PACKAGED HEAT PUMP

LHX

K-Series™ ROOFTOP UNITS

Standard Efficiency | Intelli-Guide™ Controller | R-454B | 60Hz

COMMERCIAL PRODUCT SPECIFICATIONS (EHB) 15 and 20 Tons

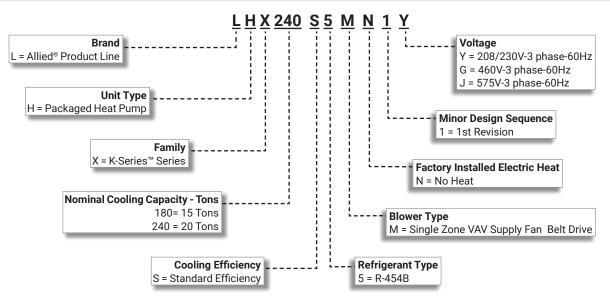
Net Cooling Capacity - 176,000 to 224,000 Btuh Net Heating Capacity - 172,000 to 224,000 Btuh

Optional Electric Heat - 15 to 90 kW

K-SERIES™

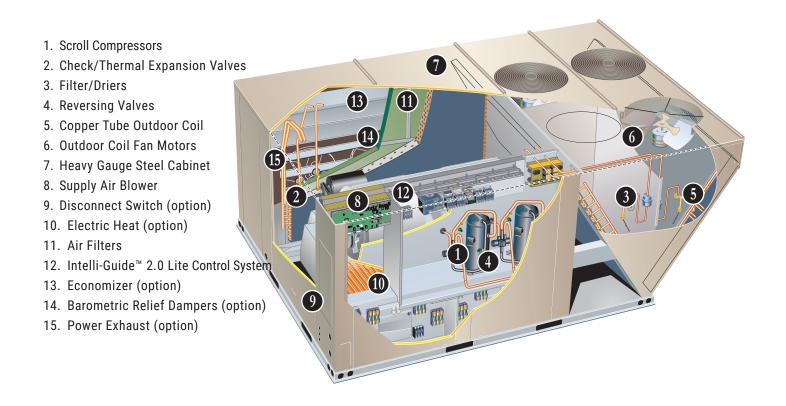


MODEL NUMBER IDENTIFICATION



FEATURE HIGHLIGHTS

K-Series rooftop units are engineered with the right technologies and options to meet standard efficiency requirements while delivering reliable performance and year-round comfort.



CONTENTS

Approvals And Warranty
Blower Data
Cooling/Heating Ratings
Dimensions
- Accessories
- Unit
Electrical Accessories - Disconnects
Electrical/Electric Heat Data
- 15 Ton
- 20 Ton
Electric Heat Capacities
Features And Benefits
Model Number Identification
Optional Conventional Temperature Control Systems
Options / Accessories
Outdoor Sound Data
Sequence Of Operation
Specifications
Unit Clearances
Weight Data

APPROVALS AND WARRANTY

APPROVALS

- · AHRI Standard 340/360-2023 certified
- ETL 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 (<u>Number: OSP-0596</u>), 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
- ISO 9001 Registered Manufacturing Quality System

WARRANTY

- Compressors Limited five years
- Intelli-Guide™2.0 Lite 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
- System can operate from 30°F to 125°F without any additional controls

R-454B Refrigerant

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

1 Scroll Compressors

- Scroll compressors for high performance, reliability and quiet operation
- Resiliently mounted on rubber grommets for quiet operation

Compressor Crankcase Heaters

 Protects against refrigerant migration that can occur during low ambient operation or during extended off cycles

2 Check/Thermal Expansion Valves

Ensures optimal performance throughout the application range

3 Filter/Driers

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

High Pressure Switches

- · Protects the compressor from overload conditions
- Auto-reset

Low Pressure Switches

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

4 Reversing Valves

 4-way interchange reversing valve effects a rapid change in direction of refrigerant flow resulting in quick changeover from cooling to heating and vice versa

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

6 Coil Construction

- Copper tube construction
- · Enhanced rippled-edge aluminum fins
- · Flared shoulder tubing connections
- · Silver soldered construction
- · Factory leak tested
- · Two independent slanted coild for easy cleaning
- Cross row circuiting of indoor coil with rifled copper tubing optimizes both sensible and latent cooling capacity

Antimicrobial Condensate Drain Pan

- Composite pan, sloped to meet drainage requirements of ASHRAE 62.1
- Antimicrobial additive resists growth of mold and mildew on drain pan, which improves indoor air quality and reduces drain line blockage
- · Side or bottom drain connections

6 Outdoor Coil Fan Motors

- Thermal overload protected
- · Totally enclosed
- · Permanently lubricated ball bearings
- Shaft up
- · Wire basket mount

FEATURES AND BENEFITS

COOLING / HEATING SYSTEM (continued)

Outdoor Coil Fans

PVC coated fan guards furnished

Required Selections

Cooling Capacity

Specify nominal cooling capacity

Options/Accessories

Field Installed

Condensate Drain Trap

Available in copper or PVC

Drain Pan Overflow Switch

 Monitors condensate level in drain pan, shuts down unit if drain becomes clogged

Options/Accessories

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

Construction

- Heavy-gauge steel
- 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) return air flow configuration

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

Power Entry

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

Exterior Panels

- · Constructed of heavy-gauge, galvanized steel
- 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

Access Panels

- · Filter section
- · Blower section
- · Heating section
- · Compressor/controls section

Options/Accessories

Factory Installed

Hinged Access Panels

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

Field Installed

Combination Coil/Hail Guards

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

Horizontal Return Air Panel Kit

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

Burglar Bars

- Heavy gauge galvanized frame
- Fully welded
- 3/4 in. bar meets ASTM specification
- Frame meets ASTM A446, A525, A526 and A527 specification
- Burglar bars designed to fit ductwork

FEATURES AND BENEFITS

BLOWER

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

Motor

- · Overload protected
- · Ball bearings

8 Supply Air Blower

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

Blower Proving Switch

Monitors blower operation, shuts down unit if blower fails

MSAV® Multi-Stage Air Volume Operation

- MSAV® Multi-Stage Air Volume stages the amount of airflow according to compressor stages, heating demand, ventilation demand or smoke alarm
- Units utilize a Variable Frequency Drive (VFD) to stage the supply air 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 we preset airflow
- 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

Ordering Information

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

Required Selections

- Order blower motor HP and drive kit number required when base unit is ordered
- See Drive Kit Specifications Table

Options/Accessories

Field Installed

VFD Automatic Bypass Kit

- Bypass Kit can be used to automatically bypass the VFD and operate the unit in single speed (CAV) blower mode if the inverter needs to be serviced or replaced
- VFD Automatic Bypass Control must be enabled by Config ID on the unit controller

FEATURES AND BENEFITS

ELECTRICAL

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 guick 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 state and an alarm code reports to the unit controller
- Prevents unit start-up if the unit is in the incorrect phase; unit start-ups in the wrong phase could lead to issues such as compressors functioning in reverse
- Monitors power supple 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 or Field Installed

Disconnect Switch

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

GFI Service Outlets (2)

- 115V ground fault circuit interrupter (GFCI) type options:
 - · Field installed, non-powered, field wired

Field Installed

11) Electric Heat

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

GFI Weatherproof Cover

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

INDOOR AIR QUALITY



Air Filters

Disposable 2 inch MERV 4 filters furnished as standard

Options/Accessories

Field Installed

Healthy Climate® High Efficiency Air Filter

 Disposable MERV 8, MERV 13 (Minimum Efficiency) Reporting Value based on ASHRAE 52.2) efficiency

Replacement Filter Media Kit With Frame

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

Indoor Air Quality (CO₂) Sensors

- Monitors CO₂ levels
- Reports to the Unit Controller which adjusts economizer dampers as needed

INTELLI-GUIDE™ 2.0 LITE CONTROL SYSTEM



12 The Control System is designed to accelerate equipment install and service. Standard with all K-Series™ rooftop units, control system integrates key technologies that lower installation costs, drive system efficiency, and protect your investments.

The Intelli-Guide™ 2.0 Lite Unit Controller is a microprocessor-based controller that provides flexible control of all unit functions.

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 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
- 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 Intelli-Guide™ 2.0 Lite Unit Controller enhance functionality without the need to change components

Configurable Built-In Functions

- Up to two distinct Cooling Airflows in Thermostat Mode
- Programmable independent heating, ventilation and cooling blower speeds
- 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
- · Demand Control Ventilation
- · Dehumidification Operation

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
- Gas Valve Time Delay Between First and Second Stage
- · Minimum Compressor Run Time

Control Methods / Interfaces:

- · DDC and 24V Thermostat
- BACnet MS/TP (Field Option)
- · 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

NOTE - Intelli-Guide™ 2.0 Control System features vary with the type of rooftop unit in which the control is installed.

CONTROL SYSTEM

INTELLI-GUIDE™ 2.0 LITE CONTROL SYSTEM (continued)

Controls Options

Field Installed

Dirty Filter Switch

Senses static pressure increase and issues alarm if necessary

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

•

OPTIONS / ACCESSORIES

ECONOMIZER

- Economizer operation is set and controlled by the Intelli-Guide™ 2.0 Lite Unit Controller
- Simple plug-in connections from Economizer to unit controller for easy installation
- All K-Series[™] 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

13 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 2019 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 Intelli-Guide™ 2.0 Lite 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.

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

Field Installed

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

EXHAUST

Field Installed

1 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

15 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.

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

Field Installed

Motorized Outdoor Air Damper

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

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 CO₂
- 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

K-Series™ LHX Packaged Heat Pump 15 and 20 Ton | Page 11

OPTIONAL CONVENTIONAL TEMPERATUR	RE CONTROL SYSTEMS	
Description		Order Number
CS8500 Commercial 7 Day Programmable Thermostat		
CS8500 7-Day Thermostat	No CO₂ Sensing	24K55
	With CO₂ Sensing	24K53
Sensors/Accessories	¹ Remote non-adjustable wall-mount 10k	47W37
	¹ Remote non-adjustable wall-mount 11k	94L61
Sysbus Network Cable (Yellow) for CS8500 and LCS-5030	Wired Room Sensor	
Twisted pair 100% shielded communication cable, Red and B	lack 500 ft. box	27M19
22 AWG, yellow jacket, rated at 75°C, 300V, Plenum rated Insulation - Low smoke PVC, NEC, CMP	1000 ft. box	94L63
Insulation - Low Smoke PVC, NEC, CMP	2500 ft. roll	68M25
CS7500 Commercial 7-Day Programmable Thermostat		
CS7500 7-Day Thermostat		24K41
Sensors/Accessories	² Remote non-adjustable wall-mount 20k	47W36
	² Remote non-adjustable wall-mount 10k	47W37
	Remote non-adjustable discharge air (duct mount)	19L22
	Outdoor temperature sensor	X2658
CS3000 Commercial 5-2 Day Programmable Thermostat		
CS3000 5-2 Day Thermostat		11Y05
Sensors/Accessories	Remote non-adjustable wall mount 10k averaging	47W37
	Thermostat wall mounting plate	X2659
Universal Thermostat Guard with Lock (clear)		
	Inside Dimensions (H x W x D) 5-7/8 x 8-3/8 x 3 in.	39P21

 $^{^{\}scriptsize 1}\,$ Up to nine of the same type remote temperature sensors can be connected in parallel.

Op to fille of the Same type felliote temperature sensors out to commissions.
 Remote wall-mount sensors can be applied in any of the following combinations:
 One Sensor - (1) 47W36, Two Sensors - (2) 47W37, Three Sensors - (2) 47W36 and (1) 47W37

 Four Sensors - (4) 47W36, Five Sensors - (3) 47W36 and (2) 47W37

SEQUENCE OF OPERATION

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.

<u>UNIT OPERATION WITH 2-STAGE THERMOSTAT (2 COOL AND 2 HEAT STAGES, Y1, Y2, W1, W2)</u> 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)

¹ Unit Features An Economizer And Outdoor Air Is Suitable

COOLING

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.

¹ 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

Cooling - Thermostat Mode (Y1, Y2)

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.

<u>UNIT OPERATION WITH 3-STAGE THERMOSTAT OR ZONE SENSOR (3 COOL AND 2 HEAT STAGES, Y1, Y2, Y3 AND W1, W2)</u>

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)

¹ Unit Features An Economizer And Outdoor Air Is Suitable

COOLING

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, compressors 1 is energized while supply air blower stays on high cooling speed. After compressor 1 is energized the economizer stays at maximum open.

Y3 Demand:

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

¹ 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

Cooling - Thermostat or Zone Sensor Mode (Y1, Y2, Y3)

Y1 Demand:

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

Y2/Y3 Demand:

All compressors are energized 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 Lite 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.

If the unit is equipped with Electric heat, then the modules are energized during a defrost cycle to maintain discharge air temperature.

HEATING

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 2 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) to temper discharge air temperature.

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.

Item Description		Order	S	ize
item bescription		Number	180	240
COOLING SYSTEM				
Condensate Drain Trap	PVC	22H54	Х	Х
	Copper	76W27	Х	Х
Drain Pan Overflow Switch		21Z07	X	X
BLOWER - SUPPLY AIR				
Blower Options	Single Zone VAV Supply Fan	Factory	0	0
Motors - Single Zone VAV Supply Fan	Belt Drive - 3 HP	Factory	0	
	Belt Drive - 5 HP	Factory	0	0
	Belt Drive - 7.5 HP	Factory	0	0
	Belt Drive - 10 HP	Factory		0
VFD Bypass Kit	3, 5, 7.5 HP - No Overload	37G64	Χ	
(for Single Zone VAV Supply Fan equipped units)	10 HP - With Overload	37G65	Χ	
Drive Kits	Kit #1 535-725 rpm	Factory	0	
See Blower Data Tables for usage and selection	Kit #2 710-965 rpm	Factory	0	
Selection	Kit #3 685-856 rpm	Factory	0	0
	Kit #4 850-1045 rpm	Factory	0	0
	Kit #5 945-1185 rpm	Factory	0	0
	Kit #6 850-1045 rpm	Factory	0	0
	Kit #7 945-1185 rpm	Factory	0	0
	Kit #8 1045-1285 rpm	Factory	0	0
	Kit #10 1045-1285 rpm	Factory		0
	Kit #11 1135-1330 rpm	Factory		0
CABINET				
Burglar Bars	(US)	44N20	Х	Х
	(CA)	X2889	Х	Х
Combination Coil/Hail Guards		23U71	Х	Х
Hinged Access Panels		Factory	0	0
CONTROLS				
NOTE - Also see Conventional Thermostat Control Syst	tems on pagepage 11 for Additional	Options.		
BACnet® MS/TP Module		38B35	Х	Х
Dirty Filter Switch		53W68	Х	Х
Smoke Detector - Supply or Return (Power board and one	sensor)	37G73	Х	Х
Smoke Detector - Supply and Return (Power board and two	sensors)	37G74	Х	Х

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

Itam Dagawintian		Order	Si	ze
Item Description		Number	180	240
NDOOR AIR QUALITY				
Air Filters				
High Efficiency Air Filters	MERV 8	54W67	Χ	Х
24 x 24 x 2 (Order 6 per unit)	MERV 13	52W40	Х	Х
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter m	nedia)	44N61	X	X
Indoor Air Quality (CO ₂) Sensors	,			
Sensor - Wall-mount, off-white plastic cover with LCD display		77N39	Х	Х
Sensor - Wall-mount, off-white plastic cover, no display		23V86	X	Х
Sensor - Black plastic case, LCD display, rated for plenum mounting		87N52	X	Х
Sensor - Black plastic case, no display, rated for plenum mounting		23V87	X	X
CO₂ Sensor Duct Mounting Kit - for downflow applications		23Y47	X	X
Aspiration Box - for duct mounting non-plenum rated CO ₂ sensors (77N39)		90N43	X	X
UVC Germicidal Light Kit				
UVC Light Kit (110/230v-1ph)		21A94	Х	Х
Step-Down Transformers 460V primary,	230V secondary	10H20	Х	Х
575V primary,	230V secondary	10H21	X	Х
LECTRICAL				
Voltage 60 Hz 208	3/230V - 3 phase	Factory	0	0
	460V - 3 phase	Factory	0	0
	575V - 3 phase	Factory	0	0
Disconnect Switch	80 amp	54W85	OX	OX
see Electric Heat Tables for usage)	150 amp	54W86	OX	OX
	250 amp	54W87	OX	OX
GFI Service Outlets 15 amp non-powered, field-wired (208/2		74M70	X	Χ
² 20 amp non-powered, field-wired (208/23	• ,	67E01	X	X
	ŕ			
Weatherproof Cover for GFI		10C89	Х	Х
LECTRIC HEAT				
15 kW	208/230V-3ph	30U62	Х	Х
	460V-3ph	30U63	Х	Х
	575V-3ph	30U64	Х	X
30 kW	208/230V-3ph	30U68	Х	Х
	460V-3ph	30U69	Х	Х
	575V-3ph	30U70	Х	Х
15 kW	208/230V-3ph	30U74	Х	Х
	460V-3ph	30U75	X	X
	575V-3ph	30U76	X	Х
50 kW	208/230V-3ph	30U80	X	X
	460V-3ph	30U81	X	X
	575V-3ph	30U82	X	X
90 kW	208/230V-3ph	30U83	,	X
· · · · ·	_00,200 v opii	_		
	460V-3ph	30U84		X

¹ 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).

² Canada requires a minimum 20 amp circuit. Select 20 amp, non-powered, field wired GFI.

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

	Order	Si	ize
Item Description	Number	180	240
ECONOMIZER			
High Performance Economizer (Approved for California Title 24 Building Standards AM	CA Class 1A Ce	rtified)	
High Performance Economizer (Downflow or Horizontal)	22J18	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)	er 2 21Z09	Х	Х
Sensible Control Sensor is Furnish	ned Factory	0	0
Single Enthalpy (Not for Title 24)	21Z09	0	0
Barometric Relief Dampers With Exhaust Hood			
Downflow Barometric Relief Dampers	54W78	OX	OX
Horizontal Barometric Relief Dampers	16K99	Х	Х
OUTDOOR AIR			
Outdoor Air Dampers With Outdoor Air Hood			
Motorized	22J27	Х	Х
Manual	13U05	Х	Х
POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)			
Standard Static, SCCR Rated 208/23	0V 22H90	Х	Х
46	0∨ 22H91	Х	Х
	-	Х	Х

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	Si	ze
nem bescription		Number	180	240
ROOF CURBS				
Hybrid Roof Curbs, Downflow				
8 in. height		11F58	Χ	Х
14 in. height		11F59	Х	Х
18 in. height		11F60	Х	Х
24 in. height		11F61	Х	Х
Adjustable Pitch Curb				
14 in. height		43W26	Х	Х
Standard Roof Curbs, Horizontal - Requires Horizontal Return Air I	Panel Kit			
26 in. height - slab applications		11T89	Х	Х
37 in. height - rooftop applications		11T96	Х	Х
Insulation Kit For Standard Horizontal Curbs		,		
For 26 in. Curb		73K32	Х	Х
For 37 in. Curb		73K34	Х	Х
Horizontal Return Air Panel Kit		,		
Required for Horizontal Applications with Roof Curb		87M00	Х	Х
CEILING DIFFUSERS		,		
Step-Down - Order one	RTD11-185S	13K63	Х	
	RTD11-275S	13K64		Х
Flush - Order one	FD11-185S	13K58	Х	
	FD11-275S	13K59		Х
Transitions (Supply and Return) - Order one	C1DIFF33C-1	12X68	Х	
	C1DIFF34C-1	12X70		Х

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

Model		LHX180S5M	LHX240S5M
Nominal Tonnage		15 Ton	20 Ton
Efficiency Type		Standard	Standard
Blower Type		Single Zone VAV Supply Fan	Single Zone VAV Supply Fan
Cooling	Gross Cooling Capacity (Btuh)	181,000	232,000
Performance	¹ Net Cooling Capacity (Btuh)	176,000	224,000
	¹ AHRI Rated Air Flow (cfm)	5500	7000
	¹ IEER (Btuh/Watt)	13.5	13.5
	¹ EER (Btuh/Watt)	10.6	10.6
	Total Unit Power (kW)	16.6	21.1
Heating	¹ Total High Heating Capacity (Btuh)	172,000	224,000
Performance	1 COP	3.30	3.30
	Total Unit Power (kW)	15.3	19.9
	¹ Total Low Heating Capacity (Btuh)	98,000	124,000
	¹ COP	2.1	2.1
	Total Unit Power (kW)	13.7	17.3
Sound Rating Nur	()	93	93
Refrigerant	Refrigerant Type	R-454B	R-454B
Charge	Circuit 1	22 lbs. 8 oz.	22 lbs. 0 oz.
Jilarge	Circuit 2	20 lbs. 3 oz.	21 lbs. 8 oz.
Electric Heat Avail		15-30-45-60 kW	15-30-45-60-90 kW
Compressor Type		Scroll (2)	Scroll (2)
Outdoor	Net face area - ft.² (total)	55.1	55.1
Coils	Rows	2	2
30110	Fins - in.	20	20
Outdoor	Motor HP (number and type)	1/3 (4 PSC)	1/3 (4 PSC)
Coil Fans	Rpm	1075	1075
	Watts	1750	1750
	Diameter - (No.) in.	(4) 24	(4) 24
	Blades	3	3
	Total Air volume - cfm	16,000	16,000
ndoor	Net face area - ft.² (total)	21.4	21.4
Coils	Tube diameter - in.	3/8	3/8
	Rows	3	4
	Fins - in.	14	14
	Condensate drain size (NPT) - in.	(1) 1 in.	(1) 1 in.
	Expansion device type	Balanced Port Thermo	ostatic Expansion Valve
Indoor	Nominal motor HP	3, 5, 7.5	5, 7.5, 10
Blower	Maximum usable motor HP (US)	3.45, 5.75, 8.62	5.75, 8.63, 11.5
and	Motor - Drive kit number	3 HP	5 HP
Drive		Kit 1 535-725 rpm	Kit 3 685-856 rpm
Selection		Kit 2 710-965 rpm	Kit 4 850-1045 rpm
		5 HP	Kit 5 945-1185 rpm
		Kit 3 685-856 rpm	7.5 HP
		Kit 4 850-1045 rpm	Kit 6 850-1045 rpm
		Kit 4 830-1043 fpm Kit 5 945-1185 rpm	Kit 7 945-1185 rpm
		•	Kit 8 1045-1285 rpm
		7.5 HP	· ·
		Kit 6 850-1045 rpm	10 HP
		Kit 7 945-1185 rpm	Kit 7 945-1185 rpm
		Kit 8 1045-1285 rpm	Kit 10 1045-1285 rpm
			Kit 11 1135-1330 rpm
	Wheel (Number) diameter x width - in.		5 x 15
ilters	Type of filter		Disposable
	Number and size - in.		x 24 x 2
ine voltage data	(Volts-Phase-Hz)		30-3-60
			-3-60
NOTE Cre	anacity includes evaporator blower motor heat deduction		-3-60
write - Lirose cooling o	Superity includes evanorator blower motor heat deduction	DE MET CODING CANACITY GOES NOT INCLIDE EVA	DOMESTON DIOWER MOTOR BEST REGULATION

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

NOTE – Motor service factor limit - 1.0.

¹ 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.

² 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.

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 LHX180S5M (1 COMPRESSOR - PART LOAD)

								Ou	tdoor A	ir Tem	peratu	re Enter	ing Outo	loor C	oil						
Entering	Total		(65°F					75°F				-	35°F					95°F		
Wet Bulb	Air Volume	Total Cool	Comp. Motor		ible To		Total Cool	Comp. Motor		ible To atio (S/		Total Cool	Comp. Motor		ible To atio (S/		Total Cool	Comp. Motor		ible To atio (S/	
Tem- perature		Cap.	Input		ry Bul	b	Cap.	Input		ry Bul		Cap.	Input		Dry Bulb		Сар.	Input	Dry Bulb		
perature	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
	3500	97.3	3.84	0.83	0.96	1	91.9	4.46	0.85	0.97	1	86.1	5.13	0.87	0.98	1	79.5	5.84	0.89	0.99	1
63°F	4000	100.4	3.83	0.87	0.98	1	94.8	4.45	0.89	0.99	1	88.9	5.13	0.91	0.99	1	82	5.85	0.93	1	1
	4500	103	3.82	0.9	0.99	1	97.3	4.45	0.92	0.99	1	90.7	5.13	0.93	1	1	84.3	5.86	0.94	1	1
	3500	103.6	3.82	0.6	8.0	0.95	98.1	4.45	0.6	0.82	0.96	91.5	5.13	0.6	0.84	0.97	85.5	5.87	0.6	0.86	0.98
67°F	4000	106.6	3.81	0.62	0.84	0.97	100.9	4.45	0.63	0.86	0.98	93.9	5.13	0.63	0.89	0.98	87.5	5.87	0.64	0.92	0.99
	4500	109.1	3.8	0.65	0.87	0.98	102.4	4.45	0.66	0.91	0.99	96.7	5.13	0.66	0.92	1	89.3	5.88	0.67	0.94	1
	3500	110.5	3.8	0.39	0.58	0.78	104.1	4.45	0.38	0.59	0.79	98.4	5.14	0.37	0.59	0.82	91.3	5.88	0.35	0.59	0.83
71°F	4000	113.4	3.79	0.4	0.61	0.81	106.9	4.45	0.39	0.62	0.83	100.4	5.14	0.37	0.62	0.86	94.1	5.89	0.36	0.63	0.89
	4500	116	3.78	0.4	0.62	0.85	109	4.44	0.4	0.65	0.88	102.9	5.14	0.38	0.65	0.91	95.9	5.88	0.37	0.66	0.93

15 TON - COOLING LHX180S5M (2 COMPRESSORS - FULL LOAD)

F . 4								Ou	tdoor A	ir Tem	peratu	re Enter	ing Outo	loor C	oil						
Entering	Total			85°F					95°F				1	05°F					115°F		
Wet Bulb	Air	Total	Comp.		ible To		Total	Comp.		ible To		Total	Comp.		ible To		Total	Comp.		ible To	
Tem-	Volume	Cool	Motor	Ra	atio (S	(T)	Cool	Motor		atio (S/		Cool	Motor	Ra	atio (S/	T)	Cool	Motor	R	atio (S/	T)
perature		Cap.	Input		ry Bul	b	Cap.	Input		ry Bul	b	Cap.	Input	D	ry Bul	b	Сар.	Input		ry Bull	b
porataro	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
	4800	175.9	10.67	0.7	0.84	0.96	163.9	12.12	0.7	0.86	0.98	150.5	13.68	0.71	0.88	0.99	136.2	15.4	0.72	0.9	1
63°F	6000	188.2	10.7	0.75	0.9	1	174.8	12.17	0.76	0.93	1	160.3	13.75	0.77	0.95	1	146.4	15.49	0.79	0.98	1
	7200	196.2	10.72	8.0	0.96	1	183.6	12.2	0.81	0.98	1	169.8	13.81	0.83	0.99	1	155.8	15.56	0.86	1	1
	4800	188.9	10.7	0.53	0.67	0.81	175.7	12.17	0.52	0.68	0.82	161.7	13.75	0.52	0.69	0.84	147.5	15.49	0.53	0.7	0.87
67°F	6000	199.2	10.73	0.56	0.73	0.88	186.1	12.2	0.56	0.74	0.9	171.6	13.82	0.57	0.76	0.92	157	15.56	0.57	0.78	0.95
	7200	209.3	10.76	0.6	0.78	0.93	194.5	12.25	0.6	0.8	0.96	179.8	13.87	0.61	0.82	0.97	163.2	15.61	0.62	0.84	0.99
	4800	202.7	10.74	0.37	0.52	0.65	190	12.22	0.36	0.52	0.66	175.6	13.84	0.35	0.52	0.67	161.2	15.59	0.34	0.52	0.69
71°F	6000	215.4	10.78	0.39	0.56	0.71	200.6	12.27	0.39	0.56	0.72	185.1	13.9	0.39	0.57	0.74	169.7	15.65	0.37	0.57	0.76
	7200	223.5	10.79	0.41	0.59	0.76	208.4	12.3	0.4	0.6	0.78	192	13.93	0.41	0.62	0.8	175.8	15.7	0.4	0.62	0.82

15 TON - HEATING LHX180S5M

landa an Cail		Air Temperature Entering Outdoor Coil														
Indoor Coil Air Volume	65	°F	45	°F	25	°F	5	°F	-15°F							
70°F Dry Bulb cfm	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						
Ç	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW						
4800	229.3	13.26	171.9	11.50	117.5	10.06	80.9	9.01	52.1	8.17						
6000	234.4	12.16	176.0	10.76	121.0	9.59	83.1	8.66	54.1	7.94						
7200	238.6	11.50	179.9	10.33	124.7	9.31	86.0	8.46	56.6	7.80						

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 LHX240S5M (1 COMPRESSOR - PART LOAD)

								Ou	tdoor A	ir Tem	peratu	re Enter	ing Outo	loor C	oil						
Entering	Total		(65°F					75°F				8	35°F					95°F		
Wet Bulb Tem-	Air Volume	Total Cool	Comp. Motor		ible To atio (S		Total Cool	Comp. Motor		ible To atio (S/		Total Cool	Comp. Motor		ible To atio (S/		Total Cool	Comp. Motor		ible To atio (S/	
perature		Сар.	Input		ry Bul		Сар.	Input		ry Bul		Сар.	Input		ry Bul		Сар.	Input		Dry Bull	
po. a.a.	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
	4500	128.7	5.69	0.82	0.96	1	123.8	6.56	0.84	0.97	1	118	7.48	0.86	0.98	1	111	8.46	0.88	0.99	1
63°F	5500	134.3	5.7	0.88	0.98	1	128	6.58	0.9	0.99	1	121.9	7.51	0.93	0.99	1	115.4	8.49	0.94	1	1
	6500	138.7	5.7	0.93	0.99	1	131.9	6.6	0.94	1	1	125.8	7.54	0.95	1	1	119.3	8.53	0.96	1	1
	4500	136	5.7	0.6	0.79	0.95	129.7	6.59	0.6	0.81	0.96	123.5	7.52	0.61	0.83	0.97	117.7	8.51	0.62	0.85	0.98
67°F	5500	140.6	5.7	0.62	0.85	0.97	135.2	6.61	0.63	0.87	0.98	128.7	7.55	0.65	0.9	0.99	122	8.55	0.66	0.93	1
	6500	144.6	5.71	0.66	0.9	0.99	139.1	6.63	0.67	0.93	0.99	132.5	7.58	0.69	0.94	1	124.4	8.56	0.71	0.96	1
	4500	143.2	5.71	0.38	0.57	0.76	137.8	6.62	0.38	0.58	0.77	131.5	7.57	0.38	0.59	0.8	124.9	8.57	0.38	0.6	0.82
71°F	5500	148.2	5.71	0.39	0.61	0.82	142.8	6.65	0.39	0.62	0.85	135.3	7.6	0.39	0.64	0.87	128.6	8.6	0.39	0.65	0.9
	6500	152.4	5.72	0.4	0.64	0.88	145.5	6.66	0.4	0.66	0.91	139.4	7.63	0.41	0.68	0.93	131	8.62	0.41	0.7	0.95

20 TON - COOLING LHX240S5M (2 COMPRESSORS - FULL LOAD)

Fastanian								Out	tdoor A	ir Tem	peratu	re Enter	ing Outo	door C	oil						
Entering Wet	Total			85°F					95°F				1	05°F					115°F		
Bulb	Air	Total	Comp.	Sens	ible To	Total	Total	Comp.	Sens	ible To	Total	Total	Comp.	Sensi	ible To	Total	Total	Comp.	Sens	ible To	Total
Tem-	Volume	Cool	Motor	Ra	atio (S	(T)	Cool	Motor	R	atio (S/	T)	Cool	Motor	Ra	atio (S/	T)	Cool	Motor	R	atio (S/	T)
perature		Cap.	Input		ry Bul	b	Cap.	Input		ry Bul	b	Сар.	Input	D	ry Bul	b	Сар.	Input		Ory Bull	b
perature	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
	6400	230.2	14.98	0.73	0.86	0.98	218.6	16.92	0.74	0.88	0.99	204.6	19.07	0.75	0.9	1	190	21.52	0.76	0.93	1
63°F	8000	243.3	15.08	0.78	0.93	1	229.3	17.03	0.79	0.95	1	215.5	19.18	0.81	0.97	1	201.4	21.63	0.83	0.99	1
	9600	253	15.16	0.82	0.97	1	239.2	17.13	0.84	0.99	1	226	19.28	0.86	1	1	212.8	21.74	0.89	1	1
	6400	244.7	15.09	0.57	0.71	0.83	231	17.05	0.57	0.72	0.85	217.4	19.2	0.57	0.73	0.87	203.5	21.64	0.57	0.74	0.9
67°F	8000	256.1	15.18	0.6	0.76	0.9	241.7	17.15	0.61	0.77	0.92	228.5	19.31	0.61	0.79	0.94	212	21.72	0.62	0.81	0.97
	9600	265.9	15.26	0.63	0.81	0.95	251.1	17.24	0.64	0.82	0.97	235.5	19.4	0.65	0.85	0.99	219.4	21.79	0.66	0.87	1
	6400	259.1	15.2	0.42	0.56	0.69	246.8	17.21	0.41	0.56	0.69	233.2	19.36	0.41	0.56	0.7	216.6	21.77	0.39	0.57	0.72
71°F	8000	272.1	15.31	0.43	0.59	0.74	256.7	17.29	0.43	0.6	0.75	241.9	19.46	0.42	0.6	0.77	225.9	21.87	0.42	0.62	0.79
	9600	280.9	15.38	0.44	0.63	0.79	264.7	17.38	0.44	0.64	0.81	249.4	19.54	0.44	0.64	0.83	233	21.95	0.44	0.66	0.86

20 TON - HEATING LHX240S5M

Indoor Cail				Air T	emperature En	tering Outdoo	r Coil			
Indoor Coil Air Volume	65	°F	45	°F	25	°F	5	°F	-15	5°F
70°F Dry	Total Heating	Comp. Motor								
Bulb cfm	Capacity	Input								
Cilli	kBtuh	kW								
6400	285.1	17.05	223.9	15.18	163.3	13.58	118.9	12.22	78.9	10.36
8000	289.2	15.83	226.5	14.33	166.7	13.09	120.4	11.86	81.0	10.17
9600	297.5	15.11	234.0	13.85	173.3	12.81	126.7	11.69	87.0	10.09

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 24 for wet coil and option/accessory air resistance data.

See page 24 for factory installed drive kit specifications.

See page 25 for minimum air volume required for use with optional electric heat

	09	BHP	:	:	-	4.15	4.45	4.70	2.00	5.30	2.60	5.90	6.25	6.55	06.9	7.25	7.60	8.00	8.35	8.75	9.15	9.60	10.05	10.45	:	:		:		:	-	:	:
	2.6	RPM	1			1205	1210	1215	1225	1230	1235	1240	1250	1255	1265	1270	1275	1285	1290	1300	1305	1315	1325	1330			-				:		:
		BHP	1	:		3.85	1.10	4.35	4.65	4.90	5.20	5.50	5.80	6.10	6.45	6.75	7.10	_	7.85	8.25	8.60	00.6	9.40	9.85	10.30	08.01	11.20				:	-	-
	2.40	RPM E	<u> </u>	:	<u> </u>	1160	1165 4	1175 4	1180 4	1185 4	1195	1200	1205	1215 6	1220 6	1225 6	1235 7	1240 7	1250 7	1260 8	1265 8	1275 6	1280 9	1290	1300 1	1310 1	1315 1	-	<u> </u>		<u> </u>	:	:
		BHP R	:	:	3.30	3.55 1	3.75 1	4.05	4.25 1	4.50 1	4.80 1	5.10 1	5.35	5.65	5.95	6.30 1	6.60 1	6.95	7.30 1	7.65	8.05 1	8.40 1	8.85 1	9.25 1	9.65 1	10.10	10.55 1	11.05	11.50	<u>.</u> ;	· :	:	· :
	2.20	RPM B	:	-	1110 3	1115 3	1120 3	1130 4	1135 4	1140 4	1150 4	1155 5	1160 5	1170 5	1175 5	1185 6	1190 6	1200 6	1205 7	1215 7	1225 8	1230 8	1240 8	1250 9	1255 9	1265 10	1275 10	1285 11	1295 11	<u> </u>	-	:	-
		BHP R	:	:	3.00	3.25	3.45	3.65	3.90	4.15	4.40	4.70 1	4.95	5.20 1	5.50 1	5.85	6.10 1	6.45 13	6.75 13	7.15 13	7.50 1;	7.85 1;	8.25 1;	8.65 13	9.05 1;	9.40 13	9.85 1;	10.30 13	0.80	11.25	-	:	-
	2.00	RPM B	-	:	1060 3	1070 3	1075 3	1080	1085 3	1095 4	1100 4	1110 4	1115 4	1120 5	1130 5	1140 5	1145 6	1155 6	1160 6	1170 7	1180 7	1185 7	1195 8	1205 8	1215 9	1220 9	1230 9	1240 10	1250 10	1260 11	<u> </u>	-	<u>'</u> ;
		BHP R	-	2.55	2.70 10	2.90 10	10 10	3.30 10	3.55 10	3.80 10	4.00 1	4.25 1	4.50 1	4.80 17	5.05 17	5.35 1	5.60 17	5.95 1	6.25 1	6.60 17	6.90 17	7.25 1′	7.65 1′	8.05 12	8.35 12	8.75 12	9.20 12	9.60 12	10.05	10.50 12	11.00	11.45	-
Pa)	1.80	RPM B	<u>'</u>	1005 2.	1010 2.	1020 2.	1025 3.	1030 3.	1040 3.	1045 3.	1050 4.	1060 4.	1065 4.	1075 4.	1080 5.	1090 5.	1095 5.	1105 5.	1115 6.	1125 6.	1130 6.	1140 7.	1150 7.	1160 8.	1165 8.	1175 8.	1185 9.	1195 9.	1205 10	1215 10	1225 11	1235 11	· :
3auge (BHP RI	2.10 -	2.25 10	2.45 10	.60 10	2.80 10	3.00 10	3.20 10	3.40 10	3.65 10	3.85 10	4.10 10	4.35 10	4.60 10	4.85 10	5.10 10	5.40 11	5.75 11	6.05 11	6.35 11	6.70 11	7.05 11	7.40 11	7.75 11	8.15 11	8.55 11	8.95 11	9.40 12	9.80 12	10.25 12	10.70	11 20
Water (1.60	RPM BI	950 2.	955 2.	960 2.	965 2.	970 2.	980 3.	985 3.	995 3.	1000	1010 3.	1015 4.	1025 4.	1030 4.	1040 4.	1045 5.	1055 5.	1065 5.	1075 6.	1080 6.	.9 060	1100 7.	1110 7.	1120 7.	1130 8.	1140 8.	1150 8.	1160 9.	1170 9.	1180 10	1190 10	1200 11
TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)		BHP RF	1.85 94	2.00	2.15 9(2.30 96	2.45	2.65 98	2.85 98	3.05 99	3.25 10	3.45 10	3.65 10	3.90 10	4.15 10	4.40 10	4.65 10	4.95 10	5.25 10	5.50 10	5.80 10	6.10 10	6.45 11	6.80 11	7.15 11	7.50 11	7.85 11	8.25 11	8.65 11	9.05 11	9.55 11	10.00	10 45 12
URE - I	1.40	RPM BI	_	900 2.0	905 2.	910 2.3	915 2.	925 2.0			945 3.	955 3.4		970 3.9	975 4.	985 4.	995 4.0	1005 4.9	1015 5.3	1020 5.4	1030 5.8	1040 6.	1050 6.4	1060 6.8	1070 7.	1080 7.3	1090 7.8	1100 8.3	1110 8.0	1120 9.0	1135 9.	1145 10.	1155 10
PRESS		-	068 09		_	_			50 930	70 940	_		55 960					_	_	`	_	_	_	•	_	`	`	.60 11	.95 11	`	-		
TATIC	1.20	M BHP	0 1.60	0 1.70	5 1.85	0 2.00	5 2.15	5 2.35	0 2.50	0 2.70	0 2.90	5 3.05	5 3.25	0 3.45	0 3.70	0 3.95	0 4.20	0 4.45	5 4.65	5 4.95	5 5.25	5 5.50	5 5.85	0.15	15 6.45	25 6.80	10 7.20	_		70 8.35	30 8.75	95 9.20	0 65
OTAL S		HP RPM	30 830	.45 840	30 845	70 850	35 855	98 00	15 870	30 880	068 09	35 895	35 905)5 910	25 920	15 930	70 940	.95 950	15 955	.45 965	70 975	.95 985	.25 995	.55 1005	35 1015	1025	55 1040	.90 1050	20 1060	30 1070	00 1080	.40 1095	85 1105
F	1.00	亩	1.30	_	30 1.60		795 1.8	00 2.00		15 2.30					3.25		<u>ო</u>	က	4	4	4	4	2	_	0 5.85		9		1005 7.20		1030 8.0	040 8.4	0.55 8 8
		BHP RPM	1.10 76	20 775				1.65 800	80 810	95 815						3.00 870				3.85 910			4.65 940		5.20 960		5.85 985	15 995	`	6.85 10		7.65 10	8 05 10
	0.80	RPM B	695 1.	700 1.	_	715 1.	•			_	_	_	_			_		_	_	845 3.	_		880 4.	890 4.3	900 5	910 5.		935 6.	_		970 7.3	985 7.	1000
		BHP RF		0.95 7	1.05 7	_		1.35 73		1.60 7				2.15 78						3.30 8							5.15 9;	5.45 93	5.75 9	6.15 9	6.45 9		7 25 10
	09'0	RPM B	_	620 0.	_	635 1.	`	`	_		_	690 1.	700 2.			_		_	_	775 3.	_	800 3.	810 4.	_	835 4.			875 5.	_	900 6.	910 6.	925 6.	940 7
		BHP R		0.70						1.25 6										2.75 7			3.40 8		3.90 8	4.20 8	4.45 8				5.65		6.40 9
	0.40	RPM B	_	530 0	540 0				575 1	585 1	595 1	605 1	_							700 2			740 3		765 3		790 4		_	835 5	845 5	9 098	875 6
		BHP R		0.45	_				0.75		0.95									2.20 7					3.25 7				4.30		_		5.55
	0.20	RPM B	_	415 0.	425 0.	435 0.	445 0.		470 0.	480 0.	495 0.					560 1.				615 2.						700 3.							805
	amr	<u> </u>															_																
	Air volume	5	3250	3500	3750	4000	4250	4500	4750	2000	5250	2200	5750	0009	6250	6500	6750	7000	7250	7500	7750	8000	8250	8500	8750	0006	9250	9200	9750	10,000	10,250	10,500	10,750

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 - in. w.g.

Air Volume	Wet Ind	oor Coil	Electric Heat	Economizer	Fil	ters	Horizontal Roof
cfm	180S	240\$	Electric neat	Economizer	MERV 8	MERV 13	Curb
3250	0.02	0.03			0.01	0.04	0.04
3500	0.02	0.03			0.01	0.04	0.05
3750	0.02	0.03			0.01	0.04	0.05
4000	0.02	0.04			0.01	0.04	0.06
4250	0.02	0.04			0.01	0.05	0.07
4500	0.02	0.05			0.01	0.05	0.07
4750	0.02	0.05			0.02	0.05	0.08
5000	0.03	0.05			0.02	0.06	0.08
5250	0.03	0.06			0.02	0.06	0.09
5500	0.03	0.07			0.02	0.06	0.10
5750	0.03	0.07			0.02	0.07	0.11
6000	0.04	0.08	0.01		0.03	0.07	0.11
6250	0.04	0.08	0.01	0.01	0.03	0.07	0.12
6500	0.04	0.09	0.01	0.02	0.03	0.08	0.13
6750	0.05	0.10	0.01	0.03	0.03	0.08	0.14
7000	0.05	0.10	0.01	0.04	0.04	0.08	0.15
7250	0.06	0.11	0.01	0.05	0.04	0.09	0.16
7500	0.06	0.12	0.01	0.06	0.04	0.09	0.17
8000	0.07	0.13	0.02	0.09	0.05	0.10	0.19
8500	0.08	0.15	0.02	0.11	0.05	0.10	0.21
9000	0.09	0.16	0.04	0.14	0.06	0.11	0.24
9500	0.10	0.18	0.05	0.16	0.07	0.12	0.26
10,000	0.11	0.20	0.06	0.19	0.07	0.12	0.29
10,500	0.12	0.22	0.09	0.22	0.08	0.13	0.31
11,000	0.14	0.24	0.11	0.25	0.09	0.14	0.34

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.a.

A !			Step-Dow	n Diffuser			Flush [Diffuser
Air Volume		RTD11-185S			RTD11-275			
cfm	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open	2 Ends Open	1 Side/2 Ends Open	All Ends & Sides Open	FD11-185S	FD11-275
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

	A in Maluma	¹ Effective Thr	ow Range - ft.		Air Values	¹ Effective Thr	ow Range - ft.
Size	Air Volume cfm	RTD11-185S Step-Down	FD11-185S Flush	Size	Air Volume cfm	RTD11-275 Step-Down	FD11-275 Flush
	5600	39 - 49	28 - 37		7200	33 - 38	26 - 35
	5800	42 - 51	29 - 38		7400	35 - 40	28 - 37
180	6000	44 - 54	40 - 50		7600	36 - 41	29 - 38
100	6200	45 - 55	42 - 51		7800	38 - 43	40 - 50
	6400	46 - 55	43 - 52	240	8000	39 - 44	42 - 51
	6600	47 - 56	45 - 56		8200	41 - 46	43 - 52
		ce an airstream travel		-	8400	43 - 49	44 - 54
outlet or diffuser be sides open.	efore the maximum ve	elocity is reduced to 50	0 ft. per minute. Four		8600	44 - 50	46 - 57
P					8800	47 - 55	48 - 59

	AL/ELECTRIC I	1EAI D	AIA										15	TON
Model								LHX18	30S5M					
¹ Voltage - 60Hz	!			2	08/230	V - 3 P	h	,	46	60V - 3	Ph	57	75V - 3	Ph
Compressor 1	Rated Lo	ad Amps			24	1.4				11.9			9.4	
(Non-Inverter)	Locked Ro	tor Amps			2	10				103			78	
Compressor 2	Rated Lo	ad Amps			27	7.7				11.5			9	
(Non-Inverter)	Locked Ro	tor Amps			17	8.5				103			78	
	Full Load Amps (4 N	on-ECM)			2	.4				1.3			1	
Motors (4)		Total			9	.6				5.2			4	
Power Exhaust	Full Lo	ad Amps			2	.4				1.3			1	
(2) 0.33 HP		Total			4	.8				2.6			2	
Service Outlet 11	15V GFI (amps)				1	5				15			20	
Indoor Blower		HP		3	į	5	7	.5	3	5	7.5	3	5	7.5
Motor	Full Lo	ad Amps	10	0.6	16	6.7	24	1.2	4.8	7.6	11	3.9	6.1	9
² Maximum		Unit Only	1	00	1	10	1	10	45	50	50	35	40	40
Overcurrent Protection (MOCP)		0.33 HP Exhaust	1	10	1	10	1:	25	50	50	50	40	40	45
³ Minimum		Unit Only	8	80	8	6	9	3	37	40	43	29	31	34
Circuit Ampacity (MCA)	With (2)) 0.33 HP r Exhaust	8	35	9	11	9	8	39	42	46	31	33	36
ELECTRIC HEA	T DATA		1		1		1			1	1	'	1	1
Electric Heat Vo	oltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum	Unit+	15 kW	125	125	125	150	150	150	60	70	70	50	50	60
Overcurrent	Electric Heat	30 kW	175	175	175	200	175	200	90	90	90	70	70	70
Protection (MOCP)	-	45 kW	200	225	225	225	225	250	110	110	125	90	90	90
(WOOI)	-	60 kW	225	250	225	250	225	250	110	125	125	90	90	100
³ Minimum	Unit+	15 kW	119	125	125	131	132	138	59	62	66	47	49	52
Circuit	Electric Heat	30 kW	158	170	164	176	172	184	82	85	88	65	67	70
Ampacity (MCA)	_	45 kW	197	215	203	221	211	229	105	107	111	83	85	88
(MOA)	_	60 kW	205	224	211	230	218	238	109	112	115	87	89	92
² Maximum	Unit+	15 kW	125	150	150	150	150	150	70	70	70	50	60	60
Overcurrent	Electric Heat ⁻	30 kW	175	175	175	200	200	200	90	90	100	70	70	80
Protection (MOCP)	and (2) 0.33 HP - Power Exhaust	45 kW	225	225	225	250	225	250	110	110	125	90	90	90
(MOOI")	i owei Exilaust _	60 kW	225	250	225	250	250	250	125	125	125	90	100	100
³ Minimum	Unit+	15 kW	124	130	130	136	137	143	62	65	68	49	51	54
Circuit	Electric Heat	30 kW	163	175	169	181	176	188	85	87	91	67	69	72
Ampacity (MCA)	and (2) 0.33 HP	45 kW	202	220	208	226	215	233	107	110	113	85	87	90

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

Power Exhaust -

(MCA)

60 kW

¹ Extremes of operating range are plus and minus 10% of line voltage.

² HACR type breaker or fuse.

³ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

⁴ Disconnect must be field furnished.

ELECTRIC	AL/ELECTRIC I	HEAT D	ATA										20	TON
Model								LHX24	40S5M					
¹ Voltage - 60H	z			2	08/230	V - 3 P	h		46	0V - 3	Ph	57	'5V - 3	Ph
Compressor 1	Rated Lo	ad Amps			28	3.5				13.5			10.7	
(Non-Inverter)	Locked Ro	tor Amps			2	55				123			93.7	
Compressor 2	Rated Lo	ad Amps			28	3.5				13.5			10.7	
(Non-Inverter)	Locked Ro	tor Amps			2	55				123			93.7	
Outdoor Fan	Full Load Amps (4 N	on-ECM)			2	.4				1.3			1	
Motors (4)		Total			9	.6				5.2			4	
Power Exhaust	Full Lo	ad Amps			2	.4				1.3			1	
(2) 0.33 HP		Total			4	.8				2.6			2	
Service Outlet	115V GFI (amps)				1	5				15			20	
Indoor Blower		HP	;	5	7	.5	1	0	5	7.5	10	5	7.5	10
Motor	Full Lo	ad Amps	16	5.7	24	1.2	30	0.8	7.6	11	14	6.1	9	11
² Maximum		Unit Only	1	10	12	25	12	25	50	60	60	40	45	50
Overcurrent Protection (MOCP)		0.33 HP Exhaust	1	10	12	25	12	25	50	60	60	45	45	50
³ Minimum		Unit Only	9)1	9	8	10	06	44	47	50	35	38	40
Circuit Ampacity (MCA)		0.33 HP Exhaust	9)6	10	03	1′	10	46	50	53	37	40	42
ELECTRIC HE	AT DATA	DATA								'				
Electric Heat V	/oltage		208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
² Maximum	Unit+	15 kW	150	150	150	150	150	175	70	70	80	60	60	60
Overcurrent Protection	Electric Heat	30 kW	175	200	200	200	200	200	90	100	100	80	80	80
(MOCP)		45 kW	225	250	225	250	225	250	125	125	125	90	100	100
,		60 kW	225	250	250	250	250	250	125	125	125	100	100	100
		90 kW	300	350	300	350	300	350	175	175	175	125	125	150
³ Minimum	Unit+	15 kW	130	136	138	144	145	151	66	70	73	53	56	58
Circuit Ampacity	Electric Heat	30 kW	169	181	177	189	184	196	89	92	95	71	74	76
(MCA)		45 kW	208	226	216	234	223	241	111	115	118	89	92	94
,	_	60 kW	216	235	224	243	231	250	116	119	122	92	95	97
		90 kW	279	307	286	315	293	322	152	155	158	121	124	126
² Maximum	Unit+	15 kW	150	150	150	150	150	175	70	80	80	60	60	60
Overcurrent Protection	Electric Heat ⁻ and (2) 0.33 HP -	30 kW	175	200	200	200	200	225	100	100	100	80	80	80
(MOCP)	Power Exhaust _	45 kW	225	250	225	250	250	250	125	125	125	100	100	100
, ,		60 kW	225	250	250	250	250	300	125	125	125	100	100	100
		90 kW	300	350	300	350	300	350	175	175	175	125	150	150
2 8 4: :	Unit+	15 kW	135	141	142	148	149	156	69	72	75	55	58	60
³ Minimum														
Circuit	Electric Heat	30 kW	174	186	181	193	189	201	91	95	98	73	76	78
			174 213	186 231	181 220	193 239	189 228	201 246	91 114	95 117	98 120	73 91	76 94	78 96

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

90 kW

¹ Extremes of operating range are plus and minus 10% of line voltage.

² HACR type breaker or fuse.

³ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

⁴ Disconnect must be field furnished.

ELECTRICAL ACCESSORIES - DISCONNECTS

15 TON | LHX180S5

Motor HP	;	3	į	5	7	.5	3	5	7.5	3	5	7.5
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W85	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	4 N/A	54W87	4 N/A	4 N/A	4 N/A	4 N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W87	54W86	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	54W87	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	4 N/A	54W86	54W86	54W86	54W86	54W86	54W86					

20 TON | LHX240S5

Motor HP		 5	7	.5	1	0	5	7.5	10	5	7.5	10
		1		1			_			_		
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	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	54W87	54W87	4 N/A	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 60 kW	4 N/A	54W86	54W86	54W86	54W86	54W86	54W86					
+ Electric Heat 90 kW	4 N/A	54W87	54W87	54W87	54W86	54W86	54W86					
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W87	54W87	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	NA	54W87	NA	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	4 N/A	54W86	54W86	54W86	54W86	54W86	54W86					
+ Power Exhaust + Elec. Heat 90 kW	4 N/A	54W87	54W87	54W87	54W86	54W86	54W86					

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

FIELD WIRING NOTES

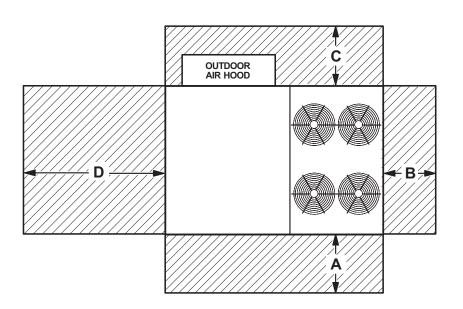
- For use with copper wiring only
- Field wiring not furnished
- All wiring must conform to NEC or CEC and local electrical codes
- For specific wiring information, please refer to the installation instructions

¹ Disconnect must be field furnished.

ELEC	ELECTRIC HEAT CAPACITIES														
Volts		15 kW			30 kW			45 kW			60 kW			90 kW	
Input	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages
208	11.3	38,600	1	22.5	76,800	1	33.8	115,300	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

UNIT CLEARANCES

Unit With Economizer



¹ Unit Clearance	Α		В		С		D		Тор
Offit Clearance	in.	mm	in.	mm	in.	mm	in.	mm	Clearance
Service Clearance	60	1524	36	914	36	914	66	1676	Unobstructed
Minimum Operation Clearance	45	1143	36	914	36	914	41	1041	Unobstructed

 $^{{\}sf NOTE}\ \hbox{-}\ {\sf Entire}\ {\sf perimeter}\ {\sf of}\ {\sf unit}\ {\sf base}\ {\sf requires}\ {\sf support}\ {\sf when}\ {\sf elevated}\ {\sf above}\ {\sf the}\ {\sf mounting}\ {\sf surface}.$

Service Clearance - Required for removal of serviceable parts. Minimum Operation Clearance - Required clearance for proper unit operation.

OUTDOOR SOUND DATA									
Unit	Octave I	Band Sound	Power Leve	ls dBA, re 10)-12 Watts - Co	enter Freque	ncy - Hz	¹ Sound Rating	
Model Number	125	250	500	1000	2000	4000	8000	Number (dBA)	
LHX180S, 240S	80	83	87	88	84	80	71	93	

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

¹ 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), dB (100 Hz to 10,000 Hz).

WEIGHT DATA								
Size	N	et	Shipping					
Size	lbs.	kg	lbs.	kg				
180 Base Unit	2044	927	2244	1018				
180 Max. Unit	2374	1077	2574	1168				
240 Base Unit	2081	944	2281	1035				
240 Max. Unit	2411	1094	2611	1184				

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

Description		lbs.	kg
ECONOMIZER / OUTDOOR AIR / EXHAUST			
Economizer			
Economizer Dampers (with Outdoor Air Hood)		102	46
Barometric Relief Dampers (downflow)		30	14
Barometric Relief Dampers (horizontal)		20	9
Outdoor Air Dampers With Hood (Downflow)			
Motorized		18	39
Manual		10	22
Power Exhaust		62	28
ELECTRIC HEAT			
15 kW		59	27
30 kW		59	27
45 kW		76	34
60 kW		76	34
90 kW		84	38
COIL/HAIL GUARDS	'		'
All models		46	21
ROOF CURBS			
Hybrid Roof Curbs, Downflow			
8 in. height		136	62
14 in. height		169	77
18 in. height		191	87
24 in. height		224	102
Adjustable Pitch Curb, Downflow			
14 in. height		224	102
Horizontal Roof Curbs, Standard			
26 in. height		450	204
37 in. height		540	245
CEILING DIFFUSERS			
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

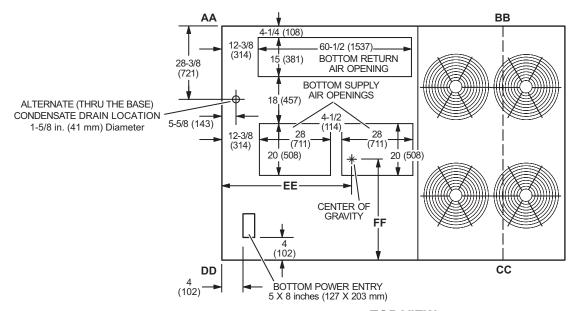
CORNER WEIGHTS

AA BB CC DD EE FF

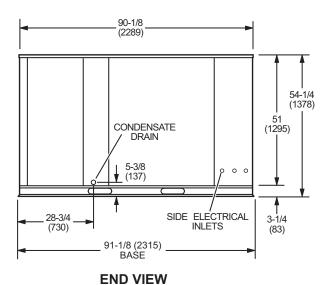
CONTENT WEIGHTO						OLIVIE	VOI OIV	~****					
Size	Α	AA		BB		CC		DD		EE		FF	
Size	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm	
180 Std. Unit	389	176	471	213	649	294	536	243	59	1499	38-3/8	975	
180 Max. Unit	495	224	574	260	701	318	604	274	57-7/8	1470	41	1042	
240 Std. Unit	391	177	472	214	666	302	552	250	59	1499	37-7/8	962	
240 Max. Unit	497	225	575	261	718	326	621	281	57-3/4	1467	40-1/2	1029	

Std. 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



LIFTING HOLES
(For Rigging
Front and Back)

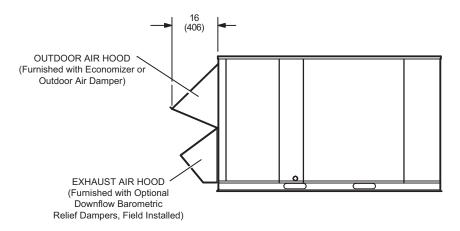
132-5/8
(3369)

LIFTING HOLES
(For Rigging
Front and Left Side Only)

107-3/4 (2737)
BASE

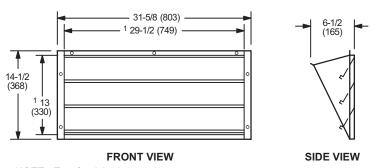
132-5/8
(645)

OUTDOOR AIR HOOD DETAIL



OPTIONAL HORIZONTAL BAROMETRIC RELIEF DAMPERS WITH HOOD

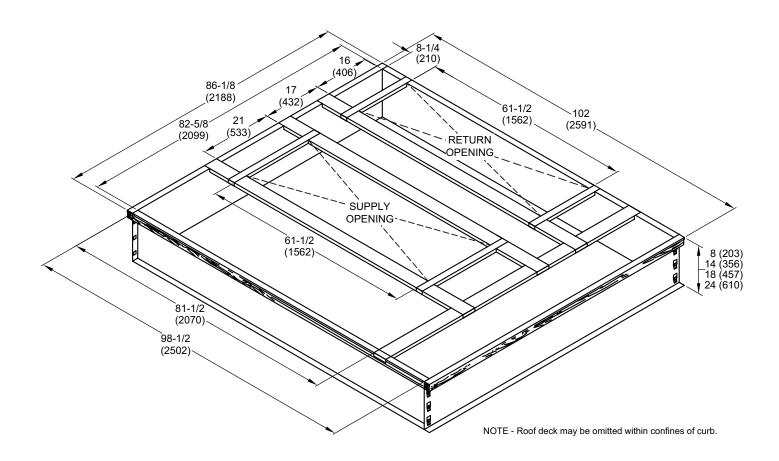
(Field installed in horizontal return air duct adjacent to unit)



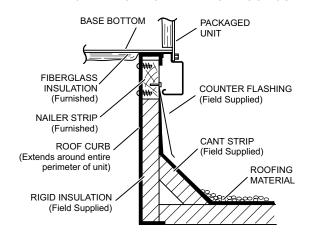
NOTE - Two furnished per order no.

NOTE - Opening size required in return air duct.

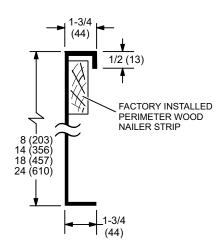
HYBRID ROOF CURBS - DOUBLE DUCT OPENING



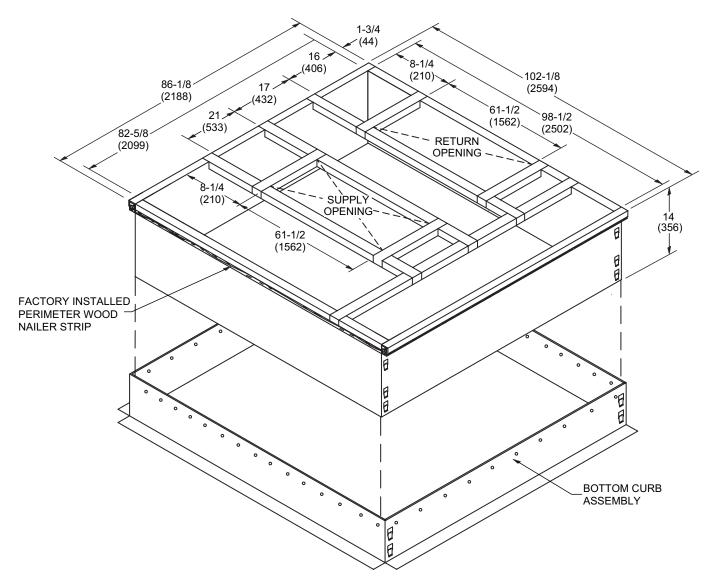
TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB

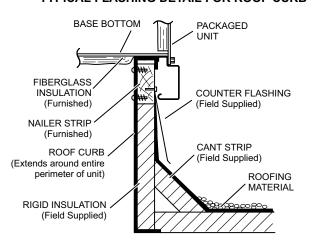


ADJUSTABLE PITCH CURB - DOUBLE DUCT OPENING

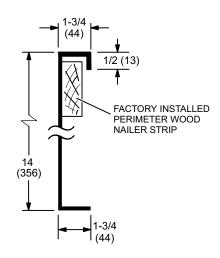


NOTE - Maximum slope pitch is 3/4 in. per 1 foot (19 mm per 305 mm) in any one direction.

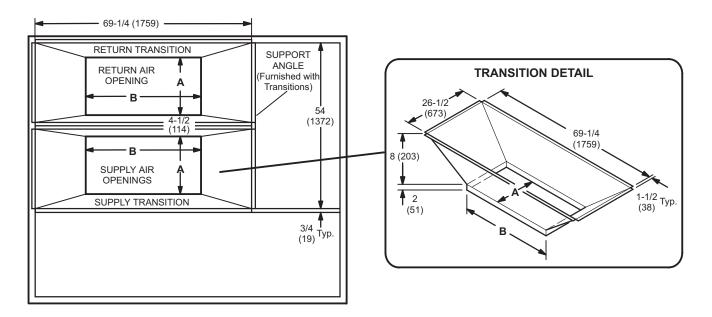
TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB



ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS

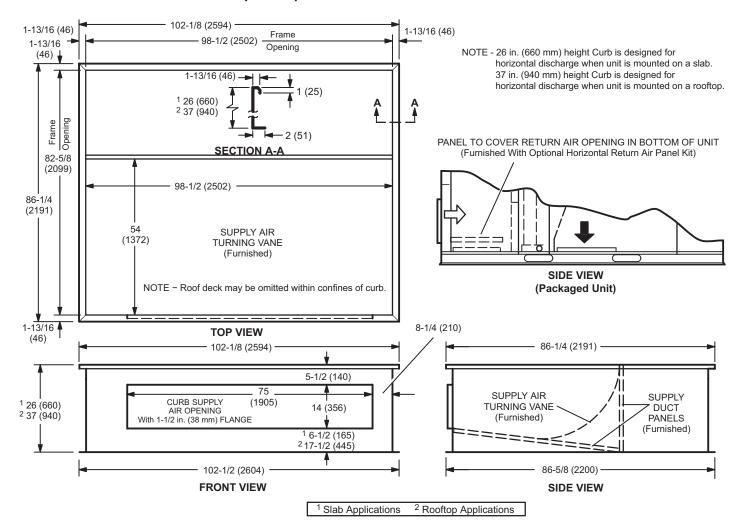


TOP VIEW

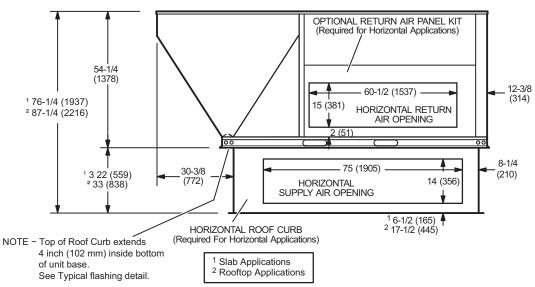
TRANSITION OPENING SIZES

Model		4	В		
Number	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

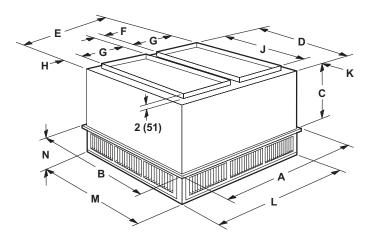


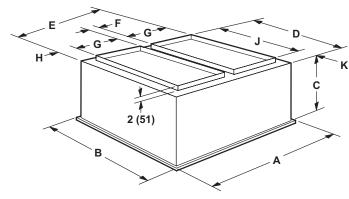
HORIZONTAL SUPPLY AND RETURN AIR OPENINGS WITH HORIZONTAL ROOF CURB



COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS STEP-DOWN CEILING DIFFUSER FLUS

FLUSH CEILING DIFFUSER





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

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

REVISIONS				
Sections	Description of Change			
Options / Accessories	Added Burglar Bars.			









Visit us at www.allied-commercial.com
For the latest technical information, visit us at www.allied-commercial.com
Contact us at 1-800-448-5872

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