

# TECHNICAL GUIDE

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## DOWNFLOW/UPFLOW ELECTRIC FURNACE

### MODELS: EBE/EUE SERIES



**EBE**



**EUE**



## DESCRIPTION

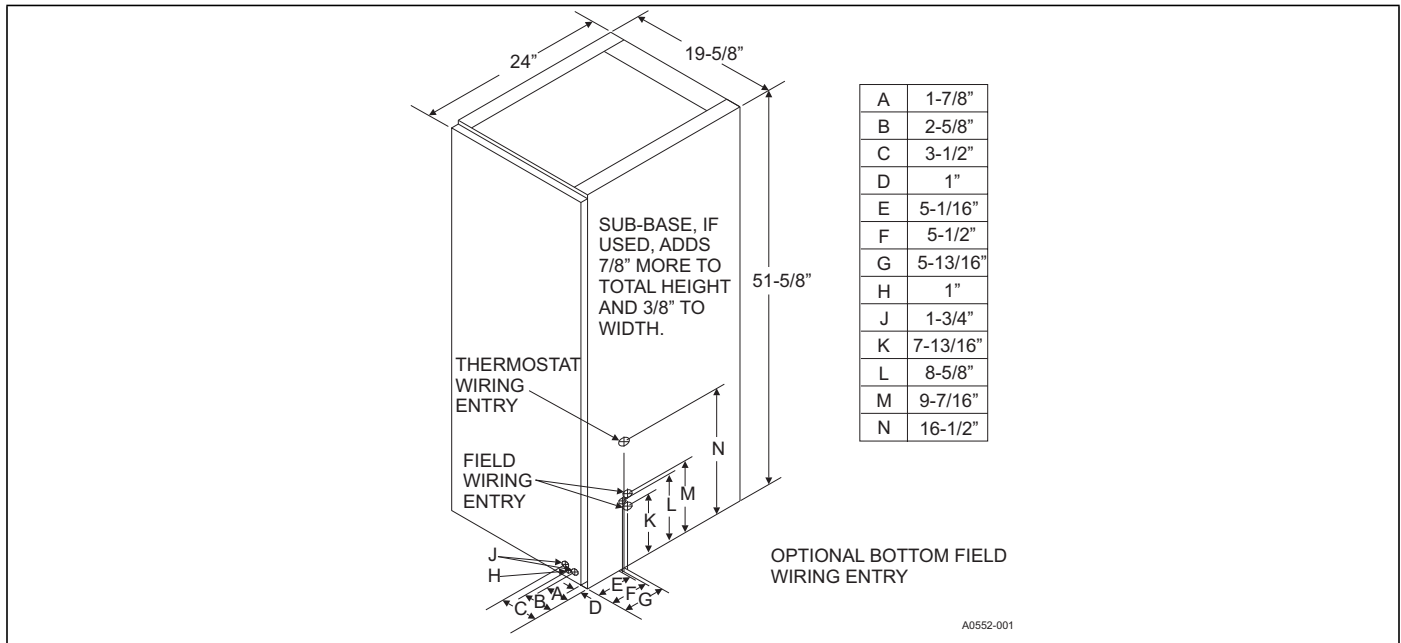
The EBE/EUE Series Electric Furnace is actually two systems in one. As an air handler, it provides airflow for air conditioning and heat pump cooling requirements. As an electric furnace, its range of heating capacities makes the EBE/EUE a perfect match for the heating requirements of almost any manufactured or modular home.

## WARRANTY

*2-year limited parts warranty, and 1-year labor.*

## FEATURES

- Zero clearance feature allows the EBE/EUE unit to be installed where space is a premium.
- Pre-painted white front panels provide a scratch resistant, attractive, easy to clean appliance finish.
- Built-in coil cabinet is design-matched to work in conjunction with EBE/EUE furnaces, heat pumps, and air conditioners manufactured by Johnson Controls in Wichita, Kansas, providing ease of installation and highly efficient operating performance. The EBE/EUE unit has a coil shelf installed and a solid door.
- Air Conditioner and Heat Pump operation ready. All models have a multi-speed blower capable of handling cooling and heat pump loads.
- Heating package includes specifically designed, long lasting nickel/chrome heat elements.
- Universal throw-away filter cleans the air and is easy to replace on the EBE unit. No filters are furnished with EUE models. External filter base and/or filter rack needed for field installation.
- Accessory blower kit available for larger A/C applications.
- As defined by the U.S. Department of Energy, these furnaces are 100% efficient when used in specified applications.



A0552-001

**Physical and Electrical Data**

<sup>1</sup> Model Number			<sup>2,3</sup> EBE10A EUE10A	<sup>3,4</sup> EBE12A EUE12A	<sup>5</sup> EBE15A EUE15A	<sup>5</sup> EBE17A EUE17A	<sup>5</sup> EBE20A EUE20A	<sup>5</sup> EBE23A EUE23A
D.O.E. Output	240 VAC	BTU	34,000	39,000	51,000	56,000	67,000	77,000
	60 Hz, 1 Phase	kW	10.0	11.4	15.0	16.4	19.6	22.6
OUTPUT CAPACITY	230 VAC	BTU	31,000	36,000	47,000	52,000	61,000	71,000
	60 Hz, 1 Phase	kW	9.1	10.6	13.8	15.2	17.9	20.8
	220 VAC	BTU	29,000	33,000	43,000	48,000	57,000	65,000
	60 Hz, 1 Phase	kW	8.5	9.7	12.6	14.1	16.7	19.1
Element Capacity @ 240 VAC		kW	9.6	11.2	14.4	16.0	19.2	21.6
		Amps	40.0	46.7	60.0	66.7	80.0	90.0
Motor Amps @ 240 V		4.0 Maximum						
Circuit Load Amps @ 240 V	CKT 1		43.8	50.5 <sup>5</sup>	43.8	47.1	43.8	47.1
	CKT 2		NA	NA	20.0	23.3	40.0	46.7
Filter Size for EBE in top of unit only		16 x 20 x 1						
Filter Size for EBE in louvered door only		20 x 20 x 1						
Shipping Weights			83	84	85	86	84	86

**NOTES:**

- 1 Casing or cabinet must be permanently grounded in accordance with National Electrical Code (NEC) or other applicable codes
- 2 Does not require a jumper
- 3 Approved for Single Branch Circuit Service Only
- 4 Jumper provided for Single Branch Circuit Only
- 5 Requires jumper bars (P/N 3500-378P)

## EBE/EUE Series Blower Performance

Static Pressure (in. W.C.)	Speed	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
CFM (STD. Air) for all EBE/EUE Models	High (5)	1607	1563	1515	1477	1434	1406	1377	1345
	Medium High (4)	1390	1346	1298	1286	1253	1224	1201	1160
	Medium (3)	1241	1192	1151	1115	1097	1074	1032	1000
	Medium Low (2)	1099	1051	1002	979	949	912	872	855
	Low (1)	1006	950	923	896	860	826	800	728

### NOTES:

- Applications with static pressures higher than 0.3 in. are not recommended.
- A blower off delay of 60 seconds is built into the motor.
- For up to E(B,U)E15\* models heating, use Low speed (1) for compliance with Fan Efficiency Rating test.
- For E(B,U)E17\*, E(B,U)E20\*, and E(B,U)E23\* models heating, use Medium Low speed (2) for compliance with Fan Efficiency Rating test.
- For all models constant fan operation, use Low speed (1) for compliance with Fan Efficiency Rating test.

## Wiring Requirements

Models	<sup>1</sup> EBE10A EUE10A	<sup>2</sup> EBE12A EUE12A	<sup>3</sup> EBE15A EUE15A	<sup>3</sup> EBE17A EUE17A	<sup>3</sup> EBE20A EUE20A	<sup>3</sup> EBE23A EUE23A				
<b>Single Branch Circuit Service</b>	<b>2 Leads + 1 Ground CKT #1</b>									
Nominal Circuit Load - Amps	43.8	50.5	63.8	70.4	83.8	93.8				
Minimum Wire Size (90°C)	#8	#6	#4	#4	#3	#2				
Minimum Wire Size (75°C)	#6	#6	#4	#3	#2	#1				
Minimum Wire Size (60°C)	#6	#4	#3	#2	#1	#0				
Ground Wire Size	#10	#8	#8	#8	#6	#6				
Max. Fuse (or C.B.) - Amps	60	70	80	90	110	125				
Dual Branch Circuit Service	NOT APPROVED		CKT #1	CKT #2	CKT #1	CKT #2	CKT #1	CKT #2		
Branch Circuit Load - Amps			43.8	20.0	47.1	23.3	43.8	40.0	47.1	46.7
Branch Circuit Min. - Amps			54.8	25.0	58.9	29.1	54.8	50.0	58.9	58.4
Minimum Wire Size (90°C)			#8	#10	#6	#10	#8	#8	#6	#6
Minimum Wire Size (75°C)			#6	#10	#6	#10	#6	#8	#6	#6
Minimum Wire Size (60°C)			#6	#10	#4	#10	#6	#6	#4	#4
Ground Wire Size <sup>4</sup>			#10	#10	#10	#10	#10	#10	#10	#10
Max. Fuse (or C.B.) - Amps	60	30	60	30	60	50	60	60		

### NOTES:

- Does not require a jumper
- Jumper provided for Single Branch Circuit Only
- Requires jumper bars (P/N 3500-378P)
- Refer to NEC, Table 250-122 for Non-Sheathed Conductor Ground Wire

## LOCATION

Access for servicing is an important factor in the location of any furnace. A minimum of 24 in. must be provided in front of the furnace for access to the heating elements and controls. This access can be provided by a closet door or by locating the furnace 24 in. from a facing wall or partition.

## FURNACE CLEARANCE

This furnace is approved for 0 in. clearance to combustible material on all or any part of the furnace exterior and the inlet or outlet duct work except as stated below.

For furnaces installed in upflow application, there must be a minimum of 1 in. (2.54 cm) clearance from the bare surface of the outlet duct work for a distance of 3 ft (91.4 cm) from the supply air opening. This requirement is met if the duct is wrapped with an insulating material at least 1 in. thick that has an R-value of at least R-4.

## RETURN AIR

In order for the furnace to work properly, a closet or alcove must have a certain total free area opening for return air.

### For Heating Only Furnace

A minimum of 200 sq in. (1290 sq cm) free area opening. Use any return grille with a minimum of 200 sq in. free opening.

### For Up to 4 Ton AC and HP Applications (Standard Blower)

A minimum of 250 sq in. (1613 sq cm) free area opening. The standard blower assembly supplied with the furnace is capable of handling up to 4 ton AC applications. Use any return grille with a minimum of 250 sq in. (1613 sq cm) free area opening.

### For 5 Ton AC Applications (Accessory Blower)

A minimum of 350 sq in. (2129 sq cm) free area opening. Use 5 ton AC blower accessory 3500-7911. Use any return grille with a minimum of 350 sq in. (2129 sq cm) free area opening with 5 ton AC blower accessory 3500-7911. The upflow return air box accessory 3500-8982 can also be used with 5 ton AC blower accessory 3500-7911.

### Location

For downflow applications, the return air opening can be located in a closet front door, in a sidewall above the furnace casing, or in a louvered door on the furnace. If the opening for the return air is located in the floor, sidewalls, or closet door anywhere below the furnace casing height, 6 in. minimum clearance must be provided on the furnace side where return is located to provide for proper airflow.

For upflow installations, a closet that is 32 in. wide by 30 in. deep with a 30-inch wide door is necessary. This is not required if there is a return grille installed below the furnace.

## AIR FILTER

The filter supplied with the furnace is a throw-away filter. Filters need to be cleaned frequently. The filter supplied with the furnace is disposable and not reusable. Change filters often because clean filters provide added comfort, provide a better and cleaner environment, and increase the efficiency of the furnace.

### Filter Location

The front panel of the furnace must be removed to gain access to the filter of the downflow furnace. However, the filter for the upflow furnace is located behind the return air grill, adjacent to the furnace closet or any other location in the return air.

