

# Heavy Duty Unit Heater KB Series



## Model Code:

KB	48	10	-1	-B1	T
A	B	C	D	E	F

**A:** Series  
**B:** 20 - 208V, 24 - 240/208V  
 27 - 277V, 48 - 480V  
**C:** kiloWatts (4-66)  
**D:** -1 = Single Phase  
 -3 = Three Phase  
**E:** -B1 = Bracket  
**F:** T = Thermostat



- Spiral finned element
- Long life unit bearing motor
- Auto Reset Limit
- Aluminum fan blade
- Built-in thermostat option
- Standard color: gray
- High-temp safety limit
- Universal mounting bracket included
- Tested to UL standards for safety
- Adjustable louvers
- 5-year limited warranty



## The KB Horizontal Unit Heater

King's KB series unit heaters are designed for use as primary or supplemental heat sources in large or exposed areas, including high-rise buildings, stores, warehouses, garages, water treatment and fire room vaults to prevent freezing. Spiral finned steel elements and high CFM ensure even air distribution producing cooler element operation, prolonging heater life. By combining the highest quality components, with a dynamically balanced fan blade, the KB unit heater will provide years of trouble-free service. Includes universal wall/ceiling bracket for simple installation.

### Factory Installed Options

**Power Contactor:** Standard on heaters above 5kW and on all 3-Phase models; optional on 2 to 5kW 1-Phase heaters.

**24 Volt Control:** Standard on 480V heaters; optional on all other heaters.

**Mounting:** Standard universal bracket made from heavy gauge Steel. Low profile optional.

**Rough Service:** 5 lugs are provided to securely mount heater in heavy industrial applications or marine vessels where vibration and movement are a concern. Includes 5-hole bracket.

### Control Options

- 1-Pole or 2-Pole thermostat temperature indicated label with 44°F energy code setting
- Built-in two-stage thermostat on single phase heaters
- Summer fan switch
- 3-position switch (Heat-Off-Fan)
- Pilot light (power On indication)
- Padlocking disconnect
- Wall-mounted thermostat line or low voltage
- Optional ECO2S Energy-saving automatic 2-stage heating with remote

*NOTE: Multiple heaters can be controlled by a single thermostat if phasing is coordinated in the control wiring.*

## Engineering Specifications

*Contractor shall supply and install KB Series unit heaters manufactured by King Electrical Mfg. Company. Heaters shall be of the wattage and voltage as indicated on the plans.*

**Construction:** All exterior and interior metal enclosure parts are made from 20 gauge electrogalvanized Steel with a rust inhibiting baked enamel finish. Smooth rounded corners and protective edge trim give an attractive modern appearance.

**Adjustable Outlet Louver:** Louvers direct air up or down as needed for the heating application.

**Rear Intake Screen:** Heavy gauge steel screen protects against foreign objects making accidental contact with the rotating fan blade.

**Spiral Fin Elements:** The metal sheath element is copper brazed with spiral fins then molded into a coil configuration. This combination produces the best heat transfer while eliminating the potential for hot spots by positioning the element in the maximum airflow stream.

**Totally Enclosed Fan Motor:** Permanently lubricated long life, unit bearing with 20cc of oil. Epoxy-coated motor with enclosed rotor resists moisture and corrosion for long-lasting, trouble-free operation.

**Staging:** Two-Stage operation is available as an optional feature.

**Aluminum Fan Blade:** Axial flow-type fan mounted directly to the motor shaft for maximum efficiency.

**Auto-Reset Thermal Cutout:** Power is disconnected from the element if an overheated condition occurs. The fan continues to run to dissipate excess heat from the element. The element is re-energized automatically when the normal operating temperature returns.

**Internal Controls:** Magnetic contactors are standard on all 480V heaters, all 208V/1-Phase, 240V/1-Phase, 277V/1-Phase heaters above 6kW, and all 3-Phase heaters. The control voltage is equal to the line voltage (208, 240 or 277) except for 480V models where a transformer is provided for 24V control. Over 5kW the line voltage control is operating the contactor coil only and will draw only 1 Amp. See page 64 for control voltages.

**Fusing:** Internal circuit fusing is provided when the heater ampacity exceeds 48 Amps to comply with N.E.C. standards. A fan delay is provided standard on models 12.5-kW and above to dissipate residual heat from the heating elements.

**Easy Installation:** A quick access panel located on the bottom of the heater allows for quick wiring and easy maintenance for the life of the heater. Includes universal wall/ceiling bracket for simple installation.

**Approvals:** cULus (E41422)

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## Ordering Information - single phase

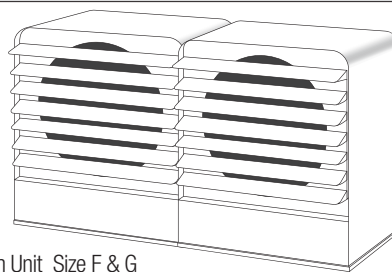
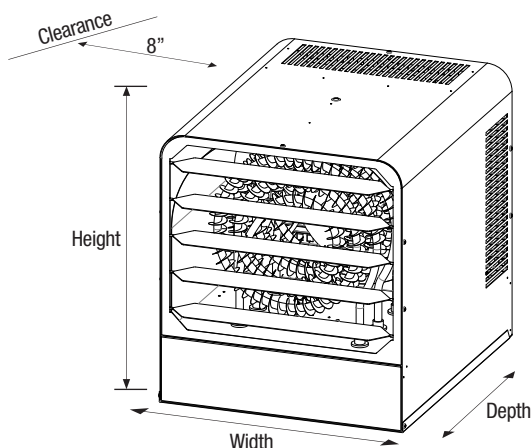
MODEL	UPC	KW	BTUH	PHASE	VOLTS	AMPS	**THERMOSTAT CONTROL VOLTAGE	MOTOR HP	CFM	TEMP. RISE	AIR THROW	MAX. MOUNT HEIGHT	SIZE	WT. (lbs.)
KB2004-1-B1	20928	4	13.5	1	208	19.2	208	5W	400	38°	15ft.	8ft.	A	30.5
KB2404-1-B1	13354	4	13.5	1	240/208	16.6/14.4	240	5W	400	38°	15ft.	8ft.	A	30.5
KB2704-1-B1	13361	4	13.5	1	277	14.4	277	5W	400	38°	15ft.	8ft.	A	30.5
KB4804-1-B1	22091	4	13.5	1	480	8.3	24	5W	400	38°	15ft.	8ft.	A	30.5
KB2005-1-B1	13366	5	17	1	208	24	208	9W	400	40°	16ft.	8ft.	A	30.5
KB2405-1-B1	13374	5	17	1	240/208	20.8/18	240	9W	400	40°	16ft.	8ft.	A	30.5
KB2705-1-B1	15240	5	17	1	277	18.1	277	9W	400	40°	16ft.	8ft.	A	30.5
KB4805-1-B1	13388	5	17	1	480	10.4	24	9W	400	40°	16ft.	8ft.	A	30.5
KB2006-1-B1	22092	6	20.5	1	208	28.8	208	9W	400	45°	16ft.	8ft.	A	30.5
KB2406-1-B1	13424	6	20.5	1	240/208	25/21.6	240	9W	400	45°	16ft.	8ft.	C	30.5
KB2706-1-B1	22093	6	20.5	1	277	21.6	277	9W	400	45°	16ft.	8ft.	C	30.5
KB4806-1-B1	22094	6	20.5	1	480	12.5	24	9W	400	45°	16ft.	8ft.	C	30.5
KB2007-1-B2	22242	7.5	25.6	1	208	36.1	208	16W	600	40°	20ft.	9ft.	C	45.0
KB2407-1-B1	22243	7.5	25.6	1	240/208	31.2/27	240	16W	600	40°	20ft.	9ft.	C	45.0
KB2707-1-B1	22095	7.5	25.6	1	277	27	277	16W	600	40°	20ft.	9ft.	C	45.0
KB4807-1-B2	22244	7.5	25.6	1	480	15.6	24	16W	600	40°	20ft.	9ft.	C	45.0
KB2010-1-B2	13538	10	34.1	1	208	48.1	208	25W	725	44°	24ft.	10ft.	C	45.0
KB2410-1-B2	13546	10	34.1	1	240/208	41.6/36.1	240	25W	725	44°	24ft.	10ft.	C	45.0
KB2710-1-B2	13554	10	34.1	1	277	36.1	277	25W	725	44°	24ft.	10ft.	C	45.0
KB4810-1-B2	13560	10	34.1	1	480	20.8	24	25W	725	44°	24ft.	10ft.	C	45.0
KB2012-1-B2	13616	12.5	42.7	1	208	60.1	208	35W	825	48°	30ft.	11ft.	C	45.0
KB2412-1-B2	13624	12.5	42.7	1	240/208	52/45.1	240	35W	825	48°	30ft.	11ft.	C	45.0
KB2712-1-B2	22096	12.5	42.7	1	277	45.1	277	35W	825	48°	30ft.	11ft.	C	45.0
KB4812-1-B2	22097	12.5	42.7	1	480	26	24	35W	825	48°	30ft.	11ft.	C	45.0
KB2015-1-B2	13672	15	51.2	1	208	72.1	208	35W	925	51°	33ft.	12ft.	C	45.0
KB2415-1-B2	22098	15	51.2	1	240/208	62.5/54.1	240	35W	925	51°	33ft.	12ft.	C	45.0
KB2715-1-B2	22099	15	51.2	1	277	54.2	277	35W	925	51°	33ft.	12ft.	C	45.0
KB4815-1-B2	22100	15	51.2	1	480	31.3	24	35W	925	51°	33ft.	12ft.	C	45.0

\*Dual rated heaters will draw 13% less amps and 25% less wattage when operated at 208V.

Maximum mounting height is manufacturer's recommendation

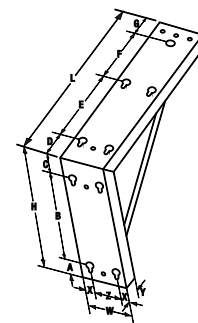
\*\*Over 5kw line voltage control is operating the contactor coil only, and will draw under 1 amp.

### Dimensional Data



Twin Unit Size F & G

HEATER SIZE	HEIGHT	DEPTH	WIDTH
A	16.5"	11"	15"
B	16.5"	18"	15"
C	16.5"	13.5"	15"
D	18.5"	18"	15"
E	20.5"	18"	15"
F	18.5"	18"	30"
G	20.5"	18"	30"



### KBB-1 & KBB-2

Unit heater brackets can be used for mounting on ceiling or wall. 3/8" threaded hole on top of unit heater can also be used with threaded rod to drop the unit closer to the floor. Refer to bracket selection chart.

# Heavy Duty Unit Heater KB Series

## Ordering Information - three phase

MODEL	UPC	KW	BTUH	PHASE	VOLTS	AMPS	**THERM. CONTROL VOLTAGE	MOTOR HP	CFM	TEMP. RISE	AIR THROW	MAX. MOUNT HEIGHT	*SIZE	WT. (lbs.)
KB4803-3MP-B2	13318	3	10.2	1-3	480	6.3	24	5W	400	37°	14ft.	8ft.	B	45.0
KB2005-3MP-B2	13370	5	17.1	1-3	208	24 & 13.9	208	9W	400	40°	16ft.	8ft.	B	45.0
KB2405-3MP-B2	22102	5	17.1	1-3	240/208	20.8/18 & 18/15.6	240	9W	400	40°	16ft.	8ft.	B	45.0
KB4805-3MP-B2	13392	5	17.1	1-3	480	10.4 & 6	24	9W	400	40°	16ft.	8ft.	B	45.0
KB2007-3MP-B2	13450	7.5	25.6	1-3	208	36.1 & 20.8	208	16W	600	40°	20ft.	9ft.	B	46.5
KB2407-3MP-B2	13458	7.5	25.6	1-3	240/208	31.2/27 & 18/15.6	240	16W	600	40°	20ft.	9ft.	B	46.5
KB4807-3MP-B2	13472	7.5	25.6	1-3	480	15.6 & 24	24	16W	600	40°	20ft.	9ft.	B	46.5
KB2009-3MP-B2	22103	9	30.7	1-3	208	43.2 & 24.9	208	16W	725	42°	24ft.	9ft.	B	46.5
KB2409-3MP-B2	13526	9	30.7	1-3	240/208	37.5/32.5 & 21.6/18.7	240	16W	725	42°	24ft.	9ft.	B	46.5
KB4809-3MP-B2	13534	9	30.7	1-3	480	18.7 & 10.6	24	16W	725	42°	24ft.	9ft.	B	46.5
KB2010-3MP-B2	13542	10	34.1	1-3	208	27.7	208	25W	725	44°	24ft.	10ft.	B	46.5
KB2410-3MP-B2	13550	10	34.1	1-3	240/208	41.6/36.1 & 24/20.8	240	25W	725	44°	24ft.	10ft.	B	46.5
KB4810-3MP-B2	13564	10	34.1	1-3	480	20.8 & 12	24	25W	725	44°	24ft.	10ft.	B	46.5
KB2012-3MP-B2	13620	12.5	42.7	1-3	208	34.6	208	35W	825	48°	30ft.	11ft.	B	46.5
KB2412-3MP-B2	13632	12.5	42.7	1-3	240/208	30/26	240	35W	825	48°	30ft.	11ft.	B	46.5
KB4812-3MP-B2	13644	12.5	42.7	1-3	480	26 & 15	24	35W	825	48°	30ft.	11ft.	B	46.5
KB2015-3MP-B2	13676	15	51.2	1-3	208	41.6	208	35W	925	51°	33ft.	12ft.	B	46.5
KB2415-3MP-B2	13688	15	51.2	1-3	240/208	36/31.2	240	35W	925	51°	33ft.	12ft.	B	46.5
KB4815-3MP-B2	22104	15	51.2	1-3	480	18	24	35W	925	51°	33ft.	12ft.	B	46.5
KB2020-3-B2	13734	20	68.3	3	208	55.5	208	50W	1100	57°	47ft.	13ft.	D	47.5
KB2420-3-B2	13738	20	68.3	3	240/208	48.1/41.6	240	50W	1100	57°	47ft.	13ft.	D	47.5
KB4820-3MP-B2	22105	20	68.3	1-3	480	24	24	50W	1100	57°	47ft.	13ft.	D	47.5
KB2025-3-B2	22106	24	85.3	3	208	69.4	208	1/4HP / 50W	1350	58°	41ft.	14ft.	E	60.5
KB2425-3-B2	13784	24	85.3	3	240/208	60.1/52.1	240	1/4HP / 50W	1350	58°	41ft.	14ft.	D	60.5
KB4825-3-B2	22107	24	85.3	3	480	30.1	24	1/4HP / 50W	1350	58°	41ft.	14ft.	D	60.5
KB2030-3-B2	13806	30	102.4	3	208	83.3	208	1/4HP	1800	53°	48ft.	15ft.	E	60.5
KB2430-3-B2	13810	30	102.4	3	240/208	72.1/62.5	240	1/4HP	1800	53°	48ft.	15ft.	E	60.5
KB4830-3-B2	13816	30	102.4	3	480	24	24	1/4HP	1800	53°	48ft.	15ft.	E	60.5
KB2040-3-B2	22108	40	136.5	3	208	111	208	(2) 50W	2200	57°	53ft.	15ft.	F	60.5
KB2440-3-B2	22109	40	136.5	3	240/208	96.2/83.3	240	(2) 50W	2200	57°	53ft.	15ft.	F	60.5
KB4840-3-B2	22110	40	136.5	3	480	48.1	24	(2) 50W	2200	57°	53ft.	15ft.	F	60.5
KB2050-3-B2	22111	50	170.6	3	208	138.8	208	(2) 50W	2400	65°	58ft.	15ft.	F	60.5
KB2450-3-B2	22112	50	170.6	3	240/208	120.2/104.2	240	(2) 50W	2400	65°	58ft.	15ft.	F	60.5
KB4850-3-B2	22113	50	170.6	3	480	60.1	24	(2) 50W	2400	65°	58ft.	15ft.	F	60.5
KB2460-3-B2	22114	60	204.8	3	240/208	144.3/125	240	(2) 1/4HP	2700	70°	65ft.	18ft.	G	60.5
KB4860-3-B2	22115	60	204.8	3	480	79.5	24	(2) 1/4HP	2700	70°	65ft.	18ft.	G	60.5

6" minimum clearance to walls and ceilings.

Over 5KW line voltage control is operating the contactor coil only, and will draw under 1 AMP.

\*Dual rated heaters will draw 13% less amps and 25% less wattage when operated at 208V.

## Field Mount Accessories

MODEL	UPC	DESCRIPTION	WT. (lbs.)
KBB-1	15192	Universal Wall/Ceiling Small Mounting Bracket (for heaters with size A heaters)	3
KBB-2	15195	Universal Wall/Ceiling Large Mounting Bracket (for heaters with size B, C, D and E) (Use 2 brackets for size F & G)	4
KBB-4	15351	Rough Service or Low Profile Mounting Bracket for any heater (2 each required for size F and G)*	4
KBT	15189	Capillary Bulb-Style Thermostat Kit (single pole single throw) 25 Amp	.5
KBT-2	18209	Capillary Bulb-Style Thermostat Kit (double pole single throw) 25 Amp	.5

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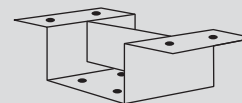
## Bracket Selection Chart

BRACKET #	HEATER KW SIZE USED WITH	BRACKET DIMENSIONS												
		L	W	H	A	B	C	D	E	F	G	X	Y	Z
KBB-1	3 to 7.5 kW (1 phase)	12½"	3"	10"	1¼"	7¼"	1½"	1¾"	5½"	4"	1¼"	½"	1"	2"
KBB-2	10 to 15 kW (1 phase) 3 to 30 kW (3 phase)	17"	3"	10"	1¼"	7¼"	1½"	2"	8½"	5¼"	1¼"	½"	1"	2"

## Factory Options

ADD SUFFIX:	DESCRIPTION
-T	1-Pole Unit Mounted Thermostat (temperature range 40°F - 100°F)
-T2	2-Pole Unit Mounted Thermostat (temperature range 40°F - 100°F) 6kW and higher
-TP	Tamperproof Thermostat with Slotted Shaft
-B1	Mounting Bracket KBB-1 (included with heater size A and C)
-B2	Mounting Bracket KBB-2 (included with heater size B, D and E)
-SF	Summer Fan Switch
-SFR	Control Relay and 24V Transformer for Remote Summer Fan Operation
-3PS	3-Position Switch (Heat / Fan / Off)
-PL	Pilot Light (power ON indication)
-CX	Power Contactor for 3 kW - 5kW 1-Phase Models (Line Voltage Coil)
-CT24	Transformer that Converts 208, 240 and 277 Volts to 24 Volt Control Circuit (add power contactor (-CX) for 3 kW - 5kW 1-Phase models)
-CT120	Same as (-CT24) except 120 Volt Control Components (add power contactor (-CX) for 3kW - 5kW 1-Phase models)
-DS40	40 Amp, 3-Pole Disconnect Switch w/ Padlock Provision
-DS60	60 Amp, 3-Pole Disconnect Switch w/ Padlock Provision
-DS80	80 Amp, 3-Pole Disconnect Switch w/ Padlock Provision
-DS100	100 Amp, 3-Pole Disconnect Switch w/ Door Interlock and Padlock Provision
-2S1	2-Stage Control for Single Phase Models Only. No 3 Phase Models
-5MT	5 Mounting Weld Nuts Provided on Heater for Rough Service Use (includes KBB-4 5 hole bracket)
-5MT2	Rough Service Mounting Holes (4 each) fabricated into top of each heater to accept KBB-4 Mounting Brackets (2 each KBB-4 included)

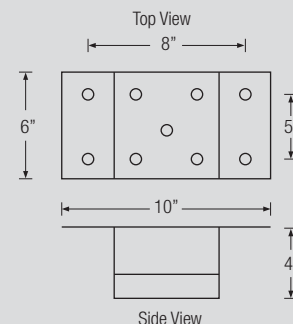
## Rough Service / Low Profile • KBB-4 Mounting Bracket



This bracket is manufactured in a Low Profile design with 5 mounting holes. *When using this bracket for Low Ceiling Profile installation use center hole only.*

Option **(-5MT)** is for *rough service support*. Request this option at the time of order placement. The heater will have four mounting holes fabricated into the top.

Attach bracket using the four outside mounting holes to provide a rigid mount. The price of option **(-5MT)** includes the KBB-4 bracket. This is ideal for use on ships, containers or any application where the heater will experience vibration.



## Upgrade to ECO2S 2-Stage Controller with IR Remote Control



### ECO2S Electronic Controller Features:

- Electronic control for accuracy
- Energy-saving automatic 2-stage heating
- Large LED display
- Remote control and wall bracket included
- Thermostat timer mode (1-9 Hours)
- Fan only mode
- Built-in fan delay



The **ECO2S KB controller adds unparalleled performance**, energy efficiency and user control by incorporating another King innovation, the in-built ECO2S electronic thermostat with remote control. Offering energy efficient 2-stage heating, with Eco mode that automatically uses the lowest wattage needed to heat the room, integrated fan only and timer modes, as well as a remote control for simple operation. Note: All 1-phase ECO2S models use a size C heater case.

### Factory Installed Options

ADD SUFFIX	UPC	DESCRIPTION
KB1-ECO*	22078	Electronic controller for 1-phase heater
KB3-ECO*	22079	Electronic controller for 3-phase heater

\*Includes heating thermostat with 2 stage control, timer, fan delay, cooling thermostat with summer fan, and IR remote



# Selecting The Proper Unit Heater

To obtain the best performance from King unit heaters use this chart for proper heater selection. To determine which type of unit is best note the ceiling height and room size. In addition to the air throw capabilities of each type of unit heater, wall and ceiling insulation must be considered when determining wattage requirements. The most common error of unit heater selection is installing a unit designed for low ceiling application on a high ceiling. In this application heat is unable to circulate properly to the floor – the result: unsatisfactory comfort or performance level. Following this guide allows correct unit heater selection for the determined space and environment. With correct selection and placement this King unit heater will provide years of high performance heating.

## Application Tips

First, calculate heating loads in the conventional way using the N.E.M.A. handbook or ASHRAE guide. Next, determine quantity and size of heaters to be used. In instances where large groups of people are normally settled in the same location use a large number of smaller kW heaters (Example: people on a production line or skilled machine operations). By utilizing heaters in this manner one can best distribute uniform heat, prevent hot drafts, reduce potential noise levels and balance the electrical operating demand. When considering warehouse areas or storage rooms where heat distribution and constant temperatures are less important, use fewer heaters of higher capacity. To maintain uniform heat and reduce stratified air it is recommended that the total CFM of the units turn the air over approximately 3 times per hour.

## Horizontal Mount

Smaller rooms can be heated by one unit heater. Where two walls are exposed heaters should be mounted as shown below. In larger rooms, units should be located so air streams wipe exposed walls without blowing at them. Units should be located so the airstream of one supports that of another thus setting up a circulatory air movement. (Distance between units to be approximately 1 times published air throw). Units should not be mounted horizontally in areas having ceiling heights in excess of 10 to 12 feet.

## Vertical Mount

Units should be mounted vertically in high bay areas where they may not otherwise interfere with assorted material or handling equipment. Heaters should be situated to provide free air circulation. Size and selection of units should be based on recommended mounting height. Unit heaters are frequently used to combat cold air inrush when loading dock doors are opened. For such applications, one or more units should be arranged to blow warm air vertically in front of opening.

## Dual Mounting

Where square footage is large and comfort essential, both horizontal and vertical installations may best serve your requirements.

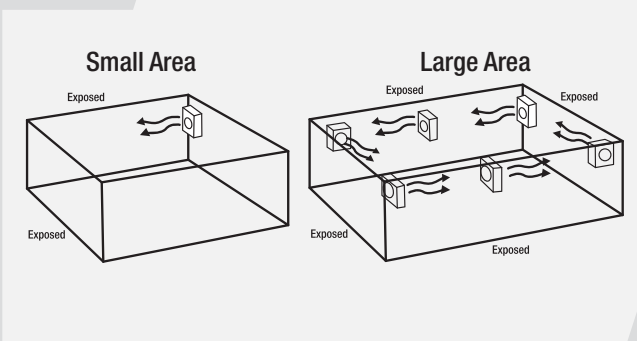
## Mounting Limitations

Unit heaters should not be used in potentially explosive atmospheres. The finish is not intended for direct salt spray exposure in marine applications or the highly corrosive atmospheres of swimming pools, chemical storage bins, etc. Please refer to the factory for explosion proof or marine application heater information. Do not install unit heaters above recommended maximum mounting height. See chart for height information. Obstructions must not block unit heater air inlet or discharge. To prevent possible injury heaters must be mounted at least 6 feet above the floor to prevent accidental contact with heating element or fan blade.

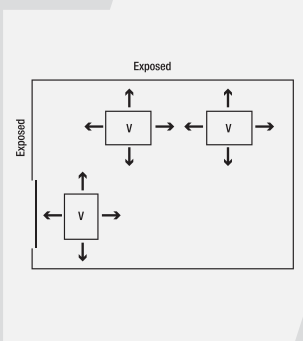
## Selection

CEILING HEIGHT	UNDER 8 FEET	10 FEET	12 FEET	13 FEET AND OVER
250 Sq. Ft.	N/A	KBP	KBP	KFUH
1000 Sq. Ft.	KBP	KBP	KBP / KB	KFUH
2000 Sq. Ft.	KBP / KB	KBP / KB	KB / KFUH	KFUH
3000 Sq. Ft.	KB	KB	KFUH	KFUH
5000 Sq. Ft.	KB	KFUH	KFUH	KFUH
10,000 Sq. Ft.	KB	KFUH	KFUH	KFUH

### Horizontal



### Vertical



### Dual

