PACKAGED HEAT PUMP

LDT

ENLIGHT ROOFTOP UNITS

High Efficiency | Dual-Fuel | 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
Gas Input Heat Capacity | 169,000 to 480,000 Btuh

ENLIGHT

LENNOX CORE CONTROL SYSTEM

MSAV™ MULTI-STAGE AIR VOLUME

SMARTWIRE™ SYSTEM

ASHRAE Standard 90.1

ENERGY STAR

MODEL NUMBER IDENTIFICATION

L D T 240 H 5 M S 1 Y

Brand
L = Lennox®

Unit Type
D = Packaged Duel Fuel (Heat Pump/Gas Heating) Unit

Family
T = Enlight Series

Nominal Cooling Capacity - Tons
156 = 13 Tons
180 = 15 Tons
240 = 20 Tons

Cooling Efficiency
H = High Efficiency

Refrigerant Type
5 = R-454B

Blower Type
M = MSAV® Multi-Stage Air Volume, Belt Drive

Heating Type
L = Low Gas Heat, 1 Stage
S = Standard Gas Heat, 2 Stage
M = Medium Gas Heat, 2 Stage
H = High Gas Heat, 2 Stage

Minor Design Sequence
1 = 1st Revision

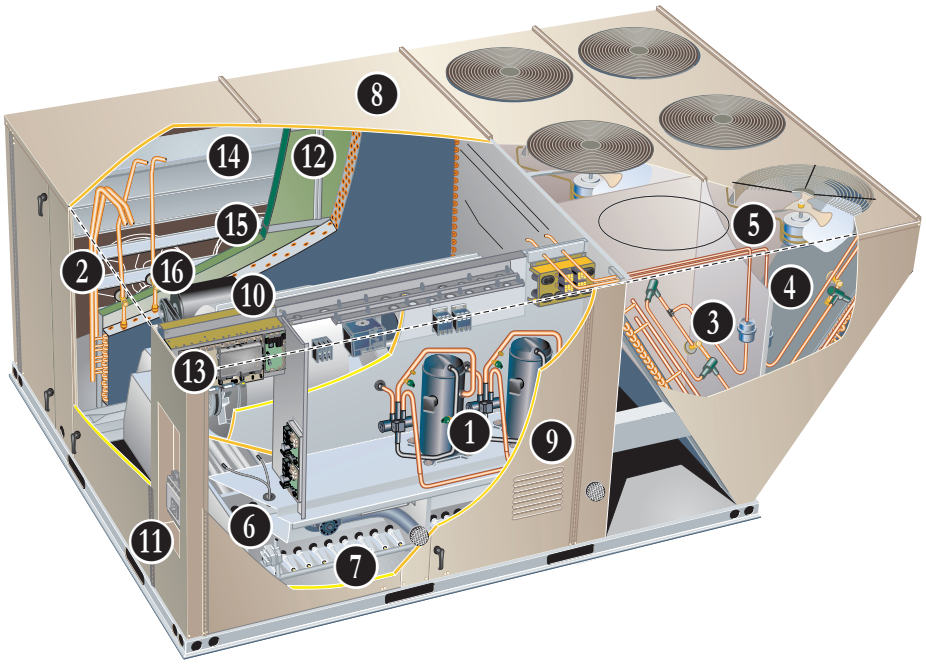
Voltage
Y = 208/230V-3 phase-60Hz
G = 460V-3 phase-60Hz
J = 575V-3 phase-60Hz

Form Number 211116 | September 2024
Supersedes all previous versions

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



CONTENTS

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

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

FEATURES AND BENEFITS

DUAL-FUEL OPERATION

(Heating Mode)

- Operates the heat pump for 1st stage heating
  - If 1st stage heat settings are not met, 2nd stage activates gas heating (secondary heat source)
- Mechanical heat pump operation automatically terminates on gas heat start-up
- Lennox® CORE Control System automatically changes blower speeds between heat pump heating and gas heating
- Blower operates in high speed during 1st stage (heat pump) operation and terminates during changeover to gas heat operation
- Blower starts when heat exchanger is warm, and runs in high speed during 2nd stage (gas heat) operation
  - If continuous blower operation is available on the thermostat, a change in blower speed automatically occurs during heat pump to gas heat changeover

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 System operates down to 35°F ambient (default dual fuel balance point)
- Mechanical heating operates at ambient temperatures above -15°F
- Gas Heating operates from 35°F down to -40°F

NOTE - Optional Low Temperature Vestibule Heater extends gas heat operation down to -60°F.

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 Thermal Expansion Valves

- Ensures optimal performance throughout the application range

Reversing Valves

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

3 Filter/Driers

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

High Pressure Switches

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

Low Pressure Switches

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

FEATURES AND BENEFITS

COOLING/HEATING SYSTEM (continued)

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

4 Outdoor Coil
- Copper tube construction
- Enhanced rippled-edge aluminum fins
- Flared shoulder tubing connections
- Silver soldered construction
- Factory leak tested
- Two independent slanted coils for easy cleaning

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

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

5 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 Fans
- PVC coated fan guard 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

HEATING SYSTEM

6 Heat Exchanger
- Tubular construction, stainless steel
- Life-cycle tested

7
- Aluminized steel inshot burners
- Direct spark ignition
- Electronic flame sensor
- Combustion air inducer
- Redundant automatic dual stage gas valve with manual shut-off

Electronic Pilot Ignition
- Electronic spark igniter provides positive direct ignition of burners on each operating cycle
- Permits main gas valve to stay open only when the burners are proven to be lit
- If loss of flame occurs, gas valve closes, shutting off the gas to the burners
- LED indicates status and aids in troubleshooting
- Factory installed in the control section

Limit Controls
- Redundant limit controls with fixed temperature setting
- Protects heat exchanger and other components from overheating

Safety Switches
- Flame roll-out switch
- Flame sensor
- Combustion air inducer proving switch
- Protects system operation

HEATING SYSTEM (continued)

Required Selections

Gas Input Choice - Order one:
- Low Gas Heat, 1 Stage (169,000 Btuh)
- Standard Gas Heat, 2 Stage (84,500/260,000 Btuh)
- Medium Gas Heat, 2 Stage (117,000/360,000 Btuh)
- High Gas Heat, 2 Stage (156,000/480,000 Btuh)

NOTE – Two-stage heat models can be operated with four stages of gas heating when controlled in either zone sensor, Discharge Air Control, or fresh air tempering mode on the Lennox CORE® Control System. See Gas Heating Specifications table.

Options/Accessories

Field Installed

Bottom Gas Piping Kit
- Allows bottom gas entry

Combustion Air Intake Extensions
- Recommended for use with existing flue extension kits in areas where high snow areas can block intake air
- Order two kits

Low Temperature Vestibule Heater
- Electric heater automatically controls minimum temperature in gas burner compartment when temperature is below -40°F
- CSA certified to allow operation of unit down to -60°F

LPG/Propane Kits
- Conversion kit to field change over units from Natural Gas to LPG/Propane
- Order two kits

Vertical Vent Extension Kit
- Use to exhaust flue gases vertically above unit
- Required when unit vent is too close to fresh air intakes per building codes
- Also prevents ice formation on intake louvers
- Kit contains vent transition, vent tee, drain cap and installation hardware
- Order two kits.

NOTE - Straight vent pipes (4 in. B-Vent) and caps are not furnished and must be field supplied. Refer to kit instructions for additional information.

CABINET

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

Airflow Choice
- Units are 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/Gas Entry
- Electrical and gas 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

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

Required Selections

Airflow Configuration
- Specify downflow or horizontal

CABINET (Continued)

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
  - Coated reheat coil
  - Painted blower housing
  - Painted base
- Outdoor Corrosion Protection:
  - Coated coil
  - Painted outdoor base

Factory or 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

BLOWER

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

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

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

10 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
- 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

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
- For 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 is furnished and factory installed with High SCCR option.

Factory or Field Installed

11 Disconnect Switch
- Accessible outside of unit
- Spring loaded weatherproof cover furnished

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

INDOOR AIR QUALITY

12 Air Filters
- Disposable 2 inch MERV 4 filters furnished as standard

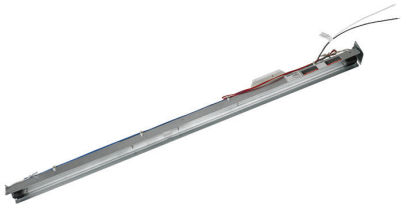
Options/Accessories

Factory or Field Installed

Healthy Climate® High Efficiency Air Filters
- Disposable MERV 8 and 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

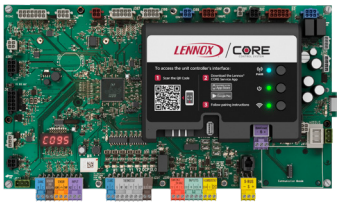
NOTE - Step-down transformer may be ordered separately for 460V and 575V units.

- Approved by ETL

Indoor Air Quality (CO_2) Sensors
- Monitors CO_2 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



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 Service Mobile 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

Download on the App Store | ANDROID APP ON Google play

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
- Gas Valve Time Delay Between First and Second Stage
- 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

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_2 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_2 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

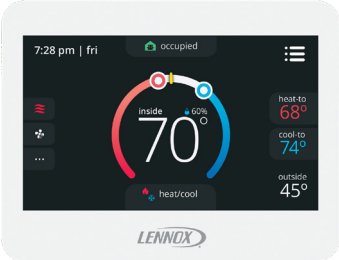
Field Installed

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

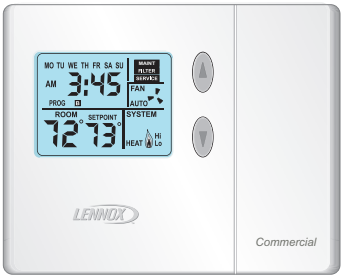


- Fully Communicating Sensor
- Full Color Touchscreen Interface
- Variable Speed System Control (On Compatible Units)
- Up To 4 Heat / 4 Cool
- Built-In Sensors For Temperature, Humidity And Optional CO_2
- Remote Sensor Options For Occupancy, Temperature
- BACnet Capable Options
- 5-2 or 7-Day Scheduling
- 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
CS8500 Commercial 7 Day Programmable Thermostat		
CS8500 7-Day Thermostat	No CO_2 Sensing	**24K55**
	With CO_2 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 Black 22 AWG, yellow jacket, rated at 75°C, 300V, Plenum rated Insulation - Low smoke PVC, NEC, CMP	500 ft. box	**27M19**
	1000 ft. box	**94L63**
	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**
Temperature/Humidity Room Sensor		
A335MT13AE1 Wired Temperature/Humidity Room Sensor (Non-Communicating)		**21W06**

[1] Up to nine of the same type remote temperature sensors can be connected in parallel.

[2] 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

[1] 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.

[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

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.

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)

COOLING

[1] Unit Features An Economizer And Outdoor Air Is Suitable

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.

[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

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

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 Mode

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.

Gas heating is not energized during a defrost cycle.

HEATING

NOTE – THERMOSTAT MODE HAS TWO STAGES OF HEATING. ROOM SENSOR MODE HAS UP TO THREE STAGES OF HEATING.

Thermostat or Zone Sensor - Outdoor Air Temperature is more than the Balance Point

W1/H1 Demand:

A first-stage heating demand (W1/H1) will energize all compressors (mechanical heating), the outdoor fans, and supply air blower operates at the heating speed.

W2/H2 Demand:

A second-stage heating demand (W2/H2) will de-energize the compressors (mechanical heating) and Low Gas Heat will be energized. The supply air blower operates at the heating speed.

H3 Demand:

A third-stage heating demand (H3) will de-energize Mechanical Heating and High Gas Heat will be energized. The supply air blower operates at the heating speed.

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

NOTE – Balance Point (default is 35°F). User adjustable from 10°F to 76°F.

Thermostat or Zone Sensor - Outdoor Air Temperature is less than the Balance Point

W1 Demand:

A first-stage heating demand (W1/H1) will energize Low Gas Heat and the supply air blower operates at the heating speed.

W2 Demand:

A second-stage heating demand (W2/H2) will energize High Gas Heat and the supply air blower operates at the heating speed.

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

NOTE – Balance Point (default is 35°F). User adjustable from 10°F to 76°F.

NOTE - If the Outdoor Air Temperature is less than the Balance Point, the controller will lock out Mechanical Heating and will enable gas heat only.

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
COOLING SYSTEM					
Condensate Drain Trap	PVC	**22H54**	X	X	X
	Copper	**76W27**	X	X	X
Drain Pan Overflow Switch		**21Z07**	OX	OX	OX
HEATING SYSTEM					
Bottom Gas Piping Kit		**85M31**	X	X	X
Combustion Air Intake Extensions (order two)		**89L97**	X	X	X
Gas Heat Input	Low - 169,000 Btuh	Factory	O	O	
	Standard - 260,000 Btuh	Factory	O	O	O
	Medium - 360,000 Btuh	Factory	O	O	O
	High - 480,000 Btuh	Factory		O	O
Low Temperature Vestibule Heater	208/230V-3ph	**22H58**	X	X	X
	460V-3ph	**22H59**	X	X	X
	575V-3ph	**13X68**	X	X	X
LPG/Propane Conversion Kits (Order 2 kits)	Low Heat	**14N28**	X	X	
	Standard Heat	**14N28**	X	X	X
	Medium Heat	**14N29**	X	X	X
	High Heat	**14N30**	X	X	X
Vertical Vent Extension Kit (Order two kits)		**42W16**	X	X	X
BLOWER - SUPPLY AIR					
Blower Option	MSAV® Multi-Stage Air Volume (With VFD Bypass Control)	Factory	O	O	
	MSAV® Multi-Stage Air Volume (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	Kit #1 535-725 rpm	Factory	O	O	
See Blower Data Tables for usage and selection	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 1135-1365 rpm	Factory			O
	Blower Belt Auto-Tensioner	**24B80**	X	X	X
CABINET					
Combination Coil/Hail Guards		**23U71**	OX	OX	OX
Corrosion Protection		Factory	O	O	O

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	Size 180	Size 240
CONTROLS					
Commercial Controls	LonTalk® Module	**54W27**	OX	OX	OX
	Novar® LSE	Factory	O	O	O
Dirty Filter Switch		**53W68**	OX	OX	OX
Fresh Air Tempering		**21Z08**	OX	OX	OX
Smoke Detector - Supply or Return (Power board and one sensor)		**22H56**	OX	OX	OX
Smoke Detector - Supply and Return (Power board and two sensors)		**22H57**	OX	OX	OX
INDOOR AIR QUALITY					
Air Filters					
Healthy Climate® High Efficiency Air Filters 24 x 24 x 2 (Order 6 per unit)	MERV 8	**54W67**	OX	OX	OX
	MERV 13	**52W40**	OX	OX	OX
	MERV 16	**21U42**	X	X	X
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)		**44N61**	X	X	X
Indoor Air Quality (CO_2) Sensors					
Sensor - Wall-mount, off-white plastic cover with LCD display		**24C58**	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display		**23V86**	X	X	X
Sensor - Black plastic case, LCD display, rated for plenum mounting		**87N52**	X	X	X
Sensor - Black plastic case, no display, rated for plenum mounting		**23V87**	X	X	X
CO_2 Sensor Duct Mounting Kit - for downflow applications		**23Y47**	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO2 sensors (**24C58**)		**90N43**	X	X	X
Needlepoint Bipolar Ionization (NPBI)					
Needlepoint Bipolar Ionization (NPBI) Kit		**21U37**	X	X	
		21U38			X
UVC Germicidal Light Kit					
[1] Healthy Climate® UVC Light Kit (110/230v-1ph)		**21A94**	X	X	X
Step-Down Transformers	460V primary, 230V secondary	**10H20**	X	X	X
	575V primary, 230V secondary	**10H21**	X	X	X
ELECTRICAL					
Voltage 60 Hz	208/230V - 3 phase	Factory	O	O	O
	460V - 3 phase	Factory	O	O	O
	575V - 3 phase	Factory	O	O	O
HACR Circuit Breakers		Factory	O	O	O
[2] Short-Circuit Current Rating (SCCR) of 100kA (includes Phase/Voltage Detection)		Factory	O	O	O
Disconnect Switch (see Disconnect Table for usage, page 30)	80 amp	**54W88**	OX	OX	OX
	150 amp	**54W89**	OX	OX	OX
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V, 575V)	**74M70**	OX	OX	OX
	15 amp factory-wired and powered (208/230V, 460V)	Factory	O	O	O
	[3] 20 amp non-powered, field-wired (208/230V, 460V, 575V)	**67E01**	X	X	X
	[3] 20 amp non-powered, field-wired (575V)	Factory	O	O	O
Weatherproof Cover for GFI		**10C89**	X	X	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] Disconnect Switch is furnished and factory installed with High SCCR option.

[3] 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

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OPTIONS / ACCESSORIES

Item Description		Order Number	Size 156	Size 180	Size 240
ECONOMIZER					
High Performance Economizer (Approved for California Title 24 Building Standards AMCA Class 1A Certified)					
High Performance Economizer (Downflow or Horizontal) 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		**22J18**	OX	OX	OX
Economizer Controls					
Differential Enthalpy (Not for Title 24)	Order 2	**21Z09**	OX	OX	OX
Sensible Control	Sensor is Furnished	Factory	O	O	O
Single Enthalpy (Not for Title 24)		**21Z09**	OX	OX	OX
Global Control	Sensor Field Provided	Factory	O	O	O
Building Pressure Control		**13J77**	X	X	X
Outdoor Air CFM Control		**13J76**	X	X	X
Barometric Relief Dampers With Exhaust Hood					
Downflow Barometric Relief Dampers		**54W78**	OX	OX	OX
Horizontal Barometric Relief Dampers		**16K99**	X	X	X
OUTDOOR AIR					
Outdoor Air Dampers With Outdoor Air Hood					
Motorized		**22J27**	OX	OX	OX
Manual		**13U05**	X	X	X
[4] POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)					
Standard Static, SCCR Rated	208/230V	**22H90**	OX	OX	OX
	460V	**22H91**	OX	OX	OX
	575V	**22V34**	OX	OX	OX

[4] Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately.

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

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

SPECIFICATIONS — UNIT

Model			LDT156H5M	LDT180H5M	LDT240H5M
Nominal Tonnage			**13 Ton**	**15 Ton**	**20 Ton**
Efficiency Type			**High**	**High**	**High**
Blower Type			MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume	MSAV® Multi-Stage Air Volume
Cooling Performance	Gross Cooling Capacity (Btuh)		160,000	182,000	237,000
	[1] Net Cooling Capacity (Btuh)		156,000	176,000	228,000
	[1] AHRI Rated Air Flow (cfm)		4500	5500	7000
	[1] IEER (Btuh/Watt)		15.2	15.3	15.3
	[1] EER (Btuh/Watt)		11.9	10.9	10.9
	Total Unit Power (kW)		13.1	16.1	20.9
Heating Performance	[1] Total High Heat Capacity (Btuh)		150,000	176,000	226,000
	[1] COP		3.4	3.4	3.4
	Total Unit Power (kW)		12.9	15.2	19.5
	[1] Total Low Heat Capacity (Btuh)		86,000	104,000	128,000
	[1] COP		2.1	2.1	2.1
	Total Unit Power (kW)		12.0	14.5	17.8
Gas Heat Available			See page 22		
Sound Rating Number		dBA	94	94	94
Refrigerant		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.
Compressor Type (number)			Two-Stage Scroll (1) Single-Stage Scroll (1)		
Outdoor Coils		Net face area - ft.² (total)	55.1	55.1	55.1
		Number of rows	2	2	2
		Fins - in.	20	20	20
Outdoor Coil Fans		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
Indoor Coils		Net face area - ft.² (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
		Expansion device type	Balanced Port Thermostatic Expansion Valve		
[3] **Indoor Blower and Drive Selection**		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 Kit 1 535-725 rpm Kit 2 710-965 rpm 5 HP Kit 3 - 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm	3 HP Kit 1 535-725 rpm Kit 2 710-965 rpm 5 HP Kit 3 - 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm 7.5 HP Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm	5 HP Kit 3 685-856 rpm Kit 4 850-1045 rpm Kit 5 945-1185 rpm 7.5 HP Kit 6 850-1045 rpm Kit 7 945-1185 rpm Kit 8 1045-1285 rpm 10 HP 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.
Filters		Type of filter	MERV 4, Disposable		
		Number and size - in.	(6) 24 x 24 x 2		
Line voltage data (Volts-Phase-Hz)			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.

[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.

NOTE – Motor service factor limit - 1.0.

SPECIFICATIONS — GAS HEAT

Model			LDT156 LDT180	LDT156 LDT180 LDT240		LDT180 LDT240
Heat Input Type			**Low (L)**	**Standard (S)**	**Medium (M)**	**High (H)**
Number of Gas Heat Stages			One	[1] Two	[1] Two	[1] Two
[1] Gas Heating Performance	Input - Btuh	First Stage	169,000	85,000	117,000	156,000
		Second Stage	- - -	169,000	234,000	312,000
		Third Stage	- - -	214,000	297,000	396,000
		Fourth Stage	- - -	260,000	360,000	480,000
	Output - Btuh	First Stage	135,000	- - -	- - -	- - -
		Second Stage	- - -	- - -	- - -	- - -
		Third Stage	- - -	- - -	- - -	- - -
		Fourth Stage	- - -	211,000	292,000	389,000
Temperature Rise Range - °F		First Stage	15-45	15-45	30-60	40-70
		Second Stage	- - -	- - -	- - -	- - -
Minimum Air Volume - cfm			3000	4500	4500	5125
Thermal Efficiency			80%	81%	81%	81%
Gas Supply Connections			1 in. NPT	1 in. NPT	1 in. NPT	1 in. NPT
Recommended Gas Supply Pressure - in. w.g.		Natural	7	7	7	7
		LPG/Propane	11	11	11	11
Gas Supply Pressure Range		Min./Max. (Natural)	4.7 - 10.5 in. w.g.			
		Min./Max. (LPG)	10.8 - 13.5 in. w.g.			

[1] Two-stage heat models can be operated with four stages of gas heating when controlled in either zone sensor, Discharge Air Control, or fresh air tempering mode on the Lennox® CORE unit controller.

HIGH ALTITUDE DERATE

NOTE - Units may be installed at altitudes up to 2000 feet above sea level without any modification.
At altitudes above 2000 feet, units must be derated to match gas manifold pressures shown in table below.
At altitudes above 4500 feet units must be derated 4% for each 1000 feet above sea level.

NOTE – This is the only permissible derate for these units.

Refer to the Installation Instructions for more detailed information.

ONE STAGE HEAT

No Adjustment Required

TWO STAGE HEAT

Heat Input Type	Altitude Feet	Gas Manifold Pressure - in. w.g.		Input Rate (Btuh)	
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage
Standard (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	169,000	239,000
Medium (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	234,000	331,000
High (2 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	312,000	442,000

FOUR STAGE HEAT

[1] Heat Input Type	Altitude Feet	Gas Manifold Pressure - in. w.g.		Input Rate (Btuh)			
		Natural Gas	LPG/Propane Gas	First Stage	Second Stage	Third Stage	Fourth Stage
Standard (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	85,000	169,000	204,000	239,000
Medium (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	117,000	234,000	283,000	331,000
High (4 stage)	2001 - 4500	1.6 / 3.1	4.4 / 8.9	156,000	312,000	377,000	442,000

[1] Four-Stage Gas Heating is field configured.

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 LDT156H5M (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		
	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 LDT156H5M (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		
	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 LDT156H5M (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		
	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 LDT156H5M

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 LDT180H5M (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		
	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 LDT180H5M (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		
	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 LDT180H5M (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		
	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 LDT180H5M

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 LDT240H5M (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		
	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 LDT240H5M (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		
	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 LDT240H5M (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		
	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 LDT240H5M

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 (heat section, economizer, etc.)
3 - Any field installed accessories air resistance (heat section, duct resistance, diffuser, etc.)

Then determine from blower table blower motor output and drive required.
See page 27 for wet coil, option/accessory air resistance data, and factory installed drive kit specifications.

Minimum Air Volume Required For Different Gas Heat Sizes:
Low Heat - 3000 cfm | Standard and Medium Heat - 4500 cfm | High Heat - 5125 cfm

Air Volume cfm	TOTAL STATIC PRESSURE - Inches Water Gauge (Pa)																									
	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80		2.00		2.20		2.40		2.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2750	385	0.30	505	0.50	600	0.70	680	0.90	755	1.10	820	1.30	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3000	395	0.35	515	0.55	610	0.75	685	1.00	760	1.20	825	1.45	885	1.70	---	---	---	---	---	---	---	---	---	---	---	---
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	---	---	---	---	---	---	---	---	---	---
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	2.55	---	---	---	---	---	---	---	---
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	960	2.45	1010	2.70	1060	3.00	1110	3.30	---	---	---	---
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	965	2.60	1020	2.90	1070	3.25	1115	3.55	1160	3.85	1205	4.15
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	970	2.80	1025	3.10	1075	3.45	1120	3.75	1165	4.10	1210	4.45
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	980	3.00	1030	3.30	1080	3.65	1130	4.05	1175	4.35	1215	4.70
4750	470	0.75	575	1.10	660	1.45	740	1.80	810	2.15	870	2.50	930	2.85	985	3.20	1040	3.55	1085	3.90	1135	4.25	1180	4.65	1225	5.00
5000	480	0.85	585	1.25	670	1.60	750	1.95	815	2.30	880	2.70	940	3.05	995	3.40	1045	3.80	1095	4.15	1140	4.50	1185	4.90	1230	5.30
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.65	1050	4.00	1100	4.40	1150	4.80	1195	5.20	1235	5.60
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.85	1060	4.25	1110	4.70	1155	5.10	1200	5.50	1240	5.90
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.65	1015	4.10	1065	4.50	1115	4.95	1160	5.35	1205	5.80	1250	6.25
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.90	1025	4.35	1075	4.80	1120	5.20	1170	5.65	1215	6.10	1255	6.55
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	1080	5.05	1130	5.50	1175	5.95	1220	6.45	1265	6.90
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	1090	5.35	1140	5.85	1185	6.30	1225	6.75	1270	7.25
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	1095	5.60	1145	6.10	1190	6.60	1235	7.10	1275	7.60
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	1105	5.95	1155	6.45	1200	6.95	1240	7.45	1285	8.00
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	955	4.65	1015	5.25	1065	5.75	1115	6.25	1160	6.75	1205	7.30	1250	7.85	1290	8.35
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	965	4.95	1020	5.50	1075	6.05	1125	6.60	1170	7.15	1215	7.65	1260	8.25	1300	8.75
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	1130	6.90	1180	7.50	1225	8.05	1265	8.60	1305	9.15
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	1140	7.25	1185	7.85	1230	8.40	1275	9.00	1315	9.60
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	1150	7.65	1195	8.25	1240	8.85	1280	9.40	1325	10.05
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	1160	8.05	1205	8.65	1250	9.25	1290	9.85	1330	10.45
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	1165	8.35	1215	9.05	1255	9.65	1300	10.30	---	---
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	1175	8.75	1220	9.40	1265	10.10	1310	10.80	---	---
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.55	1040	7.20	1090	7.85	1140	8.55	1185	9.20	1230	9.85	1275	10.55	1315	11.20	---	---
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	1195	9.60	1240	10.30	1285	11.05	---	---	---	---
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	1205	10.05	1250	10.80	1295	11.50	---	---	---	---
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	1215	10.50	1260	11.25	---	---	---	---	---	---
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	10.25	1225	11.00	---	---	---	---	---	---	---	---
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	1235	11.45	---	---	---	---	---	---	---	---
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	---	---	---	---	---	---	---	---	---	---
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	---	---	---	---	---	---	---	---	---	---	---	---

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	Gas Heat Exchanger			Economizer	Filters			Horizontal Roof Curb
		Low/ Standard Heat	Medium Heat	High Heat					
	in. w.g.	in. w.g.	in. w.g.	in. w.g.	in. w.g.	MERV 8	MERV 13	MERV 16	in. w.g.
2750	.02	.02	.04	.05	- - -	.01	.03	.06	.03
3000	.02	.03	.04	.05	- - -	.01	.03	.06	.04
3250	.03	.03	.05	.06	- - -	.01	.04	.07	.04
3500	.03	.03	.05	.06	- - -	.01	.04	.08	.05
3750	.03	.04	.06	.07	- - -	.01	.04	.08	.05
4000	.04	.04	.06	.07	- - -	.01	.04	.09	.06
4250	.04	.04	.06	.08	- - -	.01	.05	.10	.07
4500	.05	.05	.07	.09	- - -	.01	.05	.10	.07
4750	.05	.05	.08	.10	- - -	.02	.05	.11	.08
5000	.05	.05	.09	.11	- - -	.02	.06	.12	.08
5250	.06	.06	.10	.12	- - -	.02	.06	.12	.09
5500	.07	.06	.10	.13	- - -	.02	.06	.13	.10
5750	.07	.06	.11	.14	- - -	.02	.07	.14	.11
6000	.08	.07	.12	.15	- - -	.03	.07	.14	.11
6250	.08	.07	.12	.16	.01	.03	.07	.15	.12
6500	.09	.08	.13	.17	.02	.03	.08	.16	.13
6750	.10	.08	.14	.18	.03	.03	.08	.17	.14
7000	.10	.09	.15	.19	.04	.04	.08	.17	.15
7250	.11	.09	.16	.20	.05	.04	.09	.18	.16
7500	.12	.10	.17	.21	.06	.04	.09	.19	.17
8000	.13	.11	.19	.24	.09	.05	.10	.21	.19
8500	.15	.12	.20	.26	.11	.05	.10	.22	.21
9000	.16	.13	.23	.29	.14	.06	.11	.24	.24
9500	.18	.14	.25	.32	.16	.07	.12	.25	.26
10,000	.20	.16	.27	.35	.19	.07	.12	.27	.29
10,500	.22	.17	.30	.38	.22	.08	.13	.29	.31
11,000	.24	.18	.31	.40	.25	.09	.14	.30	.34

BLOWER DATA

POWER EXHAUST FAN PERFORMANCE

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

CEILING DIFFUSER AIR RESISTANCE - in. w.g.

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

CEILING DIFFUSER AIR THROW DATA - ft.

Size	Air Volume cfm	[1] Effective Throw Range - ft.	
		RTD11-185S Step-Down	FD11-185S Flush
156, 180	5600	39 - 49	28 - 37
	5800	42 - 51	29 - 38
	6000	44 - 54	40 - 50
	6200	45 - 55	42 - 51
	6400	46 - 55	43 - 52
	6600	47 - 56	45 - 56

[1] 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.

Size	Air Volume cfm	[1] Effective Throw Range - ft.	
		RTD11-275S Step-Down	FD11-275S Flush
240	7200	33 - 38	26 - 35
	7400	35 - 40	28 - 37
	7600	36 - 41	29 - 38
	7800	38 - 43	40 - 50
	8000	39 - 44	42 - 51
	8200	41 - 46	43 - 52
	8400	43 - 49	44 - 54
	8600	44 - 50	46 - 57
	8800	47 - 55	48 - 59

ELECTRICAL DATA — 13 TON

Model		LDT156H5M					
[1] 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	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
[2] 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
[3] 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

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

[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] Factory installed circuit breaker not available.

ELECTRICAL DATA — 15 TON

Model		LDT180H5M								
[1] 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	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
[2] 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
[3] 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

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

[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] Factory installed circuit breaker not available.

ELECTRICAL DATA — 20 TON

Model		LDT240H5M								
[1] 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	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
[2] 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
[3] 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

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

[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] Factory installed circuit breaker not available.

ELECTRICAL ACCESSORIES - DISCONNECTS

13 TON | LDT156H5

Motor HP	3		5		3	5	3	5
Electric Heat Voltage	208	240	208	240	480	480	600	600
Unit Only	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88
Unit + Power Exhaust	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88

15 TON | LDT180H5

Motor HP	3		5		7.5		3	5	7.5	3	5	7.5
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit + Power Exhaust	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88	54W88	54W88	54W88

20 TON | LDT240H5

Motor HP	5		7.5		10		5	7.5	10	5	7.5	10
Electric Heat Voltage	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W89	54W89	54W89	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88
Unit + Power Exhaust	54W89	54W89	54W89	54W88	54W88	54W88	54W88	54W88	54W88	54W88	54W88	54W88

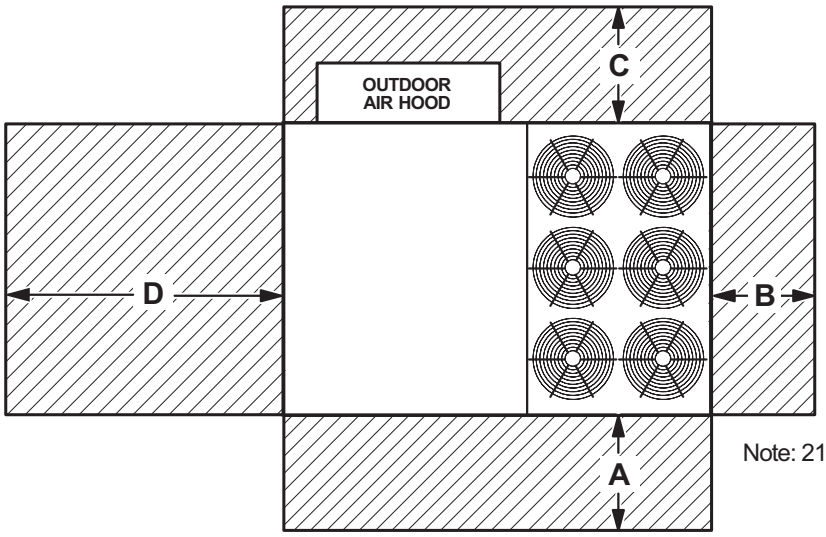
Disconnects - 54W88 - 80A
54W89 - 150A
90W82 - 250A

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

INSTALLATION CLEARANCES

Unit With Economizer



Note: 210-240-300 sizes shown

[1] Unit Clearance	A		B		C		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	
Service Clearance	60	1524	36	914	36	934	66	1676	Unobstructed
Clearance to Combustibles	36	914	1	25	1	25	1	25	
Minimum Operation Clearance	45	1143	36	914	36	914	41	1041	

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

[1] Service Clearance - Required for removal of serviceable parts.
Clearance to Combustibles - Required clearance to combustible material.
Minimum Operation Clearance - Required clearance for proper unit operation.

OUTDOOR SOUND DATA

Size	Octave Band Sound Power Levels dBA, re 10^{-12} Watts - Center Frequency - Hz							[1] 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.

[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), dBA (100 Hz to 10,000 Hz).

WEIGHT DATA — UNIT

Size	Net		Shipping	
	lbs.	kg	lbs.	kg
156 Base Unit	2358	1070	2558	1160
156 Max. Unit	2643	1199	2843	1290
180 Base Unit	2386	1082	2586	1173
180 Max. Unit	2671	1212	2871	1302
240 Base Unit	2428	1101	2628	1192
240 Max. Unit	2713	1231	2913	1321

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
ECONOMIZER / OUTDOOR AIR / EXHAUST			
Economizer			
Economizer Dampers (with Outdoor Air Hood)		167	76
Barometric Relief Dampers (downflow)		30	14
Barometric Relief Dampers (horizontal)		20	9
Outdoor Air Dampers with Hood (downflow)			
Motorized		39	18
Manual		22	10
Power Exhaust		62	28
GAS HEAT EXCHANGER (NET WEIGHT)			
Medium Heat (adder over standard heat)		18	8
High Heat (adder over standard heat)		64	29
COMBINATION COIL/HAIL GUARDS			
All models		36	16
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, 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

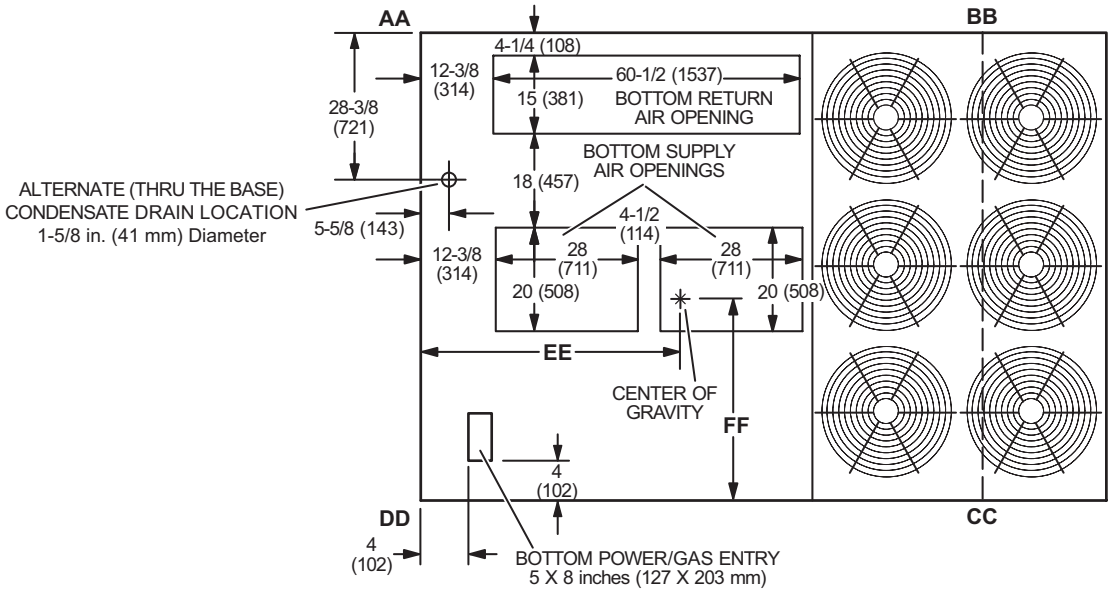
DIMENSIONS - UNIT

CORNER WEIGHTS | **CENTER OF GRAVITY**

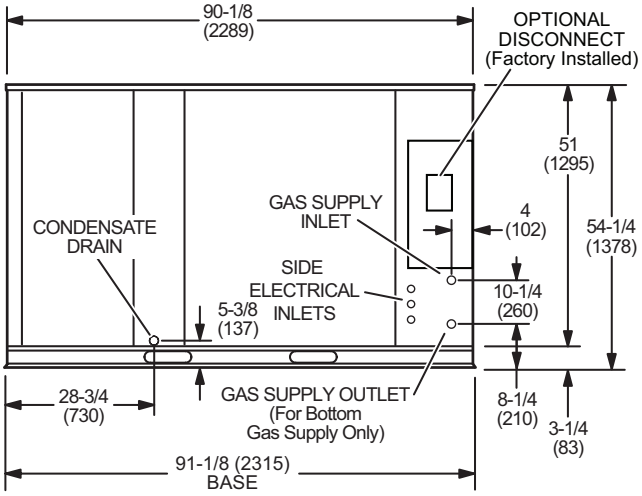
Model	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
LDT156 Base Unit	452	205	506	230	739	336	660	300	57	1446	37	941
LDT156 Max. Unit	558	254	598	272	769	350	718	326	55-3/4	1416	39-7/8	1012
LDT180 Base Unit	453	206	508	231	753	342	672	306	57	1448	36-3/4	933
LDT180 Max. Unit	559	254	599	272	783	356	730	332	55-3/4	1416	39-1/2	1003
LDT240 Base Unit	456	207	509	232	772	351	691	314	56-7/8	1444	36-1/4	921
LDT240 Max. Unit	561	255	601	273	802	364	749	340	55-3/4	1416	39	991

Base Unit - The unit with NO INTERNAL OPTIONS.

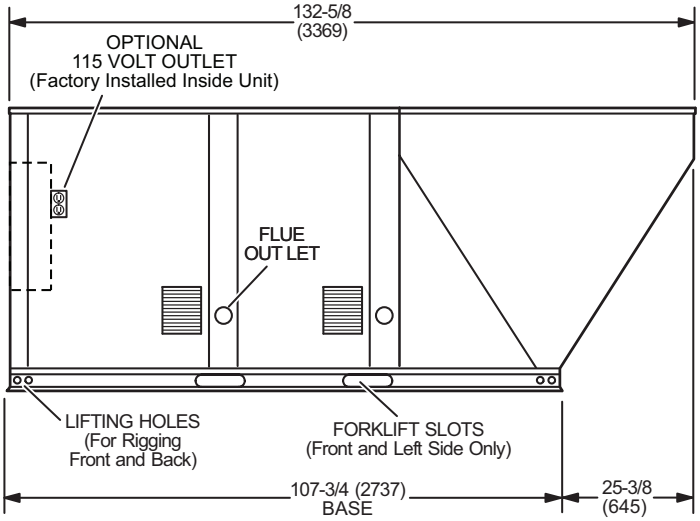
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit.



TOP VIEW

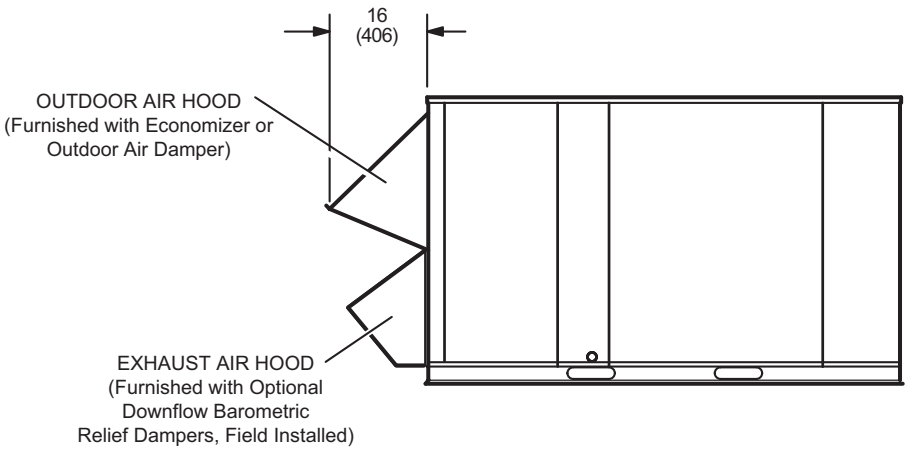


END VIEW



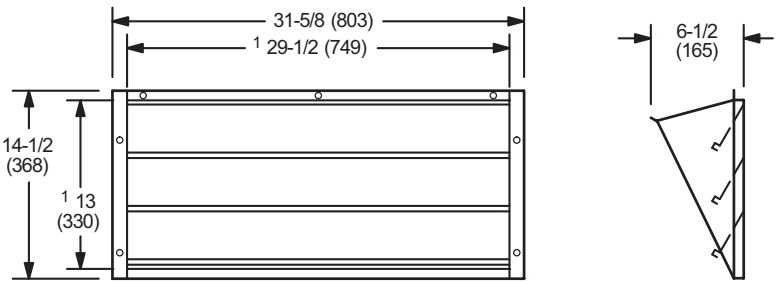
SIDE VIEW

OUTDOOR AIR HOOD DETAIL



OPTIONAL HORIZONTAL BAROMETRIC RELIEF DAMPERS WITH HOOD

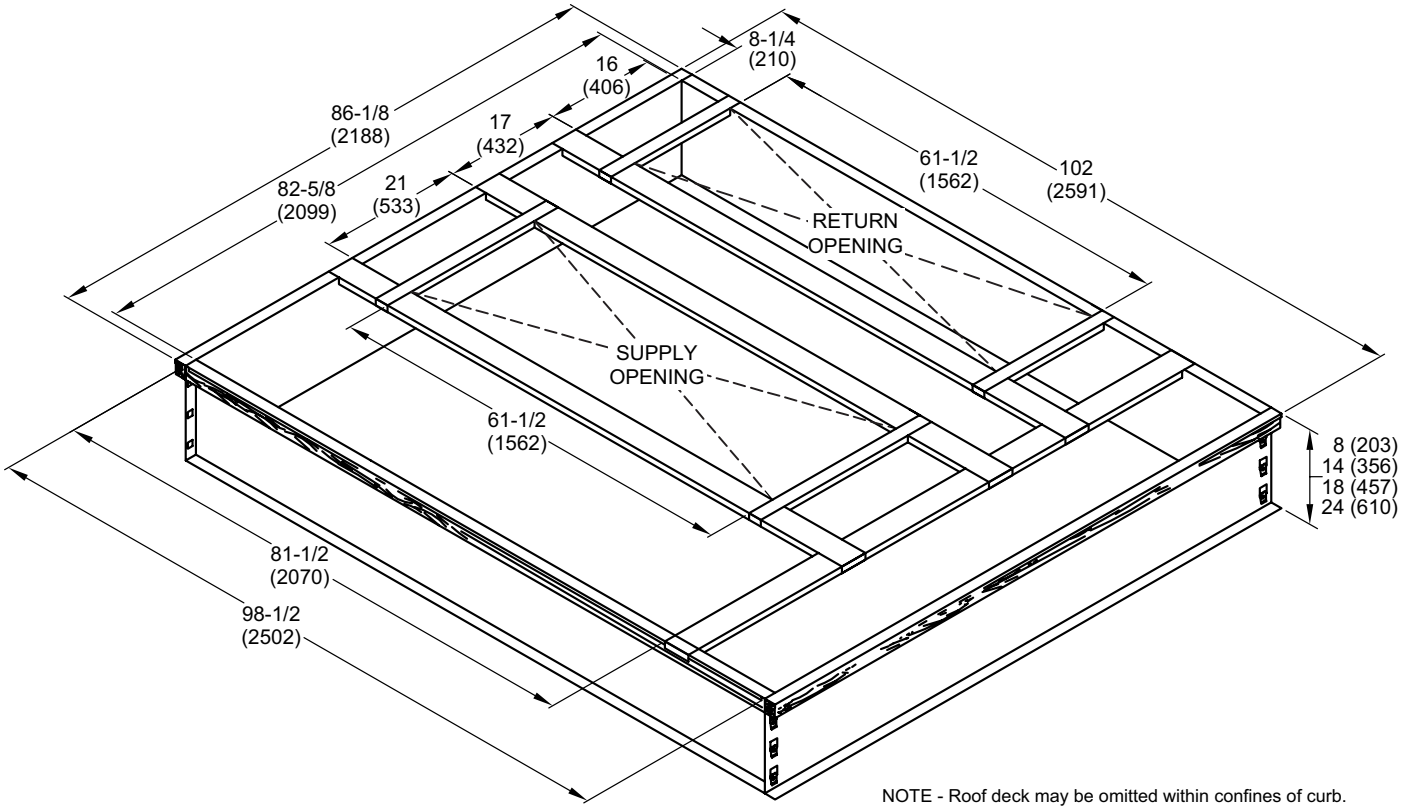
(Field installed in horizontal return air duct adjacent to unit)



FRONT VIEW **SIDE VIEW**

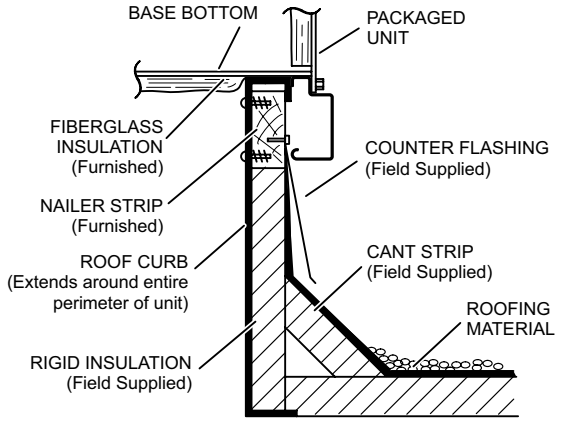
NOTE - Two furnished per order no.
[1] NOTE - Opening size required in return air duct.

HYBRID ROOF CURBS - DOUBLE DUCT OPENING

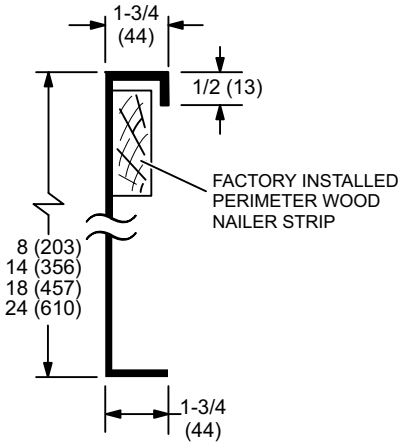


NOTE - Roof deck may be omitted within confines of curb.

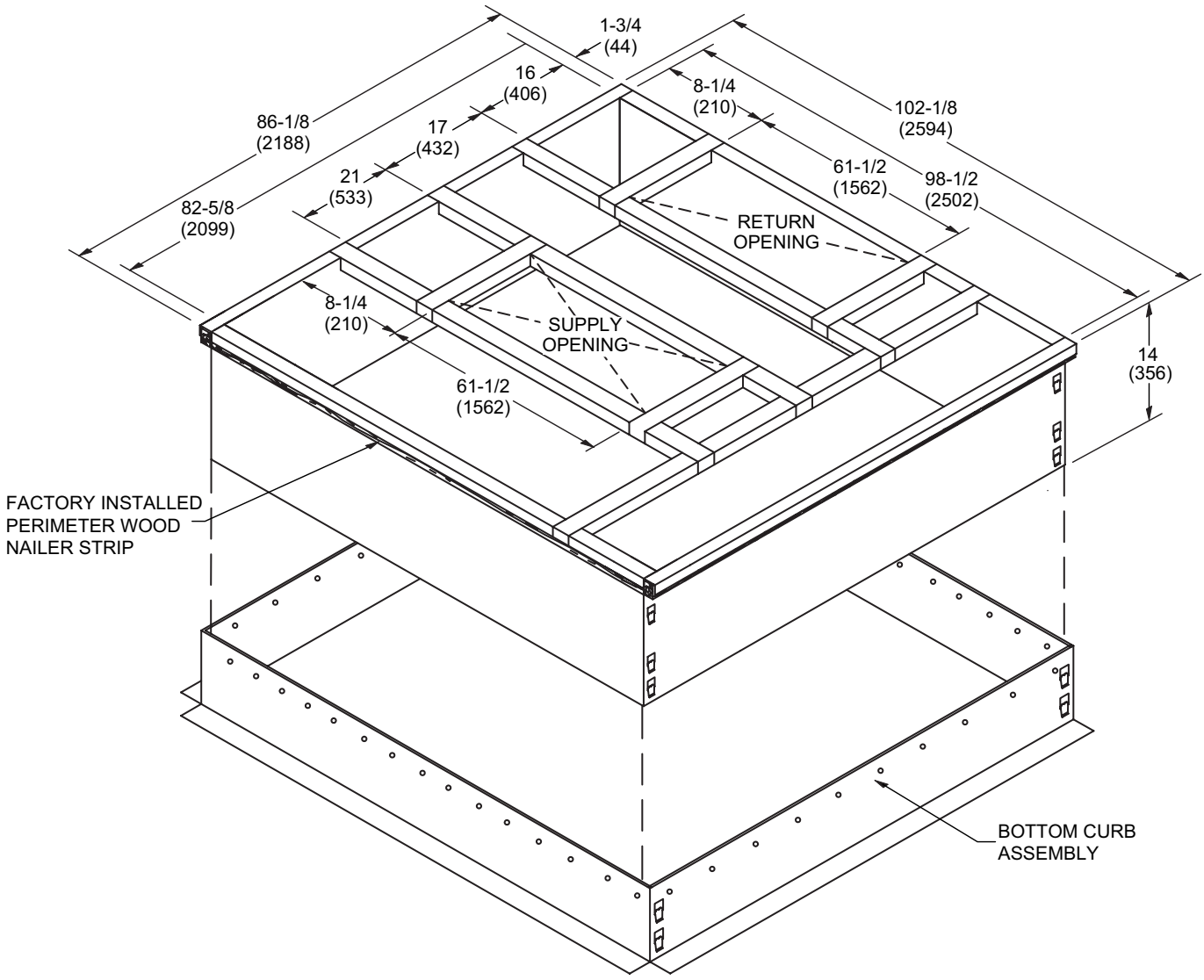
TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB

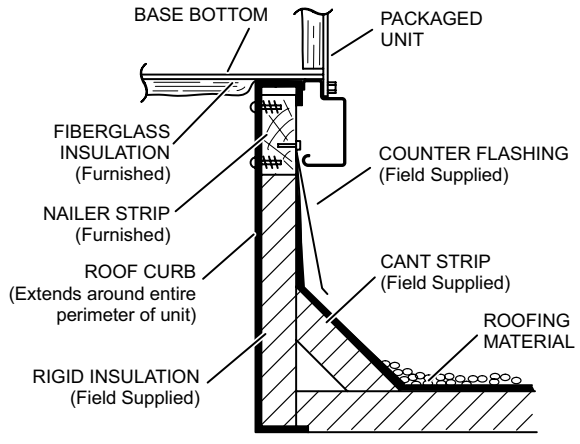


ADJUSTABLE PITCH CURB - DOUBLE DUCT OPENING

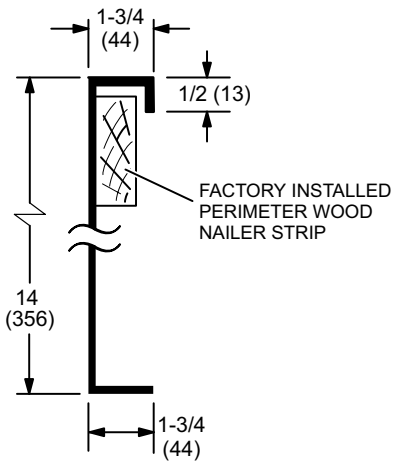


NOTE - Maximum slope pitch is 3/4 in. per 1 foot (19 mm per 305 mm) in any one direction.

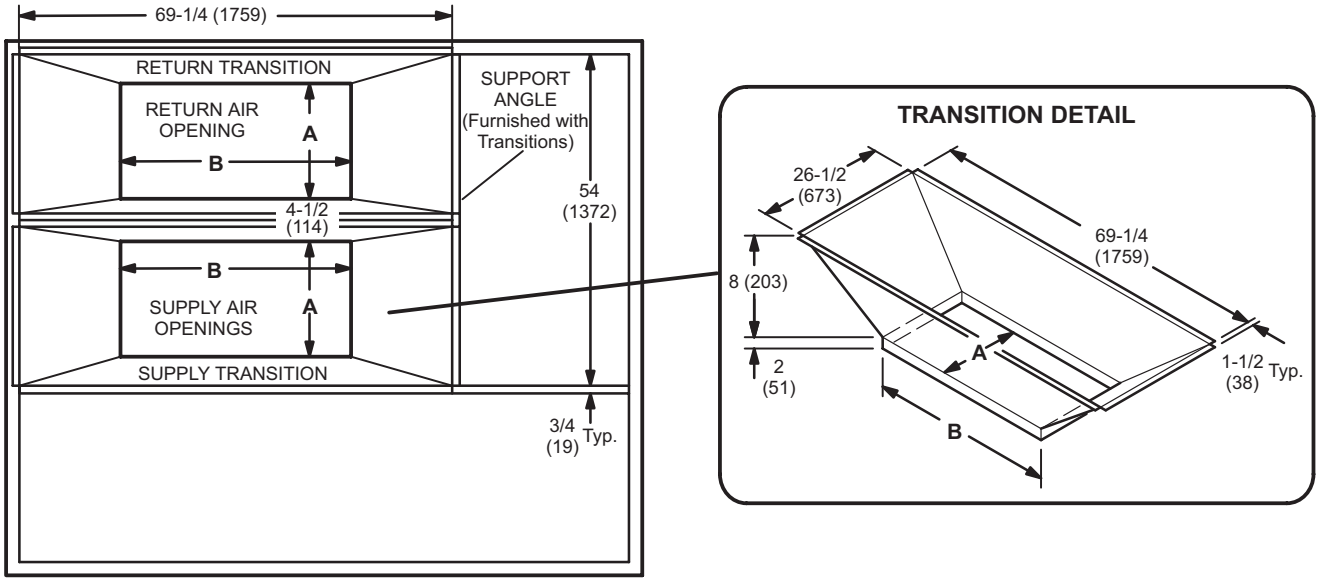
TYPICAL FLASHING DETAIL FOR ROOF CURB



DETAIL ROOF CURB



ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS

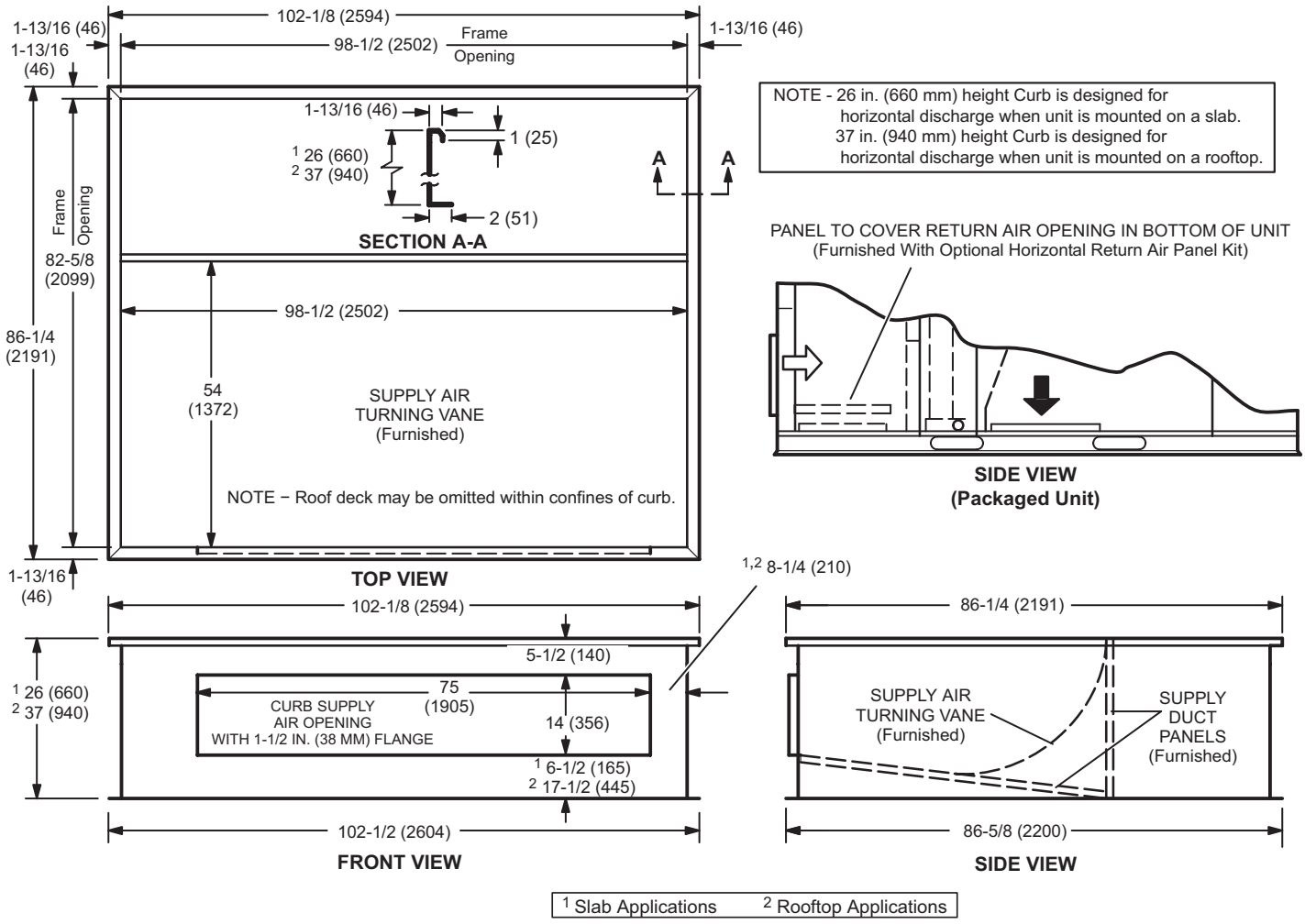


TOP VIEW

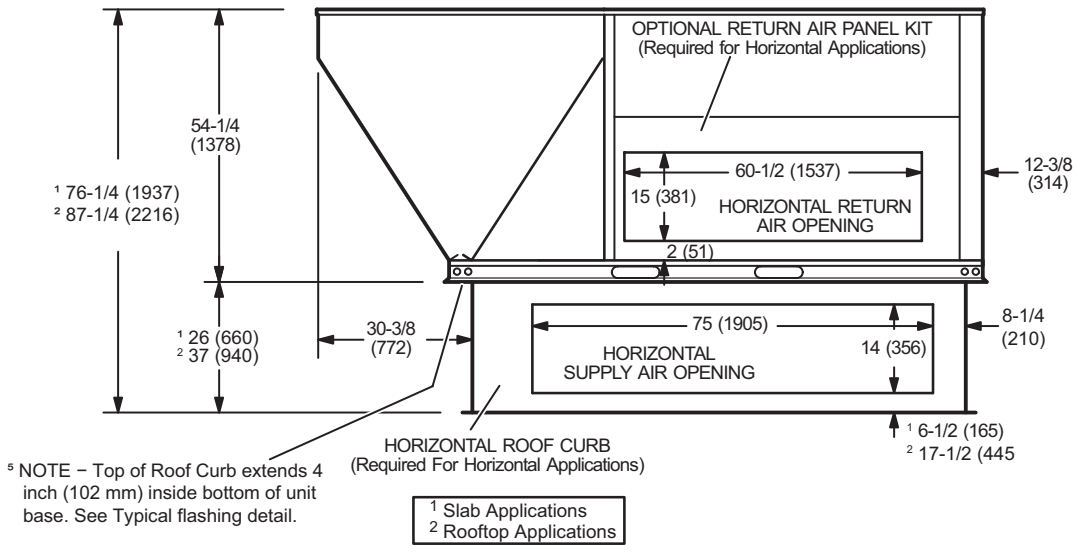
TRANSITION OPENING SIZES

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

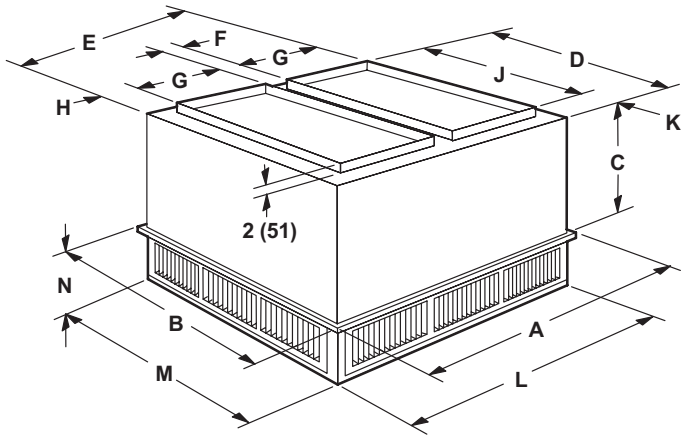


HORIZONTAL SUPPLY AND RETURN AIR OPENINGS WITH HORIZONTAL ROOF CURB



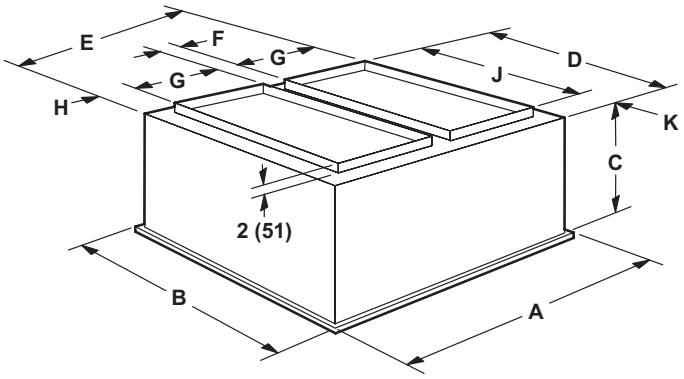
COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

STEP-DOWN CEILING DIFFUSER



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

FLUSH CEILING DIFFUSER



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

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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.