



# LCH

## Energence® Ultra-High Efficiency Rooftop Units

60 Hz

### COMMERCIAL PRODUCT SPECIFICATIONS

Bulletin No. 210734  
March 2021  
Supersedes August 2019



**ENERGENCE™**  
Saving Energy with Intelligence™



**SMARTWIRE™ SYSTEM**

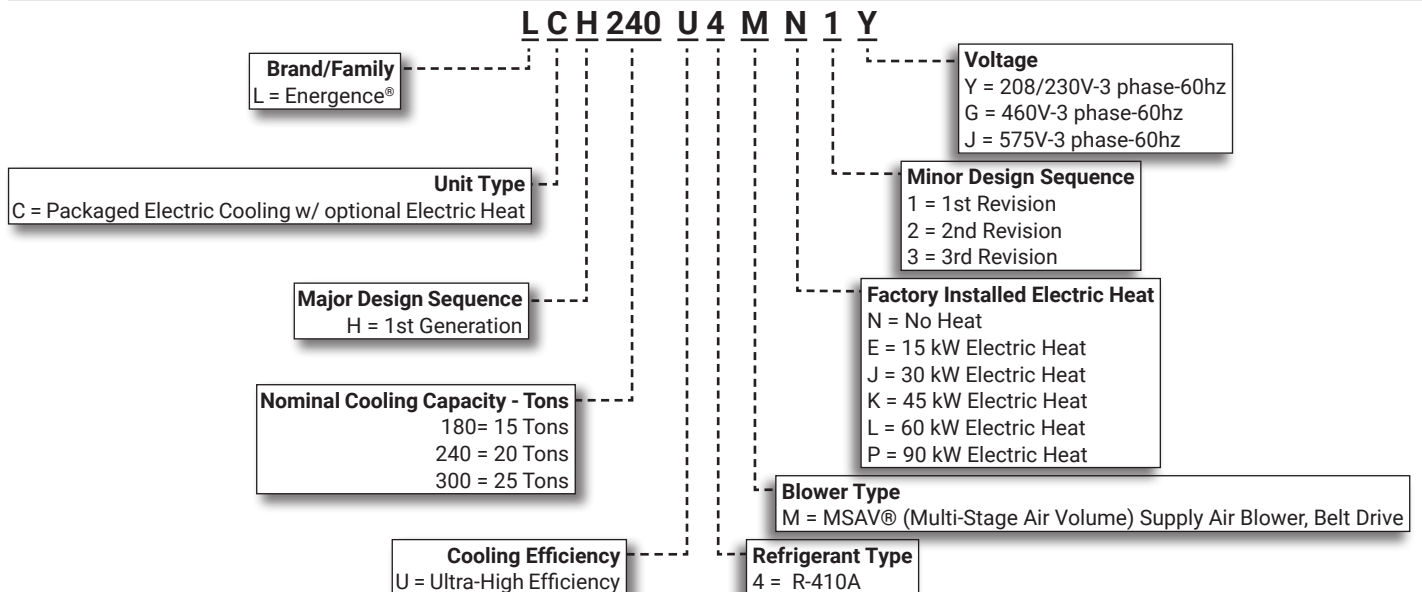
**ASHRAE 90.1  
COMPLIANT**



**15 to 25 Tons**

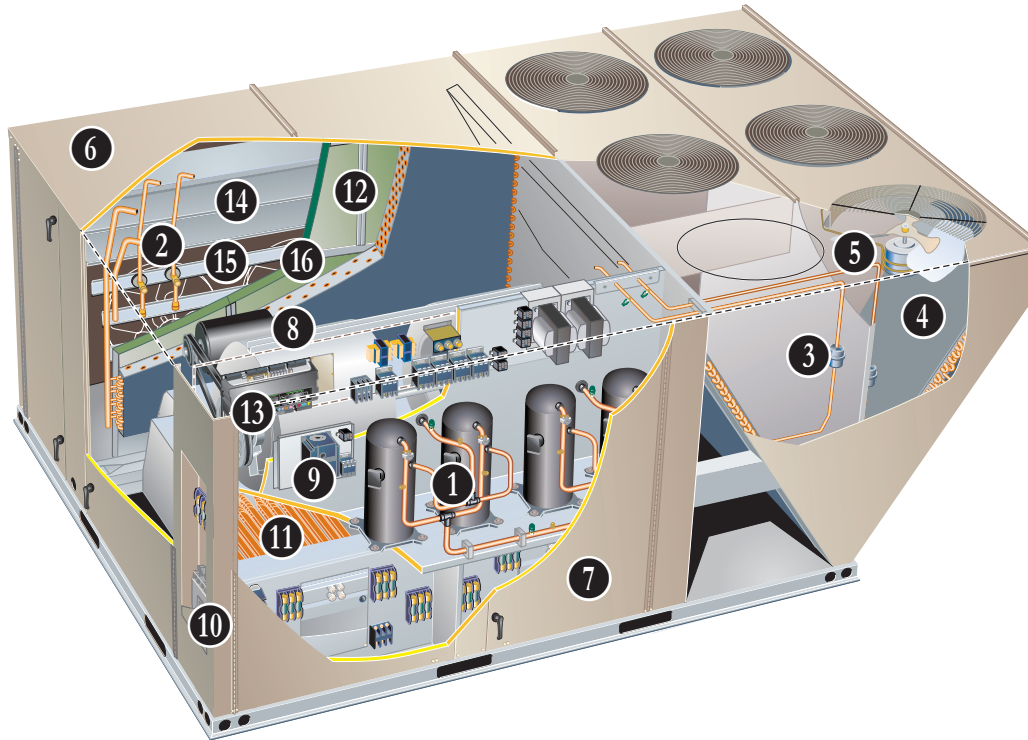
**Net Cooling Capacity - 180,000 to 265,000 Btuh**  
**Optional Electric Heat - 15 to 90 kW**

### MODEL NUMBER IDENTIFICATION



## FEATURE HIGHLIGHTS

Lennox' Energence® Ultra-High Efficiency rooftop unit product line was created to save energy with intelligence by offering some of the highest energy efficiency ratings available with a powerful, easy to use unit controller. This makes Energence rooftop units perfect for business owners looking for an HVAC product with the lowest total cost of ownership.



1. Tandem Scroll Compressors
2. Thermal Expansion Valves
3. Filters/Driers
4. Condenser Coil
5. Variable-Speed ECM Outdoor Coil Fan Motors
6. Heavy Gauge Steel Cabinet
7. Hinged Access Panels
8. Supply Air Blower
9. Variable Frequency Drive (VFD)
10. Disconnect Switch (option)
11. Electric Heat (option)
12. Air Filters
13. Prodigy® Control System
14. Economizer (option)
15. Downflow Barometric Relief Dampers (option)
16. Power Exhaust Fans (option)

## CONTENTS

Approvals And Warranty . . . . .	3
Blower Data . . . . .	28
Control System . . . . .	8
Dimensions - Accessories . . . . .	38
Dimensions - Unit . . . . .	37
Electrical Accessories - Disconnects . . . . .	34
Electrical/Electric Heat Data . . . . .	31
Electric Heat Capacities . . . . .	35
Features And Benefits . . . . .	3
Model Number Identification . . . . .	1
Optional Conventional Temperature Control Systems . . . . .	12
Options / Accessories . . . . .	21
Outdoor Sound Data . . . . .	35
Ratings . . . . .	25
Sequence Of Operation . . . . .	14
Specifications . . . . .	24
Unit Clearances . . . . .	35
Weight Data . . . . .	36

## APPROVALS AND WARRANTY

### **APPROVALS**

- AHRI Standard 340/360 certified
- ETL and CSA listed
- CSA certified energy ratings
- Unit and components ETL, NEC, and CEC bonded for grounding to meet safety standards for servicing
- All models are ASHRAE 90.1 compliant
- All models meet California Code of Regulations, Title 24 requirements for staged airflow
- ISO 9001 Registered Manufacturing Quality System
- ENERGY STAR® certified

### **WARRANTY**

- Compressors - Limited five years
- Prodigy® 2.0 Unit Controller - Limited three years
- Optional High Performance Economizers - Limited five years
- All other covered components - Limited one year

## FEATURES AND BENEFITS

### **COOLING SYSTEM**

- Designed to maximize sensible and latent cooling performance at design conditions
- System can operate from 40°F to 125°F without any additional controls

#### **R-410A Refrigerant**

- Non-chlorine based
- Ozone friendly

#### **1 Tandem Scroll Compressors**

- Scroll compressors on all models for high performance, reliability and quiet operation
- Advanced cooling system design features tandem compressors arranged in two single circuit systems that operate together or independently depending on load requirements
- Compressors utilize the maximum area of the coils for maximum heat transfer
- Advanced algorithms in the Prodigy® Control System manage compressor run-times to even the load between the system when running at part-load conditions
- Compressors are resiliently mounted on rubber grommets for quiet operation

#### **Compressor Crankcase Heaters**

- Protects against refrigerant migration that can occur during low ambient operation

#### **2 Thermal Expansion Valves**

- Assures optimal performance throughout the application range
- Removable element head

#### **3 Filter/Driers**

- High capacity filter/drier protects the system from dirt and moisture

#### **High Pressure Switches**

- Protects the compressors from overload conditions such as dirty condenser coils, blocked refrigerant flow, or loss of outdoor fan operation

#### **Low Pressure Switches**

- Protects the compressors from low pressure conditions such as low refrigerant charge, or low/no airflow

#### **Freezestats**

- Protects the evaporator coil from damaging ice build-up due to conditions such as low/no airflow, or low refrigerant charge

#### **4 Condenser Coil**

- Copper tube construction
- Enhanced rippled-edge aluminum fins
- Flared shoulder tubing connections
- Silver soldered construction

#### **Evaporator Coil**

- Copper tube construction
- Enhanced rippled-edge aluminum fins
- Flared shoulder tubing connections
- Silver soldered construction for improved heat transfer
- Factory leak tested
- Cross row circuiting with rifled tubing optimizes both sensible and latent cooling capacity

#### **Condensate Drain Pan**

- Plastic pan, sloped to meet drainage requirements per ASHRAE 62.1
- Side or bottom drain connections

## FEATURES AND BENEFITS

### **COOLING SYSTEM (continued)**

#### **5 Variable-Speed ECM Outdoor Coil Fan Motors**

- Fan speed is directly controlled by the Prodigy 2.0 unit controller
- Thermal overload protected
- Totally enclosed
- Permanently lubricated ball bearings
- Shaft up
- Wire basket mount

#### **Outdoor Coil Fans**

- PVC coated fan guards furnished

#### **Required Selections**

#### **Cooling Capacity**

- Specify nominal cooling capacity

#### **Options/Accessories**

#### **Factory or Field Installed**

#### **Condensate Drain Trap**

- Available in copper or PVC
- Field installed only, may be factory ordered to ship with unit

#### **Drain Pan Overflow Switch**

- Monitors condensate level in drain pan
- Shuts down unit if drain becomes clogged

### **CABINET**

#### **6 Construction**

- Heavy-gauge steel panels
- Full perimeter heavy-gauge galvanized steel base rail
- Base rails have rigging holes
- Three sides of the base rail have forklift slots
- Raised edges around duct and power entry openings in the bottom of the unit for water protection

#### **Airflow Choice**

- Units are available in downflow (vertical) or horizontal return air flow configuration

**NOTE** - Units can be field converted to horizontal air flow with optional Horizontal Return Air Panel Kit and Horizontal Roof Curb.

#### **Power Entry**

- Electrical lines can be brought through the unit base or through horizontal access knock-outs

#### **Exterior Panels**

- Constructed of heavy-gauge, galvanized steel
- Two-layer enamel paint finish

#### **Insulation**

- Fully insulated with non-hygroscopic fiberglass insulation (conditioned areas)
- Unit base is fully insulated
- Base insulation serves as an air seal to the roof curb, eliminating the need to add a seal during installation

#### **7 Hinged Access Panels**

- Filter section
- Blower section
- Heating section
- Compressor/controls section
- Panel seals and quarter-turn latching handles provide a tight air and water seal

#### **Required Selections**

#### **Airflow Configuration**

- Specify downflow or horizontal

#### **Options/Accessories**

#### **Factory Installed**

#### **Corrosion Protection**

- Completely flexible immersed coating
- Electrodeposited dry film process
- AST ElectroFin E-Coat
- Meets Mil Spec MIL-P-53084, ASTM B117 Standard Method Salt Spray Testing
- Indoor Corrosion Protection:
  - Coated coil
  - Painted blower housing
  - Painted indoor base
- Outdoor Corrosion Protection:
  - Coated coil
  - Painted outdoor base

#### **Field Installed**

#### **Combination Coil/Hail Guards**

- Heavy gauge steel frame
- Painted to match cabinet
- Expanded metal mesh protects outdoor coil

#### **Horizontal Return Air Panel Kit**

- Required for horizontal applications with Horizontal Roof Curb
- Contains panel with return air opening for field replacement of existing unit panel and panel to cover bottom return air opening in unit
- See dimension drawings

## FEATURES AND BENEFITS

### **BLOWER**

A wide selection of supply air blower options are available to meet a variety of airflow requirements

#### **Motor**

- Overload protected, equipped with ball bearings
- Belt drive motors are offered on all models and are available in several different sizes to maximize air performance

#### **Motor Efficiency**

- All blower motors 5 hp and above meet minimum energy efficiency standards in accordance with the Energy Independence and Security Act (EISA) of 2007

### **8 Supply Air Blower**

- Forward curved blades
- Double inlet
- Blower wheel is statically and dynamically balanced
- Ball bearings
- Adjustable pulley (allows speed change)
- Blower assembly slides out of unit for servicing
- Grease fittings furnished

#### **Required Selections**

#### **MSAV® (Multi-Stage Air Volume)**

- Stages the amount of airflow according to compressor stages, heating demand, ventilation demand or smoke alarm

**NOTE** - Part load airflow in cooling mode should not be set below the following cfm/ton levels to reduce the risk of evaporator coil freeze-up.

- 130 cfm/ton - 1 compressor
- 160 cfm/ton - 2 compressors
- 190 cfm/ton - 3 compressors
- 220 cfm/ton - All compressors

- 9** • Utilizes a Variable Frequency Drive (VFD) to stage the supply blower airflow
  - VFD alters the frequency and voltage of the power supply to the blower to control blower speed
  - The amount of airflow for each stage can be set according to a parameter in the Prodigy® 2.0 unit controller
  - Unit is shipped from the factory with preset airflow
  - MSAV® can be ordered with or without an Electronic Bypass Control
  - If equipped with the bypass control the MSAV® features manual (default) or automatic electronic bypass control of the VFD
  - In case of a VFD malfunction, a VFD alarm is generated by the Prodigy® 2.0 unit controller
  - VFD can be manually bypassed to continue unit operation at full blower speed
  - Or the unit controller can be set to automatically switch to full blower speed if a VFD alarm is generated
  - VFD has an operational range of 0 to 125°F outdoor air ambient temperature
  - Lower operating costs are obtained when the blower is operated on lower speeds

**NOTE** - Variable Frequency Drive (VFD) is designed to operate on balanced, three-phase power. Operating units on unbalanced three-phase power will reduce the reliability of all electrical components in the unit. Unbalanced power is a result of the power delivery system supplied by the local utility company. Factory-installed inverters are sized to drive blower motors with an equivalent current rating using balanced three-phase power. If unbalanced three-phase power is supplied; the installer must replace the existing factory-installed inverter with an inverter that has a higher current rating to allow for the imbalance. Refer to the installation instructions for additional information and replacement information.

#### **Ordering Information**

- Specify motor horsepower and drive kit number when base unit is ordered

#### **Options/Accessories**

#### **Factory Installed**

##### **Blower Belt Auto-Tensioner**

- Provides proper tension to belt drive blower belt without the need for regular adjustments
- Maintains airflow and proper performance

## FEATURES AND BENEFITS

### **ELECTRICAL**

**NOTE** - All units include terminal block and fuse block in power entry junction box for single power entry application

#### **SmartWire™ System**

- Advanced wiring connectors are keyed and color-coded to prevent miswiring
- Wire coloring scheme is standardized across all models
- Each connection is intuitively labeled to make troubleshooting and servicing quick and easy

#### **Electrical Plugs**

- Positive connection electrical plugs connect common accessories or maintenance parts for easy removal or installation

#### **Phase/Voltage Detection Phase**

- Monitors power supply to assure phase is correct at unit start-up
- If phase is incorrect, the unit will not start and an alarm code is reported to the unit controller
- Protects unit from being started with incorrect phasing which could lead to issues such as compressors running backwards
- Voltage detection monitors power supply voltage to assure proper voltage
- If voltage is not correct (over/under voltage conditions) the unit will not start and an alarm code is reported to the unit controller

### **Required Selections**

#### **Voltage Choice**

- Specify when ordering base unit

### **Options/Accessories**

#### **Factory Installed**

##### **Circuit Breakers**

- HACR type
- For overload and short circuit protection
- Factory wired and mounted in the power entry panel
- Current sensitive and temperature activated
- Manual reset

#### **SCR (Silicon Controlled Rectifier) Electric Heat Control**

- Modulates small, precise increments of power to the electric heat load eliminating temperature fluctuations associated with mechanical controls
- Almost instantaneous operation with no moving parts
- Zero-Cross (fast cycling) feature improves electric heater life with less contraction and expansion of the heating elements
- The SCR operates when there is no call for heat from the building control system or thermostat
- SCR air tempering is controlled by a secondary thermostat and remote duct sensor (ordered separately)
- A call for heat overrides the SCR and modulates the SCR to 100% heat output
- A call for cooling overrides the SCR

**NOTE** - The SCR option is not available with 45 kW, 60 kW and 90kW electric heat (208/230V) models.

**NOTE** - Blower Proving Switch is required and must be ordered separately for factory installation. See Controls in the Options/Accessories table.

**NOTE** - Available for use with conventional thermostat controls or Novar® control systems only.

#### **Short-Circuit Current Rating (SCCR)**

- Higher short-circuit protection up to 100kA

#### **Factory or Field Installed**

##### **10 Disconnect Switch**

- Accessible from outside of unit
- Spring loaded weatherproof cover furnished

##### **11 Electric Heat**

- Helix wound nichrome elements
- Individual element limit controls
- Wiring harness
- Unit fuse block
- See Options / Accessories tables for ordering information

#### **GFI Service Outlets (2)**

- 115V ground fault circuit interrupter (GFCI) type
- Available non-powered, field-wired or factory-wired and powered

#### **Field Installed**

##### **GFI Weatherproof Cover**

- Single-gang cover
- Heavy-duty UV-resistant polycarbonate case construction
- Hinged base cover with gasket



## FEATURES AND BENEFITS

### INDOOR AIR QUALITY

#### 12 Air Filters

- Disposable 2 inch filters furnished as standard

#### Options/Accessories

##### **Factory or Field Installed**

##### **Healthy Climate® High Efficiency Air Filters**

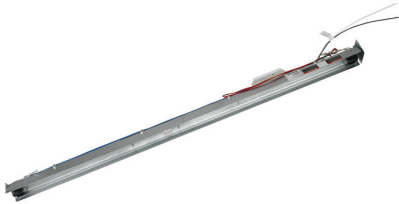
- Disposable MERV 8 or MERV 13 (Minimum Efficiency Reporting Value based on ASHRAE 52.2) efficiency 2 inch pleated filters

##### **Replacement Filter Media Kit With Frame**

- Replaces existing pleated filter media
- Includes washable metal mesh screen and metal frame with clip for holding replaceable non-pleated filter

##### **Field Installed**

##### **Healthy Climate® UVC Germicidal Light Kit**



- Germicidal lamps emit ultra-violet (UV-C) energy, which has been proven to be effective in reducing microbes such as viruses, bacteria, yeasts, and molds
- This process either destroys the organism or controls its ability to reproduce
- UV-C energy greatly reduces the growth and proliferation of mold and other bioaerosols (bacteria and viruses) on illuminated surfaces (particularly coil and drain pan)
- Field installed in the blower/evaporator coil section
- Magnetic safety interlock terminates power when access panels are removed
- All necessary hardware for installation is included
- Lamps operate on 110/230V, 1 phase power supply

**NOTE** - Step-down transformer may be ordered separately for 460V and 575V units.

- Approved by ETL

##### **Indoor Air Quality (CO<sub>2</sub>) Sensors**

- Monitors CO<sub>2</sub> levels, reports to the Prodigy 2.0 unit controller which adjusts economizer dampers as needed

### PRODIGY® CONTROL SYSTEM



- 13** The Prodigy 2.0 unit controller is a microprocessor-based controller that provides flexible control of all unit functions.

#### Features:

- LCD Display
  - Easy to read menu (4 lines x 20 character display)
  - Buttons for menu navigation during setup and diagnostic
  - Menu navigation LEDs for Data, Setup, Service, Settings
  - Main Menu and Help Buttons for quick navigation to home screen and built-in help functions
  - Scroll, Value Adjustment Select and Save Buttons
  - Setup menu insures proper installation and simplified setup of the rooftop unit
  - Profile setup copies key settings between units with the same configuration to reduce setup time
  - USB port allows a technician to download and transfer unit information to help verify service was performed
  - USB software updates on the Prodigy Control System enhance functionality without the need to change components
  - Unit Controller Software
  - Unit self-test verifies individual critical component and system performance
  - Economizer test function assures economizer is operating correctly
  - Time Clock with Run-Time Information
- Built-In Functions Include:**
- Adjustable Blower On/Off Delay
  - Built-in Control Parameter Defaults
  - Compressor Time-Off Delay
  - DDC Compatible
  - Dirty Filter Switch Input
  - Discharge Air Temperature Control
  - Display/Sensor Readout
  - Economizer Control Options (See Economizer / Exhaust Air / Outdoor Air sections)
  - Fresh Air Tempering
  - Over 100 diagnostic and status messages in English
  - Exhaust Fan Control Modes for fresh air damper position
  - Permanent Diagnostic Code Storage
  - Field Adjustable Control Parameters (Over 200 settings)
  - Indoor Air Quality Input (Demand Control Ventilation)
  - Low Ambient Controls for cooling operation down to 0°F
  - Gas Valve Time Delay Between First and Second Stage
  - Minimum Compressor Run Time
  - Network Capable (Can be daisy chained to other units or controls)
  - Night Setback Mode
  - Return Air Temperature Limit Control
  - Safety Switch Input allows Controller to respond to a external safety switch trip
  - Service Relay Output
  - Smoke Alarm Mode has four choices (unit off, positive pressure, negative pressure, purge)
  - Up to 2 heat/2 cool (standard Prodigy unit controller thermostat input)
  - Up to 3 cool with additional relay
  - Up to 4 cool with room sensor or network operation
  - "Strike Three" Protection
  - Gas Reheat Control allows simultaneous heating and cooling operation for humidity control of process air applications such as supermarkets
  - On Demand Dehumidification monitors and controls condenser hot gas reheat operation with Humiditrol® dehumidification option
  - Thermostat Bounce Delay
  - Warm Up Mode Delay
  - LED Indicators
  - PC Interface connects the Prodigy 2.0 unit controller to a PC with the Lennox Unit Controller Software
  - Room Sensor Operation controls temperature

**NOTE** - Prodigy Control System features vary with the type of rooftop unit in which the control is installed.

**NOTE** - See separate Prodigy Control System Product Specifications Bulletin for additional information.



## CONTROL SYSTEM

### **PRODIGY® CONTROL SYSTEM (continued)**

#### **Control Options**

##### **Factory or Field Installed**

###### **Blower Proving Switch**

- Monitors blower operation, shuts down unit if blower fails

###### **Dirty Filter Switch**

- Senses static pressure increase indicating dirty filter condition

###### **Fresh Air Tempering**

- Used in applications with high outside air requirements
- Controller energizes the first stage heat as needed to maintain a minimum supply air temperature for comfort, regardless of the thermostat demand
- When ordered as a factory option, sensor ships with the unit for field installation

###### **Smoke Detector**

- Photoelectric type
- Installed in supply air section, return air section or both sections
- Available with power board and single sensor (supply or return) or power board and two sensors (supply and return)
- Power board located in unit control compartment

###### **Interoperability via BACnet® or LonTalk® Protocols**

- Communication compatible with third-party automation systems that support the BACnet Application Specific Controller device profile, LonMark® Space Comfort Controller functional profile, or LonMark Discharge Air Controller functional profile

##### **Commercial Control Systems**

###### **L Connection® Network Control System**

- Complete building automation control system for single or multi-zone applications
- Options include local interface, software for local or remote communication, and hardware for networking other control functions
- See L Connection Network Control System Product Specifications Bulletin for details

###### **After-Market DDC**

- Novar® Unit Controller and options

###### **Thermostats**

- Control system and thermostat options
- After-Market unit controller options

##### **Field Installed**

###### **General Purpose Control Kit**

- Plug-in control provides additional analog and digital inputs/outputs for field installed options

## OPTIONS / ACCESSORIES

### **ECONOMIZER**

- Economizer operation is set and controlled by the Prodigy 2.0 unit controller
- Simple plug-in connections from economizer to unit controller for easy installation
- All Emergence rooftop units are equipped with factory installed CEC Title 24 approved sensors for outside, return and discharge air temperature monitoring

**NOTE** - Optional sensors may be used instead of unit sensors to determine whether outdoor air is suitable for free cooling. See Options/Accessories table.

##### **Factory or Field Installed**

#### **14 High Performance Economizer**

- Approved for California Title 24 building standards
- Low leakage dampers are Air Movement and Control Association International (AMCA) Class 1A Certified - Maximum 3 CFM per sq. ft. leakage at 1 in. w.g.
- ASHRAE 90.1-2010 compliant
- Outdoor Air Hood with mist elimination is included when economizer is factory installed and is furnished with economizer when ordered for field installation
- Gear-driven action
- High torque 24-volt fully-modulating spring return damper motor
- Return air and outdoor air dampers
- Plug-in connections to unit
- Stainless steel bearings
- Enhanced neoprene blade edge seals
- Flexible stainless steel jamb seals

**NOTE** - High Performance Economizers are not approved for use with enthalpy controls in Title 24 applications.

**NOTE** - The Free Cooling setpoint for Title 24 applications must be set based on the Climate Zone where the system is installed. See Section 140.4 "Prescriptive Requirements for Space Conditioning Systems" of the California Energy Commission's 2013 Building Energy Efficiency Standards.

**NOTE** - Refer to Installation Instructions for complete setup information.

##### **Differential Sensible Control**

- Factory setting
- Uses outdoor air and return air sensors that are furnished with the unit
- The Prodigy® 2.0 unit controller compares outdoor air temperature with return air
- When the outdoor air is below the configured setpoint and cooler than return air, the controller activates the economizer

## OPTIONS / ACCESSORIES

### **ECONOMIZER (continued)**

**NOTE** - Differential Sensible Control can be configured in the field to provide Offset Differential Sensible Control or Single Sensible Control.

**NOTE** - In Offset Differential Sensible Control mode, the economizer is enabled if the temperature differential (offset) between outdoor air and return air reaches the configured setpoint. In Single Sensible Control mode, the economizer is enabled when outdoor air temperature falls below the configured setpoint.

#### **Global Control**

- The unit controller communicates with a DDC system with one global sensor (enthalpy or sensible)
- Determines whether outside air is suitable for free cooling on all units connected to the control system
- Sensor must be field provided

#### **Factory or Field Installed**

##### **Single Enthalpy Temperature Control (Not for Title 24)**

- Outdoor air enthalpy sensor enables Economizer if the outdoor enthalpy is less than the setpoint of the control

##### **Differential Enthalpy Control (Not for Title 24)**

- Order two Single Enthalpy Controls
- One is field installed in the return air section
- One is installed in the outdoor air section
- Allows the economizer control to select between outdoor air or return air, whichever has lower enthalpy

#### **Field Installed**

##### **Outdoor Air CFM Control**

- Maintains constant outdoor air volume levels on the supply air fan and varying unit airflows
- Velocity sensor located in the rooftop unit outdoor air section, the Prodigy® 2.0 unit controller changes the economizer position to help minimize the effect of supply fan speed changes on outdoor air volume levels
- Setpoint for outdoor air volume is established by field testing

**NOTE** - Not available with Demand Control Ventilation (CO<sub>2</sub> Sensor) or Building Pressure Control.

##### **Building Pressure Control**

- Maintains constant building pressure level
- Includes a static pressure transducer and outdoor static pressure assembly
- Using differential pressure information between the outdoor air and the building air, the Prodigy® 2.0 unit controller changes the economizer position to help maintain a constant building pressure

**NOTE** - Not available with Demand Control Ventilation (CO<sub>2</sub> Sensor) or Outdoor Air CFM Control.

### **EXHAUST**

#### **Factory or Field Installed**

##### **15 Downflow Barometric Relief Dampers**

- Allow relief of excess air
- Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle
- Exhaust hood is factory installed when dampers are factory installed with economizer
- Exhaust hood is furnished with dampers when ordered for field installation
- Bird screen furnished

##### **16 Power Exhaust Fans**

- Install internal to unit for downflow applications only with economizer option
- Provides exhaust air pressure relief
- Interlocked to run when supply air blower is operating
- Fans run when outdoor air dampers are 50% open (adjustable)
- Motor is overload protected
- Dual propeller type fans are 20 in. diameter
- Five blades
- Two 1/3 hp motors

**NOTE** - Requires Economizer with furnished Outdoor Air Hood and Downflow Barometric Relief Dampers.

**NOTE** - MSAV® (Multi-Stage Air Volume) and VAV (Variable Air Volume) models are equipped with 2-stage power exhaust fans. Power exhaust operates in 1st stage (one fan) up to 70% of supply air blower speed. Both exhaust fans operate in 2nd stage when supply air blower speed is above 70% (adjustable) of full speed.

#### **Field Installed**

##### **Horizontal Barometric Relief Dampers**

- For use when unit is configured for horizontal applications requiring an economizer
- Allows relief of excess air
- Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle
- Field installed in return air duct
- Bird screen and hood furnished

## OPTIONS / ACCESSORIES

### **OUTDOOR AIR**

#### **Factory or Field Installed**

##### **Outdoor Air Damper**

- Downflow or Horizontal
- Linked mechanical dampers
- 0 to 25% (fixed) outdoor air adjustable
- Installs in unit
- Includes outdoor air hood
- Automatic model features fully modulating spring return damper motor with plug-in connection
- Manual model features parallel blade, gear-driven dampers with adjustable fixed position

#### **ROOF CURBS**

##### **Field Installed**

- Nailer strip furnished (downflow only)
- Mates to unit
- US National Roofing Contractors Approved
- Shipped knocked down

##### **Downflow**

##### **Hybrid Roof Curbs**

- Interlocking tabs fasten corners together
- No tools required
- Can also be fastened together with furnished hardware
- Available in 8, 14, 18, and 24 inch heights

##### **Adjustable Pitch Curb**

- Fully adjustable pitch curbs (3/4 in. per foot in any direction) provide a level platform for rooftop units allowing flexible installations on roofs with uneven or sloped angles
- Uses interlocking tabs to fasten corners together. No tools required
- Hardware is furnished to connect upper curb with lower curb
- Available in 14 inch height

##### **Horizontal**

- Meet National Roofing Code requirements
- Converts unit from downflow to horizontal (side) air flow
- Return air is on unit, supply air is on curb
- See dimension drawings
- Available in 26, 30, 37 and 41 inch heights

**NOTE** - Requires Horizontal Return Air Panel Kit.

**NOTE** - Optional Insulation Kit is available to help prevent sweating.

##### **Adaptor Curbs (not shown)**

- Curbs are regionally sourced
- Dimensions vary based upon the source

**NOTE** - Contact your local sales representative for a detailed cut sheet with applicable dimensions.

### **CEILING DIFFUSERS**

#### **Field Installed**

##### **Ceiling Diffusers**

##### **(Flush or Step-Down)**

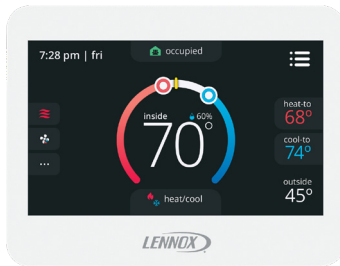
- White powder coat finish on diffuser face and grilles
- Insulated UL listed duct liner
- Diffuser box has collars for duct connection
- Step-down diffusers have double deflection blades
- Flush diffusers have fixed blades
- Provisions for suspending
- Internally sealed to prevent recirculation
- Removable return air grille
- Adapts to T-bar ceiling grids or plaster ceilings

##### **Transitions (Supply and Return)**

- Used with diffusers
- Installs in roof curb
- Galvanized steel construction
- Flanges furnished for duct connection to diffusers
- Fully insulated

## OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

### ComfortSense® 8500 Commercial 7-Day Programmable Thermostat



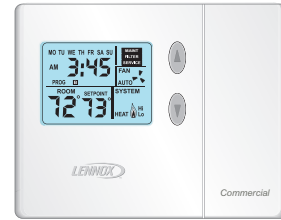
- Fully Communicating Sensor
- Full Color Touchscreen Interface
- Variable Speed System Control (On Compatible Units)
- Up To 4 Heat / 4 Cool
- Built-In Sensors For Temperature, Humidity And Optional CO<sub>2</sub>
- Remote Sensor Options For Occupancy, Temperature
- BACnet Capable Options
- 5-2 or 7-Day Scheduling
- Smooth Setback Recovery
- Heat/Cool Auto-Changeover
- Four-Wire Installation
- FDD, ASHRAE, IECC Compliant

### ComfortSense® 7500 Commercial 7-Day Programmable Thermostat



- Premium Universal Thermostat
- Full Color Touchscreen Interface
- Up To 4 Heat / 4 Cool
- Built-In Sensors For Temperature and Humidity
- Remote Sensors Options For Temperature, Discharge Air, Outdoor Air
- 5-2 or 7-Day Scheduling
- Smooth Setback Recovery
- Heat/Cool Auto-Changeover
- FDD, ASHRAE, IECC Compliant

### ComfortSense® 3000 Commercial 5-2 Day Programmable Thermostat



- Conventional Multi-Stage Thermostat
- Intuitive Display
- Push-Button Operation
- Up To 2 Heat / 2 Cool
- Built-In Temperature Sensor
- Remote Temperature Sensing
- Up to 5-2 Day Scheduling
- Smooth Setback Recovery
- Heat/Cool Auto-changeover

### Wired Room Sensor (LCS-5030)



- Simple Push-Button Override
- Variable Speed System Control (On Compatible Units)
- Up To 4 Heat / 4 Cool
- Built-In Temperature and Humidity Sensors
- AA Battery / 24VAC Powered
- SBUS Wired Operation
- Automatic Sensor Averaging
- Locking Hex Screw

OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS		
Description		Catalog No.
<b>ComfortSense® 8500 Commercial 7 Day Programmable Thermostat</b>		
CS8500 7-Day Thermostat	No CO <sub>2</sub> Sensing	<b>17G75</b>
	With CO <sub>2</sub> Sensing	<b>17G76</b>
Sensors/Accessories	<sup>1</sup> Remote non-adjustable wall-mount 10k	<b>47W37</b>
	<sup>1</sup> Remote non-adjustable wall-mount 11k	<b>94L61</b>
<b>Sysbus Network Cable (Yellow) for ComfortSense 8500 and LCS-5030 Wired Room Sensor</b>		
Twisted pair 100% shielded communication cable, Red and Black	500 ft. box	<b>27M19</b>
22 AWG, yellow jacket, rated at 75°C, 300V, Plenum rated	1000 ft. box	<b>94L63</b>
Insulation - Low smoke PVC, NEC, CMP	2500 ft. roll	<b>68M25</b>
<b>ComfortSense® 7500 Commercial 7-Day Programmable Thermostat</b>		
CS7500 7-Day Thermostat		<b>17G74</b>
Sensors/Accessories	<sup>2</sup> Remote non-adjustable wall-mount 20k	<b>47W36</b>
	<sup>2</sup> Remote non-adjustable wall-mount 10k	<b>47W37</b>
	Remote non-adjustable discharge air (duct mount)	<b>19L22</b>
	Outdoor temperature sensor	<b>X2658</b>
<b>ComfortSense® 3000 Commercial 5-2 Day Programmable Thermostat</b>		
CS3000 5-2 Day Thermostat		<b>11Y05</b>
Sensors/Accessories	Remote non-adjustable wall mount 10k averaging	<b>47W37</b>
	Thermostat wall mounting plate	<b>X2659</b>
<b>ComfortSense® Non-Programmable Thermostat</b>		
CS3000 Non-Programmable Thermostat		<b>51M32</b>
<b>Universal Thermostat Guard with Lock (clear)</b>		
	Inside Dimensions (H x W) 5 7/8 x 8 3/8 in.	<b>39P21</b>
<b>Wired Room Sensor</b>		
LCS-5030 Wired Room Sensor		<b>21L07</b>

<sup>1</sup> Up to nine of the same type remote temperature sensors can be connected in parallel.

<sup>2</sup> Remote wall-mount sensors can be applied in any of the following combinations:  
 One Sensor - (1) 47W36, Two Sensors - (2) 47W37, Three Sensors - (2) 47W36 and (1) 47W37  
 Four Sensors - (4) 47W36, Five Sensors - (3) 47W36 and (2) 47W37

## SEQUENCE OF OPERATION

### **HEATING MODE (ELECTRIC HEAT)**

*NOTE - Heating Mode Is The Same For All Control Options.*

#### **W1 Demand:**

Electric heat energized (stage 1 on units with 2-stage) and supply air blower operates at heating speed.

#### **W2 Demand:**

Electric heat energized (stage 2 on units with 2-stage) and supply air blower operates at heating speed.

### **Modulating Outdoor Air Damper**

The minimum damper position for “occupied low blower” and “occupied high blower” is adjusted during unit setup to provide minimum fresh air requirements per ASHRAE 62.1 at the corresponding supply air blower speeds.

- When supply air blower is off or the unit is in unoccupied mode, the outdoor air damper is closed.
- When unit is in occupied mode and supply air blower is operating at a speed below the “midpoint” blower speed, the outdoor air damper is at minimum “low blower” position.
- When unit is in occupied mode and supply air blower is operating at a speed equal to or above the “midpoint” blower speed, the outdoor air damper is at minimum “high blower” position.

*NOTE - The “midpoint” blower speed is an average of the minimum and maximum blower speed (minimum speed + maximum speed divided by 2).*

### **THERMOSTAT MODE**

The thermostat mode has specific sequence-of-operation scenarios for Lennox’ Ultra-High Efficiency product line. The standard thermostat mode will typically allow 2 stages of heating and cooling operation. Units with a globally-controlled economizer option can have 2 stages of mechanical cooling and free cooling economizer operation. The MSAV® (Multi-Stage Air Volume) blower will also allow up to 5 different supply blower speed values: 2 speed values for cooling mode, 1 speed value for heating mode, 1 speed value for ventilation, and an extra speed for when one of the smoke alarm options is used. When using the factory default, the smoke alarm mode will turn off the blower. It is important to note that the unit controller merely passes along the instructions to provide heating, cooling, or other unit operations.



## SEQUENCE OF OPERATION

### **THERMOSTAT MODE - MSAV® (MULTI-STAGE AIR VOLUME) OPERATION WITH 2-STAGE THERMOSTAT**

#### **SUPPLY AIR BLOWER CFM**

Unit has the following supply air blower CFM settings:

- Heating CFM
- High Cooling CFM
- Low Cooling CFM
- Ventilation CFM
- Blower Speed
- Smoke Speed (Used only in smoke removal option - not covered here)

#### **Unit Features An Economizer And Outdoor Air Is Suitable**

*NOTE - Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third-party controller and provided to the rooftop unit via a network connection.*

##### **Y1 Demand:**

All compressors are off, supply air blower is on low cooling CFM to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain Parameter 159 setting (supply air temperature).

##### **Y2 Demand:**

All compressors are off, supply air blower is on high cooling CFM providing higher cooling capacity, and economizer modulates to maintain Parameter 159 setting (supply air temperature).

Parameter 164 dictates when one compressor from each circuit is energized while supply air blower stays on high cooling CFM providing maximum cooling capacity. After compressor is energized the economizer stays at maximum open.

#### **Unit Does Not Feature An Economizer Or Outdoor Air Is Not Suitable**

##### **Y1 Demand:**

One compressor from each circuit operates and supply air blower operates at low cooling CFM.

##### **Y2 Demand:**

All compressors operate and supply air blower operates at high cooling CFM.

## SEQUENCE OF OPERATION

### **THERMOSTAT MODE - MSAV® (MULTI-STAGE AIR VOLUME) OPERATION WITH 3-STAGE THERMOSTAT (continued)**

#### **SUPPLY AIR BLOWER CFM**

Unit has following supply air blower CFM settings:

- Heating CFM
- High Cooling CFM
- Medium-Low Cooling CFM
- Low Cooling CFM
- Ventilation CFM
- Blower Speed
- Smoke Speed (Used only in smoke removal option - not covered here)

#### **Unit Features An Economizer And Outdoor Air Is Suitable**

*NOTE - Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third-party controller and provided to the rooftop unit via a network connection.*

##### **Y1 Demand:**

All compressors are off, supply air blower is on low cooling CFM to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain Parameter 159 setting (supply air temperature).

##### **Y2 Demand:**

All compressors are off, supply air blower is on high cooling CFM providing higher cooling capacity, economizer modulates (minimum to maximum open position) to maintain Parameter 159 setting (supply air temperature).

Parameter 164 dictates when one compressor from each circuit is energized while supply air blower stays on high cooling CFM providing maximum cooling capacity. After compressors are energized the economizer stays at maximum open.

##### **Y3 Demand:**

All compressors are energized and supply air blower stays on high cooling CFM.

#### **Unit Does Not Feature An Economizer Or Outdoor Air Is Not Suitable**

##### **Y1 Demand:**

One compressor operates and supply air blower operates at low cooling CFM.

##### **Y2 Demand:**

One compressor from each circuit operates and supply air blower operates at medium-low cooling CFM.

##### **Y3 Demand:**

All compressors from each circuit operate and supply air blower operates at high cooling CFM.

## SEQUENCE OF OPERATION

### **ZONE SENSOR MODE**

When in zone sensor mode, the unit can modulate four stages of cooling or two stages of heating operation. In this case, the unit controller will control all unit staging operations. While in zone sensor mode, multi-stage air volume applications can use up to 4 different supply blower CFM values for cooling. Zone sensor mode takes full advantage of the unit controller's features, increasing staging and control capabilities. To operate correctly, the unit must receive information from a temperature sensor. It may also receive setpoint information from a network device. Based on this information, the unit controller will either turn on or off various cooling and heating stages to maintain comfort control.

In zone sensor mode, it is possible to operate the unit without a network device. In this case the unit controller will control the zone temperature based on the backup occupied and unoccupied setpoints stored in the unit controller. The unit controller decides which setpoints to use based on the status of the occupied input. For example, if the unit is in occupied mode, the unit controller will use the occupied backup setpoints and if the unit is not in unoccupied mode the unit controller will use the unoccupied backup setpoints. In this scenario the unit controller not only records diagnostic information and makes sure the unit maintains safe operation limits,. It also controls all staging and unit operations.

### **ZONE SENSOR MODE HEATING**

For heating, the unit controller monitors space temperature from the zone sensor. Based on this information and the setpoints sent to the unit controller from the Lennox or third-party network device, the unit controller turns on or off the heating stages to maintain the desired temperature setpoint.

The Ultra-High Efficiency product line features up to four independent heat stages in larger equipment. The exact percent of heating capacity used will vary depending on the size of the unit and the heating capacity. Regardless of how many stages are present, the unit controller will seek to provide the right amount of heat to satisfy the demand.

The sequence of operation for increasing and decreasing heating stages is best shown by the staging chart on page 31. As you can see from the chart, the unit will activate the heating stages if the space temperature drops to certain temperatures. If the temperature continues to drop, the unit will continue to add heating stages until the unit reaches full heating capacity. Notice that the example heating setpoint is 70°F with a 1° deadband. Also notice that the stage-up timer is 15 minutes. The unit controller will call for the next heating stage if the space temperature has been in the stage-up timer deadband region for 15 continuous minutes. The stage-up timer deadband region is the range between the temperature at which the current heating stage was called, and the temperature at which the next heating stage would be called. Heating stages will deactivate immediately after the space temperature has been satisfied. These are all default setpoints and can be changed to customize the unit to the specific application.

It is important to note that units with multi-stage air volume supply blowers operate at the selected heating speed for all stages of heating. The supply blower speed will not change as heat stages increase or decrease because there is only one heating supply blower speed setpoint.

### **ZONE SENSOR MODE COOLING**

For cooling, the unit controller monitors space temperature from the zone sensor. Based on this information and the setpoints sent to the unit controller from an optional Lennox or third-party network device, the unit controller turns on or off cooling stages to maintain the desired temperature setpoint.

The Ultra-High Efficiency product line features up to four independent cooling stages in larger equipment. Regardless of how many stages are available, the unit controller will seek to provide the right amount of cooling to satisfy the demand. This helps provide great comfort control and to minimize energy consumption. The sequence of operation for increasing and decreasing cooling stages is best shown by the staging chart on page 31. As you can see from the chart, the unit will activate cooling stages if the space temperature rises above certain setpoints. If the temperature continues to rise, the unit will continue to add cooling stages until the unit reaches full cooling capacity. Notice that the example cooling setpoint is 75°F with a 1° deadband. Notice that the stage-up timer is 15 minutes. The unit controller will call for the next cooling stage if the space temperature has been in the stage-up timer deadband region for 15 continuous minutes. The stage-up timer deadband region is the range between the temperature at which the current cooling stage was called, and the temperature at which the next cooling stage would be called. Cooling mode has a stage-down delay default that keeps the next lower stage on for 15 minutes after a higher stage has ended. This feature is to make sure the unit doesn't prematurely shut off a cooling stage. These are all default setpoints and can be changed to customize the unit to the specific application.

## SEQUENCE OF OPERATION

### **ZONE SENSOR MODE (continued)**

#### **ZONE SENSOR MODE COOLING WITH/WITHOUT ECONOMIZER**

If the outdoor air is suitable and the unit features an economizer, instead of using mechanical cooling to meet the first cooling demand, the unit controller will try to meet the demand by opening the economizer and using outdoor air. The economizer damper will modulate to maintain Parameter 159 setting (supply air temperature) to meet the cooling demand.

If mechanical cooling is locked out because of low ambient outside air temperature, then mechanical cooling will not come on and the unit will attempt to satisfy any demand by modulating the economizer's damper position to maintain Parameter 159 setting (supply air temperature). The setpoints at which mechanical cooling locks out and the economizer maintains supply air temperature are adjustable.

If mechanical cooling is not locked out and if the unit is able to satisfy the room temperature requirements using outdoor air, then the unit will close the economizer to the minimum setpoint and cease cooling operation. If the unit is unable to satisfy the room temperature requirements using outdoor air, then the unit will react to a second cooling demand, which will trigger the first stage of mechanical cooling and bring the economizer to the full open position. The unit will continue turning on stages of mechanical cooling until the unit has satisfied the space temperature setpoint. Because the unit can provide up to 4 stages of cooling, and the economizer now qualifies as the first stage of cooling, the unit controller will group the remaining two compressors in a four compressor unit together in the event that two compressors are already energized. This means that to address the fourth stage cooling demand the unit will increase the mechanical cooling from two compressors energized to all compressors energized.

See table for unit operation without an economizer.

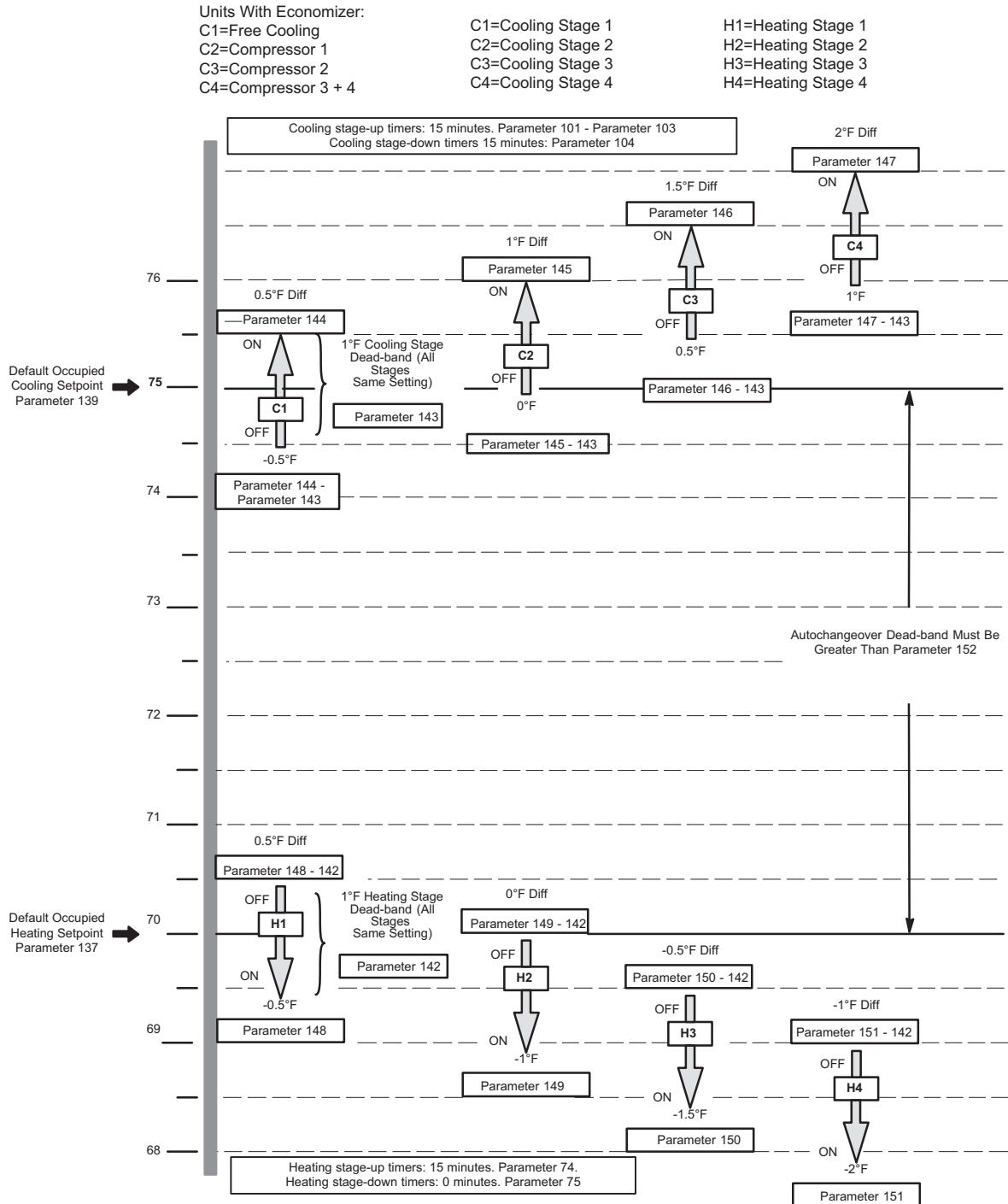
#### **ZONE SENSOR MODE COOLING**

Cooling Demand	Unit with Economizer	Unit Without Economizer or Outdoor Air is Unsuitable
One	Economizer	One Compressor
Two	Economizer + One Compressor	Two Compressors
Three	Economizer + Two Compressors	Three Compressors
Four	Economizer + All Compressors	All Compressors

# SEQUENCE OF OPERATION

## ZONE SENSOR MODE (continued)

### ROOM SENSOR STAGES Default Values Shown



## SEQUENCE OF OPERATION

### **ZONE SENSOR MODE - MSAV® (MULTI-STAGE AIR VOLUME) (continued)**

#### **SUPPLY AIR BLOWER CFM**

Unit has following supply air blower CFM settings:

- Heating CFM
- High Cooling CFM
- Medium-High Cooling CFM
- Medium-Low Cooling CFM
- Low Cooling CFM
- Ventilation CFM
- Blower Speed
- Smoke Speed (Used only in smoke removal option - not covered here)

#### **Unit Features An Economizer And Outdoor Air Is Suitable**

*NOTE - Outdoor air suitability is determined by the energy state of outdoor ambient (enthalpy or sensible) and its ability to achieve the desired free cooling effects. Outdoor air suitability can also be determined by a third-party controller and provided to the rooftop unit via a network connection.*

##### **Y1 Demand:**

All compressors are off, supply air blower is on low cooling CFM to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain Parameter 159 setting (supply air temperature).

##### **Y2 Demand:**

All compressors are off, supply air blower is on high cooling CFM providing higher cooling capacity, and economizer modulates to maintain Parameter 159 setting (supply air temperature).

Parameter 164 dictates when one compressor is energized while supply air blower stays on high cooling CFM providing maximum cooling capacity. After compressors are energized the economizer stays at maximum open.

##### **Y3 Demand:**

Two compressors are energized while supply air blower is on high cooling CFM providing even higher cooling capacity.

##### **Y4 Demand:**

All compressors are energized while supply air blower is on high cooling CFM providing maximum cooling capacity.

#### **Unit Does Not Feature An Economizer (Or Outdoor Air Is Not Suitable)**

##### **Y1 Demand:**

One compressor operates and supply air blower operates at low cooling CFM.

##### **Y2 Demand:**

Two compressors operate and supply air blower operates at medium-low cooling CFM.

##### **Y3 Demand:**

Three compressors operate and supply air blower operates at medium-high cooling CFM.

##### **Y4 Demand:**

All compressors operate and supply air blower operates at high cooling CFM.



## OPTIONS / ACCESSORIES

Item Description		Catalog Number	Unit Model No.		
			180	240	300
COOLING SYSTEM					
Condensate Drain Trap	PVC	22H54	OX	OX	OX
	Copper	76W27	OX	OX	OX
Corrosion Protection		Factory	O	O	O
Drain Pan Overflow Switch		21Z07	OX	OX	OX
Refrigerant Type		R-410A	O	O	O
BLOWER - SUPPLY AIR					
Blower	MSAV (multi-stage air volume) blower option (With VFD Bypass Control)	Factory	O	O	O
	MSAV (multi-stage air volume) blower option (Without VFD Bypass Control)	Factory	O	O	O
Motors - MSAV (multi-stage air volume)	Belt Drive (standard efficiency) - 3 hp	Factory	O		
	Belt Drive (standard efficiency) - 5 hp	Factory	O	O	O
	Belt Drive (standard efficiency) - 7.5 hp	Factory	O	O	O
	Belt Drive (standard efficiency) - 10 hp	Factory		O	O
Drive Kits	Kit #1 535-725 rpm	Factory	O		
See Blower Data Tables for usage and selection	Kit #2 710-965 rpm	Factory	O		
	Kit #3 685-856 rpm	Factory	O	O	O
	Kit #4 850-1045 rpm	Factory	O	O	O
	Kit #5 945-1185 rpm	Factory	O	O	O
	Kit #6 850-1045 rpm	Factory	O	O	O
	Kit #7 945-1185 rpm	Factory	O	O	O
	Kit #8 1045-1285 rpm	Factory	O	O	O
	Kit #10 1045-1285 rpm	Factory		O	O
	Kit #11 1135-1365 rpm	Factory		O	O
	Blower Belt Auto-Tensioner	Factory	O	O	O
CABINET					
Combination Coil/Hail Guards		13T12	X	X	X
CONTROLS					
Blower Proving Switch		21Z10	OX	OX	OX
Commercial Controls	Prodigy® Control System - BACnet® Module	59W51	OX	OX	OX
	Prodigy® Control System - LonTalk® Module	54W27	OX	OX	OX
	Novar® ETM-2051	64W74	OX	OX	OX
	Novar® LSE	Factory	O	O	O
	L Connection® Building Automation System	- - -	X	X	X
Dirty Filter Switch		53W68	OX	OX	OX
Fresh Air Tempering		21Z08	OX	OX	OX
General Purpose Control Kit		13J78	X	X	X
Smoke Detector - Supply or Return (Power board and one sensor)		83W40	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)		83W41	OX	OX	OX

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX = Configure To Order (Factory Installed) or Field Installed.

O = Configure To Order (Factory Installed).

X = Field Installed.

## OPTIONS / ACCESSORIES

Item Description	Catalog Number	Unit Model No.			
		180	240	300	
INDOOR AIR QUALITY					
Air Filters					
Healthy Climate® High Efficiency Air Filters	MERV 8	54W67	OX	OX	OX
24 x 24 x 2 (Order 6 per unit)	MERV 13	52W40	OX	OX	OX
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)		44N61	OX	OX	OX
Indoor Air Quality (CO₂) Sensors					
Sensor - Wall-mount, off-white plastic cover with LCD display		77N39	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		87N53	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting		87N52	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting		87N54	X	X	X
CO₂ Sensor Duct Mounting Kit - for downflow applications		85L43	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO₂ sensors (87N53 or 77N39)		90N43	X	X	X
UVC Germicidal Light Kit					
¹ Healthy Climate® UVC Light Kit (110/230v-1ph)		21A94	X	X	X
Step-Down Transformers	460V primary, 230V secondary	10H20	X	X	X
	575V primary, 230V secondary	10H21	X	X	X
ELECTRICAL					
Voltage 60 hz	208/230V - 3 phase	Factory	O	O	O
	460V - 3 phase	Factory	O	O	O
	575V - 3 phase	Factory	O	O	O
Disconnect Switch (see Electric Heat Tables for usage, page 31)	80 amp	54W85	OX	OX	OX
	150 amp	54W86	OX	OX	OX
	250 amp	54W87	OX	OX	OX
² Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O
GFI	15 amp non-powered, field-wired (208/230V, 460V, 575V)	74M70	OX	OX	OX
Service	15 amp factory-wired and powered (208/230V, 460V, 575V)	Factory	O	O	O
Outlets	20 amp non-powered, field-wired (575V only)	67E01	OX	OX	OX
Weatherproof Cover for GFI		10C89	X	X	X
ELECTRIC HEAT					
15 kW	208/230V-3ph	53W84	OX	OX	OX
	460V-3ph	53W86	OX	OX	OX
	575V-3ph	53W87	OX	OX	OX
30 kW	208/230V-3ph	53W92	OX	OX	OX
	460V-3ph	53W94	OX	OX	OX
	575V-3ph	53W95	OX	OX	OX
45 kW	208/230V-3ph	54W00	OX	OX	OX
	460V-3ph	54W02	OX	OX	OX
	575V-3ph	54W03	OX	OX	OX
60 kW	208/230V-3ph	54W08	OX	OX	OX
	460V-3ph	54W10	OX	OX	OX
	575V-3ph	54W11	OX	OX	OX
90 kW	208/230V-3ph	54W12		OX	OX
	460V-3ph	54W14		OX	OX
	575V-3ph	54W15		OX	OX
SCR (Silicon Controlled Rectifier) Electric Heat Control		Factory	O	O	O
NOTE - The SCR option is not available with 45 kW, 60 kW and 90kW electric heat (208/230V) models.					
Thermostat (required)		Y9682	X	X	X
Duct Sensor (required)		Y9683	X	X	X

<sup>1</sup> Lamps operate on 110-230V single-phase power supply. Step-down transformer may be ordered separately for 460V and 575V units. Alternately, 110V power supply may be used to directly power the UVC ballast(s).

<sup>2</sup> Disconnect Switch not available with higher SCCR option. Short-Circuit Current Rating option not available on field installed electric heat or 90kW electric heat (208/240V) models.

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX = Configure To Order (Factory Installed) or Field Installed.

O = Configure To Order (Factory Installed).

X = Field Installed.

## OPTIONS / ACCESSORIES

Item Description	Catalog Number	Unit Model No.			
		180	240	300	
ECONOMIZER					
High Performance Economizer (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)					
High Performance Economizer Downflow or Horizontal - Includes Outdoor Air Hood. Order Downflow or Horizontal Barometric Relief Dampers separately.	16Y98	OX	OX	OX	
Economizer Controls					
Differential Enthalpy (Not for Title 24)	Order 2 21Z09	OX	OX	OX	
Sensible Control	Sensor is Furnished Factory	O	O	O	
Single Enthalpy (Not for Title 24)	21Z09	OX	OX	OX	
Global Control	Sensor Field Provided Factory	O	O	O	
Building Pressure Control	13J77	X	X	X	
Outdoor Air CFM Control	13J76	X	X	X	
Barometric Relief Dampers With Exhaust Hood					
Downflow Barometric Relief Dampers	54W78	OX	OX	OX	
Horizontal Barometric Relief Dampers	16K99	X	X	X	
OUTDOOR AIR					
Outdoor Air Dampers With Outdoor Air Hood					
Motorized	13U04	OX	OX	OX	
Manual	13U05	OX	OX	OX	
¹ POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)					
Standard Static	208/230V 75W90	OX	OX	OX	
	460V 75W91	OX	OX	OX	
	575V 75W92	OX	OX	OX	
ROOF CURBS					
Hybrid Roof Curbs, Downflow					
8 in. height	11F58	X	X	X	
14 in. height	11F59	X	X	X	
18 in. height	11F60	X	X	X	
24 in. height	11F61	X	X	X	
Adjustable Pitch Curb					
14 in. height	43W26	X	X	X	
Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit					
26 in. height - slab applications	11T89	X	X	X	
37 in. height - rooftop applications	11T96	X	X	X	
Insulation Kit For Standard Horizontal Roof Curbs					
For 26 in. Curb	73K32	X	X	X	
For 37 in. Curb	73K34	X	X	X	
Horizontal Return Air Panel Kit					
Required for Horizontal Applications with Roof Curb	87M00	X	X	X	
CEILING DIFFUSERS					
Step-Down - Order one	RTD11-185S 13K63	X			
	RTD11-275S 13K64		X	X	
Flush - Order one	FD11-185S 13K58	X			
	FD11-275S 13K59		X	X	
Transitions (Supply and Return) - Order one	C1DIFF33C-1 12X68	X			
	C1DIFF34C-1 12X70		X	X	

<sup>1</sup> Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately.

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX = Configure To Order (Factory Installed) or Field Installed.

O = Configure To Order (Factory Installed).

X = Field Installed.

## SPECIFICATIONS

General Data		15 Ton	20 Ton	25 Ton
Nominal Tonnage		15 Ton	20 Ton	25 Ton
Model Number		LCH180U4M	LCH240U4M	LCH300U4M
Efficiency Type		Ultra	Ultra	Ultra
Blower Type		MSAV® (Multi-Stage Air Volume)	MSAV® (Multi-Stage Air Volume)	MSAV® (Multi-Stage Air Volume)
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh	185,300	241,000	272,000
	<sup>1</sup> Net Cooling Capacity - Btuh	180,000	234,000	265,000
	AHRI Rated Air Flow - cfm	5,200	6,400	8,400
	Total Unit Power - kW	14.2	19.5	25.2
	<sup>1</sup> EER (Btuh/Watt)	12.7	12.0	10.5
	<sup>2</sup> IEER (Btuh/Watt)	20.2	20.0	17.5
<b>Refrigerant Charge</b>	Refrigerant Type	R-410A	R-410A	R-410A
	Circuit 1	20 lbs. 0 oz.	21 lbs. 4 oz.	23 lbs. 8 oz.
	Circuit 2	20 lbs. 8 oz.	22 lbs. 0 oz.	21 lbs. 0 oz.
<b>Electric Heat Available - See page 22</b>		15-30-45-60 kW	15-30-45-60-90 kW	15-30-45-60-90 kW
<b>Compressor Type (number)</b>		Tandem Scroll (4)	Tandem Scroll (4)	Tandem Scroll (4)
<b>Outdoor Coils</b>	Net face area (total) - sq. ft.	55.2	55.2	55.2
	Tube Diameter - in.	3/8	3/8	3/8
	Number of rows	2	2	2
	Fins per inch	20	20	20
<b>Outdoor Coil Fans</b>	Motor - (No.) horsepower	(6) 1/3 ECM	(6) 1/3 ECM	(6) 1/3 ECM
	Motor rpm	530 - 895	590 - 955	590 - 955
	Total Motor watts	210 - 860	555 - 1740	555 - 1740
	Diameter - (No.) in.	(6) 24	(6) 24	(6) 24
	Number of blades	3	3	3
	Total Air volume - cfm	16,000	19,500	19,500
<b>Indoor Coils</b>	Net face area (total) - sq. ft.	21.4	21.4	21.4
	Tube diameter - in.	3/8	3/8	3/8
	Number of rows	4	4	3
	Fins per inch	14	14	14
	Drain connection - No. and size	(1) 1 in. FPT	(1) 1 in. FPT	(1) 1 in. FPT
	Expansion device type	Balance port TXV, removable head		
<sup>3</sup> <b>Indoor Blower and Drive Selection</b>	Nominal motor output	3 hp, 5 hp, 7.5 hp	5 hp, 7.5 hp, 10 hp	5 hp, 7.5 hp, 10 hp
	Maximum usable motor output (US Only)	3.45 hp, 5.75 hp, 8.62 hp	5.75 hp, 8.62 hp, 11.5 hp	5.75 hp, 8.62 hp, 11.5 hp
	Motor - Drive kit number	<b>3 hp Std. Eff.</b> <b>Kit 1</b> 535-725 rpm <b>Kit 2</b> 710-965 rpm <b>3 hp High. Eff.</b> <b>Kit 3</b> - 685-856 rpm <b>Kit 4</b> 850-1045 rpm <b>5 hp</b> <b>Kit 3</b> 685-856 rpm <b>Kit 4</b> 850-1045 rpm <b>Kit 5</b> 945-1185 rpm <b>7.5 hp</b> <b>Kit 6</b> 850-1045 rpm <b>Kit 7</b> 945-1185 rpm <b>Kit 8</b> 1045-1285 rpm	<b>5 hp</b> <b>Kit 3</b> 685-856 rpm <b>Kit 4</b> 850-1045 rpm <b>Kit 5</b> 945-1185 rpm <b>7.5 hp</b> <b>Kit 6</b> 850-1045 rpm <b>Kit 7</b> 945-1185 rpm <b>Kit 8</b> 1045-1285 rpm <b>10 hp</b> <b>Kit 7</b> 945-1185 rpm <b>Kit 10</b> 1045-1285 rpm <b>Kit 11</b> 1135-1365 rpm	<b>5 hp</b> <b>Kit 3</b> 685-856 rpm <b>Kit 4</b> 850-1045 rpm <b>Kit 5</b> 945-1185 rpm <b>7.5 hp</b> <b>Kit 6</b> 850-1045 rpm <b>Kit 7</b> 945-1185 rpm <b>Kit 8</b> 1045-1285 rpm <b>10 hp</b> <b>Kit 7</b> 945-1185 rpm <b>Kit 10</b> 1045-1285 rpm <b>Kit 11</b> 1135-1365 rpm
	Blower wheel nominal D x W - in.	(2) 15 x 15	(2) 15 x 15	(2) 15 x 15
<b>Filters</b>	Type of filter	Fiberglass, disposable		
	Number and size - in.	(6) 24 x 24 x 2		
<b>Electrical characteristics</b>		208/230V, 460V or 575V - 60 hertz - 3 phase		

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.

<sup>1</sup> AHRI Certified to AHRI Standard 340/360; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air; minimum external duct static pressure.

<sup>2</sup> Integrated Energy Efficiency Ratio tested according to AHRI Standard 340/360.

<sup>3</sup> Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – MSAV® (Multi-Stage Air Volume) drive is limited to a motor service factor of 1.0.

## RATINGS

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

### 15 TON ULTRA-HIGH EFFICIENCY LCH180U4M (1 COMPRESSOR OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	2000	54.5	2.1	0.85	0.99	1	48.6	2.38	0.85	1	1	43	2.69	0.86	1	1	37.3	3.04	0.87	1	1
	2200	56.4	2.1	0.88	1	1	50.8	2.38	0.89	1	1	45.1	2.69	0.9	1	1	39.2	3.04	0.92	1	1
	2400	58.5	2.1	0.91	1	1	52.7	2.38	0.92	1	1	46.9	2.69	0.93	1	1	40.9	3.04	0.95	1	1
67°F	2000	58.7	2.1	0.65	0.83	0.97	52.6	2.38	0.63	0.83	0.98	46.4	2.69	0.61	0.84	1	39.8	3.04	0.59	0.85	1
	2200	60.2	2.1	0.67	0.86	0.99	54	2.38	0.66	0.87	1	47.6	2.69	0.64	0.89	1	41	3.04	0.62	0.9	1
	2400	61.5	2.1	0.69	0.89	1	55.1	2.39	0.68	0.91	1	48.7	2.69	0.67	0.92	1	42	3.04	0.65	0.94	1
71°F	2000	63.1	2.1	0.48	0.65	0.81	56.9	2.39	0.45	0.64	0.82	50.5	2.69	0.41	0.62	0.82	44	3.04	0.35	0.6	0.84
	2200	64.7	2.11	0.49	0.67	0.84	58.4	2.39	0.46	0.66	0.85	51.9	2.69	0.42	0.65	0.87	45.2	3.04	0.37	0.64	0.88
	2400	66.1	2.11	0.5	0.69	0.88	59.6	2.39	0.47	0.68	0.89	53	2.69	0.44	0.68	0.9	46.3	3.04	0.39	0.67	0.92

### 15 TON ULTRA-HIGH EFFICIENCY LCH180U4M (2 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	2400	100.5	3.88	0.68	0.82	0.95	92.9	4.4	0.68	0.83	0.96	85.1	4.98	0.68	0.83	0.99	76.8	5.64	0.68	0.85	1
	3000	107.4	3.89	0.74	0.89	1	99.5	4.41	0.74	0.91	1	91.1	4.98	0.75	0.93	1	82.6	5.64	0.76	0.95	1
	3600	113.3	3.9	0.79	0.96	1	104.6	4.42	0.8	0.98	1	96.2	4.99	0.81	1	1	88.3	5.64	0.83	1	1
67°F	2400	109.4	3.89	0.54	0.66	0.78	101.3	4.41	0.53	0.66	0.79	93.1	4.99	0.52	0.66	0.8	84.6	5.64	0.5	0.65	0.82
	3000	116.6	3.9	0.57	0.71	0.85	108.1	4.42	0.57	0.72	0.87	99.2	4.99	0.56	0.73	0.89	89.9	5.64	0.55	0.74	0.92
	3600	121.7	3.91	0.61	0.77	0.92	112.8	4.43	0.6	0.78	0.95	103.8	5	0.6	0.79	0.97	94.1	5.64	0.6	0.81	1
71°F	2400	118.2	3.9	0.41	0.53	0.64	110.1	4.42	0.4	0.52	0.64	101.5	4.99	0.38	0.51	0.64	92.5	5.64	0.35	0.5	0.64
	3000	125.9	3.91	0.43	0.56	0.69	117	4.43	0.42	0.56	0.7	107.9	5	0.4	0.55	0.71	98.5	5.64	0.38	0.55	0.72
	3600	131.3	3.92	0.44	0.6	0.75	122.2	4.44	0.43	0.6	0.76	112.4	5	0.42	0.6	0.77	102.8	5.65	0.4	0.6	0.78

### 15 TON ULTRA-HIGH EFFICIENCY LCH180U4M (3 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	3600	149.1	5.97	0.7	0.83	0.95	139.5	6.75	0.7	0.84	0.97	129.5	7.61	0.7	0.85	0.99	118.9	8.6	0.71	0.87	1
	4500	158.3	6	0.75	0.89	1	148	6.77	0.75	0.92	1	137.7	7.64	0.76	0.94	1	126.5	8.63	0.78	0.96	1
	5400	165.7	6.02	0.8	0.96	1	155.2	6.8	0.81	0.98	1	144.6	7.66	0.82	1	1	134.2	8.64	0.84	1	1
67°F	3600	160.8	6.01	0.55	0.67	0.79	150.7	6.78	0.55	0.68	0.81	140.4	7.65	0.54	0.68	0.82	129.4	8.63	0.53	0.69	0.83
	4500	170.4	6.03	0.58	0.72	0.86	159.6	6.81	0.58	0.73	0.88	148.1	7.66	0.58	0.74	0.9	136.4	8.65	0.58	0.76	0.93
	5400	177	6.05	0.62	0.78	0.93	166	6.83	0.62	0.79	0.95	154.2	7.68	0.61	0.8	0.98	142.1	8.66	0.62	0.82	1
71°F	3600	172.4	6.04	0.42	0.54	0.65	162.1	6.81	0.42	0.53	0.65	151	7.68	0.4	0.53	0.66	139.8	8.66	0.39	0.53	0.66
	4500	182.5	6.07	0.44	0.57	0.7	171.4	6.84	0.43	0.57	0.71	159.8	7.7	0.41	0.57	0.72	147.6	8.68	0.41	0.57	0.74
	5400	189.7	6.09	0.45	0.61	0.76	177.9	6.86	0.45	0.61	0.77	165.6	7.72	0.44	0.61	0.79	152.9	8.69	0.43	0.62	0.8

### 15 TON ULTRA-HIGH EFFICIENCY LCH180U4M (ALL COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		85°F					95°F					105°F					115°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	4800	183	10.35	0.71	0.86	0.99	170	11.7	0.72	0.88	1	156.4	13.27	0.73	0.9	1	142.1	15.1	0.75	0.93	1
	6000	193.6	10.39	0.77	0.94	1	180	11.74	0.78	0.96	1	166.1	13.31	0.8	0.99	1	152	15.13	0.83	1	1
	7200	202.3	10.43	0.83	1	1	189.5	11.77	0.85	1	1	176.1	13.33	0.87	1	1	162	15.16	0.91	1	1
67°F	4800	197.1	10.41	0.55	0.69	0.82	183.6	11.75	0.55	0.7	0.84	169.4	13.32	0.55	0.71	0.86	154	15.13	0.55	0.73	0.9
	6000	207.7	10.44	0.59	0.75	0.9	193.1	11.78	0.59	0.76	0.93	177.7	13.34	0.6	0.78	0.96	161.9	15.16	0.6	0.81	0.99
	7200	215.4	10.47	0.63	0.81	0.97	199.9	11.81	0.63	0.83	1	184.1	13.36	0.64	0.85	1	167.7	15.18	0.65	0.88	1
71°F	4800	211.5	10.46	0.41	0.54	0.67	197.3	11.81	0.4	0.54	0.67	182.4	13.35	0.4	0.54	0.69	166.8	15.17	0.38	0.55	0.7
	6000	222.3	10.5	0.44	0.58	0.72	207.6	11.84	0.42	0.59	0.74	191.4	13.39	0.42	0.59	0.76	174.8	15.21	0.41	0.6	0.79
	7200	230.5	10.53	0.44	0.62	0.79	214.6	11.87	0.44	0.63	0.81	197.9	13.41	0.44	0.64	0.83	180.7	15.22	0.43	0.65	0.86

## RATINGS

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

### 20 TON ULTRA-HIGH EFFICIENCY LCH240U4M (1 COMPRESSOR OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	2600	71.2	2.28	0.8	0.97	1	66.6	2.65	0.81	0.99	1	62	3.05	0.82	1	1	57.5	3.49	0.84	1	1
	2900	73.3	2.28	0.83	1	1	69	2.65	0.84	1	1	64.4	3.05	0.86	1	1	59.8	3.49	0.89	1	1
	3200	75.8	2.27	0.86	1	1	71.3	2.64	0.88	1	1	66.7	3.05	0.9	1	1	62	3.49	0.93	1	1
67°F	2600	75.7	2.27	0.62	0.78	0.94	70.9	2.65	0.62	0.79	0.96	65.8	3.05	0.62	0.8	0.98	60.7	3.49	0.62	0.82	1
	2900	77.8	2.27	0.64	0.81	0.98	72.7	2.64	0.64	0.82	1	67.5	3.05	0.64	0.84	1	62.1	3.49	0.65	0.86	1
	3200	79.4	2.26	0.66	0.84	1	74.2	2.64	0.66	0.86	1	68.9	3.04	0.66	0.88	1	63.5	3.48	0.67	0.9	1
71°F	2600	80.4	2.26	0.46	0.61	0.76	75.5	2.64	0.45	0.61	0.77	70.3	3.04	0.44	0.61	0.78	65.1	3.48	0.42	0.61	0.79
	2900	82.7	2.25	0.47	0.63	0.79	77.6	2.63	0.46	0.63	0.8	72.2	3.04	0.45	0.64	0.82	66.9	3.48	0.44	0.64	0.84
	3200	84.5	2.24	0.48	0.65	0.82	79.3	2.62	0.47	0.65	0.83	73.9	3.03	0.46	0.66	0.85	68.3	3.47	0.45	0.67	0.88

### 20 TON ULTRA-HIGH EFFICIENCY LCH240U4M (2 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	3200	134.6	4.66	0.67	0.81	0.95	127.6	5.39	0.68	0.82	0.97	120.5	6.2	0.68	0.84	0.99	112.8	7.07	0.69	0.86	1
	4000	143.1	4.66	0.72	0.88	1	135.6	5.4	0.73	0.9	1	127.9	6.21	0.74	0.93	1	120.1	7.09	0.76	0.95	1
	4800	150	4.66	0.77	0.96	1	142.1	5.41	0.79	0.98	1	134.3	6.22	0.8	1	1	126.9	7.1	0.81	1	1
67°F	3200	145.1	4.66	0.53	0.65	0.77	137.6	5.41	0.53	0.66	0.78	130	6.21	0.53	0.66	0.8	122	7.09	0.53	0.67	0.81
	4000	154.2	4.66	0.56	0.69	0.84	146.2	5.41	0.57	0.71	0.86	137.6	6.22	0.57	0.72	0.88	129	7.1	0.57	0.73	0.91
	4800	160.4	4.64	0.59	0.75	0.92	151.9	5.4	0.6	0.76	0.94	143.5	6.22	0.59	0.78	0.97	134.3	7.1	0.61	0.79	0.99
71°F	3200	156	4.65	0.42	0.52	0.63	148.1	5.4	0.41	0.52	0.63	140.1	6.22	0.39	0.52	0.64	132.1	7.1	0.4	0.52	0.64
	4000	165.7	4.63	0.42	0.55	0.67	157.3	5.39	0.42	0.55	0.68	148.4	6.21	0.41	0.55	0.69	139.8	7.1	0.4	0.56	0.71
	4800	172.8	4.61	0.43	0.58	0.72	163.9	5.37	0.43	0.59	0.73	154.7	6.2	0.43	0.59	0.75	145.3	7.09	0.43	0.6	0.77

### 20 TON ULTRA-HIGH EFFICIENCY LCH240U4M (3 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	4800	194	7.68	0.71	0.84	0.96	184.8	8.83	0.72	0.85	0.98	175.1	10.08	0.73	0.87	0.99	165.2	11.45	0.74	0.89	1
	6000	205.2	7.73	0.76	0.9	1	195.1	8.89	0.77	0.92	1	185.2	10.14	0.78	0.94	1	174.4	11.52	0.8	0.97	1
	7200	214.4	7.77	0.81	0.97	1	204	8.93	0.82	0.99	1	193.5	10.19	0.84	1	1	183.5	11.57	0.86	1	1
67°F	4800	208.3	7.75	0.57	0.69	0.81	198.3	8.9	0.57	0.69	0.82	188.4	10.16	0.57	0.7	0.83	177.6	11.54	0.57	0.71	0.85
	6000	220.3	7.78	0.6	0.73	0.87	209.3	8.94	0.6	0.74	0.88	198.6	10.21	0.6	0.76	0.91	186.7	11.59	0.61	0.77	0.93
	7200	229	7.81	0.62	0.78	0.93	217.4	8.97	0.63	0.8	0.95	206.1	10.24	0.64	0.82	0.98	193.7	11.62	0.65	0.83	1
71°F	4800	223	7.79	0.44	0.55	0.66	212.5	8.96	0.43	0.55	0.67	202	10.23	0.43	0.55	0.68	190.7	11.61	0.42	0.56	0.69
	6000	235.8	7.82	0.45	0.58	0.71	224.6	8.99	0.45	0.59	0.72	212.9	10.26	0.44	0.59	0.73	200.8	11.65	0.45	0.6	0.75
	7200	244.7	7.83	0.46	0.61	0.75	233	9	0.46	0.62	0.77	221.2	10.28	0.46	0.63	0.79	208.4	11.67	0.46	0.64	0.81

### 20 TON ULTRA-HIGH EFFICIENCY LCH240U4M (ALL COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		85°F					95°F					105°F					115°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	6400	237.1	13.72	0.69	0.84	0.99	224.5	15.55	0.69	0.86	1	211.1	17.57	0.71	0.89	1	196.8	19.78	0.73	0.92	1
	8000	250.4	13.83	0.74	0.93	1	237	15.67	0.75	0.96	1	222.5	17.69	0.78	0.99	1	208.6	19.91	0.81	1	1
	9600	261.1	13.92	0.8	1	1	248	15.76	0.82	1	1	234.6	17.8	0.85	1	1	220.6	20.03	0.88	1	1
67°F	6400	254.9	13.86	0.54	0.66	0.8	241	15.71	0.54	0.67	0.82	227.2	17.73	0.55	0.69	0.84	211.6	19.94	0.55	0.7	0.88
	8000	268.1	13.97	0.56	0.71	0.88	253	15.81	0.57	0.73	0.91	237.7	17.81	0.58	0.75	0.94	221.8	20.04	0.6	0.78	0.98
	9600	277.3	14.03	0.6	0.77	0.96	262.5	15.87	0.61	0.79	0.99	246.2	17.89	0.62	0.82	1	228.4	20.1	0.63	0.86	1
71°F	6400	272.3	14	0.41	0.52	0.64	257.9	15.84	0.41	0.52	0.65	243.8	17.88	0.4	0.53	0.66	227.1	20.08	0.4	0.54	0.68
	8000	286.3	14.08	0.42	0.56	0.69	270.8	15.92	0.42	0.56	0.7	254.9	17.95	0.42	0.57	0.72	238.4	20.18	0.42	0.58	0.75
	9600	296	14.12	0.43	0.58	0.74	280.9	15.99	0.43	0.6	0.76	264.2	18.02	0.43	0.61	0.79	245.7	20.23	0.43	0.63	0.82



## RATINGS

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

### 25 TON ULTRA-HIGH EFFICIENCY LCH300U4M (1 COMPRESSOR OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Tem- perature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																							
		65°F						75°F						85°F						95°F					
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)				Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)				Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)				Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			
				Dry Bulb						Dry Bulb						Dry Bulb						Dry Bulb			
				75°F	80°F	85°F				75°F	80°F	85°F				75°F	80°F	85°F				75°F	80°F	85°F	
63°F	cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F				
	3200	86.6	2.99	0.78	0.95	1.00	83.6	3.32	0.85	0.85	1.00	76.5	3.70	0.79	0.98	1.00	73.4	4.20	0.87	0.84	1.00				
	3600	91.4	3.06	0.86	0.85	1.00	84.1	3.33	0.80	0.99	1.00	81.4	3.74	0.88	0.84	1.00	73.7	4.20	0.79	1.00	1.00				
67°F	4000	91.6	3.07	0.80	1.00	1.00	89.2	3.39	0.90	0.84	1.00	81.4	3.74	0.79	1.00	1.00	78.8	4.24	0.92	0.81	1.00				
	3200	91.9	3.07	0.72	0.77	0.93	84.8	3.33	0.69	0.84	1.00	81.5	3.74	0.73	0.78	0.96	74.2	4.21	0.68	0.86	1.00				
	3600	92.6	3.08	0.70	0.85	1.00	89.5	3.40	0.75	0.79	0.97	82.1	3.75	0.69	0.87	1.00	78.4	4.24	0.76	0.79	1.00				
71°F	4000	98.0	3.17	0.76	0.79	0.98	89.6	3.40	0.70	0.88	1.00	86.4	3.80	0.77	0.80	1.00	78.4	4.24	0.70	0.91	1.00				
	3200	92.4	3.08	0.58	0.72	0.53	89.6	3.40	0.58	0.69	0.83	81.9	3.75	0.58	0.73	0.51	78.9	4.25	0.58	0.68	0.85				
	3600	97.8	3.17	0.59	0.70	0.84	89.7	3.40	0.59	0.75	0.51	87.1	3.81	0.59	0.69	0.86	78.6	4.24	0.58	0.76	0.48				
	4000	97.3	3.16	0.61	0.76	0.59	95.0	3.48	0.61	0.7	0.87	86.5	3.80	0.59	0.77	0.58	83.5	4.29	0.61	0.70	0.90				

### 25 TON ULTRA-HIGH EFFICIENCY LCH300U4M (2 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	4000	161.0	5.88	0.69	0.83	0.96	151.2	6.52	0.70	0.84	0.98	141.1	7.34	0.7	0.86	0.99	130.6	8.34	0.71	0.88	1.00
	5000	170.6	6.01	0.75	0.90	1.00	160.6	6.63	0.76	0.92	1.00	150.0	7.42	0.77	0.94	1.00	139.1	8.40	0.78	0.97	1.00
	6000	178.5	6.13	0.80	0.97	1.00	168.0	6.72	0.80	0.99	1.00	157.5	7.49	0.83	1.00	1.00	147.1	8.46	0.85	1.00	1.00
67°F	4000	173.4	6.05	0.54	0.67	0.80	163.3	6.66	0.54	0.67	0.81	152.8	7.45	0.54	0.68	0.82	141.7	8.42	0.53	0.69	0.84
	5000	183.0	6.20	0.57	0.72	0.87	172.4	6.78	0.58	0.73	0.89	161.1	7.54	0.58	0.74	0.91	149.5	8.48	0.58	0.76	0.93
	6000	190.2	6.31	0.61	0.78	0.94	178.9	6.86	0.61	0.79	0.96	166.9	7.60	0.61	0.81	0.98	154.8	8.53	0.62	0.83	1.00
71°F	4000	185.7	6.24	0.42	0.53	0.65	175.1	6.81	0.41	0.53	0.65	164.3	7.57	0.39	0.53	0.66	152.9	8.51	0.38	0.52	0.66
	5000	195.9	6.41	0.43	0.57	0.70	184.7	6.95	0.42	0.57	0.71	173.0	7.68	0.41	0.57	0.72	160.9	8.59	0.40	0.57	0.73
	6000	203.3	6.54	0.45	0.60	0.76	191.5	7.05	0.44	0.60	0.77	179.3	7.76	0.43	0.61	0.79	166.8	8.65	0.42	0.61	0.80

### 25 TON ULTRA-HIGH EFFICIENCY LCH300U4M (3 COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	6000	233.3	9.49	0.71	0.85	0.95	220.9	10.64	0.71	0.86	0.97	207.9	12.01	0.72	0.88	0.98	193.2	13.61	0.73	0.90	1.00
	7200	244.1	9.66	0.75	0.90	1.00	230.9	10.78	0.76	0.91	1.00	216.6	12.12	0.77	0.93	1.00	204.2	13.74	0.79	0.94	1.00
	8400	251.9	9.78	0.79	0.94	1.00	239.0	10.88	0.80	0.95	1.00	227.0	12.26	0.82	0.97	1.00	212.3	13.85	0.84	0.98	1.00
67°F	6000	249.6	9.74	0.56	0.69	0.81	236.4	10.85	0.56	0.69	0.83	222.8	12.20	0.56	0.70	0.84	208.4	13.80	0.56	0.71	0.86
	7200	260.1	9.92	0.58	0.73	0.87	246.2	11.00	0.58	0.74	0.89	231.8	12.33	0.59	0.75	0.91	216.7	13.90	0.59	0.76	0.92
	8400	268.1	10.06	0.61	0.77	0.91	253.6	11.11	0.61	0.78	0.93	238.8	12.43	0.62	0.80	0.94	223.1	13.99	0.62	0.82	0.96
71°F	6000	265.6	10.01	0.42	0.54	0.66	252.0	11.08	0.42	0.54	0.67	237.8	12.41	0.41	0.54	0.68	223.1	13.98	0.40	0.55	0.69
	7200	276.6	10.20	0.43	0.57	0.71	262.3	11.25	0.43	0.57	0.72	247.3	12.55	0.42	0.58	0.73	231.7	14.11	0.42	0.58	0.74
	8400	285.0	10.36	0.44	0.60	0.75	269.7	11.38	0.44	0.60	0.76	254.5	12.66	0.44	0.61	0.78	238.1	14.20	0.43	0.62	0.80

### 25 TON ULTRA-HIGH EFFICIENCY LCH300U4M (ALL COMPRESSORS OPERATING) - MSAV (Multi-Stage Air Volume)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		85°F					95°F					105°F					115°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	8000	274.6	16.97	0.73	0.88	1.00	257.6	19.25	0.74	0.90	1.00	239.4	21.82	0.76	0.93	1.00	220.1	24.68	0.78	0.96	1.00
	9500	285.5	17.15	0.77	0.94	1.00	267.4	19.40	0.79	0.97	1.00	249.2	21.97	0.81	0.99	1.00	230.1	24.85	0.84	1.00	1.00
	11000	294.4	17.28	0.82	0.99	1.00	276.6	19.54	0.84	1.00	1.00	259.3	22.13	0.86	1.00	1.00	240.5	25.02	0.90	1.00	1.00
67°F	8000	293.7	17.27	0.56	0.71	0.85	275.9	19.52	0.57	0.72	0.87	256.7	22.08	0.57	0.73	0.89	235.7	24.94	0.58	0.75	0.93
	9500	304.2	17.45	0.59	0.75	0.91	285.3	19.68	0.60	0.77	0.94	264.6	22.23	0.60	0.79	0.96	243.7	25.09	0.61	0.82	0.99
	11000	312.1	17.58	0.62	0.80	0.97	292.7	19.81	0.63	0.82	0.99	271.9	22.35	0.64	0.84	1.00	249.5	25.20	0.65	0.87	1.00
71°F	8000	312.4	17.58	0.42	0.55	0.68	293.8	19.82	0.41	0.55	0.69	273.7	22.38	0.41	0.56	0.71	252.3	25.24	0.40	0.57	0.73
	9500	323.4	17.78	0.43	0.58	0.73	303.6	20.00	0.43	0.59	0.75	282.7	22.53	0.42	0.60	0.77	260.4	25.40	0.42	0.61	0.79
	11000	331.5	17.93	0.44	0.61	0.77	311.5	20.14	0.44	0.62	0.79	289.4	22.67	0.44	0.63	0.82	266.6	25.51	0.44	0.65	0.85

BLOWER DATA

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

FOR ALL UNITS ADD:

- 1 - Wet indoor coil air resistance of selected unit.
- 2 - Any factory installed options air resistance (electric heat, economizer, etc.)
- 3 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output and drive required.

See page 29 for wet coil and option/accessory air resistance data.

See page 29 for factory installed drive kit specifications.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

All units require 6000 cfm minimum air with electric heat.

Air Volume cfm	TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)																									
	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80		2.00		2.20		2.40		2.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2750	385	0.30	505	0.50	600	0.70	680	0.90	755	1.10	820	1.30	885	1.50	950	1.70	1005	1.90	1060	2.10	1110	2.30	1160	2.50	1205	2.70
3000	395	0.35	515	0.55	610	0.75	685	1.00	760	1.20	825	1.45	885	1.70	950	1.95	1005	2.15	1060	2.35	1110	2.55	1160	2.75	1205	2.95
3250	405	0.40	520	0.60	615	0.85	695	1.10	765	1.30	830	1.60	890	1.85	955	2.10	1005	2.30	1060	2.50	1110	2.70	1160	2.90	1205	3.10
3500	415	0.45	530	0.70	620	0.95	700	1.20	775	1.45	840	1.70	900	2.00	965	2.25	1015	2.45	1070	2.65	1120	2.85	1170	3.05	1205	3.25
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	970	2.40	1020	2.60	1075	2.80	1125	3.00	1175	3.20	1205	3.40
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	975	2.55	1025	2.75	1080	2.95	1130	3.15	1180	3.35	1205	3.55
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	975	2.70	1025	2.90	1080	3.10	1130	3.30	1180	3.50	1205	3.70
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	985	2.90	1035	3.10	1090	3.30	1140	3.50	1190	3.70	1205	3.90
4750	470	0.75	575	1.10	660	1.45	740	1.80	810	2.15	870	2.50	930	2.85	985	3.10	1035	3.30	1090	3.50	1140	3.70	1190	3.90	1205	4.10
5000	480	0.85	585	1.25	670	1.60	750	1.95	815	2.30	880	2.70	940	3.05	995	3.30	1045	3.50	1100	3.70	1150	3.90	1200	4.10	1205	4.30
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.50	1050	3.70	1100	3.90	1150	4.10	1200	4.30	1205	4.50
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.70	1060	3.90	1110	4.10	1160	4.30	1200	4.50	1205	4.70
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.60	1015	3.90	1065	4.10	1115	4.30	1160	4.50	1200	4.70	1205	4.90
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.85	1025	4.10	1075	4.30	1120	4.50	1170	4.70	1200	4.90	1205	5.10
6250	545	1.40	640	1.90	720	2.35	795	2.80	860	3.25	920	3.70	975	4.15	1030	4.40	1080	4.60	1130	4.80	1175	5.00	1200	5.20	1205	5.40
6500	560	1.55	650	2.05	730	2.50	805	3.00	870	3.45	930	3.95	985	4.40	1040	4.70	1090	4.90	1140	5.10	1185	5.30	1200	5.50	1205	5.70
6750	570	1.70	665	2.20	745	2.70	815	3.20	880	3.70	940	4.20	995	4.65	1045	4.95	1095	5.15	1145	5.35	1190	5.55	1200	5.75	1205	5.95
7000	585	1.85	675	2.35	755	2.90	825	3.40	890	3.95	950	4.45	1005	4.95	1055	5.25	1105	5.45	1155	5.65	1200	5.85	1200	6.05	1205	6.25
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	955	4.65	1015	5.25	1065	5.55	1115	5.75	1160	5.95	1200	6.15	1200	6.35	1205	6.55
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	965	4.95	1020	5.50	1075	5.80	1125	6.00	1170	6.20	1200	6.40	1200	6.60	1205	6.80
7750	630	2.40	715	3.00	790	3.55	855	4.10	920	4.70	975	5.25	1030	5.80	1080	6.10	1130	6.30	1180	6.50	1200	6.70	1200	6.90	1205	7.10
8000	640	2.55	725	3.20	800	3.80	865	4.35	930	4.95	985	5.50	1040	6.10	1090	6.40	1140	6.60	1185	6.80	1200	7.00	1200	7.20	1205	7.40
8250	655	2.80	740	3.40	810	4.00	880	4.65	940	5.25	995	5.85	1050	6.45	1100	6.75	1150	6.95	1195	7.15	1200	7.35	1200	7.55	1205	7.75
8500	670	3.00	750	3.65	825	4.30	890	4.90	950	5.55	1005	6.15	1060	6.80	1110	7.00	1160	7.20	1200	7.40	1200	7.60	1200	7.80	1205	8.00
8750	685	3.25	765	3.90	835	4.55	900	5.20	960	5.85	1015	6.45	1070	7.15	1120	7.35	1170	7.55	1200	7.75	1200	7.95	1200	8.15	1205	8.35
9000	700	3.50	780	4.20	850	4.85	910	5.50	970	6.15	1025	6.80	1080	7.50	1130	7.70	1180	7.90	1200	8.10	1200	8.30	1200	8.50	1205	8.70
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.55	1040	7.20	1090	7.85	1140	8.05	1190	8.25	1200	8.45	1200	8.65	1200	8.85	1205	9.05
9500	730	4.00	805	4.75	875	5.45	935	6.15	995	6.90	1050	7.60	1100	8.25	1150	8.45	1200	8.65	1200	8.85	1200	9.05	1200	9.25	1205	9.45
9750	745	4.30	820	5.05	885	5.75	950	6.55	1005	7.20	1060	7.95	1110	8.65	1160	8.85	1200	9.05	1200	9.25	1200	9.45	1200	9.65	1205	9.85
10,000	760	4.60	835	5.40	900	6.15	960	6.85	1015	7.60	1070	8.35	1120	9.05	1170	9.25	1200	9.45	1200	9.65	1200	9.85	1200	10.05	1205	10.25
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	9.75	1200	9.95	1200	10.15	1200	10.35	1200	10.55	1205	10.75
10,500	790	5.20	860	6.00	925	6.85	985	7.65	1040	8.40	1095	9.20	1145	10.00	1190	10.20	1200	10.40	1200	10.60	1200	10.80	1200	11.00	1205	11.20
10,750	805	5.55	875	6.40	940	7.25	1000	8.05	1055	8.85	1105	9.65	1155	10.45	1200	10.65	1200	10.85	1200	11.05	1200	11.25	1200	11.45	1205	11.65
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	1200	11.10	1200	11.30	1200	11.50	1200	11.70	1200	11.90	1205	12.10

## BLOWER DATA

### FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Motor Efficiency	Nominal hp	Maximum hp	Drive Kit Number	RPM Range
Standard	3	3.45	1	535 - 725
Standard	3	3.45	2	710 - 965
High	3	3.45	3	685 - 856
High	3	3.45	4	850 - 1045
Standard	5	5.75	3	685 - 856
Standard	5	5.75	4	850 - 1045
Standard	5	5.75	5	945 - 1185
Standard	7.5	8.63	6	850 - 1045
Standard	7.5	8.63	7	945 - 1185
Standard	7.5	8.63	8	1045 - 1285
Standard	10	11.50	7	945 - 1185
Standard	10	11.50	10	1045 - 1285
Standard	10	11.50	11	1135 - 1365

NOTE - Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE – MSAV® (Multi-Stage Air Volume) drive is limited to a motor service factor of 1.0.

### FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume cfm	Wet Indoor Coil	Electric Heat	Economizer	Filters		Horizontal Roof Curb
	in. w.g.	in. w.g.	in. w.g.	MERV 8	MERV 13	in. w.g.
2750	.02	---	---	.01	.03	.03
3000	.02	---	---	.01	.03	.04
3250	.03	---	---	.01	.04	.04
3500	.03	---	---	.01	.04	.05
3750	.03	---	---	.01	.04	.05
4000	.04	---	---	.01	.04	.06
4250	.04	---	---	.01	.05	.07
4500	.05	---	---	.01	.05	.07
4750	.05	---	---	.02	.05	.08
5000	.05	---	---	.02	.06	.08
5250	.06	---	---	.02	.06	.09
5500	.07	---	---	.02	.06	.10
5750	.07	---	---	.02	.07	.11
6000	.08	.01	---	.03	.07	.11
6250	.08	.01	.01	.03	.07	.12
6500	.09	.01	.02	.03	.08	.13
6750	.10	.01	.03	.03	.08	.14
7000	.10	.01	.04	.04	.08	.15
7250	.11	.01	.05	.04	.09	.16
7500	.12	.01	.06	.04	.09	.17
8000	.13	.02	.09	.05	.10	.19
8500	.15	.02	.11	.05	.10	.21
9000	.16	.04	.14	.06	.11	.24
9500	.18	.05	.16	.07	.12	.26
10,000	.20	.06	.19	.07	.12	.29
10,500	.22	.09	.22	.08	.13	.31
11,000	.24	.11	.25	.09	.14	.34

## BLOWER DATA

### POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure	Air Volume Exhausted
in. w.g.	cfm
0.00	8630
0.05	8210
0.10	7725
0.15	7110
0.20	6470
0.25	5790
0.30	5060
0.35	4300
0.40	3510
0.45	2690
0.50	1840

### CEILING DIFFUSER AIR RESISTANCE - in. w.g.

Air Volume cfm	Step-Down Diffuser						Flush Diffuser	
	RTD11-185S			RTD11-275S			FD11-185S	FD11-275S
	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open		
5000	.51	.44	.39	---	---	---	.27	---
5200	.56	.48	.42	---	---	---	.30	---
5400	.61	.52	.45	---	---	---	.33	---
5600	.66	.56	.48	---	---	---	.36	---
5800	.71	.59	.51	---	---	---	.39	---
6000	.76	.63	.55	.36	.31	.27	.42	.29
6200	.80	.68	.59	---	---	---	.46	---
6400	.86	.72	.63	---	---	---	.50	---
6500	---	---	---	.42	.36	.31	---	.34
6600	.92	.77	.67	---	---	---	.54	---
6800	.99	.83	.72	---	---	---	.58	---
7000	1.03	.87	.76	.49	.41	.36	.62	.40
7200	1.09	.92	.80	---	---	---	.66	---
7400	1.15	.97	.84	---	---	---	.70	---
7500	---	---	---	.51	.46	.41	---	.45
7600	1.20	1.02	.88	---	---	---	.74	---
8000	---	---	---	.59	.49	.43	---	.50
8500	---	---	---	.69	.58	.50	---	.57
9000	---	---	---	.79	.67	.58	---	.66
9500	---	---	---	.89	.75	.65	---	.74
10,000	---	---	---	1.00	.84	.73	---	.81
10,500	---	---	---	1.10	.92	.80	---	.89
11,000	---	---	---	1.21	1.01	.88	---	.96

### CEILING DIFFUSER AIR THROW DATA - ft.

Model No.	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.		Model No.	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.	
		RTD11-185S Step-Down	FD11-185S Flush			RTD11-275S Step-Down	FD11-275S Flush
180	5600	39 - 49	28 - 37	240, 300	7200	33 - 38	26 - 35
	5800	42 - 51	29 - 38		7400	35 - 40	28 - 37
	6000	44 - 54	40 - 50		7600	36 - 41	29 - 38
	6200	45 - 55	42 - 51		7800	38 - 43	40 - 50
	6400	46 - 55	43 - 52		8000	39 - 44	42 - 51
	6600	47 - 56	45 - 56		8200	41 - 46	43 - 52
					8400	43 - 49	44 - 54
					8600	44 - 50	46 - 57
					8800	47 - 55	48 - 59

<sup>1</sup> 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. per minute. Four sides open.

## ELECTRICAL/ELECTRIC HEAT DATA

15 TON

Model No.		LCH180U4M								
<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	13.1			6.1			4.4		
	Locked Rotor Amps	83.1			41			33		
Compressor 2	Rated Load Amps	13.1			6.1			4.4		
	Locked Rotor Amps	83.1			41			33		
Compressor 3	Rated Load Amps	13.1			6.1			4.4		
	Locked Rotor Amps	83.1			41			33		
Compressor 4	Rated Load Amps	13.1			6.1			4.4		
	Locked Rotor Amps	83.1			41			33		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.8 (16.8)			1.4 (8.4)			1.1 (6.6)		
Power Exhaust (2) 0.33 HP	Full Load Amps (total)	2.4 (4.8)			1.3 (2.6)			1 (2)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	3	5	7.5	3	5	7.5	3	5	7.5
	Full Load Amps	10.6	16.7	24.2	4.8	7.6	11	3.9	6.1	9
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	90	100	110	45	45	50	30	35	40
	With (2) 0.33 HP Power Exhaust	100	110	125	45	50	60	35	35	45
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	84	91	100	40	43	47	30	32	36
	With (2) 0.33 HP Power Exhaust	88	95	105	42	45	50	32	34	38

## ELECTRIC HEAT DATA

Electric Heat Voltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V	
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat	15 kW	90	90	100	100	110	110	45	45	50	30	35	40
		30 kW	<sup>4</sup> 100	110	<sup>4</sup> 100	125	<sup>4</sup> 110	125	60	60	60	45	45	50
		45 kW	150	150	<sup>4</sup> 150	175	<sup>4</sup> 150	175	80	80	90	60	70	70
		60 kW	<sup>4</sup> 150	175	<sup>4</sup> 150	175	175	175	80	90	90	70	70	70
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat	15 kW	84	84	91	91	100	100	40	43	47	30	32	36
		30 kW	92	104	100	112	109	121	52	55	59	41	44	48
		45 kW	131	149	139	157	148	166	74	78	82	60	62	66
		60 kW	139	158	146	166	156	175	79	82	86	63	66	69
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	100	100	110	110	125	125	45	50	60	35	35	45
		30 kW	<sup>4</sup> 100	110	<sup>4</sup> 110	125	<sup>4</sup> 125	150	60	60	70	45	50	50
		45 kW	<sup>4</sup> 150	175	<sup>4</sup> 150	175	175	175	80	90	90	70	70	70
		60 kW	<sup>4</sup> 150	175	175	175	<sup>4</sup> 175	200	90	90	90	70	70	80
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	88	88	95	95	105	105	42	45	50	32	34	38
		30 kW	98	110	106	118	115	127	55	58	63	44	47	50
		45 kW	137	155	145	163	154	172	77	81	85	62	65	68
		60 kW	145	164	152	172	162	181	82	85	90	66	68	72

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.<sup>4</sup> Factory installed circuit breaker not available.

## ELECTRICAL/ELECTRIC HEAT DATA

20 TON

Model No.		LCH240U4M								
<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 2	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 3	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Compressor 4	Rated Load Amps	13.5			8			5		
	Locked Rotor Amps	109			59			40		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.8 (16.8)			1.4 (8.4)			1.1 (6.6)		
Power Exhaust (2) 0.33 HP	Full Load Amps (total)	2.4 (4.8)			1.3 (2.6)			1 (2)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	100	125	125	50	60	70	40	45	50
	With (2) 0.33 HP Power Exhaust	110	125	125	60	60	70	40	45	50
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	92	102	110	50	55	58	35	38	41
	With (2) 0.33 HP Power Exhaust	97	106	115	53	57	61	37	40	43

## ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat	15 kW	100	100	125	125	125	125	50	60	70	40	45	50
		30 kW	<sup>4</sup> 100	125	125	125	<sup>4</sup> 125	150	60	60	70	45	50	50
		45 kW	<sup>4</sup> 150	175	<sup>4</sup> 150	175	175	175	80	90	90	70	70	70
		60 kW	<sup>4</sup> 150	175	175	175	<sup>4</sup> 175	200	90	90	90	70	70	80
		90 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	<sup>4</sup> 250	<sup>4</sup> 300	125	125	150	100	100	110
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat	15 kW	92	92	102	102	110	110	50	55	58	35	38	41
		30 kW	100	112	109	121	117	129	55	59	63	44	48	50
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	110	110	125	125	125	125	60	60	70	40	45	50
		30 kW	<sup>4</sup> 110	125	<sup>4</sup> 125	150	<sup>4</sup> 125	150	60	70	70	50	50	60
		45 kW	<sup>4</sup> 150	175	175	175	<sup>4</sup> 175	200	90	90	90	70	70	80
		60 kW	175	175	<sup>4</sup> 175	200	<sup>4</sup> 175	200	90	90	100	70	80	80
		90 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	<sup>4</sup> 300	<sup>4</sup> 250	<sup>4</sup> 300	125	150	150	100	110	110
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	97	97	106	106	115	115	53	57	61	37	40	43
		30 kW	106	118	115	127	123	135	58	63	66	47	50	53
		45 kW	145	163	154	172	162	180	81	85	89	65	68	71
		60 kW	152	172	162	181	170	189	85	90	93	68	72	74
		90 kW	215	244	224	253	233	262	122	126	130	97	101	103

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.<sup>4</sup> Factory installed circuit breaker not available.



## ELECTRICAL/ELECTRIC HEAT DATA

25 TON

Model No.		LCH300U4M								
<sup>1</sup> Voltage - 60hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1	Rated Load Amps	19.6			8.2			6.6		
	Locked Rotor Amps	136			66.1			55.3		
Compressor 2	Rated Load Amps	19.6			8.2			6.6		
	Locked Rotor Amps	136			66.1			55.3		
Compressor 3	Rated Load Amps	19.6			8.2			6.6		
	Locked Rotor Amps	136			66.1			55.3		
Compressor 4	Rated Load Amps	19.6			8.2			6.6		
	Locked Rotor Amps	136			66.1			55.3		
Outdoor Fan Motors (6)	Full Load Amps (total)	2.8 (16.8)			1.4 (8.4)			1.1 (6.6)		
Power Exhaust (2) 0.33 HP	Full Load Amps (total)	2.4 (4.8)			1.3 (2.6)			1 (2)		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	125	150	150	60	60	70	45	50	50
	With (2) 0.33 HP Power Exhaust	125	150	150	60	60	70	45	50	50
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	117	126	134	51	55	59	41	45	47
	With (2) 0.33 HP Power Exhaust	122	131	139	54	58	62	43	47	49

## ELECTRIC HEAT DATA

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat	15 kW	125	125	150	150	150	150	60	60	70	45	50	50
		30 kW	125	125	150	150	150	150	60	60	70	45	50	50
		45 kW	<sup>4</sup> 150	175	<sup>4</sup> 150	175	175	175	80	90	90	70	70	70
		60 kW	<sup>4</sup> 150	175	175	175	<sup>4</sup> 175	200	90	90	90	70	70	80
		90 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	<sup>4</sup> 250	<sup>4</sup> 300	125	125	150	100	100	110
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat	15 kW	117	117	126	126	134	134	51	55	59	41	45	47
		30 kW	117	117	126	126	134	134	55	59	63	44	48	50
		45 kW	139	157	148	166	156	174	78	82	86	62	66	68
		60 kW	146	166	156	175	164	183	82	86	90	66	69	72
		90 kW	209	238	218	247	227	256	118	123	126	95	98	101
<sup>2</sup> Maximum Overcurrent Protection	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	125	125	150	150	150	150	60	60	70	45	50	50
		30 kW	125	125	150	150	150	150	60	70	70	50	50	60
		45 kW	<sup>4</sup> 150	175	175	175	<sup>4</sup> 175	200	90	90	90	70	70	80
		60 kW	175	175	<sup>4</sup> 175	200	<sup>4</sup> 175	200	90	90	100	70	80	80
		90 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	<sup>4</sup> 300	<sup>4</sup> 250	<sup>4</sup> 300	125	150	150	100	110	110
<sup>3</sup> Minimum Circuit Ampacity	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	122	122	131	131	139	139	54	58	62	43	47	49
		30 kW	122	122	131	131	139	139	58	63	66	47	50	53
		45 kW	145	163	154	172	162	180	81	85	89	65	68	71
		60 kW	152	172	162	181	170	189	85	90	93	68	72	74
		90 kW	215	244	224	253	233	262	122	126	130	97	101	103

NOTE - All units have a minimum Short Circuit Current Rating (SCCR) of 5000 amps.

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.<sup>2</sup> HACR type breaker or fuse.<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.<sup>4</sup> Factory installed circuit breaker not available.

## ELECTRICAL ACCESSORIES - DISCONNECTS

### 15 ton | LCH180U4M

Motor Horsepower	3		5		7.5		3	5	7.5	3	5	7.5
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W85	54W85	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W85	54W85	54W85	54W85	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 15 kW	54W85	54W85	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85

### 20 ton | LCH240U4M

Motor Horsepower	5		7.5		10		5	7.5	10	5	7.5	10
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W86	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 90 kW	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W86	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Power Exhaust + Elec. Heat 90 kW	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86

### 25 TON | LCH300U4M

Motor Horsepower	5		7.5		10		5	7.5	10	5	7.5	10
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W85	54W85	54W85	54W85	54W86	54W85	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 90 kW	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W85	54W85	54W85	54W85	54W86	54W85	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 90 kW	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	<sup>1</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86

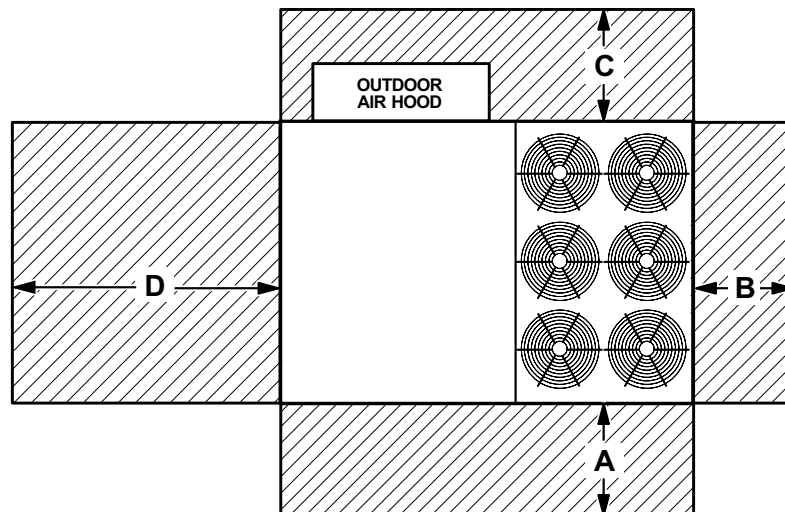
<sup>1</sup> Disconnect must be field furnished.

## ELECTRIC HEAT CAPACITIES

Volts Input	15 kW			30 kW			45 kW			60 kW			90 kW		
	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages
208	11.3	38,600	1	22.5	76,800	1	33.8	115,300	2	45.0	153,600	2	67.6	230,700	2
220	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
230	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
240	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
440	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
460	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
480	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
550	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
575	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
600	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2

## UNIT CLEARANCES

### Unit With Economizer



<sup>1</sup> Unit Clearance	A		B		C		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	
<b>Service Clearance</b>	60	1524	36	914	36	934	66	1676	Unobstructed
<b>Minimum Operation Clearance</b>	45	1143	36	914	36	914	41	1041	

NOTE - Entire perimeter of unit base requires support when elevated above the mounting surface.

<sup>1</sup> **Service Clearance** - Required for removal of serviceable parts.

**Minimum Operation Clearance** - Required clearance for proper unit operation.

## OUTDOOR SOUND DATA

Unit Model Number	Octave Band Sound Power Levels dBA, re 10 <sup>-12</sup> Watts - Center Frequency - Hz							<sup>1</sup> Sound Rating Number (dBA)
	125	250	500	1000	2000	4000	8000	
180	71	76	80	78	74	70	63	86
240, 300	73	81	86	84	78	73	67	90

Note - The octave sound power data does not include tonal corrections.

<sup>1</sup> Sound Rating Number according to ARI Standard 370-2001 (includes pure tone penalty). The Sound Rating Number is the overall A-Weighted Sound Power Level, (LWA), dB (100 Hz to 10,000 Hz).

## WEIGHT DATA

Model Number	Net		Shipping	
	lbs.	kg	lbs.	kg
180 Base Unit	2240	1016	2440	1107
180 Max. Unit	2570	1166	2770	1256
240 Base Unit	2280	1034	2480	1125
240 Max. Unit	2620	1188	2820	1279
300 Base Unit	2320	1052	2520	1143
300 Max. Unit	2660	1207	2860	1297

NOTE - Max. Unit is the unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories EXTERNAL to unit.

## OPTIONS / ACCESSORIES

Description	Shipping Weight	
	lbs.	kg
<b>CEILING DIFFUSERS</b>		
<b>Step-Down</b>		
RTD11-185S	168	76
RTD11-275S	238	108
<b>Flush</b>		
FD11-185S	168	76
FD11-275S	238	108
<b>Transitions</b>		
C1DIFF33C-1	80	36
C1DIFF34C-1	75	34

## ECONOMIZER / OUTDOOR AIR / EXHAUST

### Economizer

Economizer Dampers	102	46
Barometric Relief Dampers (downflow)	30	14
Barometric Relief Dampers (horizontal)	20	9
Outdoor Air Damper Hood (downflow)	65	29

### Outdoor Air Dampers

Outdoor Air Damper Section (downflow) - Automatic (including Hood)	18	39
Outdoor Air Damper Section (downflow) - Manual (including Hood)	10	22

### Power Exhaust

	62	28
--	----	----

## ELECTRIC HEAT

15 kW	59	27
30 kW	59	27
45 kW	76	34
60 kW	76	34
90 kW	84	38

## MSAV (MULTI-STAGE AIR VOLUME) SUPPLY AIR BLOWER OPTION

Variable Frequency Drive (VFD) and associated components	10	5
--	----	---

## ROOF CURBS

### Hybrid Roof Curbs, Downflow

8 in. height	75	34
14 in. height	105	48
18 in. height	125	57
24 in. height	155	70

### Adjustable Pitch Curb, Downflow

14 in. height	262	119
---------------	-----	-----

### Horizontal, Standard

26 in. height	470	213
37 in. height	505	229

## PACKAGING

LTL Packaging (less than truck load)	310	141
--------------------------------------	-----	-----

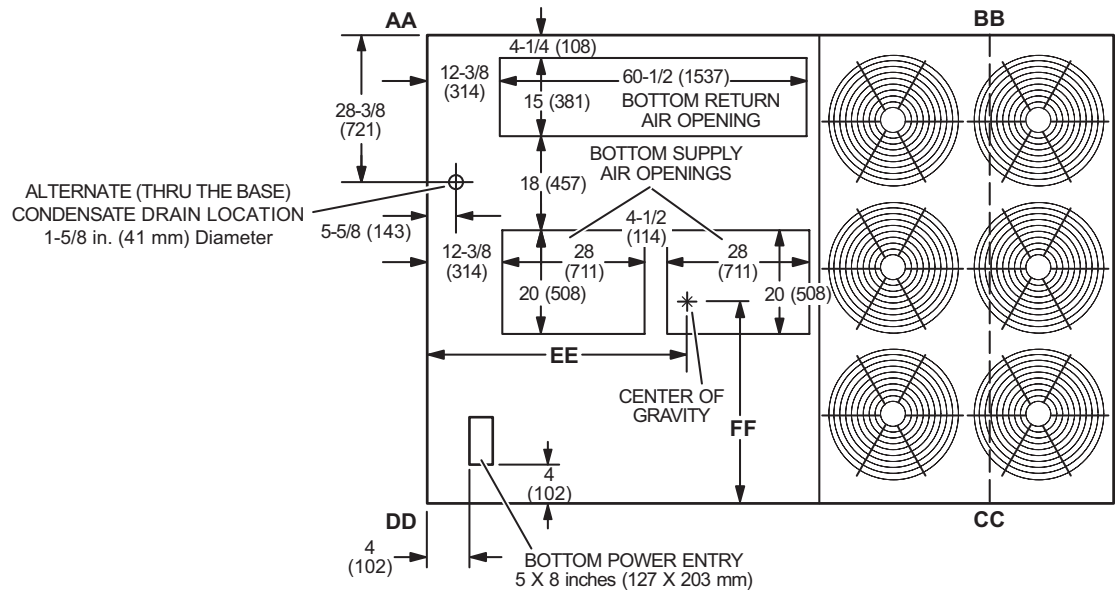
## DIMENSIONS - UNIT

### CORNER WEIGHTS

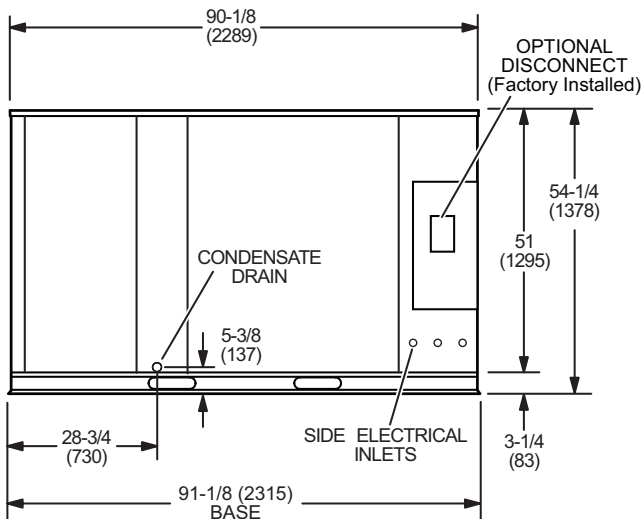
Model No.	AA		BB		CC		DD		CENTER OF GRAVITY		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm	in.	mm
LCH180 Base Unit	438	199	480	218	692	314	630	286	56-1/2	1334	37-1/2	953		
LCH180 Max. Unit	546	248	577	262	743	337	703	319	55-1/2	1410	40	1016		
LCH240 Base Unit	473	215	473	215	667	303	667	303	53-3/4	1365	38	965		
LCH240 Max. Unit	591	268	569	258	717	325	744	337	52-3/4	1340	40-1/2	1029		
LCH300 Base Unit	473	215	473	215	667	303	667	303	53-3/4	1365	38	965		
LCH300 Max. Unit	591	268	569	258	717	325	744	337	52-3/4	1340	40-1/2	1029		

Base Unit - The unit with NO INTERNAL OPTIONS.

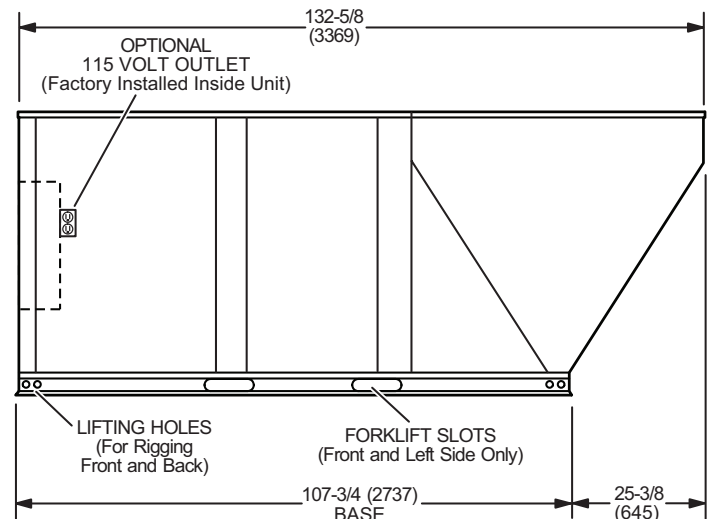
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit.



TOP VIEW

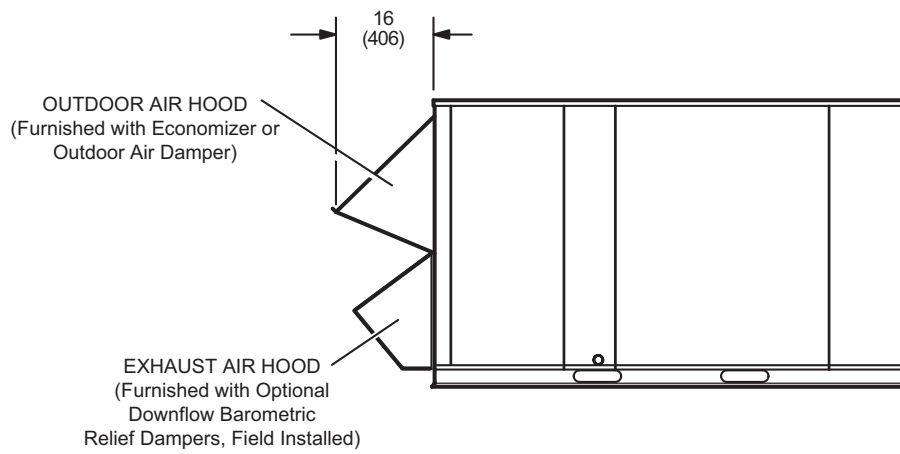


END VIEW



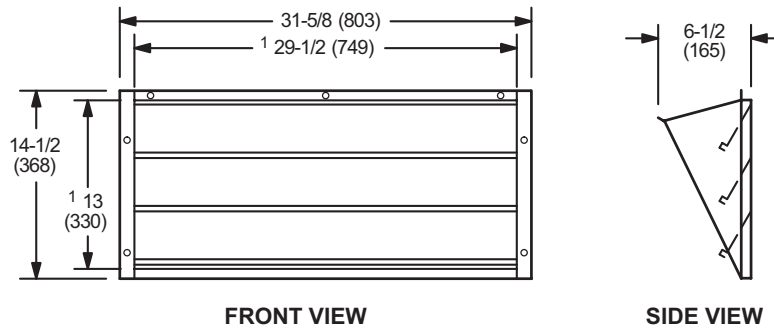
SIDE VIEW

**OUTDOOR AIR HOOD DETAIL**



**OPTIONAL HORIZONTAL BAROMETRIC RELIEF DAMPERS WITH HOOD**

(Field installed in horizontal return air duct adjacent to unit)

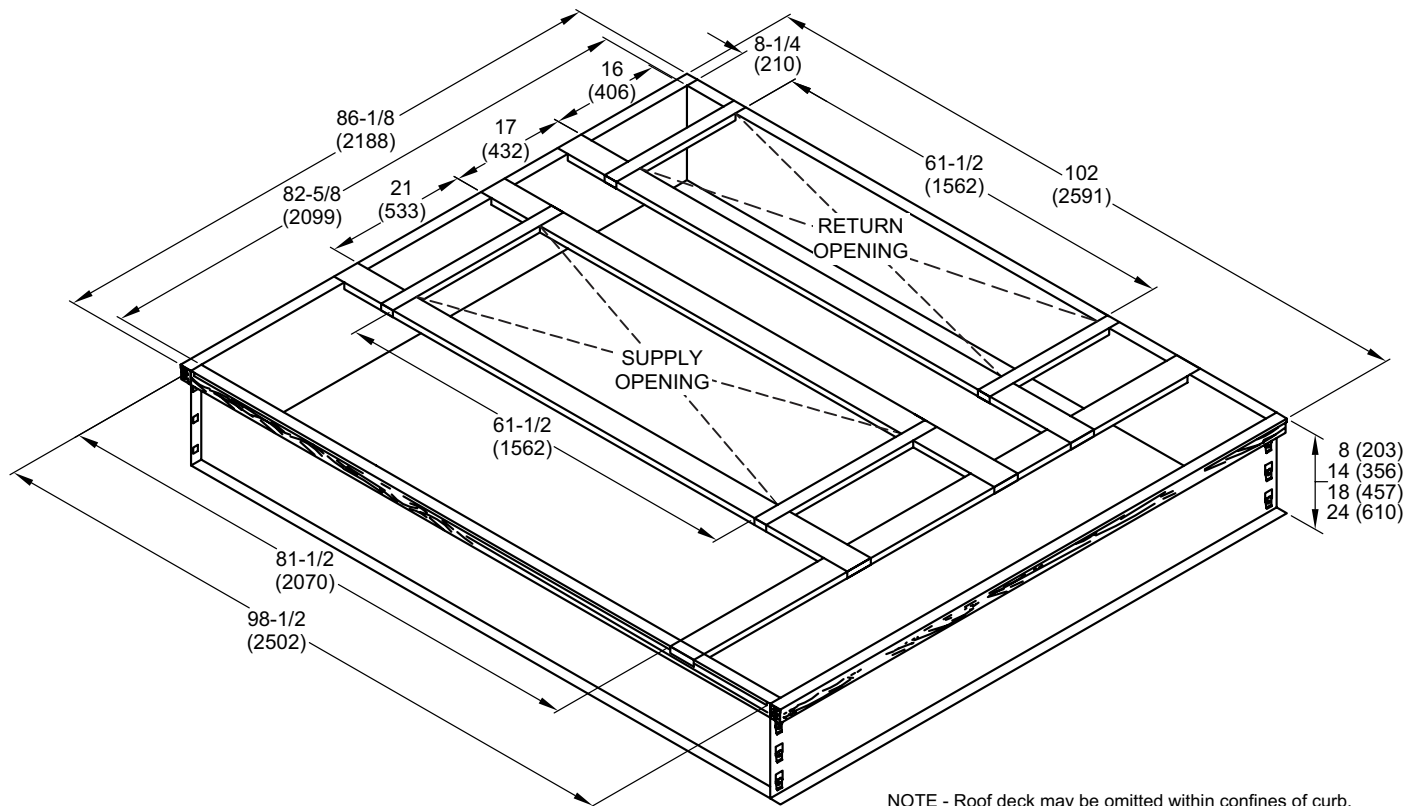


NOTE - Two furnished per order no.

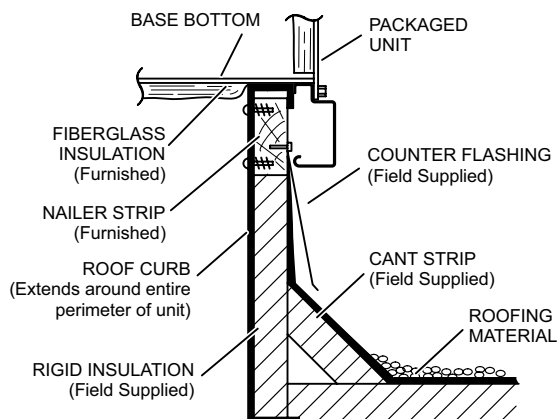
<sup>1</sup> NOTE - Opening size required in return air duct.

## DIMENSIONS - ACCESSORIES

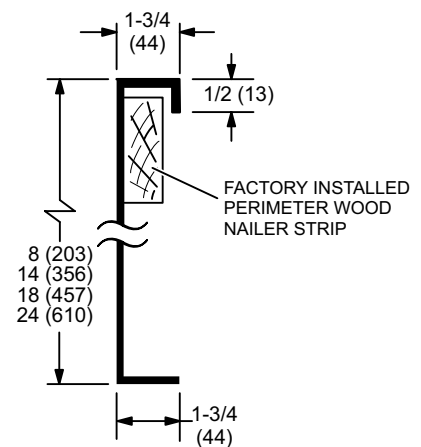
### HYBRID ROOF CURBS - DOUBLE DUCT OPENING



#### TYPICAL FLASHING DETAIL FOR ROOF CURB



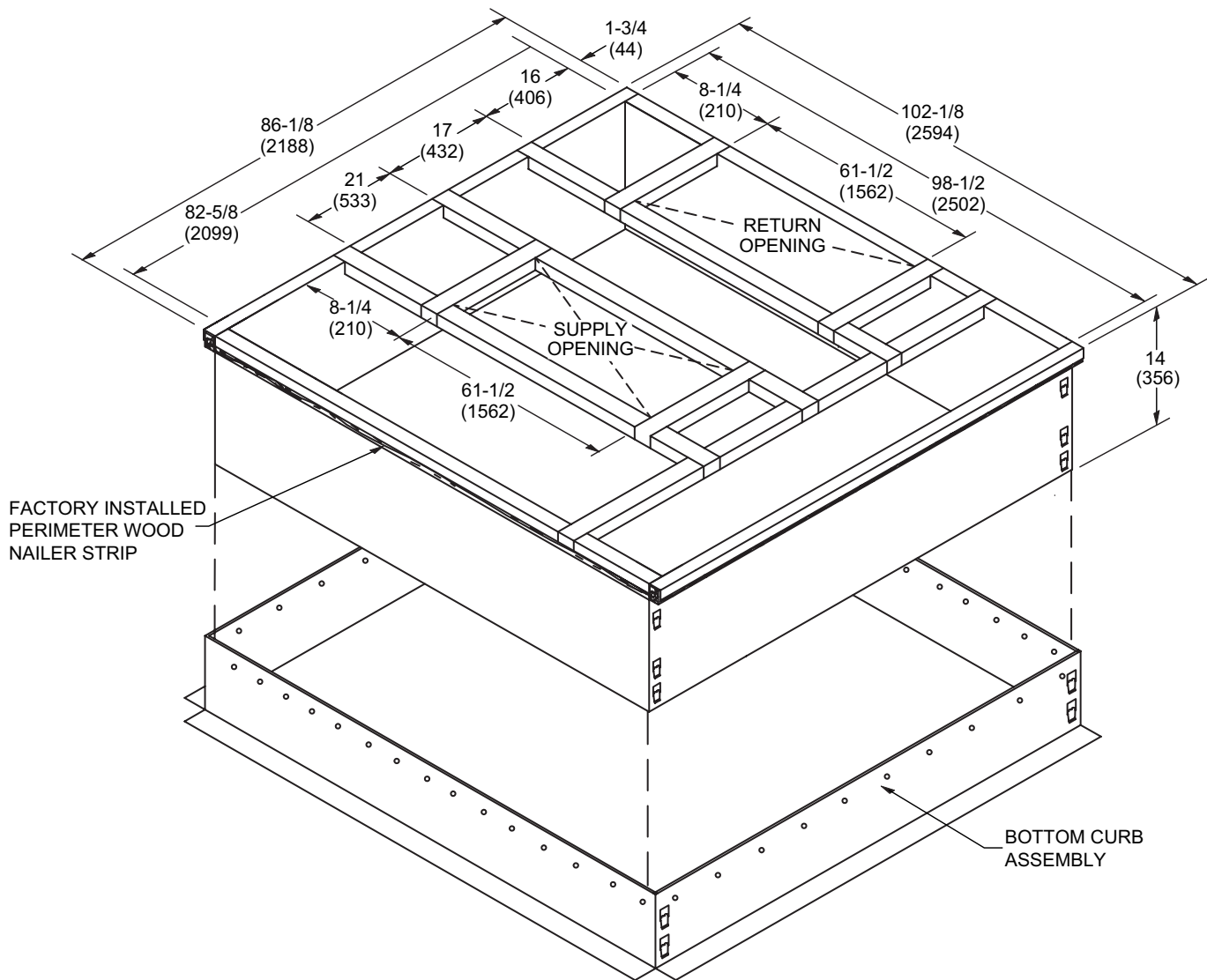
#### DETAIL ROOF CURB





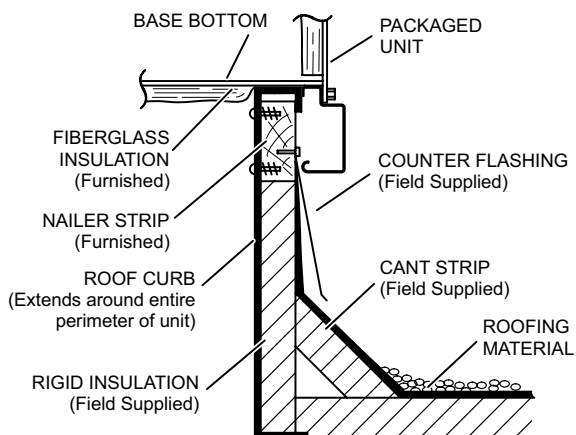
## DIMENSIONS - ACCESSORIES

### ADJUSTABLE PITCH CURB - DOUBLE DUCT OPENING

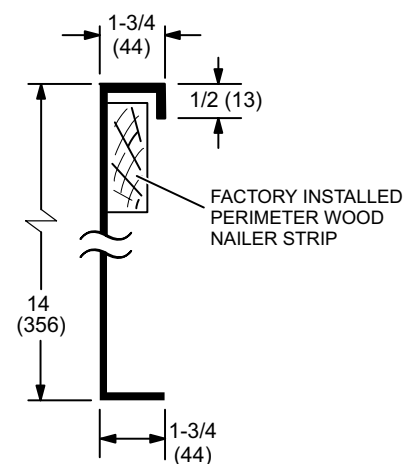


NOTE - Maximum slope pitch is 3/4 in. per 1 foot (19 mm per 305 mm) in any one direction.

#### TYPICAL FLASHING DETAIL FOR ROOF CURB

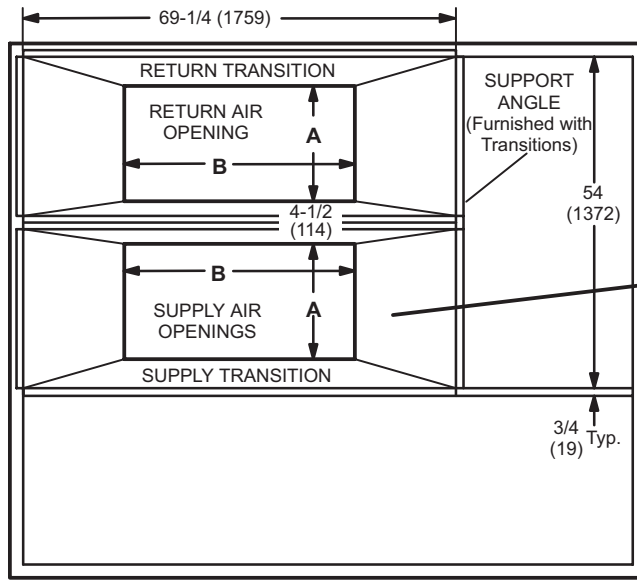


#### DETAIL ROOF CURB

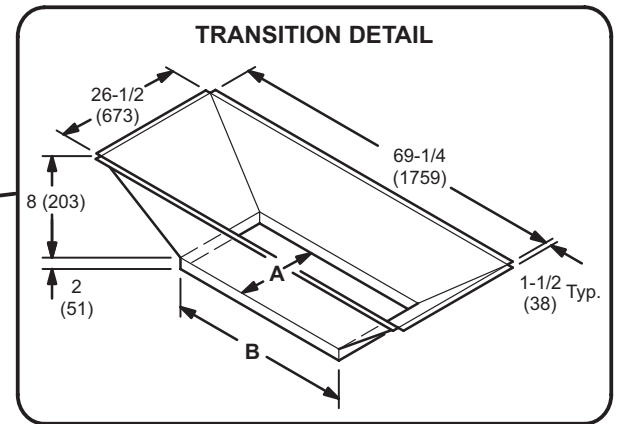


## DIMENSIONS - ACCESSORIES

### ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS



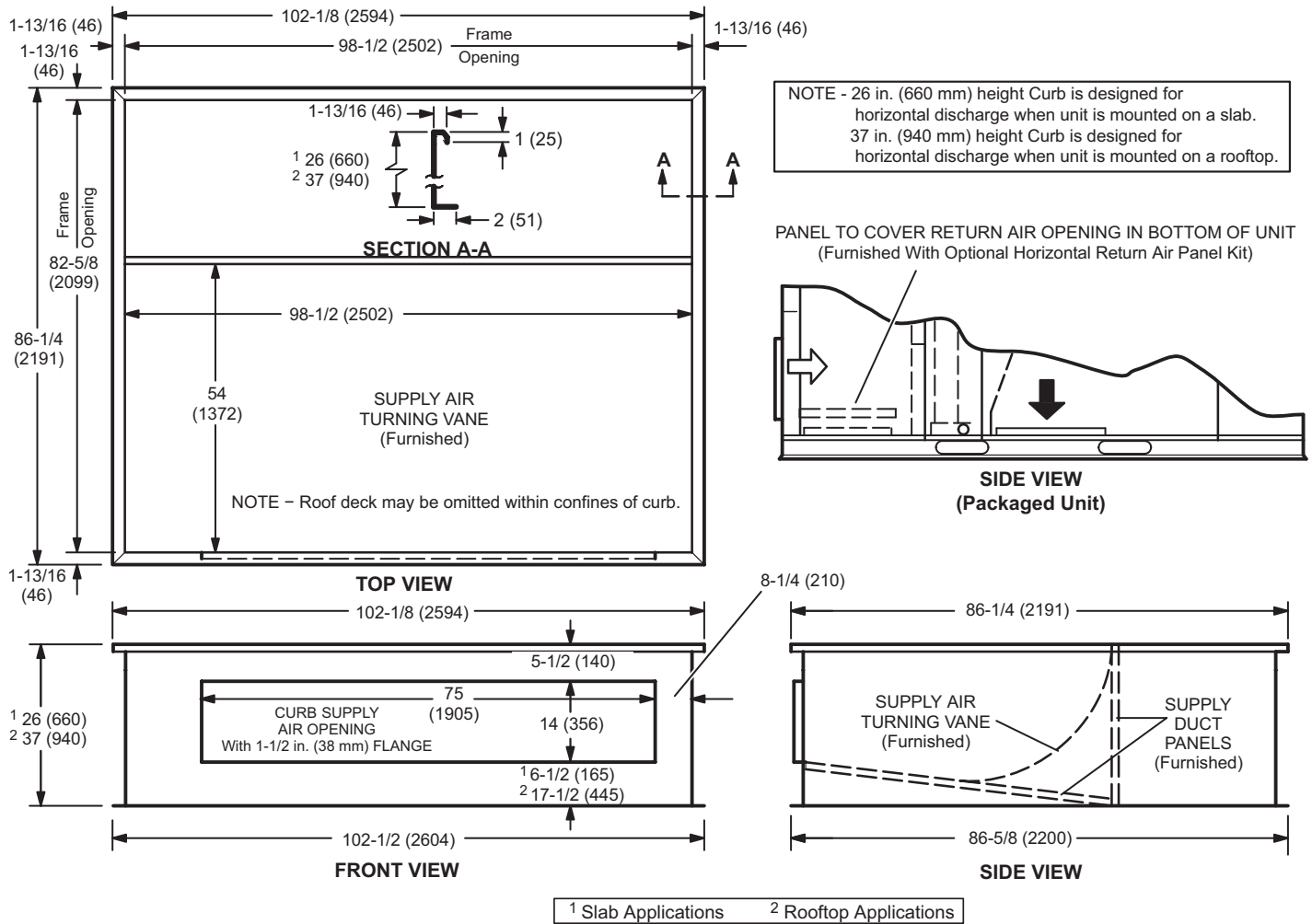
TOP VIEW



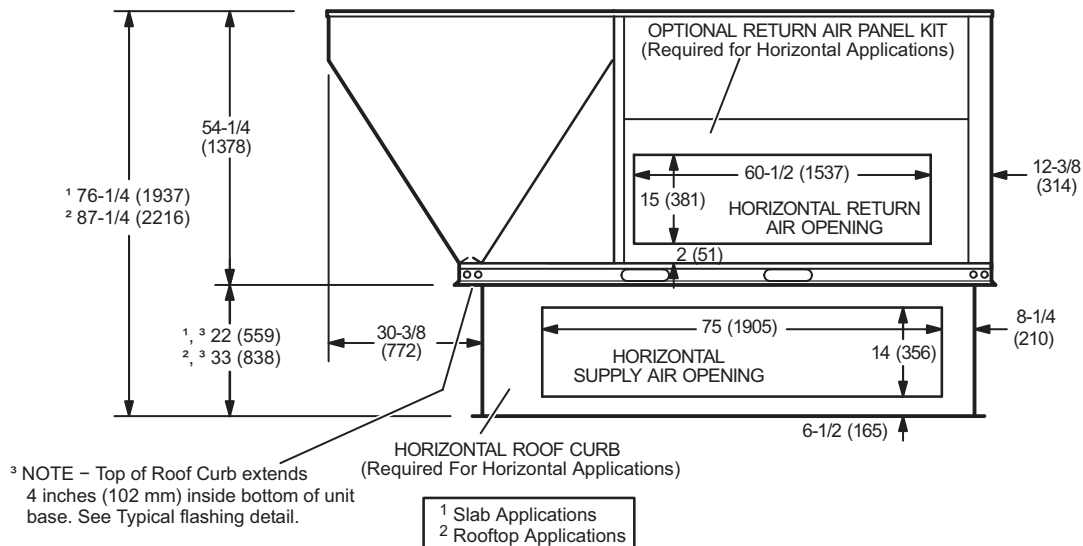
TRANSITION OPENING SIZES

Model Number	A		B	
	inch	mm	inch	mm
C1DIFF33C-1	18	457	36	914
C1DIFF34C-1	24	610	48	1219

## HORIZONTAL ROOF CURBS – Requires Optional Horizontal Return Air Panel Kit



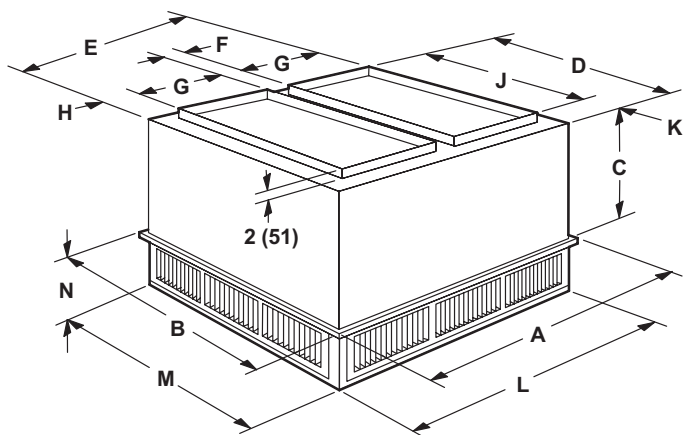
## HORIZONTAL SUPPLY AND RETURN AIR OPENINGS WITH HORIZONTAL ROOF CURB



## DIMENSIONS - ACCESSORIES

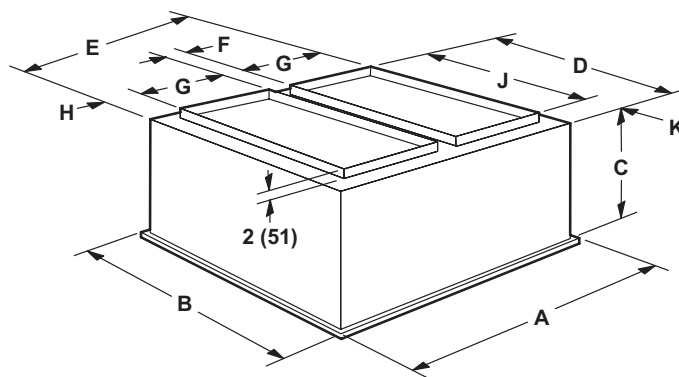
### COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

#### STEP-DOWN CEILING DIFFUSER



Model Number		RTD11-185S	RTD11-275S
A	in.	47-5/8	59-5/8
	mm	1210	1514
B	in.	47-5/8	59-5/8
	mm	1210	1514
C	in.	24-5/8	30-5/8
	mm	625	778
D	in.	45-1/2	57-1/2
	mm	1156	1461
E	in.	45-1/2	57-1/2
	mm	1156	1461
F	in.	4-1/2	4-1/2
	mm	114	114
G	in.	18	24
	mm	457	610
H	in.	2-1/2	2-1/2
	mm	64	64
J	in.	36	48
	mm	914	1219
K	in.	4-3/4	4-3/4
	mm	121	121
L	in.	45-1/2	57-1/2
	mm	1156	1461
M	in.	45-1/2	57-1/2
	mm	1156	1461
N	in.	10-1/8	11-1/8
	mm	257	283
Duct Size	in.	18 x 36	24 x 48
	mm	457 x 914	610 x 1219

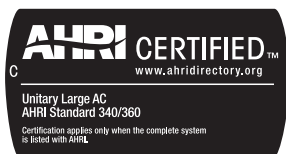
#### FLUSH CEILING DIFFUSER



Model Number		FD11-185S	FD11-275S
A	in.	47-5/8	59-5/8
	mm	1210	1514
B	in.	47-5/8	59-5/8
	mm	1210	1514
C	in.	29-1/4	35-1/4
	mm	743	895
D	in.	45	57
	mm	1143	1148
E	in.	45	57
	mm	1143	1448
F	in.	4-1/2	4-1/2
	mm	114	114
G	in.	18	24
	mm	457	610
H	in.	2-1/4	2-1/4
	mm	57	57
J	in.	36	48
	mm	914	1219
K	in.	4-1/2	4-1/2
	mm	114	114
Duct Size	in.	18 x 36	24 x 48
	mm	457 x 914	610 x 1219

## REVISIONS

Sections	Description of Change
Options/Accessories	<p>Added step-down transformers for UVC lights.</p> <p><b>Catalog numbers revised for:</b></p> <p>Blower Proving Switch</p> <p>Condensate Drain Trap</p> <p>Drain Pan Overflow Switch</p> <p>Fresh Air Tempering</p> <p>Single Enthalpy</p>



Visit us at [www.lennox.com](http://www.lennox.com)

For the latest technical information, [www.lennoxcommercial.com](http://www.lennoxcommercial.com)

Contact us at 1-800-4-LENNOX

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

©2021 Lennox Industries, Inc.