

LENNOX®**ENGINEERING DATA****CANADIAN EDITION****COOLING AND ELECTRIC HEAT****CHA16-261-311-410-510-650****PACKAGED UNITS****COOLING AND ELECTRIC HEAT**

***23,400 to 56,000 Btuh (6.9 to 16.4 kW) Cooling Capacity**
12,600 to 85,300 Btuh (3.7 to 25.0 kW) Optional Electric Heat

*ARI Standard 210/240 Ratings

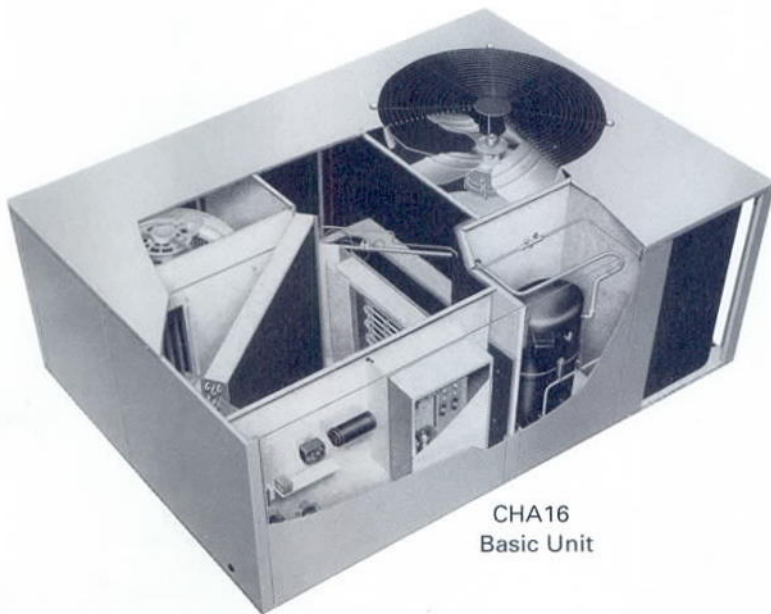
CHA16**(2 to 5 Ton)****(7.0 to 17.6 kW)**

Bulletin #485040

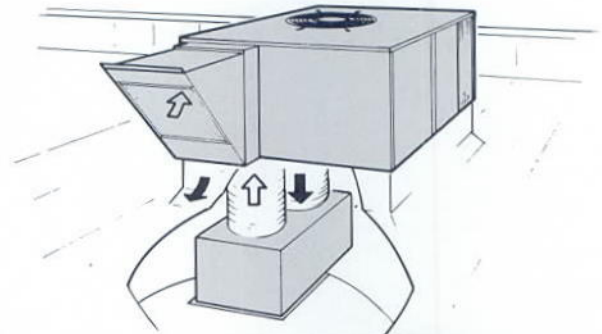
April 1993

Supersedes

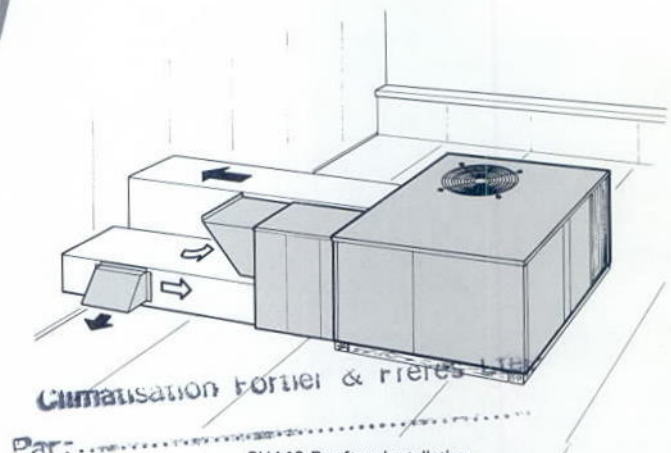
October 1991



CHA16
Basic Unit



CHA16 Rooftop Installation With Combination
Supply and Return Air System



CHA16 Rooftop Installation
With Horizontal Economizer

Application — Lennox CHA16 single package air conditioning units are designed for outdoor rooftop or ground level installations in residential or light commercial applications. Units are capable of delivering bottom (down-flo) or side (horizontal) handling of supply and return air. CHA16 models are available in five sizes, single and three phase voltage with 23,400 to 56,000 Btuh (6.9 to 16.4 kW) cooling capacity.

CHA16 models are available with a choice of thermostat and related controls which include: electro-mechanical, electronic, W973, T7300, T8600, T8621 and W7400. In addition a factory installed commercial controls platform consisting of: control system and economizer wiring harness is furnished as standard.

Optional accessories include: electric heaters, condenser coil guards, horizontal filter kit, roof mounting frames, stand-off mounting kit, down-flo or horizontal economizer dampers with modulating damper motor, step-down or flush ceiling supply and return air diffusers, and manual outdoor air dampers. See Specification tables.

Approvals — Units have been tested in the Lennox Research Laboratory environmental test room and rated in accordance with ARI Standard 210/240-89. In addition, units have been sound rated in the Lennox reverberant sound test room in accordance with ARI Standard 270-84. Units and optional electric heaters are C.S.A. certified and units and components within are bonded for grounding to meet safety standards for servicing required by C.S.A. and CEC. Blower data is from unit tests conducted in the Lennox Laboratory air test chamber.

Equipment Warranty — The compressor has a limited warranty for a full 5 years. All other components have a limited warranty for one year. Refer to Lennox Equipment Limited Warranty included with the equipment.

Weather Resistant Cabinet — Rugged cabinet is constructed of heavy gauge galvanized steel. Cabinet is subject to a five station metal wash process resulting in a perfect bonding surface for the paint finish of powder enamel, electrostatically bonded to the metal. Large removable cabinet panels allow service access. Base section and cabinet panels exposed to conditioned air are lined with thick fiberglass insulation. Supply and return air openings have flanges for ease of duct connection. Control box with factory installed controls is conveniently located for service access. A low voltage terminal strip is furnished and factory installed on all models. Electrical inlets are furnished for entry into the cabinet. Evaporator coil drain pan is constructed of corrosion resistant galvalume and is equipped with a galvanized pipe (mpt) drain outlet. Lifting brackets are factory installed on all models.

Refrigeration System — Complete factory sealed refrigeration system consists of: compressor, condenser coil and fan, evaporator coil and blower, liquid line strainer, suction and liquid line service gauge ports and full operating charge of refrigerant. CHA16-510 and -650 models have an expansion valve and thermometer well. All models have factory installed high pressure switch (manual reset) and loss of charge switch.

FEATURES

Dependable and Quiet Compressor — Rugged and reliable compressor is hermetically sealed, suction cooled, overload protected and equipped with internal pressure relief valve. Built-in protection devices assure protection from excessive current and temperature. The entire running gear is spring mounted within the sealed housing. In addition, the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation. All compressors have a immersible self-regulating type crankcase heater. Heater is temperature actuated to operate only when required and ensures proper lubrication at all times.

Copper Tube/Enhanced Fin Evaporator and Condenser Coils — Extra large surface area and circuiting of Lennox designed coils provide maximum cooling efficiency, excellent heat transfer and low air resistance. Coils are constructed of precisely spaced ripple-edged aluminum fins fitted to durable copper tubes. Fins are equipped with collars that grip tubing for maximum contact area. Lanced fins provide maximum exposure of fin surface to air stream. Flared shoulder tubing connections and silver soldering provide tight, leakproof joints. Long life copper tubing is easy to field service. Coil is thoroughly factory tested under high pressure to insure leakproof construction. Evaporator coils feature rifled copper tubing for superior refrigerant flow resulting in maximum heat transfer.

Powerful Blower — Units are equipped with direct drive centrifugal blower precisely matched to the unit for maximum efficiency and minimum noise level. Blower is statically and dynamically balanced as an assembly before being installed in the unit. Multiple speed permanent split capacitor (PSC) motor is resiliently mounted. A choice of blower speeds is available, see blower performance tables. Change in blower speed is easily accomplished by a simple field change in wiring.

Efficient Condenser Fan — Direct drive fan draws air through the condenser coil and discharges it vertically, up and away from the building. Fan orifice design and low fan tip speed keeps operating sound level at a minimum. Uniform air movement through the coil results in high refrigerant cooling capacity. Permanently lubricated, inherently protected, PSC motor is totally enclosed for maximum protection from rain, dust and corrosion. All models are equipped with a corrosion resistant PVC coated steel wire fan guard.

Air Filters (Furnished) — Cleanable polyurethane one inch (25mm) thick filter and filter rack is furnished for field installation in CHA16 models for down-flo applications. Filter rack will accept up to two inch (51mm) thick filter. For horizontal applications without economizer, an optional HF16 Horizontal Filter Kit is available. See Specifications table.

Commercial Controls Platform — A commercial controls platform is furnished and factory installed on all models. This control platform consists of: control system and economizer wiring harness with jack plug connections. The wiring harness facilitates installation of the control system and economizer dampers. A choice of several systems are available, see page 4.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Thermostat (Optional) — Thermostat is not furnished and must be ordered extra. See Lennox Price Book. For control systems, see page 4.

Compressor Monitor (Optional) — Compressor monitor T6-1469 (45F08) is available for field installation. Non-adjustable switch (low ambient cut-out) prevents compressor operation when outdoor temperature is below 35°F (2°C).

Low Ambient Kit (Optional for -510-650 Units Only) — Units will operate satisfactorily in the cooling mode down to 45°F (7°C) outdoor air temperature without any additional controls. For cases where operation of the unit in the cooling mode is required at low ambients, a Low Ambient Control Kit (LB-57113BC) can be added in the field, enabling it to operate properly down to 30°F (-1°C). Kit must be ordered extra.

Electric Heat (Optional) — Additive electric heaters field install internal to the unit cabinet and are available in several kW sizes, see Electric Heat Data tables. Heaters are factory assembled with controls installed and wired. Low voltage wiring only requires plug-in field connection. Helix wound nichrome heating elements are exposed directly in the air stream resulting in instant heat transfer, low element temperatures and long service life.

ECH16R heating elements are equipped with accurately located individual limit controls with fixed temperature off setting and automatic reset. Elements also have supplemental thermal cutoff safety fuses providing positive protection in case of excessive temperatures. Cut-off fuses are mounted external to the element face plate for quick and easy replacement. ECH16R heaters are equipped with a thermal relay sequencer to bring the heating elements on and off line, in sequence, with a time delay between each element. Sequencer also initiates and terminates blower operation.

ECH16 heating elements are equipped with accurately located individual limit controls with fixed temperature off setting and automatic reset. Elements also have supplemental secondary limits providing positive protection in case of excessive temperatures. Secondary limits are mounted external to the element face plate for quick and easy replacement. Fuse block is also furnished. ECH16-20 and 25 kW (208/240v-3ph) electric heaters are equipped with a thermal relay sequencer to bring the heating elements on and off line, in sequence, with a time delay between each element. Sequencer also initiates and terminates blower operation. Heating control relay(s) is furnished as standard. Heater control box and access cover are constructed of heavy gauge galvanized steel.

Outdoor Thermostat Kit (Optional) — An outdoor thermostat can be used to lock out some of the electric heating elements on ECH16-15, 20 and 25 kW (208/240v-1ph) optional electric heaters. Outdoor thermostat maintains the heating load on the low power input as long as possible before allowing the full power load to come on the line. Thermostat kit (LB-29740BA) and mounting box (M-1595) must be ordered extra.

Timed-Off Control (Optional) — Timed-off control (LB-50709BA) is available for field installation. Prevents compressor short-cycling and also allows time for suction and discharge pressure to equalize, permitting the compressor to start in an unloaded condition. Automatic reset control provides a time delay between compressor shutoff and start-up.

Condenser Coil Guards (Optional) — PVC coated steel wire coil guards are available and must be ordered extra. CHA16-261-311-410 models require 2 per unit, LB-82199CB. CHA16-510-650 models require 3 per unit, LB-82199CC. Correct number of guards are furnished per order number.

Unit Stand-Off Mounting Kit (Optional) — Field installed kit (38H18) elevates horizontal application units above the mounting surface away from damaging moisture. Includes six high impact polystyrene stand-off mounts. Stand-offs are easily attached to unit and mounting surface. See dimension drawings. Kit must be ordered extra.

RMF16 Roof Mounting Frame (Optional) — Roof mounting frame mates to the unit and provides a weather sealed rooftop installation. Shipped knocked down for ease of shipping and handling, it is easily field assembled. A wood nailer strip is secured to the frame sides to facilitate flashing. Design is approved by the National Roofing Contractor's Association.

RMF16U-26/95 Universal Roof Mounting Frame (Optional) — Roof mounting frame mates to the unit and provides a weather sealed rooftop installation. Shipped knocked down for ease of shipping and handling, it is easily field assembled. A wood nailer strip is secured to the frame sides to facilitate flashing. See dimension drawing. Optional DK16U-26/65 Frame Duct Kit is available and must be ordered extra. Kit contains duct supports.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

REMD16M Economizer (Optional) — Economizer field installs directly in CHA16 unit cabinets. See dimension drawings. Economizer consists of: cabinet constructed of heavy gauge steel with a baked-on enamel paint finish, outdoor air intake hood, combination outdoor air and recirculated air dampers with pressure operated gravity exhaust air damper. Formed damper blades rotate smoothly in nylon bearings and are gasketed for a tight seal. The economizer dampers and controls are shipped factory assembled, adjusted and cycled and only require plug-in connection. The positioning of the outdoor and recirculated air dampers is accomplished by a 24 volt fully modulating spring return damper motor with adjustable minimum position switch and controlled by the room thermostat, electronic discharge air sensor and solid-state adjustable outdoor air enthalpy control. The enthalpy control allows 0 to 100% outdoor air to be used for "free cooling" when outdoor temperature and humidity are acceptable. Indoor filter for economizer is not furnished. REMD16M utilizes existing filter furnished with CHA16 unit. Filter rack will accept up to two-inch (51mm) thick filter. See Air Resistance table, page 20 for resistance data of two-inch (51mm) thick pleated polyester filter or two-inch (51mm) fiberglass media filter. Removable exhaust air hood allows access to filter. Outdoor air intake hood is field installed. A cleanable filter in the outdoor air hood provides extra air filtering and bird screen protection.

EMDH16 Horizontal Economizer (Optional) — The horizontal economizer section is shipped factory assembled, adjusted and cycled. Field installs on the unit and only requires plug-in connection. The economizer section consists of: heavy gauge steel cabinet with baked-on enamel paint finish, fully insulated with thick fiberglass insulation and recirculated air and outdoor air dampers. Formed damper blades rotate smoothly in nylon bearings and are gasketed for tight seal. The positioning of the outdoor and recirculated air dampers is accomplished by a 24 volt fully modulating spring return damper motor with adjustable minimum position switch and controlled by the room thermostat, electronic discharge air sensor and solid-state adjustable outdoor air enthalpy control. The enthalpy controls allows 0 to 100% outdoor air to be used for "free cooling" when outdoor humidity and temperature are acceptable. A one-inch (25mm) thick disposable fiberglass filter is furnished. Filter rack will accept up to two-inch (51mm) thick filter. Removable panel allows easy access to filter. A cleanable filter in the outdoor air hood provides extra air filtering and bird screen protection.

GEDH16-65 Gravity Exhaust Dampers (Optional) — Available for use with EMDH16M horizontal economizer assembly. Pressure operated assembly field installs in the return air duct adjacent to the economizer assembly. Exhaust dampers also have bird screen.

Differential Enthalpy Control (Optional) — A solid-state return air enthalpy sensor is available to be used in conjunction with the outdoor air enthalpy control to determine which air has the lowest enthalpy. The air with the lowest enthalpy will be selected. Return air enthalpy sensor (54G44) field installs in the REMD16M or EMDH16M economizer damper section and must be ordered extra.

OAD3-46/65 Manual Minimum Fresh Air Damper (Optional For Horizontal Applications) — Fresh air damper field installs in the return air duct adjacent to the unit cabinet. Equipped with manually operated damper which will allow a fixed amount of outdoor air into the system.

OAD16 Down-Flo Manual Minimum Fresh Air Damper (Optional) — Built-in damper assembly is furnished in cabinet panel that field interchanges with existing blower access panel. Manually operated sliding damper allows entry of a fixed amount (0-25%) of outdoor air into the system. See dimension drawing. An outdoor air hood with cleanable filter media is also provided.

HF16 Horizontal Filter Kits (Optional) — Kits are available for horizontal unit applications and must be ordered extra. Painted heavy gauge steel cabinet has filter access panel for easy servicing. Disposable two-inch (51mm) thick pleated fiber filter is furnished as standard. See specifications tables and dimension drawings.

Unit Single Point Power Source Sub-Fuse Box (Optional) — Field installs internal to the unit cabinet. Provides sub-fusing to the unit. Used in conjunction with the ECH16 electric heat control box or the ECH16R electric heat single point power source sub-fuse box, for single point power source applications. Fuses are furnished with box. Constructed of galvanized steel with prepunched mounting holes and electrical inlet and outlet holes. Box cover is hinged for easy access. Ten boxes are available, shipping weight 5 lbs (2kg). See Electric Heat Data tables for usage.

'R' Series Electric Heat Single Point Power Source Sub-Fuse Box (Optional) — Available for use with ECH16R electric heaters. Used in conjunction with ECH16 fuse box for single point power source applications. Field installs internal to the unit cabinet. Fuses are furnished with box. Box is constructed of galvanized steel with prepunched mounting holes and electrical inlet and outlet holes. Box cover is hinged for easy access. Three boxes are available, shipping weight 4 lbs (2kg). See Electric Heat Data tables for usage.

Roof Curb Power Entry Kit (Optional) — Field installed kit is available for power entry to the unit through the roof mounting frame. Kit contains 40-inch (1.0m) length of armored conduit and necessary installing hardware. Knockouts in end of roof mounting frame are provided for ease of installation. See dimension drawing. Two kits are required, one for low voltage and one for high voltage. Kits must be ordered extra. Three conduit sizes are available. Order Kit No. 18H70 — 1/2-inch (13mm). 18H71 — 1-inch (25mm). 18H72 — 1-1/2-inch (38mm).

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

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

SRT16 Supply and Return Transitions (Optional) — Transitions field install in the roof mounting frame and provide segregated and simple duct connections to supply and return diffuser. Completely insulated galvanized steel transitions have collars for round duct connection. Round duct from the transitions to the diffuser is not furnished and must be provided by the installer. Transitions are completely factory assembled and easily field install in the roof mounting frame with minimum costs and labor requirement. Must be ordered extra. See Specifications table.

CONTROL SYSTEM OPTIONS (Must Be Ordered Extra)

Electro-Mechanical Thermostat and Control System (Optional) — The thermostat and related controls of this system must be ordered extra. Two stage heat and two stage cool thermostat (13F06) with dual temperature selector levers. Uses subbase (13F17) with manual system switch (Off-Heat-Auto-Cool) and fan switch (Auto-On) or non-switching subbase (13F16). SP11 Remote Status Panel (12F83) or SSP11 Remote Switching Status Panel (12F84) is available for observing and controlling unit operation from the conditioned area. A SSP11 Relay Kit (41G39) is required for switching functions of the Switching Status Panel. Kit must be ordered extra. For nite operation the following are available. Single stage heating thermostat (13F12) and non-switching subbase (13F16). For applications without the economizer a Nite Kit (39G74), containing a plug-in relay, is required to override the operation of day thermostat. For applications with economizer, a Nite Relay (20G52) is required. Two time clocks are available for the system. Automatic 7 day time clock programs a weekly schedule. Any day or days can be omitted. Day and nite periods are distinctly marked. When the settings have been made the clock will turn the system on and off. Spaced in 2 hour increments and equipped with battery back-up in case of power outage. 24 hour nite setback time clock automatically programs the system to keep conditioned area at a more conservative temperature level (nite setback thermostat setting) during a period of vacancy. Spaced in 15 minute increments and equipped with battery back-up in case of power outage. See Price Book for time clock selection and catalog numbers. Also available is a Warm Up Kit (39G77) which holds the economizer outdoor air dampers closed during nite heat operation and morning warm up. See Flow Chart on Page 5.

T8600 and T8621 Electronic Thermostat Control Systems (Optional) — Control system must be ordered extra for field installation. All thermostats feature built-in time delays, system switch (Heat-Off-Cool-Auto), fan switch (Auto-On) for continuous or intermittent blower operation, touch sensitive key-board and LCD display with time, day, status and temperature readout in °F or °C. T8600 thermostats have a wiring wallplate and 5-1-1 day programming for weekdays and Saturday/Sunday schedules. T8621 thermostats have a switching subbase and full independent 7 day programming. Both thermostats have four different time and temperature settings per day. T8600 has two LED's to indicate Energy Savings (Setback) and System "On". T8621 has one LED to indicate System "On". Both thermostats have instant override capabilities for skipping current program, running previous program, temporarily raising or lowering for current program or overriding program indefinitely, and battery back-up. See below for catalog nos. and descriptions.

Model No.	Catalog No.	Description
T8600A1018	72E02	Heating Only, 5-1-1 day
T8600C1204	85E82	Man. Change 1 htg./1 clg. 5-1-1 day
T8600D	27H31	Auto Change 1 htg./1 clg. 5-1-1 day
T8621A7010	75E25	Auto Change 1 htg./1 clg. 7 day
T8621D7014	75E27	Auto Change 2 htg./2 clg. 7 day

SP11 Remote Status Panel (12F83) is available for checking unit operation from within the conditioned area. See Flow Chart on page 6.

W7400 Control System (Optional) — Control system must be ordered extra. Control Module (74G11) controls the operation of the economizer dampers and the stages of heating and cooling. Controlling input signals are setpoint, space temperature sensor and time-of-day scheduling from the thermostat. The control module balances the space temperature signal against the number of stages operating for system output. System output is measured and updated by monitoring the actual space temperature deviation from set point, and the rate of change of the space temperature. The control module field installs in the unit or in a remote panel located within the conditioned area. Two thermostats are available for the system. A room thermostat (36G63) with integral sensor that installs in the conditioned space or a remote thermostat (36G65) that installs outside the conditioned space with a Room Temperature Sensor (58C92) in the conditioned area or a Return Air Temperature Sensor (27C40) in the return air duct of the unit. Both thermostats are equipped with touch sensitive key-board, automatic switching from heat to cool, no anticipator, zero droop, indicator lites, hour/day programming, override capabilities, time readout, stage status indicators, battery back-up and wiring wallplate. W7400 Plug-In Relay (furnished with the control module) provides separate set points for the economizer dampers and DX cooling. SP11 Remote Status Panel (12F83) is available for checking unit operation within the conditioned area. See Flow Chart on page 6.

T7300 Thermostat and Control System (Optional) — The thermostat and related controls of this system must be ordered extra. T7300 programmable thermostat (81G59) has internal or optional remote temperature sensing, touch sensitive keyboard, automatic switching from heat to cool, °F or °C temperature readout, no anticipator, droop/no droop selection, indicator LED's, hour/day programming, override capabilities, time readout, stage status indicators, operational mode readout and battery back-up. T7300 thermostat has a choice of subbases. Switching subbase (81G60) has selectable output staging up to two heat and two cool, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On) and two status LED's for monitoring various equipment operation. Switching subbase (13H76) features selectable output

staging up to three heat and two cool, indicator LED's, manual system switch (Auto-Cool-Off-Heat-Emergency Heat) (Heat Pump only) and fan switch (Auto-On). Both subbases also features an auxiliary relay output which controls economizer operation during occupied and unoccupied periods. Also available is a Room Temperature Sensor (58C92) or Room Temperature Sensor with 3-hour override and setpoint adjustment (86G67) for installation in the conditioned area and a Return Air Temperature Sensor (27C40) for installation in the return air duct of the unit. SP11 Status Panel (12F83) is available for checking unit operation from within the conditioned area. See Flow Chart on page 6.

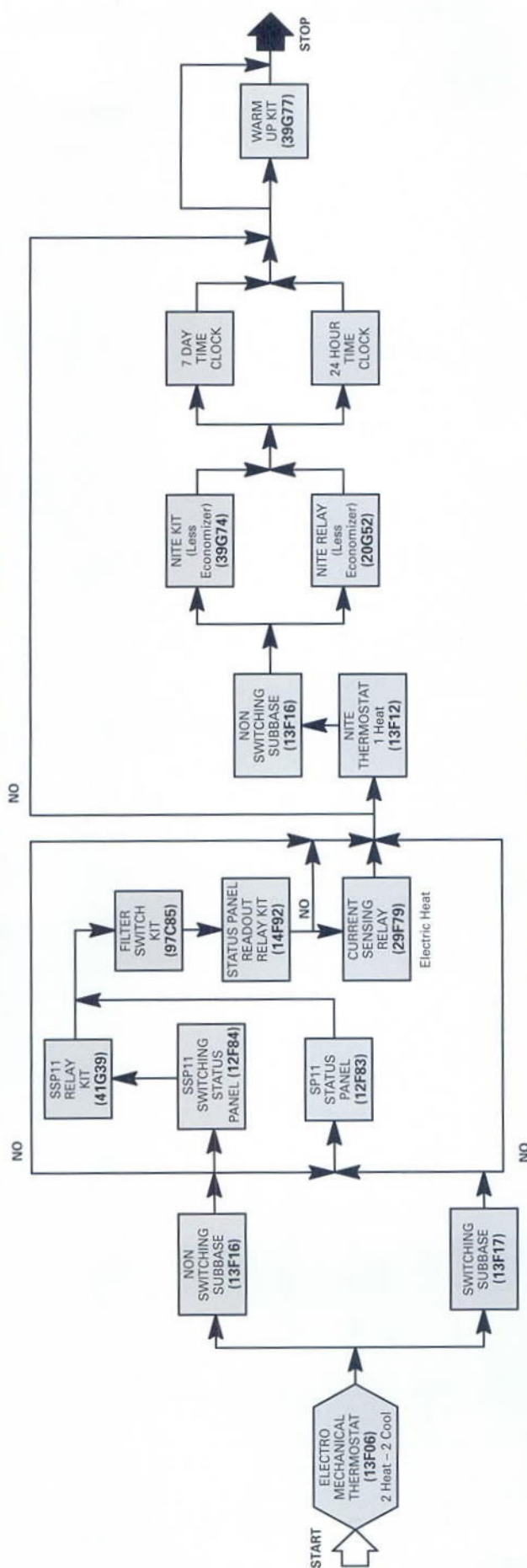
W973 Control System (Optional) — Control system must be ordered extra. Logic Panel (39G76) controls the operation of the economizer dampers and the stages of cooling and heating in response to a signal from the thermostat. To maintain stable temperatures the logic panel balances the conditioned space thermostat demand against the system output. System output is measured by a discharge sensor (furnished with the logic panel) located in the discharge air duct of the unit. The combined demand and output signals from the sensor determines economizer damper position and number of cooling or heating stages energized. The logic panel field installs in the unit or in a remote panel located within the conditioned space. W973 Plug-In Relay (furnished with the logic panel) is required to adapt the control system to the unit. Two thermostats are available for the system. Dual set point room thermostat (25C52) or transmitter (25C51) with a choice of remote sensors. Both have separate heating-cooling locking set points concealed under the cover and do not have indicating thermometer. The room thermostat has integral sensor and installs in the conditioned space. The transmitter installs outside the conditioned space with a Room Temperature Sensor (58C92) in the conditioned area or a Return Air Temperature Sensor (27C40) in the return air duct of the unit. Thermostat and transmitter are furnished with a wiring wallplate. Also available is a switching subbase (58C93) with system selector switch (Heat-Auto-Cool-Off) and fan switch (Auto-On). For applications with economizer, a Nite Relay (20G52) is required. SP11 Remote Status Panel (12F83) or SSP11 Remote Switching Status Panel (12F84) is available for observing and controlling unit operation from the conditioned area. Two time clocks are available for the system. Automatic 7 day time clock programs a weekly schedule. Any day or days can be omitted. Day and nite periods are distinctly marked. When the settings have been made the clock will turn the system on and off. Spaced in 2 hour increments and equipped with battery back-up. 24 hour nite setback time clock automatically programs the system to keep the conditioned area at a more conservative temperature level (nite set back thermostat setting) during a period of vacancy. Spaced in 15 minute increments and equipped with battery back-up. See Price Book for time clock selection and catalog numbers. Also available is a Warm Up Kit (39G77) which holds economizer outdoor air dampers closed during nite heat operation and warm up. See Flow Chart on page 5.

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

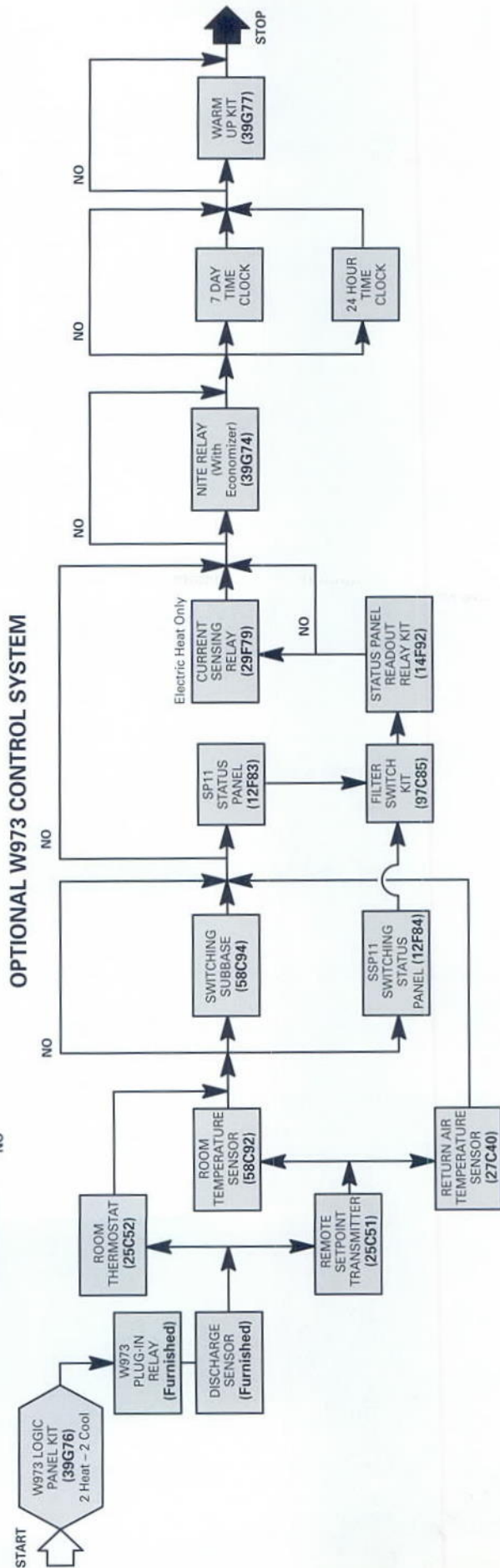
SSP11 Remote Switching Status Panel (Optional) — The operation of the unit can be controlled and observed on the Switching Status Panel (12F84) conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode," "Heat Mode," "Compressor 1," "Compressor 2," "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates economizer damper operation or DX cooling operation for units without the economizer. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicates a requirement for service. Additionally, panel is equipped with a system selector switch (Off — Heat — Auto — Cool — Emergency Heat) (Heat Pump Only), fan switch (Auto — On) and after hours timer. Fan switch provides a choice of intermittent (Auto) or continuous (On) blower operation. Manually operated after hours timer (0 to 12 hours) overrides night setback controls providing normal operation for time period set. A momentary push button switch is used to initiate the timer period. The following field installed controls are required for use with the status panel and must be ordered extra. Filter Switch Kit (97C85) is required for operation of the filter light. Operation of No Heat light with electric heat requires a Current Sensing Relay (29F79). Status Panel Readout Relay Kit (14F92) is required to interface status panel with unit operation.

TEMPERATURE CONTROL SELECTION FLOWCHARTS

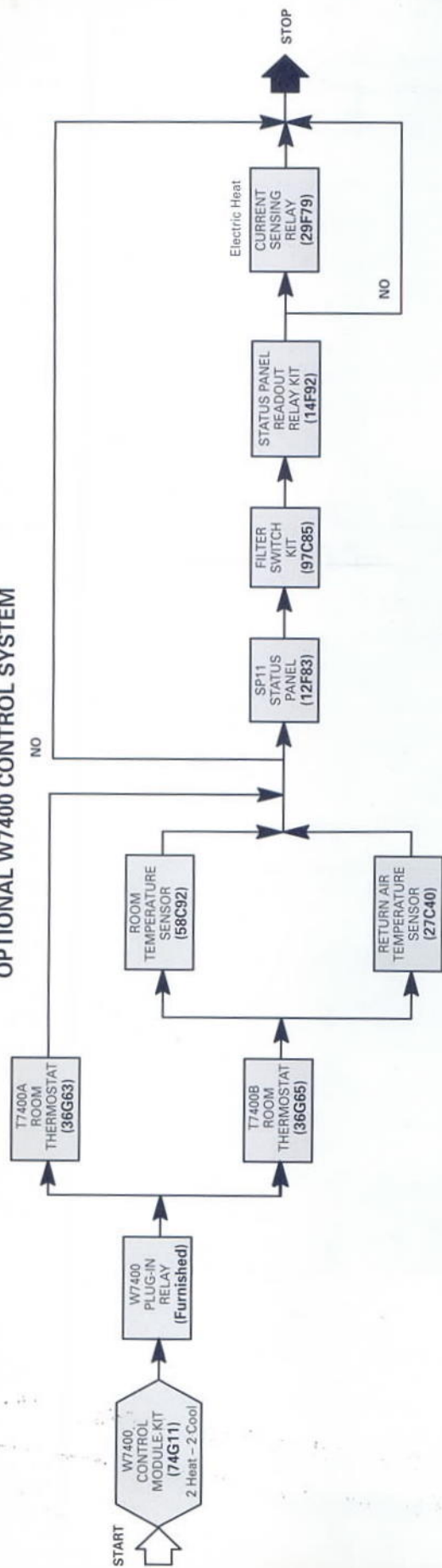
OPTIONAL ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM



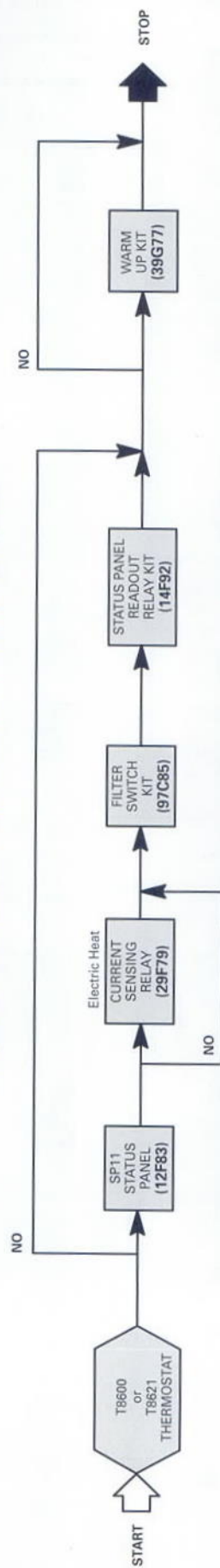
OPTIONAL W973 CONTROL SYSTEM



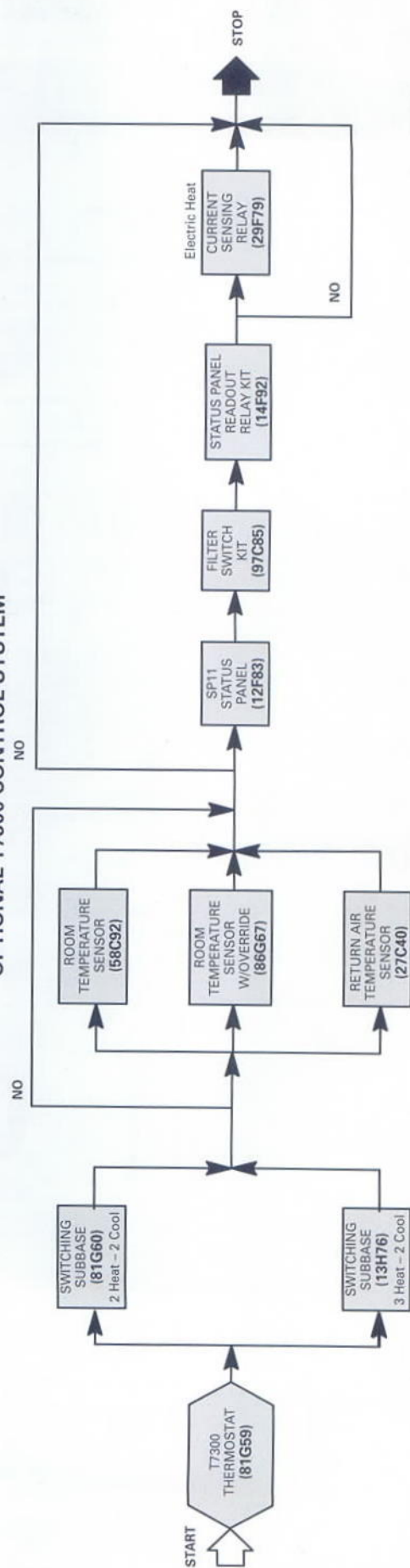
OPTIONAL W7400 CONTROL SYSTEM



OPTIONAL T8600/T8621 THERMOSTAT CONTROL SYSTEM



OPTIONAL T7300 CONTROL SYSTEM



Model No.				CHA16-261	CHA16-311	CHA16-411 CHA16-413	CHA16-511 CHA16-513	CHA16-651 CHA16-653	
★ARI Standard 270 SRN (bels)				8.0	8.0	8.0	8.2	8.2	
*ARI Standard 210/240 Ratings	Total cooling capacity — Btuh (kW)			23,400 (6.9)	28,600 (8.4)	33,200 (9.7)	45,000 (13.2)	57,000 (16.5)	
	Total unit watts			2490	3055	3650	5000	6065	
	SEER (Btuh/Watts)			10.25	10.15	10.00	10.00	10.25	
	EER (Btuh/Watts)			9.4	9.4	9.1	9.0	9.4	
Refrigerant charge (R-22)				3 lbs. 3 ozs. (1.45 kg)	4 lbs. 4 ozs. (1.93 kg)	4 lbs. 8 ozs. (2.04 kg)	5 lbs. 9 ozs. (2.52 kg)	7 lbs. 7 ozs. (3.37 kg)	
Evaporator Blower	Blower wheel nominal diameter x width		in. mm	9 x 8 229 x 203	10 x 7 254 x 178	10 x 7 254 x 178	10 x 8 254 x 203	11-1/2 x 9 292 x 229	
	Motor horsepower (W)			1/3 (249)	1/3 (249)	1/3 (249)	1/2 (373)	3/4 (560)	
Evaporator Coil	Net face area — sq. ft. (m²)			3.20 (0.30)	3.20 (0.30)	4.10 (0.38)	5.80 (0.54)	5.80 (0.54)	
	Tube diameter — in. (mm) & No. of rows			3/8 (9.5) — 2	3/8 (9.5) — 2	3/8 (9.5) — 2	3/8 (9.5) — 2	3/8 (9.5) — 2	
Fins per inch (m)				15 (591)	17 (669)	17 (669)	15 (591)	15 (591)	
Condenser Coil	Net face area sq. ft. (m²)	Outer coil		8.60 (0.80)	8.60 (0.80)	8.60 (0.80)	14.30 (1.33)	14.30 (1.33)	
		Inner coil		----	8.40 (0.78)	8.40 (0.78)	5.90 (0.55)	13.80 (1.28)	
	Tube diameter — in. (mm) & No. of rows			3/8 (9.5) — 1	3/8 (9.5) — 2	3/8 (9.5) — 2	3/8 (9.5) — 1.4	3/8 (9.5) — 2	
	Fins per inch (m)			20 (787)	20 (787)	20 (787)	20 (787)	20 (787)	
Condenser Fan	Diameter — in. (mm) & No. of blades			20 (508) — 4	20 (508) — 4	20 (508) — 4	24 (610) — 4	24 (610) — 4	
	Air volume — cfm (L/s)			2400 (1135)	2200 (1040)	2200 (1040)	4000 (1890)	3600 (1700)	
Motor horsepower (W) — motor watts				1/6 (124) — 230	1/6 (124) — 220	1/6 (124) — 220	1/4 (187) — 340	1/4 (187) — 330	
Condensate drain size mpt — in. (mm)				3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)	3/4 (19)	
Number and size of filters — in. (mm) polyurethane				(1) 16 x 25 x 1 (406 x 635 x 25)			(1) 20 x 25 x 1 (508 x 635 x 25)		
Net weight of basic unit — lbs. (kg)				310 (141)	331 (150)	338 (153)	438 (199)	473 (215)	
Shipping weight of basic unit — lbs. (kg) 1 package				379 (172)	398 (181)	402 (182)	533 (242)	568 (258)	
Electrical characteristics (60 hz)				208/230v 1 ph		208/230v 1 or 3 ph 460v or 575v 3ph			
Optional Condenser Coil Guards				LB-82199CB			LB-82199CC		
•Optional Down-Flo	Model No. (Net Weight)			OAD16-41 (10 lbs.) (5kg)		OAD16-65 (16 lbs.) (7kg)			
Outdoor Air Dampers (Manual)	Number and	Outdoor	in.	(1) 14 x 6 x 1		(1) 18 x 6 x 1			
	Size of Filters	(foam)	mm	(1) 356 x 152 x 25		(1) 203 x 152 x 25			
Optional Roof Curb Power Entry Kit — conduit size — in. (mm)				18H70 — 1/2 (13)		18H71 — 1 (25)	18H72 — 1-1/2 (38)		
Optional Roof Mounting Frame (Net Weight)		Standard Frame (86 lbs.) (39 kg)					RMF16-65		
		Universal Frame (22 lbs.) (10 kg)		RMF16U-26/95					
		Duct Kit (10 lbs.) (5 kg)		DK16U-26/65 (for RMF16U-26/95 only)					
Optional Economizer Dampers with Gravity Exhaust	Model No. (Net Weight)			REMD16M-41 (85 lbs.) (39kg)		REMD16M-65 (105 lbs.) (48kg)			
	Number and Size of Filters	†Indoor	in.	(1) 6 x 25 x 1		(1) 20 x 25 x 1			
			mm	(1) 406 x 635 x 25		(1) 508 x 635 x 25			
		Outdoor (foam)	in.	(1) 19-3/8 x 15-3/4 x 1		(1) 19-7/8 x 22-3/4 x 1			
				(1) 492 x 400 x 25		(1) 505 x 578 x 25			
Optional Horizontal Economizer Dampers	Model No. (Net Weight)			EMDH16M-41 (70 lbs.) (32kg)		EMDH16M-65 (86 lbs.) (39kg)			
	Number and Size of Filters	Indoor (fiberglass)	in.	(1) 20 x 20 x 1		(1) 20 x 25 x 1			
			mm	(1) 508 x 508 x 25		(1) 508 x 635 x 25			
		Outdoor (foam)	in.	(1) 16-1/2 x 21-3/4 x 1		(1) 22-1/2 x 25-1/4 x 1			
				(1) 419 x 552 x 25		(1) 572 x 641 x 25			
Optional Gravity Exhaust Dampers — (Net Weight)				GEDH16-65 (4 lbs.) (2kg) use with EMDH16M					
Optional Ceiling Supply and Return Air Diffusers (Net Weight)			Step-down	RTD9-65 (67 lbs.) (30kg)					
			Flush	FD9-65 (37 lbs.) (17kg)					
			Transition	SRT16-65 (20 lbs.) (9kg)					
Optional Horizontal Filter Kit	Model No. (Net Weight)			HF16-46 (18 lbs.) (8kg)		HF16-65 (21 lbs.) (10kg)			
	Number and size of filters		in. mm	(1) 20 x 20 x 2 (1) 508 x 508 x 51		(1) 20 x 25 x 2 (1) 508 x 635 x 51			
Optional Controls Selection				Electro-Mechanical Thermostat Controls					
				W973 Controls					
				W7400 Controls					
				T7300 Thermostat Controls					
†Commercial Controls Platform				Furnished and Factory Installed					

* Sound Rating Number in accordance with ARI Standard 270.

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

†Furnished as standard. Consists of: factory installed control system and economizer wiring harness.

†Indoor filter is not furnished with economizer. REMD16M utilizes existing filter furnished with CHA16 unit.

•For horizontal applications, units use OAD3-46/65 outdoor air damper.

(27°C) db/67°F (19°C) wb from the evaporator air.
 ss. A16 unit.

ELECTRICAL DATA — CHA16-261-311 Models — Single Phase Voltage

Model No.		CHA16-261	CHA16-311
Line voltage data		60 hz — 1 ph	60 hz - 1 ph
		208/230v	208/230v
Compressor	Rated load amps	11.5	14.7
	Locked rotor amps	60.0	73.0
Condenser	Full load amps	1.1	1.1
Fan Motor	Locked rotor amps	2.2	2.2
Evaporator	Full load amps	2.2	3.0
Blower Motor	Locked rotor amps	4.2	6.2
Recommended maximum fuse size (amps)		25	30
Unit power factor		.98	.98
*Minimum Circuit Ampacity		17.7	22.5

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

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

ELECTRICAL DATA — CHA16-411-511-651 Models — Single Phase Voltage

Model No.		CHA16-411	CHA16-511	CHA16-651
Line voltage data		60 hz — 1 ph	60 hz - 1 ph	60 hz - 1 ph
		208/230v	208/230v	208/230v
Compressor	Rated load amps	17.9	23.4	27.6
	Locked rotor amps	94.0	105.0	135.0
Condenser	Full load amps	1.1	2.3	2.3
Fan Motor	Locked rotor amps	2.2	4.4	4.4
Evaporator	Full load amps	3.0	3.9	4.6
Motor	Locked rotor amps	6.2	8.3	10.0
Recommended maximum fuse size (amps)		40	50	60
Unit power factor		.95	.92	.97
*Minimum Circuit Ampacity		27	36	42

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

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

ELECTRICAL DATA — CHA16-413-513-653 Models — Three Phase Voltage

Model No.		CHA16-413			CHA16-513			CHA16-653		
Line voltage data		60 hz — 3 ph			60 hz — 3 ph			60 hz — 3 ph		
		208/230v	460v	575v	208/230v	460v	575v	208/230v	460v	575v
Compressor	Rated load amps	11.3	5.2	4.5	15.4	8.4	6.5	17.7	9.4	6.3
	Locked rotor amps	78.0	40.0	32.0	130.0	64.0	52.0	150.0	73.0	59.0
Condenser	Full load amps	1.1	0.7	††0.7	2.3	1.1	††1.1	2.3	1.1	††1.1
Fan Motor (1 phase)	Locked rotor amps	2.2	1.3	††1.3	4.4	2.0	††2.0	4.4	2.0	††2.0
Evaporator	Full load amps	3.0	1.8	††1.8	3.9	1.8	††1.8	4.6	1.8	††1.8
Blower Motor (1 phase)	Locked rotor amps	6.2	4.4	††4.4	8.3	4.4	††4.4	10.0	3.8	††3.8
Recommended maximum fuse size (amps)		25	15	15	40	20	15	45	20	15
Unit power factor		.85	.83	.83	.78	.78	.78	.89	.89	.89
*Minimum Circuit Ampacity		19.0	9.0	9.0	26.0	14.0	11	30.0	15.0	11

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

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

†† Motors are rated at 460 volts. Full load amps shown are for step-down transformer output.

FIELD WIRING — Basic Models

A — *Four Wire Low Voltage (Electromechanical)

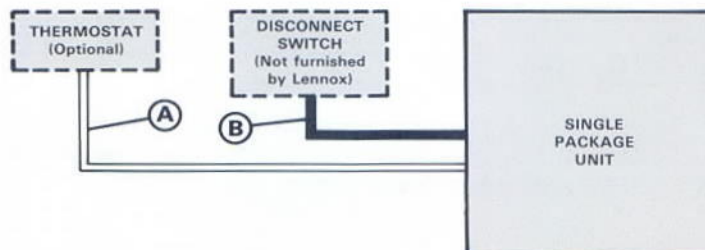
— *Five Wire Low Voltage (Electronic)

*When Economizer with two stage cooling thermostat is used, one additional wire is required

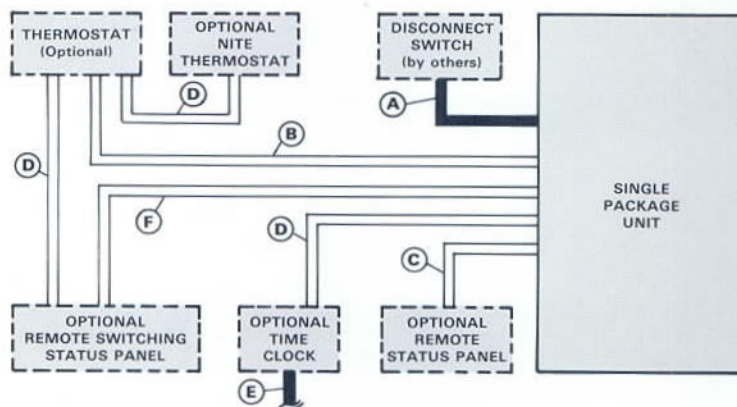
B — Two Wire Power (See Electrical Data Table)

— Field wiring not furnished —

NOTE — All wiring must conform to CEC and local electrical codes.



ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM

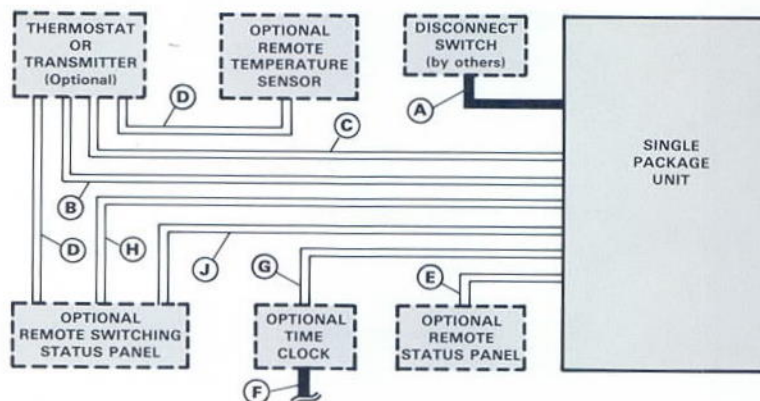


- A — Two or Three wire power (See Electrical Data table)
- B — Six wire low voltage
 - Five wire low voltage (with SSP11 Switching Status Panel)
- C — Nine wire low voltage
- D — Two wire low voltage
- E — Two wire low voltage
- F — Sixteen wire low voltage

— Field wiring not furnished —

NOTE — All wiring must conform to CEC and local electrical codes.

W973 CONTROL SYSTEM

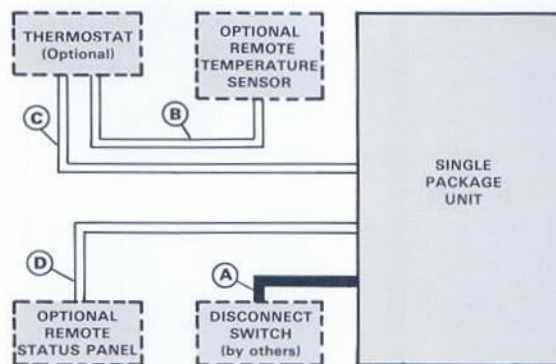


- A — Two or Three wire power (See Electrical Data table)
 - B — Seven wire low voltage — DC only
 - Five wire low voltage — DC only — with SSP11 Switching Status Panel
 - Seven wire low voltage — DC only — with switching subbase
 - C — Two wire low voltage — AC only — with switching subbase
 - D — Two wire low voltage — DC only
 - E — Nine wire low voltage — AC only
 - F — Two wire low voltage — AC only
 - G — Two wire low voltage — AC only
 - H — Thirteen wire low voltage — AC only
 - J — Two wire low voltage — DC only
- 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 CEC and local electrical codes.

W7400 CONTROL SYSTEM

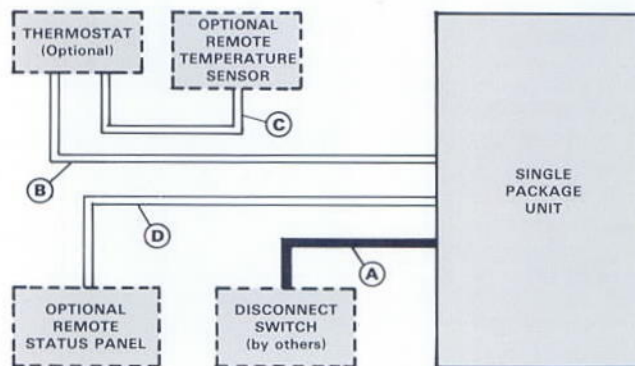


- A — Two or Three wire power (See Electrical Data table)
- B — Two wire low voltage
- C — Four wire low voltage
- D — Nine wire low voltage

— Field wiring not furnished —

NOTE — All wiring must conform to CEC and local electrical codes.

T7300, T8600 or T8621 THERMOSTAT CONTROL SYSTEM



- A — Two or Three wire power (See Electrical Data table)
- B — Nine wire low voltage
- C — Two wire low voltage
 - Seven wire low voltage (with optional override sensor)
- D — Nine wire low voltage (T7300 with optional override sensor)
 - Seven wire low voltage (T8621)
 - Four wire low voltage (T8600)

— Field wiring not furnished —

NOTE — All wiring must conform to CEC and local electrical codes.

CHA16-261 & CHA16-311 ELECTRIC HEAT DATA

Single Package Unit Model No.	Electric Heater Model No. & Net Weight	No. of Steps & Phase	Volts Input	Heater only *Minimum Circuit Ampacity	Electric Heat Kw Input	Electric Heat Btuh Input	Optional Single Point Power Source Boxes		
							Heater Sub-Fuse Box	Unit Sub-Fuse Box	Total Unit & Electric Heat *Minimum Circuit Ampacity
CHA16-261	ECH16R-5 (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5	ECH16-261	25.1
			220	23.9	4.2	14,300			26.5
			230	24.9	4.6	15,700			27.5
			240	26.0	5.0	17,100			28.6
	ECH16R-7 (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7	ECH16-261	34.3
			220	33.5	5.9	20,100			36.1
			230	35.0	6.4	21,800			37.6
			240	36.5	7.0	23,900			39.1
	ECH16R-10 (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10	ECH16-261	47.8
			220	47.8	8.4	28,700			50.4
			230	50.0	9.2	31,400			52.6
			240	52.1	10.0	34,100			54.8
	ECH16-15 (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	ECH16-261	70.4
			220	71.6	12.6	43,000			74.3
			230	74.9	13.8	47,100			77.5
			240	78.1	15.0	51,200			80.8
CHA16-311	ECH16R-5 (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5	ECH16-311	26.4
			220	23.9	4.2	14,300			27.5
			230	24.9	4.6	15,700			28.7
			240	26.0	5.0	17,100			29.8
	ECH16R-7 (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7	ECH16-311	35.4
			220	33.5	5.9	20,100			37.0
			230	35.0	6.4	21,800			38.7
			240	36.5	7.0	23,900			40.3
	ECH16R-10 (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10	ECH16-311	48.9
			220	47.8	8.4	28,700			51.2
			230	50.0	9.2	31,400			53.6
			240	52.1	10.0	34,100			55.9
	ECH16-15 (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	ECH16-311	71.5
			220	71.6	12.6	43,000			75.0
			230	74.9	13.8	47,100			78.4
			240	78.1	15.0	51,200			81.9

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

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CHA16-411-413 ELECTRIC HEAT DATA

Single Package Unit Model No.	Electric Heater Model No. & Net Weight	No. of Steps & Phase	Volts Input	Heater only *Minimum Circuit Ampacity	Electric Heat Kw Input	Electric Heat Btuh Input	Optional Single Point Power Source Boxes		
							Heater Sub-Fuse Box	Unit Sub-Fuse Box	Total Unit & Electric Heat *Minimum Circuit Ampacity
CHA16-411	ECH16R-5 (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5	ECH16-411	26.3
			220	23.9	4.2	14,300			27.6
			230	24.9	4.6	15,700			28.6
			240	26.0	5.0	17,100			29.8
	ECH16R-7 (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7	ECH16-411	35.4
			220	33.5	5.9	20,100			37.3
			230	35.0	6.4	21,800			38.8
			240	36.5	7.0	23,900			40.3
	ECH16R-10 (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10	ECH16-411	48.9
			220	47.8	8.4	28,700			51.5
			230	50.0	9.2	31,400			53.8
			240	52.1	10.0	34,100			55.9
	ECH16-15 (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	ECH16-411	71.5
			220	71.6	12.6	43,000			75.4
			230	74.9	13.8	47,100			78.6
			240	78.1	15.0	51,200			81.9
	ECH16-20 (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----	ECH16-411	94.0
			220	95.5	16.8	57,300			99.3
			230	99.8	18.4	62,800			103.5
			240	104.1	20.0	68,300			107.9
CHA16-413	ECH16-5 (17 lbs.) (8kg)	1 step (3 phase)	208	13.0	3.7	12,600	----	ECH16-413	16.8
			220	13.8	4.2	14,300			17.5
			230	14.4	4.6	15,700			18.1
			240	15.0	5.0	17,100			18.8
	ECH16-7 (17 lbs.) (8 kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-413	22.0
			220	19.3	5.9	20,100			23.0
			230	20.1	6.4	21,800			23.9
			240	21.0	7.0	23,900			24.8
			440	9.6	5.8	19,800	----	ECH16-413	11.9
			460	10.1	6.5	22,200			12.4
			480	10.5	7.0	23,900			12.8
			550	7.6	5.8	19,800	----	ECH16-413/513	9.9
	ECH16-10 (17 lbs.) (8 kg)	1 step (3 phase)	575	8.0	6.4	21,800			10.3
			600	8.4	7.0	23,900			10.6
			208	26.1	7.5	25,600	----	ECH16-413	29.9
			220	27.6	8.4	28,700			31.4
			230	28.9	9.2	31,400			32.6
			240	30.1	10.0	34,100			33.9
			440	13.8	8.4	28,700	----	ECH16-413	16.0
			460	14.4	9.2	31,400			16.6
	ECH16-15 (17 lbs.) (8 kg)	1 step (3 phase)	480	15.0	10.0	34,100			17.3
			550	11.0	8.4	28,700	----	ECH16-413/513	13.3
			575	11.5	9.2	31,400			13.8
			600	12.0	10.0	34,100			14.3
			208	39.1	11.3	38,600	----	ECH16-413	42.9
			220	41.4	12.6	43,000			45.1
			230	43.2	13.8	47,100			47.0
			240	45.1	15.0	51,200			48.9
	ECH16-20 (20 lbs.) (9 kg)	2 steps (3 phase)	440	20.6	12.6	43,000	----	ECH16-413	22.9
			460	21.6	13.8	47,100			23.9
			480	22.5	15.0	51,200			24.8
			550	16.5	12.6	43,000	----	ECH16-413/513	18.8
		1 step (3 phase)	575	17.3	13.7	47,100			19.5
			600	18.0	15.0	51,200			20.3
			208	52.1	15.0	51,200	----	ECH16-413	55.9
			220	55.1	16.8	57,300			58.9
			230	57.6	18.4	62,800			61.4
			240	60.1	20.0	68,300			63.9
			440	27.6	16.8	57,300	----	ECH16-413	29.9
			460	28.9	18.4	62,800			31.1
			480	30.1	20.0	68,300			32.4
			550	22.0	16.8	57,300	----	ECH16-413/513	24.3
			575	23.0	18.3	62,800			25.3
			600	24.0	20.0	68,300			26.3

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

CHA16-511-513 ELECTRIC HEAT DATA

Single Package Unit Model No.	Electric Heater Model No. & Net Weight	No. of Steps & Phase	Volts Input	Heater only *Minimum Circuit Ampacity	Electric Heat Kw Input	Electric Heat Btuh Input	Optional Single Point Power Source Boxes		
							Heater Sub-Fuse Box	Unit Sub-Fuse Box	Total Unit & Electric Heat *Minimum Circuit Ampacity
CHA16-511	ECH16R-7 (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7	ECH16-511	36.5
			220	33.5	5.9	20,100			38.4
			230	35.0	6.4	21,800			39.9
			240	36.5	7.0	23,900			41.4
	ECH16R-10 (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10	ECH16-511	50.0
			220	47.8	8.4	28,700			52.6
			230	50.0	9.2	31,400			54.9
			240	52.1	10.0	34,100			57.0
	ECH16-15 (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	ECH16-511	72.6
			220	71.6	12.6	43,000			76.5
			230	74.9	13.8	47,100			79.8
			240	78.1	15.0	51,200			83.0
	ECH16-20 (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----	ECH16-511	95.1
			220	95.5	16.8	57,300			100.4
			230	99.8	18.4	62,800			104.6
			240	104.1	20.0	68,300			109.0
	ECH16-25 (19 lbs.) (9kg)	1 step (1 phase)	208	112.9	18.8	64,200	----	ECH16-511	117.8
			220	119.4	21.0	71,700			124.3
			230	124.9	23.0	78,500			129.8
			240	130.3	25.0	85,300			135.1
CHA16-513	ECH16-7 (17 lbs.) (8kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-513	23.1
			220	19.3	5.9	20,100			24.1
			230	20.1	6.4	21,800			25.0
			240	21.0	7.0	23,900			25.9
			440	9.6	5.8	19,800	----	ECH16-513/653	11.9
			460	10.1	6.5	22,200			12.4
			480	10.5	7.0	23,900			12.8
			550	7.6	5.8	19,800			9.9
	ECH16-10 (17 lbs.) (8kg)	1 step (3 phase)	575	8.0	6.4	21,800	----	ECH16-413/513	10.3
			600	8.4	7.0	23,900			10.6
			208	26.1	7.5	25,600	----	ECH16-513	31.0
			220	27.6	8.4	28,700			32.5
			230	28.9	9.2	31,400			33.8
			240	30.1	10.0	34,100			35.0
			440	13.8	8.4	28,700	----	ECH16-513/653	16.0
			460	14.4	9.2	31,400			16.6
	ECH16-15 (17 lbs.) (8kg)	1 step (3 phase)	480	15.0	10.0	34,100	----	ECH16-413/513	17.3
			550	11.0	8.4	28,700			13.3
			575	11.5	9.2	31,400			13.8
			600	12.0	10.0	34,100			14.3
	ECH16-20 (20 lbs.) (9kg)	2 steps (3 phase)	208	39.1	11.3	38,600	----	ECH16-513	44.0
			220	41.4	12.6	43,000			46.3
			230	43.2	13.8	47,100			48.1
			240	45.1	15.0	51,200			50.0
			440	20.6	12.6	43,000	----	ECH16-513/653	22.9
			460	21.6	13.8	47,100			23.9
			480	22.5	15.0	51,200			24.8
			550	16.5	12.6	43,000	----	ECH16-413/513	18.8
	ECH16-25 (20 lbs.) (9kg)	1 step (3 phase)	575	17.3	13.7	46,800			19.5
			600	18.0	15.0	51,200			20.3
	ECH16-7 (17 lbs.) (8kg)	2 steps (3 phase)	208	52.1	15.0	51,200	----	ECH16-513	57.0
			220	55.1	16.8	57,300			60.0
			230	57.6	18.4	62,800			62.5
			240	60.1	20.0	68,300			65.0
		1 step (3 phase)	440	27.6	16.8	57,300	----	ECH16-513/653	29.9
			460	28.9	18.4	62,800			31.1
			480	30.1	20.0	68,300			32.4
			550	22.0	16.8	57,300	----	ECH16-413/513	24.3
CHA16-513	ECH16-10 (17 lbs.) (8kg)	2 steps (3 phase)	575	23.0	18.3	62,400			25.3
			600	24.0	20.0	68,300			26.3
		1 step (3 phase)	208	65.1	18.8	64,200	----	ECH16-513	70.0
			220	68.9	21.0	71,700			73.8
			230	72.0	22.9	78,100			76.9
			240	75.1	25.0	85,300			80.0
	ECH16-15 (18 lbs.) (8kg)	2 steps (3 phase)	440	34.5	21.0	71,700	----	ECH16-513/653	36.8
			460	36.0	22.9	78,100			38.3
			480	37.6	25.0	85,300			39.9
			550	27.6	21.1	72,000	----	ECH16-413/513	29.9
		1 step (3 phase)	575	28.9	23.0	78,500			31.1
			600	30.1	25.0	85,300			32.4

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

CHA16-651-653 ELECTRIC HEAT DATA

Single Package Unit Model No.	Electric Heater Model No. & Net Weight	No. of Steps & Phase	Volts Input	Heater only *Minimum Circuit Ampacity	Electric Heat Kw Input	Electric Heat Btuh Input	Optional Single Point Power Source Boxes		
							Heater Sub-Fuse Box	Unit Sub-Fuse Box	Total Unit & Electric Heat *Minimum Circuit Ampacity
CHA16-651	ECH16R-7 (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7	ECH16-651	37.4
			220	33.5	5.9	20,100			39.3
			230	35.0	6.4	21,800			40.8
			240	36.5	7.0	23,900			42.3
	ECH16R-10 (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10	ECH16-651	50.9
			220	47.8	8.4	28,700			53.5
			230	50.0	9.2	31,400			58.3
			240	52.1	10.0	34,100			57.9
	ECH16-15 (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	ECH16-651	73.5
			220	71.6	12.6	43,000			77.4
			230	74.9	13.8	47,100			80.6
			240	78.1	15.0	51,200			83.9
	ECH16-20 (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----	ECH16-651	96.0
			220	95.5	16.8	57,300			101.3
			230	99.8	18.4	62,800			105.5
			240	104.1	20.0	68,300			109.9
	ECH16-25 (19 lbs.) (9kg)	1 step (1 phase)	208	112.9	18.8	64,200	----	ECH16-651	118.6
			220	119.4	21.0	71,700			125.1
			230	124.9	23.0	78,500			130.6
			240	130.3	25.0	85,300			136.0
CHA16-653	ECH16-7 (17 lbs.) (8kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-653	24.0
			220	19.3	5.9	20,100			25.0
			230	20.1	6.4	21,800			25.9
			240	21.0	7.0	23,900			26.8
			440	9.6	5.8	19,800	----	ECH16-513/653	11.9
			460	10.1	6.5	22,200			12.4
			480	10.5	7.0	23,900			12.8
			550	7.6	5.8	19,800			9.9
	ECH16-10 (17 lbs.) (8kg)	1 step (3 phase)	575	8.0	6.4	21,800	----	ECH16-653	10.3
			600	8.4	7.0	23,900			10.6
			208	26.1	7.5	25,600	----	ECH16-653	31.9
			220	27.6	8.4	28,700			33.4
			230	28.9	9.2	31,400			34.6
			240	30.1	10.0	34,100			35.9
			440	13.8	8.4	28,700	----	ECH16-513/653	16.0
			460	14.4	9.2	31,400			16.6
	ECH16-15 (17 lbs.) (8kg)	1 step (3 phase)	480	15.0	10.0	34,100	----	ECH16-653	13.3
			550	11.0	8.4	28,700			13.8
			575	11.5	9.2	31,400			14.3
			600	12.0	10.0	34,100			14.3
			208	39.1	11.3	38,600	----	ECH16-653	44.9
			220	41.4	12.6	43,000			47.1
			230	43.2	13.8	47,100			49.0
			240	45.1	15.0	51,200			50.9
	ECH16-20 (20 lbs.) (9kg)	2 steps (3 phase)	440	20.6	12.6	43,000	----	ECH16-513/653	22.9
			460	21.6	13.8	47,100			23.9
			480	22.5	15.0	51,200			24.8
			550	16.5	12.6	43,000			18.8
		1 step (3 phase)	575	17.3	13.7	46,800	----	ECH16-653	19.5
			600	18.0	15.0	51,200			20.3
			208	52.1	15.0	51,200			57.9
			220	55.1	16.8	57,300			60.9
	ECH16-25 (20 lbs.) (9kg)	2 steps (3 phase)	230	57.6	18.4	62,800	----	ECH16-653	63.4
			240	60.1	20.0	68,300			65.9
		1 step (3 phase)	440	27.6	16.8	57,300	----	ECH16-513/653	29.9
			460	28.9	18.4	62,800			31.1
			480	30.1	20.0	68,300			32.4
			550	22.0	16.8	57,300	----	ECH16-653	24.3
			575	23.0	18.3	62,400			25.3
			600	24.0	20.0	68,300			26.3
	ECH16-25 (20 lbs.) (9kg)	2 steps (3 phase)	208	65.1	18.8	64,200	----	ECH16-653	70.9
			220	68.9	21.0	71,700			74.6
			230	72.0	22.9	78,100			77.8
			240	75.1	25.0	85,300			80.9
		1 step (3 phase)	440	34.5	21.0	71,700	----	ECH16-513/653	36.8
			460	36.0	22.9	78,100			38.3
			480	37.6	25.0	85,300			39.9
			550	27.6	21.1	72,000			29.9
	ECH16-25 (20 lbs.) (9kg)	1 step (3 phase)	575	28.9	23.0	78,500	----	ECH16-653	31.1
			600	30.1	25.0	85,300			32.4

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

RATINGS

NOTE — To determine Sensible Capacity, Leaving Wet and Dry Bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 11.

CHA16-261 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
	Dry Bulb					Dry Bulb						Dry Bulb								
	L/s	cfm	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C			
63°F (17.2°C)	330	700	6.9	23,600	1830	.75	.90	1.00	6.6	22,400	1890	.77	.93	1.00	6.2	21,000	1980	.79	.96	1.00
	380	800	7.1	24,400	1850	.78	.94	1.00	6.7	23,000	1910	.80	.97	1.00	6.3	21,600	2000	.82	1.00	1.00
	425	900	7.3	24,900	1860	.81	.98	1.00	6.9	23,600	1920	.83	1.00	1.00	6.5	22,200	2020	.85	1.00	1.00
67°F (19.4°C)	330	700	7.2	24,700	1860	.59	.74	.88	6.9	23,400	1910	.60	.76	.90	6.5	22,100	2020	.61	.78	.93
	380	800	7.5	25,500	1870	.61	.77	.92	7.1	24,100	1920	.62	.79	.94	6.7	22,700	2040	.63	.81	.97
	425	900	7.6	26,100	1870	.63	.80	.96	7.2	24,700	1930	.64	.82	.98	6.8	23,200	2050	.65	.84	1.00
71°F (21.7°C)	330	700	7.6	25,800	1870	.44	.59	.74	7.1	24,400	1930	.45	.60	.76	6.7	23,000	2050	.45	.61	.77
	380	800	7.8	26,600	1870	.45	.61	.77	7.4	25,100	1940	.46	.62	.79	6.9	23,700	2070	.46	.64	.81
	425	900	8.0	27,200	1870	.46	.63	.80	7.5	25,700	1950	.46	.64	.82	7.1	24,100	2090	.47	.66	.84

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

CHA16-311 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
	Dry Bulb					Dry Bulb						Dry Bulb								
	L/s	cfm	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C			
63°F (17.2°C)	415	875	8.5	29,000	2230	.74	.88	1.00	8.1	27,600	2390	.75	.90	1.00	7.6	26,100	2560	.76	.93	1.00
	470	1000	8.7	29,900	2250	.76	.92	1.00	8.3	28,400	2420	.78	.94	1.00	7.9	26,900	2580	.80	.97	1.00
	530	1125	9.0	30,600	2270	.79	.95	1.00	8.5	29,000	2440	.81	.98	1.00	8.1	27,500	2610	.83	1.00	1.00
67°F (19.4°C)	415	875	8.9	30,400	2260	.58	.72	.86	8.5	29,000	2430	.59	.74	.88	8.1	27,500	2610	.60	.76	.90
	470	1000	9.2	31,400	2280	.60	.75	.90	8.8	29,900	2470	.60	.76	.92	8.3	28,300	2640	.62	.79	.94
	530	1125	9.5	32,300	2320	.61	.77	.94	9.0	30,700	2500	.62	.79	.96	8.5	29,000	2670	.63	.81	.98
71°F (21.7°C)	415	875	9.3	31,800	2300	.43	.58	.72	8.9	30,300	2480	.44	.59	.74	8.4	28,700	2660	.44	.60	.75
	470	1000	9.6	32,900	2340	.44	.59	.75	9.2	31,300	2520	.44	.60	.76	8.7	29,700	2690	.45	.62	.78
	530	1125	9.9	33,800	2370	.45	.61	.78	9.4	32,100	2550	.45	.62	.79	8.9	30,400	2720	.45	.63	.81

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

CHA16-411-413 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
	Dry Bulb					Dry Bulb						Dry Bulb								
	L/s	cfm	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C			
63°F (17.2°C)	495	1050	10.2	34,800	2770	.72	.87	.99	9.8	33,300	2980	.74	.89	1.00	9.3	31,800	3190	.75	.91	1.00
	565	1200	10.5	35,800	2810	.75	.91	1.00	10.0	34,200	3020	.77	.93	1.00	9.6	32,800	3230	.78	.95	1.00
	635	1350	10.8	36,800	2830	.78	.94	1.00	10.2	34,900	3040	.80	.96	1.00	9.8	33,500	3260	.81	.98	1.00
67°F (19.4°C)	495	1050	10.7	36,400	2820	.57	.71	.85	10.2	34,800	3040	.58	.73	.87	9.8	33,400	3260	.58	.74	.88
	565	1200	11.0	37,500	2860	.59	.74	.89	10.5	35,900	3080	.60	.75	.90	10.0	34,300	3300	.60	.77	.92
	635	1350	11.3	38,400	2880	.60	.77	.92	10.8	36,800	3110	.61	.78	.94	10.3	35,100	3330	.62	.80	.96
71°F (21.7°C)	495	1050	11.1	37,900	2870	.43	.57	.71	10.6	36,300	3100	.43	.58	.72	10.2	34,800	3320	.43	.59	.74
	565	1200	11.5	39,100	2900	.43	.59	.74	11.0	37,400	3130	.44	.60	.75	10.5	35,800	3360	.44	.61	.77
	635	1350	11.8	40,000	2930	.44	.60	.77	11.3	38,400	3170	.44	.61	.78	10.7	36,600	3400	.45	.62	.80

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

CHA16-511-513 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
	Dry Bulb					Dry Bulb						Dry Bulb								
	L/s	cfm	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C			
63°F (17.2°C)	660	1400	13.4	45,700	3640	.72	.87	.99	12.8	43,700	3930	.73	.89	1.00	12.2	41,700	4210	.75	.91	1.00
	755	1600	13.8	47,100	3680	.75	.90	1.00	13.2	45,100	3970	.76	.92	1.00	12.5	42,600	4250	.78	.95	1.00
	850	1800	14.0	47,800	3700	.78	.94	1.00	13.5	46,000	4000	.79	.96	1.00	12.9	43,900	4300	.81	.98	1.00
67°F (19.4°C)	660	1400	14.0	47,700	3700	.57	.71	.85	13.4	45,700	4000	.57	.72	.86	12.8	43,700	4290	.58	.74	.88
	755	1600	14.4	49,200	3730	.58	.74	.88	13.8	47,100	4040	.59	.75	.90	13.2	45,000	4350	.60	.77	.92
	850	1800	14.8	50,500	3770	.60	.76	.92	14.2	48,300	4080	.61	.78	.94	13.5	46,100	4390	.62	.79	.96
71°F (21.7°C)	660	1400	14.6	49,700	3750	.42	.57	.71	13.9	47,600	4060	.43	.57	.72	13.3	45,500	4370	.43	.58	.73
	755	1600	15.0	51,200	3790	.43	.58	.74	14.4	49,100	4110	.43	.59	.75	13.7	46,900	4430	.44	.60	.76
	850	1800	15.4	52,500	3830	.44	.60	.77	14.7	50,200	4150	.44	.61	.78	14.1	48,000	4480	.44	.62	.79

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

RATINGS

NOTE — To determine Sensible Capacity, Leaving Wet and Dry Bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 11.

CHA16-651-653 COOLING CAPACITY

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																	
			85°F (29°C)						95°F (35°C)						105°F (41°C)					
			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)			Total Cooling Capacity		Comp. Motor Watts Input	Sensible To Total Ratio (S/T)		
	Dry Bulb					Dry Bulb						Dry Bulb								
	L/s	cfm	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C	kW	Btuh	75°F 24°C	80°F 27°C	85°F 29°C			
63°F (17.2°C)	825	1750	17.2	58,800	4330	.72	.88	.99	16.5	56,300	4660	.74	.89	1.00	15.7	53,700	4970	.75	.91	1.00
	945	2000	17.7	60,500	4380	.75	.91	1.00	16.8	57,200	4700	.77	.94	1.00	16.1	54,900	5020	.78	.95	1.00
	1060	2250	18.0	61,500	4410	.78	.94	1.00	17.3	59,000	4750	.80	.96	1.00	16.4	55,900	5060	1.00	1.00	1.00
67°F (19.4°C)	825	1750	18.0	61,400	4410	.57	.72	.85	17.3	58,900	4740	.58	.73	.86	16.5	56,300	5080	.59	.74	.88
	945	2000	18.5	63,200	4460	.59	.74	.89	17.8	60,600	4800	.62	.76	.90	16.9	57,800	5140	.61	.77	.92
	1060	2250	19.0	64,700	4490	.61	.77	.93	18.1	61,900	4840	.62	.78	.94	17.3	59,100	5190	.63	.80	.97
71°F (21.7°C)	825	1750	18.7	63,900	4480	.43	.57	.71	18.0	61,400	4820	.43	.57	.73	17.2	58,700	5170	.43	.59	.74
	945	2000	19.3	65,700	4530	.43	.58	.74	18.5	63,000	4880	.44	.59	.75	17.7	60,300	5230	.44	.61	.77
	1060	2250	19.7	67,200	4560	.44	.60	.77	18.9	64,400	4920	.45	.61	.78	18.0	61,600	5280	.45	.63	.80

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

BLOWER DATA

CHA16-261 BLOWER PERFORMANCE AT 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1370	645	950	450	875	415	660	310
.05	12	1365	645	955	450	880	415	670	315
.10	25	1350	635	960	455	885	420	675	320
.15	37	1340	630	960	455	885	420	680	320
.20	50	1320	625	955	450	880	415	680	320
.25	62	1300	615	950	450	875	415	680	320
.30	75	1280	605	940	445	870	410	675	320
.40	100	1220	575	920	435	850	400	660	310
.50	125	1150	545	880	415	820	385	630	295
.60	150	1070	505	835	395	775	365	585	275
.70	175	975	460	780	370	725	340	535	250
.75	185	925	435	745	350	700	330	500	235

NOTE — All air data is measured external to the unit without air filter.

CHA16-261 BLOWER PERFORMANCE AT 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1405	665	905	425	820	385	620	295
.05	12	1400	660	935	440	845	400	640	300
.10	25	1385	655	955	450	865	410	655	310
.15	37	1370	645	975	460	880	415	665	315
.20	50	1355	640	985	465	890	420	670	315
.25	62	1335	630	990	465	895	420	670	315
.30	75	1310	620	985	465	890	420	670	315
.40	100	1260	595	965	455	870	410	650	305
.50	125	1195	565	915	430	830	390	615	290
.60	150	1120	530	840	395	865	410	560	265
.70	175	1035	490	740	350	675	320	490	230
.75	185	990	465	685	325	620	295	445	210

NOTE — All air data is measured external to the unit without air filter.

CHA16-311 BLOWER PERFORMANCE AT 230 VOLTS
 (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1355	640	1255	590	1105	520	900	425
.05	12	1345	635	1250	590	1100	520	910	430
.10	25	1330	630	1245	590	1090	515	915	430
.15	37	1310	620	1235	585	1080	510	915	430
.20	50	1290	610	1220	575	1070	505	910	430
.25	62	1270	600	1205	570	1055	500	900	425
.30	75	1245	590	1180	555	1035	490	890	420
.40	100	1190	560	1130	535	990	465	855	405
.50	125	1125	530	1060	500	935	440	805	380
.60	150	1050	495	980	560	870	410	735	345
.70	175	960	455	885	420	790	375	655	310
.75	185	915	430	835	395	745	350	605	285

NOTE — All air data is measured external to the unit without air filter.

CHA16-311 BLOWER PERFORMANCE AT 230 VOLTS
 (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1445	680	1330	630	1105	520	900	425
.05	12	1435	680	1295	610	1105	520	910	430
.10	25	1420	670	1285	605	1105	520	915	430
.15	37	1400	660	1275	600	1100	520	920	435
.20	50	1380	650	1265	595	1095	515	920	435
.25	62	1360	640	1250	590	1085	510	915	430
.30	75	1335	630	1230	580	1070	505	905	425
.40	100	1280	605	1185	560	1035	490	880	415
.50	125	1220	575	1135	535	995	470	840	395
.60	150	1150	545	1070	505	935	440	790	375
.70	175	1070	505	995	470	870	410	720	340
.75	185	1025	485	955	450	830	390	680	320

NOTE — All air data is measured external to the unit without air filter.

CHA16-411-413 BLOWER PERFORMANCE AT 230 VOLTS
 (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1415	670	1350	635	1135	530	915	430
.05	12	1395	660	1335	630	1125	530	905	425
.10	25	1375	650	1315	620	1115	525	895	420
.15	37	1360	640	1290	610	1110	525	890	420
.20	50	1355	640	1275	600	1105	520	885	420
.25	62	1325	625	1255	590	1095	515	875	415
.30	75	1310	620	1235	585	1085	510	865	410
.40	100	1265	595	1195	565	1060	500	845	400
.50	125	1220	575	1155	545	1020	480	825	390
.60	150	1170	550	1105	520	975	460	785	370
.70	175	1115	525	1045	495	925	435	725	340
.75	185	1085	510	1010	475	895	420	685	325

NOTE — All air data is measured external to the unit without air filter.

CHA16-411-413 BLOWER PERFORMANCE AT 230 VOLTS
 (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1490	705	1460	690	1145	540	920	435
.05	12	1470	695	1440	680	1135	535	910	430
.10	25	1450	685	1420	670	1125	530	900	425
.15	37	1435	675	1395	660	1120	530	895	420
.20	50	1430	675	1375	650	1115	525	890	420
.25	62	1400	660	1355	640	1105	520	880	415
.30	75	1380	650	1335	630	1095	515	870	410
.40	100	1335	630	1285	605	1070	505	850	400
.50	125	1285	605	1235	585	1030	485	830	390
.60	150	1235	585	1195	565	985	465	790	375
.70	175	1185	560	1140	540	935	440	730	345
.75	185	1160	545	1110	525	905	425	690	325

NOTE — All air data is measured external to the unit without air filter.

CHA16-413 BLOWER PERFORMANCE AT 460/575 VOLTS
(With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1625	765	1465	690	1100	520
.05	12	1600	755	1445	680	1100	520
.10	25	1570	740	1420	670	1100	520
.15	37	1555	735	1395	660	1095	515
.20	50	1525	720	1385	655	1090	515
.25	62	1485	700	1365	645	1075	505
.30	75	1465	690	1340	630	1070	505
.40	100	1400	660	1285	605	1035	490
.50	125	1335	630	1235	585	1005	475
.60	150	1260	595	1165	550	955	450
.70	175	1170	550	1085	510	875	415
.75	185	1100	520	1045	495	815	385

NOTE — All air data is measured external to the unit without air filter.

CHA16-413 BLOWER PERFORMANCE AT 460/575 VOLTS
(With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	1710	805	1590	750	1105	520
.05	12	1685	795	1565	740	1105	520
.10	25	1655	780	1535	725	1105	520
.15	37	1630	770	1510	715	1100	520
.20	50	1610	760	1490	705	1095	515
.25	62	1570	740	1470	695	1085	510
.30	75	1540	725	1445	680	1075	505
.40	100	1475	695	1385	655	1040	490
.50	125	1405	665	1330	630	1010	475
.60	150	1335	630	1260	595	960	455
.70	175	1240	585	1185	560	885	420
.75	185	1180	555	1150	545	825	390

NOTE — All air data is measured external to the unit without air filter.

CHA16-511-513 BLOWER PERFORMANCE AT 230 VOLTS
(With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2065	975	1715	810	1515	715	1305	615
.05	12	2055	970	1705	805	1505	710	1300	615
.10	25	2040	965	1690	800	1495	705	1300	615
.15	37	2020	955	1680	795	1485	700	1295	610
.20	50	2000	945	1665	785	1475	695	1290	610
.25	62	1975	930	1650	780	1470	695	1285	605
.30	75	1950	920	1635	770	1450	685	1280	605
.40	100	1885	890	1600	755	1425	670	1260	595
.50	125	1810	855	1565	740	1395	660	1225	580
.60	150	1730	815	1525	720	1360	640	1175	555
.70	175	1645	775	1600	755	1320	625	1110	525
.75	185	1600	755	1455	685	1295	610	1070	505

NOTE — All air data is measured external to the unit without air filter.

CHA16-511-513 BLOWER PERFORMANCE AT 230 VOLTS
(With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds							
		High		Medium-High		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2140	1010	1785	840	1535	725	1305	615
.05	12	2115	1000	1770	835	1530	720	1300	615
.10	25	2090	985	1755	830	1520	715	1295	610
.15	37	2070	975	1745	825	1510	715	1290	610
.20	50	2045	965	1730	815	1500	710	1285	605
.25	62	2020	955	1715	810	1490	705	1280	605
.30	75	1995	940	1700	800	1480	700	1275	600
.40	100	1935	915	1665	785	1460	690	1260	595
.50	125	1875	885	1630	770	1430	675	1235	585
.60	150	1800	850	1585	750	1400	660	1205	570
.70	175	1710	805	1530	720	1370	645	1170	550
.75	185	1655	780	1495	705	1355	640	1150	545

NOTE — All air data is measured external to the unit without air filter.

CHA16-513 BLOWER PERFORMANCE AT 460/575 VOLTS
 (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2140	1010	1745	825	1175	555
.05	12	2120	1000	1730	815	1175	555
.10	25	2080	980	1720	810	1170	550
.15	37	2045	965	1710	805	1170	550
.20	50	2005	945	1695	800	1165	550
.25	62	1975	930	1680	795	1160	545
.30	75	1940	915	1665	785	1150	545
.40	100	1870	885	1625	765	1135	535
.50	125	1790	845	1580	745	1110	525
.60	150	1705	805	1515	715	1075	505
.70	175	1605	760	1430	675	1030	485
.75	185	1555	740	1375	650	1000	470

NOTE — All air data is measured external to the unit without air filter.

CHA16-513 BLOWER PERFORMANCE AT 460/575 VOLTS
 (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2160	1020	1815	855	1210	570
.05	12	2125	1005	1800	850	1210	570
.10	25	2095	990	1790	845	1200	565
.15	37	2060	970	1780	840	1200	565
.20	50	2025	955	1760	830	1195	565
.25	62	1990	940	1745	825	1190	560
.30	75	1955	925	1730	815	1185	560
.40	100	1885	890	1690	800	1170	550
.50	125	1805	850	1640	775	1140	540
.60	150	1715	810	1575	745	1105	520
.70	175	1615	760	1495	705	1065	505
.75	185	1560	735	1445	680	1040	490

NOTE — All air data is measured external to the unit without air filter.

CHA16-651-653 BLOWER PERFORMANCE AT 230 VOLTS
 (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds									
		High		Medium-High		Medium		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2725	1285	2490	1175	2235	1055	1940	915	1620	765
.05	12	2695	1270	2435	1150	2210	1045	1930	910	1625	765
.10	25	2665	1260	2430	1145	2185	1030	1925	910	1625	765
.15	37	2635	1245	2415	1140	2160	1020	1910	900	1610	760
.20	50	2600	1225	2395	1130	2140	1010	1895	895	1590	750
.25	62	2555	1205	2365	1115	2130	1005	1880	885	1580	745
.30	75	2510	1185	2335	1100	2115	1000	1865	880	1565	740
.40	100	2445	1155	2275	1075	2060	970	1830	865	1540	725
.50	125	2385	1125	2230	1050	2005	945	1765	835	1505	710
.60	150	2285	1080	2140	1010	1940	915	1725	815	1455	685
.70	175	2210	1045	2075	980	1880	885	1660	785	1405	665
.75	185	2175	1025	2030	960	1845	870	1615	760	1370	645

NOTE — All air data is measured external to the unit without air filter.

CHA16-651-653 BLOWER PERFORMANCE AT 230 VOLTS
 (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds									
		High		Medium-High		Medium		Medium-Low		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2850	1345	2530	1195	2255	1065	1970	930	1640	775
.05	12	2820	1330	2475	1170	2230	1050	1965	925	1645	775
.10	25	2790	1315	2475	1170	2205	1040	1955	925	1645	775
.15	37	2760	1300	2455	1160	2180	1030	1940	915	1630	770
.20	50	2725	1285	2435	1150	2160	1020	1925	910	1610	760
.25	62	2680	1265	2405	1135	2150	1015	1910	900	1600	755
.30	75	2630	1240	2375	1120	2135	1010	1895	895	1585	750
.40	100	2570	1215	2315	1090	2080	980	1860	880	1560	735
.50	125	2510	1185	2270	1070	2025	955	1795	845	1525	720
.60	150	2410	1135	2180	1030	1960	925	1755	830	1475	695
.70	175	2335	1100	2115	1000	1900	895	1690	800	1425	670
.75	185	2300	1085	2070	975	1865	880	1650	780	1390	655

NOTE — All air data is measured external to the unit without air filter.

BLOWER DATA

CHA16-653 BLOWER PERFORMANCE AT 460/575 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2725	1285	2405	1135	1905	900
.05	12	2680	1265	2365	1115	1890	890
.10	25	2635	1245	2325	1095	1870	880
.15	37	2590	1220	2290	1080	1855	875
.20	50	2550	1205	2255	1065	1840	870
.25	62	2515	1185	2220	1050	1820	860
.30	75	2485	1175	2190	1035	1795	845
.40	100	2395	1130	2120	1000	1745	825
.50	125	2325	1095	2050	965	1680	795
.60	150	2235	1055	1970	930	1570	740
.70	175	2150	1015	1900	895	1560	735
.75	185	2100	990	1860	880	1515	715

NOTE — All air data is measured external to the unit without air filter.

CHA16-653 BLOWER PERFORMANCE AT 460/575 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure		Air Volume at Various Blower Speeds					
		High		Medium		Low	
in. w.g.	Pa	cfm	L/s	cfm	L/s	cfm	L/s
0	0	2850	1345	2430	1145	1940	915
.05	12	2805	1325	2385	1125	1920	905
.10	25	2760	1300	2345	1105	1905	900
.15	37	2715	1280	2310	1090	1885	890
.20	50	2670	1260	2275	1075	1870	880
.25	62	2640	1245	2240	1055	1850	875
.30	75	2605	1230	2210	1045	1825	860
.40	100	2515	1185	2140	1010	1775	840
.50	125	2445	1155	2120	1000	1710	805
.60	150	2355	1110	1990	940	1600	755
.70	175	2270	1070	1920	905	1590	750
.75	185	2225	1050	1880	885	1545	730

NOTE — All air data is measured external to the unit without air filter.

FILTER AND ACCESSORY AIR RESISTANCE

Unit Model No.	Air Volume		Total Air Resistance — inches water gauge (Pa)					
			With 1" (25mm) Filter Furnished With CHA16 Unit	REMD16 Down-Flo Economizer			EMDH16 Horizontal Economizer	
	cfm	L/s		Less Filter	With Optional Pleated Polyester 2" (51mm) Filter	With Optional Fiberglass 2" (51mm) Filter	With Furnished 1" (25mm) Filter	Less Filter
CHA16-261 CHA16-311 CHA16-410	800	380	.15 (37)	.05 (12)	.27 (67)	.13 (32)	.18 (45)	.10 (25)
	1000	470	.18 (45)	.06 (15)	.34 (85)	.18 (45)	.26 (65)	.15 (37)
	1200	565	.21 (52)	.09 (22)	.42 (104)	.24 (60)	.35 (87)	.21 (52)
	1400	660	.25 (62)	.15 (37)	.51 (127)	.31 (77)	.46 (114)	.29 (72)
CHA16-510 CHA16-650	1600	755	.15 (37)	.05 (12)	.40 (99)	.27 (67)	.30 (75)	.17 (42)
	1800	850	.17 (42)	.06 (15)	.48 (119)	.33 (82)	.35 (87)	.19 (47)
	2000	945	.20 (50)	.08 (20)	.56 (139)	.39 (97)	.40 (99)	.22 (55)
	2200	1040	.23 (57)	.13 (32)	.66 (164)	.46 (114)	.47 (117)	.26 (65)

NOTE — Electric heaters have no appreciable air resistance.

DIFFUSER AIR RESISTANCE

Unit Model No.	Air Volume		Total Air Resistance — inches water gauge (Pa)			
	cfm	L/s	RTD9-65 Diffuser			FD9-65 Diffuser
			2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	
CHA16-261 CHA16-311 CHA16-410	800	380	.15 (37)	.13 (32)	.11 (27)	.11 (27)
	1000	470	.19 (47)	.16 (40)	.14 (35)	.14 (35)
	1200	565	.25 (62)	.20 (50)	.17 (42)	.17 (42)
	1400	660	.33 (82)	.26 (65)	.20 (50)	.20 (50)
CHA16-510 CHA16-650	1600	755	.43 (107)	.32 (80)	.20 (50)	.24 (60)
	1800	850	.56 (139)	.40 (99)	.30 (75)	.30 (75)
	2000	945	.73 (182)	.50 (124)	.36 (90)	.36 (90)
	2200	1040	.95 (236)	.63 (157)	.44 (109)	.44 (109)

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

Grille Vanes	Air Volume		*Effective Throw — ft. (m)		
	cfm	L/s	Horizontal Vanes 180° Straight	Horizontal Vanes 22° Down	Horizontal Vanes 45° Down
2 Ends Open	600	285	21 (6.5)	20 (6.0)	14 (4.5)
	800	380	22 (6.5)	21 (6.5)	15 (4.5)
	1000	470	24 (7.5)	22 (6.5)	16 (5.0)
	1200	565	25 (7.5)	23 (7.0)	17 (5.0)
	1400	660	27 (8.0)	25 (7.5)	18 (5.5)
	1600	755	29 (9.0)	26 (8.0)	19 (6.0)
	1800	850	31 (9.5)	27 (8.0)	20 (6.0)
	2000	945	33 (10.0)	28 (8.5)	21 (6.5)
	2200	1040	35 (10.5)	30 (9.0)	22 (6.5)
	2400	1135	38 (11.5)	34 (10.5)	23 (7.0)
1 Side 2 Ends Open	600	285	15 (4.5)	14 (4.5)	8 (2.5)
	800	380	16 (5.0)	15 (4.5)	9 (2.5)
	1000	470	17 (5.0)	16 (5.0)	10 (3.0)
	1200	565	18 (5.5)	17 (5.0)	11 (3.5)
	1400	660	19 (6.0)	18 (5.5)	12 (3.5)
	1600	755	20 (6.0)	18 (5.5)	12 (3.5)
	1800	850	21 (6.5)	19 (6.0)	13 (4.0)
	2000	945	23 (7.0)	20 (6.0)	14 (4.5)
	2200	1040	25 (7.5)	22 (6.5)	16 (5.0)
	2400	1135	27 (8.0)	24 (7.5)	17 (5.0)
All Ends And Sides Open	600	285	11 (3.5)	10 (3.0)	7 (2.0)
	800	380	12 (3.5)	11 (3.5)	8 (2.5)
	1000	470	13 (4.0)	12 (3.5)	8 (2.5)
	1200	565	14 (4.5)	13 (4.0)	9 (2.5)
	1400	660	15 (4.5)	14 (4.5)	9 (2.5)
	1600	755	16 (5.0)	14 (4.5)	10 (3.0)
	1800	850	17 (5.0)	15 (4.5)	10 (3.0)
	2000	945	18 (5.5)	16 (5.0)	11 (3.5)
	2200	1040	19 (6.0)	17 (5.0)	12 (3.5)
	2400	1135	20 (6.0)	18 (5.5)	12 (3.5)

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

Air Volume		*Effective Throw — ft. (m)
cfm	L/s	
600	285	7 (2.0)
800	380	8 (2.5)
1000	470	8 (2.5)
1200	565	9 (2.5)
1400	660	9 (2.5)
1600	755	10 (3.0)
1800	850	11 (3.5)
2000	945	12 (3.5)
2200	1040	12 (3.5)
2400	1135	13 (4.0)

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

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

GUIDE SPECIFICATIONS

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

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

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

Air Distribution — Equipment shall be capable of bottom 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.³ (kg/m³) density fiberglass or equivalent.

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

Equipment Warranty — Compressors have a limited warranty for a full five years. Most of the other components have a limited warranty for one year. Refer to the Lennox Equipment Limited Warranty certificate included with the unit for additional 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 enhanced fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than sq. ft. (m²) (evaporator) and sq. ft. (m²) (condenser). Optional coil guard(s) shall be available.

The compressor shall be resiliently mounted, have overload protection and internal pressure relief. CHA16 models shall have compressor crankcase heater. The refrigeration system shall have suction and liquid line service gauge ports, liquid line strainer and full refrigerant charge. CHA16-510 & 650 shall have expansion valve and thermometer well. All models shall have high pressure switch and loss of charge switch. Control options shall consist of thermostat, timed-off control and low ambient control. Shall be rated in accordance with ARI Standard 210/240-89.

Commercial Controls Platform — Shall be furnished and factory installed. Platform shall include control system and economizer wiring harness. Wiring harness shall be used in conjunction with thermostats, related control systems, and economizer dampers.

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

Optional electric heaters shall be field installed. Heating elements shall be nichrome bare wire exposed directly to the air stream. ECH16R safety devices shall consist of limit controls and thermal cut-off safety fuses. ECH16 safety devices shall consist of limit controls and fuse block. ECH16-20 and 25kW (208/240V-3ph) heaters shall have thermal time delay relay to bring elements on and off in sequence with at time delay between each element. Heaters shall be C.S.A. listed. Optional heater sub-fuse box shall be available for ECH16R electric heaters for single point power supply applications.

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. Supply and return air openings shall be flanged. Evaporator coil condensate drain shall be provided. All models shall have low voltage terminal strip. Lifting brackets shall be factory installed on all models.

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

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

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

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

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. Frame design shall be approved by National Roofing Contractors Association.

Economizer Dampers — Furnish and install complete with controls an air mixing damper assembly including outdoor air and recirculated air dampers. REMD16 shall include pressure operated gravity exhaust dampers. The assembly shall provide for the introduction of outside air for minimum ventilation and free cooling. Damper motor shall be 24 volt fully modulating spring return. Controls shall include electronic discharge air sensor, minimum position switch, and solid-state adjustable enthalpy control. Control option available shall consist of differential enthalpy control (return air sensor).

Horizontal Gravity Exhaust Dampers — Pressure operated dampers shall install in return air duct for horizontal applications. Damper blades shall ride in nylon bearings and be gasketed for tight seal and quiet operation.

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

Horizontal Filter Kit — Optional kit shall be available for horizontal return air applications. Shall have disposable air filter.

Stand-Off Mounting Kit — Optional kit shall be available to elevate unit above mounting surface in horizontal applications.

Roof Curb Power Entry Kit — Optional kit shall provide power entry to the unit through the roof mounting frame.

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.

Single Point Power Source Unit Sub-Fuse Box — Optional box shall field install internal to the unit and provide single point power source connection and sub-fusing for unit. Shall be of galvanized steel with mounting holes, electrical inlets and hinged cover.

Remote Status Panel — Shall be available for installation within the conditioned area to observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2, No Heat and Filter.

Remote Switching Status Panel — Shall be available for installation within the conditioned area to control and observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2, No Heat and Filter. System selector switch and fan switch shall provide operational mode and blower operation. After hours timer switch shall override night setback controls and provide normal operation for time period set.

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.

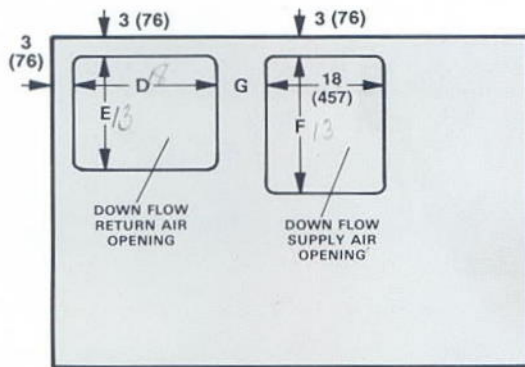
CHA16 BASIC UNIT

CORNER WEIGHTS

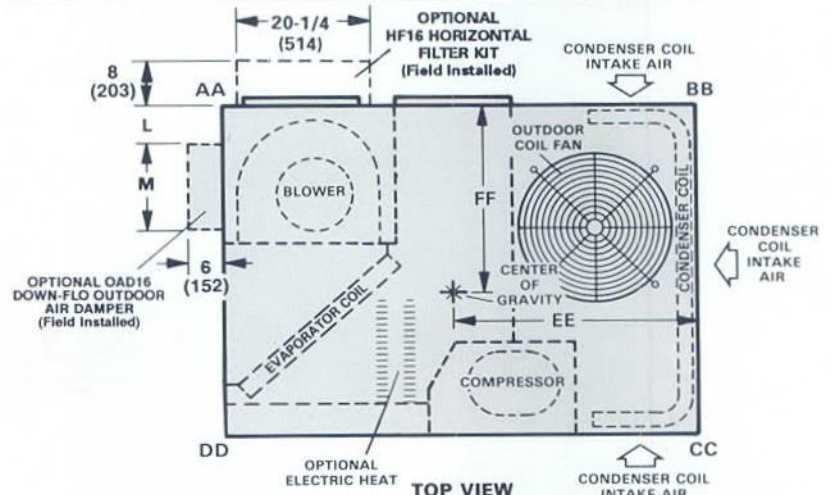
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA16-261	61	28	67	30	94	43	87	39
CHA16-311	66	30	71	32	101	46	93	42
CHA16-410	67	30	73	33	103	47	95	43
CHA16-510	86	39	93	42	135	61	124	56
CHA16-650	101	46	101	46	136	62	135	61

CENTER OF GRAVITY

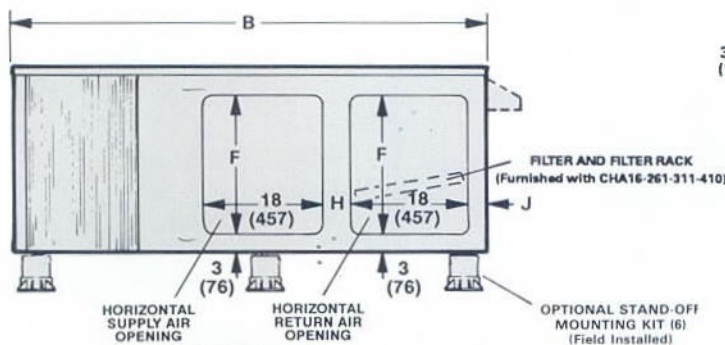
Model Number	EE		FF	
	in.	mm	in.	mm
CHA16-261	28-3/4	730	27	685
CHA16-311				
CHA16-410				
CHA16-510	34-3/4	883	30-3/4	781
CHA16-650	36-1/4	921	29-3/4	756



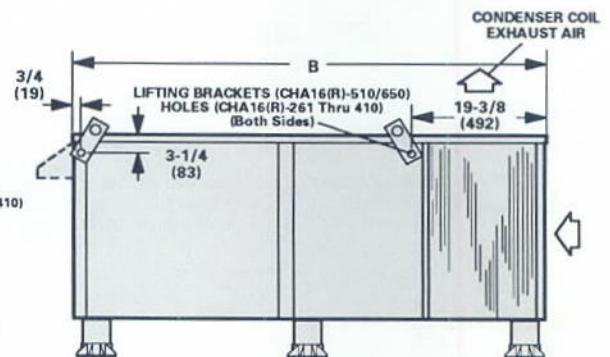
TOP VIEW BASE SECTION



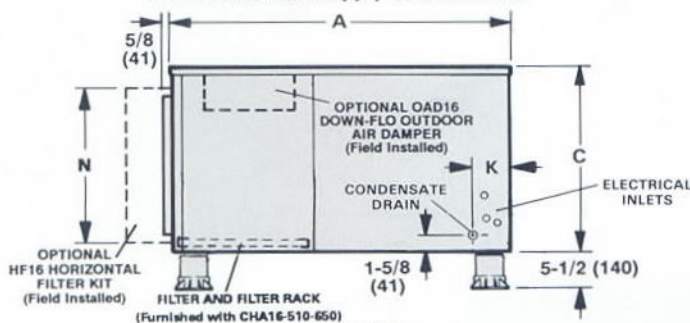
TOP VIEW



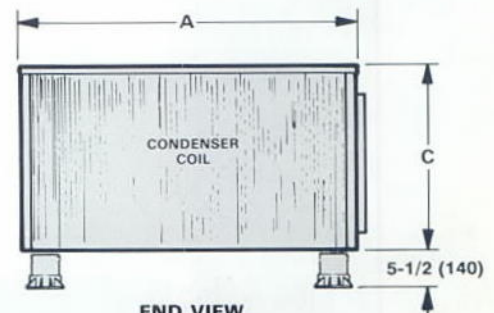
**BACK VIEW
(With Horizontal Supply & Return Air)**



FRONT VIEW



END VIEW



END VIEW

Model No.	A		B		C		D		E		F		G	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA16-261	46	1168	60	1524	23	584	18	457	13	330	13	330	10	254
CHA16-311														
CHA16-411-413														
CHA16-511-513	52	1321	72-1/2	1842	29	737	22	559	18	457	22	737	7-1/2	191
CHA16-651-653														

Model No.	H		J		K		L		M		N	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA16-261												
CHA16-311	3	76	4	102	6-1/2	165	2	51	14-1/2	368	22	559
CHA16-411-413												
CHA16-511-513	5	127	3	76	6-1/8	156	5	127	18-5/8	473	*22	*559
CHA16-651-653												

*Dimensions shown for CHA16-511-513 unit. Dimension is 27 in. (686 mm) for CHA16-651-653 units.

ACCESSORY DIMENSIONS — inches (mm)

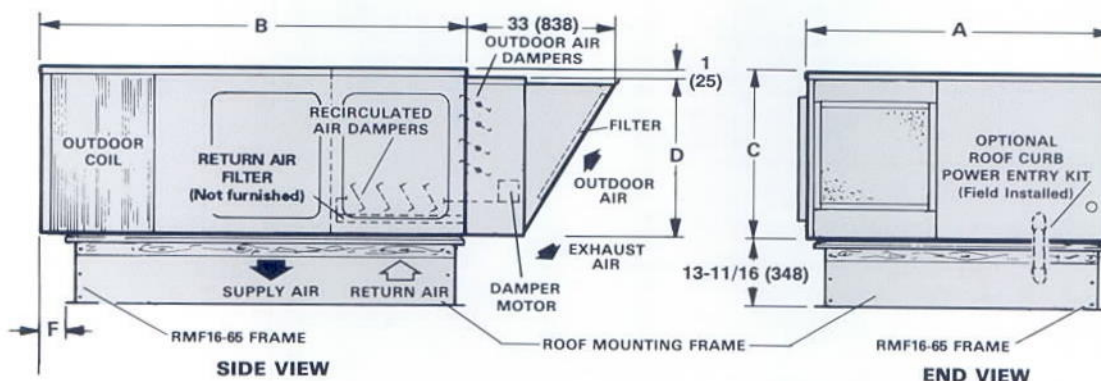
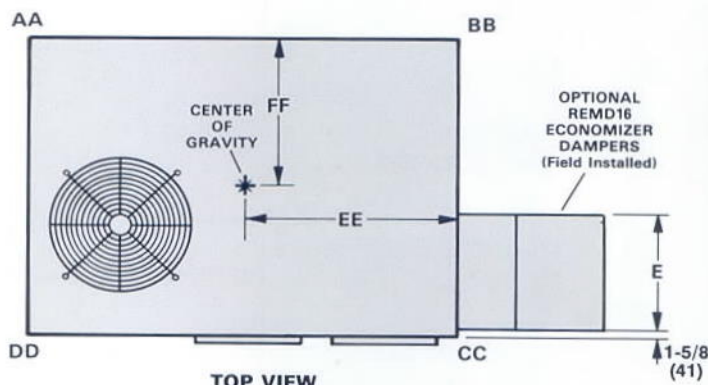
CHA16 UNIT WITH REMD16M ECONOMIZER DAMPER SECTION AND RMF16 ROOF MOUNTING FRAME

CORNER WEIGHTS

Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA16-261	126	57	107	49	92	42	108	49
CHA16-311	132	60	112	51	97	44	113	51
CHA16-410	134	61	114	52	98	52	115	52
CHA16-510	173	78	145	66	124	56	148	67
CHA16-650	183	83	146	66	132	60	164	74

CENTER OF GRAVITY

Model Number	EE		FF	
	in.	mm	in.	mm
CHA16-261	32-3/8	822	21-1/4	540
CHA16-311				
CHA16-410				
CHA16-510	41-5/8	1057	23-15/16	608
CHA16-650	40-1/4	1022	24-9/16	624

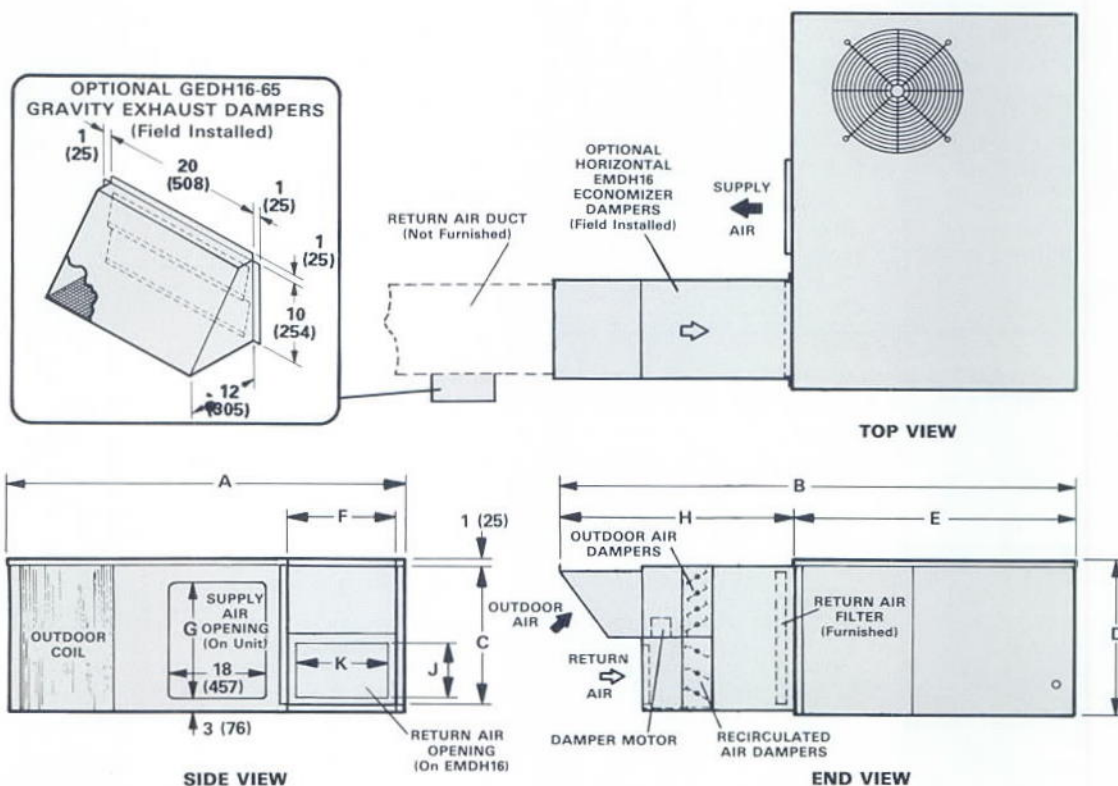


Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA16-261	46	1168	60	1524	23	584	21-3/4	552	16	406	----	----
CHA16-311												
CHA16-411-413												
CHA16-511-513	52	1321	72-1/2	1842	29	737	27-3/4	705	20-1/4	514	3-1/2	89
CHA16-651-653												

*Dimensions reflect usage with RMF16-41 mounting frame.

ACCESSORY DIMENSIONS — inches (mm)

CHA16 UNIT WITH EMDH16M HORIZONTAL ECONOMIZER DAMPER SECTION AND GEDH16-65 GRAVITY EXHAUST DAMPERS

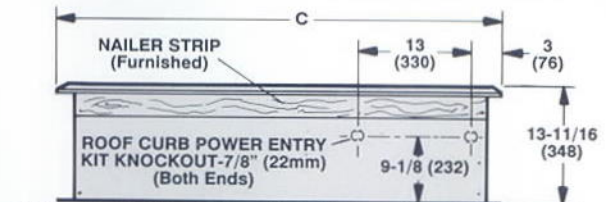
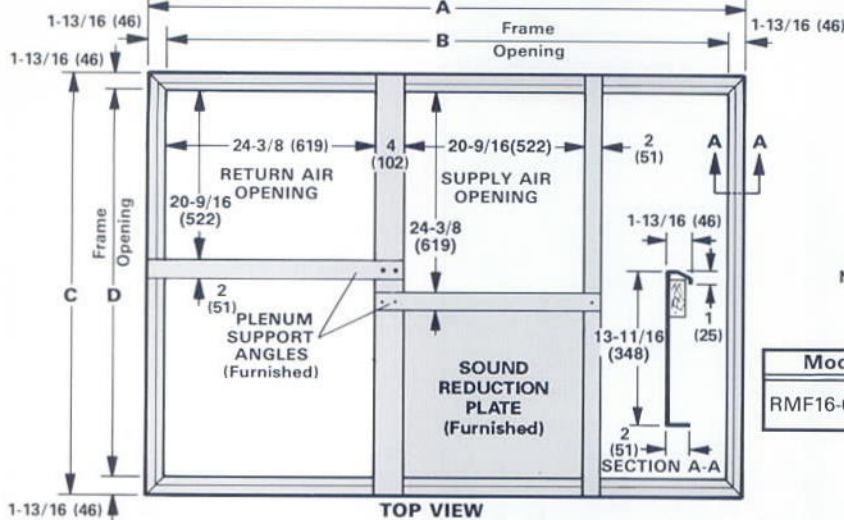


Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHA16-261 CHA16-311 CHA16-411-413	60	1524	84-1/2	2146	22	559	23	584	46	1168	22	559
CHA16-511-513 CHA16-651-653	72-1/2	1842	97-7/8	2486	27	686	29	737	52	1320	23-5/8	600

Model No.	G		H		J		K	
	in.	mm	in.	mm	in.	mm	in.	mm
CHA16-261 CHA16-311 CHA16-411-413	13	330	38-1/2	979	9	229	20	508
CHA16-511-513 CHA16-651-653	22	559	45-7/8	1165	12	305	21-3/4	552

ACCESSORY DIMENSIONS — inches (mm)

RMF16-65 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING FOR CHA16 UNITS

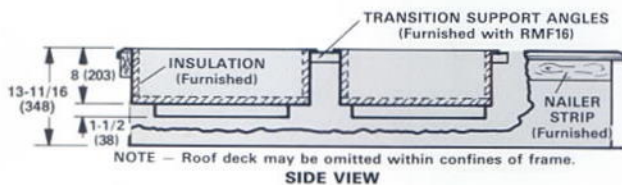


NOTE — Roof deck may be omitted within confines of frame.

END VIEW

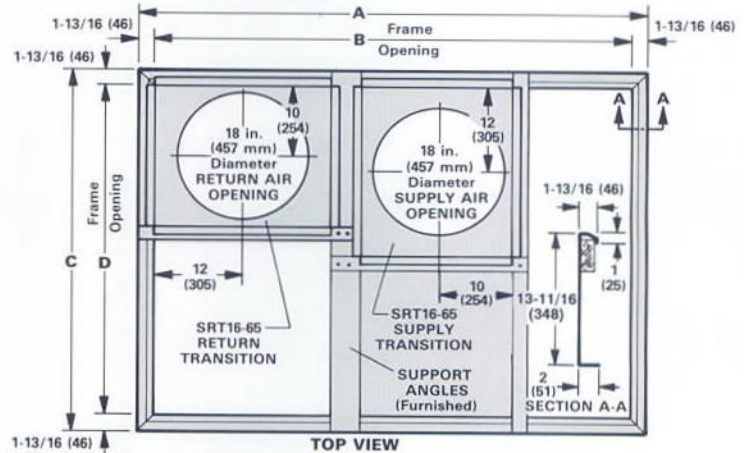
Model No.		A	B	C	D
RMF16-65	in.	69	65-3/8	50-1/2	46-7/8
	mm	1753	1661	1283	1191

RMF16-65 ROOF MOUNTING FRAME FOR CHA16 UNITS WITH SRT16-65 SUPPLY AND RETURN AIR TRANSITIONS FOR FD9-65 & RTD9-65 CEILING DIFFUSER



NOTE — Roof deck may be omitted within confines of frame.

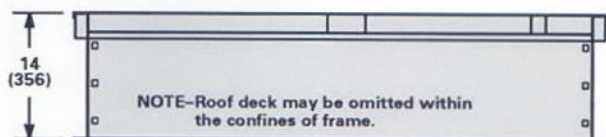
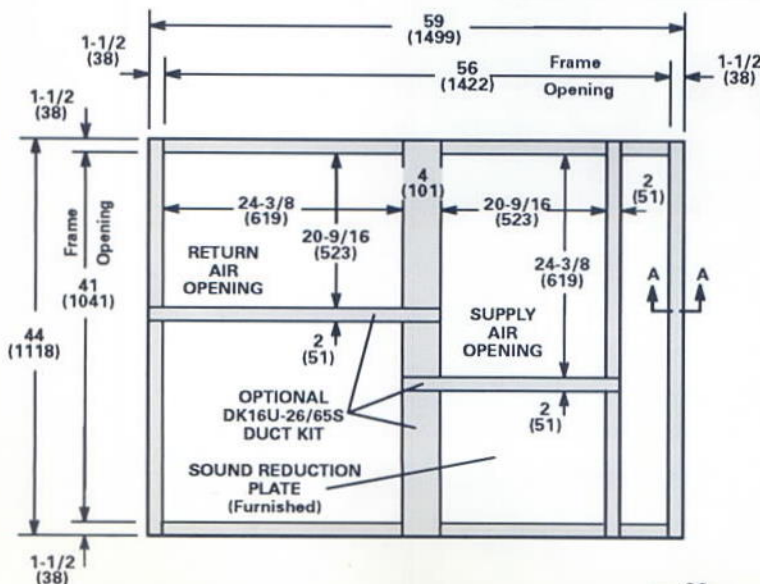
SIDE VIEW



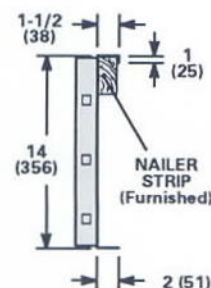
TOP VIEW

Model No.	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
RMF16-65 with SRT16-65	69	1753	65-3/8	1661	50-1/2	1283	46-7/8	1191

RMF16U-26/95S ROOF MOUNTING FRAME WITH OPTIONAL DK16U-26/65S DUCT KIT

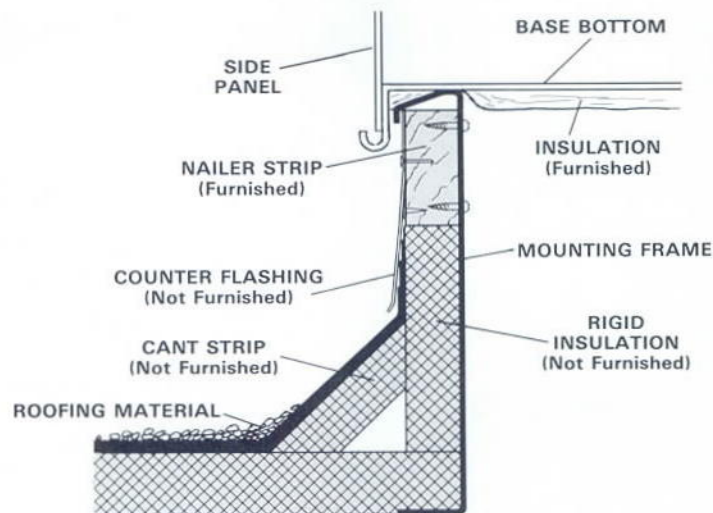


NOTE—Roof deck may be omitted within the confines of frame.



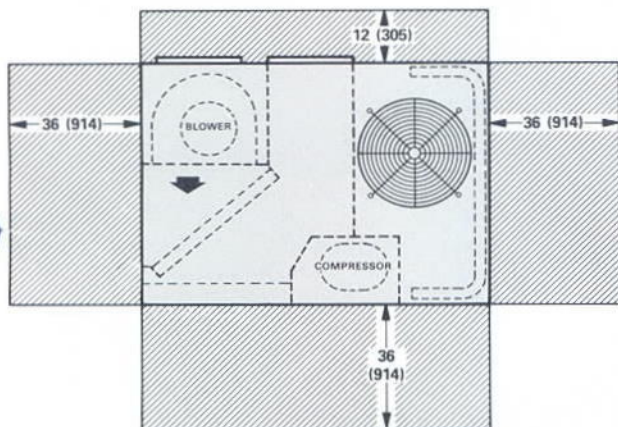
SECTION A-A

**TYPICAL FLASHING FOR RMF16-65
ROOF MOUNTING FRAMES WITH CHA16 SERIES UNITS**



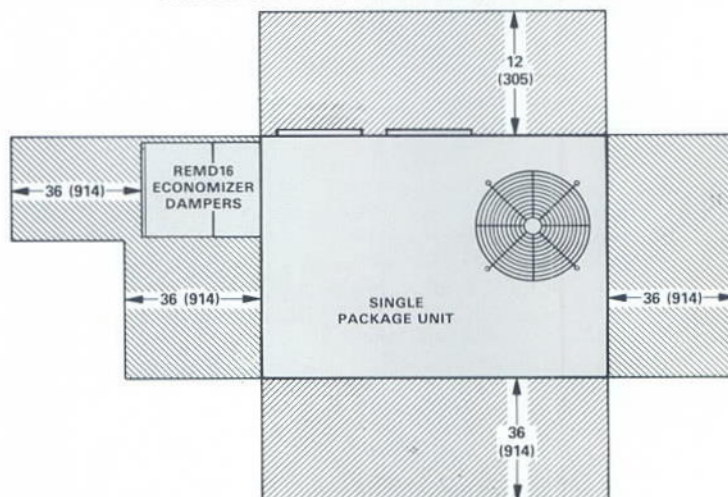
INSTALLATION CLEARANCES - inches (mm)

CHA16 BASIC UNIT



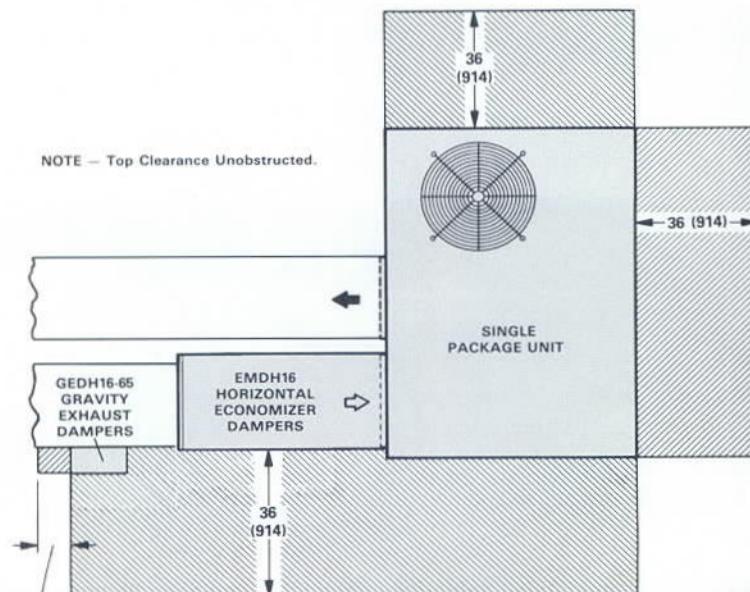
NOTE - Top Clearance Unobstructed.

CHA16 UNIT WITH REMD16M ECONOMIZER



NOTE - Top Clearance Unobstructed.

**CHA16 UNIT WITH EMDH16M ECONOMIZER AND
GEDH16-65 GRAVITY EXHAUST DAMPERS**



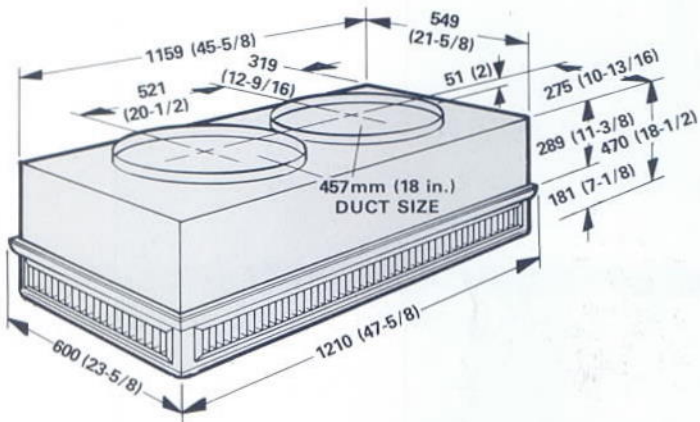
NOTE - Top Clearance Unobstructed.

Allow adequate clearance for duct and GEDH16-65 installation.

ACCESSORY DIMENSIONS — inches (mm)

COMBINATION SUPPLY AND RETURN AIR CEILING DIFFUSERS

RTD9-65 STEP-DOWN DIFFUSER



FD9-65 FLUSH DIFFUSER

