

# INSTALLATION AND MAINTENANCE



## Electric Unit Heater KFUH Series



DANGER

**ELECTRIC SHOCK OR FIRE HAZARD**

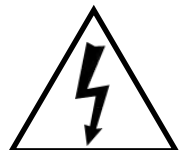
READ ALL WIRE SIZING, VOLTAGE REQUIREMENTS AND SAFETY DATA TO AVOID PROPERTY DAMAGE AND PERSONAL INJURY

WARNING

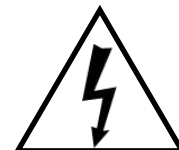
**READ CAREFULLY** - Use the heater only as described in this manual. Any other use is not recommended and could result in fire, electric shock, and personal injury. Following these instructions will prevent difficulties that might occur during the installation and use of the heater. Please study the instructions first, as they may save considerable time and trouble during use addition to providing important safety information. Make sure to save these instructions for future use.

### NEVER LEAVE HEATER UNATTENDED WHILE CONNECTED TO A POWER SOURCE

- WARNING** To prevent a possible electrical shock, disconnect all power coming to heater at main service panel before wiring or servicing.
- WARNING** All wiring must be in accordance with the National Electrical Code (Canadian Electrical Code in Canada) and all applicable local codes. The heater must be grounded as a precaution against electrical shock. Supply wiring must be copper and suitable for at least 75° C.
- WARNING** Verify power supply and control voltages coming to the heater match the ratings printed on the heater nameplate before energizing.
- WARNING** Heater must be installed so the minimum clearances shown in Specifications table are maintained.
- WARNING** This heater is NOT suitable for use in hazardous locations as described by the National Fire Protection Association (NFPA). this heater has hot and arcing or sparking parts inside. DO NOT use in areas where gasoline, paint or other flammable liquids are used or stored.
- WARNING** The mounting structure and anchoring hardware MUST BE capable of reliably supporting the weight of the heater plus mounting bracket if used. Refer to specifications table for heater weight.
- WARNING** Heater air flow MUST be directed parallel to or away from adjacent walls.
- WARNING** To prevent a possible fire, DO NOT block air intakes or exhaust openings in any manner. DO NOT allow foreign objects to enter grille openings as this may cause electric shock, fire or damage to heater.



CAUTION—RISK OF ELECTRIC SHOCK  
DO NOT OPEN HEATER SHELL  
NO USER—SERVICEABLE PARTS INSIDE



# KFUH Series INSTALLATION INSTRUCTIONS

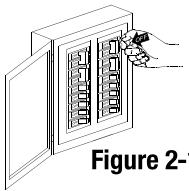


Figure 2-1

**CAUTION!**  
Turn OFF all electrical power to install heater

It is extremely important you verify the electrical power supply is the same voltage as the heater being installed. 240 and 480 Volt heaters are not interchangeable. Powering a 480 Volt unit with 240 Volt supply wires will reduce the heater output by approximately 75% and is never recommended. Powering a 240 Volt unit with 480 Volt supply wires will destroy the heater and voids all warranties

! DANGER !

ELECTRIC SHOCK OR FIRE HAZARD

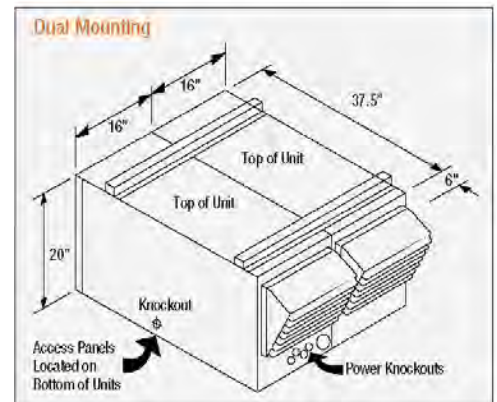
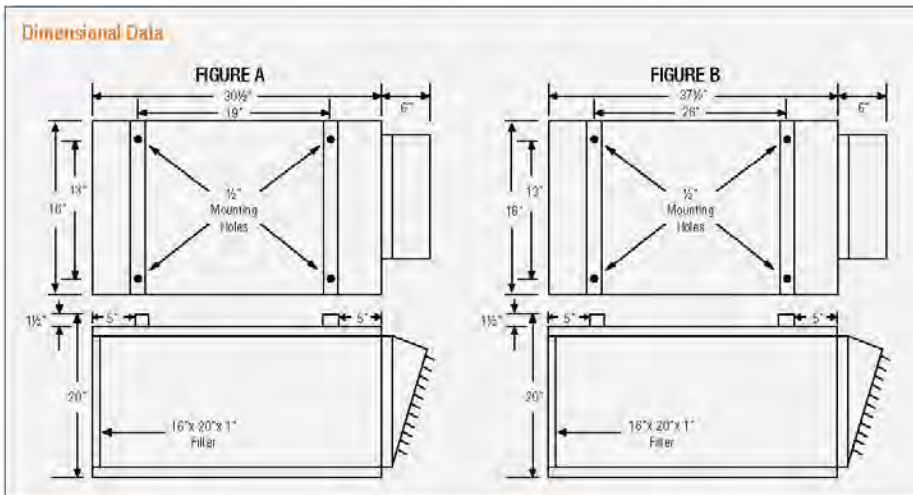
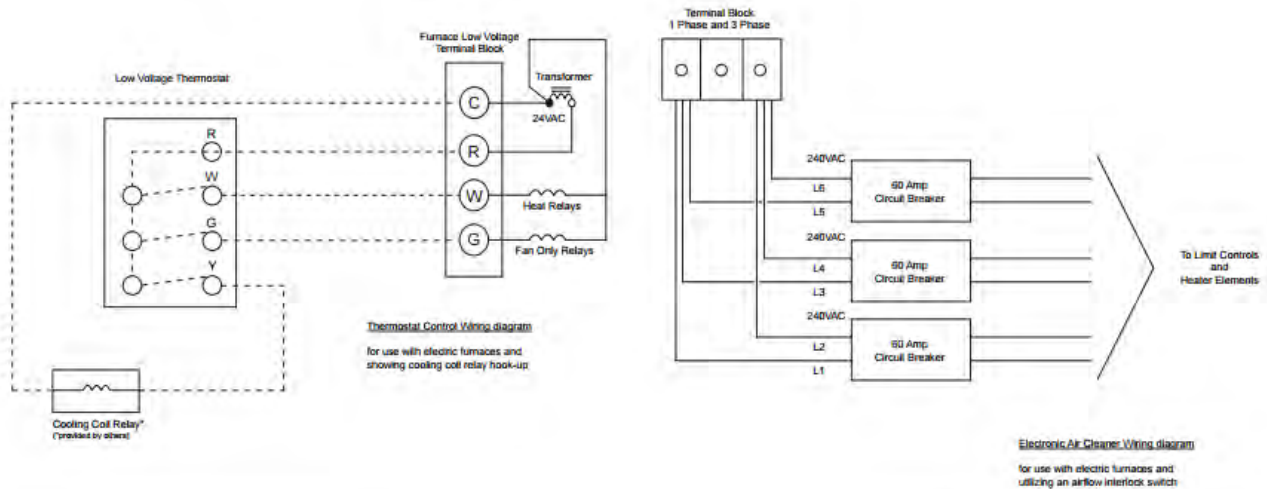
READ ALL WIRE SIZING, VOLTAGE REQUIREMENTS AND SAFETY DATA TO AVOID PROPERTY DAMAGE AND PERSONAL INJURY

**CHECK:** Ensure blower wheel is free-turning and that element assemblies are in place. Be sure filter is in proper position and not torn or damaged. Check that blower housing and motor have not separated from element compartment during shipment.

## FIELD WIRING

208 Volt and 240 Volt heaters are equipped with circuit breakers over 48 Amps to provide internal circuit protection and a field disconnect on the unit. A terminal block provides a single strike for field wiring.

480 Volt units do not have circuit breakers but are fused when internal protection is required and are also supplied with terminal blocks for field wiring. Consult the National Electric Code for proper wire size and service circuit breaker protection.



# KFUH Series INSTALLATION INSTRUCTIONS

## MOUNTING:

KFUH heaters can be mounted vertically or horizontally as shown. 3/8" weldnuts are welded into brackets and will accept 3/8 threaded rod. A minimum of 6 inches clearance to vertical and horizontal surfaces and 6 feet minimum above floor are required. Louvers can be adjusted for desired airflow.

## APPLICATION TIPS:

First, calculate the 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 unit heaters. (Example: people on a production line)

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's recommended that the total CFM of all units turn the air over approx. 3 times per hour.

## HORIZONTAL MOUNTING:

Smaller rooms can be heated by one unit heater.

Where two walls are exposed, heaters should be mounted as shown (Fig 1).

In larger rooms, units should be located so their air streams wipe exposed walls without blowing at them (Fig. 2).

Units should be located so that the air stream of one supports that of another thus setting up a circulatory air movement. (Distance between units to be approximately 1½ times published air throw). Units should not be mounted horizontally in areas having ceiling heights in excess of 10 to 12 feet.

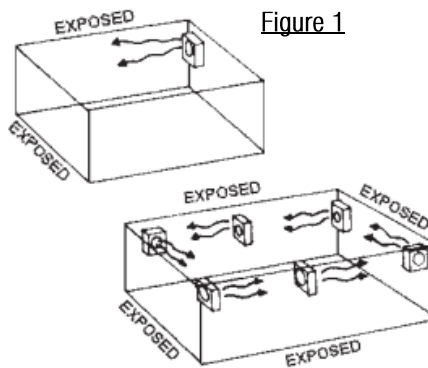


Figure 1

Figure 2

## VERTICAL MOUNTING:

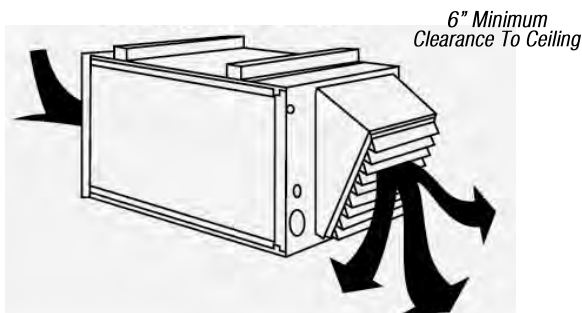
Units should be mounted vertically where they may otherwise interfere with assorted material, handling equipment and in high bay areas. Heaters should be situated to provide free air circulation. Size and selection of units should be based on recommended mounting height.

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.

### Horizontal Mount Diagram

*Ceilings under 12 feet*

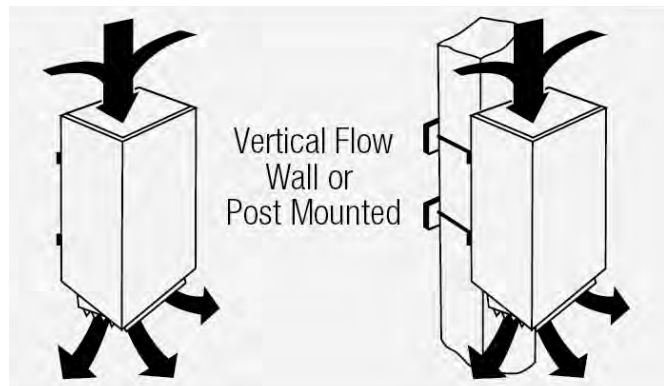
HORIZONTAL FLOW CEILING MOUNTED



### Vertical Mount Diagram

*Ceilings over 12 feet*

VERTICAL FLOW OR POST MOUNTED



# KFUH Series INSTALLATION INSTRUCTIONS

## DUAL MOUNTING:

Where square footage is large and comfort essen-

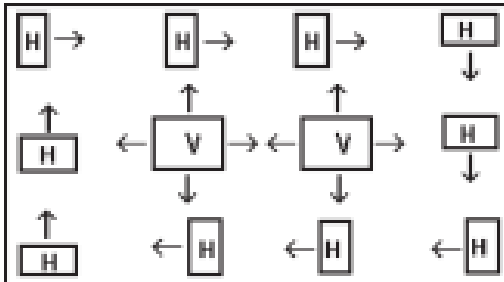


Figure 3

## MOUNTING LIMITATIONS:

1. KFUH unit heaters should not be used in potentially explosive atmospheres.
2. 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.
3. Please refer to the factory for explosion proof or marine application heater information.
4. Do not install unit heaters above recommended maximum mounting height.
5. Obstructions must not block unit heater air inlet or discharge.
6. To prevent possible injury heaters must be mounted at least 6 feet above the floor to prevent accidental contact with the heating element or fan blade.

## OPERATION:

When control thermostat is turned up to demand heat, the blower and heating elements should be energized. Unit heaters with sequencers installed will have up to 30 seconds delay in start-up. When turned to cool position heat-cool thermostats should bring on the blower only for air only.

## MAINTANANCE:

"CAUTION" Disconnect power at the main service panel before inspecting or cleaning this heater. Lock or Tag breaker to prevent accidental shock.

Because of its rugged design, superior engineering and quality craftsmanship the King KFUH Unit Heater requires little maintenance. With minimum care your electric heater should last a lifetime. King recommends changing the air intake filter at least twice a year and checking the motor and blower for excessive dust / lint accumulation to maintain the efficiency of the heater. While King recommends the filter be changed twice a year, your environment may require more frequent changes.

## CONTROL WIRING:

Connect thermostat to terminals R and W1 for heating, R and G for air only. This can be done with a single stage heat/cool thermostat or a single stage heat-only thermostat and a separate fan-only switch to control the fan-relay installed on KFUH.

Most models have two stage operation and are provided with terminals W1 and W2. If a single stage thermostat is used it should be connected to terminals R and W1 and a jumper wire installed from terminals W1 to W2 (see enclosed control circuit wiring diagram). Some models of furnace have the 24 VAC power available between terminal C and R for use with external air conditioning relay option. Never short or cross these two terminals! The transformer will fail.

# AIRFLOW CHART



## Air Flow Chart

MODEL	KW	HP	BLOWER	CFM	RISE (F)
KFUH**04	4	1/5	90-7R	832	15
KFUH**05	5	1/5	90-7R	832	19
KFUH**08	8	1/5	90-7R	1030	25
KFUH**10	10	1/5	90-7R	1030	31
KFUH**12	12.5	1/3	90-7R	1168	37
KFUH**15	15	1/3	90-7R	1168	41
KFUH**18	17.5	1/3	90-7R	1376	40
KFUH**20	20	1/2	100-8T	1575	40
KFUH**25	25	1/2	100-8T	1690	47
KFUH**30	30	3/4	100-8T	1987	48
KFUH**35	35	3/4	100-8T	2154	51
KFUH**40	40	1/2	100-8T	3150	40
KFUH**50	50	1/2	100-8T	3380	47
KFUH**60	60	3/4	100-8T	3974	48
KFUH**70	70	3/4	100-8T	4308	51

## Electric Unit Heater KFUH Series

(1) \*\* Represents the voltage, 20=208V, 24=240V, 48=480V.  
Voltage of the KFUH unit does not affect the data in this table.

90-7R 9" Blower Wheel Diameter, 7" Wide

100-8T 10" Blower Wheel Diameter, 8" Wide

HP PSC Motor



# KFUH Series INSTRUCTIONS

## **WARRANTY:**

The King KFUH unit heater is warranted against defects in workmanship and materials for five years from date of installation. Extended warranty applies to heating element only; all other components are covered for two years. This warranty does not apply to damage from accident, misuse or alteration; nor where the connected voltage is more than 5% above the nameplate voltage; nor to equipment improperly installed, wired or maintained in violation of this instruction sheet. All claims for warranty work must be accompanied by proof of the date of installation. The customer shall be responsible for all costs incurred in the removal or reinstallation of products, including labor costs, and shipping costs incurred to return products to King Manufacturing. King, will repair or replace, at our option, at no charge to you with return freight paid by King. King shall not be liable for consequential damages arising with respect to the product, whether based upon negligence, tort, strict liability or contract. No other written or oral warranty applies, nor any warranties by Representatives, Dealers, Employees of King or any other person.

King Manufacturing can be contacted in Seattle, Washington U.S.A. by phone at (206) 762-0400, fax (206) 763-7738 or website [www.king-electric.com](http://www.king-electric.com).

## TROUBLESHOOTING GUIDE

ISSUE	POSSIBLE CAUSE	REMEDY
Unit Will Not Start	-Thermostat wire is not connected -Circuit breaker is off -24 Volt transformer burned out -Wire connection off or there are broken wires -Reset button tripped -Wrong voltage	-Repair -Reset -Replace -Repair or replace -Reset -Check the power source
Motor will not stop	-Defective sequencer or contactor	-Replace
Unit goes off on high limit	-Dirty air filter -Defective sequencer -Defective limit control -Power failure	-Replace -Replace -Replace -Reset manual limit push button 20-35kW units
Vibration Noise	-Blower assembly loose	-Secure blower & motor cage
Unit has a buzzing sound when not in use	-Low voltage transformer or defective or loose	-Replace or tighten
Unit continues to heat after room is up to set temperature -does not shut off	-Defective sequencer -Defective thermostat -Thermostat wires to ground -Motor wires to ground -Thermostat accidentally shorted & contacts were welded	-Replace -Replace -Repair -Repair -Replace -Make sure all connections are tight
Unit Blows Cold Air	- Single stage thermostat on a 2 stage unit	-Jump stage 2 to stage 1