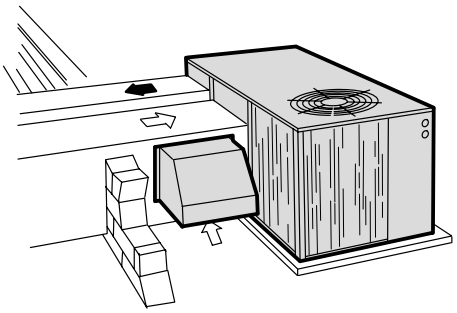
CHA16-090-120
PACKAGED UNITS
COOLING & ELECTRIC HEAT

***88,000 to 119,000 Btuh (25.8 to 34.9 kW) Cooling Capacity**
25,600 to 170,600 Btuh (7.5 to 50.0 kW) Optional Electric Heat

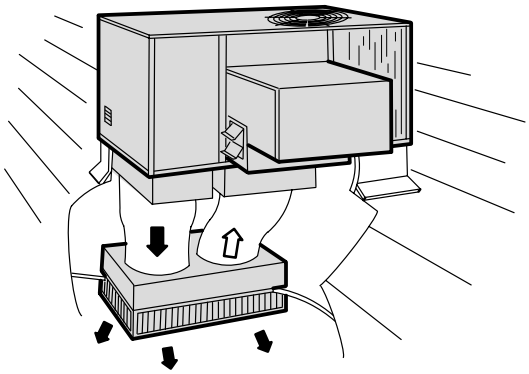
***ARI Standard Ratings**

CHA16
(7.5 & 10 Ton)
(26. & 35.2 kW)

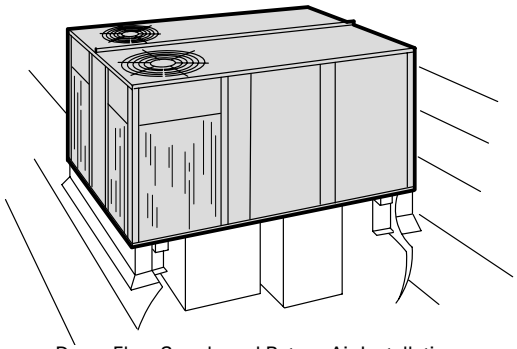
Bulletin No. 210088
August 1997
Supersedes June 1995



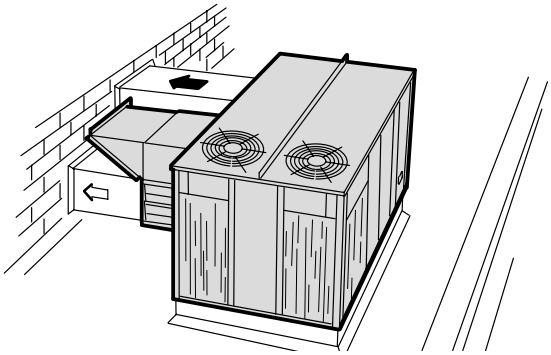
Horizontal (Side) Supply and Return Air Installation with OAD16 Outdoor Air Dampers.

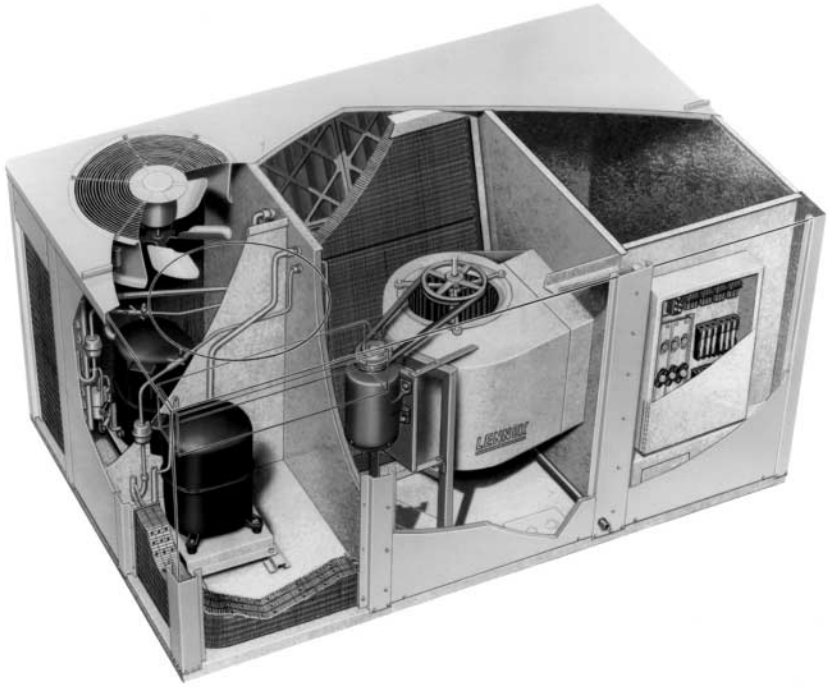


Down-Flow Supply and Return Air Installation With RMF16 Roof Mounting Frame, REMD16M Economizer and RTD11 Ceiling Diffuser.



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





CHA16-120

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FEATURES

Application ◻ Lennox CHA16 single package air conditioning units are designed for bottom (down-flo) or side (horizontal) handling of supply and return air. A separate roof mounting frame mates to the unit base and when flashed into the roof permits weatherproof duct connections and entry into the conditioned area in down-flow applications. The units can also be installed at grade level with horizontal (side) duct connections. A choice of RTD11 step-down or FD11 flush ceiling diffusers are available for combination ceiling supply and return air distribution systems. Optional economizer dampers provide ◻free cooling◻ by using outdoor air in lieu of mechanical refrigeration. Units are available for cooling only or cooling with electric heat. Voltage options provide a choice for power supply requirements. Units are available with a choice of thermostats and realted controls. A factory installed commercial controls platform is furnished standard. Units are shipped factory assembled, piped and wired. Each unit is factory test operated insuring unit dependability.

Approvals ◻ Models have been rated in accordance standards included in ARI Standard 210/240-94. Units have been sound tested in accordance with conditions included in ARI Standard 270-95. Units are U.L. and C.S.A. Listed and components within are bonded for grounding to meet safety standards for servicing required by U.L., NEC, C.S.A. and CEC.

Equipment Warranty ◻ Compressors have a limited warranty for a full 5 years. All other components have a limited warranty for a full one year. Refer to Lennox Equipment Limited Warranty included with equipment.

Cabinet ◻ 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 a 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. Electrical inlets are provided in cabinet base and condenser section cabinet panel for wiring entry. Control box with factory installed controls is conveniently located for service access. A low voltage terminal strip is provided in the control box for ease of field wiring connections. Lifting brackets are furnished for ease of handling and rigging. Evaporator coil condensate drain connection extends outside of cabinet for ease of connection.

Air Filters ◻ Disposable frame type two inch (51 mm) thick commercial grade filters are furnished as standard. Filters are readily accessible for service. See dimension drawings. Filter rack is designed to accept one inch (25 mm) thick cleanable filters.

Refrigeration System ◻ Factory sealed refrigerant system consists of multiple compressors, condenser coil and direct drive fan(s), evaporator coil and belt drive blower, expansion valve, high capacity driers, thermometer wells, high pressure switch and loss of charge switch, with a full operating charge of refrigerant. Factory installed freezestat prevents evaporator coil freeze-up during low ambient operation. Independent refrigerant circuits provide staging control to fit varying cooling loads.

Copper Tube Evaporator and Condenser Enhanced Fin Coils ◻ Extra large surface area and circuiting of 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. 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. The evaporator coil is face split with separate circuits. Each circuit has its separate expansion valve, compressor and refrigerant charge.

Condenser Fan(s) ◻ CHA16-090 is equipped with single fan. CHA16-120 has two. Direct drive fan(s) draw large air volumes uniformly through condenser coils and discharges it vertically. Fan orifice design and low fan tip speed keeps operating sound level at a minimum. Uniform air flow through the coil results in high refrigerant cooling capacity. Fan motor is permanently lubricated and overload protected. Motor is resiliently mounted. Corrosion resistant PVC coated steel wire fan guard(s) are furnished.

Supply Air Blower ◻ Belt drive centrifugal blower delivers large air volume efficiently and with minimum power consumption. Blower wheel is heavy duty, with forward curved blades and double inlet. Wheel is statically and dynamically balanced to eliminate vibration and designed to give maximum air delivery. Bearings are heavy duty, self aligning, permanently sealed and lubricated. Design of motor mounting base permits quick and simple motor changeover, belt tension adjustment or belt changing. Adjustable motor pulley allows for variable speed adjustments. Motor is overload protected. See specifications table for motors and drives available.

Compressors ◻ Rugged and reliable compressors are hermetically sealed, suction cooled and overload protected. CHA16-090 and -120 units have internal pressure relief valve. Compressors are internally protected from excessive current and temperature. Crankcase heaters are furnished on all compressors. All units have two compressors. Compressor monitor (non-adjustable) prevents compressor operation when outdoor temperature is below 40°F (4°C). In addition, the compressors are installed on resilient rubber mounts in the unit, assuring quiet and vibration free operation .

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

ECH16 Additive Electric Heat (Optional) ◻ Available factory or field installed in 10kW through 50kW sizes. Heater design permits use of single point power supply. Helix wound nichrome heating elements are exposed directly in the air stream resulting in instant heat transfer, lower coil temperatures and long service life. Elements are accurately located and insulated from the heavy gauge steel support frame by high quality insulators. Time delays bring the elements on and off the line in sequence and equal increments in response to demand with a time delay between each element. Elements are equipped with individual limit controls providing positive protection in case of overheating. Heaters may be two stage controlled with each stage being energized only when required. Fuse block for electric heaters must be ordered extra, see Optional Accessories tables. Factory installed heaters will have the fuse block factory installed. Fuse block must be field installed on field installed heaters. Wiring harness and mounting screws are provided with fuse block.

Timed-Off Control (Optional) ◻ Timed-off control is available for field installation. Prevents compressor short-cycling. Automatic reset control provides a time delay between compressor shutoff and start-up. Kit **(40G20)** includes two LB-50709BA controls.

Bottom Power Entry Kit (Optional) ◻ Factory or field installed kit LB-55757CA **(34G70)** is provided for bottom power entry into the unit within the confines of the roof mounting frame. Kit contains wiring junction box with cover 6◻ x 8◻ x 10◻ (152 mm x 203 mm x 254 mm), 78 inch (2.0 m) length of armored cable and necessary installing hardware. Galvanized steel junction box with prepunched mounting holes and electrical knockouts installs on electrical inlet openings located in the unit base. See basic unit dimension drawing.

Low Ambient Control Kit (Optional) ◻ System will operate satisfactorily down to 45°F (7°C) outdoor air temperature without additional controls. If air conditioning operation is required at low ambients a field installed low ambient kit can be added enabling the unit to operate down to 30°F (–1°C). See Optional Accessories tables.

RMF16 Roof Mounting Frame (Optional) ◻ Sturdy mounting frame mates to the single package unit and provides an automatic weather sealed rooftop installation. Shipped knocked down for ease of shipping and handling it is easily field assembled. A nailer strip is secured to the frame sides to facilitate flashing. Approved by National Roofing Contractors Association.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

REMD16M Economizer Dampers (Optional) ◻ Economizer consists of: mechanically linked recirculated air dampers and outdoor air dampers, damper motor and controls. Economizers are shipped factory wired and only require plug-in connection. Formed low leakage (less than 3%) dampers rotate smoothly in nylon bearings. Outdoor air dampers are equipped with stainless steel seals for minimum air leakage. The positioning of the dampers is accomplished with a 24 volt fully modulating spring return damper motor with adjustable minimum damper position switch. Damper motor is controlled by the room thermostat, mixed air controller and solid-state adjustable outdoor air enthalpy control. The enthalpy control allows for 0 to 100% outdoor air (first stage of cooling) to be used for ◻free cooling◻ when outdoor humidity and temperature are acceptable. Additionally, an integrated economizer cycle can be accomplished by allowing the outside air dampers to remain open, continuing to admit outside air, and cycling the compressors to provide dehumidification and additional cooling, as needed. The integrated economizer cycle uses only the amount of mechanical cooling necessary. Two cleanable polyurethane media frame filters are furnished for extra air filtering and bird screen protection.

REMD16M-95 & 135 are available for down-flow applications only. Economizer cabinet is constructed of heavy gauge galvanized steel with a powder enamel paint finish electrostatically bonded to the metal and completely insulated with thick fiberglass insulation. Economizer cabinet field installs on the unit cabinet. Provisions have been made in the economizer cabinet for easy field installation of optional GED16 gravity exhaust dampers. See dimension drawings.

EMDH16M Horizontal Economizer Dampers (Optional) ◻ The EMDH16M horizontal economizer cabinet section contains recirculated air dampers, outdoor air dampers, damper motor and controls. Economizer section field installs on the unit cabinet. Outdoor air hood is shipped separately and is field installed. Economizer is factory assembled and wired and only requires field plug-in connection. Cabinet is constructed of heavy gauge galvanized steel with a powdered enamel finish electrostatically bonded to the metal. Completely insulated with thick fiberglass insulation. Recirculated damper section of cabinet has flanged air openings for ease of duct connection. Formed low leakage (less than 3%) dampers rotate smoothly in nylon bearings. Outdoor air damper blades are equipped with stainless steel seals for minimum air leakage. The positioning of the dampers is accomplished with a 24 volt fully modulating spring return damper motor with adjustable minimum positioner. Damper motor is controlled by the room thermostat, mixed air controller and solid-state adjustable outdoor air enthalpy control. The enthalpy control allows for 0 to 100% outdoor air (first stage of cooling) to be used for ◻free cooling◻ when outdoor humidity and temperature are acceptable. Additionally, an integrated economizer cycle can be accomplished by allowing the outside air dampers to remain open, continuing to admit outside air, and cycling the compressors to provide dehumidification and additional cooling as needed. The integrated economizer cycle uses only the amount of mechanical cooling necessary. Two cleanable polyurethane media frame filters are furnished for extra air filtering and bird screen protection. See dimension drawing. Provisions have been made in the economizer cabinet for easy field installation of optional GED16 gravity exhaust dampers. Requires Optional Horizontal Supply and Return Air Kit for duct connection to unit. See Optional Accessories tables.

GED16 Gravity Exhaust Dampers (Optional) ◻ For use with REMD16M and EMD16M economizer damper sections and must be ordered extra. Openings are provided in the economizer cabinet for easy field installation. See dimension drawing. Two exhaust dampers are furnished for installation on the economizer section. Rainhoods are also furnished for field installation on the 95/135/160 model. Neoprene coated fiberglass dampers prevent blow-back and outdoor air infiltration during off cycle. Bird screen is provided.

Differential Enthalpy Control (Optional) ◻ A solid-state return air enthalpy sensor is available to be used 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 return air section.

OAD16 Outdoor Air Damper Section (Optional) ◻ Damper section with factory installed and linked dampers field installs external to the unit cabinet. Interchangeable unit cabinet panel with opening for installation is furnished with damper for down-flow air applications. Two-piece cabinet panel allows access to controls. See unit dimension drawing for location. Damper section field installs in return air duct for horizontal supply and return air applications. A cleanable polyurethane media frame type air filter is furnished and factory installed. Dampers allow a fixed amount of outdoor air into the system and can be adjusted for air quantities up to 25%. Damper section is available for manual or automatic operation. Manually operated dampers may be adjusted and locked in place for the amount of air desired. Automatic operation is available with the addition of a spring return 3 position damper actuator. Actuator only requires plug-in connection for operation.

Horizontal Supply & Return Air Kit (Optional) ◻ Provides horizontal supply and return air duct connection to the side of the unit. Kit contains duct connection flanges for field installation on the supply and return air openings, screws for installing, two filler panels for supply and return air openings in the unit base not being used and a filter access panel to replace the existing cabinet panel above the return air opening. See Optional Accessories tables.

RTD11 Combination Ceiling Supply and Return Diffuser Assembly (Optional) ◻ Step-down mount diffuser extends slightly below ceiling level 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 flanges for ease of duct connection, hanging rings for suspending and 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. See Optional Accessories tables.

FD11 Combination Ceiling Supply and Return Diffuser Assembly (Optional) ◻ 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 flanges for ease of duct connections, support hanger eyelets at the top corners for secure installation and 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. See Optional Accessories tables.

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 flanges for ease of duct connection. Duct from the transitions to the diffuser is not furnished and must be provided by installer. Transitions are completely factory assembled and easily field installed in the roof mounting frame with minimum costs and labor requirements. See Optional Accessories tables.

- ◻ SRT16-95 used with the RMF16-95 with CHA16-090.
- ◻ SRT16-135 used with the RMF16-135/160 with CHA16-120.

OPTIONAL TEMPERATURE CONTROL SYSTEMS

Optional Electro-Mechanical Thermostat and Control System □ 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 emergency heat subbase and relay kit **(49G09)** with manual system switch (Off-Emergency Heat-Heat-Auto-Cool), fan switch (Auto-On) and red emergency heat indicator LED. Also available is a 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. SSP11 Relay Kit **(41G39)** is required for switching functions of the Switching Status Panel. Kit must be ordered extra and field installed. 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. Two time clocks are available for the system. Automatic 7 day time clock programs a weekly schedule. Any day or days can be omitted. Each day of the week is clearly separated from every other day. 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. Cycle Control **(42H52)** is required with CHP16-090 and -120 units. Control with plug-in connections provides a timed-on and timed-off function to prevent compressor short-cycling. See Flowchart on page 6.

W973 Control System (Optional) □ 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 switching subbase **(58C94)** with system selector switch (Cool-Auto-Heat-Emergency Heat) and fan switch (On-Auto-Off). 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. Each day of the week is clearly separated from every other day. 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 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 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 warm up. See Flowchart on page 6.

T8621 Electronic Thermostat and Control System (Optional) □ T8621 auto change, 2heat/2cool **(75E27)** programmable thermostat has a switching subbase and full independent 7 day programming. Thermostat has four different time and temperature settings per day. One LED is used to indicate System □ON□. T8621 thermostat has instant override capabilities for skipping current program, running previous program, temporarily raising or lowering for current program or overriding program indefinitely. Three □AAA□ alkaline batteries protect programs in case of power failure. SP11 Remote Status Panel **(12F83)** is available for checking unit operation within the conditioned area. See Flowchart on page 6.

W7400 Control System (Optional) □ 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 **(36G62) or (36G63)** with integral sensor that installs in the conditioned space or a remote thermostat **(36G64 or (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 keyboard, automatic switching from heat to cool, no anticipator, zero droop, indicator lights, 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 Flowchart on page 7.

T7300 Thermostat and Control System (Optional) □ 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)** features selectable output staging up to two heat and two cool, indicator LED□s, manual system switch (Heat-Off-Auto-Cool) and fan switch (Auto-On). 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 Flowchart on page 7.

SP11 Remote Status Panel (Optional) □ The operation of the unit can be checked at a glance on the Remote Status Panel **(12F83)** 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 and Compressor 2 lights are green when operating and will turn red if there is an operational malfunction. The No Heat and Filter lights will show red and indicate a requirement for service. 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. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation. Current Sensing Relay **(29F79)** is required with electric heat for operation of the No Heat light.

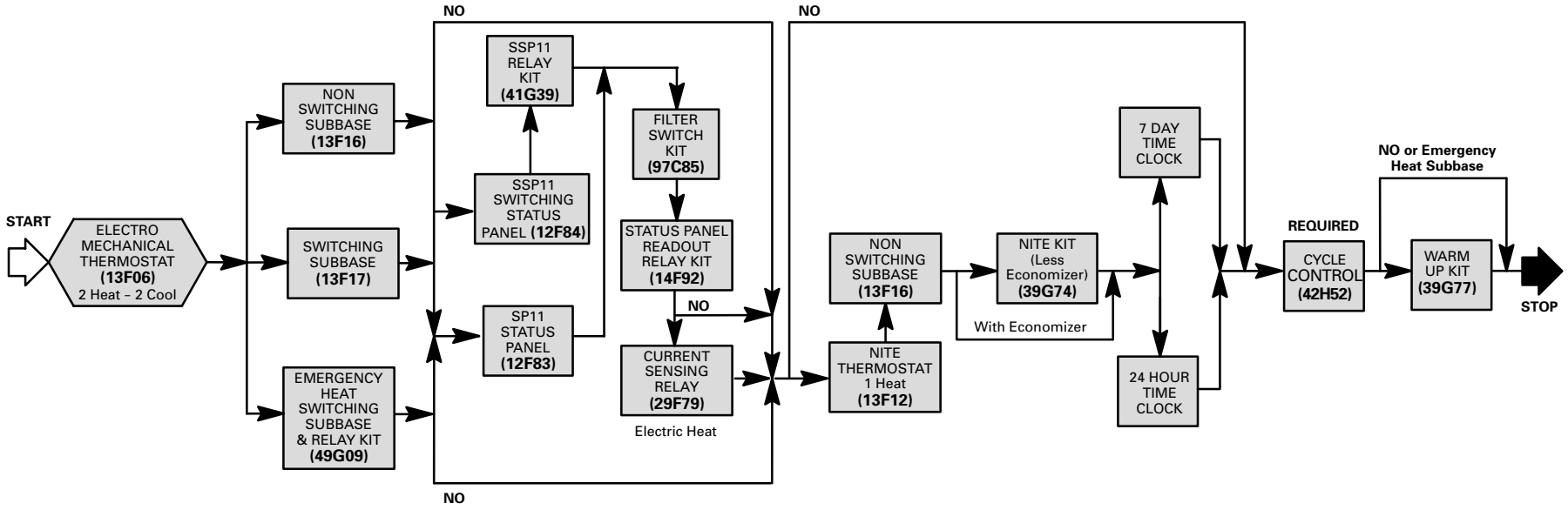
SSP11 Remote Switching Status Panel (Optional) □ The operation of the unit can be controlled and observed on the Switching Status panel **(12F84)** conveniently located within the conditioned area. Signal lights on the panel indicate □Cool Mode□, □Heat Mode□, □Compressor 1□, □Compressor 2□, □No Heat□ 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 and Compressor 2 lights are green when operating and will turn red if there is an operational malfunction. 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. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation. Current Sensing Relay **(29F79)** is required with electric heat for operation of the No Heat light.

OPTIONAL DDC TEMPERATURE CONTROL SYSTEMS (Field Installed)

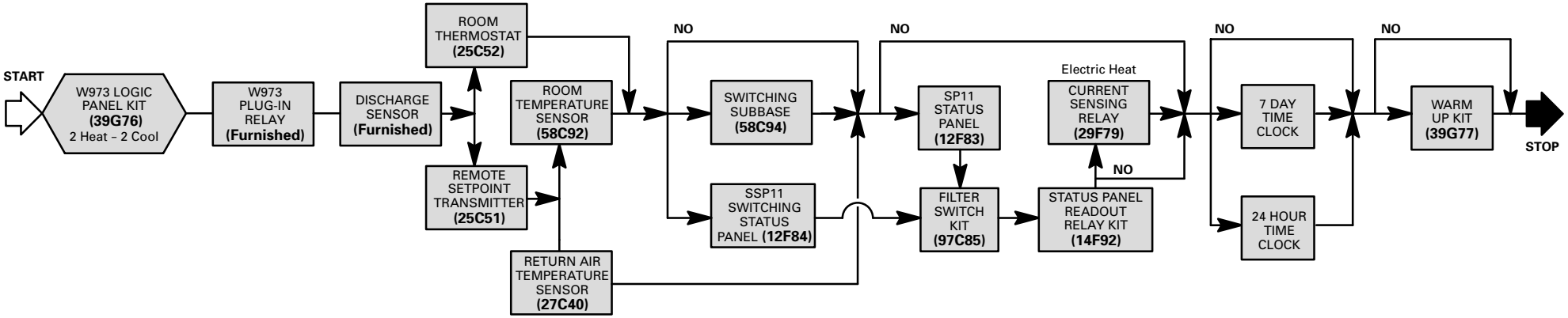
System and Component Description	Field Installed Catalog No.
CPC 810–3060 KIT	☐
Control Module/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness ☐ Network communications (RS–485, shielded pair twisted wire), 8 analog/digital inputs, 8 form–C relay outputs, 2 analog outputs, 24 VAC, output connections (2 stage heat/2 stage cool, 2 auxiliary outputs (user defined), economizer, fan), input connections (space temperature, discharge and return air temperature, 2 compressor monitoring, 2 aux inputs (user defined), local override (1 to 240 minutes), Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Return Air Sensor provides input to module to determine heating or cooling operation and number of stages required, Discharge Air Sensor monitors leaving air temperature during unit operation	**61J81**
Sensor ☐ Room temperature	**48J43**
Dirty Filter Switch ☐ Senses static pressure increase indicating a dirty filter condition	**33K00**
JOHNSON UNT KIT	☐
Control Module/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness ☐Stand alone control of all heating, cooling and economizer functions, various operation modes (including: occupied, unoccupied, warm-up, standby), network communications, 6 analog inputs, 4 binary inputs, momentary override, advanced unit diagnostics, indoor air quality control, outdoor air temperature and humidity monitoring, alarm monitoring of: sensors, airflow, economizer, dirty filter, heating /cooling operation, cooling limit. Blower Proving Switch monitors blower operation and locks out unit in case of blower failure. Control module may be used in multi–zone applications (i.e. L–Zone).	**79K86**
TE-6400 Zone Sensor ☐ Room temperature, terminal block style wiring, quick–mount design, latching door mechanism, warmer/cooler setpoint adjustment, optional override button, nickel sensors, options for choosing mounting, plug–in phone style jack connection for handheld commissioning tool	**42N44**
Zone Commissioning Tool ☐Handheld interface tool, monitor and adjust 36 analog and binary points, password protected, carrying case	**60K37**
Dirty Filter Switch ☐ Senses static pressure increase indicating a dirty filter condition	**33K00**
JOHNSON FACILITATOR KIT	☐
Control Module/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness ☐Stand alone control of all heating, cooling and economizer functions, various operation modes (including: occupied, unoccupied, warm-up, standby), network communications, 6 analog inputs, 4 binary inputs, momentary override, advanced unit diagnostics, indoor air quality control, outdoor air temperature and humidity monitoring, alarm monitoring of: sensors, airflow, economizer, dirty filter, heating /cooling operation, cooling limit. Blower Proving Switch monitors blower operation and locks out unit in case of blower failure. Control module for use in single zone applications.	**86K63**
TE-6400 Zone Sensor ☐ Room temperature, terminal block style wiring, quick–mount design, latching door mechanism, warmer/cooler setpoint adjustment, optional override button, nickel sensors, options for choosing mounting, plug–in phone style jack connection for handheld commissioning tool	**42N44**
Dirty Filter Switch ☐ Senses static pressure increase indicating a dirty filter condition	**33K00**
NOVAR ETM–2050 KIT	☐
Electronic Thermostat Module (ETM)/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness ☐ Module monitors unit operation from different sensors installed in unit, has outputs for 2 stage heat/2 stage cool, automatic or continuous blower operation, economizer damper operation and night setback, features: day/occupied mode with low enthalpy (outdoor air damper open), high enthalpy (outdoor air damper closed) or night/unoccupied mode (outdoor air damper closed), network communication (RS–485, shielded pair twisted wire), local override (1 to 255 minutes), watchdog function, failsafe operation, ETM allows units to be ▯daisy chained▯ together (up to 31 units) to be operated from one central location with an ▯executive▯ type control processor (onsite or offsite), built-in time delays, built-in unit operating defaults, diagnostic LED▯s indicate various operating functions, surge suppression protects ETM against lightning or voltage spikes, Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Return Air Sensor provides input to ETM module to determine heating or cooling operation and number of stages required, Discharge Air Sensor monitors leaving air temperature during unit operation	**10J38**
Dirty Filter Switch ☐ Senses static pressure increase indicating a dirty filter condition	**33K00**
Room Temperature Sensor ☐ Provides input to ETM module to determine heating or cooling operation and number of stages required (ordered separately)	**97H53**
Night Setback Override Switch ☐ Allows momentary override of night setback during unoccupied mode	Field Furnished
NOVAR CUSTOM CONTROLLER KIT	☐
Control Module/Blower Proving Switch/Discharge Air Sensor/Room Air Sensor/Wiring Harness ☐ User definable comfort setpoint, on/off and time of day control, cycle II ventilation control	**91K90**
Dirty Filter Switch ☐ Senses static pressure increase indicating a dirty filter condition	**33K00**

TEMPERATURE CONTROL SELECTION FLOWCHARTS

OPTIONAL ELECTRO-MECHANICAL THERMOSTAT



OPTIONAL W973 CONTROL SYSTEM



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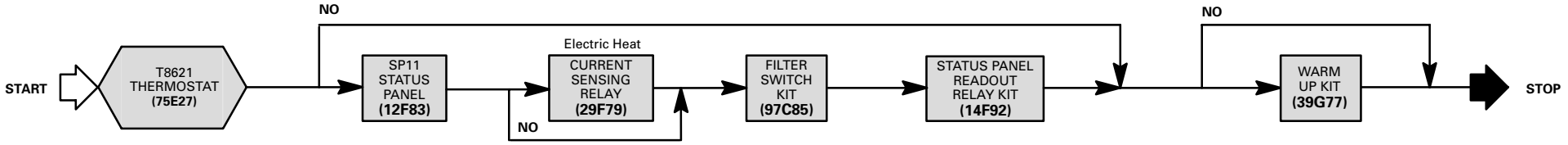

TEMPERATURE CONTROL SELECTION FLOWCHARTS

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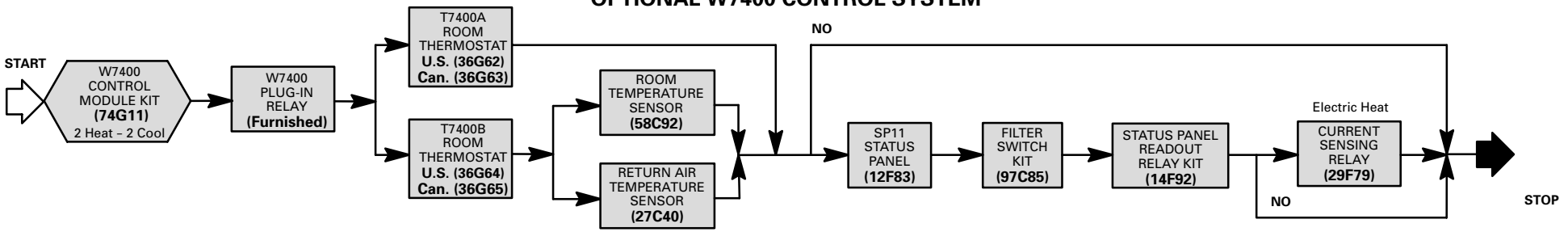

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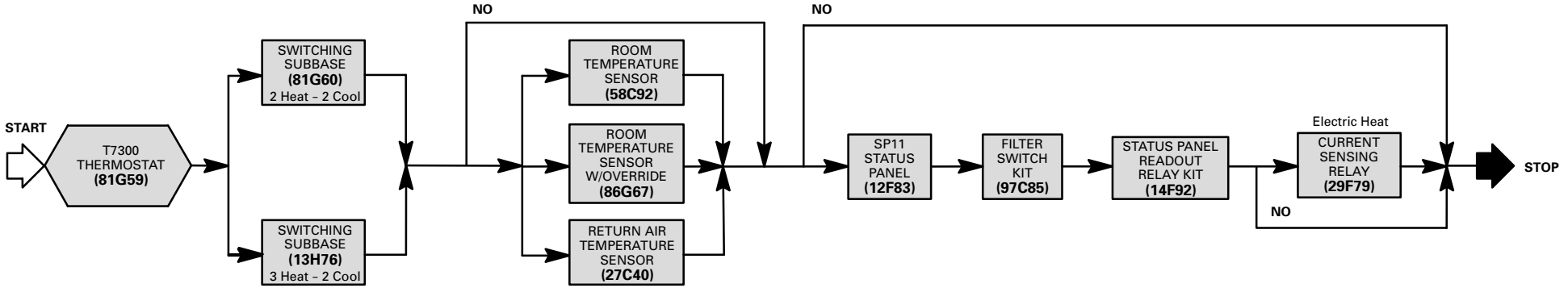
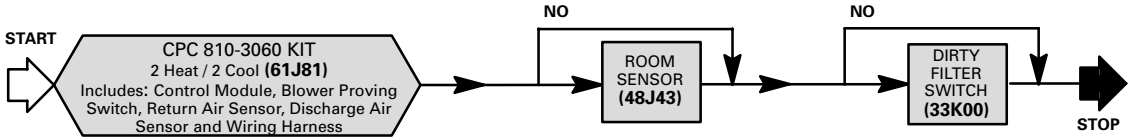
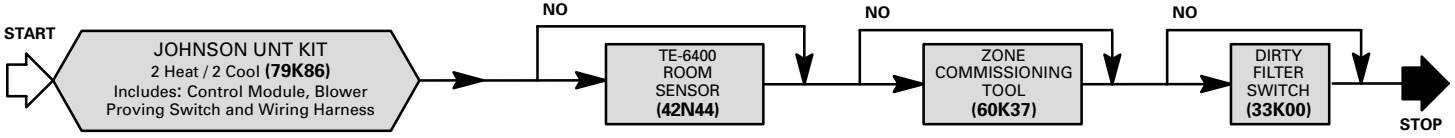


DDC TEMPERATURE CONTROL SELECTION FLOWCHARTS

CPC 810-3060



JOHNSON UNT



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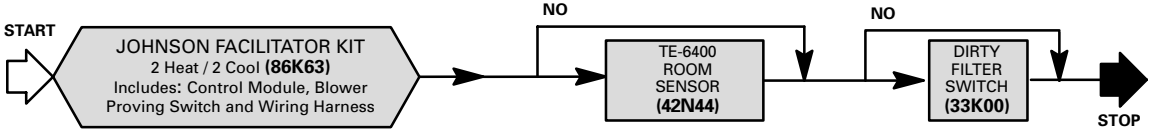
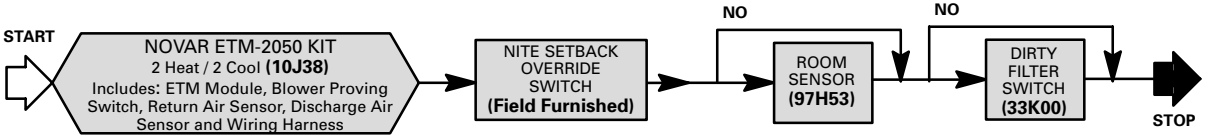


NOVAR ETM-2050



SPECIFICATIONS

Model No.			CHA16-090	CHA16-120
★ARI Standard 210/240 Ratings	Total cooling capacity ◻ Btuh (kW)		88,000 (25.8)	119,000 (34.9)
	Total unit watts		9,780	13,220
	EER (Btuh/Watt)		9.0	
	Integrated Part Load Value (Btuh/Watt)		9.1	8.6
*Sound Rating (db)			86	88
Refrigerant (22) Charge	Stage 1		6 lbs. 4 oz. (2.83 kg)	7 lbs. 4 oz. (3.29 kg)
	Stage 2		5 lbs. 14 oz. (2.66 kg)	7 lbs. 4 oz. (3.29 kg)
Evaporator Blower and Drive Selection	Blower wheel nom. diameter x width – in. (mm)		12 x 12 (305 x 305)	15 x 15 (381 x 381)
	[1]Factory Installed Drives	Motor horsepower (W) nom–max	2 (1492) – 2.30 (1716)	3 (2238) – 3.45 (1213)
		Voltage & phase	208/230v, 460v or 575v-3ph	
		RPM range	740 ◻ 1010	730 ◻ 950
Evaporator Coil	Net face area ◻ sq. ft. (m2)		7.75 (0.72)	9.46 (0.88)
	Tube diameter ◻ in. (mm) & No. of rows		3/8 (9.5) ◻ 3	3/8 (9.5) ◻ 4
	Fins per inch (m)		14 (551)	12 (472)
Condenser Coil	Net face area ◻ sq. ft. (m2)		15.67 (1.46)	20.0 (1.86)
	Tube diameter ◻ in. (mm) & No. of rows		3/8 (9.5) ◻ 2	
	Fins per inch (m)		20 (787)	
Condenser Fan	Diameter ◻ in. (mm) & No. of blades		24 (610) ◻ 4	(2) 20 (508) ◻ 5
	Air volume ◻ cfm (L/s)		5300 (2500)	6400 (3020) total
	Motor horsepower (W)		3/4 (560)	(2) 1/3 (224)
	Motor watts		660	875 (total)
Condensate drain size mpt ◻ in. (mm)			1 (25)	
No. & size of filters ◻ in. (mm)			(4) 16 x 20 x 2 (406 x 508 x 51)	(4) 16 x 25 x 2 (406 x 635 x 51)
Net weight of basic unit ◻ lbs. (kg) (1 Package)			765 (347)	1055 (479)
Electrical characteristics			208/230v, 460v or 575v-3ph	

* Sound Rating Number in accordance with conditions included in 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. Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.
[1] Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. In Canada, nominal motor output is also maximum usable motor output.

OPTIONAL ACCESSORIES

Model No.			CHA16-090	CHA16-120
Electric Heat	Model No.		ECH16-82/95	ECH16-135/160
	kW input range		10-15-20-30-40	15-20-30-40-50
	[1]Fuse Block	208/230 volt	**61H83**	**72G10**
		460 volt	**61H84**	**72G11**
		575 volt	**61H85**	**72G12**
Roof Mounting Frame ◻ (Net Weight)			RMF16-95 (107 lbs.) (49 kg)	RMF16-135/160 (119 lbs.) (54 kg)
Economizer Dampers	Model No. – Net Weight		REMD16M-95 (118 lbs.) (54 kg)	REMD16M-135 (125 lbs.) (57 kg)
	No. & size of filters ◻ in. (mm)		(2) 16 x 25 x 1 (406 x 635 x 25)	(2) 16 x 25 x 1 (406 x 635 x 25)
Horizontal Economizer Dampers	Model No. – Net Weight		EMDH16M-95 (120 lbs.) (54 kg)	EMDH16M-135 (137 lbs.) (62 kg)
	No. & size of filters ◻ in. (mm)		(2) 16 x 25 x 1 (406 x 635 x 25)	(2) 16 x 25 x 1 (406 x 635 x 25)
Exhaust Dampers ◻ (Net Weight) (Net Face Area)			GED16-95/135/160 (5 lbs.) (2 kg) (0.43 sq. ft.) (0.04 m^2)	
Differential Enthalpy Control			**54G44**	
Horizontal Supply and Return Air Kit ◻ (Net Weight)			**34G71** (30 lbs.) (14 kg)	LB-55756BB (35 lbs.) (16 kg)
Bottom Power Entry Kit ◻ (Net Weight)			(LB-55757CA) **34G70** (12 lbs.) (5 kg)	
Ceiling Supply and Return Air Diffusers (Net Weight)		Step-Down	RTD11-95 (88 lbs.) (40 kg)	RTD11-135 (125 lbs.) (57kg)
		Flush	FD11-95 (75 lbs.) (34 kg)	FD11-135 (95 lbs.) (43 kg)
		Transition	SRT16-95 (29 lbs.) (13 kg)	SRT16-135 (38 lbs.) (17 kg)
Outdoor Air Dampers ◻ (Net Weight) No. & size of filters (in.)			OAD16-95 (41 lbs.) (19 kg) (1) 16 x 20 x 1 (406 x 508 x 25)	OAD16-135 (43 lbs.) (20 kg) (1) 16 x 20 x 1 (406 x 508 x 25)
Automatic OAD16 Damper Kit ◻ (Net Weight)			**35G21** (7 lbs.) (3 kg)	
Low Ambient Control Kit			**15J80**	LB-57113BH **(16J86)**
Timed-Off Control (2) LB-50709BA			**40G20**	**40G20**

[1]Must be ordered extra. Factory installed heaters will have fuse block installed. Fuse block must be field installed in field installed heaters.

ELECTRICAL DATA

Model No.		CHA16-090			CHA16-120		
Line voltage data ◻ 60 hz ◻ 3 phase		208/230v	460v	575v	208/230v	460v	575v
Compressors (2)	Rated load amps ◻ each (total)	14.8/14.1 (28.9)	7.7/7.1 (14.8)	6.4/5.8 (12.2)	17.3 (34.6)	9.6 (19.2)	7.0 (14.0)
	Locked rotor amps ◻ each (total)	130 (260.0)	64 (128.0)	52 (104.0)	150 (300.0)	73 (146.0)	50 (100.0)
Condenser Fan Motor(s)	Full load amps (total)	3.7	1.9	1.6	2.1 (4.2)	1.2 (2.4)	1.0 (2.0)
	Locked rotor amps (total)	7.3	3.7	3.4	5.1 (10.2)	2.7 (5.4)	2.3 (4.6)
Evaporator Blower Motor	Motor Output – hp (W)	2 (1492)			3 (2238)		
	Full load amps	7.5	3.4	2.7	10.6	4.8	3.9
	Locked rotor amps	41.0	20.4	16.2	58.0	26.8	23.4
†Recommended maximum fuse size (amps)		50	25	20	60	35	30
▶Minimum Circuit Ampacity		44.0	23.0	19.0	54.0	29.0	22.0
Unit power factor		.88	.88	.88	.88	.88	.88

†Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.
▶Where current does not exceed 100 amps, HACR type circuit breaker may be used in place of fuse (U.S only).
NOTE ◻ Extremes of operating range are plus and minus 10 % of line voltage.

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

CHA16-090 MODELS

Electric Heat Model No. & Net Weight	No. of Steps	Volts Input	kW Input	Btuh Output	†Total Unit & Electric Heat Minimum Circuit Ampacity
ECH16-82/95-10 208/230v **(61H68)** 460v **(61H73)** 575v **(61H78)** 38 lbs. (17 kg)	1	208	7.5	25,600	44.0
		220	8.4	28,700	
		230	9.2	31,400	
		240	10.0	34,100	
	1	440	8.4	28,700	23.0
		460	9.2	31,400	
		480	10.0	34,100	
	1	550	8.4	28,700	19.0
		575	9.2	31,400	
		600	10.0	34,100	
ECH16-82/95-15 208/230v **(61H69)** 460v **(61H74)** 575v **(61H79)** 38 lbs. (17 kg)	1	208	11.3	38,600	49.0
		220	12.6	43,000	
		230	13.5	46,100	54.0
		240	15.0	51,200	
	1	440	12.6	43,000	
		460	13.8	46,100	27.0
		480	15.0	51,200	
	1	550	12.6	43,000	
		575	13.8	46,100	22.0
		600	15.0	51,200	
ECH16-82/95-20 208/230v **(61H70)** 460v **(61H75)** 575v **(61H80)** 42 lbs. (19 kg)	[1]2	208	15.0	51,200	62.0
		220	16.8	57,300	
		230	18.4	62,800	69.0
		240	20.0	68,300	
	1	440	16.8	57,300	
		460	18.4	62,800	35.0
		480	20.0	68,300	
	1	550	16.8	57,300	
		575	18.4	62,800	28.0
		600	20.0	68,300	
ECH16-82/95-30 208/230v **(61H71)** 460v **(61H76)** 575v **(61H81)** 42 lbs. (19 kg)	[1]2	208	22.5	76,800	88.0
		220	25.2	86,000	
		230	27.5	93,900	99.0
		240	30.0	102,400	
	1	440	25.2	86,000	
		460	27.6	93,900	50.0
		480	30.0	102,400	
	1	550	25.2	86,000	
		575	27.6	93,900	40.0
		600	30.0	102,400	
ECH16-82/95-40 208/230v **(61H72)** 460v **(61H77)** 575v **(61H82)** 53 lbs. (24 kg)	[1]3	208	30.0	102,400	114.0
		220	33.6	114,700	
		230	36.8	125,600	129.0
		240	40.0	136,500	
	[1]2	440	33.6	114,700	
		460	36.8	125,600	65.0
		480	40.0	136,500	
	[1]2	550	33.6	114,700	
		575	36.8	125,600	52.0
		600	40.0	136,500	

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

CHA16-120 MODELS

Electric Heat Model No. & Net Weight	No. of Steps	Volts Input	kW Input	Btuh Output	†Total Unit & Electric Heat Minimum Circuit Ampacity
ECH16-135/160-15 208/230v **(72G21)** 460v **(72G26)** 575v **(72G31)** 38 lbs. (17 kg)	1	208	11.3	38,600	54.0
		220	12.6	43,000	
		230	13.5	46,100	58.0
		240	15.0	51,200	
	1	440	12.6	43,000	
		460	13.8	46,100	29.0
		480	15.0	51,200	
	1	550	12.6	43,000	
		575	13.8	46,100	25.0
		600	15.0	51,200	
ECH16-135/160-20 208/230v **(72G22)** 460v **(72G27)** 575v **(72G32)** 42 lbs. (19 kg)	[1]2	208	15.0	51,200	66.0
		220	16.8	57,300	
		230	18.4	62,800	73.0
		240	20.0	68,300	
	1	440	16.8	57,300	
		460	18.4	62,800	37.0
		480	20.0	68,300	
	1	550	16.8	57,300	
		575	18.4	62,800	29.0
		600	20.0	68,300	
ECH16-135/160-30 208/230v **(72G23)** 460v **(72G28)** 575v **(72G33)** 42 lbs. (19 kg)	[1]2	208	22.5	76,800	92.0
		220	25.2	86,000	
		230	27.5	93,900	103.0
		240	30.0	102,400	
	1	440	25.2	86,000	
		460	27.6	93,900	52.0
		480	30.0	102,400	
	1	550	25.2	86,000	
		575	27.6	93,900	41.0
		600	30.0	102,400	
ECH16-135/160-40 208/230v **(72G24)** 460v **(72G29)** 575v **(72G34)** 53 lbs. (24 kg)	[1]3	208	30.0	102,400	118.0
		220	33.6	114,700	
		230	36.8	125,600	133.0
		240	40.0	136,500	
	[1]2	440	33.6	114,700	
		460	36.8	125,600	67.0
		480	40.0	136,500	
	[1]2	550	33.6	114,700	
		575	36.8	125,600	53.0
		600	40.0	136,500	
ECH16-135/160-50 208/230v **(72G25)** 460v **(72G30)** 575v **(72G35)** 58 lbs. (26 kg)	[1]4	208	37.5	128,000	144.0
		220	42.0	143,300	
		230	46.0	157,000	163.0
		240	50.0	170,600	
	[1]2	440	43.8	149,500	
		460	46.0	157,000	82.0
		480	50.0	170,600	
	[1]2	550	43.8	149,500	
		575	46.0	157,000	65.0
		600	50.0	170,600	

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

W973 CONTROL SYSTEM

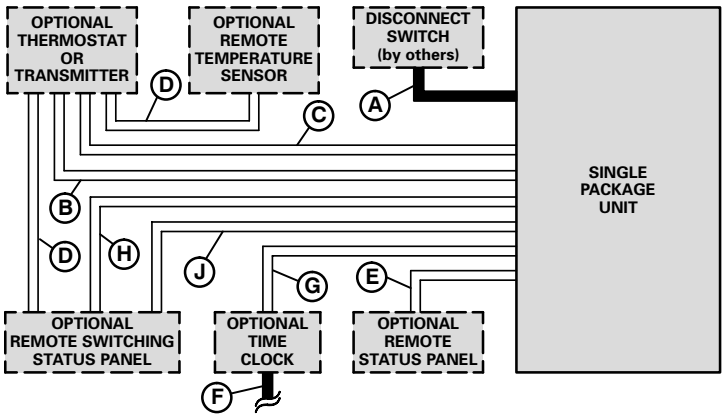
A ◻ Three wire power (See Electrical Data Table)
B ◻ Seven wire low voltage ◻ DC only
◻ Five wire low voltage ◻ DC only ◻ with SSP11 Switching Status Panel
◻ Eight wire low voltage ◻ DC only ◻ with switching subbase
C ◻ Two wire low voltage ◻ AC only ◻ with switching subbase
D ◻ Two wire low voltage ◻ DC only
E ◻ Eleven wire low voltage ◻ AC only
F ◻ Two wire power
G ◻ Two wire low voltage ◻ AC only
H ◻ Fifteen wire low voltage ◻ AC only
J ◻ Two wire low voltage ◻ DC only

AC ◻ Alternating current
DC ◻ Direct current

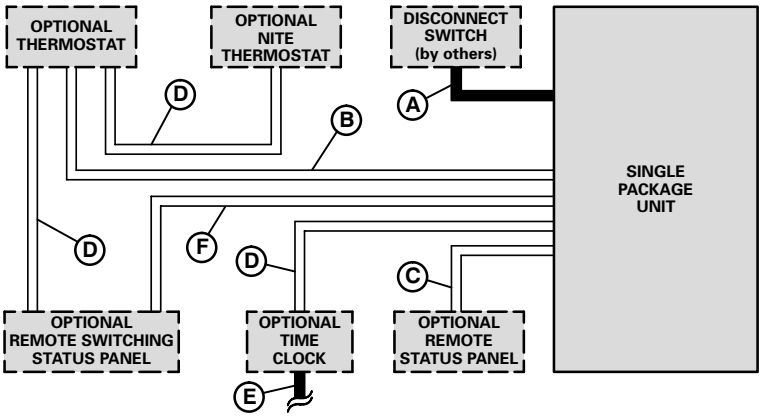
NOTE ◻ Run separate harnesses for AC and DC. AC voltage interferes with DC signals.

Field wiring not furnished

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



ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM

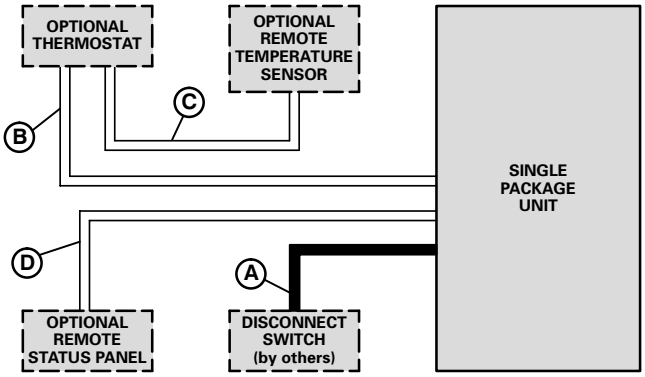


A ◻ Three wire power (See Electrical Data Table)
B ◻ Six wire low voltage
◻ Five wire low voltage ◻ with SSP11 Switching Status Panel
◻ Eight wire low voltage ◻ with Emergency Heat Switching Subbase
C ◻ Eleven wire low voltage
D ◻ Two wire low voltage
E ◻ Two wire low voltage
F ◻ Eighteen wire low voltage

Field wiring not furnished

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

T7300 THERMOSTAT, W7400 OR T8621 THERMOSTAT CONTROL SYSTEM



A ◻ Three wire power (See Electrical Data Table)
B ◻ Four wire low voltage (W7400)
◻ Nine wire low voltage
C ◻ Two wire low voltage (T7300 and W7400)
◻ Seven wire low voltage (T7300 Room Sensor with override)
D ◻ Eleven wire low voltage

Field wiring not furnished

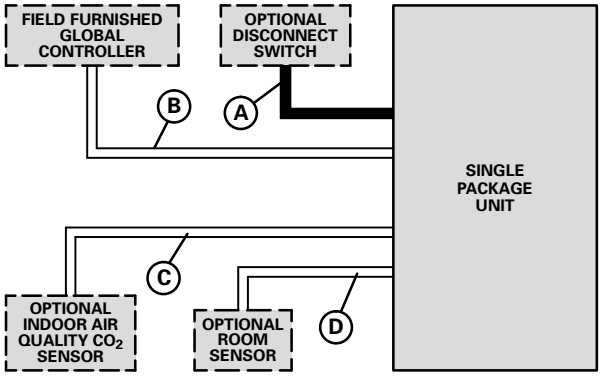
NOTE ◻ All wiring must conform to NEC or CEC and local electrical codes.

ALL DDC CONTROL SYSTEMS

A ◻ Three wire power (See Electrical Data Table)
B ◻ RS-485 shielded pair twisted wire + ground
C ◻ Four wire low voltage
D ◻ Two wire low voltage (Andover Infinity, CPC 810-3060 and Novar ETM-2050)
Four wire low voltage (Honeywell W7620)
Six wire low voltage (Johnson UNT and Facilitator)

Field wiring not furnished

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



RATINGS

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

CHA16-090 ONE COMPRESSOR OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																					
			65°F (18°C)						75°F (24°C)						85°F (29°C)						95°F (35°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) 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	kW	Btuh		75°F 24°C	80°F 27°C	85°F 29°C
63°F (17.2°C)	1180	2500	16.4	56,100	2940	.68	.79	.90	15.9	54,100	3230	.69	.80	.92	15.2	51,900	3530	.70	.82	.94	14.6	49,800	3830	.71	.84	.96
	1415	3000	17.3	58,900	2960	.71	.83	.95	16.6	56,700	3260	.72	.85	.97	15.9	54,300	3570	.73	.87	.98	15.3	52,200	3880	.75	.88	1.00
	1650	3500	17.9	61,200	2980	.74	.87	.99	17.3	58,900	3290	.75	.89	1.00	16.4	56,100	3610	.76	.91	1.00	15.8	53,800	3930	.78	.93	1.00
67°F (19.4°C)	1180	2500	17.3	59,000	2960	.55	.65	.76	16.7	56,900	3270	.55	.66	.77	16.0	54,700	3580	.56	.67	.78	15.4	52,500	3900	.56	.68	.80
	1415	3000	18.2	62,000	2990	.56	.68	.80	18.1	59,500	3300	.57	.69	.81	16.8	57,300	3630	.58	.71	.83	16.1	54,900	3950	.59	.72	.85
	1650	3500	18.8	64,000	3010	.58	.71	.84	18.1	61,700	3330	.59	.72	.85	17.3	59,200	3660	.60	.74	.87	16.6	56,700	4000	.61	.75	.90
71°F (21.7°C)	1180	2500	18.1	61,900	2990	.43	.53	.63	17.5	59,700	3300	.43	.53	.64	16.9	57,600	3630	.43	.54	.65	16.2	55,200	3960	.43	.55	.66
	1415	3000	18.9	64,600	3020	.43	.55	.66	18.3	62,300	3340	.43	.55	.67	17.6	59,900	3680	.44	.56	.68	16.8	57,500	4020	.44	.57	.69
	1650	3500	19.6	66,900	3040	.43	.56	.69	18.9	64,400	3370	.44	.57	.70	18.1	61,900	3710	.44	.58	.71	17.4	59,300	4060	.44	.59	.73

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

CHA16-090 BOTH COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																					
			85°F (29°C)						95°F (35°C)						105°F (41°C)						115°F (46°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) 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	kW	Btuh		75°F 24°C	80°F 27°C	85°F 29°C
63°F (17.2°C)	1180	2500	25.8	88,200	7160	.72	.85	.97	24.8	84,500	7660	.73	.86	.99	23.4	80,700	8140	.75	.88	1.00	22.4	76,300	8590	.76	.91	1.00
	1415	3000	26.9	91,900	7290	.75	.89	1.00	25.7	87,600	7790	.77	.92	1.00	24.4	83,400	8280	.78	.94	1.00	23.2	79,300	8760	.81	.97	1.00
	1650	3500	27.7	94,500	7380	.78	.95	1.00	26.4	90,100	7890	.80	.96	1.00	25.1	85,800	8410	.82	.98	1.00	23.9	81,600	8890	.85	1.00	1.00
67°F (19.4°C)	1180	2500	27.2	92,700	7320	.57	.70	.81	26.0	88,900	7850	.58	.71	.83	24.9	84,900	8370	.59	.72	.85	23.7	80,900	8860	.60	.74	.87
	1415	3000	28.2	96,300	7460	.60	.73	.86	27.0	92,300	8000	.60	.74	.88	25.8	88,100	8530	.61	.76	.91	24.6	83,900	9030	.62	.78	.93
	1650	3500	29.1	99,200	7560	.62	.76	.91	27.8	94,900	8120	.63	.78	.93	26.5	90,600	8650	.64	.80	.96	25.2	86,000	9150	.65	.82	.98
71°F (21.7°C)	1180	2500	28.5	97,100	7490	.44	.56	.67	27.3	93,200	8040	.44	.56	.68	26.1	89,200	8580	.44	.57	.69	24.9	85,100	9100	.44	.58	.71
	1415	3000	29.5	100,700	7620	.44	.58	.70	28.3	96,600	8190	.45	.59	.72	27.0	92,300	8740	.45	.60	.73	25.8	88,000	9270	.46	.61	.75
	1650	3500	30.3	103,600	7730	.45	.60	.74	29.1	99,200	8310	.45	.61	.75	27.7	94,700	8860	.46	.62	.77	26.4	90,200	9390	.47	.64	.80

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

CHA16-120 ONE COMPRESSOR OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																					
			65°F (18°C)						75°F (24°C)						85°F (29°C)						95°F (35°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) 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	kW	Btuh		75°F 24°C	80°F 27°C	85°F 29°C
63°F (17.2°C)	1650	3500	20.9	71,500	4010	.70	.81	.93	20.1	68,700	4390	.71	.83	.95	19.3	66,000	4780	.72	.85	.97	18.5	63,300	5170	.73	.87	.99
	2005	4250	21.9	74,700	4080	.74	.87	.99	21.0	71,700	4470	.74	.88	1.00	20.2	68,900	4860	.76	.90	1.00	19.3	65,800	5250	.77	.93	1.00
	2360	5000	22.6	77,200	4120	.77	.91	1.00	21.7	73,900	4520	.78	.94	1.00	20.7	70,800	4910	.80	.96	1.00	19.8	67,600	5310	.81	.98	1.00
67°F (19.4°C)	1650	3500	22.1	75,400	4090	.56	.67	.78	21.3	72,700	4480	.56	.68	.79	20.5	69,900	4880	.57	.69	.81	19.6	67,000	5290	.57	.70	.83
	2005	4250	23.1	78,800	4150	.58	.72	.83	22.2	75,700	4550	.58	.72	.85	21.3	72,700	4960	.59	.73	.87	20.4	69,500	5370	.60	.75	.89
	2360	5000	23.7	80,900	4190	.59	.74	.88	22.8	77,900	4600	.61	.76	.90	21.9	74,800	5020	.63	.78	.92	20.9	71,500	5440	.63	.80	.95
71°F (21.7°C)	1650	3500	23.1	78,900	4160	.44	.54	.64	21.6	76,300	4570	.43	.54	.65	21.6	73,700	4980	.43	.55	.66	20.7	70,500	5410	.44	.56	.68
	2005	4250	24.0	81,800	4210	.43	.56	.69	23.1	79,000	4630	.44	.57	.69	22.3	76,100	5060	.45	.58	.71	21.5	73,300	5490	.44	.58	.72
	2360	5000	24.5	83,500	4240	.44	.58	.72	23.8	81,100	4670	.44	.59	.74	22.9	78,200	5110	.45	.61	.75	22.0	75,100	5550	.46	.61	.77

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

CHA16-120 BOTH COMPRESSORS OPERATING

Entering Wet Bulb Temperature	Total Air Volume		Outdoor Air Temperature Entering Condenser Coil																					
			85°F (29°C)						95°F (35°C)						105°F (41°C)						115°F (46°C)					
			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cooling Capacity		Compressor Motor Watts Input	Sensible To Total Ratio (S/T) 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	kW	Btuh		75°F 24°C	80°F 27°C	85°F 29°C
63°F (17.2°C)	1650	3500	34.6	118,100	9770	.72	.86	.98	33.1	113,100	10,480	.74	.87	1.00	31.6	107,800	11,180	.75	.90	1.00	29.9	102,000	11,830	.77	.93	1.00
	2005	4250	35.9	122,600	9930	.76	.91	1.00	34.4	117,400	10,650	.78	.93	1.00	32.5	111,000	11,350	.80	.96	1.00	30.8	105,300	12,040	.82	.99	1.00
	2360	5000	26.9	126,100	10,040	.80	.96	1.00	35.2	120,300	10,760	.82	.99	1.00	33.5	114,300	11,500	.84	1.00	1.00	32.1	109,600	12,260	.87	1.00	1.00
67°F (19.4°C)	1650	3500	36.6	125,000	10,000	.57	.70	.82	35.1	119,800	10,750	.58	.71	.84	33.5	114,400	11,490	.59	.73	.86	31.9	108,800	12,210	.60	.74	.89
	2005	4250	38.0	129,600	10,170	.59	.74	.88	36.4	124,200	10,930	.60	.75	.90	34.7	118,400	11,690	.62	.77	.92	33.1	112,800	12,420	.63	.79	.95
	2360	5000	39.1	133,300	10,280	.62	.77	.92	37.2	127,100	11,060	.63	.80	.95	35.5	121,300	11,830	.64	.82	.98	33.8	115,500	12,570	.66	.84	1.00
71°F (21.7°C)	1650	3500	38.6	131,800	10,230	.43	.55	.67	37.1	126,500	11,010	.44	.56	.68	35.4	120,900	11,790	.44	.57	.70	33.7	115,000	12,560	.44	.58	.72
	2005	4250	39.9	136,200	10,390	.44	.58	.71	38.3	130,800	11,190	.45	.59	.73	36.7	125,100	11,990	.45	.60	.75	34.9	119,100	12,760	.45	.61	.77
	2360	5000	40.8	139,300	10,500	.45	.60	.75	39.3	134,100	11,320	.46	.62	.77	37.5	127,900	12,130	.46	.63	.79	35.7	121,800	12,910	.47	.64	.82

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

BLOWER DATA

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

CHA16-090 BLOWER PERFORMANCE

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

NOTE ◘ All data is measured external to the unit with dry coil and air filters in place. See Page 15 for Accessory Air Resistance data.
*Minimum air volume at .25 in. w.g. (62 Pa) with electric heat.
NOTE ◘ In Canada, maximum usable motor output is 2 hp (1.49 kW).

CHA16-120 BLOWER PERFORMANCE

Air Volume cfm (L/s)	STATIC PRESSURE EXTERNAL TO UNIT Inches Water Gauge (Pa)																	
	.20 (50)		.40 (100)		.50 (125)		.70 (175)		.80 (200)		.90 (225)		1.00 (250)		1.10 (275)		1.30 (325)		1.50 (375)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
3600 (1700)	585	0.89 (0.66)	655	1.13 (0.84)	700	1.25 (0.93)	770	1.52 (1.13)	795	1.65 (1.23)	820	1.80 (1.34)	850	1.93 (1.44)	875	2.08 (1.55)	935	2.41 (1.80)	985	2.68 (2.00)
3800 (1795)	605	1.00 (0.75)	685	1.25 (0.93)	720	1.37 (1.02)	785	1.67 (1.24)	805	1.80 (1.34)	830	1.94 (1.45)	860	2.08 (1.55)	890	2.26 (1.69)	940	2.56 (1.91)	995	2.85 (2.13)
4000 (1890)	630	1.14 (0.85)	705	1.41 (1.05)	740	1.50 (1.12)	795	1.81 (1.35)	820	1.96 (1.46)	845	2.11 (1.57)	875	2.26 (1.69)	905	2.43 (1.81)	955	2.67 (1.99)	1000	3.01
4200 (1980)	650	1.29 (0.96)	725	1.57 (1.17)	755	1.70 (1.27)	810	2.01 (1.50)	835	2.16 (1.61)	865	2.31 (1.72)	890	2.46 (1.84)	920	2.63 (1.96)	970	2.93 (2.19)	1005	3.15
4400 (2075)	680	1.46 (1.09)	745	1.76 (1.31)	780	1.91 (1.42)	825	2.22 (1.66)	855	2.37 (1.77)	880	2.51 (1.87)	910	2.69 (2.01)	930	2.83 (2.11)	980	3.14	----	----
4600 (2170)	705	1.65 (1.23)	770	1.95 (1.45)	795	2.11 (1.57)	845	2.43 (1.81)	870	2.58 (1.92)	900	2.75 (2.05)	925	2.92 (2.18)	950	3.06	995	3.33	----	----
4800 (2265)	730	1.85 (1.38)	790	2.17 (1.62)	810	2.33 (1.74)	865	2.66 (1.98)	890	2.82 (2.10)	920	2.99 (2.23)	945	3.15	970	3.32	----	----	----	----
5000 (2360)	755	2.07 (1.54)	810	2.42 (1.81)	835	2.59 (1.93)	885	2.91 (2.17)	910	3.07 (2.29)	935	3.24 (2.42)	960	3.41	----	----	----	----	----	----
5200 (2455)	775	2.30 (1.72)	830	2.69 (2.00)	855	2.84 (2.12)	910	3.18 (2.37)	935	3.34 (2.49)	----	----	----	----	----	----	----	----	----	----

NOTE ◘ All data is measured external to the unit with dry coil and with the air filters in place. See Page 15 for Accessory Air Resistance data.
NOTE ◘ Data in unshaded area denotes field furnished drive kit.

ACCESSORY AIR RESISTANCE

Unit Model No.	Air Volume		Total Resistance inches water gauge (Pa)						
						RTD11 Step-Down Diffuser			
	cfm	L/s	Wet Evaporator Coil	REMD16M Down-flow Economizer	EMDH16M Horizontal Economizer	2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	FD11 Flush Diffuser
CHA16-090	2400	1185	.12 (30)	.03 (7)	.03 (7)	.21 (52)	.18 (45)	.15 (37)	.14 (35)
	2600	1225	.13 (32)	.04 (10)	.04 (10)	.24 (60)	.21 (52)	.18 (45)	.17 (42)
	2800	1320	.14 (35)	.04 (10)	.04 (10)	.27 (67)	.24 (60)	.21 (52)	.20 (50)
	3000	1415	.16 (40)	.05 (12)	.05 (12)	.32 (80)	.29 (72)	.25 (62)	.25 (62)
	3200	1510	.18 (45)	.05 (12)	.05 (12)	.41 (102)	.37 (92)	.32 (80)	.31 (77)
	3400	1605	.19 (47)	.06 (15)	.06 (15)	.50 (124)	.45 (112)	.39 (97)	.37 (92)
	3600	1700	.21 (52)	.06 (15)	.06 (15)	.61 (152)	.54 (134)	.48 (119)	.44 (109)
	3800	1795	.23 (57)	.07 (17)	.07 (17)	.73 (182)	.63 (157)	.57 (142)	.51 (127)
CHA16-120	3600	1700	.12 (30)	.03 (7)	.03 (7)	.36 (90)	.28 (70)	.23 (57)	.15 (37)
	3800	1795	.13 (32)	.04 (10)	.04 (10)	.40 (99)	.32 (80)	.26 (65)	.18 (45)
	4000	1890	.14 (35)	.04 (10)	.04 (10)	.44 (109)	.36 (90)	.29 (72)	.21 (52)
	4200	1980	.15 (37)	.05 (12)	.05 (12)	.49 (122)	.40 (99)	.33 (82)	.24 (60)
	4400	2075	.16 (40)	.05 (12)	.05 (12)	.54 (134)	.44 (109)	.37 (92)	.27 (67)
	4600	2170	.17 (42)	.06 (15)	.06 (15)	.60 (149)	.49 (122)	.42 (104)	.31 (77)
	4800	2265	.18 (45)	.07 (17)	.07 (17)	.65 (162)	.53 (132)	.46 (114)	.35 (87)
	5000	2360	.19 (47)	.09 (22)	.09 (22)	.69 (172)	.58 (144)	.50 (124)	.39 (97)
	5200	2455	.20 (50)	.10 (25)	.10 (25)	.75 (186)	.62 (154)	.54 (134)	.43 (107)

CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume		*Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	cfm	L/s	ft.	m	ft.	m
CHA16-090	3000	1415	27 □ 33	8 □ 10	25 □ 30	8 □ 9
	3375	1595	30 □ 37	9 □ 11	28 □ 34	9 □ 10
	3750	1770	34 □ 41	10 □ 12	31 □ 38	9 □ 12
CHA16-120	4400	2075	34 □ 42	10 □ 13	32 □ 40	10 □ 12
	4950	2335	38 □ 47	12 □ 14	36 □ 45	11 □ 14
	5500	2595	43 □ 52	13 □ 16	40 □ 50	12 □ 15

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

GUIDE SPECIFICATIONS

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

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

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

Air Distribution ☐ *Equipment shall be capable of bottom (down-flo) 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 U.L. and C.S.A. Listing. All wiring shall be in compliance with NEC and CEC.*

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

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

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

Multiple compressors shall be resiliently mounted, have overload protection, compressor monitor and crankcase heater. Units shall internal pressure relief. The refrigeration system shall have suction and liquid line service gauge ports, high pressure switches, loss of charge switches, thermometer well, driers, freezestat and full refrigerant charge. Control option available shall consist of low ambient control and timed-off control. Shall be rated in accordance with ARI Standard 210/240-94.

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

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

Cabinet ☐ *Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connection entry. Evaporator coil condensate drain extended outside cabinet shall be provided. Lifting brackets shall be provided for rigging.*

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

Supply Air Blowers ☐ *Centrifugal supply air blower shall have permanently lubricated ball bearings and adjustable belt drive. Motor mount base shall permit ease of motor changeover and belt tension adjustment. Blower wheel shall be statically and dynamically balanced. Blower shall be capable of delivering . . . . . cfm (L/s) at an external static pressure of . . . . . .inches water gauge (Pa) requiring . . . . . bhp (W) and . . . . . rpm.*

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

Air Filters ☐ *Disposable filters furnished shall have not less than . . . . . .sq. ft. (m2) of free area.*

OPTIONAL ACCESSORIES

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

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

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

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

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

Bottom Power Entry Kit ☐ *Optional kit shall provide bottom power entry to the unit within the confines of 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.*

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.*

UNIT DIMENSIONS ◻ inches (mm)

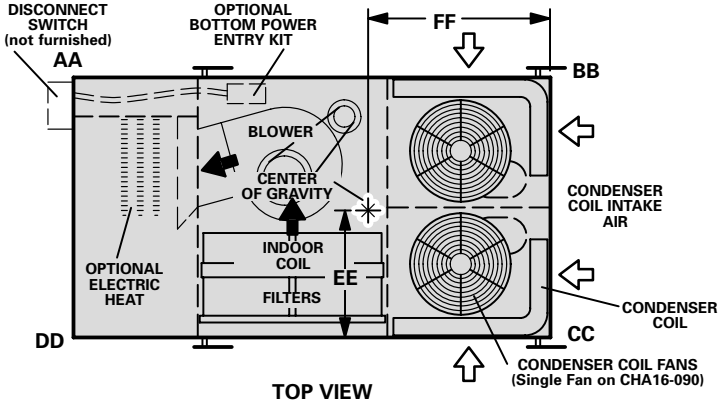
CHA16-090 & -120

CORNER WEIGHTS lbs. (kg)

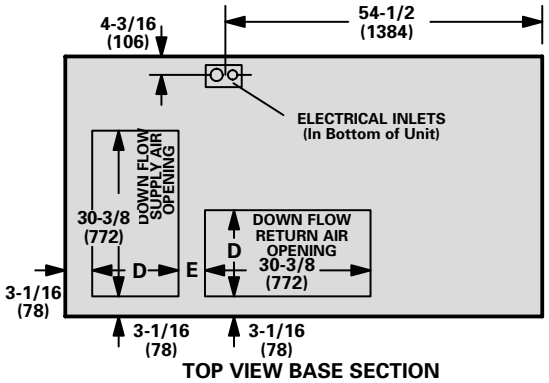
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA16-090	177	80	284	129	186	84	116	53
CHA16-120	210	95	346	157	308	140	187	85

CENTER OF GRAVITY in. (mm)

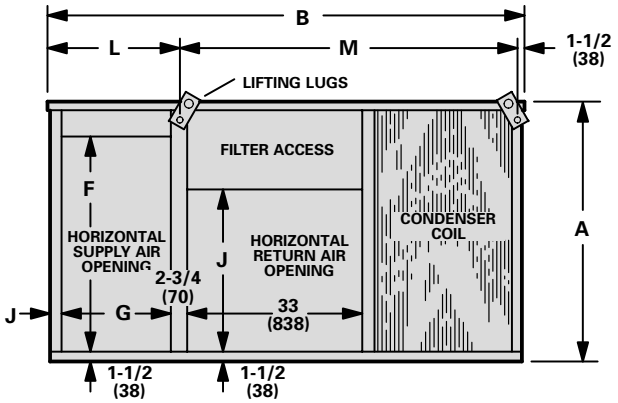
Model Number	EE		FF	
	inch	mm	inch	mm
CHA16-090	29	737	36-1/4	921
CHA16-120	31	787	35-1/2	902



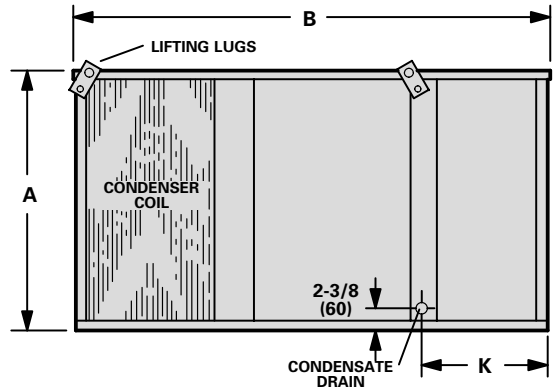
TOP VIEW



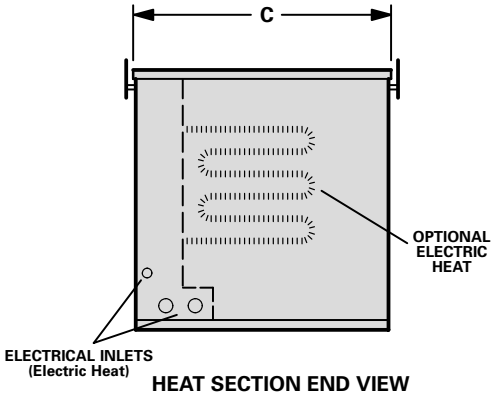
TOP VIEW BASE SECTION



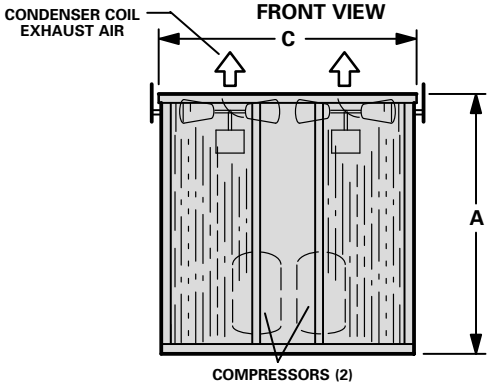
BACK VIEW
WITH HORIZONTAL SUPPLY & RETURN AIR OPENING



FRONT VIEW



HEAT SECTION END VIEW



CONDENSER SECTION END VIEW

Model Number	A		B		C		D		E		F		G		H		J		K		L		M	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHA16-090	39	991	88-1/2	2248	48	1219	16-1/2	419	5-5/8	143	32-1/8	816	19-7/16	494	24-5/8	625	1-5/8	41	25-1/16	637	22-1/8	562	64-7/8	1648
CHA16-120	46	1168	94	2388	60	1524	24	610	4-7/16	113	39-1/8	994	25-1/4	641	31-5/8	803	2	51	31-3/16	792	28-1/2	724	64	1626

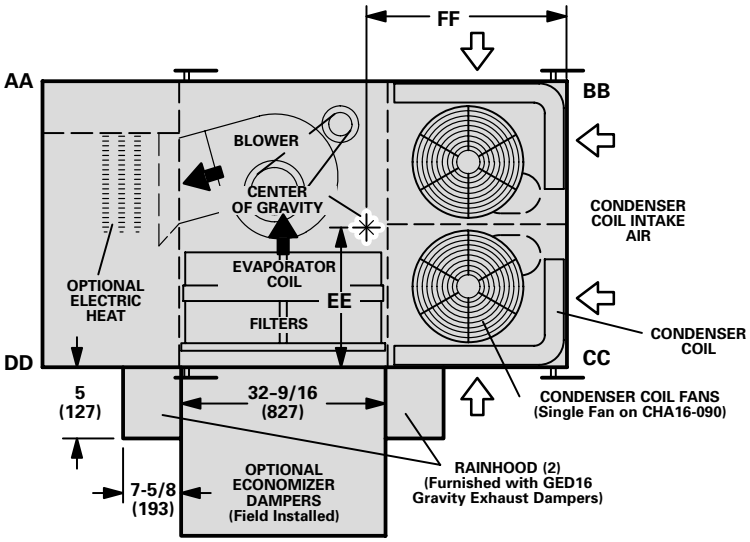
CHA16-090 AND -120 UNIT WITH REMD16M ECONOMIZER DAMPER SECTION AND RMF16 ROOF MOUNTING FRAME

CORNER WEIGHTS lbs. (kg)

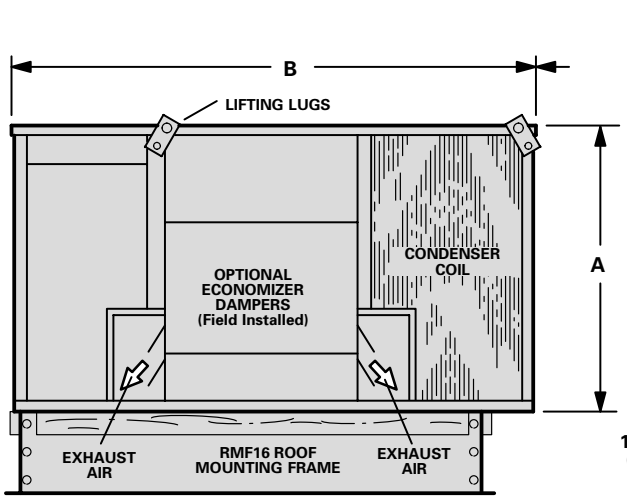
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA16-090	189	86	251	114	241	109	181	82
CHA16-120	222	101	342	155	360	163	233	106

CENTER OF GRAVITY in. (mm)

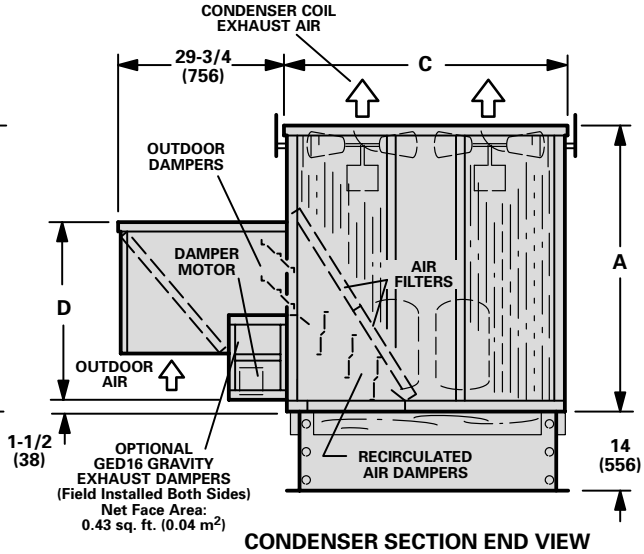
Model Number	EE		FF	
	inch	mm	inch	mm
CHA16-090	24-1/2	622	38	965
CHA16-120	29-1/4	743	37	940



TOP VIEW



BACK VIEW



CONDENSER SECTION END VIEW

Model Number	A		B		C		D	
	inch	mm	inch	mm	inch	mm	inch	mm
CHA16-090	39	991	88-1/2	2248	48	1219	28-9/16	725
CHA16-120	46	1168	94	2388	60	1524	34-9/16	878

ACCESSORY DIMENSIONS □ inches (mm)

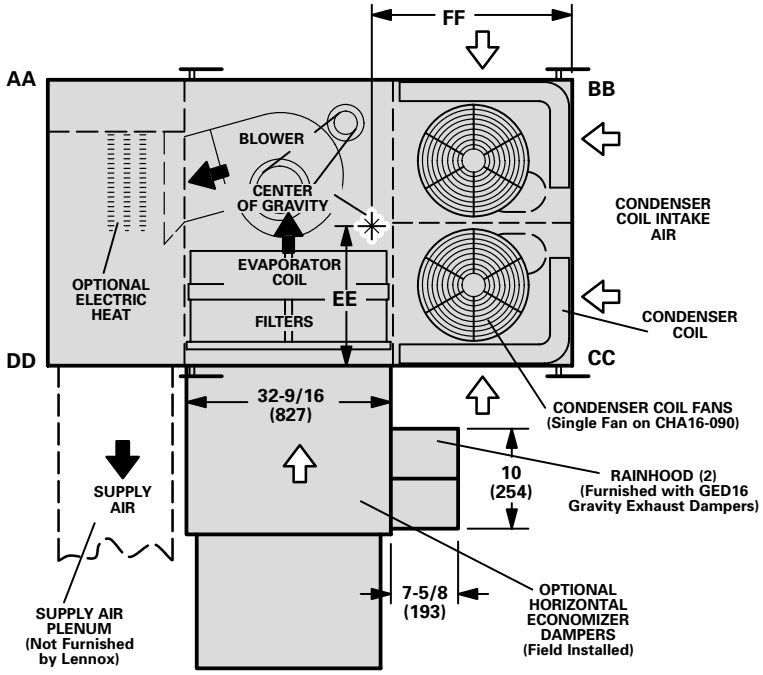
CHA16-090 AND -120 UNITS WITH EMDH16 HORIZONTAL ECONOMIZER DAMPER SECTION

CORNER WEIGHTS lbs. (kg)

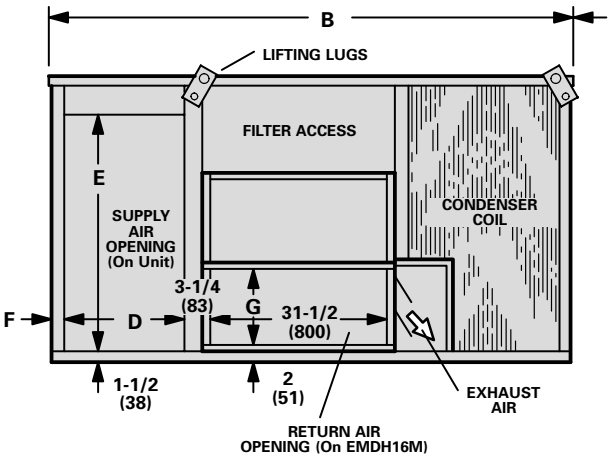
Model Number	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHA16-090	189	86	251	114	241	109	181	82
CHA16-120	222	101	342	155	360	163	233	106

CENTER OF GRAVITY in. (mm)

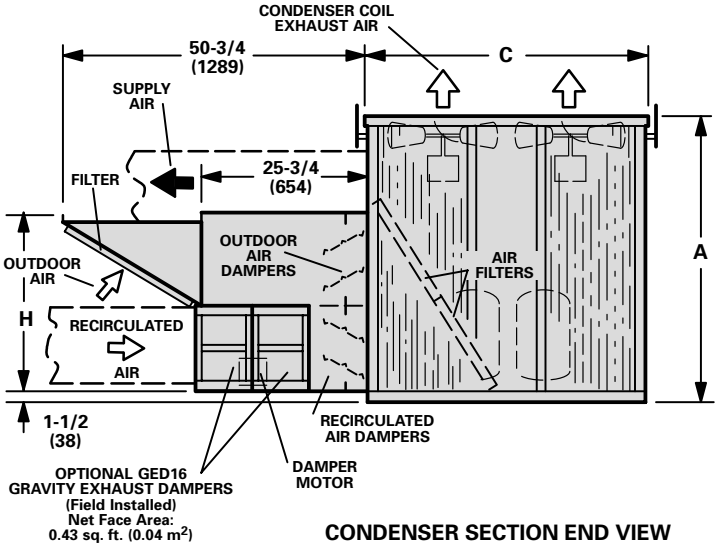
Model Number	EE		FF	
	inch	mm	inch	mm
CHA16-090	24-1/2	622	38	965
CHA16-120	29-1/4	743	37	940



TOP VIEW



BACK VIEW

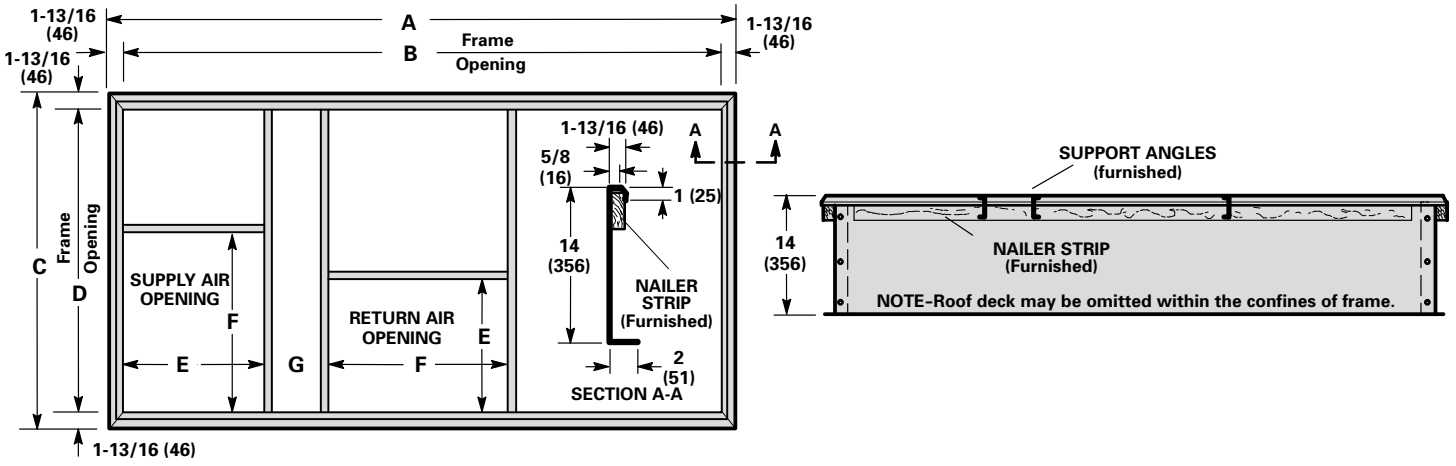


CONDENSER SECTION END VIEW

Model Number	A		B		C		D		E		F		G		H	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHA16-090	39	991	88-1/2	2248	48	1219	19-7/16	494	32-1/8	816	1-5/8	41	13-1/4	337	28-3/4	730
CHA16-120	46	1168	94	2388	60	1524	25-1/4	641	39-1/8	994	2	51	19-1/4	489	34-3/4	883

ACCESSORY DIMENSIONS □ inches (mm) U.S. Only

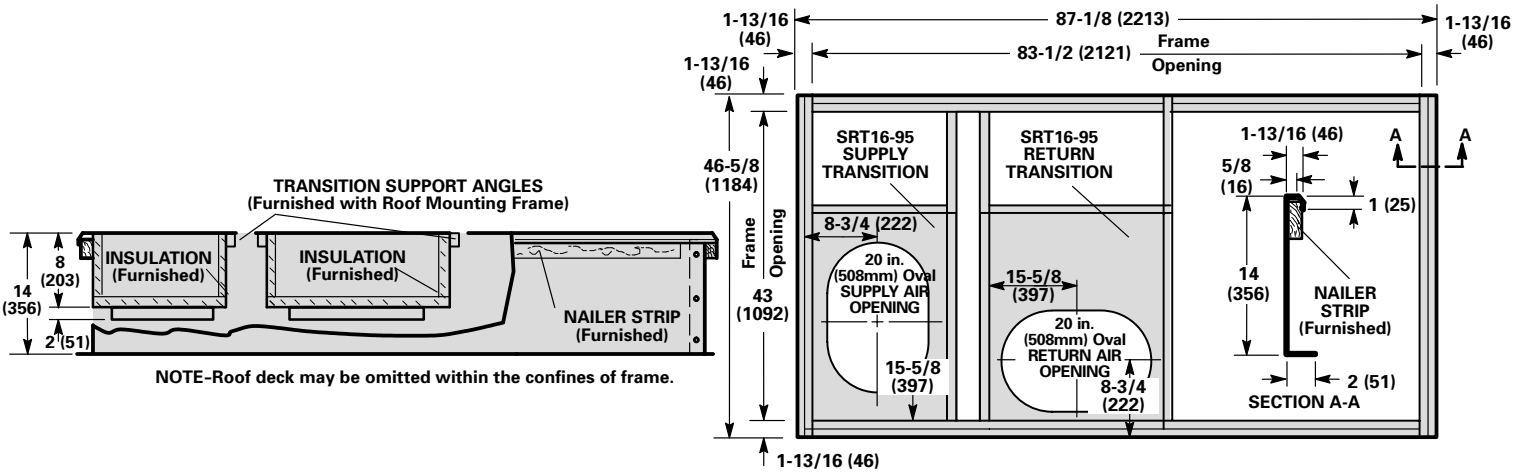
RMF16 SERIES ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING



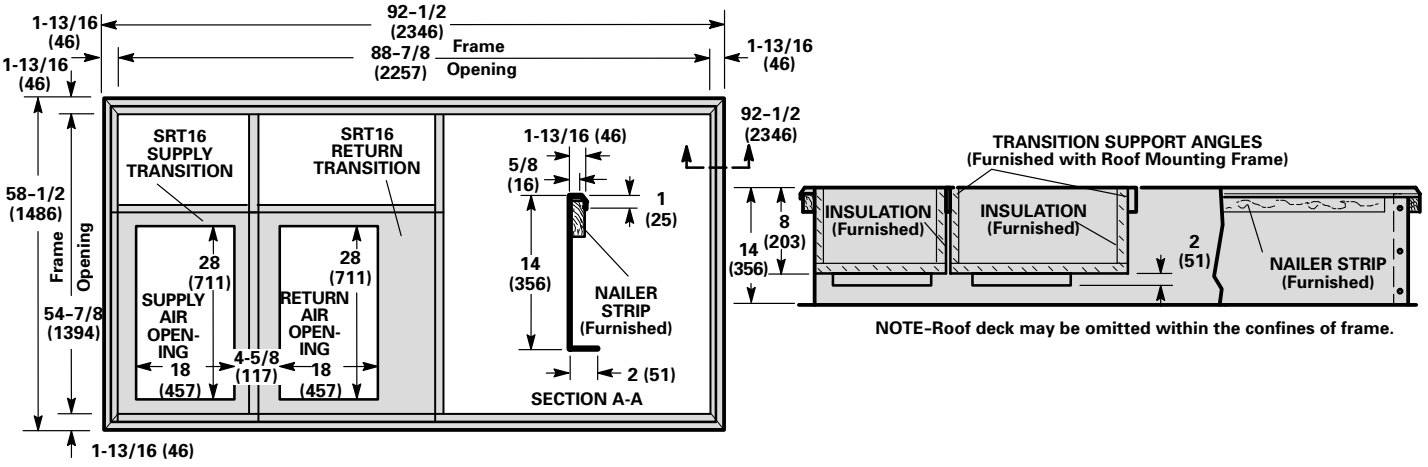
Model Number	A		B		C		D		E		F		G	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RMF16-95	87-1/8	2213	83-1/2	2121	46-5/8	1184	43	1092	17-15/16	456	31-1/2	800	4	102
RMF16-135/160	92-1/2	2350	88-7/8	2257	58-1/2	1486	54-7/8	1394	25-1/4	641	*	*	3-3/16	81

*31-1/2 inches (800 mm) for CHA16-120 Units.

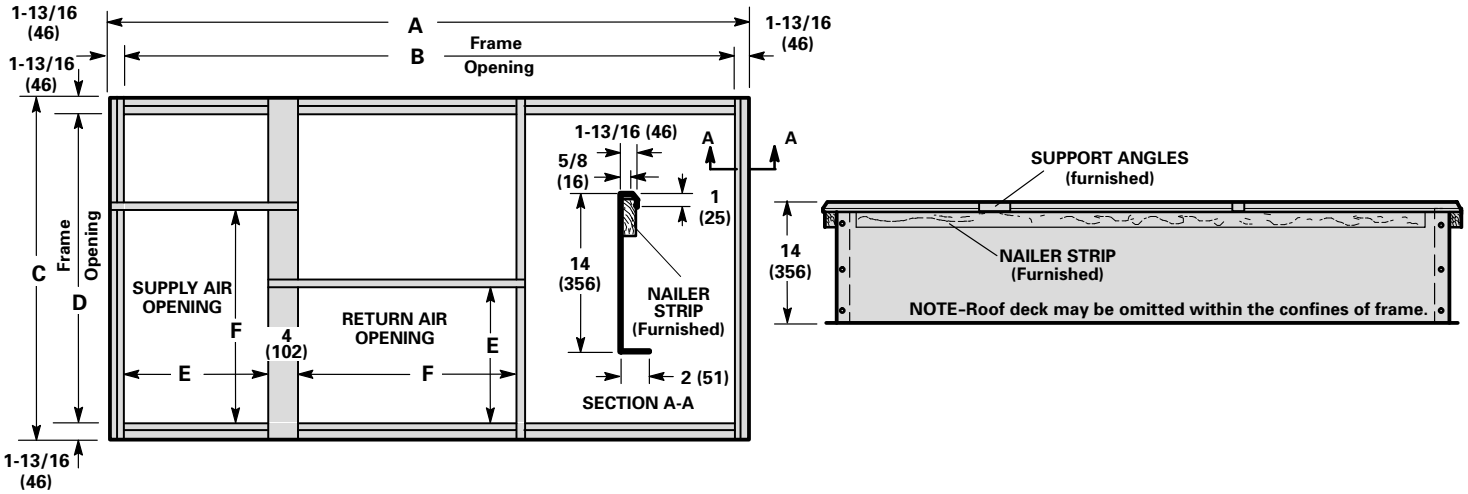
RMF16-95 ROOF MOUNTING FRAMES WITH SRT16 SUPPLY AND RETURN AIR TRANSITIONS FOR FD11-95 AND RTD11-95 CEILING DIFFUSERS



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



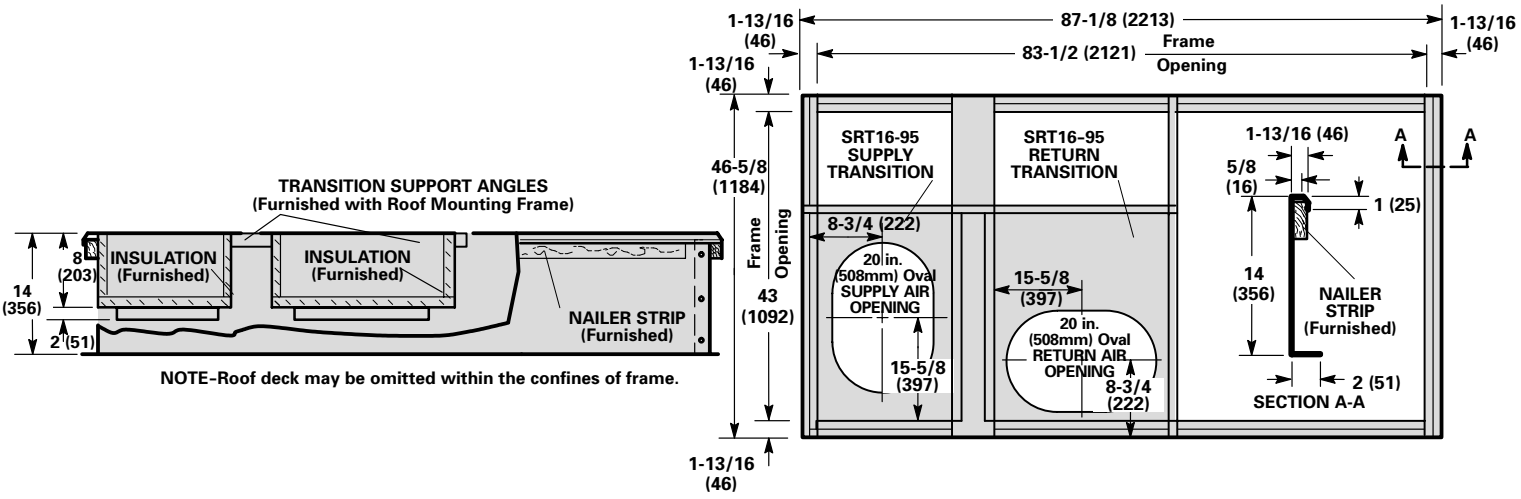
RMF16-95 and -135/160 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING



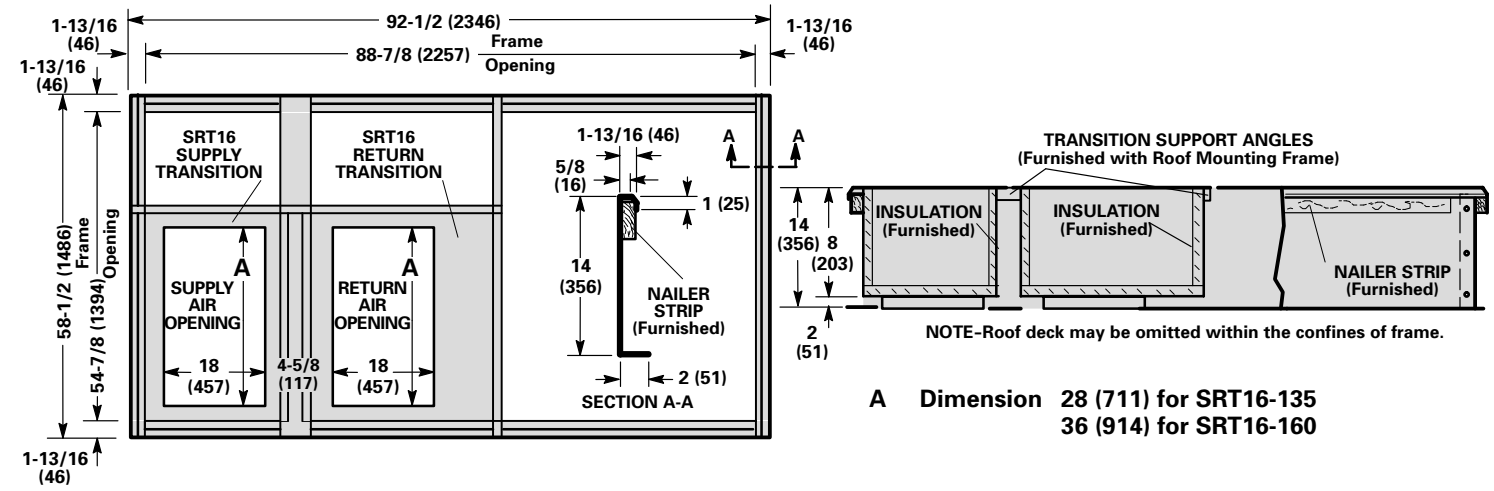
Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
RMF16-95	87-1/8	2213	83-1/2	2121	46-5/8	1184	43	1092	17-15/16	456	31-1/2	800
RMF16-135/160	92-1/2	2350	88-7/8	2257	58-1/2	1486	54-7/8	1394	25-1/4	641	*	*

*31-1/2 inches (800 mm) for -120 units.

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



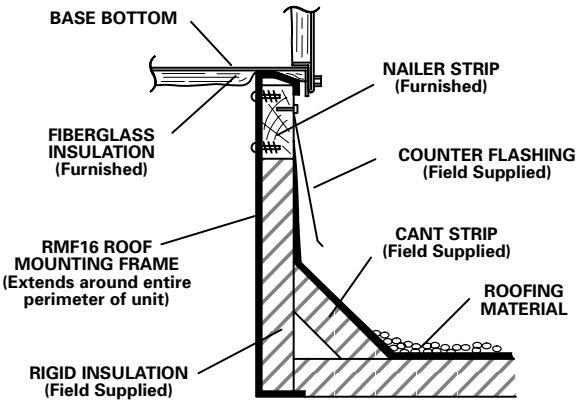
RMF16-135/160 ROOF MOUNTING FRAMES WITH SRT16 SUPPLY AND RETURN AIR TRANSITIONS FOR FD11 & RTD11 CEILING DIFFUSERS



A Dimension 28 (711) for SRT16-135
36 (914) for SRT16-160

ACCESSORY DIMENSIONS □ inches (mm)

TYPICAL FLASHING DETAIL FOR RMF16 ROOF MOUNTING FRAME



ROOF MOUNTING FRAME SPECIFICATIONS

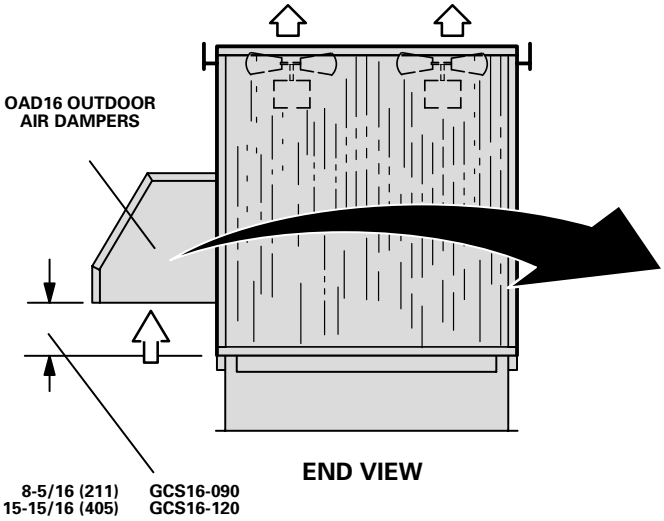
Roof Mounting frame is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.

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

*Includes both sides of frame.

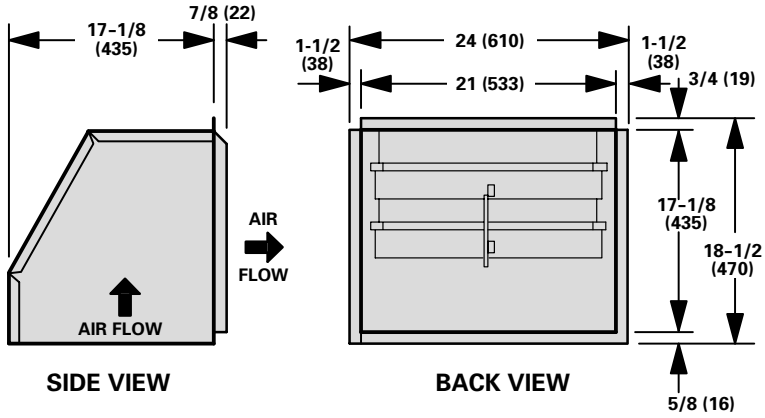
CHA16 UNIT WITH OAD16 OUTDOOR AIR DAMPER SECTION DOWN-FLOW SUPPLY AND RETURN AIR

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



END VIEW

OAD16 OUTDOOR AIR DAMPER SECTION

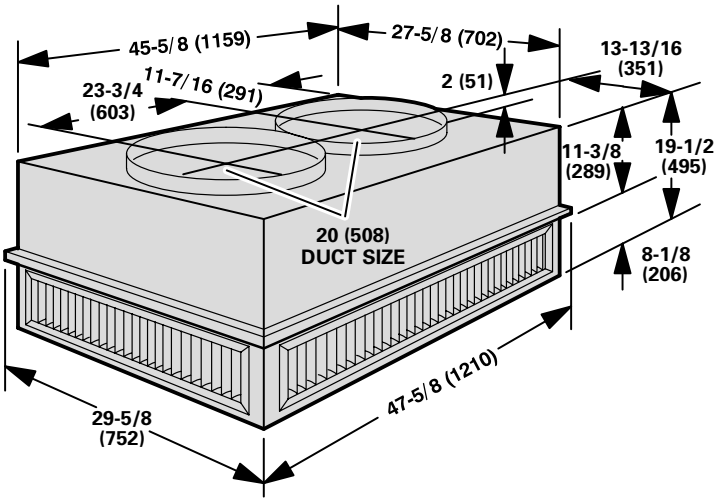


SIDE VIEW

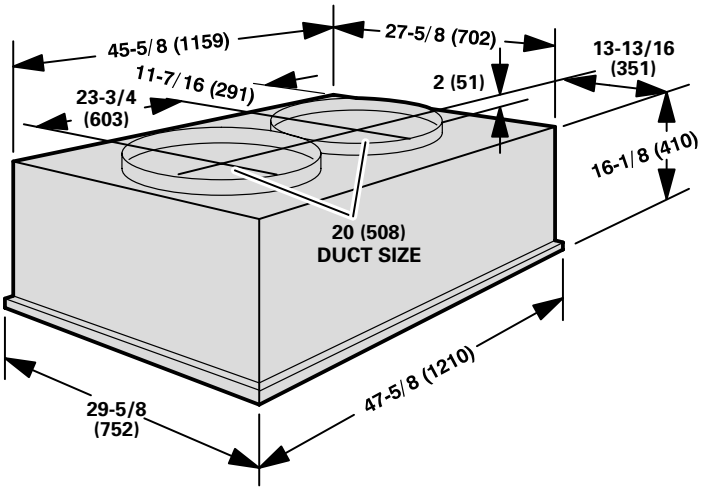
BACK VIEW

COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

RTD11-95 STEP-DOWN CEILING DIFFUSER

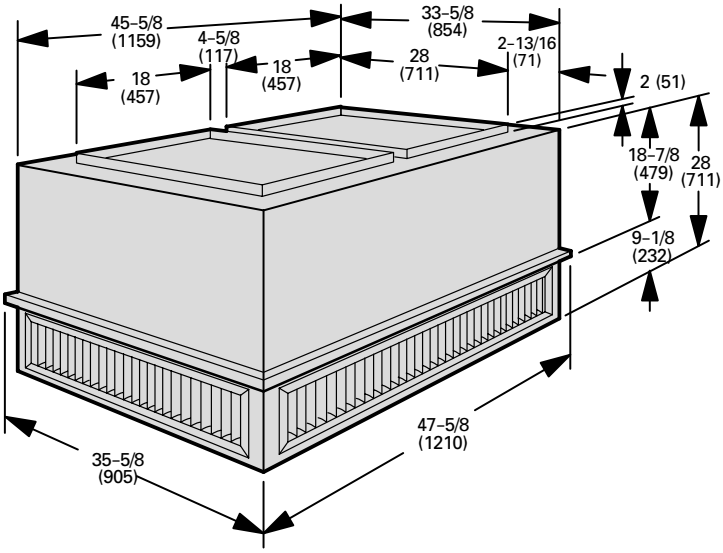


FD11-95 FLUSH CEILING DIFFUSER

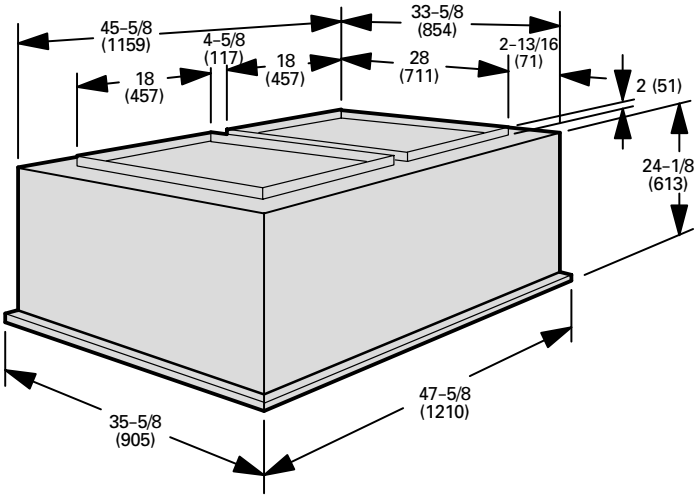


ACCESSORY DIMENSIONS □ inches (mm)

RTD11-135
STEP-DOWN CEILING DIFFUSER

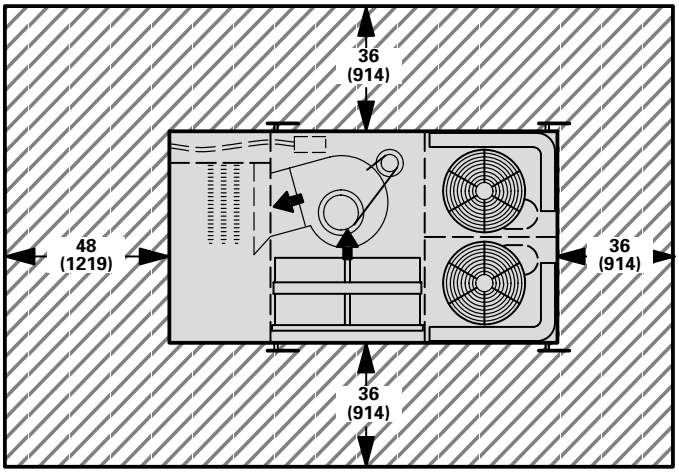


FD11-135
FLUSH CEILING DIFFUSER



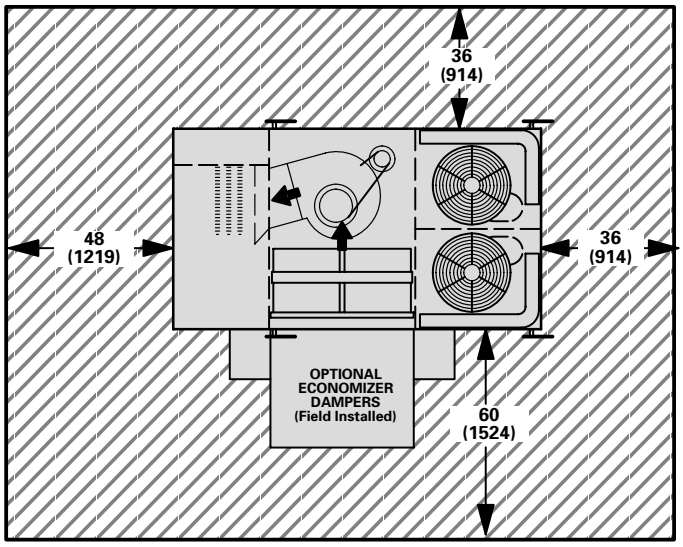
INSTALLATION CLEARANCES □ inches (mm)

CHA16 BASIC UNIT



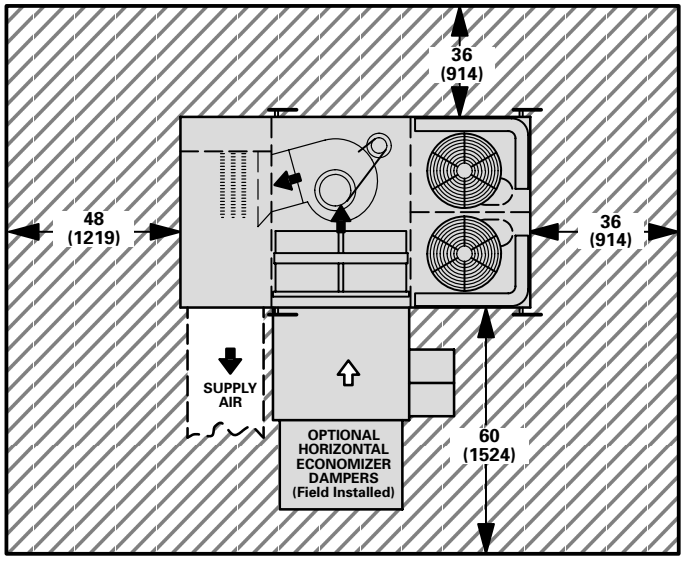
NOTE Top Clearance Unobstructed.
NOTE Entire perimeter of unit requires support when elevated above mounting surface.

CHA16 UNIT WITH REMD16M ECONOMIZER DAMPER SECTION



NOTE Top Clearance Unobstructed.

CHA16 UNIT WITH EMDH16M HORIZONTAL ECONOMIZER DAMPER SECTION



NOTE Top Clearance Unobstructed.