

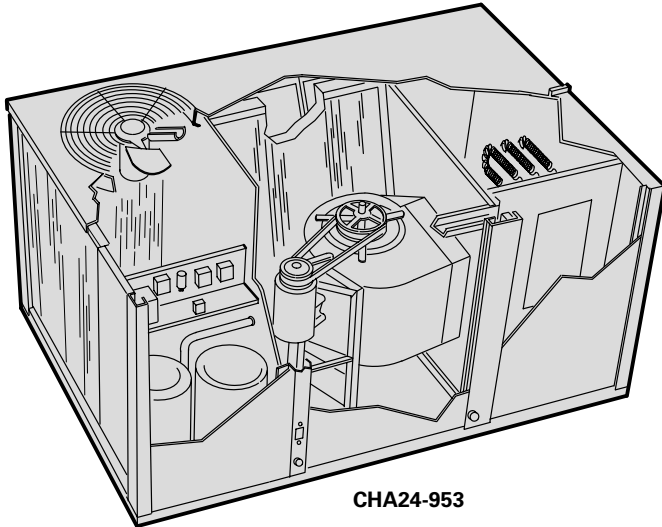
**CHA24-953-1353-1603
PACKAGED UNITS**

COOLING & ELECTRIC HEAT

***88,000 to 144,000 Btuh (25.8 to 42.2 kW) Cooling Capacity**
25,600 to 170,600 Btuh (7.5 to 50.0 kW) Optional Electric Heat

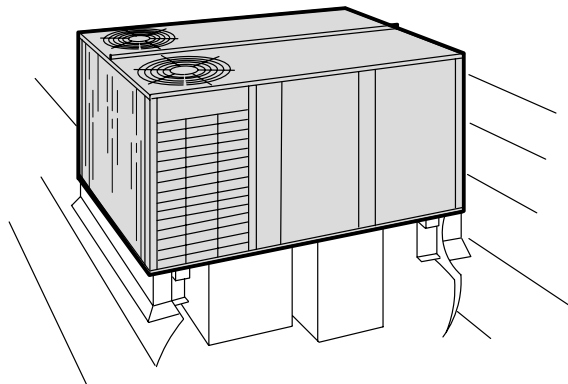
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*ARI Standard Ratings

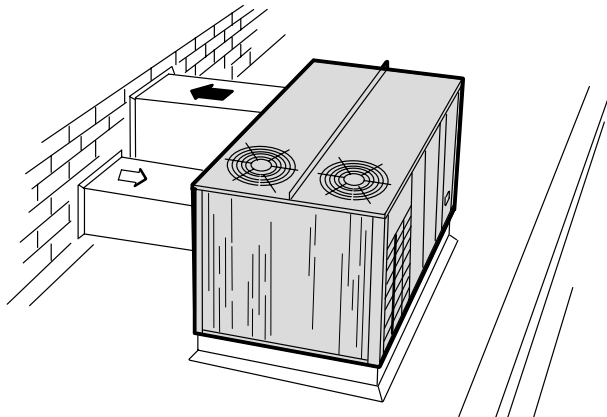


CHA24-953

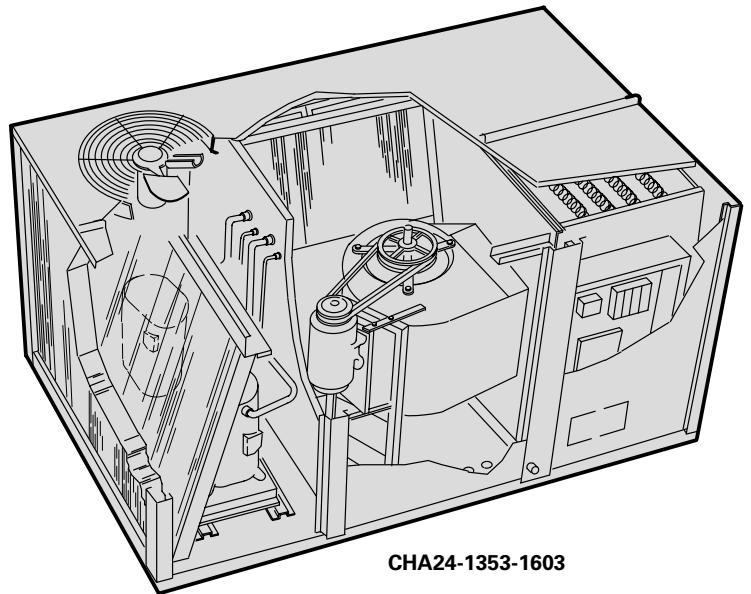
Typical Applications



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



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



CHA24-1353-1603



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FEATURES

Item	CHA24-953	CHA24-1353	CHA24-1603
Air Flow Choice — Bottom (down-flow) or horizontal (side) supply and return air	Std.	Std.	Std.
Approvals — U.L. and C.S.A. listed, components bonded for grounding to meet safety standards for servicing required by U.L., C.S.A. and National and Canadian Electrical Codes	Std.	Std.	Std.
ARI Standard 210/240-89 Certified Ratings	Std.	Std.	—
ARI Standard 360-86 Certified Ratings	—	—	Std.
ARI Standard 270-84 Sound Rating Certified	Std.	Std.	NA
Bottom Power Entry	†Opt.	†Opt.	Std.
Cabinet — Heavy gauge galvanized steel, fully insulated, powdered enamel paint finish, large removeable access panels, electrical inlets in cabinet base and electric heat end panel, control box with factory installed controls low voltage terminal strip, unit lifting brackets	Std.	Std.	Std.
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	Std.	Std.	Std.
Compressors — Reciprocating type, hermetically sealed, suction cooled, overload protected	Std.	—	Std.
Compressors — Copeland® Compliant Scroll™ type, hermetically sealed, discharge temperature thermostat (protects compressor)	—	Std.	—
Compressor Crankcase Heaters	Std.	Std.	—
Condenser Coils — Slab coil construction	—	Std.	Std.
Condenser Coils — Formed coil construction	Std.	—	—
Condenser Fan — Low sound operating levels, PVC coated fan guard furnished	Std.	Std.	Std.
Condenser Fan Motor — Overload protected, permanently lubricated, ball bearings	Std.	Std.	Std.
Control Box Panel — Hinged for easy access, factory installed	*Opt.	Std.	Std.
Corrosion Protection — Phenolic epoxy coating applied to condenser coil only (with painted base section) or to both condenser and evaporator coils (with painted condenser and evaporator base section and painted blower housings), factory applied	**Opt.	**Opt.	**Opt.
Disconnect — Factory installed	*Opt.	*Opt.	*Opt.
Filters — Disposable 2 inch (51 mm) pleated, commercial grade, filter rack will accept 1 inch (25 mm) thick filters	Std.	Std.	Std.
Filter Access — Hinged filter door with quarter turn fasteners	Std.	Std.	Std.
Low Ambient Controls — Allows unit cooling operation down to 30°F (–1°C)	†Opt.	Std.	Std.
Refrigeration System — Consists of: compressors, condenser coil and direct drive fan(s), evaporator coil and belt drive blower, expansion valves, high capacity driers, thermometer wells, high pressure switches, low pressure switches, full refrigerant charge, freezestat (prevents coil freeze-up during low ambient operation), independent refrigerant circuits (allows staging)	Std.	Std.	Std.
Service Outlets (2) — Factory installed, 120v ground fault circuit interrupter (GFCI) type	*Opt.	*Opt.	*Opt.
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),	Std.	Std.	Std.
Supply Air Motor — Overload protected, equipped with ball bearings	Std.	Std.	Std.
Warranty — Limited five years compressors, limited one year all other components, see limited warranty certificate included with unit for details	Std.	Std.	Std.

Std.= Standard with unit.

Opt. = Optional.

NA = Not applicable

*Available as part of factory installed Electrical Convenience Package, see Factory Installed Options tables.

†Available for field installation, see Optional Field Installed Accessories tables. Also part of factory installed Electrical Convenience Package, see Factory Installed Options tables.

**Available factory installed Corrosion Protection Package, see Factory Installed Options tables.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Item	CHA24-953	CHA24-1353	CHA24-1603
Control System — Electro-mechanical Thermostat	Opt.	Opt.	Opt.
Control System — W973	Opt.	Opt.	Opt.
Control System — T7300 Thermostat	Opt.	Opt.	Opt.
Control System — W7400	Opt.	Opt.	Opt.
❖ Control System — T8600 and T8621 Thermostat	Opt.	Opt.	Opt.
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)	Opt.	Opt.	Opt.
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	RTD11-95	RTD11-135	RTD11-185
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	FD11-95	FD11-135	FD11-185
Transitions (Supply and Return) — Used with diffusers, installs in roof mounting frame, galvanized steel construction, flanges furnished for duct connection, fully insulated	SRT16-95	SRT16-135	SRT16-160
Economizer Dampers (Down-Flow) — 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 controller, solid-state adjustable outdoor air enthalpy control, 0 to 100% outdoor air adjustable, cleanable aluminum mesh frame filter furnished, gravity exhaust air dampers furnished, fresh air and exhaust air hoods furnished for field installation, powdered enamel paint finish	†REMD24M-95	†REMD24M-135	†REMD24M-160
Economizer Dampers (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 controller, solid-state adjustable outdoor air enthalpy control, 0 to 100% outdoor air adjustable, two cleanable polyurethane frame filters furnished, galvanized steel cabinet, flanged air openings on return air section, outdoor air hood shipped separately, powdered enamel paint finish, fully insulated, requires optional Horizontal Supply and Return Air Kit for duct connection NOTE — Installation requires field modification to filter access door	EMDH16M-95	EMDH16M-135	EMDH16M-160
Economizer Gravity Exhaust Dampers (Horizontal) — For use with EMDH16 horizontal economizer damper sections, two neoprene coated fiberglass dampers furnished, rainhoods furnished, bird screen furnished	GED16-95/135/160	GED16-95/135/160	GED16-95/135/160
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	**Opt.	**Opt.	**Opt.
Electric Heat Fuse Block — Wiring harness and mounting screws furnished	**Opt.	**Opt.	**Opt.
Horizontal Supply and Return Air Kit — Provides duct connection to unit, flanges furnished, hardware furnished, two filler panels furnished for unused air openings, filter access panel furnished	Opt.	Opt.	Opt.
Outdoor Air Damper Section — Linked mechanical dampers, interchangeable unit panel furnished (down-flow applications), two-piece cabinet (control access), cleanable polyurethane frame type filter furnished, 0 to 25% (fixed) outdoor air adjustable, manual or automatic operation (kit required for automatic operation), installs on unit for down-flow applications, installs in return air duct for horizontal applications	OAD24-95	OAD24-135	OAD24-160
Outdoor Air Damper Automatic Damper Kit — 3 position damper actuator, plug-in connection	Opt.	Opt.	Opt.
Roof Mounting Frame — Nailer strip furnished, mates to unit, U.S. National Roofing Contractors Approved, shipped knocked down	RMF16-95	RMF16-135/160	RMF16-135/160
Smoke Detector — Photoelectric type, factory installed in return air section	*Opt.	*Opt.	*Opt.
❖ Universal Roof Mounting Frame — Nailer strip furnished, mates to unit, shipped knocked down	RMF16U-26/95	—	—
❖ Universal Roof Mounting Frame Duct Kit — Required with RMF16U-26/95, duct and unit support channels furnished	DK16U-95	—	—
Timed-Off Control — Prevents compressor short-cycling, contains two controls	Opt.	Opt.	Opt.

Opt.= Optional. See Optional Field Installed Accessories tables for ordering information.
 †Available for field installation, see Field Installed Accessories tables. Also available as factory installed Economizer Package, see Factory Installed Options tables.
 *Available factory installed Smoke Detector Package, see Factory Installed Options tables.
 **Available for field installation, see Optional Electric Heat Data tables. Also available as part of factory installed Electric Heat, see Factory Installed Options tables.

OPTIONAL TEMPERATURE CONTROL SYSTEMS (See Flow Charts on Pages 6 and 7)

System and Component Description	Catalog No.
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
Nite 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
Warm Up Kit — Holds economizer dampers closed during night heating operation and morning warm-up	39G77
Cycle Control (Required) — Plug-in connections, provides timed-on and off function, prevents compressor short cycling	42H51
W973 CONTROL SYSTEM	
Logic Panel/Discharge Sensor/Plug-in Relay — Panel controls operation of economizer and stages of heating and cooling in response to signals from thermostat, balances conditioned space thermostat demand against system output, system output measured by discharge sensor (furnished), combined demand and output signals determine economizer damper position and number of cooling or heating stages required, logic panel may be installed in unit or remotely located, W973 Plug-in Relay (furnished) adapts control system to unit	39G76
Thermostat — Dual setpoint, separate heating-cooling levers, locking setpoints, integral sensor	25C52
Subbase — Switching with system selector switch (Heat-Auto-Off-Cool), fan switch (Auto-On)	58C93
Transmitter — Dual setpoint, separate heating-cooling levers, locking setpoints, requires sensor	25C51
Subbase — Switching with system selector switch (Heat-Auto-Off-Cool), fan switch (Auto-On)	58C93
Sensor — Room temperature	58C92
Sensor — Return air temperature	27C40
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
Warm Up Kit — Holds economizer dampers closed during night heating operation and morning warm-up	39G77
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	81G59
Subbase — Selectable staging up to two stage heat & two stage cool, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On), indicator LED's, auxiliary relay output for economizer operation	81G60
Subbase — Selectable staging up to three stage heat & two stage cool, manual system switch (Auto-Cool-Off-Heat-Emergency Heat) (heat pump only), fan switch (Auto-On), indicator LED's, auxiliary relay output for economizer operation	13H76
Sensor — Room temperature	58C92
Sensor — Room temperature with 3 hour override and setpoint adjustment	86G67
Sensor — Return air temperature	27C40

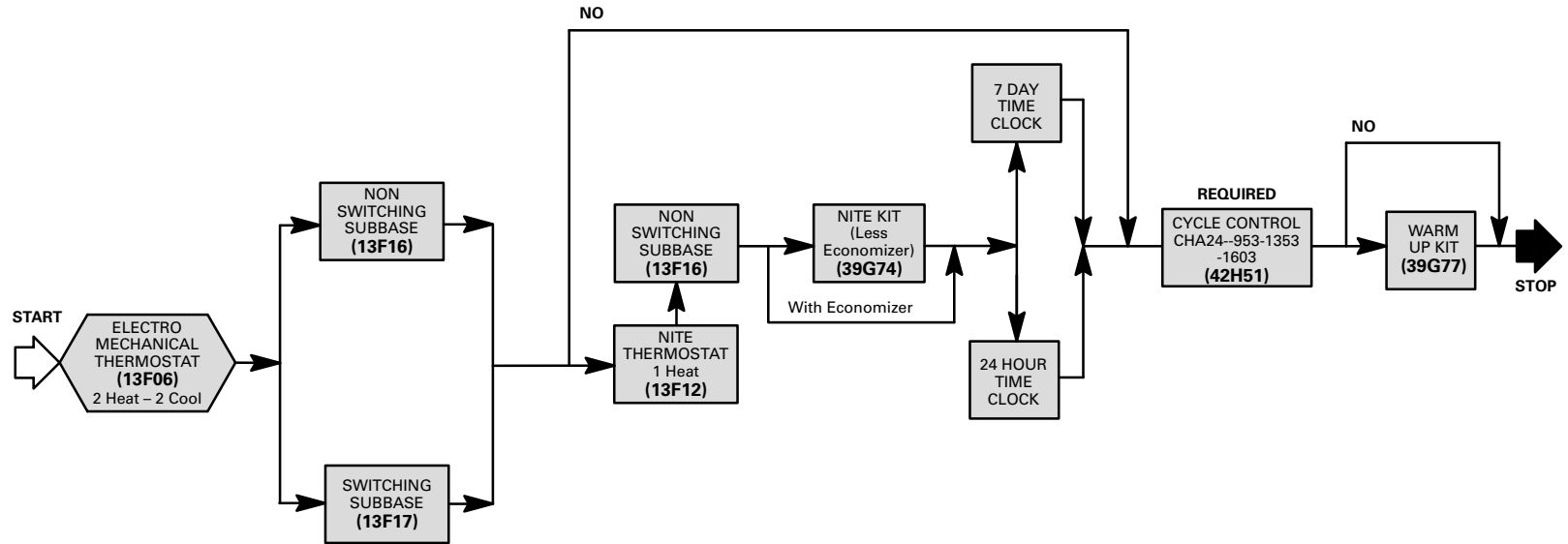
OPTIONAL TEMPERATURE CONTROL SYSTEMS (See Flow Charts on Pages 6 and 7)

System and Component Description	Catalog No.
W7400 CONTROL SYSTEM	—
Control Module/Plug-in Relay — Module controls operation of economizer and stages of heating and cooling, setpoint/space temperature sensor and time-of-day signals control unit operation, module balances space temperature signal against stages operating to determine system output, system output is measured and updated by monitoring actual space temperature deviation from setpoint and rate of change of space temperature, module may be installed in unit or remotely located, plug-in relay (furnished) provides set points for economizer and DX cooling, choice of thermostats	74G11
Thermostat — Room thermostat with integral sensor, touch sensitive keyboard, automatic switching, no anticipator, zero droop, indicator lights, hour/day programming, override capabilities, time readout, stage status indicators, battery back-up, wiring wallplate	36G62 (°F) or ⚡36G63 (°C)
Thermostat — Remote thermostat (sensor required), touch sensitive keyboard, automatic switching, no anticipator, zero droop, indicator lights, hour/day programming, override capabilities, time readout, stage status indicators, battery back-up, wiring wallplate	36G64 (°F) or ⚡36G65 (°C)
Sensor — Room temperature	58C92
Sensor — Return air temperature	27C40
⚡ T8600 and T8621 THERMOSTAT CONTROL SYSTEMS	—
Thermostats — 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, T8621 has switching subbase and one LED (system “On”), T8600 has wiring wall plate and two LED’s (Energy Savings and system “On”), both have 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, see below for additional descriptions	See left for catalog numbers
T8600C1055 71E91 . . . 1 htg./1 clg. 5-1-1 day programming, manual changeover T8600D1079 27H31 . . . 1 htg./1 clg. 5-1-1 day programming, auto changeover T8621A7010 75E25 . . . 1 htg./1 clg. 7 day programming, auto changeover T8621D7055 27H29 . . . 2 htg./2 clg. 7 day programming, auto changeover	
Warm Up Kit — Holds economizer dampers closed during night heating operation and morning warm-up	39G77

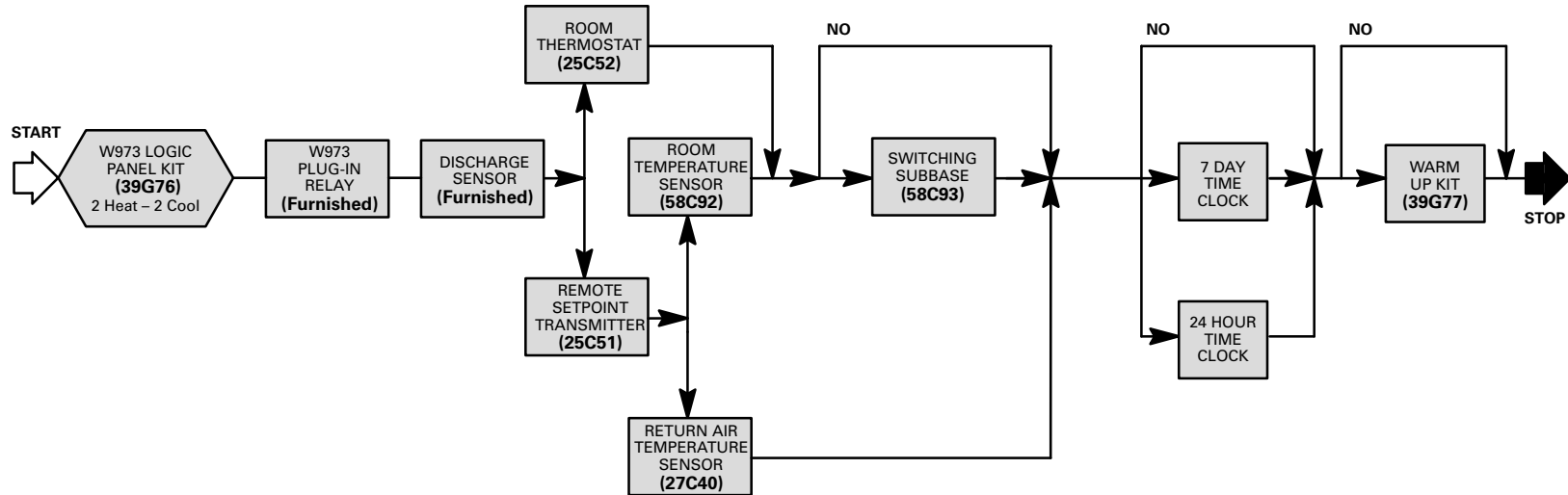
LOGIC CONTROLS PACKAGE (Factory Installed Option)

Component Description	Catalog No.
ETM Electronic Thermostat Module — Factory installed control monitors unit operation from different sensors factory installed in unit, has outputs for 2 stage heat/2 stage cool, automatic or continuous blower operation, economizer damper operation and night setback, features: day/occupied mode with low enthalpy (outdoor air damper open), high enthalpy (outdoor air damper closed) or night/unoccupied mode (outdoor air damper closed), ETM allows units to be “daisy chained” together (up to 31 units) to be operated from one central location with an “executive” type control processor (onsite or offsite), built-in time delays, built-in unit operating defaults, diagnostic LED’s indicate various operating functions, surge suppression protects ETM against lightning or voltage spikes	Factory Installed In Unit
Return Air Sensor — Provides input to ETM module to determine heating or cooling operation and number of stages required	Factory Installed In Unit
Blower Proving Switch — Monitors blower operation, locks out unit in case of blower failure, sends signal to ETM module for alarm	Factory Installed In Unit
Dirty Filter Switch — Senses static pressure increase indicating a dirty filter condition	Factory Installed In Unit
Discharge Air Monitor — Senses leaving air temperature for monitoring unit operation	Factory Installed In Unit
Room Temperature Sensor — Provides input to ETM module to determine heating or cooling operation and number of stages required (ordered separately)	97H53
Night Setback Override Switch — Allows momentary override of night setback during unoccupied mode	Field Furnished

OPTIONAL ELECTRO-MECHANICAL THERMOSTAT

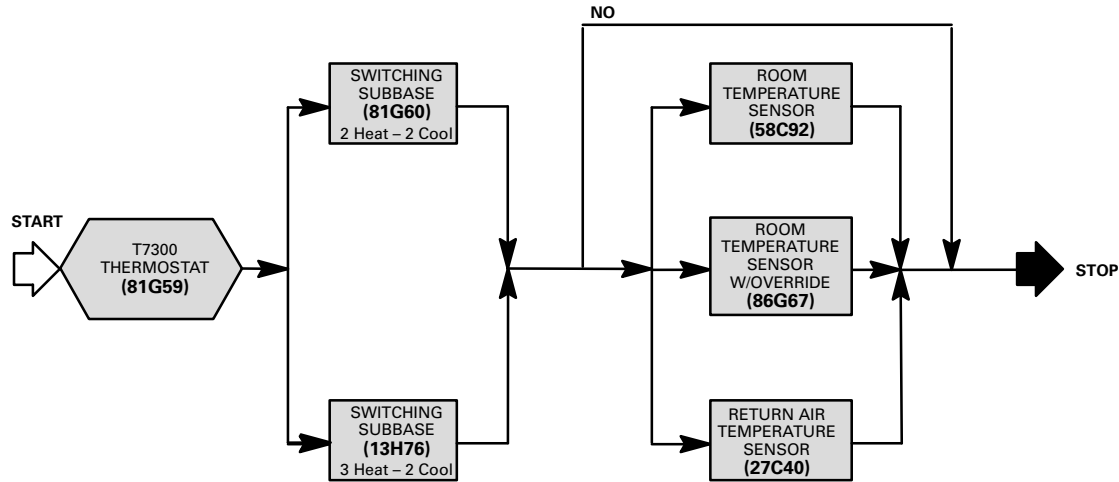


OPTIONAL W973 CONTROL SYSTEM

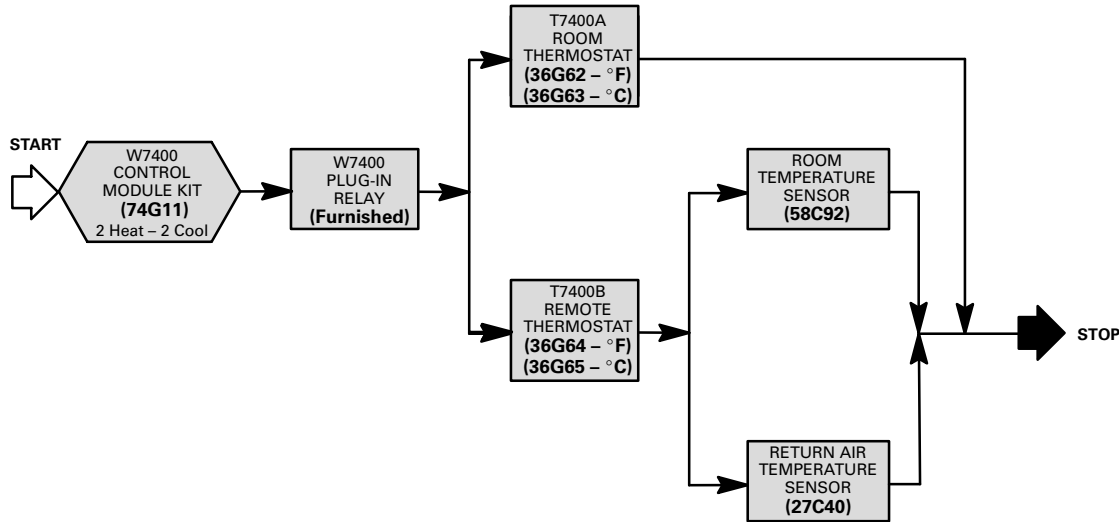


TEMPERATURE CONTROL SELECTION FLOWCHARTS

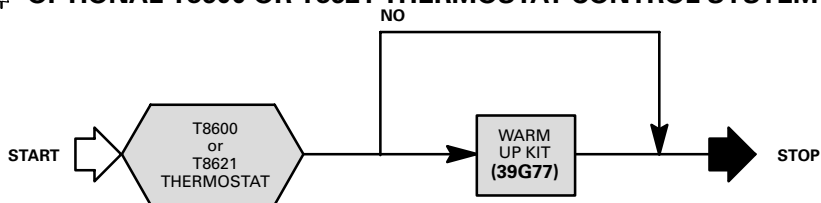
OPTIONAL T7300 CONTROL SYSTEM



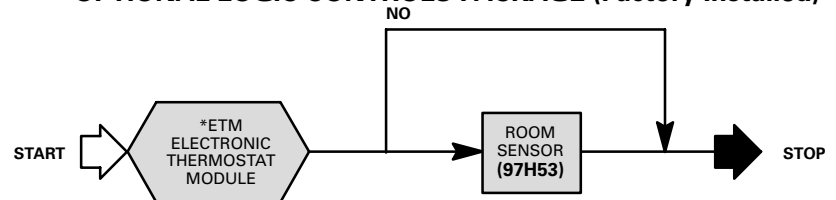
OPTIONAL W7400 CONTROL SYSTEM



OPTIONAL T8600 OR T8621 THERMOSTAT CONTROL SYSTEM



OPTIONAL LOGIC CONTROLS PACKAGE (Factory Installed)



*Includes Return Air Sensor, Blower Proving Switch, Dirty Filter Switch and Discharge Air Monitor factory installed in unit.

SPECIFICATIONS — CHA24-953 & CHA24-1353

Model No.		CHA24-953	CHA24-1353	
Cooling Ratings	Gross cooling capacity — Btuh (kW)	92,800 (27.2)	123,700 (36.2)	
	*Total cooling capacity — Btuh (kW)	88,000 (25.8)	119,000 (34.9)	
	*Total unit watts	8800	11,780	
	*EER (Btuh/Watts)	10.0	10.1	
	*™Integrated Part Load Value	10.0	9.8	
	°ARI Standard 270 SRN (Bels)	8.6	8.4	
Refrigerant Charge (HCFC-22)	Circuit 1	6 lbs. 0 oz. (2.72 kg)	11 lbs. 0 oz. (4.99 kg)	
	Circuit 2	6 lbs. 0 oz. (2.72 kg)	11 lbs. 0 oz. (4.99 kg)	
Evaporator Blower and Drive Selection	Blower wheel nominal dia. x width — in. (mm)		12 x 12 (305 x 305)	15 x 15 (381 x 381)
	Factory Installed **Drives	Nominal motor hp (W)	2 (1492)	3 (2238)
		Maximum usable hp (W)	2.30 (1716)	3.45 (2574)
		Voltage & phase	208/230/460v or 575v-3ph	208/230/460v or 575v-3ph
		RPM range	740 — 1010	730 — 950
Evaporator Coil	Net face area — sq. ft. (m ²)		7.75 (0.72)	9.46 (0.88)
	Tube diameter — in. (mm) & No. of rows		3/8 (9.5) — 3	3/8 (9.5) — 4
	Fins per inch (m)		14 (551)	12 (472)
	Expansion device type		Thermostatic Expansion Valve	
	Drain connection size mpt — in. (mm) PVC		1 (25.4)	1 (25.4)
Condenser Coil	Net face area — sq. ft. (m ²)		15.67 (1.46)	30.25 (2.81)
	Tube diameter — in. (mm) & No. of rows		3/8 (9.5) — 2	3/8 (9.5) — 2
	Fins per inch (m)		20 (787)	20 (787)
Condenser Fan(s)	Diameter — in. (mm) & No. of blades		(1) 24 (610) — 4	(2) 22 (559) — 4
	Air volume — cfm (L/s)		5150 (2430)	8800 (4155) Total
	Motor horsepower (W)		(1) 3/4 (560)	(2) 1/2 (373)
	Motor rpm		1075	1075
	Motor watts		650	995 Total
Filters (furnished)	Type of filter		Disposable, commercial grade	
	No. & size — in. (mm)		(4) 16 x 20 x 2 (406 x 508 x 51)	(4) 16 x 25 x 2 (406 x 635 x 51)
Net weight of basic unit — lbs. (kg)		810 (367)	1105 (501)	
Shipping weight of basic unit — lbs. (kg) (1 Package)		995 (451)	1195 (542)	
Electrical characteristics		208/230v, 460v or 575v — 60 hertz — 3 phase		

° Sound Rating Number in accordance with ARI Standard 270.

* Rated in accordance with ARI Standard 210/240; 95°F (35°F) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air.

™ Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.

NOTE — ARI capacity is net and includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

** 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. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

SPECIFICATIONS — CHA24-1603

Model No.		CHA24-1603	
Cooling Ratings	Gross cooling capacity — Btuh (kW)	150,700 (44.2)	
	*Total cooling capacity — Btuh (kW)	144,000 (42.2)	
	*Total unit watts	15,500	
	*EER (Btuh/Watts)	9.3	
	*™Integrated Part Load Value	10.3	
	°ARI Standard 270 SRN (Bels)	8.8	
Refrigerant Charge (HCFC-22)	Circuit 1	11 lbs. 8 oz. (5.22 kg)	
	Circuit 2	11 lbs. 8 oz. (5.22 kg)	
Evaporator Blower and Drive Selection	Blower wheel nominal dia. x width — in. (mm)	15 x 15 (381 x 381)	
	Factory Installed **Drives	Nominal motor hp (W)	3 (2238)
		Maximum usable hp (W)	3.45 (2574)
		Voltage & phase	208/230v, 460v or 575v — 60 hertz — 3 phase
		RPM range	730 — 950
Evaporator Coil	Net face area — sq. ft. (m ²)	11.9 (1.11)	
	Tube diameter — in. (mm) & No. of rows	3/8 (9.5) — 3	
	Fins per inch (m)	12 (472)	
	Expansion device type	Thermostatic Expansion Valve	
	Drain connection size mpt — in. (mm) PVC	1 (25.4)	
Condenser Coil	Net face area — sq. ft. (m ²)	30.25 (2.81)	
	Tube diameter — in. (mm) & No. of rows	3/8 (9.5) — 2	
	Fins per inch (m)	20 (787)	
Condenser Fans	Diameter — in. (mm) & No. of blades	(2) 22 (559) — 4	
	Air volume — cfm (L/s)	8800 (4155) Total	
	Motor horsepower (W)	(2) 1/2 (373)	
	Motor rpm	1075	
	Motor watts	995 Total	
Filters (furnished)	Type of filter	Disposable, commercial grade	
	No. & size of filters — in. (mm)	(4) 20 x 25 x 2 (508 x 635 x 25)	
Net weight of basic unit — lbs. (kg)		1200 (544)	
Shipping weight of basic unit — lbs. (kg) (1 Package)		1385 (628)	
Electrical characteristics		208/230v, 460v or 575v — 60 hertz — 3 phase	

° Sound Rating Number in accordance with ARI Standard 270.

* Rated in accordance with ARI Standard 360; 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air.

™ Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.

NOTE — ARI capacity is net and includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

** 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. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

OPTIONAL FIELD INSTALLED ACCESSORIES — CHA24-953 and CHA24-1353

Unit Model No.		CHA24-953	CHA24-1353	
Electric Heat	Model No.	ECH16-82/95	ECH16-135/160	
	kW input range	10-15-20-30-40 kW (all voltages)	15-20-30-40-50 kW (all voltages)	
	*Fuse Block	208/230 volt	61H83	49J41
		460 volt	61H84	49J42
575 volt		61H85	49J43	
Roof Mounting Frame — (Net Weight)		RMF16-95 (32G90) (107 lbs.) (49 kg)	RMF16-135/160 (32G91) (119 lbs.) (54 kg)	
☼ Universal Roof Mounting Frame — (Net Weight)		RMF16U-26/95 (22 lbs.) (10 kg) (94H90)	----	
☼ Duct Kit For Universal Frame — (Net Weight)		DK16U-95 (28 lbs.) (13 kg) (94H92)	----	
Down-Flow Economizer Dampers with Gravity Exhaust	Model No. (Net Weight)	REMD24M-95 (60 lbs.) (27 kg)	REMD24M-135 (80 lbs.) (36 kg)	
	Catalog No. & net face area		77J41 (2.1 sq. ft. (0.20 m ²))	77J42 (2.8 sq. ft. (0.26 m ²))
	No. & size of filters	in.	(1) 32-1/4 x 16-1/2 x 1	(1) 32-1/4 x 21-1/2 x 1
		mm	(1) 819 x 419 x 25	(1) 819 x 546 x 25
Horizontal Economizer Dampers	Model No. (Net Weight)	EMDH16M-95 (120 lbs.) (54 kg)	EMDH16M-135 (137 lbs.) (62 kg)	
	Catalog No.		24H03	24H04
	No. & size of filters	in.	(2) 16 x 25 x 1	(2) 16 x 25 x 1
		mm	(2) 406 x 635 x 25	(2) 406 x 635 x 25
Exhaust Dampers — (Net Weight) — Net Face Area		GED16-95/135/160 (5 lbs.) (2 kg) — 0.43 sq. ft. (0.04 m ²) (34G80) for use with EMDH16		
Differential Enthalpy Control		54G44		
Horizontal Supply and Return Air Kit — (Net Weight)		LB-55756BA (35G71) (30 lbs.) (14 kg)	LB-55756BB (35G42) (35 lbs.) (16 kg)	
Bottom Power Entry Kit		LB-55757CA (34G70) (12 lbs.) (5 kg)		
Ceiling Supply and Return Air Diffusers (Net Weight)	Step-Down	RTD11-95 (29G04) (88 lbs.) (40 kg)	RTD11-135 (29G05) (125 lbs.) (57 kg)	
	Flush	FD11-95 (29G08) (75 lbs.) (34 kg)	FD11-135 (29G09) (95 lbs.) (43 kg)	
	Transition	SRT16-95 (33G96) (29 lbs.) (13 kg)	SRT16-135 (97H10) (38 lbs.) (17 kg)	
Outdoor Air Dampers	Model No. (Net Weight)	OAD24-95 (41 lbs.) (19 kg)	OAD24-135 (43 lbs.) (20 kg)	
	Catalog No.		74J32	77J49
	No. & size of filters — in. (mm)		(1) 16 x 20 x 1 (406 x 508 x 25)	(1) 16 x 20 x 1 (406 x 508 x 25)
Automatic Damper Kit — (Net Weight)		35G21 (7 lbs.) (3 kg)		
Low Ambient Kit		LB-57113BG (15J80)	Furnished	
Timed-Off Control Kit (2) LB-50709BA		40G20		

*Must be ordered extra.

OPTIONAL FIELD INSTALLED ACCESSORIES – CHA24-1603

Unit Model No.		CHA24-1603	
Electric Heat	Model No.		ECH16-135/160
	kW input range		15-20-30-40-50 kW (all voltages)
	*Fuse Block	208/230 volt	47J51
		460 volt	47J52
575 volt		49J40	
Roof Mounting Frame – (Net Weight)		RMF16-135/160 (32G91) (119 lbs.) (54 kg)	
Down-Flow Economizer Dampers with Gravity Exhaust	Model No. (Net Weight)		REMD24M-160 (100 lbs.) (45 kg)
	Catalog No. & net face area		77J43 (3.6 sq. ft. (0.33 m ²))
	No. & size of filters	in.	(1) 40-1/4 x 21-1/2 x 1
		mm	(1) 1022 x 546 x 25
Horizontal Economizer Dampers	Model No. (Net Weight)		EMDH16M-160 (147 lbs.) (67 kg)
	Catalog No.		24H05
	No. & size of filters	in.	(2) 20 x 25 x 1
		mm	(2) 508 x 635 x 25
Exhaust Dampers – (Net Weight) – Net Face Area		GED16-95/135/160 (5 lbs.) (2 kg) – 0.43 sq. ft. (0.04 m ²) (34G80) for use with EMDH16	
Differential Enthalpy Control		54G44	
Horizontal Supply and Return Air Kit – (Net Weight)		LB-55756BC (51G27) (42 lbs.) (19 kg)	
Ceiling Supply and Return Air Diffusers (Net Weight)	Step-Down	RTD11-185 (29G06) (392 lbs.) (178 kg)	
	Flush	FD11-185 (29G10) (289 lbs.) (131 kg)	
	Transition	SRT16-160 (97H11) (70 lbs.) (32 kg)	
Outdoor Air Dampers	Model No. (Net Weight)		OAD24-160 (45 lbs.) (20 kg)
	Catalog No.		77J50
	No. & size of filters – in. (mm)		(1) 16 x 20 x 1 (406 x 508 x 25)
Automatic Damper Kit – (Net Weight)		35G21 (7 lbs.) (3 kg)	
Timed-Off Control Kit (2) LB-50709BA		40G20	

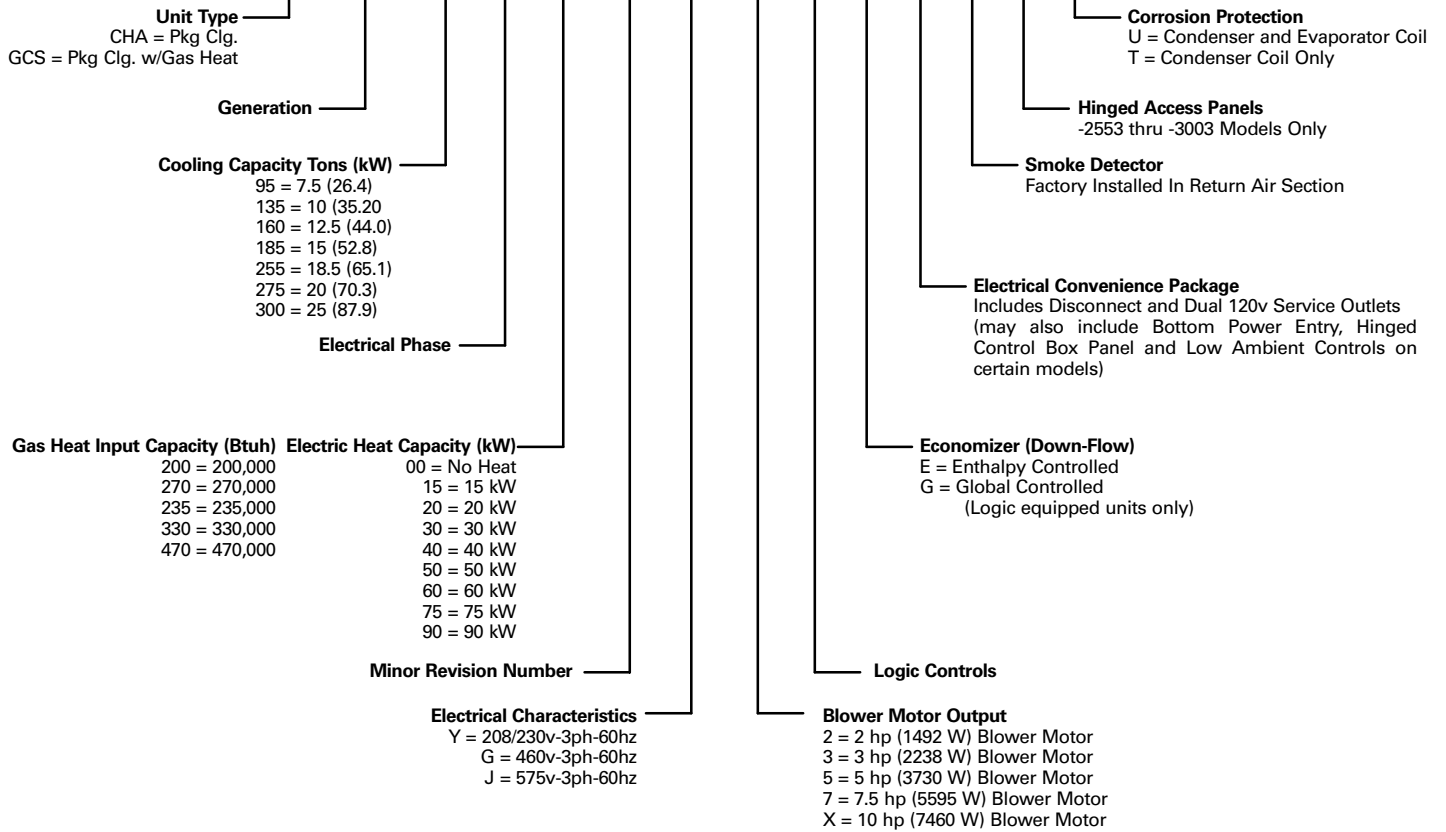
*Must be ordered extra.

MODEL NUMBER IDENTIFICATION

NOTE — See Factory Installed Options Selection on Next Page For Complete Description Of Available Accessories.
NOTE — This example shows all possible combinations available.

Factory Installed Options

CHA 24-135 3-00 -3 G - 3 L E D S H U



FACTORY INSTALLED OPTIONS SELECTION

CHA24-953

Packaged Unit Model No.	Voltage Selection 3 phase 60hz	Electric Heat (Select One)	Electrical Convenience Package (D)	Economizer Package (E) or (G)	Smoke Detector Package (S)	Corrosion Protection Package (T) or (U)
CHA24-953 Basic unit includes: -2 hp (1492W) Blower Motor -Hinged Filter Access	208/230v	None 10kW 15kW 20kW *30kW *40kW	Unit Disconnect, Bottom Power Entry and Low Ambient Controls Installed and Wired. Dual 120v GFCI Service Outlets, (Field Wired) Hinged Control Box Panel	Down-Flow Economizer With Gravity Exhaust Installed and Wired (E) Enthalpy Controlled or (G) Globally Controlled	Photoelectric Smoke Detector Installed and Wired In Return Air Section	Corrosion Resistant Coating Applied To Both Condenser And Evaporator Coils With Painted Base in Condensing And Evaporator Sections And Painted Blower Housing (U) Or Condenser Coil Only With Painted Base Condensing Section(T)
	460V	None 10kW 15kW 20kW *30kW *40kW				
	575v	None *10kW 15kW 20kW 30kW *40kW				

CHA24-1353

Packaged Unit Model No.	Voltage Selection 3 phase 60hz	Electric Heat (Select One)	Electrical Convenience Package (D)	Economizer Package (E) or (G)	Smoke Detector Package (S)	Corrosion Protection Package (T) or (U)
CHA24-1353 Basic unit includes: -3 hp (2238W) Blower Motor -Hinged Control Box -Hinged Filter Access -Low Ambient Controls	208/230v	None 15kW 20kW 30kW *40kW *50kW	Unit Disconnect, and Bottom Power Entry Installed and Wired Dual 120v GFCI Service Outlets, (Field Wired)	Down-Flow Economizer With Gravity Exhaust Installed and Wired (E) Enthalpy Controlled or (G) Globally Controlled	Photoelectric Smoke Detector Installed and Wired In Return Air Section	Corrosion Resistant Coating Applied To Both Condenser And Evaporator Coils With Painted Base in Condensing And Evaporator Sections And Painted Blower Housing (U) Or Condenser Coil Only With Painted Base Condensing Section(T)
	460V	None 15kW 20kW 30kW *40kW *50kW				
	575v	None *15kW 20kW 30kW 40kW *50kW				

CHA24-1603

Packaged Unit Model No.	Voltage Selection 3 phase 60hz	Electric Heat (Select One)	Electrical Convenience Package (D)	Economizer Package (E) or (G)	Smoke Detector Package (S)	Corrosion Protection Package (T) or (U)
CHA24-1603 Basic unit includes: -3 hp (2238W) Blower Motor -Hinged Control Box -Hinged Filter Access -Low Ambient Controls -Bottom Power Entry	208/230v	None 15kW 20kW 30kW *40kW *50kW	Unit Disconnect Installed and Wired and Dual 120v GFCI Service Outlets (Field Wired)	Down-Flow Economizer With Gravity Exhaust Installed and Wired (E) Enthalpy Controlled or (G) Globally Controlled	Photoelectric Smoke Detector Installed and Wired In Return Air Section	Corrosion Resistant Coating Applied To Both Condenser And Evaporator Coils With Painted Base in Condensing And Evaporator Sections And Painted Blower Housing (U) Or Condenser Coil Only With Painted Base Condensing Section(T)
	460V	None 15kW 20kW 30kW *40kW *50kW				
	575v	None *15kW 20kW 30kW 40kW *50kW				

*NOTE— Check with Customer Service Representative for availability of certain electric heat sizes for factory installation.

All Models

Packaged Unit Model No.	Logic Controls Package (L)
All Models	Controls for Logic control system factory installed

ELECTRICAL DATA — CHA24-953 and CHA24-1353

Model No.		CHA24-953			CHA24-1353			
Line voltage data — 60 Hz — 3 phase		208/230v	460v	575v	208/230v	460v	575v	
Compressors (2)	Rated load amps — each (total)	14.1/14.1 (28.2)	7.1/7.1 (14.2)	5.8/5.8 (11.6)	17.3/17.3 (34.6)	9.0/9.0 (18.0)	7.1/7.1 (14.2)	
	Locked rotor amps — each (total)	130/130 (260.0)	64/64 (128.0)	52/52 (104.0)	123/123 (246.0)	62/62 (124.0)	50/50 (100.0)	
Condenser Fan Motors (2)	Full load amps — each (total)	3.7	1.9	1.6	3.0/3.0 (6.0)	1.5/1.5 (3.0)	1.2/1.2 (2.4)	
	Locked rotor amps — each (total)	7.3	3.7	2.9	6.0/6.0 (12.0)	3.0/3.0 (6.0)	2.9/2.9 (5.8)	
Evaporator Blower Motor	Motor Output	hp	2	2	2	3	3	
		W	1492	1492	1492	2238	2238	2238
	Full load amps		7.5	3.4	2.7	10.6	4.8	3.9
	Locked rotor amps		41.0	20.4	16.2	58.0	26.8	23.4
Recommended maximum fuse size (amps)		50	25	20	70	35	25	
Service Outlets (2) 120 volt GFCI (amp rating)		20	20	20	20	20	20	
*Minimum Circuit Ampacity		43.0	22.0	18.0	56.0	29.0	23.0	
Unit power factor		.88	.88	.88	.88	.88	.88	

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

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

ELECTRICAL DATA — CHA24-1603

Model No.		CHA24-1603			
Line voltage data — 60 Hz — 3 phase		208/230v	460v	575v	
Compressors (2)	Rated load amps — each (total)	20.8/20.8 (41.6)	8.1/8.1 (16.2)	6.5/6.5 (13.0)	
	Locked rotor amps — each (total)	142/142 (288.0)	72/72 (144.0)	58/58 (116.0)	
Condenser Fan Motors (2)	Full load amps — each (total)	3.0/3.0 (6.0)	1.5/1.5 (3.0)	1.2/1.2 (2.4)	
	Locked rotor amps — each (total)	6.0/6.0 (12.0)	3.0/3.0 (6.0)	2.9/2.9 (5.8)	
Evaporator Blower Motor	Motor Output	hp	3	3	
		W	2238	2238	
	Full load amps		10.6	4.8	3.9
	Locked rotor amps		58.0	26.8	23.4
Recommended maximum fuse size (amps)		80	30	25	
Service Outlets (2) 120 volt GFCI (amp rating)		20	20	20	
*Minimum Circuit Ampacity		64.0	26.0	21.0	
Unit power factor		.88	.88	.88	

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

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

W973 CONTROL SYSTEM

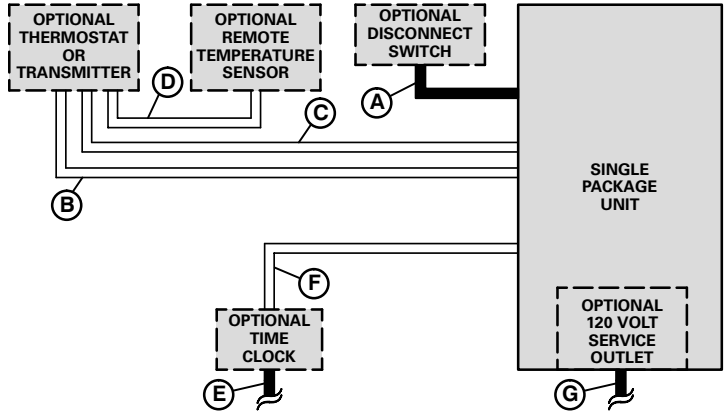
- A – Three wire power (See Electrical Data Table)
- B – Seven wire low voltage – DC only
- C – Two wire low voltage – AC only – with switching subbase
- D – Two wire low voltage – DC only
- E – Two wire power
- F – Two wire low voltage – AC only
- G – Two wire power (120 volt)

AC – Alternating current
DC – Direct current

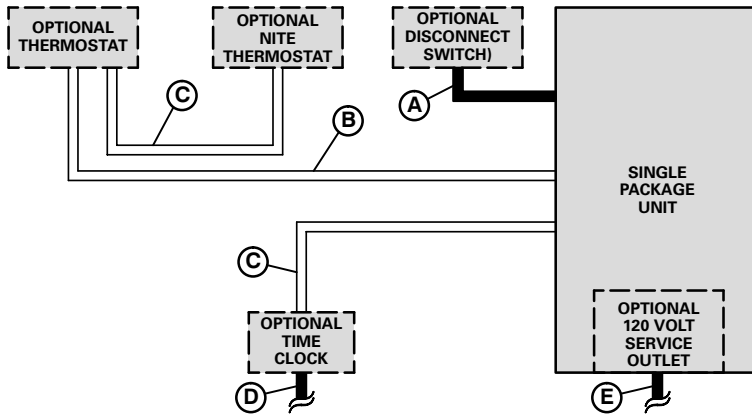
NOTE – Run separate harnesses for AC and DC.
AC voltage interferes with DC signals.

– Field wiring not furnished –

NOTE – All wiring must conform to NEC or CEC and local electrical codes.



ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM



- A – Three wire power (See Electrical Data Table)
- B – Six wire low voltage
- C – Two wire low voltage
- D – Two wire power
- E – Two wire power (120 volt)

– Field wiring not furnished –

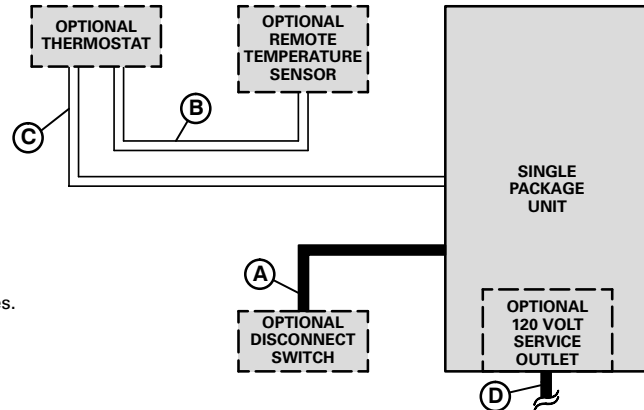
NOTE – All wiring must conform to NEC or CEC and local electrical codes.

W7400 CONTROL SYSTEM

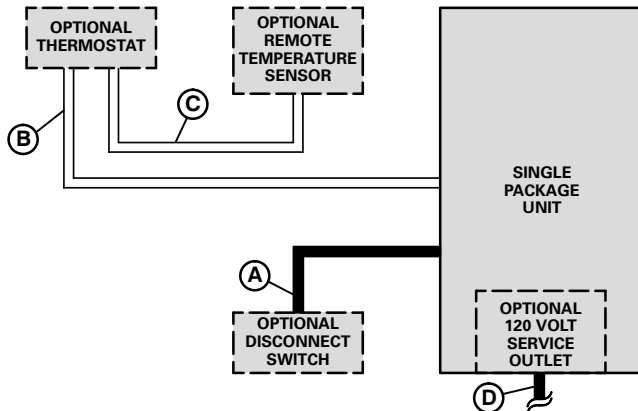
- A – Three wire power (See Electrical Data Table)
- B – Two wire low voltage
- C – Four wire low voltage
- D – Two wire power (120 volt)

– Field wiring not furnished –

NOTE – All wiring must conform to NEC or CEC and local electrical codes.



T8600, T8621 THERMOSTAT OR T7300 THERMOSTAT CONTROL SYSTEM



- A – Three wire power (See Electrical Data Table)
- B – Nine wire low voltage
- C – Two wire low voltage
- Seven wire low voltage (T7300 Room Sensor with override)
- D – Two wire power (120 volt)

– Field wiring not furnished –

NOTE – All wiring must conform to NEC or CEC and local electrical codes.

OPTIONAL ELECTRIC HEAT DATA (Heater Fuse Block Must Be Ordered Extra)

CHA24-953 MODELS

CHA24-1353 MODELS

Electric Heat Model No. & Net Weight	No. of Steps	Volts Input	kw Input	Btuh Output	*Total Unit & Electric Heat Minimum Circuit Ampacity
ECH16-82/95-10 208/230v (61H68) 460v (61H73) 575v (61H78) 38 lbs. (17 kg)	1	208	7.5	25,600	43.0
		220	8.4	28,700	
		230	9.2	31,400	43.0
		240	10.0	34,100	
	1	440	8.4	28,700	
		460	9.2	31,400	22.0
		480	10.0	34,100	
	1	550	8.4	28,700	
		575	9.2	31,400	18.0
600		10.0	34,100		
ECH16-82/95-15 208/230v (61H69) 460v (61H74) 575v (61H79) 38 lbs. (17 kg)	1	208	11.3	38,600	49.0
		220	12.6	43,000	
		230	13.5	46,100	55.0
		240	15.0	51,200	
	1	440	12.6	43,000	
		460	13.8	46,100	27.0
		480	15.0	51,200	
	1	550	12.6	43,000	
		575	13.8	46,100	22.0
600		15.0	51,200		
ECH16-82/95-20 208/230v (61H70) 460v (61H75) 575v (61H80) 42 lbs. (19 kg)	**2	208	15.0	51,200	62.0
		220	16.8	57,300	
		230	18.4	62,800	70.0
		240	20.0	68,300	
	1	440	16.8	57,300	
		460	18.4	62,800	35.0
		480	20.0	68,300	
	1	550	16.8	57,300	
		575	18.4	62,800	28.0
600		20.0	68,300		
ECH16-82/95-30 208/230v (61H71) 460v (61H76) 575v (61H81) 42 lbs. (19 kg)	**2	208	22.5	76,800	88.0
		220	25.2	86,000	
		230	27.5	93,900	100.0
		240	30.0	102,400	
	1	440	25.2	86,000	
		460	27.6	93,900	50.0
		480	30.0	102,400	
	1	550	25.2	86,000	
		575	27.6	93,900	40.0
600		30.0	102,400		
ECH16-82/95-40 208/230v (61H72) 460v (61H77) 575v (61H82) 53 lbs. (24 kg)	**3	208	30.0	102,400	114.0
		220	33.6	114,700	
		230	36.8	125,600	130.0
		240	40.0	136,500	
	**2	440	33.6	114,700	
		460	36.8	125,600	65.0
		480	40.0	136,500	
	**2	550	33.6	114,700	
		575	36.8	125,600	52.0
600		40.0	136,500		

Electric Heat Model No. & Net Weight	No. of Steps	Volts Input	kW Input	Btuh Output	*Total Unit & Electric Heat Minimum Circuit Ampacity
ECH16-135/160-15 208/230v (72G21) 460v (72G26) 575v (72G31) 38 lbs. (17 kg)	1	208	11.3	38,600	
		220	12.6	43,000	58.0
		230	13.5	46,100	
		240	15.0	51,200	
	1	440	12.6	43,000	
		460	13.8	46,100	29.0
		480	15.0	51,200	
	1	550	12.6	43,000	
		575	13.8	46,100	23.0
600		15.0	51,200		
ECH16-135/160-20 208/230v (72G22) 460v (72G27) 575v (72G32) 42 lbs. (19 kg)	**2	208	15.0	51,200	
		220	16.8	57,300	73.0
		230	18.4	62,800	
		240	20.0	68,300	
	1	440	16.8	57,300	
		460	18.4	62,800	37.0
		480	20.0	68,300	
	1	550	16.8	57,300	
		575	18.4	62,800	29.0
600		20.0	68,300		
ECH16-135/160-30 208/230v (72G23) 460v (72G28) 575v (72G33) 42 lbs. (19 kg)	**2	208	22.5	76,800	
		220	25.2	86,000	103.0
		230	27.5	93,900	
		240	30.0	102,400	
	1	440	25.2	86,000	
		460	27.6	93,900	52.0
		480	30.0	102,400	
	1	550	25.2	86,000	
		575	27.6	93,900	41.0
600		30.0	102,400		
ECH16-135/160-40 208/230v (72G24) 460v (72G29) 575v (72G34) 53 lbs. (24 kg)	**3	208	30.0	102,400	
		220	33.6	114,700	133.0
		230	36.8	125,600	
		240	40.0	136,500	
	**2	440	33.6	114,700	
		460	36.8	125,600	67.0
		480	40.0	136,500	
	**2	550	33.6	114,700	
		575	36.8	125,600	53.0
600		40.0	136,500		
ECH16-135/160-50 208/230v (72G25) 460v (72G30) 575v (72G35) 58 lbs. (26 kg)	**4	208	37.5	128,000	
		220	42.0	143,300	133.0
		230	46.0	157,000	
		240	50.0	170,600	
	**2	440	43.8	149,500	
		460	46.0	157,000	67.0
		480	50.0	170,600	
	**2	550	43.8	149,500	
		575	46.0	157,000	53.0
600		50.0	170,600		

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F (75°C).
 **May be used with two stage control.
 NOTE — Fuse block must be ordered extra. Factory installed heaters will have the fuse block factory installed. Fuse block must be installed in field installed heaters. See Optional Accessories tables.

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F (75°C).
 **May be used with two stage control.
 NOTE — Fuse block must be ordered extra. Factory installed heaters will have the fuse block factory installed. Fuse block must be installed in field installed heaters. See Optional Accessories tables.

OPTIONAL ELECTRIC HEAT DATA (Heater Fuse Block Must Be Ordered Extra)

CHA24-1603 MODELS

Electric Heat Model No. & Net Weight	No. of Steps	Volts Input	kW Input	Btuh Output	*Total Unit & Electric Heat Minimum Circuit Ampacity
ECH16-135/160-15 208/230v (72G21) 460v (72G26) 575v (72G31) 38 lbs. (17 kg)	1	208	11.3	38,600	64.0
		220	12.6	43,000	
		230	13.5	46,100	
		240	15.0	51,200	
	1	440	12.6	43,000	29.0
		460	13.8	46,100	
		480	15.0	51,200	
	1	550	12.6	43,000	23.0
		575	13.8	46,100	
600		15.0	51,200		
ECH16-135/160-20 208/230v (72G22) 460v (72G27) 575v (72G32) 42 lbs. (19 kg)	**2	208	15.0	51,200	73.0
		220	16.8	57,300	
		230	18.4	62,800	
		240	20.0	68,300	
	1	440	16.8	57,300	37.0
		460	18.4	62,800	
		480	20.0	68,300	
	1	550	16.8	57,300	29.0
		575	18.4	62,800	
600		20.0	68,300		
ECH16-135/160-30 208/230v (72G23) 460v (72G28) 575v (72G33) 42 lbs. (19 kg)	**2	208	22.5	76,800	103.0
		220	25.2	86,000	
		230	27.5	93,900	
		240	30.0	102,400	
	1	440	25.2	86,000	52.0
		460	27.6	93,900	
		480	30.0	102,400	
	1	550	25.2	86,000	41.0
		575	27.6	93,900	
600		30.0	102,400		
ECH16-135/160-40 208/230v (72G24) 460v (72G29) 575v (72G34) 53 lbs. (24 kg)	**3	208	30.0	102,400	133.0
		220	33.6	114,700	
		230	36.8	125,600	
		240	40.0	136,500	
	**2	440	33.6	114,700	67.0
		460	36.8	125,600	
		480	40.0	136,500	
	**2	550	33.6	114,700	53.0
		575	36.8	125,600	
600		40.0	136,500		
ECH16-135/160-50 208/230v (72G25) 460v (72G30) 575v (72G35) 58 lbs. (26 kg)	**4	208	37.5	128,000	133.0
		220	42.0	143,300	
		230	46.0	157,000	
		240	50.0	170,600	
	**2	440	43.8	149,500	67.0
		460	46.0	157,000	
		480	50.0	170,600	
	**2	550	43.8	149,500	53.0
		575	46.0	157,000	
600		50.0	170,600		

*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F (75°C).

**May be used with two stage control.

NOTE — Fuse block must be ordered extra. Factory installed heaters will have the fuse block factory installed. Fuse block must be installed in field installed heaters. See Optional Accessories tables.

RATINGS

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

CHA24-1603 COOLING CAPACITY (With One Compressor Only Operating)

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																							
			65°F (18°C)						75°F (24°C)						85°F (29°C)						95°F (35°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C		
63°F (17.2°C)	1980	4200	22.4	76,500	4620	.59	.73	.85	21.5	73,300	5030	.60	.74	.87	20.6	70,300	5470	.61	.76	.89	19.6	67,000	5960	.62	.77	.91
	2360	5000	23.5	80,200	4670	.62	.76	.91	22.5	76,900	5100	.63	.78	.93	21.5	73,400	5560	.65	.80	.96	20.5	70,000	6040	.66	.82	.99
	2735	5800	24.3	83,000	4720	.66	.80	.97	23.3	79,500	5150	.67	.82	1.00	22.3	76,000	5610	.69	.84	1.00	21.2	72,400	6110	.70	.86	1.00
67°F (19.4°C)	1980	4200	23.7	80,700	4680	.47	.59	.70	22.7	77,400	5110	.47	.60	.72	21.7	74,200	5580	.48	.61	.73	20.8	71,000	6070	.48	.62	.75
	2360	5000	24.7	84,400	4740	.48	.61	.75	23.7	81,000	5180	.49	.62	.77	22.7	77,600	5650	.50	.63	.78	21.7	74,100	6160	.50	.65	.80
	2735	5800	25.6	87,300	4780	.50	.64	.80	24.6	83,800	5230	.51	.65	.81	23.5	80,200	5710	.52	.66	.83	22.4	76,600	6220	.53	.68	.86
71°F (21.7°C)	1980	4200	24.9	84,900	4750	.35	.48	.58	23.9	81,600	5190	.35	.49	.59	22.9	78,200	5670	.35	.49	.60	22.0	74,900	6180	.36	.50	.61
	2360	5000	26.0	88,700	4800	.36	.49	.61	24.9	85,100	5250	.36	.50	.62	23.9	81,600	5740	.36	.50	.63	22.9	78,100	6260	.36	.51	.64
	2735	5800	26.8	91,400	4840	.36	.51	.64	25.8	87,900	5300	.37	.51	.65	24.7	84,300	5800	.37	.52	.67	23.6	80,600	6330	.37	.53	.68

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

CHA24-1603 TOTAL COOLING CAPACITY (With Both Compressors Operating)

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																							
			85°F (29°C)						95°F (35°C)						105°F (41°C)						115°F (46°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T)		
						Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb		
L/s	cfm	kW	Btuh	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C	kW	Btuh	Watts Input	75°F/24°C	80°F/27°C	85°F/29°C		
63°F (17.2°C)	1980	4200	41.8	143,800	11,230	.66	.83	.98	40.3	137,400	12,180	.68	.85	.99	37.3	127,200	13,050	.69	.87	1.00	34.3	117,200	13,920	.71	.90	1.00
	2360	5000	43.7	149,000	11,380	.70	.89	1.00	41.8	142,700	12,340	.72	.90	1.00	38.7	132,000	13,230	.73	.92	1.00	35.4	120,900	14,100	.76	.96	1.00
	2735	5800	45.0	153,700	11,490	.75	.95	1.00	42.7	145,700	12,450	.77	.96	1.00	39.4	134,600	13,330	.78	.97	1.00	36.3	124,000	14,250	.81	1.00	1.00
67°F (19.4°C)	1980	4200	44.5	151,800	11,450	.52	.65	.80	42.7	145,700	12,440	.53	.66	.82	39.5	134,700	13,350	.54	.68	.83	36.5	124,600	14,270	.55	.71	.85
	2360	5000	46.1	157,400	11,580	.54	.69	.85	44.2	151,000	12,590	.55	.71	.87	40.9	139,500	13,530	.56	.72	.89	37.7	128,600	14,460	.58	.75	.92
	2735	5800	47.4	161,800	11,680	.56	.73	.92	45.4	155,000	12,710	.57	.75	.94	41.9	142,900	13,660	.58	.76	.95	38.6	131,800	14,630	.60	.79	.98
71°F (21.7°C)	1980	4200	46.8	159,700	11,640	.39	.52	.65	45.0	153,600	12,670	.40	.53	.66	41.6	142,100	13,630	.40	.54	.67	38.6	131,700	14,590	.41	.55	.69
	2360	5000	48.4	165,300	11,770	.40	.54	.68	46.6	158,900	12,820	.40	.55	.69	43.1	147,100	13,790	.41	.56	.71	39.8	135,900	14,770	.42	.58	.74
	2735	5800	49.8	169,900	11,870	.40	.56	.72	47.8	163,000	12,920	.41	.57	.73	44.2	150,700	13,920	.42	.58	.75	40.8	139,300	14,910	.43	.60	.78

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

BLOWER DATA

CHA24-953 BLOWER PERFORMANCE

Air Volume cfm (L/s)	STATIC PRESSURE EXTERNAL TO UNIT — Inches Water Gauge																	
	.20 (50)		.40 (100)		.50 (125)		.70 (175)		.80 (200)		.90 (225)		1.00 (250)		1.10 (275)		1.30 (325)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
2600 (1225)	----	----	----	----	815	1.00 (0.75)	895	1.30 (0.97)	930	1.40 (1.04)	980	1.50 (1.11)	1020	1.65 (1.23)	1055	1.80 (1.34)	1155	2.05 (1.53)
2800 (1320)	----	----	800	1.05 (0.78)	840	1.15 (0.86)	920	1.40 (1.04)	955	1.55 (1.16)	995	1.65 (1.23)	1030	1.80 (1.34)	1065	1.95 (1.45)	1145	2.25 (1.83)
3000 (1415)	----	----	840	1.20 (0.90)	875	1.30 (0.97)	940	1.55 (1.16)	980	1.70 (1.27)	1015	1.90 (1.42)	1050	2.05 (1.53)	1085	2.20 (1.64)	----	----
3200 (1510)	815	1.20 (0.90)	885	1.45 (1.08)	910	1.50 (1.12)	975	1.75 (1.31)	1005	1.90 (1.42)	1045	2.10 (1.57)	1080	2.20 (1.64)	----	----	----	----
*3400 (1605)	860	1.45 (1.08)	920	1.65 (1.23)	950	1.75 (1.31)	1010	2.00 (1.49)	1045	2.15 (1.60)	1080	2.30 (1.72)	----	----	----	----	----	----
3600 (1770)	900	1.70 (1.27)	960	1.90 (1.42)	985	2.05 (1.53)	1045	2.25 (1.68)	----	----	----	----	----	----	----	----	----	----
3800 (1795)	950	1.95 (1.45)	995	2.20 (1.64)	----	----	----	----	----	----	----	----	----	----	----	----	----	----

NOTE — All data is measured external to the unit with dry coil and air filters in place. See Page 21 for Accessory Air Resistance data.

*Minimum air volume at .25 in. w.g. (62 Pa) with electric heat.

NOTE — In Canada, maximum usable motor output is 2 hp (1.49 kW).

BLOWER DATA

CHA24-1353 BLOWER PERFORMANCE

Air Volume cfm (L/s)	STATIC PRESSURE EXTERNAL TO UNIT – Inches Water Gauge																			
	.20 (50)		.40 (100)		.50 (125)		.70 (175)		.80 (200)		.90 (225)		1.00 (250)		1.10 (275)		1.30 (325)		1.50 (375)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
3600 (1700)	585	0.89 (0.66)	655	1.13 (0.84)	700	1.25 (0.93)	770	1.52 (1.13)	795	1.65 (1.23)	820	1.80 (1.34)	850	1.93 (1.44)	875	2.08 (1.55)	935	2.41 (1.80)	985	2.68 (2.00)
3800 (1795)	605	1.00 (0.75)	685	1.25 (0.93)	720	1.37 (1.02)	785	1.67 (1.24)	805	1.80 (1.34)	830	1.94 (1.45)	860	2.08 (1.55)	890	2.26 (1.69)	940	2.56 (1.91)	995	2.85 (2.13)
4000 (1890)	630	1.14 (0.85)	705	1.41 (1.05)	740	1.50 (1.12)	795	1.81 (1.35)	820	1.96 (1.46)	845	2.11 (1.57)	875	2.26 (1.69)	905	2.43 (1.81)	955	2.67 (1.99)	1000	3.01 (2.25)
4200 (1980)	650	1.29 (0.96)	725	1.57 (1.17)	755	1.70 (1.27)	810	2.01 (1.50)	835	2.16 (1.61)	865	2.31 (1.72)	890	2.46 (1.84)	920	2.63 (1.96)	970	2.93 (2.19)	1005	3.15 (2.35)
4400 (2075)	680	1.46 (1.09)	745	1.76 (1.31)	780	1.91 (1.42)	825	2.22 (1.66)	855	2.37 (1.77)	880	2.51 (1.87)	910	2.69 (2.01)	930	2.83 (2.11)	980	3.14 (2.34)	-----	-----
4600 (2170)	705	1.65 (1.23)	770	1.95 (1.45)	795	2.11 (1.57)	845	2.43 (1.81)	870	2.58 (1.92)	900	2.75 (2.05)	925	2.92 (2.18)	950	3.06 (2.28)	995	3.33 (2.48)	-----	-----
4800 (2265)	730	1.85 (1.38)	790	2.17 (1.62)	810	2.33 (1.74)	865	2.66 (1.98)	890	2.82 (2.10)	920	2.99 (2.23)	945	3.15 (2.35)	970	3.32 (2.48)	-----	-----	-----	-----
5000 (2360)	755	2.07 (1.54)	810	2.42 (1.81)	835	2.59 (1.93)	885	2.91 (2.17)	910	3.07 (2.29)	935	3.24 (2.42)	960	3.41 (2.54)	-----	-----	-----	-----	-----	-----
5200 (2455)	765	2.30 (1.72)	830	2.69 (2.01)	855	2.84 (2.12)	910	3.18 (2.37)	935	3.34 (2.49)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

NOTE – All data is measured external to the unit with dry coil and with the air filters in place. See Page 21 for Accessory Air Resistance data.

NOTE – In Canada, maximum usable motor output is 3 hp (2.24kW).

CHA24-1603 BLOWER PERFORMANCE

Air Volume cfm (L/s)	STATIC PRESSURE EXTERNAL TO UNIT – Inches Water Gauge																			
	.20 (50)		.40 (100)		.50 (125)		.70 (175)		.80 (200)		.90 (225)		1.00 (250)		1.10 (275)		1.30 (325)		1.50 (375)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
4200 (1980)	-----	-----	715	1.53 (1.14)	750	1.67 (1.25)	810	1.91 (1.42)	840	2.05 (1.53)	870	2.17 (1.62)	900	2.31 (1.72)	930	2.45 (1.83)	985	2.77 (2.07)	1035	3.06 (2.28)
4400 (2075)	-----	-----	740	1.71 (1.28)	770	1.83 (1.41)	830	2.10 (1.57)	860	2.24 (1.67)	890	2.39 (1.78)	915	2.51 (1.87)	945	2.67 (1.99)	995	2.96 (2.21)	1050	3.31 (2.47)
4600 (2170)	700	1.66 (1.24)	765	1.82 (1.36)	795	2.13 (1.59)	855	2.33 (1.74)	880	2.45 (1.83)	910	2.60 (1.94)	935	2.75 (2.05)	960	2.89 (2.16)	1015	3.21 (2.39)	1065	3.56 (2.66)
4800 (2265)	730	1.85 (1.38)	790	2.14 (1.60)	820	2.27 (1.69)	875	2.54 (1.89)	905	2.70 (2.01)	930	2.85 (2.13)	955	3.01 (2.25)	980	3.26 (2.43)	1030	3.41 (2.54)	1080	3.81 (2.84)
5000 (2360)	755	2.06 (1.54)	815	2.37 (1.77)	845	2.53 (1.89)	900	2.80 (2.09)	925	2.96 (2.21)	950	3.11 (2.32)	975	3.27 (2.44)	1000	3.41 (2.54)	1050	3.75 (2.80)	1095	4.06 (3.03)
5200 (2455)	785	2.38 (1.78)	845	2.65 (1.98)	870	2.80 (2.09)	920	3.07 (2.29)	950	3.25 (2.42)	975	3.42 (2.55)	1000	3.56 (2.66)	1025	3.75 (2.80)	1070	4.06 (3.03)	1115	4.39 (3.27)
5400 (2550)	810	2.61 (1.95)	870	2.95 (2.20)	895	3.07 (2.29)	950	3.41 (2.54)	970	3.55 (2.65)	995	3.70 (2.76)	1020	3.87 (2.89)	1045	4.09 (3.05)	1090	4.38 (3.27)	1135	4.74 (3.54)
5600 (2645)	840	2.95 (2.20)	895	3.23 (2.41)	920	3.39 (2.53)	970	3.72 (2.78)	995	3.88 (2.89)	1020	4.05 (3.02)	1045	4.22 (3.15)	1065	4.37 (3.26)	1110	4.72 (3.52)	1155	5.08 (3.79)
5800 (2735)	865	3.25 (2.42)	920	3.53 (2.63)	945	3.73 (2.83)	995	4.05 (3.02)	1020	4.25 (3.17)	1045	4.42 (3.30)	1065	4.57 (3.41)	1090	4.76 (3.55)	1130	5.08 (3.79)	1175	5.46 (4.07)

NOTE – All data is measured external to the unit with dry coil and with the air filters in place. See Page 21 for Accessory Air Resistance data.

NOTE – Data in shaded area requires field furnished drive kit.

NOTE – In Canada, maximum usable motor output is 3 hp (2.24kW).

BLOWER DATA

ACCESSORY AIR RESISTANCE

Unit Model No.	Air Volume		Total Resistance — inches water gauge (Pa)						
			Wet Evaporator Coil	REMD24M Down-Flow Economizer	EMDH16M Horizontal Economizer	RTD11 Step-Down Diffuser			FD11 Flush Diffuser
	cfm	L/s				2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	
CHA24-953	2400	1185	.12 (30)	.25 (62)	.03 (7)	.21 (52)	.18 (45)	.15 (37)	.14 (35)
	2600	1225	.13 (32)	.31 (77)	.04 (10)	.24 (60)	.21 (52)	.18 (45)	.17 (42)
	2800	1320	.14 (35)	.37 (92)	.04 (10)	.27 (67)	.24 (60)	.21 (52)	.20 (50)
	3000	1415	.16 (40)	.43 (107)	.05 (12)	.32 (80)	.29 (72)	.25 (62)	.25 (62)
	3200	1510	.18 (45)	.50 (124)	.05 (12)	.41 (102)	.37 (92)	.32 (80)	.31 (77)
	3400	1605	.19 (47)	.53 (132)	.06 (15)	.50 (124)	.45 (112)	.39 (97)	.37 (92)
	3600	1700	.21 (52)	.55 (137)	.06 (15)	.61 (152)	.54 (134)	.48 (119)	.44 (109)
	3800	1795	.23 (57)	.60 (149)	.07 (17)	.73 (182)	.63 (157)	.57 (142)	.51 (127)
CHA24-1353	3600	1700	.12 (30)	.18 (45)	.03 (7)	.36 (90)	.28 (70)	.23 (57)	.15 (37)
	3800	1795	.13 (32)	.19 (47)	.04 (10)	.40 (99)	.32 (80)	.26 (65)	.18 (45)
	4000	1890	.14 (35)	.21 (52)	.04 (10)	.44 (109)	.36 (90)	.29 (72)	.21 (52)
	4200	1980	.15 (37)	.24 (60)	.05 (12)	.49 (122)	.40 (99)	.33 (82)	.24 (60)
	4400	2075	.16 (40)	.26 (65)	.05 (12)	.54 (134)	.44 (109)	.37 (92)	.27 (67)
	4600	2170	.17 (42)	.28 (70)	.06 (15)	.60 (149)	.49 (122)	.42 (104)	.31 (77)
	4800	2265	.18 (45)	.30 (75)	.07 (17)	.65 (162)	.53 (132)	.46 (114)	.35 (87)
	5000	2360	.19 (47)	.31 (77)	.09 (22)	.69 (172)	.58 (144)	.50 (124)	.39 (97)
CHA24-1603	4200	1980	.10 (25)	.18 (45)	.06 (15)	.22 (55)	.19 (47)	.16 (40)	.10 (25)
	4400	2075	.11 (27)	.20 (50)	.07 (17)	.28 (70)	.24 (60)	.20 (50)	.12 (30)
	4600	2170	.12 (30)	.21 (52)	.07 (17)	.34 (85)	.29 (72)	.24 (60)	.15 (37)
	4800	2265	.13 (32)	.23 (57)	.08 (20)	.40 (99)	.34 (85)	.29 (72)	.19 (47)
	5000	2360	.14 (35)	.26 (65)	.08 (20)	.46 (114)	.39 (97)	.34 (85)	.23 (57)
	5200	2455	.15 (37)	.31 (77)	.09 (22)	.52 (129)	.44 (109)	.39 (97)	.27 (67)
	5400	2550	.16 (40)	.34 (85)	.10 (25)	.58 (144)	.49 (122)	.43 (107)	.31 (77)
	5600	2645	.17 (42)	.38 (94)	.12 (30)	.64 (159)	.54 (134)	.47 (117)	.35 (87)
	5800	2735	.18 (45)	.40 (99)	.13 (32)	.70 (174)	.59 (147)	.51 (127)	.39 (97)

NOTE — Electric Heat has no appreciable air resistance.

CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume		*Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	cfm	L/s	ft.	m	ft.	m
CHA24-953	3000	1415	27 — 33	8 — 10	25 — 30	8 — 9
	3375	1595	30 — 37	9 — 11	28 — 34	9 — 10
	3750	1770	34 — 41	10 — 12	31 — 38	9 — 12
CHA24-1353	4400	2075	34 — 42	10 — 13	32 — 40	10 — 12
	4950	2335	38 — 47	12 — 14	36 — 45	11 — 14
	5500	2595	43 — 52	13 — 16	40 — 50	12 — 15
CHA24-1603	4200	1980	39 — 46	12 — 14	40 — 48	12 — 15
	5000	2360	41 — 50	12 — 15	43 — 52	13 — 16
	5800	2735	43 — 52	13 — 16	45 — 54	14 — 16

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

GUIDE SPECIFICATIONS

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

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

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

Air Distribution — Equipment shall be capable of bottom (down-flow) or side (horizontal) handling of conditioned air. All air distribution ducts shall be fiberglass or ga. galvanized steel insulated with inch (mm) thick lb./ft.² (kg/m²) density fiberglass or equivalent.

Approvals — All electrical components shall have U.L. and C.S.A. Listing. All wiring shall be in compliance with NEC and CEC.

Equipment Warranty — Compressors have a limited warranty for a full five years. All other components have a limited warranty for one year. Refer to the Lennox Equipment Limited Warranty certificate included with the unit for details.

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

The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than sq. ft. (m²) (evaporator) andsq. ft. (m²) (condenser). CHA24-953 condenser coil shall be formed coil construction. CHA24-1353-1603 condenser coil shall be slab coil construction.

Compressors shall be resiliently mounted, have overload protection and crankcase heaters. CHA24-1353 shall have scroll compressor. The refrigeration system shall have suction and liquid line service gauge ports, high pressure switches, low pressure switches, thermometer wells, driers, freezestat and full refrigerant charge. CHA24-1353 & -1603 shall have low ambient controls. Control option available shall consist of low ambient controls (CHA24-953) and timed-off control. Shall be rated in accordance with ARI Standard 210/240-89 or 360-86.

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. Evaporator coil condensate drain extended outside cabinet shall be provided. Lifting brackets shall be provided for rigging. Bottom power entry shall be furnished on CHA24-1603 (optional for CHA24-953 & -1353). Control box panel shall be hinged for easy access on CHA24-1353 & -1603. (optional for CHA24-953).

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

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. Blower wheel shall be statically and dynamically balanced with ball bearings. Blower shall be capable of delivering cfm (L/s) at an external static pressure of inches water gauge (Pa) requiring bhp (W) and rpm.

Condenser Fan(s) — Direct drive propeller type condenser fan(s) shall discharge vertically and be direct driven by a hp (W) motor. Fan motor shall have ball bearings and be permanently lubricated and inherently protected. Fan(s) shall have a safety guard.

Air Filters — Disposable filters furnished shall have not less thansq. ft. (m²) of free area.

OPTIONAL ACCESSORIES

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

.Electric heaters shall be available for factory or 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 with a time delay between each element. Limit controls shall provide overload and short circuit protection. Optional fuse block shall be required on electric heaters.

Roof Mounting Frame — Furnish and install a steel roof mounting frame for bottom discharge and return air duct connection. It shall mate to the bottom perimeter of the equipment. When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of a roofing contractor. RMF16 frame shall be approved by U.S. National Roofing Contractors Association.

Economizer Damper Section — Furnish and install complete with recirculated air dampers, outside air dampers, air filters, damper actuator and controls. Low leakage dampers shall ride in nylon bearings. Down-flow economizer shall have gravity exhaust. The economizer section shall provide for the introduction of 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 55°F (13°C) mixed air controller, damper actuator, adjustable minimum position switch and solid-state adjustable outdoor air enthalpy control. Cabinet shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Control option shall consist of differential enthalpy control (return air sensor). Down-flow economizer shall be available for factory or field installation.

Gravity Exhaust Dampers — Optional pressure operated dampers shall be available for field installation in EMDH16 horizontal economizer damper section. Neoprene coated fiberglass dampers shall prevent blow-back and outdoor air infiltration during off cycle. Shall be equipped with rainhoods and bird screen. Shall be furnished with down-flow economizer.

Outdoor Air Damper Section — Optional outdoor dampers shall be available to provide outdoor air requirements of up to 25%. Shall be available for manual or automatic operation. Damper section field installs external to the unit. Shall be equipped with filter for extra air filtering and bird screen protection.

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. It shall be capable of not less than ft. (m) radius of effective throw. 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.

Disconnect Package — Furnish and factory install package that includes unit disconnect, dual 120 volt GFCI type service outlets, bottom power entry (CHA24-953 & -1353 only), low ambient controls (CHA24-953 only) and hinged control box panel (CHA24-953 only).

Smoke Detector Package — Furnish and factory install photoelectric type smoke detector in return air section.

Corrosion Protection Package — Furnish and factory apply phenolic epoxy coating to condenser and evaporator coils with painted condensing and evaporator base sections and painted blower housings or apply only to condenser coil with painted condensing section base.

UNIT DIMENSIONS – inches (mm)

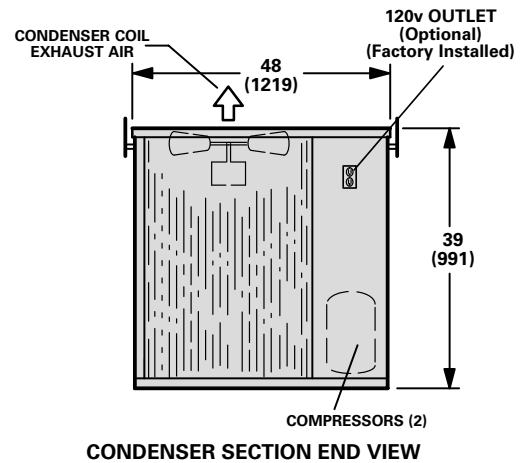
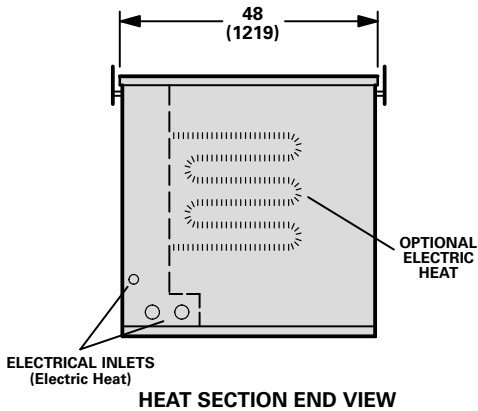
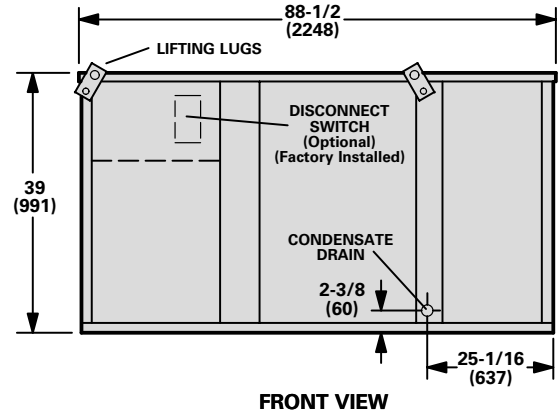
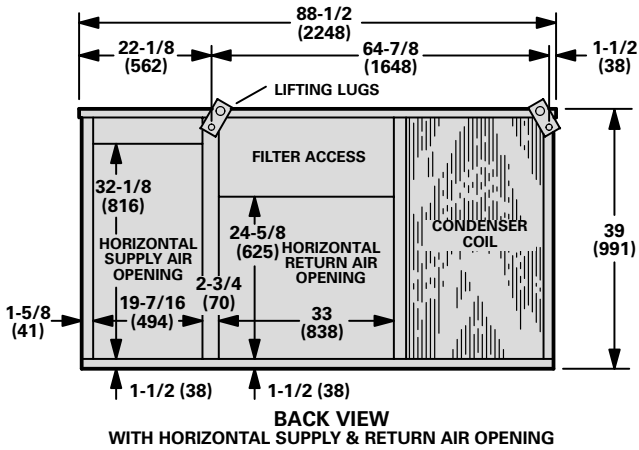
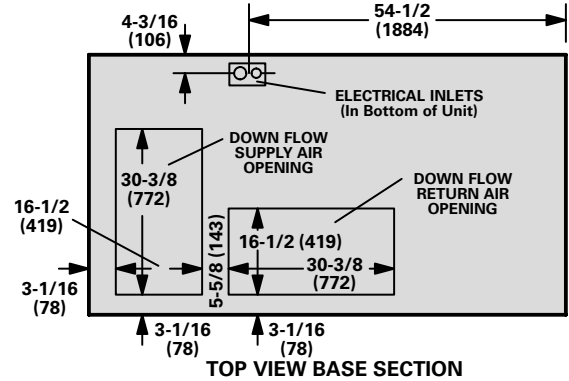
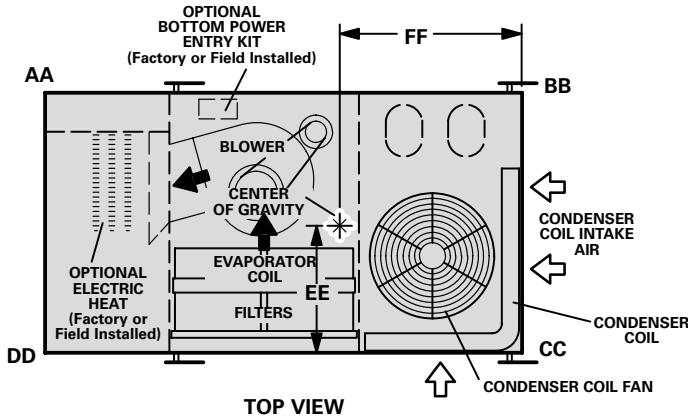
CHA24-953 BASIC UNIT

CORNER WEIGHTS – lbs. (kg)

Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-953	201	91	289	131	189	86	131	59

CENTER OF GRAVITY – inches (mm)

Model Number	EE		FF	
	inch	mm	inch	mm
CHA24-953	29	737	36-1/4	921



ACCESSORY DIMENSIONS – inches (mm)

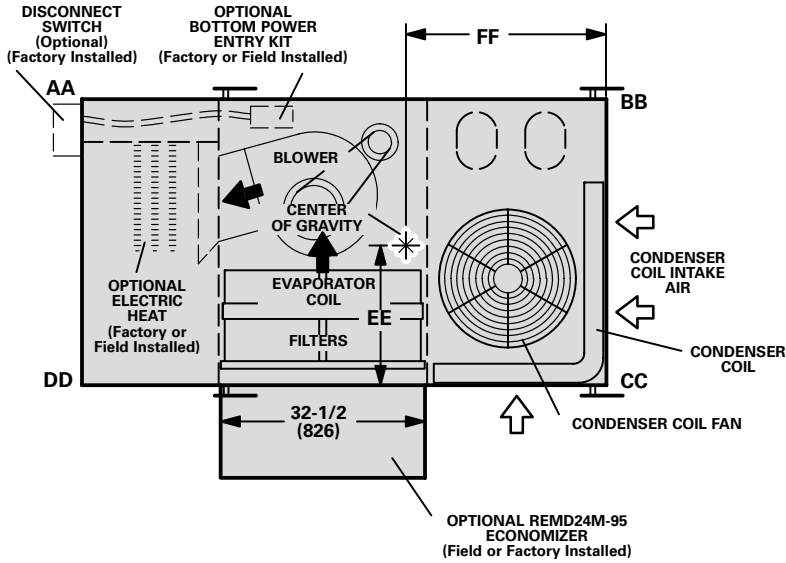
**CHA24-953 UNIT WITH REMD24M-95 ECONOMIZER DAMPER SECTION
AND RMF16-95 ROOF MOUNTING FRAME**

CORNER WEIGHTS – lbs. (kg)

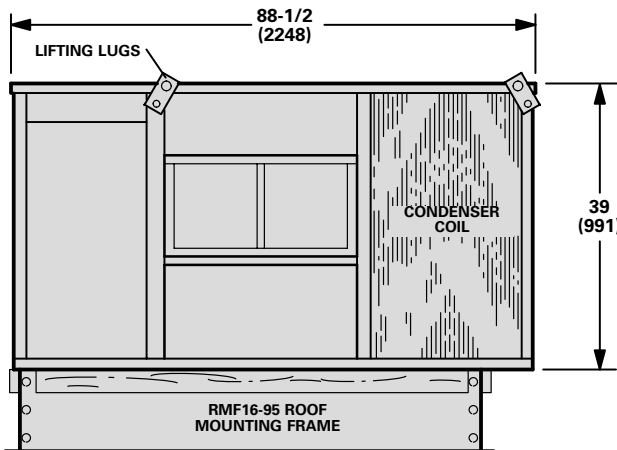
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-953	233	107	325	147	244	111	175	79

CENTER OF GRAVITY – inches (mm)

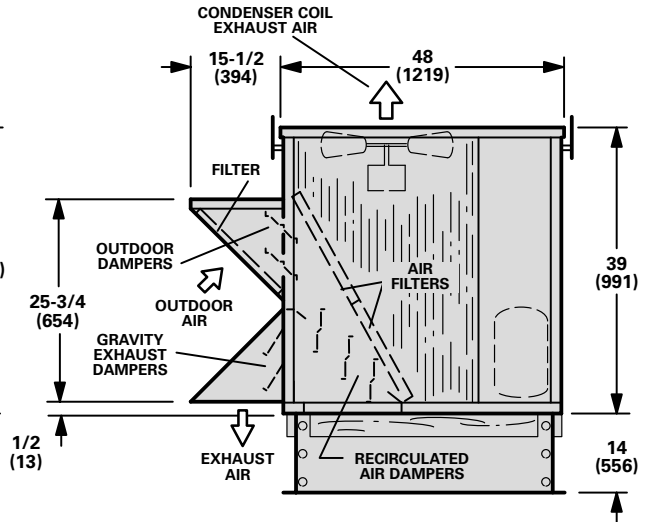
Model Number	EE		FF	
	inch	mm	inch	mm
CHA24-953	27-1/2	700	37	940



TOP VIEW



BACK VIEW



CONDENSER SECTION END VIEW

ACCESSORY DIMENSIONS — inches (mm)

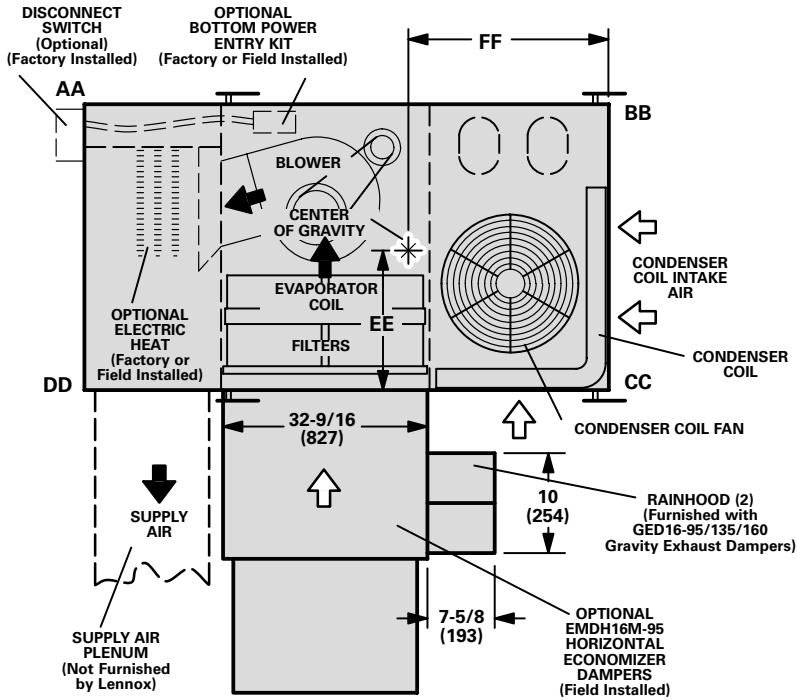
**CHA24-953 UNITS WITH
EMDH16M-95 HORIZONTAL ECONOMIZER DAMPER SECTION**

CORNER WEIGHTS — lbs. (kg)

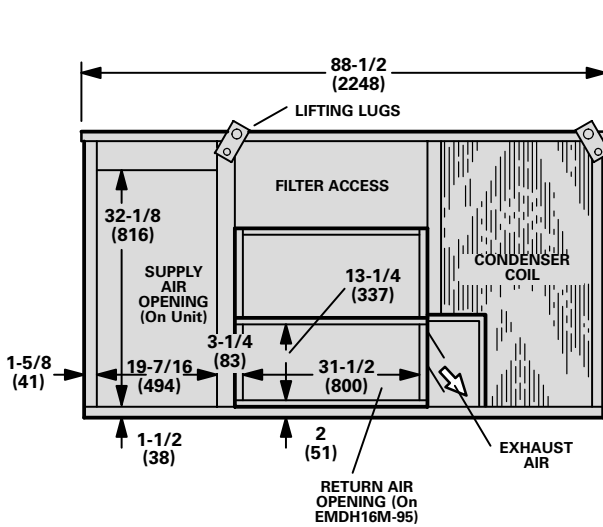
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-953	204	93	271	123	260	118	196	89

CENTER OF GRAVITY — inches (mm)

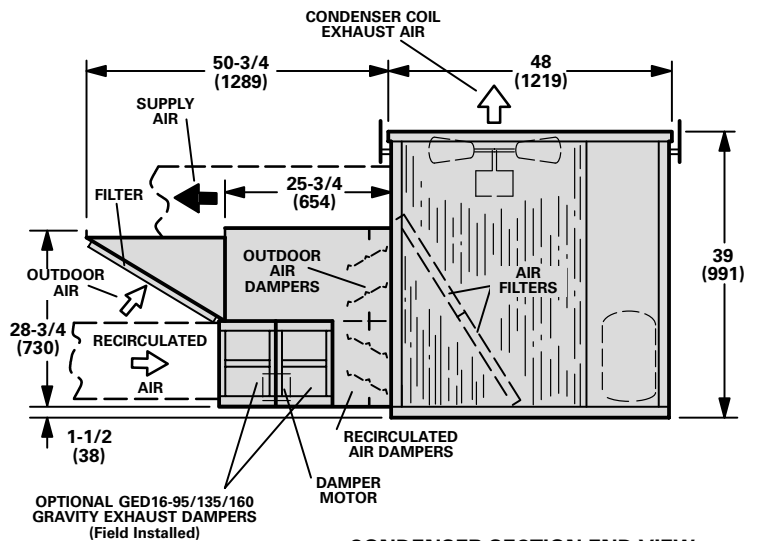
Model Number	EE		FF	
	inch	mm	inch	mm
CHA24-953	24-1/2	622	38	965



TOP VIEW



BACK VIEW



CONDENSER SECTION END VIEW

UNIT DIMENSIONS – inches (mm)

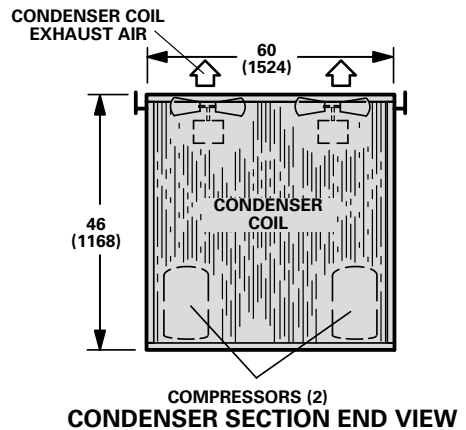
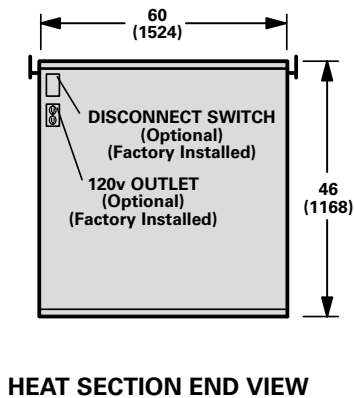
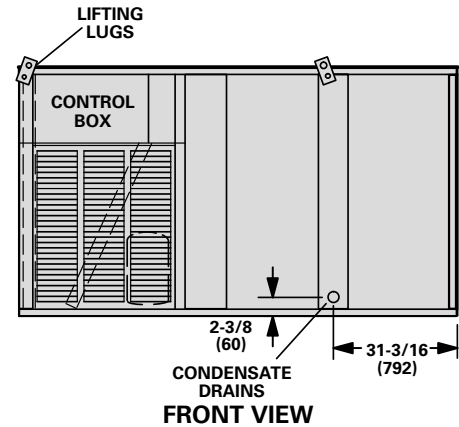
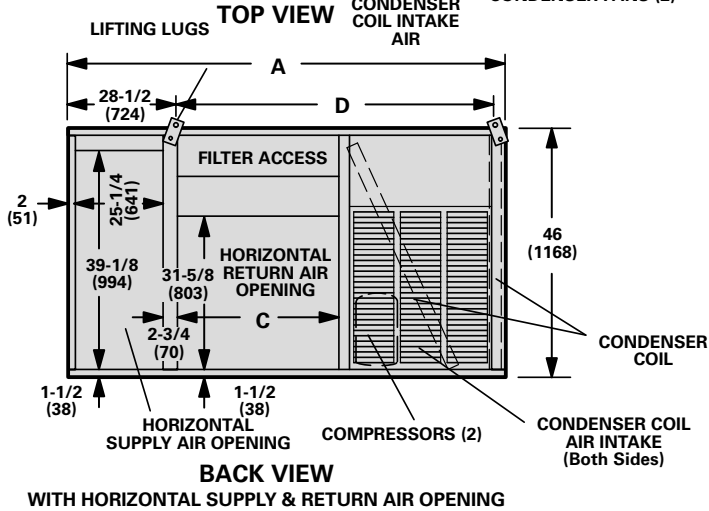
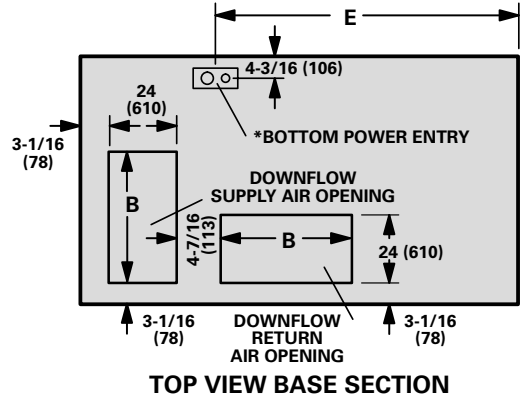
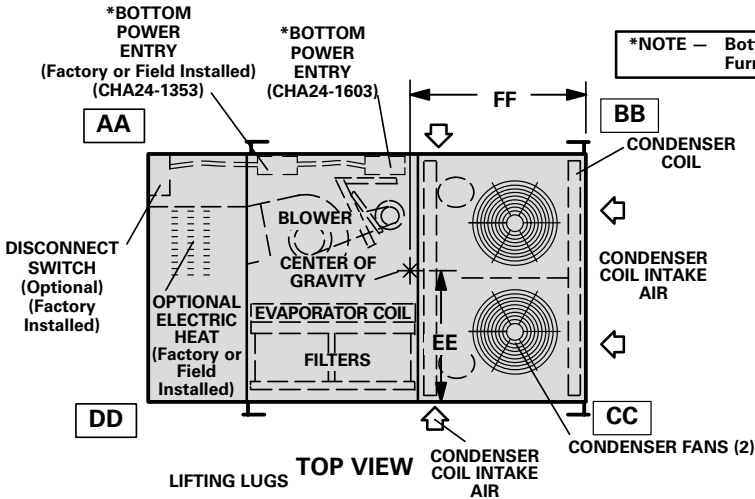
CHA24-1353 AND -1603 BASIC UNITS

CORNER WEIGHTS – lbs. (kg)

Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-1353	250	113	362	164	289	131	199	90
CHA24-1603	258	117	402	182	329	149	211	96

CENTER OF GRAVITY – in. (mm)

Model No.	EE		FF	
	in.	mm	in.	mm
CHA24-1353	33-3/8	848	40	1016
CHA24-1603	33	838	40-1/2	1029



Model No.	A		B		C		D		E	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA24-1353	98	2489	30-3/8	772	33	838	68	1727	57-1/2	1461
CHA24-1603	106	2692	38	965	41	1041	76	1930	29-1/2	749

ACCESSORY DIMENSIONS – inches (mm)

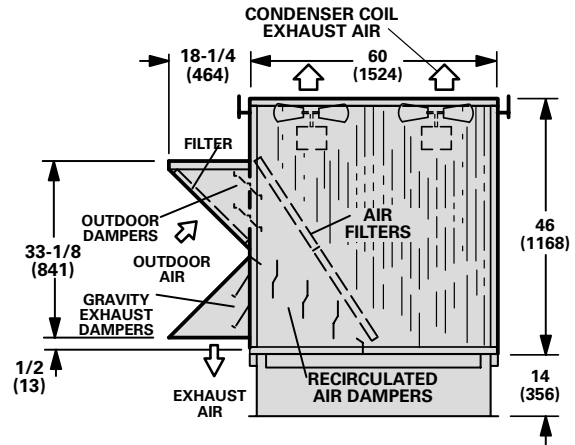
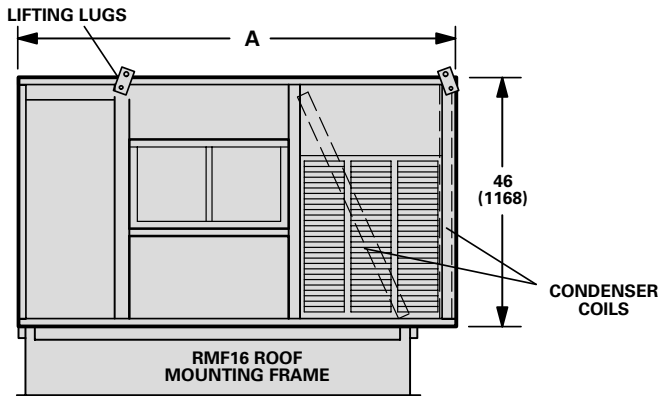
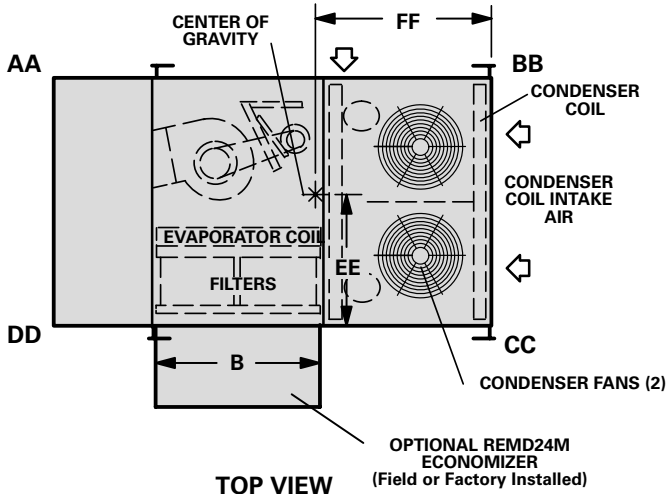
**CHA24-1353 AND -1603 WITH REMD24M DOWN-FLOW ECONOMIZER DAMPER SECTION
AND RMF16 ROOF MOUNTING FRAME
(Down-Flo Position Only)**

CORNER WEIGHTS – lbs. (kg)

Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-1353	284	129	400	181	362	164	257	117
CHA24-1603	401	182	602	273	250	113	167	76

CENTER OF GRAVITY – in. (mm)

Model No.	EE		FF	
	in.	mm	in.	mm
CHA24-1353	31-1/2	800	40-1/2	1029
CHA24-1603	27-1/2	699	42-1/2	1080



BACK VIEW

CONDENSER SECTION END VIEW

Model No.	A		B	
	in.	mm	in.	mm
CHA24-1353	98	2489	32-1/2	826
CHA24-1603	106	2692	40-1/2	1029

ACCESSORY DIMENSIONS – inches (mm)

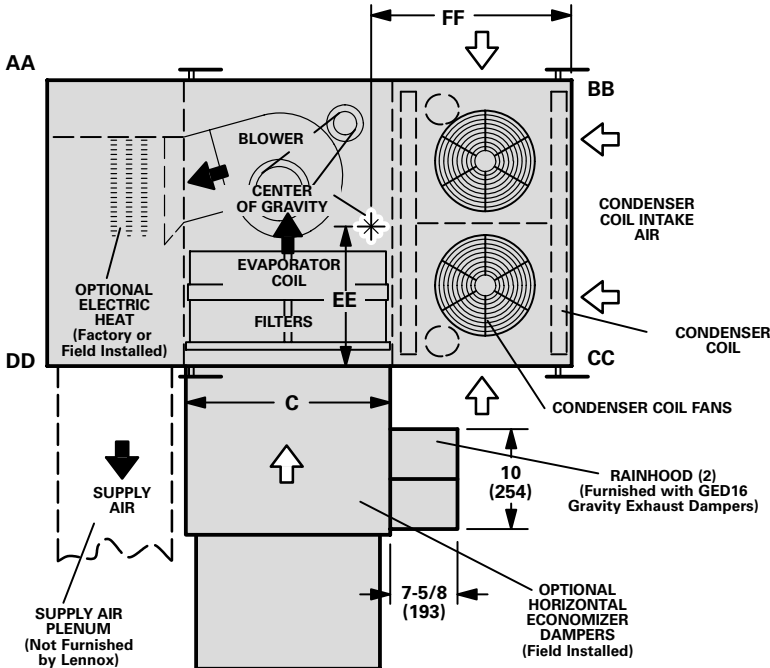
**CHA24-1353 & 1603 UNITS WITH
EMDH16M HORIZONTAL ECONOMIZER DAMPER SECTION**

CORNER WEIGHTS – lbs. (kg)

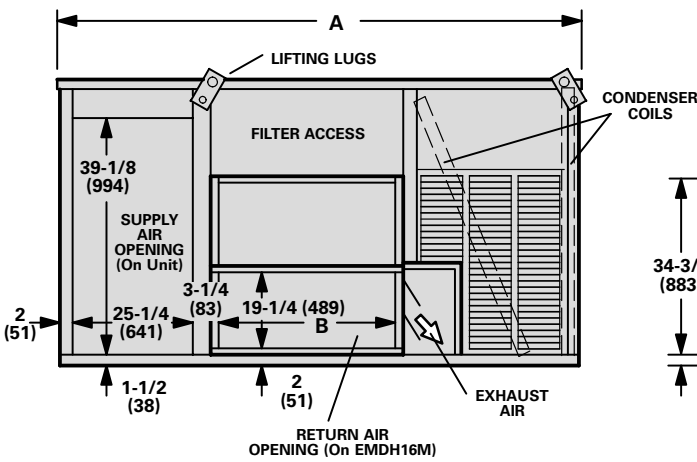
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA24-1353	254	115	349	158	370	168	269	122
CHA24-1603	233	106	342	155	459	208	313	142

CENTER OF GRAVITY – inches (mm)

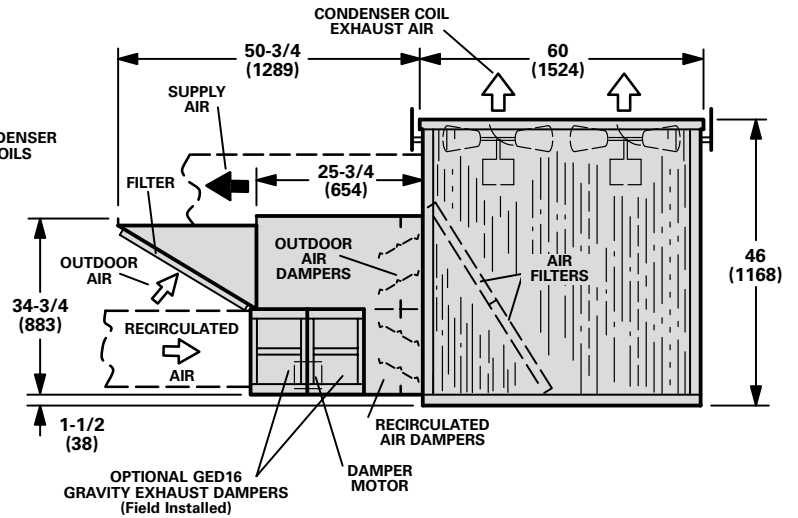
Model Number	EE		FF	
	inch	mm	inch	mm
CHA24-1353	29	737	41-1/4	1048
CHA24-1603	25-1/2	648	43	1092



TOP VIEW



BACK VIEW

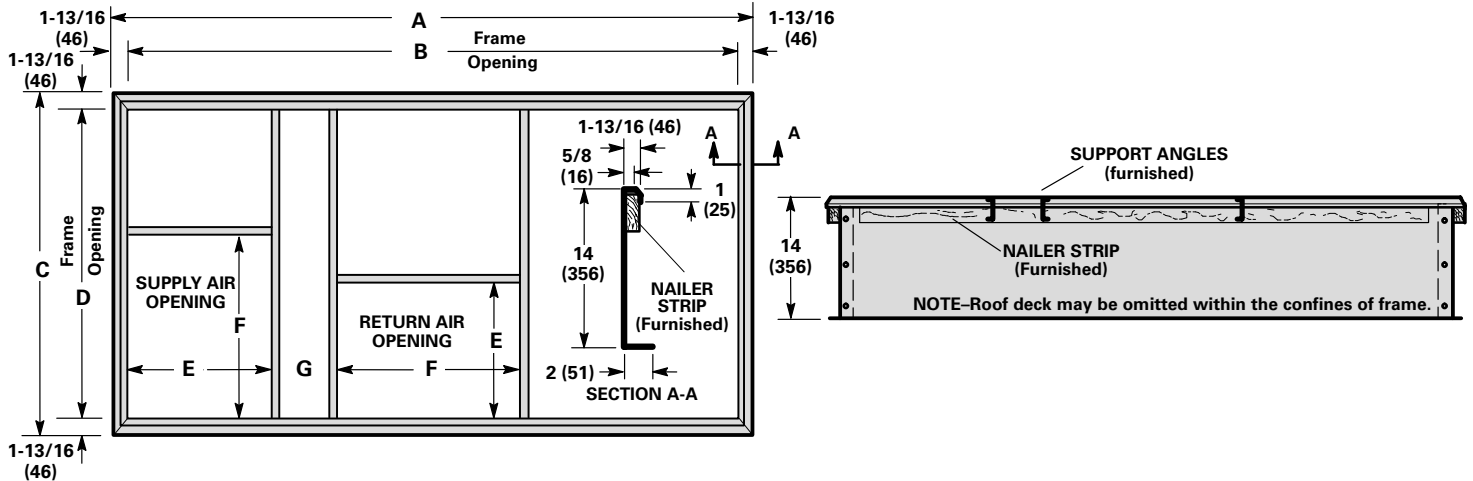


CONDENSER SECTION END VIEW

Model Number	A		B		C	
	inch	mm	inch	mm	inch	mm
CHA24-1353	94	2388	31-1/2	800	32-9/16	827
CHA24-1603	102	2591	39-1/2	1003	40-9/16	1030

ACCESSORY DIMENSIONS – inches (mm)

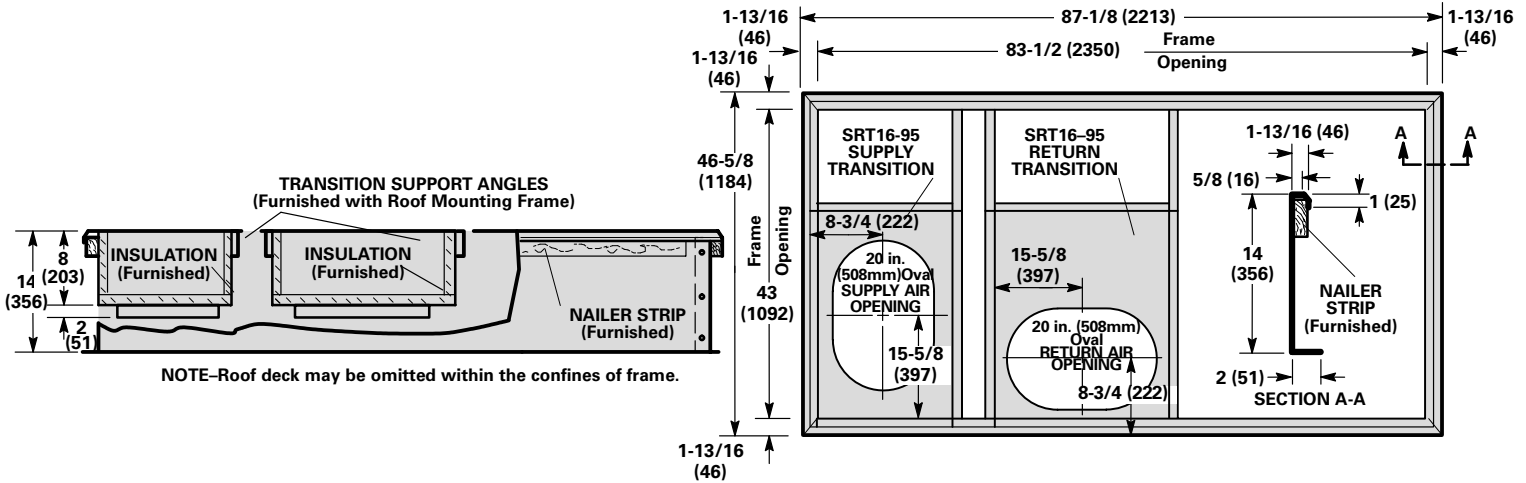
RMF16 SERIES ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING



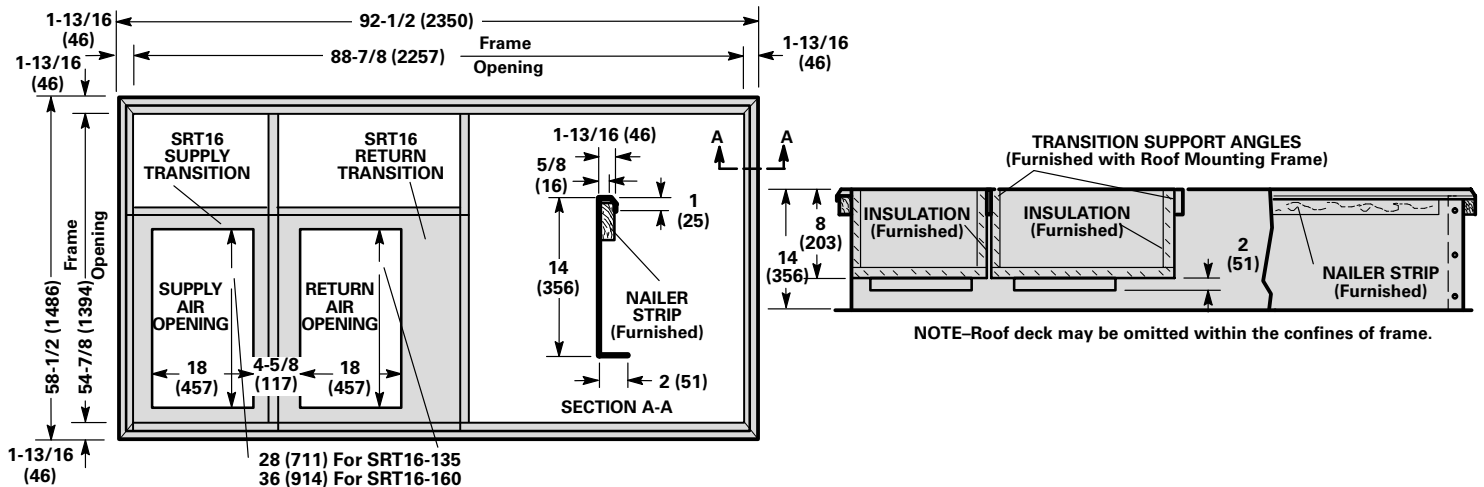
Model No.	A		B		C		D		E		F		G	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RMF16-95	87-1/8	2213	83-1/2	2121	46-5/8	1184	43	1092	17-15/16	456	31-1/2	800	4	102
RMF16-135/160	92-1/2	2350	88-7/8	2257	58-1/2	1486	54-7/8	1394	25-1/4	641	*	*	3-3/16	81

*31-1/2 inches for -1353 units. 39-1/2 inches for -1603 units.

**RMF16-95 ROOF MOUNTING FRAME WITH SRT16-95
SUPPLY AND RETURN AIR TRANSITIONS FOR FD11-95 & RTD11-95 CEILING DIFFUSERS**

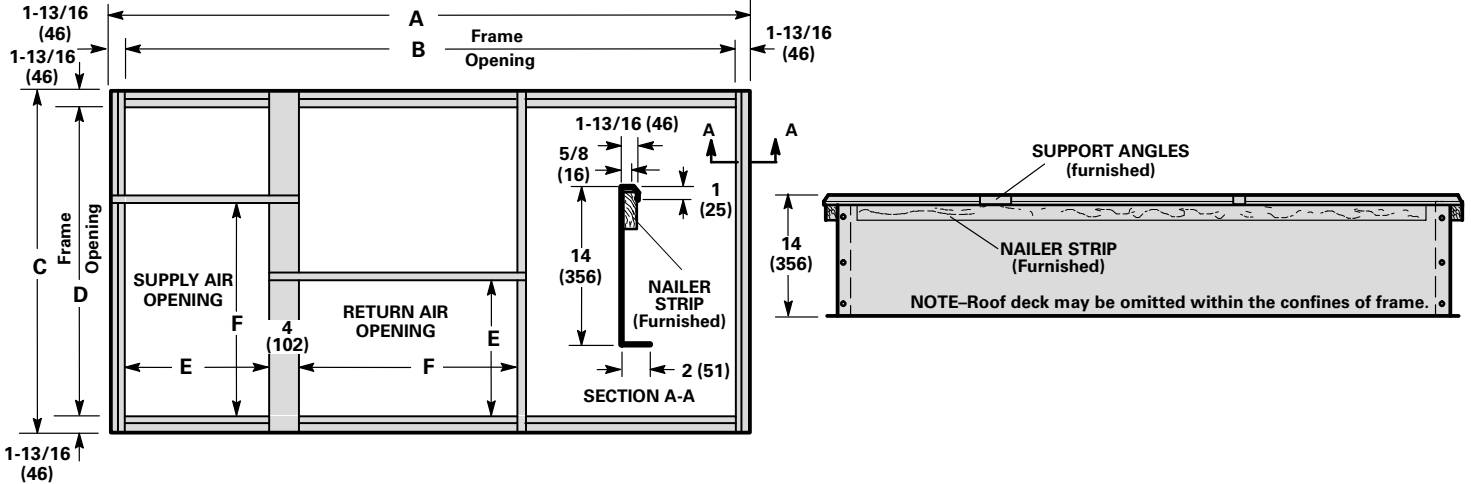


**RMF16-135/160 ROOF MOUNTING FRAME WITH SRT16
SUPPLY AND RETURN AIR TRANSITIONS FOR FD11 & RTD11 CEILING DIFFUSERS**



28 (711) For SRT16-135
36 (914) For SRT16-160

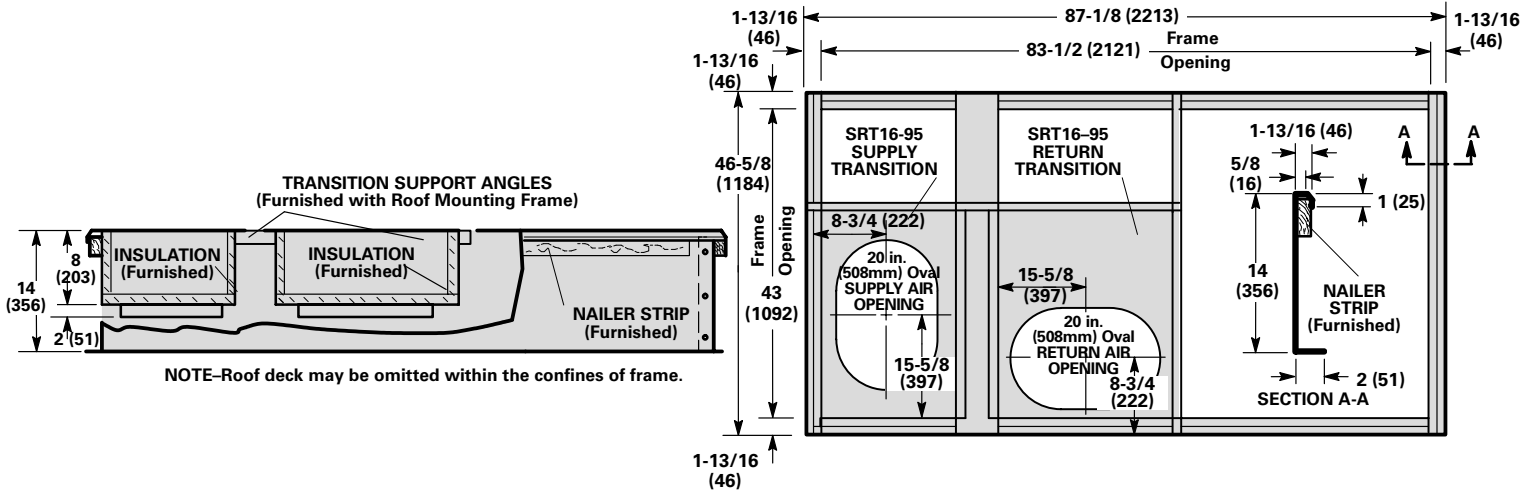
RMF16-95 AND RMF16-135/160 SERIES ROOF MOUNTING FRAMES WITH DOUBLE DUCT OPENING



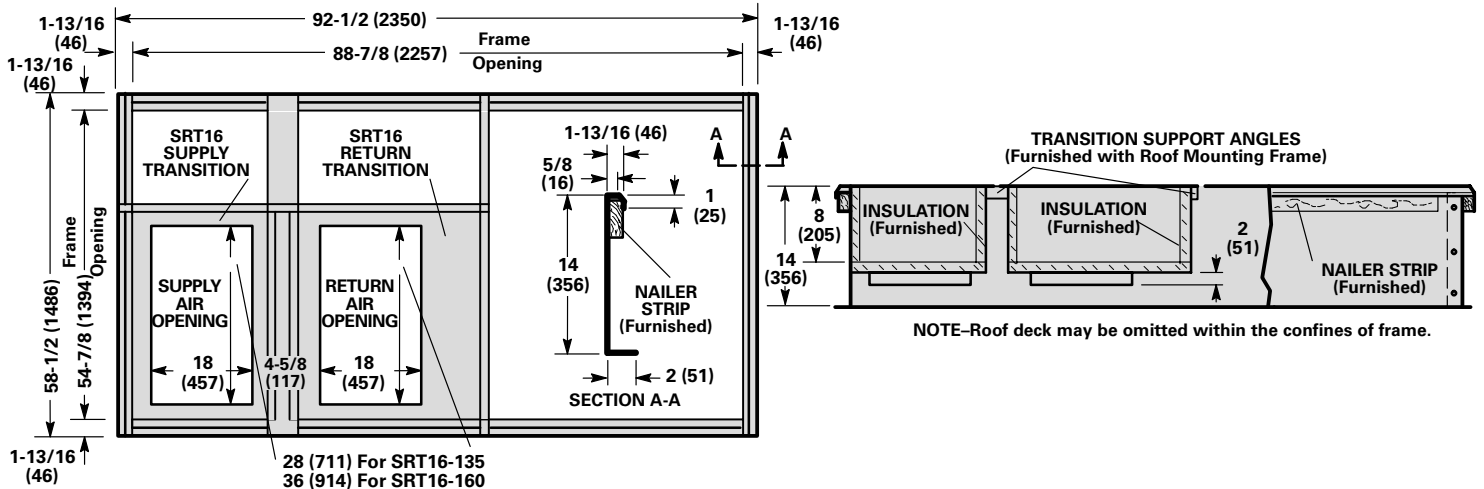
Model No.	A		B		C		D		E		F	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RMF16-95	87-1/8	2213	83-1/2	2121	46-5/8	1184	43	1092	17-15/16	456	31-1/2	800
RMF16-135/160	92-1/2	2350	88-7/8	2257	58-1/2	1486	54-7/8	1394	25-1/4	641	*	*

*31-1/2 inches (800 mm) for -1353 units. 39-1/2 (1003 mm) for -1603 units.

**RMF16-95 ROOF MOUNTING FRAMES WITH SRT16
SUPPLY AND RETURN AIR TRANSITIONS FOR FD11-95 & RTD11-95 CEILING DIFFUSERS**

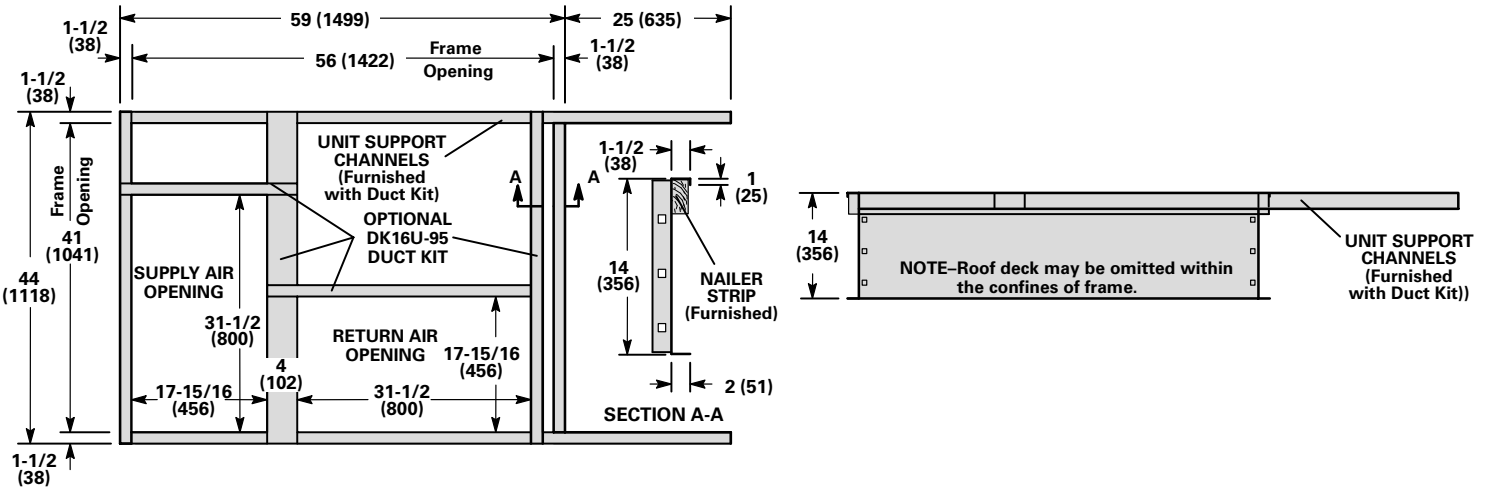


**RMF16-135/160 ROOF MOUNTING FRAMES WITH SRT16
SUPPLY AND RETURN AIR TRANSITIONS FOR FD11 & RTD11 CEILING DIFFUSERS**



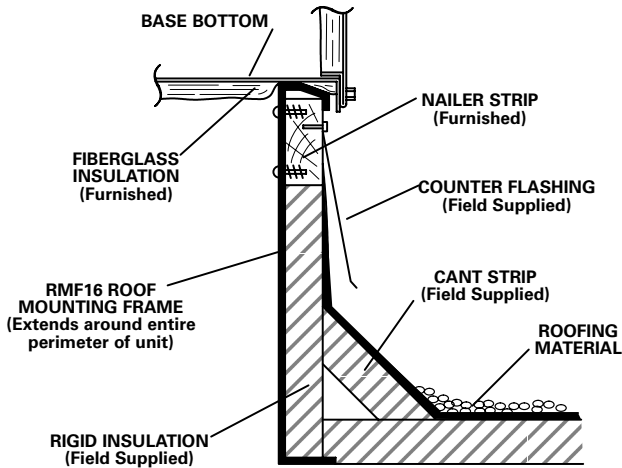
ACCESSORY DIMENSIONS – inches (mm) Canada Only

RMF16U-26/95 UNIVERSAL ROOF MOUNTING FRAME WITH OPTIONAL DK16U-95 DUCT KIT (-953 Units Only)



ACCESSORY DIMENSIONS – inches (mm)

TYPICAL FLASHING DETAIL FOR RMF16 ROOF MOUNTING FRAME



ROOF MOUNTING FRAME SPECIFICATIONS

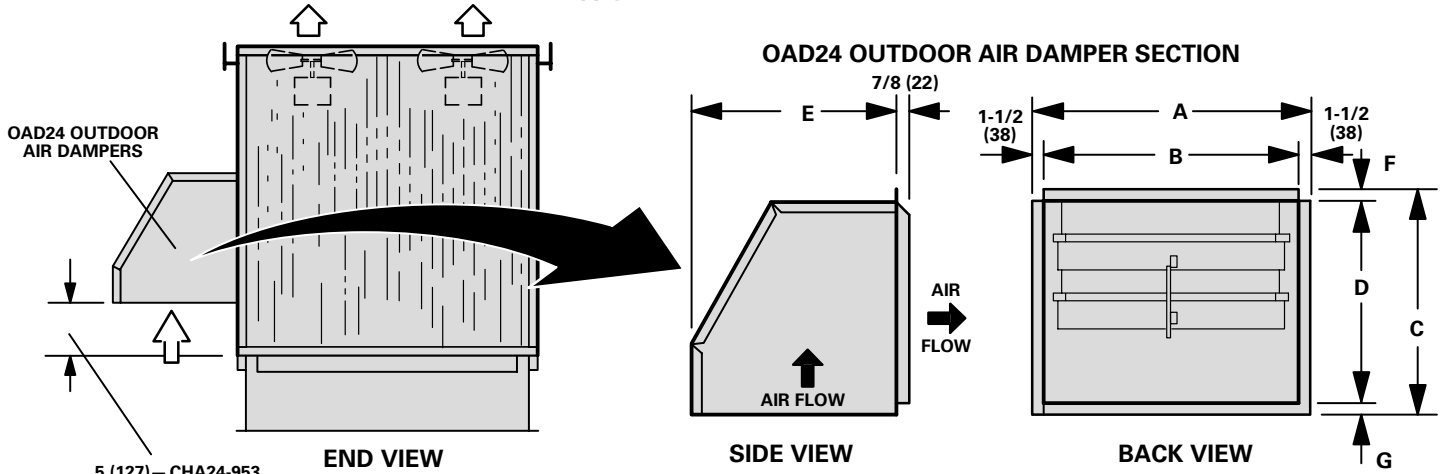
Roof Mounting frame is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.

Roof Mounting Frames	RMF16-95 RMF16-135/160
*Moment of inertia (I) (in. ⁴) (cm ⁴)	42 (1748)
*Section modulus $\frac{I}{C}$ (in. ³) (cm ³)	5.8 (95)
Maximum weight (lb/ft) (kg/m) of length	5.5 (8.2)
Design strength (psi) (kPa)	20,000 (137,900)

*Includes both sides of frame.

**CHA24 UNIT WITH OAD24 OUTDOOR AIR DAMPER SECTION
DOWN-FLO SUPPLY AND RETURN AIR**

NOTE – For Horizontal (Side) Supply And Return Air, OAD24 Field Installs on Return Air Duct

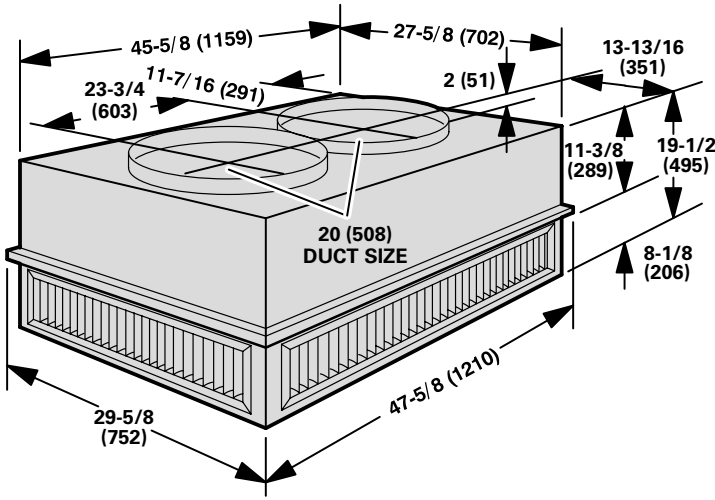


5 (127) – CHA24-953
12-15/16 (329) – CHA24-1353 & 1603

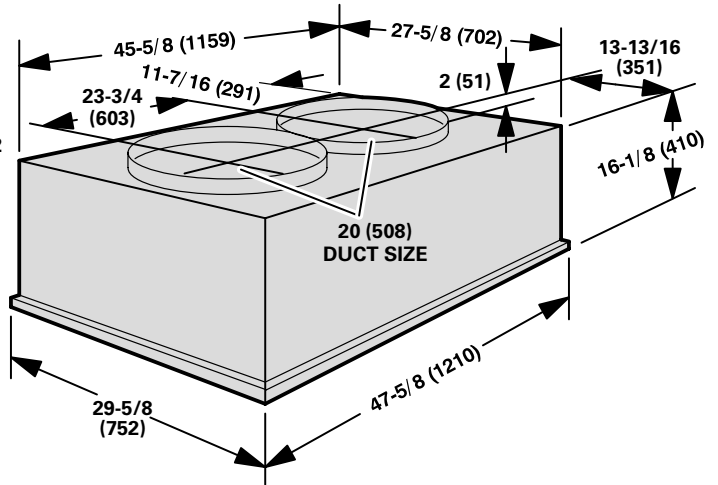
Model Number	A		B		C		D		E		F		G	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
OAD24-95 OAD24-135 OAD24-160	24	610	21	533	18-1/2	470	17-1/8	435	17-1/8	435	3/4	19	5/8	16

COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

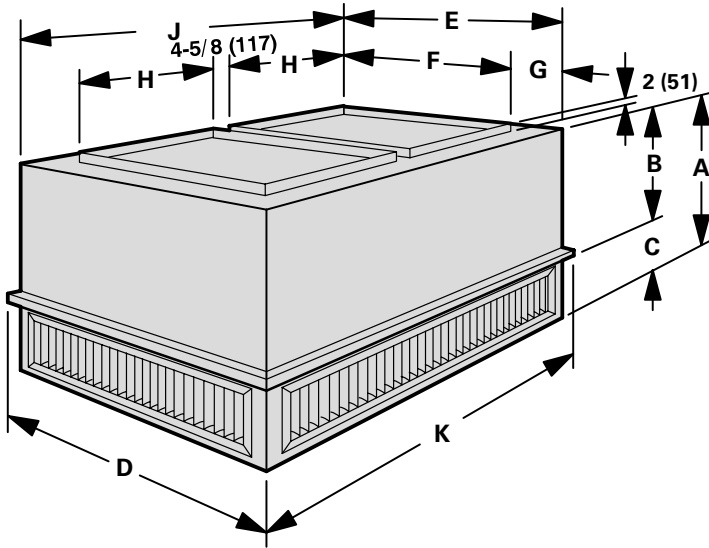
RTD11-95 STEP-DOWN CEILING DIFFUSER



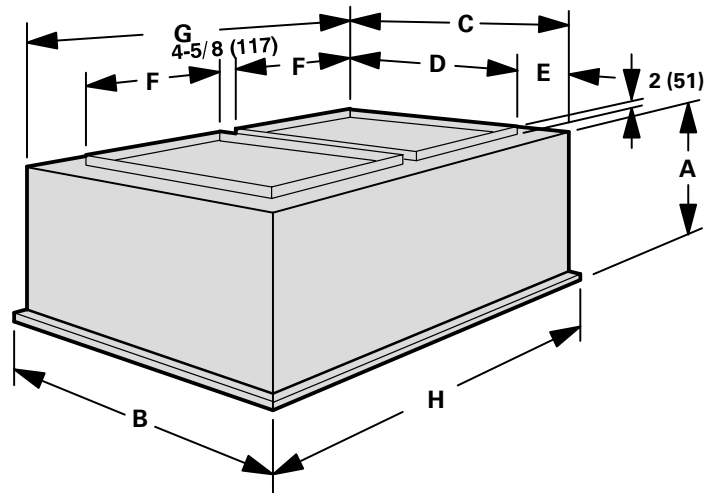
FD11-95 FLUSH CEILING DIFFUSER



RTD11-135 & RTD11-185 STEP-DOWN CEILING DIFFUSERS



FD11-135 & FD11-185 FLUSH CEILING DIFFUSERS



Model Number	A		B		C		D		E	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RTD11-135	28	711	18-7/8	479	9-1/8	232	35-5/8	905	33-5/8	854
RTD11-185	34	864	23-7/8	606	10-1/8	257	47-5/8	1210	45-5/8	1159

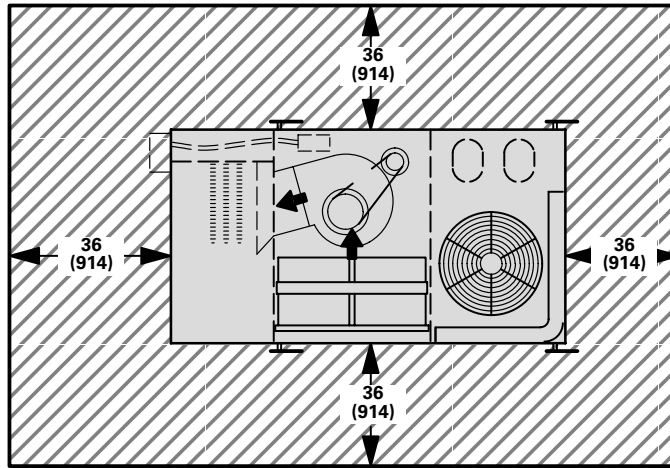
Model Number	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
FD11-135	24-1/8	613	35-5/8	905	33-5/8	854	28	711
FD11-185	30-1/8	765	47-5/8	1210	45-5/8	1159	36	914

Model Number	F		G		H		J		K	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RTD11-135	28	711	2-13/16	71	18	457	45-5/8	1159	47-5/8	1210
RTD11-185	36	914	4-13/16	122	18	457	45-5/8	1159	47-5/8	1210

Model Number	E		F		G		H	
	in.	mm	in.	mm	in.	mm	in.	mm
FD11-135	2-13/16	71	18	457	45-5/8	1159	47-5/8	1210
FD11-185	4-13/16	122	18	457	45-5/8	1159	45-5/8	1210

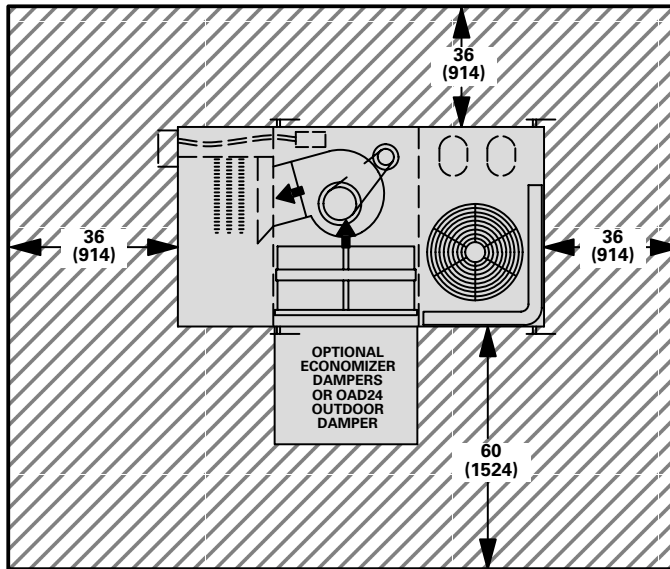
INSTALLATION CLEARANCES – inches (mm)

CHA24 BASIC UNIT



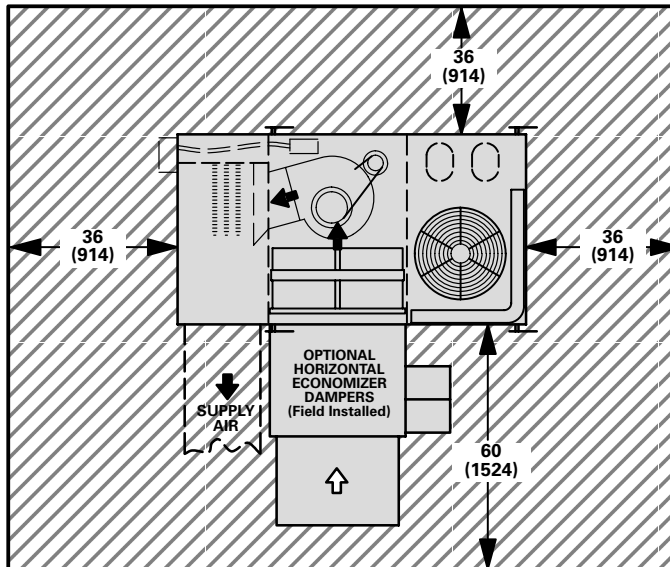
NOTE – Top Clearance Unobstructed.
 NOTE – Entire perimeter of unit requires support when elevated above mounting surface.

CHA24 UNIT WITH REMD24M ECONOMIZER DAMPER SECTION OR OAD24 OUTDOOR AIR DAMPER SECTION



NOTE – Top Clearance Unobstructed.

CHA24 UNIT WITH EMDH16M HORIZONTAL ECONOMIZER DAMPER SECTION



NOTE – Top Clearance Unobstructed.