

ISO 9001, 14001 Approved Company

FAR-INFRARED HEATER

USER'S MANUAL

# VAL6

## TKH-181W



- Thank you for purchasing Far-Infrared Heater VAL6 TKH-181W.  
For safety, please carefully read the User's Manual and fully understand each function before using it correctly. After reading the manual, please do not throw away it and store it in a safe and well-visible place.
- Even without any faults in the product, please conduct regular inspection for once a year so you can use the product safely and longer.

**Shizuoka Seiki Co.,Ltd.**

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## Warnings for Safety

### Sign explanation

	 Warning	Warning sign for dangers that may cause death or injury.
	 Caution	Warning sign for dangers that may cause damage in the product and property or injury.
		This is a prohibition sign. In the middle of the sign will be diagram of detailed activities that must be banned. (Left sign means "Do Not Disassemble")
		This is a forced or directions sign. In the middle of the sign will be diagram of detailed activities that must be followed. (Left sign means "Please unplug the plug from power")

# Warnings for Safety



## Power/Installation place

★ Following information is prepared for user's safety and loss in property.  
 ★ Please read the following carefully to use the product properly.

▶ As the heater will be extremely hot when it is used, do not let any child to get close to the heater and touch or hang on the heater.

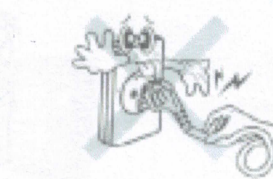
Do not use damaged or loosed plug and socket.

▶ There are risks of electric shock and fire.



Do not pull out the cord line to unplug or touch the plug with wet hands.

▶ There are risks of electric shock and fire.



When the heater is not used for a long time (when you sleep and leave the site), please unplug.

▶ It can cause fire due to electrical short from insulation aging.



Please use it at the socket of 120V that is grounded properly.

▶ There are chances of damage and electric shock.



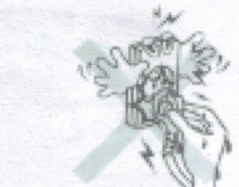
Do not plug many power lines at the same time.

▶ It may cause overheat and fire.



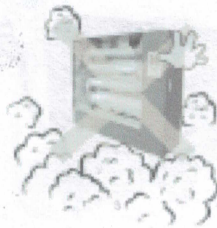
Do not connect or touch the plug with wet hands.

▶ There are causes of electric shock.



Do not install the heater in unstable place and spaces with lots of dust and moisture.

▶ If the heater falls down, it may cause fire or burn.



Since it is dangerous to cover or place the heater improperly, do not connect timer, programmer, or other equipments to automatically control the power.

▶ There are risks of fire.



## Warnings for Safety



### Special Warnings

- ★ Following information is prepared for user's safety and loss in property
- ★ Please read the following carefully to use the product properly.

- When the heater is used inside a building, please connect stovepipe to the outside of building, and install air ventilation opening before usage.
  - Stovepipe should be made with stainless steel, total length less than 4m and curves can be made up to 3 times.



Do not touch the heater during combustion or immediately after when the heater is off.

- ▶ It may cause burn.



Do not let infants, toddlers or children to play around the heater. Install separate safety net to keep out of reach of children.

- ▶ Child may fall down and get burnt.



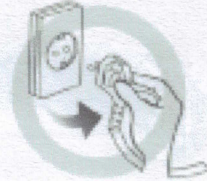
Never move the heater during combustion. Please move the heater when it is perfectly cooled down.

- ▶ It may cause fire or burn.



When the heater makes strange sound or smoke, immediately unplug the power and inquire to the service center.

- ▶ There are risks of electric shock and fire.



Do not cover the heater with inflammable clothes or towels.

- ▶ There are risks of fire.



Do not use the heater right under the power outlet.

- ▶ There are risks of fire.



## Warnings for Safety



### Special Warnings

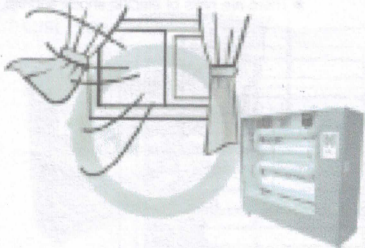
★ Following information is prepared for user's safety and loss in property.  
 ★ Please read the following carefully to use the product properly.

• This product has purpose of heating only. When the heater breaks down and starts fire due to wrong usage of the heater with other purposes such as cooking and drying, we do not take any responsibilities.



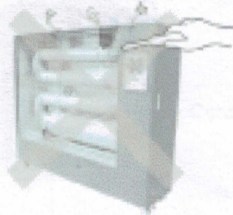
Ventilate the room once or twice in every hour when the heater is on.

▶ This can be reason for indoor air pollution or oxygen deficiency.



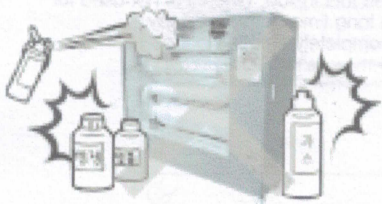
Do not repair, disassemble and remodel the heater.

▶ There are risks of fire, electric shock and injury due to wrong operation, and if it is remodelled voluntarily, the company do not take any responsibilities for accidents or breakdowns.



Do not place other inflammables such as chemicals and combustible materials nearby the heater. (Do not use explosiveness such as hair spray, benzene and propane gas or combustibles such as sofa, chair or curtain)

▶ There are risks of explosion and fire.



During refuelling, do not let the fuel to flow around the heater. If it leaks around the heater, please close the fuel filler cap, and wipe off the fuel immediately.



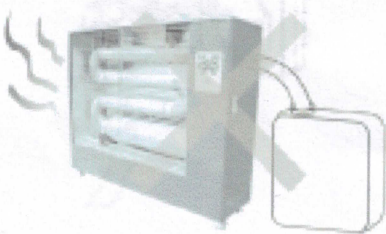
Do not use fuels with high volatility such as gasoline, benzene and thinner. Please use high quality and clean fuel

▶ There are risks of breakdown and fire.



Never refuel the heater when it is used. Please put in the fuel when the heater is turned off.

▶ There are risks of fire.



## Warnings for Safety



### Special Warnings

- ★ Following information is prepared for user's safety and loss in property.
- ★ Please read the following carefully to use the product properly.

- When the heater is used outdoor, install the heater at the place that is independent of influence by rain and wind. Also, put on the brake for the wheel, so it would not move easily.



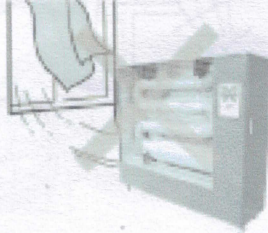
#### Please maintain the safety distance.

- ▶ Install the heater 2.5m from materials that can be burnt easily such as curtain, wood or plywood and 2.5 m from top as well.



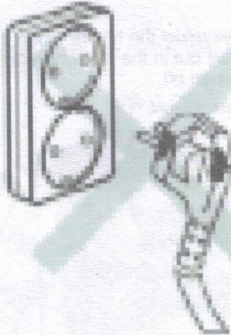
#### Do not use at the place, where it is exposed to rain, strong wind or raindrops.

- ▶ It may cause abnormal combustion or influent insulation of electrical parts.
- ▶ There are risks of electric shock and fire.



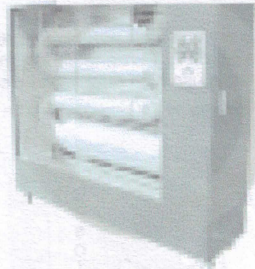
When the power cable is damaged (when it is disconnected or sheath is peeled off) please exchange it with the manufacturing company or repair center.

- ▶ It may start fire or electric shock as the power cable is damaged.



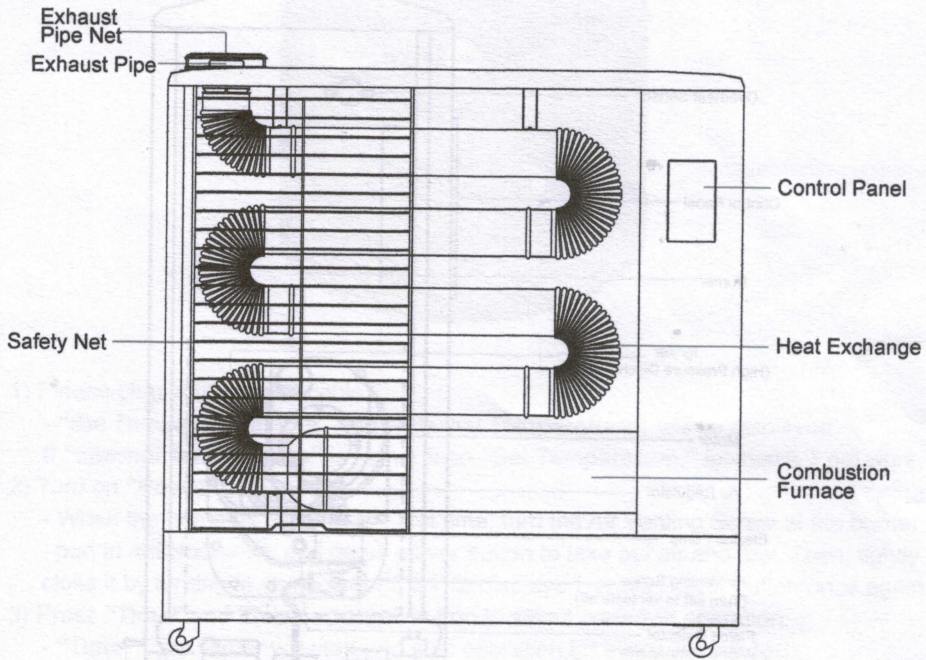
When the heater is not used for a long time, do not store the heater with the fuel inside. When it is not used for a long time or thrown away, completely empty the fuel.

- ▶ There are risks of explosion.



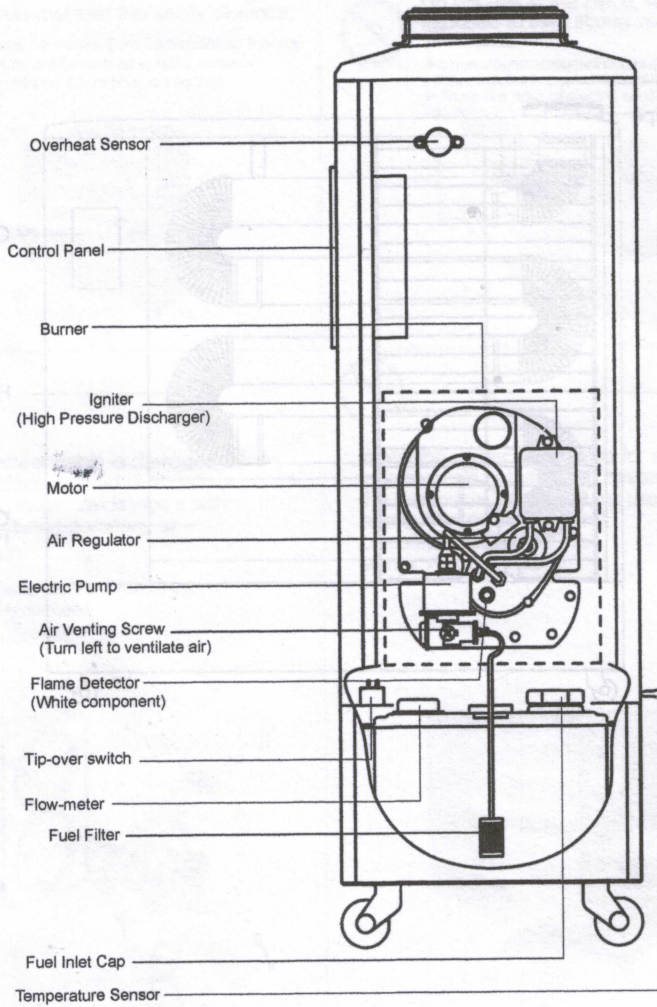
**Name of Each Part**

**<Front>**



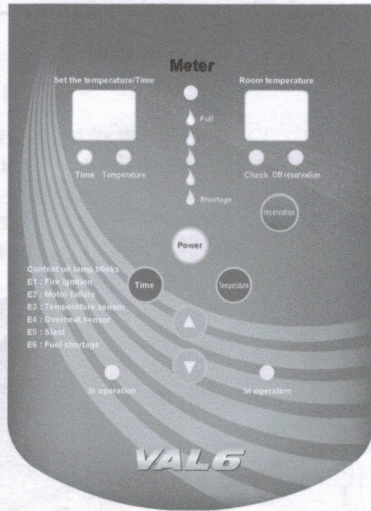
## Name of Each Part

<Internal diagram for side>



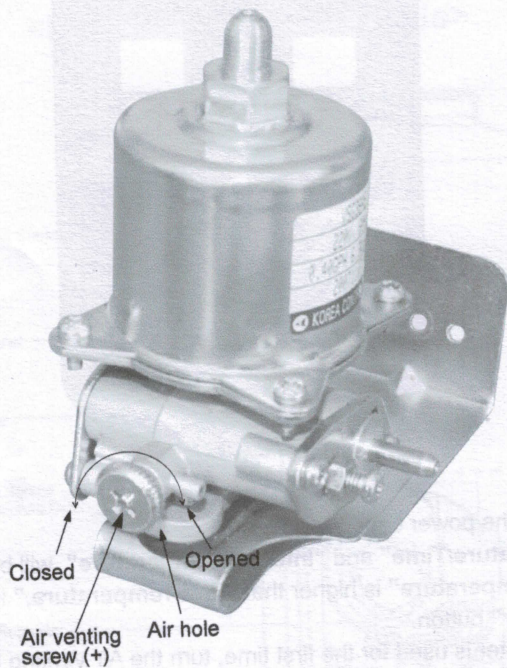


## How to use correctly



- 1) Please plug in the power cable.
  - **“Set Temperature/Time”** and **“Internal Temperature”** will be displayed.
  - If **“Internal Temperature”** is higher than **“Set Temperature,”** ignition will not work.
- 2) Turn on **“Power”** button.
  - When the heater is used for the first time, turn the Air Venting Screw at the burner part in anticlockwise, and press power button to take out air and fuel. Then, tightly close it by turning in clockwise. (If **“E1”** is displayed, press Power button once again.)
- 3) Press **“Time”** and **“Temperature”** button to select preferred operation.
  - **“Time”**: The heater will start and stop operation for every 30 minute.
  - You can change the cycle from 5-25 minutes with 5 minutes as unit.
  - For example: If 15 minutes are selected, the heater will operate 15 minutes and then turned off for 15 minutes.
  - **“Temperature”**: The heater will continue to operate until the internal temperature reaches as the set temperature.
  - Select preferred temperature between 0°C and 40°C with 1°C as unit.
- 4) **“Time”** and **“Temperature”** can be set by pressing **“Up”** and **“Down”** buttons.
- 5) To stop the heater, press **“Power.”**
  - Combustion will stop and burner motor will stop after 5 minutes.
- 6) Turn-off timer: Turn-off timer can be set for every hour from 1 to 12 hours.
  - Press the timer button, control the desired time with **“Up”** and **“Down”** button, and the timer will be automatically set after 2 seconds.
  - If you press **“Turn-off Timer”** button once more, setting will be cancelled.

## Air venting before test-driving



### ※ When it is operated for the first time:

If external fuel tank is used or when the heater is operated after refuelling, ignite failure can happen. In this case, ventilate the air by following procedures as below;

1. Turn the air venting screw (+) in anticlockwise for 2-3 times.
2. Press on Power button once.
3. Bubble (fuel) will come out from the air hole. (After 10 seconds)
4. When the ignition is on, turn the screw (+) in clockwise. If it does not work, try again. (When it does not work after 4 times, contact the service center)  
→ This heater is designed to operate without air ventilation after refuelling the empty tank.
5. If it does not work for the first time, try above steps from 1-3 for about 3 times. (When it does not work after 4 times, contact the service center)

## Preparation before usage

### ■ Fuelling

#### 1) Fuelling Step

- ① Open the fuel inlet cap for the fuel tank.
- ② Carefully put in the fuel, trying not to leak the fuel.  
- At this time, fill in the fuel until the flow-meter reaches "F."
- ③ Tightly close the inlet cap.
- ④ Check if fuel has leaked around fuel tank or each part of the heater.  
If it is leaked, clean it.



#### 2) Warnings of ignition for the first time

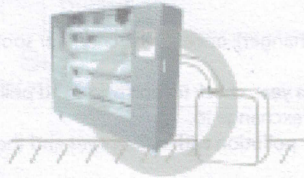
- ① When the heater is used for the first time, fuel that is used during the manufacturing process and other substances can combust, so please ignite at the outside of the building.  
- When the heater is used for the first time, it might have some smell due to above reasons. As you use it for a while, smell will be gone.  
(Takes about 10 minutes)  
**As it is not a breakdown, do not worry and continue to use the heater.**



#### Warnings for fuelling



Please fuel at the place with flat and balanced floor.



Never refuel the heater when it is used. Refuel it when the power is turned off and the fire is completely out.



Do not put too much fuel until it overflows. Fuel until the flow-meter reaches "F."

▶ It may cause fire.



Do not put low-quality fuel. Always use high-quality and clean fuel.

▶ It may cause breakdown.



## Daily Check-up

### Warning

- Check-up and cleaning must be done after stopping "combustion" of the heater.
- Check if fuel leaks from any place near the fuel tank.
- Check if combustion furnace or heating tube is corroded and damaged.
- If heat-reflecting board is dusted, clean it perfectly.
- Check if the heater makes soot from the exhaust pipe.
- Burner is adjusted to be suitable for function of the heater. User should not control it voluntarily. If it is controlled voluntarily, please inquire to the store you have purchased the heater.

### Warning

- External part of the heater should be done after unplugging the cable and when it is completely cooled down. It should be cleaned with cloths soaked in neutral detergent or dried cloths.
- Pouring water to the heater for cleaning can cause electric accidents or break down of the heater.

## Regular inspection and fire extinguisher placement

### ■ Regular Inspection

- Combustion furnace and heating tube (heat exchanger): once a year, check for soot and then clean it (when it is polluted).
- Combustion furnace and reflection board: once a year, check for corrosion and pollution and then clean it (when it is corroded too much, exchange it).
- Fuel filter (Inside the tank): once a year, check for pollution with naked eyes and then exchange it.

### ■ Fire Extinguisher Placement



Warning

- Please place fire extinguisher where there is inflammable, and check its contents frequently.
- It is the most effective extinguishing tool for initial fire fighting.
- Fire extinguisher should be stored in a place, where it can easily found.

## Specifications

Item \ Model	TKH-181	
Fuel	Kerosene or diesel	
Fuel Consumption (gal./h)	0.5	
Heat Output (BTU/h)	67,500	
Heating Area (Ft <sup>2</sup> )	1,776	
Usage	Heating	
Power	AC120V / 60Hz	
Power Consumption	During ignition	60W
	During Combustion	40W
Size (W×D×H)	48.6 X 12.6 X 50.9 (inch)	
Fuel Tank Size	12gal.	
Stovepipe Diameter (When connected)	0.3 (inch)	
Fuel duration hours	22~24 Hours	
Safety Equipment	Flame detecting equipment, Overheat prevention equipment, Over-current shorting equipment, Motor overheat prevention equipment, Overturing safety equipment, Indoor temperature detect equipment, Motor rotation detect equipment	

## Check list before applying for After Service

When the front control panel displays as follows;

Displayed signals	Reasons of default	Check-ups and actions to take
E1: Ignite Failure	Burner does not ignite.	<ul style="list-style-type: none"> <li>- Out of fuel</li> <li>- Oil pipe is filled with air (→ Ventilate air)</li> <li>- Phototube is polluted (→ Clean it)</li> </ul>
E2: Fault in Motor	Motor is broken down	<ul style="list-style-type: none"> <li>- Change the motor</li> </ul>
E3: Temperature Sensor	Temperature sensor is broken down	<ul style="list-style-type: none"> <li>- Temperature sensor connection terminal is disconnected. (→ Connect the terminal)</li> </ul>
E4: Overheat Sensor	Overheat sensor is broken down	<ul style="list-style-type: none"> <li>- Check for combustion trace due to flame inside the burner (→ Inquire for service)</li> <li>- Check if overheat controller wiring is disconnected. (→ Reconnect, then restart)</li> </ul>
E5: Unbalanced	Heater is unbalanced	<ul style="list-style-type: none"> <li>- Check if the heater is moving (It can happen if the heater is shaken → restart)</li> <li>- Conduction switch is disconnected (→ Connect the switch and restart)</li> </ul>
E6: Lack of Fuel	No fuel	<ul style="list-style-type: none"> <li>- Refuel (→ Restart)</li> </ul>
Hi	Temperature is more than 50 °C	<ul style="list-style-type: none"> <li>- Check if temperature sensor detector is placed inside (→ Put the sensor outside)</li> </ul>

☞ When E1 - E6 happen, reasons of error should be arranged before starting it again.

Press "Power" button twice to restart the heater.

Air ventilation procedure is clearly explained in page 10. Please refer to it.

If following errors are made and measures are taken but the heater does not work, inquire for the service.

Errors	Check list	Measures
All the lamps in front control panel are turned off.	<ul style="list-style-type: none"> <li>- Power failure</li> <li>- Power cable is unplugged</li> <li>- Fuse is disconnected</li> </ul>	<ul style="list-style-type: none"> <li>- Connect to power</li> <li>- Change the fuse</li> </ul>
The heater turns on and off regularly.	<ul style="list-style-type: none"> <li>- Operation setting is selected as "Time"</li> </ul>	<ul style="list-style-type: none"> <li>- Select "Temperature"</li> </ul>
Flow-meter does not work but the heater operates	<ul style="list-style-type: none"> <li>- Flow-meter is disconnected.</li> </ul>	<ul style="list-style-type: none"> <li>- Connect the line.</li> </ul>
Smoky smell is made during initial operation	<ul style="list-style-type: none"> <li>- The smell is made as the foreign substance in inside the gasket burns</li> </ul>	<ul style="list-style-type: none"> <li>- No smell will be made 1-2 hours later</li> </ul>
Fuel smell is too strong	<ul style="list-style-type: none"> <li>- As the heater turns off after the operation, it might have some smell</li> <li>- Fuel is leaked during refuelling</li> </ul>	<ul style="list-style-type: none"> <li>- Operate more than 15 minutes.</li> <li>- Clean out leaked fuel</li> </ul>
Internal temperature displays higher than normal	<ul style="list-style-type: none"> <li>- Check for location of temperature sensor at the back of the heater (If sensor is placed inside the heater).</li> </ul>	<ul style="list-style-type: none"> <li>- Fix the sensor in the right place.</li> </ul>

MEMO

A large rectangular area with a solid border, containing 18 horizontal dashed lines for writing.