

ELITE 12™ ("R" Models)
CHP20(R)V-261-311-410-461-510-650
PACKAGED UNITS – HEAT PUMPS

CHP20(R)V
(2 To 5 Ton)
(7.0 To 17.6 kW)

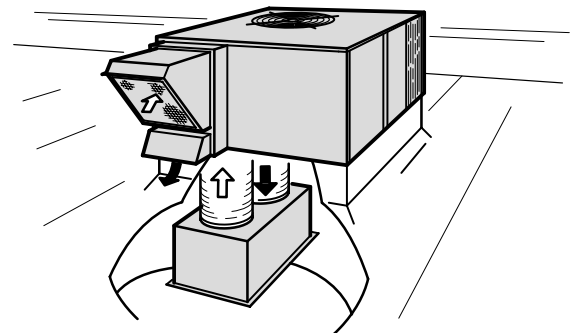
***23,800 to 60,000 Btuh (7.0 to 17.6 kW) Cooling Capacity**
***22,800 to 61,000 Btuh (6.7 to 17.9 kW) Heating Capacity**
12,600 to 85,300 Btuh (3.7 to 25.0 kW) Optional Electric Heat

Bulletin #210068
April 1995
Supersedes August 1994

*ARI Standard 210/240 Ratings

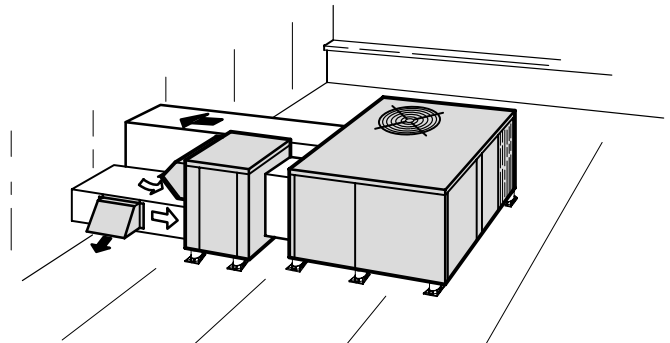


**NEW CUTAWAY
POSITION
ONLY**



Rooftop Installation With Economizer and
Combination Supply and Return Air System

CHP20RV
Basic Unit



Rooftop Installation
With Horizontal Economizer

Application — Lennox single package CHP20(R)V heat pump 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. CHP20(R)V models are available in six model sizes, single phase voltage (CHP20(R)V-261-311-411-461-511-651) and three phase voltage (CHP20V-413-513-653) with 23,800 to 60,000 Btuh (7.0 to 17.6 kW) cooling capacity and 22,800 to 61,000 Btuh (6.7 to 17.9 kW) heating capacity. **NOTE** — "R" models are not available in Canada.

The CHP20V-410-510-650 non "R" single and three phase voltage models are available with a choice of thermostat and related controls which include: electro-mechanical, W973, T7300 and W7400. In addition a factory installed commercial controls platform consisting of: control system and economizer wiring harness is furnished as standard. The commercial controls platform and related control systems are not available on the CHP20RV models.

Optional accessories include: supplemental electric heaters, outdoor coil guards (CHP20V non "R" models), down-flo filter adaptor kit (CHP20RV models), roof mounting frames, stand-off mounting kit, down-flo or horizontal economizer dampers with modulating or 3 position damper motor (CHP20V non "R" models), step-down or flush ceiling supply and return air diffusers and manual outdoor air dampers. See Optional Accessories tables.

Approvals — Units have been tested in the Lennox Research Laboratory environmental test room and rated according to Department of Energy (DOE) test procedures and in accordance with ARI Standard 210/240-89. In addition, units are tested and listed by Underwriter's Laboratories and have been sound rated in the Lennox reverberant sound test room in accordance with ARI Standard 270-84. DOE covered products are rated under 65,000 Btuh (19.0 kW) with single and three phase power input. Units and components within are bonded for grounding to meet safety standards for servicing required by U.L., C.S.A., NEC and CEC. Optional electric heaters are U.L. and C.S.A. listed and rated and tested according to DOE test procedures and Federal Trade Commission (FTC) labeling regulations. 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 10 years in residential applications and 5 years in non-residential applications. All other covered components have a limited warranty for five years in residential applications and 1 year in non-residential applications. Refer to Lennox Equipment Limited Warranty furnished with the equipment for details.

Cabinet — Rugged cabinet is constructed of heavy gauge galvanized steel and completely insulated with thick fiberglass insulation. Pre-painted steel cabinets have an outside paint finish of mildly textured enamel with a primer coat on all unpainted inside surfaces. Large removable cabinet panels allow service access. 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 with CHP20V non "R" models. Electrical inlets are furnished for entry into the cabinet. Indoor coil drain pan is constructed of corrosion resistant painted galvanized steel and is equipped with a galvanized pipe (mpt) drain outlet. Coil guards are furnished on all CHP20RV models. Lifting brackets are factory installed on all models.

Refrigeration System — Complete factory sealed refrigeration system consists of: compressor, outdoor coil and fan, indoor coil and blower, high pressure switch (manual reset), reversing valve, suction and liquid line service gauge ports and full operating charge of refrigerant. All models have a check and expansion valve and thermometer well. CHP20V non "R" models have factory installed loss of charge switch.

FEATURES (Continued)

Copeland® Compliant Scroll Compressor — High efficiency compressor features durability, steady uniform suction flow, constant discharge flow, high volumetric efficiency, quiet operation and the ability to start under any system load. Use of the scroll compressor eliminates the need for accumulator, start capacitor and start relay. The compliant scroll type compressor is a simple compression concept design consisting of two involute spiral coils matched together to create a series of crescent-shaped gas pockets between them. During compression, one scroll remains stationary while the other is allowed to orbit, not rotate, around the fixed one. As this motion occurs, gas is drawn into the outer pocket sealing off the open passage. As the spiral movement continues, the pockets between the scrolls are pushed to the center of the scrolls while simultaneously being reduced in volume. When the pocket reaches the center, the gas is now at high pressure and is forced out of a port located in the center of the fixed scroll. During compression, several pockets are being compressed simultaneously resulting in a smooth nearly continuous compression cycle. Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency. The scroll compressor is tolerant to the effects of liquid slugging and contaminants. Should this occur, the scrolls separate and allow the liquid or contaminants to be worked to the center and discharged. Low gas pulses during compression minimize operational sound level. Motor is inherently protected from excessive current and temperature. Compressor is installed on resilient rubber mounts, assuring vibration free operation.

Copper Tube/Enhanced Fin Indoor and Outdoor 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. Indoor coils feature rifled copper tubing for superior refrigerant flow resulting in maximum heat transfer.

Defrost Control — A solid state clock timer defrost control provides a defrost cycle, if needed, every 30 or 60 or 90 minutes (adjustable) of compressor "on" time at outdoor temperature below 45°F (7°C). A thermostat mounted on the outdoor coil determines when the defrost cycle is required and also when to terminate a cycle.

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 VSM motor is resiliently mounted. Three switches (continuous blower, electric heating speed and heat pump cooling/heating speed) on motor control blower speed. Six different positions on each switch allow a variety of blower speeds. See blower performance tables.

BDC1 Blower Control — Electronic blower control interfaces the VSM motor with the thermostat. Control allows blower to operate at three of the six speeds available. Control is factory installed in the unit control box. The BDC1 control has three diagnostic indicator LED's (ON/OFF - HEAT - HI/LOW) to assist in servicing.

Efficient Outdoor Coil Fan — Direct drive fan draws air through the outdoor 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.

Commercial Controls Platform (CHP20V Non "R" Models) — A commercial controls platform is furnished and factory installed on the CHP20V non "R" single and three phase voltage 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.

Air Filters (Furnished on CHP20V Non "R" Models Only) — Cleanable polyurethane one inch (25 mm) thick filter and filter rack is furnished for field installation in CHP20V non "R" models for down-flo applications. Filter rack will accept up to two inch (51 mm) thick filter. For horizontal applications without economizer, filter must be field installed in return air duct. DF16 Down-Flo Filter Adaptor is available for CHP20RV models and must be ordered extra.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Supplemental 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. Cutoff fuses are mounted external to the element face plate for quick and easy replacement. Heaters are also equipped with a thermal relay sequencer to bring the 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 (56A87) and mounting box M-1595 (31461) must be ordered extra.

'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. (2 kg) See Electric Heat Data tables for usage.

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. (2 kg) See Electric Heat Data tables for usage.

Thermostat (Optional) — Thermostat is not furnished and must be ordered extra. CHP20RV models require a standard heat pump thermostat. See Thermostats bulletin in Accessories section and Lennox Price Book. For thermostat and related controls for the CHP20V non "R" single and three phase voltage models see page 4.

Low Ambient Kit (Optional) — 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-57113BM (27J00) can be added in the field, enabling it to operate properly down to 30°F (-1°C).

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Timed-Off Control (Optional) — Timed-off control LB-50709BA (32F21) is available for field installation. Prevents compressor short-cycling and also allows time for suction and discharge pressure to equalize on all models, permitting the compressor to start in an unloaded condition. Automatic reset control provides a time delay between compressor shutoff and start-up.

Outdoor Coil Guards (Optional For CHP20V Non "R" Models) — PVC coated steel wire coil guards are available and must be ordered extra. CHP20V-410 require 2 per unit, LB-82199CF (47J23). CHP20V-510-650 models require 3 per unit, LB-82199CG (47J24). Correct number of guards are furnished per order number. Coil guards are furnished as standard with CHP20RV models.

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 U.S. National Roofing Contractor's Association. RMF16-41 may be used with all sizes of CHP20(R)V models with slight overhang on the CHP20(R)V-461-510 & -650 models. RMF16-65 frame exactly matches the CHP20(R)V-461-510 & -650 models.

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.

REMD16 Economizer (Optional for CHP20V Non "R" Models Only) — Economizer field installs directly in CHP20V 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 three position 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. REMD16 utilizes existing filter supplied with CHP20V units. Filter rack will accept up to two-inch (51 mm) thick filter. See Air Resistance table, page 21 for resistance data of two-inch (51 mm) pleated non-woven cotton fabric or two-inch (51 mm) fiberglass media filter. Removable exhaust air hood allows access to filter. Outdoor air intake hood is field installed. A cleanable aluminum mesh frame filter in the outdoor air hood provides extra air filtering and bird screen protection.

REMD16M Economizer (Optional) — The REMD16M economizer damper section is identical to the REMD16 model except it is equipped with a fully modulating spring return damper motor. See Specifications table.

EMDH16 Horizontal Economizer (Optional for CHP20V Non "R" Models Only) — 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 three position 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 (25 mm) thick frame type disposable filter is furnished. Filter rack will accept up to two-inch (51 mm) thick filter. Removable panel allows easy access to filter. A cleanable aluminum mesh frame filter in the outdoor air hood provides extra air filtering and bird screen protection.

EMDH16M Economizer (Optional) — The EMDH16M horizontal economizer damper section is identical to the EMDH16 model except it is equipped with a fully modulating spring return damper motor. See Specifications table.

GEDH16-65 Gravity Exhaust Dampers (Optional) — Available for use with EMDH16 horizontal economizer assembly. Pressure operated assembly (23H06) 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 (54G44) 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 field installs in the REMD16 or EMDH16 economizer damper section and must be ordered extra.

OAD16 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.

DF16 Down-Flo Filter Adaptor Kit (Optional for CHP20RV Models Only) — Heavy gauge steel filter rails field install on down-flo return air opening. One-inch (25 mm) thick cleanable frame type filter is furnished as standard. Filter rails are designed to accept up to two-inch (51 mm) thick filter. See Air Resistance table, page 21 for resistance data of two-inch (51 mm) pleated non-woven cotton fabric or two-inch (51 mm) fiberglass media filter. Filter access is accomplished by removing unit blower access panel. See Optional Accessories table for filter size.

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 (1.0 m) 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-in. (13 mm) (18H71) 1-in. (25 mm) (18H72) 1-1/2-in. (38 mm).

RTD9-65 Combination Ceiling Supply and Return Diffuser (Optional) — RTD9-65 step-down mount diffuser (27G87) 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 Optional Accessories tables.

FD9-65 Combination Ceiling Supply and Return Diffuser (Optional) — FD9-65 flush mount diffuser (27G86) 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 Optional Accessories tables.

SRT16 Supply and Return Transitions (Optional) — Transitions (15H02) 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 Optional Accessories tables.

OPTIONAL TEMPERATURE CONTROL SELECTION (Non "R" Models Only)

Optional Electro-Mechanical Thermostat and Control System — The thermostat and related controls of this system must be ordered extra for field installation. 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 (**43G98**) 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 (**43G99**) 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. 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.

Optional W7400 Control System — Control system must be ordered extra for field installation. 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**) with integral sensor that installs in the conditioned space or a remote thermostat (**36G64**) 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 Flow Chart on page 6.

Optional W973 Control System — Control system must be ordered extra for field installation. 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 (**43G98**) 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 (**43G99**) 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. Also available is a Warm Up Kit (**39G77**) which holds the economizer outdoor air dampers closed during nite heat operation and warm up. See Flow Chart on page 5.

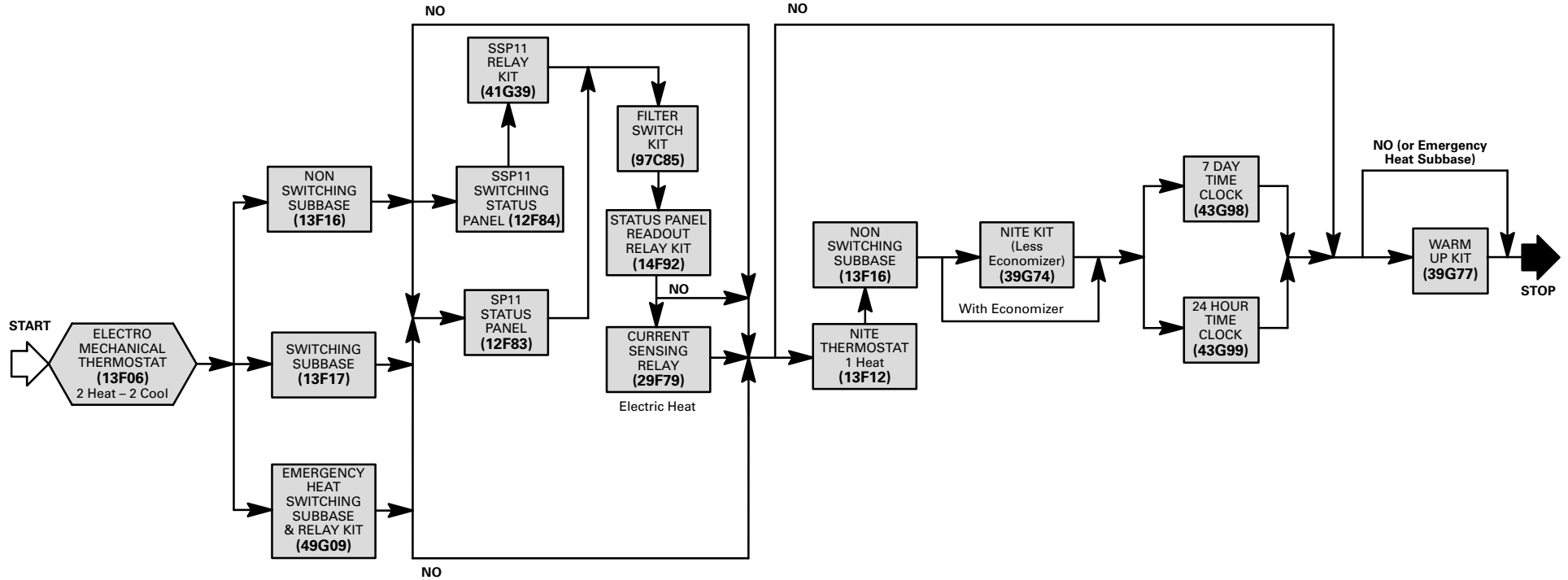
Optional T7300 Thermostat and Control System — The thermostat and related controls of this system must be ordered extra for field installation. T7300 programmable thermostat (**81G59**) has internal or optional remote temperature sensing, touch sensitive keyboard, automatic switching from heat to cool, °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**) features 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.

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 and must be specified when ordering. Filter Switch Kit (**97C85**) is used with the Filter light. Status Panel Readout Relay Kit (**14F92**) is required to interface status panel with unit operation. Current Sensing Relay (**29F79**) is required for operation of No Heat light with electric heat.

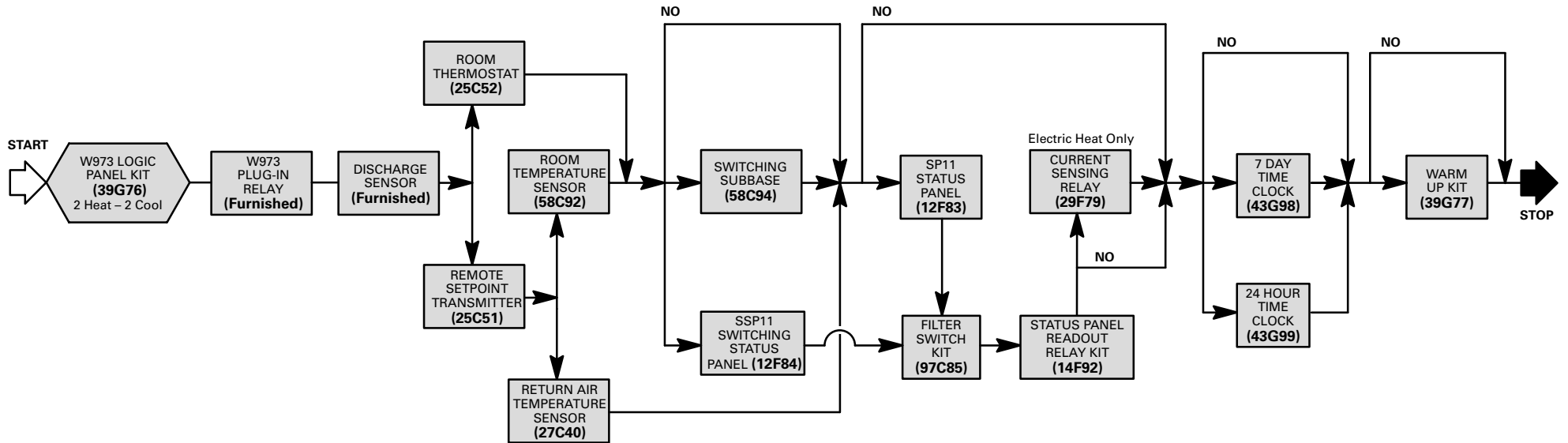
SSP11 Remote Switching Status Panel (Optional) — The operation of the unit can be controlled and observed on the Switching Status panel (**12F84**) conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode", "Heat Mode", "Compressor 1", "Compressor 2", "No Heat" 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. Status Panel Readout Relay Kit (**14F92**) is required to interface status panel with unit operation. Current Sensing Relay (**29F79**) is required for operation of No Heat light with electric heat.

CONTROL SYSTEM SELECTION FLOWCHARTS – Non “R” Models Only

OPTIONAL ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM

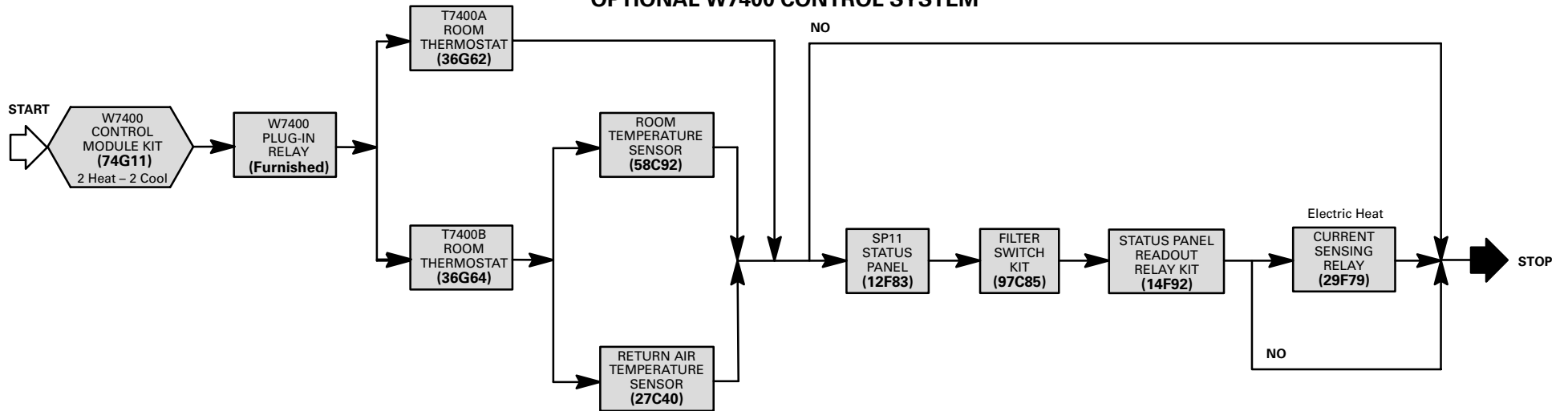


OPTIONAL W973 CONTROL SYSTEM

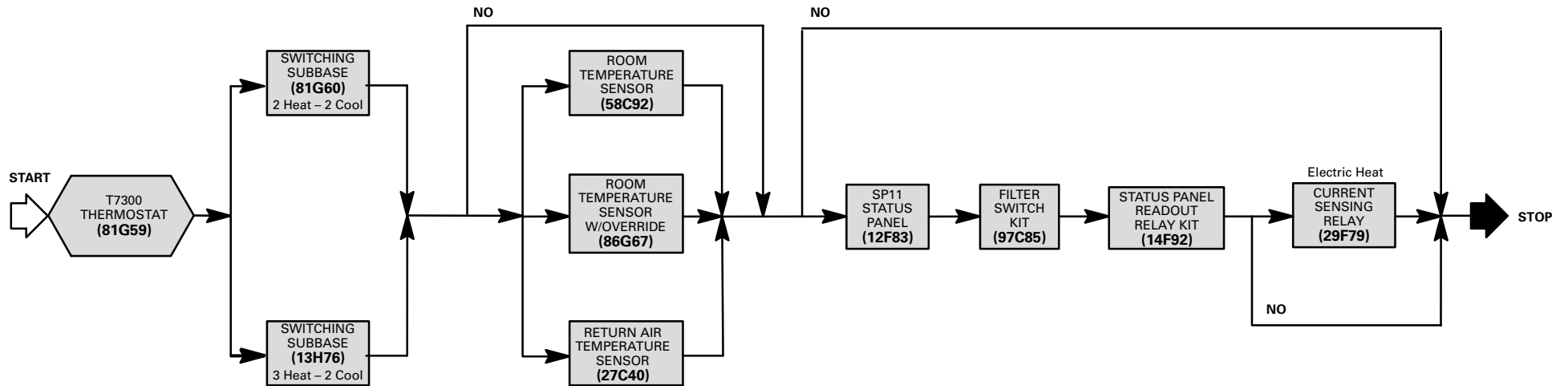


CONTROL SYSTEM SELECTION FLOWCHARTS – Non “R” Models Only

OPTIONAL W7400 CONTROL SYSTEM



OPTIONAL T7300 CONTROL SYSTEM



SPECIFICATIONS — CHP20(R)V-261-311-411-413

Model No.		CHP20RV-261	CHP20RV-311	CHP20RV-411 CHP20V-411 CHP20V-413	
*ARI Cooling Ratings	Cooling Capacity — Btuh (kW)	23,800 (7.0)	29,600 (8.7)	34,200 (10.0)	
	Total unit watts	2270	2725	3310	
	SEER (Btuh/Watts)	12.55	12.35	12.10	
	EER (Btuh/Watts)	10.50	10.90	10.40	
*ARI Certified High Temperature Heating Ratings	Total Capacity — Btuh (kW)	22,800 (6.7)	28,400 (8.3)	34,200 (10.0)	
	Total unit watts	1970	2415	2975	
	C.O.P	3.46	3.50	3.22	
	**HSPF — Region IV (Region V)	7.20 (6.05)	7.25 (6.20)	7.05 (6.20)	
*ARI Certified Low Temperature Heating Ratings	Total Capacity — Btuh (kW)	13,200 (3.9)	16,200 (4.7)	20,400 (6.0)	
	Total unit watts	1785	2195	2690	
	C.O.P	2.16	2.18	2.22	
★Sound Rating Number (bels)		8.0	8.0	8.0	
Refrigerant Charge (HCFC-22)		5 lbs. 0 oz. (2.27 kg)	5 lbs. 10 oz. (2.55 kg)	6 lbs. 8 oz. (2.95 kg)	
Indoor Coil Blower	Blower wheel nominal diameter x width — in. (mm)	10 x 7 (254 x 178)	10 x 7 (254 x 178)	10 x 7 (254 x 178)	
	Motor output — hp (W)	1/2 (373)	1/2 (373)	1/2 (373)	
Indoor Coil	Net face area — sq. ft. (m ²)	3.2 (0.30)	4.1 (0.38)	4.1 (0.38)	
	Tube diameter — in. (mm) & No. of rows	3/8 (9.5) — 3	3/8 (9.5) — 3	3/8 (9.5) — 3	
	Fins per inch (m)	15 (591)	15 (591)	15 (591)	
Outdoor Coil	Net face area — sq. ft. (m ²)	Outer coil	8.6 (0.80)	8.6 (0.80)	8.6 (0.80)
		Inner coil	5.3 (0.49)	8.3 (0.77)	8.3 (0.77)
	Tube diameter — in. (mm) & no. of rows	3/8 (9.5) — 1.6	3/8 (9.5) — 2	3/8 (9.5) — 2	
	Fins per inch (m)	20 (787)	20 (787)	20 (787)	
Outdoor Coil Fan(s)	Diameter — in. (mm) & No. of blades	20 (508) — 4	20 (508) — 4	20 (508) — 4	
	Air Volume — cfm (L/s)	2350 (1110)	2200 (1040)	2200 (1040)	
	Motor output — hp (W)	1/6 (124)	1/6 (124)	1/6 (124)	
	Motor watts	220	220	220	
Condensate drain size mpt — in. (mm)		3/4 (19)	3/4 (19)	3/4 (19)	
●No. & size of filters — in. (mm)		●Not Furnished		●(1) 16 x 25 x 1 (406 x 635 x 25) (polyurethane)	
Net weight of basic unit — lbs. (kg)		338 (153)	352 (160)	355 (161)	
Shipping weight of basic unit — lbs. (kg) (1 Package)		402 (182)	416 (189)	419 (190)	
Electrical characteristics (60 hz)		208/230v-1ph	208/230v-1ph	208/230v-1ph or 3 ph	
†Commercial Controls Platform		----		Furnished and Factory Installed (non "R" models only)	

★Sound Rating Number in accordance with ARI Standard 270.

*Rated in accordance with ARI Standard 210/240.

Cooling Ratings— 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19.5°C) wb entering indoor coil air.

High Temperature Heating Ratings— 47°F (8°C) db/43°F (6°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.

Low Temperature Heating Ratings— 17°F (-8°C) db/15°F (-9°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.

**Heating Seasonal Performance Factor.

†Furnished as standard on CHP20V non "R" models only. Consists of: factory installed controls system and economizer wiring harness.

●Filters are not furnished with CHP20RV models. Down-flo applications require DF16 Down-flo Filter Kit, see Accessories Table. Filters are furnished with CHP20V non "R" models.

SPECIFICATIONS — CHP20(R)V-461-511-513-651-653

Model No.		CHP20RV-461	CHP20RV-511 CHP20V-511 CHP20V-513	CHP20RV-651 CHP20V-651 CHP20V-653
*ARI Cooling Ratings	Cooling Capacity — Btuh (kW)	44,000 (12.9)	49,000 (14.4)	60,000 (17.6)
	Total unit watts	4010	4535	5930
	SEER (Btuh/Watts)	12.55	12.60	12.00
	EER (Btuh/Watts)	10.90	10.80	10.10
*ARI Certified High Temperature Heating Ratings	Total Capacity — Btuh (kW)	41,500 (12.2)	49,000 (14.4)	61,000 (17.9)
	Total unit watts	3785	4335	6005
	C.O.P	3.26	3.30	3.00
	**HSPF — Region IV (Region V)	7.55 (6.75)	7.45 (6.45)	7.20 (6.55)
*ARI Certified Low Temperature Heating Ratings	Total Capacity — Btuh (kW)	26,600 (7.8)	31,200 (9.1)	39,600 (11.6)
	Total unit watts	3450	3940	5230
	C.O.P	2.26	2.32	2.22
★Sound Rating Number (bels)		8.2	8.2	8.4
Refrigerant Charge (HCFC-22)		9 lbs. 12 oz. (4.42 kg)	10 lbs. 8 oz. (4.76 kg)	10 lbs. 8 oz. (4.76 kg)
Indoor Coil Blower	Blower wheel nominal diameter x width — in. (mm)	11 x 8 (279 x 203)	11 x 8 (279 x 203)	11 x 8 (279 x 203)
	Motor output — hp (W)	1 (746)	1 (746)	1 (746)
Indoor Coil	Net face area — sq. ft. (m ²)	5.8 (0.54)	5.8 (0.54)	5.8 (0.54)
	Tube diameter — in. (mm) & No. of rows	3/8 (9.5) — 3	3/8 (9.5) — 3	3/8 (9.5) — 3
	Fins per inch (m)	15 (591)	15 (591)	15 (591)
Outdoor Coil	Net face area — sq. ft. (m ²)	Outer coil	14.3 (1.33)	14.3 (1.33)
		Inner coil	9.9 (0.92)	13.8 (1.28)
	Tube diameter — in. (mm) & no. of rows	3/8 (9.5) — 1.7	3/8 (9.5) — 2	3/8 (9.5) — 2
	Fins per inch (m)	20 (787)	20 (787)	20 (787)
Outdoor Coil Fan(s)	Diameter — in. (mm) & No. of blades		24 (610) — 4	24 (610) — 3
	Air Volume — cfm (L/s)		3600 (1700)	4000 (1890)
	Motor output — hp (W)		1/4 (187)	1/3 (249)
	Motor watts		340	430
Condensate drain size mpt — in. (mm)		3/4 (19)	3/4 (19)	3/4 (19)
●No. & size of filters — in. (mm)		●Not Furnished	(1) 20 x 25 x 1 (508 x 635 x 25) (polyurethane)	
Net weight of basic unit — lbs. (kg)		455 (206)	537 (244)	545 (247)
Shipping weight of basic unit — lbs. (kg) (1 Package)		565 (256)	593 (269)	601 (273)
Electrical characteristics (60 hz)		208/230v-1ph	208/230v-1ph or 3 ph	
†Commercial Controls Platform		Furnished and Factory Installed (non “R” models only)		

★Sound Rating Number in accordance with ARI Standard 270.

*Rated in accordance with ARI Standard 210/240.

Cooling Ratings— 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19.5°C) wb entering indoor coil air.

High Temperature Heating Ratings— 47°F (8°C) db/43°F (6°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.

Low Temperature Heating Ratings— 17°F (-8°C) db/15°F (-9°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.

**Heating Seasonal Performance Factor.

†Furnished as standard on CHP20 non “R” models only. Consists of: factory installed controls system and economizer wiring harness.

●Filters are not furnished with CHP20RV models. Down-flo applications require DF16 Down-flo Filter Kit, see Accessories Table. Filters are furnished with CHP20V non “R” models.

OPTIONAL ACCESSORIES – CHP20V-410-510-650 Non “R” Models (Must Be Ordered Extra)

Unit Model No.			CHP20V-411 CHP20V-413	CHP20V-511 CHP20V-513	CHP20V-651 CHP20V-653
Electric Heat Model No. and Ratings	ECH16R-5	Output – Btuh (kW)	19,000 (5.6)	----	
		*A.F.U.E.	99.0%	----	
	ECH16R-7 ECH16-7	Output – Btuh (kW)	26,000 (7.6)	27,000 (7.9)	
		*A.F.U.E.	99.0%	99.0%	
	ECH16R-10 ECH16-10	Output – Btuh (kW)	36,000 (10.5)	37,000 (10.8)	
		*A.F.U.E.	99.0%	99.0%	
	ECH16-15	Output – Btuh (kW)	53,000 (15.6)	54,000 (15.8)	
		*A.F.U.E.	99.0%	99.0%	
	ECH16-20	Output – Btuh (kW)	70,000 (20.5)	71,000 (20.8)	
		*A.F.U.E.	99.0%	99.0%	
	ECH16-25	Output – Btuh (kW)	----	88,000 (25.8)	
		*A.F.U.E.	----	99.0%	
Outdoor Thermostat Kit		Thermostat Kit	LB-29740BA (56A87)		
		Mounting Box	M-1595 (31461)		
Outdoor Coil Guards			LB-82199CF (47J23)	LB-82199CG (47J24)	
Outdoor Air Dampers (Manual) – (Net Weight) filter media size – in. (mm)			OAD16-41 (12 lbs.) (5 kg) (15H00) 5 x 17 x 1 (127 x 432) x 25)	OAD16-65 (12 lbs.) (5 kg) (15H01) 8 x 17 x 1 (203 x 432) x 25)	
Roof Curb Power Entry Kit (conduit size) – in. (mm)			1/2 in. (12 mm) (18H70) 1 in. (25 mm) (18H71) 1-1/2 in. (38 mm) (18H72)		
Roof Mounting Frame – (Net Weight)			RMF16-41 (75 lbs.) (34 kg) (73H79)	RMF16-41 (75 lbs.) (34 kg) (73H79) or RMF16-65 (86 lbs.) (39 kg) (73H81)	
Stand-off Mounting Kit			(38H18) contains six stand-offs		
Economizer Dampers with Gravity Exhaust	Model No.	3 position – (Net Weight)	REMD16-41 (41 lbs.) (19 kg) (58H73)	REMD16-65 (66 lbs.) (30 kg) (58H75)	
		Modulating – (Net Weight)	REMD16M-41 (41 lbs.) (19 kg) (58H72)	REMD16M-65 (66 lbs.) (30 kg) (58H74)	
	No. and size of filters in. (mm)	Indoor	●(1) 16 x 25 x 1 (406 x 635 x 25)	●(1) 20 x 25 x 1 (508 x 635 x 25)	
		Outdoor	(1) 13-3/4 x 25 x 1 (349 x 635 x 25) (aluminum mesh)	(1) 17-3/4 x 25 x 1 (451 x 635 x 25) (aluminum mesh)	
Horizontal Economizer Dampers	Model No.	3 position – (Net Weight)	EMDH16-41 (110 lbs.) (50 kg) (14H97)	EMDH16-65 (130 lbs.) (59 kg) (14H98)	
		Modulating – (Net Weight)	EMDH16M-41 (110 lbs.) (50 kg) (23H03)	EMDH16M-65 (130 lbs.) (59 kg) (23H02)	
	No. and size of filters in. (mm)	Indoor	(1) 20 x 25 x 1 (517 x 620635 x 25) (fiberglass)	(2) 14 x 25 x 1 (356 x 635 x 25) (fiberglass)	
		Outdoor	(1) 8 x 24 x 1 (203 x 620 x 25) (aluminum mesh)	(1) 8 x 28 x 1 (203 x 711 x 25) (aluminum mesh)	
Gravity Exhaust Dampers – (Net Weight)			GEDH16-65 (4 lbs.) (2 kg) (23H06) use with EMDH16		
Differential Enthalpy Control			(54G44) use with REMD16 or EMDH16		
Low Ambient Control Kit			LB-57113BM (27J00)		
Timed-Off Control			LB-50709BA (32F21)		
Ceiling Supply and Return Air Diffusers (Net Weight)	Step-Down	RTD9-65 (67 lbs.) (30 kg) (27G87)			
	Flush	FD9-65 (37 lbs.) (17 kg) (27G86)			
	Transition	SRT16-65 (20 lbs.) (9 kg) (15H02)			

*Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.

●Indoor filter is not furnished with economizer. REMD16 utilizes filter furnished with CHP20V unit.

OPTIONAL ACCESSORIES — CHP20RV-261-311-411-461-511-651 (Must Be Ordered Extra)

Unit Model No.		CHP20RV-261	CHP20RV-311	CHP20RV-411	CHP20RV-461	CHP20RV-511	CHP20RV-651	
Electric Heat Model No. and Ratings	ECH16R-5	Output — Btuh (kW)	19,000 (5.6)	19,000 (5.6)	19,000 (5.6)	----		
		*A.F.U.E.	99.0%	99.0%	99.0%	----		
	ECH16R-7 ECH16-7	Output — Btuh (kW)	26,000 (7.6)	27,000 (7.9)	26,000 (7.6)	27,000 (7.9)		
		*A.F.U.E.	99.0%	99.0%	99.0%	99.0%		
	ECH16R-10 ECH16-10	Output — Btuh (kW)	36,000 (10.5)	37,000 (10.8)	36,000 (10.5)	37,000 (10.8)		
		*A.F.U.E.	99.0%	99.0%	99.0%	99.0%		
	ECH16-15	Output — Btuh (kW)	53,000 (15.6)	54,000 (15.8)	53,000 (15.6)	54,000 (15.8)		
		*A.F.U.E.	99.0%	99.0%	99.0%	99.0%		
	ECH16-20	Output — Btuh (kW)	----		70,000 (20.5)	71,000 (20.8)		
		*A.F.U.E.	----		99.0%	99.0%		
	ECH16-25	Output — Btuh (kW)	----			88,000 (25.8)		
		*A.F.U.E.	----			99.0%		
	Outdoor Thermostat Kit	Thermostat Kit	LB-29740BA (56A87)					
		Mounting Box	M-1595 (31461)					
Stand-Off Mounting Kit		(38H18) contains six stand-offs						
Outdoor Air Dampers (Manual) — (Net Weight) filter media size — in. (mm)		OAD16-41 (12 lbs.) (5 kg) (15H00) 5 x 17 x 1 (127 x 432 x 25)			OAD16-65 (12 lbs.) (5 kg) (15H01) 8 x 17 x 1 (203 x 432 x 25)			
Roof Curb Power Entry Kit (conduit size)		1/2 in. (38 mm) (18H70) 1 in. (25 mm) (18H71) 1-1/2 in. (38 mm) (18H72)						
Roof Mounting Frame — (Net Weight)		RMF16-41 (75 lbs.) (34 kg) (73H79)			RMF16-41 (75 lbs.) (34 kg) (73H79) or RMF16-65 (86 lbs.) (39 kg) (73H81)			
Down-Flo Filter Adaptor Kit	Model No.	DF16-41 (21H59)			DF16-65 (21H60)			
	No. & size of filters — in. (mm)	(1) 16 x 25 x 1 (406 x 635 x 25) (polyurethane)			(1) 20 x 25 x 1 (508 x 635 x 25) (polyurethane)			
Ceiling Supply and Return Air Diffusers (Net Weight)	Step-Down	RTD9-65 (67 lbs.) (30 kg) (27G87)						
	Flush	FD9-65 (37 lbs.) (17 kg) (27G86)						
	Transition	SRT16-65 (20 lbs.) (9 kg) (15H02)						
Low Ambient Control Kit		LB-57113BM (27J00)						

*Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.

ELECTRICAL DATA — CHP20(R)V-261-311-411-461-511-651 — SINGLE PHASE VOLTAGE

Model No.		CHP20RV-261	CHP20RV-311	CHP20(R)V-411	CHP20RV-461	CHP20(R)V-511	CHP20(R)V-651
Line voltage data (60 Hz — 1 phase)		208/230v	208/230v	208/230v	208/230v	208/230v	208/230v
Compressors	Rated load amps	11.6	13.5	16.1	19.9	23.7	28.9
	Locked rotor amps	62.5	76.0	88.0	107.0	129.0	169.0
Outdoor Coil Fan Motor	Full load amps	1.1	1.1	1.1	2.3	2.3	2.3
	Locked rotor amps	2.2	2.2	2.2	4.4	4.4	4.8
Indoor Coil Blower Motor	Full load amps	6.0	6.0	6.0	8.2	8.2	8.2
**Recommended maximum fuse size (amps)		30	35	40	50	60	70
*Minimum Circuit Ampacity		22.0	24.0	28.0	36.0	41.0	47.0
Unit power factor		.97	.91	.94	.89	.91	.99

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

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

**Where current does not exceed 100 amps, HACR type circuit breaker may be used in place of fuse.

ELECTRICAL DATA — CHP20V-413-513-653 — THREE PHASE VOLTAGE

Model No.		CHP20V-413	CHP20V-513	CHP20V-653
Line voltage data (60 Hz — 3 phase)		208/230v	208/230v	208/230v
Compressors	Rated load amps	10.3	13.5	17.3
	Locked rotor amps	77.0	99.0	123.0
Outdoor Coil Fan Motor	Full load amps	1.1	2.3	2.3
	Locked rotor amps	2.2	4.4	4.8
Indoor Coil Blower Motor (1 phase)	Full load amps	6.0	8.2	8.2
**Recommended maximum fuse size (amps)		30	40	45
*Minimum Circuit Ampacity		20.0	28.0	33.0
Unit power factor		.80	.87	.86

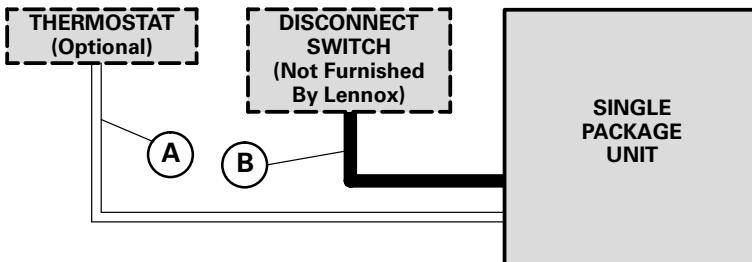
*Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

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

**Where current does not exceed 100 amps, HACR type circuit breaker may be used in place of fuse.

†Motor rated at 230 volts. Full load amps shown are for step-down transformer output.

FIELD WIRING — CHP20RV MODELS



- A — Five Wire Low Voltage (Electro-mechanical)
- Six Wire Low Voltage (Electronic)
- B — Two Wire Power (See Electrical Data Table)
- Field Wiring Not Furnished —

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

OPTIONAL CONTROL SYSTEMS FIELD WIRING – NON “R” MODELS ONLY

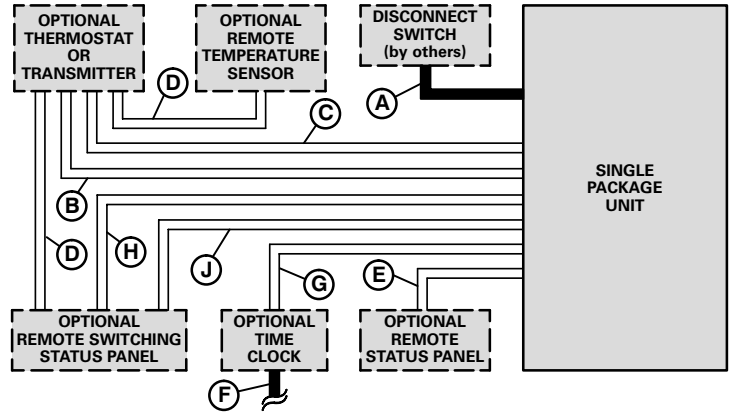
W973 CONTROL SYSTEM

- 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
 - 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 low voltage – AC only
 - 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

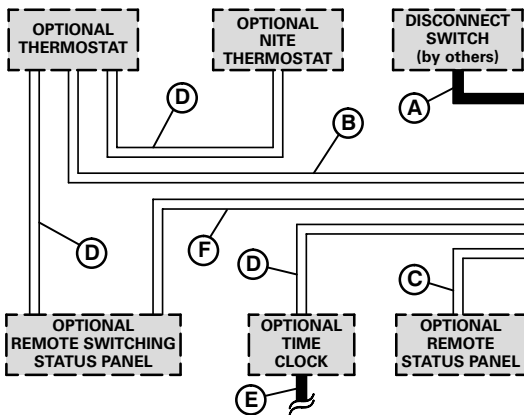
NOTE – Run separate harness for AC and DC.
AC voltage interferes with DC signals.

– Field wiring not furnished –

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



ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM



- A – Two or three wire power (See Electrical Data Table)
- B – Six wire low voltage
 - Five wire low voltage – with SSP11 Switching Status Panel
 - Ten 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 –

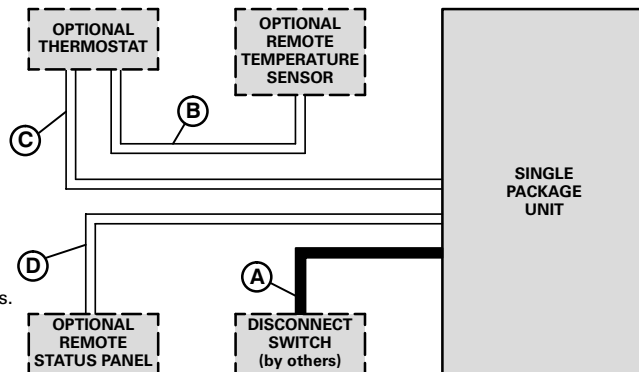
NOTE – All wiring must conform to NEC or CEC and local electrical codes.

W7400 CONTROL SYSTEM

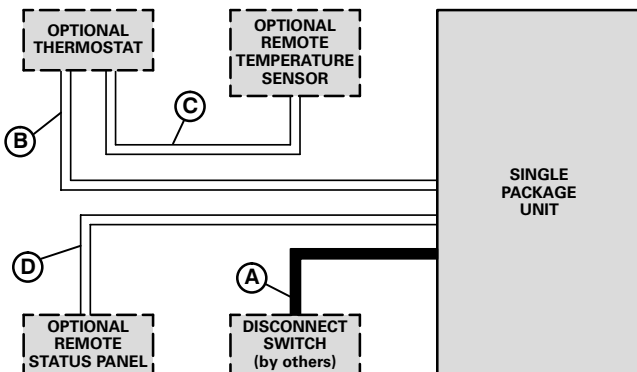
- A – Two or three wire power (See Electrical Data Table)
- B – Two wire low voltage
- C – Four wire low voltage
- D – Eleven wire low voltage

– Field wiring not furnished –

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



T7300 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 (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.

ELECTRIC HEAT DATA – CHP20R-261-311

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
CHP20RV-261	ECH16R-5 (31H46) (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5 (31H26)	ECH16-261 (31H10)	44.1
			220	23.9	4.2	14,300			45.4
			230	24.9	4.6	15,700			46.4
			240	26.0	5.0	17,100			47.5
	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)		53.1
			220	33.5	5.9	20,100			54.9
			230	35.0	6.4	21,800			56.5
			240	36.5	7.0	23,900			58.0
	ECH16R-10 (31H48) (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)		66.6
			220	47.8	8.4	28,700			69.2
			230	50.0	9.2	31,400			71.4
			240	52.1	10.0	34,100			73.6
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----		89.2
			220	71.6	12.6	43,000			93.1
			230	74.9	13.8	47,100			96.4
			240	78.1	15.0	51,200			99.6
CHP20RV-311	ECH16R-5 (31H46) (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5 (31H26)	ECH16-311 (31H11)	46.6
			220	23.9	4.2	14,300			47.9
			230	24.9	4.6	15,700			48.9
			240	26.0	5.0	17,100			50.0
	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)		55.6
			220	33.5	5.9	20,100			57.4
			230	35.0	6.4	21,800			59.0
			240	36.5	7.0	23,900			60.5
	ECH16R-10 (31H48) (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)		69.1
			220	47.8	8.4	28,700			71.7
			230	50.0	9.2	31,400			73.9
			240	52.1	10.0	34,100			76.1
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----		91.7
			220	71.6	12.6	43,000			95.6
			230	74.9	13.8	47,100			98.9
			240	78.1	15.0	51,200			102.1

*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).

ELECTRIC HEAT DATA — CHP20(R)V-411-413

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
CHP20(R)V-411	ECH16R-5 (31H46) (4 lbs.) (2kg)	1 step (1 phase)	208	22.5	3.7	12,600	ECH16R-26/41-5 (31H26)	ECH16-411 (31H12)	49.9
			220	23.9	4.2	14,300			51.1
			230	24.9	4.6	15,700			52.2
			240	26.0	5.0	17,100			53.2
	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)		58.9
			220	33.5	5.9	20,100			60.7
			230	35.0	6.4	21,800			62.2
			240	36.5	7.0	23,900			63.7
	ECH16R-10 (31H48) (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)		72.4
			220	47.8	8.4	28,700			75.0
			230	50.0	9.2	31,400			77.2
			240	52.1	10.0	34,100			79.4
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----		95.0
			220	71.6	12.6	43,000			98.9
			230	74.9	13.8	47,100			102.2
			240	78.1	15.0	51,200			105.4
	ECH16-20 (31H28) (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----		117.5
			220	95.5	16.8	57,300			122.7
			230	99.8	18.4	62,800			127.1
			240	104.1	20.0	68,300			131.4
CHP20V-413	ECH16-5 208/230v (31H30) (19 lbs.) (9kg)	1 step (3 phase)	208	13.0	3.7	12,600	----	ECH16-413 (31H15)	33.3
			220	13.8	4.2	14,300			33.9
			230	14.4	4.6	15,700			34.5
			240	15.0	5.0	17,100			35.0
	ECH16-7 208/230v (31H31) (19 lbs.) (9kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-413 (31H15)	38.2
			220	19.3	5.9	20,100			39.3
			230	20.1	6.4	21,800			40.1
			240	21.0	7.0	23,900			41.0
	ECH16-10 208/230v (31H32) (19 lbs.) (9kg)	1 step (3 phase)	208	26.1	7.5	25,600	----	ECH16-413 (31H15)	46.0
			220	27.6	8.4	28,700			47.5
			230	28.9	9.2	31,400			48.8
			240	30.1	10.0	34,100			50.1
	ECH16-15 208/230v (31H33) (19 lbs.) (9kg)	1 step (3 phase)	208	39.1	11.3	38,600	----	ECH16-413 (31H15)	59.1
			220	41.4	12.6	43,000			61.4
			230	43.2	13.8	47,100			63.2
			240	45.1	15.0	51,200			65.1
	ECH16-20 208/230v (31H34) (22 lbs.) (10kg)	2 steps (3 phase)	208	52.1	15.0	51,200	----	ECH16-413 (31H15)	72.1
			220	55.1	16.8	57,300			75.1
			230	57.6	18.4	62,800			77.6
			240	60.1	20.0	68,300			80.1

*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).

ELECTRIC HEAT DATA – CHP20RV-461

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
CHP20RV-461	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)	ECH16-511 (31H13)	67.0
			220	33.5	5.9	20,100			68.8
			230	35.0	6.4	21,800			70.4
			240	36.5	7.0	23,900			71.9
	ECH16R-10 (31H48) (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)		80.5
			220	47.8	8.4	28,700			83.1
			230	50.0	9.2	31,400			85.3
			240	52.1	10.0	34,100			87.5
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----		103.1
			220	71.6	12.6	43,000			107.0
			230	74.9	13.8	47,100			110.3
			240	78.1	15.0	51,200			113.5
	ECH16-20 (31H28) (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----		125.6
			220	95.5	16.8	57,300			130.8
			230	99.8	18.4	62,800			135.2
			240	104.1	20.0	68,300			139.5
	ECH16-25 (31H29) (19 lbs.) (9kg)	1 step (1 phase)	208	112.9	18.8	64,200	----		148.3
			220	119.4	21.0	71,700			154.8
			230	124.9	23.0	78,500			160.2
			240	130.3	25.0	85,300			165.6

*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).

ELECTRIC HEAT DATA – CHP20(R)V-511-513

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 *Min. Cir. Amp.
CHP20(R)V-511	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)	ECH16-511 (31H13)	71.8
			220	33.5	5.9	20,100			73.6
			230	35.0	6.4	21,800			75.1
			240	36.5	7.0	23,900			76.6
	ECH16R-10 (31H48) (5 lbs) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)	85.3	
			220	47.8	8.4	28,700		87.9	
			230	50.0	9.2	31,400		90.1	
			240	52.1	10.0	34,100		92.3	
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----	107.9	
			220	71.6	12.6	43,000		111.8	
			230	74.9	13.8	47,100		115.1	
			240	78.1	15.0	51,200		118.3	
	ECH16-20 (31H28) (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----	130.4	
			220	95.5	16.8	57,300		135.6	
			230	99.8	18.4	62,800		140.0	
			240	104.1	20.0	68,300		144.3	
	ECH16-25 (31H29) (19 lbs.) (9kg)	1 step (1 phase)	208	112.9	18.8	64,200	----	153.0	
			220	119.4	21.0	71,700		159.5	
			230	124.9	23.0	78,500		165.0	
			240	130.3	25.0	85,300		170.4	
CHP20V-513	ECH16-7 208/230v (31H31) (19 lbs.) (9kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-513 (31H16)	45.6
			220	19.3	5.9	20,100			46.7
			230	20.1	6.4	21,800			47.5
			240	21.0	7.0	23,900			48.4
	ECH16-10 208/230v (31H32) (19 lbs.) (9kg)	1 step (3 phase)	208	26.1	7.5	25,600	----	ECH16-513 (31H16)	53.4
			220	27.6	8.4	28,700			54.9
			230	28.9	9.2	31,400			56.2
			240	30.1	10.0	34,100			57.5
	ECH16-15 208/230v (31H33) (19 lbs.) (9kg)	1 step (3 phase)	208	39.1	11.3	38,600	----	ECH16-513 (31H16)	66.5
			220	41.4	12.6	43,000			68.8
			230	43.2	13.8	47,100			70.6
			240	45.1	15.0	51,200			72.5
	ECH16-20 208/230v (31H34) (22 lbs.) (10kg)	2 steps (3 phase)	208	52.1	15.0	51,200	----	ECH16-513 (31H16)	79.5
			220	55.1	16.8	57,300			82.5
			230	57.6	18.4	62,800			85.0
			240	60.1	20.0	68,300			87.5
	ECH16-25 208/230v (31H35) (22 lbs.) (10kg)	2 steps (3 phase)	208	65.1	18.8	64,200	----	ECH16-513 (31H16)	92.5
			220	68.9	21.0	71,700			96.3
			230	72.0	22.9	78,100			99.4
			240	75.1	25.0	85,300			102.5

*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).

ELECTRIC HEAT DATA – CHP20(R)V-651-653

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 *Min. Cir. Amp.
CHP20(R)V-651	ECH16R-7 (31H47) (5 lbs.) (2kg)	1 step (1 phase)	208	31.6	5.3	18,100	ECH16R-26/65-7 (31H25)	ECH16-651 (31H14)	78.1
			220	33.5	5.9	20,100			79.9
			230	35.0	6.4	21,800			81.5
			240	36.5	7.0	23,900			83.0
	ECH16R-10 (31H48) (5 lbs.) (2kg)	1 step (1 phase)	208	45.1	7.5	25,600	ECH16R-26/65-10 (31H24)		91.6
			220	47.8	8.4	28,700			94.2
			230	50.0	9.2	31,400			96.4
			240	52.1	10.0	34,100			98.6
	ECH16-15 (31H27) (18 lbs.) (8kg)	1 step (1 phase)	208	67.8	11.3	38,600	----		114.3
			220	71.6	12.6	43,000			118.2
			230	74.9	13.8	47,100			121.4
			240	78.1	15.0	51,200			124.6
	ECH16-20 (31H28) (19 lbs.) (9kg)	1 step (1 phase)	208	90.3	15.0	51,200	----		136.8
			220	95.5	16.8	57,300			142.0
			230	99.8	18.4	62,800			146.3
			240	104.1	20.0	68,300			150.6
	ECH16-25 (31H29) (19 lbs.) (9kg)	1 step (1 phase)	208	112.9	18.8	64,200	----		159.4
			220	119.4	21.0	71,700			165.9
			230	124.9	23.0	78,500			171.4
			240	130.3	25.0	85,300			176.8
CHP20V-653	ECH16-7 208/230v (31H31) (19 lbs.) (9kg)	1 step (3 phase)	208	18.3	5.3	18,100	----	ECH16-653 (31H17)	50.4
			220	19.3	5.9	20,100			51.5
			230	20.1	6.4	21,800			52.3
			240	21.0	7.0	23,900			53.2
	ECH16-10 208/230v (31H32) (19 lbs.) (9kg)	1 step (3 phase)	208	26.1	7.5	25,600	----	ECH16-653 (31H17)	58.2
			220	27.6	8.4	28,700			59.7
			230	28.9	9.2	31,400			61.0
			240	30.1	10.0	34,100			62.2
	ECH16-15 208/230v (31H33) (19 lbs.) (9kg)	1 step (3 phase)	208	39.1	11.3	38,600	----	ECH16-653 (31H17)	71.2
			220	41.4	12.6	43,000			73.5
			230	43.2	13.8	47,100			75.3
			240	45.1	15.0	51,200			77.2
	ECH16-20 208/230v (31H34) (22 lbs.) (10kg)	2 steps (3 phase)	208	52.1	15.0	51,200	----	ECH16-653 (31H17)	84.2
			220	55.1	16.8	57,300			87.2
			230	57.6	18.4	62,800			89.7
			240	60.1	20.0	68,300			92.2
	ECH16-25 208/230v (31H35) (22 lbs.) (10kg)	2 steps (3 phase)	208	65.1	18.8	64,200	----	ECH16-653 (31H17)	97.3
			220	68.9	21.0	71,700			101.1
			230	72.0	22.9	78,100			104.2
			240	75.1	25.0	85,300			107.3

*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).

BLOWER DATA

CHP20(R)V-261-311-411-413 BLOWER PERFORMANCE 0 thru 1.0 in. w.g. (0 Through 250 Pa) External Static Pressure

FACTORY BLOWER MOTOR SWITCH POSITIONS

	Switch 1	Switch 2	Switch 3
CHP20RV-261	1	1	1
CHP20RV-311	3	3	3
CHP20(R)-410	5	5	5

Switches on VSM Motor	Function	Air Volume	Speed Selector Positions on VSM Motor Switches					
			Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Switch 1	Continuous Blower	cfm	400	500	600	700	800	900
		L/s	190	235	285	330	380	425
Switch 2	Electric Heat Speed	cfm	800	900	1050	1125	1200	1250
		L/s	380	425	495	530	565	590
Switch 3	Heat Pump Cooling/ Heating Speed	cfm	800	900	1050	1125	1200	1250
		L/s	380	425	495	530	565	590

NOTE — The effect of static pressure is included in the air volumes listed.

CHP20(R)V-461-511-513-651-653 BLOWER PERFORMANCE 0 thru 1.0 in. w.g. (0 Through 250 Pa) External Static Pressure

FACTORY BLOWER MOTOR SWITCH POSITIONS

	Switch 1	Switch 2	Switch 3
CHP20RV-461	1	3	3
CHP20(R)-510	3	3	4
CHP20(R)-650	5	3	5

Switches on VSM Motor	Function	Air Volume	Speed Selector Positions on VSM Motor Switches					
			Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
Switch 1	Continuous Blower	cfm	700	800	1000	1200	1300	1400
		L/s	330	380	470	565	615	660
Switch 2	Electric Heat Speed	cfm	1250	1350	1500	1600	1800	2000
		L/s	590	635	710	755	850	945
Switch 3	Heat Pump Cooling/ Heating Speed	cfm	1250	1350	1500	1600	1800	2000
		L/s	590	635	710	755	850	945

NOTE — The effect of static pressure is included in the air volumes listed.

ACCESSORY BLOWER DATA

FILTER AND ACCESSORY AIR RESISTANCE

Unit Model No.	Air Volume		Total Air Resistance — inches water gauge (Pa)								
			1"(25mm) Filter Furnished With CHP20V non "R" Units	REMD16 Down-Flo Economizer (non "R" models only)			EMDH16 Horizontal Economizer (non "R")		DF16 Down-Flo Filter Adaptor Kit ("R" models only)		
	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	With Furnished 1"(25mm) Filter	With Optional Pleated 2"(51mm) Filter	With Optional Fiberglass 2"(51mm) Filter
CHP20RV-261 CHP20RV-311 CHP20(R)V-410	800	380	.15 (37)	.05 (12)	.27 (67)	.13 (32)	.18 (45)	.10 (25)	.15 (37)	.27 (67)	.13 (32)
	1000	470	.18 (45)	.06 (15)	.34 (85)	.18 (45)	.26 (65)	.15 (37)	.18 (45)	.34 (85)	.18 (45)
	1200	565	.21 (52)	.09 (22)	.42 (104)	.24 (60)	.35 (87)	.21 (52)	.21 (52)	.42 (104)	.24 (60)
CHP20RV-461 CHP20(R)V-510 CHP20(R)V-650	1400	660	.13 (32)	.04 (10)	.33 (82)	.22 (55)	.25 (62)	.15 (37)	.13 (32)	.29 (72)	.17 (42)
	1600	755	.15 (37)	.05 (12)	.40 (99)	.27 (67)	.30 (75)	.17 (42)	.15 (37)	.35 (87)	.22 (55)
	1800	850	.17 (42)	.06 (15)	.48 (119)	.33 (82)	.35 (87)	.19 (47)	.17 (42)	.42 (104)	.27 (67)
	2000	945	.20 (50)	.08 (20)	.56 (139)	.39 (97)	.40 (99)	.22 (55)	.20 (50)	.49 (122)	.32 (80)

NOTE — Electric heaters have no appreciable air resistance.

ACCESSORY BLOWER DATA

DIFFUSER AIR RESISTANCE

Unit Model No.	Air Volume		Total Air Resistance — inches water gauge (Pa)			
			RTD9-65 Diffuser			FD9-65 Diffuser
	cfm	L/s	2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	
CHP20RV-261 CHP20RV-311 CHP20(R)V-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)
CHP20RV-461 CHP20(R)V-510 CHP20(R)V-650	1400	660	.33 (82)	.25 (62)	.19 (47)	.19 (47)
	1600	755	.43 (107)	.32 (80)	.24 (60)	.24 (60)
	1800	850	.56 (139)	.40 (90)	.30 (75)	.30 (75)
	2000	945	.73 (182)	.50 (124)	.36 (90)	.36 (90)

NOTE — Electric heat has no appreciable air resistance.

RTD9-65 STEP-DOWN CEILING DIFFUSER AIR THROW DATA

Grille Vanes	Air Volume		*Effective Throw — ft. (m)		
			Horizontal Vanes 180° Straight	Horizontal Vanes 22° Down	Horizontal Vanes 45° Down
	cfm	L/s			
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 Sides And Ends 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)

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

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 determined at a point where conditioned air velocity has decreased to 50 ft. (15m) per minute.

WET INDOOR COIL AIR RESISTANCE

Model No.	Air Volume		Air Resistance	
	cfm	L/s	in. w.g.	Pa
CHP20RV-261 CHP20RV-311 CHP20(R)V-410	800	380	.07	17
	1000	470	.08	20
	1200	565	.09	22
CHP20RV-461 CHP20(R)V-510	1400	660	.12	30
	1600	755	.13	32
	1800	850	.14	.35
CHP20(R)V-650	2000	945	.15	.37
	1600	755	.11	.27
	1800	850	.12	.30
	2000	945	.13	.32

GUIDE SPECIFICATIONS

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

General — Furnish and install a single package heat pump unit 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.

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

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 thick lb./ft.³ (kg/m³) density fiberglass or equivalent.

DX Cooling System — The total certified cooling capacity shall not be less than Btuh (kW) with an indoor coil 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 an outdoor coil entering temperature of °F (°C). The compressor power input shall not exceed Kw at these conditions.

Heating System — The total certified heating capacity shall not be less than Btuh (kW) with an indoor coil air volume of cfm (L/s), an entering wet bulb air temperature of °F (°C), an entering dry bulb temperature of °F (°C) and an outdoor coil entering air temperature of °F (°C). The total compressor power input shall not exceed Kw at the above conditions.

The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than sq. ft. (m²) (indoor coil) and sq. ft. (m²) (outdoor coil). Optional coil guard(s) shall be available.

The scroll compressor shall be resiliently mounted, have internal current and temperature protection. The refrigeration system shall have suction and liquid line service gauge ports, high pressure switch, check and expansion valve and full refrigerant charge. CHP20V non "R" models shall have loss of charge switch. Control options shall consist of thermostat and low ambient control. Shall be rated in accordance with ARI Standard 210/240-89 and DOE test procedures.

Supplemental 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 25 Kw (208/240v-3ph) heaters shall have thermal time delay relay to bring elements on and off in sequence with a time delay between each element. Heaters shall be U.L. and 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. Indoor coil condensate drain extended outside cabinet shall be provided. CHP20V-410-510-650 non "R" models shall have low voltage terminal strip. Lifting brackets shall be factory installed on all models.

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

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 a safety guard.

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. Frame design shall be approved by U.S. 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 three position or 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 filter for extra air filtering and bird screen protection.

Down-Flo Filter Adaptor — Optional filter adaptor shall field install in CHP20RV unit to provide filtering for basic unit in down-flo applications. Shall include 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.

UNIT DIMENSIONS — inches (mm)

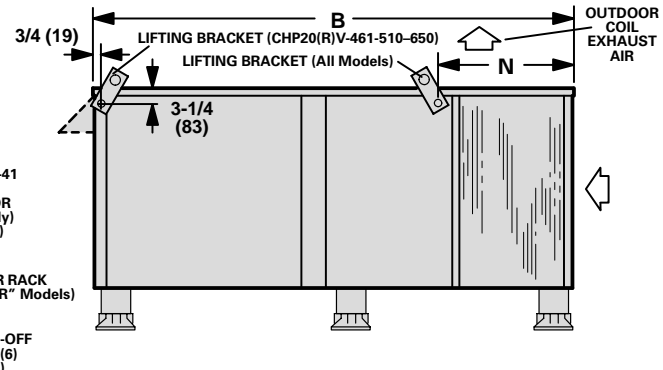
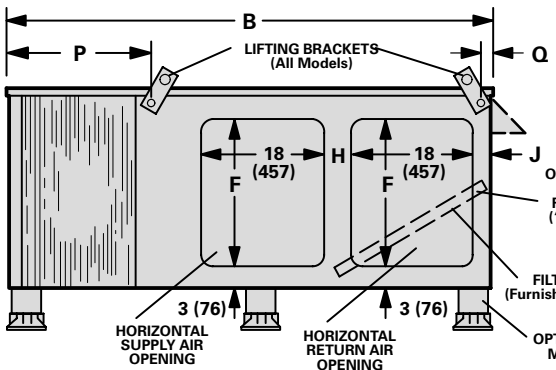
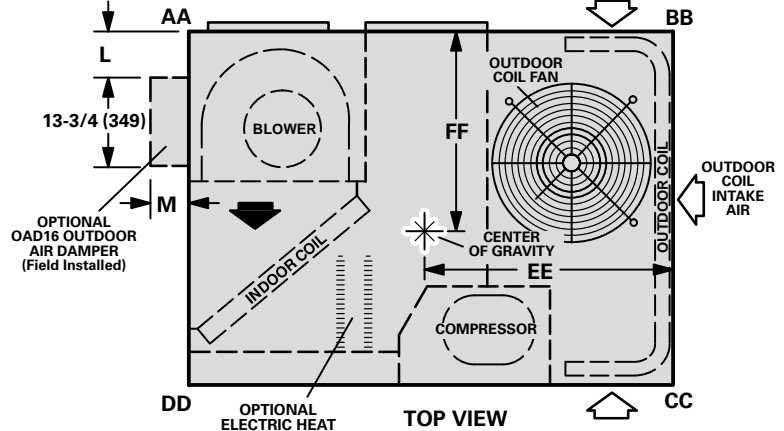
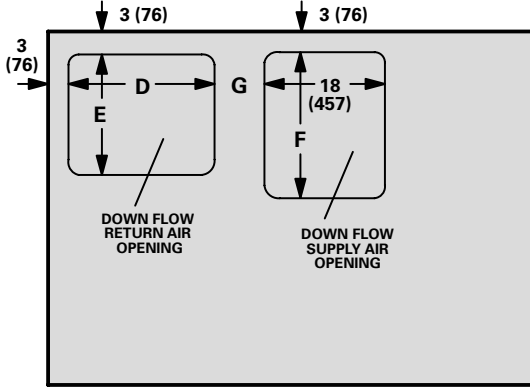
CHP20(R)V BASIC UNIT

CORNER WEIGHTS — lbs. (kg)

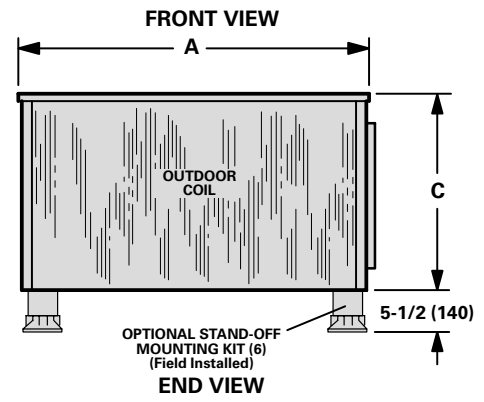
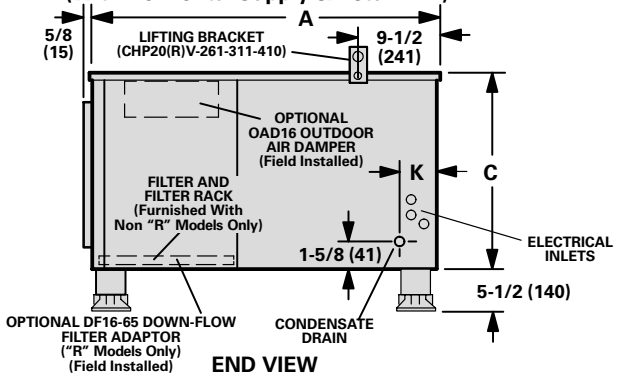
CENTER OF GRAVITY — in. (mm)

Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHP20RV-261	66	30	71	32	104	47	97	44
CHP20RV-311	69	31	74	34	108	49	101	46
CHP20(R)V-410	69	31	74	34	109	49	102	46
CHP20RV-461	93	42	91	42	137	62	137	62
CHP20(R)V-510	105	48	111	50	165	75	156	71
CHP20(R)V-650	107	49	113	51	167	76	158	72

Model No.	EE		FF	
	inch	mm	inch	mm
CHP20RV-261	29	737	27-3/8	695
CHP20RV-311	29	737	27-3/8	695
CHP20(R)V-410	29	737	27-3/8	695
CHP20RV-461	36-1/4	921	31-7/16	799
CHP20(R)V-510-650	35-1/4	895	31	787



(With Horizontal Supply & Return Air)



Model No.	A		B		C		D		E		F		G		H	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHP20RV-261	46	1168	60	1524	23	584	18	457	13	330	13	330	10	254	3	76
CHP20RV-311																
CHP20(R)V-410																
CHP20RV-461	52	1321	72-1/2	1842	29	737	22	559	18	457	22	737	7-1/2	191	5	127
CHP20(R)V-510-650																

Model No.	J		K		L		M		N		P		Q	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHP20RV-261	4	102	6-1/2	165	2	51	5	127	20	508	16-5/8	422	4	102
CHP20RV-311														
CHP20(R)V-410														
CHP20RV-461	3	76	6-1/8	156	5	127	8	203	19-3/8	492	19-3/8	492	3/4	19
CHP20(R)V-510-650														

ACCESSORY DIMENSIONS – inches (mm)

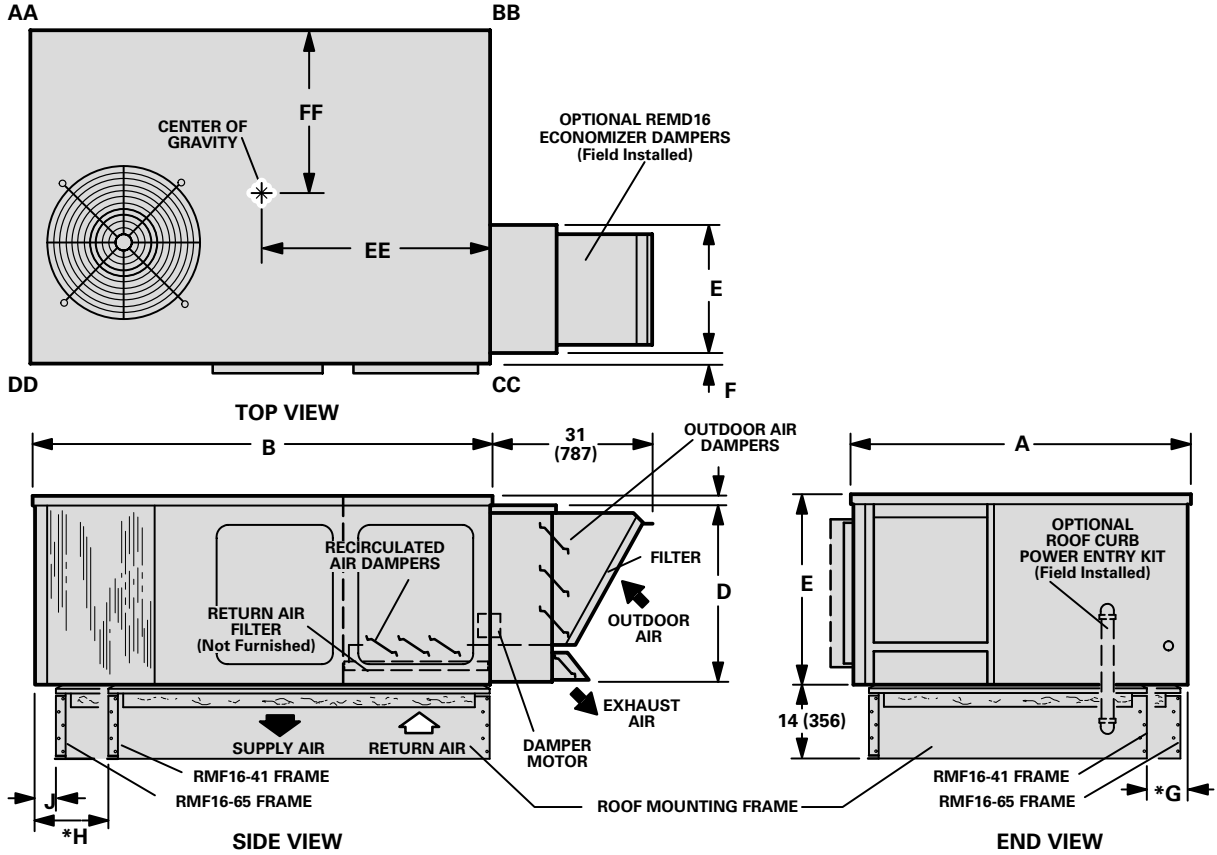
CHP20V-410-510-650 NON "R" UNITS WITH REMD16M ECONOMIZER DAMPER SECTION AND RMF16 ROOF MOUNTING FRAME

CORNER WEIGHTS – lbs. (kg)

Model No.	AA		BB		CC		DD	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
CHP20V-410	141	64	120	55	99	45	117	53
CHP20V-510	205	93	174	79	142	64	168	76
CHP20V-650	207	94	176	80	144	65	170	77

CENTER OF GRAVITY – in. (mm)

Model No.	EE		FF	
	inch	mm	inch	mm
CHP20V-410	29	737	27-3/8	695
CHP20V-510	40-5/16	1024	23-5/16	592
CHP20V-650	39-3/16	995	23-7/16	595

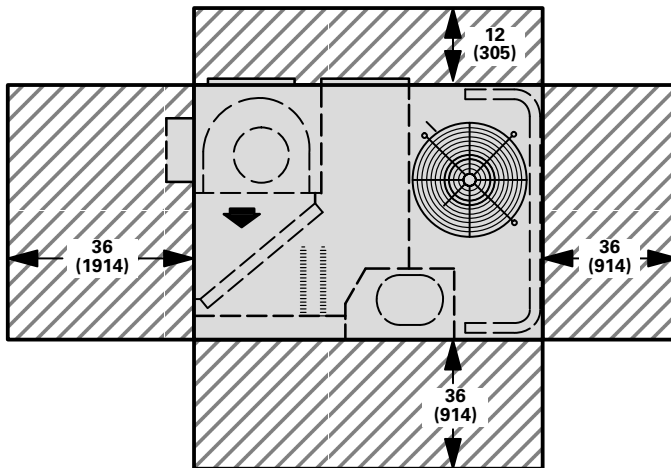


Model No.	A		B		C		D		E		F		*G		*H		J	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHP20V-410	46	1168	60	1524	23	584	21-3/4	552	16-1/8	410	3/4	19	---	---	---	---	---	---
CHP20V-510-650	52	1321	72-1/2	1842	29	737	27-3/4	705	20-1/4	514	1-1/2	38	7	178	16	406	3-1/2	89

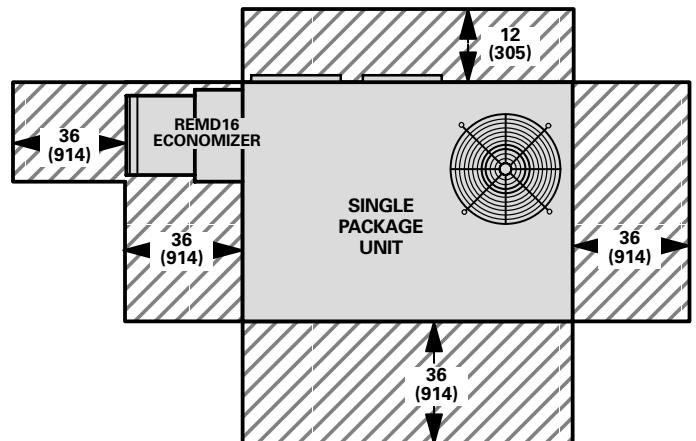
*Dimensions reflect usage with RMF16-41 mounting frame.

INSTALLATION CLEARANCES – inches (mm)

CHP20(R)V BASIC UNIT



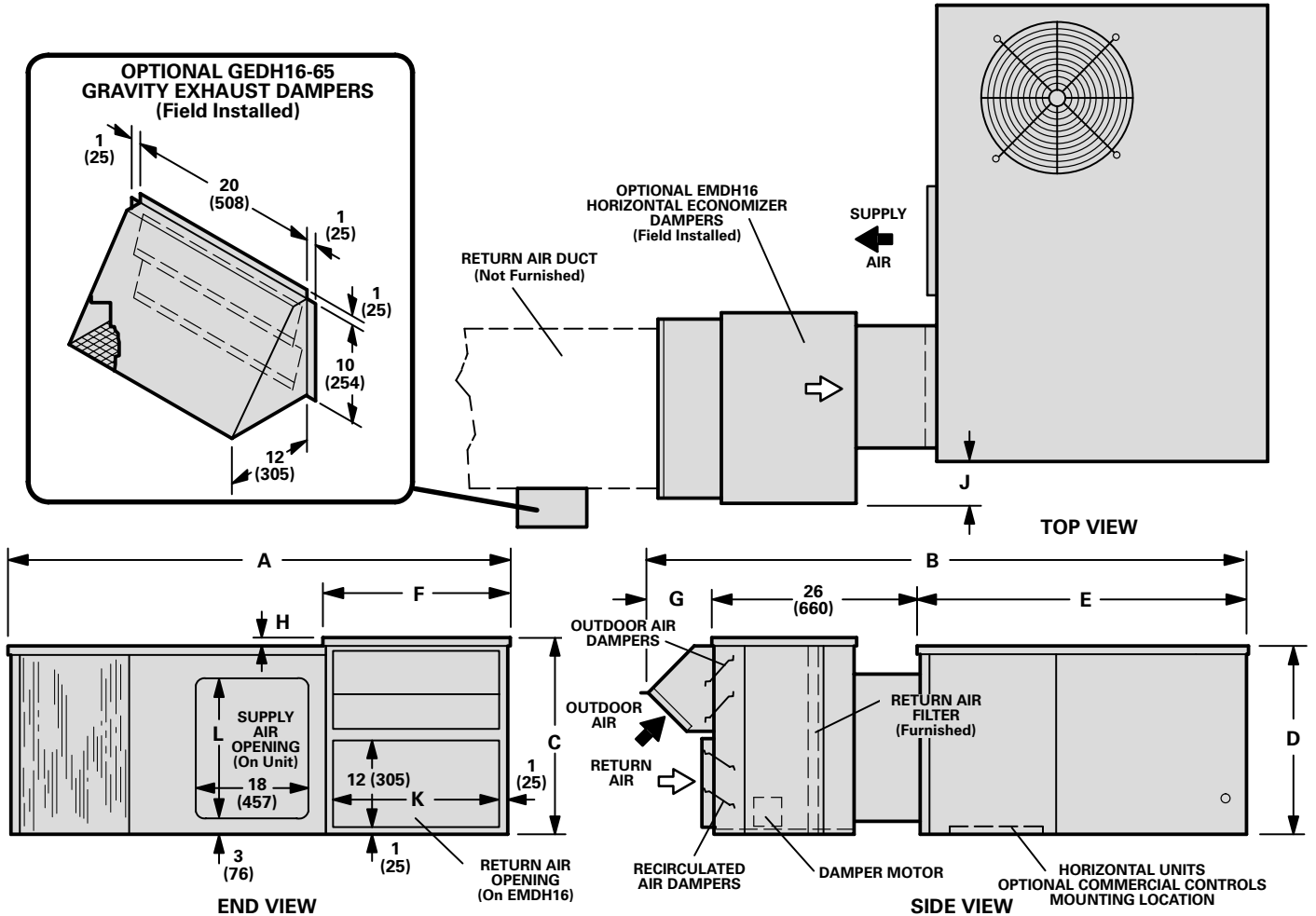
CHP20V-410-510-650 UNITS WITH REMD16 ECONOMIZER



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

ACCESSORY DIMENSIONS – inches (mm)

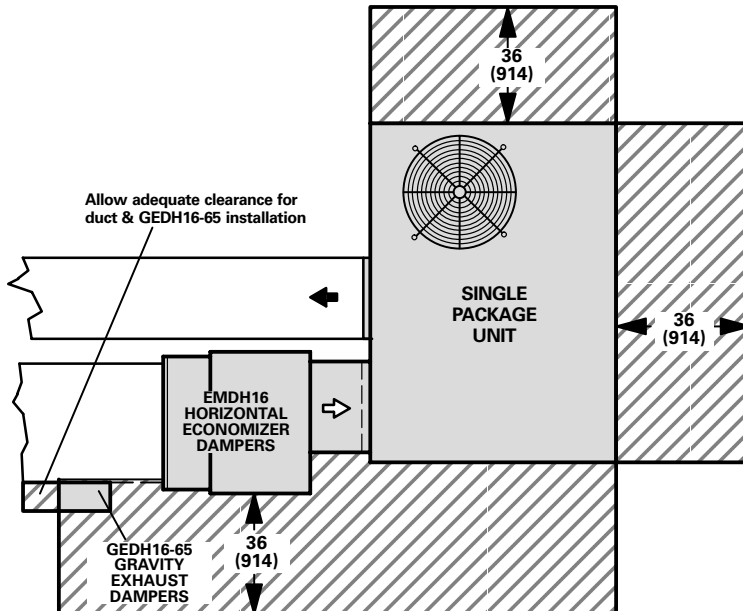
CHP20V-410-510-650 NON "R" UNITS WITH EMDH16M HORIZONTAL ECONOMIZER DAMPER SECTION AND GEDH16-65 GRAVITY EXHAUST DAMPER



Model No.	A		B		C		D		E		F		G		H		J		K		L	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
CHP20V-410	63	1600	81-1/2	2070	26	660	23	584	46	1168	26	660	9-1/2	241	3	76	3	76	24	610	13	330
CHP20V-510,-650	79-1/2	2019	90	2286	30-3/8	772	29	737	52	1321	30-1/2	775	12	305	1-1/2	38	7	178	28-7/8	733	22	559

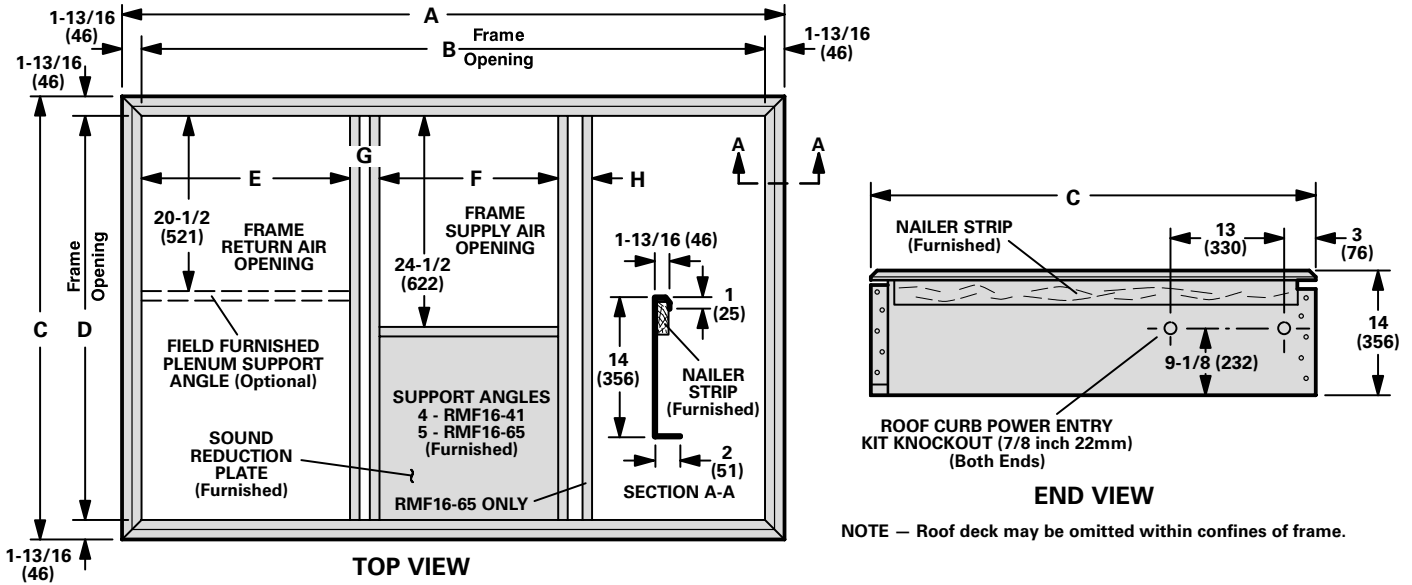
INSTALLATION CLEARANCES – inches (mm)

CHP20V-410-510-650 UNITS WITH EMDH16 ECONOMIZER AND GEDH16-65 GRAVITY EXHAUST DAMPER



ACCESSORY DIMENSIONS – inches (mm)

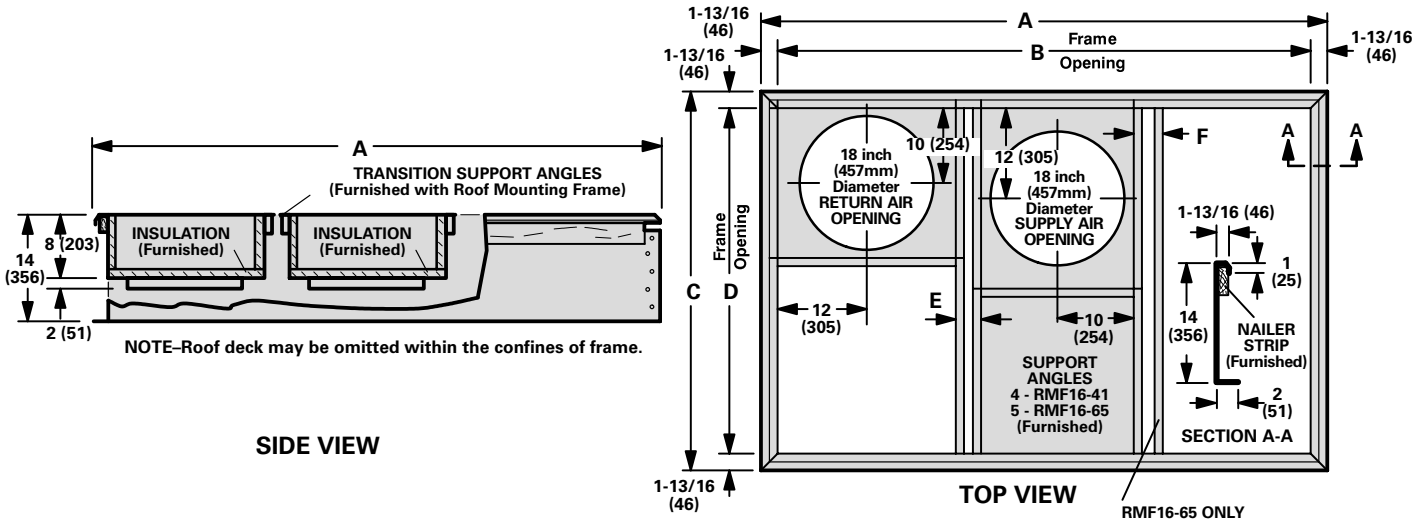
RMF16-41 & 65 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING FOR CHP20(R) UNITS



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
RMF16-41	56-3/8	1432	52-3/4	1340	44-7/8	1140	41-1/4	1048	24-3/8	619	20-9/16	522	*4	102	----	----
RMF16-65	69	1753	65-3/8	1661	50-1/2	1283	46-7/8	1191	24-1/4	616	20-1/2	521	4	102	4	102

*3-1/4 inches (83 mm) for CHP20(R)V-261-311-410 models.

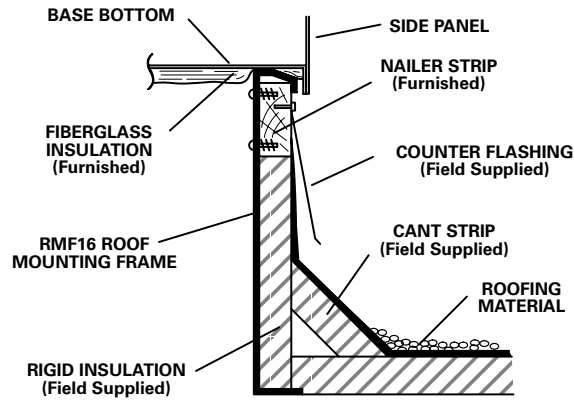
RMF16-41 & 65 ROOF MOUNTING FRAME FOR CHP20(R) UNITS WITH SRT16-65 SUPPLY AND RETURN AIR TRANSITIONS FOR FD9-65 & RTD9-65 CEILING DIFFUSERS



Model No.	A		B		C		D		E		F	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RMF16-41 with SRT16-65	56-3/8	1432	52-3/4	1340	44-7/8	1140	41-1/4	1048	*4	102	----	----
RMF16-65 with SRT16-65	69	1753	65-3/8	1661	50-1/2	1283	46-7/8	1191	4	102	4	102

*3-1/4 inches (83 mm) for CHP20(R)V-261-311-410 models.

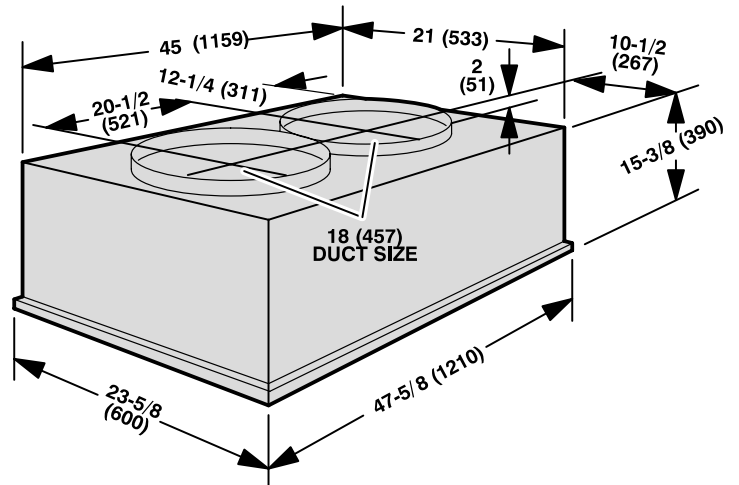
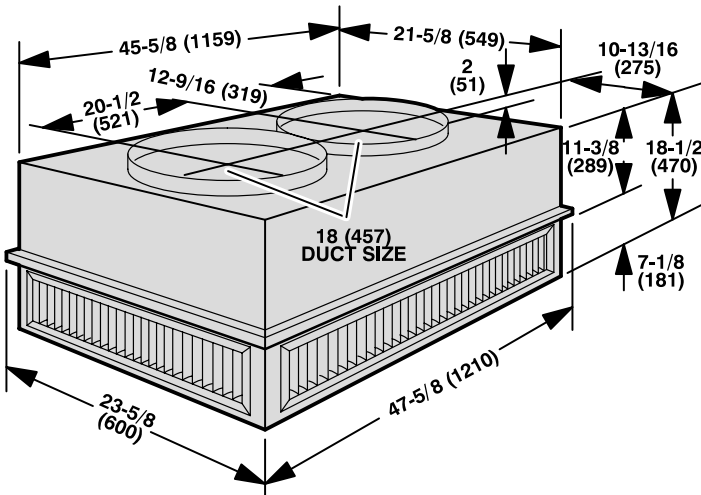
**TYPICAL FLASHING FOR RMF16-41 & 65
ROOF MOUNTING FRAMES WITH CHP20(R)V UNITS**



COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

RTD9-65 STEP-DOWN DIFFUSER

FD9-65 FLUSH DIFFUSER



DIFFUSER AIR PATTERN

