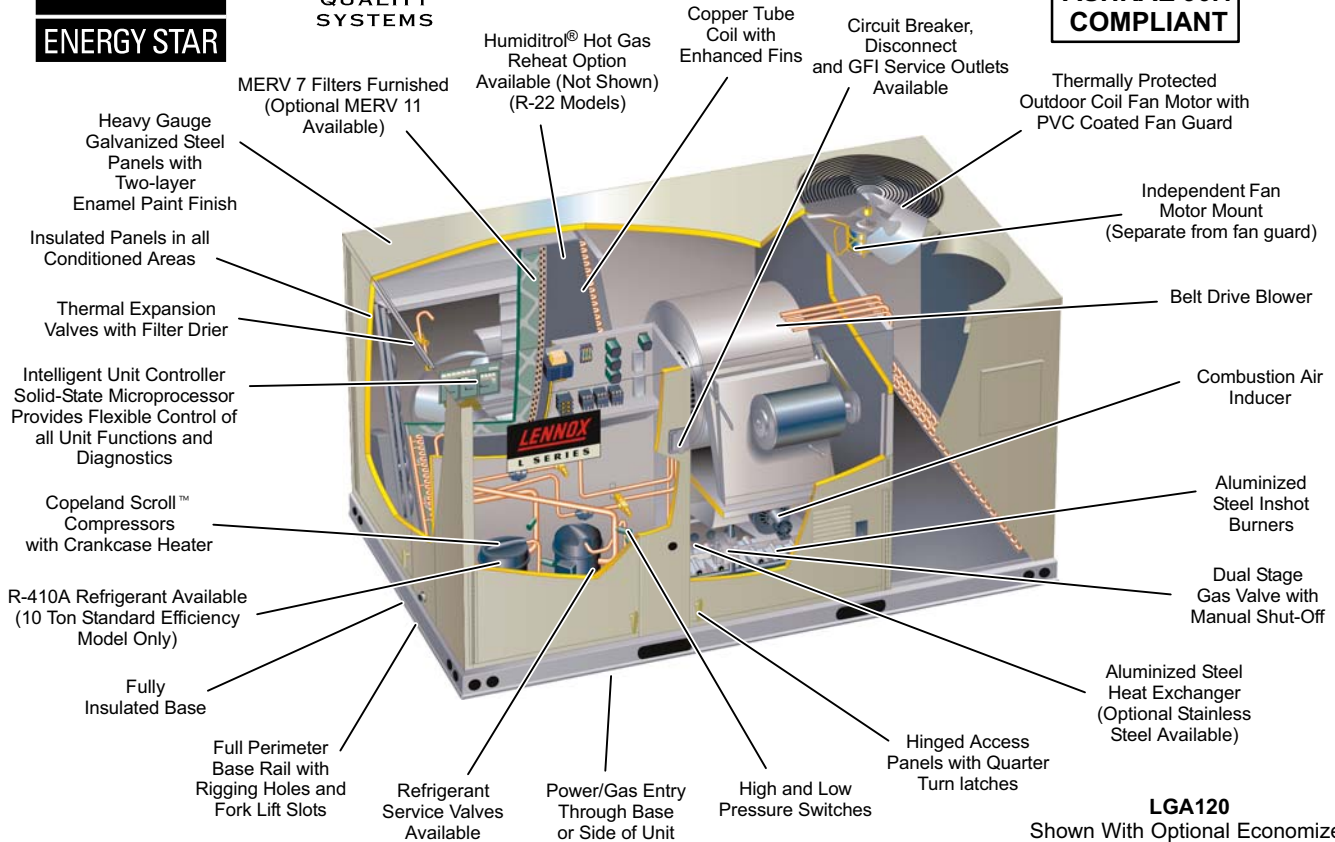
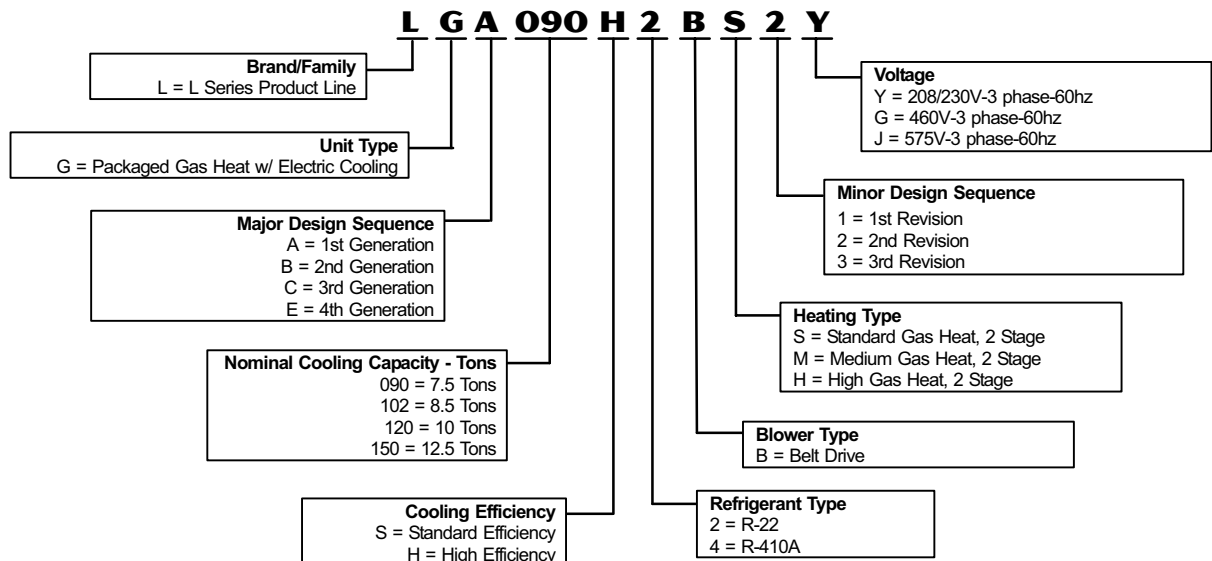




ASHRAE 90.1 COMPLIANT



MODEL NUMBER IDENTIFICATION



Visit us at www.lennox.com
For the latest technical information, www.davenet.com

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

FEATURES AND BENEFITS

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APPROVALS

ETL and CSA listed.
Efficiency rating verified by CSA.
Components bonded for grounding to meet safety standards for servicing required by UL, CSA and National and Canadian Electrical Codes.
Certified in accordance with the ULE certification program, which is based on ARI Standard 340/360-2000.
ISO 9001 Registered Manufacturing Quality System.
ENERGY STAR® certified units are designed to use less energy, help save money on utility bills, and help protect the environment.

CABINET

Construction

Heavy-gauge steel panels and full perimeter heavy-gauge galvanized steel base rail provides structural integrity for transportation, handling, and installation.
Base rails have rigging holes. Three sides of the base rail have fork slots.
Raised edges around duct and power entry openings in the bottom of the unit provide additional protection against water entering the building.

Air-Flow Choice

Units are available in down-flow (vertical) or horizontal air flow configuration.

Duct Flanges

Horizontal supply duct flange is standard on all units.

Power/Gas Entry

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

Exterior Panels

Constructed of heavy-gauge, galvanized steel with a two-layer enamel paint finish.

Insulation

All panels adjacent to conditioned air are fully insulated with non-hygroscopic fiberglass insulation.
Unit base is fully insulated. The insulation also serves as an air seal to the roof curb, eliminating the need to add a seal during installation.

Access Panels

Hinged access panels are provided for the economizer/filter section, blower/heating section and the compressor/controls section.

All panels have seals and quarter-turn latching handles to provide a tight air and water seal.

COOLING SYSTEM

Designed to maximize sensible and latent cooling performance at design conditions.
Two efficiency levels provide flexibility.
System can operate from 0°F (-18°C) to 125°F (52°C) without any additional controls.

Compressors

Resiliently mounted on rubber grommets for quiet operation.
Copeland Scroll™ compressors on all models for high performance, reliability and quiet operation.

Compressor Crankcase Heaters

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

Thermal Expansion Valves

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

Filter/Driers

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

High Pressure Switches

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

Low Pressure Switches

Protects the compressor from low pressure conditions such as low refrigerant charge, or low/no air flow.

Freezestats

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

Coil Construction

Copper tube construction, enhanced rippled-edge aluminum fins, flared shoulder tubing connections, silver soldered construction for improved heat transfer. Factory leak tested.

Evaporator Coil

Face split with separate circuits.
Cross row circuiting optimizes both sensible and latent cooling capacity.

Condenser Coil

Slab type on all models.

Condensate Drain Pan

Painted, galvanized pan with positive slope.
Drain connection extends outside unit.

Outdoor Coil Fan Motors

Thermal overload protected, totally enclosed, permanently lubricated ball bearings, shaft up, wire basket mount.

Outdoor Coil Fans

PVC coated fan guard furnished.

Refrigerant Choice

LGC120S models can be ordered with R-22 or R-410A refrigerant systems.

HEATING SYSTEM

Aluminized steel inshot burners, direct spark ignition, electronic flame sensor, combustion air inducer, redundant automatic dual stage gas valve with manual shut-off.

Fan & Limit Controls

Factory installed, limit controls with fixed temperature setting.
Heat limit controls protect against overheating.

Safety Switches

Flame roll-out switches, flame sensor switches and combustion air inducer proving switches protect system operation.
All safety switches are monitored by the IMC unit controller and diagnostic errors are reported and recorded.

Heat Exchanger

Tubular construction, aluminized steel, life cycle tested.
Stainless Steel Heat Exchanger is required if mixed air temperature is below 45°F (7°C).

FEATURES AND BENEFITS

AIR FILTERS

Disposable 2 inch (51 mm) pleated MERV 7 filters (Minimum Efficiency Reporting Value based on ASHRAE 52.2).
Optional MERV 11 filters are available for factory or field installation - See Optional Accessories section.

BLOWER

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

Specify standard or high efficiency.

Supply Air Blower

Overload protected, belt drive motors.
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.

Ordering Information

Specify motor horsepower and drive kit number when base unit is ordered.
See Blower Data table for specifications.

SERVICEABILITY

Designed to streamline general maintenance and decrease troubleshooting time.

Diagnostics

IMC diagnostic codes pinpoint problems, minimizing troubleshooting time.

Marked & Color-Coded Wiring

All electrical wiring is color-coded and marked to identify which components it is connecting.

Electrical Plugs

Positive connection electrical plugs are used to connect common accessories or maintenance parts for easy removal or installation.

Toolless, Hinged Access Panels

Large access panels are hinged and have quarter-turn, latching handles for quick and easy access to maintenance areas.

Blower Access

Blower assembly slides out of the unit for easy access.

Thermal Expansion Valves

Thermal expansion valves are located near the perimeter of the unit for easier access.

Removable element head allows change out of element and bulb without removing the TXV.

Coil Cleaning

Slab coils allow for easy cleaning. Doors at each end of the coil compartment allow access to clean coils from the inside.

Standard Components

A large number of common maintenance parts are standard throughout the entire range of sizes (3-30 tons), reducing the need to carry a lot of different parts to the job or in inventory.

Compressor Compartment

Compressors are located near the perimeter of the unit for easier access.

Compressors are isolated from the condenser air flow allowing system operation checks to be done without changing the air flow across the outdoor coils.

Service Valves (optional)

Optional factory installed liquid and discharge service valves allow refrigerant to be isolated to the high side for service work on the low side of the refrigeration system.

WARRANTY

Limited ten years aluminum heat exchanger, limited fifteen years optional stainless steel heat exchanger.

Limited five years on compressors.

Limited three years on Integrated Modular Control.

Limited one year all other covered components.

FEATURES AND BENEFITS

INTELLIGENT UNIT CONTROLLER

The Integrated Modular Control (IMC) is a solid-state microprocessor-based control board that provides flexible control of all unit functions.

All control voltage is provided via a 24V (secondary) transformer with built-in circuit breaker protection.

Built-in functions include:

Blower On/Off Delay - Adjustable time delay between blower on and off.

Built-in Control Parameter Defaults - no programming required.

Compressor Time-Off Delay - Adjustable time delay between compressor shutoff and start up.

DDC Compatible - Various third party DDC controllers can be factory or field installed. Refer to the Unit Controllers section for details.

Dirty Filter Switch Input - When a Dirty Filter Switch is installed, the IMC will signal when the indoor blower static pressure increases, indicating a dirty filter condition. Switch is optional and can be factory or field installed.

Display/Sensor Readout - Displays control parameters, diagnostic codes, and sensor readings. The IMC unit controller displays temperature readings from return air, supply air, and outdoor air sensors that are furnished as standard on all L Series units. IMC will also display readings from optional sensors such as zone sensors, CO₂ sensors or relative humidity sensors.

Economizer Control Choice - the economizer is controlled by an add-on board to the IMC. The economizer control board has four choices (DIP switch selectable) for controlling the economizer.

1 - Sensible Control - Uses the outdoor air and return air sensors that are furnished with the unit. The IMC compares the two temperatures and enables the economizer when the outdoor air is cooler than return air.

2 - Global Enthalpy Control - the IMC communicates with a DDC system that uses one global sensor (enthalpy or sensible), to determine whether outdoor air is suitable for free cooling on all units connected to the control system. Sensor must be field provided.

3 - Outdoor Enthalpy Control - Senses outdoor air enthalpy and enables economizer if the enthalpy is less than the setpoint of the board. Can be ordered factory or field installed.

4 - Differential Enthalpy Control - Two solid-state enthalpy sensors allow the control board to select between outdoor air or return air, whichever has lower enthalpy. Can be ordered factory or field installed.

Fresh Air Tempering - The IMC energizes the first stage heat as needed to maintain a minimum supply air temperature for comfort, regardless of the thermostat demand. For factory option, sensor ships with unit but must be field installed in the supply air duct.

Extensive Unit Diagnostics - The IMC monitors all sensors and functions related to unit operation to provide critical information. The IMC will display detailed diagnostic information with over 80 diagnostic codes to pinpoint any problems and reduce troubleshooting time. All diagnostic codes are listed inside control access panel for easy reference.

Permanent Diagnostic Code Storage - Maintains diagnostic codes through a power failure.

Field Changeable Control Parameters - Over 100 different control parameters allow customization of the unit operation by changing delays, cooling stages, deadbands, and setpoints.

Indoor Air Quality Input - The IMC is Demand Control Ventilation ready from the factory (optional field installed CO₂ sensor required). Two modes of operation are available: setpoint and proportional.

1 - Setpoint - Opens the economizer dampers to full position when CO₂ setpoint level is reached.

2 - Proportional - Opens the dampers at the first set point and gradually increases it as the CO₂ level increases until the second setpoint is reached.

Low Ambient Controls - Allows unit cooling operation down to 0°F (-18°C).

Gas Valve Time Delay Between First and Second Stage -

Allows gradual increase of input rate.

Minimum Compressor Run Time - Ensures proper oil return to the compressor.

Network Capable - The IMC can be daisy chained to other L Series units or L Connection[®] Network controllers using twisted pair wire.

Night Setback Mode - Adjusts setpoints, closes outdoor air dampers and operates the blower on demand, may be customized for special requirements.

Return Air Temperature Limit Control - Allows the user to override the demands based upon the return air temperature during either heating or cooling operation. Helps protect against abnormal operating conditions in the event of a room sensor or thermostat failure.

Safety Switch Input - Normally-closed digital input allows the IMC to respond to a external safety switch trip (phase protector, low voltage, etc.) shutting down unit operation.

Service Relay Output - Digital output can indicate a critical error has occurred to an external control device.

Smoke Alarm Mode - Control board has four choices for responding to a smoke alarm.

1 - Unit Off - unit will turn off.

2 - Positive Pressure - blower is energized, exhaust fan is de-energized, and the outdoor air dampers are opened.

3 - Negative Pressure - blower is energized, exhaust fan is energized, and the outdoor air dampers are closed.

4 - Purge - blower is energized, exhaust fan is energized, and the outdoor air dampers are opened.

Staging - Capable of up to 2 heat/3 cool staging with a third party DDC control system or thermostat and up to 2 heat /4 cool staging with room sensor and L Connection[®] network controller.

“Strike Three” Protection - Ends cooling or heating operation when any of the following occurs three times (adjustable) within a thermostat cycle: low pressure trip, high pressure trip, heat limit trip, or freeze-stat trip.

Gas Reheat - Control parameter option that allows simultaneous heating and cooling operation on gas units for controlling humidity for process air applications such as supermarkets. Field installed relative humidity sensor or humidity thermostat required.

Thermostat Bounce Delay - Protects compressor from short cycling when mechanical thermostat is used.

Warm-up Mode Delay - Adjustable time that the economizer dampers are kept in the closed position during morning warm-up.

On-Board User Interface - Push-button, DIP switches used with three-digit display readout for field adjusting of control parameters.

PC Interface - PC with optional Unit Controller software may be used to field or remotely adjust parameters, read alarms, or display unit status.

HUMIDITROL® HOT GAS REHEAT OPTION - 090H, 102H, 120H, 150S MODELS (R-22)

Factory installed option designed to control humidity (R-22 models only).

Provides dehumidification on demand using ASHRAE 90.1 recommended method for reheat with comfort conditioning humidity control.

In addition to a thermostat or room sensor used for conventional operation, a humidity sensor is required and must be located in the occupied space. Remote Mounted Humidity Sensor Kit (17M50) is required for field installation.

The humidity sensor provides input to the Integrated Modular Control which is used to control activation of the dehumidification operation.

Reheat controls are located in the compressor control section of the unit for easy access.

Benefits

Improves indoor air quality.

Helps prevent damage due to high humidity levels.

Improves comfort levels by reducing space humidity levels.

OPERATION

No Dehumidification Demand - The unit will operate conventionally whenever there is a demand for cooling or heating and no dehumidification demand.

Free cooling is only permitted when there is no demand for dehumidification.

Dehumidification Demand Only - The IMC is factory set at 60% relative humidity setpoint and can be adjusted at the IMC or with optional Unit Controller Software.

For L Connection® Network Control Panel (NCP) applications, the humidity setpoint can be adjusted at the NCP.

The unit will operate in the dehumidification mode until the relative humidity of the conditioned space is 3% below the setpoint.

Reheat operation will initiate on a dehumidification demand and does not require a cooling demand.

The reheat coil is sized to offset most of the 1st stage sensible cooling effect during reheat only operation. This reduces sensible cooling capacity and extends compressor run time to control humidity when the cooling load is low.

A solenoid valve diverts hot gas from the compressor to the reheat coil.

The cooled and dehumidified air from the evaporator is reheated as it passes through the reheat coil.

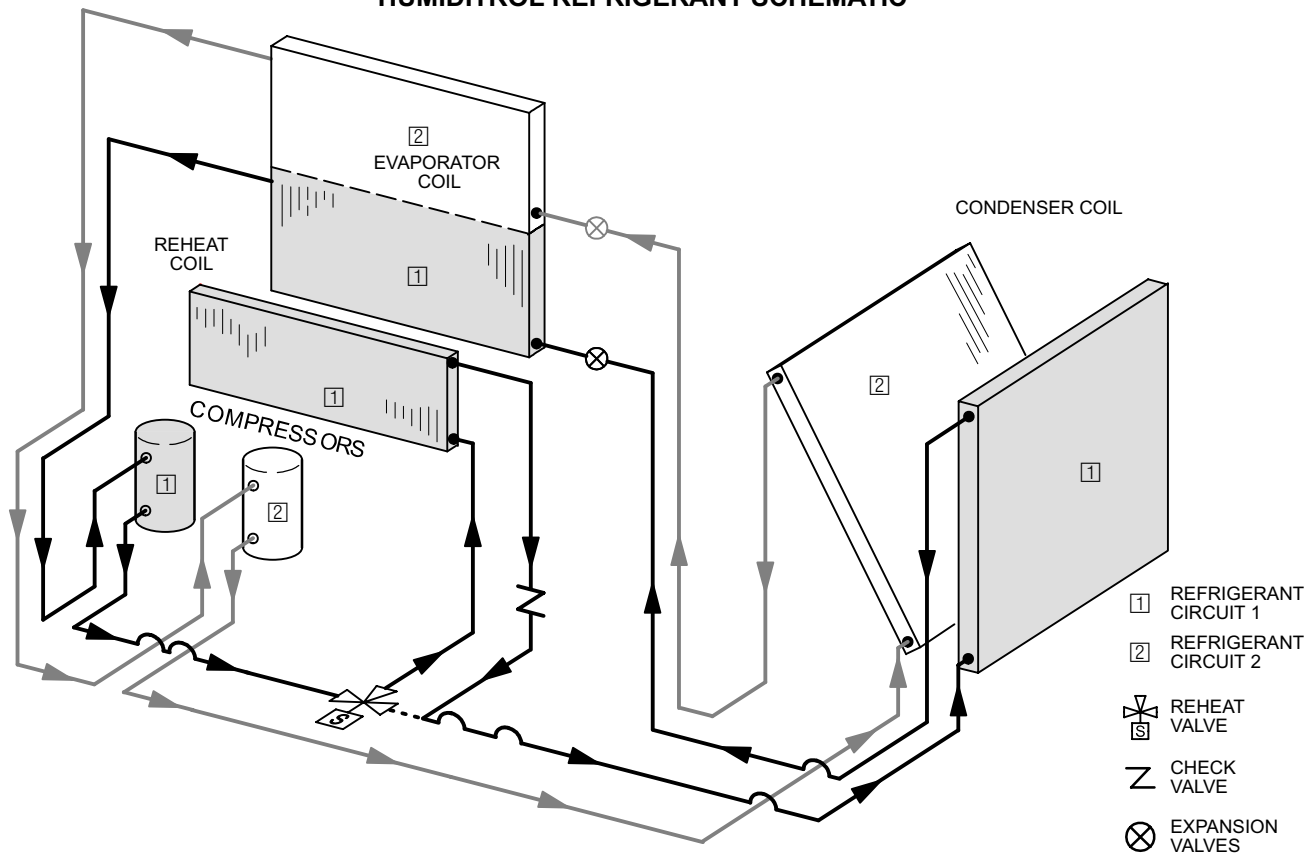
The de-superheated and partially condensed refrigerant continues to the outdoor condenser coil where condensing is completed. The unit will continue to operate in this mode until the dehumidification demand is satisfied.

A heating demand will terminate reheat operation.

Dehumidification and Cooling Demand (Thermostat/Room Sensor Application)

- If both a dehumidification and a first stage cooling demand occur, the system will operate compressor 1 in reheat and compressor 2 in cooling. A demand for 2nd stage cooling will terminate compressor 1 reheat operation and will then operate compressor 1 and compressor 2 in cooling until 2nd stage cooling demand is satisfied.

HUMIDITROL REFRIGERANT SCHEMATIC



REQUIRED SELECTIONS - Items MUST be specified when the unit is ordered

Cooling Capacity - Specify the nominal cooling capacity of the unit.

Cooling Efficiency - Specify either standard or high efficiency.

Voltage Choice - Specify when ordering base unit.

Air Flow Configuration - Specify horizontal or down-flow.

Gas Input - Order one:

84,500/130,000 Btuh (24.7/38.1 kW) Standard Heat Gas Input

117,000/180,000 Btuh (34.3/52.7 kW) Medium Heat Gas Input

156,000/240,000 Btuh (45.7/70.3 kW) High Heat Gas Input

Refrigerant Choice (LGC120S 10 Ton Only)

Specify R-22 or R410A refrigerant (this size unit only).

Supply Air Blower

Order Standard or High Efficiency Blower motor (See Blower Data Table for specifications).

Order one drive kit, see Drive Kit Specifications Table.

OPTIONAL ACCESSORIES

FACTORY INSTALLED ONLY - Items must be ordered with the unit for factory installation

ELECTRICAL

Circuit Breakers - HACR circuit breaker without power distribution lugs. Accessible from outside of unit, spring-loaded weatherproof cover furnished. Main power to the unit is field connected to the circuit breaker which allows all power to be shutoff for service. Circuit breaker is sized to the unit maximum overcurrent protection (MOCP) size.

CABINET

Corrosion Protection - Phenolic epoxy coating, applied to condenser coils (with painted base section) and evaporator coils (with painted base and painted blower housings), factory applied to either section or both sections.

FACTORY OR FIELD INSTALLED

These items can either be ordered with the unit for factory installation or ordered at any time and field installed

CONTROLS

Blower Proving Switch - Monitors blower operation, shuts down unit if blower fails.

Commercial Controls - Unit controllers and system controllers, see pages 23-28 for complete listing.

Dirty Filter Switch - Senses static pressure increase indicating dirty filter condition.

Smoke Detector - Photoelectric type, installed in supply air section or return air section or both sections.

COOLING

Condensate Drain Trap - field installed only, may be factory enclosed to ship with unit. Available in copper or PVC.

ELECTRICAL

Disconnect Switch - Accessible from outside of unit, spring loaded weatherproof cover furnished.

GFI Service Outlets (2) - 115v ground fault circuit interrupter (GFCI) type, field wired.

FILTERS

MERV 11 Filters - Disposable 2 inch (51 mm) pleated MERV 11 filters (Minimum Efficiency Reporting Value based on ASHRAE 52.2).

GAS HEAT

Fresh Air Tempering - Used in applications with high outside air requirements. The IMC 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, the sensor ships with the unit but must be field installed.

COOLING

Service Valves - Fully serviceable brass valves installed in discharge and liquid lines.

GAS HEAT

Stainless Steel Heat Exchanger - Required if mixed air temperature is below 45 °F (7 °C).

HUMIDITROL®

Humiditrol® Condenser Reheat Option (R-22 Model Only) -

Factory installed option designed to control humidity. Provides dehumidification on demand using ASHRAE 90.1 recommended method for comfort conditioning humidity control. Available for LGA090H, LGA102H, LGA120H and LGC150S only.

ECONOMIZER/OUTDOOR AIR/EXHAUST OPTIONS

Economizer - Parallel gear driven action recirculated air and outdoor air dampers, plug-in connections to unit, nylon bearings, neoprene seals, 24 volt fully modulating spring return motor, adjustable minimum damper position, damper assembly slides in unit, outdoor air hood must be ordered separately, optional down-flow barometric relief dampers available, choice of economizer controls, the IMC add-on board for economizer control is included with the economizer.

Enthalpy Control Kit - Differential - Two solid-state enthalpy sensors that allow the economizer control board to select between outdoor air or return air, whichever has lowest enthalpy.

Enthalpy Control Kit - Outdoor - Outdoor air enthalpy sensor that allows the economizer control board to open the dampers if the outdoor enthalpy is less than the setpoint of the board.

Down-Flow Barometric Relief Dampers - Allows relief of excess air, aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle, bird screen furnished, see Field Installed section (below) for damper hood

Outdoor Air Damper Section - Linked mechanical dampers, 0 to 25% (fixed) outdoor air adjustable, installs in unit, outdoor air hood must be ordered separately. Automatic model features fully modulating spring return damper motor with plug-in connection. Manual model features a slide damper.

Minimum mixed air temperature in heating mode 30°F (-1°C)

Maximum mixed air temperature in cooling mode: 90°F (32°C)

Outdoor Air Hood - Required with LAREMD Economizer, LAOAD and LAOADM Outdoor Air Damper Sections, two cleanable aluminum mesh fresh air filter furnished.

Power Exhaust Fan - Installs external to unit for down-flow applications only with economizer option, provides exhaust air pressure relief, interlocked to run when supply air blower is operating, fan runs when outdoor air dampers are 50% open (adjustable), motor is overload protected, steel cabinet and hood painted to match unit. Fan is 20 in. (508 mm) in diameter with 5 fan blades. Total air volume is 4200 cfm (1980 L/s) at 0 in. wg. (0 Pa). 1/3 hp (249 W) motor. 300 Watts total input.

OPTIONAL ACCESSORIES

FIELD INSTALLED ONLY - Not available for factory installation, must be ordered separately and field installed.

CABINET

Coil Guards - Painted, galvanized steel wire guards to protect outdoor coil. Not used with Hail Guards.

Grille Guards - Protects space between outdoor coils and main cabinet.

Hail Guards - Constructed of heavy gauge steel, painted to match cabinet, helps protect outdoor coils from hail damage. Not used with Coil Guards.

Horizontal Conversion Kit - Two piece duct cover in kit blocks off unit down flow supply air opening, horizontal return air opening panel (on unit) is moved to block off down flow return air opening for horizontal applications.

CEILING DIFFUSERS

Ceiling Diffusers - Aluminum grilles, large center grille, insulated diffuser box with flanges, hanging rings furnished, interior transition (even air flow), internally sealed (prevents recirculation), 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.

CONTROLS

Thermostat Control Systems - See page 29.

OUTDOOR AIR/EXHAUST OPTIONS

Down-Flow Barometric Relief Damper Hood - Field installed only.

Horizontal Barometric Relief Dampers - 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, two dampers per order number.

GAS HEAT

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

LPG/Propane Kit - conversion kit to field changeover units from Natural Gas to LPG/Propane.

Vertical Vent Extension Kit - for high snow areas or when vent is too close to fresh air intake.

HUMIDITROL®

Humidity Sensor Kit, Remote Mounted - Humidity sensor required with factory installed Humiditrol™ Option or Supermarket reheat field selectable option.

INDOOR AIR QUALITY

Indoor Air Quality (CO₂) Sensor - Monitors CO₂ levels, reports to IMC board which adjusts economizer dampers as needed.

ROOF CURB

Roof Curb, Down-Flow - Nailer strip furnished, mates to unit, US National Roofing Contractors Approved, shipped knocked down. Available in 14 inch (356 mm) and 24 inch (610 mm) heights.

OPTIONAL ACCESSORIES - SEE PAGE 6-7 FOR DETAILED DESCRIPTIONS

The catalog and part numbers that appear here are for ordering field installed accessories only.

Item	Factory	Field	7.5 ton 090	8.5 ton 102	10 ton 120	12.5 ton 150
Cabinet Accessories		⇒	88K51			
		⇒	86K29			
		⇒	88K24			
		⇒	LTHSDKGC10/15			
Ceiling Diffusers		⇒	RTD11-95 88 lbs. (40 kg)	RTD11-135 205 lbs. (93 kg)	RTD11-185 392 lbs. (178 kg)	
		⇒	FD11-95 75 lbs. (34 kg)	FD11-135 174 lbs. (79 kg)	FD11-185 289 lbs. (131 kg)	
		⇒	LASRT08/10 30 lbs (14 kg)	LASRT10/12 32 lbs (15 kg)	LASRT15 36 lbs. (16 kg)	
Controls		• ⇒	LTABPSK			
		• ⇒	See pages 23 - 29			
		• ⇒	LTADFSK			
		• ⇒	LTASASDK10/36			
		• ⇒	LTRASDK-10/30			
Cooling Accessories		• ⇒	LTACDKP03/36			
		• ⇒	LTACDKC03/36			
		•	Factory installed option			
Corrosion Protection		•	Factory installed option			
Economizer		• ⇒	LAREMD10/15 - 47 lbs. (21 kg)			
		• ⇒	LAOAH10/15 - 11 lbs. (5 kg) (2) 16 x 25 x 1 in. (406 x 635 x 25 mm)			
		• ⇒	LTADEK03/36			
		• ⇒	LTASEK03/36			
		•	See Intelligent Unit Controller Features, Page 4			
		•	See Intelligent Unit Controller Features, Page 4			
		•	See Intelligent Unit Controller Features, Page 4			
Barometric Relief		• ⇒	LAGED10/15 - 8 lbs. (4 kg)			
		• ⇒	LAGEH09/15			
		• ⇒	LAGEDH03/15 - 8 lbs. (4 kg)			
Outdoor Air Dampers		• ⇒	LAOADM10/15 - 31 lbs. (14 kg)			
		• ⇒	LAOAD10/15 - 26 lbs. (12 kg)			
		• ⇒	LAOAH10/15 - 11 lbs. (5 kg) (2) 16 x 25 x 1 in. (406 x 635 x 25 mm)			
		• ⇒	LAPEF10/15 - 28 lbs. (13 kg)			
Power Exhaust		• ⇒	Factory installed option			
		• ⇒	30M38			
		• ⇒	LTAGFIK10/15			
Filters		• ⇒	AFK-11 (18 x 24 x 2 order four per unit)			
Gas Heating Accessories		• ⇒	LTACA1K10/15			
		• ⇒	45L78			
		• ⇒	LTALPGK-130 - Standard Heat, LTALPGK-180 - Medium Heat LTALPGK-240 - High Heat			
		•	Factory installed option			
		• ⇒	LTAWEK10/15			
Humiditrol® Hot Gas Reheat Option 090H, 102H, 120H and 150S		•	Factory installed option			
		• ⇒	17M50			
Indoor Air Quality (CO₂) Sensors		• ⇒	LTIAQSDMK03/36			
		• ⇒	LTIAQSWDK03/36			
		• ⇒	LTIAQSWN03/36			
		• ⇒	LTIAQSN03/36			
		• ⇒	LTIAQSDMBN03/36			
		• ⇒	LTIAQABD03/36			
		• ⇒	LTIAQSHM03/36			
Down-Flow Roof Curbs		• ⇒	LARMF10/15-14 - 126 lbs. (57 kg)			
		• ⇒	LARMF10/15-24 - 174 lbs. (79 kg)			

SPECIFICATIONS - STANDARD EFFICIENCY COOLING

7.5 - 8.5 TON

General Data		Nominal Tonnage			7.5 Ton			8.5 Ton		
		Model No.			LGC090S2B			LGC102S2B		
		Efficiency Type			Standard			Standard		
Cooling Performance	Gross Cooling Capacity - Btuh (kW)	96,000 (28.1)			106,000 (31.1)					
	¹ Net Cooling Capacity - Btuh (kW)	93,000 (27.3)			102,000 (29.9)					
	ARI Rated Air Flow - cfm (L/s)	3000 (1415)			3400 (1605)					
	³ Sound Rating Number (dB)	88			88					
	Total Unit Power (kW)	9.0			9.9					
	¹ EER (Btuh/Watt)	10.3			10.3					
	² Integrated Part Load Value (Btuh/Watt)	10.8			10.4					
Refrigerant Charge Furnished R-22	Circuit 1	6 lbs. 0 oz. (2.72 kg)			6 lbs. 0 oz. (2.72 kg)					
	Circuit 2	6 lbs. 0 oz. (2.72 kg)			6 lbs. 0 oz. (2.72 kg)					
	Refrigerant Charge Furnished R-410A	Circuit 1	Not Available			Not Available				
		Circuit 2	Not Available			Not Available				
	Refrigerant Charge Furnished R-22 w/ Humiditrol Option	Circuit 1	Not Available			Not Available				
		Circuit 2	Not Available			Not Available				
Gas Heating Performance	Two-Stage Heat Input Type	Standard	Medium	High	Standard	Medium	High			
	Input - Btuh (kW) First Stage	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)			
	Second Stage	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)			
	Output - Btuh (kW) Second Stage	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)			
	CSA Thermal Efficiency	80.0%			80.0%					
	Gas Supply Connections	3/4 in. npt			3/4 in. npt					
	Recommended Gas Supply Pressure - Natural LPG/Propane	7 in. w.c. (1.7 kPa) 11 in. w.c. (2.7 kPa)			7 in. w.c. (1.7 kPa) 11 in. w.c. (2.7 kPa)					
Compressor Type (No.)		Scroll (2)			Scroll (2)					
Condenser Coil	Net face area - sq. ft. (m ²)	29.3 (2.72) total			29.3 (2.72) total					
	Tube diameter - in. (mm)	3/8 (9.5)			3/8 (9.5)					
	Number of rows	1			1					
	Fins per inch (m)	20 (787)			20 (787)					
Condenser Fans	Motor horsepower (W)	(2) 1/3 (249)			(2) 1/3 (249)					
	Motor rpm	1075			1075					
	Total Motor watts	700			700					
	Diameter - in. (mm) - no. of blades	(2) - 24 (610) - 3			(2) 24 (610) - 3					
	Total air volume - cfm (L/s)	8,000 (3775)			8,000 (3775)					
Evaporator Coil	Net face area - sq. ft. (m ²)	10.5 (0.98) total			10.5 (0.98) total					
	Tube diameter - in. (mm) - No. of rows	3/8 (9.5) - 3			3/8 (9.5) - 3					
	Fins per inch (m)	14 (551)			14 (551)					
	Drain connection - no. & size	(1) 1 in. NPT coupling			(1) 1 in. NPT coupling					
	Expansion device type	Balanced Port Thermostatic Expansion Valve, removeable power head								
⁴ Indoor Blower and Drive Selection	Nominal motor output	2 hp (1.5 kW), 3 hp (2.2 kW), 5 hp (3.7 kW)								
	Maximum usable motor output	2.3 hp (1.7 kW), 3.45 hp (2.6 kW), 5.75 hp (4.3 kW)								
	Motor - Drive kit	2 hp kit #1 - 680 - 925 rpm kit #3 - 895 - 1120 rpm			2 hp kit #1 - 680 - 925 rpm kit #3 - 895 - 1120 rpm					
	3 hp kit #1 - 680 - 925 rpm kit #2 - 680 - 925 rpm kit #3 - 895 - 1120 rpm kit #4 - 895 - 1120 rpm kit #5 - 1110 - 1395 rpm kit #6 - 1110 - 1395 rpm			3 hp kit #1 - 680 - 925 rpm kit #2 - 680 - 925 rpm kit #3 - 895 - 1120 rpm kit #4 - 895 - 1120 rpm kit #5 - 1110 - 1395 rpm kit #6 - 1110 - 1395 rpm						
	5 hp kit #4 - 895 - 1120 rpm kit #6 - 1110 - 1395 rpm			5 hp kit #4 - 895 - 1120 rpm kit #6 - 1110 - 1395 rpm						
	Wheel nominal diameter x width - in. (mm)	(1) 15 x 15 (381 x 381)			(1) 15 x 15 (381 x 381)					
Filters	Type of filter	Disposable, pleated MERV 7 (standard) or MERV 11 (optional)								
	Number and size - in. (mm)	(4) 18 x 24 x 2 (457 x 610 x 51)								
Electrical characteristics		208/230V, 460V or 575V - 60 hertz - 3 phase								

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.
¹ Certified in accordance with the ULE certification program, which is based on ARI Standard 340/360, 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air; minimum external duct static pressure.
² Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.
³ Sound Rating Number rated in accordance with test conditions included in ARI Standard 270.
⁴ 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 by Lennox 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.

SPECIFICATIONS - STANDARD EFFICIENCY COOLING

10 - 12.5 TON

General Data		10 Ton			12.5 ton			
Nominal Tonnage		LGC120S2B (R-22)			LGC150S2B			
Model No.		LGC120S4B (R-410A)						
Efficiency Type		Standard			Standard			
Cooling Performance	Gross Cooling Capacity - Btuh (kW)	126,000 (36.6) (R-22) 128,000 (37.5) (R-410A)			145,000 (42.5)			
	¹ Net Cooling Capacity - Btuh (kW)	120,000 (35.2) (R-22) 122,000 (35.7) (R-410A)			138,000 (40.4)			
	ARI Rated Air Flow - cfm (L/s)	3800 (1795) (R-22) 3600 (1700) (R-410A)			4250 (2005)			
	³ Sound Rating Number (dB)	88			88			
	Total Unit Power (kW)	11.6 (R-22) 11.8 (R-410A)			14.5			
	¹ EER (Btuh/Watt) ² Integrated Part Load Value (Btuh/Watt)	10.3 10.5 (R-22) 11.3 (R-410A)			9.5 9.2			
Refrigerant Charge Furnished R-22	Circuit 1	10 lbs. 0 oz. (4.53 kg)			14 lbs. 0 oz. (6.35 kg)			
	Circuit 2	10 lbs. 0 oz. (4.53 kg)			14 lbs. 0 oz. (6.35 kg)			
	Refrigerant Charge Furnished R-410A	Circuit 1	11 lbs. 8 oz. (5.22 kg)			Not Available		
		Circuit 2	11 lbs. 8 oz. (5.22 kg)			Not Available		
	Refrigerant Charge Furnished R-22 w/ Humiditrol Option	Circuit 1	Not Available			14 lbs. 8 oz. (6.58 kg)		
		Circuit 2	Not Available			14 lbs. 0 oz. (6.35 kg)		
Gas Heating Performance	Two-Stage Heat Input Type	Standard	Medium	High	Standard	Medium	High	
	Input - Btuh (kW) First Stage	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)	
		130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	
	Output - Btuh (kW) Second Stage	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)	
		CSA Thermal Efficiency	80.0%			80.0%		
	Gas Supply Connections	3/4 in. NPT			3/4 in. NPT			
Recommended Gas Supply Pressure - Natural LPG/Propane	7 in. w.c. (1.7 kPa)			7 in. w.c. (1.7 kPa)				
	11 in. w.c. (2.7 kPa)			11 in. w.c. (2.7 kPa)				
Compressor Type (No.)		Scroll (2)			Scroll (2)			
Condenser Coil	Net face area - sq. ft. (m ²)	29.3 (2.72) total			26.6 (2.47) total			
	Tube diameter - in. (mm)	3/8 (9.5)			3/8 (9.5)			
	Number of rows	2			3			
	Fins per inch (m)	20 (787)			20 (787)			
Condenser Fans	Motor horsepower (W)	(2) 1/3 (249)			(2) 1/2 (372)			
	Motor rpm	1075			1075			
	Total Motor watts	700			1150			
	Diameter - in. (mm) - no. of blades	(2) - 24 (610) - 3			(2) 24 (610) - 3			
	Total air volume - cfm (L/s)	8,000 (3775)			9,000 (4245)			
Evaporator Coil	Net face area - sq. ft. (m ²)	10.5 (0.98) total			10.5 (0.98) total			
	Tube diameter - in. (mm) - No. of rows	3/8 (9.5) - 4			3/8 (9.5) - 4			
	Fins per inch (m)	14 (551)			14 (551)			
	Drain connection - no. & size	(1) 1 in. NPT coupling			(1) 1 in. NPT coupling			
	Expansion device type	Balanced Port Thermostatic Expansion Valve, removeable power head						
⁴ Indoor Blower and Drive Selection	Nominal motor output	2 hp (1.5 kW), 3 hp (2.2 kW), 5 hp (3.7 kW)						
	Maximum usable motor output	2.3 hp (1.7 kW), 3.45 hp (2.6 kW), 5.75 hp (4.3 kW)						
	Motor - Drive kit	2 hp kit #1 - 680 - 925 rpm kit #3 - 895 - 1120 rpm			2 hp kit #1 - 680 - 925 rpm kit #3 - 895 - 1120 rpm			
		3 hp kit #1 - 680 - 925 rpm kit #2 - 680 - 925 rpm kit #3 - 895 - 1120 rpm kit #4 - 895 - 1120 rpm kit #5 - 1110 - 1395 rpm kit #6 - 1110 - 1395 rpm			3 hp kit #1 - 680 - 925 rpm kit #2 - 680 - 925 rpm kit #3 - 895 - 1120 rpm kit #4 - 895 - 1120 rpm kit #5 - 1110 - 1395 rpm kit #6 - 1110 - 1395 rpm			
Wheel nominal diameter x width - in. (mm)	(1) 15 x 15 (381 x 381)			(1) 15 x 15 (381 x 381)				
Filters	Type of filter	Disposable, pleated MERV 7 (standard) or MERV 11 (optional)						
	Number and size - in. (mm)	(4) 18 x 24 x 2 (457 x 610 x 51)			(4) 18 x 24 x 2 (457 x 610 x 51)			
Electrical characteristics		208/230V, 460V or 575V - 60 hertz - 3 phase						

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

¹ Certified in accordance with the ULE certification program, which is based on ARI Standard 340/360, 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air; minimum external duct static pressure.

² Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.

³ Sound Rating Number rated in accordance with test conditions included in ARI Standard 270.

⁴ 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 by Lennox 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.

SPECIFICATIONS - HIGH EFFICIENCY COOLING

7.5 - 8.5 TON

General Data		Nominal Tonnage	7.5 Ton			8.5 Ton		
		Model No.	LGA090H2B			LGA102H2B		
		Cooling Efficiency Type	High			High		
Cooling Performance	Gross Cooling Capacity - Btuh (kW)		93,800 (27.5)			105,000 (30.8)		
	¹ Net Cooling Capacity - Btuh (kW)		90,000 (26.4)			101,000 (29.6)		
	ARI Rated Air Flow - cfm (L/s)		2900 (1370)			3200 (1510)		
	³ Sound Rating Number (dB)		88			88		
	Total Unit Power (kW)		8.0			9.0		
	¹ EER (Btuh/Watt)		11.3			11.2		
	² Integrated Part Load Value (Btuh/Watt)		12.0			11.7		
	Refrigerant Charge Furnished (R-22)	Circuit 1	10 lbs. 0 oz. (4.54 kg)			10 lbs. 8 oz. (4.76 kg)		
		Circuit 2	10 lbs. 0 oz. (4.54 kg)			10 lbs. 8 oz. (4.76 kg)		
	Refrigerant Charge Furnished w/ Humiditrol Option (R-22)	Circuit 1	12 lbs. 0 oz. (5.44 kg)			12 lbs. 0 oz. (5.44 kg)		
		Circuit 2	10 lbs. 0 oz. (4.54 kg)			10 lbs. 8 oz. (4.76 kg)		
Gas Heating Performance	Two Stage Gas Heat Input Type	Standard	Medium	High	Standard	Medium	High	
	Input - Btuh (kW) First Stage	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)	
	Second Stage	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	
	Output - Btuh (kW) Second Stage	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)	
	CSA Thermal Efficiency	80.0%			80.0%			
	Gas Supply Connections	3/4 in. npt			3/4 in. npt			
	Recommended Gas Supply Pressure Natural LPG/Propane	7 in. w.c. (1.7 kPa) 11 in. w.c. (2.7 kPa)			7 in. w.c. (1.7 kPa) 11 in. w.c. (2.7 kPa)			
Compressor Type (No.)		Scroll (2)			Scroll (2)			
Condenser Coil	Net face area - sq. ft. (m ²)	29.3 (2.72) total			29.3 (2.72) total			
	Tube diameter - in. (mm)	3/8 (9.5)			3/8 (9.5)			
	Number of rows	2			2			
	Fins per inch (m)	20 (787)			20 (787)			
Condenser Fans	Motor horsepower (W)	(2) 1/3 (249)			(2) 1/3 (249)			
	Motor rpm	1075			1075			
	Total Motor watts	700			700			
	Diameter - in. (mm) - number of blades	(2) 24 (610) - 3			(2) 24 (610) - 3			
	Total Air volume - cfm (L/s)	8,000 (3775)			8,000 (3775)			
Evaporator Coil	Net face area - sq. ft. (m ²)	10.5 (0.98) total			10.5 (0.98) total			
	Tube diameter - in. (mm)	3/8 (9.5)			3/8 (9.5)			
	Number of rows	3			3			
	Fins per inch (m)	14 (551)			14 (551)			
	Condensate Drain - number and size	(1) 1 in. NPT coupling			(1) 1 in. NPT coupling			
	Expansion device type	Balanced Port Thermostatic Expansion Valve, removeable power head						
⁴ Indoor Blower and Drive Selection	Belt Drive - Nominal motor output	2 hp (1.5 kW)			2 hp (1.5 kW)			
		3 hp (2.2 kW)			3 hp (2.2 kW)			
		5 hp (3.7 kW)			5 hp (3.7 kW)			
	Maximum usable output (US Only)	2.3 hp (1.7 kW)			2.3 hp (1.7 kW)			
		3.45 hp (2.6 kW)			3.45 hp (2.6 kW)			
		5.75 hp (4.3 kW)			5.75 hp (4.3 kW)			
	Motor - Drive kit	2 hp			2 hp			
		kit #1 - 680 - 925 rpm			kit #1 - 680 - 925 rpm			
		kit #3 - 895 - 1120 rpm			kit #3 - 895 - 1120 rpm			
		3 hp			3 hp			
kit #1 - 680 - 925 rpm			kit #1 - 680 - 925 rpm					
kit #2 - 680 - 925 rpm			kit #2 - 680 - 925 rpm					
kit #3 - 895 - 1120 rpm			kit #3 - 895 - 1120 rpm					
kit #4 - 895 - 1120 rpm			kit #4 - 895 - 1120 rpm					
kit #5 - 1110 - 1395 rpm			kit #5 - 1110 - 1395 rpm					
kit #6 - 1110 - 1395 rpm			kit #6 - 1110 - 1395 rpm					
5 hp			5 hp					
kit #4 - 895 - 1120 rpm			kit #4 - 895 - 1120 rpm					
kit #6 - 1110 - 1395 rpm			kit #6 - 1110 - 1395 rpm					
	Wheel nominal diameter x width - in. (mm)	(1) 15 x 15 (381 x 381)			(1) 15 x 15 (381 x 381)			
Filters	Type of filter	Disposable, pleated MERV 7 (standard) or MERV 11 (optional)						
	Number and size - in. (mm)	(4) 18 x 24 x 2 (457 x 610 x 51)						
Electrical characteristics		208/230V, 460V or 575V - 60 hertz - 3 phase						

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

¹ Certified in accordance with the ULE certification program, which is based on ARI Standard 340/360, 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air; minimum external duct static pressure.

² Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.

³ Sound Rating Number rated in accordance with test conditions included in ARI Standard 270.

⁴ 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 by Lennox 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.

SPECIFICATIONS - HIGH EFFICIENCY COOLING

10 TON

General Data	Nominal Tonnage Model No. Cooling Efficiency Type	10 Ton LGA120H2B High			
Cooling Performance	Gross Cooling Capacity - Btuh (kW)	125,000 (36.6)			
	¹ Net Cooling Capacity - Btuh (kW)	120,000 (35.2)			
	ARI Rated Air Flow - cfm (L/s)	3600 (1700)			
	³ Sound Rating Number (dB)	88			
	Total Unit Power (kW)	10.9			
	¹ EER (Btuh/Watt)	11.0			
	² Integrated Part Load Value (Btuh/Watt)	11.8			
Gas Heating Performance	Refrigerant Charge Furnished (R-22)	Circuit 1	11 lbs. 8 oz. (5.22 kg)		
		Circuit 2	11 lbs. 8 oz. (5.22 kg)		
	Refrigerant Charge Furnished w/ Humiditrol Option (R-22)	Circuit 1	13 lbs. 8 oz. (6.12 kg)		
		Circuit 2	11 lbs. 8 oz. (5.23 kg)		
	Two-Stage Gas Heat Input Type	Standard	Medium	High	
	Input - Btuh (kW)	First Stage	84,500 (24.8)	117,000 (34.3)	156,000 (45.7)
	Second Stage	130,000 (38.1)	180,000 (52.7)	240,000 (70.3)	
	Output - Btuh (kW)	Second Stage	104,000 (30.5)	144,000 (42.2)	192,000 (56.3)
	CSA Thermal Efficiency	80.0%			
	Gas Supply Connections	3/4 in. NPT			
	Recommended Gas Supply Pressure	Natural 7 in. w.c. (1.7 kPa)			
		LPG/Propane 11 in. w.c. (2.7 kPa)			
Compressor Type (No.)		Scroll (2)			
Condenser Coil	Net face area - sq. ft. (m ²)	29.3 (2.72) total			
	Tube diameter - in. (mm)	3/8 (9.5)			
	Number of rows	2			
	Fins per inch (m)	20 (787)			
Condenser Fans	Motor horsepower (W)	(2) 1/3 (249)			
	Motor rpm	1075			
	Total Motor watts	700			
	Diameter - in. (mm) - number of blades	(2) 24 (610) - 3			
	Total Air volume - cfm (L/s)	8,000 (3775)			
Evaporator Coil	Net face area - sq. ft. (m ²)	10.5 (0.98) total			
	Tube diameter - in. (mm)	3/8 (9.5)			
	Number of rows	4			
	Fins per inch (m)	14 (551)			
	Condensate Drain - number and size	(1) 1 in. NPT coupling			
	Expansion device type	Balanced Port Thermostatic Expansion Valve, removeable power head			
⁴ Indoor Blower and Drive Selection	Belt Drive - Nominal motor output	2 hp (1.5 kW)			
		3 hp (2.2 kW)			
		5 hp (3.7 kW)			
	Maximum usable output (US Only)	2.3 hp (1.7 kW)			
		3.45 hp (2.6 kW)			
		5.75 hp (4.3 kW)			
	Motor - Drive kit	2 hp			
		kit #1 - 680 - 925 rpm			
		kit #3 - 895 - 1120 rpm			
		3 hp			
kit #1 - 680 - 925 rpm					
kit #2 - 680 - 925 rpm					
kit #3 - 895 - 1120 rpm					
kit #4 - 895 - 1120 rpm					
kit #5 - 1110 - 1395 rpm					
kit #6 - 1110 - 1395 rpm					
5 hp					
kit #4 - 895 - 1120 rpm					
kit #6 - 1110 - 1395 rpm					
	Wheel nominal diameter x width - in. (mm)	(1) 15 x 15 (381 x 381)			
Filters	Type of filter	Disposable, pleated MERV 7 (standard) or MERV 11 (optional)			
	Number and size - in. (mm)	(4) 18 x 24 x 2 (457 x 610 x 51)			
Electrical characteristics		208/230V, 460V or 575V - 60 hertz - 3 phase			

NOTE - Net capacity includes evaporator blower motor heat deduction. Gross capacity does not include evaporator blower motor heat deduction.
¹ Certified in accordance with the ULE certification program, which is based on ARI Standard 340/360, 95°F (35°C) outdoor air temperature and 80°F (27°C) db/67°F (19°C) wb entering evaporator air; minimum external duct static pressure.
² Integrated Part Load Value rated at 80°F (27°C) outdoor air temperature.
³ Sound Rating Number rated in accordance with test conditions included in ARI Standard 270.
⁴ 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 by Lennox 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.

BLOWER DATA

BELT DRIVE BLOWER - BASE UNIT

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY (NO HEAT SECTION) WITH DRY INDOOR COIL AND 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 (duct resistance, diffuser, etc.)

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

See below for blower motors and drives. See page 18 for wet coil and option/accessory air resistance data.

BOLD INDICATES FIELD FURNISHED DRIVE.

Air Volume cfm (L/s)	Total Static Pressure - in. w.g. (Pa)													
	.20 (50) RPM BHP (kW)	.40 (100) RPM BHP (kW)	.60 (150) RPM BHP (kW)	.80 (200) RPM BHP (kW)	1.00 (250) RPM BHP (kW)	1.20 (300) RPM BHP (kW)	1.40 (350) RPM BHP (kW)	1.60 (400) RPM BHP (kW)	1.80 (450) RPM BHP (kW)	2.00 (495) RPM BHP (kW)	2.20 (545) RPM BHP (kW)	2.40 (595) RPM BHP (kW)	2.60 (645) RPM BHP (kW)	
2250 (1060)	455 0.30 (0.22)	555 0.45 (0.34)	640 0.60 (0.45)	720 0.80 (0.60)	790 1.00 (0.75)	855 1.20 (0.90)	915 1.40 (1.04)	975 1.60 (1.19)	1030 1.85 (1.38)	1080 2.05 (1.53)	1130 2.30 (1.72)	1175 2.55 (1.90)	1220 2.80 (2.09)	
2500 (1180)	475 0.40 (0.30)	575 0.55 (0.41)	660 0.70 (0.52)	735 0.90 (0.67)	805 1.10 (0.82)	870 1.30 (0.97)	930 1.55 (1.16)	985 1.75 (1.31)	1040 2.00 (1.49)	1090 2.25 (1.68)	1140 2.50 (1.87)	1185 2.75 (2.05)	1230 3.00 (2.24)	
2750 (1300)	495 0.45 (0.34)	595 0.65 (0.48)	675 0.85 (0.63)	750 1.05 (0.78)	820 1.25 (0.93)	885 1.45 (1.08)	940 1.70 (1.27)	995 1.90 (1.42)	1050 2.20 (1.64)	1100 2.45 (1.83)	1145 2.65 (1.98)	1195 2.95 (2.20)	1240 3.25 (2.42)	
3000 (1415)	525 0.55 (0.41)	615 0.75 (0.56)	695 0.95 (0.71)	770 1.20 (0.90)	835 1.40 (1.04)	895 1.60 (1.19)	955 1.85 (1.38)	1010 2.10 (1.57)	1060 2.35 (1.75)	1110 2.65 (1.98)	1160 2.90 (2.16)	1205 3.20 (2.39)	1250 3.45 (2.57)	
3250 (1535)	550 0.65 (0.48)	640 0.90 (0.67)	715 1.10 (0.82)	790 1.35 (1.01)	855 1.60 (1.19)	915 1.80 (1.34)	970 2.05 (1.53)	1025 2.35 (1.75)	1075 2.60 (1.94)	1125 2.85 (2.13)	1170 3.15 (2.35)	1215 3.40 (2.54)	1260 3.70 (2.76)	
3500 (1650)	580 0.80 (0.60)	665 1.05 (0.78)	740 1.25 (0.93)	810 1.50 (1.12)	870 1.75 (1.31)	930 2.00 (1.49)	985 2.25 (1.68)	1040 2.55 (1.90)	1090 2.85 (2.13)	1135 3.10 (2.31)	1185 3.40 (2.54)	1230 3.70 (2.76)	1270 4.00 (2.98)	
3750 (1770)	605 0.95 (0.71)	690 1.20 (0.90)	760 1.45 (1.08)	830 1.70 (1.27)	890 1.95 (1.45)	950 2.25 (1.68)	1005 2.50 (1.87)	1055 2.80 (2.09)	1105 3.10 (2.31)	1150 3.35 (2.50)	1195 3.65 (2.72)	1240 3.95 (2.95)	1285 4.30 (3.21)	
4000 (1890)	635 1.10 (0.82)	715 1.40 (1.04)	785 1.65 (1.23)	850 1.90 (1.42)	910 2.20 (1.64)	965 2.45 (1.83)	1020 2.75 (2.05)	1070 3.05 (2.28)	1120 3.35 (2.50)	1165 3.65 (2.72)	1210 3.95 (2.95)	1255 4.30 (3.21)	1295 4.60 (3.43)	
4250 (2005)	665 1.30 (0.97)	740 1.60 (1.19)	810 1.85 (1.38)	870 2.15 (1.60)	930 2.45 (1.83)	985 2.75 (2.05)	1040 3.05 (2.28)	1090 3.35 (2.50)	1135 3.65 (2.72)	1185 4.00 (2.98)	1225 4.30 (3.21)	1270 4.65 (3.47)	1310 4.95 (3.69)	
4500 (2125)	695 1.50 (1.12)	770 1.80 (1.34)	835 2.10 (1.57)	895 2.40 (1.79)	955 2.70 (2.01)	1005 3.00 (2.24)	1060 3.35 (2.50)	1105 3.65 (2.72)	1155 4.00 (2.98)	1200 4.30 (3.21)	1245 4.65 (3.47)	1285 5.00 (3.73)	1325 5.30 (3.95)	
4750 (2240)	725 1.75 (1.31)	795 2.05 (1.53)	860 2.40 (1.79)	920 2.70 (2.01)	975 3.00 (2.24)	1030 3.35 (2.50)	1080 3.65 (2.72)	1125 3.95 (2.95)	1175 4.35 (3.25)	1215 4.65 (3.47)	1260 5.00 (3.73)	1300 5.35 (3.99)	1340 5.70 (4.25)	
5000 (2360)	760 2.05 (1.53)	825 2.35 (1.75)	885 2.65 (1.98)	945 3.00 (2.24)	1000 3.35 (2.50)	1050 3.65 (2.72)	1100 4.00 (2.98)	1145 4.35 (3.25)	1190 4.70 (3.51)	1235 5.05 (3.77)	1280 5.45 (4.07)	---	---	
5250 (2475)	790 2.30 (1.72)	855 2.65 (1.98)	910 2.95 (2.20)	970 3.35 (2.50)	1020 3.65 (2.72)	1070 4.00 (2.98)	1120 4.35 (3.25)	1165 4.70 (3.51)	1210 5.10 (3.80)	1255 5.45 (4.07)	---	---	---	
5500 (2595)	820 2.60 (1.94)	880 2.95 (2.20)	940 3.30 (2.46)	995 3.70 (2.76)	1045 4.05 (3.02)	1095 4.40 (3.28)	1145 4.80 (3.58)	1190 5.15 (3.84)	1230 5.50 (4.10)	---	---	---	---	
5750 (2715)	850 2.95 (2.20)	910 3.30 (2.46)	965 3.70 (2.76)	1020 4.05 (3.02)	1070 4.45 (3.32)	1120 4.80 (3.58)	1165 5.20 (3.88)	1210 5.60 (4.18)	---	---	---	---	---	
6000 (2830)	885 3.35 (2.50)	940 3.70 (2.76)	995 4.10 (3.06)	1045 4.45 (3.32)	1095 4.85 (3.62)	1145 5.25 (3.92)	1190 5.65 (4.21)	---	---	---	---	---	---	

FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Model No.	Motor Efficiency	Motor Outputs				RPM Range					
		Nominal hp	Maximum hp	Nominal kW	Maximum kW	Drive 1	Drive 2	Drive 3	Drive 4	Drive 5	Drive 6
090 102 120 150	Standard or High	2	2.3	1.5	1.7	680 - 925	---	895 - 1120	---	---	---
	Standard	3	3.45	2.2	2.6	680 - 925	---	895 - 1120	---	1110 - 1395	---
	High	3	3.45	2.2	2.6	---	680 - 925	---	895 - 1120	---	1110 - 1395
	Standard or High	5	5.75	3.7	4.3	---	---	---	895 - 1120	---	1110 - 1395

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 by Lennox 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.

BLOWER DATA

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume		Wet Indoor Coil				Humiditrol Condenser Reheat Coil - 090H, 102H 120H, 150S		Gas Heat Exchanger						Economizer 090, 102, 120, 150		MERV 11 Filter	
		090, 102		120S, 120H,150S		in. w.g.	Pa	Standard Heat		Medium Heat		High Heat		in. w.g.	Pa	in. w.g.	Pa
cfm	L/s	in. w.g.	Pa	in. w.g.	Pa			in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa				
2250	1060	.06	15	.10	25	.02	5	.05	12	.07	17	.09	22	.035	9	.01	2
2500	1180	.08	20	.12	30	.03	7	.05	12	.09	22	.11	27	.04	10	.01	2
2750	1325	.09	22	.14	35	.03	7	.06	15	.10	25	.13	32	.045	11	.02	5
3000	1420	.10	25	.16	40	.03	7	.07	17	.12	30	.16	40	.05	12	.02	5
3250	1535	.11	27	.19	47	.04	10	.08	20	.15	37	.19	47	.06	15	.02	5
3500	1650	.13	32	.21	52	.04	10	.09	22	.17	42	.22	55	.07	17	.03	7
3750	1770	.14	35	.23	57	.05	12	.10	25	.20	50	.26	65	.075	19	.03	7
4000	1890	.16	40	.26	65	.05	12	.11	27	.22	55	.30	75	.08	20	.04	10
4250	2005	.17	42	.28	70	.06	15	.12	30	.25	62	.34	85	.09	22	.04	10
4500	2125	.18	45	.31	77	.07	17	.13	32	.28	70	.38	94	.10	25	.04	10
4750	2240	.20	50	.33	82	.07	17	.14	35	.31	77	.42	104	.11	27	.05	12
5000	2360	.22	55	.36	90	.08	20	.16	40	.35	87	.47	117	.12	30	.06	15
5250	2475	.24	60	.39	97	.08	20	.18	45	.38	94	.52	129	.13	32	.06	15
5500	2595	.26	65	.42	104	.09	22	.20	50	.42	104	.57	142	.14	35	.07	17
5750	2715	.28	70	.45	112	.10	25	.22	55	.46	114	.62	154	.15	37	.07	17
6000	2830	.30	75	.48	119	.10	25	.24	60	.50	124	.68	169	.16	40	.08	20

AIR RESISTANCE - CEILING DIFFUSERS

Unit Size	Air Volume		RTD11 Step-Down Diffuser						FD11 Flush Diffuser	
			2 Ends Open		1 Side, 2 Ends Open		All Ends & Sides Open		in. w.g.	Pa
cfm	L/s	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.		
090 Models	2400	1135	0.21	52	0.18	45	0.15	37	0.14	35
	2600	1225	0.24	60	0.21	52	0.18	45	0.17	42
	2800	1320	0.27	67	0.24	60	0.21	52	0.20	50
	3000	1415	0.32	80	0.29	72	0.25	62	0.25	62
	3200	1510	0.41	102	0.37	92	0.32	80	0.31	77
	3400	1605	0.50	124	0.45	112	0.39	97	0.37	92
	3600	1700	0.61	152	0.54	134	0.48	119	0.44	109
3800	1795	0.73	182	0.63	157	0.57	142	0.51	127	
102 & 120 Models	3600	1700	0.36	90	0.28	70	0.23	57	0.15	37
	3800	1795	0.40	99	0.32	80	0.26	65	0.18	45
	4000	1890	0.44	109	0.36	90	0.29	72	0.21	52
	4200	1980	0.49	122	0.40	99	0.33	82	0.24	60
	4400	2075	0.54	134	0.44	109	0.37	92	0.27	67
	4600	2170	0.60	149	0.49	122	0.42	104	0.31	77
	4800	2265	0.65	162	0.53	132	0.46	114	0.35	87
	5000	2360	0.69	172	0.58	144	0.50	124	0.39	97
5200	2455	0.75	186	0.62	154	0.54	134	0.43	107	
150 Models	4200	1980	0.22	55	0.19	47	0.16	40	0.10	25
	4400	2075	0.28	70	0.24	60	0.20	50	0.12	30
	4600	2170	0.34	85	0.29	72	0.24	60	0.15	37
	4800	2265	0.40	99	0.34	85	0.29	72	0.19	47
	5000	2360	0.46	114	0.39	97	0.34	85	0.23	57
	5200	2455	0.52	129	0.44	109	0.39	97	0.27	67
	5400	2550	0.58	144	0.49	122	0.43	107	0.31	77
	5600	2645	0.64	159	0.54	134	0.47	117	0.35	87
5800	2735	0.70	174	0.59	147	0.51	127	0.39	97	

BLOWER DATA

CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume		¹ Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	cfm	L/s	ft.	m	ft.	m
090	2600	1225	24 - 29	7 - 9	19 - 24	6 - 7
	2800	1320	25 - 30	8 - 9	20 - 28	6 - 9
	3000	1415	27 - 33	8 - 10	21 - 29	6 - 9
	3200	1510	28 - 35	9 - 11	22 - 29	7 - 9
	3400	1605	30 - 37	9 - 11	22 - 30	7 - 9
102 120	3600	1700	25 - 33	8 - 10	22 - 29	7 - 9
	3800	1795	27 - 35	8 - 11	22 - 30	7 - 9
	4000	1885	29 - 37	9 - 11	24 - 33	7 - 10
	4200	1980	32 - 40	10 - 12	26 - 35	8 - 11
	4400	2075	34 - 42	10 - 13	28 - 37	9 - 11
150	5600	2645	39 - 49	12 - 15	28 - 37	9 - 11
	5800	2740	42 - 51	13 - 16	29 - 38	9 - 12
	6000	2830	44 - 54	13 - 17	40 - 50	12 - 15
	6200	2925	45 - 55	14 - 17	42 - 51	13 - 16
	6400	3020	46 - 55	14 - 17	43 - 52	13 - 16
	6600	3115	47 - 56	14 - 17	45 - 56	14 - 17

¹ Throw is the horizontal or vertical distance an air stream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. (15 m) per minute. Four sides open.

POWER EXHAUST FANS PERFORMANCE

Return Air System Static Pressure		Air Volume Exhausted	
in. w.g.	Pa	cfm	L/s
0	0	4200	1980
0.05	12	3970	1875
0.10	25	3750	1770
0.15	37	3520	1660
0.20	50	3300	1560
0.25	62	3080	1455
0.30	75	2860	1350
0.35	87	2640	1245

HIGH ALTITUDE DERATE

Units may be installed at altitudes up to 2000 feet (610 m) above sea level without any modification. At altitudes above 2000 feet (610 m), units must be derated to match gas manifold pressures shown in table below. NOTE - This is the only permissible derate for these units.

Altitude		Gas Manifold Pressure			
		Natural Gas		LPG/Propane	
ft.	m	in. w.g.	kPa	in. w.g.	kPa
2001 - 3000	610 - 915	3.6	0.90	10.2	2.54
3001 - 4000	915 - 1220	3.5	0.87	9.9	2.46
4001 - 5000	1220 - 1525	3.4	0.85	9.6	2.39
5001 - 6000	1525 - 1830	3.3	0.82	9.4	2.34
6001 - 7000	1830 - 2135	3.2	0.80	9.1	2.26
7001 - 8000	2135 - 2440	3.1	0.77	8.8	2.19
8001 - 10,000	2440 - 3048	Contact Technical Support			

OUTDOOR SOUND DATA

Unit Model No.	Octave Band Sound Power Levels dB, re 10 ⁻¹² Watts							¹ Sound Rating Number (dB)
	Center Frequency - HZ							
	125	250	500	1000	2000	4000	8000	
090, 102, and 120	92	88	87	83	78	72	67	88
150	93	89	88	84	78	73	67	88

¹ Tested according to ARI Standard 270-95 test conditions and ANSI Standard S1.32-1981.

ELECTRICAL DATA

7.5 TON STANDARD / HIGH EFFICIENCY

Model No.		LGC090S									LGA090H								
Line voltage data - 60 Hz - 3 phase		208/230V			460V			575V			208/230V			460V			575V		
Compressors (2)	Rated load amps - each (total)	12.8 (25.6)			6.4 (12.8)			5.1 (10.2)			12.4 (24.9)			6.4 (12.8)			4.8 (9.6)		
	Locked rotor amps - each (total)	91 (182)			46 (92)			37 (74)			88 (176)			44 (88)			34 (68)		
Condenser Fan Motor	Number of motors	2			2			2			2			2			2		
	Full load amps - each (total)	2.4 (4.8)			1.3 (2.6)			1.0 (2.0)			2.4 (4.8)			1.3 (2.6)			1.0 (2.0)		
	Locked rotor amps - each (total)	4.7 (9.4)			2.4 (4.8)			1.9 (3.8)			4.7 (9.4)			2.4 (4.8)			1.9 (3.8)		
Evaporator Blower Motor	Motor Output - hp	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5
	kW	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7
	Full load amps	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1
	Locked rotor amps	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6
¹ Maximum Overcurrent Protection (amps)	With Exhaust Fan	50	50	70	25	25	30	20	20	25	50	50	60	25	25	30	20	20	25
	Less Exhaust Fan	50	50	60	25	25	30	20	20	25	50	50	60	25	25	30	20	20	25
² Minimum Circuit Ampacity	With Exhaust Fan	44	47	53	22	24	26	18	19	21	43	46	52	22	24	26	17	18	20
	Less Exhaust Fan	42	45	51	21	22	25	17	18	20	41	44	50	21	22	25	16	17	19
Optional Power Exhaust Fan	(Number) Horsepower (W)	(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)		
	Full load amps	2.4			1.3			1.0			2.4			1.3			1.0		
	Locked rotor amps	4.7			2.4			1.9			4.7			2.4			1.9		
Service Outlet (2) 115 volt GFCI (amp rating)		15			15			15			15			15			15		

8.5 TON STANDARD / HIGH EFFICIENCY

Model No.		LGC102S									LGA102H								
Line voltage data - 60 Hz - 3 phase		208/230V			460V			575V			208/230V			460V			575V		
Compressors (2)	Rated load amps - each (total)	14.7 (29.4)			7.1 (14.2)			5.8 (11.6)			14.7 (29.4)			7.1 (14.2)			5.1 (10.2)		
	Locked rotor amps - each (total)	91 (182)			50 (100)			37 (74)			91 (182)			46 (92)			37 (74)		
Condenser Fan Motors (2)	Full load amps - each (total)	2.4 (4.8)			1.3 (2.6)			1.0 (2.0)			2.4 (4.8)			1.3 (2.6)			1.0 (2.0)		
	Locked rotor amps - each (total)	4.7 (9.4)			2.4 (4.8)			1.9 (3.8)			4.7 (9.4)			2.4 (4.8)			1.9 (3.8)		
Evaporator Blower Motor	Motor Output - hp	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5
	kW	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7
	Full load amps	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1
	Locked rotor amps	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6
¹ Maximum Overcurrent Protection (amps)	With Exhaust Fan	60	60	70	30	30	35	20	25	25	60	60	70	30	30	35	20	20	25
	Less Exhaust Fan	60	60	70	25	30	30	20	20	25	60	60	70	25	30	30	20	20	25
² Minimum Circuit Ampacity	With Exhaust Fan	48	51	57	24	25	28	19	20	23	48	51	57	24	25	28	18	19	21
	Less Exhaust Fan	46	49	55	22	27	27	18	19	22	46	49	55	22	24	27	17	18	20
Optional Power Exhaust Fan	(Number) Horsepower (W)	(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)		
	Full load amps	2.4			1.3			1.0			2.4			1.3			1.0		
	Locked rotor amps	4.7			2.4			1.9			4.7			2.4			1.9		
Service Outlet (2) 115 volt GFCI (amp rating)		15			15			15			15			15			15		

10 TON STANDARD EFFICIENCY

Model No.		LGC120S (R-22)									LGC120S (R-410A)								
Line voltage data - 60 Hz - 3 phase		208/230V			460V			575V			208/230V			460V			575V		
Compressors (2)	Rated load amps - each (total)	15.4 (30.8)			7.4 (14.8)			5.9 (11.8)			20.5 (41)			9.6 (19.2)			7.6 (15.2)		
	Locked rotor amps - each (total)	124 (248)			59.6 (119.2)			49.4 (98.8)			155 (310)			75 (150)			54 (108)		
Condenser Fan Motors (2)	Full load amps - each (total)	2.4 (4.8)			1.3 (2.6)			1.0 (2.0)			2.4 (4.8)			1.3 (2.6)			1.0 (2.0)		
	Locked rotor amps - each (total)	4.7 (9.4)			2.4 (4.8)			1.9 (3.8)			4.9 (9.4)			2.4 (4.8)			1.9 (3.8)		
Evaporator Blower Motor	Motor Output - hp	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5
	kW	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7
	Full load amps	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1
	Locked rotor amps	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6
¹ Maximum Overcurrent Protection (amps)	With Exhaust Fan	60	60	70	30	30	35	20	25	25	80	80	90	35	35	40	30	30	30
	Less Exhaust Fan	60	60	70	30	30	30	20	25	25	70	80	80	35	35	40	25	30	30
² Minimum Circuit Ampacity	With Exhaust Fan	50	53	59	24	26	29	19	21	23	61	64	71	29	31	34	23	24	27
	Less Exhaust Fan	47	51	57	23	25	27	18	20	22	59	62	68	28	29	32	22	23	26
Optional Power Exhaust Fan	(Number) Horsepower (W)	(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)		
	Full load amps	2.4			1.3			1.0			2.4			1.3			1.0		
	Locked rotor amps	4.7			2.4			1.9			4.7			2.4			1.9		
Service Outlet (2) 115 volt GFCI (amp rating)		15			15			15			15			15			15		

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

1 HACR type breaker or fuse.

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

ELECTRICAL DATA

10 TON HIGH EFFICIENCY / 12.5 TON STANDARD EFFICIENCY

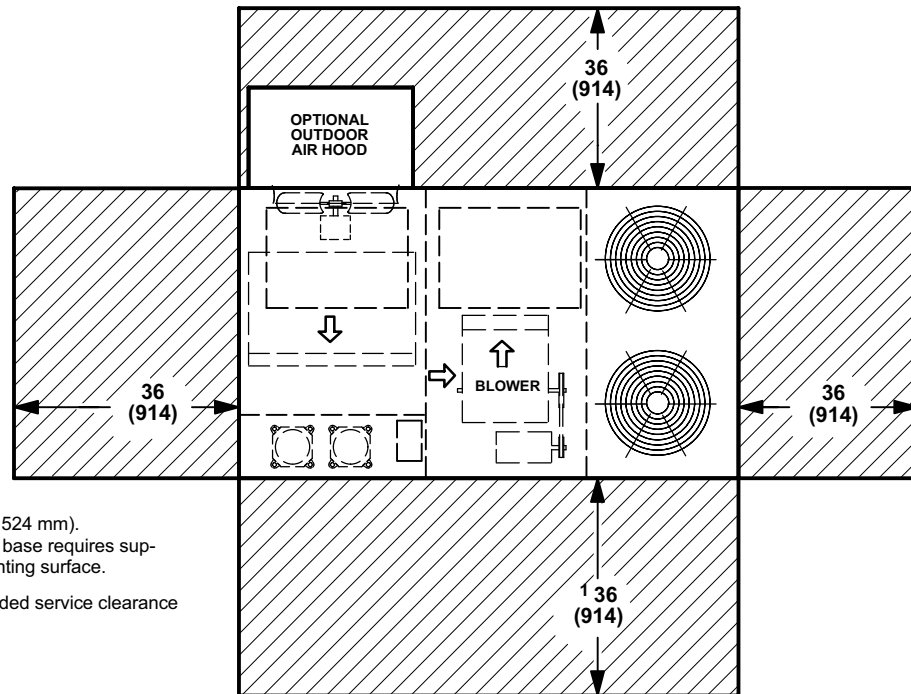
Model No.		LGA120H									LGC150S								
Line voltage data - 60 Hz - 3 phase		208/230V			460V			575V			208/230V			460V			575V		
Compressors (2)	Rated load amps - each (total)	17.3 (34.6)			9.0 (18.0)			7.1 (14.2)			18.6 (37.2)			9 (18)			7.4 (14.8)		
	Locked rotor amps - each (total)	123 (246)			62 (124)			50 (100)			156 (312)			75 (150)			54 (108)		
Condenser Fan Motors (2)	Full load amps - each (total)	2.4 (4.8)			1.3 (2.6)			1.0 (2.0)			3.0 (6.0)			1.5 (3.0)			1.2 (2.4)		
	Locked rotor amps - each (total)	4.9 (9.4)			2.4 (4.8)			1.9 (3.8)			6.0 (12.0)			3.0 (6.0)			2.9 (5.8)		
Evaporator Blower Motor	Motor Output - hp	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5
	kW	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7	1.5	2.2	3.7
	Full load amps	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1	7.5	10.6	16.7	3.4	4.8	7.6	2.7	3.9	6.1
	Locked rotor amps	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6	46.9	66	105	20.4	26.8	45.6	16.2	23.4	36.6
¹ Maximum Overcurrent Protection (amps)	With Exhaust Fan	70	70	80	35	35	40	25	30	30	70	70	80	35	35	40	30	30	30
	Less Exhaust Fan	60	70	70	35	35	35	25	25	30	70	70	80	35	35	35	25	30	30
² Minimum Circuit Ampacity	With Exhaust Fan	54	57	63	28	29	32	22	23	26	58	61	67	28	30	33	23	24	27
	Less Exhaust Fan	52	55	61	27	28	31	21	22	25	56	59	65	27	29	31	22	23	26
Optional Power Exhaust Fan	(Number) Horsepower (W)	(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)			(1) 1/3 (249)		
	Full load amps	2.4			1.3			1.0			2.4			1.3			1.0		
	Locked rotor amps	4.7			2.4			1.9			4.7			2.4			1.9		
Service Outlet (2) 115 volt GFI (amp rating)		15			15			15			15			15			15		

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

1 HACR type breaker or fuse.

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

INSTALLATION CLEARANCES - INCHES (MM)

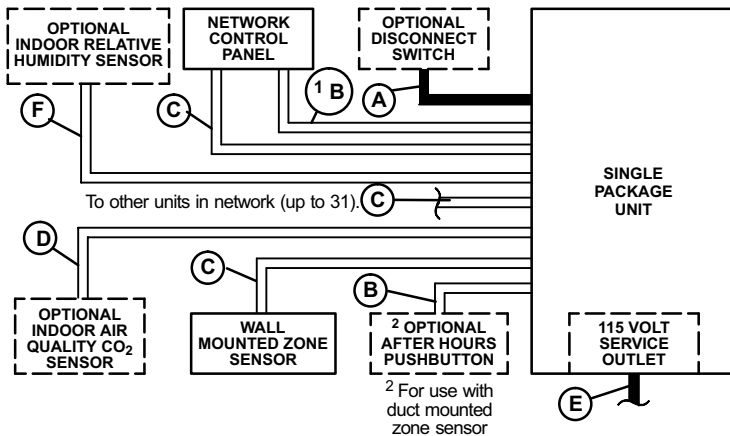


NOTE - Top Clearance 60 in. (1524 mm).

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

¹ 60 in. (1524 mm) recommended service clearance for blower deck removal

L CONNECTION® SYSTEM CONTROLLER



- A - Three wire power (See unit Electrical Data Table)
- B - Two wire low voltage 20 AWG minimum
- C - One twisted pair with shield. Lennox #27M19 (Belden type 88761) or equivalent (Must be daisy chained to each unit if more than one unit is connected to Network Control Panel).
- D - Four wire low voltage 20 AWG minimum
- E - Two wire power (115 volt)
- F - Three conductor twisted with shield. Two single twisted pair cables (Lennox #27M19), one double twisted pair cable (Belden type 88723) or equivalent.

— Field wiring not furnished —

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

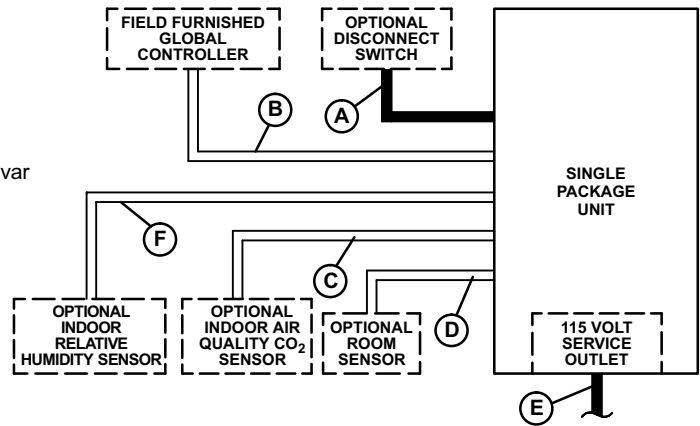
¹ Optional wall-mount transformer (18M13) may be used to power the NCP instead of using the unit's 24vac.

ALL UNIT CONTROLLER SYSTEMS

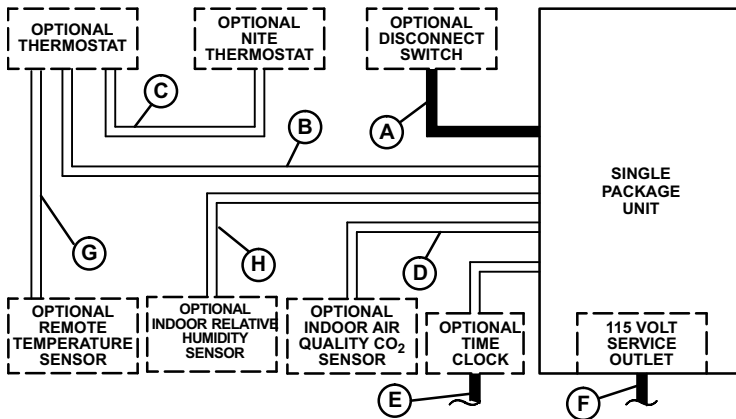
- A - Three wire power (See Electrical Data Table)
- B - Shielded twisted pair cable
- C - Four wire low voltage
- D - Two wire low voltage (CPC 810-3062)
Three wire low voltage (CSI MR88R)
Four wire low voltage (Johnson Metasys UNT)
Four wire low voltage (Novar Custom Controller) + 2 wire low voltage (Novar Custom Controller)
Seven wire low voltage (Honeywell Excel 10 W7750B)
- E - Two wire power (115 volt)
- F - Three conductor twisted with shield. Two single twisted pair cables (Lennox #27M19), one double twisted pair cable (Belden type 88723) or equivalent.

— Field wiring not furnished —

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



ELECTRO-MECHANICAL, ELECTRONIC OR HONEYWELL T7300 THERMOSTAT CONTROL SYSTEM



- A - Three wire power (See Electrical Data Table)
- B - Six wire low voltage (Electro-Mechanical)
Seven wire low voltage (Electronic)
Nine wire low voltage (Honeywell T7300)
Ten wire low voltage (Honeywell T7300 with Service LED)
- C - Two wire low voltage (Electro-Mechanical Only)
- D - Four wire low voltage (All Systems)
- E - Two wire power
- F - Two wire power (115 volt)
- G - Two wire low voltage
- Seven wire low voltage (T7300 Room Sensor with override)
- H - Three conductor twisted with shield. Two single twisted pair cables (Lennox #27M19), one double twisted pair cable (Belden type 88723) or equivalent.

— Field wiring not furnished —

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

L CONNECTION® BUILDING AUTOMATION SYSTEM

Network Control Up To 31 Units - Large LCD Display Screen - 7 Day Programming plus Holidays - Six Different Time/Temperature Schedules per Day - Storage of Last 75 Alarms With Time/Date - Remote Access (with NCP PC Software)



NCP1 Network Control Panel 59L21

ZONE TEMPERATURE SENSORS (One sensor required per unit)



Description	Order No.
Wall-Mount After Hours Override Button - Terminal Block Connection - Network Jack for L Connection PC Software	



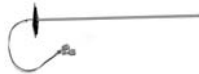
Wall Mounted Zone Sensor - With warmer/cooler adjustment	56L80
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Wall Mounted Zone Sensor - Without warmer/cooler adjustment	94L60
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Miniature Wall-Mount - Terminal Block Connection	
Miniature Wall Mounted Zone Sensor	94L61



Wall-Mount - Terminal Block Connection	
Wall Mounted Zone Sensor - use with Building Controller (BC1) for monitoring critical areas	59M04



Wall-Mount - Leaded Connection	
Flush Mount Zone Sensor	76M32

Temperature Averaging Kit	
Two zone sensors for temperature averaging in one room	23M20

Duct-Mount (For return air duct)	
Duct Mounted Zone Sensor	56L81

ZONE HUMIDITY SENSOR



Wall Mounted Zone Humidity Sensor	17M50
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Duct Mounted Relative Humidity Sensor	76M31
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OUTDOOR TEMPERATURE SENSOR



Mounted in watertight enclosure with a sun shield. Use with Building Controller (BC1) to monitor outdoor temperature	59M05
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CO₂ SENSORS

Sensor - white case, CO ₂ display	77N39
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Sensor - white case, no display	87N53
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Sensor - black case, CO ₂ display	87N52
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Sensor - duct mounted, black, no display	87N54
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AFTER HOURS REMOTE OVERRIDE BUTTON



After Hours Remote Override Button - Wall Plate furnished (Use with Duct Mounted Zone Sensor if required)	56L16
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Continued on next page ►

L CONNECTION® BUILDING AUTOMATION SYSTEM

Description	Order No.
NETWORK THERMOSTAT CONTROL (REQUIRED) - DDC that allows network control of T-Class Packaged Units or Splits over L Connection™ Network	



Description	Order No.
NTC1 - 2 Htg.-3 Clg.	17M10

1 PC SOFTWARE

FOR SETUP, CONFIGURATION AND SCHEDULE ADJUSTMENT OF THE NETWORK CONTROL PANEL (NCP)



Network Control Panel (NCP) Software

For Remote/Local NCP access	96L82
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NOTE - Requires PC Converter Kit (96L78) for local access and Network Modem Kit (94L62) for remote access

FOR SETUP, CONFIGURATION AND SERVICING OF NETWORK THERMOSTAT CONTROL (NTC)



Unit Controller Software

For Remote/Local network control	96L80
--	--------------

NOTE - Requires PC Converter Kit (96L78) for local access and Network Modem Kit (94L62) for remote access

NETWORK MODEM KIT - Provides direct digital communication between a single rooftop unit (or network of rooftop units) and the Network Control Panel



Connects phone line directly to L Connection network - Includes modem, PC Converter, cables	94L62
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NOTE - Requires either NCP software and/or Unit Controller Software

BUILDING CONTROLLER



BC1-1 - Use to control lights, vent hoods, exhaust fans, sprinklers and other devices based upon unit occupied operation or time schedule.	17M12
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KWH DEMAND CONTROLLER





Use with the Building Controller, the monitor sends a 24VAC output to a building control device to load shed when electrical demand is high.	76M33
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NOTE - Requires kWh meter with KYZ output.

¹ Computer system requirements: IBM compatible PC with Pentium or higher processor, Microsoft® Windows® 95, 98, Me, 2000, XP, or NT®. (Windows® 95, Windows® 98, Windows® Me, Windows® 2000, Windows® XP, and Windows® NT® are registered trademarks of Microsoft Corp.), 256 MB RAM (more memory may be required to run additional applications simultaneously), requires at least 20 MB of free hard drive space, VGA or higher resolution monitor (screen resolution must be 800 X 600 or higher and 256 colors), CD-ROM drive, mouse or compatible pointing device, serial COM port, PC modem (model no. USR5699B, USR5610B, USR5686E, 005686-03, 3CP5610A, 3CP5699A, 005687-03, or USR3686D is recommended) for remote connections.

L CONNECTION® BUILDING AUTOMATION SYSTEM

	Description	Order No.
AMBIENT LIGHT SENSOR		
	Use with the Building Controller and Network Control Panel for automatic lighting control	34M67
NEMA 1 ENCLOSURES		
	NEMA Enclosure	17M11
	For Network Modem Kit or Building Controller	34M23
	For Network Control Panel	34M24
NETWORK PHONE LINE AUTO-ROUTER		
(Allows modem, fax and phone to share one line - routes signal to connect to device automatically)		
	Network Phone Line Auto-Router	34M22
NETWORK BUS TO PC CONVERTER KIT		
	Allows PC connection to L Connection network - Required for any L Connection PC software when used on a local network	96L78
COMMUNICATION CABLE		
	500 ft. Roll - RS-485 twisted pair communication wire - plenum rated	27M19
	1000 ft. Roll - RS-485 twisted pair communication wire - plenum rated	94L63
	2500 ft. Roll - RS-485 twisted pair communication wire - plenum rated	68M25
NETWORK CONTROL PANEL WALL TRANSFORMER - Separate power supply for NCP (if desired)		
Screw terminals		
	Transformer - 20VA, Class 2, Primary 120V, 60Hz, Secondary 24V	18M13
MISCELLANEOUS COMPONENTS		
	Air Flow Switch	18L89
	Dirty Filter Switch	31L11
	Outdoor Air Sensor	14K92
	Discharge Air Sensor	99K64
	Return Air Sensor	99K64

OPTIONAL UNIT CONTROLLERS - FACTORY OR FIELD INSTALLED

System and Component Description

Field Installed
Catalog No.

CPC 810-3062

Control Module/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness - Network communications (RS-485, shielded pair twisted wire), 8 analog/digital inputs, 8 form-C relay outputs, 2 analog outputs, 24 VAC, output connections (2 stage heat/2 stage cool, 2 auxiliary outputs (user defined), economizer, fan), input connections (space temperature, discharge and return air temperature, 2 compressor monitoring, 2 aux. inputs (user defined), local override (1 to 240 minutes), Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Return Air Sensor provides input to module to determine heating or cooling operation and number of stages required, Discharge Air Sensor monitors leaving air temperature during unit operation

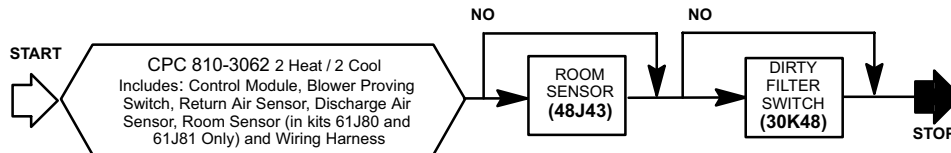
71M57

Sensor - Room temperature

48J43

Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition

30K48



System and Component Description

Field Installed
Catalog No.

CSI MR88R

Control Module/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness - Small point count controller, supports free-form modular DDC programming, intelligent I/STAT for independent local analog or digital control, local override and setpoint adjustment, 4 local or global points, integral start/stop schedule, standalone operation, universal inputs (thermistor, voltage, current, contact), 8 relay or low voltage triac outputs, analog outputs, 7 signal inputs plus power, ISTAT port, MR LAN port (RS-485, shielded pair twisted wire), self test diagnostics with LED readout, input point parameters (normal and narrow range, indoor and outdoor temperature range, individual calibration)

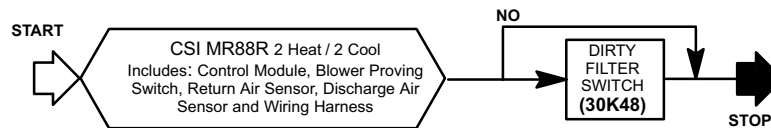
71M56

Sensor - Room temperature sensor with microprocessor data communications and power, alphanumeric LCD display for modes selected, mode selection push buttons for (Function, Call, Service, Change and Select), password protection for Service mode, up to 4 global point assignment with red LED's to indicate (Set Temp., Fan Speed, Room and Outside)

I/STAT
(Field Furnished)

Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition

30K48



HONEYWELL EXCEL 10 (W7750B)

Control Module (W7750B)/Blower Proving Switch/Discharge Air Sensor/Return Air Sensor/Wiring Harness - Standalone control (staged or modulating) of all heating, cooling, mixed air, system fan and economizer functions, up to four stages of heating/cooling combinations, for single zone applications, 6 relay outputs, 2 digital inputs, 1 resistive analog input, network communications, LonMark compliant, configuration options include: supply fan type of air handler, occupancy sensor, window sensor, wall module option, dirty filter monitor, indoor air quality override and smoke control. modes of operation include: occupied, standby, unoccupied, bypass occupied, override modes, start-up and wait, cooling, heating, emergency heat, off mode, disabled mode, smoke emergency, freeze protect, manual position, fan only and disabled. Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Return Air Sensor provides input to module to determine heating or cooling operation and number of stages required.

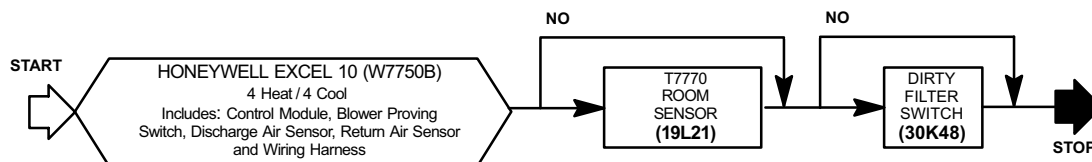
71M59

Sensor - Room temperature, with setpoint knob

19L21

Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition

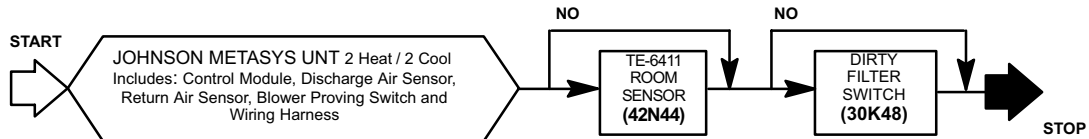
30K48



OPTIONAL UNIT CONTROLLERS - FACTORY OR FIELD INSTALLED

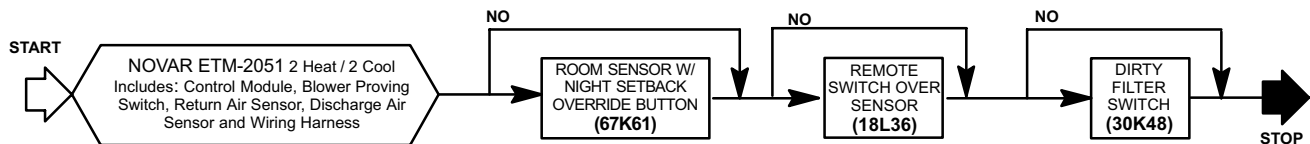
JOHNSON METASYS UNIT

Control Module/Blower Proving Switch/Wiring Harness -Standalone control of all heating, cooling and economizer functions, various operation modes (including: occupied, unoccupied, warm-up, standby), network communications, 6 analog inputs, 4 binary inputs, momentary override, zone lighting control, advanced unit diagnostics, indoor air quality control, outdoor air temperature and humidity monitoring, alarm monitoring of: sensors, airflow, economizer, dirty filter, heating /cooling operation, cooling limit, Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Control module may be used in multi-zone applications (i.e. L-Zone).	71M62 (208/230V-3ph) 71M63 (460V-3ph) 71M64 (575V-3ph)
Commissioning Tool - Hand-held interface tool, monitor & adjust 36 analog/binary points, carrying case.	60K37
Sensor - Room temperature, phone jack style wiring, quick-mount design, latching door mechanism, setpoint adjustment (warmer/cooler), optional override button, nickel sensors, options for choosing setpoint, indication, mounting and wiring type, plug for handheld commissioning tool (60K36).	42N44
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48



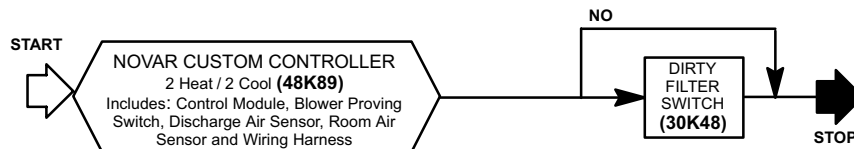
NOVAR ETM-2051

Electronic Thermostat Module (ETM)/Blower Proving Switch/Return Air Sensor/Discharge Air Sensor/Wiring Harness - Module monitors unit operation from different sensors installed in unit and monitors unit diagnostic codes of the IMC. The ETM has outputs for 2 stage heat/2 stage cool, 7 relay outputs: fan Cool 1, Cool 2, Heat 1, Heat 2, Economizer, Night Mode, automatic or continuous blower operation, economizer damper operation and night setback, features: day/occupied mode with low enthalpy (outdoor air damper open), high enthalpy (outdoor air damper closed) or night/unoccupied mode (outdoor air damper closed), network communication (RS-485, shielded pair twisted wire), local override (1 to 255 minutes), watchdog function, fail-safe operation, ETM allows units to be "daisy chained" together (up to 31 units) to be operated from one central location with an "executive" type control processor (on-site or off-site), built-in time delays, built-in unit operating defaults, diagnostic LED's indicate various operating functions, surge suppression protects ETM against lightning or voltage spikes, Blower Proving Switch monitors blower operation and locks out unit in case of blower failure, Return Air Sensor provides input to ETM module to determine heating or cooling operation and number of stages required, Discharge Air Sensor monitors leaving air temperature during unit operation	71M58
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48
Room Temperature Sensor with Built-in Night Setback Override Button - Provides input to ETM module to determine heating or cooling operation and number of stages required (ordered separately). Override button allows momentary override of night setback during unoccupied mode.	67K61
Sensor - Remote switch over	18L36



NOVAR CUSTOM CONTROLLER

Control Module/Blower Proving Switch/Discharge Air Sensor/Room Air Sensor/Wiring Harness - User definable comfort setpoint, on/off and time of day control, cycle II ventilation control	71M65
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48



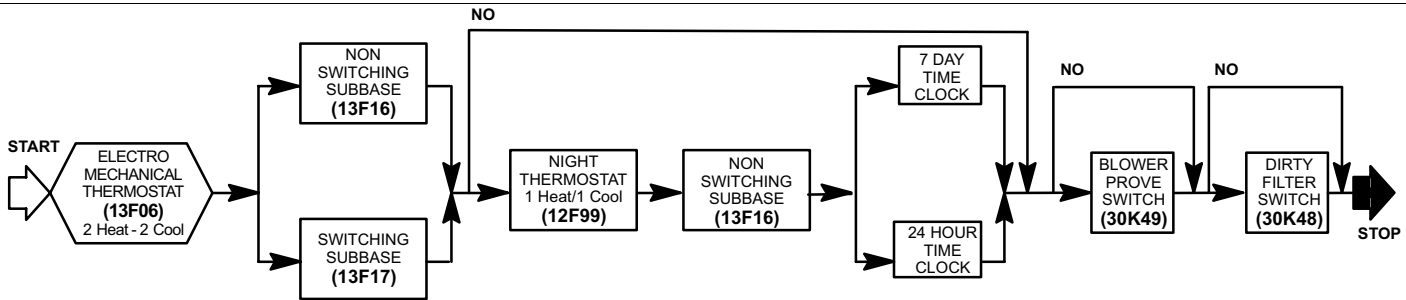
OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS - FIELD INSTALLED

System and Component Description

Field Installed
Catalog No.

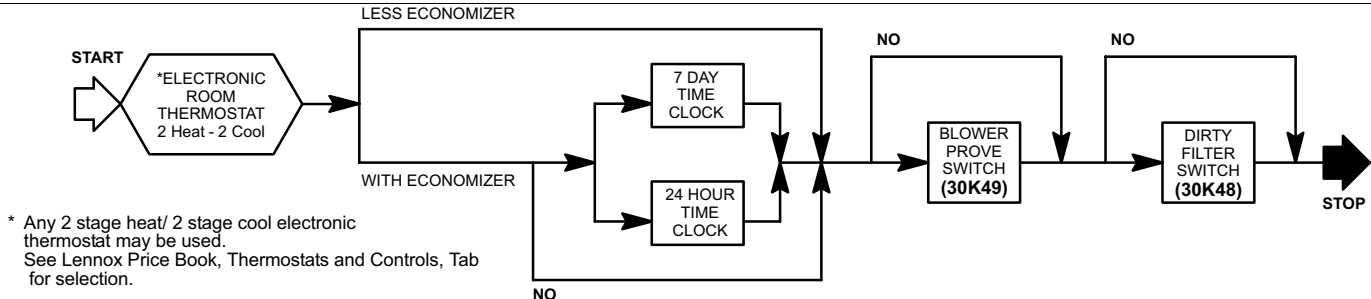
ELECTRO-MECHANICAL THERMOSTAT

Thermostat - Two stage heat & two stage cool with dual temperature levers, subbase choice	13F06
Subbase - Manual system switch (Off-Heat-Auto-Cool), fan switch (Auto-On)	13F17
Subbase - Non-switching	13F16
Night Setback Operation - Order components below	
Heating Thermostat - Single stage heat / Single stage cool	12F99
Subbase - Non-switching	13F16
Time Clock - 7 day operation, indicates day and night periods, 2 hour increments, battery back-up	See Price Book
Time Clock - 24 hour night setback operation, 15 minute increments, battery back-up	See Price Book
Blower Proving Switch - Monitors blower operation, locks out unit in case of blower failure	30K49
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48



ELECTRONIC THERMOSTAT

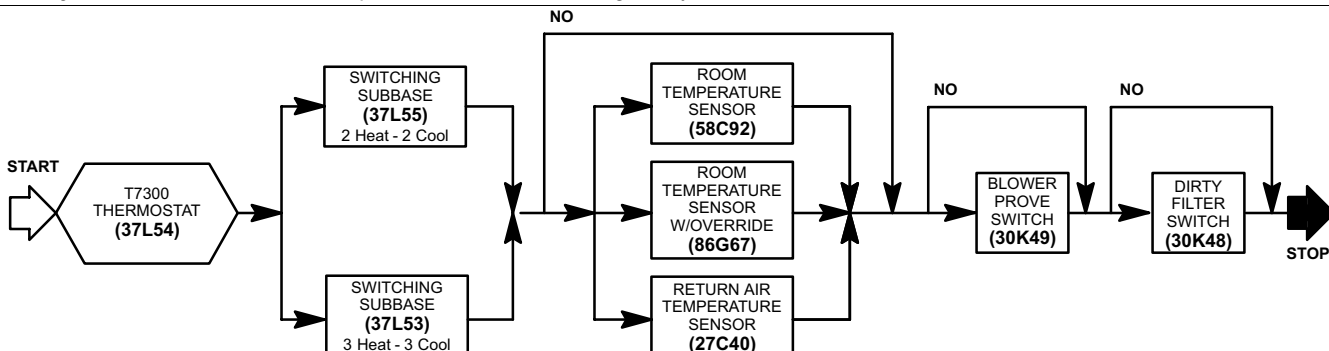
Electronic Thermostat - Any two stage heat/ two stage cool electronic thermostat may be used.	See Price Book
Time Clock - 7 day operation, indicates day and night periods, 2 hour increments, battery back-up	See Price Book
Time Clock - 24 hour night setback operation, 15 minute increments, battery back-up	See Price Book
Blower Proving Switch - Monitors blower operation, locks out unit in case of blower failure	30K49
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48



* Any 2 stage heat/ 2 stage cool electronic thermostat may be used. See Lennox Price Book, Thermostats and Controls, Tab for selection.

HONEYWELL T7300 THERMOSTAT

Thermostat - Programmable, internal or optional remote temperature sensing (sensor required), touch sensitive keyboard, automatic switching, °F or °C readout, no anticipator, droop/no droop selection, indicator LED's, hour/day programming, override capabilities, time and operational mode readout, stage status indicators, battery back-up, subbase choice, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On)	37L54
Subbase - Selectable staging, indicator LED's, auxiliary relay output for economizer operation	
2 Heat / 2 Cool	37L55
3 Heat / 3 Cool	37L53
Sensor - Room temperature	58C92
Sensor - Room temperature with 3 hour override and setpoint adjustment	86G67
Sensor - Return air temperature	27C40
Blower Proving Switch - Monitors blower operation, locks out unit in case of blower failure	30K49
Dirty Filter Switch - Senses static pressure increase indicating a dirty filter condition	30K48



DIMENSIONS AND WEIGHTS - INCHES (MM)

Shown With Optional Economizer Dampers, Power Exhaust Fans, Convenience Outlet, Unit Disconnect

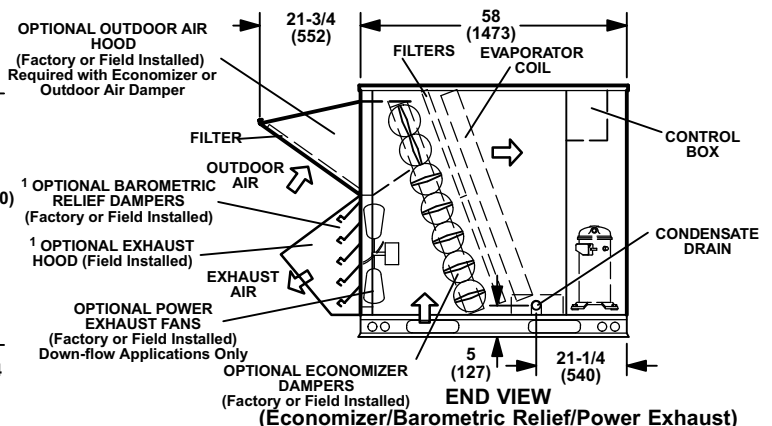
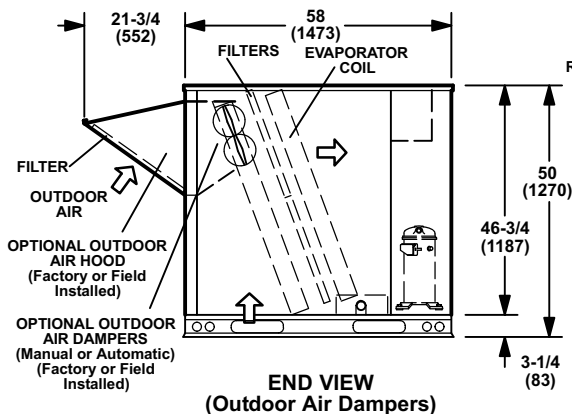
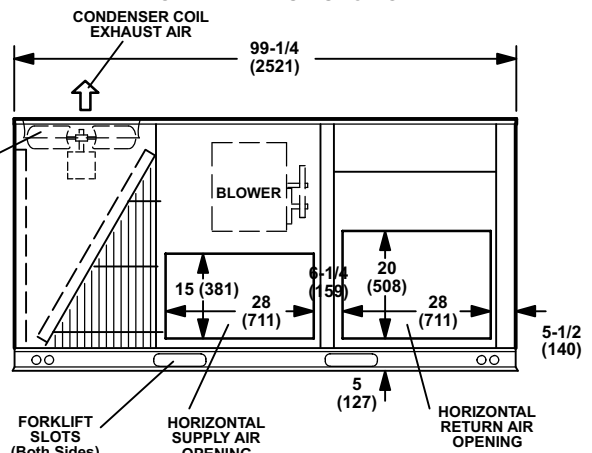
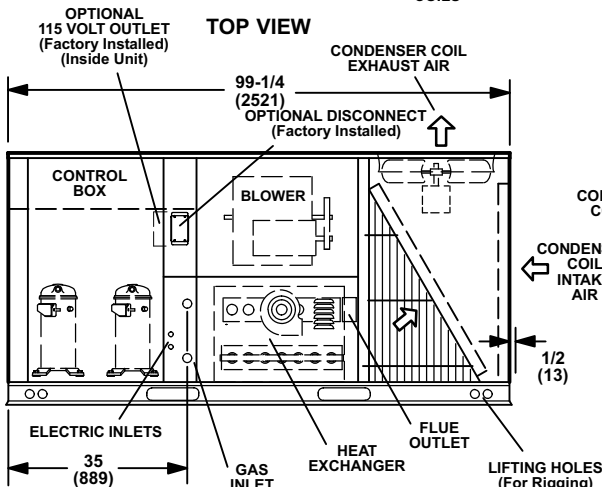
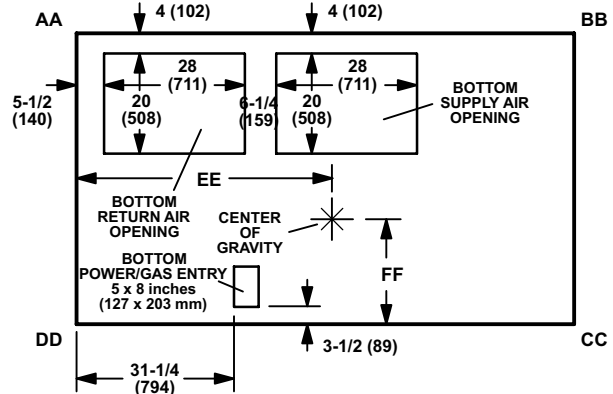
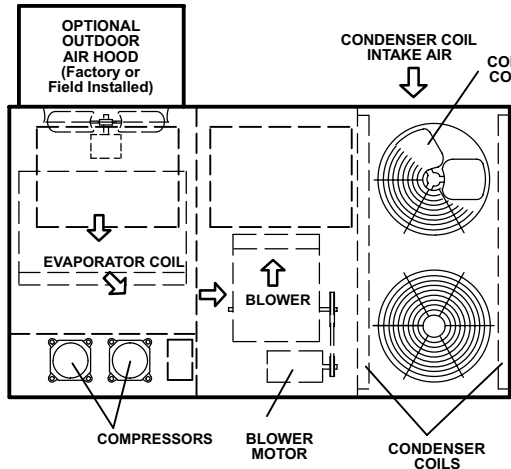
Model Number	WEIGHTS				CORNER WEIGHTS								CENTER OF GRAVITY			
	Net		Shipping		AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	inch	mm	inch	mm
090/102 Base Unit	1300	590	1385	628	314	142	289	131	329	149	368	167	47	1194	21-1/2	546
090/102 Max. Unit	1525	692	1610	730	381	173	339	154	374	170	431	195	46	1168	23-1/2	597
120 Base Unit	1355	615	1440	653	328	149	300	136	343	156	384	174	47	1194	21-1/2	546
120 Max. Unit	1580	717	1665	755	394	179	352	160	387	176	447	203	46	1168	23-1/2	597
150 Base Unit	1390	630	1475	669	336	152	312	152	353	160	389	176	47-1/2	1207	22	559
150 Max. Unit	1615	733	1700	771	403	183	364	165	398	181	450	204	46-1/2	1181	24	610

ACCESSORY SHIPPING WEIGHTS (add to base unit weight)

Economizer + Hood	58 lbs.	26 kg	Power Exhaust	28 lbs.	13 kg
Outdoor Air Damper + Hood	42 lbs.	19 kg	LTL Packaging (less than truck load)	105 lbs.	48 kg

Base Unit - The unit with NO OPTIONS.

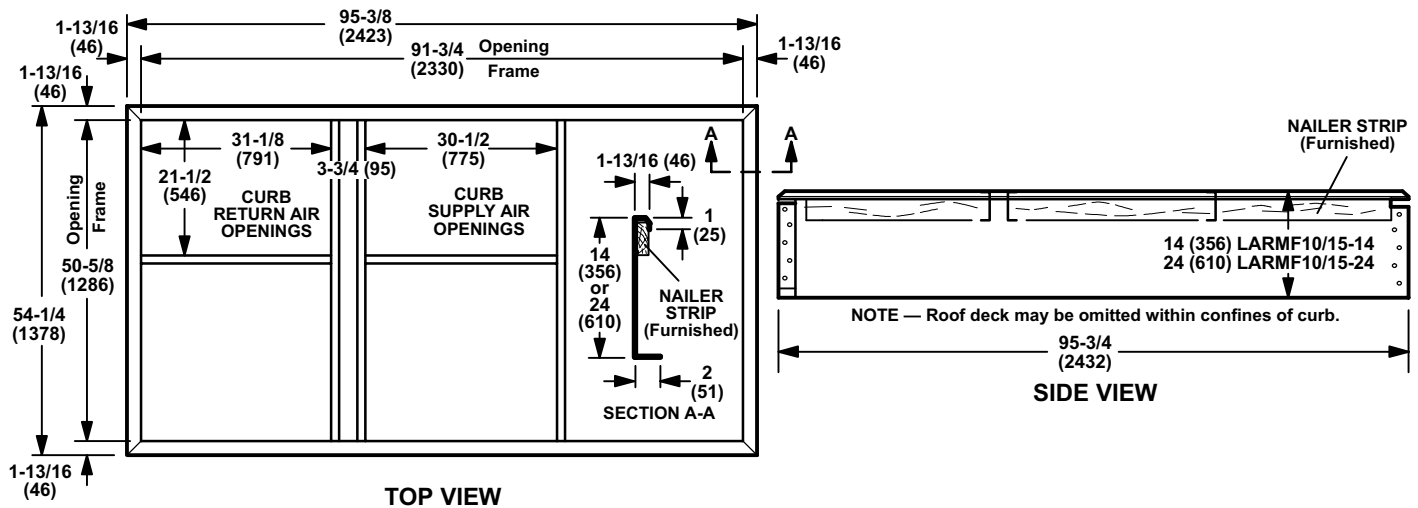
Max. Unit - The unit with ALL OPTIONS Installed. (Economizer, Power Exhaust Fans, and Controls)



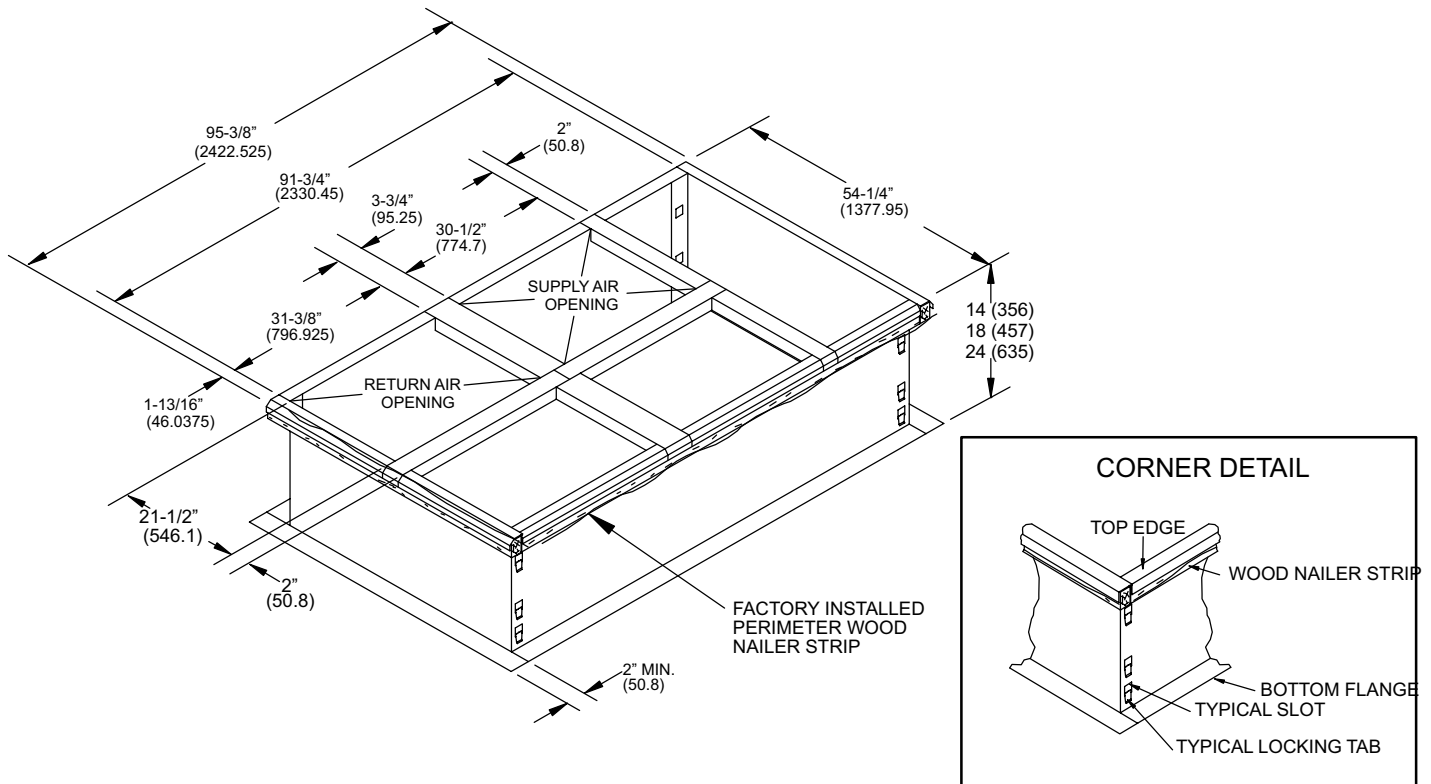
¹ NOTE — Field Installed in Return Air Duct for Horizontal Applications.

ACCESSORY DIMENSIONS - INCHES (MM)

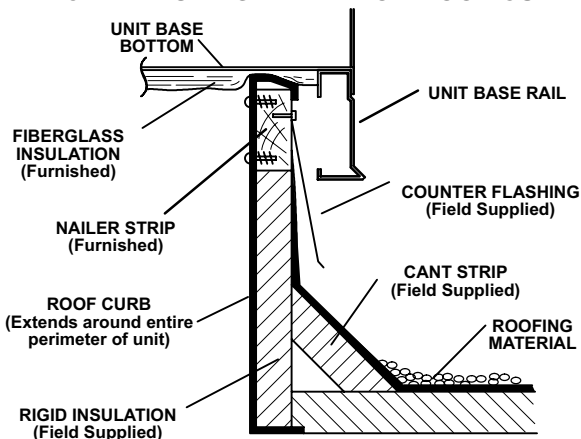
LARMF10/15-14 and LARMF10/15-24 STANDARD ROOF CURBS - DOUBLE DUCT OPENING



LARMF10/15S-14, LARMF10/15S-18 and LARMF10/15S-24 CLIPLOCK 1000 ROOF CURBS - DOUBLE DUCT OPENING



TYPICAL FLASHING DETAIL FOR ROOF CURB



ROOF CURB SPECIFICATIONS

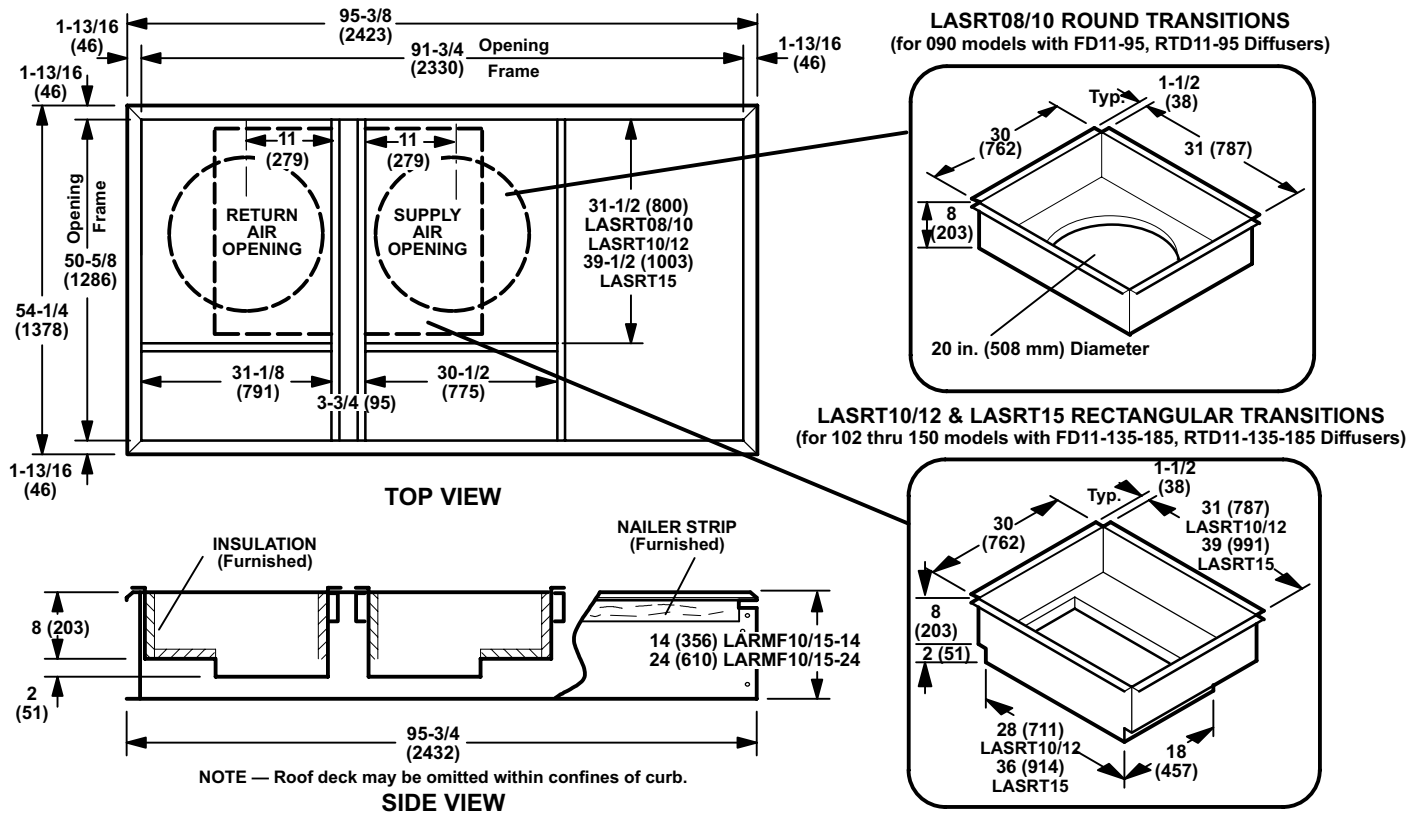
Roof Curb is rigid enough to be spanned over its entire length or cantilevered if supported on both sides of center of gravity.

Roof Curb	LARMF10/15-14	LARMF10/15-24
¹ Moment of inertia (I) (in. ⁴) (cm ⁴)	39 (1634)	160 (6639)
¹ Section modulus $\frac{I}{C}$ (in. ³) (cm ³)	5.5 (90)	13.1 (512)
Curb weight. (lb./ft.) (kg/m) of length	5.5 (8.2)	8.5 (12.7)
Design strength (psi) (kPa)	20,000 (137,900)	20,000 (137,900)

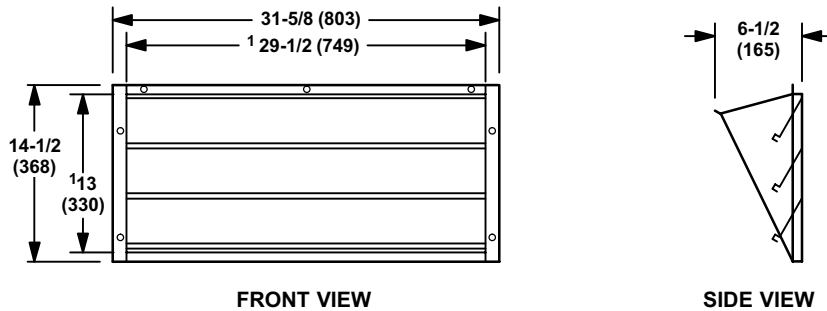
¹ Includes both sides of curb.

ACCESSORY DIMENSIONS - INCHES (MM)

**LARMF10/15-14 and LARMF10/15-24 ROOF CURBS
WITH LASRT SUPPLY & RETURN AIR TRANSITIONS FOR FD11 & RTD11 CEILING DIFFUSERS**



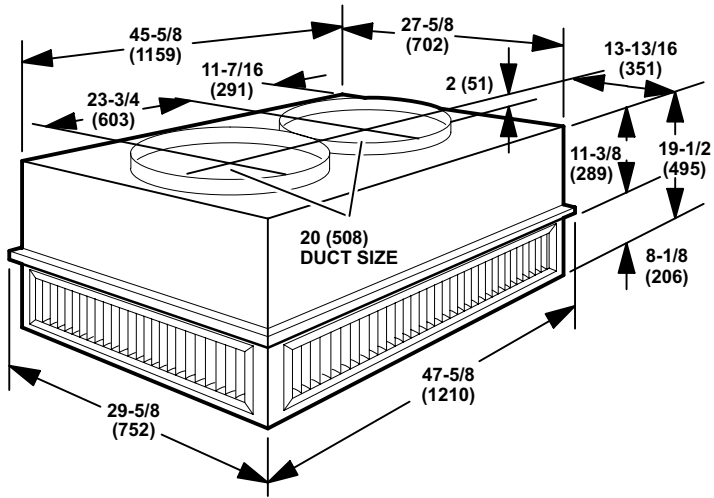
LAGEDH03/15 HORIZONTAL BAROMETRIC RELIEF DAMPERS - Field installed in horizontal return air duct adjacent to unit



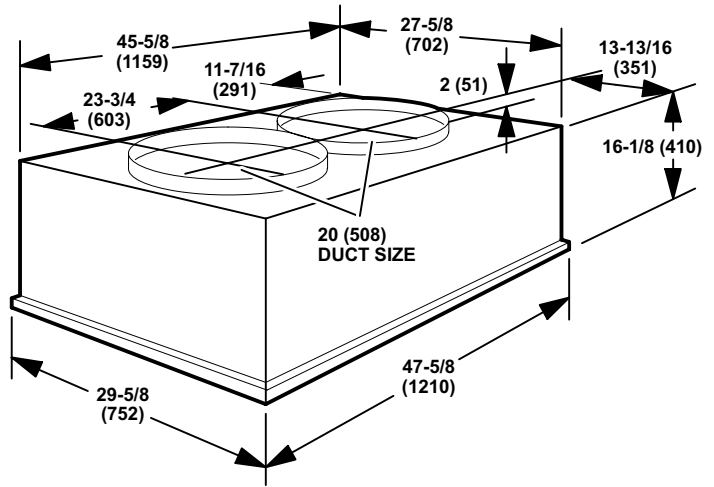
ACCESSORY DIMENSIONS - INCHES (MM)

COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

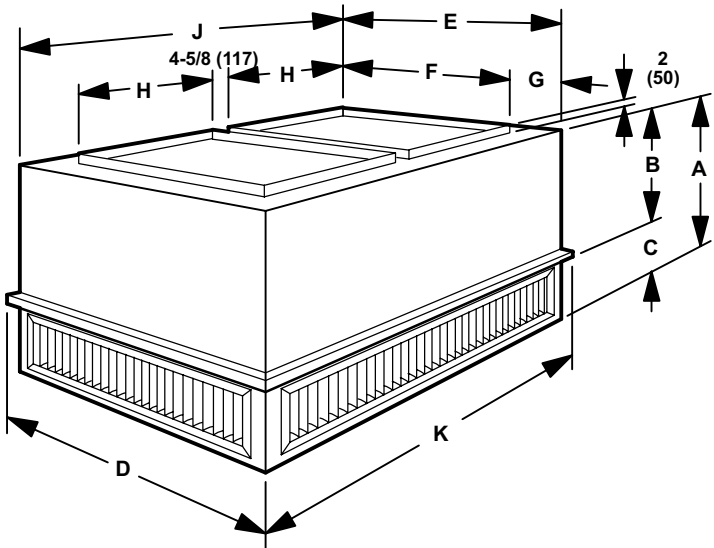
RTD11-95 STEP-DOWN



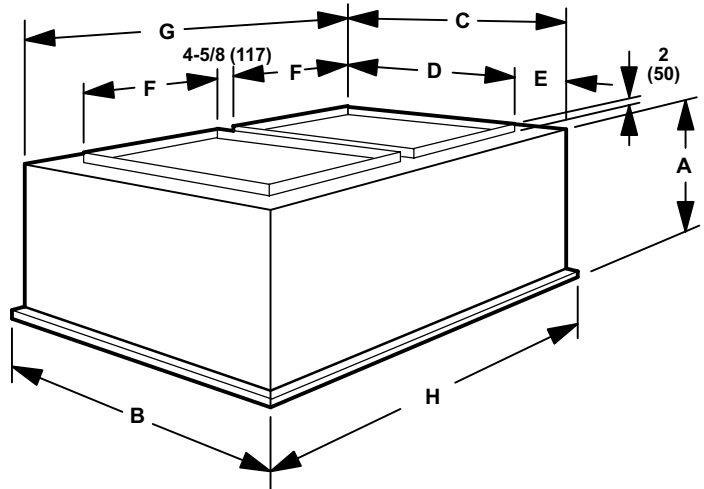
FD11-95 FLUSH



RTD11-135-185 STEP-DOWN



FD11-135-185 FLUSH



Model Number	A		B		C		D		E	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RTD11-135	28	711	18-7/8	479	9-1/8	232	35-5/8	905	33-5/8	854
RTD11-185	34	864	23-7/8	606	10-1/8	257	47-5/8	1210	45-5/8	1159

Model Number	A		B		C		D	
	inch	mm	inch	mm	inch	mm	inch	mm
FD11-135	24-1/8	613	35-5/8	905	33-5/8	854	28	711
FD11-185	30-1/8	613	47-5/8	1210	45-5/8	1159	36	914

Model Number	F		G		H		J		K	
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm
RTD11-135	28	711	2-13/16	71	18	457	45-5/8	1159	47-5/8	1210
RTD11-185	36	914	4-13/16	122	18	457	45-5/8	1159	47-5/8	1210

Model Number	E		F		G		H	
	inch	mm	inch	mm	inch	mm	inch	mm
FD11-135	2-13/16	71	18	457	45-5/8	1159	47-5/8	1210
FD11-185	4-13/16	122	18	457	45-5/8	1159	47-5/8	1210

GUIDE SPECIFICATIONS

Specifying Engineer Please Note - These Guide Specifications cover all L Series units (3 thru 30 tons). Please edit to accurately identify the options selected for the job.

SECTION 15730 UNITARY AIR CONDITIONING EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Unitary Outdoor Packaged Rooftop Unit with gas fired heating systems and direct expansion, air to air mechanical electric cooling.

B. Related Sections:

1. Division I – General Requirements
2. Section 05580 – Formed Metal Fabrications: Custom enclosures for the rooftop unit.
3. Section 15080 – Mechanical Insulation: Duct and pipe insulation for the rooftop unit.
4. Section 15800 – Air Distribution: Ducts, duct accessories, fans, air terminal units, air outlets & inlets, and air cleaning devices associated with the rooftop unit.
5. Section 15900 – HVAC Instrumentation and Controls: Controls for the rooftop unit.
6. Section 15950 – Testing, Adjusting and Balancing: Procedures for testing, adjusting and balancing the rooftop unit.
7. Division 7 – Fire Alarm Section

1.2 REFERENCES

- A. ASNI/ASHRAE Standard 15 – 2001: Safety Standard for Refrigeration Systems
- B. ASHRAE Standard 62.1 – 2001: Ventilation Standard for Acceptable Indoor Air Quality.
- C. ANSI/ASHRAE/IESNA Standard 90.1-2001: Energy Standard for Buildings Except Low-Rise Residential Buildings
- D. ASHRAE Standard 52.2-1999: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- E. ARI Standard 210/240-2003: Unitary Air Conditioning Equipment (capacities from 0 to 65 kbtuh)
- F. ARI Standard 340/360-2000: Commercial & Industrial Air Conditioning Equipment (capacities from 65 kbtuh to 250 kbtuh)
- G. ARI Standard 270-95: Sound Rating of Outdoor Unitary Equipment
- H. ARI Standard 370-2001: Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment.
- I. NFPA-90A-2002: Standard for Installation of Air Conditioning and Ventilation Systems > 25,000FT³
- J. UL 1995 & CAN/CSA-C22.2 No. 236-M95: Standard for Heating and Cooling Equipment
- K. ANSI Z21.47-2000 & CSA-2.3a-M99: Standard for Gas Fired Central Furnaces. (US & Canada)
- L. ISO 9002:1994 Quality Systems – Model for Quality Assurance in Production, Installation, and Servicing.
- M. CAN/CGA 2.17-M91: Gas Fired Appliances for Use at High altitudes. (Canada only)
- N. CAN/CSA C22.2 No. 0-M91: General Requirements – Canadian Electrical Code Part II. (Canada only)
- O. CSA C22.2 No. 3-M91: Electrical Features of Fuel Burning Equipment (Canada only).
- P. NAECA: US National Appliance Energy Conservation Act of 1988. (US Only)

Q. EPACT: US Energy Policy Act of 1992. (US Only)

R. South Coast Air Quality Management District Rule 1111: NOx Emissions for Fan Type Central Furnaces. (California Only)

1.3 SYSTEM DESCRIPTION

A. Design Requirements:

1. Unit construction shall be in compliance with the following standards:
 - a. UL 1995 & CAN/CSA-C22.2 No. 236-M95: Standard for Heating and Cooling Equipment
 - b. ANSI Z21.47-2000 & CSA-2.3a-M99: Standard for Gas Fired Central Furnaces. (US & Canada)
 - c. CAN/CGA 2.17-M91: Gas Fired Appliances for Use at High altitudes. (Canada only)
 - d. CSA C22.2 No. 3-M91: Electrical Features of Fuel Burning Equipment (Canada only).
 - e. ANSI/ASHRAE/IESNA Standard 90.1-2001: Energy Standard for Buildings Except Low-Rise Residential Buildings

B. Performance Requirements:

1. ARI Rated Net Cooling Efficiency shall meet or exceed ASHRAE Standard 90.1-2001 at a rated air flow not less than 350 CFM/ton.
2. Rated Heating Thermal Efficiency shall meet or exceed ASHRAE Standard 90.1-2001.

1.4 SUBMITTALS

A. Product Data

1. Model Number
2. ARI Gross and Net Cooling Capacity
3. ARI Full and Part Load Cooling Efficiency
4. Gross Cooling Capacity at design conditions
5. Gross Sensible Cooling Capacity at design conditions
6. Leaving dry and wet bulb air temperature for cooling
7. Heating Capacity Input (Low & High Stage)
8. Heating Thermal Efficiency
9. Gas Type
10. Gas Supply Pressure
11. Gas Supply Fitting Connection Size
12. Supply Fan Nominal Horsepower
13. Supply Air Flow
14. External Static Pressure
15. Supply Air Filter Type
16. Supply Air Filter Size
17. Equipment Sound Rating
18. Condensate Drain Fitting Size
19. Shipping Weight
20. Net Installed Unit weight
21. Unit Voltage
22. Maximum Over Current Protection
23. Minimum Circuit Ampacity
24. Refrigerant Type
25. Factory Installed Options List
26. Field Accessory List
27. Equipment Feature List

B. Shop Drawings

1. Plan View with dimensions
2. Front View with dimensions
3. End View with dimensions
4. Back View with dimensions
5. Curb detail with dimensions

C. Quality Assurance/Control

1. ARI Directory Listing (for units = 248kbtuh)
2. UL, ETL or CSA Listing
3. ISO 9002 Registration

D. Closeout Submittals

1. Equipment inspection report.
2. Equipment operation test report.
3. Operation and Maintenance manuals.
4. Warranty Cards.

GUIDE SPECIFICATIONS

1.5 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer's factory shall be ISO 9002:1994 registered.
 - 2. Installing contractors shall be manufacturer trained.
 - 3. Manufacturer shall have parts and service available throughout the U.S.A. and Canada.
- B. Regulatory Requirements
 - 1. Local Energy and Mechanical Codes.
 - 2. NAECA: US National Appliance Energy Conservation Act of 1988. (US Only)
 - 3. EPACT: US Energy Policy Act of 1992. (US Only)
 - 4. South Coast Air Quality Management District Rule 1111: NOx Emissions for Fan Type Central Furnaces (California only).
- C. Certifications
 - 1. ARI Standard 210/240-2003: Unitary Air Conditioning Equipment (capacities from 0 to 65 kbtuh)
 - 2. ARI Standard 340/360-2000: Commercial & Industrial Air Conditioning Equipment (capacities from 65 kbtuh to 250 kbtuh)
 - 3. ISO 9002:1994 Quality Systems – Model for Quality Assurance in Production, Installation, and Servicing.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Packing, Shipping, Handling, and Unloading
 - 1. Units shall be shipped, handled, and unloaded according to manufacturer's instructions.
- B. Acceptance at Site
 - 1. For Owner provided product, Contractor shall be responsible for acceptance of equipment at site.
- C. Storage and Protection
 - 1. Contractor shall be responsible for storage and protection of equipment from damage until it is installed.
 - 2. Factory shipping covers shall remain in place until installation.

1.7 WARRANTY

- A. Gas heat exchangers
 - 1. Aluminized steel type shall have a limited warranty for ten years.
 - 2. Stainless steel type shall have a limited warranty for fifteen years.
- B. Compressors
 - 1. Shall have a limited warranty for five years.
- C. Microprocessor based unit controller
 - 1. Shall have a limited warranty for three years.
- D. All other parts
 - 1. Shall have a limited warranty for one year.

1.8 SYSTEM START UP, OWNERS INSTRUCTIONS, COMMISSIONING

- A. System Start Up
 - 1. The rooftop unit shall be started up per manufacturer's instructions.
- B. Owner's Instructions
 - 1. Manufacturer representative shall instruct owner's representative on start up and operation of the equipment if required by the owner.

- C. Commissioning
 - 1. Manufacturer trained contractor shall statically and dynamically test the operation of the rooftop unit to verify its conformance to design criteria if required by the engineer.

1.11 MAINTENANCE

- A. Extra Materials:
 - 1. One set of supply air filters shall be provided to the owner if required by the owner.
- B. Replacement parts:
 - 1. A list of common replacement parts shall be provided to the owner if required by the owner.
- C. Maintenance Service
 - 1. Air filters shall be changed every three months
 - 2. Gas heat exchanger shall be serviced annually before the heating season.
 - 3. Evaporator and condenser coils shall be cleaned annually before the cooling season.
 - 4. Refrigeration system operations shall be checked annually for proper operation.
 - 5. Supply fan belts shall be inspected bi-annually for proper tension and signs of wear.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Lennox L Series Units

2.2 EQUIPMENT

- A. Packaged Gas Heat, Electric Cool Rooftop Unit:
 - 1. Direct expansion, air to air mechanical electric cooling and induced draft gas fired heating system complete with microprocessor based electronic controls that are DDC capable. Unit airflow shall be convertible for downward (vertical) or horizontal airflow. All factory installed wiring, piping, controls, and options shall be provided within the unit enclosure.

2.3 COMPONENTS

- A. Cabinet
 - 1. All exterior panels shall be constructed of G90 galvanized steel with a 0.20 – 0.30 mils urethane primer and 0.70 - 0.80 mils polyester coat on the top side and a 0.15 – 0.25 mils urethane primer and 0.20 to 0.30 mils polyester coat on the back side. Coating shall be resistant to 1000 hours of salt spray per ASTM B-117; 500 hours of humidity exposure per ASTM D2247; and 168 hours of heat resistance per ASTM D3454. Coating shall be impact resistant per ASTM D2794; Abrasion resistant per ASTM D4060; and Solvent resistant per NCCA No. II-18. Coating shall have a H minimum pencil hardness per ASTM D3363. Coating shall have a 3T no tape pick off Flexibility per NCCAII-19. Coating shall have a "no tape pick off" cross hatch adhesion resistance per ASTM D3359.
 - 2. All interior panels shall be constructed of G90 galvanized steel.
 - 3. Cabinet panels where conditioned air is handled shall be fully insulated with a minimum of ½" (1.3 cm) thick, 1.5 lb/ft³ density, non-hygroscopic fiberglass insulation with a minimum "R" value of 1.9°F -FT²-h/BTU. Insulation in the gas heat section shall be foil face.
 - 4. Cabinet base shall be one piece on units less than or equal to 12.5 Tons to prevent water entry into building.
 - 5. Cabinet top panel shall be one piece on units less than or equal to 12.5 Tons
 - 6. Cabinet top panel edge shall be broken 30° away from cabinet to prevent water entry into cabinet.

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7. Cabinet top panel shall be water tight to interior compartment.
 8. Cabinet base shall be insulated a minimum of ½" (1.3 cm) thick, 1.5 lb/ft³ density, non-hygroscopic fiberglass insulation with a minimum "R" value of 1.9°F-FT²-h/BTU.
 9. Openings shall be provided for both bottom and side electrical connections.
 10. Openings shall be provided for both bottom and side gas supply connections on units 7.5 – 30 tons.
 11. Bottom utility entry opening shall have 7/8" (2.2 cm) minimum raised edge to prevent water entry into building.
 12. Evaporator coil condensate drain pan shall be sloped ¼" per foot and constructed of corrosion resistant material.
 13. Drain pan coupling shall be accessible without the removal of panels.
 14. Service access doors shall have corrosion resistant hinges and factory installed, re-sealing handles that provide tool-less access to the compressor, controls and filter sections of the unit. Access doors shall have a full perimeter seal around them to prevent air leakage or water entry.
 15. Service access doors shall have corrosion resistant hinges and factory installed, re-sealing handles that provide tool-less access to the heat and blower sections of 7.5–30 ton units. Access doors shall have a full perimeter seal around them to prevent air leakage or water entry.
 16. Full perimeter base rails shall be provided and constructed with a minimum of 14ga, G90 galvanized steel.
 17. Fork lift slots shall be available on three sides of the unit and shall not be positioned directly below the condenser coil
 18. Rigging holes shall be provided on all four corners of the base rail of the unit.
 19. Supply and return air base openings shall have a 1" (2.54 cm) minimum raised edge to prevent water entry into the duct work.
 20. Horizontal supply and return air openings shall have a 1" (2.54 cm) minimum raised edge for duct connections.
- B. Wiring
1. Shall be color coded and continuously marked to identify point to point component connections.
 2. Shall not touch any hot-gas refrigerant lines
 3. Shall not touch any sharp metal edges.
- C. Cooling System
1. Shall be capable of operating from 0 °F (-18 °C) to 125 °F (52 °C) without the installation of additional controls.
 2. Shall have one independent compressor circuit on units 3 through 6 nominal tons.
 3. Shall have two independent compressor circuits on units 7.5 through 12 nominal tons.
 4. Shall have three independent compressor circuits on units 13, 15 and 30 nominal tons.
 5. Shall have four independent compressor circuits on 17.5, 20 and 25 nominal ton units.
 6. Each compressor circuit shall have a self sealing, discharge line access port for reading refrigerant pressures.
 7. Each compressor circuit shall have a self sealing suction line access port for reading refrigerant pressures.
 8. Each compressor circuit shall have a self sealing liquid line access port for reading refrigerant pressures.
 9. Refrigerant access ports shall be isolated from the condenser fan air stream.
 10. Each compressor circuit shall have an automatic reset, high pressure switch to protect the compressor from extreme refrigerant pressures
 11. Each compressor circuit shall have an automatic reset low pressure switch to protect the compressor from the loss of refrigerant charge.
12. Each compressor circuit shall have a liquid line filter-drier to protect the compressor and thermostatic expansion valve from moisture and dirt.
 13. Each compressor circuit shall be leak tested to 0.3 oz/year for circuits with = 10lbs of refrigerant or 0.50 oz/year for circuits with >10lbs of refrigerant at a minimum of 150 psig (1034 kPa).
 14. Each compressor circuit shall have a full R-22 refrigerant charge.
 15. Copper tubing shall not touch sharp metal surfaces.
 16. The compressor circuits on the 5, 15, 20, 21, and 30 ton high efficiency models and 10 ton standard efficiency models shall have available as a factory option a full R-410A refrigerant charge.
 17. Each compressor circuit shall have available as a factory installed option, discharge and liquid line service valves for isolating a compressor circuit's refrigerant in the outdoor coil. This option shall not be available on 13 –25 ton units with enhanced dehumidification system (Humiditrol).
- D. Evaporator Coils
1. Shall be constructed with enhanced aluminum fins mechanically bonded to internally grooved, copper tubes.
 2. Shall have balanced port thermal expansion valves to provide optimal performance over the application range.
 3. Shall have freeze protection on each compressor circuit.
 4. Shall be pressure and leak tested to 500 psig (3447 kPa).
 5. Shall not exceed 15 fins per inch so they can be easily cleaned
 6. Each compressor circuit on the coil shall be divided across the face of the coil and be active through the full depth of the coil to ensure optimal latent performance.
 7. A four layer, epoxy-modified, phenolic dip coating (Technicoat 10-1) shall be available as a factory option for enhanced corrosion protection.
- E. Condenser coils
1. Shall be constructed with enhanced aluminum fins mechanically bonded to copper tubes and be pressure leak tested to 500 psig (3477 kPa).
 2. Slab construction and a maximum fin per inch count of 20 shall be used for cleanability on units above 6 tons.
 3. Formed coils shall allow separation and not exceed 20 fins per inch for cleanability on units 6 tons and below.
 4. A four layer, epoxy-modified phenolic dip coating (Technicoat 10-1) shall be available as an option for enhanced corrosion protection.
- F. Compressors
1. Shall be hermetic, scroll type with sweat connections for the suction and discharge lines.
 2. Shall be resiliently mounted
 3. Shall have thermal overload protection for all windings with automatic reset.
 4. Shall have crankcase heaters.
 5. Shall have a voltage application range of + 10% of unit nameplate voltage.
 6. Shall be isolated from the condenser fan air stream to allow system operation check without disrupting air flow.
 7. Shall be mounted off the base on units 13-30 tons to reduce sound transmission through the base.
 8. Shall be refrigerant cooled.
 9. Shall have reverse rotation protection
- G. Cooling Controls
1. Shall support up to two stages of cooling from a thermostat or an external DDC controller without the need for any additional controls.
 2. Shall support up to three stages of cooling when used with a relay and a three stage thermostat or DDC controller.
 3. Shall support up to four stages of cooling when used with Lennox' L Connection Network Building Automation System.

GUIDE SPECIFICATIONS

4. Shall allow a blower on delay of up to 60 seconds after a cooling demand is received. The default value is zero.
 5. Shall allow a blower off delay of up to 240 seconds after a cooling demand has ended. The default value is zero.
 6. On three phase units, shall have a minimum compressor on time of 240 seconds that can be adjusted between 60 and 510 seconds.
 7. On single phase units, shall have a minimum compressor off time of 300 seconds that can be adjusted between 60 and 510 seconds.
 8. Shall have a default maximum high pressure switch trip occurrence during a cooling or dehumidification cycle of 3. This trip occurrence limit shall be adjustable between 1 and 8 occurrences. If this maximum limit is reached, the compressor shall be locked out and the digital output for service shall be activated.
 9. Shall have a default maximum low pressure switch trip occurrence during a cooling or dehumidification cycle of 3. This trip occurrence limit shall be adjustable between 1 and 8 occurrences. If this maximum limit is reached, the compressor shall be locked out and the digital output for service shall be activated.
 10. Shall have a low pressure trip read delay of 5 minutes if the compressor off time has been less than 4 hours and the outdoor temperature is less than 70°F (21°C). This delay shall be adjustable from 0 to 34 minutes. The temperature set point shall be adjustable from 10°F (-12°C) to 100°F (38°C). The compressor off time shall be adjustable from 1 to 6 hours.
 11. Shall have a low pressure trip read delay of 15 minutes if the compressor off time has been 4 hours or greater and the outdoor temperature is less than 70°F (21°C). This delay shall be adjustable from 0 to 34 minutes. The temperature set point shall be adjustable from 10°F (-12°C) to 100°F (38°C). The compressor off time shall be adjustable from 1 to 6 hours.
 12. Shall have a low pressure trip read delay of 2 minutes if the compressor off time has been less than 4 hours and the outdoor temperature is 70°F (21°C) or greater. This delay shall be adjustable from 0 to 34 minutes. The temperature set point shall be adjustable from 10°F (-12°C) to 100°F (38°C). The compressor off time shall be adjustable from 1 to 6 hours.
 13. Shall have a low pressure trip read delay of 8 minutes if the compressor off time has been 4 hours or greater and the outdoor temperature is 70°F (21°C) or greater. This delay shall be adjustable from 0 to 34 minutes. The temperature set point shall be adjustable from 10°F (-12°C) to 100°F (38°C). The compressor off time shall be adjustable from 1 to 6 hours.
 14. Shall record an error in non-volatile memory with each pressure switch trip occurrence (either high or low) and identify the compressor circuit.
 15. Shall have a low outdoor air temperature compressor lock out set point of 0°F (-18°C) for each compressor circuit. This low outdoor temperature limit set point shall be individually adjustable for each compressor circuit from 80°F (-27°C) to -30°F (-34°C).
 16. Shall have a maximum allowable evaporator freeze trip occurrence of 3 during a cooling demand and this limit shall be adjustable from 1 to 4 occurrences. The control shall shut off the compressor each time a freeze trip occurs and record an error code in non-volatile memory. If the maximum limit is reached, the compressor shall be locked out and the digital output for service shall be activated.
 17. On units with multiple condenser fans, shall have a 6 second time delay between condenser fan shut off and re-start to prevent reverse rotation of the fan. This time delay shall be adjustable between 0 and 16 seconds.
 18. On units with 4 condenser fans, shall have a first stage low outdoor temperature set point of 55°F (13°C) that shall reduce the air flow through the condenser by turning off some of the fans. This set point shall be adjustable between 60°F (16°C) and 10°F (-12°C).
 19. On units with 6 condenser fans, shall have a second stage low outdoor temperature set point of 40°F (4°C) that shall reduce the air flow through the condenser by turning off all the fans. This set point shall be adjustable between 60°F (16°C) and 10°F (-12°C).
 20. On units with 6 condenser fans, shall have a condenser fan on delay of 2 seconds. This shall be adjustable between 0 and 240 seconds.
- H. Gas Heating System
1. Shall be an induced draft, natural gas fired system with direct spark ignition, electronic flame sensors, flame roll-out switches, high heat limit switches, induced draft failure switch, and capable of operating to an altitude of 4500 ft (1370 m) without a de-rate to the manifold pressure.
 2. Shall have the ability to be converted for use with LPG/propane using a field installed accessory.
 3. Complete service access shall be provided for controls, burners and heat exchanger.
 4. Low NOx emission (40 ng/Joule or less) inserts compliant with California Emission requirements shall be available as a factory installed option on 3-6 ton units.
 5. The gas piping system shall be completely tight and free of leaks when pressurized to the maximum supply pressure.
- I. Gas Valve
1. Shall be two stage, redundant type gas heat valve
 2. Shall accept natural gas standard.
 3. Shall accept LPG/ propane with a field installed accessory.
- J. Heat exchanger
1. Shall be a tubular design constructed of aluminized steel for applications with mixed air temperatures of 45 °F (7.2 °C) or above. For applications with mixed air temperatures below 45 °F (7.2 °C), stainless steel construction shall be provided as a factory installed option.
- K. Gas Burners
1. Shall be inshot type gas burners constructed of aluminized steel.
- L. Heating Controls
1. Shall support two stages of heating control from a thermostat or DDC.
 2. Shall turn the supply fan on 40 seconds after a heating demand is received. This time delay shall be adjustable from 8 to 60 seconds.
 3. Shall turn the supply fan off 120 seconds after a heating demand has ended. This time delay shall be adjustable from 80 to 300 seconds.
 4. Shall have a delay time of 30 seconds between low and high fire of a two-stage gas valve system. This time delay shall be adjustable from 30 to 160 seconds.
 5. Shall have a heat off delay of 100 seconds after the thermostat heating demand has ended. This heat off delay shall be adjustable from 30 to 300 seconds.
 6. Shall turn off the heat and keep the supply air fan running if an over heat limit occurs
 7. Shall have an adjustable maximum over heat limit trip count during a heating cycle of 3 and indicate reaching this limit by activating the digital output for service. This maximum count limit shall be adjustable from 1 to 15 counts.
 8. Shall report an error with each occurrence of an over heat limit trip and identify the limit that tripped. Error code shall be stored in non-volatile memory.
 9. Shall shut off gas heat if a flame roll-out occurs and report an error identifying the roll-out switch
 10. Shall have a maximum flame roll-out switch trip count during a heating cycle of 3 and indicate reaching this limit by activating the digital output for service. This maximum count limit shall be adjustable from 1 to 6 counts.

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11. Shall turn off the heat if the induced air flow is too low and report an error identifying the pressure switch.
 12. Shall have a maximum induced air flow pressure switch trip count during a heating cycle of 3 and indicate reaching this limit by activating the digital output for service. This maximum count limit shall be adjustable from 1 to 6 counts.
 13. Shall report an error if the gas valve is not energized two minutes after a heating demand and identify the gas valve
 14. Shall have a maximum ignition failure count of 3 and indicate reaching this limit by activating the digital output for service. This maximum count limit shall be adjustable from 1 to 6 counts.
 15. Shall shut off the gas valve if a flame is not sensed. An error shall be reported and stored in non-volatile memory.
 16. Shall have a delay between stages on the gas valve.
 17. Shall shut the unit off if the gas valve is energized but there is not demand for heat. An error shall be reported and stored in non-volatile memory.
- M. Supply Air Fan Motor and Drives
1. Shall have permanently lubricated ball bearings for belt drive motors and permanently lubricated sleeve bearings for direct drive motors.
 2. Motors shall have thermal overload protection with automatic reset.
 3. Belt drive blowers shall have adjustable sheaves for blower speed adjustment.
 4. Low and high static fan motors and drives shall be available as a factory installed option.
- N. Supply Air Fan
1. Shall be double inlet type constructed of G90 galvanized steel with forward curved blades.
 2. Shall be statically and dynamically balanced.
 3. Shall slide out or provide accessibility from two adjacent sides of the unit for servicing and belt tension adjustment.
- O. Supply Air Fan Control
1. Shall have continuous or automatic control for occupied periods.
 2. Shall have adjustable on/off delay for both cooling and heating operation
- P. Supply Air Filters
1. Unit shall be furnished with standard, disposable 2 inch (51 mm) pleated, MERV 7 (Minimum Efficiency Reporting Value based on ASHRAE standard 52.2) filters.
 2. Disposable, 2 inch (51 mm) pleated, MERV 11 (Minimum Efficiency Reporting Value based on ASHRAE standard 52.2) filters shall be available as a factory installed option.
 3. Permanent, 2 inch poly metal frame filters with replaceable media shall be available as a factory installed option or field installed accessory.
 4. Unit Controls shall support the addition of an optional dirty filter switch and report an error when it is tripped.
- Q. Condenser Fan Motor
1. Shall be direct drive type with permanently lubricated ball bearings.
 2. Shall have thermal overload protection with automatic reset and be water tight.
 3. Motor mount shall be isolated from the fan safety guard.
- R. Condenser Fans
1. Shall be propeller type constructed of corrosion resistant material and discharge vertically with a finger safety guard.
- S. Microprocessor Based Unit Controller
1. Integrated DDC type, solid state, microprocessor based control board shall be provided to control all operations of the unit.
 2. Shall have a green blinking LED to indicate normal operation.
3. Shall have yellow LEDs to indicate a thermostat demand mode.
 4. Shall have a push button to reset the board. Push button shall also allow user to select pre-programmed functions or view sensor input values or diagnostic fault codes or view the firmware version.
 5. Shall have a yellow LED to indicate data transmission along the network.
 6. Shall have a four position dip switch to select the operating mode of the unit.
 7. Shall have a test mode to allow quick operation checks with shorter delays for mode changes.
 8. Shall have a four position dip switch to set unit type and voltage phase.
 9. Shall have a five position dip switch to set unit network address.
 10. Shall have RS-485 communication port for connection with a PC to use the optional interface software.
 11. Shall have a 3 wire network bus connection terminal.
 12. Shall report an error if a power failure occurs on the main control board or any of the daughter control boards. The digital output for service shall also be activated.
 13. Shall report an error if a communication failure occurs on the main control board or any of the daughter control boards. The digital output for service shall also be activated.
 14. Shall report an error if the outdoor air sensor fails and shall default control operation to the high outdoor air limits.
 15. Shall allow for zone sensor calibration.
 16. Thermostat Operation
 - a. Shall be 2 stage heat/2 stage cool thermostat or DDC capable
 - b. Shall be 2 stage heat/3 stage cool capable when used with a relay and a 2 stage heat/3 stage cool thermostat or DDC.
 - c. Shall be 2 stage heat/4 stage cool zone sensor capable when used with Lennox' L Connection Network Building Automation System.
 - d. Shall have a night set back (unoccupied) mode
 - e. Shall have thermostat bounce delay of 3 seconds.
 - f. Shall have return air limit control for either heating or cooling operation.
 - g. Shall have an automatic change over time delay of 5 minutes between heating and cooling operation or visa versa. This time delay shall be adjustable from 1 to 15 minutes.
 17. Diagnostics
 - a. Shall have 81 diagnostic fault codes. See cooling, heating, fan and unit control sections for detailed error codes.
 - b. Shall store up to 80 of the most recent diagnostic fault codes in non-volatile memory

GUIDE SPECIFICATIONS

18. Shall have 32 Digital Inputs for the following:
 - a. Occupied mode
 - b. Low cool demand
 - c. High cool demand
 - d. Low heat demand
 - e. High heat demand
 - f. Supply fan demand
 - g. Smoke detector demand
 - h. Phase monitor or loss of phase switch
 - i. Dirty filter indicator
 - j. Supply air proving indicator
 - k. Primary heat limit 1
 - l. Primary heat limit 2
 - m. Secondary heat limit 1
 - n. Secondary heat limit 2
 - o. Flame roll out switch 1
 - p. Flame roll out switch 2
 - q. Induced draft motor switch 1
 - r. Induced draft motor switch 2
 - s. Gas valve sense switch 1
 - t. Gas valve sense switch 2
 - u. Low pressure switch 1
 - v. Low pressure switch 2
 - w. Low pressure switch 3
 - x. Low pressure switch 4
 - y. High pressure switch 1
 - z. High pressure switch 2
 - aa. High pressure switch 3
 - ab. High pressure switch 4
 - ac. Freeze protection switch 1
 - ad. Freeze protection switch 2
 - ae. Freeze protection switch 3
 - af. Freeze protection switch 4
 19. Shall have 6 Analog Inputs for the following:
 - a. Return air temperature sensor
 - b. Supply air temperature sensor
 - c. Outdoor air temperature sensor
 - d. Optional L Connection Network Zone Temperature Sensor
 - e. Optional relative humidity sensor
 - f. Optional CO₂ sensor
 20. Shall have 18 Digital Outputs for the following:
 - a. Supply air fan motor
 - b. Compressor 1
 - c. Compressor 2
 - d. Compressor 3
 - e. Compressor 4
 - f. Condenser Fan 1
 - g. Condenser Fan 2
 - h. Condenser Fan 3
 - i. Condenser Fan 4
 - j. Condenser Fan 5
 - k. Condenser Fan 6
 - l. Inducer fan motor 1
 - m. Inducer fan motor 2
 - n. Heat 1
 - o. Heat 2
 - p. Heat 3
 - q. Heat 4
 - r. Critical diagnostic fault code occurrence
 21. Smoke Evacuation
 - a. Shall have selectable programs for smoke evacuation using either a positive pressure; negative pressure with supply fan and exhaust fan; negative pressure with exhaust fan only; or purge control sequence.
 22. Display
 - a. Shall have three digit display for diagnostic codes and sensor readings
 - b. Shall display return air, supply air and outdoor air temperatures.
 - c. Shall display return air, supply air and outdoor air temperature in °F or °C
 - d. Shall display RH if optional sensor installed.
 - e. Shall display CO₂ ppm level if optional sensor installed.
 - f. Shall display zone temperature if optional zone sensor is installed.
 - g. Shall display damper position if optional economizer or motorized outdoor air damper is installed.
 23. Fresh air temperature control
 - a. Shall have selectable program for warming cold fresh ventilation air using first stage heat
 - b. Shall activate first stage of heating if supply air temperature falls below the selected temperature set point. The temperature set point range shall be from 40°F (4°C) to 70°F (21°C).
 - c. The temperature at which first stage heating is turned off shall be 20°F (11°C) above the set point. This deadband shall be adjustable from 10°F (5.5°C) to 20°F (11°C).
 - d. The minimum cycle time for this heating operation shall be 8 minutes. This run time shall be adjustable from 2 to 30 minutes.
 24. Natural or Propane Gas Heat Reheat Control
 - a. A selectable program to simultaneously allow first stage cooling to operate from either a dehumidistat or humidity sensor and heating to operate from a thermostat or DDC shall be available. The relative humidity setpoint associated with this operation shall have a default value of 60%. This set point shall be adjustable from 0 – 100%.
 25. Loss of Power Protection (1 ph units only)
 - a. Upon 2 consecutive power interrupts occur, the unit controller shall keep the compressors off for a period of 5 minutes to allow the refrigerant pressures to equalize.
 26. Loss of Phase or Brown Out Protection
 - a. A 24V digital input shall be available to initiate unit shut down upon activation.
- ### 2.4 ACCESSORIES
- A. Dehumidification System (Humiditrol)
1. Shall be available as a factory installed option on 3, 4, 5, 7.5, 8.5, 10, 13, 15, 17.5 and 20 ton high efficiency R-22 models and 6, 12 and 25 ton standard efficiency R-22 models.
 2. Shall be capable of activating the cooling system along with the hot-gas reheat coil when the sensed humidity level exceeds the desired set point.
 3. Shall be capable of simultaneously operating both the non hot-gas reheat compressor circuits and hot-gas reheat compressor circuits of multiple compressor units when both the humidity level and the first stage cooling temperature level exceed their set points.
 4. Shall be capable of prioritizing a cooling demand over a dehumidification demand and shut off the hot-gas reheat coil circuit(s) to meet the temperature requirements. Shall be able of turning the hot-gas reheat coil back on if the dehumidification demand still exists after the cooling demand has been met.
 5. Shall consist of a reheat coil, three-way solenoid valve, a check valve and associated copper piping.
 6. Reheat coil shall be constructed with enhanced aluminum fins mechanically bonded to copper tubes. Fin count shall not exceed 14 fins per inch.
 7. Reheat coil shall be located on the leaving air side of the evaporator coil.
 8. Reheat coil shall cover 40% of evaporator coil face area on 3-6 ton units; shall cover 67% of evaporator coil face area of compressor circuit #1 on 7.5 –12.5 ton units; shall cover 50% of evaporator coil face area of compressor circuits 1 and 2 on 13 and 15 ton units and 67% of evaporator coil face area of compressor circuits 1 and 2 on 17.5, 20 and 25 ton units.
 9. Three way solenoid valve shall be non-modulating type and normally closed for the reheat coil.
 10. Check valve shall be provided to prevent reverse flow of refrigerant during cooling operation.

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- B. Economizer
1. Shall be available for factory or field installation in the unit with or without barometric or power exhaust relief.
 2. Shall have a microprocessor based control board that is attached to the main unit control board via a direct pin connection to the main control board. This board shall be located in the main control compartment and not the economizer section of the unit.
 3. Construction
 - a. Shall be fully modulating (0-100%) complete with recirculating air dampers, low leakage outside air dampers and controls.
 - b. Damper motor shall be direct coupled, gear driven, 24 volt, fully modulating (0-100%) design.
 - c. Outdoor air hood with filters shall be provided and constructed of G90 galvanized steel with a 0.20 – 0.30 mils urethane primer and 0.70 - 0.80 mils polyester coat on the top side and a 0.15 – 0.25 mils urethane primer and 0.20 to 0.30 mils polyester coat on the back side. Coating shall be resistant to 1000 hours of salt spray per ASTM B-117; 500 hours of humidity exposure per ASTM D2247; and 168 hours of heat resistance per ASTM D3454. Coating shall be impact resistant per ASTM D2794; Abrasion resistant per ASTM D4060; and Solvent resistant per NCCA No. II-18. Coating shall have a H minimum pencil hardness per ASTM D3363. Coating shall have a 3T no tape pick off Flexibility per NCCAI-19. Coating shall have a "no tape pick off" cross hatch adhesion resistance per ASTM D3359.
 4. Free Cooling Control
 - a. Shall have sensible, global, single or dual enthalpy economizer control
 - b. Shall have a maximum open damper position for free cooling of 100%. This maximum position shall be adjustable from 0 to 100%.
 - c. Shall have the ability to lock out free cooling if the outdoor temperature falls below a set point. The set point range shall be from 30°F (-1°C) to 60°F (16°C).
 - d. Control shall allow compressors to cycle for additional cooling as needed.
 - e. Control shall allow compressors to be delayed from 0 to 136 minutes if a second stage cooling demand is received after a night set back period and outdoor air is suitable for cooling.
 - f. Shall control the supply air temperature to 55°F (13°C) by modulating the dampers. This set point shall be adjustable from 45°F (7°C) to 65°F (18°C).
 5. Ventilation Control
 - a. Shall have the ability to manually set the minimum damper position via a potentiometer on the economizer control board.
 - b. Dampers shall be kept closed for the first 60 minutes of occupied operation after an unoccupied period if there is a heating demand. This warm up time delay shall be adjustable from 0 to 136 minutes.
 6. Demand Control Ventilation (DCV)
 - a. Shall have selectable programs for demand control ventilation when optional CO₂ sensor is installed using either a set point or proportional control sequence.
 - b. Shall have a default maximum percent travel of 100% for DCV operation. This position shall be adjustable from 0 to 100%.
 - c. Shall start to open the damper if the CO₂ level is 502 ppm or greater. This set point shall be adjustable from 0 to 2000 ppm.
 - d. Shall put the damper at 100% of travel if the CO₂ level is 1004 ppm or greater. This set point shall be adjustable from 0 to 2000 ppm.
 - e. Shall put the damper at minimum position if the outdoor temperature is 10°F (-12°C) or lower. This low temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - f. Shall start closing the damper if the outdoor temperature is 40°F (4°C) or lower. This low temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - g. Shall put the damper at minimum position if the outdoor temperature is 105°F (41°C) or higher. This high temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - h. Shall start closing the damper if the outdoor temperature is 75°F (24°C) or higher. This high temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
- C. Motorized Outdoor Air Damper
1. Shall be available factory or field installed internal to the unit to provide 0-25%, motorized operation of outdoor air requirements.
 2. Shall have a microprocessor based control board that is attached to the main unit control board via a direct pin connection to the main control board. This board shall be located in the main control compartment and not the outdoor section of the unit.
 3. Construction
 - a. Shall be fully modulating (0-100%) complete with low leakage outside air dampers and controls.
 - b. Damper motor shall be direct coupled, gear driven, 24 volt, fully modulating (0-100%) design.
 - c. Outdoor air hood with filters shall be provided and constructed of G90 galvanized steel with a 0.20 – 0.30 mils urethane primer and 0.70 - 0.80 mils polyester coat on the top side and a 0.15 – 0.25 mils urethane primer and 0.20 to 0.30 mils polyester coat on the back side. Coating shall be resistant to 1000 hours of salt spray per ASTM B-117; 500 hours of humidity exposure per ASTM D2247; and 168 hours of heat resistance per ASTM D3454. Coating shall be impact resistant per ASTM D2794; Abrasion resistant per ASTM D4060; and Solvent resistant per NCCA No. II-18. Coating shall have a H minimum pencil hardness per ASTM D3363. Coating shall have a 3T no tape pick off Flexibility per NCCAI-19. Coating shall have a "no tape pick off" cross hatch adhesion resistance per ASTM D3359.
 4. Ventilation Control
 - a. Shall have the ability to manually set the opening damper position via a potentiometer on the control board.
 5. Demand Control Ventilation (DCV)
 - a. Shall have selectable programs for demand control ventilation when optional CO₂ sensor is installed using either a set point or proportional control sequence.
 - b. Shall have a default maximum percent travel of 100% for DCV operation. This position shall be adjustable from 0 to 100%.
 - c. Shall start to open the damper if the CO₂ level is 502 ppm or greater. This set point shall be adjustable from 0 to 2000 ppm.
 - d. Shall put the damper at 100% of travel if the CO₂ level is 1004 ppm or greater. This set point shall be adjustable from 0 to 2000 ppm.
 - e. Shall put the damper at minimum position if the outdoor temperature is 10°F (-12°C) or lower. This low temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - f. Shall start closing the damper if the outdoor temperature is 40°F (4°C) or lower. This low temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - g. Shall put the damper at minimum position if the outdoor temperature is 105°F (41°C) or higher. This high temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).
 - h. Shall start closing the damper if the outdoor temperature is 75°F (24°C) or higher. This high temperature set point shall be adjustable from -31°F (-35°C) to 132°F (56°C).

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- D. Manual Outdoor Air Damper
1. Shall be available factory or field installed internal to the unit to provide fixed outdoor air requirements up to 25%.
 2. Outdoor air hood with filters shall be provided and constructed of G90 galvanized steel with a 0.20 – 0.30 mils urethane primer and 0.70 - 0.80 mils polyester coat on the top side and a 0.15 – 0.25 mils urethane primer and 0.20 to 0.30 mils. polyester coat on the back side. Coating shall be resistant to 1000 hours of salt spray per ASTM B-117; 500 hours of humidity exposure per ASTM D2247; and 168 hours of heat resistance per ASTM D3454. Coating shall be impact resistant per ASTM D2794; Abrasion resistant per ASTM D4060; and Solvent resistant per NCCA No. II-18. Coating shall have a H minimum pencil hardness per ASTM D3363. Coating shall have a 3T no tape pick off Flexibility per NCCAI-19. Coating shall have a “no tape pick off” cross hatch adhesion resistance per ASTM D3359.
- E. Gravity Exhaust Dampers (Barometric Relief Dampers)
1. Shall be available factory or field installed
 2. Pressure operated dampers shall be available for factory or field installation for either horizontal or down-flow (vertical) applications.
 3. Extruded aluminum dampers shall prevent blow-back and outdoor air infiltration during off cycle.
- F. Power Exhaust Fan
1. Shall be available factory (7.5 tons or larger) or field installed for downflow (vertical) units with economizers.
 2. Direct drive, propeller type fan shall exhaust air through exhaust damper.
 3. Motor shall be overload protected with permanently lubricated ball bearings.
 4. Exhaust fan control shall turn on when damper travel reaches 50%. This set point shall be adjustable from 0 to 100%.
- G. Outdoor Coil Guards
1. Shall be available for field installation.
 2. Coil guards constructed of galvanized steel, ¾” bird screen with enamel paint finished metal salt spray tested for 1000 hours per ASTM B-117 shall be available for protection from perimeter damage.
- H. Outdoor Coil Hail Guards
1. Shall be available for field installation.
 2. Hail guards constructed of galvanized steel, ¾” bird screen with enamel paint finish metal salt spray tested for 1000 hours per ASTM B-117 and angled downward for protection from hail shall be available for field installation.
- I. Disconnects
1. A unit disconnect switch shall be available as a factory option or field installed accessory.
- J. Circuit Breakers
1. A unit circuit breaker shall be available as a factory option.
- K. Service Outlet
1. Dual 115 volt, 15 amp GFCI type service outlets shall be factory installed. Wiring shall be either field provided (all sizes) or unit powered (13 – 30 ton only).
- L. Service Valves
1. Service valves for isolating each compressor circuit's refrigerant in the outdoor coil to allow servicing of the low side of the system shall be available as a factory installed option on all units except 13- 30 ton units with enhanced dehumidification option (Humiditrol).
- M. Dirty Filter Switch
1. An air pressure switch that indicates a dirty filter shall be available either factory or field installed.
- N. Air Proving Switch
1. An air pressure switch that indicates no supply air shall be available either factory or field installed.
- O. Smoke Detectors
1. Supply and/or return air smoke detectors shall be available either factory or field installed.
- P. LP/Propane Kit
1. A field installed fuel kit that allows the unit to be converted from natural gas to propane shall be available.
- Q. Roof Curb
1. A galvanized steel roof curb with wood nailer strip for flashing shall mate to the bottom perimeter of the equipment for either horizontal or downflow (vertical) discharge applications.
 2. For downflow applications, supports for attaching supply and return air ductwork shall be provided.
 3. Flashing shall be the responsibility of the roofing contractor.
 4. Frame shall be approved by U.S. National Roofing Contractors Association.
 5. Roof curb frames shall be available in either 14” (35.6 cm) or 24” (61 cm) heights.

2.5 SOURCE QUALITY CONTROL

- A. Tests, Inspections
1. Unit shall be run tested at the factory
- B. Verification of Performance
1. Factory run test record shall be available for review if requested.

PART 3 EXECUTION

3.1 INSTALLERS

- A. Installers shall be manufacturer trained

3.2 EXAMINATION

- A. Site shall be examined and deemed acceptable to receive the rooftop units prior to installation.

3.3 INSTALLATION

- A. Rooftop unit shall be installed per manufacturer's instructions

3.4 CONSTRUCTION

- A. Interface with Other Work
1. Unit shall be compatible with building automation system described in Section 15900.
- B. Sequences of Operation
1. Unit shall have two stages of cooling
 2. Unit shall have two stages of heating
 3. Refrigeration system and supply fan shall operate when a demand for cooling is received from the building automation system.
 4. Gas heating system and supply fan shall operate when a demand for heating is received from the building automation system.
 5. Supply fan shall operate continuously when an occupied demand is received from the building automation system.

3.5 FIELD QUALITY CONTROL

- A. Site Tests, Inspection
1. Equipment Operation Test shall be conducted by manufacturer trained contractor to verify proper operation.

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