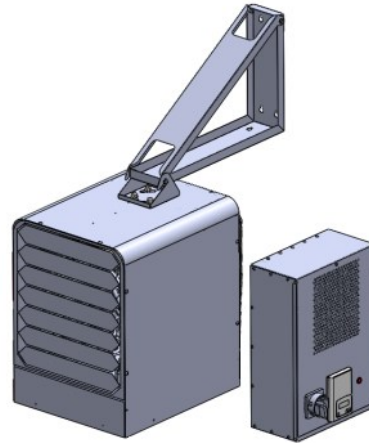


INSTALLATION AND MAINTENANCE



KBSH Series

High Temperature Heater



DANGER

ELECTRIC SHOCK OR FIRE HAZARD

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

Congratulations on the purchase of your new KING ELECTRICAL UNIT HEATER, made with the highest standards in electrical design and quality components to ensure your satisfaction in durability and performance. The stainless steel fin tube element which has a 5 year warranty is backed by a heavy-duty fan directing a strong flow of warm air to any desired area through adjustable louvers. The rugged, totally enclosed, service-free motor is combined with our fan design to maintain the correct relationship of air volume to final air temperature. Also included is a quick access panel for wiring and universal bracket for ceiling or wall mount applications.

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.

- WARNING** To prevent a possible electrical shock, disconnect all power coming to heater at main service panel and any remote power supplies 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 105° 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 grill openings as this may cause electric shock, fire or damage to heater.
- WARNING** Louver adjustment (Do not attempt to adjust while heater is operational): The Louvers are opened during testing at factory, but may have shifted during shipping, make sure the louvers are rotated less than 45 degrees from horizontal before operation. To adjust the opening angle, grasp the left and right end of louver and twist with two hands to the desired position.
- WARNING** If you enter the room while the heater is operating, exit immediately if you feel dizzy, tired, or uncomfortable. Staying too long can result in overheating.



**CAUTION—RISK OF ELECTRIC SHOCK
DO NOT OPEN HEATER SHELL**





WARNING



EQUIPMENT AND PERSONAL WARNINGS

Before installing and operating this product, the user and/or installer must read, understand, and follow these instructions. This product must be installed by a qualified and certified electrician in accordance with the NEC and local building codes. All user-supplied conduit, conduit fittings, conduit hubs, temperature limiting and temperature regulating controllers and components, transformers, contactors, and other electrical parts and equipment, must be suitably rated for the application and Listed for the US and Certified for Canada. The following instructions must be followed to avoid personal injury, death, or property damage.

1. When performing installation, servicing, or cleaning of the system, it is recommended to wear safety glasses and gloves.
2. Make sure that all screws and electrical terminal connections are tightly secured before operating the unit in case they may have loosened during transportation.
3. Protect the equipment with the appropriately sized circuit breaker or fuse.
4. Make sure the line voltage matches with what is indicated on the unit's nameplate.
5. The KBSH must be grounded. Ground lugs are found in both the control box AND the unit heater.
6. Switch off the power at the circuit breaker/fuse before installing, repairing, or cleaning the unit.
7. When notching or drilling into framing or wall studs, comply with code and manufacture limitations on allowable modifications to the structural members.
8. The unit is intended for Industrial Use Only. The unit is not intended for residential or commercial heating applications.
9. When cutting or drilling into the wall or ceiling, do not damage electrical wiring or other hidden utilities.
10. This unit is very hot when in use and is a burn risk when in normal use. To avoid burns, do not let bare skin touch any hot surfaces on the heater or in the room. Let the unit fully cool down before handling or servicing it.
11. Make sure that no flammable objects or substances are in the room to be heated.
12. Make sure all objects within the room can withstand your elevated temperature, up to 160F (71C), to avoid permanently damaging them.
13. When entering the room while the unit is operational, do not stay inside for longer than 15 minutes. Extended exposure to high temperatures can cause overheating which can lead to death.
14. Safeguards should be put in place to ensure all persons can exit the room when the unit is operating above 104F (40C). Alternatively, safeguards should be in place so that unintended persons cannot enter the room while the unit is operating.
15. A tripped high temperature limit control, indicated by a red light on the control box, indicates that the unit has been subjected to abnormal operating conditions. The limit is self-holding and the unit will remain off until power is turned off and the unit is cooled. Identify any causes for temperature rise and remove any blockages if they exist. After the unit is cooled, turn the unit back on and check for normal operation. If the unit is defective, cut off the power supply at the circuit breaker immediately and do not use the unit until it is repaired or replaced.

MOUNTING OF UNIT

1. The KBSH can be mounted on either the wall or ceiling with the provided mounting hook or bracket. If the mounting bracket is not used, be sure to leave the appropriate clearances to the wall and ceiling, at least 13". The supplied mounting bracket meets all clearances from the wall and ceiling.
2. The control box should be mounted on the wall in an adjacent room to the heater. The control box is not to be subjected to the high ambient temperature that the heater is providing.
3. There are 4 3/8" holes in each corner of the control box to secure to different types of walls or Unistrut.
4. The temperature probe should mount through the wall from the control box to the room containing the heater. The probe should take readings from the same wall or the nearest wall that the heater is mounted to.
5. Mount the temperature probe within 2 feet of the air intake of the heater to ensure the motor is not receiving a higher ambient temperature than intended. Failure to do so may result in unintended tripping of the thermal cut-out or a reduced motor-lifetime.

KBSH INSTALLATION

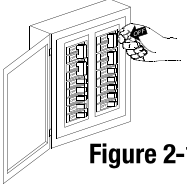


Figure 2-1

CAUTION!

Turn OFF all electrical power to install heater



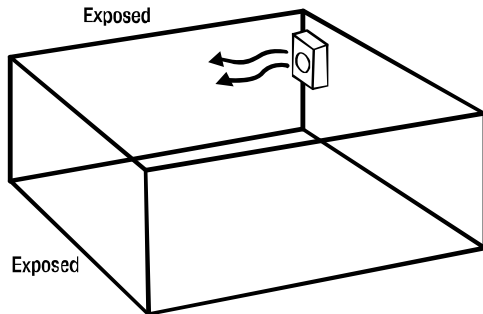
Selecting A Location For Your Heater:

The control box will need to be mounted in an area outside of the room where the heater will be installed, but the control box must remain indoors. Mounting it to the exterior side of the wall where the heater is to be mounted is recommended.

The heater should be installed out of the reach of persons, 6' from the ground. The direction of air flow should not be restricted by machinery, beams, columns or partitions, etc., and the air flow should wipe exposed walls rather than blowing directly at them.

Heaters should be directed away from any potential room occupants and placed in a location that can distribute the air to all locations within the room. This will allow the room to reach an evenly controlled temperature quicker.

Small rooms can be heated by one unit heater. Current constructions only permits the use of a single unit per room unless an additional control box is mounted for the additional heater. A well-insulated room can be heated more effectively to the desired temperatures without the use of an additional heater.



Unpack & Inspect Your New Heater

Remove heater from the box and inspect it for any damage. Verify you have received the universal wall/ceiling mounting bracket.

Tools Needed

You will need the following tools to install your unit heater:

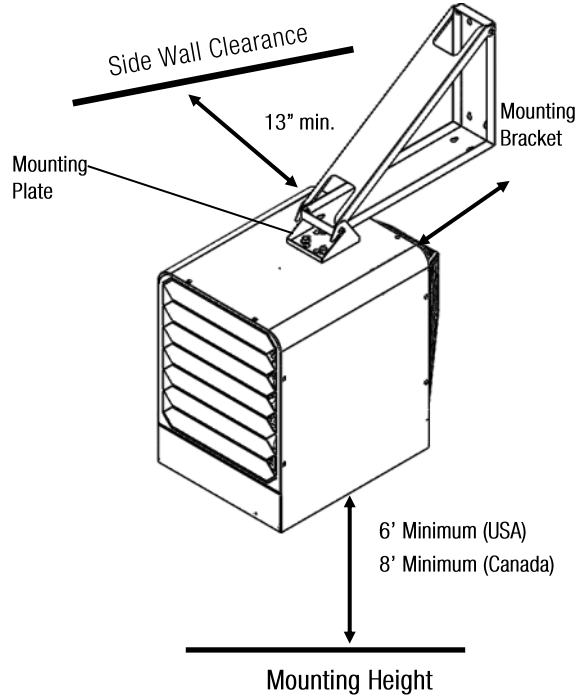
- Screwdriver - (Phillips head & slotted)
- Wire Cutters
- Pliers
- Adjustable Wrench
- Electric Drill

Hardware Needed For Installation

You will also need the following hardware, which can be purchased from your local hardware store or electrical supply house:

- adequate gauge, length, and temperature rated wire for your application
- proper size fuses or breakers to handle amperage
- proper wire connectors for your application
 - ring terminals are required for some connections
- fasteners appropriate for application that are strong enough to hold unit

Conduit will be required for the connections between the control box and the heater. The wires will need to pass between the wall separating the heated area where the heater is mounted and the outer area where the control box is mounted.



Mounting Height

When the airflow of the heater is directed vertically or horizontally the minimum mounting height of 6 feet above floor (8 feet above floor for Canada).

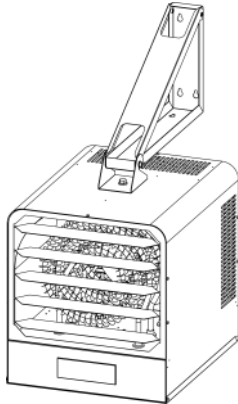
Distance From Vertical Side Walls

Be sure to maintain 13" minimum clearance to walls and ceilings from the main body of the heater.

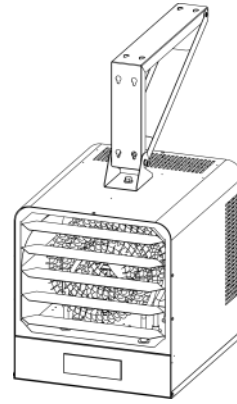
KBSH INSTALLATION

Installing the Ceiling/Wall Mounting Bracket

Heater can be installed in either a Ceiling Mount or Wall Mount orientation. Locate a stud in ceiling or wall and securely fasten L-shaped mounting bracket to supporting surface with at least 2 fasteners strong enough to hold unit at least 1-1/4" in length.

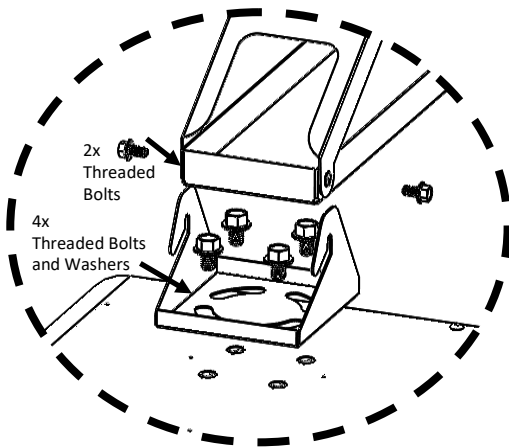


Wall Mount



Ceiling Mount

Figure 1



Installing U-Mounting Bracket Hook

The heater comes with a U-shaped bracket for installing the heater to the Ceiling/Wall bracket, allowing the heater to be quickly and easily installed.

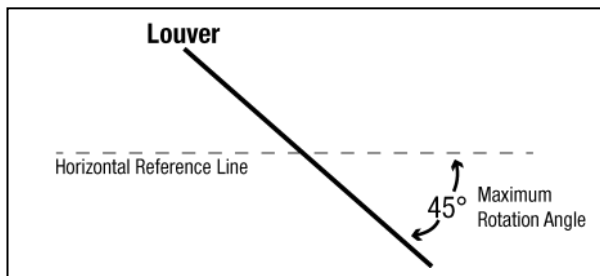
1. Attach the U-shaped bracket to the heater by placing the 4 threaded bolt provided in the hardware package.
2. Install the 2 pcs 1/4"-20 machine screws into the Ceiling/Wall Bracket, leaving them loose and leaving least 3/8" of the shaft exposed.
3. Insert the hooks of the U-shaped bracket onto the exposed 1/4"-20 machine screws. This will hold the heater in place while the screws are being tighten. This two piece bracket design makes it quick and easy for one person to install and hang the heater. (Refer to Figure 1).

Louver Adjustment: (Do not adjust while heater is operational):

The Heater is shipped with louvers in the closed position and must be opened prior to use. Confirm louvers are rotated less than 45 degrees from horizontal before operation. To adjust the opening angle, grasp the left and right end of louver and twist with two hands to the desired position.

CAUTION: Increasing angle beyond 45° degrees from horizontal may restrict air flow causing over temperature limit to activate & shut off the heater.

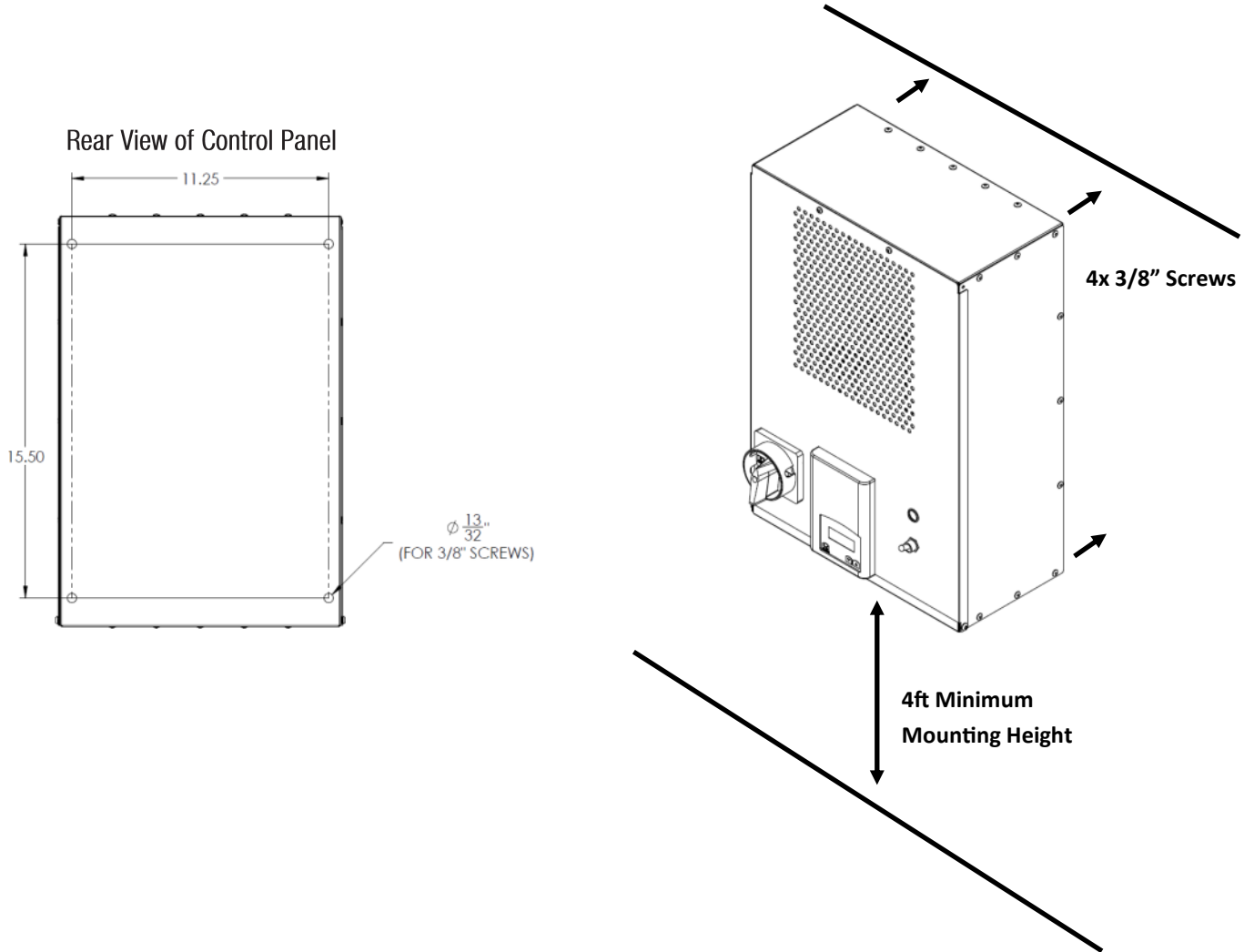
Louver Adjustment



KBSH INSTALLATION

Installing the Control Panel

The control panel can be mounted on any wall or Unistrut using the 4 holes located inside the control panel at the corners. These holes take a 3/8" screw head. Mount the panel at an appropriate and accessible height, approximately 4-5 feet from the floor. See below illustration to locate mounting hole distances.



KBSH Operation

Normal Operation

When the unit is turned on, the fan will be active at all times. The unit will pulse the elements of the heater to regulate and maintain temperatures at the set point of the thermostat. When the room temperature is lower than 15 degrees from the set point, the elements will receive full power. As the room temperature gets closer to the set point, the elements will turn on and off to regulate and maintain the temperature.

Power On and Off

The disconnect switch will allow you to cut off all power to the power distribution box and heater. This switch should be turned off to maintain the unit, but it should not be used as a primary On/Off switch. This will bypass the fan delay that is programmed into the unit. Excess element heat may trip off the thermal cut-out if this is used to turn off the unit. The System On/Off wiring location on the wiring diagram can be used to attach a local or remote On/Off toggle switch.

Fan Only Mode

The Fan Only switch will allow you to run the fan without the elements receiving power. This setting can be used to cool down the room after use or for general air flow without heat. This is turned on with the front toggle switch at the front of the Power Distribution box.

KBSH WIRING INSTRUCTIONS

! **DANGER** !

ELECTRIC SHOCK OR FIRE HAZARD

LINE VOLTAGE IS PRESENT ON SOME OF THE TERMINALS ON THE CONTROL TERMINAL BOARD. ALWAYS DISCONNECT THE POWER FROM THE HEATER BEFORE MAKING ANY CONNECTIONS TO THE CONTROL BOARD TO PREVENT ELECTRIC SHOCK HAZARD.

1. Connect the control box to the voltage and frequency specified on the nameplate. High voltage connections have available 1/2", 3/4" and 1" knockouts available to wire
2. Field wiring must be properly sized to carry the amperage of the heater in accordance with the NEC.
3. The control box access door is hinged and has a screw on the top. Remove the screw to gain access.
4. Electrical knockouts are provided on the back of the heater close to the power contactor. Use the diameter that fits the required conduit fitting size. Line voltage and low voltage knockouts are available to separate wiring.
5. The control box is provided with cord grips to wire each of the incoming and

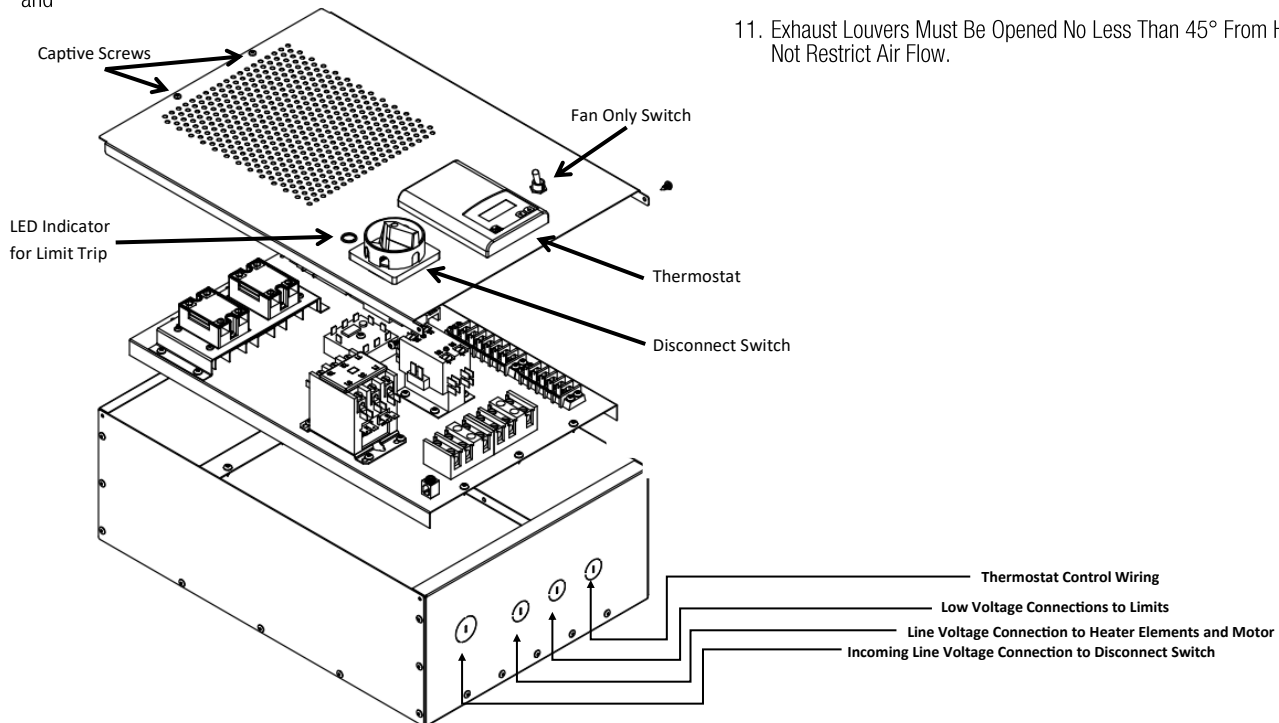
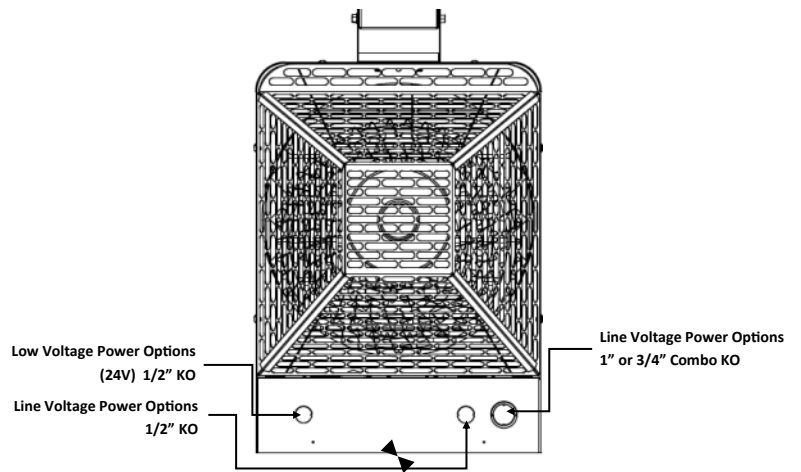


Diagram 1



6. A ground terminal is provided in the control box and inside the unit heater. The ground wire should be connected before other connections are made.
7. The Mains Disconnect Switch is equipped to accept the power supply wire. Copper wire must be rated at 600 V and 105° C for the heater branch circuit.
8. Each heater has a wiring diagram affixed to the inside of the access door. Consult diagram before making any field connections.
9. Three-phase power connections may be used with heater models marked -3MP. These units are factory wired for three-phase operation. Connect the wires as indicated in the wiring diagram attached to the heater.
10. Adjust the louvers to the desired position before operation.
11. Exhaust Louvers Must Be Opened No Less Than 45° From Horizontal To Not Restrict Air Flow.

Dimensional Diagrams

