

- **Unit Type** — **CHA** = Packaged Cooling Unit
- **Series** — 16
- **Cooling Capacity kW (Tons)** — 180 = 52.8 (15); 240 = 70.3 (20)
- **Blower Motor Output** — 3HP = 2.24 kW (3 hp); 5HP = 3.73 kW (5 hp); 7.5HP = 5.6 kW (7.5 hp)
- **Minor Revision Number** — 1
- **Voltage** — M =380/420v-3 phase-50hz

FEATURES

Air Flow Choice
- Bottom (down-flow) or horizontal (side) supply and return air.

Cabinet
- Heavy gauge galvanized steel, fully insulated, prepainted enamel paint finish, large removeable access panels, electrical inlets (bottom power entry) in cabinet base and indoor section, control box with factory installed controls, full perimeter base rails with forklift slots and holes for rigging.

Coil Construction (Evaporator and Condenser)
- Copper tube construction, ripple-edged enhanced aluminum fins, flared shoulder tubing connections, silver soldered construction, factory tested, evaporator coil face split with separate circuits, evaporator coil drain connection outside of unit cabinet.

NOTE - Due to Lennox' ongoing committment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability.
Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.
Installation and service must be performed by a qualified installer and servicing agency.

FEATURES

Compressors
- Reciprocating type, hermetically sealed, overload protected (-180 models).
- Copeland® Compliant Scroll® type, hermetically sealed, overload protected (-240 models).

Condenser Coils
- "L" shaped formed coil construction.

Condenser Fans
- Low sound operating levels, polyvinyl chloride (PVC) coated fan guard furnished.

Condenser Fan Motors
- Overload protected, permanently lubricated, ball bearings

Filters
- Disposable 51mm (2 inch) pleated.

Refrigeration System
- Consists of: compressors, condenser coil and direct drive fans, evaporator coil and belt drive blower, expansion valves, high capacity driers, full refrigerant charge, freezestats (prevents coil freeze-up during low ambient operation), independent refrigerant circuits (allows staging), low ambient cooling operation down to -1°C (30°F) without additional controls.

Supply Air Blower
- Belt drive, forward curved blades with double inlet, blower wheel statically and dynamically balanced, permanently lubricated sleeve bearings, adjustable pulley (allows speed change).

Supply Air Motor
- Overload protected, equipped with ball bearings.

Unit Testing
- Test conditions are those included in Air Conditioning and Refrigeration Institute (ARI) Standard 340/360-93 while operating at rated voltage and air volumes.
- Units and components are bonded for grounding to meet safety standards for servicing required by Underwriter's Laboratories (UL) and the International Electrotechnical Commission (IEC).
- Blower data is from unit tests conducted in the Lennox Laboratory air test chamber.

OPTIONAL ACCESSORIES (MUST BE ORDERED EXTRA)

Item		CHA16-180	CHA16-240
Coil Guard - Polyvinyl chloride coated steel wire guards to protect outdoor coil. Not used with Hail Guards.		**78L49**	
Control Systems		See Optional Temperature Controls Systems	
Differential Enthalpy Control - For use with economizer dampers, solid-state return air sensor allows selection between outdoor air and return air (whichever has lowest enthalpy).		**54G44**	
Diffusers (Step-Down) - Aluminum grilles, double deflection louvers, large center grille, insulated diffuser box with flanges, hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), adapts to T-bar ceiling grids or plaster ceilings.		RTD11-185 178 kg (392 lbs.)	RTD11-275 183 kg (403 lbs.)
Diffusers (Flush) - Aluminum grilles, fixed blade louvers, large center grille, insulated diffuser box with flanges, hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), adapts to T-bar ceiling grids or plaster ceilings.		FD11-185 131 kg (289 lbs.)	FD11-275 165 kg (363 lbs.)
Transitions (Supply and Return) - Used with diffusers, installs in roof mounting frame, galvanized steel construction, flanges furnished for duct connection, fully insulated.		SRT16-18 34 kg. (75 lbs)	SRT16-24 54 kg (120 lbs.)
Economizer Dampers (Down-Flow or Horizontal) - Mechanically linked recirculated air and outdoor air dampers, plug-in connections to unit, nylon bearings, stainless steel seals (outdoor dampers), 24 volt fully modulating spring return damper motor, adjustable minimum damper position switch, mixed air sensor, solid-state adjustable outdoor air enthalpy control, 0 to 100% outdoor air adjustable, powdered enamel paint finish. NOTE - Economizer Damper Hood is required and must be ordered separately (see below). NOTE - Gravity Exhaust Dampers are required for down-flow applications and must be ordered separately (see below).	Model No. - Net Weight	REMD16M-18/24 95 lbs. (43 kg) (order Economizer Damper Hood for complete assembly)	
	Net face area	0.49 m^2 (5.3 sq. ft.)	
Economizer Damper Hood - Required with REMD16M economizer dampers (see above). Installs over outdoor air dampers. Includes cleanable aluminum mesh frame filters.	Order Number	**81L45** - 16 kg (36 lbs.)	
	Number and Size of Filters	(2) 635 x 635 x 25 mm (25 x 25 x 1 in.)	
Economizer Gravity Exhaust Dampers - Required with REMD16 economizer dampers in down-flow applications. Optional for horizontal applications. Neoprene coated fiberglass dampers. Includes rain hood. Field installs on economizer for down-flow applications. Field installs on return air duct for horizontal applications. See dimension drawings.		GED16-18/24 10 kg. (23 lbs)	
Economizer Power Exhaust Fans - For use with REMD16M economizer dampers (see above). Provides pressure relief. Installed between economizer and gravity exhaust dampers (required). Interlocked to run when return air dampers are closed and supply air blowers are operating. Overload protected. Must be ordered separately.	Model Number - Net Weight	PED16-18/24 - 36 kg (80 lbs.)	
	Diameter - mm (inch) - Number of blades	508 (20) - 5	
	Total air volume - m^3/s (cfm)	2.36 (5000)	
	Motor Watts (horsepower)	(2) - 250 (1/3)	
	Total Watts input	650	
Electric Heat - Factory or field installed, helix wound nichrome elements, time delay for element staging, individual element limit controls, may be two-stage controlled, requires optional Fuse Block		ECH16-185-15 15 kW ECH16-185/300 30-45-60-75 kW	ECH16-185/300 30-45-60-75 kW
Unit Fuse Block - Required for electric heat installation, wiring harness and mounting screws furnished	2.2 kW (3 hp)	**84L20** (45 amp)	- - - -
	5 kW (3.7 hp)	**84L22** (50 amp)	**84L22** (50 amp)
	7.5 kW (5.7 hp)	- - - -	**84L22** (50 amp)

CONTINUED ON NEXT PAGE ▶

OPTIONAL ACCESSORIES (MUST BE ORDERED EXTRA)

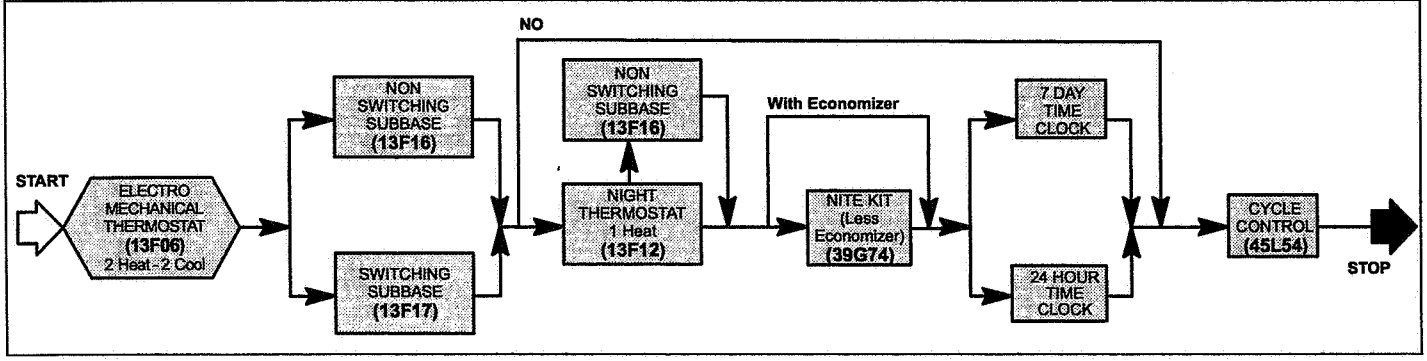
Item		CHA16-180	CHA16-240
Hail Guards - Heavy duty field installed coil guard protects coils from damage. Not used with Coil Guards.		**78L48**	
Horizontal Supply and Return Air Kit - Provides duct connection to unit, flanges furnished, hardware furnished, two filler panels furnished for unused air openings in base.		HDK16-18/24 25 kg (55 lbs.)	
Low Ambient Controls - Allows unit operation down to -17.7°C (0°F).		LB-57113BY **(85L42)**	
Outdoor Air Damper/Hood Section - Linked mechanical dampers, 0 to 25% (fixed) outdoor air adjustable, cleanable aluminum mesh frame type filter furnished in hood, section installs on unit for down-flow applications with Outdoor Air Damper Panel Kit (required must be ordered separately - see below). Damper/Hood section field installs in return air duct for horizontal supply and return air applications, panel kit not required for horizontal applications. Minimum mixed air temperature: Electric heat mode: -1°C (30°F) Maximum mixed air temperature: Cooling mode: 32°C (90°F)		OAD16-18/24 (Order Air Damper Hood and Damper Panel Kit for complete assembly)	
Outdoor Air Damper/Hood - Cleanable aluminum mesh frame type filter furnished, installs over outdoor air damper section.	Order Number - Net Weight	**81L38** - 24 kg (52 lbs.)	
	Number and Size of Filters - mm (inch)	(1) 660 x 711 x 25 (26 x 28 x 1)	
Outdoor Air Damper Panel Kit (Down-Flow Applications) - Interchangeable unit panel - Net Weight		**81L39** - 9 kg (20 lbs.)	
Outdoor Air Damper Motorized Damper Kit - 3 position damper actuator, plug-in connection.		**35G21** - 3 kg (7 lbs.)	
Roof Mounting Frame - Nailer strip furnished, mates to unit, shipped knocked down.		RMF16-18/24 70 kg (154 lbs.)	

OPTIONAL TEMPERATURE CONTROL SYSTEMS

System and Component Description		Catalog Number
ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM		
Thermostat - Two stage heat & two stage cool with dual temperature levers, subbase choice		**13F06**
Subbase - Manual system switch (Off-Heat-Auto-Cool), fan switch (Auto-On)		**13F17**
Subbase - Non-switching		**13F16**
Night Setback Operation - Order components below		-
Heating Thermostat - Single stage heat		**13F12**
Subbase - Non-switching		**13F16**
Night Kit - Required if economizer is not used, contains plug-in relay, overrides operation of day thermostat		**39G74**
Time Clock - 7 day operation, indicates day and night periods, 2 hour increments, battery back-up		**See Price Book for Selection**
Time Clock - 24 hour night setback operation, 15 minute increments, battery back-up		**See Price Book for Selection**
Cycle Control (Required) - provides timed-on and off function, prevents compressor short cycling		**45L54**
T7300 THERMOSTAT CONTROL SYSTEM		
Thermostat — Programmable, internal or optional remote temperature sensing (sensor required), touch sensitive keyboard, automatic switching, °F or °C readout, no anticipator, droop/no droop selection, indicator LED's, hour/day programming, override capabilities, time and operational mode readout, stage status indicators, battery back-up, subbase choice, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On)		**37L54**
Subbase — Selectable staging, indicator LED's, auxiliary relay output for economizer operation	Up to two stage heat and two stage cool	**37L55**
	Up to three stage heat and three stage cool	**37L53**
Sensor - Room temperature		**58C92**
Sensor - Room temperature with 3 hour override and setpoint adjustment		**86G67**
Sensor - Return air temperature		**27C40**
T8621D THERMOSTAT CONTROL SYSTEM		
Thermostats — (T8621D) - Auto changeover, 2 htg./2 clg. 7 day programming , built-in time delays, system switch (Heat-Off-Cool-Auto), fan switch (Auto-On), touch sensitive keyboard, LCD display (Time-Day-Status -Temperature readout in °F or °C), four different time and temperature settings per day, instant override capabilities for skipping current program, running previous program, temporarily raising or lowering temperature for current program or overriding program indefinitely, three "AAA" battery back-up.		**27H29**

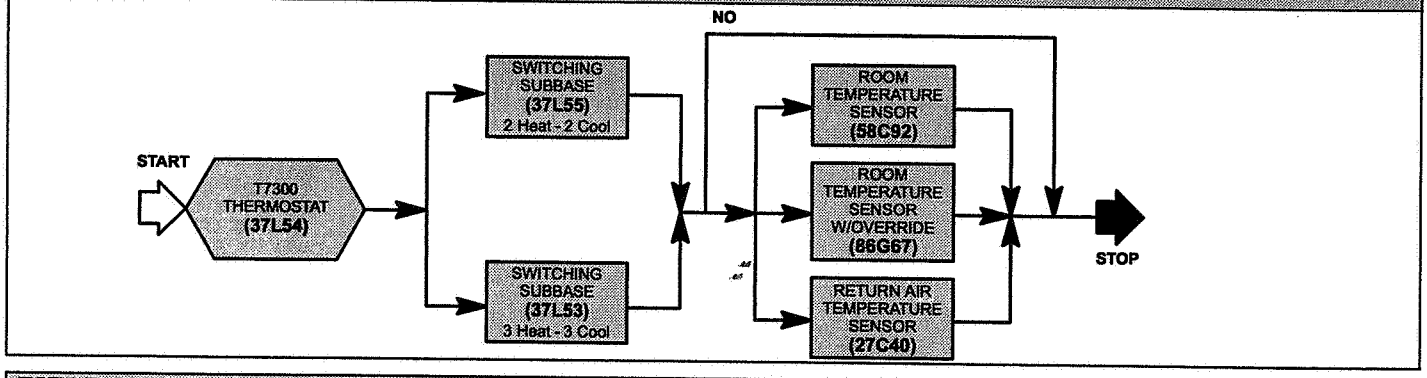
OPTIONAL TEMPERATURE CONTROL SYSTEMS FLOWCHARTS

ELECTRO-MECHANICAL THERMOSTAT



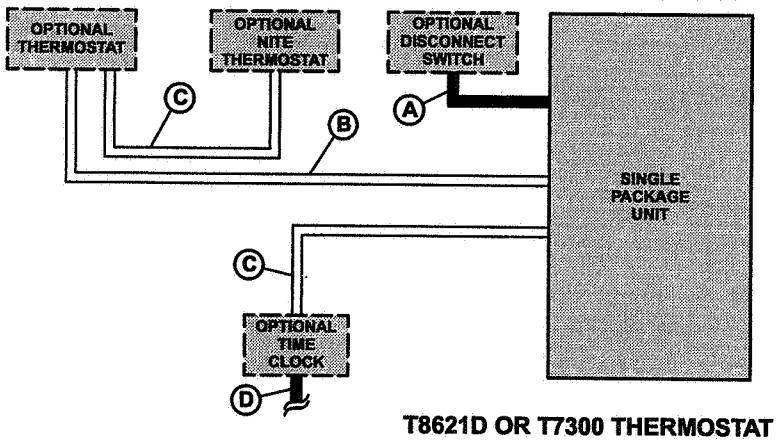
OPTIONAL TEMPERATURE CONTROL SYSTEMS FLOWCHARTS

HONEYWELL T7300 THERMOSTAT



FIELD WIRING

ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM



A — Three phase with neutral (See Electrical Data Table)

B — Six wire 24V

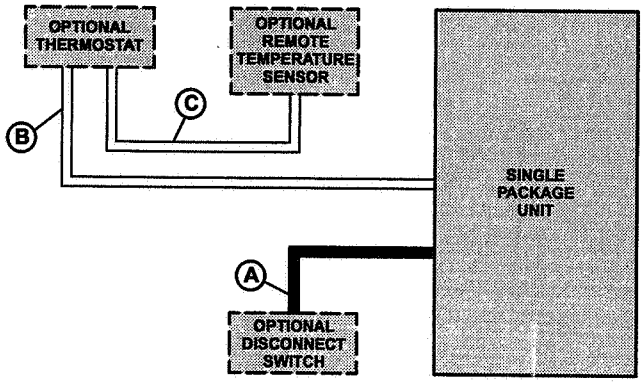
C — Two wire 24V

D — Two wire 24V

— Field wiring not furnished —

NOTE — All wiring must conform to local electrical codes.

T8621D OR T7300 THERMOSTAT CONTROL SYSTEM



A — Three phase with neutral (See Electrical Data Table)

B — Nine wire 24V

C — Two wire 24V

— Seven wire 24V (T7300 Room Sensor with Override)

— Field wiring not furnished —

NOTE — All wiring must conform to local electrical codes.

ELECTRIC DATA

Model Number			CHA16-180		CHA16-240	
Line voltage data - 50 Hz - 3 phase with neutral			380/420V			
Compressors (3)	Rated load amps each (total)		8.6 (25.8)		9.1 (27.3)	
	Locked rotor amps each (total)		55.0 (165.0)		70.0 (210.0)	
Condenser Fan Motor (2)	Full load amps (total)		1.9 (3.8)		2.4 (4.8)	
	Locked rotor amps (total)		3.7 (7.4)		11.5 (23.0)	
Evaporator Blower Motor	Motor Output	kW	2.2	3.7	3.7	5.6
		hp	3	5	5	7.5
	Full load amps		5	7.8	7.8	11.8
	Locked rotor amps		28	50	50	79.5
Recommended maximum fuse size (amps)	**With Exhaust Fan**		**45**	**50**	**50**	**60**
	Less Exhaust Fan		**45**	**45**	**50**	**50**
***Minimum Circuit Ampacity**	**With Exhaust Fan**		**40**	**43**	**45**	**49**
	Less Exhaust Fan		**37**	**40**	**43**	**47**
Optional Power Exhaust Fan	(Number) Watts (hp)		(2) - 250 (1/3)			
	Full load amps (total)		2.6 (5.2)			
	Locked rotor amps (total)		4.8 (9.6)			

SPECIFICATIONS

Model Number			CHA16-180	CHA16-240
Nominal Tonnage (kW)			15 (52.5)	20 (70.0)
Cooling Ratings	Gross cooling capacity - kW (Btuh) (kcal)		49.1 (167 700) (42 300)	60.6 (206 900) (52 100)
	★Total cooling capacity - kW (Btuh) (kcal)		46.8 (160 000) (40 300)	57.4 (196 000) (49 400)
	★Total unit kW		17.4	21.2
	★EER (Btuh/Watts)		9.1	9.2
	★Integrated Part Load Value		9.2	9.2
	C.O.P - Coefficient of Performance		2.7	
Refrigerant Charge Furnished (HCFC-22)	Circuit 1		3.40 kg (7 lbs. 8 oz.)	3.86 kg (8 lbs. 8 oz.)
	Circuit 2		3.40 kg (7 lbs. 8 oz.)	3.86 kg (8 lbs. 8 oz.)
	Circuit 3		3.40 kg (7 lbs. 8 oz.)	3.86 kg (8 lbs. 8 oz.)
Evaporator Blower and Drive Selection	Blower wheel nominal diameter x width - mm (in.)		457 x 457 (18 x 18)	
	2.2 kW Motor and Factory Installed [1]Drives	Nominal motor kW (hp)	2.24 (3)	----
		Maximum usable kW (hp)	2.57 (3.45)	----
		Voltage and phase	380/420v - 3ph with neutral	----
		Rev/min range	640-845	----
	3.7 kW Motor and Factory Installed [1]Drives	Nominal motor kW (hp)	3.73 (5)	
		Maximum usable kW (hp)	4.29 (5.75)	
		Voltage and phase	380/420v - 3ph with neutral	
		Rev/min range	760-960	
	5.6 kW Motor and Factory Installed [1]Drives	Nominal motor kW (hp)	----	5.60 (7.5)
		Maximum usable kW (hp)	----	6.42 (8.6)
		Voltage and phase	----	380/420v - 3ph with neutral
		Rev/min range	----	920-1110
Evaporator Coil	Net face area - m^2 (ft^2)		1.66 (17.9)	
	Tube diameter - mm. (in) and number of rows		9.5 (3/8) - 3	9.5 (3/8) - 4
	Fins per meter (inch)		551 (14)	
	Expansion device type		Thermostatic Expansion Valve	
	Drain connection size male pipe thread - mm (in.)		25.4 (1)	
Condenser Coil	Net face area - m^2 (sq. ft.)		2.74 (29.5)	
	Tube diameter - inch (mm) and number of rows		9.5 (3/8) - 2	
	Fins per meter (inch)		787 (20)	
Condenser Fans	Diameter - mm (inch) and number of blades		(2) 610 (24) - 4	(2) 660 (26) - 4
	Air volume - m^3/s (cfm)		3935 (8335)	5310 (11 250)
	Motor Watts (hp)		560 (3/4)	746 (1)
	Motor rpm		900	950
	Motor watts		920	1570
Filters (furnished)	Type of filter		Disposable, pleated	
	Number and size - mm (in.)		(6) 457 x 610 x 51 (18 x 24 x 2)	
Net weight of basic unit - kg (lbs.)			658 (1450)	714 (1575)
Shipping weight of basic unit - kg (lbs.) (1 Package)			735 (1620)	792 (1745)
Electrical characteristics			380/420v - 50 hertz - 3 phase with neutral	

★The rating test conditions are those included in Air Conditioning and Refrigeration Institute (ARI) Standard 340/360 while operating at rated voltage and air volumes.
[1]Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished by Lennox are shown.

OPTIONAL ELECTRICAL HEAT DATA

CHA16-180

Electric Heat Model Number and Net Weight	No. of Steps	Volts Input	kw Input	Output		†Total Unit and Electric Heat Minimum Circuit Ampacity	
				Btuh	kcal	2.2 kW (3 hp)	3.7 kW (5 hp)
ECH16-185-15 (24H32) 17 kg (38 lbs.)	1	380	9.4	32 100	8 100	40	43
	1	400	10.4	35 500	8 900		
	1	420	11.5	39 200	9 900		
ECH16-185/300-30 (24H33) 19 kg (42 lbs.)	1	380	18.8	64 100	16 200	50	53
	1	400	20.9	71 300	18 000		
	1	420	23.0	78 500	19 800		
ECH16-185/300-45 (24H34) 19 kg (42 lbs.)	[1]2	380	28.2	96 200	24 200	69	73
	[1]2	400	31.2	106 500	26 800		
	[1]2	420	34.4	117 400	29 600		
ECH16-185/300-60 (24H35) 24 kg (53 lbs.)	[1]2	380	37.6	128 300	32 300	73	77
	[1]2	400	41.6	141 200	35 600		
	[1]2	420	45.9	156 600	39 500		
ECH16-185/300-75 (24H36) 26 kg (58 lbs.)	[1]2	380	47.0	160 400	40 200	89	92
	[1]2	400	52.1	177 800	44 800		
	[1]2	420	57.4	195 900	49 400		

[1]May be used with two stage control.

CHA16-240

Electric Heat Model Number and Net Weight	No. of Steps	Volts Input	kw Input	Output		†Total Unit and Electric Heat Minimum Circuit Ampacity	
				Btuh	kcal	3.7 kW (5 hp)	5.6 kW (7.5 hp)
ECH16-185/300-30 (24H33) 19 kg (42 lbs.)	1	380	18.8	64 100	162 00	53	58
	1	400	20.9	71 300	18 000		
	1	420	23.0	78 500	19 800		
ECH16-185/300-45 (24H34) 19 kg (42 lbs.)	[1]2	380	28.2	96 200	24 200	73	78
	[1]2	400	31.2	106 500	26 800		
	[1]2	420	34.4	117 400	29 600		
ECH16-185/300-60 (24H35) 24 kg (53 lbs.)	[1]2	380	37.6	128 300	32 300	77	82
	[1]2	400	41.6	141 200	35 600		
	[1]2	420	45.9	156 600	39 500		
ECH16-185/300-75 (24H36) 26 kg (58 lbs.)	[1]2	380	47.0	160 400	40 200	92	97
	[1]2	400	52.1	177 800	44 800		
	[1]2	420	57.4	195 900	49 400		

[1]May be used with two stage control.

COOLING RATINGS

NOTE — For Temperatures and Capacities not shown in tables, see bulletin — Cooling Unit Rating Table Correction Factor Data in Miscellaneous Engineering Data section.

CHA16-180 — TWO COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																						
			18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)				
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
	m^3/s	cfm	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.26	4800	33.9	115.6	7.80	.71	.85	.97	32.4	110.4	8.40	.72	.87	.99	30.8	105.0	9.06	.74	.89	1.00	29.1	99.4	9.76	.75	.92	1.00
	2.83	6000	35.1	119.8	7.90	.76	.92	1.00	33.5	114.4	8.54	.78	.94	1.00	31.9	108.8	9.24	.80	.97	1.00	30.2	103.2	9.98	.82	.99	1.00
	3.40	7200	36.2	123.4	8.00	.81	.98	1.00	34.6	118.2	8.66	.83	.99	1.00	33.0	112.6	9.40	.86	1.00	1.00	31.4	107.2	10.20	.89	1.00	1.00
19°C (67°F)	2.26	4800	35.9	122.6	7.98	.55	.68	.81	34.3	117.0	8.62	.56	.70	.83	32.6	111.2	9.34	.57	.71	.86	30.8	105.0	10.08	.58	.73	.88
	2.83	6000	37.0	126.2	8.08	.58	.74	.89	35.3	120.4	8.74	.59	.75	.91	33.5	114.4	9.48	.61	.77	.94	31.6	107.8	10.24	.62	.80	.97
	3.40	7200	37.8	129.0	8.14	.61	.79	.95	36.0	123.0	8.84	.63	.81	.97	34.2	116.6	9.58	.64	.84	.99	32.2	110.0	10.36	.66	.87	1.00
22°C (71°F)	2.26	4800	38.2	130.4	8.18	.42	.54	.66	36.5	124.6	8.90	.42	.55	.67	34.6	118.2	9.66	.42	.56	.69	32.8	111.8	10.46	.43	.57	.71
	2.83	6000	39.3	134.0	8.28	.43	.57	.71	37.5	127.8	9.02	.43	.58	.73	35.5	121.2	9.80	.43	.60	.75	33.5	114.4	10.60	.44	.61	.78
	3.40	7200	40.0	136.4	8.34	.44	.60	.77	38.1	130.0	9.10	.44	.62	.79	36.1	123.2	9.88	.45	.63	.82	34.1	116.2	10.70	.46	.65	.85

CHA16-180 — ALL COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																						
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)				
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
	m^3/s	cfm	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.26	4800	48.8	166.5	12.49	.72	.86	.99	45.2	154.2	14.01	.74	.90	1.00	41.5	141.5	15.66	.77	.94	1.00	37.9	129.2	17.23	.81	.98	1.00
	2.83	6000	50.6	172.6	12.67	.77	.94	1.00	46.9	160.0	14.28	.81	.97	1.00	43.3	147.6	16.00	.85	1.00	1.00	39.8	135.9	17.74	.89	1.00	1.00
	3.40	7200	52.2	178.1	12.85	.83	.99	1.00	48.6	165.8	14.55	.87	1.00	1.00	45.0	153.4	16.38	.91	1.00	1.00	41.3	141.0	18.15	.96	1.00	1.00
19°C (67°F)	2.26	4800	51.7	176.5	12.81	.56	.70	.83	47.9	163.3	14.43	.58	.72	.87	43.8	149.4	16.14	.59	.75	.91	39.9	136.1	17.76	.62	.79	.96
	2.83	6000	53.3	181.7	12.99	.59	.75	.91	49.1	167.7	14.64	.61	.78	.95	44.9	153.3	16.40	.64	.82	.99	40.9	139.4	18.05	.66	.87	1.00
	3.40	7200	54.4	185.5	13.11	.63	.81	.97	50.1	171.1	14.81	.65	.85	1.00	45.8	156.3	16.58	.68	.89	1.00	41.8	142.5	18.29	.71	.94	1.00
22°C (71°F)	2.26	4800	55.1	188.0	13.17	.42	.54	.67	50.9	173.8	14.94	.42	.56	.70	46.6	159.0	16.76	.43	.58	.73	42.5	144.9	18.47	.44	.60	.77
	2.83	6000	56.5	192.8	13.35	.43	.58	.73	52.2	178.0	15.12	.44	.60	.76	47.7	162.9	16.97	.45	.62	.80	43.4	148.1	18.73	.46	.66	.85
	3.40	7200	57.5	196.3	13.46	.44	.62	.79	53.0	181.0	15.26	.45	.64	.83	48.4	165.3	17.12	.47	.67	.87	44.0	150.2	18.89	.48	.71	.92

CHA16-240 — TWO COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																						
			18°C (65°F)						24°C (75°F)						29°C (85°F)						35°C (95°F)				
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
	m^3/s	cfm	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.72	5760	41.1	140.4	7.66	.71	.85	.98	40.0	136.4	8.50	.72	.86	.99	38.6	131.8	9.48	.72	.88	1.00	37.2	127.0	10.62	.74	.89	1.00
	3.40	7200	42.7	145.6	7.80	.76	.93	1.00	41.4	141.2	8.66	.77	.94	1.00	40.1	136.8	9.64	.79	.95	1.00	38.6	131.8	10.76	.80	.97	1.00
	4.08	8640	44.0	150.2	7.92	.82	.98	1.00	42.7	145.8	8.78	.83	.99	1.00	41.4	141.2	9.78	.85	1.00	1.00	40.0	136.6	10.92	.87	1.00	1.00
19°C (67°F)	2.72	5760	43.5	148.4	7.88	.55	.68	.81	42.2	144.0	8.74	.56	.69	.83	40.7	139.0	9.72	.57	.70	.84	39.3	134.0	10.84	.57	.72	.86
	3.40	7200	44.8	152.8	8.00	.59	.74	.89	43.4	148.2	8.88	.59	.75	.91	41.9	143.0	9.86	.60	.77	.93	40.3	137.6	11.00	.61	.78	.95
	4.08	8640	45.7	156.0	8.10	.62	.80	.96	44.3	151.2	8.98	.63	.81	.98	42.8	146.0	9.96	.64	.83	.99	41.1	140.4	11.08	.65	.85	1.00
22°C (71°F)	2.72	5760	46.1	157.4	8.14	.42	.54	.66	44.7	152.6	9.02	.42	.54	.67	43.3	147.6	10.00	.42	.55	.68	41.7	142.2	11.14	.42	.56	.69
	3.40	7200	47.3	161.4	8.28	.43	.58	.72	45.9	156.6	9.16	.43	.58	.73	44.3	151.2	10.14	.43	.59	.74	42.7	145.6	11.28	.44	.60	.76
	4.08	8640	48.2	164.4	8.38	.44	.61	.78	46.7	159.2	9.24	.44	.62	.80	45.0	153.6	10.24	.45	.63	.81	43.3	147.8	11.36	.45	.64	.83

CHA16-240 — ALL COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Outdoor Coil																						
			27°C (80°F)						35°C (95°F)						43°C (110°F)						52°C (125°F)				
			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Comp Motor kW Input	Sensible To Total Ratio (S/T) Dry Bulb		
	m^3/s	cfm	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F	kW	kBtuh		24°C 75°F	27°C 80°F	29°C 85°F
17°C (63°F)	2.72	5760	59.1	201.5	13.45	.72	.87	.99	56.0	191.0	15.91	.74	.89	1.00	52.6	179.5	18.84	.76	.93	1.00	48.8	166.6	22.40	.79	.96	1.00
	3.40	7200	61.3	209.0	13.67	.78	.95	1.00	58.1	198.2	16.12	.80	.98	1.00	54.7	186.8	19.11	.83	1.00	1.00	51.2	174.6	22.70	.87	1.00	1.00
	4.08	8640	63.2	215.7	13.88	.84	1.00	1.00	60.2	205.5	16.37	.87	1.00	1.00	56.9	194.0	19.39	.90	1.00	1.00	53.2	181.4	23.01	.94	1.00	1.00
19°C (67°F)	2.72	5760	62.4	212.8	13.81	.56	.70	.84	59.0	201.4	16.24	.57	.72	.86	55.3	188.8	19.23	.59	.74	.89	51.4	175.3	22.76	.60	.77	.93
	3.40	7200	64.1	218.8	13.99	.60	.76	.92	60.6	206.9	16.46	.61	.78	.95	56.9	194.2	19.41	.63	.81	.98	52.7	179.8	22.97	.65	.85	1.00
	4.08	8640	65.4	223.3	14.14	.64	.82	.99	61.8	211.0	16.59	.65	.85	1.00	58.0	197.8	19.56	.67	.89	1.00	53.7	183.4	23.15	.70	.92	1.00
22°C (71°F)	2.72	5760	66.1	225.5	14.23	.42	.55	.68	62.6	213.7	16.68	.42	.56	.70	58.7	200.3	19.67	.43	.57	.72	54.5	185.8	23.24	.43	.59	.75
	3.40	7200	67.7	231.1	14.43	.43	.59	.74	64.1	218.7	16.89	.44	.60	.76	60.1	204.9	19.86	.44	.62	.79	55.6	189.7	23.45	.45	.64	.83
	4.08	8640	68.8	234.9	14.56	.45	.63	.80	65.1	222.1	17.01	.45	.65	.83	61.0	208.0	20.00	.46	.67	.87	56.4	192.6	23.60	.48	.70	.91

BLOWER DATA - CHA16-180

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL & AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:

1 - Wet indoor coil air resistance of selected unit.

2 - Any field installed accessories air resistance (electric heat, economizer, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output.

See Page 9 for wet coil and optional accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

●Units require 2.31 m^3/s (4900 cfm) minimum air with electric heat.

BOLD ITALIC INDICATES FIELD FURNISHED DRIVE

Air Volume cfm (m^3/s)	STATIC PRESSURE EXTERNAL TO UNIT — Inches Water Gauge (Pa)																	
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)	
	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)
4800 (2.27)	***455***	***0.90 (0.67)***	***515***	***1.10 (0.82)***	***570***	***1.25 (0.93)***	***620***	***1.45 (1.08)***	670	1.70 (1.27)	715	1.90 (1.42)	760	2.10 (1.57)	800	2.35 (1.75)	840	2.55 (1.90)	880	2.80 (2.09)
4900 (2.31)	***460***	***0.95 (0.71)***	***520***	***1.10 (0.82)***	***575***	***1.30 (0.97)***	***625***	***1.55 (1.16)***	675	1.75 (1.31)	720	1.95 (1.45)	760	2.15 (1.60)	805	2.40 (1.79)	845	2.65 (1.98)	880	2.85 (2.13)
5000 (2.36)	***470***	***1.00 (0.75)***	***525***	***1.15 (0.86)***	***580***	***1.40 (1.04)***	***630***	***1.60 (1.19)***	675	1.80 (1.34)	720	2.00 (1.49)	765	2.25 (1.68)	805	2.45 (1.83)	845	2.70 (2.01)	885	2.95 (2.20)
5100 (2.41)	***475***	***1.05 (0.78)***	***530***	***1.25 (0.93)***	***585***	***1.45 (1.08)***	***635***	***1.65 (1.23)***	680	1.85 (1.38)	725	2.10 (1.57)	770	2.35 (1.75)	810	2.55 (1.90)	850	2.80 (2.09)	885	3.05 (2.28)
5200 (2.46)	***480***	***1.10 (0.82)***	***535***	***1.30 (0.97)***	***590***	***1.50 (1.12)***	640	1.70 (1.27)	685	1.95 (1.45)	730	2.15 (1.60)	775	2.40 (1.79)	815	2.65 (1.98)	850	2.85 (2.13)	890	3.15 (2.35)
5300 (2.50)	***485***	***1.15 (0.86)***	***545***	***1.35 (1.01)***	***595***	***1.55 (1.16)***	645	1.80 (1.34)	690	2.00 (1.49)	735	2.25 (1.68)	775	2.45 (1.83)	815	2.70 (2.01)	855	2.95 (2.20)	890	3.20 (2.39)
5400 (2.55)	***495***	***1.20 (0.90)***	***550***	***1.40 (1.04)***	***600***	***1.60 (1.19)***	650	1.85 (1.38)	695	2.05 (1.53)	740	2.30 (1.72)	780	2.55 (1.90)	820	2.80 (2.09)	860	3.05 (2.28)	895	3.30 (2.46)
5500 (2.60)	***500***	***1.25 (0.93)***	***555***	***1.45 (1.08)***	***605***	***1.70 (1.27)***	655	1.90 (1.42)	700	2.15 (1.60)	745	2.40 (1.79)	785	2.65 (1.98)	825	2.90 (2.16)	860	3.10 (2.31)	900	3.40 (2.54)
5600 (2.65)	***505***	***1.30 (0.97)***	***560***	***1.55 (1.16)***	***610***	***1.75 (1.31)***	660	2.00 (1.49)	705	2.25 (1.68)	745	2.45 (1.83)	790	2.70 (2.01)	830	3.00 (2.24)	865	3.20 (2.39)	900	3.45 (2.57)
5700 (2.69)	***515***	***1.40 (1.04)***	***570***	***1.60 (1.19)***	***620***	***1.85 (1.38)***	665	2.05 (1.53)	710	2.30 (1.72)	750	2.55 (1.90)	790	2.80 (2.09)	830	3.05 (2.28)	870	3.30 (2.46)	905	3.55 (2.65)
5800 (2.74)	***520***	***1.45 (1.08)***	***575***	***1.65 (1.23)***	***625***	***1.90 (1.42)***	670	2.15 (1.60)	715	2.40 (1.79)	755	2.60 (1.94)	795	2.85 (2.13)	835	3.15 (2.35)	875	3.40 (2.54)	910	3.65 (2.72)
5900 (2.79)	***530***	***1.50 (1.12)***	***580***	***1.75 (1.31)***	***630***	***2.00 (1.49)***	675	2.20 (1.64)	720	2.45 (1.83)	760	2.70 (2.01)	800	2.95 (2.20)	840	3.25 (2.42)	875	3.50 (2.61)	910	3.75 (2.80)
6000 (2.83)	***535***	***1.60 (1.19)***	***585***	***1.80 (1.34)***	***635***	***2.05 (1.53)***	680	2.30 (1.72)	725	2.55 (1.90)	765	2.80 (2.09)	805	3.05 (2.28)	845	3.35 (2.50)	880	3.60 (2.69)	915	3.85 (2.87)
6100 (2.88)	***545***	***1.65 (1.23)***	***595***	***1.90 (1.42)***	640	2.15 (1.60)	685	2.40 (1.79)	730	2.65 (1.98)	770	2.90 (2.16)	810	3.15 (2.35)	845	3.40 (2.54)	885	3.70 (2.76)	920	3.95 (2.95)
6200 (2.93)	***550***	***1.75 (1.31)***	***600***	***1.95 (1.45)***	645	2.20 (1.64)	690	2.45 (1.83)	735	2.75 (2.05)	775	3.00 (2.24)	815	3.25 (2.42)	850	3.50 (2.61)	890	3.80 (2.83)	925	4.10 (3.06)
6300 (2.98)	***560***	***1.80 (1.34)***	***605***	***2.05 (1.53)***	655	2.30 (1.72)	695	2.55 (1.90)	740	2.80 (2.09)	780	3.10 (2.31)	820	3.35 (2.50)	855	3.60 (2.69)	890	3.90 (2.91)	925	4.15 (3.10)
6400 (3.02)	***565***	***1.90 (1.42)***	***615***	***2.15 (1.60)***	660	2.40 (1.79)	705	2.65 (1.98)	745	2.90 (2.16)	785	3.20 (2.39)	825	3.45 (2.57)	860	3.70 (2.76)	895	4.00 (2.98)	930	4.30 (3.21)
6500 (3.07)	***570***	***1.95 (1.45)***	***620***	***2.20 (1.64)***	665	2.50 (1.87)	710	2.75 (2.05)	750	3.00 (2.24)	790	3.30 (2.46)	830	3.55 (2.65)	865	3.85 (2.87)	900	4.10 (3.06)	935	4.40 (3.28)
6600 (3.12)	***580***	***2.05 (1.53)***	***625***	***2.30 (1.72)***	670	2.55 (1.90)	715	2.85 (2.13)	755	3.10 (2.31)	795	3.40 (2.54)	830	3.65 (2.72)	870	3.95 (2.95)	905	4.25 (3.17)	940	4.55 (3.39)
6700 (3.16)	***585***	***2.15 (1.60)***	***635***	***2.40 (1.79)***	680	2.70 (2.01)	720	2.95 (2.20)	760	3.20 (2.39)	800	3.50 (2.61)	835	3.75 (2.80)	875	4.05 (3.02)	910	4.35 (3.25)	945	4.65 (3.47)
6800 (3.21)	***595***	***2.25 (1.68)***	640	2.50 (1.87)	685	2.75 (2.05)	725	3.05 (2.28)	765	3.30 (2.46)	805	3.60 (2.69)	840	3.85 (2.87)	880	4.20 (3.13)	915	4.50 (3.36)	945	4.75 (3.54)
6900 (3.26)	***600***	***2.30 (1.72)***	645	2.55 (1.90)	690	2.85 (2.13)	730	3.10 (2.31)	770	3.40 (2.54)	810	3.70 (2.76)	845	3.95 (2.95)	885	4.30 (3.21)	915	4.55 (3.39)	950	4.85 (3.62)
7000 (3.31)	***610***	***2.40 (1.79)***	655	2.70 (2.01)	695	2.95 (2.20)	740	3.25 (2.42)	775	3.50 (2.61)	815	3.80 (2.83)	850	4.10 (3.06)	885	4.40 (3.28)	920	4.70 (3.51)	955	5.00 (3.73)
7100 (3.35)	***615***	***2.50 (1.87)***	660	2.80 (2.09)	705	3.10 (2.31)	745	3.35 (2.50)	785	3.65 (2.72)	820	3.95 (2.95)	855	4.20 (3.13)	890	4.50 (3.36)	925	4.80 (3.58)	960	5.15 (3.84)
7200 (3.40)	***625***	***2.60 (1.94)***	665	2.85 (2.13)	710	3.20 (2.39)	750	3.45 (2.57)	790	3.75 (2.80)	825	4.05 (3.02)	860	4.35 (3.25)	895	4.65 (3.47)	930	4.95 (3.69)	***965***	***5.30 (3.95)***

BLOWER DATA - CHA16-240

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL & AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:

1 - Wet indoor coil air resistance of selected unit.

2 - Any field installed accessories air resistance (electric heat, economizer, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output.

See Page 9 for wet coil and optional accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

•Units require 2.31 m^3/s (4900 cfm) minimum air with electric heat.

BOLD ITALIC INDICATES FIELD FURNISHED DRIVE

Air Volume cfm (m^3/s)	STATIC PRESSURE EXTERNAL TO UNIT — Inches Water Gauge (Pa)																			
	.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)		2.00 (495)	
	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)	rev/ min	BHP (kW)
6000 (2.83)	***560***	***1.70 (1.27)***	***610***	***1.95 (1.45)***	***660***	***2.20 (1.64)***	***710***	***2.45 (1.83)***	755	2.75 (2.05)	795	3.00 (2.24)	840	3.30 (2.46)	880	3.60 (2.69)	915	3.85 (2.87)	955	4.20 (3.13)
6100 (2.88)	***565***	***1.75 (1.31)***	***620***	***2.05 (1.53)***	***670***	***2.30 (1.72)***	***715***	***2.55 (1.90)***	760	2.85 (2.13)	800	3.10 (2.31)	845	3.40 (2.54)	885	3.70 (2.76)	920	3.95 (2.95)	955	4.25 (3.17)
6200 (2.93)	***575***	***1.85 (1.38)***	***625***	***2.10 (1.57)***	***675***	***2.35 (1.75)***	***720***	***2.65 (1.98)***	765	2.90 (2.16)	805	3.20 (2.39)	850	3.50 (2.61)	885	3.75 (2.80)	925	4.10 (3.06)	960	4.40 (3.28)
6300 (2.98)	***580***	***1.90 (1.42)***	***635***	***2.20 (1.64)***	***680***	***2.45 (1.83)***	***725***	***2.75 (2.05)***	770	3.00 (2.24)	815	3.30 (2.46)	850	3.60 (2.69)	890	3.90 (2.91)	930	4.20 (3.13)	965	4.50 (3.36)
6400 (3.02)	***590***	***2.00 (1.49)***	***640***	***2.30 (1.72)***	***685***	***2.55 (1.90)***	***735***	***2.85 (2.13)***	775	3.10 (2.31)	820	3.45 (2.57)	855	3.70 (2.76)	895	4.00 (2.98)	935	4.35 (3.25)	970	4.65 (3.47)
6500 (3.07)	***595***	***2.10 (1.57)***	***645***	***2.35 (1.75)***	***695***	***2.65 (1.98)***	***740***	***2.95 (2.20)***	780	3.20 (2.39)	825	3.55 (2.65)	860	3.80 (2.83)	900	4.10 (3.06)	940	4.45 (3.32)	975	4.75 (3.54)
6600 (3.12)	***605***	***2.20 (1.64)***	***655***	***2.45 (1.83)***	***700***	***2.75 (2.05)***	***745***	***3.05 (2.28)***	785	3.30 (2.46)	830	3.65 (2.72)	865	3.90 (2.91)	905	4.25 (3.17)	940	4.55 (3.39)	975	4.85 (3.62)
6700 (3.16)	***610***	***2.25 (1.68)***	***660***	***2.55 (1.90)***	***705***	***2.85 (2.13)***	***750***	***3.15 (2.35)***	795	3.45 (2.57)	835	3.75 (2.80)	870	4.00 (2.98)	910	4.35 (3.25)	945	4.65 (3.47)	980	4.95 (3.69)
6800 (3.21)	***620***	***2.35 (1.75)***	***665***	***2.65 (1.98)***	***715***	***2.95 (2.20)***	***755***	***3.25 (2.42)***	800	3.55 (2.65)	840	3.85 (2.87)	880	4.20 (3.13)	915	4.50 (3.36)	950	4.80 (3.58)	985	5.10 (3.80)
6900 (3.26)	***625***	***2.45 (1.83)***	***675***	***2.75 (2.05)***	***720***	***3.05 (2.28)***	765	3.35 (2.50)	805	3.65 (2.72)	845	3.95 (2.95)	885	4.30 (3.21)	920	4.60 (3.43)	955	4.90 (3.66)	990	5.25 (3.92)
7000 (3.31)	***635***	***2.55 (1.90)***	***680***	***2.85 (2.13)***	***725***	***3.15 (2.35)***	770	3.45 (2.57)	810	3.75 (2.80)	850	4.10 (3.06)	890	4.40 (3.28)	925	4.75 (3.54)	960	5.05 (3.77)	995	5.40 (4.03)
7100 (3.35)	***640***	***2.65 (1.98)***	***690***	***3.00 (2.24)***	***735***	***3.30 (2.46)***	775	3.60 (2.69)	815	3.90 (2.91)	855	4.20 (3.13)	895	4.55 (3.39)	930	4.85 (3.62)	965	5.20 (3.88)	1000	5.55 (4.14)
7200 (3.40)	***650***	***2.80 (2.09)***	***695***	***3.05 (2.28)***	***740***	***3.40 (2.54)***	780	3.70 (2.76)	820	4.00 (2.98)	860	4.35 (3.25)	900	4.70 (3.51)	935	5.00 (3.73)	970	5.35 (3.99)	1005	5.65 (4.21)
7300 (3.45)	***655***	***2.85 (2.13)***	***705***	***3.20 (2.39)***	***745***	***3.50 (2.61)***	790	3.85 (2.87)	830	4.15 (3.10)	865	4.45 (3.32)	905	4.80 (3.58)	940	5.15 (3.84)	975	5.45 (4.07)	1010	5.80 (4.33)
7400 (3.49)	***665***	***3.00 (2.24)***	***710***	***3.30 (2.46)***	755	3.65 (2.72)	795	3.95 (2.95)	835	4.30 (3.21)	870	4.60 (3.43)	910	4.95 (3.69)	945	5.25 (3.92)	980	5.60 (4.18)	1015	5.95 (4.44)
7500 (3.54)	***675***	***3.10 (2.31)***	***715***	***3.40 (2.54)***	760	3.75 (2.80)	800	4.05 (3.02)	840	4.40 (3.28)	880	4.75 (3.54)	915	5.05 (3.77)	950	5.40 (4.03)	985	5.75 (4.29)	1020	6.10 (4.55)
7600 (3.59)	***680***	***3.20 (2.39)***	***725***	***3.55 (2.65)***	765	3.85 (2.87)	805	4.20 (3.13)	845	4.50 (3.36)	885	4.90 (3.66)	920	5.20 (3.88)	955	5.55 (4.14)	990	5.90 (4.40)	1020	6.20 (4.63)
7700 (3.64)	***690***	***3.35 (2.50)***	***730***	***3.65 (2.72)***	775	4.00 (2.98)	815	4.35 (3.25)	850	4.65 (3.47)	890	5.00 (3.73)	925	5.35 (3.99)	960	5.70 (4.25)	995	6.05 (4.51)	1025	6.40 (4.77)
7800 (3.68)	***695***	***3.45 (2.57)***	***740***	***3.80 (2.83)***	780	4.15 (3.10)	820	4.45 (3.32)	860	4.80 (3.58)	895	5.15 (3.84)	930	5.50 (4.10)	965	5.85 (4.36)	1000	6.20 (4.63)	1030	6.55 (4.89)
7900 (3.73)	***705***	***3.60 (2.69)***	***745***	***3.90 (2.91)***	785	4.25 (3.17)	825	4.60 (3.43)	865	4.95 (3.69)	900	5.30 (3.95)	935	5.65 (4.21)	970	6.00 (4.48)	1005	6.35 (4.74)	1035	6.70 (5.00)
8000 (3.78)	***710***	***3.70 (2.76)***	***755***	***4.05 (3.02)***	795	4.40 (3.28)	835	4.75 (3.54)	870	5.10 (3.80)	905	5.45 (4.07)	940	5.80 (4.33)	975	6.15 (4.59)	1010	6.50 (4.85)	1040	6.85 (5.11)
8100 (3.82)	***720***	***3.85 (2.87)***	***760***	***4.20 (3.13)***	800	4.55 (3.39)	840	4.90 (3.66)	875	5.25 (3.92)	915	5.60 (4.18)	950	6.00 (4.48)	980	6.30 (4.70)	1015	6.70 (5.00)	1045	7.05 (5.26)
8200 (3.87)	***730***	***4.00 (2.98)***	770	4.35 (3.25)	810	4.70 (3.51)	845	5.05 (3.77)	885	5.40 (4.03)	920	5.75 (4.29)	955	6.15 (4.59)	985	6.45 (4.81)	1020	6.85 (5.11)	1050	7.20 (5.37)
8300 (3.92)	***735***	***4.15 (3.10)***	775	4.45 (3.32)	815	4.85 (3.62)	855	5.20 (3.88)	890	5.55 (4.14)	925	5.90 (4.40)	960	6.30 (4.70)	995	6.65 (4.96)	1025	7.00 (5.22)	1055	7.35 (5.48)
8400 (3.97)	***745***	***4.30 (3.21)***	785	4.65 (3.47)	825	5.00 (3.73)	860	5.35 (3.99)	895	5.70 (4.25)	930	6.05 (4.51)	965	6.45 (4.81)	1000	6.85 (5.11)	1030	7.20 (5.37)	1065	7.60 (5.67)
8500 (4.01)	***750***	***4.40 (3.28)***	790	4.75 (3.54)	830	5.15 (3.84)	865	5.50 (4.10)	900	5.85 (4.36)	940	6.25 (4.66)	970	6.60 (4.92)	1005	7.00 (5.22)	1035	7.35 (5.48)	1070	7.80 (5.82)
8600 (4.06)	760	4.60 (3.43)	800	4.95 (3.69)	835	5.30 (3.95)	875	5.70 (4.25)	910	6.05 (4.51)	945	6.45 (4.81)	975	6.75 (5.04)	1010	7.15 (5.33)	1040	7.55 (5.63)	1075	7.95 (5.93)
8700 (4.11)	765	4.70 (3.51)	805	5.10 (3.80)	845	5.45 (4.07)	880	5.85 (4.36)	915	6.20 (4.63)	950	6.60 (4.92)	985	7.00 (5.22)	1015	7.35 (5.48)	1045	7.70 (5.74)	1080	8.15 (6.08)
8800 (4.16)	775	4.90 (3.66)	815	5.25 (3.92)	850	5.60 (4.18)	885	6.00 (4.48)	920	6.35 (4.74)	955	6.75 (5.04)	990	7.15 (5.33)	1020	7.50 (5.60)	1055	7.95 (5.93)	1085	8.35 (6.23)
8900 (4.20)	785	5.05 (3.77)	820	5.40 (4.03)	860	5.80 (4.33)	895	6.20 (4.63)	930	6.55 (4.89)	960	6.90 (5.15)	995	7.35 (5.48)	1025	7.70 (5.74)	1060	8.15 (6.08)	1090	8.55 (6.38)
9000 (4.25)	790	5.20 (3.88)	830	5.60 (4.18)	865	5.95 (4.44)	900	6.35 (4.74)	935	6.75 (5.04)	970	7.15 (5.33)	1000	7.50 (5.60)	1035	7.95 (5.93)	1065	8.30 (6.19)	1095	8.70 (6.49)

BLOWER DATA

ACCESSORY AIR RESISTANCE

Unit Model Number	Air Volume		Total Resistance - Pa (inches water gauge)						
			Wet Evaporator Coil	Electric Heat	REMD16M Down-Flow Economizer	RTD11 Step-Down Diffuser			FD11 Flush Diffuser
	m^3/s	cfm				2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	
CHA16-180	2.27	4800	35 (.14)	37(.15)	7 (.03)	114 (.46)	99 (.40)	90 (.36)	60 (.24)
	2.36	5000	35 (.14)	42 (.17)	7 (.03)	127 (.51)	109 (.44)	97 (.39)	67 (.27)
	2.46	5200	37 (.15)	50 (.20)	7 (.03)	139 (.56)	119 (.48)	104 (.42)	75 (.30)
	2.55	5400	40 (.16)	55 (.22)	10 (.04)	152 (.61)	129 (.52)	112 (.45)	81 (.33)
	2.65	5600	42 (.17)	55 (.22)	10 (.04)	164 (.66)	139 (.56)	119 (.48)	90 (.36)
	2.74	5800	45 (.18)	62 (.25)	12 (.05)	177 (.71)	147 (.59)	127 (.51)	97 (.39)
	2.83	6000	47 (.19)	64 (.26)	12 (.05)	189 (.76)	157 (.63)	137 (.55)	104 (.42)
	2.93	6200	50 (.20)	72 (.29)	12 (.05)	199 (.80)	169 (.68)	147 (.59)	114 (.46)
	3.02	6400	52 (.21)	77 (.31)	15 (.06)	214 (.86)	179 (.72)	157 (.63)	124 (.50)
	3.12	6600	55 (.22)	80 (.32)	15 (.06)	229 (.92)	191 (.77)	167 (.67)	134 (.54)
	3.21	6800	57 (.23)	82 (.33)	17 (.07)	246 (.99)	206 (.83)	179 (.72)	144 (.58)
	3.31	7000	60 (.24)	82 (.33)	17 (.07)	256 (1.03)	216 (.87)	189 (.76)	154 (.62)
	3.40	7200	62 (.25)	85 (.34)	20 (.08)	271 (1.09)	229 (.92)	199 (.80)	164 (.66)
CHA16-240	2.83	6000	60 (.24)	64 (.26)	12 (.05)	90 (.36)	77 (.31)	67 (.27)	72 (.29)
	3.07	6500	70 (.28)	80 (.32)	15 (.06)	104 (.42)	90 (.36)	77 (.31)	85 (.34)
	3.31	7000	77 (.31)	82 (.33)	17 (.07)	122 (.49)	102 (.41)	90 (.36)	99 (.40)
	3.54	7500	85 (.34)	99 (.40)	22 (.09)	127 (.51)	114 (.46)	102 (.41)	112 (.45)
	3.78	8000	94 (.38)	104 (.42)	25 (.10)	147 (.59)	122 (.49)	107 (.43)	124 (.50)
	4.01	8500	104 (.42)	124 (.50)	27 (.11)	172 (.69)	144 (.58)	124 (.50)	142 (.57)
	4.25	9000	114 (.46)	144 (.58)	32 (.13)	196 (.79)	167 (.67)	144 (.58)	164 (.66)

PED16-18/24 POWER EXHAUST FANS PERFORMANCE

Model Number	Air Volume		Return Air System Static Pressure	
	m^3/s	cfm	Pa	In. w.g.
PED16-18/24	2.83	6000	0	0
	2.69	5700	12	.05
	2.50	5300	25	.10
	2.36	5000	37	.15
	2.21	4700	50	.20
	1.98	4200	62	.25
	1.70	3600	75	.30

CEILING DIFFUSER AIR THROW DATA

Model Number	Air Volume		[1] Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	m^3/s	cfm	m	ft.	m	ft.
CHA16-180	2.65	5600	12 - 15	39 - 49	9 - 11	28 - 37
	2.74	5800	13 - 16	42 - 51	9 - 12	29 - 38
	2.83	6000	13 - 17	44 - 54	12 - 15	40 - 50
	2.93	6200	14 - 17	45 - 55	13 - 16	42 - 51
	3.02	6400	14 - 17	46 - 55	13 - 16	43 - 52
	3.12	6600	14 - 17	47 - 56	14 - 17	45 - 56
CHA16-240	3.40	7200	10 - 12	33 - 38	8 - 11	26 - 35
	3.49	7400	11 - 12	35 - 40	9 - 11	28 - 37
	3.59	7600	11 - 13	36- 41	9 - 12	29 - 38
	3.68	7800	11 - 13	38 - 43	12 - 15	40 - 50
	3.78	8000	12 - 13	39 - 44	13 - 16	42 - 51
	3.87	8200	12 - 14	41 - 46	13 - 16	43 - 52
	3.97	8400	13 - 15	43 - 49	13 - 17	44 - 54
	4.06	8600	13 - 15	44 - 50	14 - 17	46 - 57
	4.16	8800	14 - 17	47 - 55	15 - 18	48 - 59

[1] Throw is the horizontal or vertical distance an air stream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 15 m (50 ft.) per minute. Four sides open.

GUIDE SPECIFICATIONS

General
- *Furnish and install a single package air to air direct expansion 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 test operate system at the factory before shipment.*

Air Distribution
- *Equipment shall be capable of bottom (down-flow) or side (horizontal) handling of conditioned air.*

Cooling System
- *The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Condenser coil shall be formed coil construction.*
- *Compressors shall be resiliently mounted and have overload protection. The refrigeration system shall have discharge, suction and liquid line service gauge ports, driers, freezestats and full refrigerant charge.*
- *Control option available shall consist of low ambient controls.*

Cabinet
- *Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal.*
- *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. Bottom power entry shall be furnished.*
- *Shall have peep hole with cover for flame viewing of burners.*
- *Evaporator coil condensate drain extended outside cabinet shall be provided.*
- *Lifting holes in full perimeter base rails shall be provided for rigging.*

Service Access
- *Large removeable panels shall allow complete service access to compressor/heating/controls, blower and air filter/economizer compartments.*

Supply Air Blowers
- *Centrifugal supply air blower shall have permanently lubricated sleeve bearings and adjustable belt drive.*
- *Motor mount base shall permit ease of motor changeover and belt tension adjustment with a belt tensioning lead screw.*
- *Blower wheel shall be statically and dynamically balanced.*
- *Supply air blower motor shall have ball bearings.*

Condenser Fans
- *Direct drive propeller type condenser fans shall discharge vertically.*
- *Fan motor shall have ball bearings and be permanently lubricated and inherently protected.*
- *Fans shall have a safety guard.*

Air Filters
- *Disposable 51 mm (2 inch) thick pleated filters shall be furnished.*

OPTIONAL ACCESSORIES

Additive Electric Heaters
- *Electric heaters shall be available for field installation.*
- *Heating elements shall be nichrome bare wire exposed directly to the air stream. Time delays shall bring the elements on and off in sequence wit a time delay between each element.*
- *Limit controls shall provide overload and short circuit protection.*
- *Optional unit fuse block shall be required on electric heaters.*

Roof Mounting Frame
- *Mechanical contractor shall install a steel roof mounting frame for bottom discharge and return air duct connection.*
- *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.*

Economizer Damper Section
- *Furnish and install economizer complete with recirculated air dampers, outside air dampers, damper actuator and controls.*
- *Low leakage dampers shall ride in nylon bearings. The economizer section shall provide for the introduction of up to 100% outdoor air for minimum ventilation and free cooling.*
- *Integrated economizer cycle shall allow compressors to cycle for dehumidification and additional cooling, as needed, with 100% outdoor air intake.*
- *Damper actuator shall be 24 volt, fully modulating spring return. Controls shall include fixed 13 °C (55 °F) mixed air controller, damper actuator, adjustable minimum position switch and solid-state adjustable outdoor air enthalpy control.*
- *Damper hood (required and ordered separately) with filters shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal.*
- *Gravity exhaust dampers shall be required and ordered separately for down-flow air applications and optional for horizontal applications.*

Economizer Gravity Exhaust Dampers
- *Pressure operated dampers shall be required for field installation on economizer in down-flow air applications.*
- *Dampers shall be available as an option for field installation in return air duct for horizontal air applications.*
- *Neoprene coated fiberglass dampers shall prevent blow-back and outdoor air infiltration during off cycle.*

Economizer Power Exhaust Fans
- *Shall be available for all models with economizer (down-flow applications only).*
- *Direct drive propeller type fans shall exhaust air through optional gravity exhaust dampers (required).*
- *Motor shall be overload protected.*
- *Fans shall be field installed between economizer and gravity exhaust dampers.*

Outdoor Air Damper Section
- *Optional outdoor dampers shall be available for down-flow applications to provide outdoor air requirements of up to 25%.*
- *Shall be available for manual or automatic (with optional motorized damper kit) operation.*
- *Damper/hood assembly field installs external to the unit.*
- *Hood with filters shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal.*
- *Optional panel kit that replaces unit panel shall be required for damper/hood installation.*

Horizontal Supply & Return Air Kit
- *Optional kit shall provide necessary cabinet parts to field convert unit for side (horizontal) supply and return air duct connections.*

Ceiling Diffusers
- *Furnish and install a (flush or stepdown) optional combination ceiling supply and return air diffuser.*
- *Supply and return transitions shall be available, for field installation in the roof mounting frame, to provide duct connection to the diffuser.*

Control Systems
- *Shall provide a selection of thermostats and related controls to automatically operate the mechanical equipment through the heating or cooling and ventilating cycles as required.*

DIMENSIONS - MM (INCHES)

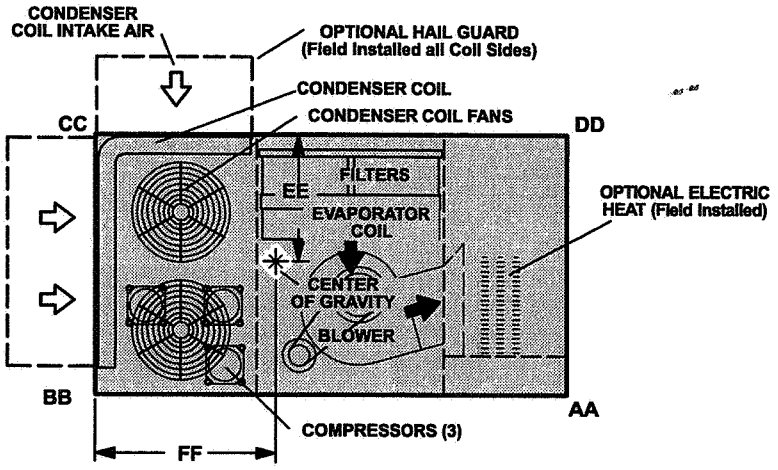
Basic Unit

CORNER WEIGHTS

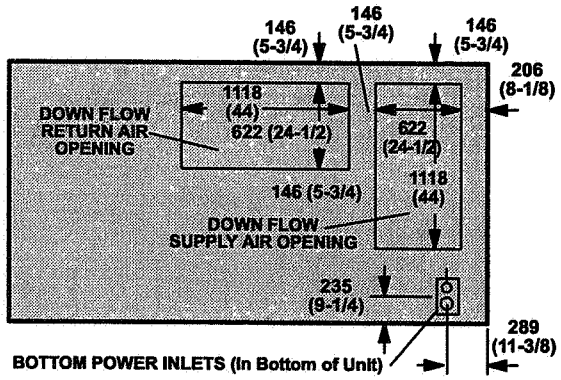
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
CHA16-180	146	322	196	432	178	392	138	302
CHA16-240	156	343	217	479	195	429	147	323

CENTER OF GRAVITY

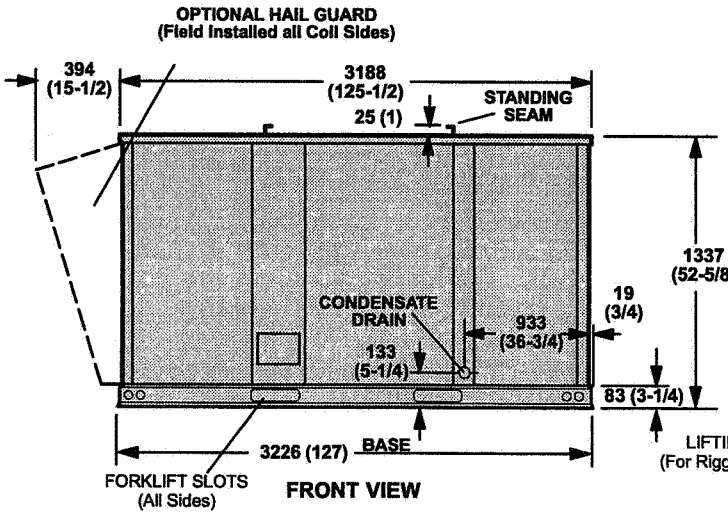
Model Number	EE		FF	
	mm	inch	mm	inch
CHA16-180	1026	40-3/8	1327	52-1/4
CHA16-240	1038	40-7/8	1289	50-3/4



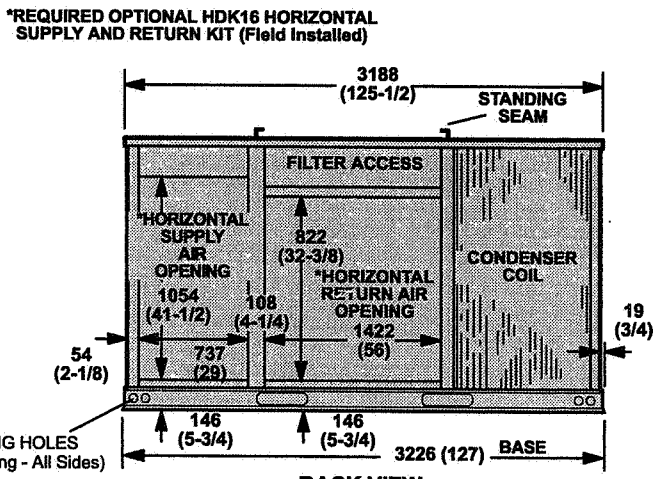
TOP VIEW



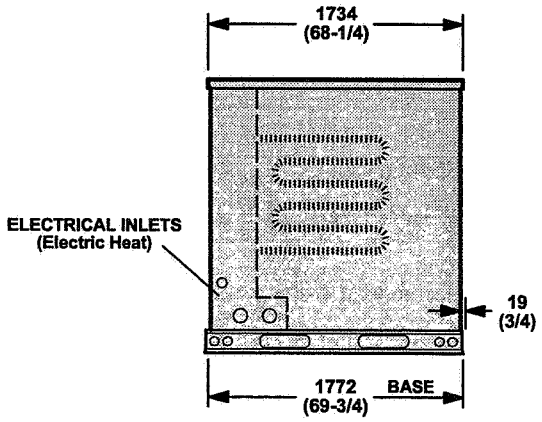
TOP VIEW BASE SECTION



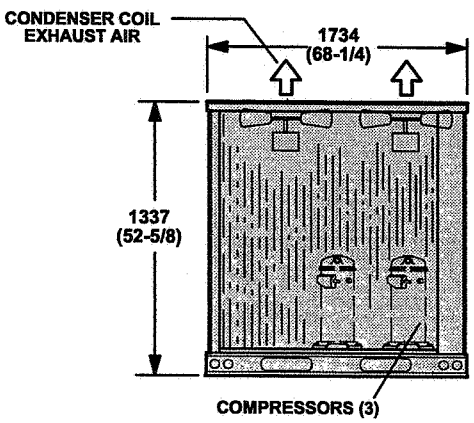
FRONT VIEW



BACK VIEW
WITH HORIZONTAL SUPPLY & RETURN AIR OPENING



HEAT SECTION END VIEW



CONDENSER SECTION END VIEW

DIMENSIONS - MM (INCHES)

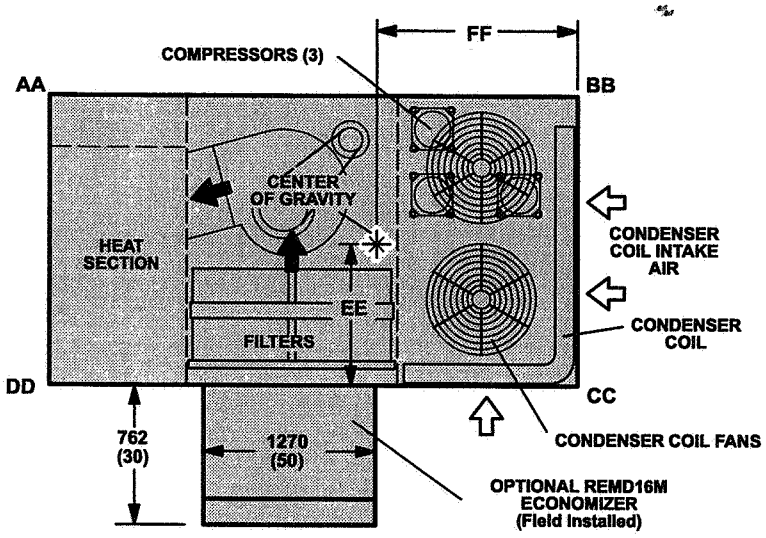
Basic Unit With REMD16M (Down-Flow) Economizer Damper Section & RMF16 Roof Mounting Frame

CORNER WEIGHTS

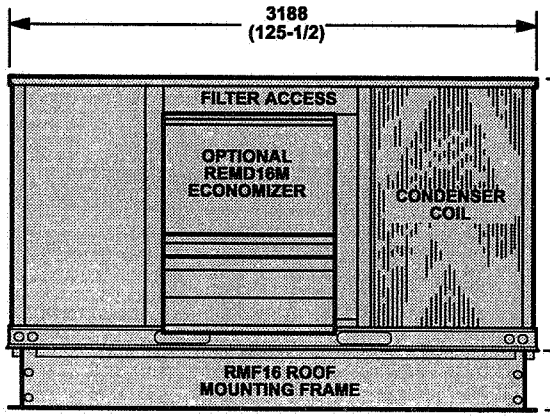
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
CHA16-180	165	363	216	476	218	480	166	365
CHA16-240	174	383	237	522	237	522	174	383

CENTER OF GRAVITY

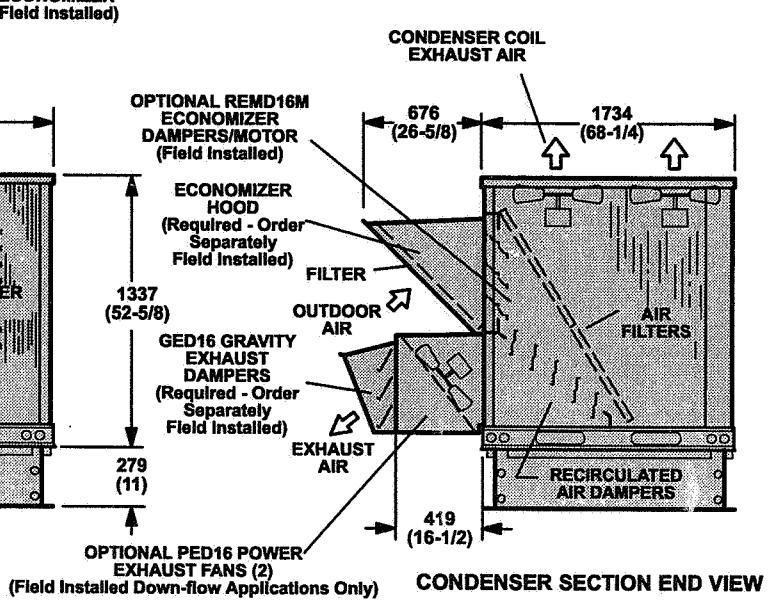
Model Number	EE		FF	
	mm	inch	mm	inch
CHA16-180	873	34-3/8	1327	52-1/4
CHA16-240	886	34-7/8	1289	50-3/4



TOP VIEW

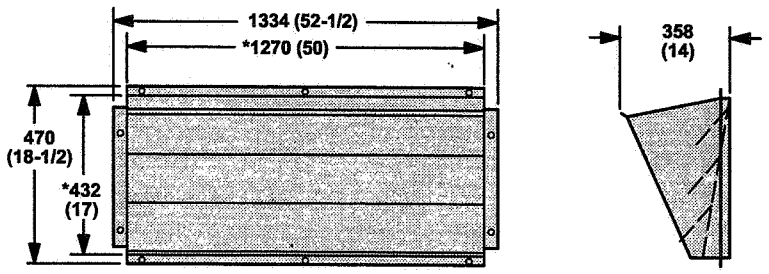


BACK VIEW



CONDENSER SECTION END VIEW

GED16 GRAVITY EXHAUST DAMPERS



FRONT VIEW

SIDE VIEW

*NOTE — Opening size required in return air duct for horizontal applications.

DIMENSIONS - MM (INCHES)

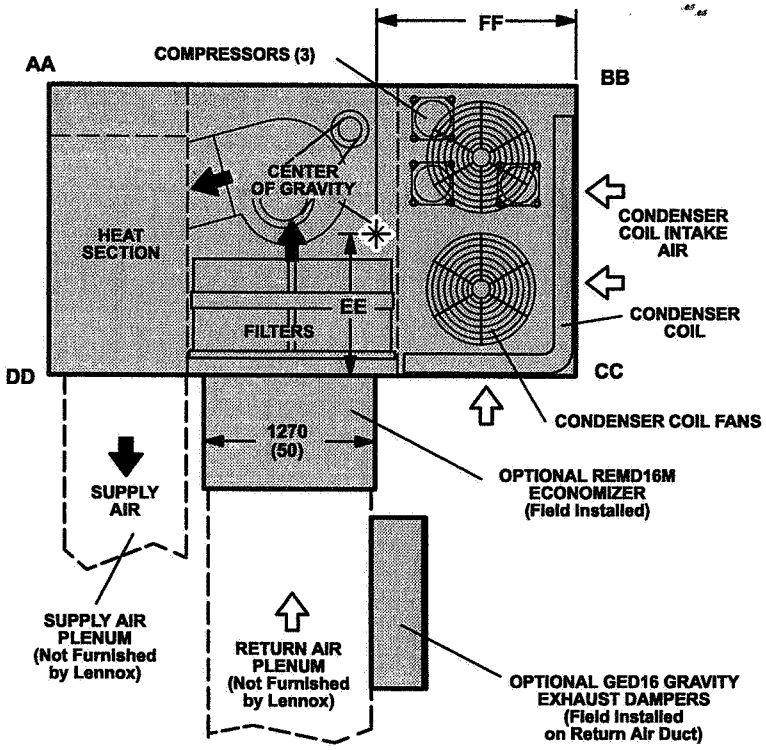
Basic Unit With REMDH16M Economizer Damper Section - Horizontal Installation

CORNER WEIGHTS

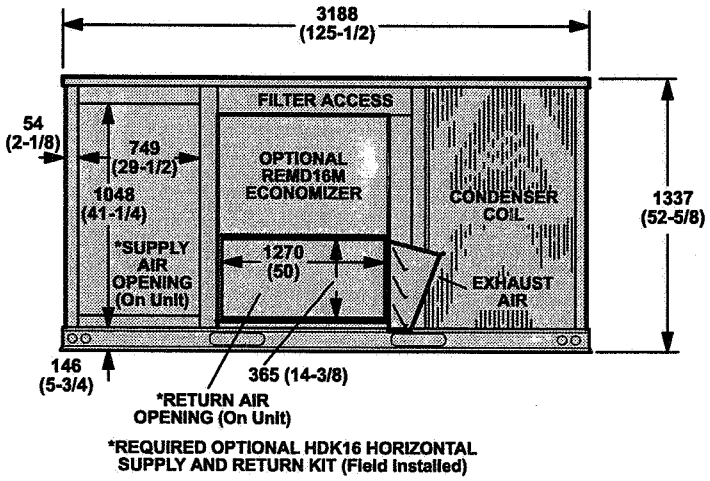
Model Number	AA		BB		CC		DD	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
CHA16-180	162	357	214	471	208	459	159	351
CHA16-240	171	377	235	518	226	499	168	370

CENTER OF GRAVITY

Model Number	EE		FF	
	mm	inch	mm	inch
CHA16-180	924	36-3/8	1327	52-1/4
CHA16-240	937	36-7/8	1289	50-3/4

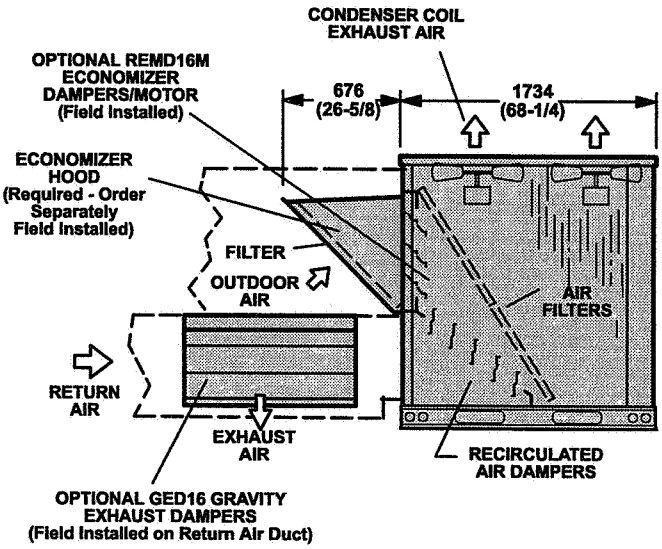


TOP VIEW



*REQUIRED OPTIONAL HDK16 HORIZONTAL SUPPLY AND RETURN KIT (Field Installed)

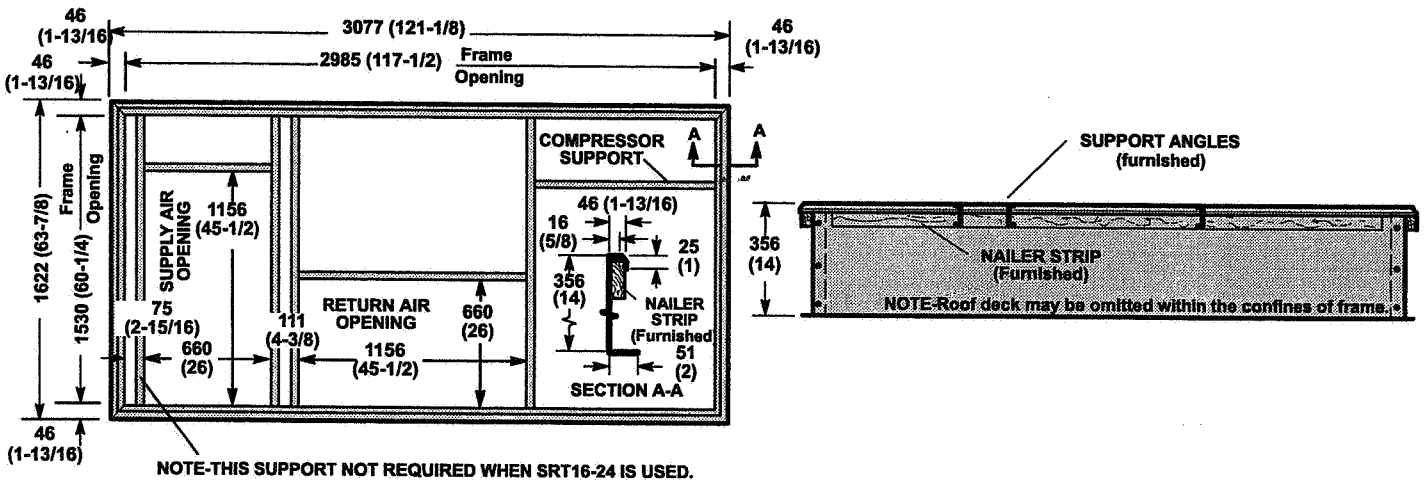
BACK VIEW
WITH HORIZONTAL SUPPLY & RETURN AIR OPENING



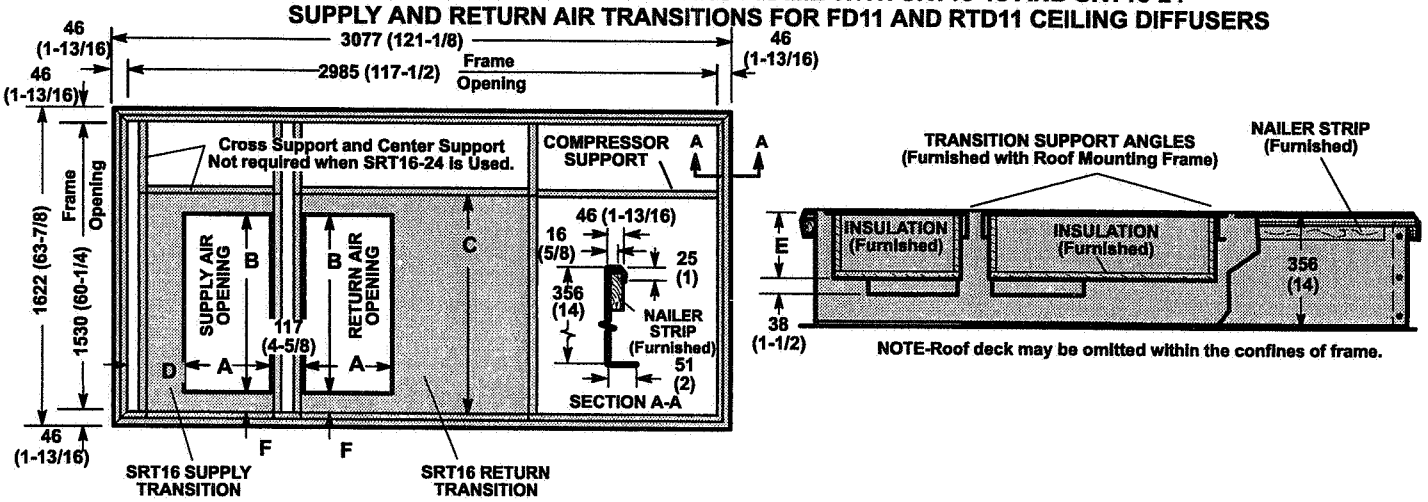
CONDENSER SECTION END VIEW

ACCESSORY DIMENSIONS - MM (INCHES)

RMF16-18/24 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING

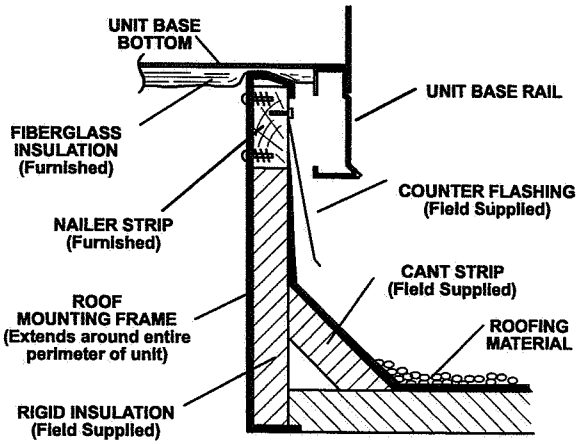


RMF16-18/24 ROOF MOUNTING FRAME WITH SRT16-18 AND SRT16-24 SUPPLY AND RETURN AIR TRANSITIONS FOR FD11 AND RTD11 CEILING DIFFUSERS



Model Number	A		B		C		D		E		F	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
RMF16-18/24 with SRT16-18	457	18	914	36	1143	45	191	7-1/2	203	8	114	4-1/2
RMF16-18/24 with SRT16-24	610	24	1219	48	1270	50	114	4-1/2	305	12	25	1

TYPICAL FLASHING DETAIL FOR RMF16 ROOF MOUNTING FRAME



ROOF MOUNTING FRAME SPECIFICATIONS

Roof Mounting frame is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.

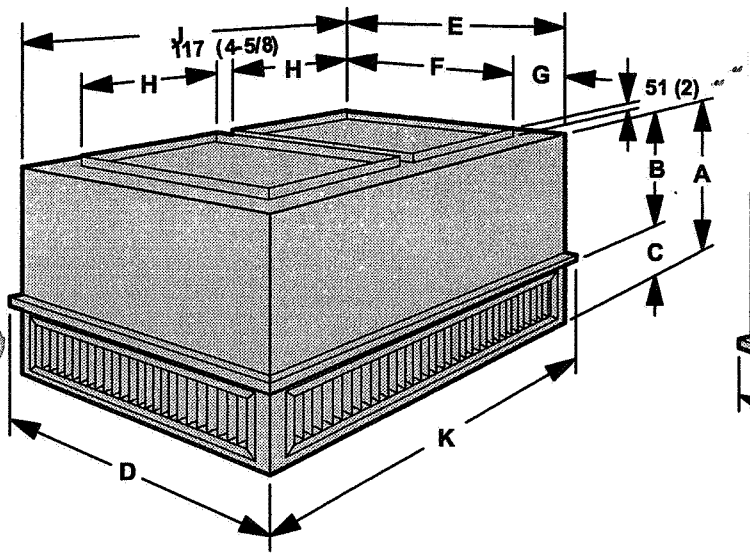
Roof Mounting Frame	RMF16
*Moment of inertia (I) (mm^4) ($in.^4$)	1.75×10^7 (42)
*Section modulus $\frac{I}{C}$ (mm^3) ($in.^3$)	9.5×10^3 (5.8)
Maximum weight (kg/m) (lb/ft.) of length	8.2 (5.5)
Design strength (mPa) (psi)	138 (20 000)

*Includes both sides of frame.

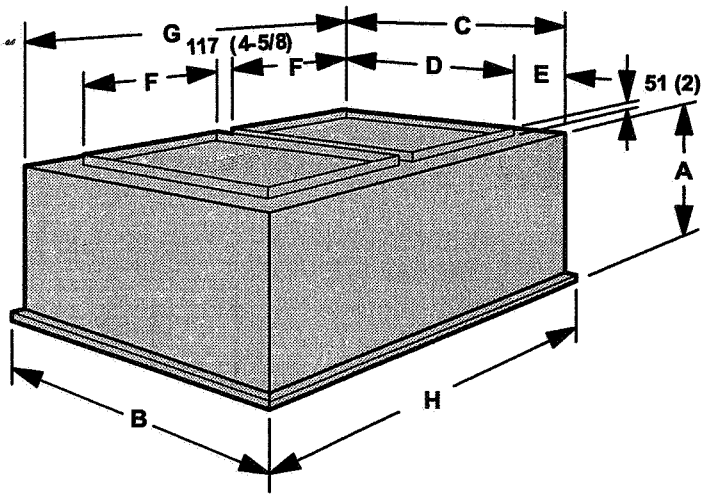
ACCESSORY DIMENSIONS - MM (INCHES)

COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

STEP-DOWN CEILING DIFFUSER



FLUSH CEILING DIFFUSER



Model Number	A		B		C		D		E	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
RTD11-185	864	34	606	23-7/8	257	10-1/8	1210	47-5/8	1159	45-5/8
RTD11-275	1016	40	225	28-7/8	283	11-1/8	1514	59-5/8	1470	57-7/8

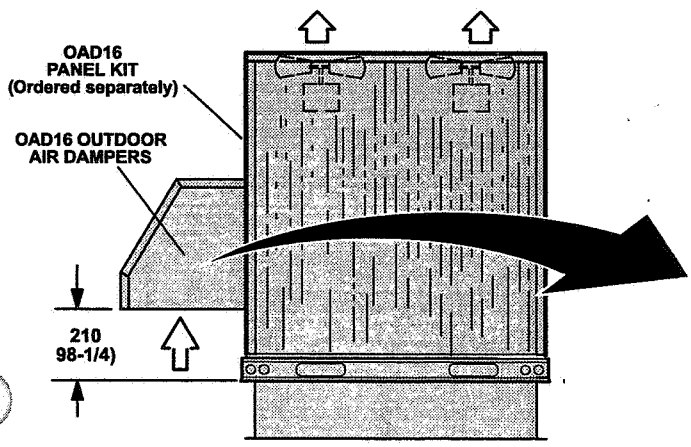
Model Number	F		G		H		J		K	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
RTD11-185	914	36	122	4-13/16	457	18	1159	45-5/8	1210	47-5/8
RTD11-275	1219	48	122	4-13/16	610	24	1464	57-5/8	1521	59-5/8

Model Number	A		B		C		D	
	mm	in.	mm	in.	mm	in.	mm	in.
FD11-185	613	30-1/8	1210	47-5/8	1159	45-5/8	914	36
FD11-275	918	36-1/8	1514	59-5/8	1464	57-5/8	1219	48

Model Number	E		F		G		H	
	mm	in.	mm	in.	mm	in.	mm	in.
FD11-185	122	4-13/16	457	18	1159	45-5/8	1210	47-5/8
FD11-275	122	4-13/16	610	24	1464	57-5/8	1521	59-5/8

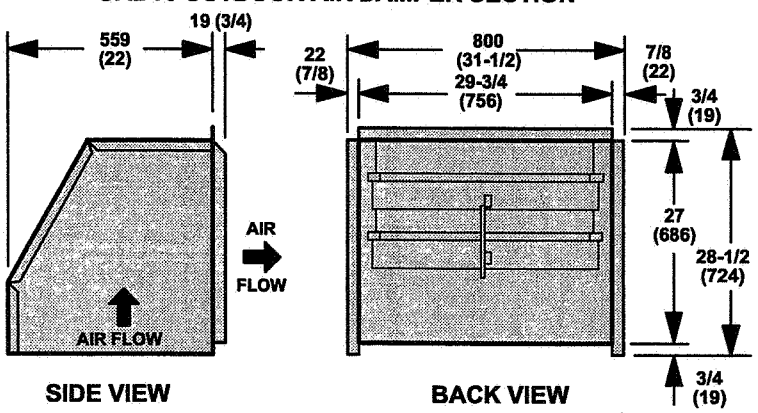
CHA16 UNIT WITH OAD16 OUTDOOR AIR DAMPER SECTION
DOWN-FLOW SUPPLY AND RETURN AIR

NOTE - For Horizontal (Side) Supply And Return Air, OAD16 Field Installs on Return Air Duct



END VIEW

OAD16 OUTDOOR AIR DAMPER SECTION

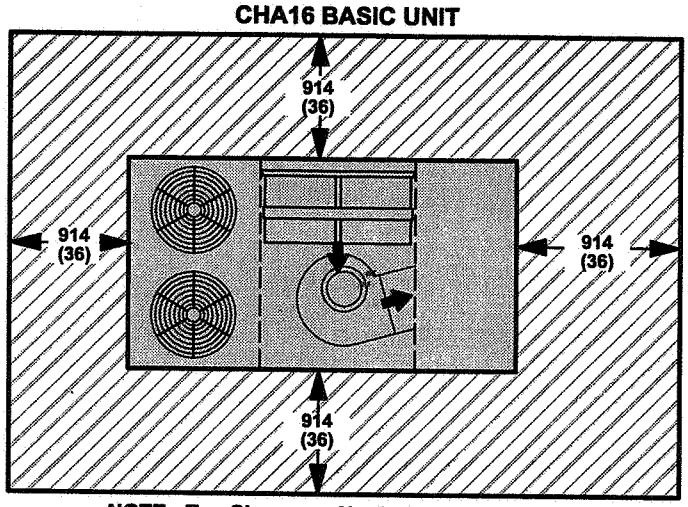


SIDE VIEW

BACK VIEW

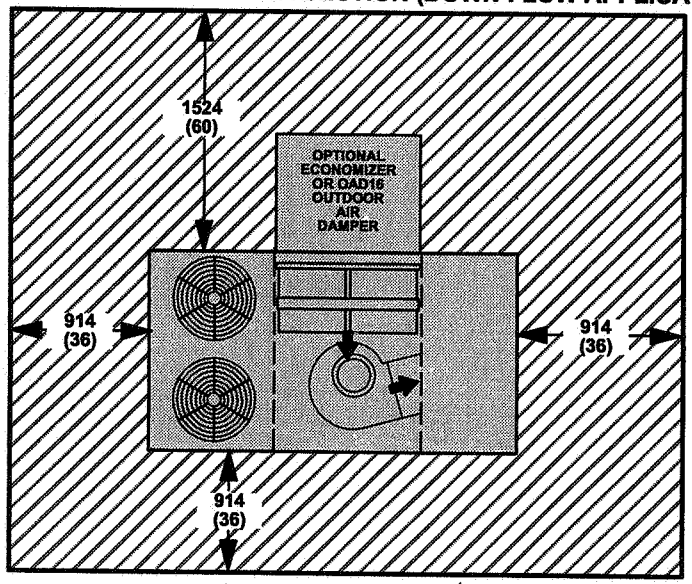
INSTALLATION CLEARANCES - MM (INCHES)

CHA16 BASIC UNIT



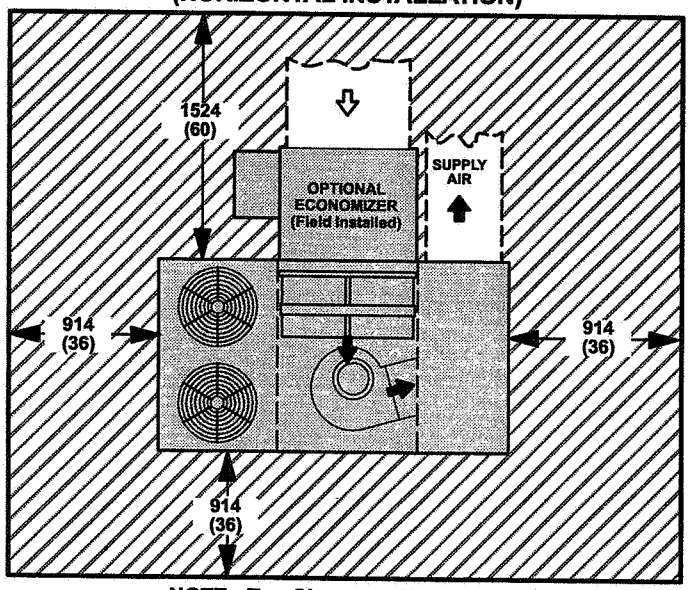
NOTE - Top Clearance Unobstructed.
NOTE - Entire perimeter of unit requires support when elevated above mounting surface.

CHA16 UNIT WITH REMD16M ECONOMIZER DAMPER SECTION OR OAD16 OUTDOOR AIR DAMPER SECTION (DOWN-FLOW APPLICATIONS)



NOTE - Top Clearance Unobstructed.

CHA16 UNIT WITH REMD16M ECONOMIZER DAMPER SECTION (HORIZONTAL INSTALLATION)



NOTE - Top Clearance Unobstructed.