REZNOR®

MODEL AEB
AIR TURNOVER
HEATING/COOLING SYSTEM

Contents

IMPORTANT: Specifications are subject to change without notice. This guide is intended to provide specifications and technical information only.

This guide is not intended to be an instruction manual. When installing HVAC Equipment, you must check and conform to all local and national building codes. Improper installation of HVAC Equipment could be dangerous. Consult manufacturer's installation manual for instructions and important warnings.

In keeping with our policy of continuous product improvement, we reserve the right to alter, at any time, the design, construction, dimensions, weights, etc., of equipment information shown here.

REZNOR®

Model AEB

Vertical, Indoor or Outdoor, Air Turnover Unit with Optional Heating, Cooling and Ventilation

DESCRIPTION

Model AEB

Reznor Model AEB indirect fired units are designed for indoor or outdoor installation in industrial and commercial buildings where air turnover (destratification) is desired. These air handlers are suitable for a wide variety of heating, cooling, and makeup air applications.

Air turnover units are ideal for large open space heating, cooling, ventilation and filtration requirements. They are widely used in manufacturing, distribution and warehouse facilities, as well as steel, pharmaceutical, food and merchandise storage facilities. Air turnover units are also very effective at controlling humidity levels in a space.

Model ACB units are shop assembled and wired complete with burner, primary combustion chamber and secondary heat transfer surfaces, mechanical combustion system, propeller and motor assembly, sheet metal casing, controls and safety devices, flame tested at the manufacturer's plant and shipped as a complete package assembly. Required accessories are mounted in the factory. Units will be split into sections when required for shipping purposes. Model ACB units offer a complete range of sizes for air handling capacities from 3,250 to 150,000 CFM and heating outputs from 200,000 to 6,000,000 BTUH. Units are also available without heating.

The industrial four-pass, continuously welded drum and tube heat exchanger are constructed of 409 or 304 stainless steel. The robust heat exchanger offers 80+% efficiency and unsurpassed longevity. A forced draft industrial burner provides excellent combustion with low maintenance. Flame safeguards, gas regulators and hydraulic main gas safety shut-off valve are standard. An optional power venter is available. In buildings where negative air pressure or contamination occurs, a sealed combustion duct can be installed. Choose from FM or IRI gas trains with hydraulic shut-off valve and controls. A 15:1 modulating gas burner is available. Burners are available for use with natural gas, propane or fuel oil.

The unit is constructed of a welded structural iron frame, primed with an epoxy rust inhibitor. The cabinet is constructed of G90, 18 gauge metal. An industrial alkyd enamel gray finish is applied. For outdoor units, epoxy finishes or custom coloring can be selected to match a building exterior. Hinged access doors with stainless steel piano hinges, compression latches and safety switches make for easy fan and motor access.

Each heater is equipped with 1, 2, or 3 low noise propeller fans. Each fan consists of 6 air foil blades. Fan assembly is statically and dynamically balanced at the factory. Fans are mounted on a heavy duty, machined and polished solid steel shaft. The fan motor is mounted on a fully adjustable base. Choose from EPACT Compliant ODP, TEFC or premium efficiency ODP motors. Motors are available with spring or RIS vibration isolation. Perforated liners provided on fan section including fan divider partitions. Sound is captured by the liners and muffled in the two inch thick fiberglass insulation.

Safety controls include a flame safeguard relay with LED status, optional ultra-violet flame detection and prepurge cycle. Fan switch, high and low gas pressure switch, differential air proving switch, and a manual reset temperature high limit safety switch are also available.

Air intake is through an expanded metal screen inlet plenum (heating only) open on all four sides. Flat filter racks can be included in the inlet plenum, or a separate V-Bank filter section can be ordered. Pleated filters can be changed out through hinged access doors. Single or multiple opening inlet air plenums are optional (standard with cooling units). Units can be configured for a 20% outdoor inlet opening with motorized damper or a full mixing box with 100% outside air capability. Mixing box has a variety of damper options including: economizer with enthalpy sensor, differential enthalpy R/A and O/A sensor, and low leak aluminum airfoil dampers operated with direct drive actuators. Dampers are to be designed for operation down to -40°F.

An integral outside air plenum can introduce outside air prior to the filters. The plenum casings are constructed the same as the unit and finished to match. Inlet plenum is designed to prevent water from entering the unit. When the plenum is exterior wall mounted, to finish color can be matched to the exterior of the building. A wall mount flange with gasket runs the perimeter of the inlet plenum. The louvered inlet plenum is equipped with expanded metal where necessary.

Direct expansion or chilled water cooling coils available in blow through or draw through arrangements. Units supplied with cooling include the sound attenuation features as standard. Cooling coil plenum consists of double wall construction. The coil section is insulated with 1" or 2" thick fiberglass insulation. Units with cooling sections include discharge air plenum with adjustable supply air grilles. The plenum features a double sloped 304 stainless steel condensate pan with drain. All pans are a minimum 18 gauge 304 stainless steel continuously TIG welded. Multiple coils are stacked vertically and include intermediate drain pans to reduce refrigerant pressure drop and possibility of water carry over. Coils have 0.020 in. minimum copper tube wall thickness. The fins are rippled and made of a minimum of 0.006 in. aluminum sheet. Coils feature (direct expansion interlaced multi-circuit design) (chilled water). Coils are pressure tested to 250 psig to ensure no refrigerant leaks. Coils are designed around 400 CFM per ton. Coil bypass with manual adjustment damper are provided to prevent CFM per ton ratio exceeding 500.

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Model AEB (cont'd)

Vertical, Indoor or Outdoor, Air Turnover Unit with Optional Heating, Cooling and Ventilation

DESCRIPTION (cont'd)

Heating only units have expanded metal screens on discharge, grilles are optional. In addition to natural gas, LP and fuel oil, Model AEB can be fitted for steam, hot water or electric coils for heating. For outdoor units an interior trapezoidal shaped discharge section can be provided to distribute air inside the building. The discharge is double lined with two inch thick insulation and perforated liner. Discharge section acoustically attenuates airborne noise. Diffuser screens are located on the font of the discharge. The discharge plenum is equipped with single or double adjustable air double deflection airfoil type blades.

The remote control enclosure can include: 10 point circuit analyzer, return and/or discharge smoke detector(s), and seven day time clock with night stat.

Other optional equipment include: a full OSHA approved service platform for complete access to burner and gas manifold, bearings equipped with automatic greasing canisters

STANDARD FEATURES

- Hinged access doors with stainless steel piano hinges, compression latches and safety switch
- Numbered control wiring, terminal strip and component identification labels
- EEPAC high efficiency fan motor with adjustable 1.5 s.f. V-Belt drive
- Control transformer with service switch and circuit breaker
- All wiring external to control cabinet within BX cable or conduit
- Induced draft blower
- ETL certified ANSI gas train, flame monitoring and safety controls
- Dead front fused disconnect switch
- Spark igniter and flame rectification
- Fan and high limit switch
- Industrial, four-pass, 409 stainless steel primary and secondary heat exchangers
- PowerFlame™ forced draft industrial burner provides excellent combustion with low maintenance
- Fireye™ flame safeguard provides the safest and most reliable flame monitoring available
- Maxitrol™ regulators
- Hydraulic main gas safety shut-off valve
- Standard Dead-front Safety Disconnect Switch
- Welded structural iron frame, primed with epoxy rust inhibitor
- Galvanealed zinc rich "paint grip" 18 gauge sheet metal
- Industrial alkyd enamel machine gray 3 mil thick casing finish
- Expanded metal inlet/discharge screen (recommended for heating applications)
- Two inch thick Insulated casing with perforated "sound trap" liner in fan deck
- Units supplied with cooling include the sound attenuation feature as standard
- Units supplied without heat exchanger include transition section with sound attenuated construction
- Cooling units are provided with adjustable supply air grilles as standard
- Hinged fan/motor access doors
- High efficiency six bladed airfoil turbine props

FACTORY INSTALLED OPTIONS

- Electric, hot water or steam heating coils
- Sealed combustion duct connection
- Factory Mutual (FM) or Industrial Risk Insurers (IRI) gas train with hydraulic shut-off valve and controls
- 304 stainless steel primary and secondary heat exchangers (or 304 primary with a 409 secondary stainless steel heat exchanger)
- On/off, two stage or full modulation burner forced draft burner
- TEFC, high efficiency or two-speed motors
- Variable frequency drives
- Nema 4 or 12 control enclosure
- Remote control enclosure
- 10 point circuit analyzer
- Return and/or discharge smoke detector(s)
- Sound attenuation
- Automatic greasing canisters
- Vibration isolation; spring or RIS
- Extended grease lines
- Epoxy paint finish
- Special materials of construction
- Automatic Greasing Canisters
- Custom paint color
- Two inch thick insulation with perforated liner in top of discharge section
- Heating unit have expanded metal screens on discharge, grilles
- Low leak aluminum airfoil dampers operated with direct drive actuators.
- Low leak insulated aluminum airfoil dampers designed for operation down to -40°F
- Blades are to be internally insulated with expanded polyurethane foam and thermally broken - the complete blade shall have an insulating factor of R-2.29 and temperature index of 55.
- Automatic greasing canisters for bearings
- Greasing canisters with pump driven microprocessor

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Model AEB (cont'd)

Vertical, Indoor or Outdoor, Air Turnover Unit with Optional Heating, Cooling and Ventilation

FIELD INSTALLED OPTIONS

- Single or multiple discharge/inlet openings
- 20% outdoor inlet opening with motorized damper
- Full mix box with 100% outside air capability. Available with two position summer/winter ventilation mode or integrated modulating economizer.
- Indoor/outdoor construction
- Flat filters or V-Bank filter section with pleated filters and hinged access doors
- Direct expansion or chilled water cooling coils available in blow through or draw through arrangements
- Mix box section with motorized dampers
- Full occupied/unoccupied seven day programmability
- Complete temperature control packages including DDC interfacing or computer control
- D/X cooling, chilled water, steam, hot water and electric coils
- Seven day time clock with night stat
- Cooling Coil Section
  - Double wall construction
  - Insulated with (1) (2) inch thick fiberglass insulation.
  - The plenum shall feature a double sloped 304 stainless steel, 18 gauge (minimum), continuously TIG welded condensate pan with drain
  - Multiple coils shall be stacked vertically and include intermediate drain pans
  - Coils constructed of 0.020 in. minimum copper tube wall thickness
  - Minimum 0.006 in. thick aluminum sheet fins
  - Coil bypass with manual adjustment damper.
- Discharge Section with Cooling Coil
  - Double lined with two inch thick insulation and perforated liner in top discharge section
  - Sound attenuation in discharge air section
  - Minimum 2 in. thick steel blades painted with industrial paint to match unit
  - Each blade shall be individually adjustable
  - Dual bank of airfoil type blades for vertical and horizontal air diffusion control
- Outside Air Plenum
  - Inlet plenum designed to prevent water from entering the unit.
  - Exterior wall mounted plenum color finish to match building colors
  - Wall mount flange with gasket runs the perimeter of the inlet plenum.
  - Inlet plenum with expanded metal
- Integral Service Platform with Ladder
  - OSHA approved service platform for complete access to burner and gas manifold
  - Service platform includes 12 gauge expanded metal screen and a welded 3 in. structural iron frame
  - Four in. high kick plate and locking chains.
  - OSHA approved ladder with hand guide rails and concrete securing feet
- Discharge Section
  - Trapezoidal shaped discharge section shall be provided to distribute air inside the building (for outdoor units)
  - Double lined with two inch thick insulation and perforated liner
  - Sound attenuation
  - Diffuser screens located on the font of the discharge
  - Single or double adjustable air double deflection airfoil type blades.
- Humidification Plenum
  - Internal liner constructed of minimum 22 gauge G90 galvanized steel
  - Humidifier mounted, wired and tested from the factory.
  - Gas to steam microprocessor control
- "Oil Mist" Filtration
  - Two stages of filtration
  - Primary: flat filter back with Farr ECO™ four inch thich filters with a drain trough connected to common drain pipe
  - Secondary: Two inch thick 30% efficient pleated filters.

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THE AIR TURNOVER SOLUTION

THE PROBLEM: STRATIFICATION

The physical properties of air dictate that hot air is lighter than cold air and consequently hot air has a tendency to rise while cold air tends to fall. These fundamental laws, while basic, have a direct negative impact when applied to industrial heating applications.

Industrial buildings typically entail large areas of several thousand square feet with a 20 foot or greater ceiling height. As the cold air in the space migrates to the floor it forces the lighter hot air to the ceiling where it becomes trapped. Consequently stratification occurs from the floor to the ceiling and then taking into account the heat associated with the building light source and process heat operations, the problem only escalates. With this in mind, ceiling temperatures could conceivably be in excess of 125°F while the individual work areas at ground level will experience temperature swings. Conditions of this nature will waste energy and cause the facility occupants to be extremely uncomfortable.

THE TRADITIONAL SOLUTION

Increasing the building's heating equipment capacity would seem to be an obvious solution if applied directly at the individual work areas. However this solution does not address the energy loss issues attributed to the high temperature conditions that exist at the ceiling level due to stratification. In fact, this solution would only increase both installed cost and operating cost dramatically.

THE AIR TURNOVER SOLUTION

A better idea. By capturing and recirculating the hot air trapped at the ceiling level, and then forcing it back into the work area, additional energy use can be avoided, dramatically reducing both installed cost and operating cost.

By continuously circulating a high volume of air and heating it to achieve a low temperature rise, the entire volume of air within the space can be recirculated (usually several times in a relatively short period of time). As shown in the illustration below, cool air at the floor level is drawn in through the return air plenum. Axial fans redirect the air upward across an indirect fired heat exchanger where the air is tempered slightly. The tempered air is then discharged at a low velocity at the top of the unit through a screened discharge plenum. This air is discharged back into the space developing a gentle air flow pattern, displacing the hot air at the ceiling and returning it to the floor level, eliminating the need for costly duct systems. This reduces the stratified layer and vertical temperature gradient associated with it, as well as doing an excellent job of harnessing the energy of building light source and other heat producing operations. This can amount to a significant savings.

Uniform space temperatures

- Uniform space temperatures provide more comfort and reduced building stratification.
- Heat loss and fuel consumption are reduced to a minimum with even space temperatures.

Reduced operating costs

- The highly efficient propeller fan provides the lowest electrical consumption to distribute air throughout a building.
- Outside air is not required for operation, the air turnover unit can recirculate up to 100% space air.

Lower installation costs

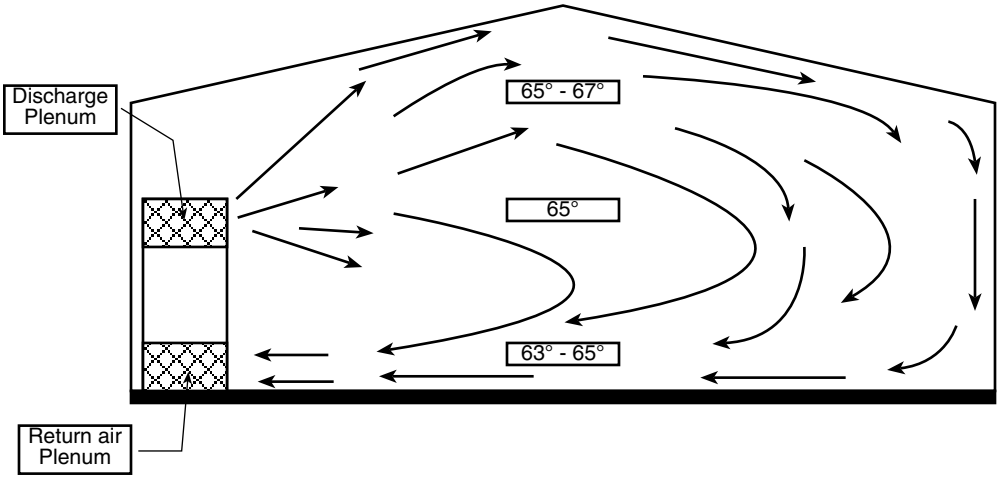
- Base mounted air turnover units relatively simple to stack and wire.
- The units do not have to be hung or supported and do not require ductwork.

Rapid temperature recovery

- Air turnover units constantly circulate large volumes of air providing rapid response to temperatures deviating from a set-point.

Outstanding indoor air quality (IAQ)

- Air is constantly rotated throughout the building to prevent stagnation.



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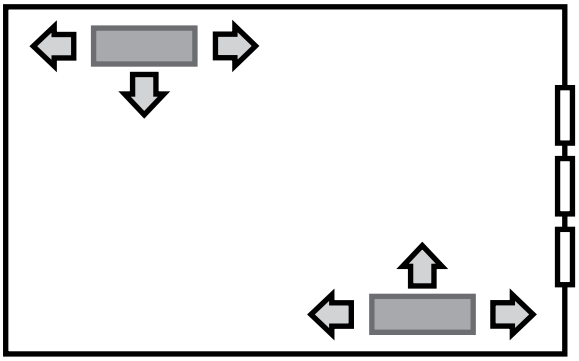
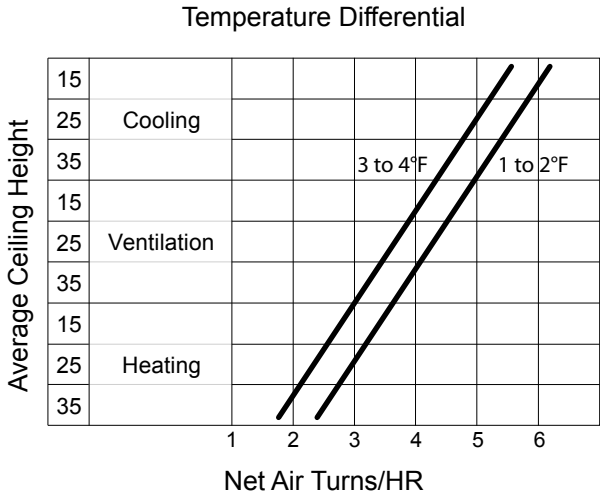
UNIT SELECTION



Typical Unit Layout



Recommended Air Turns

Air turnover units are extremely effective at heating and cooling large buildings. Few units are required to cover vast spaces and provide even temperatures throughout. High levels of inventory and storage have very little effect on performance.

Since air turnover system requires no discharge ductwork the units can virtually be placed anywhere. When located near dock doors air turnover units provide quick recovery to infiltration.

Typical Selection

1. Determine building volume
2. Subtract expected inventory to determine net volume
3. Select recommended air turns based on the above chart
4. Calculate total air volume required
5. Using standard ASHRAE methods determine building heat loss
6. Select quantity of units required
7. Select Reznor model required

Example-Heating application

Building dimensions (L x W x H).

300’ x 200’ x 30’ = 1,800,000 cu. ft.

Expected inventory displaces approximately 20% of building volume.

1,800,000 - (1,800,000 x 0.2) = 1,440,000 cu. ft.

Select recommended air turns/hour, from chart above.

2.3

Total air capacity: Net Building Volume x Air Turns/Hr ÷ 60 Min/Hr = CFM

1,440,000 cu. ft. x 2.3 Air Turns/HR ÷ 60 Min/Hr = 55,200 CFM

Building heat loss = 1,600,000 BTUH

Unit selection from Performance Tables

55,200 CFM requires Model AEB54

1,600,000 BTUH, select heat exchanger size 175 (175,000 BTUH)

Model AEB54-175

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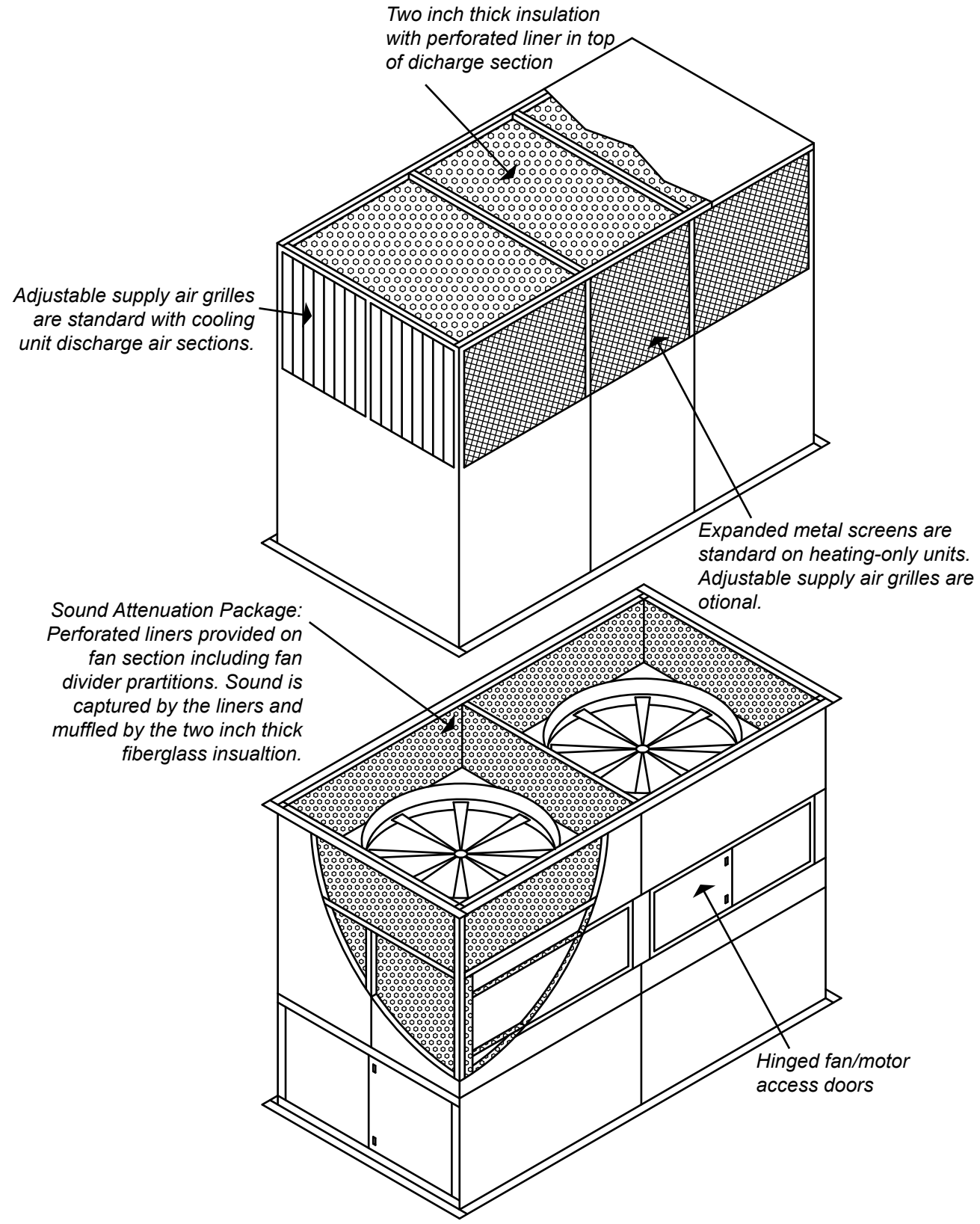
SOUND ATTENUATION

Optional sound attenuation features are available on all Model AEB units.

Units with cooling coil sections include sound attenuation features standard



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PERFORMANCE TABLES

Air Volume and Heating Capacities

All capacities are ETL™ certified.

SIZE	SCFM RANGE	FAN QTY.	FAN DIAMETER (INCHES)	FAN HP			HEAT OUTPUT (MBH)
				W/O FILTERS	W/ FILTERS	W/ COOLING	
124	3,250 - 4,000	1	24	1/2	3/4	1	200 TO 300
	4,001 - 5,000		24	3/4	1	1 1/2	
	5,001 - 7,000		24	1	1 1/2	2	
130	4,501 - 6,000	1	24	1	1 1/2	2	350 TO 400
	6,001 - 7,500		30	1	1 1/2	3	
	7,501 - 9,000		30	1 1/2	2	3	
142	9,001 - 11,000	1	36	1 1/2	2	3	450 TO 550
	11,001 - 15,000		42	2	3	5	
	15,001 - 18,000		42	3	5	5	
148	18,001 - 20,000	1	48	3	5	7 1/2	650 TO 1,000
	20,001 - 22,500		48	3	5	7 1/2	
	22,501 - 24,500		48	3	5	7 1/2	
154	24,501 - 26,000	1	48	5	5	7 1/2	750 TO 1,000
	25,001 - 29,000		54	5	7 1/2	10	
	29,001 - 32,000		54	5	7 1/2	10	
160	32,001 - 36,000	1	60	5	5	10	1,250 TO 2,500
	36,001 - 42,500		60	5	7 1/2	15	
	42,501 - 50,000		60	7 1/2	10	15	
SIZE	CFM	FAN QTY.	FAN DIAMETER (INCHES)	FAN HP			HEAT OUTPUT (MBH)
				W/O FILTERS	W/ FILTERS	W/ COOLING	
224	8,000	2	24	1/2	3/4	1	200 TO 400
	10,000			1/2	3/4	1	
	14,000			3/4	1	1 1/2	
230	12,000	2	24	1/2	3/4	1	500 TO 750
	15,000		30	3/4	1	1 1/2	
	18,000		30	1	1 1/2	2	
242	22,000	2	36	1 1/2	2	3	850 TO 1,250
	30,000		42	2	3	5	
	36,000		42	3	5	7 1/2	
248	40,000	2	48	2	3	5	1,500 TO 2,000
	45,000			3	5	7 1/2	
	50,000			3*	5	7 1/2	
254	50,000	2	54	3	5	7 1/2	2,250 TO 2,750
	60,000			5	7 1/2	10	
	65,000			5	7 1/2	10	
260	72,000	2	60	5	7 1/2	10	125 TO 6,000
	85,000			7 1/2	10	15	
	100,000			10	15	15	
360	92,000	3	60	5	7 1/2	10	125 TO 6,000
	130,000			7 1/2	10	15	
	150,000			10	15	15	

Notes:

1. ***Heat exchanger performance 80% efficient minimum.***
2. ***Maximum furnace size shown for each model, smaller furnaces can be selected.***
3. ***Contact your Reznor Representative for oil, LP and combination unit performance specifications***

* ***Requires larger propeller (supplied).***

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PERFORMANCE TABLE (cont'd)

Heating Selection Data for Single Propeller Units (Sizes 124 - 160)

HEAT EXCHANGER SIZE	HEAT OUTPUT (BTUH)	OPTIONAL DRAFT INDUCER BLOWER MOTOR HP	BURNER HP		GAS CONNECTION SIZE		STACK SIZE (IN.)
			GAS	OIL	8-14" W.C.	1-5 PSI	
20	200,000	1/2	1/6	1/3	1	1	8
30	300,000	1/2	1/3	1/3	1	1	8
40	400,000	1/2	1/3	1/3	1	1	8
50	500,000	1/2	1/3	1/3	1	1	8
65	650,000	1/2	1/3	1/3	1 1/4	1	10
75	750,000	1/2	1/3	1/3	1 1/4	1 1/4	10
85	850,000	1/2	1/3	1/3	1 1/2	1 1/4	10
100	1,000,000	1/2	1/3	1/3	1 1/2	1 1/4	10
125	1,250,000	1 1/2	1/2	1	1 1/4	1 1/2	12
150	1,500,000	1 1/2	1/2	1	1 1/2	1 1/2	12
175	1,750,000	1 1/2	1/2	1	1 1/4	1 1/4	12
200	2,000,000	2	1	2	2	1 1/2	14
250	2,500,000	2	1	2	2	2	16

Heating Selection Data for Double or Triple Propeller Units (Sizes 224 - 360)

HEAT EXCHANGER SIZE	HEAT OUTPUT (BTUH)	OPTIONAL DRAFT INDUCER BLOWER MOTOR HP	BURNER HP		GAS CONNECTION SIZE		STACK SIZE (IN.)
			GAS	OIL	8-14" W.C.	1-5 PSI	
20	200,000	1/2	1/6	1/3	1	1	8
30	300,000	1/2	1/3	1/3	1	1	8
40	400,000	1/2	1/3	1/3	1	1	8
50	500,000	1/2	1/3	1/3	1	1	8
65	650,000	1/2	1/3	1/3	1 1/4	1 1/4	10
75	750,000	1/2	1/3	1/3	1 1/4	1 1/4	10
85	850,000	1/2	1/3	1/3	1 1/2	1 1/4	10
100	1,000,000	1/2	1/3	1/3	1 1/2	1 1/4	10
125	1,250,000	1 1/2	1/2	1	1 1/4	1 1/4	12
150	1,500,000	1 1/2	1/2	1	1 1/2	1 1/2	12
175	1,750,000	1 1/2	1/2	1	2	1 1/2	12
200	2,000,000	2	1	2	1 1/2	1 1/2	14
225	2,250,000	2	1	2	1 1/2	1 1/2	14
250	2,500,000	2	1	2	2	1 1/2	14
275	2,750,000	3	1 1/2	2	2 1/2	2	16
300	3,000,000	3	1 1/2	2	2 1/2	2	16
325	3,250,000	3	1 1/2	2	2 1/2	2	16
350	3,500,000	3	3	3	2 1/2	2	16
400	4,000,000	3	3	3	3	2	16
425	4,250,000	3	3	3	3	2	16
500	5,000,000	5	5	5	3	3	18
550	5,500,000	5	5	5	3	3	18
600	6,000,000	5	5	5	3	3	18

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PERFORMANCE TABLE (cont'd)

Cooling Capacities

SIZE	AIRFLOW CAPACITY CFM	NOMINAL COOLING TONS	COIL AIRFLOW		COIL PERFORMANCE			
			BYPASS CFM	NET CFM	TOTAL MBH	SENSIBLE MBH	LAT DB / WB	APD IN. W.C.
124	3,250 - 4,000	7.5	1,000	3,000	91	67	58/56	0.27
	4,001 - 5,000	10	1,000	4,000	120	90	57/56	0.3
	5,001 - 7,000	12	2,000	5,000	148	104	59/57	0.22
130	4,501 - 6,000	12	1,000	5,000	144	101	59/57	0.25
	6,001 - 7,500	15	1,500	6,000	180	129	58/56	0.25
	7,501 - 9,000	18	2,000	7,000	223	160	57/56	0.3
142	9,001 - 11,000	20	3,000	8,000	242	172	58/56	0.27
	11,001 - 15,000	25	4,000	10,000	302	209	59/56	0.23
	15,001 - 18,000	30	6,000	12,000	370	258	58/56	0.27
148	18,001 - 20,000	40	4,000	16,000	481	341	58/56	0.29
	20,001 -22,500	45	4,500	18,000	552	380	58/56	0.25
	22,501 - 24,500	50	4,500	20,000	601	415	58/56	0.27
154	24,501 - 26,000	55	4,000	22,000	663	446	58/56	0.29
	25,001 - 29,000	60	5,000	24,000	686	484	59/57	0.27
	29,001 - 32,000	65	6,000	26,000	801	567	58/56	0.33
160	32,001 - 36,000	70	8,000	28,000	846	611	58/56	0.32
	36,001 - 42,500	80	10,000	32,500	965	697	58/56	0.31
	42,501 - 50,000	100	10,000	40,000	1,214	825	58/56	0.32

SIZE	AIRFLOW CAPACITY CFM	NOMINAL COOLING TONS	COIL AIRFLOW		COIL PERFORMANCE				FAN HP		
			BYPASS CFM	NET CFM	TOTAL MBH	SENSIBLE MBH	LAT DB / WB	APD IN. W.C.	FL IN.	FH IN.	QTY
224	8,000	16	0	8,000	194	141	62 / 58	0.34	68	18	2
	10,000	21	0	10,000	250	182	61 / 58	0.3		24	2
	14,000	30	0	14,000	360	262	61 / 58	0.28		33	2
230	12,000	20	0	12,000	240	177	64 / 60	0.32	88	16	2
	15,000	30	0	15,000	360	264	62 / 58	0.27		30	2
	18,000	40	0	18,000	480	348	60 / 57	0.34		33	2
242	22,000	40	0	22,000	480	350	63 / 59	0.27	98	36	2
	30,000	60	0	30,000	720	560	61 / 58	0.34		48	2
	36,000	70	0	36,000	840	615	62 / 58	0.3		54	2
248	40,000	80	8,000	32,000	960	673	59 / 56	0.31	110	48	2
	45,000	90	9,000	36,000	1080	765	56 / 55	0.35		51	2
	50,000	100	10,000	40,000	1200	865	58 / 56	0.34		54	2
254	50,000	100	10,000	40,000	1200	865	58 / 56	0.34	130	48	2
	60,000	120	12,000	48,000	1440	1038	58 / 56	0.36		57	2
	65,000	130	13,000	52,000	1560	1135	58 / 56	0.36		30	4
260	72,000	140	16,000	56,000	1680	1225	58 / 56	0.34	169	54	2
	85,000	170	17,000	68,000	2040	1432	59 / 56	0.31		33	4
	100,000	200	20,000	80,000	2400	1680	59 / 56	0.31		39	4

Notes:
- ***Performance based on 78°F DB & 66°F WB entering air***
- ***Saturated suction temperatures of 45°F using R-22 Refrigerant***

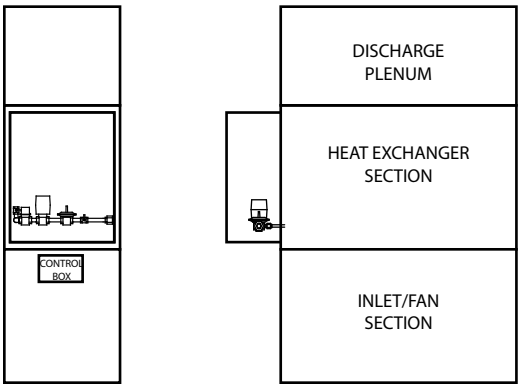
REZNOR®

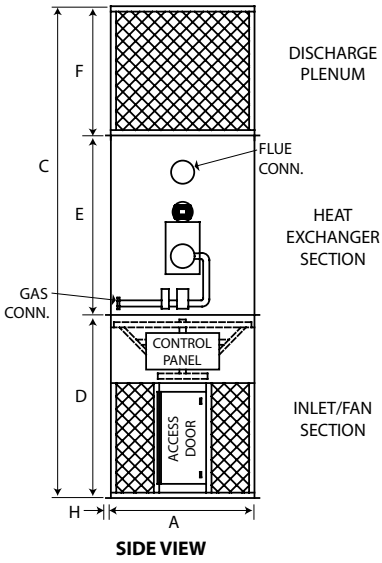
DIMENSIONS

AEB Basic Vertical Unit (Indoor)

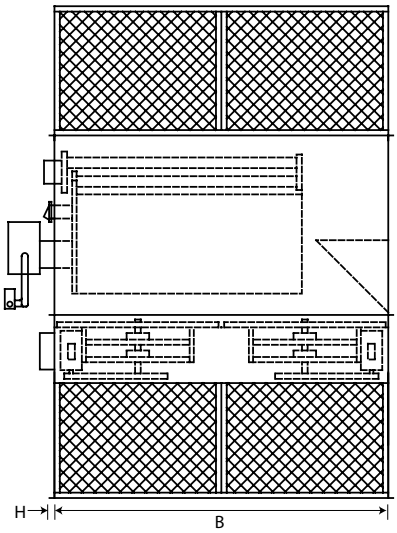
Inlet Fan Section, Heat Exchanger Section and Discharge Plenum only

±1/8" (3mm)





SIDE VIEW



FRONT VIEW

Dimensions ±1"

Size	Heating Output MBH Range	A¹	A²	B¹	B²	C 1-WAY w/ Heating	C 1-WAY w/o Heating	C 2,3,4-WAY w/ Heating	C 2,3,4-WAY w/o Heating	D	E w/ Heating	E w/o Heating	F 1-WAY	F 2,3,4-WAY	H	Weight** lbs.	Flat Filter Qty - Size
124	200-300	39	39	41	41	139	140	134	135	72	47	48	20	15	-	1500	16 - 20x25
130	350-400	45	45	61	61	152	145	147	140	72	55	48	25	20	-	1800	20 - 20x25
142	450-550	57	57	71	71	180	166	170	156	78	62	48	40	30	-	2400	28 - 16x25
148	650-750	63	63	91	91	195	171	185	161	78	72	48	45	35	-	2900	28 - 20x25
154	850-750	70	70	91	91	212	188	204	180	92	72	48	48	40	-	5000	32 - 20x25
160	1,250-1,750	80	80	111	111	246	210	231	195	102	84	48	60	45	-	5900	48 - 16x25
	2,000-2,500	80	80	131	131	262	210	247	195	102	100	48	60	45	-	6700	52 - 16x25
224	200-400	35	39	70	84	149	150	143	144	72	47	48	30	24	1 3/4	2,200	16 - 20x25
230	450-750	41	45	82	104	163	156	157	150	72	55	48	36	30	1 3/4	2,600	20 - 20x25
242	650-1,250	53	57	106	114	190	176	180	166	78	62	48	50	40	1 3/4	3,600	26 - 20x25
248	650-2,000	59	63	118	126	205	181	194	170	78	72	48	55	44	1 3/4	4,350	32 - 20x25
254	850-2,750	65	70	130	146	222	198	212	188	92	72	48	58	48	1 3/4	7,525	42 - 20x25
260	1,250-2,500	72	80	144	185	258	222	246	210	102	84	48	72	60	2 3/4	8,875	63 - 20x25
360	1,750-3,250	75	85	216	225	276	240	246	210	102	84	48	90	60	2 3/4	10,400	68 - 20x25*
	3,500-4,250	75	85	216	225	292	240	262	210	102	100	48	90	60	2 3/4	12450	68 - 20x25*

Dimensions (±25mm)

Size	Heating Output MBH Range	A¹	A²	B¹	B²	C 1-WAY w/ Heating	C 1-WAY w/o Heating	C 2,3,4-WAY w/ Heating	C 2,3,4-WAY w/o Heating	D	E w/ Heating	E w/o Heating	F 1-WAY	F 2,3,4-WAY	H	Weight** (kg)	Flat Filter Qty - Size
124	200-300	(991)	(991)	(1,041)	(1,041)	(3,531)	(3,556)	(3,404)	(3,429)	(1,829)	(1,194)	(1,219)	(508)	(381)	-	(680)	16 - 20x25
130	350-400	(1,143)	(1,143)	(1,549)	(1,549)	(3,861)	(3,683)	(3,734)	(3,556)	(1,829)	(1,397)	(1,219)	(635)	(508)	-	(816)	20 - 20x25
142	450-550	(1,448)	(1,448)	(1,803)	(1,803)	(4,572)	(4,216)	(4,318)	(3,962)	(1,981)	(1,575)	(1,219)	(1,016)	(762)	-	(1,089)	28 - 16x25
148	650-750	(1,600)	(1,600)	(2,311)	(2,311)	(4,953)	(4,343)	(4,699)	(4,089)	(1,981)	(1,829)	(1,219)	(1,143)	(889)	-	(1,315)	28 - 20x25
154	850-750	(1,778)	(1,778)	(2,311)	(2,311)	(5,385)	(4,775)	(5,182)	(4,572)	(2,337)	(1,829)	(1,219)	(1,219)	(1,016)	-	(2,268)	32 - 20x25
160	1,250-1,750	(2,032)	(2,032)	(2,819)	(2,819)	(6,248)	(5,334)	(5,867)	(4,953)	(2,591)	(2,134)	(1,219)	(1,524)	(1,143)	-	(2,676)	48 - 16x25
	2,000-2,500	(2,032)	(2,032)	(3,327)	(3,327)	(6,655)	(5,334)	(6,274)	(4,953)	(2,591)	(2,540)	(1,219)	(1,524)	(1,143)	-	(3,039)	52 - 16x25
224	200-400	(889)	(991)	(1,778)	(2,134)	(3,785)	(3,810)	(3,632)	(3,658)	(1,829)	(1,194)	(1,219)	(762)	(610)	(44)	(998)	16 - 20x25
230	450-750	(1,041)	(1,143)	(2,083)	(2,642)	(4,140)	(3,962)	(3,988)	(3,810)	(1,829)	(1,397)	(1,219)	(914)	(762)	(44)	(1,179)	20 - 20x25
242	650-1,250	(1,346)	(1,448)	(2,692)	(2,896)	(4,826)	(4,470)	(4,572)	(4,216)	(1,981)	(1,575)	(1,219)	(1,270)	(1,016)	(44)	(1,633)	26 - 20x25
248	650-2,000	(1,499)	(1,600)	(2,997)	(3,200)	(5,207)	(4,597)	(4,928)	(4,318)	(1,981)	(1,829)	(1,219)	(1,397)	(1,118)	(44)	(1,973)	32 - 20x25
254	850-2,750	(1,651)	(1,778)	(3,302)	(3,708)	(5,639)	(5,029)	(5,385)	(4,775)	(2,337)	(1,829)	(1,219)	(1,473)	(1,219)	(44)	(3,413)	42 - 20x25
260	1,250-2,500	(1,829)	(2,032)	(3,658)	(4,699)	(6,553)	(5,639)	(6,248)	(5,334)	(2,591)	(2,134)	(1,219)	(1,829)	(1,524)	(70)	(4,026)	63 - 20x25
360	1,750-3,250	(1,905)	(2,159)	(5,486)	(5,715)	(7,010)	(6,096)	(6,248)	(5,334)	(2,591)	(2,134)	(1,219)	(2,286)	(1,524)	(70)	(4,717)	68 - 20x25*
	3,500-4,250	(1,905)	(2,159)	(5,486)	(5,715)	(7,417)	(6,096)	(6,655)	(5,334)	(2,591)	(2,540)	(1,219)	(2,286)	(1,524)	(70)	(5,647)	68 - 20x25*

Notes:
Sections ship separately for field assembly.
For heating sizes larger than 6,000 MBH, contact your Reznor Representative.
A¹ and B¹ are dimensions for Model AEB without filters.
A² and B² are dimensions for Model AEB with flat filters.
Extended duct sections are available. These vertical sections can be placed between the heat exchanger and the discharge plenum. Custom sizes are available between 36" and 102" (914mm and 2,591mm). See your Reznor Representative for details.
**** Size 360 flat filter back not to exceed 130,000 CFM.***
*****Weights given are for units with heat exchangers. For weight of unit without heat exchanger, contact your Reznor Representative.***

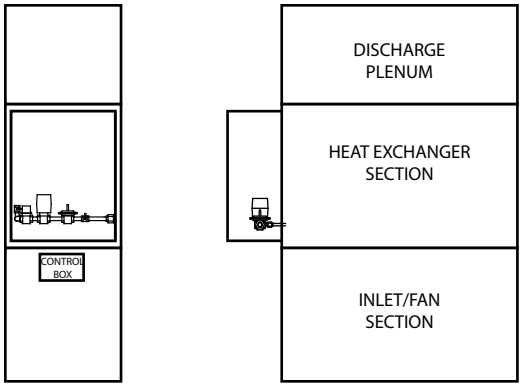
REZNOR®

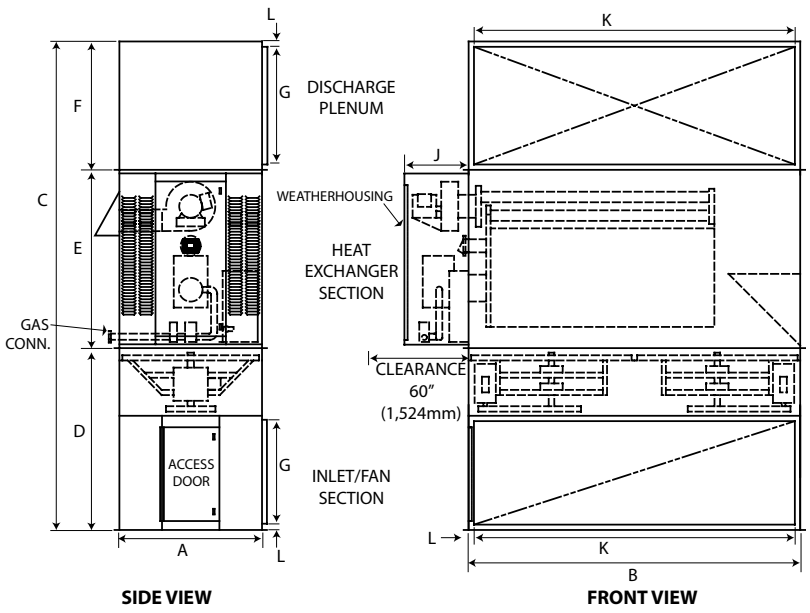
DIMENSIONS (cont'd)

AEB Basic Vertical Unit (Outdoor)

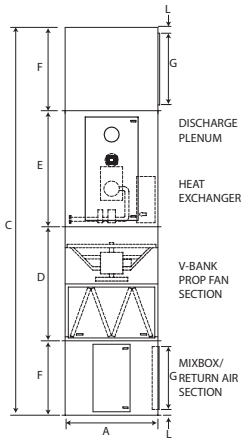
Inlet Fan Section, Heat Exchanger Section and Discharge Plenum only

±1/8" (3mm)





SIDE VIEW **FRONT VIEW**



SIDE VIEW SINGLE PROP UNIT

Dimensions ±1"

Size	Heating Output MBH Range	A	B	C w/ Heating	C w/o Heating	D	E w/ Heating	E w/o Heating	F	G	J	K	L	Weight Lbs.
124	200-300	39	41	172	173	65	47	48	30	20	30	31	5	1,500
130	350-400	45	61	180	173	65	55	48	30	20	30	51	5	1,800
142	450-550	57	71	232	218	70	62	48	50	40	30	61	5	2,400
148	650-750	63	91	247	223	75	72	48	50	40	32	81	5	2,900
154	850-750	70	91	267	243	75	72	48	60	50	32	81	5	5,000
160	1,250-1,750	80	111	302	266	78	84	48	70	60	36	101	5	5,900
	2,000-2,500	80	131	318	266	78	100	48	70	60	36	121	5	6,700
224	200-400	35	70	149	150	72	47	48	30	24	30	64	3	2,200
230	450-750	41	82	163	156	72	55	48	36	30	30	76	3	2,600
242	650-1,250	53	106	190	176	78	62	48	50	44	30	100	3	3,600
248	650-2,000	59	118	205	181	78	72	48	55	49	32	112	3	4,350
254	850-2,750	65	130	222	198	92	72	48	58	52	32	124	3	7,525
260	1,250-2,500	72	144	258	222	102	84	48	72	66	36	138	3	8,875
360	1,750-3,250	75	216	276	240	102	84	48	90	84	36	210	3	10,400
	3,000-4,250	75	216	292	240	102	100	48	90	84	36	210	3	12,450

Dimensions (±25mm)

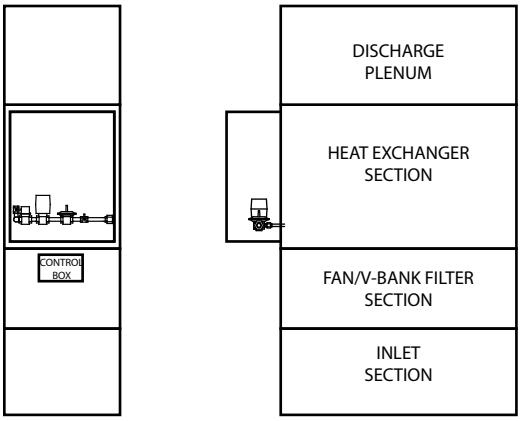
Size	Heating Output MBH Range	A	B	C w/ Heating	C w/o Heating	D	E w/ Heating	E w/o Heating	F	G	J	K	L	Weight (kg)
124	200-300	(991)	(1,041)	(4,369)	(4,394)	(1,651)	(1,194)	(1,219)	(762)	(508)	(762)	(787)	(127)	(680)
130	350-400	(1,143)	(1,549)	(4,572)	(4,394)	(1,651)	(1,397)	(1,219)	(762)	(508)	(762)	(1,295)	(127)	(816)
142	450-550	(1,448)	(1,803)	(5,893)	(5,537)	(1,778)	(1,575)	(1,219)	(1,270)	(1,016)	(762)	(1,549)	(127)	(1,089)
148	650-750	(1,600)	(2,311)	(6,274)	(5,664)	(1,905)	(1,829)	(1,219)	(1,270)	(1,016)	(813)	(2,057)	(127)	(1,315)
154	850-750	(1,778)	(2,311)	(6,782)	(6,172)	(1,905)	(1,829)	(1,219)	(1,524)	(1,270)	(813)	(2,057)	(127)	(2,268)
160	1,250-1,750	(2,032)	(2,819)	(7,671)	(6,756)	(1,981)	(2,134)	(1,219)	(1,778)	(1,524)	(914)	(2,565)	(127)	(2,676)
	2,000-2,500	(2,032)	(3,327)	(8,077)	(6,756)	(1,981)	(2,540)	(1,219)	(1,778)	(1,524)	(914)	(3,073)	(127)	(3,039)
224	200-400	(889)	(1,778)	(3,785)	(3,810)	(1,829)	(1,194)	(1,219)	(762)	(610)	(762)	(1,626)	(76)	(998)
230	450-750	(1,041)	(2,083)	(4,140)	(3,962)	(1,829)	(1,397)	(1,219)	(914)	(762)	(762)	(1,930)	(76)	(1,179)
242	650-1,250	(1,346)	(2,692)	(4,826)	(4,470)	(1,981)	(1,575)	(1,219)	(1,270)	(1,118)	(762)	(2,540)	(76)	(1,633)
248	650-2,000	(1,499)	(2,997)	(5,207)	(4,597)	(1,981)	(1,829)	(1,219)	(1,397)	(1,245)	(813)	(2,845)	(76)	(1,973)
254	850-2,750	(1,651)	(3,302)	(5,639)	(5,029)	(2,337)	(1,829)	(1,219)	(1,473)	(1,321)	(813)	(3,150)	(76)	(3,413)
260	1,250-2,500	(1,829)	(3,658)	(6,553)	(5,639)	(2,591)	(2,134)	(1,219)	(1,829)	(1,676)	(914)	(3,505)	(76)	(4,026)
360	1,750-3,250	(1,905)	(5,486)	(7,010)	(6,096)	(2,591)	(2,134)	(1,219)	(2,286)	(2,134)	(914)	(5,334)	(76)	(4,717)
	3,000-4,250	(1,905)	(5,486)	(7,417)	(6,096)	(2,591)	(2,540)	(1,219)	(2,286)	(2,134)	(914)	(5,334)	(76)	(5,647)

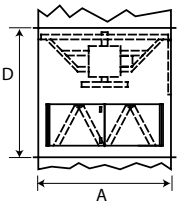
REZNOR®

DIMENSIONS (cont'd)

Fan/V-Bank Filter Section

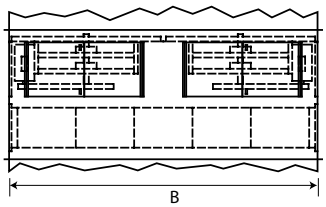
±1/8" (3mm)





FAN/V-BANK SECTION

SIDE VIEW



FRONT VIEW

SIZE	A	B	D	V-BANK FILTER QTY - SIZE
124	39	41	65	6 - 20X25
130	45	61	65	9 - 20X25
142	57	71	70	5 - 20X20 10 - 20X25
148	63	91	75	5 - 16X20 15 - 20X25
154	70	91	75	6 - 16X25 18 - 25X25
160	80	111	78	7 - 20X25 42 - 16X25
	80	131	78	7 - 20X25 42 - 16X25
224	39	84	65	12 - 20X25
230	45	104	65	15 - 20X25
242	57	114	70	20 - 20X25
248	63	126	75	30 - 20X25
254	70	146	75	40 - 20X25
260	80	185	78	63 - 20X25
360	85	225	78	90 - 20X25
	85	225	78	90 - 20X25

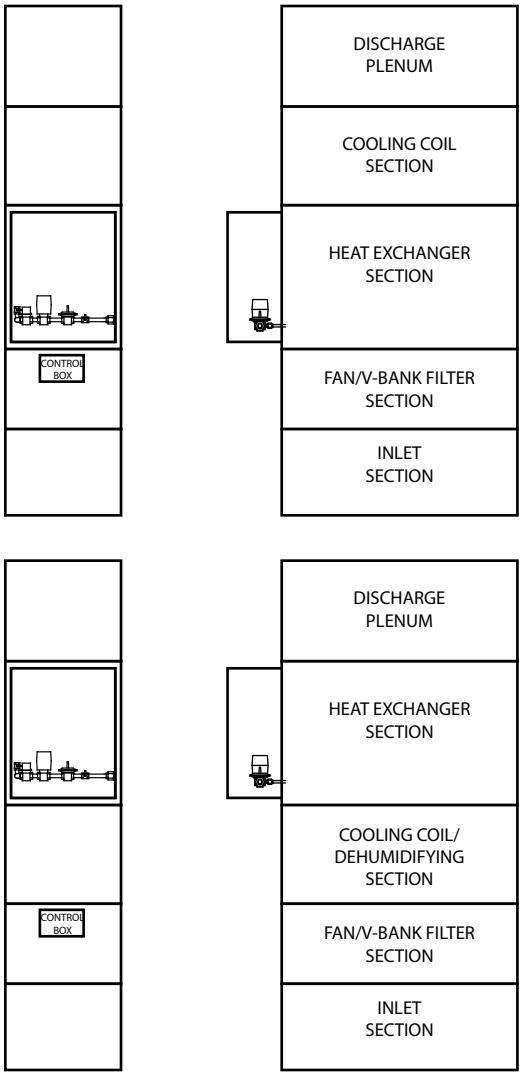
SIZE	A	B	D	V-BANK FILTER QTY - SIZE
124	(991)	(1,041)	(1,651)	6 - 20X25
130	(1,143)	(1,549)	(1,651)	9 - 20X25
142	(1,448)	(1,803)	(1,778)	5 - 20X20 10 - 20X25
148	(1,600)	(2,311)	(1,905)	5 - 16X20 15 - 20X25
154	(1,778)	(2,311)	(1,905)	6 - 16X25 18 - 25X25
160	(2,032)	(2,819)	(1,981)	42 - 16X25
	(2,032)	(3,327)	(1,981)	7 - 20X25 42 - 16X25
224	(991)	(2,134)	(1,651)	12 - 20X25
230	(1,143)	(2,642)	(1,651)	15 - 20X25
242	(1,448)	(2,896)	(1,778)	20 - 20X25
248	(1,600)	(3,200)	(1,905)	30 - 20X25
254	(1,778)	(3,708)	(1,905)	40 - 20X25
260	(2,032)	(4,699)	(1,981)	63 - 20X25
360	(2,159)	(5,715)	(1,981)	90 - 20X25
	(2,159)	(5,715)	(1,981)	90 - 20X25

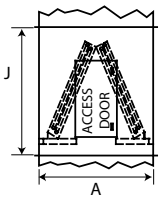
REZNOR®

DIMENSIONS (cont'd)

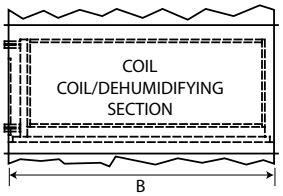
Cooling - Cooling/Dehumidifying Section

±1/8" (3mm)





SIDE VIEW



FRONT VIEW

SIZE	A	B	J	MAX. COIL SIZE X 2
124	39	41	42	35 X 23
130	45	61	48	30 X 43
142	57	71	60	40 X 53
148	63	91	66	48 X 73
154	70	91	70	52 X 93
160	80	111	72	64 X 113
	80	131	72	
224	39	84	36	30 X 68
230	45	104	36	30 X 86
242	57	114	60	54 X 96
248	63	126	70	65 X 108
254	70	146	70	65 X 128
260	80	185	90	81 X 168
360	85	225	90	81 X 207
	85	225	90	81 X 207

SIZE	A	B	J	MAX. COIL SIZE X 2
124	(991)	(1,041)	(1,067)	35 X 23
130	(1,143)	(1,549)	(1,219)	30 X 43
142	(1,448)	(1,803)	(1,524)	40 X 53
148	(1,600)	(2,311)	(1,676)	48 X 73
154	(1,778)	(2,311)	(1,778)	52 X 93
160	(2,032)	(2,819)	(1,829)	64 X 113
	(2,032)	(3,327)	(1,829)	
224	(991)	(2,134)	(914)	30 X 68
230	(1,143)	(2,642)	(914)	30 X 86
242	(1,448)	(2,896)	(1,524)	54 X 96
248	(1,600)	(3,200)	(1,778)	65 X 108
254	(1,778)	(3,708)	(1,778)	65 X 128
260	(2,032)	(4,699)	(2,286)	81 X 168
360	(2,159)	(5,715)	(2,286)	81 X 207
	(2,159)	(5,715)	(2,286)	81 X 207

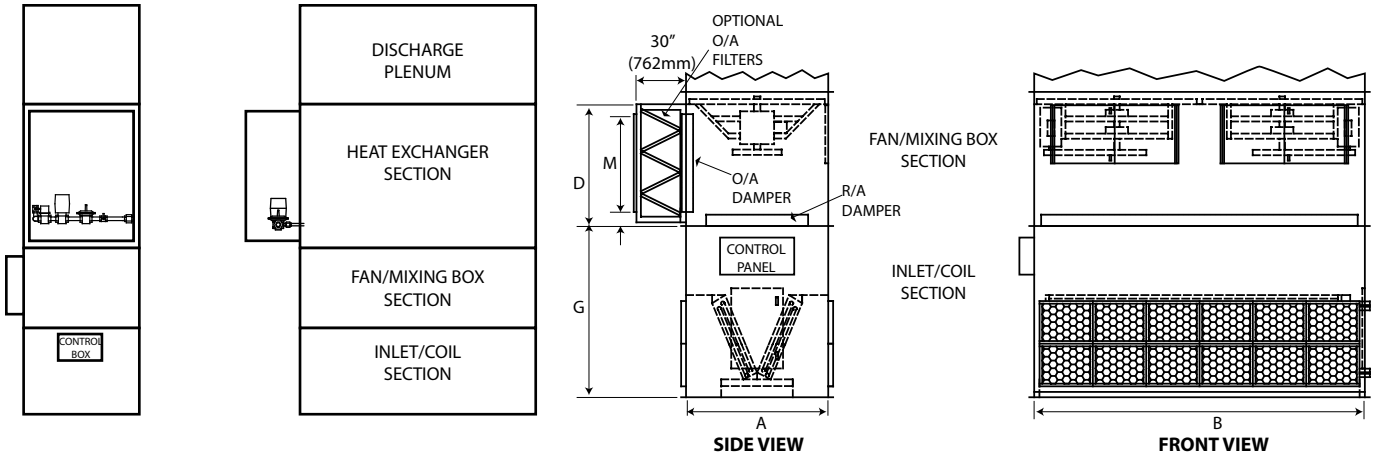
REZNOR®

DIMENSIONS (cont'd)

AEB Basic Unit Low Height Option (Outdoor)

Cooling Coil and Mixing Box

±1/8" (3mm)



SIDE VIEW **FRONT VIEW**

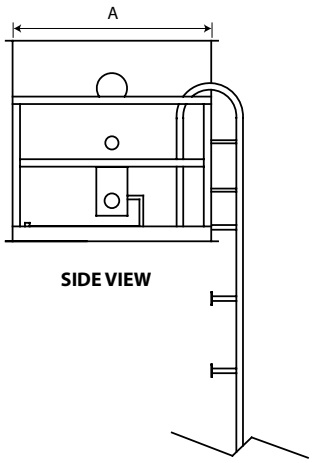
SIZE	A	B	D	G	M
224	39	84	48	36	26
230	45	104	54	36	32
242	57	114	66	60	44
248	63	126	66	70	44
254	70	146	72	70	50
260	80	185	82	90	60
360	85	225	102	90	80
	85	225	102	90	80
SIZE	**A**	**B**	**D**	**G**	**M**
224	(991)	(2,134)	(1,219)	(914)	(660)
230	(1,143)	(2,642)	(1,372)	(914)	(813)
242	(1,448)	(2,896)	(1,676)	(1,524)	(1,118)
248	(1,600)	(3,200)	(1,676)	(1,778)	(1,118)
254	(1,778)	(3,708)	(1,829)	(1,778)	(1,270)
260	(2,032)	(4,699)	(2,083)	(2,286)	(1,524)
360	(2,159)	(5,715)	(2,591)	(2,286)	(2,032)
	(2,159)	(5,715)	(2,591)	(2,286)	(2,032)

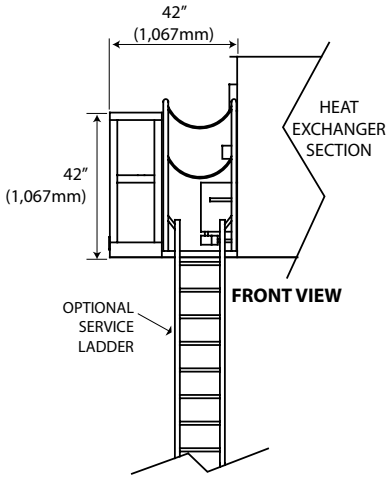
ACCESSORIES DIMENSIONS

Service Platform

±1/8" (3mm)

SIZE	A
224	39
230	45
242	57
248	63
254	70
260	80
360	60
SIZE	**A**
224	(991)
230	(1,143)
242	(1,448)
248	(1,600)
254	(1,778)
260	(2,032)
360	(1,524)

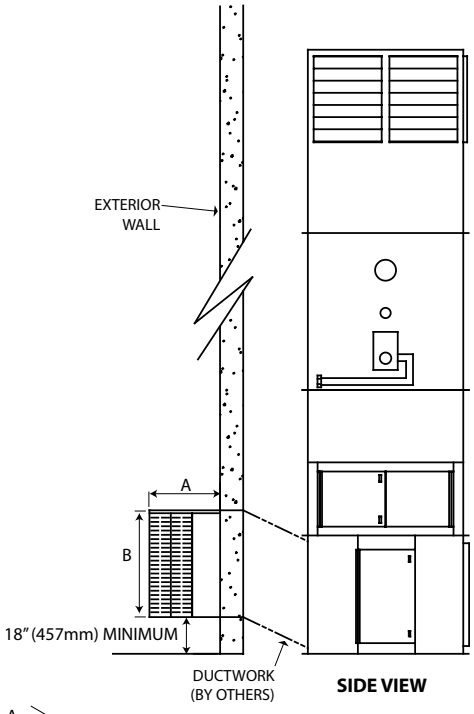


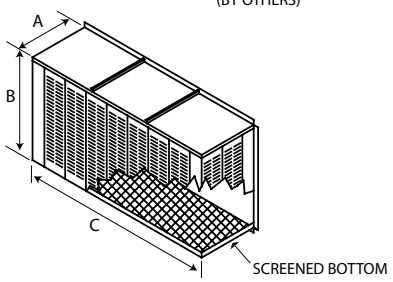


Louvered Inlet Plenum

±1/8" (3mm)

SIZE	A	B	C
224	30	30	80
230	30	36	100
242	30	48	110
248	30	48	120
254	42	55	140
260	42	65	180
360	42	85	220
SIZE	**A**	**B**	**C**
224	(762)	(762)	(2,032)
230	(762)	(914)	(2,540)
242	(762)	(1,219)	(2,794)
248	(762)	(1,219)	(3,048)
254	(1,067)	(1,397)	(3,556)
260	(1,067)	(1,651)	(4,572)
360	(1,067)	(2,159)	(5,588)



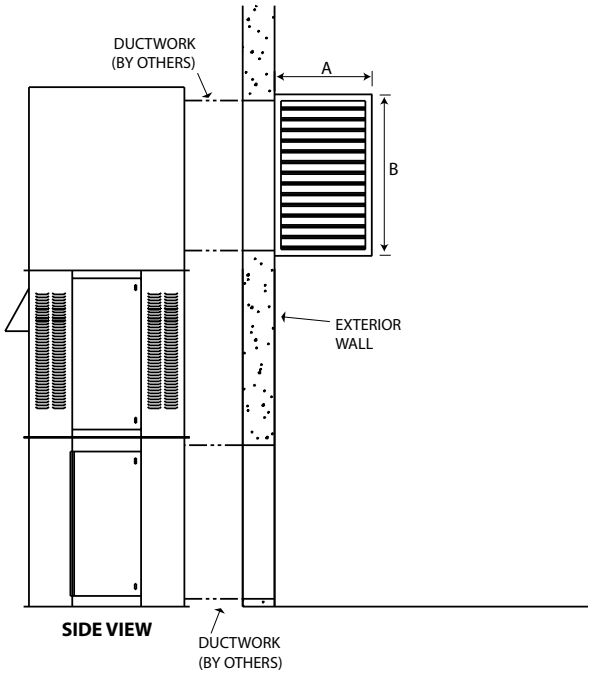


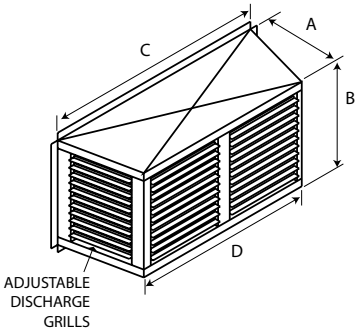
REZNOR® ACCESSORIES DIMENSIONS (cont'd)

Trapezoidal Discharge Cowl

±1/8" (3mm)

SIZE	A	B	C	D
224	30	30	75	60
230	30	30	86	75
242	42	44	110	102
248	42	50	120	110
254	42	55	130	120
260	60	66	144	130
360	60	90	220	260
SIZE	**A**	**B**	**C**	**D**
224	(762)	(762)	(1,905)	(1,524)
230	(762)	(762)	(2,184)	(1,905)
242	(1,067)	(1,118)	(2,794)	(2,591)
248	(1,067)	(1,270)	(3,048)	(2,794)
254	(1,067)	(1,397)	(3,302)	(3,048)
260	(1,524)	(1,676)	(3,658)	(3,302)
360	(1,524)	(2,286)	(5,588)	(6,604)





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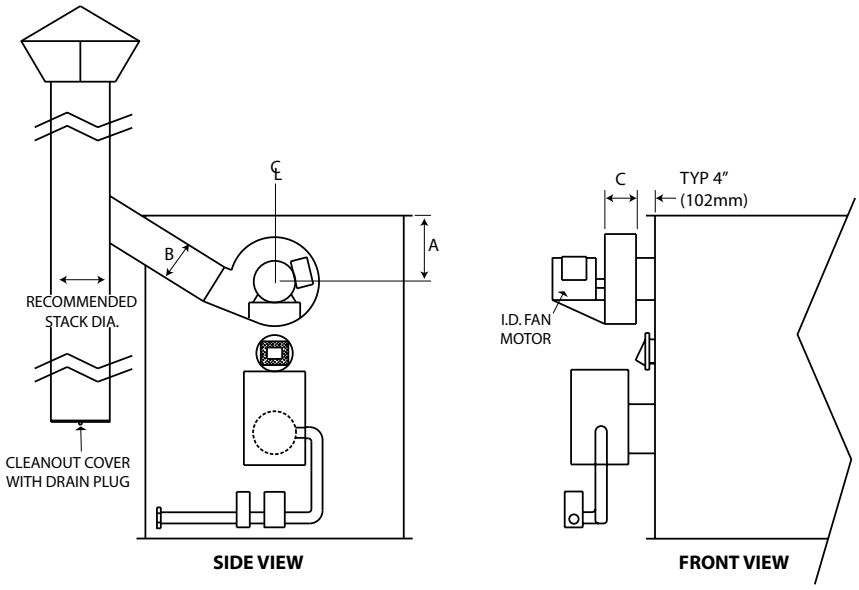
ACCESSORIES DIMENSIONS (cont'd)

Optional Power Venter

±1/8" (3mm)



SIZE	HEATER SIZE	I.D. FAN WHEEL DIAMETER	A	B	C	RECOMMENDED STACK DIAMETER
224	20-30	12	1 0	6 1/2	6 1/2	8
	35-40	12	10	6 1/2	6 1/2	8
230	45-60	12	12	6 1/2	6 1/2	8
	65-75	12	1 2	6 1/2	6 1/2	10
242	85-100	14	12	7 1/2	7 1/2	10
	125-175	18	12 1/2	9 1/2	9 1/2	12
248	125-175	18	12 1/2	9 1/2	9 1/2	12
	200-250	18	12 1/2	9 1/2	9 1/2	14
254	200-250	18	12 1/2	9 1/2	9 1/2	14
	275-325	21	14	11 1/2	11 1/2	16
260	125-175	18	12 1/2	9 1/2	9 1/2	12
	200-250	18	12 1/2	9 1/2	9 1/2	14
360	275-325	21	1 4	11 1/2	11 1/2	16
	350-425	21	1 2	11 1/2	11 1/2	16

SIZE	HEATER SIZE	I.D. FAN WHEEL DIAMETER	A	B	C	RECOMMENDED STACK DIAMETER
224	20-30	(305)	(254)	(165)	(165)	(203)
	35-40	(305)	(254)	(165)	(165)	(203)
230	45-60	(305)	(305)	(165)	(165)	(203)
	65-75	(305)	(305)	(165)	(165)	(254)
242	85-100	(356)	(305)	(191)	(191)	(254)
	125-175	(457)	(318)	(241)	(241)	(305)
248	125-175	(457)	(318)	(241)	(241)	(305)
	200-250	(457)	(318)	(241)	(241)	(356)
254	200-250	(457)	(318)	(241)	(241)	(356)
	275-325	(533)	(356)	(292)	(292)	(406)
260	125-175	(457)	(318)	(241)	(241)	(305)

REZNOR®

SAMPLE SPECIFICATIONS

General

Provide a Reznor Model AEB indirect fired air turnover unit with power burner. Unit shall be designed for (indoor) (outdoor) installation. The capacity and configuration shall be as detailed on the drawings. The heater shall be in accordance to ANSI requirements. The entire unit shall be ETL certified, listed and labeled.

Unit shall be completely factory run tested. An instantaneous flow meter shall be used to confirm the firing rate. A full combustion test is to be conducted complete with analyzer computer print out. A detailed test report and installation and maintenance manual shall be sent with the unit.

Cabinet

Unit exterior casing shall be constructed of heavy gauge galvaneal steel. The unit shall incorporate a minimum two inch structural iron welded support frame. The entire structural iron frame shall be primed with a high build epoxy rust inhibitor.

The propeller fan section is to be insulated with 1 in. 2# density fiberglass insulation for sound attenuation. The insulation shall be placed in perforated liners. All fans shall be secured on two inch wide ¼ in. thick full perimeter neoprene isolation. To ensure the casing is airtight all panels shall overlap and be caulked.

(Units without heating section have 48” tall transition section with 2” insulation and perforated metal liner between fan deck and discharge plenum as standard for sound attenuation. Optional extensions may be added to further increase unit height.)

Each section of the unit shall have pre-punched structural angle mating flanges for final assembly. All hardware and gasket is to be provided by the factory and sent with each unit.

A minimum 3 mil. coat of chain stop alkyd enamel paint shall be cured on at a minimum temperature of 140°F. Units are to be finished machinery grey color or as requested by building owner.

Blower/Motor Section

Unit shall be supplied with two, low noise propeller fans. Each propeller fan shall have a minimum of six airfoil blades. The unit shall be statically and dynamically balanced at the factory.

The fan wheel shall be mounted on a heavy duty machined and polished solid steel shaft. The shafts maximum operating speed is not to exceed 75% of its first critical speed. The propeller motors shall be T-frame, ODP type with a 1.15 s.f. The motors shall be mounted on a fully adjustable base.

The bearings are to be heavy duty pillow block type. Fan bearings shall have an L-10 bearing life base of 100,000 hours. The propellers are to be driven with adjustable 1.5 s.f. V-Belt drives.

Unit shall have a hinged and gasketed fan access door with heavy duty roller action, full compression latches to provide easy access to maintain and inspect motors, belts & bearings. Each door is to be equipped with electric safety door switches.

Heat Exchanger Section

The heat exchanger shall be four pass design. Minimum efficiency shall be ETL certified to be no less than 80% at full firing rate. The heat exchanger manufacturer shall have a minimum of ten years experience fabricating and producing furnaces.

Internal baffling of the secondary tubes is not acceptable. The heat exchangers primary and secondary heat transfer surfaces shall be constructed of 409 series stainless steel. Units shall be provided with multiple condensate drains when modulating. The heat exchanger section shall have an internal radiation shield to maintain a jacket loss of less than 2% of the rated output.

All heat transfer surfaces, including headers and the front collector box, shall be inside the casing and in the air stream. The construction of the heat exchanger shall permit free, unrestricted lateral, vertical and peripheral expansion during the heating and cooling cycle without damage or strain to any part.

The heater shall be equipped with an optional direct drive radial blade induced draft blower. The combustion chamber is to operate under a negative pressure. The fan is to be adequately sized to insure proper draft conditions. When high turndown modulations is required the unit is to be capable of 15:1 modulation. A discharge damper on the induced draft fan is to be mechanically interlocked to the main gas actuator to proportion exhaust with intake. The induced draft fan shall be directly connected to an air tight collar and collector box header located inside the heat exchanger casing.

The unit shall be equipped with a (on/off) (2 stage) (full modulation) power burner. On modulating units the main firing rate shall be factory adjusted and certified for a minimum turndown ratio of 15:1. The burner shall be equipped with a combustion air proving switch, removable pilot assembly and positive pilot combustion air supply. The combustion air damper shall be interlocked with the main gas valve to insure a proper air/gas mixture.

A solid state programmable safeguard relay with (flamerod) (ultra violet scanner) and purge card shall continuously monitor main and pilot flame. The main and pilot valve train to the burner shall be completely factory pre-piped This assembly shall be wired and include the following minimum components; main and pilot manual shut-off valves, main and pilot pressure regulators, main and pilot automatic shut-off valves and adequate unions and test ports for unconstrained service.

(The heater shall be equipped with an optional direct drive radial blade induced draft blower. The combustion chamber is to operate under a negative pressure. The fan is to be adequately sized to insure proper draft conditions. A manual locking discharge damper quadrant is to be provided for adjusting furnace pressure. When full modulation is required the discharge damper is to be electronically interlocked to the main gas valve to control draft from low to high fire.)

(A duct sleeve shall be provided directly on the burner to mount an outdoor combustion duct. The burner shall draw all air for combustion from outside.)

REZNOR®

SAMPLE SPECIFICATIONS (cont'd)

Controls

(Unit shall include a(n) [electric] [hot water] heating coil.)

Unit controls shall be contained within a hinged enclosure. Control enclosure shall have a dead front fused disconnect switch. Terminal strip, components and all wiring shall be labeled and/or numbered. Wiring in the control panel shall be run in wiring duct. The controls for the heater shall include:

- Blower motor starter with ambient compensated overloads and auxiliary contact(s).
- Primary to 120v control transformer
- 6,000 volt ignition transformer
- Control fuse block w/ slow blow fuse
- Fireye flame safeguard relay with LED status, ultra-violet flame detection & pre-purge cycle
- Discharge and/or return air temperature control sensor
- Solid state temperature control circuit with space proportional adjustable thermostat
- Manual reset temperature high limit safety switch
- Differential air proving safety switch
- High and low gas pressure safety switches
- Fan switch

All wiring shall be in compliance to the latest N.E.C. standard. External wiring to control enclosure shall be run in conduit. The gas manifold shall be approved by ANSI and include;

- High gas pressure regulator
- Manual shutoff & test firing lubricated valves
- Main gas motorized automatic shutoff valve with proof of closure switch
- Auxiliary main gas motorized automatic shutoff valve
- Pressure regulating valve
- Modulating control valve
- Pilot pressure regulator
- Pilot automatic shutoff valve
- Pilot manual shutoff valve
- Pilot needle valve
- Multiple test ports

C. Manifold pipe shall be painted with a rust inhibitor. Units are to be complete with a 10 point diagnostic center. The lights are to include; power, control fuse, blower, burner, burner airflow switch, ignition, pilot gas valve, main gas valve, safety limits & flame failure.

Control panel shall consist of an enclosure with lamacoid identification labels, control switches. Control panel shall include:

- Blower light
- Burner light
- Flame failure light
- System on-off switch
- Summer/winter switch
- Temperature selector

Optional Sections

(Filter Section)

(V-Bank filter section shall be provided with hinged access doors on both sides. Access doors are to be fully gasketed and supplied with the same industrial compression latches used with the rest of the unit. Angular racks shall hold 2 in. thick 30% efficient pleated type filters. Filters shall have an average arrestance of 76.4% in accordance with ASHRAE standard 52.1. Filter velocities not to exceed 500 FPM. The filter section is to be an integral section of the unit finished with the same casings. A complete additional set of construction filters shall be provided for each unit.)

(A flat filter section shall be provided with lift out filter tracks. Flat filter sections are utilized only when the unit height is a concern. The flat filter section reduces overall height of a unit when provided with filters. Filters shall have an average arrestance of 76.4% in accordance with ASHRAE standard 52.1. Filter velocities not to exceed 500 FPM. Expanded metal shall be supplied around the perimeter of the unit to provide support to all filters and eliminate the possibility of a filter being pulled in to the fan section. A complete additional set of construction filters shall be provided for each unit.)

(Inlet Air Section)

(An inlet damper shall provide up to twenty percent outdoor air. The damper shall be provided with a flanged duct connection. The direct drive spring return actuator is provided with an adjustable clutch to balance the percentage of outdoor air required.)

(A mixing box integral section shall support the unit and provide access to the dampers. Return air and inlet dampers are to be of galvanized steel construction. A minimum of six breaks per blade shall be provided to strengthen the blades. Maximum leakage rate not to exceed 20 cfm per square foot at 4 in. w.c. differential pressure. Dampers are to be operated with direct drive spring return actuators. [Low leak aluminum airfoil dampers are to be provided. Dampers are to be complete with blade and jam seals. Maximum leakage rate not to exceed 5 cfm per square foot at 4 in. w.c. differential pressure. Dampers are to be operated with direct drive actuators.] [Low leak insulated aluminum airfoil dampers recommended when outdoor design is below 0°F. Maximum leakage rate not to exceed 5 cfm per square foot at 4 in. w.c. differential pressure. Dampers are to be operated with a direct drive actuators. Standard air leakage data is certified under the AMCA ratings program. Dampers are to be designed for operation down to -40°F.] Blades are to be internally insulated with expanded polyurethane foam and thermally broken. The complete blade shall have an insulating factor of R-

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SAMPLE SPECIFICATIONS (cont'd)

2.29 and temperature index of 55.)

Cooling Coil Section

(Cooling coil plenum shall consist of double wall construction, single wall coil sections are not acceptable. The coil section shall be insulated with (1) (2) inch thick fiberglass insulation. The plenum shall feature a double sloped 304 stainless steel condensate pan with drain. All pans are to be minimum 18 gauge 304 stainless steel continuously TIG welded. Multiple coils shall be stacked horizontally and include intermediate drain pans to reduce refrigerant pressure drop and possibility of water carry over. Coils shall feature 0.020 in. minimum copper tube wall thickness. The fins shall be rippled and made of a minimum of 0.006 in. aluminum sheet. Coils shall feature (direct expansion interlaced multi-circuit design) (chilled water). Coils to be pressure tested to 250 psig to ensure no refrigerant leaks. Coils are to be designed around 400 CFM per ton. Coil bypass with manual adjustment damper shall be provided to prevent CFM per ton ratio exceeding 500. The differential air pressure drop over the coil shall not exceed 0.33 in. w.c.)

(Discharge section with cooling coil top shall be double lined with two inch thick insulation and perforated liner. Discharge section shall acoustically attenuate airborne noise and provide (single) (dual) directional control. Minimum 2 in. thick steel blades shall be painted with industrial paint to match unit. Each blade shall be individually adjustable. When a dual bank of airfoil type blades are provided they will provide vertical and horizontal air diffusion control.)

(Outside Air Plenum)

(An integral plenum shall be included with the unit to introduce outside air prior to the filters. The plenum casings shall be constructed the same as the unit and finished to match. Inlet plenum is to be designed to prevent water from entering the unit. Exterior wall mounted plenum shall match building exterior color. A wall mount flange with gasket will run the perimeter of the inlet plenum. The inlet velocity in to the louvered plenum is to be less than 500 FPM free area. The louvered inlet plenum is to be equipped with expanded metal where necessary.)

(Integral Service Platform with Ladder)

(A full OSHA approved service platform is to be provided for complete access to burner and gas manifold. The service platform is to feature 12 gauge expanded metal screen and a welded 3 in. structural iron frame. The service platform is to be equipped with a four in. high kick plate and locking chains. [OSHA approved ladder is to include hand guide rails and concrete securing feet.]

(Discharge Air Section)

(For outdoor units an interior trapezoidal shaped discharge section shall be provided to distribute air inside the building. The discharge shall be double lined with two inch thick insulation and perforated liner. Discharge section shall acoustically attenuate airborne noise. Diffuser screens are to be located on the font of the discharge. The discharge plenum shall be equipped with (single) (double) adjustable air double deflection airfoil type blades.)

(Automatic Greasing Canister)

(Bearings are to be equipped with automatic greasing canisters. Microprocessor controlled greasing canisters shall deliver 350 psig lubrication on a precision cycle to increase bearing longevity and practically eliminate bearing maintenance. All (four) (six) (eight) unit bearings are to be automatically lubricated every second day from a 240 cc lubrication canister. The greasing canisters with pump driven microprocessor are to be located in the main control panel for ease of adjustment. The grease canister shall contain a minimum quantity of grease to ensure two year supply prior to canister tank replacement.

(Humidification Plenum)

(Unit is to have a double lined humidification discharge plenum. The internal liner is to be minimum 22 gauge G90 galvanized steel. The unit shall include the humidifier mounted, wired and tested from the factory. Gas to steam microprocessor controlled humidifier. The humidifier is to automatically cools discharged hot water to 140°F to meet governing code requirements and to prevent damage to PVC drain piping.

- Control to ±3% RH
- Steam output rangeability up to 40 to 1 closely tracks humidity set point
- Low nitrogen oxide (NOx) emissions of less than 20 ppm
- Diagnostic test at unit start-up verifies system performance
- 82% burner efficiency rating
- Variable speed blowers and modulating gas valves provide consistent humidity output
- Full burner modulation and PID control provide accurate, responsive, and adjustable RH control
- The temperature sensor enables the controller to hold water at a preset temperature allowing rapid response to a call for humidity, enables freeze protection, and allows rapid warm up

("Oil Mist" Filtration)

The unit will be complete with two stages of filtration. The primary filtration will be specifically designed to capture "oil mist" particulate. Farr ECO™ filters four inch thick media will be installed in a flat bank filter rack around the unit. The ECO filters will be equipped with a drain trough and these are to be connected to a common drain pipe from the unit. The secondary level of filtration will consist of two inch thick 30% efficient pleated filters.

REZNOR® PRODUCT LIMITED WARRANTY

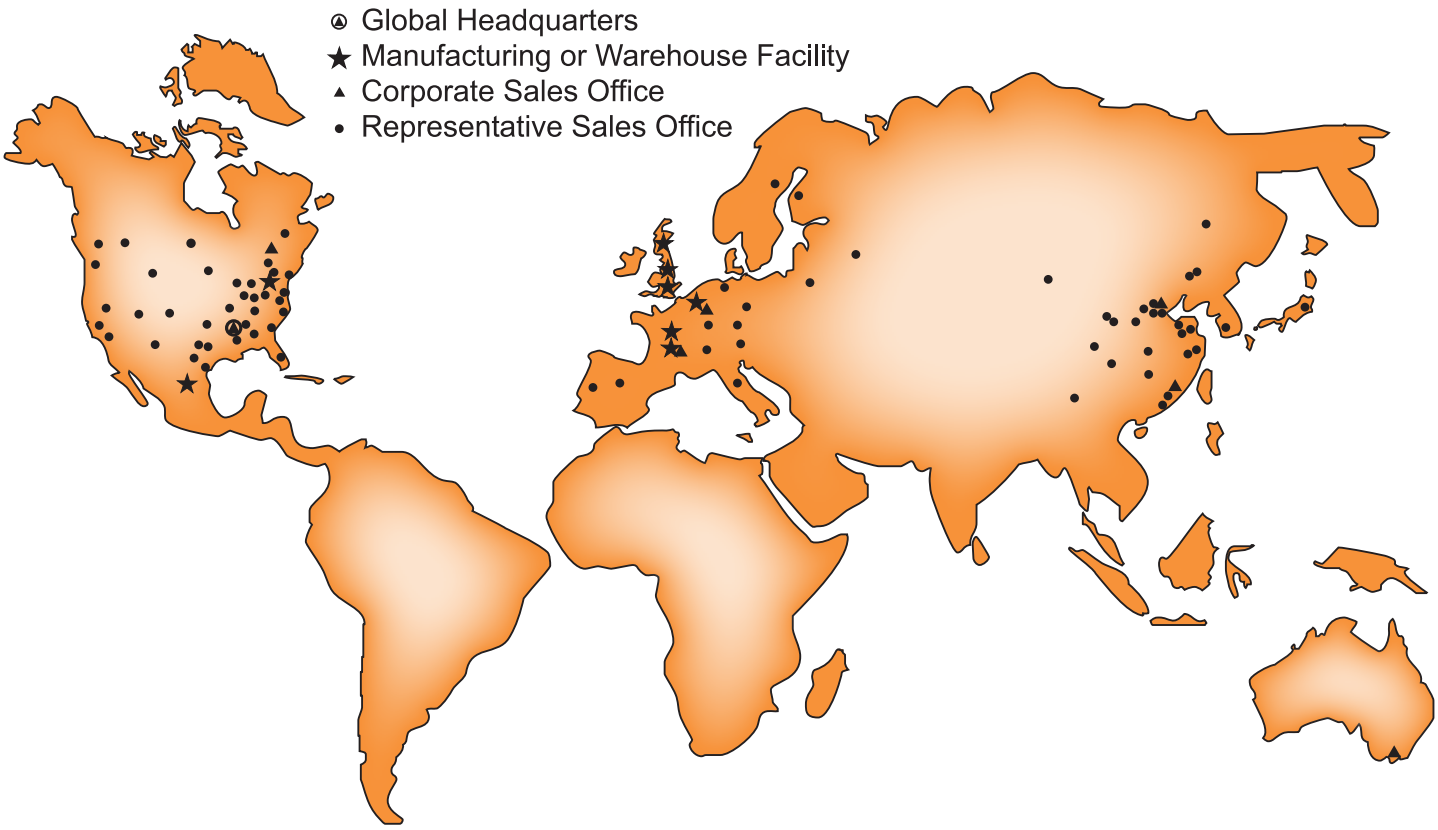
Reznor, LLC warrants to the original owner-user that this Reznor product will be free from defects in material or workmanship. This warranty is limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment by Reznor, LLC, whichever occurs first.

LIMITATIONS AND EXCLUSIONS

Reznor, LLC obligations under this warranty and the sole remedy for its breach are limited to repair, at its manufacturing facility, of any part or parts of its Reznor products which prove to be defective; or, in its sole discretion, replacement of such products. All returns of defective parts or products must include the product model number and serial number, and must be made through an authorized Reznor distributor or arranged through Reznor Customer Service. Authorized returns must be shipped prepaid. Repaired or replacement parts will be shipped by Reznor, LLC F.O.B. shipping point.

1. The warranty provided herein does not cover charges for labor or other costs incurred in the troubleshooting, repair, removal, installation, service or handling of parts or complete products.
2. All claims under the warranty provided herein must be made within ninety (90) days from the date of discovery of the defect. Failure to notify Reznor, LLC of a warranted defect within ninety (90) days of its discovery voids Reznor, LLC obligations hereunder.
3. The warranty provided herein shall be void and of no effect in the event that (a) the product has been operated outside its designed output capacity (heating, cooling, airflow); (b) the product has been subjected to misuse, neglect, accident, improper or inadequate maintenance, corrosive environments, environments containing airborne contaminants (silicone, aluminum oxide, etc.), or excessive thermal shock; (c) unauthorized modifications are made to the product; (d) the product is not installed or operated in compliance with the manufacturer's printed instructions; (e) the product is not installed and operated in compliance with applicable building, mechanical, plumbing and electrical codes; or (f) the serial number of the product has been altered, defaced or removed (g) installation and start-up procedures are not documented on the manufacturer's start-up form at the time of installation.
4. The warranty provided herein is for repair or replacement only. Reznor, LLC shall not be liable for any loss, cost, damage, or expense of any kind arising out of a breach of the warranty. Further, Reznor, LLC shall not be liable for any incidental, consequential, exemplary, special, or punitive damages, nor for any loss of revenue, profit or use, arising out of a breach of this warranty or in connection with the sale, maintenance, use, operation or repair of any Reznor product. In no event will Reznor, LLC be liable for any amount greater than the purchase price of a defective product. The disclaimers of liability included in this paragraph 4 shall remain in effect and shall continue to be enforceable in the event that any remedy herein shall fail of its essential purpose.
5. THIS WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY FOR REZNOR PRODUCTS, AND IS IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES. REZNOR, LLC SPECIFICALLY DISCLAIMS ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No person or entity is authorized to bind Reznor, LLC to any other warranty, obligation or liability for any Reznor product. Installation, operation or use of the Reznor product for which this warranty is issued shall constitute acceptance of the terms hereof.

Reznor® is your global source for heating, ventilating and air conditioning equipment.



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**For more information on Reznor HVAC Equipment,
contact your local Reznor Representative by calling 800-695-1901.
Or, find us on the internet at www.RezSpec.com**

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