PACKAGED HEAT PUMP

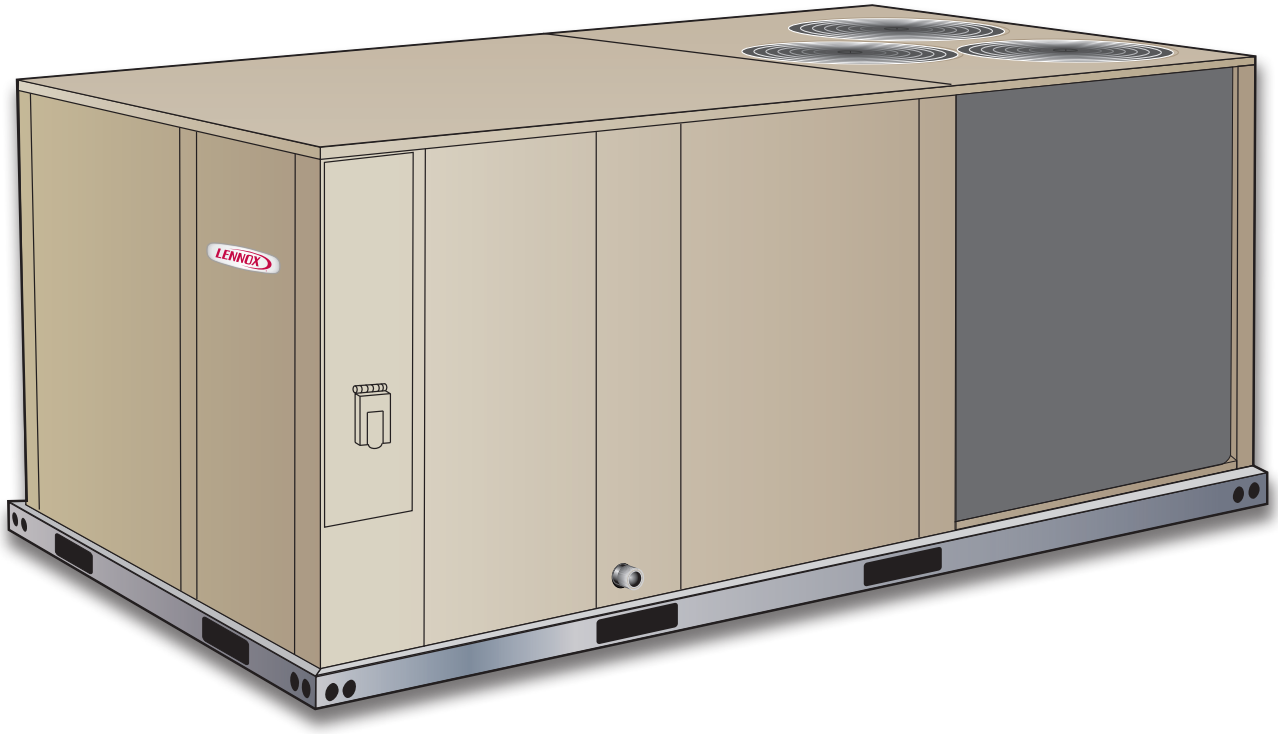
KH

Landmark® Rooftop Units

50 HZ

PRODUCT SPECIFICATIONS

Bulletin No. 490148
November 2010
Supersedes August 2010



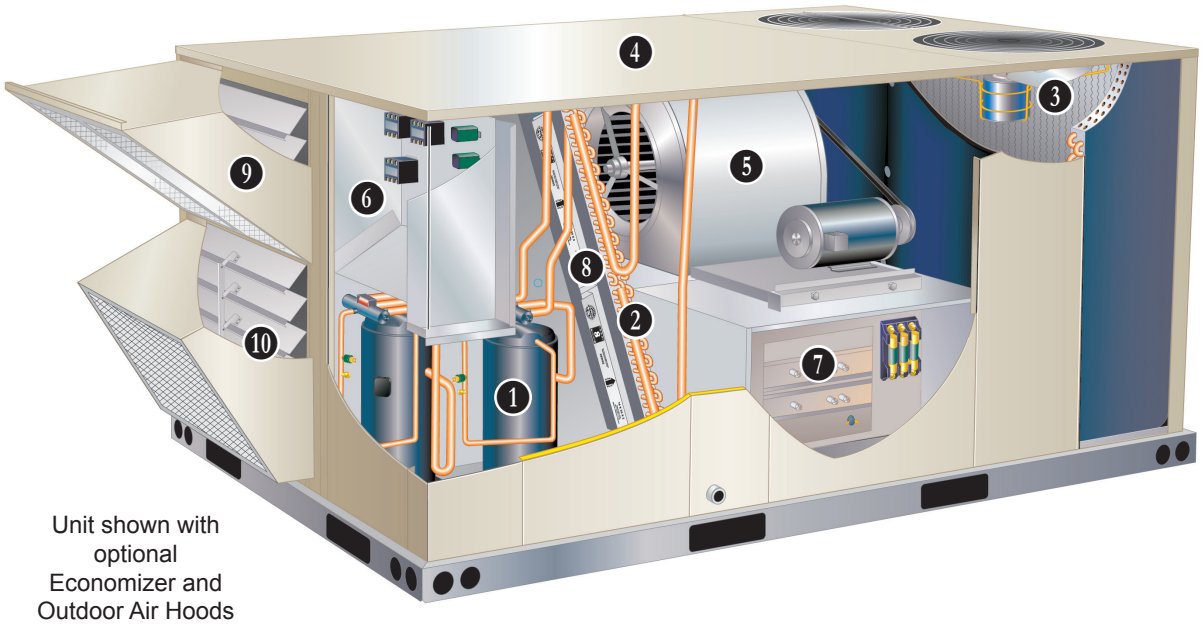
26 to 44 kW
Net Cooling Capacity – 23.6 to 36.5 kW (80 600 to 127 700 Btuh)
Net Heating Capacity - 23.3 to 36.3 kW (79 500 to 124 000 Btuh)
Optional Electric Heat - 5.7 to 45.9 kW

MODEL NUMBER IDENTIFICATION

K H A 120 S 4 B N 2 M

- **Brand/Family**
  K = Landmark®
- **Unit Type**
  H = Packaged Heat Pump
- **Major Design Sequence**
  A = 1st Generation
- **Nominal Cooling Capacity - Tons**
  092 = 26 kW
  102 = 30 kW
  120 = 35 kW
  150 = 44 kW
- **Cooling Efficiency**
  S = Standard Efficiency
- **Refrigerant Type**
  4 = R-410A
- **Blower Type**
  B = Belt Drive
- **Factory Installed Electric Heat**
  N = No Heat
- **Minor Design Sequence**
  1 = 1st Revision
  2 = 2nd Revision
  3 = 3rd Revision
- **Voltage**
  M = 380/420V-3 phase-50hz

FEATURES AND BENEFITS



Unit shown with optional Economizer and Outdoor Air Hoods

Landmark® rooftop units from Lennox are the new standard for reliable, efficient rooftop units built for long-lasting performance that can significantly improve indoor and outdoor environments. Landmark rooftop units feature:

- **R-410A Refrigerant** - Environmentally friendly
- **Scroll Compressors** - Single speed scroll compressors are furnished on all models.
- **High Pressure Switches** - Protect compressor.
- **Isolated Compressor Compartment** - Allows performance check during normal compressor operation without disrupting airflow.
- **Independent Motor Mounts** - Allows for easy and efficient service access without removing the top panel.
- **Downflow or Horizontal Airflow** - Easy field conversion.
- **Two Fork Lift Slots on Three Sides** - Easy to pick up and transport units from almost any angle.
- **Corrosion-Resistant Removable, Reversible Drain Pan** - Provides application flexibility, durability and improved serviceability.
- **Thermostatic Expansion Valves** - Provide peak cooling performance across the entire application range.
- **MERV 8 or MERV 13 Filters** - Available as field installed option, provide an enhanced level of indoor air quality, and can help the building qualify for additional Leadership in Energy and Environmental Design (LEED) credits

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PERFORMANCE / QUALITY

Components bonded for grounding to meet safety standards for servicing required by Underwriters Laboratories (UL) and the International Electrotechnical Commission (IEC).

Cooling performance is rated at test conditions included in Air- Conditioning, Heating and Refrigeration Institute (AHRI) Standard 340/360-2007 while operating at rated voltage and air volumes.

International Organization for Standardization (ISO) 9001 Registered Manufacturing Quality System.

CE MARK OPTION

The CE mark has been added to our rooftop product line as a configure to order (CTO) option. This optional construction allows units to be sold into countries requiring CE marking for rooftop products.

CE marked units meet the requirements of the Machinery Directive 2006/42/EC, Low Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC, and Gas Directive 90/396/EEC. Declaration of conformity certificates will be provided for each CE marked unit on demand.

Key features of this option over and above standard product features are:

- Touch-proof electrical components meeting the requirements of EN 60529.
- Branch circuits over 0.5 kW load have overcurrent protection.
- Rotary style/finger safe disconnect switch with locking handle prevents disconnect door from being opened with the power on. Padlock can be applied to lock the disconnect switch in the OFF position.
- The factory wiring has been redesigned for separation of high and low voltage circuits.

COOLING/HEATING SYSTEM

Designed to maximize sensible and latent cooling performance at design conditions.

System can operate in the cooling mode from 1°C to 52°C without any additional controls.

R-410A Refrigerant

Non-chlorine based, ozone friendly, R-410A.



1 Scroll Compressors

Scroll compressors on all models for high performance, reliability and quiet operation.

Resiliently mounted on rubber grommets for quiet operation.

Compressor Crankcase Heaters

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

Check/Thermal Expansion Valves

Assures optimal performance throughout the application range.

Removable element head.

Reversing Valves

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

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.

Freezestats

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

2 Coil Construction

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

COOLING/HEATING SYSTEM (CONTINUED)

Indoor Coil

Cross row circuiting with rifled copper tubing optimizes both sensible and latent cooling capacity.

Condenser Coil

Two independent formed coils allow separation for cleaning.

Condensate Drain Pan

Plastic pan, sloped to meet drainage requirements of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 62.1.

Side or bottom drain connections.

Reversible to allow connection at back of unit.

Outdoor Coil Fan Motors

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

3 **Outdoor Coil Fans**

Polyvinyl Chloride (PVC) coated fan guard furnished.

REQUIRED SELECTIONS

Cooling Capacity

Specify nominal cooling capacity of the unit

OPTIONS/ACCESSORIES

Field Installed

Condensate Drain Trap

Available in copper or polyvinyl chloride (PVC).

Drain Pan Overflow Switch

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

Low Ambient Kit

Cycles the outdoor fan while allowing compressor operation in the cooling cycle. This intermittent fan operation allows the system to operate without icing the evaporator coil and losing capacity. Designed for use in ambient temperatures no lower than -17°C.

CABINET

4 **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 forklift slots.

Raised edges around duct and power entry openings in the bottom of the unit provide additional protection against water entering the building.

Airflow Choice

Units are shipped in downflow (vertical) configuration, can be field converted to horizontal airflow with optional Horizontal Discharge Kit.

Duct Flanges

Provided for horizontal duct attachment.

Power Entry

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

Exterior Panels

Constructed of heavy-gauge, galvanized steel 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 in conditioned area. The insulation also serves as an air seal to the roof curb, eliminating the need to add a seal during installation.

Access Panels

Access panels are provided for the filter section, heating/blower section, and the compressor/ controls section.

OPTIONS/ACCESSORIES

Factory Installed

Corrosion Protection

A completely flexible immersed coating with an electrodeposited dry film process. (AST ElectroFin E-Coat) Meets Mil Spec MIL-P-53084, ASTM B117 Standard Method Salt Spray Testing.

Indoor Corrosion Protection:
- Coated coil
- Painted blower housing
- Painted base

Outdoor Corrosion Protection:
- Coated coil
- Painted base

Hinged Access Panels

Large access panels are hinged and have quarter-turn latches for quick and easy access to maintenance areas (filter, compressor / controls, heating / blower).

Field Installed

Coil Guards

Painted, galvanized steel wire guards to protect outdoor coil.

Not used with Hail Guards.

Hail Guards

Constructed of heavy gauge steel, painted to match cabinet, helps protect outdoor coils from hail damage.

Not used with Coil Guards..

Horizontal Discharge Kit

Consists of duct covers to block off downflow supply and return air openings for horizontal applications.

Also includes return air duct flanges for end return air when economizer is used in horizontal applications.

NOTE - When configuring unit for horizontal application with economizer, a separate Horizontal Barometric Relief Damper with Hood must be ordered separately for installation in the return air duct.

Return Air Adaptor Plate

For same size L Series® and T-Class™ unit replacement.

Installs on return air opening in unit to match return air opening on existing roof curbs. Also see Accessory Air Resistance table.

5 BLOWER

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

Motor

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

Supply Air Blower

Forward curved blades, double inlet, blower wheel is statically and dynamically balanced. Equipped with ball bearings and adjustable pulley (allows speed change).

Blower assembly slides out of unit for servicing.

REQUIRED SELECTIONS

Order blower motor horsepower and drive kit number required when base unit is ordered, see Drive Kit Specifications Table.

CONTROLS

6 Unit Control

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

Heat/Cool Staging - Capable of up to 2 heat / 2 cool staging with a third party DDC control system or thermostat.

Low Voltage Terminal Block - Provides screw terminal connections for thermostat or controller wiring.

Night Setback Mode - Saves energy by closing outdoor air dampers and operating supply fan on thermostat demand only.

Defrost Control

Provides a defrost cycle, if needed, every 30 or 60 or 90 minutes (adjustable) of compressor on" time at outdoor coil temperature below 1.6°C. Temperature switch mounted on outdoor coil liquid line terminates defrost cycle.

OPTIONS/ACCESSORIES

Field Installed

Smoke Detector

Photoelectric type, installed in supply air section, return air section or both sections. Available with power board and single sensor (supply or return) or power board and two sensors (supply and return).

Commercial Control Systems

Thermostats

Control system and thermostat options. Aftermarket unit controller options. See page 22.

ELECTRICAL

REQUIRED SELECTIONS

Voltage Choice

Specify when ordering base unit.

OPTIONS/ACCESSORIES

Field Installed

7 Electric Heat

Electric heat is CE marked.

Helix wound nichrome elements, individual element limit controls, wiring harness. Unit fuse block is furnished as standard. See Options / Accessories tables for ordering information.

INDOOR AIR QUALITY

8 Air Filters

Disposable 51 mm filters furnished as standard.

OPTIONS/ACCESSORIES

Field Installed

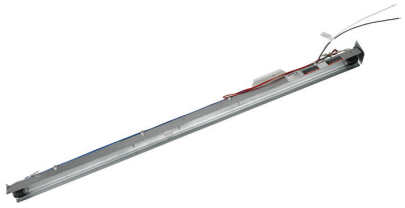
Healthy Climate® High Efficiency Air Filter

Disposable MERV 8 or MERV 13 (Minimum Efficiency Reporting Value based on ASHRAE 52.2) efficiency 51 mm pleated filters.

Replacement Filter Media Kit With Frame

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

Healthy Climate® UVC Germicidal Lamps



Germicidal lamps emit ultra-violet (UV-C) energy, which has been proven to be effective in reducing microbes such as viruses, bacteria, yeasts, and molds. This process either destroys the organism or controls its ability to reproduce.

UV-C energy greatly reduces the growth and proliferation of mold and other bioaerosols (bacteria and viruses) on illuminated surfaces (particularly coil and drain pan).

Lamps are field installed in the blower/evaporator coil section.

All necessary hardware for installation is included.

Lamps operate on 220V single-phase power supply. Step-down transformer may be ordered separately for 380/420V primary to 220V secondary units. Alternately, 220V power supply may be used to directly power the UVC ballast(s).

Magnetic safety interlock terminates power when access panels are removed.

Approved by ETL.

Indoor Air Quality (CO_2) Sensors

Monitors CO_2 levels, reports to the Unit Controller which adjusts economizer dampers as needed.

FEATURES AND BENEFITS

SERVICEABILITY

Designed to streamline general maintenance and decrease 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.

Access Panels

Large access panels for quick and easy access to maintenance areas (filter, compressor / controls/ blower / heat section).

Blower Access

Supply air blower parts are located near the access door for easy servicing and adjustment.

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

Formed condenser coil allows separation for easier cleaning.

Standard Components

A large number of common maintenance parts are standard throughout the entire range of sizes (10.5 through 88 kW), reducing the need to carry a lot of different parts to the job or maintain in inventory.

Compressor Compartment

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

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

ECONOMIZER/EXHAUST OPTIONS

Factory or Field Installed

9 Economizer with Temperature Control - Downflow or Horizontal With Barometric Relief Dampers and Hoods

Parallel gear-driven action return 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. Economizer includes outdoor air hood and barometric relief dampers with exhaust hood.

Single temperature control is furnished with economizer. Temperature sensor enables the economizer when the outdoor air temperature is below the configured setpoint.

10 Barometric Relief Dampers allow relief of excess air.

Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle.

Exhaust hood with bird screen furnished.

For use in downflow applications only.

NOTE - Outdoor Air and Barometric Relief Exhaust Hoods are included when economizer is factory installed and are furnished with economizer when ordered for field installation.

Field Installed

Single Enthalpy Temperature Control

Outdoor air enthalpy sensor enables economizer if the outdoor enthalpy is less than the setpoint of the control.

Differential Enthalpy Control

Order two Single Enthalpy Control Kits. One is field installed in the return air section, the other in the outdoor air section. Allows the economizer control board to select between outdoor air or return air, whichever has lower enthalpy.

Horizontal Barometric Relief Dampers

For use when unit is configured for horizontal applications requiring an economizer.

Allows relief of excess air

Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle.

Field installed in return air duct.

Exhaust hood with bird screen furnished.

Requires Horizontal Discharge Kit.

Power Exhaust Fan

Installs internal to unit for downflow 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. Requires Economizer with Outdoor Air Hood and Barometric Relief Dampers. Fan is 508 mm diameter with 5 blades (K1PWRE10B) With 224 W motor.

OUTDOOR AIR OPTIONS

Factory or Field Installed

Outdoor Air Damper - Downflow or Horizontal With Air Hood

Linked mechanical dampers, 0 to 25% (fixed) outdoor air adjustable, installs in unit. Includes outdoor air hood.

Automatic model features fully modulating spring return damper motor with plug-in connection.

Manual model features a slide damper.

Maximum mixed air temperature in cooling mode: 100°F.

ROOF CURBS (DOWNFLOW)

Nailer strip furnished, mates to unit, US National Roofing Contractors Approved, shipped knocked down.

Clip Curbs - Uses interlocking tabs to fasten corners together. No tools required.

Standard Curbs - Curb corners fasten together with furnished hardware.

CEILING DIFFUSERS

Ceiling Diffusers (Flush or Step-Down)

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.

OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No 092	102	120	150
CE MARK						
CE Marked Unit		Factory	O	O	O	O
COOLING SYSTEM						
Condensate Drain Trap	Polyvinyl Chloride (PVC) - C1TRAP20AD2	**76W26**	X	X	X	X
	Copper - C1TRAP10AD2	**76W27**	X	X	X	X
Corrosion Protection		Factory	O	O	O	O
Drain Pan Overflow Switch	K1SNSR71AB1-	**74W42**	X	X	X	X
Efficiency		Standard	O	O	O	O
Low Ambient Kit	K1SNSR33B-1	**54W16**	X	X	X	X
Refrigerant Type		R-410A	O	O	O	O
BLOWER - SUPPLY AIR						
Motors	Belt Drive - 1.5 kW (2 hp)	Factory	O	O	O	O
	Belt Drive - 2.2 kW (3 hp)	Factory	O	O	O	O
	Belt Drive - 3.7 kW (5 hp)	Factory	O	O	O	O
Drive Kits	Kit #1 490-740 rev/min	Factory	O	O	O	O
See Blower Data Tables for selection	Kit #2 665-920 rev/min	Factory	O	O	O	O
	Kit #3 660-995 rev/min	Factory	O	O	O	O
	Kit #7 610-810 rev/min	Factory	O	O	O	O
	Kit #8 780-1000 rev/min	Factory	O	O	O	O
	Kit #9 845-1085 rev/min	Factory	O	O	O	O
	Kit #10 750-945 rev/min	Factory	O	O	O	O
	Kit #11 865-1095 rev/min	Factory	O	O	O	O
	Kit #12 940-1190 rev/min	Factory	O	O	O	O
CABINET						
Coil Guards	(092, 102, 120) K1GARD20BS1	**55W09**	X	X	X	X
	(150) K1GARD20BP1	**55W10**	X	X	X	X
Hail Guards	(092, 102, 120) K1GARD10BS1	**55W12**	X	X	X	X
	(150) K1GARD10BP1	**55W13**	X	X	X	X
Hinged Access Panels		Factory	O	O	O	O
Horizontal Discharge Kit	K1HECK00B-1	**51W25**	X	X	X	X
Return Air Adaptor Plate (for L Series® and T-Class™ replacement)	C1CONV10B-1	**54W96**	X	X	X	X
CONTROLS						
Smoke Detector - Supply or Return (Power board and one sensor)	C1SNSR44B-1	**53W80**	X	X	X	X
Smoke Detector - Supply and Return (Power board and two sensors)	C1SNSR43B-1	**53W81**	X	X	X	X

NOTE - Catalog and model numbers shown are for ordering field installed accessories.
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X = Field Installed

OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No 092	102	120	150
INDOOR AIR QUALITY						
Air Filters						
Healthy Climate® High Efficiency Air Filters	MERV 8 - C1FLTR15B-1	**50W61**	X	X	X	X
208 x 635 x 51 mm (Order 4 per unit)	MERV 13 - C1FLTR40B-1	**52W41**	X	X	X	X
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)	C1FLTR30B-1-	**Y3063**	X	X	X	X
Indoor Air Quality (CO_2) Sensors						
Sensor - Wall-mount, off-white plastic cover with LCD display	C0SNSR50AE1L	**77N39**	X	X	X	X
Sensor - Wall-mount, off-white plastic cover, no display	C0SNSR52AE1L	**87N53**	X	X	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting	C0SNSR51AE1L	**87N52**	X	X	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	C0MISC19AE1	**87N54**	X	X	X	X
CO_2 Sensor Duct Mounting Kit - for downflow applications	C0MISC19AE1-	**85L43**	X	X	X	X
Aspiration Box - for duct mounting non-plenum rated CO_2 sensors (**87N53** or **77N39**)	C0MISC16AE1-	**90N43**	X	X	X	X
UVC Germicidal Lamps						
[1] Healthy Climate® UVC Light Kit (220V-1ph)	C1UVCL10B-1	**54W62**	X	X	X	X
ELECTRICAL						
Voltage 50 hz with neutral (No neutral on CE marked models)	380/420V - 3 phase	Factory	O	O	O	O
[2] ELECTRIC HEAT						
5.7 kW	380/420V-3ph - C1EHO057B-1M	**68W04**	X	X		
11.5 kW	380/420V-3ph - C1EHO115B-1M	**68W05**	X	X	X	X
17.2 kW	380/420V-3ph - C1EHO172B-1M	**68W06**	X	X	X	X
23 kW	380/420V-3ph - C1EHO230B-1M	**68W07**	X	X	X	X
34.5 kW	380/420V-3ph - C1EHO345B-1M	**68W08**	X	X	X	X
45.9 kW	380/420V-3ph - C1EHO459B-1M	**68W09**			X	X

[1] Lamps operate on 220V single-phase power supply. Step-down transformer may be ordered separately for 380/420V primary to 220V secondary units. Alternately, 220V power supply may be used to directly power the UVC ballast(s)

[2] Nominal kW at 420V-3ph-50hz.

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OPTIONS / ACCESSORIES

Item Description	Model Number	Catalog Number	Unit Model No 092	102	120	150
ECONOMIZER						
Economizer						
Economizer with Single Temperature Control - Downflow or Horizontal With Barometric Relief Dampers (downflow) and Air Hoods	K1ECON20B-1	**54W55**	OX	OX	OX	OX
Economizer Controls						
Single Enthalpy Control	C1SNSR64FF1	**53W64**	X	X	X	X
Differential Enthalpy Control (order 2)	C1SNSR64FF1	**53W64**	X	X	X	X
Horizontal Barometric Relief Dampers With Exhaust Hood						
Horizontal Barometric Relief Dampers - Exhaust Hood Furnished	LAGEDH03/15	**53K04**	X	X	X	X
OUTDOOR AIR						
Outdoor Air Dampers						
Motorized Dampers with outdoor air hood	C1DAMP20B-1	**53W49**	OX	OX	OX	OX
Manual Dampers with outdoor air hood	C1DAMP10B-1	**53W48**	OX	OX	OX	OX
POWER EXHAUST						
Standard Static	380/420V-3ph - K1PWRE10B-1G	**53W45**	X	X	X	X
ROOF CURBS - DOWNFLOW						
Clip Curb						
203 mm height	C1CURB23B-1	**54W46**	X	X	X	X
356 mm height	C1CURB20B-1	**54W47**	X	X	X	X
457 mm height	C1CURB21B-1	**54W48**	X	X	X	X
610 mm height	C1CURB22B-1	**54W49**	X	X	X	X
Standard						
203 mm height	C1CURB12B-1	**54W44**	X	X	X	X
356 mm height	C1CURB10B-1	**54W43**	X	X	X	X
610 mm height	C1CURB11B-1	**54W45**	X	X	X	X
Adjustable Pitched Curb						
356 mm height	C1CURB55B-1	**54W50**	X	X	X	X
CEILING DIFFUSERS						
Step-Down - Order one	RTD11-95	**29G04**	X			
	RTD11-135	**29G05**		X	X	
	RTD11-185	**29G06**				X
Flush - Order one	FD11-95	**29G08**	X			
	FD11-135	**29G09**		X	X	
	FD11-185	**29G10**				X
Transitions (Supply and Return) - Order one	LASRT08/10	**24L14**	X			
	LASRT10/12	**49K55**		X	X	
	LASRT15	**49K56**				X

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SPECIFICATIONS

General Data		Nominal kW (Tons)	26 (7.5)	30 (8.5)	35 (10)	44 (12.5)
		Model Number	**KHA092S4B**	**KHA102S4B**	**KHA120S4B**	**KHA150S4B**
		Efficiency Type	**Standard**	**Standard**	**Standard**	**Standard**
		Blower Type	Constant Air Volume CAV	Constant Air Volume CAV	Constant Air Volume CAV	Constant Air Volume CAV
Cooling Performance	Gross Cooling Capacity - kW (Btuh)		24.3 (83 100)	27.3 (93 200)	32.3 (110 300)	38.6 (131 700)
	[1] Net Cooling Capacity - kW (Btuh)		23.6 (80 600)	26.3 (89 900)	31.2 (106 700)	36.5 (124 700)
	AHRI Rated Air Flow - L/s (cfm)		3000	1605 (3400)	1699 (3600)	2124 (4500)
	Total Unit Power - kW		7.2	8.0	9.5	11.6
	[1] EER (Btuh/Watt)		11.2	11.2	11.2	10.7
	[2] IEER (Btuh/Watt)		11.2	11.2	11.2	10.7
	Refrigerant Type		R-410A	R-410A	R-410A	R-410A
	Refrigerant Charge Furnished	Circuit 1	5.7 kg (12 lbs. 8 oz.)	6.1 kg (13 lbs. 8 oz.)	6.8 kg (15 lbs. 0 oz.)	10 kg (22 lbs. 0 oz.)
		Circuit 2	5.4 kg (12 lbs. 0 oz.)	5.9 kg (13 lbs. 0 oz.)	6.8 kg (15 lbs. 0 oz.)	10.4 kg (23 lbs. 0 oz.)
Heating Performance	[1] Total High Heat Capacity - kW (Btuh)		23.3 (79 500)	26.1 (89 100)	30.4 (103 900)	36.3 (124 000)
	Total Unit Power - kW		6.7	7.5	8.8	10.9
	[1] Coefficient of Performance		3.5	3.5	3.5	3.3
	[1] Total Low Heat Capacity - kW (Btuh)		13.9 (47 300)	14.6 (49 000)	18.8 (64 100)	21.6 (73 700)
	Total Unit Power (kW)		5.9	6.2	8.1	10.3
	[1] Coefficient of Performance		2.33	2.33	2.32	2.10
Electric Heat Available - See page 9			5.7, 11.5, 17.2, 23, 34.5 KW		11.5, 17.2, 23, 34.5, 45.9 KW	
Compressor Type (number)			Scroll (2)	Scroll (2)	Scroll (2)	Scroll (2)
Outdoor Coils	Net face area (total) - m^2 (sq. ft.)		2.68 (28.8)	2.68 (28.8)	2.68 (28.8)	3.79 (40.8)
	Tube diameter - mm (in.)		9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)
	Number of rows		2	2	3	3
	Fins per m (inch)		787 (20)	787 (20)	787 (20)	787 (20)
Outdoor Coil Fans	Motor - (No.) horsepower		(2) 249 (1/3)	(2) 373 (1/2)	(2) 373 (1/2)	(3) 249 (1/3)
	Motor rev/min		896	896	896	896
	Total Motor watts		508	592	616	879
	Diameter - (No.) mm (in.)		(2) 610 (24)	(2) 610 (24)	(2) 610 (24)	(3) 610 (24)
	Number of blades		3	3	3	3
	Total Air volume - L/s (cfm)		3225 (6835)	3380 (7165)	3460 (7335)	4325 (9165)
Indoor Coils	Net face area (total) - m^2 (sq. ft.)		1.19 (12.8)	1.19 (12.8)	1.19 (12.8)	1.19 (12.8)
	Tube diameter - mm (in.)		9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)
	Number of rows		3	4	4	4
	Fins per m (inch)		551 (14)	551 (14)	551 (14)	551 (14)
	Drain connection - Number and size		(1) 1 in. NPT coupling			
	Expansion device type		Balance port TXV, removable head			
[3] **Indoor Blower and Drive Selection**	Nominal motor kW (HP)		1.5 (2)	1.5 (2)	1.5 (2)	1.5 (2)
	Maximum usable motor kW (HP)		1.7 (2.3)	1.7 (2.3)	1.7 (2.3)	1.7 (2.3)
	Kit # and rev/min range		[4] #1 490 - 740 #2 665 - 920 #3 660 - 995	[4] #1 490 - 740 #2 665 - 920 #3 660 - 995	#1 490 - 740 #2 665 - 920 #3 660 - 995	#1 490 - 740 #2 665 - 920 #3 660 - 995
	Nominal motor kW (HP)		2.2 (3)	2.2 (3)	2.2 (3)	2.2 (3)
	Maximum usable motor kW (HP)		2.6 (3.45)	2.6 (3.45)	2.6 (3.45)	2.6 (3.45)
	Kit # and rev/min range		#7 610 - 810 #8 780 - 1000 #9 845 - 1085	#7 610 - 810 #8 780 - 1000 #9 845 - 1085	[4] #7 610 - 810 #8 780 - 1000 #9 845 - 1085	#7 610 - 810 #8 780 - 1000 #9 845 - 1085
	Nominal motor kW (HP)		3.7 (5)	3.7 (5)	3.7 (5)	3.7 (5)
	Maximum usable motor kW (HP)		4.3 (5.75)	4.3 (5.75)	4.3 (5.75)	4.3 (5.75)
	Kit # and rev/min range		#10 750 - 945 #11 865 - 1095 #12 940 - 1190	#10 750 - 945 #11 865 - 1095 #12 940 - 1190	#10 750 - 945 #11 865 - 1095 #12 940 - 1190	[4] #10 750 - 945 #11 865 - 1095 #12 940 - 1190
	Blower wheel nominal diameter x width - mm (in.)		(1) 381 x 381 (15 X 15)	(1) 381 x 381 (15 X 15)	(1) 381 x 381 (15 X 15)	(1) 381 x 381 (15 X 15)
Filters	Type of filter		Disposable			
	Number and size - in.		(4) 508 x 508 x 51 (20 x 25 x 2)			
Electrical characteristics			380/420V - 50 hertz - 3 phase with neutral (No neutral on CE marked models)			

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

[1] Tested at conditions included in the ULE certification program, which is based on AHRI Standard 340/360 while operating at rated voltage and air volumes:
Cooling Ratings − 35°C (95°F) outdoor air temperature and 27°C (80°F) db/19°C (67°F) wb entering indoor coil air.
High Temperature Heating Ratings − 8°C (47°F) db/6°C (43°F) wb outdoor air temperature and 21°C (70°F) entering indoor coil air.
Low Temperature Heating Ratings − -8°C (17°F) db/-9°C (15°F) wb outdoor air temperature and 21°C (70°F) entering indoor coil air.

[2] Integrated Energy Efficiency Ratio tested at conditions included in AHRI Standard 340/360 while operating at rated voltage and air volumes.

[3] Using total air volume and system static pressure requirements determine from blower performance tables rev/min and motor output required. Maximum usable output of motors furnished are shown. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

[4] Standard motor and drive kit furnished with unit.

RATINGS

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

26 KW STANDARD EFFICIENCY KHA092S4 (1ST STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		18°C					24°C					29°C					35°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	565	12.9	1.90	.63	.78	.99	12.3	2.15	.64	.81	1.00	11.8	2.43	.65	.85	1.00	11.1	2.75	.67	.89	1.00
	710	13.5	1.91	.67	.90	1.00	12.9	2.16	.69	.94	1.00	12.3	2.44	.70	.97	1.00	11.7	2.76	.74	1.00	1.00
	850	14.0	1.91	.73	1.00	1.00	13.4	2.16	.76	1.00	1.00	12.9	2.44	.80	1.00	1.00	12.2	2.76	.84	1.00	1.00
19°C	565	13.6	1.91	.50	.61	.73	13.0	2.16	.50	.62	.76	12.5	2.44	.51	.63	.79	11.8	2.76	.52	.65	.84
	850	14.2	1.91	.52	.65	.85	13.6	2.16	.53	.67	.88	13.0	2.44	.54	.68	.93	12.3	2.76	.55	.70	.97
	850	14.7	1.92	.55	.70	.96	14.1	2.17	.56	.72	.99	13.3	2.45	.57	.76	1.00	12.6	2.76	.59	.81	1.00
22°C	565	14.3	1.91	.38	.48	.59	13.7	2.16	.38	.49	.60	13.1	2.44	.38	.50	.61	12.4	2.76	.39	.51	.63
	710	15.0	1.92	.39	.51	.63	14.4	2.17	.39	.52	.65	13.7	2.45	.40	.53	.66	12.9	2.77	.40	.54	.69
	850	15.5	1.93	.40	.54	.68	14.8	2.18	.41	.55	.70	14.1	2.45	.41	.56	.73	13.3	2.77	.41	.58	.77

26 KW STANDARD EFFICIENCY KHA092S4 (2ND STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		27°C					35°C					43°C					52°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1135	23.9	4.50	.73	.89	1.00	22.1	5.42	.75	.93	1.00	20.1	6.58	.79	.98	1.00	18.0	8.05	.85	1.00	1.00
	1415	25.1	4.52	.78	.97	1.00	23.2	5.43	.82	1.00	1.00	21.3	6.59	.87	1.00	1.00	19.1	8.06	.95	1.00	1.00
	1700	26.1	4.52	.85	1.00	1.00	24.3	5.44	.89	1.00	1.00	22.2	6.60	.95	1.00	1.00	19.9	8.05	1.00	1.00	1.00
19°C	1135	25.3	4.51	.57	.71	.85	23.4	5.44	.59	.73	.89	21.3	6.59	.61	.77	.95	18.7	8.05	.64	.82	1.00
	1700	26.4	4.53	.61	.76	.94	24.3	5.45	.63	.79	.98	22.0	6.60	.65	.85	1.00	19.4	8.06	.69	.92	1.00
	1700	27.2	4.54	.64	.82	1.00	25.0	5.45	.66	.87	1.00	22.6	6.59	.69	.93	1.00	19.9	8.04	.74	1.00	1.00
22°C	1135	26.6	4.53	.43	.56	.68	24.6	5.44	.44	.58	.71	22.4	6.60	.45	.60	.74	19.8	8.06	.46	.63	.80
	1415	27.8	4.55	.44	.59	.74	25.7	5.46	.45	.62	.77	23.2	6.60	.46	.64	.82	20.5	8.04	.48	.69	.90
	1700	28.7	4.55	.46	.63	.80	26.4	5.46	.47	.65	.85	23.8	6.60	.48	.69	.90	20.9	8.04	.51	.74	.98

26 KW STANDARD EFFICIENCY KHA092S4 - HEATING CAPACITY

Indoor Coil Air Volume 21°C Dry Bulb	Air Temperature Entering Outdoor Coil									
	18°C		7°C		-4°C		-15°C		-28°C	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
L/s	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
1135	28.6	5.9	21.8	5.5	14.7	5.1	9.6	4.4	4.8	3.3
1415	29.1	5.5	22.3	5.2	15.2	4.8	10.1	4.0	5.3	3.0
1700	29.5	5.3	22.7	4.9	15.7	4.6	10.6	3.8	5.7	2.7

RATINGS

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

30 KW STANDARD EFFICIENCY KHA102S4 (1ST STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		18°C					24°C					29°C					35°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1285	14.0	2.13	.64	.80	1.00	13.4	2.41	.66	.83	1.00	12.8	2.71	.67	.86	1.00	12.1	3.08	.69	.91	1.00
	1605	14.7	2.14	.70	.93	1.00	14.0	2.42	.71	.96	1.00	13.4	2.72	.73	1.00	1.00	12.7	3.08	.76	1.00	1.00
	1925	15.2	2.15	.75	1.00	1.00	14.6	2.42	.79	1.00	1.00	14.0	2.73	.82	1.00	1.00	13.3	3.09	.87	1.00	1.00
19°C	1285	14.8	2.14	.51	.62	.75	14.2	2.42	.52	.64	.78	13.5	2.73	.52	.65	.81	12.8	3.09	.53	.67	.86
	1925	15.4	2.15	.54	.68	.87	14.8	2.43	.55	.69	.91	14.1	2.73	.56	.70	.96	13.3	3.09	.57	.73	.99
	1925	15.9	2.16	.57	.72	.98	15.2	2.43	.58	.76	1.00	14.4	2.74	.60	.79	1.00	13.7	3.10	.60	.84	1.00
22°C	1285	15.6	2.16	.38	.49	.60	15.0	2.43	.39	.51	.62	14.3	2.74	.39	.51	.63	13.6	3.10	.40	.52	.65
	1605	16.3	2.17	.40	.53	.66	15.6	2.44	.40	.54	.67	14.9	2.75	.41	.55	.69	14.1	3.10	.41	.56	.71
	1925	16.8	2.17	.41	.56	.71	16.0	2.44	.42	.57	.72	15.3	2.75	.42	.59	.76	14.4	3.10	.42	.60	.81

30 KW STANDARD EFFICIENCY KHA102S4 (2ND STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		27°C					35°C					43°C					52°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1285	27.0	5.22	.74	.90	1.00	24.9	6.28	.77	.95	1.00	22.6	7.60	.81	1.00	1.00	20.3	9.29	.87	1.00	1.00
	1605	28.2	5.25	.80	.99	1.00	26.2	6.30	.84	1.00	1.00	24.1	7.63	.89	1.00	1.00	21.5	9.28	.97	1.00	1.00
	1925	29.5	5.26	.87	1.00	1.00	27.5	6.32	.92	1.00	1.00	25.1	7.64	.98	1.00	1.00	22.3	9.29	1.00	1.00	1.00
19°C	1285	28.6	5.25	.58	.72	.86	26.4	6.31	.60	.75	.91	23.9	7.61	.62	.78	.96	21.0	9.28	.65	.84	1.00
	1925	29.7	5.27	.62	.78	.96	27.3	6.31	.64	.82	1.00	24.7	7.64	.66	.87	1.00	21.7	9.28	.71	.95	1.00
	1925	30.5	5.28	.65	.85	1.00	28.1	6.32	.68	.90	1.00	25.4	7.64	.71	.96	1.00	22.4	9.29	.77	1.00	1.00
22°C	1285	30.2	5.27	.43	.57	.70	27.9	6.32	.44	.58	.72	25.4	7.64	.45	.61	.76	22.3	9.30	.47	.64	.82
	1605	31.4	5.29	.45	.61	.76	29.0	6.34	.46	.63	.80	26.1	7.64	.47	.66	.85	22.9	9.29	.49	.70	.93
	1925	32.3	5.31	.47	.65	.82	29.6	6.34	.48	.67	.87	26.7	7.65	.49	.71	.94	23.4	9.31	.52	.76	1.00

30 KW STANDARD EFFICIENCY KHA102S4 - HEATING CAPACITY

Indoor Coil Air Volume 21°C Dry Bulb	Air Temperature Entering Outdoor Coil									
	18°C		7°C		-4°C		-15°C		-28°C	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
L/s	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
1285	32.5	6.3	24.6	5.8	16.3	5.3	10.5	4.6	5.3	3.5
1605	33.0	5.9	25.0	5.4	16.8	4.9	10.9	4.3	5.7	3.1
1925	33.6	5.7	25.6	5.2	17.3	4.7	11.5	4.0	6.3	2.9

RATINGS

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

35 KW STANDARD EFFICIENCY KHA120S4 (1ST STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		18°C					24°C					29°C					35°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1510	16.9	2.55	.68	.82	.99	16.2	2.89	.69	.85	1.00	15.5	3.28	.71	.88	1.00	14.7	3.70	.72	.91	1.00
	1890	17.7	2.57	.73	.92	1.00	17.0	2.92	.75	.95	1.00	16.2	3.30	.76	.98	1.00	15.3	3.73	.80	1.00	1.00
	2265	18.3	2.59	.78	1.00	1.00	17.6	2.94	.81	1.00	1.00	16.9	3.33	.84	1.00	1.00	16.1	3.76	.87	1.00	1.00
19°C	1510	17.9	2.58	.54	.66	.78	17.2	2.93	.55	.67	.80	16.4	3.31	.56	.69	.83	15.6	3.74	.56	.71	.86
	2265	18.7	2.60	.57	.71	.87	17.9	2.95	.58	.73	.91	17.1	3.34	.59	.74	.94	16.1	3.77	.60	.77	.98
	2265	19.3	2.63	.60	.76	.97	18.4	2.98	.61	.78	.99	17.5	3.36	.62	.81	1.00	16.6	3.78	.64	.85	1.00
22°C	1510	18.9	2.61	.41	.52	.64	18.2	2.97	.41	.53	.65	17.3	3.35	.42	.54	.66	16.4	3.78	.42	.55	.69
	1890	19.8	2.64	.42	.56	.69	18.9	3.00	.42	.57	.70	18.1	3.38	.43	.58	.72	17.1	3.81	.43	.59	.74
	2265	20.3	2.66	.44	.59	.74	19.5	3.02	.44	.60	.76	18.5	3.40	.44	.61	.78	17.5	3.83	.45	.63	.82

35 KW STANDARD EFFICIENCY KHA120S4 (2ND STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		27°C					35°C					43°C					52°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1510	32.3	6.19	.72	.87	1.00	29.9	7.43	.74	.92	1.00	27.3	8.96	.78	.97	1.00	24.4	10.84	.83	1.00	1.00
	1890	33.7	6.24	.78	.97	1.00	31.3	7.50	.81	1.00	1.00	28.8	9.03	.86	1.00	1.00	25.9	10.90	.94	1.00	1.00
	2265	35.2	6.30	.84	1.00	1.00	32.8	7.56	.89	1.00	1.00	30.1	9.09	.94	1.00	1.00	27.0	10.95	1.00	1.00	1.00
19°C	1510	34.3	6.26	.57	.70	.83	31.7	7.52	.58	.73	.88	28.9	9.04	.60	.76	.93	25.6	10.89	.63	.81	1.00
	2265	35.7	6.31	.60	.75	.93	32.9	7.57	.62	.79	.98	29.9	9.08	.64	.83	1.00	26.4	10.91	.68	.91	1.00
	2265	36.7	6.35	.63	.81	1.00	33.8	7.61	.66	.86	1.00	30.6	9.11	.69	.92	1.00	27.1	10.95	.73	.99	1.00
22°C	1510	36.2	6.33	.43	.55	.67	33.5	7.59	.43	.56	.70	30.6	9.11	.44	.59	.73	27.1	10.96	.45	.62	.78
	1890	37.7	6.40	.44	.59	.73	34.8	7.66	.45	.61	.76	31.7	9.17	.46	.63	.81	27.9	10.98	.47	.67	.88
	2265	38.7	6.44	.46	.62	.79	35.8	7.70	.46	.65	.83	32.4	9.20	.48	.68	.90	28.6	11.03	.49	.73	.98

35 KW STANDARD EFFICIENCY KHA120S4 - HEATING CAPACITY

Indoor Coil Air Volume 21°C Dry Bulb	Air Temperature Entering Outdoor Coil									
	18°C		7°C		-4°C		-15°C		-28°C	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
L/s	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
1510	37.2	7.8	28.7	7.2	19.9	6.5	13.7	5.7	6.6	4.3
1890	38.0	7.3	29.6	6.7	20.8	6.1	14.6	5.3	7.5	3.9
2265	38.8	7.0	30.4	6.4	21.6	5.8	15.4	5.0	8.3	3.6

RATINGS

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

44 KW STANDARD EFFICIENCY KHA150S4 (1ST STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		18°C					24°C					29°C					35°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1795	19.8	3.08	.66	.82	1.00	19.1	3.43	.66	.85	1.00	18.4	3.81	.68	.87	1.00	17.5	4.23	.70	.91	1.00
	2075	20.5	3.09	.69	.89	1.00	19.8	3.43	.70	.91	1.00	19.0	3.81	.71	.95	1.00	18.1	4.23	.74	.98	1.00
	2360	21.0	3.09	.72	.96	1.00	20.3	3.44	.74	.98	1.00	19.5	3.81	.77	1.00	1.00	18.6	4.23	.80	1.00	1.00
19°C	1795	21.0	3.09	.52	.63	.77	20.4	3.44	.52	.64	.79	19.5	3.82	.53	.65	.82	18.7	4.23	.54	.67	.85
	2360	21.7	3.10	.54	.67	.84	20.9	3.44	.54	.67	.86	20.1	3.82	.55	.69	.90	19.2	4.23	.56	.71	.94
	2360	22.1	3.10	.55	.69	.91	21.4	3.45	.56	.71	.94	20.5	3.82	.57	.73	.97	19.6	4.24	.58	.77	1.00
22°C	1795	22.3	3.11	.39	.50	.61	21.5	3.45	.39	.51	.62	20.7	3.82	.40	.52	.63	19.8	4.24	.40	.52	.65
	2075	23.0	3.11	.40	.52	.64	22.2	3.45	.40	.53	.66	21.3	3.82	.40	.54	.67	20.4	4.24	.41	.55	.68
	2360	23.5	3.12	.41	.54	.67	22.6	3.46	.40	.54	.69	21.8	3.83	.41	.56	.70	20.8	4.24	.42	.57	.73

44 KW STANDARD EFFICIENCY KHA150S4 (2ND STAGE)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		27°C					35°C					43°C					52°C				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
	L/s	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C	kW	kW	24°C	27°C	29°C
17°C	1795	37.8	7.08	.72	.88	1.00	35.2	8.28	.74	.93	1.00	32.4	9.71	.78	.98	1.00	29.2	11.41	.84	1.00	1.00
	2075	38.9	7.08	.75	.95	1.00	36.4	8.28	.79	.99	1.00	33.5	9.70	.83	1.00	1.00	30.5	11.40	.90	1.00	1.00
	2360	39.9	7.09	.80	.99	1.00	37.5	8.28	.84	1.00	1.00	34.8	9.71	.88	1.00	1.00	31.7	11.42	.96	1.00	1.00
19°C	1795	40.2	7.09	.56	.70	.84	37.5	8.29	.58	.72	.88	34.3	9.71	.60	.75	.94	30.8	11.42	.62	.80	1.00
	2360	41.2	7.10	.58	.73	.90	38.5	8.29	.60	.76	.95	35.4	9.71	.62	.80	.99	31.5	11.42	.65	.86	1.00
	2360	42.2	7.10	.61	.77	.96	39.4	8.29	.63	.81	1.00	36.0	9.71	.65	.86	1.00	32.2	11.41	.68	.93	1.00
22°C	1795	42.6	7.10	.42	.55	.67	39.8	8.29	.43	.56	.70	36.6	9.71	.44	.58	.72	32.9	11.42	.45	.61	.77
	2075	43.8	7.11	.43	.57	.71	41.0	8.30	.44	.59	.73	37.6	9.72	.45	.61	.77	33.6	11.41	.46	.64	.83
	2360	44.7	7.12	.44	.59	.75	41.8	8.30	.45	.61	.78	38.3	9.72	.46	.64	.83	34.3	11.42	.47	.67	.89

44 KW STANDARD EFFICIENCY KHA150S4 - HEATING CAPACITY

Indoor Coil Air Volume 21°C Dry Bulb	Air Temperature Entering Outdoor Coil									
	18°C		7°C		-4°C		-15°C		-28°C	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
L/s	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW
1795	44.2	8.5	33.7	7.8	22.7	7.1	15.2	6.3	7.5	4.6
2075	45.1	8.2	34.6	7.5	23.6	6.8	16.1	6.0	8.4	4.4
2360	46.0	8.0	35.4	7.3	24.4	6.6	17.0	5.8	9.2	4.2

BLOWER DATA

092 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 required.

See page 18 for blower motors and drives.

See page 18 for wet coil and option/accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT - Maximum Static Pressure - 500 Pa (2.0 in. w.g.)

5.7 kW, 11.5 kW, 17.2 kW, 23 kW and 34.5 kW - 1320 L/s (2800 cfm)

Air Volume		TOTAL STATIC PRESSURE - Pa (Inches Water Gauge)																				
		50 (0.20)			100 (0.40)			150 (0.60)			200 (0.80)			250 (1.00)			300 (1.20)			350 (1.40)		
L/s	cfm	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP
1062	2250	- - -	- - -	- - -	- - -	- - -	- - -	707	0.10	0.14	753	0.37	0.5	800	0.63	0.84	847	0.86	1.15	892	1.03	1.38
1180	2500	- - -	- - -	- - -	- - -	- - -	- - -	714	0.22	0.29	758	0.48	0.64	803	0.72	0.97	849	0.94	1.26	893	1.10	1.48
1298	2750	- - -	- - -	- - -	680	0.08	0.11	721	0.34	0.45	763	0.58	0.78	807	0.81	1.09	852	1.02	1.37	896	1.18	1.58
1416	3000	- - -	- - -	- - -	689	0.22	0.29	728	0.46	0.61	770	0.69	0.93	812	0.92	1.23	856	1.11	1.49	901	1.27	1.7
1534	3250	661	0.13	0.17	698	0.34	0.46	737	0.58	0.78	777	0.81	1.09	819	1.03	1.38	862	1.22	1.63	908	1.37	1.84
1652	3500	672	0.27	0.36	708	0.48	0.65	746	0.71	0.95	786	0.93	1.25	827	1.14	1.53	870	1.33	1.78	916	1.48	1.99
1770	3750	684	0.42	0.56	719	0.63	0.85	756	0.85	1.14	795	1.07	1.43	836	1.27	1.7	880	1.45	1.95	927	1.61	2.16
1888	4000	697	0.58	0.78	731	0.78	1.05	768	1.00	1.34	807	1.21	1.62	848	1.41	1.89	892	1.59	2.13	940	1.75	2.34
2006	4250	710	0.75	1.0	745	0.95	1.27	781	1.16	1.55	819	1.37	1.83	861	1.56	2.09	906	1.74	2.33	954	1.90	2.55
2124	4500	725	0.92	1.23	759	1.12	1.5	795	1.32	1.77	834	1.53	2.05	875	1.72	2.31	921	1.90	2.55	970	2.07	2.77
2242	4750	741	1.10	1.48	775	1.30	1.74	811	1.50	2.01	850	1.71	2.29	892	1.90	2.55	939	2.08	2.79	986	2.25	3.01
2360	5000	758	1.30	1.74	791	1.49	2.0	828	1.69	2.27	867	1.89	2.54	911	2.09	2.8	958	2.28	3.05	1004	2.44	3.27
2477	5250	775	1.50	2.01	809	1.69	2.27	846	1.90	2.55	886	2.10	2.82	931	2.30	3.08	977	2.48	3.33	1021	2.66	3.56
2595	5500	794	1.72	2.3	829	1.91	2.56	866	2.12	2.84	907	2.32	3.11	952	2.52	3.38	997	2.71	3.63	1039	2.88	3.86
2713	5750	814	1.95	2.61	849	2.15	2.88	887	2.35	3.15	930	2.56	3.43	974	2.76	3.7	1018	2.95	3.95	1058	3.13	4.19
2831	6000	836	2.19	2.93	871	2.39	3.21	910	2.60	3.49	953	2.81	3.77	997	3.01	4.04	1038	3.21	4.3	1077	3.39	4.54

Air Volume		TOTAL STATIC PRESSURE - Pa (Inches Water Gauge)																	
		400 (1.60)			450 (1.80)			500 (2.00)			550 (2.20)			600 (2.40)			650 (2.60)		
L/s	cfm	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP
1062	2250	934	1.14	1.53	979	1.23	1.65	1051	1.39	1.86	1126	1.58	2.12	1183	1.76	2.36	1238	1.95	2.62
1180	2500	936	1.22	1.63	983	1.31	1.75	1052	1.46	1.96	1124	1.66	2.22	1184	1.86	2.49	1241	2.07	2.77
1298	2750	940	1.30	1.74	989	1.40	1.88	1053	1.55	2.08	1121	1.75	2.34	1185	1.96	2.63	1244	2.19	2.93
1416	3000	947	1.40	1.87	996	1.51	2.02	1055	1.65	2.21	1120	1.84	2.47	1186	2.07	2.78	1248	2.31	3.1
1534	3250	955	1.50	2.01	1004	1.62	2.17	1059	1.76	2.36	1122	1.95	2.62	1189	2.19	2.94	1252	2.45	3.28
1652	3500	965	1.62	2.17	1013	1.74	2.33	1065	1.88	2.52	1126	2.08	2.79	1193	2.33	3.12	1257	2.59	3.47
1770	3750	976	1.75	2.34	1023	1.87	2.51	1073	2.02	2.71	1133	2.22	2.98	1198	2.48	3.32	1263	2.74	3.67
1888	4000	988	1.89	2.53	1034	2.02	2.71	1083	2.17	2.91	1141	2.38	3.19	1205	2.63	3.53	1270	2.90	3.89
2006	4250	1001	2.04	2.74	1046	2.19	2.93	1094	2.34	3.14	1151	2.55	3.42	1214	2.80	3.76	1278	3.07	4.12
2124	4500	1015	2.22	2.97	1059	2.36	3.16	1106	2.52	3.38	1162	2.74	3.67	1224	2.98	4.0	1287	3.25	4.36
2242	4750	1030	2.40	3.22	1072	2.55	3.42	1119	2.72	3.64	1174	2.93	3.93	1235	3.18	4.26	1297	3.44	4.61
2360	5000	1046	2.60	3.48	1087	2.75	3.69	1134	2.92	3.92	1188	3.14	4.21	1247	3.38	4.53	1309	3.64	4.88
2477	5250	1062	2.81	3.77	1103	2.97	3.98	1150	3.15	4.22	1203	3.36	4.5	1261	3.60	4.82	1321	3.85	5.16
2595	5500	1079	3.04	4.08	1120	3.20	4.29	1166	3.38	4.53	1218	3.58	4.8	1275	3.82	5.12	1335	4.07	5.45
2713	5750	1096	3.29	4.41	1138	3.45	4.62	1183	3.62	4.85	1235	3.82	5.12	1290	4.05	5.43	- - -	- - -	- - -
2831	6000	1115	3.54	4.75	1156	3.70	4.96	1202	3.87	5.19	1252	4.07	5.45	1307	4.29	5.75	- - -	- - -	- - -

BLOWER DATA

102, 120, 150 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 required.

See page 18 for blower motors and drives.

See page 18 for wet coil and option/accessory air resistance data.

MINIMUM AIR VOLUME REQUIRED FOR USE WITH OPTIONAL ELECTRIC HEAT - Maximum Static Pressure - 500 Pa (2.0 in. w.g.)

11.5 kW, 17.2 kW, 23 kW and 34.5 kW - 1320 L/s (2800 cfm)

45.9 kW - 1885 (4000 cfm)

Air Volume		TOTAL STATIC PRESSURE - Pa (Inches Water Gauge)																				
		50 (0.20)			100 (0.40)			150 (0.60)			200 (0.80)			250 (1.00)			300 (1.20)			350 (1.40)		
L/s	cfm	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP
1062	2250	587	0.06	0.08	637	0.23	0.31	690	0.42	0.56	746	0.61	0.82	805	0.79	1.06	865	0.95	1.28	927	1.09	1.46
1180	2500	601	0.18	0.24	650	0.35	0.47	703	0.53	0.71	757	0.71	0.95	815	0.88	1.18	875	1.04	1.4	938	1.17	1.57
1298	2750	616	0.31	0.41	664	0.46	0.62	715	0.63	0.85	769	0.81	1.09	826	0.98	1.31	886	1.13	1.52	950	1.27	1.7
1416	3000	632	0.43	0.58	679	0.59	0.79	729	0.75	1.01	782	0.92	1.23	839	1.08	1.45	899	1.24	1.66	963	1.37	1.84
1534	3250	649	0.57	0.76	695	0.72	0.96	744	0.87	1.17	797	1.04	1.39	853	1.19	1.6	913	1.35	1.81	976	1.48	1.99
1652	3500	666	0.71	0.95	712	0.85	1.14	761	1.01	1.35	813	1.16	1.55	868	1.31	1.76	929	1.47	1.97	990	1.62	2.17
1770	3750	685	0.87	1.16	730	1.00	1.34	779	1.14	1.53	830	1.30	1.74	886	1.45	1.94	946	1.60	2.15	1005	1.76	2.36
1888	4000	706	1.02	1.37	750	1.16	1.55	798	1.29	1.73	849	1.44	1.93	905	1.60	2.14	965	1.75	2.35	1019	1.92	2.57
2006	4250	727	1.19	1.6	772	1.32	1.77	819	1.45	1.95	871	1.60	2.15	926	1.75	2.35	984	1.92	2.58	1034	2.09	2.8
2124	4500	750	1.37	1.84	795	1.50	2.01	843	1.63	2.19	894	1.78	2.38	949	1.93	2.59	1003	2.11	2.83	1050	2.29	3.07
2242	4750	775	1.57	2.1	820	1.69	2.26	868	1.82	2.44	919	1.96	2.63	972	2.13	2.86	1023	2.32	3.11	1067	2.51	3.36
2360	5000	802	1.77	2.37	847	1.89	2.53	895	2.02	2.71	945	2.17	2.91	997	2.36	3.16	1044	2.56	3.43	1087	2.75	3.69
2477	5250	831	1.99	2.67	876	2.11	2.83	924	2.25	3.01	973	2.41	3.23	1022	2.61	3.5	1066	2.82	3.78	1108	3.01	4.04
2595	5500	862	2.22	2.98	907	2.34	3.14	955	2.48	3.33	1002	2.68	3.59	1048	2.90	3.89	1090	3.11	4.17	1132	3.30	4.42
2713	5750	895	2.47	3.31	940	2.60	3.48	987	2.77	3.71	1032	2.99	4.01	1075	3.22	4.32	1116	3.42	4.59	1158	3.60	4.82
2831	6000	931	2.73	3.66	976	2.89	3.87	1021	3.10	4.16	1064	3.35	4.49	1104	3.57	4.78	1144	3.74	5.02	1185	3.90	5.23

Air Volume		TOTAL STATIC PRESSURE - Pa (Inches Water Gauge)																	
		400 (1.60)			450 (1.80)			500 (2.00)			550 (2.20)			600 (2.40)			650 (2.60)		
L/s	cfm	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP	rev/ min	kW	BHP
1062	2250	985	1.17	1.57	1034	1.25	1.68	1084	1.34	1.8	1136	1.45	1.95	1189	1.59	2.13	1239	1.73	2.32
1180	2500	996	1.27	1.7	1045	1.36	1.82	1095	1.46	1.96	1147	1.59	2.13	1201	1.72	2.31	1253	1.88	2.52
1298	2750	1008	1.37	1.84	1056	1.48	1.98	1105	1.59	2.13	1158	1.72	2.31	1213	1.88	2.52	1266	2.04	2.73
1416	3000	1019	1.48	1.99	1066	1.60	2.15	1115	1.73	2.32	1169	1.87	2.51	1225	2.04	2.73	1279	2.21	2.96
1534	3250	1030	1.61	2.16	1076	1.74	2.33	1126	1.88	2.52	1181	2.04	2.73	1237	2.20	2.95	1293	2.38	3.19
1652	3500	1041	1.75	2.35	1087	1.89	2.53	1138	2.04	2.73	1193	2.20	2.95	1250	2.38	3.19	1307	2.56	3.43
1770	3750	1053	1.90	2.55	1098	2.05	2.75	1150	2.21	2.96	1207	2.39	3.2	1264	2.57	3.44	1321	2.75	3.69
1888	4000	1065	2.07	2.78	1111	2.23	2.99	1164	2.40	3.22	1221	2.58	3.46	1279	2.76	3.7	1336	2.95	3.96
2006	4250	1079	2.25	3.02	1126	2.42	3.25	1180	2.60	3.49	1236	2.78	3.73	1295	2.97	3.98	1352	3.16	4.24
2124	4500	1094	2.46	3.3	1142	2.63	3.53	1196	2.81	3.77	1253	3.00	4.02	1311	3.19	4.27	1369	3.38	4.53
2242	4750	1112	2.69	3.6	1161	2.86	3.84	1215	3.04	4.08	1271	3.22	4.32	1329	3.41	4.57	1387	3.60	4.83
2360	5000	1131	2.93	3.93	1181	3.10	4.16	1235	3.28	4.4	1291	3.46	4.64	1349	3.65	4.89	1406	3.83	5.14
2477	5250	1153	3.19	4.27	1203	3.36	4.51	1256	3.54	4.74	1312	3.72	4.98	1369	3.89	5.22	1426	4.08	5.47
2595	5500	1177	3.46	4.64	1226	3.63	4.87	1278	3.80	5.09	1333	3.97	5.32	1390	4.15	5.56	- - -	- - -	- - -
2713	5750	1202	3.75	5.03	1251	3.91	5.24	1302	4.07	5.46	1356	4.24	5.68	- - -	- - -	- - -	- - -	- - -	- - -
2831	6000	1229	4.05	5.43	1276	4.20	5.63	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Nominal		Maximum		Drive Kit Number	rev/min Range
kW	hp	kW	hp		
1.5	2	1.7	2.3	1	490 - 740
1.5	2	1.7	2.3	2	665 - 920
1.5	2	1.7	2.3	3	660 - 995
2.2	3	2.6	3.45	7	610 - 810
2.2	3	2.6	3.45	8	780 - 1000
2.2	3	2.6	3.45	9	845 - 1085
3.7	5	4.3	5.75	10	750 - 945
3.7	5	4.3	5.75	11	865 - 1095
3.7	5	4.3	5.75	12	940 - 1190

POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure		Air Volume Exhausted	
Pa	in. w.g.	L/s	cfm
0	0	1498	3175
12	0.05	1394	2955
25	0.10	1267	2685
37	0.15	1137	2410
50	0.20	1022	2165
62	0.25	906	1920
75	0.30	670	1420
87	0.35	566	1200

FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE

Air Volume		Wet Indoor Coil				Electric Heat		Economizer		Filters				Return Air Adaptor Plate	
		092		102, 120, 150						MERV 8		MERV 13			
L/s	cfm	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.
1062	2250	25	0.1	32	0.13	10	0.04	20	0.08	2	0.01	10	0.04	0	0.00
1180	2500	30	0.12	37	0.15	10	0.04	27	0.11	2	0.01	12	0.05	0	0.00
1298	2750	30	0.12	42	0.17	12	0.05	30	0.12	5	0.02	12	0.05	0	0.00
1416	3000	37	0.15	47	0.19	15	0.06	32	0.13	5	0.02	15	0.06	5	0.02
1534	3250	45	0.18	57	0.23	15	0.06	37	0.15	5	0.02	15	0.06	5	0.02
1652	3500	52	0.21	65	0.26	22	0.09	37	0.15	7	0.03	17	0.07	10	0.04
1770	3750	57	0.23	72	0.29	22	0.09	37	0.15	7	0.03	20	0.08	17	0.07
1888	4000	62	0.25	77	0.31	22	0.09	47	0.19	10	0.04	20	0.08	22	0.09
2006	4250	67	0.27	85	0.34	32	0.13	47	0.19	10	0.04	22	0.09	27	0.11
2124	4500	75	0.3	92	0.37	35	0.14	55	0.22	10	0.04	22	0.09	30	0.12
2242	4750	80	0.32	99	0.4	42	0.17	62	0.25	12	0.05	25	0.1	40	0.16
2360	5000	87	0.35	107	0.43	50	0.2	72	0.29	15	0.06	25	0.1	45	0.18
2477	5250	90	0.36	114	0.46	55	0.22	80	0.32	15	0.06	27	0.11	47	0.19
2595	5500	99	0.4	124	0.5	62	0.25	85	0.34	17	0.07	30	0.12	55	0.22
2713	5750	107	0.43	139	0.56	77	0.31	112	0.45	17	0.07	30	0.12	62	0.25
2831	6000	114	0.46	147	0.59	82	0.33	129	0.52	20	0.08	32	0.13	67	0.27

BLOWER DATA

CEILING DIFFUSERS AIR RESISTANCE

Unit Size	RTD11 Step-Down Diffuser								FD11 Flush Diffuser	
	Air Volume		2 Ends Open		1 Side, 2 Ends Open		All Ends & Sides Open			
	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.	Pa	in. w.g.
092 Models	1133	2400	52	0.21	45	0.18	37	0.15	35	0.14
	1227	2600	60	0.24	52	0.21	45	0.18	42	0.17
	1321	2800	67	0.27	60	0.24	52	0.21	50	0.20
	1416	3000	80	0.32	72	0.29	62	0.25	62	0.25
	1510	3200	102	0.41	92	0.37	80	0.32	77	0.31
	1604	3400	124	0.50	112	0.45	97	0.39	92	0.37
	1699	3600	152	0.61	134	0.54	119	0.48	109	0.44
	1793	3800	182	0.73	157	0.63	142	0.57	127	0.51
102 & 120 Models	1699	3600	90	0.36	70	0.28	57	0.23	37	0.15
	1793	3800	99	0.40	80	0.32	65	0.26	45	0.18
	1888	4000	109	0.44	90	0.36	72	0.29	52	0.21
	1982	4200	122	0.49	99	0.40	82	0.33	60	0.24
	2076	4400	134	0.54	109	0.44	92	0.37	67	0.27
	2171	4600	149	0.60	122	0.49	104	0.42	77	0.31
	2265	4800	162	0.65	132	0.53	114	0.46	87	0.35
	2360	5000	172	0.69	144	0.58	124	0.50	97	0.39
	2454	5200	186	0.75	154	0.62	134	0.54	107	0.43
150 Models	1982	4200	55	0.22	47	0.19	40	0.16	25	0.10
	2076	4400	70	0.28	60	0.24	50	0.20	30	0.12
	2171	4600	85	0.34	72	0.29	60	0.24	37	0.15
	2265	4800	99	0.40	85	0.34	72	0.29	47	0.19
	2360	5000	114	0.46	97	0.39	85	0.34	57	0.23
	2454	5200	129	0.52	109	0.44	97	0.39	67	0.27
	2548	5400	144	0.58	122	0.49	107	0.43	77	0.31
	2643	5600	159	0.64	134	0.54	117	0.47	87	0.35
	2737	5800	174	0.70	147	0.59	127	0.51	97	0.39

CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume		[1] Effective Throw Range			
			RTD11 Step-Down		FD11 Flush	
	L/s	cfm	m	ft.	m	ft.
092 Models	1227	2600	7 - 9	24 - 29	6 - 7	19 - 24
	1321	2800	8 - 9	25 - 30	6 - 9	20 - 28
	1416	3000	8 - 10	27 - 33	6 - 9	21 - 29
	1510	3200	9 - 11	28 - 35	7 - 9	22 - 29
	1604	3400	9 - 11	30 - 37	7 - 9	22 - 30
102, 120 Models	1699	3600	8 - 10	25 - 33	7 - 9	22 - 29
	1793	3800	8 - 11	27 - 35	7 - 9	22 - 30
	1888	4000	9 - 11	29- 37	7 - 10	24 - 33
	1982	4200	10 - 12	32 - 40	8 - 11	26 - 35
	2076	4400	10 - 13	34 - 42	9 - 11	28 - 37
150 Models	2643	5600	12 - 15	39 - 49	9 - 11	28 - 37
	2737	5800	13 - 16	42 - 51	9 - 12	29 - 38
	2831	6000	13 - 17	44 - 54	12 - 15	40 - 50
	2926	6200	14 - 17	45 - 55	13 - 16	42 - 51
	3020	6400	14 - 17	46 - 55	13 - 16	43 - 52
	3115	6600	14 - 17	47 - 56	14 - 17	45 - 56

[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 15 m (50 ft.) per minute. Four sides open.

ELECTRICAL/ELECTRIC HEAT DATA

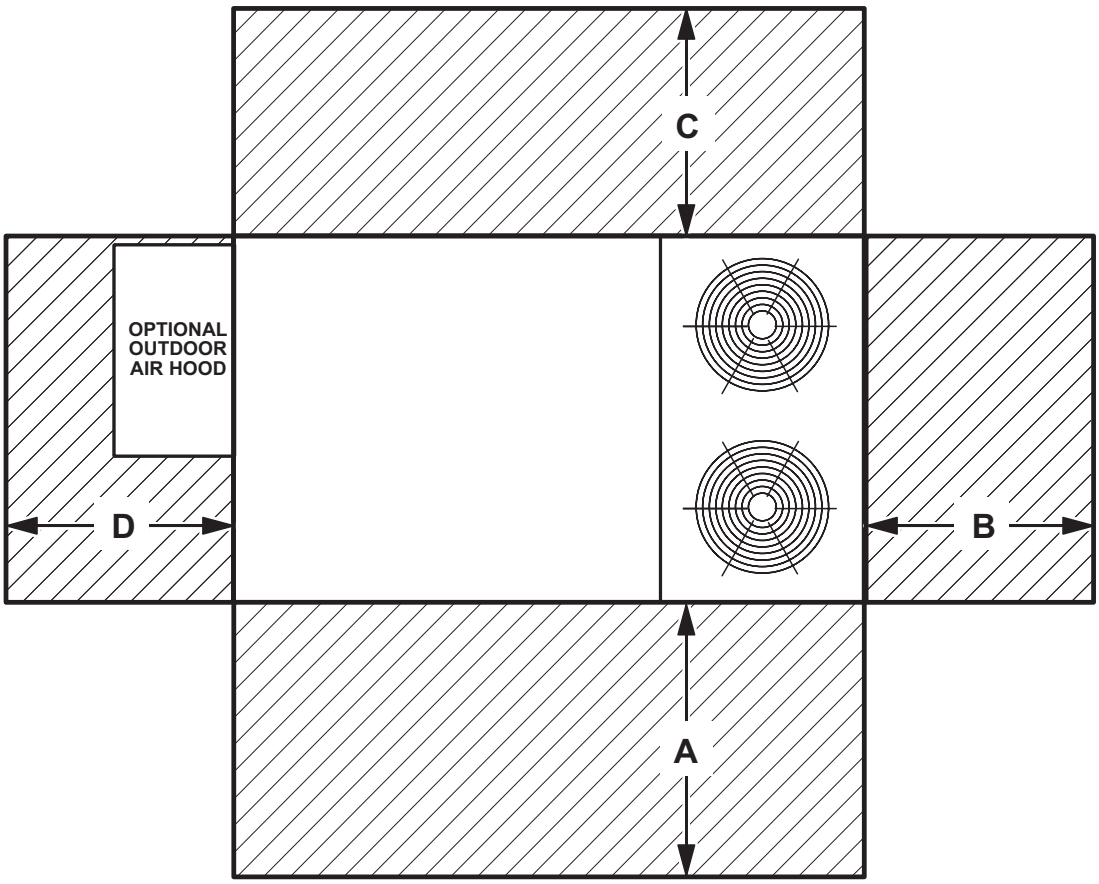
			KHA092S4			KHA102S4			KHA120S4			KHA150S4		
[1] Voltage - 50hz 3 Phase with neutral			380/420V			380/420V			380/420V			380/420V		
Compressor 1	Rated Load Amps		6.1			6.2			7.8			9.7		
	Locked Rotor Amps		41			50			51.5			64		
Compressor 2	Rated Load Amps		6.1			6.2			7.8			9.7		
	Locked Rotor Amps		41			50			51.5			64		
Outdoor Fan Motors	Full Load Amps		(2) 1.3			(2) 1.5			(2) 1.5			(3) 1.3		
	(total)		(2.6)			(3)			(3)			(3.9)		
Power Exhaust (1) 0.19 kW (0.25 HP)	Full Load Amps		1.3			1.3			1.3			1.3		
Indoor Blower Motor	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
	Full Load Amps		3.5	5	7.8	3.5	5	7.8	3.5	5	7.8	3.5	5	7.8
[2] Maximum Overcurrent Protection	Unit Only		25	25	30	25	25	30	30	30	35	35	35	40
	With 0.19 kW (0.25 HP) Power Exhaust		25	25	30	25	25	30	30	30	35	35	40	40
[3] Minimum Circuit Ampacity	Unit Only		20	22	25	21	22	26	25	26	29	29	31	34
	With 0.19 kW (0.25 HP) Power Exhaust		21	23	26	22	24	27	26	27	30	31	33	35
ELECTRIC HEAT DATA														
Electric Heat Voltage			420V	420V	420V	420V	420V	420V	420V	420V	420V	420V	420V	420V
[2] Maximum Overcurrent Protection	Unit+ [4] Electric Heat	5.7 kW	35	35	40	35	35	40	- - -	- - -	- - -	- - -	- - -	- - -
		11.5 kW	40	45	45	45	45	45	45	50	50	50	60	60
		17.2 kW	50	60	60	60	60	60	60	60	60	60	70	70
		23 kW	60	70	70	60	70	70	70	70	70	70	80	80
		34.5 kW	80	90	90	80	90	90	90	90	90	90	90	100
		45.9 kW	- - -	- - -	- - -	- - -	- - -	- - -	90	90	100	100	100	100
[3] Minimum Circuit Ampacity	Unit+ [4] Electric Heat	5.7 kW	30	32	35	31	32	36	- - -	- - -	- - -	- - -	- - -	- - -
		11.5 kW	40	42	45	41	42	45	44	46	49	49	51	54
		17.2 kW	49	51	55	51	52	55	54	56	58	59	61	64
		23 kW	59	61	65	60	62	65	64	66	68	69	71	73
		34.5 kW	79	81	84	80	82	85	84	85	88	88	90	93
		45.9 kW	- - -	- - -	- - -	- - -	- - -	- - -	88	89	92	92	94	97
[2] Maximum Overcurrent Protection	Unit+ [4] Electric Heat and 0.19 kW (0.25 HP) Power Exhaust	5.7 kW	35	35	40	35	35	40	- - -	- - -	- - -	- - -	- - -	- - -
		11.5 kW	45	45	50	45	45	50	50	50	50	50	60	60
		17.2 kW	60	60	60	60	60	60	60	60	60	60	70	70
		23 kW	70	70	70	70	70	70	70	70	70	70	80	80
		34.5 kW	80	90	90	90	90	90	90	90	90	90	100	100
		45.9 kW	- - -	- - -	- - -	- - -	- - -	- - -	90	90	100	100	100	100
[3] Minimum Circuit Ampacity	Unit+ [4] Electric Heat and 0.19 kW (0.25 HP) Power Exhaust	5.7 kW	31	33	36	32	34	37	- - -	- - -	- - -	- - -	- - -	- - -
		11.5 kW	41	43	46	42	43	47	46	47	50	50	52	55
		17.2 kW	51	53	56	52	53	57	55	57	60	60	62	65
		23 kW	61	63	66	62	63	66	65	67	70	70	72	75
		34.5 kW	80	82	86	81	83	86	85	87	89	90	92	95
		45.9 kW	- - -	- - -	- - -	- - -	- - -	- - -	89	90	93	94	96	98

[1] Extremes of operating range are plus and minus 10% of line voltage.
[2] Heating / Air Conditioning / Refrigeration (HACR) type breaker or fuse.
[3] Refer to local codes to determine wire, fuse and disconnect size requirements.
[4] Nominal kW based on 420V-3ph-50hz.

ELECTRIC HEAT CAPACITIES

Volts Input	5.7 kW			11.5 kW			17.2 kW			23 kW			34.5 kW			45.9 kW		
	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages	kW Input	Btuh Output	No. of Stages
380	4.7	16 000	1	9.4	32 100	1	14.1	48 200	1	18.8	64 200	2	28.2	96 300	2	37.6	128 400	2
400	5.2	17 800	1	10.4	35 500	1	15.6	53 300	1	20.9	71 400	2	31.2	106 600	2	41.6	142 100	2
420	5.7	19 500	1	11.5	39 300	1	17.2	58 700	1	23	78 500	2	34.5	117 500	2	45.9	156 800	2

UNIT CLEARANCES - MM (INCHES)



[1] Unit Clearance	A		B		C		D		Top Clearance
	mm	in.	mm	in.	mm	in.	mm	in.	
Service Clearance	1524	60	914	36	914	36	1524	60	Unobstructed
Minimum Operation Clearance	914	36	914	36	914	36	914	36	

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

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

OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS - FIELD INSTALLED

COMMERCIAL TOUCHSCREEN THERMOSTAT



Intuitive Touchscreen Interface - **Two Stage Heating / Two Stage Cooling Conventional or Heat Pump** - Seven Day Programmable - Four Time Periods/ Day - Economizer Output - Title 24 Compliant - ENERGY STAR® Qualified - Backlit Display - Automatic Changeover — C0STAT02AE1L **(14W81)**

Sensors For Touchscreen Thermostat

[1] Remote non-adjustable wall mount 20k temperature sensor ..... C0SNZN01AE2- **(47W36)**

[1] Remote non-adjustable wall mount 10k averaging temperature sensor ..... C0SNZN73AE1- **(47W37)**

[1] Remote non-adjustable duct mount temperature sensor ..... C0SNDC00AE1- **(19L22)**

Outdoor temperature sensor ..... C0SNSR03AE1- **(X4148)**

Accessories For Touchscreen Thermostat

Locking cover (clear) ..... C0MISC15AE1- **(39P21)**

[1] Remote sensors for C0STAT02AE1L can be applied in the following combinations: (1) C0SNZN01AE1-, (2) C0SNZN73AE1-, (2) C0SNZN01AE1- and (1) C0SNZN73AE1-, (4) C0SNZN01AE1-, (3) C0SNZN01AE1- and (2) C0SNZN73AE1.

DIGITAL NON-PROGRAMMABLE THERMOSTATS

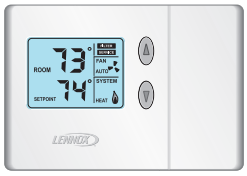


Intuitive Interface - Automatic Changeover - Simple Up and Down Temperature Control

Two-stage heating / cooling conventional systems ..... C0STAT10AE1L **(13K98)**

Sensor For Digital Non-Programmable Thermostats Above

Remote wall mounted temperature sensor..... C0SNZN00AE1- **(26K57)**



Intuitive Interface - Automatic Changeover - Backlit Display - Simple Up and Down Temperature Control

One-stage heating / cooling conventional systems ..... C0STAT12AE1L **(51M32)**

Sensor For Digital Non-Programmable Thermostats Above

Outdoor temperature sensor ..... C0SNSR04AE1- **(X2658)**

Accessories For Digital Non-Programmable Thermostats Above

Optional wall mounting plate ..... C0MISC17AE1- **(X2659)**

OUTDOOR SOUND DATA

Unit Model Number	Octave Band Sound Power Levels dBA, re 10^{-12} Watts Center Frequency - HZ							[1] Sound Rating Number (dB)
	125	250	500	1000	2000	4000	8000	
092, 102 and 120	76	79	84	83	79	73	66	88
150	77	80	85	84	79	74	66	88

Note - The octave sound power data does not include tonal corrections.
[1] Sound Rating Number according to AHRI Standard 370-2001.

WEIGHT DATA

Model Number	Net		Shipping	
	kg	lbs.	kg	lbs.
092 Base Unit	477	1052	516	1137
092 Max. Unit	548	1209	587	1294
102 Base Unit	492	1084	530	1169
102 Max. Unit	563	1241	601	1326
120 Base Unit	522	1150	560	1235
120 Max. Unit	596	1314	635	1399
150 Base Unit	612	1350	651	1435
150 Max. Unit	687	1514	725	1599

OPTIONS / ACCESSORIES

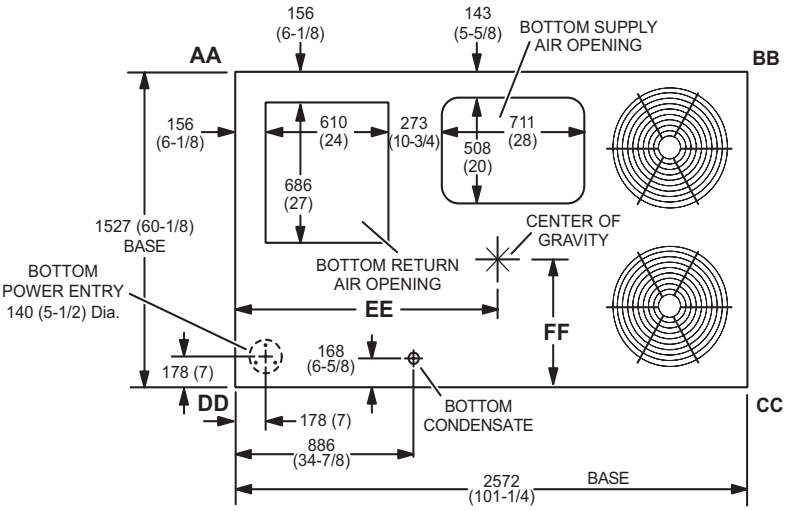
Model Number	Shipping Weight	
	kg	lbs.
CEILING DIFFUSERS		
Step-Down		
RTD11-95	40	88
RTD11-135	93	205
RTD11-185	178	392
Flush		
FD11-95	34	75
FD11-135	79	174
FD11-185	131	289
Transitions		
LASRT08/10	14	30
LASRT10/12	15	32
LASRT15	16	36
ECONOMIZER / OUTDOOR AIR / EXHAUST		
Economizer		
Economizer Dampers	25	55
Barometric Relief Dampers (downflow)	4	8
Barometric Relief Damper Hood (downflow)	11	25
Outdoor Air Hood (downflow)	10	23
Outdoor Air Dampers		
Outdoor Air Damper Section (downflow) - Automatic	4	9
Outdoor Air Damper Section (downflow) - Manual	1	2
Outdoor Air Damper Hood (downflow)	4	9
Power Exhaust	14	31
ELECTRIC HEAT		
5.7 kW	23	50
11.5 kW	23	50
17.2 kW	26	57
23 kW	26	57
34.5 kW	27	59
45.9 kW	31	68
ROOF CURBS - CLIP CURB		
Downflow		
203 mm height	40	89
356 mm height	49	109
457 mm height	57	126
610 mm height	68	150
ROOF CURBS - STANDARD		
Downflow		
203 mm height	41	91
356 mm height	52	115
610 mm height	69	153
PACKAGING		
LTL Packaging (less than truck load)	48	105

DIMENSIONS - MM (INCHES) - 092-102-120 MODELS

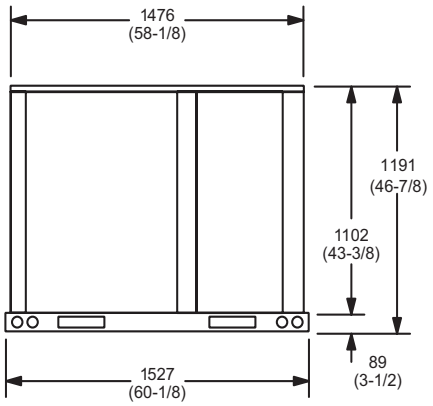
Model No.	CORNER WEIGHTS																CENTER OF GRAVITY							
	AA				BB				CC				DD				EE				FF			
	Base		Max.		Base		Max.		Base		Max.		Base		Max.		Base		Max.		Base		Max.	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	mm	in.	mm	in.	mm	in.	mm	in.
092	120	264	140	310	108	237	123	271	117	258	131	290	133	293	154	339	1181	46.5	1156	45.5	622	24.5	648	25.5
102	123	272	144	318	111	244	126	278	121	266	135	297	137	302	158	348	1181	46.5	1156	45.5	622	24.5	648	25.5
120	129	284	151	333	120	264	135	298	131	288	145	320	143	315	165	363	1181	46.5	1156	45.5	622	24.5	648	25.5

Std. Unit - The unit with NO INTERNAL OPTIONS.

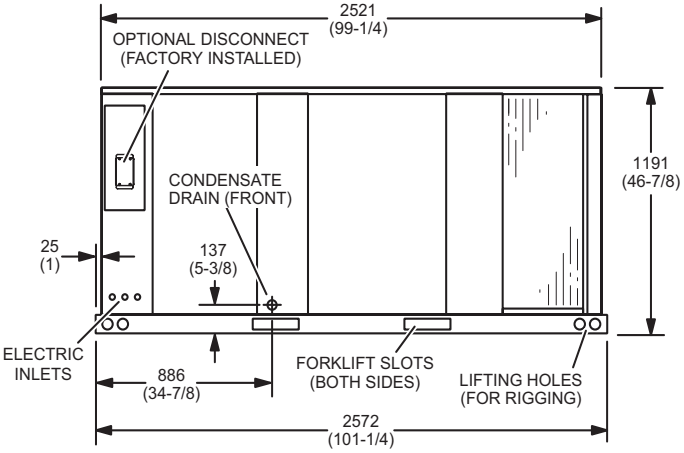
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit or high static power exhaust.



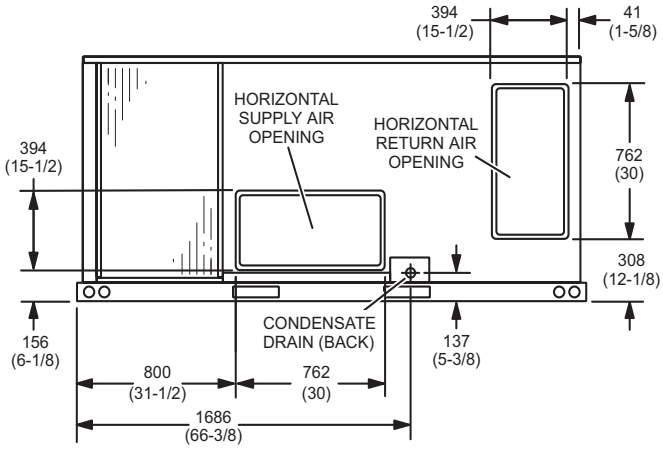
TOP VIEW



END VIEW



SIDE VIEW



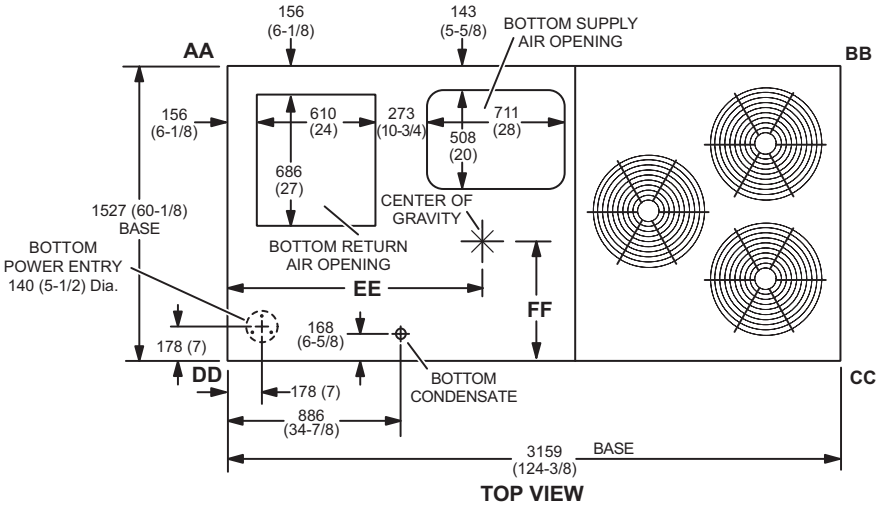
SIDE VIEW
(Horizontal Openings)

DIMENSIONS - MM (INCHES) - 150 MODELS

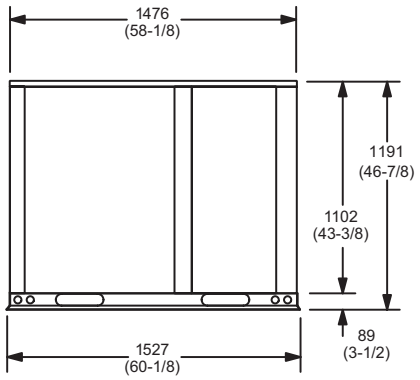
Model No.	CORNER WEIGHTS																CENTER OF GRAVITY							
	AA				BB				CC				DD				EE				FF			
	Base		Max.		Base		Max.		Base		Max.		Base		Max.		Base		Max.		Base		Max.	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	mm	in.	mm	in.	mm	in.	mm	in.
150	158	348	180	398	137	303	153	337	146	321	160	353	171	377	193	426	1181	46.5	1156	45.5	622	24.5	648	25.5

Std. Unit - The unit with NO INTERNAL OPTIONS.

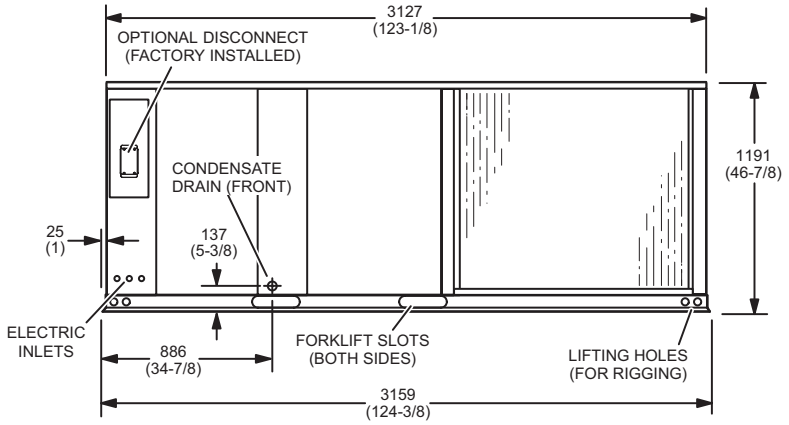
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit or high static power exhaust.



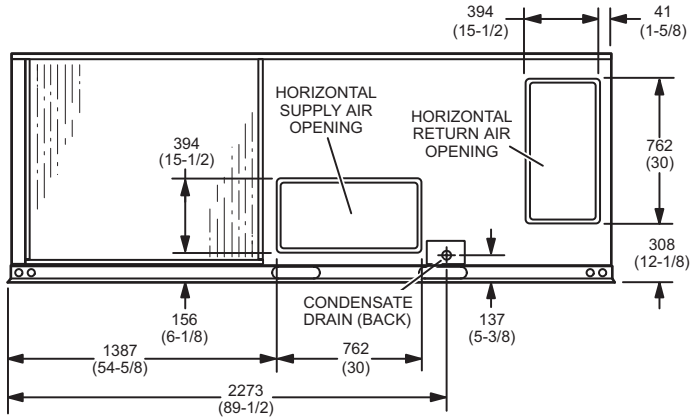
TOP VIEW



END VIEW



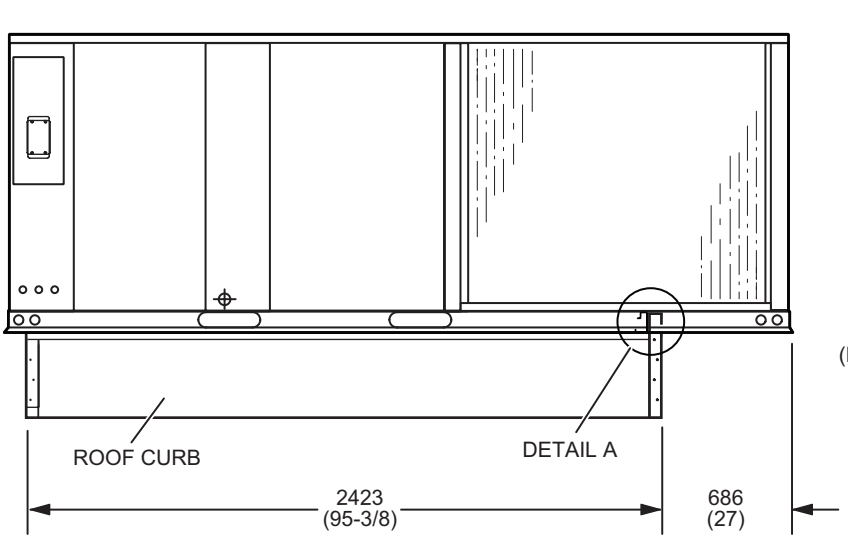
SIDE VIEW



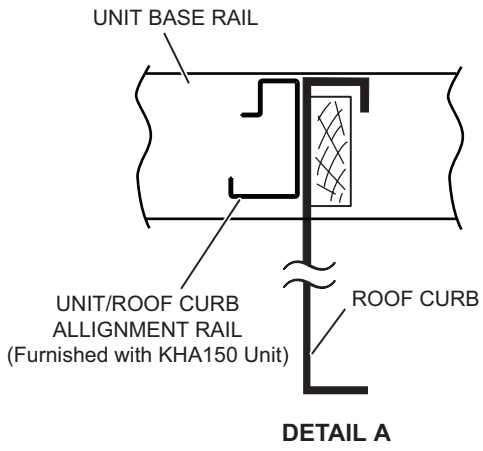
SIDE VIEW
(Horizontal Openings)

ACCESSORY DIMENSIONS - MM (INCHES)

UNIT ON CURB LOCATION – KHA150

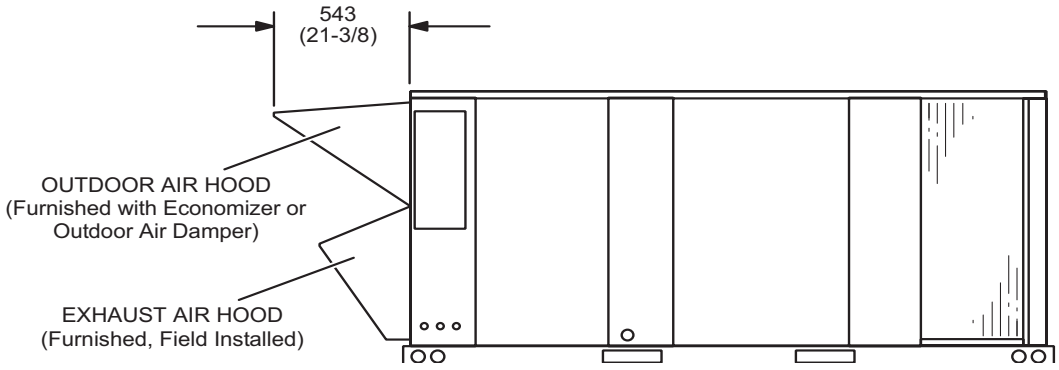


SIDE VIEW



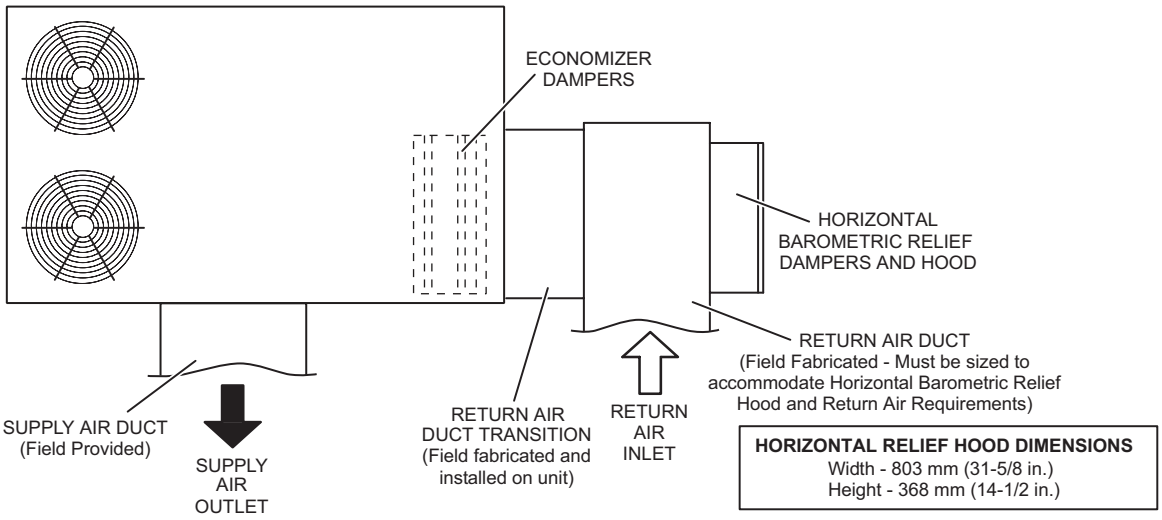
DETAIL A

OUTDOOR AIR HOOD DETAIL

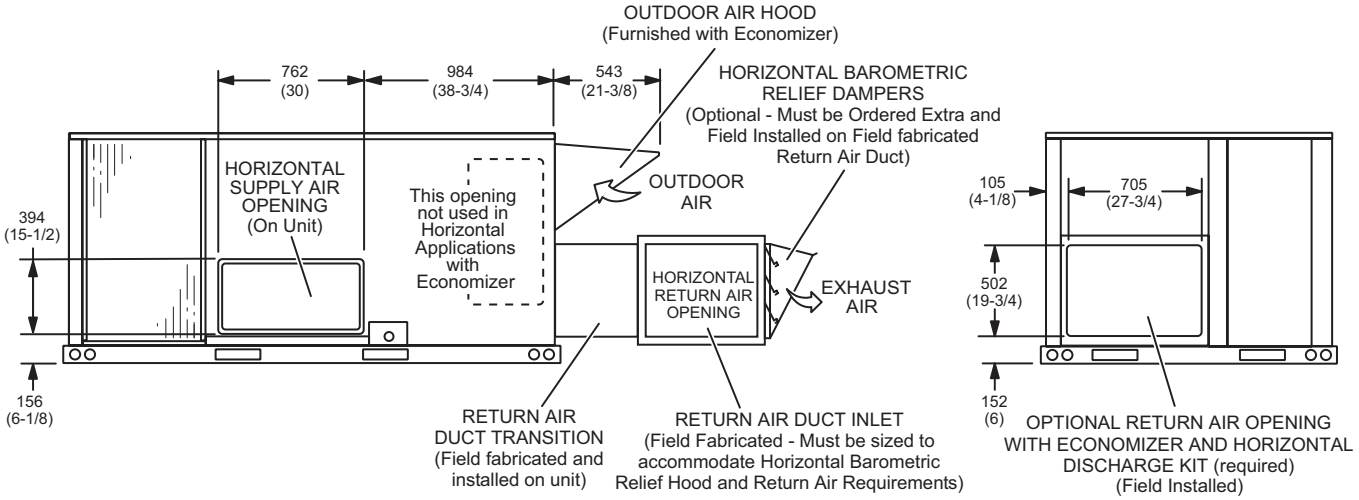


ACCESSORY DIMENSIONS - MM (INCHES)

HORIZONTAL ECONOMIZER APPLICATION
(with Optional Horizontal Barometric Relief Dampers and Horizontal Discharge Kit)



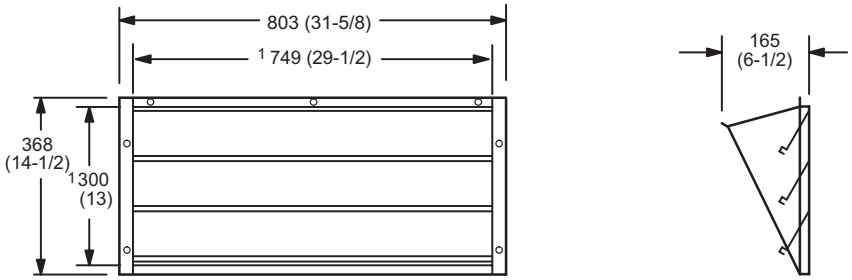
TOP VIEW



BACK VIEW **END VIEW**

NOTE - Return Air Duct and Transition must be supported.

HORIZONTAL BAROMETRIC RELIEF DAMPERS
(Field installed in horizontal return air duct adjacent to unit)

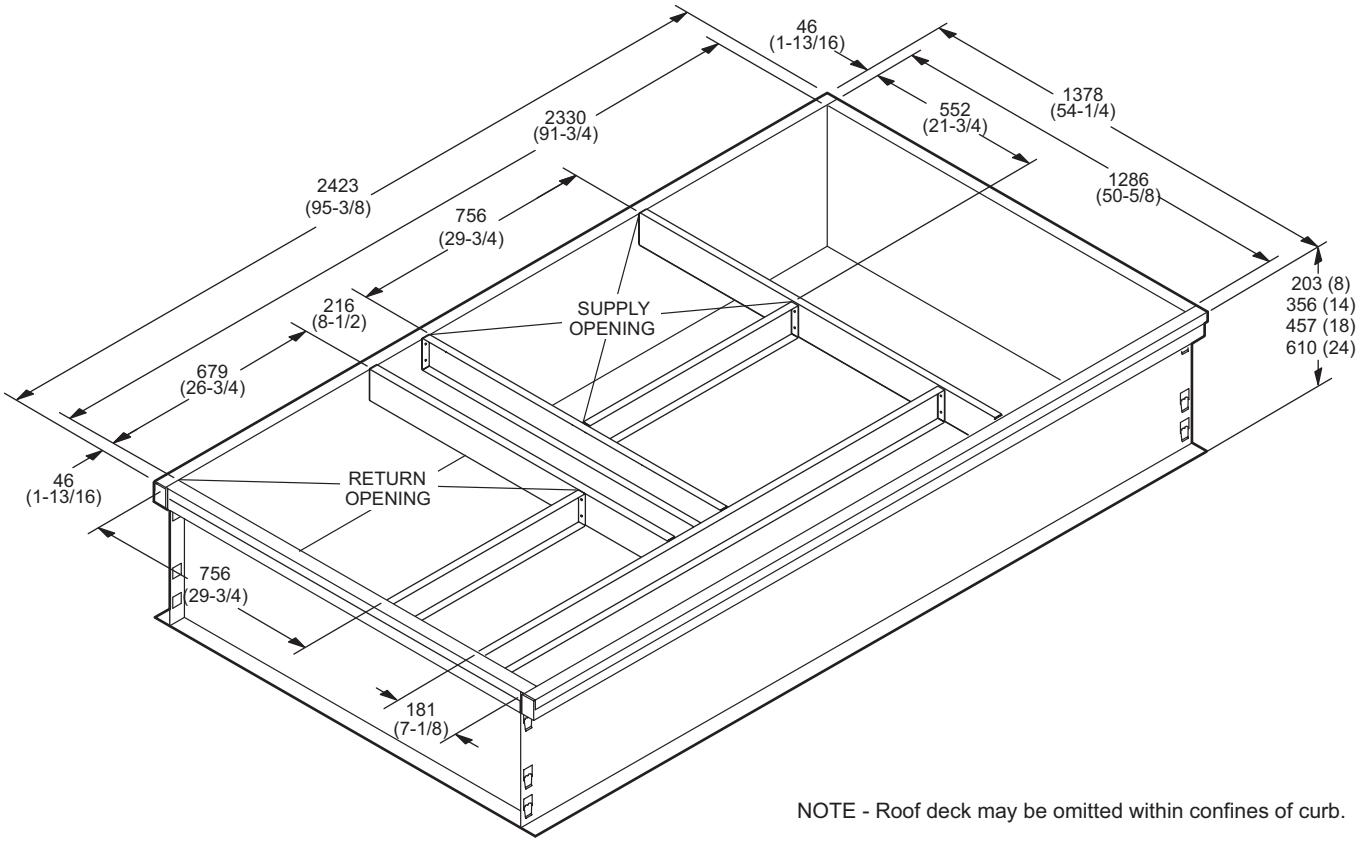


FRONT VIEW **SIDE VIEW**

[1] NOTE - Opening size required in return air duct.

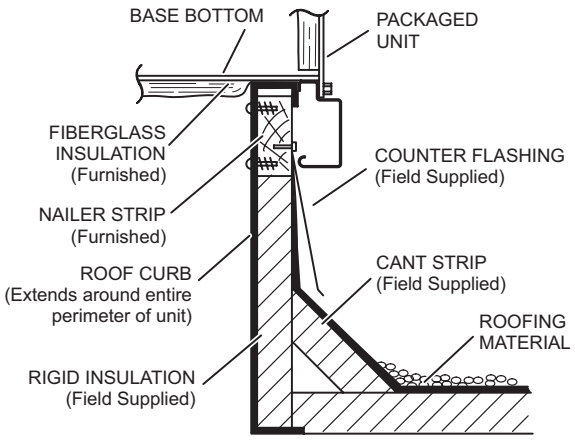
ACCESSORY DIMENSIONS - MM (INCHES)

CLIP CURBS - DOUBLE DUCT OPENING

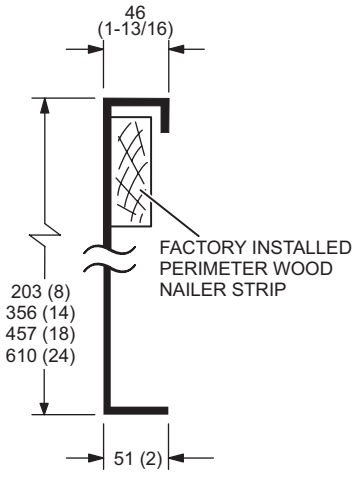


NOTE - Roof deck may be omitted within confines of curb.

TYPICAL FLASHING DETAIL FOR ROOF CURB

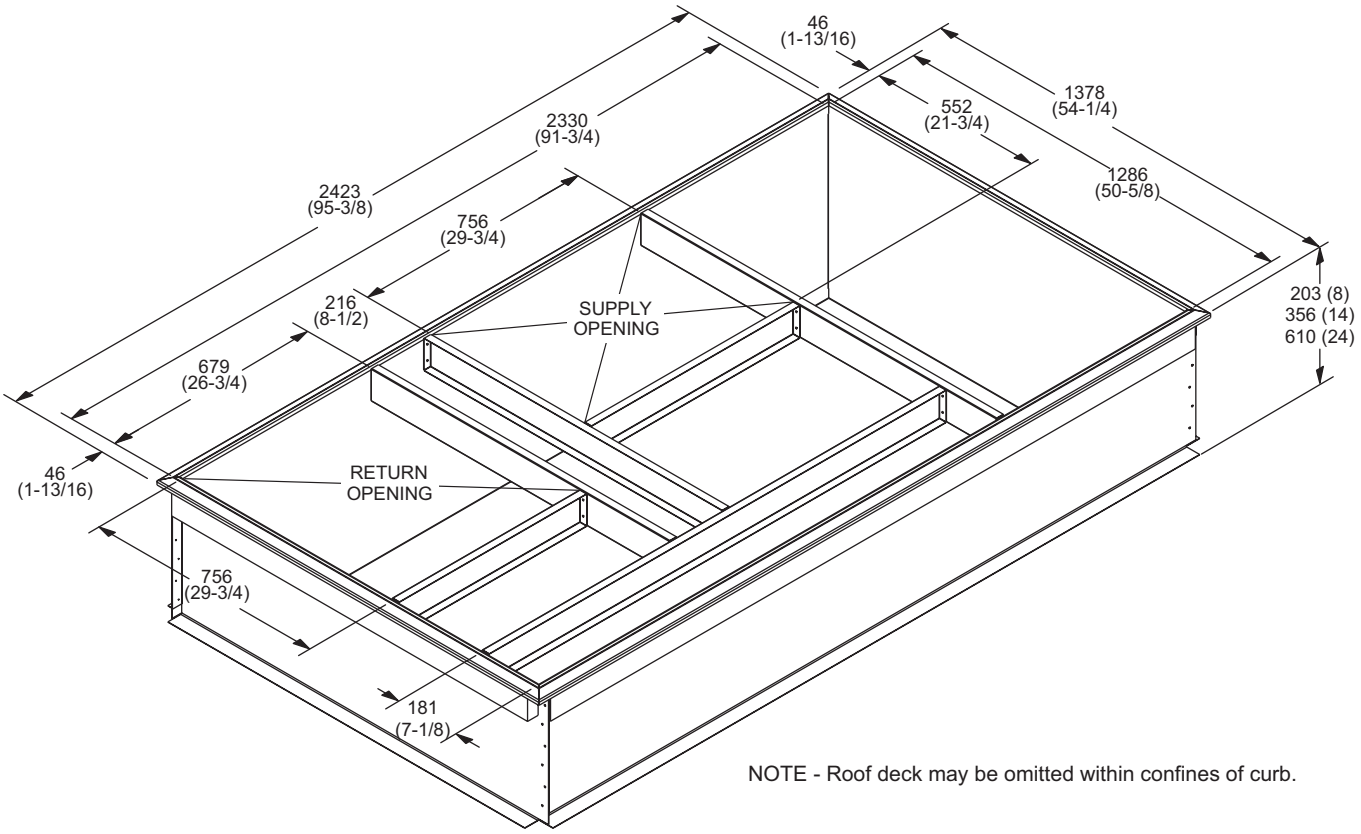


DETAIL ROOF CURB



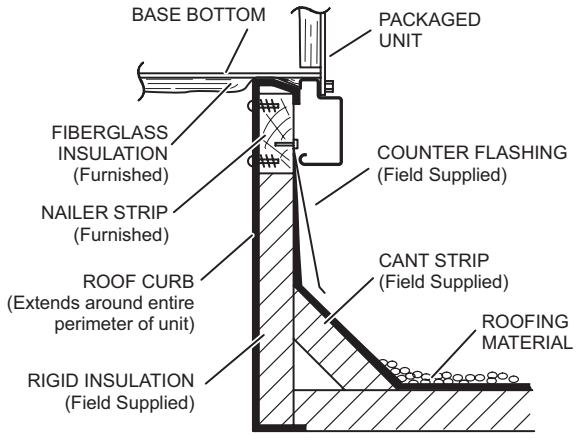
ACCESSORY DIMENSIONS - MM (INCHES)

STANDARD ROOF CURBS - DOUBLE DUCT OPENING

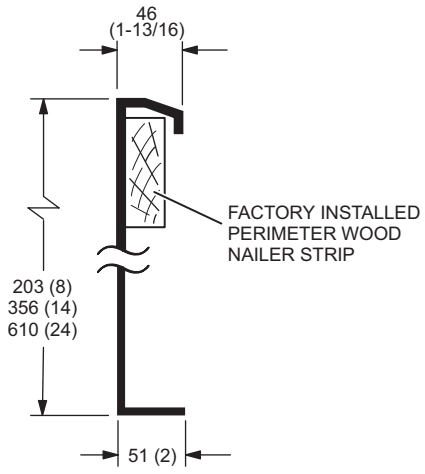


NOTE - Roof deck may be omitted within confines of curb.

TYPICAL FLASHING DETAIL FOR ROOF CURB

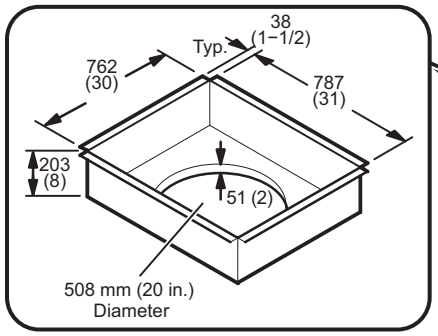


DETAIL ROOF CURB

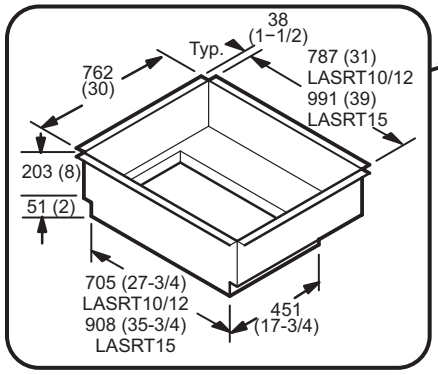


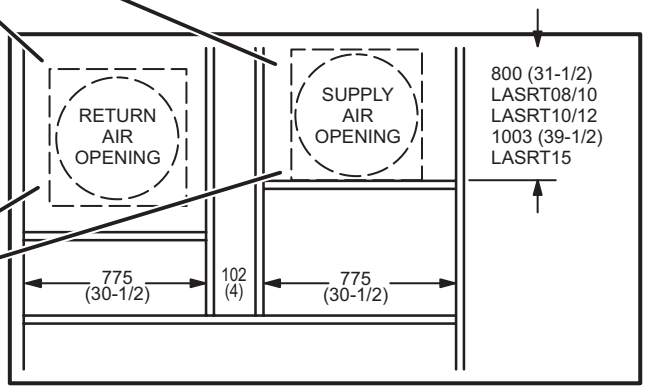
ROOF CURBS WITH SUPPLY & RETURN AIR TRANSITIONS FOR CEILING DIFFUSERS

LASRT08/10 ROUND TRANSITIONS
(for 092 models with FD11−95, RTD11−95 Diffusers)



LASRT10/12 & LASRT15 RECTANGULAR TRANSITIONS
(for 102 thru 150 models with FD11−135−185, RTD11−135−185 Diffusers)

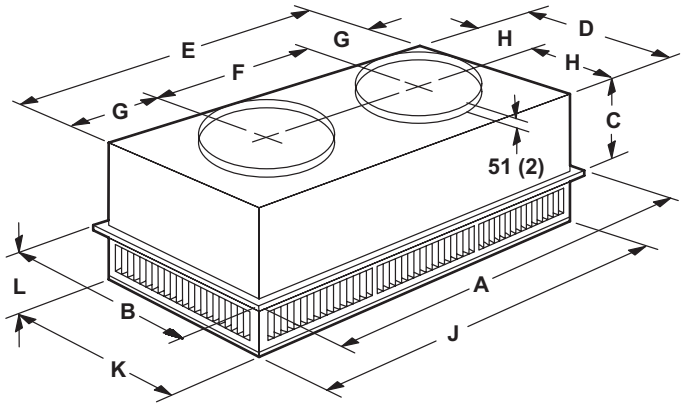




TOP VIEW

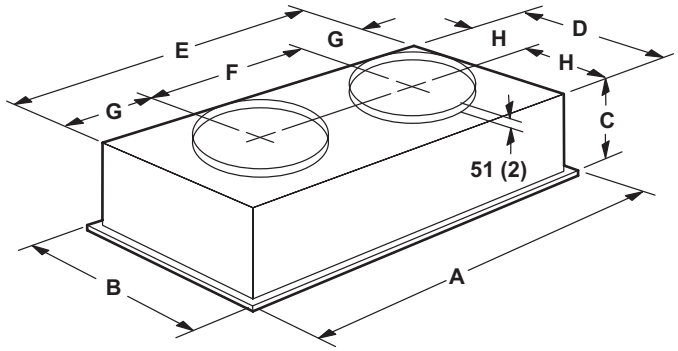
COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

STEP-DOWN CEILING DIFFUSER



Model Number		RTD11-95
A	mm	1159
	in.	47-5/8
B	mm	752
	in.	29-5/8
C	mm	365
	in.	14-3/8
D	mm	699
	in.	27-1/2
E	mm	1158
	in.	45-1/2
F	mm	572
	in.	22-1/2
G	mm	292
	in.	11-1/2
H	mm	349
	in.	13-3/4
J	mm	1156
	in.	45-1/2
K	mm	699
	in.	27-1/2
L	mm	206
	in.	8-1/8
Duct Size	mm	508 round
	in.	20 round

FLUSH CEILING DIFFUSER

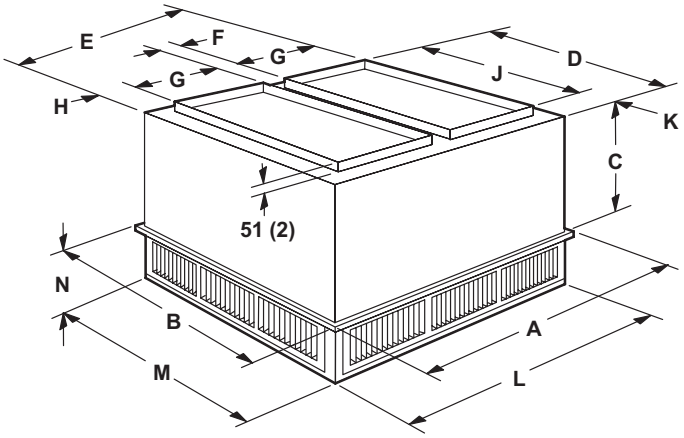


Model Number		FD11-95
A	mm	1159
	in.	47-5/8
B	mm	752
	in.	29-5/8
C	mm	422
	in.	16-5/8
D	mm	686
	in.	27
E	mm	1143
	in.	45
F	mm	22-1/2
	in.	572
G	mm	286
	in.	11-1/4
H	mm	343
	in.	13-1/2
Duct Size	mm	508 round
	in.	20 round

ACCESSORY DIMENSIONS - MM (INCHES)

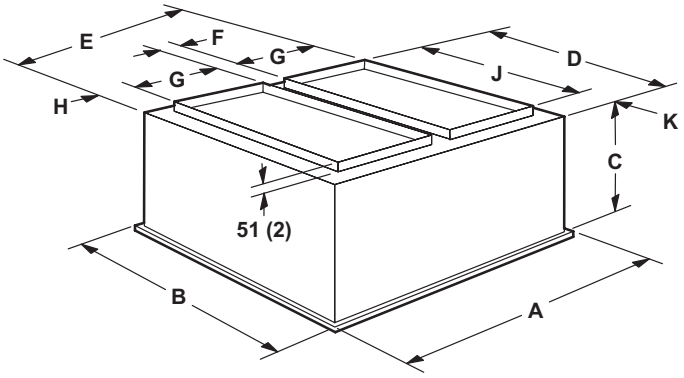
COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

STEP-DOWN CEILING DIFFUSER



Model Number		RTD11-135	RTD11-185
A	mm	1210	1210
	in.	47-5/8	47-5/8
B	mm	905	1210
	in.	35-5/8	47-5/8
C	mm	524	625
	in.	20-5/8	24-5/8
D	mm	851	1156
	in.	33-1/2	45-1/2
E	mm	1156	1156
	in.	45-1/2	45-1/2
F	mm	114	114
	in.	4-1/2	4-1/2
G	mm	457	457
	in.	18	18
H	mm	64	64
	in.	2-1/2	2-1/2
J	mm	711	914
	in.	28	36
K	mm	70	121
	in.	2-3/4	4-3/4
L	mm	1156	1156
	in.	45-1/2	45-1/2
M	mm	851	1156
	in.	33-1/2	45-1/2
N	mm	232	257
	in.	9-1/8	10-1/8
Duct Size	mm	457 x 711	457 x 914
	in.	18 x 28	18 x 36

FLUSH CEILING DIFFUSER



Model Number		FD11-135	FD11-185
A	mm	1210	1210
	in.	47-5/8	47-5/8
B	mm	905	1210
	in.	35-5/8	47-5/8
C	mm	591	743
	in.	23-1/4	29-1/4
D	mm	838	1143
	in.	33	45
E	mm	1143	1143
	in.	45	45
F	mm	112	112
	in.	4-1/2	4-1/2
G	mm	457	457
	in.	18	18
H	mm	57	57
	in.	2-1/4	2-1/4
J	mm	711	914
	in.	28	36
K	mm	64	114
	in.	2-1/2	4-1/2
Duct Size	mm	457 x 711	457 x 914
	in.	18 x 28	18 x 36

REVISIONS

Section	Description
Options/Accessories	Updated Condensate Drain Trap Kits Model and Catalog Numbers
Electric Heat Data	Revised Electric Heat kW values

ISO 9001
REGISTERED
QUALITY
SYSTEMS

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