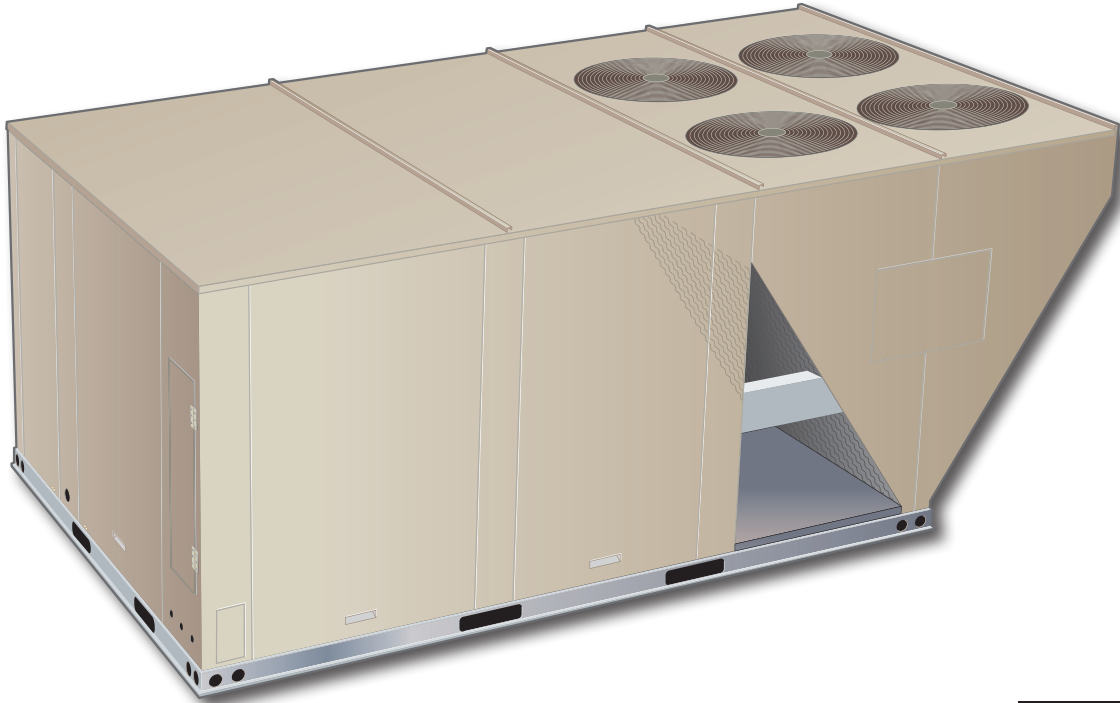




**COMMERCIAL  
PRODUCT SPECIFICATIONS**

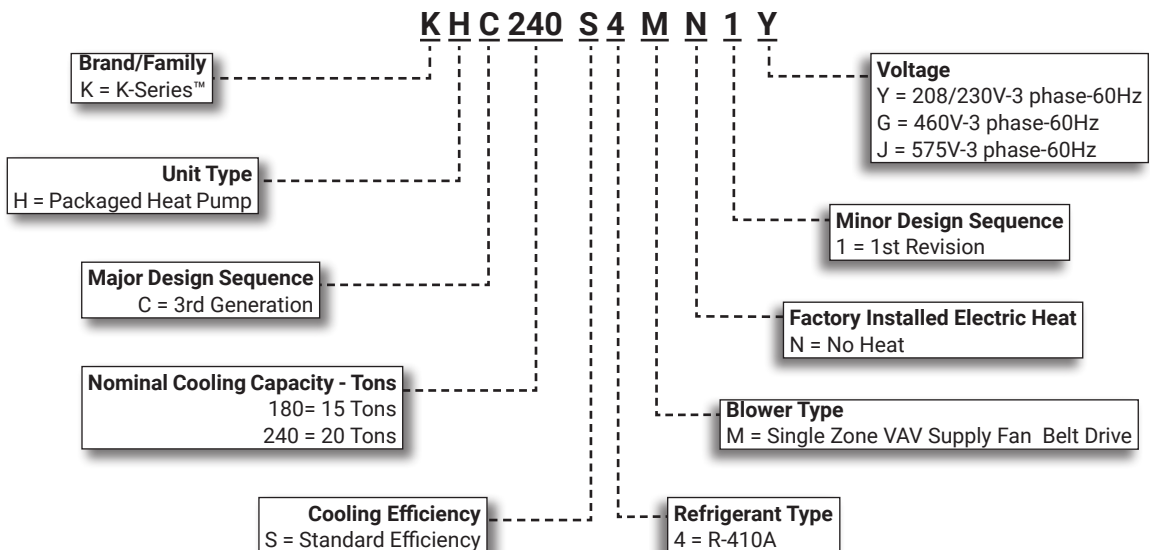
Bulletin No. 310997  
August 2023  
Supersedes May 2023



**ASHRAE 90.1  
COMPLIANT**

**15 and 20 Tons  
Net Cooling Capacity - 176,000 to 222,000 Btuh  
Net Heating Capacity - 166,000 to 218,000 Btuh  
Optional Electric Heat - 15 to 90 kW**

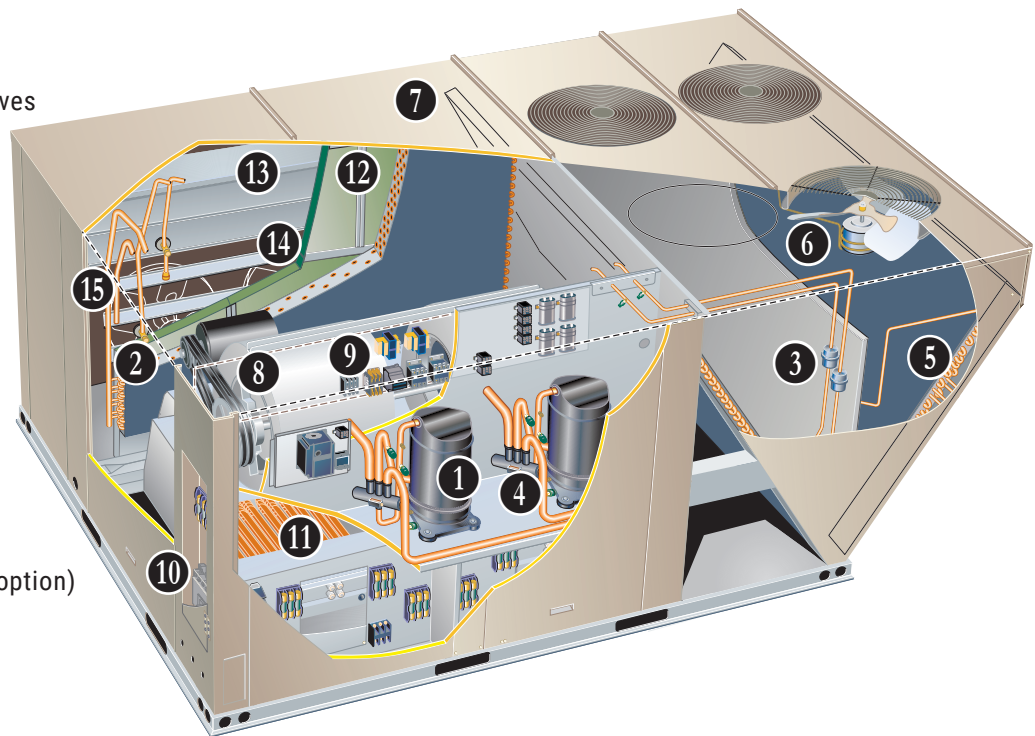
**MODEL NUMBER IDENTIFICATION**



## FEATURE HIGHLIGHTS

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

1. Scroll Compressors
2. Check/Thermal Expansion Valves
3. Filter/Driers
4. Reversing Valves
5. Copper Tube Outdoor Coil
6. Outdoor Coil Fan Motors
7. Heavy Gauge Steel Cabinet
8. Supply Air Blower
9. Unit Control
10. Disconnect Switch (option)
11. Electric Heat (option)
12. Air Filters
13. Economizer (option)
14. Barometric Relief Dampers (option)
15. Power Exhaust (option)



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## APPROVALS AND WARRANTY

### APPROVALS

- AHRI Standard 340/360 certified
- ETL listed
- CSA certified energy ratings
- Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing
- All models are ASHRAE 90.1 energy efficiency compliant and meet or exceed requirements of Section 6.8
- All models meet DOE 2023 energy efficiency standards
- All models meet California Code of Regulations, Title 24 and ASHRAE 90.1 Section 6.4.3.10 requirements for staged airflow
- ISO 9001 Registered Manufacturing Quality System

### WARRANTY

- Compressors - Limited five years
- Variable-Frequency Drive (VFD) - Limited five years
- High Performance Economizers (optional) - Limited five years
- All other covered components - Limited one year

## FEATURES AND BENEFITS

### COOLING / HEATING SYSTEM

- Designed to maximize sensible and latent cooling performance at design conditions
- System can operate from 30°F to 125°F without any additional controls

#### R-410A Refrigerant

- Non-chlorine based
- Ozone friendly

#### 1 Scroll Compressors

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

#### Compressor Crankcase Heaters

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

#### 2 Check/Thermal Expansion Valves

- Ensures optimal performance throughout the application range
- Removable element head

#### 3 Filter/Driers

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

#### High Pressure Switches

- Protects the compressor from overload conditions
- Auto-reset

#### 4 Reversing Valves

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

#### Indoor Coil Freeze Protection

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

#### 5 Coil Construction

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

#### Antimicrobial Condensate Drain Pan

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

#### 6 Outdoor Coil Fan Motors

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

#### Outdoor Coil Fans

- PVC coated fan guards furnished

### Required Selections

#### Cooling Capacity

- Specify nominal cooling capacity

## FEATURES AND BENEFITS

### COOLING / HEATING SYSTEM (continued)

#### Options/Accessories

#### Field Installed

##### Condensate Drain Trap

- Available in copper or PVC

##### Drain Pan Overflow Switch

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

#### Options/Accessories

#### Field Installed

##### Low Ambient Kit (0°F)

- Cycles the outdoor fan while allowing compressor operation in the cooling cycle
- Intermittent fan operation allows the system to operate without icing the indoor coil and losing capacity
- Designed for use in ambient temperatures no lower than 0°F

### CABINET

#### 7 Construction

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

#### Airflow Choice

- Units are shipped in downflow (vertical) return air flow configuration

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

#### Power Entry

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

#### Exterior Panels

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

#### Insulation

- Fully insulated with non-hygroscopic fiberglass insulation (conditioned areas)
- Unit base is fully insulated
- Base insulation serves as an air seal to the roof curb, eliminating the need to add a seal during installation

#### Access Panels

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

#### Options/Accessories

#### Factory Installed

##### Hinged Access Panels

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

#### Field Installed

##### Combination Coil/Hail Guards

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

##### Horizontal Return Air Panel Kit

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

#### BLOWER

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

#### 8 Motor

- Overload protected
- 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 statically and dynamically balanced
- Ball bearings
- Adjustable pulley (allows speed change)
- Blower assembly slides out of unit for servicing

## FEATURES AND BENEFITS

### **BLOWER (continued)**

#### Required Selections

#### Select Single Zone VAV Supply Fan Supply Air Blower Option

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

#### Single Zone VAV Supply Fan Operation

- Single Zone VAV stages the amount of airflow according to compressor stages, heating demand, and ventilation demand
- Units utilize a Variable Frequency Drive (VFD) to stage the supply air blower airflow
- VFD alters the frequency and voltage of the power supply to the blower to control blower speed
- The supply air blower has two speeds:
  1. **Low Speed** - 1st Stage Cooling
  2. **High Speed** - Full load cooling and all heat modes
- Full speed blower operation is set by adjusting the motor pulley to deliver the desired air volume
- Ventilation speed is selectable between high and low speed

**NOTE** - Part load airflow in cooling mode should not be set below 220 cfm/nominal full load ton to reduce the risk of evaporator coil freeze-up.

- VFD has an operational range of -40 to 125° F outdoor air ambient temperature

**NOTE** - Lower operating costs are obtained when the blower is operated on lower speeds.

**NOTE** - Variable Frequency Drive (VFD) is designed to operate on balanced, three-phase power. Operating units on unbalanced three-phase power will reduce the reliability of all electrical components in the unit. Unbalanced power is a result of the power delivery system supplied by the local utility company. Factory-installed inverters are sized to drive blower motors with an equivalent current rating using balanced three-phase power. If unbalanced three-phase power is supplied the installer must replace the existing factory-installed inverter with an inverter that has a higher current rating to allow for the imbalance. Refer to the installation instructions for additional information and replacement information.

#### Required Selections

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

#### Options/Accessories

#### **Field Installed**

##### VFD Manual Bypass Kit

- Bypass Kit can be used to operate the unit in single speed (CAV) blower mode if the inverter needs to be serviced or replaced
- The VFD Manual Bypass Control is a manual bypass and is enabled by re-configuring the wiring on the unit

#### **CONTROLS**

#### 9 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

#### 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 35°F
- Temperature switch mounted on outdoor coil vapor 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)
- Power board located in unit control compartment.

#### **Commercial Control Systems**

##### Thermostats

- Control system and thermostat options, see page 10

## FEATURES AND BENEFITS

### **ELECTRICAL**

- All units include terminal block and fuse block in power entry junction box for single power entry application

#### **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

#### **Phase Monitor**

- Phase monitor located in the control compartment detects the phasing of incoming power
- Phase monitor detects the phasing of incoming power
- If incoming power is out of phase or if any of the three phases are lost, an indicator LED on the phase monitor will turn red and the unit will not start
- In normal operation with correct incoming power phasing, the LED will be green

### **Required Selections**

#### **Voltage Choice**

- Specify when ordering base unit

### **Options/Accessories**

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

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

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

#### **GFI Service Outlets (2)**

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

#### **Field Installed**

##### **11 Electric Heat**

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

#### **GFI Weatherproof Cover**

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

### **INDOOR AIR QUALITY**

##### **12 Air Filters**

- Disposable 2 inch MERV 4 filters furnished as standard

### **Options/Accessories**

#### **Field Installed**

##### **Healthy Climate® High Efficiency Air Filter**

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

##### **Replacement Filter Media Kit With Frame**

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

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

- Monitors CO<sub>2</sub> levels
- Reports to the Unit Controller which adjusts economizer dampers as needed



## OPTIONS / ACCESSORIES

### ECONOMIZER

#### 13 Economizer Features (Standard and High Performance Common Features)

- Outdoor Air Hood with mist elimination filter is furnished
- Mixed Air Sensor is furnished for field installation in the rooftop unit

**NOTE** - Sensor is factory installed when High Performance Economizers are factory installed.

#### Field Installed

##### Standard Economizer Features (Not for Title 24)

- 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

##### Standard Economizer Control Module

- The Standard Economizer Control Module can be adjusted to operate based on outdoor air temperatures



##### Economizer Controls:

- **Damper Minimum Position** - Can be set lower than traditional minimum air requirements resulting in cost savings
- **IAQ Sensor** - Signals dampers to modulate and maintain 55°F when CO<sub>2</sub> is higher than the CO<sub>2</sub> setpoint
- **Demand Control Ventilation (DCV) LED** - A steady green Demand Control Ventilation LED indicates the IAQ reading is higher than setpoint and requires more fresh air
- **Free Cool LED** - A steady green LED indicates outdoor air is suitable for free cooling
  - Free Cooling runs when outdoor air temperature is lower than the set temperature on the economizer control

**NOTE:** The Free Cooling default setting for outdoor air temperature sensor is 55°F.

### Factory or Field Installed

#### High Performance Economizer Features

- Approved for California Title 24 building standards
- Low leakage dampers are Air Movement and Control Association International (AMCA) Class 1A Certified - Maximum 3 cfm per sq. ft. leakage at 1 in. w.g.
- ASHRAE 90.1 compliant
- Linked damper action
- High torque 24-volt fully-modulating spring return damper motor
- Return air and outdoor air dampers
- Plug-in connections to unit

**NOTE** - High Performance Economizers are not approved for use with differential enthalpy controls in Title 24 applications.

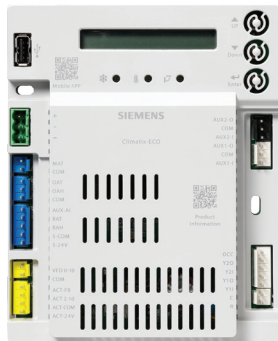
**NOTE** - The free cooling setpoint for Title 24 applications must be set based on the Climate Zone where the system is installed. See Section 140.4 "Prescriptive Requirements for Space Conditioning Systems" of the California Energy Commission's 2013 Building Energy Efficiency Standards. Refer to Installation Instructions for complete setup information and menu parameters available.

## OPTIONS / ACCESSORIES

### ECONOMIZER (continued)

#### High Performance Economizer Control Module

- Provides inputs and outputs to control economizer based on parameter settings
- Free cooling based on single dry bulb temperature, or combination temperature + humidity sensors
- Automatic switchover for different control modes
- Parameter settings based on climate zone, using GPS functionality in the Climatix Mobile application
- LED indication for free cooling operation, sensor operation and damper operation
- Quick installation and easy commissioning with the **Climatix Mobile App** on a mobile device



**NOTE** - WLAN Stick is required for App connection to module(s).

- Module displays any alarm messages (fault detection and diagnostics) as an aid in troubleshooting
- RS485 port for BACnet MSTP or Modbus RTU communication
- USB port for firmware updates and WLAN connection for setup and commissioning
- QR codes on module for quick access to download Climatix Mobile App and user documentation
- User Interface for normal operation, parameter setup and alarm notifications with an LCD display and three operation buttons:
  1. **Up Button** - Move to the previous value, step or category
  2. **Down Button** - Move to the next value, step or category
  3. **Enter Button** -
    - Press to edit the current value or option
    - Press to confirm a newly selected value or option
    - Press Enter + Up to jump up one category
    - Press Enter + Down to jump down one category

**NOTE** - The Free Cooling setpoint for Title 24 applications must be set based on the Climate Zone where the system is installed. See Section 140.4 "Prescriptive Requirements for Space Conditioning Systems" of the California Energy Commission's 2013 Building Energy Efficiency Standards.

**NOTE** - Refer to Installation Instructions for complete setup information and menu parameters available.

#### Field Installed

##### Single Enthalpy Temperature Control

- Outdoor air enthalpy sensor enables Economizer if the outdoor enthalpy is less than the setpoint of the control

**NOTE** - The factory installed economizer option comes preset for Single Enthalpy control but can be field converted to Single Sensible Temperature control by changing a parameter on the economizer control module.

#### Field Installed

##### Differential Enthalpy Control (Not for Title 24)

- Order one for factory installed economizer
- Order two for field installed economizer
  - One is field installed in the return air section
  - One in the outdoor air section
- Allows the economizer control board to select between outdoor air or return air, whichever has lower enthalpy

##### WLAN Stick

- Required for Climatix Mobile App usage
- Plugs into USB port on Module to provide a temporary WLAN connection for setup, commissioning and servicing

**NOTE** - Only one WLAN Stick is required and can be used on multiple modules.

### EXHAUST

#### Factory or Field Installed

#### 14 Downflow Barometric Relief Dampers With Exhaust Hood

- Allow relief of excess air
- Aluminum blade dampers prevent blow back and outdoor air infiltration during off cycle
- Exhaust hood with bird screen furnished

#### Field Installed

##### Horizontal Barometric Relief Dampers With Exhaust Hood

- 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

#### 15 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
- Fans runs when outdoor air dampers are 50% open (adjustable)
- Motor is overload protected
- Dual 20 in. diameter fans
- 5 blades
- Two 1/3 hp motors
- SCCR rated

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



## OPTIONS / ACCESSORIES

### **OUTDOOR AIR**

#### **Field Installed**

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

- Downflow or Horizontal
- Linked mechanical dampers
- 0 to 25% (fixed) outdoor air adjustable
- Installs in unit
- Includes outdoor air hood
- Motorized model features fully modulating spring return damper motor with plug-in connection
- Manual model features parallel blade with gear-driven dampers and adjustable fixed position

#### **ROOF CURBS**

- Nailer strip furnished (downflow only)
- Mates to unit
- US National Roofing Contractors Approved
- Shipped knocked down

##### **Hybrid Roof Curbs, Downflow**

- Interlocking tabs fasten corners together
- No tools required
- Can also be fastened together with furnished hardware
- Available in 8, 14, 18, and 24 inch heights

##### **Adjustable Pitch Curb, Downflow**

- Fully adjustable pitch curbs (3/4 in. per foot in any direction) provide a level platform for rooftop units allowing flexible installations on roofs with uneven or sloped angles
- Uses interlocking tabs to fasten corners together. No tools required
- Hardware is furnished to connect upper curb with lower curb
- Available in 14 inch height

##### **Horizontal**

- Converts unit from downflow to horizontal (side) air flow
- Return air is on unit
- Supply air is on curb
- See dimension drawings

**NOTE** - Requires Horizontal Return Air Panel Kit. Available in 26, 30, 37 and 41 inch heights. Optional Insulation Kit is available to help prevent sweating.

##### **Adaptor Curbs (not shown)**

- Curbs are regionally sourced
- Dimensions vary based upon the source

**NOTE** - Contact your local sales representative for a detailed cut sheet with applicable dimensions.

### **CEILING DIFFUSERS**

#### **Field Installed**

##### **Ceiling Diffusers (Flush or Step-Down)**

- White powder coat finish on diffuser face and grilles
- Insulated UL listed duct liner
- Diffuser box has collars for duct connection
- Step-down diffusers have double deflection blades
- Flush diffusers have fixed blades
- Provisions for suspending
- Internally sealed to prevent recirculation
- Removable return air grille
- Adapts to T-bar ceiling grids or plaster ceilings

##### **Transitions (Supply and Return)**

- Used with diffusers
- Installs in roof curb
- Galvanized steel construction
- Flanges furnished for duct connection to diffusers
- Fully insulated

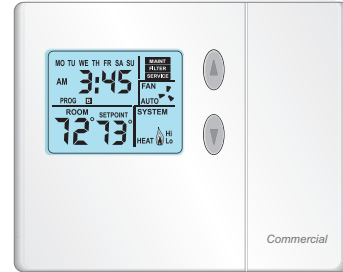
## OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

### CS7500 Commercial 7-Day Programmable Thermostat



- Premium Universal Thermostat
- Full Color Touchscreen Interface
- Up To 4 Heat / 3 Cool
- Built-In Sensors For Temperature and Humidity
- Remote Sensors Options For Temperature, Discharge Air, Outdoor Air
- 5-2 or 7-Day Scheduling
- Smooth Setback Recovery
- Heat/Cool Auto-Changeover
- FDD, ASHRAE, IECC Compliant

### CS3000 Commercial 5-2 Day Programmable Thermostat



- Conventional Multi-Stage Thermostat
- Intuitive Display
- Push-Button Operation
- Up To 2 Heat / 2 Cool
- Built-In Temperature Sensor
- Remote Temperature Sensing
- Up to 5-2 Day Scheduling
- Smooth Setback Recovery
- Heat/Cool Auto-changeover

### BACnet Compatible Thermostat With Reheat



Description	Catalog No.
<b>CS7500 Commercial 7-Day Programmable Thermostat</b>	
CS7500 7-Day Thermostat	<b>24K41</b>
Sensors/	<sup>1</sup> Remote non-adjustable wall-mount 20k <b>47W36</b>
Accessories	<sup>1</sup> Remote non-adjustable wall-mount 10k <b>47W37</b>
	Remote non-adjustable discharge air (duct mount) <b>19L22</b>
	Outdoor temperature sensor <b>X2658</b>
<b>CS3000 5-2 Day Programmable Thermostat</b>	
CS3000 5-2 Day Thermostat	<b>11Y05</b>
Sensor/	Remote non-adjustable wall mount 10k averaging <b>47W37</b>
Accessories	Thermostat wall mounting plate <b>X2659</b>
<b>BACnet 7-Day Programmable Thermostat</b>	
BACnet	<sup>2</sup> 7-Day BACnet Thermostat <b>24C57</b>
Controls	<sup>3</sup> BACnet Module <b>16X72</b>
<sup>4</sup> BACnet	With Display <b>97W23</b>
Room Sensors	Without Display <b>97W24</b>
<b>Universal Thermostat Guard with Lock (clear)</b>	
Inside Dimensions (H x W x D)	5-7/8 x 8-3/8 x 3 in. <b>39P21</b>

- <sup>1</sup> Remote wall-mount sensors can be applied in any of the following combinations:  
 One Sensor - (1) 47W36, Two Sensors - (2) 47W37, Three Sensors - (2) 47W36 and (1) 47W37  
 Four Sensors - (4) 47W36, Five Sensors - (3) 47W36 and (2) 47W37
- <sup>2</sup> BACnet Thermostat (24C57) will control units with and without the dehumidification option. If there is a mix of units equipped with and without dehumidification on the same site, this thermostat can be used for all units if suitable.
- <sup>3</sup> Not compatible with units equipped with dehumidification option.
- <sup>4</sup> Only compatible with BACnet Module (16X70).

- 7-Day Programmable
- For units with or without Humiditrol®
- BTL listed MS/TP ensures compatibility with any BACnet system
- Built-in control programs for conventional and heat pump applications
- Conventional systems up to 3-stage heat and 3-stage cool
- Heat pumps with 1 or 2 compressors and up to 2-stage auxiliary heat
- On-board temperature and humidity sensor
- Multiple configurable inputs and outputs enable advanced control strategies
- Set-up Wizard enables rapid system configuration
- No special tools required for installation or commissioning
- Seven-day (2, 4 or 6 event) occupancy scheduling per day
- Backlit 5-inch LCD touchscreen

## OPTIONS / ACCESSORIES

Item Description	Catalog Number	180	240	
<b>COOLING SYSTEM</b>				
Condensate Drain Trap	PVC	22H54	X	X
	Copper	76W27	X	X
Drain Pan Overflow Switch		10C24	X	X
Low Ambient Kit		55W73	X	X
Refrigerant Type		R-410A	O	O
<b>BLOWER - SUPPLY AIR</b>				
Blower Options	Single Zone VAV Supply Fan	Factory	O	O
Motors - Single Zone VAV Supply Fan	Belt Drive - 3 hp	Factory	O	
	Belt Drive - 5 hp	Factory	O	O
	Belt Drive - 7.5 hp	Factory	O	O
	Belt Drive - 10 hp	Factory		O
VFD Manual Bypass Kit (for Single Zone VAV Supply Fan equipped units)	3 hp, 5 hp (208/230V) 3 hp, 5 hp, 7.5 hp, 10 hp (460V and 575V)	90W52	X	X
	7.5 hp, 10 hp (208/230V)	90W51	X	X
Drive Kits See Blower Data Tables for usage and selection	Kit #1 535-725 rpm	Factory	O	
	Kit #2 710-965 rpm	Factory	O	
	Kit #3 685-856 rpm	Factory	O	O
	Kit #4 850-1045 rpm	Factory	O	O
	Kit #5 945-1185 rpm	Factory	O	O
	Kit #6 850-1045 rpm	Factory	O	O
	Kit #7 945-1185 rpm	Factory	O	O
	Kit #8 1045-1285 rpm	Factory	O	O
	Kit #10 1045-1285 rpm	Factory		O
	Kit #11 1135-1365 rpm	Factory		O
	<b>CABINET</b>			
Combination Coil/Hail Guards		23U71	X	X
Hinged Access Panels		Factory	O	O
<b>CONTROLS</b>				
<b>NOTE - Also see Conventional Thermostat Control Systems on page 10 for Additional Options.</b>				
Smoke Detector - Supply or Return (Power board and one sensor)		22H56	X	X
Smoke Detector - Supply and Return (Power board and two sensors)		22H57	X	X

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX - Configure To Order (Factory Installed) or Field Installed

O = Configure To Order (Factory Installed)

X = Field Installed

## OPTIONS / ACCESSORIES

Item Description	Catalog Number	180	240	
<b>INDOOR AIR QUALITY</b>				
<b>Air Filters</b>				
High Efficiency Air Filters 24 x 24 x 2 (Order 6 per unit)	MERV 8	<b>54W67</b>	X	X
	MERV 13	<b>52W40</b>	X	X
Replacement Media Filter With Metal Mesh Frame (includes non-pleated filter media)		<b>44N61</b>	X	X
<b>Indoor Air Quality (CO<sub>2</sub>) Sensors</b>				
Sensor - Wall-mount, off-white plastic cover with LCD display		<b>77N39</b>	X	X
Sensor - Wall-mount, off-white plastic cover, no display		<b>23V86</b>	X	X
Sensor - Black plastic case with LCD display, rated for plenum mounting		<b>87N52</b>	X	X
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting		<b>87N54</b>	X	X
CO <sub>2</sub> Sensor Duct Mounting Kit - for downflow applications		<b>85L43</b>	X	X
Aspiration Box - for duct mounting non-plenum rated CO <sub>2</sub> sensors ( <b>77N39</b> )		<b>90N43</b>	X	X
<b>ELECTRICAL</b>				
Voltage 60 Hz	208/230V - 3 phase	Factory	O	O
	460V - 3 phase	Factory	O	O
	575V - 3 phase	Factory	O	O
Disconnect Switch (see Electric Heat Tables for usage)	80 amp	<b>54W85</b>	OX	OX
	150 amp	<b>54W86</b>	OX	OX
	250 amp	<b>54W87</b>	OX	OX
GFI Service Outlets	15 amp non-powered, field-wired (208/230V, 460V only)	<b>74M70</b>	X	X
	<sup>2</sup> 20 amp non-powered, field-wired (208/230V, 460V, 575V)	<b>67E01</b>	X	X
Weatherproof Cover for GFI		<b>10C89</b>	X	X
<b>ELECTRIC HEAT</b>				
15 kW	208/230V-3ph	<b>22H66</b>	X	X
	460V-3ph	<b>22H67</b>	X	X
	575V-3ph	<b>22V35</b>	X	X
30 kW	208/230V-3ph	<b>22H70</b>	X	X
	460V-3ph	<b>22H71</b>	X	X
	575V-3ph	<b>22V37</b>	X	X
45 kW	208/230V-3ph	<b>22H74</b>	X	X
	460V-3ph	<b>22H75</b>	X	X
	575V-3ph	<b>22V39</b>	X	X
60 kW	208/230V-3ph	<b>22H78</b>	X	X
	460V-3ph	<b>22H79</b>	X	X
	575V-3ph	<b>22V41</b>	X	X
90 kW	208/230V-3ph	<b>22H80</b>		X
	460V-3ph	<b>22H81</b>		X
	575V-3ph	<b>22V42</b>		X

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

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX - Configure To Order (Factory Installed) or Field Installed

O = Configure To Order (Factory Installed)

X = Field Installed

## OPTIONS / ACCESSORIES

Item Description	Catalog Number	180	240	
<b>ECONOMIZER</b>				
<b>Standard Economizer With Outdoor Air Hood (Not for Title 24)</b>				
Standard Economizer Downflow or Horizontal Applications - Includes Outdoor Air Hood, order Downflow or Horizontal Barometric Relief Dampers separately	13U48	X	X	
<b>Standard Economizer Controls (Not for Title 24)</b>				
Single Enthalpy Control	21Z09	X	X	
Differential Enthalpy Control (order 2)	21Z09	X	X	
<b>High Performance Economizer With Outdoor Air Hood (Approved for California Title 24 Building Standards / AMCA Class 1A Certified)</b>				
High Performance Economizer Downflow or Horizontal Applications - Includes Outdoor Air Hood, order Downflow or Horizontal Barometric Relief Dampers separately	23G24	OX	OX	
<b>High Performance Economizer Controls</b>				
Single Enthalpy Control	23G26	X	X	
Differential Enthalpy Control (order 1 for factory. order 2 for field) (Not for Title 24)	23G26	X	X	
<b>Economizer Accessories</b>				
WLAN Stick (For High Performance Economizer only)	23K58	X	X	
<b>Barometric Relief Dampers With Exhaust Hood</b>				
Downflow Barometric Relief Dampers	54W78	OX	OX	
Horizontal Barometric Relief Dampers	16K99	X	X	
<b>OUTDOOR AIR</b>				
<b>Outdoor Air Dampers With Outdoor Air Hood</b>				
Motorized	22J27	X	X	
Manual	13U05	X	X	
<b><sup>1</sup> POWER EXHAUST (DOWNFLOW APPLICATIONS ONLY)</b>				
Standard Static, SCCR Rated	208/230V	22H90	X	X
	460V	22H91	X	X
	575V	22V34	X	X
<b>ROOF CURBS</b>				
<b>Hybrid Roof Curbs, Downflow</b>				
8 in. height	11F58	X	X	
14 in. height	11F59	X	X	
18 in. height	11F60	X	X	
24 in. height	11F61	X	X	
<b>Adjustable Pitch Curb</b>				
14 in. height	43W26	X	X	
<b>Standard Roof Curbs, Horizontal - Requires Horizontal Return Air Panel Kit</b>				
26 in. height - slab applications	11T89	X	X	
37 in. height - rooftop applications	11T96	X	X	
<b>Insulation Kit For Standard Horizontal Curbs</b>				
For 26 in. Curb	73K32	X	X	
For 37 in. Curb	73K34	X	X	
<b>Horizontal Return Air Panel Kit</b>				
Required for Horizontal Applications with Roof Curb	87M00	X	X	
<b>CEILING DIFFUSERS</b>				
Step-Down - Order one	RTD11-185S	13K63	X	
	RTD11-275S	13K64		X
Flush - Order one	FD11-185S	13K58	X	
	FD11-275S	13K59		X
Transitions (Supply and Return) - Order one	C1DIFF33C-1	12X68	X	
	C1DIFF34C-1	12X70		X

<sup>1</sup> Field installed Power Exhaust requires Economizer with Outdoor Air Hood and Downflow Barometric Relief Dampers with Exhaust Hood. Must be ordered separately.

NOTE - Catalog numbers shown are for ordering field installed accessories.

OX - Configure To Order (Factory Installed) or Field Installed

O = Configure To Order (Factory Installed)

X = Field Installed

## SPECIFICATIONS

General Data		Nominal Tonnage	15 Ton	20 Ton	
		Model Number	KHC180S4M	KHC240S4M	
		Efficiency Type	Standard	Standard	
		Blower Type	Single Zone VAV Supply Fan	Single Zone VAV Supply Fan	
<b>Cooling Performance</b>	Gross Cooling Capacity - Btuh		181,000	230,000	
	<sup>1</sup> Net Cooling Capacity - Btuh		176,000	222,000	
	<sup>1</sup> AHRI Rated Air Flow - cfm		5500	7000	
	Total Unit Power - kW		16.6	20.9	
	<sup>1</sup> EER (Btuh/Watt)		10.6	10.6	
	<sup>1</sup> IEER (Btuh/Watt)		13.5	13.5	
	Refrigerant Type		R-410A	R-410A	
Refrigerant Charge Furnished	Circuit 1		22 lbs. 12 oz.	22 lbs. 8 oz.	
	Circuit 2		21 lbs. 12 oz.	21 lbs. 8 oz.	
<b>Heating Performance</b>	<sup>1</sup> Total High Heat Capacity - Btuh		166,000	218,000	
	Total Unit Power - kW		14.7	19.3	
	<sup>1</sup> C.O.P.		3.30	3.30	
	<sup>1</sup> Total Low Heat Capacity - Btuh		92,000	116,000	
	Total Unit Power (kW)		13.1	16.5	
	<sup>1</sup> C.O.P.		2.05	2.05	
<b>Electric Heat Available - See page 12</b>			15-30-45-60 KW	15-30-45-60-90 KW	
<b>Compressor Type (number)</b>			(2) Single-Stage Scroll	(2) Single-Stage Scroll	
<b>Outdoor Coils</b>	Net face area (total) - sq. ft.		55.1	55.1	
	Tube diameter - in.		3/8	3/8	
	No. of rows		2	2	
	Fins per inch		20	20	
<b>Outdoor Coil Fans</b>	No. and type		(4) PSC	(4) PSC	
	Motor - (No.) horsepower		(4) 1/3	(4) 1/3	
	Motor rpm		1075	1075	
	Total Motor watts		1750	1750	
	Diameter - (No.) in.		(4) 24	(4) 24	
	Number of blades		3	3	
	Total Air volume - cfm		12,500	12,500	
<b>Indoor Coils</b>	Net face area (total) - sq. ft.		21.4	21.4	
	Tube diameter - in.		3/8	3/8	
	Number of rows		4	4	
	Fins per inch		14	14	
	Drain connection - No. and size		(1) 1 in. FPT	(1) 1in. FPT	
	Expansion device type		Balance port TXV, removable head		
<sup>2</sup> <b>Indoor Blower and Drive Selection</b>	Nominal motor output		3 hp, 5 hp, 7.5 hp	5 hp, 7.5 hp, 10 hp	
	Maximum usable motor output (US Only)		3.45 hp, 5.75 hp, 8.63 hp	5.75 hp, 8.63 hp, 11.5 hp	
	Motor - Drive kit number	<b>3 hp</b>		<b>Kit 1</b> 535-725 rpm	<b>Kit 3</b> 685-856 rpm
		<b>Kit 2</b> 710-965 rpm		<b>Kit 4</b> 850-1045 rpm	<b>Kit 5</b> 945-1185 rpm
		<b>5 hp</b>		<b>Kit 3</b> 685-856 rpm	<b>7.5 hp</b>
		<b>Kit 4</b> 850-1045 rpm		<b>Kit 6</b> 850-1045 rpm	<b>Kit 7</b> 945-1185 rpm
		<b>Kit 5</b> 945-1185 rpm		<b>Kit 7</b> 945-1185 rpm	<b>Kit 8</b> 1045-1285 rpm
		<b>7.5 hp</b>		<b>Kit 6</b> 850-1045 rpm	<b>10 hp</b>
		<b>Kit 6</b> 850-1045 rpm		<b>Kit 7</b> 945-1185 rpm	<b>Kit 7</b> 945-1185 rpm
		<b>Kit 7</b> 945-1185 rpm		<b>Kit 8</b> 1045-1285 rpm	<b>Kit 10</b> 1045-1285 rpm
<b>Kit 8</b> 1045-1285 rpm			<b>Kit 11</b> 1135-1365 rpm		
Blower wheel nominal diameter x width - in.		(2) 15 x 15	(2) 15 x 15		
<b>Filters</b>	Type of filter		MERV 4, Disposable		
	Number and size - in.		(6) 24 x 24 x 2		
<b>Electrical characteristics</b>			208/230V, 460V or 575V - 60 hertz - 3 phase		

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

<sup>1</sup> AHRI Certified to AHRI Standard 340/360:

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

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

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

<sup>2</sup> Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE - Motor service factor limit - 1.0.



## COOLING/HEATING RATINGS

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

### 15 TON - COOLING KHC180S4M (1 COMPRESSOR - PART LOAD)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																							
		65°F						75°F						85°F						95°F					
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb						
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F				
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F					
63°F	3300	101.8	4.12	0.7	0.91	1	95.8	4.55	0.72	0.95	1	89.2	5.07	0.73	1	1	82.8	5.69	0.75	1	1				
	4000	106.2	4.16	0.76	1	1	100.4	4.59	0.78	1	1	93.8	5.11	0.79	1	1	87.5	5.72	0.83	1	1				
	4800	111.5	4.21	0.83	1	1	105	4.63	0.87	1	1	98.5	5.14	0.92	1	1	91.7	5.75	0.97	1	1				
67°F	3300	108.3	4.18	0.52	0.68	0.85	102.2	4.61	0.52	0.69	0.89	95	5.11	0.53	0.71	0.93	87.8	5.72	0.53	0.73	0.99				
	4000	112.4	4.22	0.56	0.74	0.99	105.2	4.63	0.57	0.76	1	98.4	5.14	0.57	0.77	1	91.2	5.75	0.58	0.8	1				
	4800	115.4	4.26	0.6	0.8	1	108.5	4.66	0.61	0.84	1	101.3	5.16	0.62	0.89	1	93.7	5.77	0.64	0.94	1				
71°F	3300	115.5	4.25	0.36	0.51	0.66	108.7	4.66	0.35	0.51	0.67	101.8	5.16	0.34	0.51	0.69	94.3	5.77	0.34	0.53	0.71				
	4000	119.3	4.29	0.37	0.55	0.72	111.9	4.69	0.37	0.56	0.73	104.7	5.19	0.36	0.56	0.76	97.3	5.79	0.36	0.58	0.78				
	4800	122.6	4.32	0.39	0.59	0.78	114.9	4.72	0.39	0.6	0.81	107.8	5.21	0.38	0.62	0.85	100	5.81	0.38	0.64	0.91				

### 15 TON - COOLING KHC180S4M (2 COMPRESSORS - FULL LOAD)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																							
		85°F						95°F						105°F						115°F					
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb						
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F				
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F					
63°F	4800	176.5	10.65	0.71	0.86	1	163.3	11.87	0.72	0.88	1	148.6	13.28	0.73	0.91	1	130.5	14.83	0.74	0.96	1				
	6000	190	10.78	0.77	0.94	1	172.3	11.97	0.79	0.98	1	158.2	13.36	0.81	1	1	144.6	14.99	0.85	1	1				
	7200	195.7	10.84	0.83	1	1	183	12.06	0.86	1	1	168.9	13.47	0.88	1	1	154.5	15.1	0.92	1	1				
67°F	4800	193.1	10.8	0.54	0.68	0.83	176.4	12	0.54	0.7	0.85	161.9	13.4	0.54	0.71	0.87	146.2	15.02	0.53	0.72	0.9				
	6000	200.1	10.88	0.58	0.75	0.91	185.8	12.09	0.58	0.77	0.94	170.6	13.49	0.59	0.79	0.97	154.5	15.1	0.59	0.81	1				
	7200	207.5	10.96	0.62	0.82	0.99	192.6	12.16	0.63	0.84	1	176.9	13.55	0.64	0.86	1	159.2	15.15	0.65	0.9	1				
71°F	4800	204.4	10.92	0.4	0.53	0.66	189.8	12.13	0.38	0.53	0.67	174.7	13.52	0.37	0.53	0.69	158.4	15.12	0.36	0.53	0.7				
	6000	214.7	11.03	0.41	0.58	0.73	199.7	12.24	0.4	0.58	0.75	183.5	13.61	0.4	0.58	0.76	167.4	15.22	0.38	0.59	0.79				
	7200	222.2	11.11	0.43	0.62	0.8	206.6	12.31	0.43	0.62	0.81	190.7	13.69	0.42	0.63	0.84	173	15.28	0.41	0.64	0.87				

### 15 TON - HEATING KHC180S4M

Indoor Coil Air Volume 70°F Dry Bulb cfm	Air Temperature Entering Outdoor Coil									
	65°F		45°F		25°F		5°F		-15°F	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW
4800	225.8	12.53	161.8	11.32	109.1	10.21	73.3	9.49	45.2	8.74
6000	233.0	11.57	166.5	10.60	112.3	9.71	75.7	9.15	47.2	8.60
7200	239.9	10.99	170.8	10.16	115.6	9.40	78.3	8.93	49.4	8.54

## COOLING/HEATING RATINGS

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

### 20 TON - COOLING KHC240S4M (1 COMPRESSOR - PART LOAD)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		65°F					75°F					85°F					95°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW				kBtuh	kW				kBtuh	kW				kBtuh	kW				
63°F	4500	132.1	6.04	0.82	0.99	1	126.6	6.69	0.84	0.99	1	116.2	7.37	0.85	1	1	106.5	8.17	0.87	1	1
	5500	142.5	6.18	0.9	1	1	132.7	6.77	0.92	1	1	125.6	7.5	0.94	1	1	113.8	8.26	0.95	1	1
	6500	148.4	6.26	0.95	1	1	137.3	7.37	0.96	1	1	128.5	7.54	0.98	1	1	121.4	8.92	0.99	1	1
67°F	4500	145.2	6.21	0.61	0.8	0.96	134.7	6.8	0.61	0.82	0.97	126.8	7.5	0.61	0.82	0.99	113.5	8.25	0.62	0.85	1
	5500	150.8	6.29	0.65	0.87	1	138.6	6.85	0.66	0.89	1	129.2	7.54	0.66	0.92	1	120.4	8.92	0.67	0.94	1
	6500	154.3	6.34	0.7	0.94	1	143.9	6.92	0.71	0.95	1	132.4	7.59	0.72	0.97	1	125.1	8.96	0.72	0.98	1
71°F	4500	154.8	6.34	0.41	0.6	0.77	144.7	6.92	0.4	0.6	0.79	133.4	7.59	0.39	0.6	0.81	126	8.4	0.36	0.59	0.83
	5500	160	6.41	0.43	0.65	0.85	149.5	6.98	0.42	0.65	0.87	138.2	7.65	0.42	0.66	0.89	127.2	8.41	0.4	0.67	0.92
	6500	164	6.47	0.46	0.7	0.92	152.9	7.03	0.45	0.71	0.94	141.8	7.7	0.43	0.72	0.96	129.8	8.44	0.43	0.74	0.98

### 20 TON - COOLING KHC240S4M (2 COMPRESSORS - FULL LOAD)

Entering Wet Bulb Temperature	Total Air Volume	Outdoor Air Temperature Entering Outdoor Coil																			
		85°F					95°F					105°F					115°F				
		Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T) Dry Bulb		
				75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F			75°F	80°F	85°F
cfm	kBtuh	kW				kBtuh	kW				kBtuh	kW				kBtuh	kW				
63°F	6400	227	15.11	0.72	0.88	1	210.2	16.16	0.72	0.89	1	185.2	18	0.73	0.93	1	163.9	20.09	0.74	0.95	1
	8000	242.1	15.25	0.79	0.96	1	220.5	16.26	0.8	0.99	1	199.7	18.15	0.82	1	1	178.8	20.25	0.84	1	1
	9600	253.1	15.35	0.85	1	1	235.3	16.41	0.87	1	1	215.1	18.3	0.9	1	1	194.8	21.39	0.93	1	1
67°F	6400	248	14.65	0.55	0.7	0.84	226.5	16.31	0.54	0.71	0.86	204.4	18.2	0.53	0.71	0.89	182	20.28	0.51	0.72	0.92
	8000	265.2	14.81	0.59	0.77	0.93	239	16.44	0.59	0.78	0.95	216.5	18.32	0.59	0.8	0.98	193.1	21.38	0.58	0.82	1
	9600	272.1	14.87	0.64	0.83	0.99	249.1	16.54	0.64	0.85	1	220.4	19.12	0.64	0.89	1	201.8	21.47	0.64	0.9	1
71°F	6400	267.5	14.83	0.4	0.54	0.68	245.8	16.5	0.38	0.54	0.69	219.7	19.11	0.35	0.53	0.69	201.7	20.49	0.32	0.51	0.71
	8000	282.9	14.97	0.42	0.59	0.75	259	16.63	0.4	0.59	0.76	238	19.18	0.39	0.58	0.78	210.6	20.57	0.36	0.59	0.8
	9600	293.1	15.07	0.44	0.63	0.82	268.6	17.34	0.43	0.64	0.83	247.3	19.27	0.42	0.64	0.85	218	20.64	0.39	0.65	0.88

### 20 TON - HEATING KHC240S4M

Indoor Coil Air Volume 70°F Dry Bulb cfm	Air Temperature Entering Outdoor Coil									
	65°F		45°F		25°F		5°F		-15°F	
	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input	Total Heating Capacity	Comp. Motor Input
	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW	kBtuh	kW
6400	285.0	15.80	206.0	14.42	125.8	12.49	80.2	11.66	47.0	11.67
8000	292.2	14.65	209.5	13.58	128.3	11.98	82.3	11.41	48.5	11.62
9600	302.2	13.94	217.0	13.10	134.2	11.68	87.4	11.31	53.1	11.61

## BLOWER DATA

### BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL & AIR FILTERS IN PLACE

FOR ALL UNITS ADD:

- 1 - Wet indoor coil air resistance of selected unit.
- 2 - Any factory installed options air resistance (electric heat, economizer, etc.)
- 3 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

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

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

See page 19 for minimum air volume required for use with optional electric heat.

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

Air Volume cfm	0.20		0.40		0.60		0.80		1.00		1.20		1.40		1.60		1.80		2.00		2.20		2.40		2.60			
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP		
3250	405	0.40	520	0.60	615	0.85	695	1.10	765	1.30	830	1.60	890	1.85	950	2.10	1005	2.35	1060	2.60	1110	2.85	1165	3.10	1220	3.35	1275	3.60
3500	415	0.45	530	0.70	620	0.95	700	1.20	775	1.45	840	1.70	900	2.00	955	2.25	1010	2.50	1065	2.75	1120	3.00	1175	3.25	1230	3.50	1285	3.75
3750	425	0.50	540	0.75	630	1.05	710	1.30	780	1.60	845	1.85	905	2.15	960	2.40	1015	2.65	1070	2.90	1125	3.15	1180	3.40	1235	3.65	1290	3.90
4000	435	0.55	545	0.85	635	1.10	715	1.40	785	1.70	850	2.00	910	2.30	965	2.55	1020	2.80	1075	3.05	1130	3.30	1185	3.55	1240	3.80	1295	4.05
4250	445	0.60	555	0.90	645	1.25	725	1.55	795	1.85	855	2.15	915	2.45	970	2.70	1025	2.95	1080	3.20	1135	3.45	1190	3.70	1245	3.95	1300	4.20
4500	455	0.70	565	1.00	655	1.35	730	1.65	800	2.00	865	2.35	925	2.65	980	3.00	1035	3.30	1090	3.55	1145	3.80	1200	4.05	1255	4.30	1310	4.55
4750	470	0.75	575	1.10	660	1.45	740	1.80	810	2.15	870	2.50	930	2.85	985	3.20	1040	3.55	1095	3.80	1150	4.10	1205	4.35	1260	4.60	1315	4.85
5000	480	0.85	585	1.25	670	1.60	750	1.95	815	2.30	880	2.70	940	3.05	995	3.40	1050	3.75	1105	4.05	1160	4.35	1215	4.65	1270	4.90	1325	5.10
5250	495	0.95	595	1.35	680	1.70	755	2.10	825	2.50	890	2.90	945	3.25	1000	3.65	1055	3.95	1110	4.30	1165	4.60	1220	4.90	1275	5.20	1330	5.40
5500	505	1.05	605	1.45	690	1.85	765	2.25	835	2.65	895	3.05	955	3.45	1010	3.85	1065	4.15	1120	4.50	1175	4.80	1230	5.10	1285	5.40	1340	5.60
5750	520	1.15	615	1.60	700	2.00	775	2.45	840	2.85	905	3.25	960	3.65	1015	4.10	1070	4.40	1125	4.75	1180	5.05	1235	5.35	1290	5.65	1345	5.90
6000	530	1.30	630	1.75	710	2.15	785	2.60	850	3.05	910	3.45	970	3.90	1025	4.35	1080	4.65	1135	5.00	1190	5.35	1245	5.65	1300	5.95	1355	6.20
6250	545	1.40	640	1.90	720	2.35	795	2.80	860	3.25	920	3.70	975	4.15	1030	4.60	1085	4.90	1140	5.25	1195	5.60	1250	5.90	1305	6.20	1360	6.45
6500	560	1.55	650	2.05	730	2.50	805	3.00	870	3.45	930	3.95	985	4.40	1040	4.85	1095	5.15	1150	5.50	1205	5.85	1260	6.15	1315	6.45	1370	6.70
6750	570	1.70	665	2.20	745	2.70	815	3.20	880	3.70	940	4.20	995	4.65	1045	5.10	1100	5.45	1155	5.80	1210	6.10	1265	6.40	1320	6.70	1375	7.00
7000	585	1.85	675	2.35	755	2.90	825	3.40	890	3.95	950	4.45	1005	4.95	1055	5.40	1105	5.80	1160	6.15	1215	6.45	1270	6.75	1325	7.05	1380	7.30
7250	600	2.00	690	2.60	765	3.10	835	3.65	900	4.15	955	4.65	1015	5.25	1065	5.75	1115	6.05	1170	6.40	1225	6.70	1280	7.00	1335	7.30	1390	7.60
7500	615	2.20	700	2.75	775	3.30	845	3.85	910	4.45	965	4.95	1020	5.50	1075	6.05	1125	6.35	1180	6.70	1235	7.00	1290	7.30	1345	7.60	1400	7.90
7750	630	2.40	715	3.00	790	3.55	855	4.10	920	4.70	975	5.25	1030	5.80	1080	6.35	1130	6.65	1185	7.00	1240	7.30	1295	7.60	1350	7.90	1405	8.20
8000	640	2.55	725	3.20	800	3.80	865	4.35	930	4.95	985	5.50	1040	6.10	1090	6.70	1140	7.00	1195	7.35	1250	7.65	1305	7.95	1360	8.25	1410	8.50
8250	655	2.80	740	3.40	810	4.00	880	4.65	940	5.25	995	5.85	1050	6.45	1100	7.05	1150	7.35	1205	7.65	1260	7.95	1315	8.25	1370	8.55	1420	8.80
8500	670	3.00	750	3.65	825	4.30	890	4.90	950	5.55	1005	6.15	1060	6.80	1110	7.40	1160	7.70	1215	8.00	1270	8.30	1320	8.60	1380	8.90	1430	9.10
8750	685	3.25	765	3.90	835	4.55	900	5.20	960	5.85	1015	6.45	1070	7.15	1120	7.75	1175	8.05	1230	8.35	1285	8.65	1340	8.95	1400	9.25	1450	9.50
9000	700	3.50	780	4.20	850	4.85	910	5.50	970	6.15	1025	6.80	1080	7.50	1130	8.15	1175	8.45	1230	8.75	1285	9.05	1340	9.35	1400	9.65	1450	9.90
9250	715	3.75	790	4.45	860	5.15	925	5.85	985	6.55	1040	7.20	1095	7.85	1140	8.55	1185	8.85	1240	9.15	1295	9.45	1350	9.75	1405	10.05	1455	10.30
9500	730	4.00	805	4.75	875	5.45	935	6.15	995	6.90	1050	7.60	1105	8.25	1150	8.95	1195	9.25	1250	9.55	1305	9.85	1360	10.15	1415	10.45	1465	10.70
9750	745	4.30	820	5.05	885	5.75	950	6.55	1005	7.20	1060	7.95	1110	8.65	1160	9.40	1205	9.70	1260	10.00	1315	10.30	1370	10.60	1425	10.90	1475	11.20
10,000	760	4.60	835	5.40	900	6.15	960	6.85	1015	7.60	1070	8.35	1120	9.05	1170	9.80	1215	10.10	1270	10.40	1325	10.70	1380	11.00	1435	11.30	1485	11.60
10,250	775	4.90	845	5.65	910	6.45	970	7.20	1030	8.00	1080	8.75	1135	9.55	1180	10.25	1225	10.50	1280	10.80	1335	11.10	1390	11.40	1445	11.70	1495	12.00
10,500	790	5.20	860	6.00	925	6.85	985	7.65	1040	8.40	1095	9.20	1145	10.00	1190	10.70	1235	11.00	1290	11.30	1345	11.60	1400	11.90	1455	12.20	1505	12.50
10,750	805	5.55	875	6.40	940	7.25	1000	8.05	1055	8.85	1105	9.65	1155	10.45	1200	11.20	1245	11.50	1300	11.80	1355	12.10	1410	12.40	1465	12.70	1515	13.00
11,000	820	5.90	890	6.80	950	7.60	1010	8.45	1065	9.30	1115	10.05	1165	10.90	1210	11.65	1255	11.80	1310	12.10	1365	12.40	1420	12.70	1475	13.00	1525	13.50

## BLOWER DATA

### FACTORY INSTALLED BELT DRIVE KIT SPECIFICATIONS

Nominal hp	Maximum hp	Drive Kit Number	RPM Range
3	3.45	1	535 - 725
3	3.45	2	710 - 965
5	5.75	3	685 - 856
5	5.75	4	850 - 1045
5	5.75	5	945 - 1185
7.5	8.63	6	850 - 1045
7.5	8.63	7	945 - 1185
7.5	8.63	8	1045 - 1285
10	11.50	7	945 - 1185
10	11.50	10	1045 - 1285
10	11.50	11	1135 - 1365

NOTE - Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor output required. Maximum usable output of motors furnished are shown. In Canada, nominal motor output is also maximum usable motor output. If motors of comparable output are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

NOTE - Motor service factor limit - 1.0.

### FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE - in. w.g.

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

## BLOWER DATA

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

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

### POWER EXHAUST FAN PERFORMANCE

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

### CEILING DIFFUSER AIR RESISTANCE - in. w.g.

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

### CEILING DIFFUSER AIR THROW DATA

Model No.	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.		Model No.	Air Volume cfm	<sup>1</sup> Effective Throw Range - ft.	
		RTD11-185S Step-Down	FD11-185S Flush			RTD11-275 Step-Down	FD11-275 Flush
180	5600	39 - 49	28 - 37	240	7200	33 - 38	26 - 35
	5800	42 - 51	29 - 38		7400	35 - 40	28 - 37
	6000	44 - 54	40 - 50		7600	36 - 41	29 - 38
	6200	45 - 55	42 - 51		7800	38 - 43	40 - 50
	6400	46 - 55	43 - 52		8000	39 - 44	42 - 51
	6600	47 - 56	45 - 56		8200	41 - 46	43 - 52
					8400	43 - 49	44 - 54
					8600	44 - 50	46 - 57
					8800	47 - 55	48 - 59

<sup>1</sup> Throw is the horizontal or vertical distance an airstream travels on leaving the outlet or diffuser before the maximum velocity is reduced to 50 ft. per minute. Four sides open.

**ELECTRICAL/ELECTRIC HEAT DATA**

**15 TON**

Model No.		KHC180S4M								
<sup>1</sup> Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	25			12.8			9.6		
	Locked Rotor Amps	164			100			78		
Compressor 2 (Non-Inverter)	Rated Load Amps	25			12.2			9		
	Locked Rotor Amps	164			100			78		
Outdoor Fan Motors (4)	Full Load Amps (4 Non-ECM)	2.4			1.3			1		
	Total	9.6			5.2			4		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	3	5	7.5	3	5	7.5	3	5	7.5
	Full Load Amps	10.6	16.7	24.2	4.8	7.6	11	3.9	6.1	9
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit Only	100	100	110	50	50	50	35	40	40
	With (2) 0.33 HP Power Exhaust	100	110	110	50	50	50	40	40	45
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit Only	77	83	91	39	41	45	29	32	34
	With (2) 0.33 HP Power Exhaust	82	88	95	41	44	48	31	34	36

**ELECTRIC HEAT DATA**

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	125	125	125	150	150	150	70	70	70	50	50	60
		30 kW	175	175	175	175	175	200	90	90	90	70	70	80
		45 kW	200	225	200	225	225	250	110	110	125	90	90	90
		60 kW	225	225	225	250	225	250	125	125	125	90	90	100
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	116	122	122	128	130	136	61	64	67	47	50	53
		30 kW	155	167	161	173	169	181	84	87	90	65	68	71
		45 kW	194	212	200	218	208	226	106	109	113	84	86	89
		60 kW	202	221	208	227	216	235	111	114	117	87	89	92
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	125	150	150	150	150	150	70	70	70	50	60	60
		30 kW	175	175	175	200	175	200	90	90	100	70	70	80
		45 kW	200	225	225	225	225	250	110	125	125	90	90	100
		60 kW	225	250	225	250	225	250	125	125	125	90	100	100
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	121	127	127	133	134	140	64	67	70	49	52	55
		30 kW	160	172	166	178	174	186	86	89	93	67	70	73
		45 kW	199	217	205	223	213	231	109	112	115	86	88	91
		60 kW	207	226	213	232	220	240	113	116	120	89	91	94

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.

<sup>2</sup> HACR type breaker or fuse.

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

<sup>4</sup> Disconnect must be field furnished.



**ELECTRICAL/ELECTRIC HEAT DATA**

**20 TON**

Model No.		KHC240S4M								
<sup>1</sup> Voltage - 60Hz		208/230V - 3 Ph			460V - 3 Ph			575V - 3 Ph		
Compressor 1 (Non-Inverter)	Rated Load Amps	31.1			13			11		
	Locked Rotor Amps	255			123			93.7		
Compressor 2 (Non-Inverter)	Rated Load Amps	31.1			13			11		
	Locked Rotor Amps	255			123			93.7		
Outdoor Fan Motors (4)	Full Load Amps (4 Non-ECM)	2.4			1.3			1		
	Total	9.6			5.2			4		
Power Exhaust (2) 0.33 HP	Full Load Amps	2.4			1.3			1		
	Total	4.8			2.6			2		
Service Outlet 115V GFI (amps)		15			15			20		
Indoor Blower Motor	Horsepower	5	7.5	10	5	7.5	10	5	7.5	10
	Full Load Amps	16.7	24.2	30.8	7.6	11	14	6.1	9	11
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit Only	125	125	125	50	50	60	45	45	50
	With (2) 0.33 HP Power Exhaust	125	125	125	50	60	60	45	50	50
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit Only	97	104	111	43	46	49	35	38	40
	With (2) 0.33 HP Power Exhaust	102	109	116	45	49	52	37	40	42

**ELECTRIC HEAT DATA**

Electric Heat Voltage			208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	15 kW	150	150	150	150	150	175	70	70	80	60	60	60
		30 kW	175	200	200	200	200	225	90	100	100	80	80	80
		45 kW	225	250	225	250	250	250	110	125	125	90	100	100
		60 kW	250	250	250	250	250	300	125	125	125	100	100	100
		90 kW	300	350	300	350	300	350	175	175	175	125	125	150
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	15 kW	136	142	143	149	150	156	65	69	72	53	56	58
		30 kW	175	187	182	194	189	201	88	91	94	71	74	76
		45 kW	214	232	222	240	228	246	110	114	117	89	92	94
		60 kW	222	241	229	249	236	255	115	118	121	93	96	98
		90 kW	284	313	292	321	299	327	151	154	157	122	125	127
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	150	150	150	175	175	175	70	80	80	60	60	60
		30 kW	200	200	200	200	200	225	90	100	100	80	80	80
		45 kW	225	250	250	250	250	300	125	125	125	100	100	100
		60 kW	250	250	250	300	250	300	125	125	125	100	100	110
		90 kW	300	350	300	350	350	350	175	175	175	125	150	150
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (2) 0.33 HP Power Exhaust	15 kW	141	147	148	154	155	161	68	71	74	55	58	60
		30 kW	180	192	187	199	194	206	90	94	97	73	76	78
		45 kW	219	237	226	244	233	251	113	116	119	91	94	96
		60 kW	227	246	234	253	241	260	117	121	124	95	98	100
		90 kW	289	318	297	326	303	332	153	157	160	124	127	129

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

<sup>1</sup> Extremes of operating range are plus and minus 10% of line voltage.

<sup>2</sup> HACR type breaker or fuse.

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

<sup>4</sup> Disconnect must be field furnished.

## ELECTRICAL ACCESSORIES - DISCONNECTS

### 15 TON | KHC180S4

Motor Horsepower	3		5		7.5		3	5	7.5	3	5	7.5
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W85	54W85	54W86	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Electric Heat 60 kW	54W87	54W87	54W87	54W87	<sup>4</sup> N/A	<sup>4</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W85	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W86
+ Power Exhaust + Elec. Heat 60 kW	54W87	54W87	54W87	54W87	<sup>4</sup> N/A	<sup>4</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86

### 20 TON | KHC240S4

Motor Horsepower	5		7.5		10		5	7.5	10	5	7.5	10
	208V	240V	208V	240V	208V	240V	480V	480V	480V	600V	600V	600V
Unit Only	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 15 kW	54W86	54W86	54W86	54W86	54W86	54W86	54W85	54W85	54W85	54W85	54W85	54W85
+ Electric Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Electric Heat 45 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 60 kW	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Electric Heat 90 kW	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	54W87	54W87	54W87	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 15 kW	54W86	54W86	54W86	54W86	54W87	54W87	54W85	54W85	54W85	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 30 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W85	54W85	54W85
+ Power Exhaust + Elec. Heat 45 kW	54W87	54W87	54W87	54W87	54W87	54W87	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 60 kW	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	54W86	54W86	54W86	54W86	54W86	54W86
+ Power Exhaust + Elec. Heat 90 kW	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	<sup>4</sup> N/A	54W87	54W87	54W87	54W86	54W86	54W86

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

<sup>1</sup> Disconnect must be field furnished.

#### FIELD WIRING NOTES

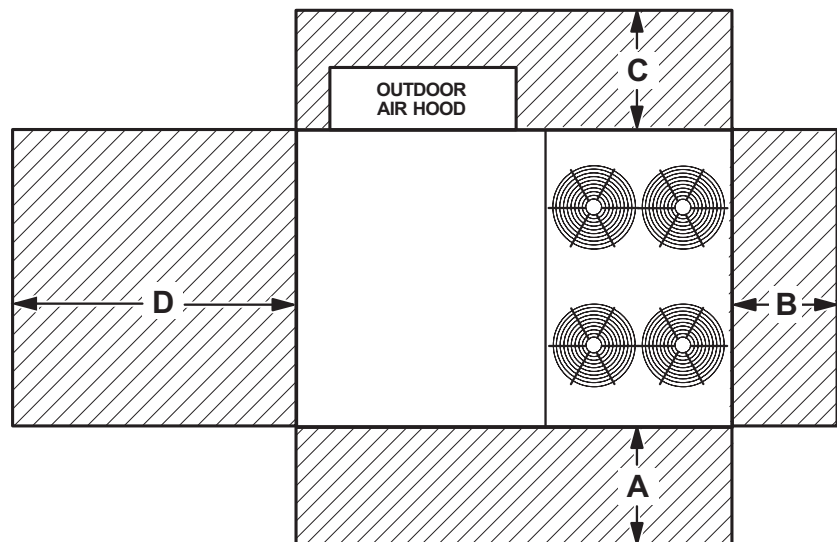
- For use with copper wiring only
- Field wiring not furnished
- All wiring must conform to NEC or CEC and local electrical codes
- For specific wiring information, please refer to the installation instructions

## ELECTRIC HEAT CAPACITIES

Volts Input	15 kW			30 kW			45 kW			60 kW			90 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
208	11.3	38,600	1	22.5	76,800	1	33.8	115,300	2	45.0	153,600	2	67.6	230,700	2
220	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
230	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
240	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
440	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
460	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
480	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2
550	12.6	43,000	1	25.2	86,000	1	37.8	129,000	2	50.4	172,000	2	75.6	258,000	2
575	13.8	47,100	1	27.5	93,900	1	41.3	141,000	2	55.1	188,000	2	82.7	282,200	2
600	15.0	51,200	1	30.0	102,400	1	45.0	153,600	2	60.0	204,800	2	90.0	307,100	2

## UNIT CLEARANCES

### Unit With Economizer



<sup>1</sup> Unit Clearance	A		B		C		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	
<b>Service Clearance</b>	60	1524	36	914	36	914	66	1676	Unobstructed
<b>Minimum Operation Clearance</b>	45	1143	36	914	36	914	41	1041	

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

<sup>1</sup> **Service Clearance** - Required for removal of serviceable parts.

**Minimum Operation Clearance** - Required clearance for proper unit operation.

## OUTDOOR SOUND DATA

Unit Model Number	Octave Band Sound Power Levels dBA, re 10 <sup>-12</sup> Watts - Center Frequency - Hz							<sup>1</sup> Sound Rating Number (dBA)
	125	250	500	1000	2000	4000	8000	
KHC180S, 240S	80	83	87	88	84	80	71	93

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

<sup>1</sup> Sound Rating Number according to AHRI Standard 370-2001 (includes pure tone penalty). Sound Rating Number is the overall A-Weighted Sound Power Level, (LWA), dB (100 Hz to 10,000 Hz).

## WEIGHT DATA

Model Number	Net		Shipping	
	lbs.	kg	lbs.	kg
180 Base Unit	2044	927	2244	1018
180 Max. Unit	2374	1077	2574	1168
240 Base Unit	2081	944	2281	1035
240 Max. Unit	2411	1094	2611	1184

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

## OPTIONS / ACCESSORIES

	Shipping Weight		
	lbs.	kg	
<b>ECONOMIZER / OUTDOOR AIR / EXHAUST</b>			
<b>Economizer</b>			
Economizer Dampers	102	46	
Barometric Relief Dampers (downflow)	30	14	
Barometric Relief Dampers (horizontal)	20	9	
Outdoor Air Damper Hood (downflow)	65	29	
<b>Outdoor Air Dampers With Hood (Downflow)</b>			
Motorized	18	39	
Manual	10	22	
<b>Power Exhaust</b>	62	28	
<b>ELECTRIC HEAT</b>			
15 kW	59	27	
30 kW	59	27	
45 kW	76	34	
60 kW	76	34	
90 kW	84	38	
<b>COIL/HAIL GUARDS</b>			
All models	46	21	
<b>ROOF CURBS</b>			
<b>Hybrid Roof Curbs, Downflow</b>			
8 in. height	136	62	
14 in. height	169	77	
18 in. height	191	87	
24 in. height	224	102	
<b>Adjustable Pitch Curb, Downflow</b>			
14 in. height	224	102	
<b>Horizontal Roof Curbs, Standard</b>			
26 in. height	450	204	
37 in. height	540	245	
<b>CEILING DIFFUSERS</b>			
Step-Down	RTD11-185S	168	76
	RTD11-275S	238	108
Flush	FD11-185S	168	76
	FD11-275S	238	108
Transitions	C1DIFF33C-1	80	36
	C1DIFF34C-1	75	34

# DIMENSIONS

# UNIT

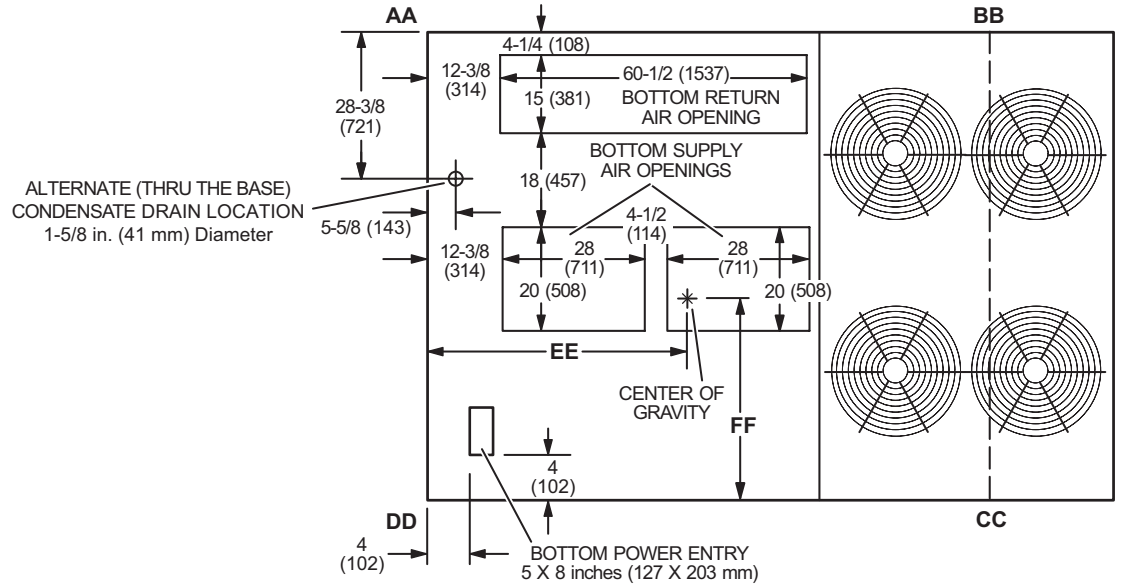
## CORNER WEIGHTS

## CENTER OF GRAVITY

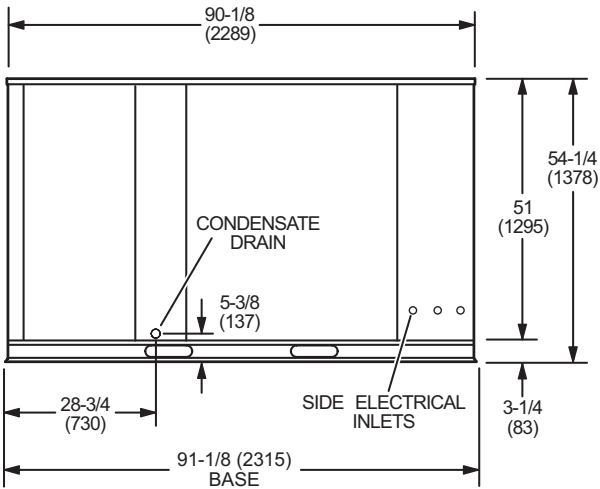
Model No.	AA		BB		CC		DD		EE		FF	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm
KHC180 Std. Unit	389	176	471	213	649	294	536	243	59	1499	38-3/8	975
KHC180 Max. Unit	495	224	574	260	701	318	604	274	57-7/8	1470	41	1042
KHC240 Std. Unit	391	177	472	214	666	302	552	250	59	1499	37-7/8	962
KHC240 Max. Unit	497	225	575	261	718	326	621	281	57-3/4	1467	40-1/2	1029

Std. Unit - The unit with NO INTERNAL OPTIONS.

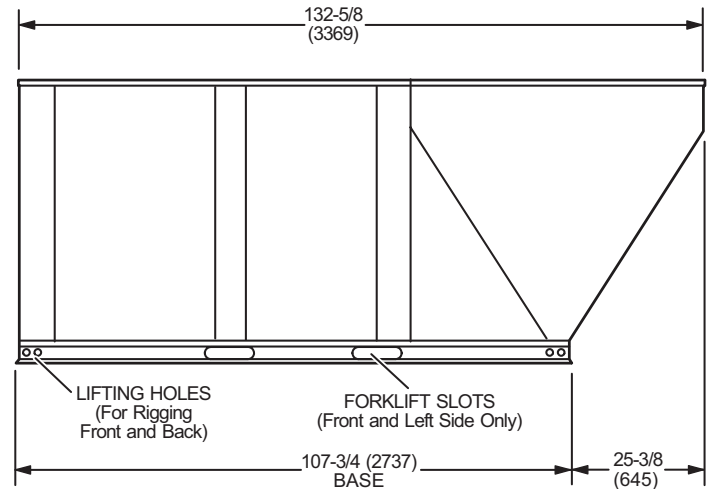
Max. Unit - The unit with ALL INTERNAL OPTIONS Installed. (Economizer, Standard Static Power Exhaust Fans, Controls, etc.). Does not include accessories external to unit.



**TOP VIEW**

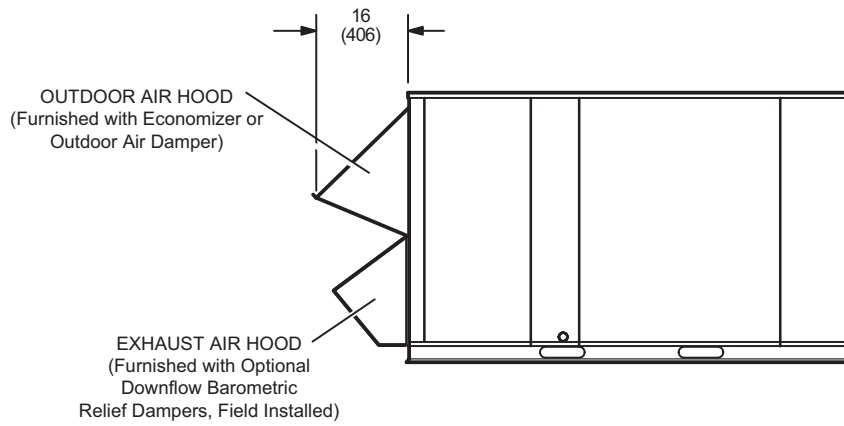


**END VIEW**



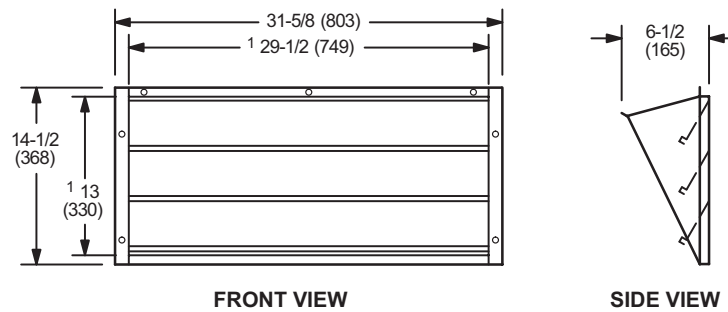
**SIDE VIEW**

**OUTDOOR AIR HOOD DETAIL**



**OPTIONAL HORIZONTAL BAROMETRIC RELIEF DAMPERS WITH HOOD**

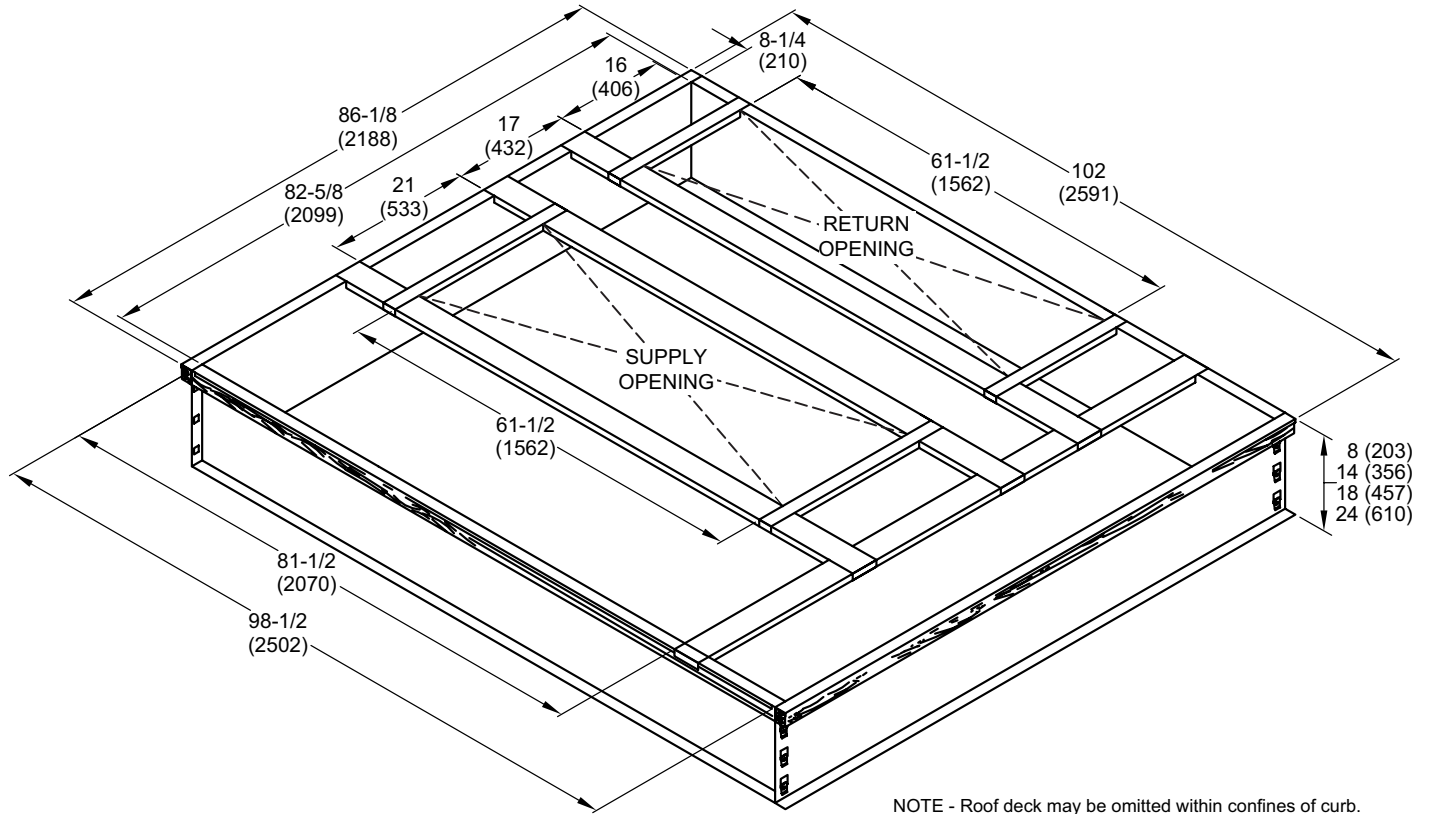
(Field installed in horizontal return air duct adjacent to unit)



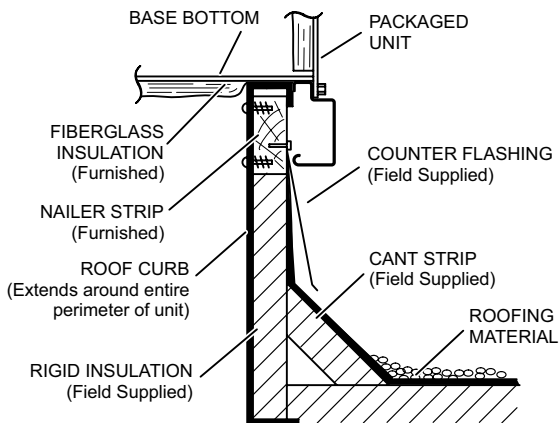
NOTE - Two furnished per order no.  
<sup>1</sup> NOTE - Opening size required in return air duct.



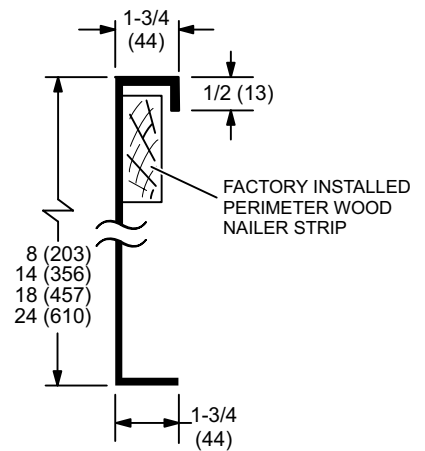
**HYBRID ROOF CURBS - DOUBLE DUCT OPENING**



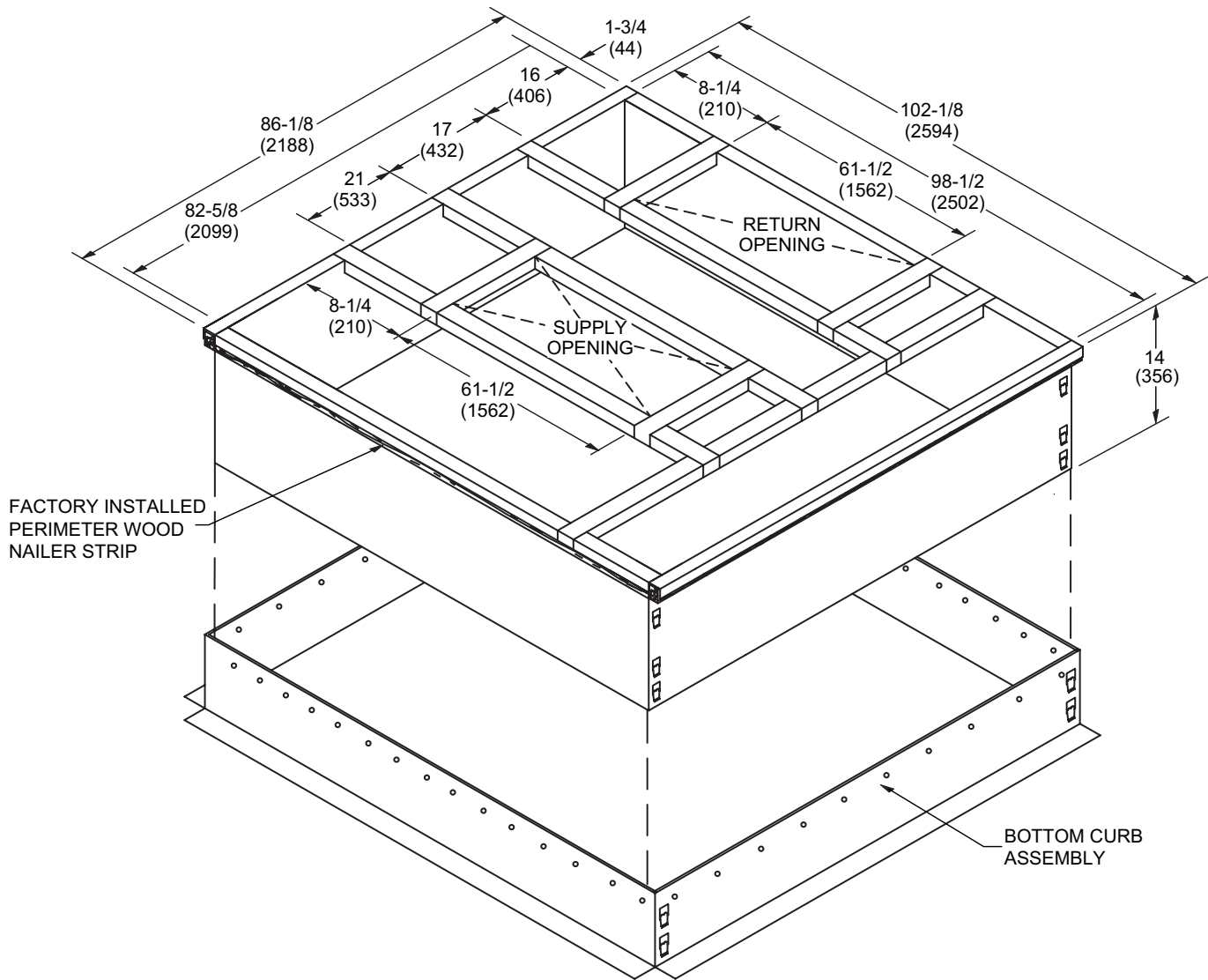
**TYPICAL FLASHING DETAIL FOR ROOF CURB**



**DETAIL ROOF CURB**

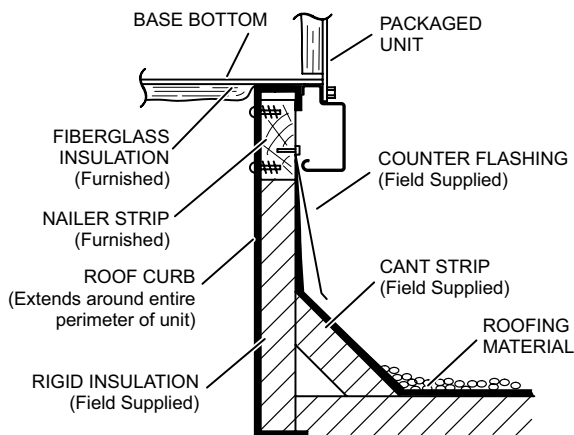


**ADJUSTABLE PITCH CURB - DOUBLE DUCT OPENING**

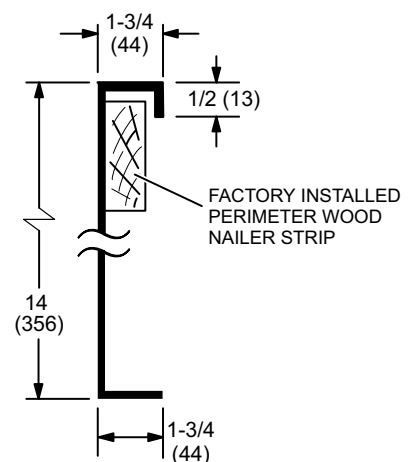


NOTE - Maximum slope pitch is 3/4 in. per 1 foot (19 mm per 305 mm) in any one direction.

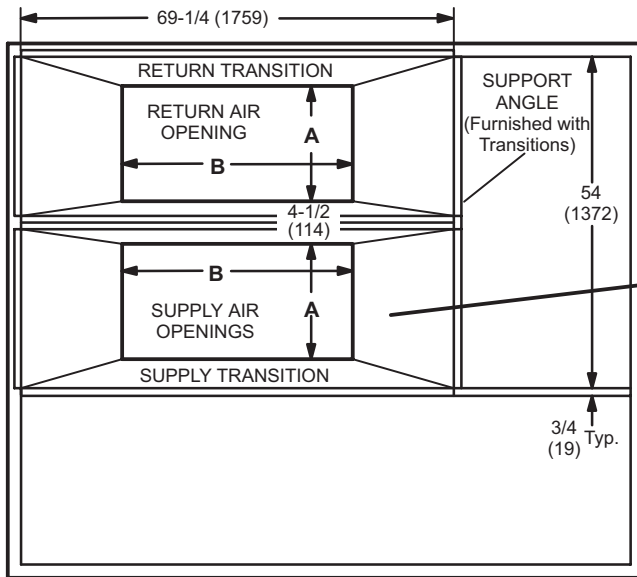
**TYPICAL FLASHING DETAIL FOR ROOF CURB**



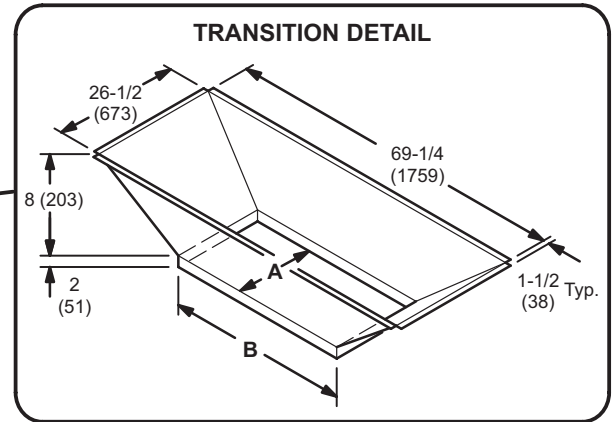
**DETAIL ROOF CURB**



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



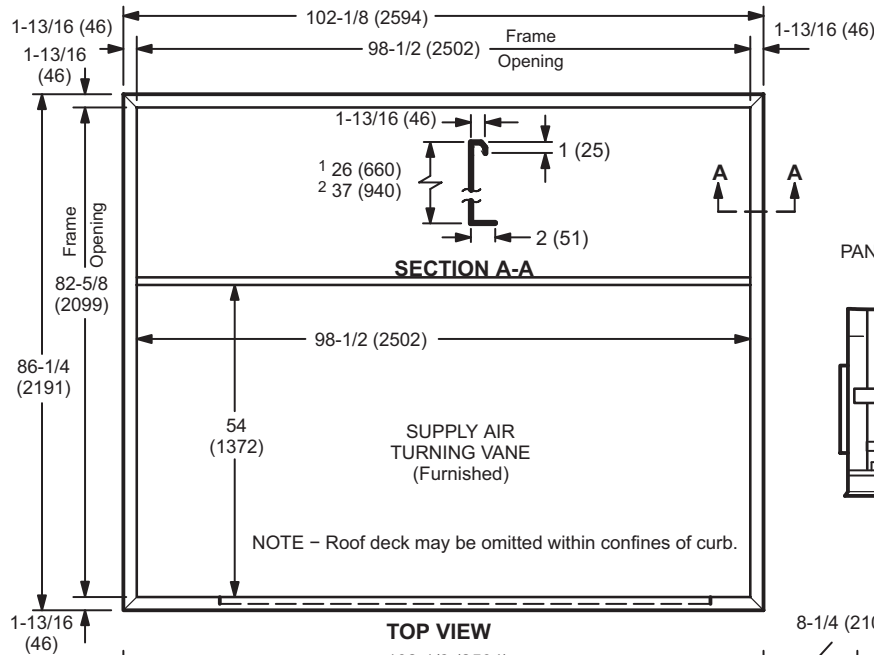
**TOP VIEW**



**TRANSITION OPENING SIZES**

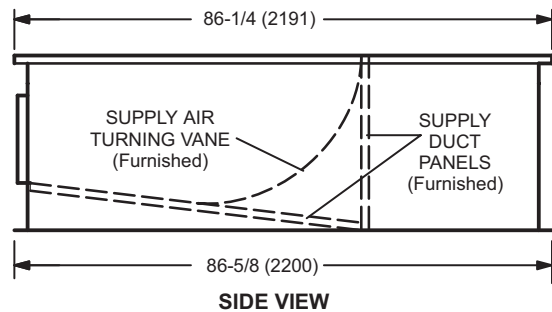
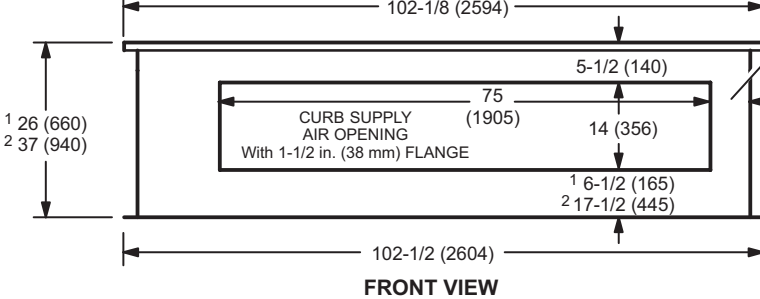
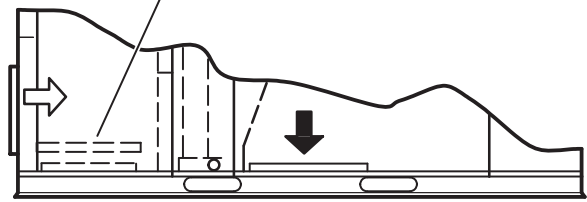
Model Number	A		B	
	inch	mm	inch	mm
C1DIFF33C-1	18	457	36	914
C1DIFF34C-1	24	610	48	1219

**HORIZONTAL ROOF CURBS – Requires Optional Horizontal Return Air Panel Kit**



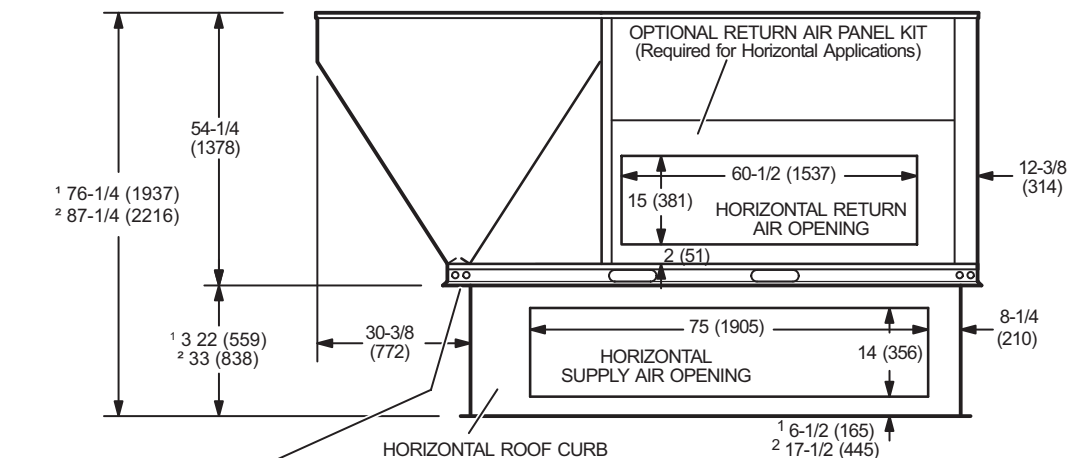
NOTE - 26 in. (660 mm) height Curb is designed for horizontal discharge when unit is mounted on a slab.  
37 in. (940 mm) height Curb is designed for horizontal discharge when unit is mounted on a rooftop.

PANEL TO COVER RETURN AIR OPENING IN BOTTOM OF UNIT (Furnished With Optional Horizontal Return Air Panel Kit)



1 Slab Applications 2 Rooftop Applications

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

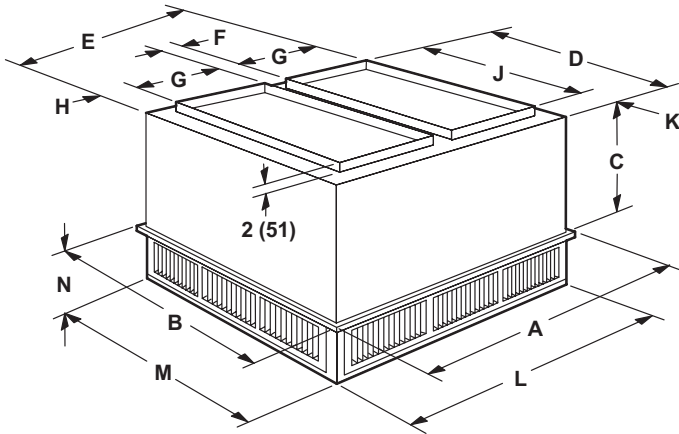


NOTE – Top of Roof Curb extends 4 inch (102 mm) inside bottom of unit base. See Typical flashing detail.

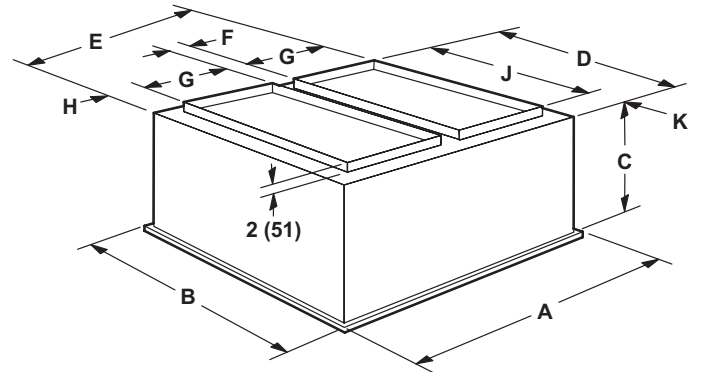
1 Slab Applications 2 Rooftop Applications

**COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS**

**STEP-DOWN CEILING DIFFUSER**



**FLUSH CEILING DIFFUSER**



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

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

## REVISIONS

Sections	Description of Change
Weight Data	Updated Roof Curb weights.



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For the latest technical information, visit us at [www.allied-commercial.com](http://www.allied-commercial.com)

Contact us at 1-800-448-5872

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