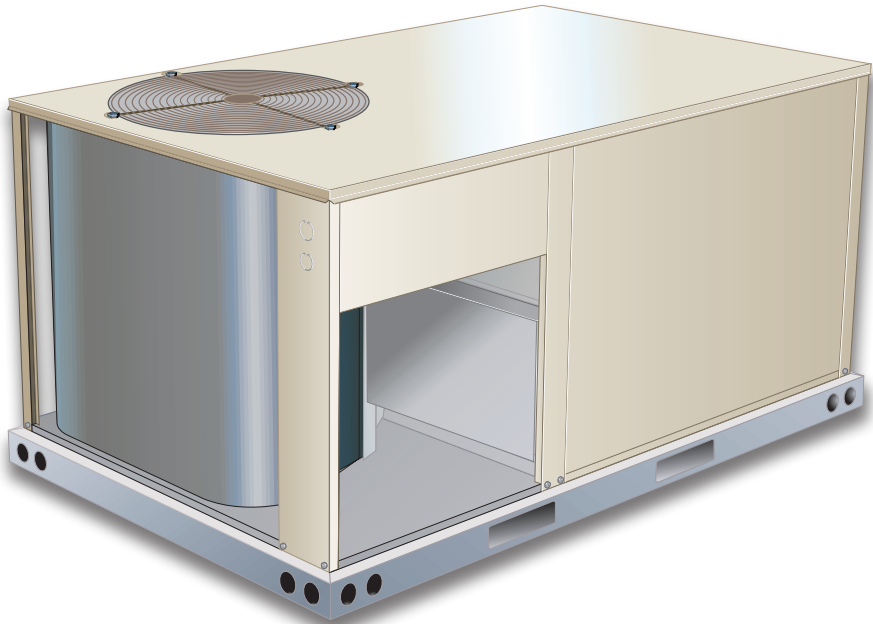




**ZHB**  
Raider® Rooftop Units  
60 Hz

**COMMERCIAL  
PRODUCT SPECIFICATIONS**

Bulletin No. 211002  
September 2023  
Supersedes all previous versions

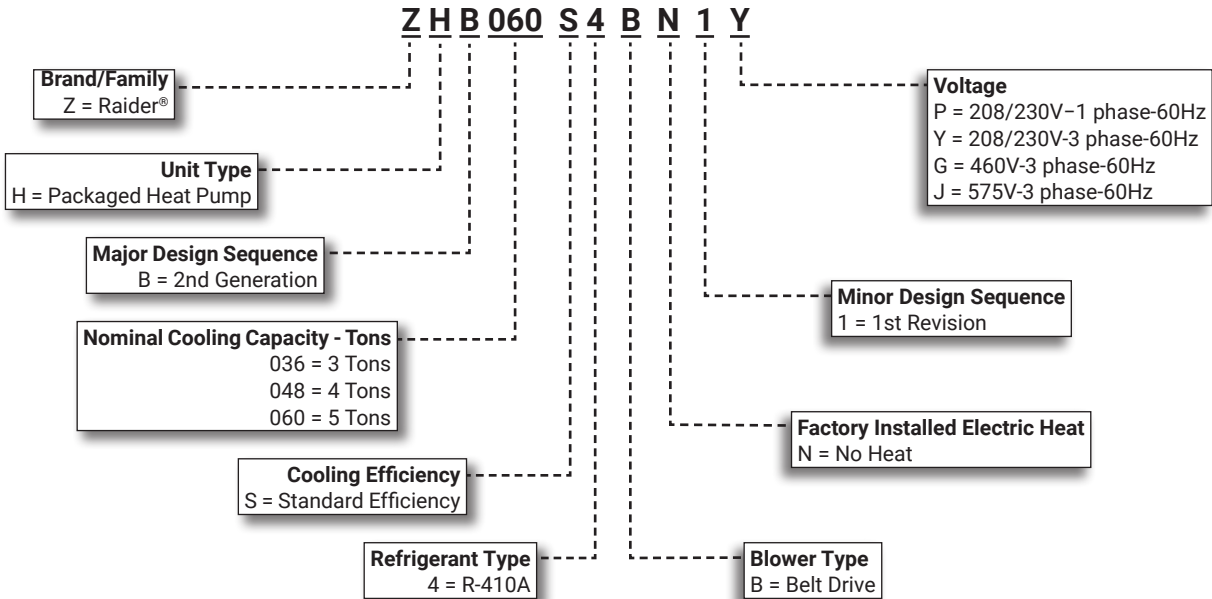


**RAIDER**

**ASHRAE 90.1  
COMPLIANT**

**3 to 5 Tons**  
**Net Cooling Capacity - 35,000 to 58,000 Btuh**  
**Net Heating Capacity - 34,200 to 55,000 Btuh**  
**Optional Electric Heat - 5 to 22.5 kW**

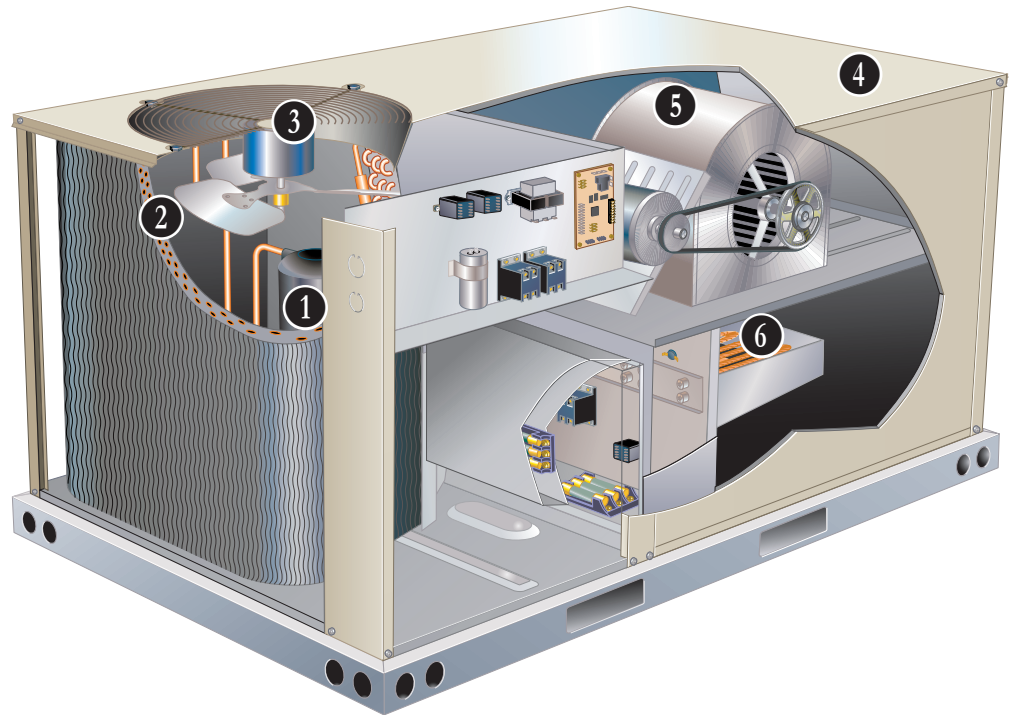
**MODEL NUMBER IDENTIFICATION**



NOTE - This document applies to all ZHB 3-5 Ton Raider® products built on or after January 1st, 2023.

## FEATURE HIGHLIGHTS

Raider® rooftop units from Lennox Commercial are the new standard for cost efficient reliable, efficient rooftop units built for long-lasting performance that can significantly improve indoor environments.



1. Scroll Compressor
2. Copper Tube Coil Construction
3. Outdoor Coil Fan Motor
4. Heavy Gauge Steel Cabinet
5. Supply Air Blower
6. Electric Heat (option)

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## APPROVALS AND WARRANTY

### APPROVALS

- AHRI Certified to AHRI Standard 210/240
- CSA certified and listed
- Unit and components are ETL, NEC, and CEC bonded for grounding to meet safety standards for servicing
- All models are ASHRAE 90 compliant
- All models meet DOE 2023 energy efficiency standards
- All models meet California Code of Regulations, Title 24 and ASHRAE 90.1-2010 Section 6.4.3.10 requirements for staged airflow
- ISO 9001 Registered Manufacturing Quality System

### WARRANTY

- Compressors - 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 35°F to 125°F without any additional controls

#### R-410A Refrigerant

- Non-chlorine based
- Ozone friendly

#### 1 Compressor

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

#### Compressor Crankcase Heater

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

#### Refrigerant Metering Orifice

Accurately meters refrigerant in system

- Refrigerant control is accomplished by exact sizing of refrigerant metering orifice

#### Filter/Drier

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

#### High Pressure Switch

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

#### Reversing Valve

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

#### 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 liquid line terminates defrost cycle

#### 2 Coil Construction

- Copper tube construction
- Enhanced rippled-edge aluminum fins
- Flared shoulder tubing connections
- Silver soldered construction
- Factory leak tested

#### Indoor Coil

- Cross-row circuiting with rifled 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
- End drain connection

#### 3 Outdoor Coil Fan Motor

- Thermal overload protected
- Totally enclosed
- Permanently lubricated bearings
- Shaft down
- Fan guard mount

#### Outdoor Coil Fan Guard

- PVC coated fan guard furnished

## FEATURES AND BENEFITS

### COOLING / HEATING SYSTEM (continued)

#### Required Selections

##### Cooling Capacity

- Specify nominal cooling capacity

#### Options/Accessories

##### Field Installed

##### Condensate Drain Trap

- Available in copper or PVC

##### Drain Pan Overflow Switch

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

##### Low Ambient Kit

- Cycles the outdoor fans while allowing compressor operation in the cooling cycle
- 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 0°F

### CABINET

#### 4 Construction

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

##### Airflow Choice

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

**NOTE** - Units can be field converted to horizontal airflow.

##### Power Entry

- Electrical lines can be routed through the unit base or through horizontal access knock-outs on the end of unit
- See dimension drawing

**NOTE** - Optional Bottom Power Entry Kit is available.

##### 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

- All panels adjacent to conditioned air are fully insulated with non-hygroscopic fiberglass insulation

##### Access Panels

- Compressor
- Heating
- Controls
- Blower
- Air filter/economizer section

#### Options/Accessories

##### Factory Installed

##### Corrosion Protection

- Completely flexible immersed coating
- Electrodeposited dry film process (AST ElectroFin E-Coat)
- ASTM B117 / DIN 53167 Salt Spray - 15,000+ hours
- ASTM G85 Annex A3 SWAAT Modified Salt Spray - 3000 hours
- VA Master Construction Specification Division 23 for High Humidity Installations
- CID AA-52474A (GSA)
- Indoor Corrosion Protection:
  - Coated coil
- Outdoor Corrosion Protection:
  - Coated coil

##### Field Installed

##### Combination Coil/Hail Guards

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

### CONTROLS

##### Unit Control

- All control voltage is provided via a 24V (secondary) transformer with inline fuse protection
- **Heat/Cool Staging** - Capable of up to 2 heat / 2 cool staging with a thermostat
- **Night Setback Mode** - Saves energy by closing outdoor air dampers and operating supply fan on thermostat demand only

##### Smoke Detectors

**NOTE** - Smoke detectors are not available and must be field provided by installer.

##### Commercial Control Systems

##### Thermostats

- Control system and thermostat options, see page 9

## FEATURES AND BENEFITS

### **BLOWER**

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

#### **5 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
- Blower wheel statically and dynamically balanced.
- Ball bearings
- Adjustable pulley (allows speed change)

#### **Required Selections**

#### **Supply Air Blower**

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

### **ELECTRICAL**

#### **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.

#### **Required Selections**

#### **Voltage Choice**

- Specify when ordering base unit.

#### **Field Installed**

#### **Bottom Power Entry Kit**

- Kit reduces the number of penetrations in the roof
- Kit includes bulkhead connectors to provides power and control wiring routing through the roof curb

#### **6 Electric Heat**

- Helix wound nichrome elements
- Individual element limit controls
- Wiring harness

**NOTE** - See Options / Accessories tables for ordering information.

**NOTE** - Unit Fuse Block is required and must be ordered separately. See Electrical / Electric Heat tables for ordering information.

### **INDOOR AIR QUALITY**

#### **Air Filters**

- Disposable 2 inch MERV 4 filters furnished as standard

#### **Options/Accessories**

#### **Field Installed**

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

- Monitors CO<sub>2</sub> levels adjusts economizer dampers as needed for Demand Control Ventilation

## OPTIONS / ACCESSORIES

### **ECONOMIZER**

#### **Economizer (Downflow or Horizontal) (Standard and High Performance Common Features)**

- Outdoor Air Hood is furnished
- Includes Barometric Relief Dampers with Exhaust Hood
- 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
- Demand Control Ventilation (DCV) ready using optional CO<sub>2</sub> sensors
- Single temperature control is furnished with Economizer
- Outdoor air sensor enables Economizer if the outdoor temperature is less than the setpoint of the control

**NOTE** - Horizontal Economizer is field installed only.

### **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

**NOTE** - 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 90.1-2010 compliant
- Gear-driven action
- High torque 24-volt fully-modulating spring return damper motor
- Return air and outdoor air dampers
- Plug-in connections to unit
- Stainless steel bearings
- Enhanced neoprene blade edge seals
- Flexible stainless steel jamb seals minimize air leakage

**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

- Module provides inputs and outputs to control economizer based on parameter settings
- Module automatically detects sensors by polling to determine which sensors are installed in system
- Module displays any alarm messages (fault detection and diagnostics) as an aid in troubleshooting
- Non-volatile memory retains parameter settings in case of power failure
- Keypad with four navigation buttons and LCD screen is furnished for setting economizer parameters
  - Menu Up/Exit (⬆) button returns to the main menu
  - Arrow Up (▲) button moves to the previous or next parameter within the selected menu
  - Arrow Down (▼) button moves to the next parameter within the selected menu
  - Select (enter) (↵) button confirms parameter selection



#### **Main Menu Structure:**

- STATUS (economizer and system operation status)
- SETPOINTS (settings for various setpoint parameters)
- SYSTEM SETUP (settings/information about the system)
- ADVANCED SETUP (freeze protection, CO<sub>2</sub> settings, stage 3 delay, and additional calibration settings)
- CHECKOUT (damper positions)
- ALARMS (output signal that can be configured for remote alarm monitoring)

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

### **Factory or Field Installed**

#### Single Enthalpy Temperature Control

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

### **Field Installed**

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

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

### **EXHAUST**

#### **Field Installed**

#### Power Exhaust Fan - Downflow or Horizontal

- Installs external to unit for applications 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
- Fan is 12 in. diameter
- Five fan blades
- 1/2 hp motor.

### **OUTDOOR AIR**

#### **Field Installed**

#### Outdoor Air Dampers - Downflow

- Single blade damper
- 0 to 25% (fixed) outdoor air adjustable
- Installs in unit
- Automatic model features fully modulating spring return damper motor with plug-in connection
- Manual model features a slide damper

**NOTE** - Maximum mixed air temperature in cooling mode is 100°F.

## OPTIONS / ACCESSORIES

### **ROOF CURBS**

#### **Field Installed**

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

- Nailer strip furnished; mates to unit
- US National Roofing Contractors approved
- Shipped knocked down
- Interlocking tabs fasten corners together
- No tools required for assembly
- Can also be fastened together with furnished hardware
- Available in 8, 14, 18, and 24 inch heights

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

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

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

### **CEILING DIFFUSERS**

#### **Field Installed**

- 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)**

**NOTE** - Ceiling Diffuser Transitions are not furnished and must be field fabricated.



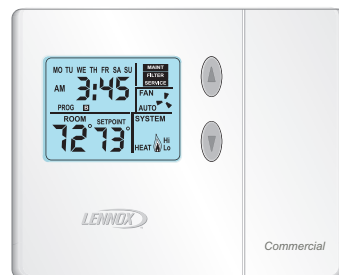
## OPTIONAL CONVENTIONAL TEMPERATURE CONTROL SYSTEMS

### 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 (factory or field) <b>16X70</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 Humiditrol® option. If there is a mix of units equipped with and without Humiditrol on the same site, this thermostat can be used for all units if suitable.

<sup>3</sup> Not compatible with units equipped with Humiditrol® option.

<sup>4</sup> Only compatible with BACnet Module (16X72).

- 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		Catalog No.	ZHB 036	ZHB 048	ZHB 060
<b>COOLING/HEATING SYSTEM</b>					
Condensate Drain Trap	PVC	<b>22H54</b>	X	X	X
	Copper	<b>76W27</b>	X	X	X
Drain Pan Overflow Switch		<b>99W59</b>	X	X	X
Low Ambient Kit		<b>99W68</b>	X	X	X
<b>BLOWER - SUPPLY AIR</b>					
Motors	Belt Drive - 0.75 hp (208/230V-1ph)	Factory	<sup>1</sup> O	<sup>1</sup> O	<sup>1</sup> O
	Belt Drive - 1 hp (208/230V, 460V, 575V-3ph)	Factory	<sup>2</sup> O	<sup>2</sup> O	<sup>2</sup> O
	Belt Drive - 1.5 hp (208/230V-1ph or 3 ph, 460V, 575V-3ph)	Factory	O	O	O
Drive Kits See Blower Data Tables for selection	Kit #ZA01 - 678-1035 rpm	Factory	O		
	Kit #ZA02 - 803-1226 rpm	Factory		O	
	Kit #ZA04 - 964-1471 rpm	Factory	O		
	<sup>3</sup> Kit #ZA05 - 1098-1490 rpm	Factory		O	
	Kit #ZAA01 - 522-784 rpm	Factory			O
	Kit #ZAA02 - 632-875 rpm	Factory			O
	<sup>3</sup> Kit #ZAA03 - 798-1105 rpm	Factory			O
<b>ELECTRICAL</b>					
Voltage 60 Hz	208/230V - 1 phase	Factory	O	O	O
	208/230V - 3 phase	Factory	O	O	O
	460V - 3 phase	Factory	O	O	O
	575V - 3 phase	Factory	O	O	O
Bottom Power Entry Kit		<b>98W08</b>	X	X	X
<b>ELECTRIC HEAT</b>					
5 kW	208/240V-1ph	<b>30U97</b>	X	X	X
	208/240V-3ph	<b>30U98</b>	X	X	X
	460V-3ph	<b>30U99</b>	X	X	X
	575V-3ph	<b>30V01</b>	X	X	X
7.5 kW	208/240V-1ph	<b>30V02</b>	X	X	X
	208/240V-3ph	<b>30V03</b>	X	X	X
	460V-3ph	<b>30V04</b>	X	X	X
	575V-3ph	<b>30V05</b>	X	X	X
10 kW	208/240V-1ph	<b>30V06</b>	X	X	X
	208/240V-3ph	<b>30V07</b>	X	X	X
	460V-3ph	<b>30V08</b>	X	X	X
	575V-3ph	<b>30V09</b>	X	X	X
15 kW	208/240V-1ph	<b>30V10</b>	X	X	X
	208/240V-3ph	<b>30V11</b>	X	X	X
	460V-3ph	<b>30V12</b>	X	X	X
	575V-3ph	<b>30V13</b>	X	X	X
22.5 kW	208/240V-1ph	<b>30V14</b>		X	X
	208/240V-3ph	<b>30V15</b>		X	X
	460V-3ph	<b>30V16</b>		X	X
	575V-3ph	<b>30V17</b>		X	X
<b>ELECTRIC HEAT ACCESSORIES</b>					
Unit Fuse Block (required) - See Electrical/Electric Heat Tables for Selection			X	X	X

<sup>1</sup> 0.75 hp blower motor is only available for 208/230V-1ph applications.

<sup>2</sup> 1 hp blower motor is only available for 208/230V-3ph applications.

<sup>3</sup> 1.5 hp blower motor is the minimum hp required with the ZA05 drive kits.

NOTE - The catalog numbers that appear here are for ordering field installed accessories only.

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

O - Configure to Order (Factory Installed)

X - Field Installed.

## OPTIONS / ACCESSORIES

Item	Catalog No.	ZHB 036	ZHB 048	ZHB 060	
<b>CABINET</b>					
Coil/Hail Guards	12X20	X	X	X	
Corrosion Protection	Factory	O	O	O	
<b>ECONOMIZER</b>					
<b>Standard Economizer With Outdoor Air Hood (Not for Title 24)</b>					
Standard Economizer (Downflow) Includes Barometric Relief Dampers and Exhaust Hood	14D94	X	X	X	
Standard Economizer (Horizontal) Includes Barometric Relief Dampers and Exhaust Hood	14D92	X	X	X	
<b>Standard Economizer Controls (Not for Title 24)</b>					
Single Enthalpy Control	21Z09	X	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) Includes Barometric Relief Dampers and Exhaust Hood	20V23	OX	OX	OX	
High Performance Economizer (Horizontal) Includes Barometric Relief Dampers and Exhaust Hood	20V24	X	X	X	
<b>High Performance Economizer Controls</b>					
Single Enthalpy Control	11G21	X	X	X	
<b>OUTDOOR AIR</b>					
<b>Outdoor Air Dampers - Includes Outdoor Air Hood</b>					
Motorized	15D19	X	X	X	
Manual	15D20	X	X	X	
<b>POWER EXHAUST FAN</b>					
Standard Static (Downflow)	208/230V-1 or 3ph	21E01	X	X	X
	460V-3ph	23E01	X	X	X
Standard Static (Horizontal)	208/230V-1 or 3ph	24E01	X	X	X
	460V-3ph	28E01	X	X	X
575V Transformer Kit	575V-3ph	59E02	X	X	X
NOTE - Order 575V Transformer Kit with 208/230V Power Exhaust Fan for 575V applications.					
<b>INDOOR AIR QUALITY</b>					
<b>Indoor Air Quality (CO<sub>2</sub>) Sensors</b>					
Sensor - Wall-mount, off-white plastic cover with LCD display	77N39	X	X	X	
Sensor - Wall-mount, black plastic case, no display, rated for plenum mounting	87N54	X	X	X	
CO <sub>2</sub> Sensor Duct Mounting Kit - for downflow applications	23Y47	X	X	X	
Aspiration Box - for duct mounting non-plenum rated CO <sub>2</sub> sensor (77N39)	90N43	X	X	X	
<b>ROOF CURBS</b>					
<b>Hybrid Roof Curbs, Downflow</b>					
8 in. height	11F76	X	X	X	
14 in. height	11F77	X	X	X	
18 in. height	11F78	X	X	X	
24 in. height	11F79	X	X	X	
<b>CEILING DIFFUSERS</b>					
Step-Down - Order one	RTD9-65S	13K60	X	X	X
Flush - Order one	FD9-65S	13K55	X	X	X

NOTE - Ceiling Diffuser Transitions are not furnished and must be field fabricated.

NOTE - The catalog numbers that appear here are for ordering field installed accessories only.

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

O - Configure to Order (Factory Installed)

X - Field Installed.

## SPECIFICATIONS

General Data		Nominal Tonnage	3 Ton	4 Ton	5 Ton	
		Model No.	ZHB036S4B	ZHB048S4B	ZHB060S4B	
		Efficiency Type	Standard	Standard	Standard	
Cooling Performance	Gross Cooling Capacity (Btuh)		36,300	47,900	59,700	
	<sup>1</sup> Net Cooling Capacity (Btuh) 3ph		35,000	46,500	58,000	
	<sup>1</sup> AHRI Rated Air Flow (cfm) 3ph		1260	1520	2015	
	<sup>1</sup> SEER (Btuh/Watt) 3ph		14.0	14.0	14.0	
	<sup>1</sup> EER (Btuh/Watt) 3ph		11.4	11.2	11.2	
	Total Unit Power (kW) 3ph		3.1	4.2	5.2	
	<sup>1</sup> Net Cooling Capacity (Btuh) 1ph		35,000	45,000	57,000	
	<sup>1</sup> AHRI Rated Air Flow (cfm) 1ph		1260	1420	2015	
	<sup>1</sup> SEER2 (Btuh/Watt) 1ph		13.4	13.4	13.4	
	<sup>1</sup> EER2 (Btuh/Watt) 1ph		10.6	10.6	10.6	
	Total Unit Power (kW) 1ph		3.0	4.1	5.3	
	Heating Performance	<sup>1</sup> Total High Heating Capacity (Btuh) 3ph		34,200	45,000	55,000
		<sup>1</sup> AHRI Rated Air Flow (cfm) 3ph		1260	1520	2015
		<sup>1</sup> HSPF (Region IV) 3ph		8.0	8.0	8.0
Total Unit Power (kW) 3ph			2.9	3.8	4.5	
<sup>1</sup> COP 3ph			3.5	3.5	3.6	
<sup>1</sup> Total Low Heating Capacity (Btuh) 3ph			20,000	26,100	32,500	
Total Unit Power (kW) 3ph			2.7	3.5	4.2	
<sup>1</sup> COP 3ph			2.2	2.2	2.25	
<sup>1</sup> Total High Heating Capacity (Btuh) 1ph			32,600	42,500	55,000	
AHRI Rated Air Flow (cfm) 1ph			1260	1420	2015	
<sup>1</sup> HSPF2 (Region IV) 1ph			6.7	6.7	6.7	
Total Unit Power (kW) 1ph			2.8	3.7	4.5	
<sup>1</sup> COP 1ph			3.4	3.3	3.5	
<sup>1</sup> Total Low Heating Capacity (Btuh) 1ph			17,800	24,400	30,000	
Total Unit Power (kW) 1ph		2.7	3.5	3.5		
<sup>1</sup> COP 1ph		2.0	2.0	2.1		
<sup>2</sup> Sound Rating Number (SRN) (dBA)		79	78	82		
Refrigerant	Type		R-410A	R-410A	R-410A	
	Charge Furnished		16 lbs. 6 oz.	15 lbs. 6 oz.	14 lbs. 14 oz.	
Electric Heat Available - See page 10			5, 7.5, 10, 15 kW	5, 7.5, 10, 15, 22.5 kW	5, 22.5 kW	
Compressor Type (one per unit)			1-Stage Scroll	1-Stage Scroll	1-Stage Scroll	
Outdoor Coil	Net face area - sq. ft.		19.9	19.9	19.9	
	Tube diameter - in.		3/8	3/8	3/8	
	Number of rows		2	2	2	
	Fins / inch		20	20	20	
	Expansion device type		Fixed Orifice			
Outdoor Coil Fan	Motor HP		(1) 1/4	(1) 1/4	(1) 1/3	
	Motor rpm		825	825	1075	
	Total motor watts		300	300	350	
	Diameter - in.		(1) 22	(1) 22	(1) 22	
	Number of blades		4	4	3	
Indoor Coil	Total air volume - cfm		3335	3335	3600	
	Net face area - sq. ft.		9.6	10.8	10.8	
	Tube diameter - in.		3/8	3/8	3/8	
	Number of rows		3	3	3	
	Fins per inch		14	14	14	
<sup>4</sup> Indoor Blower & Drive Selection	Drain Connection (no. and size) - in.		(1) 1 NPT	(1) 1 NPT	(1) 1 NPT	
	Expansion device type		Fixed Orifice	Fixed Orifice	Fixed Orifice	
	Nominal Motor HP		<sup>5</sup> 0.75 hp, <sup>6</sup> 1 hp, 1.5 hp	<sup>5</sup> 0.75 hp, <sup>6</sup> 1 hp, 1.5 hp	<sup>5</sup> 0.75 hp, <sup>6</sup> 1 hp, 1.5 hp	
	Maximum Usable Motor HP		0.86 hp, 1.15 hp, 1.7 hp	0.86 hp, 1.15 hp, 1.7 hp	0.86 hp, 1.15 hp, 1.7 hp	
	Available Drive Kits		Kit #ZA01 678-1035 rpm Kit #ZA04 964-1471 rpm	Kit #ZA02 803-1226 rpm <sup>7</sup> Kit #ZA05 1098-1490 rpm	Kit #ZAA01 522-784 rpm Kit #ZAA02 632-875 rpm <sup>7</sup> Kit #ZAA03 798-1105 rpm	
Filters	Wheel nominal diameter x width - in.		10 x 10	10 x 10	15 x 9	
	Type		Disposable			
Electrical Characteristics - 60 Hz	Number and size - in.		(4) 16 x 20 x 2	(2) 16 x 20 x 2 (2) 20 x 20 x 2	(2) 16 X 20 X 2 (2) 20 X 20 X 2	
			208/230V 1 phase 208/230V, 460V & 575V 3 phase			

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

<sup>1,2</sup> AHRI Certified to AHRI Standard 210/240:

**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>3</sup> Sound Rating Number (SRN) rated in accordance with test conditions included in ANSI/AHRI Standard 270-2008.

<sup>4</sup> Using total air volume and system static pressure requirements determine from blower performance tables rpm and motor hp required. Maximum usable hp of motors furnished are shown. In Canada, nominal motor hp is also maximum usable motor hp output. If motors of comparable hp are used, be sure to keep within the service factor limitations outlined on the motor nameplate.

<sup>5</sup> 0.75 hp motor is only available for 208/230V-1ph applications.

<sup>6</sup> 1 hp blower is only available for 208/230V-3ph applications.

<sup>7</sup> 1.5 hp motor is the minimum required with ZA05 and ZAA03 drive kits.

## 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.

### 3 TON COOLING STANDARD EFFICIENCY ZHB036S4

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)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	960	34.7	2.11	0.7	0.85	1	31.7	2.38	0.7	0.88	1	28.6	2.7	0.72	0.92	1	25.4	3.08	0.74	0.96	1
	1200	36.9	2.12	0.76	0.95	1	33.8	2.39	0.78	0.98	1	30.7	2.71	0.8	1	1	27.7	3.09	0.84	1	1
	1440	38.9	2.13	0.83	1	1	36	2.4	0.85	1	1	33	2.73	0.89	1	1	29.7	3.09	0.93	1	1
67°F	960	37.3	2.12	0.54	0.68	0.82	34.3	2.4	0.53	0.68	0.84	31.1	2.71	0.53	0.7	0.87	27.7	3.08	0.53	0.72	0.92
	1200	39.6	2.13	0.58	0.74	0.91	36.3	2.4	0.58	0.76	0.94	32.9	2.73	0.58	0.78	0.98	29.4	3.09	0.59	0.81	1
	1440	41.2	2.14	0.61	0.8	0.99	37.8	2.41	0.62	0.83	1	34.3	2.73	0.63	0.86	1	30.5	3.09	0.64	0.91	1
71°F	960	40	2.13	0.39	0.53	0.66	36.8	2.41	0.38	0.52	0.66	33.6	2.72	0.37	0.52	0.68	30	3.09	0.35	0.52	0.7
	1200	42.4	2.15	0.41	0.57	0.72	39	2.42	0.4	0.57	0.73	35.5	2.73	0.39	0.58	0.75	31.8	3.1	0.38	0.58	0.79
	1440	44	2.16	0.43	0.61	0.78	40.5	2.43	0.42	0.62	0.81	36.9	2.74	0.42	0.62	0.84	33	3.11	0.41	0.64	0.88

### 3 TON HEATING STANDARD EFFICIENCY ZHB036S4

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
960	41.2	2.49	32	2.38	22.6	2.27	15.1	2.07	7.5	1.54
1200	41.9	2.32	32.7	2.22	23.3	2.11	15.9	1.91	8.2	1.38
1440	42.5	2.23	33.3	2.13	23.8	2.02	16.4	1.82	8.7	1.29

### 4 TON COOLING STANDARD EFFICIENCY ZHB048S4

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)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	
63°F	1280	45.5	2.92	0.69	0.85	1	41.9	3.32	0.7	0.87	1	38.2	3.78	0.71	0.9	1	34.1	4.32	0.73	0.95	1
	1600	48.4	2.93	0.75	0.94	1	44.7	3.32	0.77	0.97	1	40.9	3.78	0.79	1	1	37	4.32	0.82	1	1
	1920	50.9	2.93	0.81	1	1	47.4	3.35	0.84	1	1	43.7	3.81	0.87	1	1	39.7	4.32	0.91	1	1
67°F	1280	49	2.93	0.53	0.67	0.81	45.3	3.33	0.53	0.68	0.83	41.3	3.78	0.52	0.69	0.86	37.1	4.33	0.53	0.71	0.9
	1600	51.7	2.93	0.57	0.73	0.9	47.8	3.35	0.57	0.74	0.93	43.7	3.79	0.57	0.76	0.97	39.2	4.33	0.58	0.79	1
	1920	53.8	2.94	0.6	0.79	0.98	49.7	3.35	0.61	0.81	1	45.4	3.8	0.62	0.84	1	40.8	4.33	0.63	0.88	1
71°F	1280	52.3	2.93	0.39	0.52	0.65	48.5	3.35	0.38	0.52	0.66	44.5	3.8	0.37	0.52	0.67	40.1	4.35	0.35	0.52	0.69
	1600	55.3	2.94	0.41	0.56	0.71	51.3	3.35	0.4	0.56	0.72	47	3.82	0.39	0.57	0.74	42.3	4.35	0.38	0.58	0.77
	1920	57.4	2.95	0.43	0.6	0.77	53.1	3.37	0.42	0.6	0.79	48.8	3.84	0.41	0.62	0.82	43.8	4.35	0.41	0.63	0.86

### 4 TON HEATING STANDARD EFFICIENCY ZHB048S4

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
1280	50.8	3.58	43.4	3.18	36.2	2.77	25.6	2.42	12.2	1.85
1600	51.8	3.35	44.3	2.95	37.1	2.55	26.5	2.19	13.1	1.62
1920	52.5	3.21	45	2.82	37.9	2.41	27.3	2.06	13.9	1.48

## 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.

### 5 TON COOLING STANDARD EFFICIENCY ZHB060S4

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)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)			Total Cool Cap.	Comp. Motor Input	Sensible To Total Ratio (S/T)		
				Dry Bulb					Dry Bulb					Dry Bulb					Dry Bulb		
		cfm	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F	85°F	kBtuh	kW	75°F	80°F
63°F	1600	56.7	3.61	0.68	0.86	1	50.2	4.08	0.68	0.87	1	43.5	4.65	0.68	0.9	1	36.6	5.32	0.68	0.94	1
	2000	61.2	3.63	0.75	0.95	1	54.6	4.11	0.76	0.98	1	47.7	4.68	0.78	1	1	41.2	5.36	0.8	1	1
	2400	65.3	3.66	0.82	1	1	58.9	4.14	0.84	1	1	52.4	4.7	0.86	1	1	45.4	5.38	0.9	1	1
67°F	1600	62.3	3.64	0.51	0.67	0.82	55.6	4.12	0.49	0.66	0.84	48.7	4.69	0.46	0.66	0.86	41.3	5.34	0.43	0.67	0.9
	2000	66.8	3.66	0.56	0.74	0.91	59.7	4.14	0.54	0.74	0.94	52.4	4.71	0.53	0.76	0.97	44.7	5.38	0.51	0.78	1
	2400	69.9	3.68	0.6	0.8	0.99	62.7	4.16	0.59	0.82	1	55.1	4.72	0.59	0.84	1	47.1	5.39	0.58	0.88	1
71°F	1600	67.9	3.66	0.36	0.51	0.65	61.2	4.15	0.33	0.49	0.65	53.9	4.71	0.28	0.47	0.65	46.5	5.4	0.24	0.45	0.65
	2000	72.6	3.69	0.39	0.56	0.72	65.4	4.18	0.36	0.55	0.73	57.8	4.74	0.33	0.54	0.74	49.8	5.41	0.28	0.52	0.76
	2400	75.9	3.71	0.41	0.6	0.78	68.4	4.19	0.39	0.6	0.8	60.5	4.76	0.36	0.59	0.82	52.2	5.44	0.32	0.6	0.86

### 5 TON HEATING STANDARD EFFICIENCY ZHB060S4

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
1600	61.7	3.84	52.8	3.65	44.4	3.46	31.7	3.14	15.1	2.34
2000	62.7	3.59	53.9	3.4	45.5	3.21	32.8	2.9	16.2	2.1
2400	63.7	3.45	54.8	3.26	46.4	3.07	33.7	2.75	17.1	1.95

**BLOWER DATA**

**ZHB036**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (heat section, economizer, wet coil, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

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

**DOWNFLOW**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	562	0.11	621	0.13	685	0.16	752	0.18	818	0.21	883	0.24	944	0.27	1001	0.30
1000	584	0.13	644	0.16	707	0.18	773	0.21	838	0.24	901	0.27	960	0.3	1015	0.33
1100	609	0.16	669	0.18	732	0.21	796	0.24	860	0.27	921	0.30	978	0.34	1031	0.37
1200	635	0.19	696	0.21	758	0.24	821	0.27	883	0.31	942	0.34	997	0.38	1049	0.42
1300	664	0.22	725	0.25	786	0.28	848	0.31	908	0.35	965	0.39	1018	0.43	1068	0.47
1400	696	0.26	756	0.29	816	0.32	876	0.36	935	0.40	989	0.44	1041	0.48	1089	0.52
1500	729	0.30	788	0.33	848	0.37	906	0.41	962	0.45	1015	0.50	1065	0.54	1112	0.58

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1053	0.32	1103	0.35	1149	0.38	1193	0.41	1234	0.43	1274	0.47	1312	0.50	1351	0.53
1000	1066	0.36	1114	0.39	1160	0.42	1204	0.45	1245	0.48	1284	0.51	1322	0.54	1361	0.58
1100	1081	0.40	1128	0.43	1173	0.46	1216	0.49	1257	0.53	1296	0.56	1334	0.60	1372	0.63
1200	1097	0.45	1144	0.48	1188	0.51	1231	0.54	1271	0.58	1310	0.62	1347	0.66	1385	0.69
1300	1115	0.50	1161	0.53	1204	0.56	1246	0.60	1286	0.64	1325	0.68	1362	0.72	1399	0.76
1400	1135	0.56	1179	0.59	1222	0.62	1264	0.66	1303	0.70	1341	0.75	1378	0.79	1415	0.83
1500	1157	0.62	1200	0.65	1242	0.69	1282	0.73	1321	0.77	1359	0.82	1396	0.86	1431	0.91

**HORIZONTAL**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	560	0.16	624	0.18	692	0.20	761	0.21	830	0.23	896	0.25	956	0.27	1012	0.29
1000	583	0.18	647	0.20	715	0.22	783	0.24	850	0.25	914	0.27	972	0.30	1025	0.33
1100	609	0.20	673	0.22	740	0.24	808	0.26	873	0.28	934	0.31	990	0.34	1041	0.37
1200	637	0.23	702	0.25	769	0.27	835	0.29	898	0.32	956	0.35	1009	0.38	1058	0.41
1300	669	0.26	734	0.28	800	0.30	863	0.33	924	0.36	979	0.39	1030	0.43	1077	0.46
1400	704	0.29	768	0.32	832	0.35	894	0.37	951	0.41	1004	0.44	1052	0.48	1097	0.52
1500	742	0.33	805	0.36	867	0.39	925	0.42	980	0.46	1030	0.50	1076	0.54	1119	0.58

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1064	0.32	1114	0.35	1162	0.38	1208	0.41	1251	0.45	1293	0.49	1333	0.52	1373	0.56
1000	1076	0.36	1124	0.39	1170	0.42	1216	0.46	1259	0.49	1300	0.53	1340	0.57	1379	0.61
1100	1089	0.40	1136	0.43	1181	0.46	1225	0.50	1268	0.54	1308	0.58	1347	0.62	1386	0.66
1200	1104	0.45	1150	0.48	1194	0.51	1237	0.55	1279	0.59	1319	0.63	1357	0.67	1394	0.71
1300	1121	0.5	1165	0.53	1209	0.57	1251	0.61	1292	0.65	1331	0.69	1368	0.73	1405	0.78
1400	1140	0.56	1183	0.59	1225	0.63	1266	0.67	1306	0.71	1345	0.76	1382	0.8	1417	0.85
1500	1161	0.62	1202	0.65	1243	0.69	1284	0.73	1323	0.78	1360	0.83	1396	0.87	1432	0.92

**BLOWER DATA**

**ZHB048**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (heat section, economizer, wet coil, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

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

**DOWNFLOW**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	620	0.23	681	0.29	744	0.34	809	0.39	875	0.43	941	0.47	1004	0.51	1060	0.54
1300	652	0.28	713	0.34	775	0.39	839	0.44	903	0.48	967	0.51	1025	0.55	1078	0.59
1400	687	0.33	747	0.39	809	0.44	871	0.49	934	0.53	994	0.57	1048	0.61	1098	0.64
1500	724	0.40	784	0.45	844	0.50	905	0.54	965	0.59	1021	0.62	1071	0.66	1118	0.70
1600	764	0.46	823	0.51	882	0.56	940	0.60	997	0.65	1048	0.69	1094	0.72	1140	0.75
1700	806	0.53	863	0.58	919	0.62	975	0.67	1028	0.71	1075	0.75	1119	0.78	1164	0.81
1800	849	0.60	903	0.65	957	0.69	1010	0.74	1058	0.78	1102	0.82	1145	0.85	1189	0.88
1900	892	0.68	944	0.72	995	0.77	1045	0.82	1089	0.86	1131	0.89	1174	0.92	1217	0.95
2000	935	0.76	984	0.81	1033	0.86	1079	0.91	1122	0.95	1163	0.97	1204	1.00	1247	1.03

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1111	0.58	1156	0.60	1199	0.62	1241	0.63	1284	0.65	1326	0.67	1367	0.71	1408	0.74
1300	1127	0.62	1172	0.65	1214	0.66	1256	0.68	1299	0.70	1341	0.73	1381	0.77	1421	0.81
1400	1145	0.68	1189	0.70	1231	0.72	1274	0.74	1316	0.76	1357	0.79	1397	0.83	1436	0.88
1500	1164	0.73	1208	0.75	1251	0.78	1293	0.80	1334	0.83	1374	0.86	1413	0.91	1451	0.95
1600	1185	0.79	1229	0.81	1271	0.84	1313	0.86	1354	0.90	1393	0.94	1431	0.98	1468	1.03
1700	1208	0.84	1252	0.87	1294	0.90	1335	0.94	1375	0.98	1413	1.02	1449	1.07	1485	1.12
1800	1233	0.91	1276	0.94	1318	0.98	1358	1.02	1397	1.06	1434	1.11	1469	1.16	1504	1.21
1900	1261	0.98	1303	1.02	1343	1.06	1382	1.11	1420	1.16	1455	1.21	1490	1.26	1525	1.31
2000	1289	1.07	1330	1.11	1370	1.16	1407	1.21	1444	1.27	1478	1.32	1513	1.37	1547	1.42

**HORIZONTAL**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	614	0.21	681	0.25	752	0.30	821	0.34	888	0.39	950	0.43	1006	0.46	1057	0.49
1300	644	0.24	712	0.29	782	0.34	850	0.39	915	0.43	974	0.47	1027	0.51	1076	0.53
1400	677	0.29	746	0.34	814	0.39	880	0.44	942	0.48	998	0.52	1049	0.55	1097	0.58
1500	714	0.34	781	0.40	848	0.45	911	0.49	970	0.53	1023	0.57	1072	0.60	1119	0.63
1600	752	0.40	818	0.45	882	0.50	943	0.55	999	0.59	1050	0.62	1097	0.66	1142	0.69
1700	792	0.46	855	0.52	917	0.56	975	0.61	1028	0.64	1077	0.68	1123	0.72	1166	0.75
1800	832	0.53	894	0.58	952	0.63	1007	0.67	1058	0.70	1105	0.74	1149	0.78	1192	0.82
1900	873	0.60	932	0.65	988	0.69	1040	0.73	1088	0.77	1134	0.81	1177	0.85	1219	0.90
2000	914	0.67	970	0.72	1023	0.76	1073	0.80	1120	0.85	1163	0.89	1205	0.94	1246	0.99

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1105	0.51	1152	0.53	1197	0.55	1240	0.58	1280	0.61	1320	0.64	1358	0.68	1395	0.72
1300	1123	0.55	1169	0.57	1213	0.60	1255	0.63	1295	0.67	1334	0.70	1372	0.74	1409	0.79
1400	1142	0.60	1187	0.63	1230	0.66	1272	0.69	1312	0.73	1350	0.77	1388	0.82	1424	0.86
1500	1163	0.66	1207	0.69	1249	0.72	1290	0.76	1330	0.80	1368	0.85	1405	0.90	1441	0.94
1600	1185	0.72	1228	0.75	1270	0.79	1310	0.83	1349	0.88	1387	0.93	1423	0.98	1459	1.03
1700	1209	0.78	1251	0.82	1292	0.87	1331	0.92	1370	0.97	1407	1.02	1443	1.07	1478	1.12
1800	1234	0.86	1275	0.91	1315	0.96	1354	1.01	1391	1.06	1428	1.11	1463	1.17	1498	1.22
1900	1260	0.95	1300	1.00	1340	1.05	1377	1.11	1414	1.16	1450	1.22	1485	1.27	1519	1.32
2000	1287	1.04	1326	1.10	1365	1.16	1402	1.21	1437	1.27	1472	1.33	1507	1.38	1541	1.43



**BLOWER DATA**

**ZHB060**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (heat section, economizer, wet coil, etc.).

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.).

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

**DOWNFLOW**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1600	522	0.27	552	0.32	585	0.37	619	0.43	656	0.48	693	0.53	732	0.59	771	0.64
1700	539	0.32	570	0.37	603	0.43	638	0.48	674	0.53	711	0.59	749	0.64	787	0.69
1800	558	0.38	589	0.43	623	0.48	658	0.54	694	0.59	730	0.64	767	0.70	803	0.75
1900	578	0.44	610	0.49	643	0.54	678	0.60	714	0.65	749	0.70	785	0.76	819	0.82
2000	600	0.50	632	0.56	665	0.61	699	0.66	734	0.71	769	0.77	803	0.83	837	0.90
2100	623	0.57	655	0.62	688	0.68	721	0.73	755	0.79	789	0.84	822	0.91	854	0.98
2200	647	0.65	678	0.70	711	0.75	743	0.81	776	0.86	809	0.93	841	1.00	872	1.06
2300	671	0.73	702	0.78	734	0.83	766	0.89	798	0.95	829	1.02	860	1.09	890	1.16
2400	696	0.81	726	0.87	757	0.92	788	0.98	819	1.04	850	1.11	880	1.19	909	1.26

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1600	809	0.69	844	0.74	877	0.80	908	0.85	936	0.91	963	0.97	989	1.02	1014	1.08
1700	823	0.75	857	0.80	889	0.86	919	0.92	947	0.97	973	1.03	999	1.09	1024	1.14
1800	838	0.81	870	0.87	901	0.92	931	0.98	958	1.04	984	1.10	1009	1.16	1034	1.22
1900	853	0.88	885	0.94	915	0.99	944	1.05	971	1.11	996	1.17	1021	1.23	1045	1.29
2000	869	0.96	899	1.01	929	1.07	957	1.13	984	1.19	1009	1.25	1033	1.31	1058	1.38
2100	885	1.04	915	1.10	944	1.15	971	1.22	997	1.28	1022	1.34	1046	1.40	1070	1.46
2200	902	1.13	931	1.19	959	1.24	986	1.31	1012	1.37	1036	1.43	1060	1.50	1084	1.56
2300	920	1.23	948	1.29	975	1.35	1001	1.41	1027	1.47	1051	1.53	1075	1.60	1098	1.66
2400	938	1.33	965	1.39	992	1.45	1017	1.52	1042	1.58	1066	1.64	1090	1.70	1113	1.77

**HORIZONTAL**

Air Volume cfm	External Static - in. w.g.															
	0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1600	525	0.30	561	0.34	597	0.39	635	0.43	673	0.47	711	0.51	748	0.56	784	0.61
1700	543	0.34	578	0.39	615	0.43	653	0.48	691	0.52	728	0.57	765	0.62	800	0.67
1800	561	0.39	597	0.44	635	0.49	672	0.53	710	0.58	746	0.63	782	0.68	816	0.73
1900	581	0.44	618	0.49	655	0.54	692	0.59	729	0.64	765	0.69	800	0.75	833	0.80
2000	602	0.50	639	0.55	676	0.61	713	0.66	749	0.71	784	0.76	818	0.82	850	0.88
2100	625	0.57	661	0.62	698	0.67	735	0.73	770	0.78	804	0.84	837	0.90	868	0.96
2200	648	0.64	685	0.69	721	0.75	757	0.80	791	0.86	824	0.92	856	0.98	886	1.05
2300	673	0.71	709	0.77	745	0.83	780	0.88	813	0.94	845	1.01	876	1.08	905	1.15
2400	699	0.79	734	0.85	769	0.91	803	0.97	835	1.04	866	1.11	896	1.18	924	1.25

Air Volume cfm	External Static - in. w.g.															
	0.90		1.00		1.10		1.20		1.30		1.40		1.50		1.60	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1600	819	0.66	851	0.72	883	0.77	913	0.83	943	0.89	971	0.95	998	1.01	1024	1.07
1700	833	0.72	865	0.78	896	0.84	926	0.90	954	0.96	982	1.02	1009	1.08	1034	1.14
1800	848	0.79	880	0.85	910	0.92	939	0.98	967	1.04	994	1.10	1020	1.16	1045	1.23
1900	864	0.87	895	0.93	924	0.99	953	1.06	980	1.12	1007	1.18	1032	1.25	1056	1.31
2000	881	0.95	911	1.01	940	1.08	967	1.14	994	1.21	1020	1.27	1044	1.34	1068	1.40
2100	898	1.03	927	1.10	955	1.17	982	1.23	1008	1.30	1033	1.37	1057	1.43	1080	1.50
2200	916	1.12	944	1.19	971	1.26	998	1.33	1023	1.40	1047	1.47	1071	1.54	1093	1.60
2300	934	1.22	961	1.29	988	1.36	1014	1.43	1038	1.50	1062	1.58	1085	1.65	1107	1.71
2400	952	1.32	979	1.40	1005	1.47	1030	1.54	1054	1.62	1077	1.69	1099	1.76	1121	1.83

## BLOWER DATA

### DRIVE KIT SPECIFICATIONS

Model No.	Motor HP		No. of Speeds	Drive Kits and RPM Range						
	Nominal	Maximum		ZA01	ZA02	ZA04	<sup>3</sup> ZA05	ZAA01	ZAA02	<sup>4</sup> ZAA03
ZHB036	<sup>1</sup> 0.75	0.86	1	678 - 1035	---	964 - 1471	---	---	---	---
	<sup>2</sup> 1	1.15	1	678 - 1035	---	964 - 1471	---	---	---	---
	1.5	1.7	1	678 - 1035	---	964 - 1471	---	---	---	---
ZHB048	<sup>1</sup> 0.75	0.86	1	---	803 - 1226	---	---	---	---	---
	<sup>2</sup> 1	1.15	1	---	803 - 1226	---	---	---	---	---
	1.5	1.7	1	---	803 - 1226	---	1098 - 1490	---	---	---
ZHB060	<sup>1</sup> 0.75	0.86	1	---	---	---	---	522 - 784	632 - 875	---
	<sup>2</sup> 1	1.15	1	---	---	---	---	522 - 784	632 - 875	---
	1.5	1.7	1	---	---	---	---	522 - 784	632 - 875	798 - 1105

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

<sup>1</sup> 0.75 hp blower motor is only available for 208/230V-1ph applications.

<sup>2</sup> 1 hp blower motor is only available for 208/230V-3ph applications.

<sup>3</sup> 1.5 hp blower motor is the minimum hp required with ZA05 drive kits.

<sup>4</sup> 1.5 hp blower motor is the minimum hp required with ZAA03 drive kits.

### POWER EXHAUST FAN PERFORMANCE

Return Air System Static Pressure - in. w.g.	Air Volume Exhausted cfm
0.00	1865
0.05	1785
0.10	1710
0.15	1630
0.20	1545
0.25	1450
0.30	1350
0.35	1240

### OPTIONS / ACCESSORIES AIR RESISTANCE - in. w.g.

Air Volume cfm			Electric Heat	Economizer	
	036	048, 060		Downflow	Horizontal
900	0.01	---	0.05	0.03	0.04
1000	0.01	---	0.06	0.03	0.05
1100	0.02	---	0.08	0.04	0.05
1200	0.02	0.01	0.09	0.05	0.06
1300	0.02	0.02	0.12	0.05	0.07
1400	0.03	0.02	0.17	0.06	0.08
1500	0.03	0.02	0.22	0.07	0.08
1600	0.03	0.03	0.26	0.08	0.09
1700	0.04	0.03	0.30	0.09	0.10
1800	0.04	0.03	0.33	0.10	0.11
1900	0.05	0.04	0.33	0.11	0.12
2000	0.05	0.04	0.31	0.12	0.13
2100	0.06	0.05	0.27	0.13	0.14
2200	0.06	0.05	0.29	0.14	0.15
2300	0.07	0.05	0.31	0.15	0.16
2400	0.07	0.06	0.32	0.16	0.18

## BLOWER DATA

### CEILING DIFFUSERS AIR RESISTANCE (in. w.g.)

Air Volume cfm	RTD9-65S Step-Down Diffuser			FD9-65S Flush Diffuser
	2 Ends Open	1 Side & 2 Ends Open	All Ends & Sides Open	
800	0.15	0.13	0.11	0.11
1000	0.19	0.16	0.14	0.14
1200	0.25	0.20	0.17	0.17
1400	0.33	0.26	0.20	0.20
1600	0.43	0.32	0.20	0.24
1800	0.56	0.40	0.30	0.30
2000	0.73	0.50	0.36	0.36
2200	0.95	0.63	0.44	0.44

### CEILING DIFFUSER AIR THROW DATA

Air Volume - cfm	<sup>1</sup> Effective Throw - ft.	
	Model No.	FD9-65S
800	RTD9-65S	14 - 18
1000	RTD9-65S	15 - 20
1200	RTD9-65S	16 - 22
1400	RTD9-65S	17 - 24
1600	RTD9-65S	18 - 25
1800	RTD9-65S	20 - 28
2000	RTD9-65S	21 - 29
2200	RTD9-65S	22 - 30

<sup>1</sup> Effective throw based on terminal velocities of 75 ft. per minute.

**ELECTRICAL/ELECTRIC HEAT DATA**

**3 TON**

Model No.		ZHB036S4							
<sup>1</sup> Voltage - 60Hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	15.3		8.7		4		3.6	
	Locked Rotor Amps	70		70		31		27	
Outdoor Fan Motor (1)	Full Load Amps (1 Non-ECM)	1		1		0.6		0.45	
Power Exhaust (1) 0.5 HP	Full Load Amps	1.5		1.5		0.6		0.6	
Indoor Blower Motor	Horsepower	0.75	1.5	1	1.5	1	1.5	1	1.5
	Full Load Amps	7.6	11	4.6	6.6	2.1	3	1.7	2.4
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	40	45	25	25	15	15	15	15
	With (1) 0.5 HP Power Exhaust	40	45	25	25	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	28	32	17	19	8	9	7	8
	With (1) 0.5 HP Power Exhaust	30	33	18	20	9	10	8	8

**ELECTRIC HEAT DATA**

Electric Heat Voltage			208	240	208	240	208	240	480	480	600	600
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	5 kW	60	60	60	60	35	35	15	20	15	15
		7.5 kW	70	70	70	80	40	45	20	20	20	20
		10 kW	80	80	80	90	50	50	25	25	20	20
		15 kW	100	110	100	110	70	70	30	35	25	30
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	5 kW	51	54	54	58	32	34	15	17	13	14
		7.5 kW	62	67	65	71	40	42	19	20	16	17
		10 kW	73	80	77	84	47	49	23	24	19	20
		15 kW	96	106	99	110	62	64	30	32	25	26
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	60	60	60	60	35	40	20	20	15	15
		7.5 kW	70	70	70	80	45	45	20	25	20	20
		10 kW	80	90	80	90	50	60	25	25	20	20
		15 kW	100	110	110	125	70	70	35	35	25	30
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	52	56	56	59	34	36	16	17	13	14
		7.5 kW	64	69	67	72	41	43	20	21	16	17
		10 kW	75	82	78	85	49	51	23	25	19	20
		15 kW	97	108	101	111	64	66	31	32	25	26

**ELECTRIC HEAT ACCESSORIES**

Unit Fuse Block	Unit Only	<b>10A26</b>	<b>10A26</b>	<b>10A27</b>	<b>10A29</b>	<b>10A29</b>
	Unit + Power Exhaust	<b>10A26</b>	<b>10A26</b>	<b>10A27</b>	<b>10A29</b>	<b>10A29</b>

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.

**ELECTRICAL/ELECTRIC HEAT DATA**

**4 TON**

Model No.		ZHB048S4							
<sup>1</sup> Voltage - 60Hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	20		11		5.5		4.7	
	Locked Rotor Amps	99		86		37		34	
Outdoor Fan Motor (1)	Full Load Amps (1 Non-ECM)	1.7		1.7		0.9		0.7	
Power Exhaust (1) 0.5 HP	Full Load Amps	1.5		1.5		0.6		0.6	
Indoor Blower Motor	Horsepower	0.75	1.5	1	1.5	1	1.5	1	1.5
	Full Load Amps	7.6	11	4.6	6.6	2.1	3	1.7	2.4
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	50	30	30	15	15	15	15
	With (1) 0.5 HP Power Exhaust	50	50	30	30	15	15	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	35	38	21	23	10	11	9	9
	With (1) 0.5 HP Power Exhaust	36	40	22	24	11	12	9	10

**ELECTRIC HEAT DATA**

Electric Heat Voltage			208	240	208	240	208	240	208	240	480	480	600	600
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	5 kW	70	70	70	70	40	40	40	45	20	20	15	15
		7.5 kW	80	80	80	80	45	45	45	50	25	25	20	20
		10 kW	90	90	90	90	50	60	50	60	25	30	25	25
		15 kW	110	125	110	125	60	70	70	70	35	35	30	30
		22 kW	150	175	150	175	80	90	90	90	45	45	40	40
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	5 kW	57	61	61	64	34	36	36	38	18	19	15	15
		7.5 kW	69	74	72	77	40	43	42	45	22	23	18	18
		10 kW	80	87	83	90	47	51	49	53	25	26	21	22
		15 kW	103	113	106	116	60	66	62	68	33	34	27	28
		22 kW	136	152	140	155	79	88	81	90	44	45	36	37
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	70	70	70	80	40	40	40	45	20	20	15	20
		7.5 kW	80	80	80	90	45	50	50	50	25	25	20	20
		10 kW	90	90	90	100	50	60	50	60	30	30	25	25
		15 kW	110	125	110	125	70	70	70	70	35	35	30	30
		22 kW	150	175	150	175	90	90	90	100	45	50	40	40
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	59	62	62	66	35	37	37	39	18	19	15	16
		7.5 kW	70	75	74	79	42	45	44	47	22	23	18	19
		10 kW	81	88	85	92	48	52	50	54	26	27	21	22
		15 kW	104	114	107	118	61	67	63	69	34	34	27	28
		22 kW	138	153	141	157	81	90	83	92	45	46	36	37

**ELECTRIC HEAT ACCESSORIES**

Unit Fuse Block	Unit Only	10A26	10A26	10A27	10A27	10A29	10A29
	Unit + Power Exhaust	10A26	10A26	10A27	10A27	10A29	10A29

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.

**ELECTRICAL/ELECTRIC HEAT DATA**

**5 TON**

Model No.		ZHB060S4							
<sup>1</sup> Voltage - 60Hz		208/230V - 1 Ph		208/230V - 3 Ph		460V - 3 Ph		575V - 3 Ph	
Compressor	Rated Load Amps	22.1		13.5		8		5	
	Locked Rotor Amps	125		109		59		40	
Outdoor Fan Motor (1)	Full Load Amps (1 Non-ECM)	1.7		1.7		1		0.9	
Power Exhaust (1) 0.5 HP	Full Load Amps	1.5		1.5		0.6		0.6	
Indoor Blower Motor	Horsepower	0.75	1.5	1	1.5	1	1.5	1	1.5
	Full Load Amps	7.6	11	4.6	6.6	2.1	3	1.7	2.4
<sup>2</sup> Maximum Overcurrent Protection	Unit Only	50	60	35	35	20	20	15	15
	With (1) 0.5 HP Power Exhaust	60	60	35	40	20	20	15	15
<sup>3</sup> Minimum Circuit Ampacity	Unit Only	37	41	24	26	14	14	9	10
	With (1) 0.5 HP Power Exhaust	39	42	25	27	14	15	10	11

**ELECTRIC HEAT DATA**

Electric Heat Voltage			208	240	208	240	208	240	208	240	480	480	600	600
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat	5 kW	70	70	80	80	45	45	45	50	25	25	15	20
		7.5 kW	80	90	80	90	50	50	50	50	25	30	20	20
		10 kW	90	100	90	100	50	60	60	60	30	30	25	25
		15 kW	110	125	110	125	70	70	70	80	40	40	30	30
		22 kW	150	175	150	175	90	90	90	100	50	50	40	40
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat	5 kW	60	63	63	67	36	38	39	41	21	22	15	16
		7.5 kW	71	76	75	80	42	45	45	48	24	26	18	19
		10 kW	83	90	86	93	49	53	52	56	28	30	21	22
		15 kW	105	116	109	119	62	68	65	71	36	37	27	28
		22 kW	139	155	142	158	81	90	84	93	47	48	36	37
<sup>2</sup> Maximum Overcurrent Protection (MOCP)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	70	80	80	80	45	45	50	50	25	25	20	20
		7.5 kW	80	90	90	90	50	50	50	50	30	30	20	20
		10 kW	90	100	100	100	50	60	60	60	30	30	25	25
		15 kW	110	125	110	125	70	70	70	80	40	40	30	30
		22 kW	150	175	150	175	90	100	90	100	50	50	40	40
<sup>3</sup> Minimum Circuit Ampacity (MCA)	Unit+ Electric Heat and (1) 0.5 HP Power Exhaust	5 kW	61	65	65	68	37	39	40	42	21	23	16	17
		7.5 kW	73	78	76	81	44	47	47	50	25	26	19	20
		10 kW	84	91	87	94	50	54	53	57	29	30	22	23
		15 kW	107	117	110	120	63	69	66	72	36	38	28	29
		22 kW	140	156	144	160	83	92	86	95	48	49	37	38

**ELECTRIC HEAT ACCESSORIES**

Unit Fuse Block	Unit Only	<b>10A26</b>	<b>10A26</b>	<b>10A28</b>	<b>10A28</b>	<b>10A29</b>	<b>10A29</b>
	Unit + Power Exhaust	<b>10A26</b>	<b>10A26</b>	<b>10A28</b>	<b>10A28</b>	<b>10A29</b>	<b>10A29</b>

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.

## ELECTRIC HEAT CAPACITIES

Input Voltage	5 kW			7.5 kW			10 kW		
	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output
208	1	3.8	12,800	1	5.6	19,200	1	7.5	25,600
220	1	4.2	14,300	1	6.3	21,500	1	8.4	28,700
230	1	4.6	15,700	1	6.9	23,500	1	9.2	31,400
240	1	5.0	17,100	1	7.5	25,600	1	10.0	34,200
440	1	4.2	14,300	1	6.3	21,500	1	8.4	28,700
460	1	4.6	15,700	1	6.9	23,500	1	9.2	31,400
480	1	5.0	17,100	1	7.5	25,600	1	10.0	34,200
550	1	4.2	14,300	1	6.3	21,500	1	8.4	28,700
575	1	4.6	15,700	1	6.9	23,500	1	9.2	31,400
600	1	5.0	17,100	1	7.5	25,600	1	10.0	34,200
Input Voltage	15 kW			22.5 kW					
	No of Stages	kW input	Btuh Output	No of Stages	kW input	Btuh Output			
208	1	11.2	38,400	1	16.9	57,700			
220	1	12.6	43,000	1	18.9	64,500			
230	1	13.8	47,000	1	20.7	70,700			
240	1	15.0	51,200	1	22.5	76,800			
440	1	12.6	43,000	1	18.9	64,500			
460	1	13.8	47,000	1	20.7	70,700			
480	1	15.0	51,200	1	22.5	76,800			
550	1	12.6	43,000	1	18.9	64,500			
575	1	13.8	47,000	1	20.7	70,700			
600	1	15.0	51,200	1	22.5	76,800			

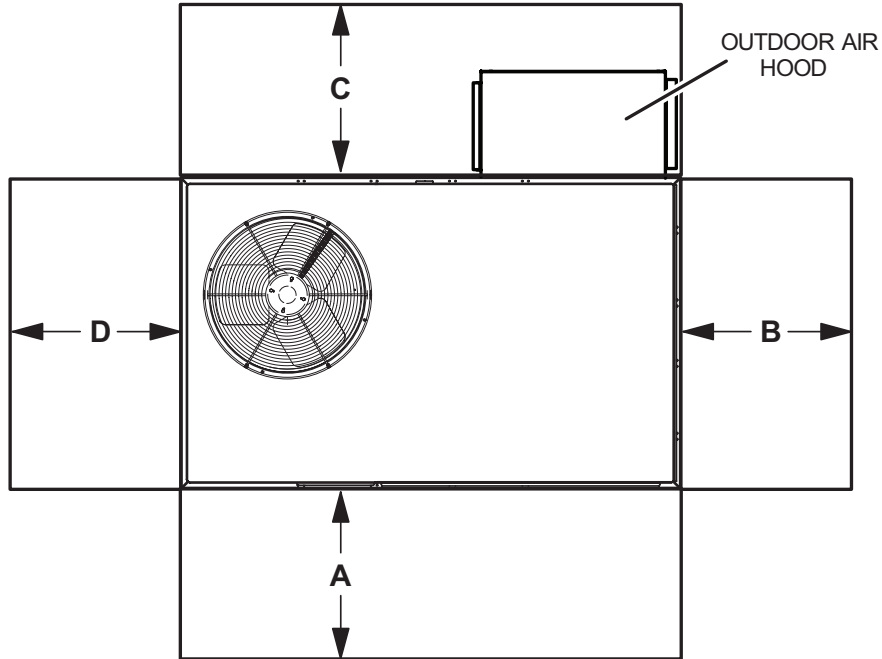
## OUTDOOR SOUND DATA

Unit Model No.	Octave Band Sound Power Levels dBA, re 10 <sup>-12</sup> Watts - Center Frequency - Hz							1 Sound Rating Number dBA
	125	250	500	1000	2000	4000	8000	
ZHB036	66	70	75	73	71	67	60	79
ZHB048	62	69	73	72	69	65	57	78
ZHB060	70	72	78	75	72	70	66	82

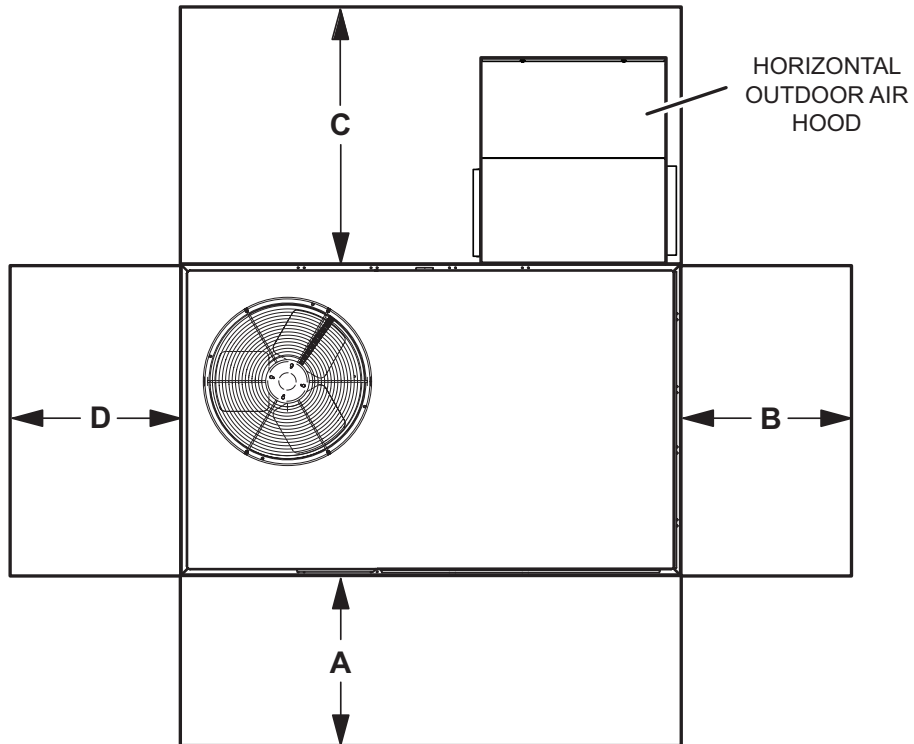
<sup>1</sup> Sound Rating Number according to AHRI Standard 270-2008. Sound Rating Number is the overall A-Weighted Sound Power Level, (LWA), dB (100 Hz to 10,000 Hz).

## UNIT CLEARANCES

### UNIT WITH DOWNFLOW ECONOMIZER



### UNIT WITH HORIZONTAL ECONOMIZER



<sup>1</sup> Unit Clearance	A		B		C Downflow		C Horizontal		D		Top Clearance
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	
<b>Service Clearance</b>	36	914	36	914	36	914	60	1524	36	914	<b>Unobstructed</b>
<b>Minimum Operation Clearance</b>	36	914	36	914	36	914	60	1524	36	914	

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.



## WEIGHT DATA

Model Number	Net				Shipping			
	Base		Max.		Base		Max.	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
ZHB036S	580	263	634	288	585	265	639	290
ZHB048S	585	265	639	290	590	268	644	292
ZHB060S	610	277	664	301	615	279	669	303

Base Unit - The unit with NO OPTIONS.

Max. Unit - The unit with ALL OPTIONS Installed. (Economizer, etc.)

## OPTIONS / ACCESSORIES

	Shipping Weights		
	lbs.	kg	
<b>ECONOMIZER / OUTDOOR AIR / POWER EXHAUST</b>			
<b>Economizer</b>			
Downflow	75	34	
Horizontal	102	46	
<b>Outdoor Air Dampers</b>			
Motorized	39	18	
Manual	29	13	
<b>Power Exhaust</b>			
Downflow	54	24	
Horizontal	41	19	
<b>ELECTRIC HEAT</b>			
5 kW	25	11	
7.5 kW	26	12	
10 kW	27	12	
15 kW	27	12	
22.5 kW	29	13	
<b>COIL/HAIL GUARDS</b>			
All models	50	23	
<b>ROOF CURBS</b>			
<b>Hybrid Roof Curbs, Downflow</b>			
8 in. height	63	29	
14 in. height	83	38	
18 in. height	93	42	
24 in. height	113	51	
<b>CEILING DIFFUSERS</b>			
Step-Down	RTD9-65S	80	36
Flush	FD9-65S	80	36

# DIMENSIONS

# UNIT

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.	Base	Max.	Base	Max.								
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	in.	mm	in.	mm	in.	mm						
036	158	72	173	78	133	60	145	66	124	56	135	61	147	67	160	73	41.25	1048	39.25	997	24.5	622	25.75	654
048	168	76	183	83	136	62	148	67	120	54	130	59	148	67	161	73	42	1067	40	1016	25	635	26.5	673
060	163	74	177	80	142	64	155	70	142	64	155	70	163	74	177	80	40.5	1029	38.5	978	23.5	597	25	635

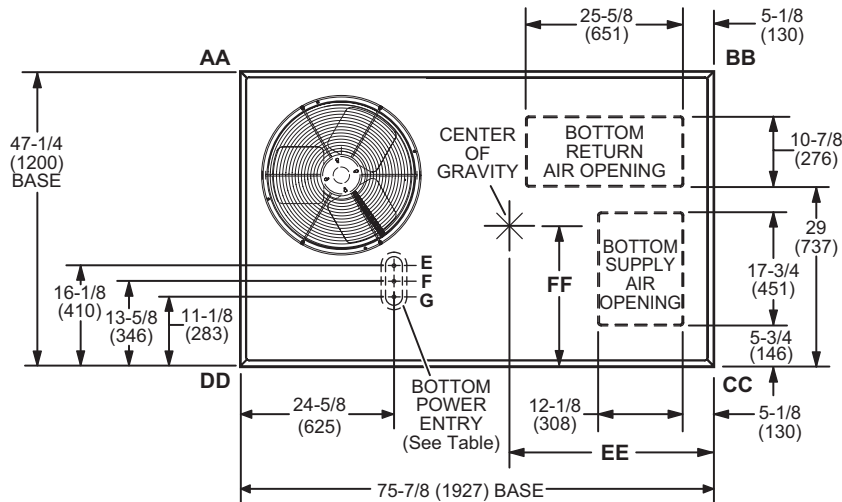
Base Unit - The unit with NO OPTIONS.

Max. Unit - The unit with ALL OPTIONS Installed. (Economizer, largest blower motor, etc.).

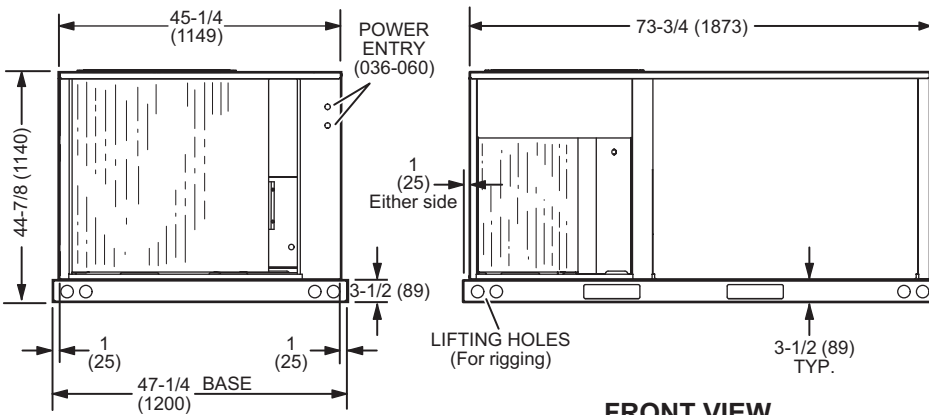
## BOTTOM POWER ENTRY

Holes required for Optional Bottom Power Entry Kit

	Threaded Conduit Fittings (Provided in Kit)	Wire Use	Hole Diameter Required in Unit Base (Max.)
E	1/2	ACC	7/8 (23)
F	1/2	24V	7/8 (23)
G	3/4	POWER	1-1/8 (29)

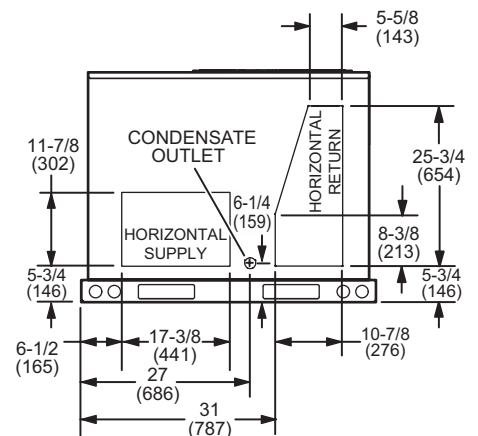


TOP VIEW (Base)



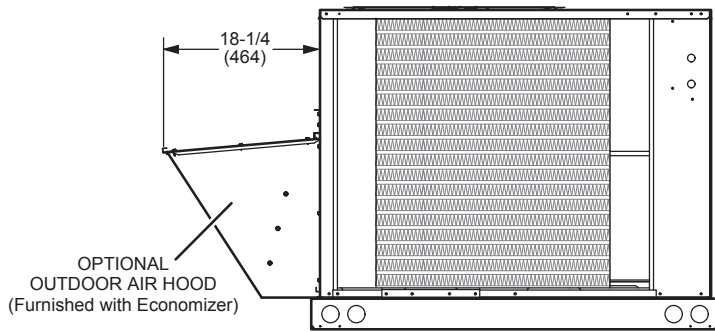
FRONT VIEW

END VIEW

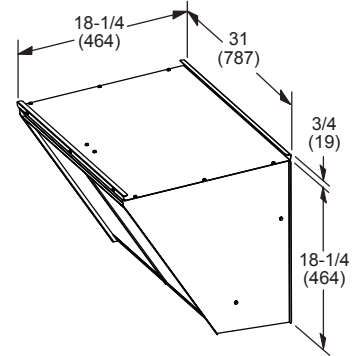


END VIEW

**OUTDOOR AIR HOOD DETAIL FOR OPTIONAL ECONOMIZER  
(Downflow Applications)**

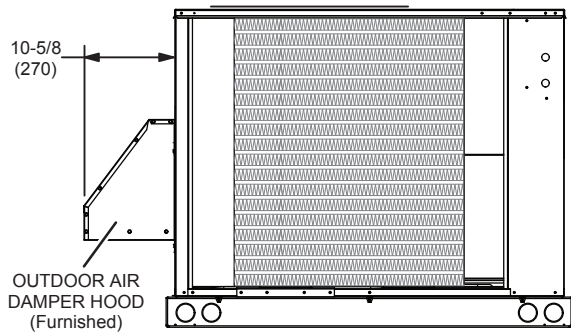


**SIDE VIEW**



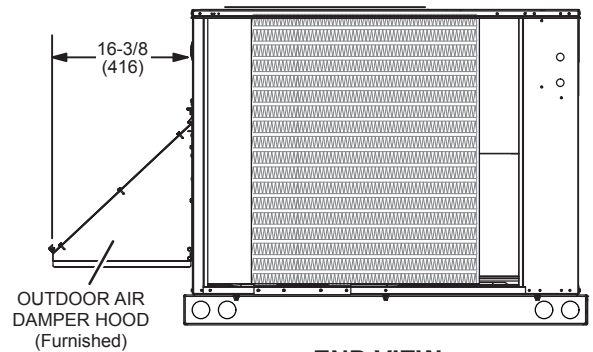
**OUTDOOR AIR DAMPER HOOD DETAIL (Downflow or Horizontal Applications)**

**MANUAL OUTDOOR AIR DAMPER HOOD**

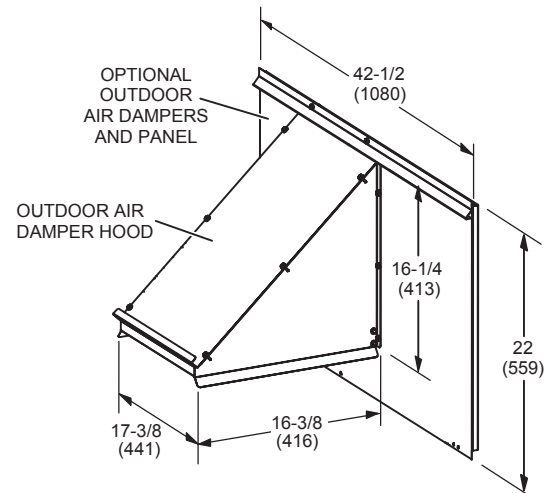
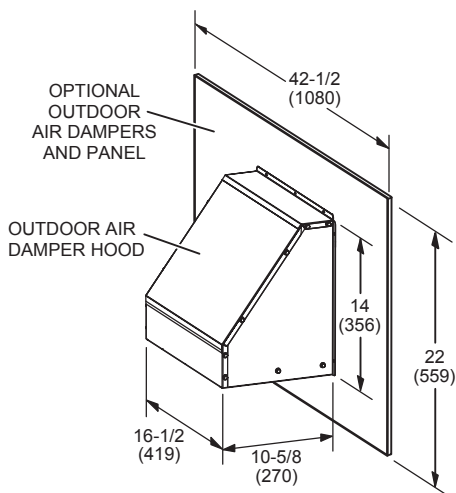


**END VIEW**

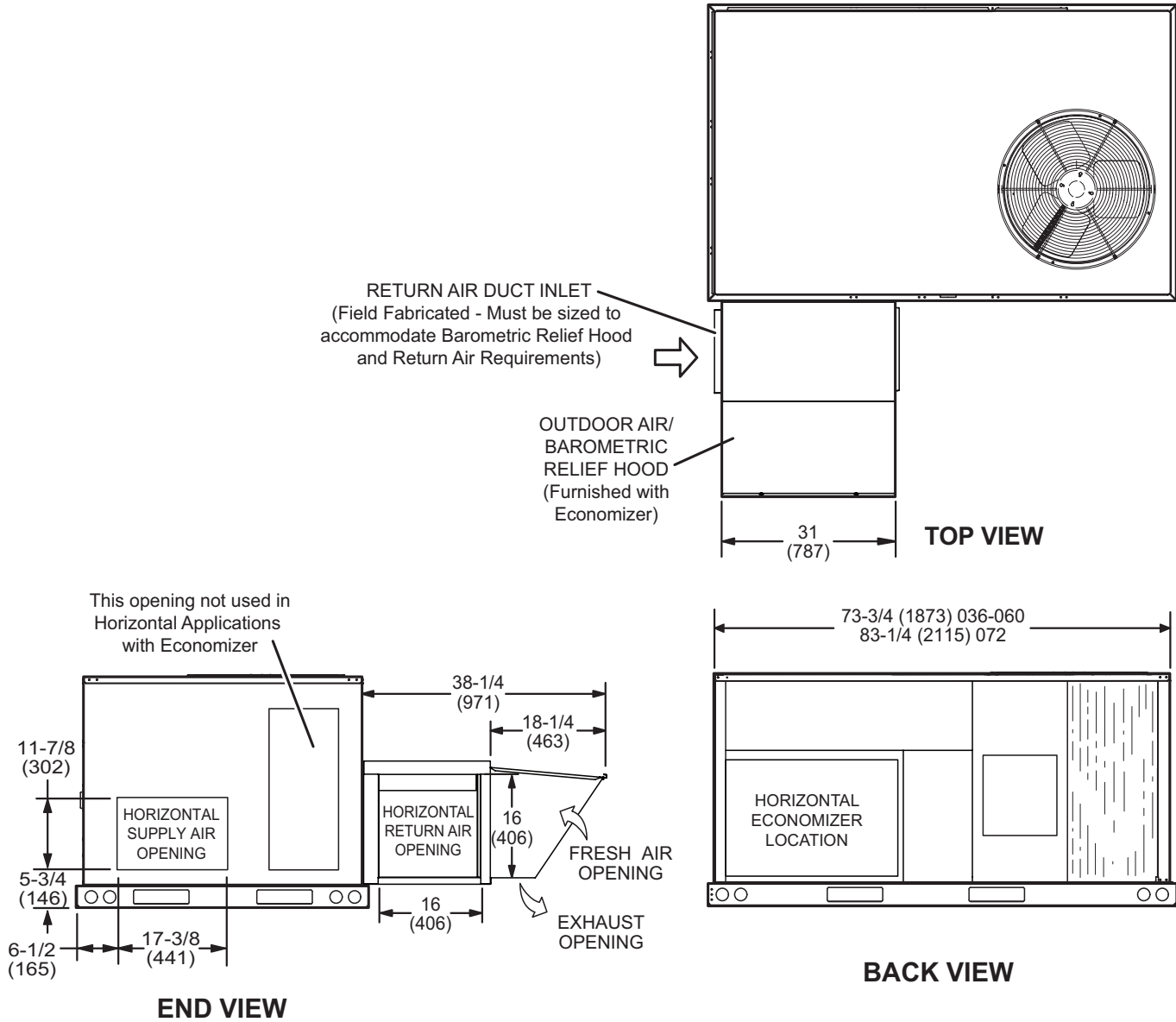
**MOTORIZED OUTDOOR AIR DAMPER HOOD**



**END VIEW**



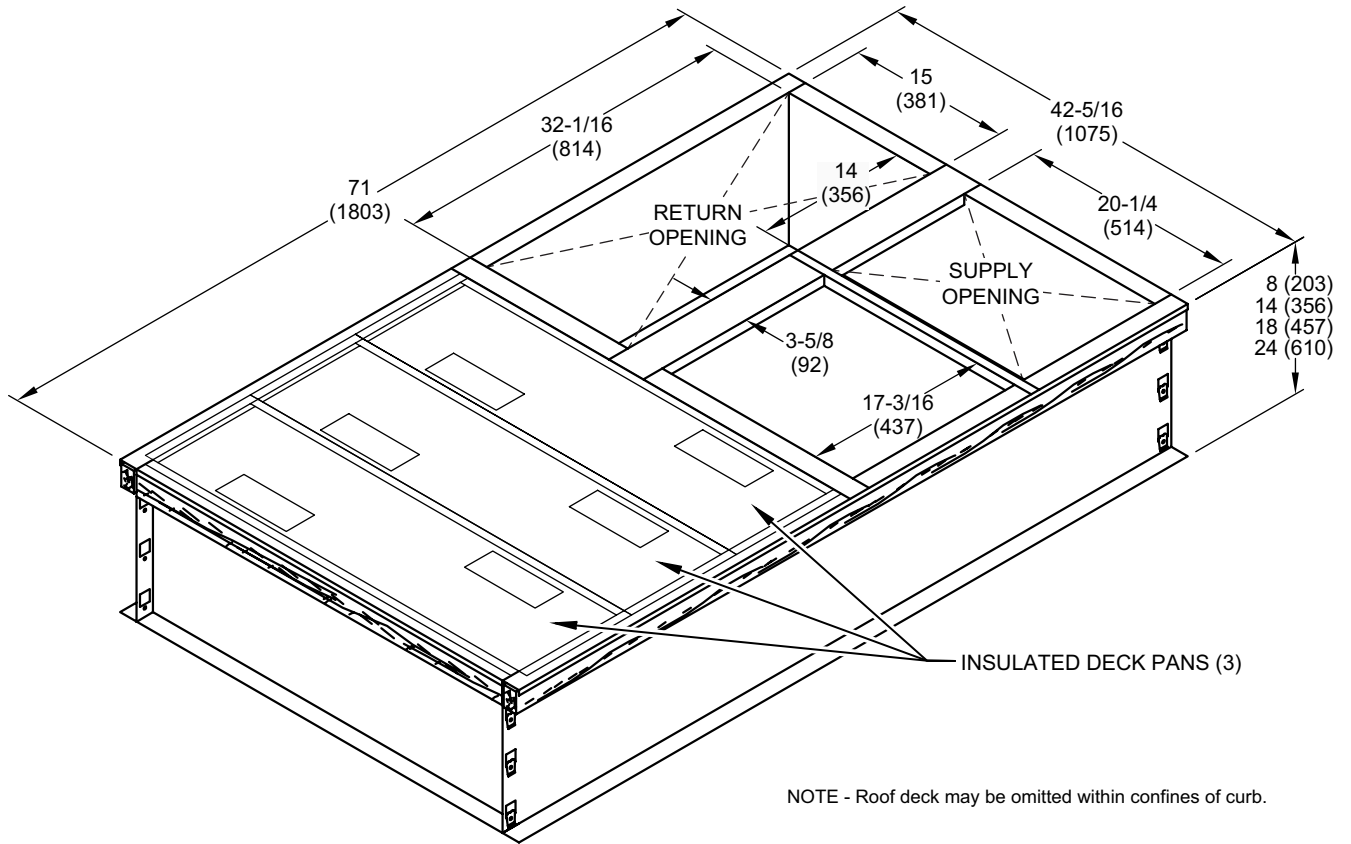
**OUTDOOR AIR HOOD DETAIL WITH OPTIONAL ECONOMIZER AND BAROMETRIC RELIEF DAMPERS  
(Horizontal Applications)**



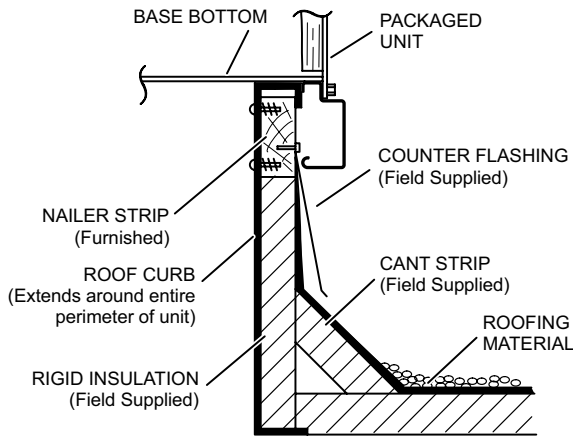
Note - Return Air Duct and Transition must be supported.

# DIMENSIONS - ACCESSORIES

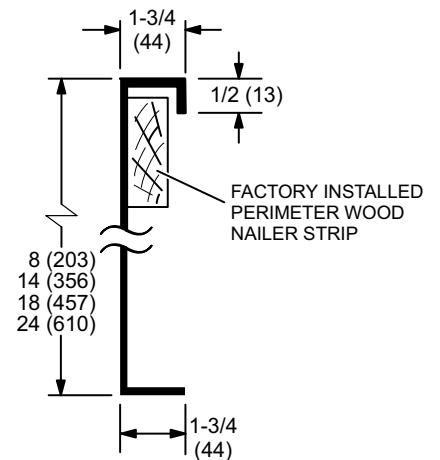
## HYBRID ROOF CURBS - DOUBLE DUCT OPENING



### TYPICAL FLASHING DETAIL FOR ROOF CURB



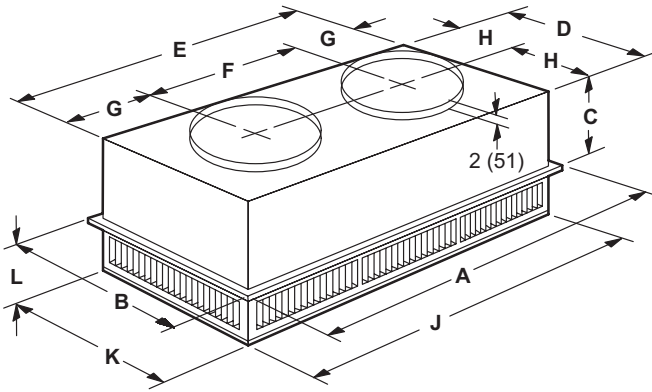
### DETAIL ROOF CURB



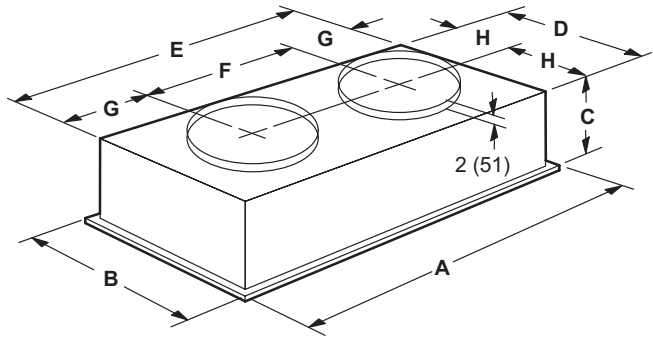
## DIMENSIONS - ACCESSORIES

### COMBINATION CEILING SUPPLY AND RETURN DIFFUSERS

#### STEP-DOWN CEILING DIFFUSER



#### FLUSH CEILING DIFFUSER



Model Number		RTD9-65S
A	in.	47-5/8
	mm	1159
B	in.	23-5/8
	mm	600
C	in.	11-3/8
	mm	289
D	in.	21-1/2
	mm	546
E	in.	45-1/2
	mm	1156
F	in.	22-1/2
	mm	572
G	in.	11-1/2
	mm	292
H	in.	10-3/4
	mm	273
J	in.	45-1/2
	mm	1156
K	in.	21-1/2
	mm	546
L	in.	7-1/8
	mm	181
Duct Size	in.	18 round
	mm	457 round

Model Number		FD9-65S
A	in.	47-5/8
	mm	1159
B	in.	23-5/8
	mm	600
C	in.	13-1/2
	mm	343
D	in.	21
	mm	533
E	in.	45
	mm	1143
F	in.	22-1/2
	mm	572
G	in.	11-1/4
	mm	286
H	in.	10-1/2
	mm	267
Duct Size	in.	18 round
	mm	457 round



## REVISIONS

Sections	Description of Change
Options/Accessories	Updated Electric Heat kit catalog numbers



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