

# Electric Furnace KF/KFS Series



### Model Code:

KF/KFS	20	20	1
A	B	C	D
A: Series			
B: 20 - 208V 24 - 240V 48 - 480V			
C: Kilowatts			
D: 1 or 3-phase			

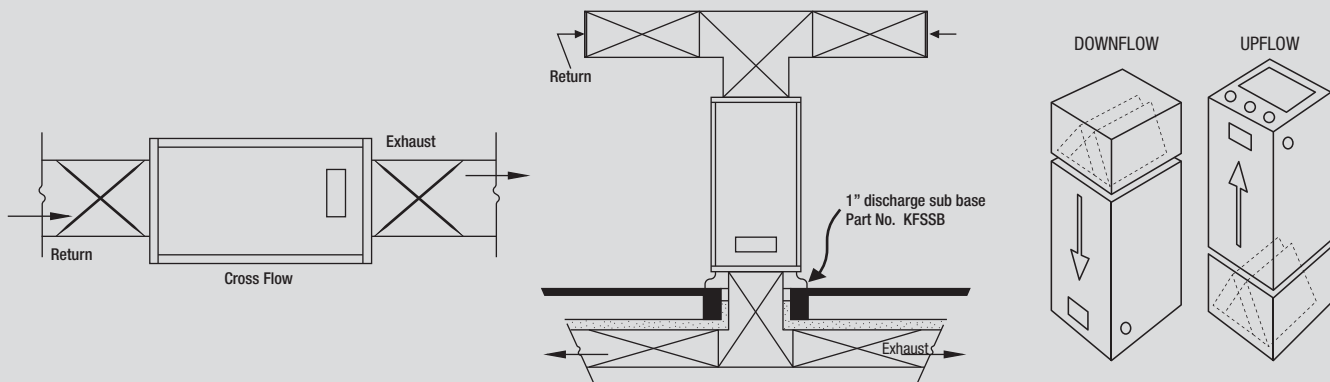


- Heavy duty open-coil element
- Direct drive motor
- Up to 3-speed motor
- Standard 24 Volt control
- Horizontal or vertical mount
- Insulated discharge cabinet
- Baked enamel finish
- Fan relay
- Silent contactors
- Sequenced elements
- Dual inlet blower
- 60 Amp disconnect protection (KFS)
- Manual reset limit on 20 kW and larger
- Welded galvanized steel construction
- Thermally protected motor
- Replaceable filter
- Mobile home approved
- 5 Year limited warranty



## The KFS Series Electric Furnace

The KFS Series furnace is the quietest and most compact unit available in its class. Ideal for residential applications, and yet powerful enough for commercial and process heating applications as well. It's the perfect choice for both new and replacement installations. The compact design allows it to be installed in either upflow, downflow or horizontal applications. Featuring a maintenance free blower, an insulated cabinet for quiet operation, and heavy gauge coiled nickel-chromium wire heating elements, the KFS furnace will provide years of trouble-free operation.



## Engineering Specifications

Contractor shall supply and install KFS Series electric furnaces manufactured by King Electrical Mfg. Company. Furnaces shall be of the wattage and voltage as indicated on the plans.

**Transformer:** Each furnace is equipped with a heavy-duty low voltage (24 Volt) transformer for the thermostat control circuit.

**Contactors or Time Delay Sequencer:** Actuates heating element banks at random intervals to minimize electrical surges in compliance with E.E.I. and N.E.M.A. standards.

**Heating Elements:** Quick heating, long life Ni-Chrome elements are sized to provide proper watt density for maximum heat dissipation by fan-forced air convection currents.

**Terminal Block:** For field wiring (optional special order) KFSTB

**Air Filter:** Convenient access for replacement of standard 16" x 20" x 1" filter.

**Overcurrent Protection:** 208 and 240 volt KFS models have 60 amp circuit breakers. 480, 208 and 240 volt KF models have terminal blocks. Internal 60 amp fusing is provided for KF models over 48 amps.

**Limit Control:** Integral automatic high temperature limit control in each heating element bank prevents the delivery of air at unsafe temperatures. 20-35 kW use a manual reset limit control to completely shut the furnace off should an over temperature occur.

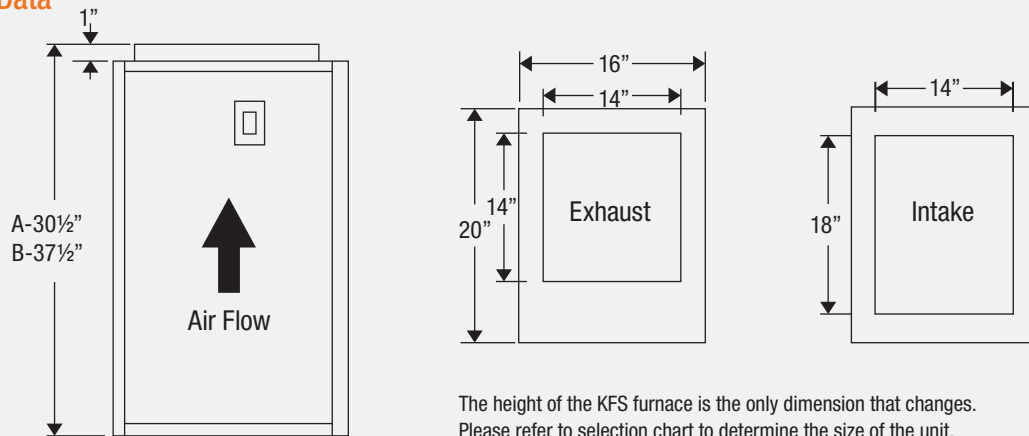
**Fan Relay:** Heavy-duty dual speed fan relay is standard with furnaces for air conditioning or summer fan operation.

**Low Voltage Terminal Block:** 24 Volt control screw terminals

**Approvals:** UL (E48864)

# Electric Furnace KF/KFS Series

## Dimensional Data



The height of the KFS furnace is the only dimension that changes. Please refer to selection chart to determine the size of the unit.

## Accessories

MODEL	UPC	DESCRIPTION	WEIGHT(lbs.)
KFS-4PJB	20185	* 4-Pole Jumper Bar - 15kW to 20kW	.05
KFS-6PJB	20184	* 6-Pole Jumper Bar - 25kW to 30kW	.05
KFSSB	20182	1" discharge sub base	5
KFS-Q02C	20181	Small Cooling Cabinet 16" L x 22" W x 19 1/2" H - 13 lbs.	25
KFS-Q03C	20180	Large Cooling Cabinet 18" L x 22" W x 19 1/2" H - 15 lbs.	25
KFS-DT	20186	Transition from 14" x 14" Outlet to 12" round	25

\* For single strike connection

## DIMENSIONAL CLEARANCE

Cabinet Sides	1 in.
Cabinet Front	0 in.
Exhaust duct within 3 feet of furnace	1 in.
Return Air Plenum	0 in.

## Options

ADD SUFFIX:	DESCRIPTION
-JB	15 kW to 30 kW, 1-Phase
-1/3HP	1/3 HP Motor & Blower - 3 kW to 18 kW
-1/2HP	1/2 HP Motor & Blower - 3 kW to 35 kW
-2S1	Two Stage Control, 1-Phase Models (see quick selection guide)
-2S3	Two Stage Control, 3-Phase Models (5 kW increments only)
*-3S1	Three Stage Control, 1-Phase Models
-1/5 ECM	1/5 hp Electronically Controlled Motor
-1/3 ECM	1/3 hp Electronically Controlled Motor

## Factory Installed Options

ADD SUFFIX:	DESCRIPTION
-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

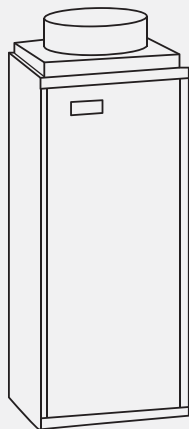
## Air Flow Chart

CASE SIZE	HP	SPEED	CFM (STATIC)							
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Small Case 30.5" tall	1/5	LOW	1090	980	940	890	840	920	800	760
		MED	1260	1090	1040	980	930	890	810	780
		HIGH	1370	1260	1220	1170	1120	1090	1080	990
	1/3	LOW	1700	1680	1670	1660	1650	1640	1630	1620
		MED	1810	1800	1790	1750	1740	1730	1720	1710
		HIGH	1960	1940	1930	1910	1870	1860	1850	1830
Large Case 37.5" tall	1/5	LOW	1160	1120	1090	1050	1020	990	960	850
		MED	1310	1230	1200	1150	1120	1050	990	910
		HIGH	1480	1410	1390	1270	1240	1180	1120	1040
	1/3	LOW	1860	1850	1840	1830	1820	1810	1790	1740
		MED	2000	1980	1960	1940	1930	1920	1910	1900
		HIGH	2120	2100	2070	2050	2030	2020	2010	2000

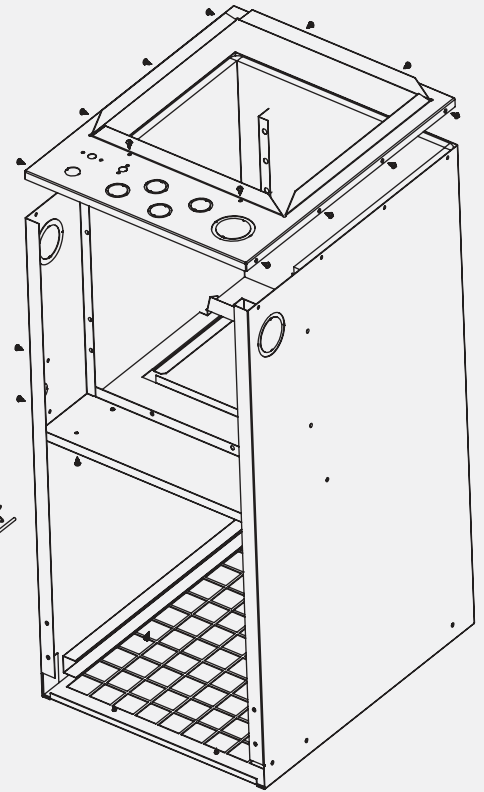
# Electric Furnace KF/KFS Series

## Internal Diagram - *exploded view*

### Smart Heating Solutions



**12" Round KFS-DT  
Duct Transition**



**Heating Elements**

**Transformer**

Each furnace is equipped with a 40VA low voltage (24 volt) transformer for the thermostat control circuit.

**Low Voltage Terminal Block**

Comes standard. With aux 24V access for dampers & air conditioning

**Heating Elements**

Quick heating long life nichrome elements are sized to provide proper watt density for maximum heat dissipation by fan forced air convection currents

**Terminal Block**

For Field Wiring (Optional Special Order)  
For single strike

**Fan Relay**

Heavy duty dual speed fan relay comes standard with furnaces for air conditioning or summer fan

**Time Delay / Contactor Sequencer**

Actuates heating element banks at random intervals to minimize electrical surges in compliance with EEL and NEMA standards.

**Limit Control**

Integral automatic high temperature limit control in each heating element bank prevents the delivery of air at unsafe temperatures. 20-35 KW also use a manual reset limit control to completely shut the furnace off should an overtemperature condition occur.

**Jumper Bar**

for circuit breaker-JB

**KF Model** has terminal block only, used when total current is under 48 amps.

**Overcurrent Protection**

60 Amp circuit breakers may be built in to comply with code requirements and offer ultimate safety in overcurrent protection. Front mounted for easy reset. Multiple circuits or single power source points

**Motor**

Long life thermally protected, permanently lubricated, direct drive motor - no belts to adjust or slip. This low noise three speed motor is designed for use with air conditioning capability as well as heating.

**Air Filter**

Convenient access for replacement of standard 16" x 20" x 1"  
Do not use pleated filters.

# Electric Furnace KF/KFS Series

## Ordering Information

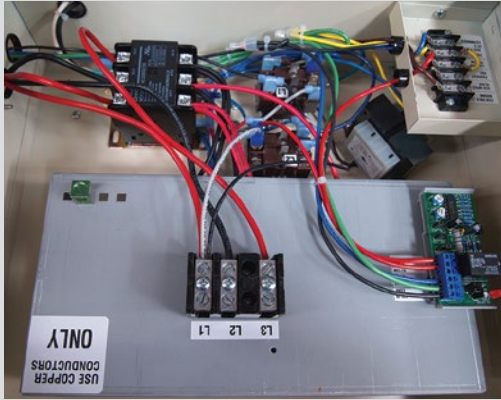
MODEL	PHASE	KILO WATTS	BTU (000)	VOLTS	*AMPS	CIRCUIT PROTECTION				75°C WIRE SIZING				# OF ELEMENTS	MOTOR		TEMPERATURE RISE			HEIGHT	WT. (lbs)
						L1 L2	L3 L4	L5 L6	L7 L8	L1 L2	L3 L4	L5 L6	L7 L8		VOLTS	HP	LOW	MED.	HIGH		
KFS2003-1	1	3	10.2	208	17.8	20				#10				1	208	1/5	12°	11°	9°	30½"	57
KFS2404-1	1	4	13.6	240	20	20				#10				1	240	1/5	16°	15°	13°	30½"	57
KFS2005-1	1	5	17.1	208	27.2	40				#8				1	208	1/5	20°	18°	16°	30½"	57
KFS2405-1	1	5	17.1	240	24.2	30				#10				1	240	1/5	20°	18°	16°	30½"	57
KF4805-1	1	5	17.1	480	12.1	15				#14				1	480	1/5	20°	18°	16°	30½"	57
KFS2006-1	1	6	20.5	208	32.2	40				#8				2	208	1/5	24°	22°	19°	30½"	57
KFS2408-1	1	8	27.3	240	37	50				#6				2	240	1/5	32°	30°	25°	30½"	65
KFS2010-1	1	10	34.1	208	51.4	30	40			#6				2	208	1/5	41°	37°	32°	30½"	65
KFS2410-1	1	10	34.1	240	45	60				#6				2	240	1/5	41°	37°	32°	30½"	65
KF4810-1	1	10	34.1	480	22.5	30				#10				2	480	1/5	41°	37°	32°	30½"	65
KFS2412-1	1	11.5	39.2	240	51.3	40	30			#8	#10			2	240	1/5	47°	42°	36°	30½"	65
KF4812-1	1	11.5	39.2	480	25.7	40				#8				2	480	1/5	47°	42°	36°	30½"	65
KFS2015-1	1	15	51.2	208	75.5	40	60			#8	#6			3	208	1/5	61°	55°	47°	30½"	74
KFS2415-1	1	15	51.2	240	65.9	30	60			#10	#6			3	240	1/5	61°	55°	47°	30½"	74
KF4815-1	1	15	51.2	480	32.9	50				#6				3	480	1/5	61°	55°	47°	30½"	74
KFS2418-1	1	17.25	58.8	240	75.2	40	60			#8	#6			3	240	1/5	70°	63°	55°	30½"	74
KF4818-1	1	17.25	58.8	480	37.6	50				#6				3	480	1/5	70°	63°	55°	30½"	74
KFS2020A-1	1	20	68.3	208	99.5	60	60			#6	#6			4	208	1/5	81°	73°	63°	37½"	76
KFS2420A-1	1	20	68.3	240	86.7	60	60			#6	#6			4	240	1/5	81°	73°	63°	37½"	76
KF4820A-1	1	20	68.3	480	43.4	60				#6				4	480	1/5	81°	73°	63°	37½"	76
KFS2020-1	1	20	68.3	208	99.4	60	60			#6	#6			4	208	1/3	57°	51°	41°	37½"	76
KFS2420-1	1	20	68.3	240	86.5	60	60			#6	#6			4	240	1/3	57°	51°	41°	37½"	76
KF4820-1	1	20	68.3	480	43.4	60				#6				4	480	1/3	57°	51°	41°	37½"	76
KFS2422-1	1	22.5	76.8	240	96.9	60	60			#6	#6			4	240	1/3	57°	51°	41°	37½"	76
KF4822-1	1	22.5	76.8	480	48.6	60				#6				4	480	1/3	57°	51°	41°	37½"	76
KFS2025-1	1	25	85.3	208	123.4	30	60	60		#10	#6	#6		5	208	1/3	72°	63°	51°	37½"	81
KFS2425-1	1	25	85.3	240	107.4	30	60	60		#10	#6	#6		5	240	1/3	72°	63°	51°	37½"	81
KF4825-1	1	25	85.3	480	53.8	20	60			#12	#6			5	480	1/3	72°	63°	51°	37½"	81
KFS2030-1	1	30	102.4	208	147.4	60	60	60		#6	#6	#6		6	208	1/3	86°	76°	62°	37½"	85
KFS2430-1	1	30	102.4	240	128.2	60	60	60		#6	#6	#6		6	240	1/3	86°	76°	62°	37½"	85
KF4830-1	1	30	102.4	480	65.7	30	60			#10	#6			6	480	1/3	86°	76°	62°	37½"	85
KFS2435-1	1	34.5	117.7	240	146.9	15	60	60	60	#14	#6	#6	#6	6	240	1/3	99°	87°	71°	37½"	85
KF4835-1	1	34.5	117.7	480	73.6	40	60			#8	#6			6	480	1/3	99°	87°	71°	37½"	85

MODEL	PHASE	KILO WATTS	BTU (000)	VOLTS	*AMPS	CIRCUIT PROTECTION			75°C WIRE SIZING			# OF ELEMENTS	MOTOR		TEMPERATURE RISE			HEIGHT	WT. (lbs)	
						L1 / L2 / L3	L1 / L2 / L3	L1 / L2 / L3	L1 / L2 / L3	L1 / L2 / L3	VOLTS		HP	LOW	MED.	HIGH				
KFS2405-3	3	5	17.1	240	15.4	20				#12			1	240	1/5	20°	18°	16°	30½"	57
KF4805-3	3	5	17.1	480	7.7	10				#14			1	480	1/5	20°	18°	16°	30½"	57
KFS2009-3	3	9	30.7	208	28.3	40				#8			3	208	1/5	37°	33°	28°	30½"	74
KFS2410-3	3	10	34.1	240	27.4	40				#8			2	240	1/5	41°	37°	32°	30½"	74
KF4810-3	3	10	34.1	480	13.7	20				#12			2	480	1/5	41°	37°	32°	30½"	74
KFS2012-3	3	11.25	38.4	208	34.6	40				#8			3	208	1/5	46°	41°	35°	30½"	74
KFS2412-3	3	12	40.9	240	32.3	40				#8			3	240	1/5	47°	42°	36°	30½"	74
KF4812-3	3	12	40.9	480	16.1	20				#12			3	480	1/5	47°	55°	36°	30½"	74
KFS2015-3	3	15	51.2	208	43.5	60				#6			3	208	1/5	61°	55°	47°	30½"	74
KFS2415-3	3	15	51.2	240	45	50				#6			3	240	1/5	61°	55°	47°	30½"	74
KF4815-3	3	15	51.2	480	21.4	30				#10			3	480	1/5	61°	63°	47°	30½"	74
KFS2418-3	3	17.25	58.8	240	44.8	60				#6			3	240	1/5	70°	63°	55°	30½"	74
KF4818-3	3	17.25	58.8	480	22.4	40				#8			3	480	1/5	70°	51°	55°	30½"	74
KFS2420-3	3	20	68.3	240	51.3	70				#6			4	240	1/3	57°	51°	41°	37½"	76
KF4820-3	3	20	68.3	480	25.7	30				#12			4	480	1/3	57°	56°	41°	37½"	74
KFS2022-3	3	22.5	76.8	208	65.5	100				#3			6	208	1/3	64°	61°	46°	37½"	85
KFS2424-3	3	24	81.6	240	60.9	75				#4			6	240	1/3	69°	61°	49°	37½"	85
KF4824-3	3	24	81.6	480	30.5	50				#6			6	480	1/3	69°	63°	49°	37½"	85
KFS2425-3	3	25	85.3	240	63	75				#4			5	240	1/3	72°	63°	51°	37½"	85
KF4825-3	3	25	85.3	480	32	50				#6			5	480	1/3	72°	76°	51°	37½"	85
KFS2030-3	3	30	102.4	208	86.5	110				#2			6	208	1/3	86°	76°	62°	37½"	85
KFS2430-3	3	30	102.4	240	75.3	100				#3			6	240	1/3	86°	76°	62°	37½"	85
KF4830-3	3	30	102.4	480	37.3	50				#6			6	480	1/3	86°	76°	62°	37½"	85
KFS2435-3	3	34.5	117.7	240	86.2	110				#2			6	240	1/3	99°	87°	71°	37½"	85
KF4835-3	3	34.5	117.7	480	43	60				#6			6	480	1/3	99°	87°	71°	37½"	85



# Electric Furnace KF/KFS Series



## Factory Installed Options

ADD SUFFIX:	DESCRIPTION
-SCR45-1	SCR Fully Modulating Fan Coil Unit, 45 Amp, 1-Phase
-SCR45-3	SCR Fully Modulating Fan Coil Unit, 45 Amp, 3-Phase
-SCR45X2-1	SCR Fully Modulating Fan Coil Unit, 90 Amp, 1-Phase
-SCR45X2-3	SCR Fully Modulating Fan Coil Unit, 90 Amp, 3-Phase

## Additional Add-On Options

ADD SUFFIX:	DESCRIPTION
-MT	Modulating Thermostat
-DS	Duct Sensor Temperature Provision
-AF	Air Flow Switch Provision (Air Flow Switch Purchased Separately)

## SCR Fully Modulating Fan Coil Unit



SCR Power Control



Fan Control Transducer

- SCR Power Control provides precise modulation of the electric resistance heating load. Available for 208V, 240V, 480V 1-phase and 3-Phase. Amp rating: 45A and 75A or 90A (2x45A units). Accepts 4 – 20 mA or 0-10 VDC input signal Includes LED indication light.
- Fan Control Transducer accepts 4 – 20 mA or 0-10 VDC input signal to produce a single-stage relay output.
- Selectable 3-Speed Fan is set up at installation to provide the required CFM.

## Optional Components for Modulating Fan Coil Unit



Modulating Thermostat



Duct Temperature Sensor



ECM Motor

- Modulating Thermostat with 0 to 10VDC modulating output controls the output temperature by modulating directly to the SCR power controller. Can be mounted remotely or on the unit for make up air applications.
- Duct Temperature Sensor is used with the modulating thermostat and is mounted on the discharge side unit to precisely control the air temperature. Controls discharge air temperature regardless of the incoming air temperature typical of make up air applications.
- Air Flow Switch Provision Terminals (Air Flow Switch Purchased Separately) to be interlocked with the unit so that the heating coils do not energize without airflow detected.
- Optional ECM Motor for multiple speed control.