

PACKAGED HEAT PUMP

**LHT**

**ENLIGHT ROOFTOP UNITS**

High Efficiency | Lennox® CORE Controller | **R-454B** | 60Hz

**COMMERCIAL  
PRODUCT SPECIFICATIONS (EHB)**



13 to 20 Tons

Net Cooling Capacity | 156,000 to 228,000 Btuh

Net Heating Capacity | 150,000 to 226,000 Btuh

Optional Electric Heat | 15 to 90 kW

**ENLIGHT**



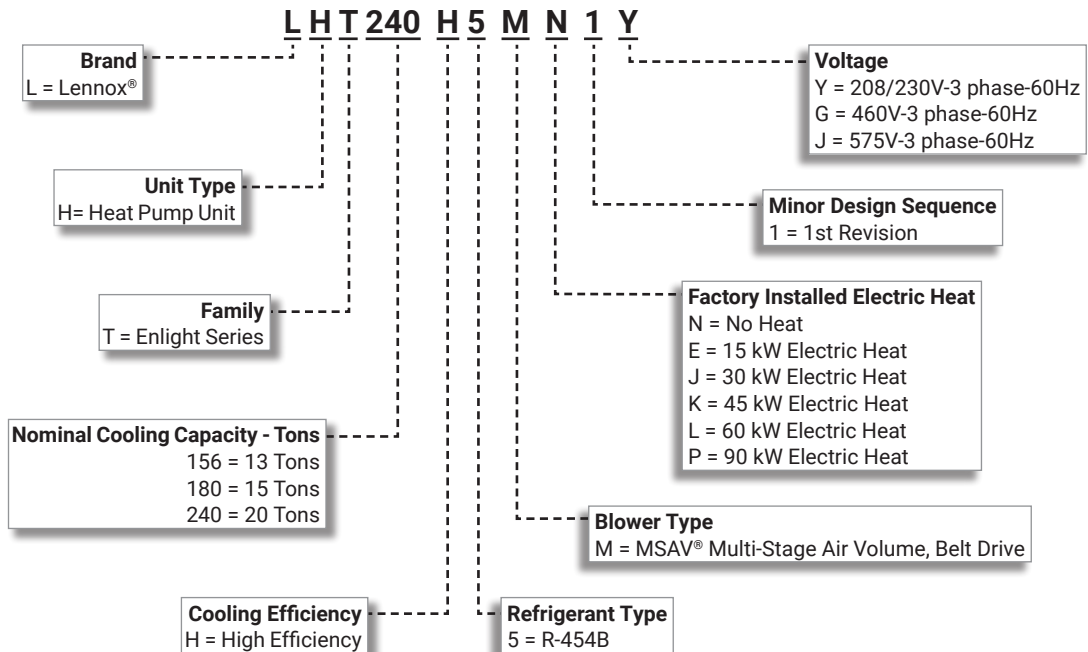
**SMART WIRE™ SYSTEM**



ASHRAE  
Standard  
**90.1**



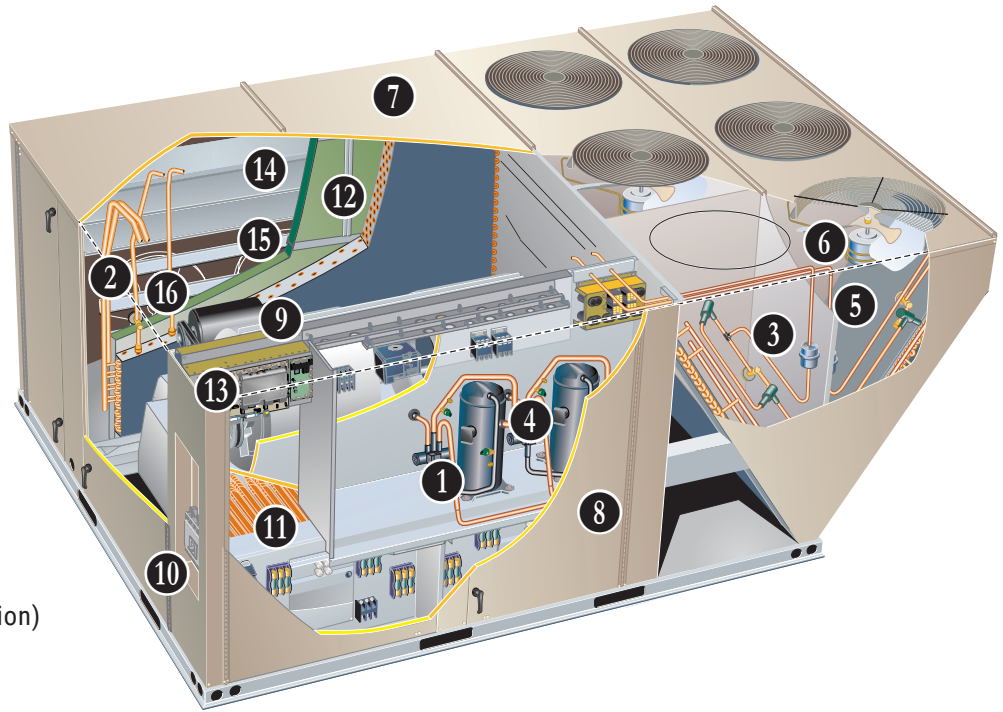
**MODEL NUMBER IDENTIFICATION**



## FEATURE HIGHLIGHTS

Enlight rooftop units featuring the Lennox® CORE Control System create a bright future through a highly energy-efficient and environmentally sustainable design. Comprehensive configurations meet a wide range of applications, making it the most flexible product line Lennox has to offer.

1. Scroll Compressors
2. Check/Thermal Expansion Valves
3. Filter/Driers
4. Reversing Valves
5. Copper Tube Outdoor Coil
6. Outdoor Coil Fan Motors
7. Heavy Gauge Steel Cabinet
8. Hinged Access Panels
9. MSAV® Multi-Stage Air Volume Blower
10. Disconnect Switch (option)
11. Electric Heat (option)
12. Air Filters
13. Lennox CORE®Control System
14. Economizer (option)
15. Barometric Relief Dampers (option)
16. Power Exhaust (option)



## CONTENTS

Approvals And Warranty . . . . .	3
Blower Data . . . . .	25
Control System . . . . .	8
Cooling/Heating Ratings . . . . .	22
Dimensions . . . . .	35
- Accessories . . . . .	36
- Unit . . . . .	35
Electrical Accessories - Disconnects . . . . .	31
Electrical/Electric Heat Data . . . . .	28
Electric Heat Capacities . . . . .	32
Features And Benefits . . . . .	3
Model Number Identification. . . . .	1
Optional Conventional Temperature Control Systems . . . . .	12
Options / Accessories . . . . .	17
Outdoor Sound Data . . . . .	33
Sequence Of Operation. . . . .	14
Specifications . . . . .	21
Unit Clearances . . . . .	33
Weight Data . . . . .	34
- Options / Accessories. . . . .	34
- Unit . . . . .	34

## APPROVALS AND WARRANTY

### APPROVALS

- AHRI Standard 340/360-2023 certified
- ETL and CSA listed
- Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing
- All models are ASHRAE 90.1 energy efficiency compliant and meet or exceed requirements of Section 6.8
- All models meet DOE 2023 energy efficiency standards and UL 60335-2-40 Refrigerant Detector Requirements
- All models have HCAI (formerly OSHPD) OSP and Special Seismic Certification ([Number: OSP-0596](#)), and meet 2021 International Building Code (IBC), 2022 California Building Code (CBC) ASCE 7, and ICC-ES AC156
- All models meet California Code of Regulations, Title 24 and ASHRAE 90.1 Section 6.4.3.10 requirements for staged airflow
- All units are ENERGY STAR® certified
- ISO 9001 Registered Manufacturing Quality System

### WARRANTY

- Compressors - Limited five years
- Lennox CORE® Unit Controller - Limited three years
- Variable Frequency Drive (VFD) - Limited five years
- High Performance Economizers (optional) - Limited five years
- All other covered components - Limited one year

## FEATURES AND BENEFITS

### COOLING/HEATING SYSTEM

- Designed to maximize sensible and latent cooling performance at design conditions
- Mechanical cooling operates from 0°F to 125°F
- Mechanical heating operates at ambient temperatures above -15°F

**NOTE** - When a call for heating is initiated at ambient temperatures above -4°F, unit will attempt to satisfy demand with mechanical heating down to -15°F ambient.

If a call for heating is initiated at or below -4°F, the unit will lockout mechanical heating (compressors) and use optional electrical heat to satisfy demand.

#### R-454B Refrigerant

- Low GWP (Global Warming Potential)
- Zero ODP (Ozone Depletion Potential)
- Low Toxicity/Lower Flammability - A2L
- Unit is factory pre-charged

#### 1 Compressor System

- System consists of one two-stage scroll compressor and one single-stage scroll compressor
- Resiliently mounted on rubber grommets for quiet operation

#### Compressor Crankcase Heaters

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

#### 2 Check/Thermal Expansion Valves

- Ensures optimal performance throughout the application range

#### 3 Filter/Driers

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

#### 4 Reversing Valve

- 4-way interchange reversing valve rapidly changes the direction of refrigerant flow resulting in quick changeover from cooling to heating and vice versa

#### High Pressure Switches

- Protects the compressor 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

#### Indoor Coil Freeze Protection

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

#### 5 Coil Construction

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

#### Indoor Coil

- Cross-row circuiting
- Rifled copper tubing

#### Outdoor Coil

- Two independent slanted coils for easy cleaning

## FEATURES AND BENEFITS

### COOLING / HEATING SYSTEM (continued)

#### Antimicrobial Condensate Drain Pan

- Composite pan, sloped to meet drainage requirements per ASHRAE 62.1
- Anti-Microbial additive prevents growth of mold and mildew, which improves indoor air quality and reduces drain line blockage
- Side or bottom drain connections

### 6 Outdoor Coil Fan Motors

- All models have PSC motors
- Thermal overload protected
- Totally enclosed
- Permanently lubricated ball bearings
- Shaft up
- Wire basket mount

#### Outdoor Coil Fan

- PVC coated fan guards furnished

#### Required Selections

#### Cooling Capacity

- Specify nominal cooling capacity

#### Options/Accessories

#### Factory or Field Installed

##### Drain Pan Overflow Switch

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

#### Field Installed

##### Condensate Drain Trap

- Available in copper or PVC

### LOW GWP REFRIGERANT DETECTION SYSTEM (RDS)

- Complies with UL 60335-2-40 approved standard
- Required for all systems using R-454B refrigerant
- Factory installed on all units
- Consists of a refrigerant detection sensor(s) and a mitigation control
- Ensures safe operation for systems equipped with R-454B refrigerant
- Sensor(s) monitors indoor coil area for R-454B refrigerant
- If R-454B refrigerant is detected the refrigerant detection system will prevent compressor and heating operation until R-454B refrigerant is no longer detected
- Refrigeration detection system energizes blower if any R-454B refrigerant is detected to mitigate any concentrations of refrigerant from the unit and the system

### CABINET

### 7 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 fork slots
- Raised edges around duct and power entry openings in the bottom of the unit for water protection

#### Airflow Choice

- Units are shipped in downflow (vertical) 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 routed through the unit base or through horizontal access knock-outs

#### Exterior Panels

- Constructed of heavy-gauge, galvanized steel
- Textured pre-paint with polyurethane finish
- Cyclic salt fog and UV exposure up to 1,680 hours per ASTM D5894

#### 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

### 8 Hinged Access Panels

- Filter section
- Heating/blower 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)
- ASTM B117 / DIN 53167 Salt Spray - 15,000+ hours
- ASTM G85 Annex A3 SWAAT Modified Salt Spray - 3,000 hours
- VA Master Construction Specification Division 23 for High Humidity Installations
- CID AA-52474A (GSA)
- Indoor Corrosion Protection:
  - Coated coil
  - Painted blower housing
  - Painted base
- Outdoor Corrosion Protection:
  - Coated coil
  - Painted outdoor base

## FEATURES AND BENEFITS

### **CABINET (Continued)**

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

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

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

#### **Field Installed**

##### **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

### **BLOWER**

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

#### **Motor**

- Overload protected
- Ball bearings

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

### **9 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
- MSAV® Multi-Stage Air Volume stages the amount of airflow according to compressor stages, heating demand, ventilation demand or smoke alarm
- MSAV® Multi-Stage Air Volume 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 Lennox® CORE Unit Controller
- Unit is shipped from the factory with preset airflow
- LHT156H/180H models with MSAV® Multi-Stage Air Volume can be ordered with or without an Electronic Bypass Control
- If equipped with the bypass control the MSAV® Multi-Stage Air Volume features manual (default) or automatic electronic bypass control of the VFD
- In case of a VFD malfunction, a VFD alarm is generated by the Lennox® CORE 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 -40 to 125°F outdoor air ambient temperature
- Lower operating costs are obtained when the blower is operated on lower speeds

**NOTE** - Units equipped a Variable Frequency Drive (VFD) are 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.

#### **Blower Proving Switch**

- Monitors blower operation, shuts down unit if blower fails

#### **Ordering Information**

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

### **Options/Accessories**

#### **Field 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**

- Keyed and color-coded wiring connectors 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**

- Monitors power supply to ensure correct phase at unit start-up
  - If phase is incorrect, the unit will not start and an alarm code reports to the unit controller
- Prevents unit start-up if the unit is the incorrect phase; unit start-ups in the wrong phase could lead to issues such as compressors functioning in reverse
- Monitors power supply voltage to ensure proper voltage
  - If voltage is not correct (over/under voltage conditions) the unit will not start and an alarm code reports to the unit controller

### **Required Selections**

#### **Voltage Choice**

- Specify when ordering base unit

### **Options/Accessories**

#### **Factory Installed**

##### **Circuit Breakers**

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

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

- Higher short-circuit protection up to 100kA

**NOTE** - Disconnect Switch not available with higher SCCR option. SCCR option only available with factory installed electric heat.

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

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

- Accessible 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 options:
  - Factory installed, powered and wired
  - Factory installed, non-powered, field wired
  - Field installed, non-powered, field wired

#### **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 MERV 4 filters furnished as standard

#### Options/Accessories

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

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

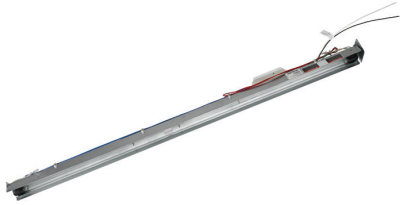
- Disposable MERV 8 or MERV 13 (Minimum Efficiency Reporting Value based on ASHRAE 52.2) efficiency 2-inch pleated filters

#### **Field Installed**

##### Healthy Climate® High Efficiency MERV 16 Air Filters

- Disposable MERV 16 (Minimum Efficiency Reporting Value based on ASHRAE 52.2) efficiency 2-inch pleated filters

##### 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
- 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)
- Destroys the organism or controls its ability to reproduce
- 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-1ph power supply

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

- Approved by ETL

#### Needlepoint Bipolar Ionization (NPBI) Kit

- NPBI technology integrates with system controls for effective air treatment
- Ionization has been shown to effectively reduce harmful pathogens, pollutants and odors
- Brush-type ionizer introduces a high concentration of both positive and negative ions into the airstream
- The bipolar ions are then dispersed into the occupied space through the duct system proactively reducing the airborne contaminants
- Ions travel within the building air stream and attach to particles, pathogens, and gas molecules, making them larger and easier to capture in the filtration system
- UL 2998 certified for zero ozone emission

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

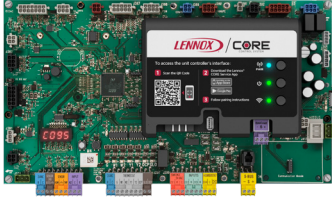
- Monitors CO<sub>2</sub> levels, reports to the Lennox CORE® Unit Controller which adjusts economizer dampers as needed

#### 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

## CONTROL SYSTEM

### CONTROL SYSTEM



- 13 The Lennox® CORE Control System is designed to accelerate equipment install and service. Standard with all Enlight rooftop units, control system integrates key technologies that lower installation costs, drive system efficiency, and protect your investments.

The Lennox® CORE Unit Controller is a microprocessor-based controller that provides flexible control of all unit functions.

#### CORE Mobile Service App

- Guided Setup with progress indicators, detailed help, and exportable summaries to manage simple, trouble-free setup, reducing commissioning times
- Enhanced Test Functionality provides real-time sensor readings, trending, and reports that enable easy troubleshooting
- Ability to set and configure parameters of the CORE Control System to manage sequence of operation
- Economizer test function ensures economizer is operating correctly



#### Additional Features:

- Built-In 7-Segment Display shows Unit Status and active alarms for easy troubleshooting
- Buttons for test and clearing delays
- SmartWire™ System with keyed and removable screw terminals ensure correct field wiring
- Built-in BACnet MS/TP and IP allow open integration to building management systems.
- Two-port Ethernet Switch enables daisy chaining for BACnet IP and automatic firmware updates

**NOTE** - Unit Internet Connection required.

- 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 Lennox® CORE Unit Controller enhance functionality without the need to change components
- Unit Controller Software

#### Configurable Built-In Functions

- Discharge Air Cooling Control
- Up to three distinct Cooling Airflows in Thermostat Mode
- Programmable independent heating, ventilation and cooling blower speeds

- Discharge Air Heating Control
- Economizer Control Options (See Economizer / Exhaust Air / Outdoor Air sections)
- Exhaust Fan Control Modes for fresh air damper position
- Configurable Morning Warm-up
- Night Setback Mode
- Fresh Air Tempering for Improved Ventilation
- Demand Control Ventilation
- Low Ambient Controls for operation down to 0°F
- Two Defrost Control Methods (demand and timed - heat pumps only)

#### Component Protection / Unit Safeguards:

- Compressor Time-Off Delay
- Adjustable Blower On/Off Delay
- Return Air Temperature Limit Control
- Safety Switch Input allows Controller to respond to a external safety switch trip
- Service Relay Output
- Thermostat Bounce Delay
- Smoke Alarm Mode has four choices (unit off, positive pressure, negative pressure, purge)
- "Strike Three" Protection
- Minimum Compressor Run Time

#### Control Methods / Interfaces:

- DDC and 24V Thermostat
- BACnet MS/TP and IP
- LONTalk (Factory and Field Option)
- Lennox S-BUS
- Zone Temperature Sensor Input
- Dehumidistat and Humidity Sensor Inputs
- Indoor Air Quality Inputs (2)
- Built-in Control Parameter Defaults
- Permanent Diagnostic Code Storage
- Field Adjustable Control Parameters (Over 200 settings)
- Multiple Configurable Digital Inputs
- LED Indicators
- PC Interface connects the Lennox® CORE Unit Controller to a PC with the Lennox Unit Controller Software

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



## CONTROL SYSTEM

### **LENNOX® CORE CONTROL SYSTEM (continued)**

#### Controls Options

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

###### Dirty Filter Switch

- Senses static pressure increase and issues alarm if necessary

###### 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

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

###### 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

##### **Field Installed**

###### Thermostats and Room Sensors

- Control system and thermostat options, see page 13

## OPTIONS / ACCESSORIES

### **ECONOMIZER**

- Economizer operation is set and controlled by the Lennox® CORE unit controller
- Simple plug-in connections from Economizer to unit controller for easy installation
- All Enlight 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 and IECC compliant
- Downflow or Horizontal with Outdoor Air Hood
- Outdoor Air Hood with mist elimination is included when Economizer is factory installed and is furnished with Economizer when ordered for field installation

**NOTE** - Downflow or horizontal economizer applications require optional Downflow or Horizontal Barometric Relief Dampers with Exhaust Hood.

- Linked damper action
- High torque 24-volt fully-modulating spring return damper motor
- Return air and outdoor air dampers
- Plug-in connections to unit

**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 2022 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 Lennox® CORE 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)**

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

**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**

- 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

#### **Single Enthalpy 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 Lennox® CORE 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 Lennox® CORE 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
- SCCR rated

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

**NOTE** - All 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**

##### **Motorized Outdoor Air Dampers**

- Linked mechanical dampers
- Fully modulating spring return damper motor with plug-in connection
- 0 to 25% (fixed) outdoor air adjustable
- Installs in unit
- Outdoor air hood with bird screen included

**NOTE** - Outdoor Air Hood is shipped separately in the unit with factory installed dampers for field installation.

#### **Field Installed**

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

- Adjustable slide damper
- Installed in unit
- Outdoor air hood with bird screen included

### **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 for assembly
- 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
- Interlocking tabs fasten corners together
- No tools required for assembly
- 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)**

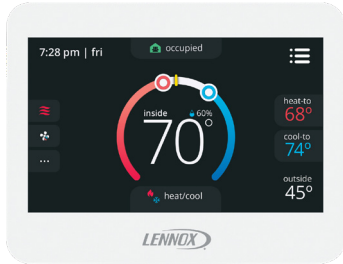
- White powder coat finish on diffuser face and grilles
- Insulated UL listed duct liner
- Diffuser box has collars for duct connection
- Step-down diffusers have double deflection blades
- Flush diffusers have fixed blades
- Provisions for suspending
- Internally sealed to prevent recirculation
- Removable 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

### CS8500 Commercial 7-Day Programmable Thermostat



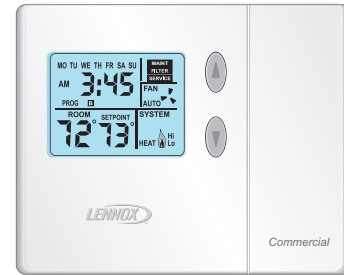
- Fully Communicating Sensor
- Full Color Touchscreen Interface
- Variable Speed System Control (On Compatible Units)
- Up To 4 Heat / 4 Cool
- Built-In Sensors For Temperature, Humidity And Optional CO<sub>2</sub>
- Remote Sensor Options For Occupancy, Temperature
- BACnet Capable Options
- 5-2 or 7-Day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

### CS7500 Commercial 7-Day Programmable Thermostat



- Premium Universal Thermostat
- Full Color Touchscreen Interface
- Up To 4 Heat / 3 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

### CS3000 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 Temperature/Humidity Room Sensor (Non-Communicating)



- Terminal blocks for wiring connections
- Five-wire sensor connection
- Off-white plastic enclosure
- Non-adjustable
- Relative humidity range: 0 -100%
- +/- 3% Accuracy

## OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

Description	Order Number
<b>CS8500 Commercial 7 Day Programmable Thermostat</b>	
CS8500 7-Day Thermostat	No CO <sub>2</sub> Sensing <b>24K55</b>
	With CO <sub>2</sub> Sensing <b>24K53</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 CS8500 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>CS7500 Commercial 7-Day Programmable Thermostat</b>	
CS7500 7-Day Thermostat	<b>24K41</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>CS3000 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>Universal Thermostat Guard with Lock (clear)</b>	
	Inside Dimensions (H x W x D) 5-7/8 x 8-3/8 x 3 in. <b>39P21</b>
<b>Temperature/Humidity Room Sensor</b>	
A335MT13AE1 Wired Temperature/Humidity Room Sensor (Non-Communicating)	<b>21W06</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

**Objective:** Outline the unit functions as a result of room thermostat or zone sensor demands.

**Given:** When economizer is present, it will function as an integral part of the unit cooling system. When not present, unit will function as if economizer is present but outdoor ambient is high and sensed as not suitable.

**UNIT OPERATION WITH 2-STAGE THERMOSTAT (2 COOL AND 2 HEAT STAGES, Y1, Y2, W1, W2)**

**SUPPLY AIR BLOWER SPEED**

Unit has following supply air blower speed setting:

- Ventilation speed
- Cooling Speed - Low
- Cooling Speed - High
- Heating speed
- Smoke speed (Used only in smoke removal option - not discussed)

**COOLING**

**<sup>1</sup> Unit Features An Economizer And Outdoor Air Is Suitable**

**Thermostat Mode (Y1, Y2)**

**Y1 Demand:**

All compressors are off, supply air blower is on low cooling speed to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting).

**Y2 Demand:**

All compressors are off, supply air blower is on high cooling speed providing higher cooling capacity, and economizer modulates to maintain 55°F supply air temperature. If economizer stays at maximum open for 3 minutes, compressor 1 is energized while supply air blower stays on high cooling speed providing maximum cooling capacity.

<sup>1</sup> *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.*

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

**Y1 Demand:**

Compressor 1 operates, and supply air blower operates at low cooling speed.

**Y2 Demand:**

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



**UNIT OPERATION WITH 3-STAGE THERMOSTAT OR ZONE SENSOR (3 COOL AND 2 HEAT STAGES, Y1, Y2, Y3 AND W1, W2)****SUPPLY AIR BLOWER SPEED**

Unit has following supply air blower speed setting:

- Ventilation speed
- Cooling Speed - Low
- Cooling Speed - Medium
- Cooling Speed - High
- Heating speed
- Smoke speed (Used only in smoke removal option - not discussed)

**<sup>1</sup> Unit Features An Economizer And Outdoor Air Is Suitable****COOLING****Thermostat or Zone Sensor Mode (Y1, Y2, Y3)****Y1 Demand:**

All compressors are off, supply air blower is on low cooling speed to minimize blower power consumption, economizer modulates (minimum to maximum open position) to maintain 55°F supply air temperature (default unit controller setting).

**Y2 Demand:**

All compressors are off, supply air blower is on high cooling speed providing higher cooling capacity, and economizer modulates to maintain 55°F supply air temperature. If economizer stays at maximum open for 3 minutes, compressor 1 is energized while supply air blower stays on high cooling speed providing maximum cooling capacity. After compressors are energized the economizer stays at maximum open.

**Y3 Demand:**

Compressors 1 and 2 are energized while supply air blower stays on high cooling speed.

<sup>1</sup> 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.

**Unit Does Not Feature An Economizer or Outdoor Air Is Not Suitable****Y1 Demand:**

Compressor 1 operates at part load and supply air blower operates at low cooling speed.

**Y2 Demand:**

Compressor 1 operates at part load with compressor 2 ON, and supply air blower operates at medium cooling speed.

**Y3 Demand:**

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

**DEFROST**

Coil Sensors (RT48 - Circuit 1 and RT49 - Circuit 2) and Ambient Sensor (RT17) provides input to the Lennox® CORE Unit Controller to initiate a defrost cycle if needed.

Coil sensors are located on a return bend for each circuit on the front of the outdoor coil.

Ambient sensor is located on the inside of the corner mullion on the back of the outdoor coil section.

If a coil sensor measures a temperature below 35°F during mechanical heating mode, defrost logic is enabled. The system will constantly monitor coil and ambient temperatures and will initiate a defrost cycle if the controller determines that the target temperature difference between the coil and ambient temperature has been satisfied, or when the accumulated run time with coil temperature below 35°F reaches 6 hours.

Defrost will not be activated on more than one circuit at the time.

If the ambient sensor fails, or the circuit is in uncalibrated state, the controller will switch to time/temperature defrost operation.

Electric heat is energized during a defrost cycle to maintain discharge air temperature.

**HEATING**

*NOTE – HEATING MODE CAN BE SET TO TWO-STAGE IN THERMOSTAT MODE OR AT FOUR-STAGE IN ROOM SENSOR MODE CONTROL OPTIONS.*

**Two-Stage Operation (Thermostat Mode)****W1 Demand:**

Both gas valves are open on Low Fire (stage 1 on units with 2-stage gas valves) and supply air blower operates at heating speed

**W2 Demand:**

Both gas valves are open on High Fire (stage 2 on units with 2-stage gas valves) and supply air blower operates at heating speed

**Four-Stage Operation (Room Sensor Mode)****W1 Demand:**

Left heat exchanger gas valve is open on Low Fire (stage 1 on units with 4-stage gas valves) and supply air blower operates at heating speed.

**W2 Demand:**

Both gas valves are open on Low Fire (stage 2 on units with 4-stage gas valves) and supply air blower operates at heating speed.

**W3 Demand:**

Left heat exchanger gas valve will open on High Fire and the right heat exchanger will remain open on Low Fire (stage 3 on units with 4-stage gas valves) and supply air blower operates at heating speed.

**W4 Demand:**

Both gas valves are open on High Fire (stage 4 on units with 4-stage gas valves) and supply air blower operates at heating speed.

**Heating Mode: Thermostat or Zone Sensor****W1/H1 Demand:**

A first-stage heating demand (W1/H1) will energize compressors 1 and 2 and the outdoor fans.

*NOTE – L1 & L2 reversing valves are de-energized in the heating mode.*

**Units With Optional Electric Heat:**

An increased heating demand (W2/H2) will energize electric heat.

*NOTE – Compressors 1 and 2 stay energized.*

**Units With Optional Two-Stage Electric Heat and Zone Sensor mode:**

An increased heating demand (H2) will energize 1st stage of electric heat.

An increased heating demand (H3) will energize 2nd stage of electric heat.

*NOTE – Compressors 1 and 2 stay energized.*

All Electric heat modules are energized during the defrost cycle (W1).

**ACCESSORIES****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).*

**Power Exhaust Operation**

*NOTE - POWER EXHAUST OPERATION IS THE SAME FOR ALL CONTROL OPTIONS*

MSAV® models are equipped with 2-stage power exhaust fans. Power exhaust fans operate when economizer outdoor air dampers are 50% open (adjustable). Power exhaust operates in 1st stage (one fan) up to 70% of supply air blower speed. 2nd stage power exhaust fans (both fans) operate when supply air blower speed is above 70% (adjustable) of full speed.

## OPTIONS / ACCESSORIES

Item Description	Order Number	Size			
		156	180	240	
<b>COOLING SYSTEM</b>					
Condensate Drain Trap	PVC	<b>22H54</b>	X	X	X
	Copper	<b>76W27</b>	X	X	X
Drain Pan Overflow Switch		<b>21Z07</b>	OX	OX	OX
<b>BLOWER - SUPPLY AIR</b>					
Blower Option	MSAV® Multi-Stage Air Volume option (With VFD Bypass Control)	Factory	O	O	
	MSAV® Multi-Stage Air Volume option (Without VFD Bypass Control)	Factory	O	O	O
Motors	Belt Drive - 3 hp	Factory	O	O	
	Belt Drive - 5 hp	Factory	O	O	O
	Belt Drive - 7.5 hp	Factory		O	O
	Belt Drive - 10 hp	Factory			O
Drive Kits See Blower Data Tables for usage and selection	Kit #1 535-725 rpm	Factory	O	O	
	Kit #2 710-965 rpm	Factory	O	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
	Kit #7 945-1185 rpm	Factory		O	O
	Kit #8 1045-1285 rpm	Factory		O	O
	Kit #10 1045-1285 rpm	Factory			O
	Kit #11 1135-1330 rpm	Factory			O
	Blower Belt Auto-Tensioner	<b>24B80</b>		X	X
<b>CABINET</b>					
Combination Coil/Hail Guards		<b>23U71</b>	OX	OX	OX
Corrosion Protection		Factory	O	O	O
<b>CONTROLS</b>					
Commercial Controls	LonTalk® Module	<b>54W27</b>	OX	OX	OX
	Novar® LSE	Factory	O	O	O
Dirty Filter Switch		<b>53W68</b>	OX	OX	OX
Fresh Air Tempering		<b>21Z08</b>	OX	OX	OX
Smoke Detector - Supply or Return (Power board and one sensor)		<b>22H56</b>	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)		<b>22H57</b>	OX	OX	OX

NOTE - Order 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	Order Number	Size			
		156	180	240	
<b>INDOOR AIR QUALITY</b>					
<b>Air Filters</b>					
Healthy Climate® High Efficiency Air Filters 24 x 24 x 2 (Order 6 per unit)	MERV 8	<b>54W67</b>	OX	OX	OX
	MERV 13	<b>52W40</b>	OX	OX	OX
	MERV 16	<b>21U42</b>	X	X	X
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)		<b>44N61</b>	X	X	X
<b>Indoor Air Quality (CO<sub>2</sub>) Sensors</b>					
Sensor - Wall-mount, off-white plastic cover with LCD display		<b>24C58</b>	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		<b>23V86</b>	X	X	X
Sensor - Black plastic case, LCD display, rated for plenum mounting		<b>87N52</b>	X	X	X
Sensor - Black plastic case, no display, rated for plenum mounting		<b>23V87</b>	X	X	X
CO <sub>2</sub> Sensor Duct Mounting Kit - for downflow applications		<b>23Y47</b>	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO <sub>2</sub> sensors ( <b>24C58</b> )		<b>90N43</b>	X	X	X
<b>Needlepoint Bipolar Ionization (NPBI)</b>					
Needlepoint Bipolar Ionization (NPBI) Kit		<b>21U37</b>	X	X	
		<b>21U38</b>			X
<b>UVC Germicidal Light Kit</b>					
<sup>1</sup> Healthy Climate® UVC Light Kit (110/230v-1ph)		<b>21A94</b>	X	X	X
Step-Down Transformers	460V primary, 230V secondary	<b>10H20</b>	X	X	X
	575V primary, 230V secondary	<b>10H21</b>	X	X	X
<b>ELECTRICAL</b>					
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,	80 amp	<b>54W85</b>	OX	OX	OX
	150 amp	<b>54W86</b>	OX	OX	OX
	250 amp	<b>54W87</b>	OX	OX	OX
HACR Circuit Breakers		Factory	O	O	O
<sup>2</sup> Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V, 575V)	<b>74M70</b>	OX	OX	OX
	15 amp factory-wired and powered (208/230V, 460V)	Factory	O	O	O
	<sup>3</sup> 20 amp non-powered, field-wired (208/230V, 460V, 575V)	<b>67E01</b>	X	X	X
	<sup>3</sup> 20 amp non-powered, field-wired (575V)	Factory	O	O	O
Weatherproof Cover for GFI		<b>10C89</b>	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 SCCR option.  
SCCR option is only available with factory installed electric heat or no electric.  
SCCR option is not available if the MOCP of the configured unit is greater than 200A.

<sup>3</sup> Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

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## OPTIONS / ACCESSORIES

Item Description	Order Number	Size			
		156	180	240	
<b>ELECTRIC HEAT</b>					
15 kW	208/230V-3ph	<b>30U62</b>	OX	OX	OX
	460V-3ph	<b>30U63</b>	OX	OX	OX
	575V-3ph	<b>30U64</b>	OX	OX	OX
30 kW	208/230V-3ph	<b>30U68</b>	OX	OX	OX
	460V-3ph	<b>30U69</b>	OX	OX	OX
	575V-3ph	<b>30U70</b>	OX	OX	OX
45 kW	208/230V-3ph	<b>30U74</b>	OX	OX	OX
	460V-3ph	<b>30U75</b>	OX	OX	OX
	575V-3ph	<b>30U76</b>	OX	OX	OX
60 kW	208/230V-3ph	<b>30U80</b>	OX	OX	OX
	460V-3ph	<b>30U81</b>	OX	OX	OX
	575V-3ph	<b>30U82</b>	OX	OX	OX
90 kW	208/230V-3ph	<b>30U83</b>			OX
	460V-3ph	<b>30U84</b>			OX
	575V-3ph	<b>30U85</b>			OX

### ECONOMIZER

#### High Performance Economizer (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)

High Performance Economizer (Downflow or Horizontal)	<b>22J18</b>	OX	OX	OX
Includes Economizer Dampers with Outdoor Air Hood				
Downflow Applications - Use furnished Outdoor Air Hood - Order Downflow Barometric Relief Dampers with Exhaust Hood separately				
Horizontal Applications - Use furnished Outdoor Air Hood - Order Horizontal Barometric Relief Dampers with Exhaust Hood separately				

#### Economizer Controls

Differential Enthalpy (Not for Title 24)	Order 2	<b>21Z09</b>	OX	OX	OX
Sensible Control	Sensor is Furnished	Factory	O	O	O
Single Enthalpy (Not for Title 24)		<b>21Z09</b>	OX	OX	OX
Global Control	Sensor Field Provided	Factory	O	O	O
Building Pressure Control		<b>13J77</b>	X	X	X
Outdoor Air CFM Control		<b>13J76</b>	X	X	X

#### Barometric Relief Dampers With Exhaust Hood

Downflow Barometric Relief Dampers	<b>54W78</b>	OX	OX	OX
Horizontal Barometric Relief Dampers	<b>16K99</b>	X	X	X

### OUTDOOR AIR

#### Outdoor Air Dampers With Outdoor Air Hood

Motorized	<b>22J27</b>	OX	OX	OX
Manual	<b>13U05</b>	X	X	X

NOTE - Order Numbers shown are for ordering field installed accessories.

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X = Field Installed.

## OPTIONS / ACCESSORIES

Item Description	Order Number	Size			
		156	180	240	
<b>4 POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)</b>					
Standard Static, SCCR Rated	208/230V	<b>22H90</b>	OX	OX	OX
	460V	<b>22H91</b>	OX	OX	OX
	575V	<b>22V34</b>	OX	OX	OX
<b>ROOF CURBS</b>					
<b>Hybrid Roof Curbs, Downflow</b>					
8 in. height		<b>11F58</b>	X	X	X
14 in. height		<b>11F59</b>	X	X	X
18 in. height		<b>11F60</b>	X	X	X
24 in. height		<b>11F61</b>	X	X	X
<b>Adjustable Pitch Curb</b>					
14 in. height		<b>43W26</b>	X	X	X
<b>Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit</b>					
26 in. height - slab applications		<b>11T89</b>	X	X	X
37 in. height - rooftop applications		<b>11T96</b>	X	X	X
<b>Insulation Kit For Standard Horizontal Roof Curbs</b>					
For 26 in. Curb		<b>73K32</b>	X	X	X
For 37 in. Curb		<b>73K34</b>	X	X	X
<b>Horizontal Return Air Panel Kit</b>					
Required for Horizontal Applications with Roof Curb		<b>87M00</b>	X	X	X
<b>CEILING DIFFUSERS</b>					
Step-Down - Order one	RTD11-185S	<b>13K63</b>	X	X	
	RTD11-275S	<b>13K64</b>			X
Flush - Order one	FD11-185S	<b>13K58</b>	X	X	
	FD11-275S	<b>13K59</b>			X
Transitions (Supply and Return) - Order one	C1DIFF33C-1	<b>12X68</b>	X	X	
	C1DIFF34C-1	<b>12X70</b>			X

<sup>4</sup> Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately.

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## SPECIFICATIONS

Model		LHT156H5M	LHT180H5M	LHT240H5M
<b>Nominal Tonnage</b>		<b>13 Ton</b>	<b>15 Ton</b>	<b>20 Ton</b>
<b>Efficiency Type</b>		<b>High</b>	<b>High</b>	<b>High</b>
<b>Blower Type</b>		MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume
<b>Cooling Performance</b>	Gross Cooling Capacity (Btuh)	160,000	182,000	237,000
	<sup>1</sup> Net Cooling Capacity (Btuh)	156,000	176,000	228,000
	<sup>1</sup> AHRI Rated Air Flow (cfm)	4500	5500	7000
	<sup>1</sup> IEER (Btuh/Watt)	15.4	15.5	15.5
	<sup>1</sup> EER (Btuh/Watt)	12.1	11.1	11.1
	Total Unit Power (kW)	12.9	15.8	20.5
<b>Heating Performance</b>	<sup>1</sup> Total High Heat Capacity (Btuh)	150,000	176,000	226,000
	<sup>1</sup> COP	3.4	3.4	3.4
	Total Unit Power (kW)	12.9	15.2	19.5
	<sup>1</sup> Total Low Heat Capacity (Btuh)	86,000	104,000	128,000
	<sup>1</sup> COP	2.1	2.1	2.1
	Total Unit Power (kW)	12.0	14.5	17.8
<b>Electric Heat Available</b>		See page 19		
<b>Sound Rating Number</b>		dBA 94	94	94
<b>Refrigerant</b>	Refrigerant Type	R-454B	R-454B	R-454B
	Circuit 1	21 lbs. 0 oz.	23 lbs. 0 oz.	20 lbs. 12 oz.
	Circuit 2	19 lbs. 0 oz.	19 lbs. 8 oz.	19 lbs. 4 oz.
	<b>Compressor Type (number)</b>	Two-Stage Scroll (1) Single-Stage Scroll (1)		
<b>Outdoor Coils</b>	Net face area - ft. <sup>2</sup> (total)	55.1	55.1	55.1
	Number of rows	2	2	2
	Fins - in.	20	20	20
<b>Outdoor Coil Fans</b>	Motor HP (number and type)	1/3 (6 PSC)	1/3 (6 PSC)	1/3 (6 PSC)
	Rpm	1075	1075	1075
	Watts (total)	2150	2150	2150
	Diameter (Number) - in.	(6) 24	(6) 24	(6) 24
	Blades	3	3	3
	Total Air volume - cfm	16,300	16,300	16,300
<b>Indoor Coils</b>	Net face area - ft. <sup>2</sup> (total)	21.4	21.4	21.4
	Tube diameter - in.	3/8	3/8	3/8
	Rows	4	4	4
	Fins - in.	14	14	14
	Condensate drain size (NPT) - in.	(1) 1	(1) 1	(1) 1
<b>Expansion device type</b>		Balanced Port Thermostatic Expansion Valve		
<sup>3</sup> <b>Indoor Blower and Drive Selection</b>	Nominal motor HP	3, 5	3, 5, 7.5	5, 7.5, 10
	Maximum usable motor HP (US)	3.45, 5.75	3.45, 5.75, 8.63	5.75, 8.62, 11.5
	Motor - Drive kit number	3 HP	3 HP	5 HP
		Kit 1 535-725 rpm Kit 2 710-965 rpm	Kit 1 535-725 rpm Kit 2 710-965 rpm	Kit 3 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm
		5 HP	5 HP	7.5 HP
		Kit 3 - 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm	Kit 3 - 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm	Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm
			7.5 HP	10 HP
			Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm	Kit 7 945-1185 rpm Kit 10 1045-1285 rpm Kit 11 1135-1330 rpm
	Wheel (Number) diameter x width - in.	(2) 15 x 15 in.	(2) 15 x 15 in.	(2) 15 x 15 in.
	<b>Filters</b>	Type of filter	MERV 4, Disposable	
Number and size - in.		(6) 24 x 24 x 2		
<b>Line voltage data (Volts-Phase-Hz)</b>		208/230-3-60, 460-3-60, 575-3-60		

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:

**Cooling Ratings** - 95°F outdoor air temperature and 80°F db/67°F wb entering indoor coil air.

**High Temperature Heating Ratings** - 47°F db/43°F wb outdoor air temperature and 70°F entering indoor coil air.

**Low Temperature Heating Ratings** - 17°F db/15°F wb outdoor air temperature and 70°F entering indoor coil air.

<sup>2</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 – Motor service factor limit - 1.0.

# COOLING/HEATING RATINGS

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

## 13 TON - COOLING LHT156H5M (1 COMPRESSOR - PART LOAD)

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	1800	59	1.83	0.73	0.88	1	54.8	2.21	0.74	0.91	1	50.3	2.64	0.76	0.93	1	45.3	3.12	0.78	0.97	1				
	2250	62.4	1.8	0.79	0.94	1	58.2	2.18	0.81	0.97	1	53.4	2.62	0.93	1	1	48	3.1	0.86	1	1				
	2700	65.2	1.78	0.84	0.99	1	60.8	2.16	0.86	1	1	55.8	2.6	0.89	1	1	51.3	3.07	0.93	1	1				
67°F	1800	63.6	1.79	0.55	0.71	0.86	59.5	2.17	0.55	0.72	0.88	54.7	2.6	0.55	0.74	0.9	49.3	3.09	0.55	0.76	0.93				
	2250	67.2	1.76	0.58	0.76	0.91	62.7	2.15	0.59	0.77	0.94	57.3	2.58	0.59	0.8	0.98	51.5	3.09	0.6	0.94	1				
	2700	69.8	1.74	0.61	0.82	0.97	65.2	2.12	0.62	0.84	1	59.5	2.56	0.63	0.87	1	54.1	3.05	0.66	0.91	1				
71°F	1800	68.7	1.75	0.38	0.54	0.69	64.4	2.13	0.37	0.54	0.7	59.1	2.57	0.35	0.54	0.72	53.9	3.05	0.33	0.54	0.74				
	2250	72.2	1.72	0.39	0.57	0.74	67.7	2.11	0.38	0.58	0.76	62	2.54	0.37	0.59	0.78	56.8	3.03	0.35	0.6	0.81				
	2700	74.9	1.7	0.4	0.6	0.8	70	2.08	0.39	0.61	0.81	64.2	2.52	0.39	0.64	0.86	58.7	3.01	0.37	0.66	0.89				

## 13 TON - COOLING LHT156H5M (2 COMPRESSORS - PART LOAD / FULL LOAD)

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						
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	3000	121.1	6.84	0.67	0.81	0.93	111.5	7.89	0.67	0.83	0.94	101.4	9.05	0.68	0.85	0.96	89.9	10.32	0.69	0.87	0.98				
	3750	130.6	6.83	0.73	0.88	0.97	120.2	7.89	0.73	0.9	0.99	109.6	9.04	0.75	0.91	1	98.5	10.32	0.77	0.93	1				
	4500	138	6.81	0.78	0.92	1	127.4	7.87	0.79	0.94	1	116.4	9.04	0.81	0.95	1	105.1	10.32	0.84	0.97	1				
67°F	3000	131.1	6.82	0.51	0.65	0.78	120.8	7.89	0.5	0.65	0.79	109.8	9.05	0.49	0.66	0.81	98.5	10.32	0.49	0.67	0.84				
	3750	140.3	6.81	0.55	0.7	0.85	128.9	7.87	0.54	0.71	0.87	117.7	9.04	0.54	0.73	0.89	105.9	10.33	0.54	0.75	0.91				
	4500	146.3	6.79	0.58	0.76	0.9	135.2	7.87	0.58	0.77	0.92	123.8	9.05	0.58	0.79	0.94	111.4	10.34	0.59	0.82	0.95				
71°F	3000	141.9	6.8	0.36	0.5	0.63	131	7.87	0.34	0.49	0.63	120	9.04	0.32	0.49	0.64	108.4	10.33	0.32	0.49	0.65				
	3750	150.4	6.77	0.38	0.54	0.68	140	7.86	0.36	0.53	0.69	128	9.05	0.35	0.53	0.7	114.7	10.33	0.34	0.54	0.73				
	4500	158.1	6.77	0.39	0.57	0.73	145.8	7.85	0.38	0.57	0.75	133.6	9.04	0.37	0.58	0.77	120.1	10.34	0.37	0.59	0.8				

## 13 TON - COOLING LHT156H5M (2 COMPRESSORS - FULL LOAD)

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						
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	4160	159.5	8.48	0.69	0.84	0.97	149.3	9.62	0.7	0.85	0.98	138.1	10.9	0.71	0.87	1	125.1	12.34	0.72	0.91	1				
	5200	170.4	8.52	0.75	0.9	1	159.5	9.66	0.76	0.93	1	146.4	10.93	0.77	0.95	1	133.8	12.39	0.8	0.98	1				
	6240	178.6	8.55	0.8	0.96	1	165.9	9.68	0.81	0.98	1	155.3	10.97	0.84	0.99	1	143.4	12.44	0.87	1	1				
67°F	4160	171.4	8.52	0.53	0.67	0.81	160.2	9.66	0.53	0.68	0.82	147.8	10.94	0.53	0.69	0.84	134.9	12.39	0.53	0.71	0.87				
	5200	181.5	8.55	0.57	0.73	0.88	169.1	9.7	0.57	0.74	0.9	157.7	10.98	0.57	0.76	0.92	143.6	12.44	0.58	0.78	0.96				
	6240	189	8.58	0.6	0.78	0.94	176.7	9.73	0.61	0.8	0.96	163.4	11	0.61	0.82	0.98	149.9	12.46	0.62	0.85	1				
71°F	4160	183.3	8.56	0.38	0.52	0.65	172.4	9.71	0.37	0.53	0.66	160.8	11	0.36	0.53	0.67	146.6	12.44	0.35	0.52	0.69				
	5200	193.8	8.59	0.41	0.56	0.71	181.8	9.75	0.39	0.56	0.73	168.8	11.02	0.38	0.57	0.74	154.7	12.48	0.38	0.57	0.75				
	6240	200.7	8.63	0.42	0.6	0.76	187.9	9.77	0.41	0.6	0.78	174.7	11.05	0.41	0.61	0.8	160.4	12.51	0.4	0.62	0.83				

## 13 TON - HEATING LHT156H5M

Indoor Coil Air Volume 70°F Dry Bulb cfm	Air Temperature Entering Outdoor Coil									
	65°F		45°F		25°F		5°F		-15°F	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW
4160	194.4	10.58	146.9	9.24	103.1	8.30	70.5	7.55	46.5	6.98
5200	198.6	9.66	149.6	8.61	105.0	7.88	71.9	7.27	47.6	6.80
6240	201.9	9.10	152.1	8.24	106.7	7.61	73.3	7.10	48.9	6.68

# COOLING/HEATING RATINGS

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

## 15 TON - COOLING LHT180H5M (1 COMPRESSOR - PART LOAD)

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	65.1	2.22	0.8	0.94	1	60.9	2.64	0.81	0.95	1	56.4	3.09	0.83	0.97	1	51.3	3.6	0.85	0.98	1
	2400	68.3	2.19	0.85	0.97	1	63.9	2.62	0.87	0.98	1	58.8	3.08	0.89	0.99	1	53.9	3.58	0.91	1	1
	2800	70.8	2.18	0.89	0.99	1	66.3	2.6	0.91	1	1	61.1	3.06	0.92	1	1	56.7	3.57	0.94	1	1
67°F	2000	70.1	2.18	0.58	0.77	0.92	65.9	2.61	0.58	0.78	0.94	60.8	3.07	0.58	0.8	0.95	55.9	3.57	0.58	0.82	0.96
	2400	73.2	2.16	0.61	0.82	0.95	68.9	2.59	0.62	0.84	0.97	63.4	3.05	0.62	0.87	0.98	58.4	3.56	0.63	0.89	1
	2800	75.7	2.14	0.64	0.86	0.98	70.1	2.57	0.63	0.89	0.99	65.5	3.04	0.67	0.91	1	60.2	3.55	0.67	0.93	1
71°F	2000	75.5	2.14	0.39	0.57	0.74	70.8	2.57	0.38	0.57	0.76	65.9	3.04	0.37	0.57	0.78	61	3.55	0.34	0.57	0.8
	2400	78.6	2.12	0.4	0.6	0.79	74.1	2.55	0.39	0.6	0.81	68.5	3.02	0.37	0.61	0.85	63.6	3.53	0.36	0.62	0.87
	2800	81	2.1	0.41	0.63	0.84	75.9	2.54	0.4	0.64	0.87	69.6	3.06	0.39	0.63	0.9	65.5	3.52	0.38	0.66	0.92

## 15 TON - COOLING LHT180H5M (2 COMPRESSORS - PART LOAD / FULL LOAD)

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		
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	3300	138.6	8.48	0.66	0.8	0.91	128.4	9.69	0.66	0.81	0.92	118.8	11.02	0.67	0.82	0.93	107.7	12.49	0.67	0.84	0.95
	4000	148	8.49	0.71	0.85	0.95	137.7	9.7	0.71	0.86	0.96	127.1	11.04	0.72	0.88	0.97	116.3	12.53	0.73	0.89	0.99
	4800	155.9	8.5	0.75	0.9	0.98	146.4	9.7	0.76	0.91	0.99	135.8	11.06	0.77	0.92	1	123.7	12.54	0.79	0.94	1
67°F	3300	149.9	8.49	0.51	0.64	0.76	139.5	9.7	0.5	0.64	0.78	128.8	11.05	0.5	0.65	0.79	117.8	12.53	0.49	0.65	0.81
	4000	158.2	8.5	0.53	0.68	0.81	148.4	9.71	0.53	0.69	0.83	137.5	11.06	0.53	0.7	0.85	124.4	12.55	0.53	0.71	0.87
	4800	166.8	8.51	0.57	0.73	0.87	155.5	9.72	0.56	0.74	0.88	143.5	11.06	0.57	0.75	0.9	130.8	12.56	0.58	0.77	0.91
71°F	3300	161.4	8.5	0.37	0.5	0.62	151.7	9.71	0.36	0.49	0.62	139.7	11.06	0.34	0.5	0.63	128	12.55	0.33	0.49	0.63
	4000	171	8.51	0.38	0.52	0.66	159.7	9.72	0.37	0.52	0.67	147.7	11.07	0.37	0.53	0.68	135.7	12.57	0.35	0.53	0.69
	4800	178.7	8.51	0.4	0.55	0.71	167.5	9.74	0.38	0.56	0.72	155.3	11.09	0.38	0.56	0.74	141.7	12.58	0.37	0.57	0.75

## 15 TON - COOLING LHT180H5M (2 COMPRESSORS - FULL LOAD)

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		
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	183.9	10.65	0.71	0.85	0.97	172.4	11.99	0.71	0.86	0.99	160.1	13.48	0.72	0.88	1	146.3	15.12	0.73	0.91	1
	6000	195.4	10.71	0.76	0.91	1	183.3	12.06	0.77	0.93	1	169.9	13.54	0.78	0.96	1	156.7	15.21	0.81	0.98	1
	7200	205	10.77	0.81	0.97	1	192.4	12.12	0.82	0.98	1	179.6	13.62	0.85	1	1	166.8	15.29	0.87	1	1
67°F	4800	196.8	10.72	0.55	0.69	0.81	185.1	12.06	0.55	0.69	0.83	172	13.55	0.54	0.7	0.85	158.7	15.22	0.54	0.71	0.87
	6000	207.8	10.78	0.58	0.74	0.88	195.7	12.14	0.59	0.75	0.9	182.9	13.64	0.59	0.76	0.93	167.4	15.29	0.59	0.79	0.96
	7200	216.7	10.84	0.62	0.79	0.94	204	12.2	0.62	0.8	0.96	189.2	13.68	0.63	0.83	0.98	173.9	15.34	0.64	0.85	1
71°F	4800	211	10.8	0.41	0.54	0.67	199.1	12.17	0.39	0.54	0.67	186	13.65	0.38	0.53	0.68	171.5	15.32	0.37	0.53	0.69
	6000	222.6	10.87	0.42	0.58	0.72	209.9	12.23	0.41	0.58	0.73	194.8	13.72	0.4	0.58	0.74	180.5	15.4	0.39	0.58	0.76
	7200	230.6	10.92	0.44	0.61	0.77	217.4	12.28	0.43	0.61	0.78	202.3	13.78	0.42	0.62	0.8	187.5	15.46	0.41	0.63	0.83

## 15 TON - HEATING LHT180H5M

Indoor Coil Air Volume 70°F Dry Bulb cfm	Air Temperature Entering Outdoor Coil									
	65°F		45°F		25°F		5°F		-15°F	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW
4800	225.0	13.09	174.0	11.37	127.6	10.18	91.3	9.24	63.3	8.42
6000	229.7	12.03	178.6	10.68	130.8	9.71	94.0	8.91	65.8	8.20
7200	234.3	11.40	182.4	10.26	134.1	9.44	97.0	8.73	68.7	8.08

# COOLING/HEATING RATINGS

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

## 20 TON - COOLING LHT240H5M (1 COMPRESSOR - PART LOAD)

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) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) 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	90.3	3.3	0.83	0.98	1	84.6	3.84	0.85	0.99	1	78.4	4.46	0.87	1	1	71.4	5.15	0.9	1	1
	4000	94.8	3.3	0.89	1	1	89.1	3.83	0.93	1	1	82.4	4.44	0.96	1	1	76.4	5.12	0.98	1	1
	4800	98.5	3.29	0.96	1	1	93.2	3.82	0.98	1	1	87.5	4.44	0.99	1	1	80.5	5.11	1	1	1
67°F	3200	96.2	3.29	0.6	0.8	0.98	90.7	3.83	0.6	0.82	0.98	83.8	4.45	0.6	0.85	0.99	77.2	5.12	0.61	0.87	1
	4000	100.6	3.28	0.64	0.87	0.99	94.9	3.82	0.65	0.89	1	87.8	4.43	0.66	0.93	1	80.6	5.11	0.68	0.97	1
	4800	104	3.28	0.68	0.94	1	98	3.81	0.7	0.97	1	90.6	4.42	0.71	0.98	1	83	5.1	0.74	0.99	1
71°F	3200	102.9	3.28	0.38	0.58	0.77	97.3	3.81	0.38	0.58	0.79	90.6	4.42	0.36	0.59	0.82	83.4	5.1	0.36	0.6	0.84
	4000	107.7	3.32	0.4	0.62	0.85	101.5	3.81	0.39	0.64	0.87	94.6	4.41	0.38	0.64	0.9	86.4	5.09	0.38	0.67	0.95
	4800	111.1	3.31	0.42	0.67	0.91	104.5	3.8	0.41	0.68	0.95	97.4	4.4	0.41	0.71	0.98	88.9	5.08	0.41	0.73	0.99

## 20 TON - COOLING LHT240H5M (2 COMPRESSORS - PART LOAD / FULL LOAD)

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) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) 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	185.2	11.49	0.69	0.83	0.94	172.2	13.04	0.7	0.84	0.95	157.4	14.76	0.71	0.87	0.96	143.1	16.7	0.72	0.88	0.98
	6000	197.5	11.54	0.74	0.89	0.98	183.8	13.1	0.76	0.91	0.99	170.8	14.83	0.77	0.92	1	154.4	16.75	0.79	0.94	1
	7200	209.1	11.58	0.79	0.93	1	194.8	13.15	0.81	0.94	1	179.5	14.86	0.83	0.96	1	164	16.78	0.85	0.98	1
67°F	4800	198.3	11.54	0.53	0.67	0.8	184.2	13.1	0.53	0.68	0.81	171	14.84	0.53	0.68	0.83	154	16.76	0.52	0.7	0.86
	6000	211.8	11.6	0.57	0.72	0.86	195.9	13.15	0.57	0.74	0.88	180.4	14.88	0.57	0.75	0.9	163.7	16.8	0.57	0.77	0.91
	7200	219.7	11.62	0.61	0.78	0.91	204.1	13.2	0.61	0.79	0.93	188.5	14.92	0.61	0.81	0.94	171.4	16.85	0.62	0.83	0.96
71°F	4800	214.2	11.6	0.39	0.53	0.65	198.6	13.16	0.38	0.52	0.66	183.6	14.89	0.36	0.52	0.67	167.4	16.81	0.34	0.52	0.68
	6000	225.5	11.65	0.41	0.57	0.71	210.6	13.24	0.4	0.56	0.72	194.9	14.96	0.39	0.56	0.73	177.2	16.87	0.37	0.57	0.75
	7200	236.1	11.7	0.42	0.6	0.75	219.4	13.28	0.42	0.6	0.77	201.9	15	0.4	0.61	0.79	184.3	16.91	0.39	0.61	0.81

## 20 TON - COOLING LHT240H5M (2 COMPRESSORS - FULL LOAD)

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) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) 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	235.2	14.15	0.72	0.85	0.97	220	15.79	0.72	0.87	0.98	205.6	17.63	0.73	0.89	1	188.6	19.7	0.74	0.92	1
	8000	249.8	14.3	0.77	0.92	1	233.1	15.94	0.78	0.94	1	217.4	17.77	0.79	0.96	1	201	19.84	0.81	0.98	1
	9600	260.1	14.41	0.81	0.97	1	244	16.06	0.83	0.98	1	228.8	17.9	0.85	0.99	1	213.1	19.98	0.88	1	1
67°F	6400	251.3	14.31	0.55	0.69	0.82	234.7	15.95	0.55	0.7	0.84	219.2	17.79	0.55	0.71	0.86	202.1	19.84	0.54	0.72	0.88
	8000	263.6	14.45	0.59	0.75	0.89	246.6	16.09	0.59	0.76	0.91	232	17.94	0.59	0.77	0.93	213.8	19.98	0.59	0.79	0.96
	9600	274.7	14.57	0.62	0.79	0.94	257.9	16.21	0.63	0.81	0.97	240	18.03	0.63	0.83	0.98	220.8	20.06	0.64	0.86	1
71°F	6400	268.1	14.5	0.41	0.55	0.67	251.8	16.15	0.39	0.54	0.68	236.9	17.99	0.38	0.54	0.69	218.1	20.03	0.37	0.54	0.7
	8000	282.5	14.65	0.42	0.58	0.73	263.9	16.28	0.41	0.59	0.74	247.1	18.11	0.4	0.59	0.76	228.1	20.14	0.39	0.59	0.77
	9600	291.6	14.74	0.43	0.62	0.78	273.4	16.38	0.43	0.62	0.79	256.2	18.21	0.42	0.63	0.81	237.1	20.24	0.42	0.64	0.84

## 20 TON - HEATING LHT240H5M

Indoor Coil Air Volume 70°F Dry Bulb cfm	Air Temperature Entering Outdoor Coil									
	65°F		45°F		25°F		5°F		-15°F	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW
6400	282.9	16902	217.6	14.88	155.5	13.39	109.6	12.07	71.2	10.74
8000	289.0	15757	220.3	14.09	158.0	12.91	111.2	11.77	73.6	10.56
9600	296.2	15023	227.2	13.64	164.5	12.63	116.5	11.56	78.9	10.47

## 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 26 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.

See page 27 for minimum air volume required for use with optional electric heat.

**TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)**

Air Volume cfm	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	1115	2.30	1170	2.50	1225	2.70	1280	2.90
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	1115	2.55	1170	2.75	1225	2.95	1280	3.15
3250	405	0.40	520	0.60	615	0.85	695	1.10	765	1.30	830	1.60	890	1.85	950	2.10	1005	2.30	1060	2.50	1115	2.70	1170	2.90	1225	3.10	1280	3.30
3500	415	0.45	530	0.70	620	0.95	700	1.20	775	1.45	840	1.70	900	2.00	955	2.25	1005	2.45	1060	2.65	1115	2.85	1170	3.05	1225	3.25	1280	3.45
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	960	2.40	1005	2.60	1060	2.80	1115	3.00	1170	3.20	1225	3.40	1280	3.60
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	965	2.55	1005	2.75	1060	2.95	1115	3.15	1170	3.35	1225	3.55	1280	3.75
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	970	2.70	1005	2.90	1060	3.10	1115	3.30	1170	3.50	1225	3.70	1280	3.90
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	980	2.90	1005	3.10	1060	3.30	1115	3.50	1170	3.70	1225	3.90	1280	4.10
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	1005	3.30	1060	3.50	1115	3.70	1170	3.90	1225	4.10	1280	4.30
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	1005	3.50	1060	3.70	1115	3.90	1170	4.10	1225	4.30	1280	4.50
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.55	1005	3.75	1060	3.95	1115	4.15	1170	4.35	1225	4.55	1280	4.75
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.75	1005	3.95	1060	4.15	1115	4.35	1170	4.55	1225	4.75	1280	4.95
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.65	1015	4.00	1005	4.20	1060	4.40	1115	4.60	1170	4.80	1225	5.00	1280	5.20
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.90	1025	4.30	1005	4.50	1060	4.70	1115	4.90	1170	5.10	1225	5.30	1280	5.50
6250	545	1.40	640	1.90	720	2.35	795	2.80	860	3.25	920	3.70	975	4.15	1030	4.60	1005	4.80	1060	5.00	1115	5.20	1170	5.40	1225	5.60	1280	5.80
6500	560	1.55	650	2.05	730	2.50	805	3.00	870	3.45	930	3.95	985	4.40	1040	4.85	1005	5.05	1060	5.25	1115	5.45	1170	5.65	1225	5.85	1280	6.05
6750	570	1.70	665	2.20	745	2.70	815	3.20	880	3.70	940	4.20	995	4.65	1045	5.10	1005	5.30	1060	5.50	1115	5.70	1170	5.90	1225	6.10	1280	6.30
7000	585	1.85	675	2.35	755	2.90	825	3.40	890	3.95	950	4.45	1005	4.95	1055	5.40	1005	5.60	1060	5.80	1115	6.00	1170	6.20	1225	6.40	1280	6.60
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	965	4.65	1015	5.25	1065	5.75	1005	5.95	1060	6.15	1115	6.35	1170	6.55	1225	6.75	1280	6.95
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	975	4.95	1020	5.50	1075	6.05	1005	6.15	1060	6.35	1115	6.55	1170	6.75	1225	6.95	1280	7.15
7750	630	2.40	715	3.00	790	3.55	855	4.10	920	4.70	975	5.25	1030	5.80	1080	6.35	1005	6.35	1060	6.55	1115	6.75	1170	6.95	1225	7.15	1280	7.35
8000	640	2.55	725	3.20	800	3.80	865	4.35	930	4.95	985	5.50	1040	6.10	1090	6.70	1005	6.55	1060	6.75	1115	6.95	1170	7.15	1225	7.35	1280	7.55
8250	655	2.80	740	3.40	810	4.00	880	4.65	940	5.25	995	5.85	1050	6.45	1100	7.05	1005	6.75	1060	6.95	1115	7.15	1170	7.35	1225	7.55	1280	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	7.40	1005	6.95	1060	7.15	1115	7.35	1170	7.55	1225	7.75	1280	7.95
8750	685	3.25	765	3.90	835	4.55	900	5.20	960	5.85	1015	6.45	1070	7.15	1120	7.75	1005	7.15	1060	7.35	1115	7.55	1170	7.75	1225	7.95	1280	8.15
9000	700	3.50	780	4.20	850	4.85	910	5.50	970	6.15	1025	6.80	1080	7.50	1130	8.15	1005	7.35	1060	7.55	1115	7.75	1170	7.95	1225	8.15	1280	8.35
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.50	1040	7.20	1090	7.85	1140	8.55	1005	7.55	1060	7.75	1115	7.95	1170	8.15	1225	8.35	1280	8.55
9500	730	4.00	805	4.75	875	5.45	935	6.15	995	6.90	1050	7.60	1100	8.25	1150	8.95	1005	7.75	1060	7.95	1115	8.15	1170	8.35	1225	8.55	1280	8.75
9750	745	4.30	820	5.05	885	5.75	950	6.55	1005	7.20	1060	7.95	1110	8.65	1160	9.40	1005	7.95	1060	8.15	1115	8.35	1170	8.55	1225	8.75	1280	8.95
10,000	760	4.60	835	5.40	900	6.15	960	6.85	1015	7.60	1070	8.35	1120	9.05	1170	9.80	1005	8.15	1060	8.35	1115	8.55	1170	8.75	1225	8.95	1280	9.15
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	10.25	1005	8.35	1060	8.55	1115	8.75	1170	8.95	1225	9.15	1280	9.35
10,500	790	5.20	860	6.00	925	6.85	985	7.65	1040	8.40	1095	9.20	1145	10.00	1190	10.70	1005	8.55	1060	8.75	1115	8.95	1170	9.15	1225	9.35	1280	9.55
10,750	805	5.55	875	6.40	940	7.25	1000	8.05	1055	8.85	1105	9.65	1155	10.45	1200	11.20	1005	8.75	1060	8.95	1115	9.15	1170	9.35	1225	9.55	1280	9.75
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	1210	11.65	1005	8.95	1060	9.15	1115	9.35	1170	9.55	1225	9.75	1280	9.95

## BLOWER DATA

### FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Nominal hp	Maximum hp	Drive Kit Number	RPM Range
3	3.45	1	535 - 725
3	3.45	2	710 - 965
5	5.75	3	685 - 856
5	5.75	4	850 - 1045
5	5.75	5	945 - 1185
7.5	8.63	6	850 - 1045
7.5	8.63	7	945 - 1185
7.5	8.63	8	1045 - 1285
10	11.50	7	945 - 1185
10	11.50	10	1045 - 1285
10	11.50	11	1135 - 1330

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 - Motor service factor limit - 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	MERV 16	in. w.g.
3250	.03	---	---	.01	.04	0.07	.04
3500	.03	---	---	.01	.04	0.08	.05
3750	.03	---	---	.01	.04	0.08	.05
4000	.04	---	---	.01	.04	0.09	.06
4250	.04	---	---	.01	.05	0.10	.07
4500	.05	---	---	.01	.05	0.10	.07
4750	.05	---	---	.02	.05	0.11	.08
5000	.05	---	---	.02	.06	0.12	.08
5250	.06	---	---	.02	.06	0.12	.09
5500	.07	---	---	.02	.06	0.13	.10
5750	.07	---	---	.02	.07	0.14	.11
6000	.08	.01	---	.03	.07	0.14	.11
6250	.08	.01	.01	.03	.07	0.15	.12
6500	.09	.01	.02	.03	.08	0.16	.13
6750	.10	.01	.03	.03	.08	0.17	.14
7000	.10	.01	.04	.04	.08	0.17	.15
7250	.11	.01	.05	.04	.09	0.18	.16
7500	.12	.01	.06	.04	.09	0.19	.17
8000	.13	.02	.09	.05	.10	0.21	.19
8500	.15	.02	.11	.05	.10	0.22	.21
9000	.16	.04	.14	.06	.11	0.24	.24
9500	.18	.05	.16	.07	.12	0.25	.26
10,000	.20	.06	.19	.07	.12	0.27	.29
10,500	.22	.09	.22	.08	.13	0.29	.31
11,000	.24	.11	.25	.09	.14	0.30	.34



## BLOWER DATA

### MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT

Electric Heat kW	Minimum cfm
15	6000
30	6000
45	6000
60	6000
90	6000

### 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.

Size	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.		Size	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.	
		RTD11-185S Step-Down	FD11-185S Flush			RTD11-275S Step-Down	FD11-275S Flush
156, 180	5600	39 - 49	28 - 37	240	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**

**13 TON**

Model		LHT156H5M					
<sup>1</sup> Voltage - 60Hz		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor 1 (Non-Inverter)	Rated Load Amps	23.2		9.5		7.8	
	Locked Rotor Amps	142		73.1		55	
Compressor 2 (Non-Inverter)	Rated Load Amps	22.4		9.1		7.2	
	Locked Rotor Amps	166.2		74.6		54	
Outdoor Fan Motors (6)	Full Load Amps (6 Non-ECM)	2.4		1.3		1	
	Total	14.4		7.8		6	
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4		1.3		1	
	Total	4.8		2.6		2	
Service Outlet 115V GFI (amps)		15		15		20	
Indoor Blower Motor	HP	3	5	3	5	3	5
	Full Load Amps	10.6	16.7	4.8	7.6	3.9	6.1
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit Only	90	100	40	45	30	35
	With (2) 0.33 HP Power Exhaust	100	110	45	45	35	35
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit Only	77	83	34	37	27	30
	With (2) 0.33 HP Power Exhaust	82	88	37	39	29	32

**ELECTRIC HEAT DATA**

		Electric Heat Voltage	208V	240V	208V	240V	480V	480V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	125	125	<sup>4</sup> 125	150	60	60	45	50
		30 kW	175	175	175	175	80	90	70	70
		45 kW	<sup>4</sup> 200	225	<sup>4</sup> 200	225	110	110	90	90
		60 kW	225	225	<sup>4</sup> 225	250	110	110	90	90
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	116	122	122	128	57	59	45	48
		30 kW	155	167	161	173	79	82	63	66
		45 kW	194	212	200	218	102	105	81	84
		60 kW	202	221	208	227	106	109	85	87
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	<sup>4</sup> 125	150	150	150	60	70	50	50
		30 kW	175	175	<sup>4</sup> 175	200	90	90	70	70
		45 kW	<sup>4</sup> 200	225	225	225	110	110	90	90
		60 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	110	125	90	90
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	121	127	127	133	59	62	47	50
		30 kW	160	172	166	178	82	85	65	68
		45 kW	199	217	205	223	104	107	83	86
		60 kW	207	226	213	232	109	112	87	89

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**

**15 TON**

Model		LHT180H5M								
<sup>1</sup> Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	25.2			10.6			8.6		
	Locked Rotor Amps	178.5			79.1			65		
Compressor 2 (Non-Inverter)	Rated Load Amps	27.7			11.5			9		
	Locked Rotor Amps	178.5			103			78		
Outdoor Fan Motors (6)	Full Load Amps (6 Non-ECM)	2.4			1.3			1		
	Total	14.4			7.8			6		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	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 (MOCP)	Unit Only	110	110	125	45	50	50	35	40	40
	With (2) 0.33 HP Power Exhaust	110	110	125	50	50	50	40	40	45
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit Only	85	91	99	38	41	44	30	32	35
	With (2) 0.33 HP Power Exhaust	90	96	104	41	43	47	32	34	37

**ELECTRIC HEAT DATA**

		Electric Heat Voltage												
		208V	240V	208V	240V	208V	240V	480V	480V	480	600V	600V	600V	
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	<sup>4</sup> 125	150	150	150	150	150	70	70	70	50	50	60
		30 kW	<sup>4</sup> 175	200	<sup>4</sup> 175	200	200	200	90	90	90	70	70	80
		45 kW	225	225	<sup>4</sup> 225	250	<sup>4</sup> 225	250	110	110	125	90	90	90
		60 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	250	250	110	125	125	90	90	100
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	124	130	131	137	138	144	61	63	67	48	50	53
		30 kW	164	176	170	182	177	189	83	86	89	66	69	71
		45 kW	203	221	209	227	216	234	106	109	112	84	87	89
		60 kW	210	230	217	236	224	243	110	113	116	88	90	93
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	150	150	150	150	150	150	70	70	70	50	60	60
		30 kW	<sup>4</sup> 175	200	<sup>4</sup> 175	200	200	200	90	90	100	70	80	80
		45 kW	225	225	<sup>4</sup> 225	250	<sup>4</sup> 225	250	110	125	125	90	90	100
		60 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	250	250	125	125	125	90	100	100
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	129	135	135	141	143	149	63	66	69	50	52	55
		30 kW	168	180	174	186	182	194	86	89	92	68	71	73
		45 kW	207	225	213	232	221	239	108	111	115	86	89	91
		60 kW	215	234	221	241	229	248	113	116	119	90	92	95

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		LHT240H5M								
<sup>1</sup> Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	26.5			14			11.5		
	Locked Rotor Amps	255			123			93.7		
Compressor 2 (Non-Inverter)	Rated Load Amps	28.5			13.5			10.7		
	Locked Rotor Amps	255			123			93.7		
Outdoor Fan Motors (6)	Full Load Amps (6 Non-ECM)	2.4			1.3			1		
	Total	14.4			7.8			6		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	HP	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 (MOCP)	Unit Only	110	125	125	60	60	60	45	50	50
	With (2) 0.33 HP Power Exhaust	125	125	125	60	60	60	50	50	50
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit Only	94	101	108	47	50	53	38	41	43
	With (2) 0.33 HP Power Exhaust	99	106	113	50	53	56	40	43	45

**ELECTRIC HEAT DATA**

		Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+	15 kW	150	150	150	150	<sup>4</sup> 150	175	70	80	80	60	60	70
	Electric Heat	30 kW	<sup>4</sup> 175	200	200	200	200	200	100	100	100	80	80	80
		45 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	250	250	125	125	125	100	100	100
		60 kW	<sup>4</sup> 225	250	250	250	<sup>4</sup> 250	<sup>4</sup> 300	125	125	125	100	100	110
		90 kW	<sup>4</sup> 300	<sup>4</sup> 350	<sup>4</sup> 300	<sup>4</sup> 350	<sup>4</sup> 300	<sup>4</sup> 350	175	175	175	125	150	150
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+	15 kW	133	139	140	146	147	154	69	73	76	56	59	61
	Electric Heat	30 kW	172	184	179	191	187	199	92	95	98	74	77	79
		45 kW	211	229	218	237	226	244	115	118	121	92	95	97
		60 kW	219	238	226	246	233	253	119	122	125	95	98	100
		90 kW	281	310	289	318	296	325	155	159	162	124	127	129
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+	15 kW	150	150	<sup>4</sup> 150	175	175	175	80	80	80	60	70	70
	Electric Heat and (2) 0.33 HP Power Exhaust	30 kW	200	200	200	200	<sup>4</sup> 200	225	100	100	110	80	80	90
		45 kW	<sup>4</sup> 225	250	<sup>4</sup> 225	250	250	250	125	125	125	100	100	100
		60 kW	250	250	250	250	<sup>4</sup> 250	<sup>4</sup> 300	125	125	150	100	110	110
		90 kW	<sup>4</sup> 300	<sup>4</sup> 350	<sup>4</sup> 300	<sup>4</sup> 350	350	<sup>4</sup> 350	175	175	175	150	150	150
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+	15 kW	138	144	145	151	152	158	72	75	78	58	61	63
	Electric Heat and (2) 0.33 HP Power Exhaust	30 kW	177	189	184	196	191	203	95	98	101	76	79	81
		45 kW	216	234	223	241	230	249	117	121	124	94	97	99
		60 kW	224	243	231	250	238	258	122	125	128	97	100	102
		90 kW	286	315	294	323	301	330	158	161	164	126	129	131

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

### 13 TON | LHT156H5

Motor HP	3		5		3	5	3	5
	208	240	208	240	480	480	600	600
Unit Only	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W85	54W86	54W85	54W85
+ Electric Heat 45 kW	54W87	54W87	54W87	54W87	54W86	54W86	54W85	54W86
+ Electric Heat 60 kW	<sup>1</sup> NA	54W87	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W87	54W87	54W87	54W87	54W86	54W86	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86

### 15 TON | LHT180H5

Motor HP	3		5		7.5		3	5	7.5	3	5	7.5
	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	54W87	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 60 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W87	54W87	54W87	NA	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86	54W86	54W86

### 20 TON | LHT240H5

Motor HP	5		7.5		10		5	7.5	10	5	7.5	10
	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	54W87	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W87	NA	54W87	NA	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 60 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 90 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W87	54W87	54W87	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W87	54W86	54W87	54W87	54W87	54W87	54W85	54W85	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W87	NA	54W87	NA	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 90 kW	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	<sup>1</sup> NA	54W87	54W87	54W87	54W86	54W86	54W86

Disconnects - 54W85 - 80A  
 54W86 - 150A  
 54W87 - 250A

<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	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages	kW Input	Btuh Output	Stages
208	11.3	38,600	1	22.5	76,800	1	33.8	115,300	1	45.0	153,600	1	67.6	230,700	1
220	12.6	43,000	1	25.2	86,000	1	37.8	129,000	1	50.4	172,000	1	75.6	258,000	1
230	13.8	47,100	1	27.5	93,900	1	41.3	141,000	1	55.1	188,000	1	82.7	282,200	1
240	15.0	51,200	1	30.0	102,400	1	45.0	153,600	1	60.0	204,800	1	90.0	307,100	1
440	12.6	43,000	1	25.2	86,000	1	37.8	129,000	1	50.4	172,000	1	75.6	258,000	1
460	13.8	47,100	1	27.5	93,900	1	41.3	141,000	1	55.1	188,000	1	82.7	282,200	1
480	15.0	51,200	1	30.0	102,400	1	45.0	153,600	1	60.0	204,800	1	90.0	307,100	1
550	12.6	43,000	1	25.2	86,000	1	37.8	129,000	1	50.4	172,000	1	75.6	258,000	1
575	13.8	47,100	1	27.5	93,900	1	41.3	141,000	1	55.1	188,000	1	82.7	282,200	1
600	15.0	51,200	1	30.0	102,400	1	45.0	153,600	1	60.0	204,800	1	90.0	307,100	1

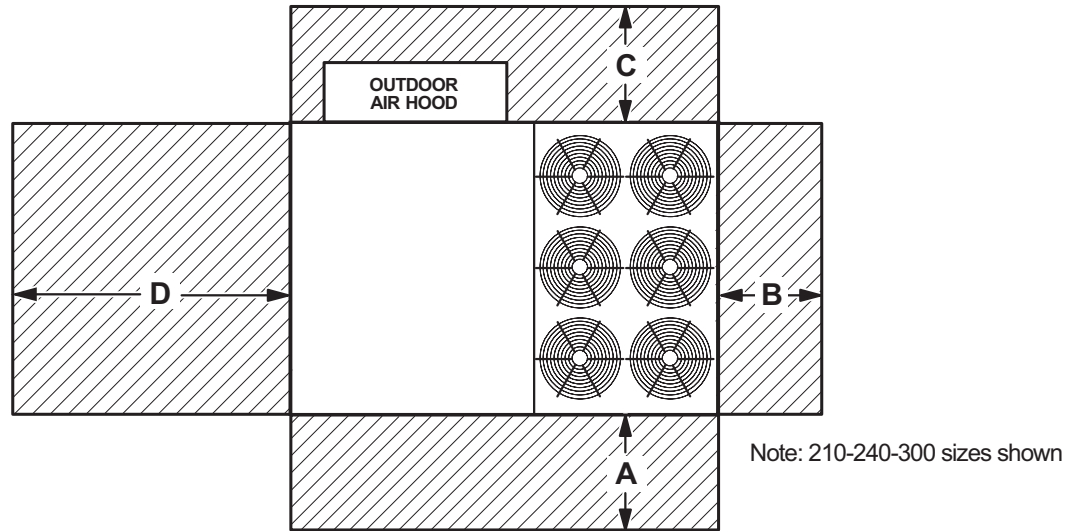
### FIELD WIRING NOTES

- For use with copper wiring only
- Field wiring not furnished
- All wiring must conform to NEC or CEC and local electrical codes
- For specific wiring information, please refer to the installation instructions



## 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

Size	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	
156, 180, 240	79	84	88	89	85	82	73	94

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

<sup>1</sup> Sound Rating Number according to AHRI Standard 370-2001 (includes pure tone penalty).

Sound Rating Number is the overall A-Weighted Sound Power Level (LWA), dBA (100 Hz to 10,000 Hz).

WEIGHT DATA				UNIT
Size	Net		Shipping	
	lbs.	kg	lbs.	kg
156 Base Unit	2198	997	2398	1088
156 Max. Unit	2488	1129	2688	1219
180 Base Unit	2226	1010	2426	1100
180 Max. Unit	2516	1141	2716	1232
240 Base Unit	2268	1029	2468	1119
240 Max. Unit	2558	1160	2758	1251

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.

FACTORY / FIELD INSTALLED OPTIONS AND ACCESSORIES - NET WEIGHTS			
Description		lbs.	kg
<b>ECONOMIZER / OUTDOOR AIR / EXHAUST</b>			
<b>Economizer</b>			
Economizer Dampers (with Outdoor Air Hood)		167	76
Barometric Relief Dampers (downflow)		30	14
Barometric Relief Dampers (horizontal)		20	9
<b>Outdoor Air Dampers with Hood (downflow)</b>			
Motorized		39	18
Manual		22	10
<b>Power Exhaust</b>		62	28
<b>ELECTRIC HEAT</b>			
15 kW		59	27
30 kW		59	27
45 kW		76	34
60 kW		76	34
90 kW		84	38
<b>COMBINATION COIL/HAIL GUARDS</b>			
All models		36	16
<b>ROOF CURBS</b>			
<b>Hybrid Roof Curbs, Downflow</b>			
8 in. height		136	62
14 in. height		169	77
18 in. height		191	87
24 in. height		224	102
<b>Adjustable Pitch Curb, Downflow</b>			
14 in. height		224	102
<b>Horizontal, Standard</b>			
26 in. height		450	204
37 in. height		540	245
<b>CEILING DIFFUSERS</b>			
Step-Down	RTD11-185S	168	76
	RTD11-275S	238	108
Flush	FD11-185S	168	76
	FD11-275S	238	108
Transitions	C1DIFF33C-1	80	36
	C1DIFF34C-1	75	34

**DIMENSIONS**

**UNIT**

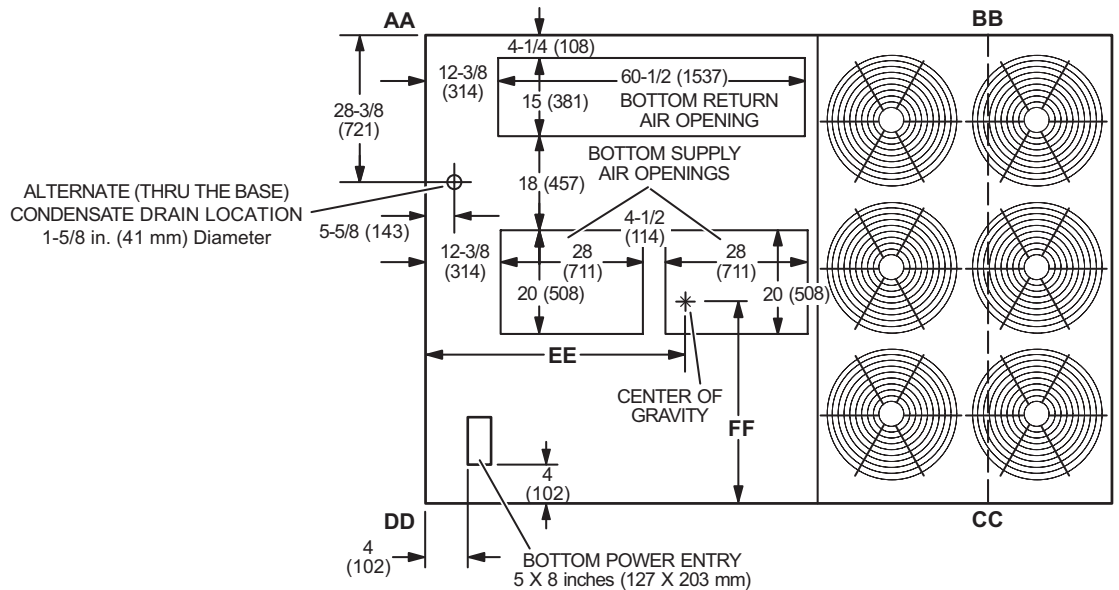
**CORNER WEIGHTS**

**CENTER OF GRAVITY**

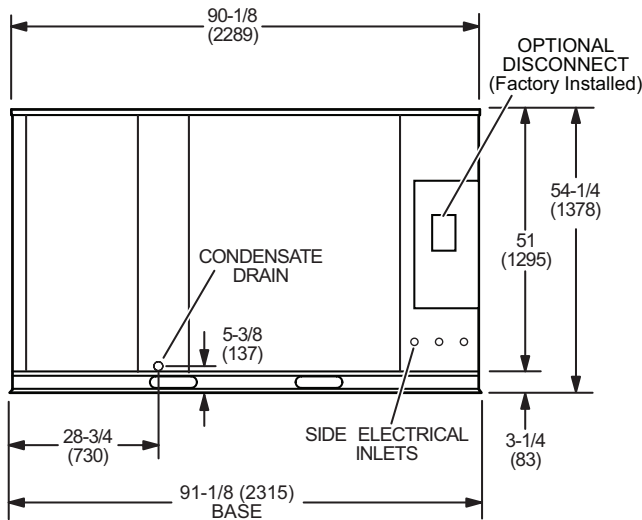
Model	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
LHT156 Base Unit	411	187	485	220	705	321	598	272	58-3/8	1481	37-1/8	943
LHT156 Max. Unit	509	231	575	261	745	338	659	300	57-1/8	1452	39-3/4	1010
LHT180 Base Unit	412	187	486	221	719	327	610	277	58-3/8	1482	36-3/4	934
LHT180 Max. Unit	511	232	577	262	758	345	671	305	57-1/8	1452	39-3/8	1000
LHT240 Base Unit	415	189	488	222	738	336	628	285	58-1/4	1479	36-1/4	921
LHT240 Max. Unit	513	233	578	263	777	353	690	314	57	1448	38-7/8	987

Base Unit - The unit with NO INTERNAL OPTIONS.

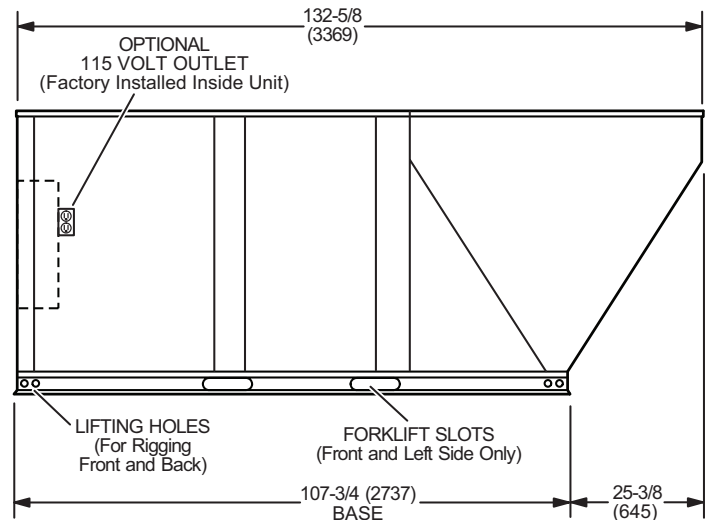
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit.



**TOP VIEW**

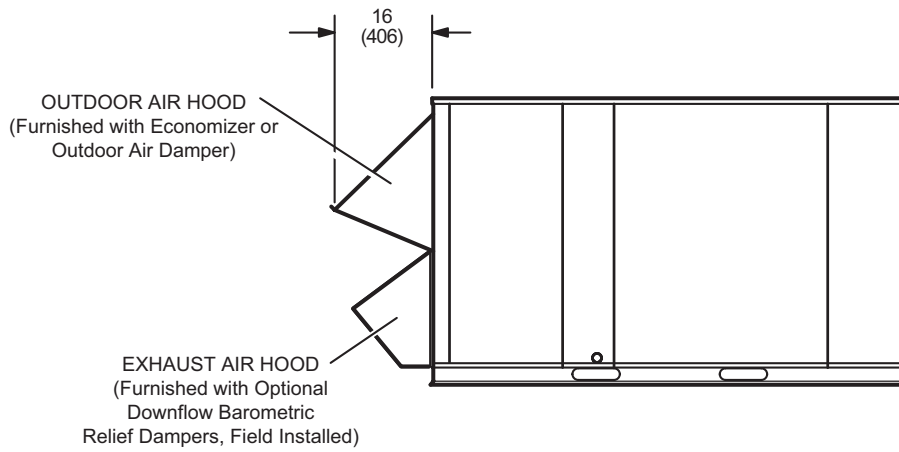


**END VIEW**



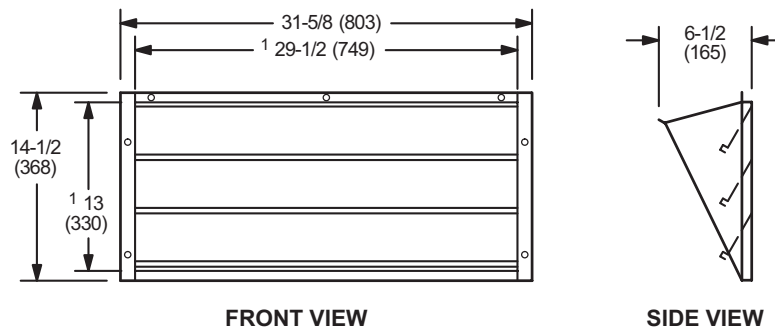
**SIDE VIEW**

**OUTDOOR AIR HOOD DETAIL**



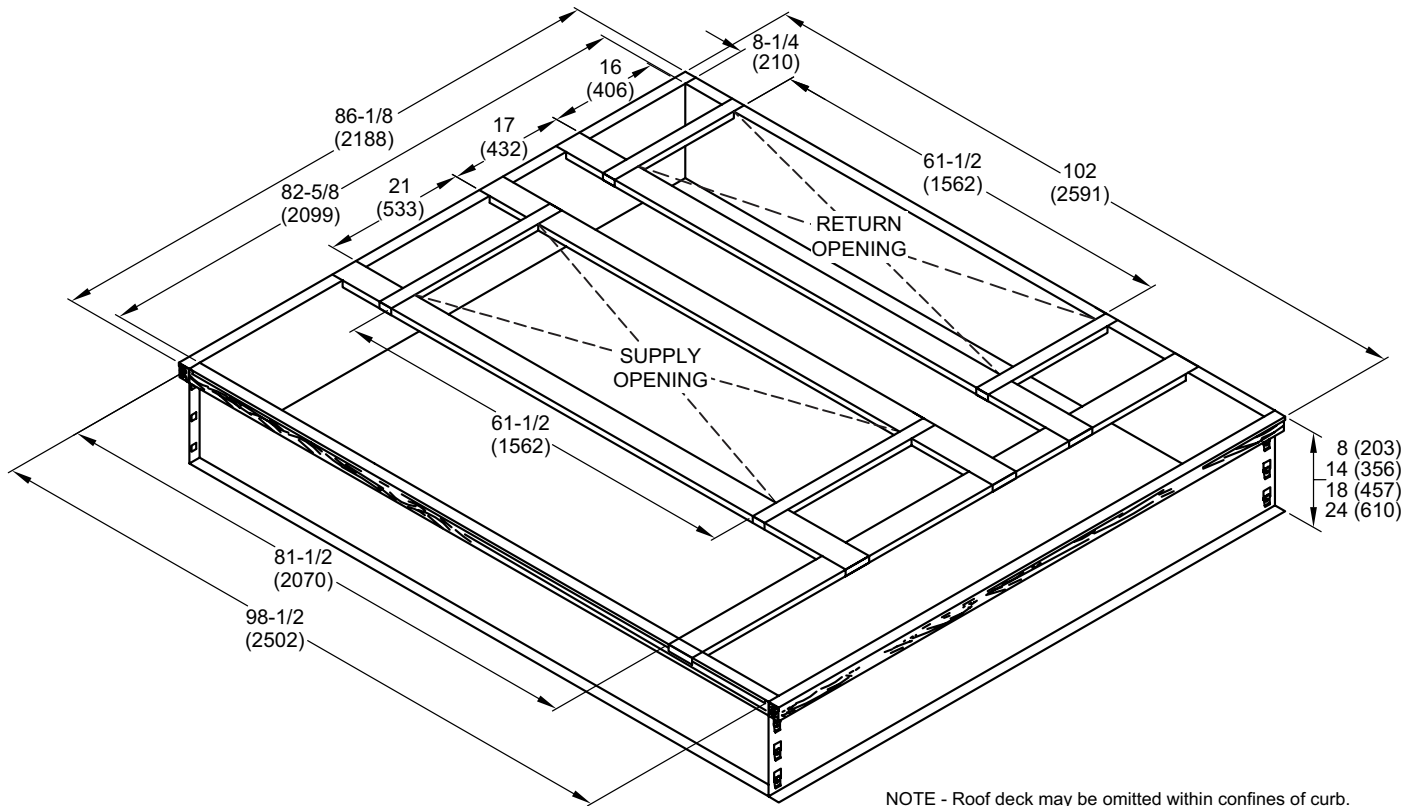
**OPTIONAL HORIZONTAL BAROMETRIC RELIEF DAMPERS WITH HOOD**

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



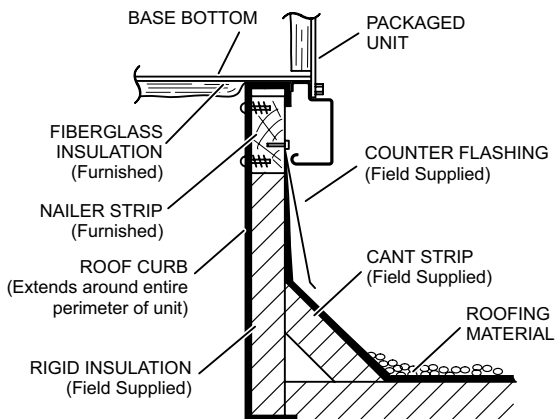
NOTE - Two furnished per order no.  
<sup>1</sup> NOTE - Opening size required in return air duct.

**HYBRID ROOF CURBS - DOUBLE DUCT OPENING**

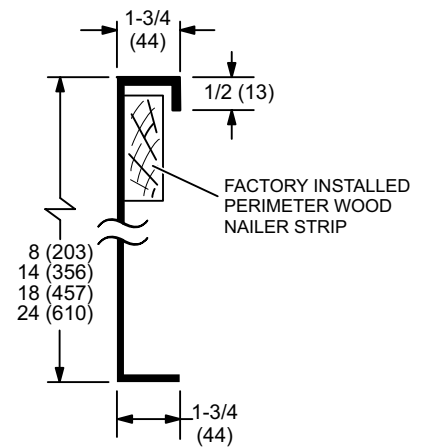


NOTE - Roof deck may be omitted within confines of curb.

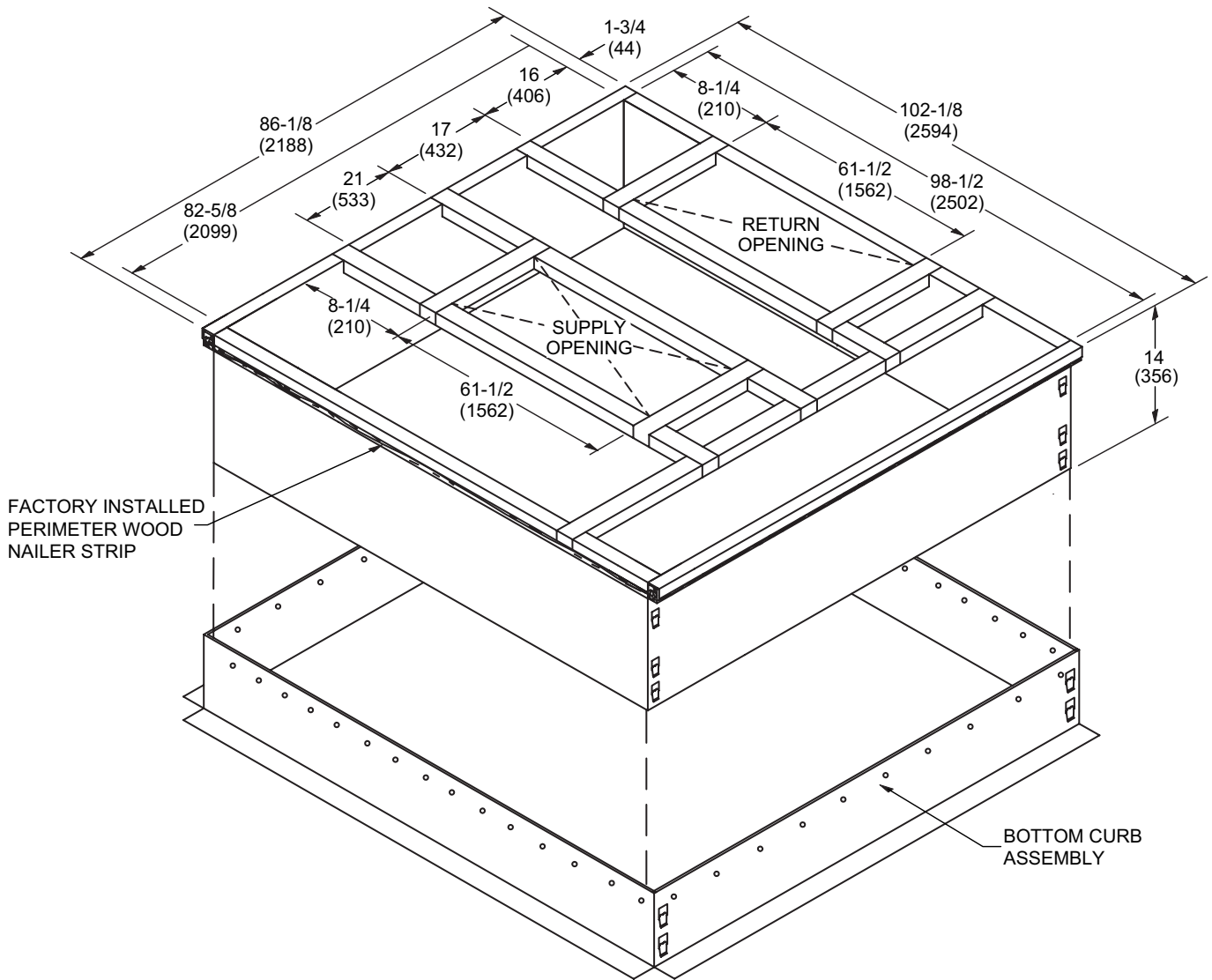
**TYPICAL FLASHING DETAIL FOR ROOF CURB**



**DETAIL ROOF CURB**

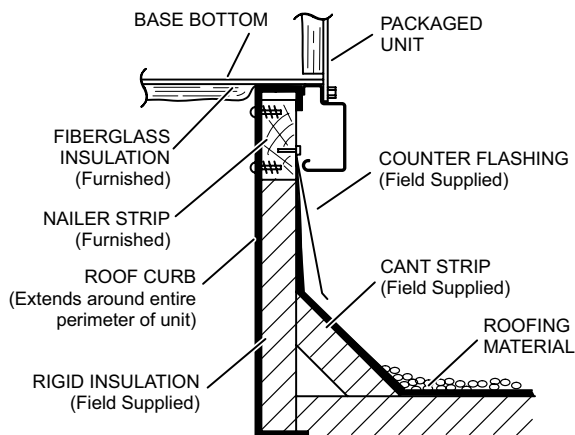


**ADJUSTABLE PITCH CURB - DOUBLE DUCT OPENING**

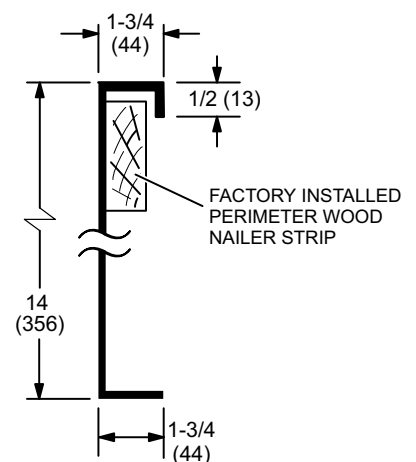


NOTE - Maximum slope pitch is 3/4 in. per 1 foot (19 mm per 305 mm) in any one direction.

**TYPICAL FLASHING DETAIL FOR ROOF CURB**

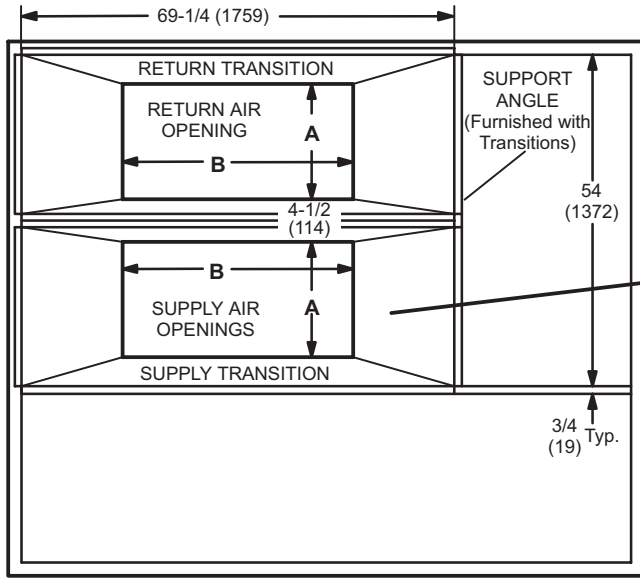


**DETAIL ROOF CURB**

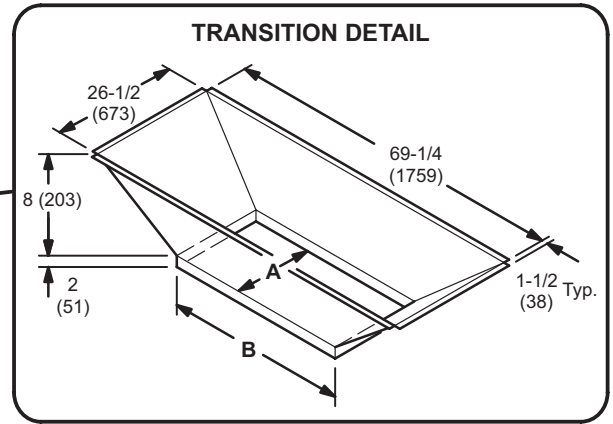




**ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS**



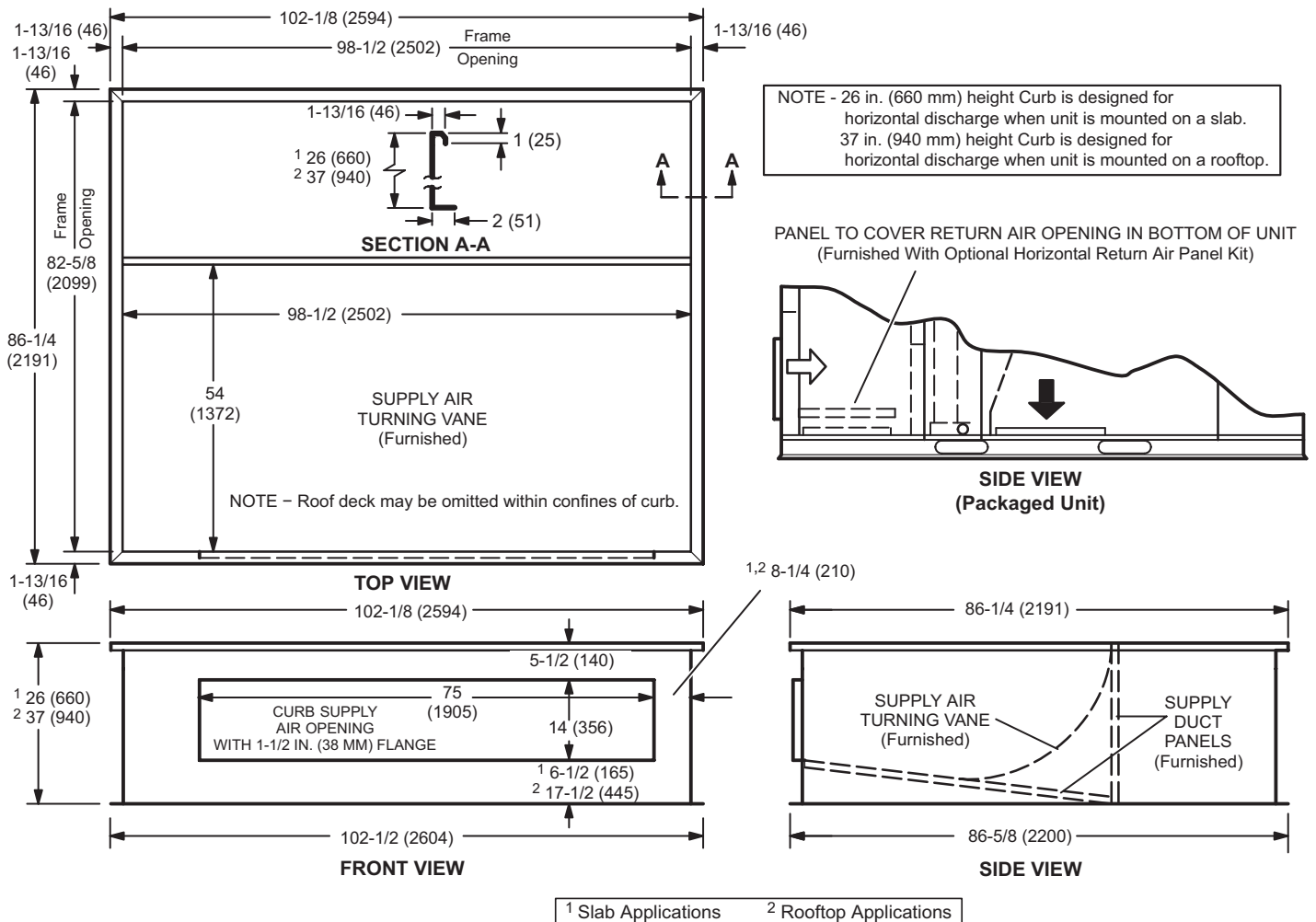
**TOP VIEW**



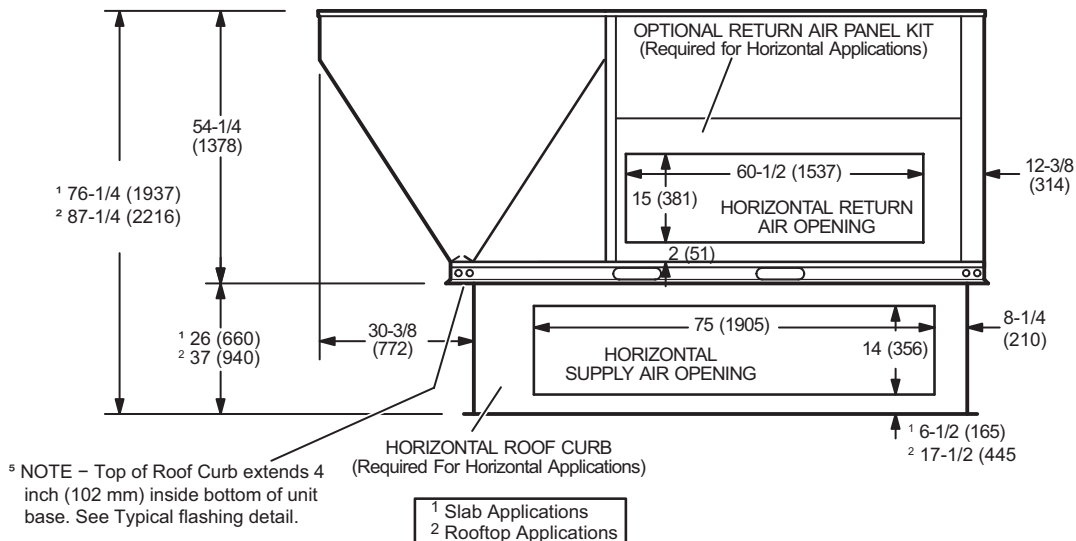
**TRANSITION OPENING SIZES**

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**

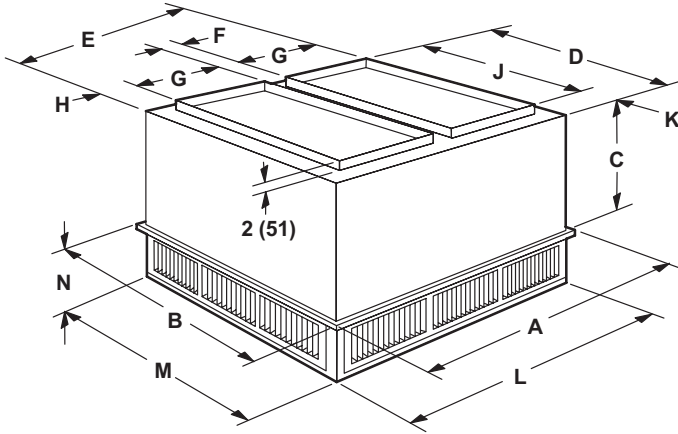


**HORIZONTAL SUPPLY AND RETURN AIR OPENINGS WITH HORIZONTAL ROOF CURB**

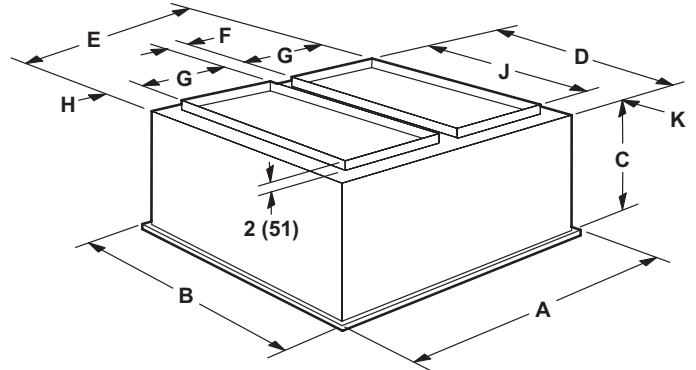


**COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS**

**STEP-DOWN CEILING DIFFUSER**



**FLUSH CEILING DIFFUSER**



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

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



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