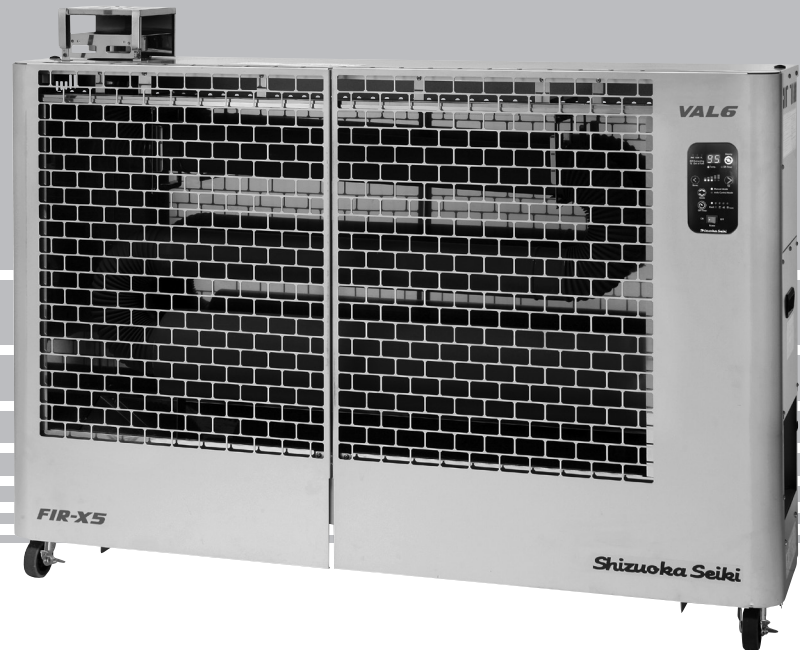


# FAR INFRARED OIL HEATER

# VAL6 FIR-X5

## Owner's Manual



English

### IMPORTANT

- This Owner's Manual provides important information on proper handling, operation, and maintenance. FAILURE TO FOLLOW THE INSTRUCTIONS, PRECAUTIONS, OR SAFETY TIPS IN THIS MANUAL AUTOMATICALLY VOIDS ALL WARRANTIES, EXPRESS OR IMPLIED.
- FAILURE TO COMPLY WITH THE INSTRUCTIONS, PRECAUTIONS, AND SAFETY TIPS IN THIS MANUAL CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND / OR ELECTRICAL SHOCK.
- Read and thoroughly understand this Owner's Manual before using the heater in any way, including unpacking, assembling, fueling, inspecting, lighting, operating, adjusting, turning off, cooling down, moving, or storing the heater.
- Please keep this Manual for the user's need and reference.
- Do not allow anyone who has not read and understood this Owner's Manual to assemble, inspect, light, operate, adjust, turn off, cool down, re-fuel, move, or store the heater.
- The requirements of local authorities having jurisdiction shall be followed.
- The installation of the unit shall be in accordance with the regulations of the authorities having jurisdiction.



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Thank you for having bought our Far Infrared Oil Heater "VAL6".

# 1 Special precautions

◆ This Manual explains necessary precautions that must be strictly followed for proper and safe operation. Precautions are divided into 3 categories ⚠ **Danger**, ⚠ **Warning**, and ⚠ **Caution**. Please read and understand well the details and meanings of each category.



## **DANGER**

“DANGER” means that failure to follow the given precaution (s) may lead to death, serious injury and/or major fire.



## **WARNING**

“WARNING” means that failure to follow the given precaution (s) may likely result in death, serious injury, fire and/or possible explosion.



## **CAUTION**

“CAUTION” means that failure to follow the given precaution (s) may result in serious injury and/or property damage.

\* Depending upon the circumstances, even the category of “CAUTION” can lead to grave damage to persons and/or property. Caution and recommendation listed in each category are equally important for safe operation, so be sure to follow the precautions in all 3 categories.

■ Following signs, used throughout this Manual, are defined as follows:

	<b>Prohibited</b> (This indicates “actions that are strictly forbidden”.)
	<b>Mandatory</b> (This indicates “actions or instructions” that must be carried out.)
	<b>Caution</b> (This indicates “actions” that require careful attention)

## ⚠ Important Notice

### ⚠ **WARNING**

- When operating or servicing this heater, please follow all instructions described in this Manual.
- When replacing parts, use only the genuine parts made or approved by the manufacturer of the heater. Please note that we shall not be held responsible or liable for any damage or accident that results from using any unapproved or non-genuine parts.
- We shall not be held liable or responsible for any damage or accident that results from disobeying or not properly carrying out any instructions in this Manual, or from the improper modification or operation of the heater.
- The State of California requires the following warning:  
⚠ **WARNING: COMBUSTION BY-PRODUCTS PRODUCED WHEN USING THIS PRODUCT CONTAIN CARBON MONOXIDE, A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS (OR OTHER REPRODUCTIVE HARM).**
- This product can expose you to chemicals including ceramic fiber, which is known to the State of California to cause cancer.  
For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).













1. As we cannot predict every possible situation of danger while operating this heater, the contents described in this Manual could not fully foresee a whole range of possible dangers. So, when operating or doing daily inspection (to this heater), please pay full attention not only to the contents of this Manual and the Labels on the heater itself, and also be constantly alert for factors that might affect the safe operation of the heater. Do not hesitate to stop operation and contact your dealer if you have any questions about any matter not discussed in this Manual.
2. If you have any question or want to know more detailed information about the heater, please contact your dealer.
3. If any irregular or missing page(s) is found in this Manual, please contact your dealer and we will exchange it with a new one.
4. Please keep the set of Standard Parts supplied with the heater.
5. The operator of the heater is responsible for warning anyone who works around the heater or comes near the heater of the dangers of the heater and the safety precautions that must thereby be taken pursuant to this Manual.

## ⚠ Purpose of this Owner's Manual
















This Manual aims to supply the user with detailed information on how to properly use, operate and service this VAL6 Heater.

## To Help Ensure Safe Operation, Comply with the Following Precautions














\* It is important that the safety precautions listed below are understood and followed prior to first operation of the heater. These precautions must also be followed thereafter.

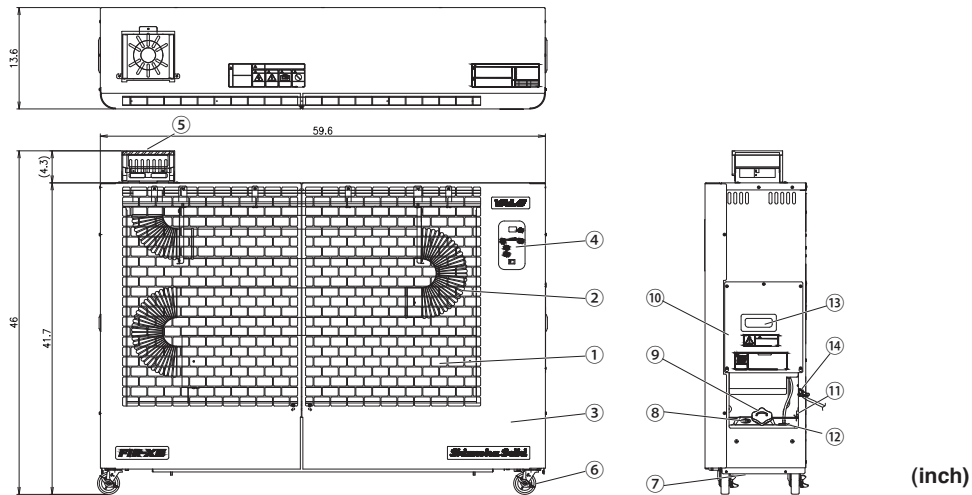
 <b>DANGER</b>			
<b>1</b>	<b>Use of gasoline prohibited</b>	Never use gasoline, for any purpose, for example, for cleaning or as fuel, in connection with, or around, operation or storage of the heater, as a fire and/or explosion may result.	
<b>2</b>	<b>Use of flammables prohibited</b>	Never use or store the heater where thinner, gasoline, liquid propane gas, or other highly flammable vapors, etc., are present, because these may lead to explosion or fire.	
<b>3</b>	<b>Ventilation required</b>	Never use the heater in poorly ventilated areas. Poor ventilation allows a buildup of carbon monoxide produced by the heater, especially if there is also inadequate combustion. CARBON MONOXIDE is a colorless and odorless poisonous gas that may lead to death or other injury. Always provide a fresh supply of outside or circulating air whenever the heater is used. Some people are more affected by carbon monoxide than others, including pregnant women, persons with heart disease, lung disease, anemia, and/or under the influence of alcohol. High altitude also creates a higher danger of susceptibility to carbon monoxide. Danger signs that a person may be suffering from carbon monoxide poisoning include, headache, dizziness, burning eyes and nose, nausea, and dry mouth or sore throat. If any of these symptoms occur, immediately seek medical attention, ventilate the area, and turn the heater off.	
 <b>WARNING</b>			
<b>1</b>	<b>Keep aerosol containers away from the heater</b>	Never place sealed, pressurized containers (such as aerosol cans) near the heater as exposure to heat from the heater may build up pressure in the container and cause it to explode with deadly force.	
<b>2</b>	<b>Never use the heater where flammable dusts are present</b>	Never operate the heater where highly flammable dusts (of wood, paper, textile, etc.) are present. Dusts, after sucked and heated by the heater, will be blown out "sparked" and cause a fire.	
<b>3</b>	<b>Be careful of hot surfaces on and around the heater</b>	Portions of the heater (both while the heater is in operation and for 30 minutes or more after the heater is turned off), are hot to the touch and may burn the skin and/or ignite clothing and other combustible materials. Avoid touching the burner and nearby areas while the heater is in operation and for at least 30 minutes after it is turned off. Also do not move or service the heater while it is operating or hot.	
<b>4</b>	<b>Do not service the heater while burning</b>	Do not service or handle the heater while burning, in operation, hot or plugged-in to avoid any injury and/or trouble.	
<b>5</b>	<b>Modification of the heater prohibited</b>	Never modify the heater by any means. Any modification may increase the chance of burns, fires, explosions, or other problems before, during, and after operation of the heater.	
<b>6</b>	<b>Be careful of electrical shock</b>	To avoid electrical shock, never use the heater where exposed to rain, snow or high humidity. If the heater or any part of it becomes immersed in water, immediately contact a qualified service agency to inspect the heater and determine if anything needs to be replaced prior to further operation. Make sure the power plug is disconnected from the electrical outlet, before starting daily inspection and maintenance.	
<b>7</b>	<b>Never use the heater for any residential application</b>	This heater is for industrial and commercial use only. Never use the heater for any residential application at all time. Wrong use of this heater can result in potential death, serious injury, fire and/or possible explosion.	

## To Help Ensure Safe Operation, Comply with the Following Precautions

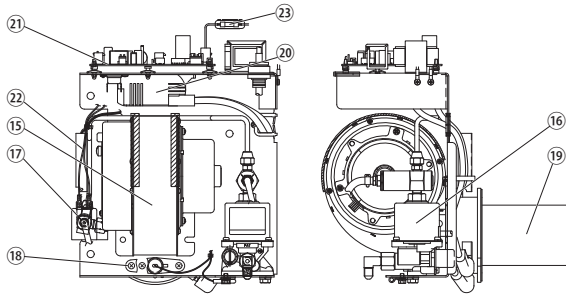
 <b>CAUTION</b>			
<b>1</b>	<b>Keep flammable materials away from the heater</b>	To avoid a fire, please keep all flammables away from the heater. (Refer to the numbers below) Top, Front : 1.5m (5ft.) or higher / Rear : 0.1m (0.32ft.) or higher / Side: 0.3m (0.98ft.) or higher	
<b>2</b>	<b>Do not block the heater</b>	To avoid a fire, never place any object within 1m (3.28ft.) from the front of the heater.	
<b>3</b>	<b>Do not try to ignite the heater more than 3 times in a row</b>	If the heater does not ignite the first time, do not try to ignite more than two more times in a row thereafter because a fire may result. If the heater does not ignite after the third attempt, stop trying and consult your dealer prior to further operation of the heater.	
<b>4</b>	<b>Do not operate the heater unattended</b>	Do not leave the heater unattended while it is in operation or cooling down so that unexpected problems, such as fire, can be dealt with immediately.	
<b>5</b>	<b>Placing the heater on combustible matter or flooring is prohibited</b>	The heater is for use on non combustible matter or flooring only unless the shielding mat, part #503002-05001 is used. Materials of shielding mat : glass cloth and aluminum film Dimension of shielding mat : 1200 x 1200 x (3.5) mm (L x W x H)	
<b>6</b>	<b>Operation of the heater when either the heater or the operator is wet is prohibited</b>	Do not use the heater where it is exposed to water, e.g, rain or snow, and do not operate the heater with wet hands or if it becomes wet. Water contact may cause an electric shock or other danger or malfunction.	
<b>7</b>	<b>Do not use the heater in high altitudes</b>	When the heater is used in an altitude higher than 1000m (3200ft.) above sea level, some adjustments will be required. Please contact your dealer about the adjustments. The heater, if not duly adjusted, may cause a fire.	
<b>8</b>	<b>Stop using the heater when anything irregular is found</b>	If a burning smell or smoke occurs during operation of the heater, immediately turn off the heater and consult your dealer. Further operation may result in a fire or other hazard.	
<b>9</b>	<b>Do not move the heater while in operation</b>	Moving the heater while it is on or otherwise in operation is prohibited. Movement may result in a fire, especially if the heater is overturned or unbalanced.	
<b>10</b>	<b>Turn the heater off before unplugging it</b>	Before taking the electric plug out of the outlet, please make sure the operating lamp is OFF.	
<b>11</b>	<b>Turn off while refueling</b>	Never refill the fuel tank when the heater is on or it is still hot. Refueling while the heater is still operating or hot may cause a “flash back” of flames to the fuel container or other hazard, causing serious injury and/or property damage. For the same reason, refueling should only be done outdoors and away from any open flame. In addition, spilling fuel on a carpet while refueling or otherwise creates an additional fire hazard.	
<b>12</b>	<b>Use only the correct voltage</b>	Only electrical voltage and frequency specified on the model plate must be used, to avoid a fire, electrical shock and/or damage.	
<b>13</b>	<b>Ground the heater before operation</b>	Prior to operation, confirm that the heater is properly connected to a grounded power cord and outlet. Attempting to use or operating the heater without proper grounding may result in dangerous electrical shock.	
<b>14</b>	<b>Do not pull out the power plug by pulling on the power cord</b>	When disconnecting the power cord, always pull out the plug, never the cord, to unplug the cord. To pull out the cord may damage the cord itself and result in fire through electrical shock or short circuit.	

## To Help Ensure Safe Operation, Comply with the Following Precautions

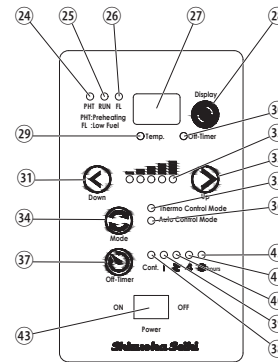
 <b>CAUTION</b>			
<b>15</b>	<b>Do not damage the power cord</b>	Do not place excessive force on the cord by bending, pulling, twisting, pinching or remodeling. Also, do not place any heavy objects on the heater, etc. that may damage it, to avoid a fire and electric shock.	
<b>16</b>	<b>Use gloves</b>	When cleaning the heater, use gloves, to avoid any injury to hand or fingers. Use of gloves while operating and moving the heater is also recommended.	
<b>17</b>	<b>Make sure the flame is extinguished and the power off before leaving the heater unattended</b>	After shutting off the heater, make sure that the flame is extinguished and the power disconnected before leaving the heater unattended. It is also not safe to leave the heater unattended while it is cooling off or to leave it in any area where children are present or may come upon it.	
<b>18</b>	<b>Do not dispose of the heater illegally</b>	When you dispose of the heater, please do not dispose of it illegally and consult your local authorities or specialists on how to properly dispose of it.	
<b>19</b>	<b>Do not use the heater in the following places or conditions</b>	<p>To prevent accident or injury, do not use the heater in the following places or under the following conditions:</p> <ul style="list-style-type: none"> <li>• On vibrating, trembling, or unstable flooring</li> <li>• On ladders, scaffolds, or sawhorses</li> <li>• On any floor that is slanted, sloped, or not level</li> <li>• On stairs or anywhere where it might block access to emergency exits</li> <li>• Near unstable or stacked materials</li> <li>• In windy, humid, or dusty areas, and areas where metal particles are present</li> <li>• In areas where the flow of people or vehicles is impeded or obstructed</li> </ul> <p>Always use caution in determining where to place the heater for use or storage and take into account both present and potential future dangers.</p>	
<b>20</b>	<b>Do not operate in extreme temperatures</b>	Make sure that the heater operates at temperatures between $-20^{\circ}$ and $30^{\circ}\text{C}$ ( $-4^{\circ}$ and $86^{\circ}\text{F}$ ). If the heater operates at more than $30^{\circ}\text{C}$ ( $86^{\circ}\text{F}$ ), the heater will overheat and result in fire.	
<b>21</b>	<b>Provide the Owner's Manual to the new owner</b>	If the heater is sold or given to a new owner, make sure that this Owner's Manual is transferred to the new owner along with the heater.	
<b>22</b>	<b>Do not use fuel of low quality</b>	Do not use fuel of low quality such as discarded oil or fuel mixed with water.	
<b>23</b>	<b>Be careful when moving or storing the heater</b>	When the heater is moved or stored, it must be in a level position to avoid a leakage of fuel.	
<b>24</b>	<b>Keep away from children</b>	The heater should not be used, cooled, or stored where children could have access to it. The heater must not be ignited, operated, maintained, attended to, or otherwise used in any way by children.	
<b>25</b>	<b>Children or the handicapped are not to operate this heater</b>	This heater is not to be operated by children or physically handicapped or person without proper knowledge and experience unless they have been given proper supervision or instruction.	
<b>26</b>	<b>Do not use the heater in an environment subject to corrosive gas.</b>	Do not use the heater in an environment subject to corrosive gas. (Ex. ammonia arising from livestock barn) Parts can become corroded and cause unit to operate improperly.	



### < Burner section >



### < Operation panel >



- ① Combustion chamber
- ② Radiation tube
- ③ Guard
- ④ Operation panel
- ⑤ Exhaust port
- ⑥ Wheel
- ⑦ Fuel tank
- ⑧ Fuel gauge
- ⑨ Fuel tank cap
- ⑩ Burner cover (burner inside)
- ⑪ Tip-over switch
- ⑫ Fuel sensor
- ⑬ Overheat protection system
- ⑭ External thermostat cord
- ⑮ Combustion fan

- ⑯ Fuel pump
- ⑰ Solenoid valve
- ⑱ Flame monitor
- ⑲ Draft tube
- ⑳ Igniter
- ㉑ Control board
- ㉒ Fuel preheater
- ㉓ Fuse
- ㉔ Preheating lamp
- ㉕ Run indicator light
- ㉖ Low fuel lamp
- ㉗ Display
- ㉘ Display switching button
- ㉙ Temperature display lamp

- ⑳ Off-timer display lamp
- ㉑ Down button
- ㉒ Up button
- ㉓ Combustion level lamp
- ㉔ Mode switching button
- ㉕ Thermo control mode lamp
- ㉖ Auto control mode lamp
- ㉗ Off-timer setting button
- ㉘ Continuous combustion lamp
- ㉙ 1 hour lamp
- ㉚ 2 hours lamp
- ㉛ 4 hours lamp
- ㉜ 8 hours lamp
- ㉝ Operation switch

### Description of Safety Devices

⑪ Tip-over Switch	Automatically extinguishes the flame when motion or an impact is detected during operation. <b>Operating condition</b> : The error code [A4] is displayed at display and if the heater is operating, the fan will cool down the heater for about 5 minutes (hereafter referred to as post purge).
⑬ Overheat Protection System	Automatically extinguishes the flame should the heater overheat. <b>Operating condition</b> : The error code [A3] is displayed at display and if the heater is operating, Post-Purge sequence will run for 5 minutes.
⑱ Flame Monitor	This automatically extinguishes the flame when ignition fails or flame goes out during the operation. This monitor, when it detects any irregularity before ignition, automatically extinguishes the flame. <b>Operating condition</b> : The error code [A1] is displayed at display and if the heater is operating, Post-Purge sequence will run for 5 minutes.
㉒ Fuel Preheater	This fuel preheater warms the fuel up to prevent its viscosity from rising. This starts to operate at the time of plugged-in if the ambient temperature is below 5°C (41°F).
㉓ Electrical System Protection (Fuse)	Cuts off power to the heater should an electrical surge pass through the circuit caused by damage to the heater, etc. <b>Operating condition</b> :The whole operation stops.
Abnormal Fan Speed	This automatically extinguishes the flame when the number of rotation of the motor changes significantly.

## 3-1. Preparation for operation .....



### DANGER

- Never use highly flammable fuel like gasoline, to avoid fire.
- Never contaminate or mix fuels. For example, never contaminate kerosene with gasoline by using a gasoline container to carry kerosene. Even a small amount of gasoline, or other volatile fuels, in kerosene is hazardous. Store kerosene only in containers specifically labeled and approved for kerosene and do not use the container for any other fuels or chemicals.

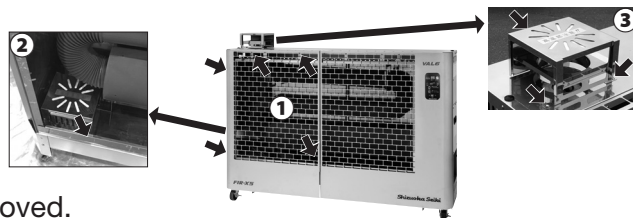


### CAUTION

- Please refuel only while the heater is turned off and completely extinguished.
- Use only the electric power (voltage and frequency) specified on the model plate of the heater to operate the heater. Using electrical power different from the specifications may result in fire, electrical shock, and/or damage.
- Please confirm the ground/earth cable is properly connected, to prevent electrical shock.
- When disconnecting the electric power cord, be sure to always pull the plug out by itself. Do not pull out the plug by pulling on the power cord. Also, do not allow or cause excessive force to be exerted on the cord at any time to avoid damaging it and causing a fire or shock hazard. The heater should not be operated with the power cord in a taut or tightened position to further avoid damage to the cord, accidental unplugging of the electricity, and fire and/or shock.

### ■ Installation of the exhaust port

- 1 Remove five screws and the guard on the left.
- 2 Remove one screw and the exhaust port.
- 3 Install the exhaust port with three screws.
- 4 Put the removed guard back with five screws removed.



### ■ Refueling

#### Observations

- Please use “kerosene” or “Fuel-Oil no heavier than No.2 (Diesel)” and do not use poor quality or foul fuel.

- 1 Remove the fuel cap and insert a handy suction pump into the fuel tank.
- 2 Watch the fuel gauge while refueling. Do not overfill.
- 3 Tighten the fuel cap, and wipe off any excess fuel.

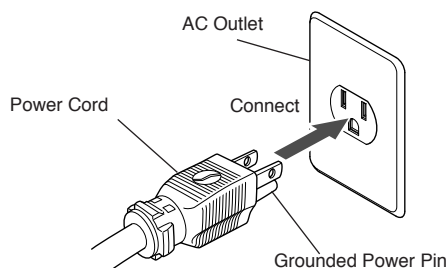
### ■ Connecting the power supply



### CAUTION

- Do not use an adapter to change the power plug or power outlet from grounded (3 prongs or inlets) to ungrounded (2 prongs or inlets) as this improperly overrides the safety function in grounding the heater by the provided power plug. Also if the power cord or plug need to be replaced, please be sure to replace it only with genuine or manufacturer-approved replacement parts.

- 1 Make sure that the operating switch is “OFF”, then plug the heater’s power plug into standard 120 volt / 60Hz, 3-prong grounded outlet.
- 2 When the power cord is connected, heater will turn on after 3 minutes of warm-up sequence is completed. If ambient temperature is over 40F, heater will turn on right away without warm-up sequence.



## 3-2. Operating procedures.....



### CAUTION

- If any smoke or burning smell coming from the heater is detected, turn the heater off immediately to prevent a fire. Then contact your dealer and the heater must be inspected before further operation.
- More than three consecutive attempts to ignite the heater may cause a fire. If the heater does not ignite after three consecutive attempts, stop trying and contact your dealer for an inspection of the heater.
- When using the heater, be careful of the rise in floor temperature.
- Do not operate the heater, if the fuel tank is dirty and/ or foul to prevent poor ignition or improper burning.

### Ignition Procedures

#### Observations

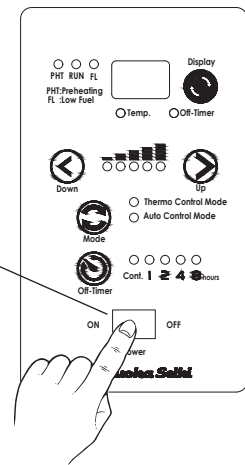
- To make sure the heater is under normal operation, and please do not leave the heater until you confirm that it is functioning properly.

- 1 Make sure the heater has enough fuel.
- 2 Turn "ON" the operation switch, and the heater will ignite in about 15 seconds.

#### If ignition fails, try again as follows

Turn "OFF" the operation switch. Wait for the "RUN" indicator light turns off. Then, try step 2 above again.

Operation Switch "ON"



### Limitation of consecutive operating try

Do not repeat ignition retry more than 3 times. After 3 times of consecutive misfire, the system goes to error as code "A7". Please contact your dealer or solve the cause of misfire. Then, disconnect and reconnect the power plug, so that the system will come back.

### Shut-Down Operation



### CAUTION

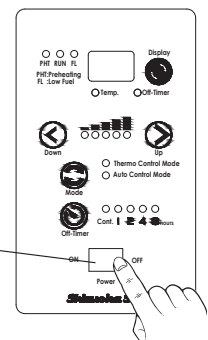
- After the heater is shut down, please make sure that the flame is completely extinguished before leaving the heater unattended or moving or storing it.

#### Observations

- Before disconnect the power plug from the AC outlet, please make sure that the fan motor is stopped.
- Never disconnect the power plug while the heater is operating, it will cause heater to malfunction.

Turn "OFF" the operation switch, so that cooling sequence will start. The cooling sequence will automatically stop about after 5 minutes.

Operation Switch "OFF"




### 3-3. Explanation of operation mode .....

#### ■ How to set the desired temperature

This heater has two combustion modes. In either case, set the temperature in Auto Control Mode.

- 1 Press the Mode button on the operation panel to select the Auto Control Mode.
- 2 Press the UP/DOWN button to set the desired temperature.(The default value is 55°F.)
- 3 After 5 seconds , the temperature setting is fixed and the display changes from blinking to lighting.

 **CAUTION**

- Ambient temperature sensor is installed at the back of the main unit, the displayed temperature and room temperature may not be the same.
- During operation in the Thermo Control Mode, when the temperature reaches the set temperature, the heater goes to standby mode. During the standby mode, “RUN” indicator light and Temperature display remain visible. Please make sure that the heater is in the waiting state during the standby mode.

#### ■ Thermo Control Mode

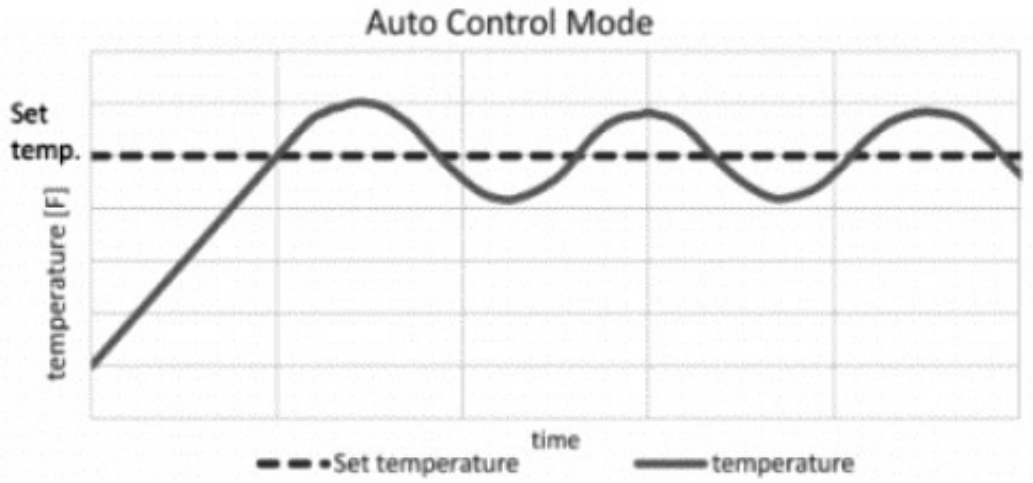
The heater operates at the set combustion level.

##### How to operate

During combustion, press the Mode button to select the Thermo Control Mode. Press the Up/Down buttons to change the combustion level. Once the ambient temperature reaches the preset temperature of Auto Control Mode, the heater will extinguish the flame and start cooling sequence automatically. When the ambient temperature goes below the preset temperature, the heater restarts. This sequence is repeated as long as the operating switch remains on.


#### ■ Auto Control Mode

The combustion level is automatically adjusted according to the set temperature.



##### How to operate

Press the Mode button to select the Auto Control Mode. Set the desired temperature by referring to “How to set the desired temperature” above.

 **CAUTION**

- With the Auto Control Mode, heater may not reach to the set-temperature as size and structure of building may affect.

#### ■ Off-Timer setting

During combustion, press the Off-Timer button to change the duration of operation. After 5 seconds, the Off-Timer setting is fixed and display changes from blinking to lighting.

## ■ Display switching

By pressing Display button, the display of the current temperature and the remaining time of the off-timer are switched. If the ambient temperature exceeds 99°F, 「H」 will be displayed. If it is lower than -9°F, 「L」 will be displayed.

## 3-4. How to connect External Thermostat.....

### ■ Before connecting the external thermostat

Set the setting temperature to 99°F in auto control mode.

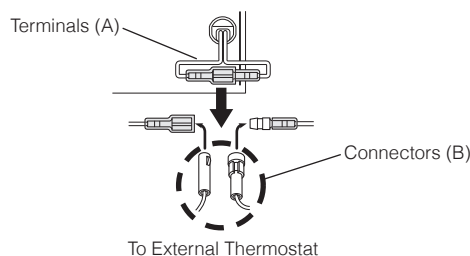
(Refer to [How to set the desired temperature] on **page10**.)

Select the Thermo Control Mode in condition above and then install the external thermostat.

The combustion level can be changed during operation.

#### To connect the control device

- 1** Uncouple the terminals (A) attached to the tip of white wires that come out of the burner base.
- 2** Connect both male and female terminals to the connectors (B) of external thermostat.



### CAUTION

- If the heater is at the standby mode during external thermostat operation, “RUN” indicator light and Temperature display turn off. Require special care when the heater starts after the standby mode. Off-timer can't be used with external thermostat operation.
- When the heater is controlled by another device (such as external thermostat or timer), the heater could turn itself on at any time. Be sure the heater is always attended.
- When using an external thermostat, use an electronic thermostat.
- If a mechanical type thermostat is used, the ON/OFF operation becomes unstable, and the heater may stop by detecting a misfire.

## 3-5. Operation with Portable Generator.....



### WARNING

- Before operating the heater from a portable generator, please confirm that the generator has been properly connected to the ground earth. To operate the generator without proper grounding may result in electrical shock. Please refer to the owner's manual supplied by the generator's manufacturer.

The heater operates within the voltage range of 108 Volts to 132 Volts based on standard 120 Volts. Before plugging the heater into the generator, the output voltage of generator should be verified.

If the voltage does not measure in this range, the heater should not be plugged into the generator.

# 4 Inspection



## WARNING

- Never inspect or service the heater while it is burning, in operation, hot or plugged-in to avoid any injury and/or trouble.



## CAUTION

- Before starting any inspection or service, please make sure the heater is shut down and that the power cord is disconnected to avoid electric shock.
- When cleaning the heater, please wear gloves to prevent possible injury.

### Observations

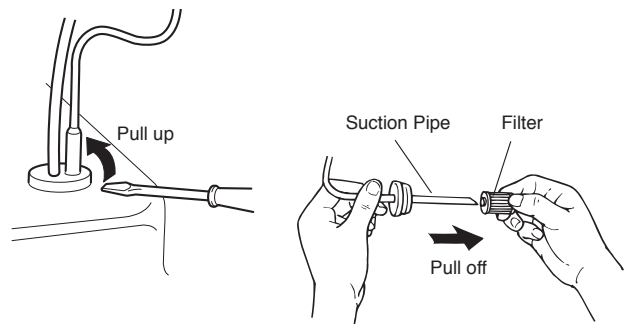
- Prior to each operation check the heater for signs of damage. Do not operate a damaged heater. Have it inspected and repaired by a qualified service agency.
- Prior to each operation check the heater for signs of fuel leakage. Do not operate a heater with fuel leakage. Have it inspected and repaired by a qualified service agency.

## 4-1. Daily inspection .....

### ■ Inspection of the filter and drainage of water from the fuel tank

#### Checking the filter element

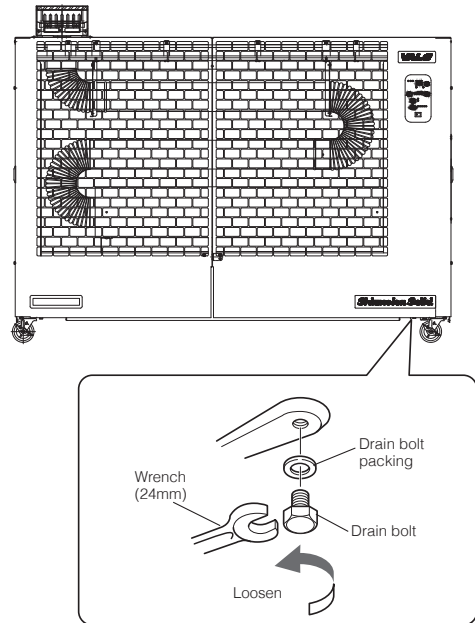
- 1 Remove the suction pipe from the fuel tank.
- 2 If the filter is dirty, replace it with a new one.
- 3 Return the suction pipe to the fuel tank and firmly secure.



#### Drainage of water from the fuel tank

- 1 Remove the fuel cap and insert a suction pump into the tank.
- 2 Remove as much fuel as possible (with the suction pump). Be sure that the fuel being removed is put only into a can or other container approved in your area for holding flammable liquids such as kerosene and Fuel-Oil no heavier than No.2 (Diesel).
- 3 Tighten the fuel cap firmly.
- 4 Prepare an empty container of about 4 liters (1.1gallons) capacity: to hold fuel and water remaining in the fuel tank, place the container under the drain bolt (of the fuel tank).
- 5 Next, use a 24mm wrench to remove the drain bolt and tilt the fuel tank until the fuel is completely drained out of the tank. (At the same time, be careful not to lose the drain bolt packing.)
- 6 Restore the drain bolt packing and tighten the drain bolt firmly so that fuel can not leak out (of the fuel tank).

- 7** Wipe off fuel or water spilled over the tank and the surrounding area.
- 8** Be sure to dispose of in a safe manner as approved in your local area the fuel, etc, placed in the empty container and the materials used to clean up any spilled fuel, etc. Safely clean and/or dispose of the empty container as also approved in your local area.

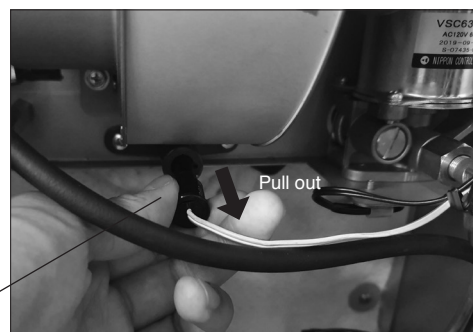
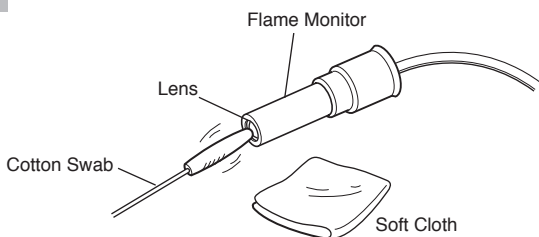


## ■ Inspection and cleaning of the flame monitor

### Observations

- When removing the flame monitor, hold it by its main assembly; do not pull out the cord.

- 1** Unscrew five screws of burner cover and take the burner cover off. Pull out the flame monitor and check if the lens is dirty/foul.
- 2** If the lens is dirty/foul, clean the surface of the lens with a soft cotton swab or cloth until it is clear. Do not use any cleansers of any type, e. g., glass cleaner, to clean the lens.
- 3** Replace the flame monitor. Then securely replace the burner cover using the provided screws.



## ■ Inspection of “dirt/dust” on the main unit

- 1** Check whether or not dirt/dust is on and around the heater.
- 2** If dirt or dust is found, remove it with a vacuum cleaner or a soft, non-abrasive, cloth. Do not use any cleansers of any type, especially spray cleansers, as they may leave a residue or infiltrate the operating mechanism of the heater and cause a fire, clog or otherwise damage the heater.

## 4-2. Periodic inspection .....

The heater must be checked periodically, and especially after periods of sustained or heavy use, for safe and proper operation, and for service maintenance. Have your dealer inspection of the heater no less than twice a year.

## 5 How to store the heater



### CAUTION

- If the heater is stored or not used for an extended period of time, empty the fuel tank to help prevent fuel leakage and other possible fire dangers.

When you store the heater, please disconnect the power plug from the extension cord and/or the AC outlet and store the heater indoors where it is less humid.

### Observations

- Do not store the fuel over summer months for use during next heater season. Using old fuel could damage the heater.

## 6 Troubleshooting

### ■ When you face problems with your heater, please refer to this checklist before consulting with your dealer.

In case satisfactory results do not result by referring to the table, or you have problems not described in this table, please contact your dealer. While consulting with him, please describe the problem you have, together with model name and serial number of your heater.

Phenomenon	Possible Cause	Remedy
The heater does not start. (The lamp does not light up.)	Power cord is not connected with an AC outlet. Power supply is cut off.	Please connect the power cord with an AC outlet, and check the power supply.
	Blown fuse	Replace fuse with a new one.
The heater does not start. (The lamp is lit.)	Safety devices are working.	Please check the safety device (refer to page 15)
The heater does not ignite.	No fuel in the fuel tank.	Please pour fuel into the tank.
	There is water in the fuel tank.	Please clean up the tank and fill it with fresh/clean fuel.
	Fuel filter element is clogged.	Check the filter element and replace it with a new one.
	Nozzle is clogged	Replace nozzle with a new one. (refer to page 16)
The flame goes out during the operation.	Wrong or foul fuel is used.	Please clean up the fuel tank and fill it with fresh/new fuel.
	Flame monitor is dirty.	Please clean up the flame monitor.
	Fuel filter element is clogged.	Please check the filter element and replace it with a new one.
	Safety devices are working.	Please check the safety device. (refer to page 15)

If the following phenomenon takes place, it is usually not a sign of trouble. Please check again before consulting with your dealer.

Phenomenon	Explanation
When used for the first time, smoke or smell comes out of the heater.	Because fuel is burning together with dusts, etc. This phenomenon will disappear after a short while.
At the time of ignition or shut-down of the heater, noise comes from the burner section.	Noise is caused by expansion or shrinkage of the burner section due to temperature's up and down. This is not irregular.

## ■ Error codes and countermeasures

When the heater is abnormal, the run indicator light blinks and an error code is displayed.

Display	Matters	Explanation and Countermeasures
A1	Misfire	When misfire occurs, the heater automatically stops. Take the measures (refer to page 14) and turn on the power again. If the error recurs after taking countermeasures, please contact your dealer.
A2	Out of fuel	No fuel in the fuel tank. Please pour fuel into the tank.
A3	Overheat	When overheating is detected, the heater automatically stops. The burner may be abnormal. Please contact your dealer.
A4	Tip-over	When the heater receives a large vibration or shock, it automatically stops. Check that the heater is not damaged and turn it on again.
A5	Abnormal fan speed	The heater stops when an abnormality of the combustion fan is detected during combustion. The heater may be abnormal. Please contact your dealer.
A6	Low voltage stop	When the power supply voltage is 70V and less, the heater stops. Connect to a normal power source and turn it on again.
A7	3 consecutive misfire	The heater will not be able to operate after three (3) times of consecutive misfire. Please make sure the cause of misfire along with "Troubleshooting". Then, disconnect the power plug and connect it again, so that the system will come back.
A8	Circuitboard communication abnormality	The heater automatically stops when communication between the control board and the operation board fails. The board or wiring may be faulty. The 「A8」 display appears when communication is restored.
HV	High Voltage	The operation is prohibited when the power supply voltage is connected to an abnormal high voltage. Connect to a normal power source.
LV	Low voltage detection	The 「LV」 is displayed when the power voltage drops below approximately 90volts during operation. The operation is continued, but connect it to a normal power source.



## WARNING

- Never service the heater while it is burning, in operation, hot or plugged-in to avoid any injury and/ or trouble.

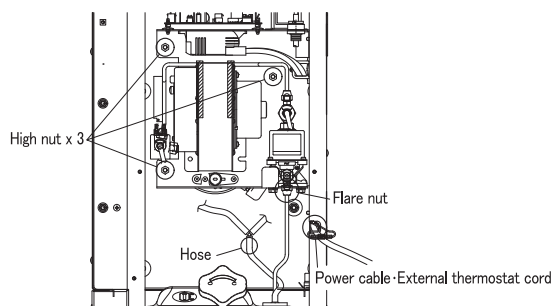


## CAUTION

- Before starting any service to avoid electric shock, please make sure the heater is shut down and that the power cord is disconnected.
- When servicing the heater, please wear gloves to prevent possible injury.

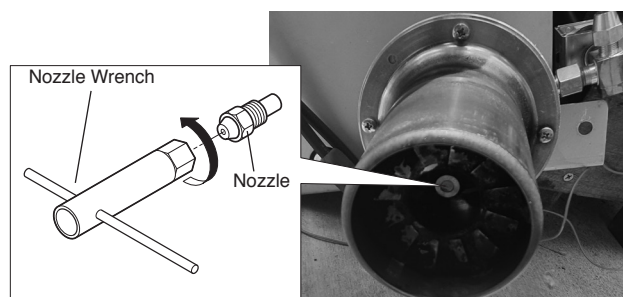
## ■ Replacing a nozzle

- 1 Unscrew five screws of the burner cover and take the burner cover off.
- 2 Disconnect the four connectors(overheat protection, tip-over switch, operation board connector, fuel sensor, temperature sensor : refer to page 17)
- 3 Remove the flare nut, high nuts, hose, power cable and external thermostat cord. (There are three high nuts.) And take the burner unit off.
- 4 Replace with a new nozzle by using the provided nozzle wrench.
- 5 Tighten the nozzle using the nozzle wrench until the nozzle is fixed.
- 6 Put the burner unit back with three nuts removed.
- 7 Connect the three connectors into the operating board and tighten the flare nut.
- 8 Put the burner cover back with five screws removed.



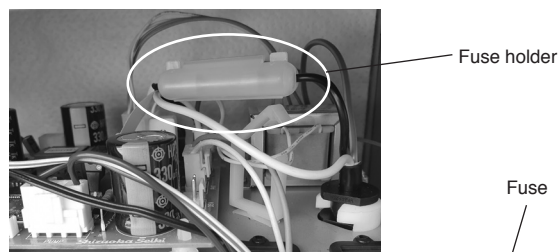
### Observations

- Be careful not to touch electrodes

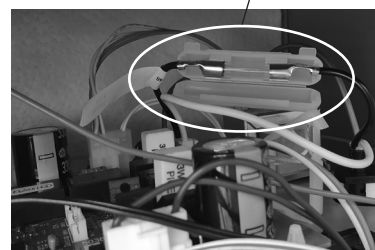


## ■ Replacing a fuse

- 1 Unscrew five screws of burner cover and remove the burner cover.
- 2 Take out the fuse from the fuse holder.
- 3 Replace with a new one.
- 4 Close the fuse holder.
- 5 Put the burner cover back with five screws removed.



Open a fuse holder and take out a fuse. Check whether the fuse is blown out.



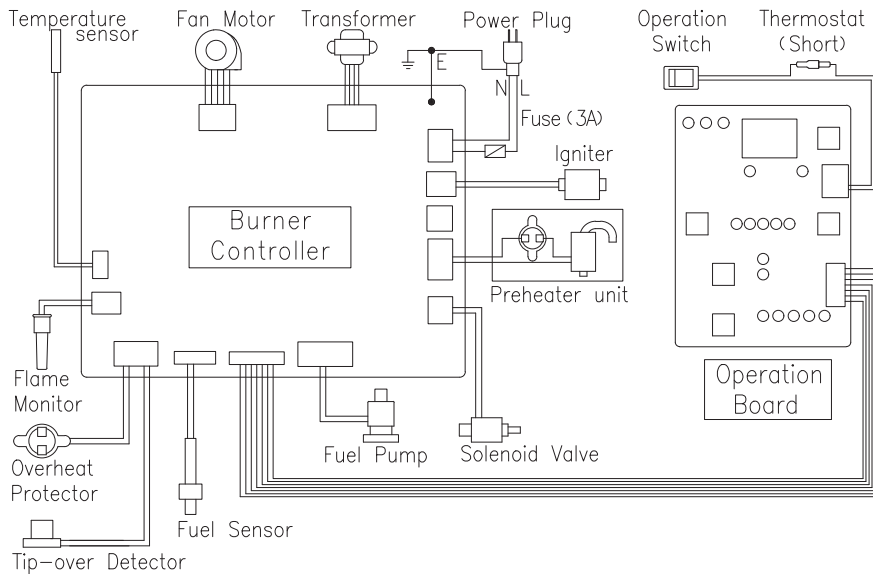
# 8

# Specifications

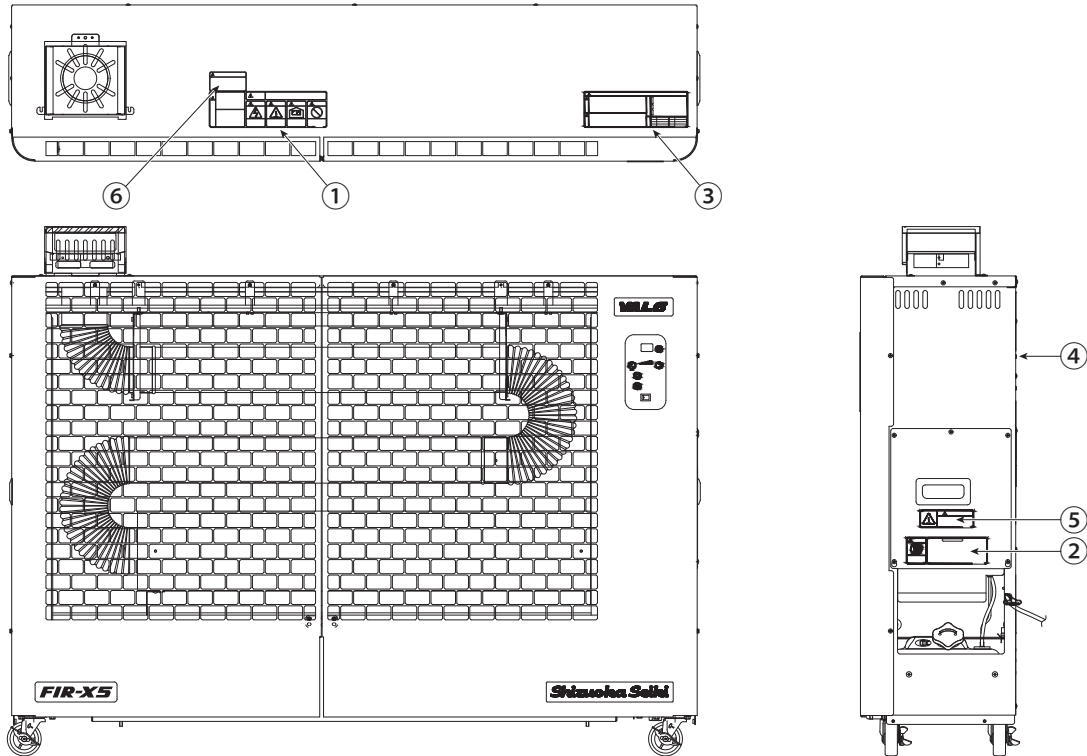
<b>Model Type</b>	VAL6 FIR-X5	<b>Electric Fuse</b>	3A
<b>Type</b>	Radiated / Direct-fired	<b>Operating Noise Level</b>	56 dBA(Lv.5), 55dBA(Lv.4), 54dBA(Lv.3), 53dBA(Lv.2), 52dBA(Lv.1)
<b>Ignition System</b>	High intensity discharge	<b>Safety Systems</b>	Tip-over Switch Flame Monitor Electrical System Protection (High Voltage, Low Voltage, Prevention of automatic ignition after black-out) Overheat Protection Anomaly detection system for fan motor
<b>Fuel</b>	Kerosene or Fuel-Oil no heavier than No.2(Diesel)		
<b>Fuel Consumption (Heat Output)</b>	Lv. 5 : 0.53 GAL/h, 1.72 kg/h (75,100 BTU, 22.0 kW) Lv. 4 : 0.50 GAL/h, 1.63 kg/h (71,300 BTU, 20.9 kW) Lv. 3 : 0.48 GAL/h, 1.55 kg/h (67,600 BTU, 19.8 kW) Lv. 2 : 0.45 GAL/h, 1.46 kg/h (63,800 BTU, 18.7 kW) Lv. 1 : 0.42 GAL/h, 1.38 kg/h (60,100 BTU, 17.6 kW)	<b>Other Systems</b>	Preheater for fuel supply Solenoid valve for remaining fuel Valve for draining air
<b>Tank Capacity</b>	7.9 gallons	<b>Functions</b>	Combustion mode Thermo control mode ( The combustion level is manually maintained. ) Auto control mode ( The combustion level is automatically adapted to programed temperature setting ) OFF-timer ( 1, 2, 4, 8 hours ) Display(7seg) switching ( Temperature[F], OFF-timer remaining time )
<b>Continuous Operating Time</b>	Level 5 : 14 hours (Stopped by fuel sensor)		
<b>Dimensions (inch)</b>	46.0 H x 59.6 W x 13.6 D		
<b>Weight (w/empty tank)</b>	172 Lbs, 78kg		
<b>Power Supply</b>	AC 120V (60Hz)		
<b>Power Consumption</b>	Igniting : 65W, Burning : 45W(Lv.5), 41W(Lv.4), 37W(Lv.3), 34W(Lv.2), 31W(Lv.1) +44W When Preheater is operating		

English

## Wiring Diagram



- Safety labels provide important information for safe use of the heater. So, please do not remove or soil them.
- If any of the labels is unreadable or removed, please ask your dealer for a new one and replace with the new one.



### ① Danger Label

<b>Caution</b>	Do not place anything near the exhaust port.	<b>Warning</b> Never use heater for home use. Due to the high amount of heat, there is a risk of fire and carbon monoxide poisoning.		
	Use only handles on the sides to move heater. Never move heater while in operation.	<b>Warning</b> Always unplug heater before servicing.	<b>Warning</b> Never touch heat radiation tubes and other components while they are hot.	<b>Warning</b> Always use heater in well ventilated area.

>PETC 50361-204001

### ② Caution on Refueling • Filter maintenance Label

<b>Danger</b>  Never use gasoline.	<b>Filter maintenance</b> <ul style="list-style-type: none"> <li>Remove the suction pipe and the return hose from the burner.</li> <li>Pry out the rubber plug with the suction pipe attached from the tank.</li> <li>Do not drop the fuel filter element into the tank.</li> <li>Pull out the fuel filter element from the suction pipe.</li> <li>Rinse the element with diesel or kerosene.</li> <li>If the element is very dirty, replace it.</li> <li>Re-attach the element to the suction pipe. Be sure the element is fully inserted into the suction pipe.</li> <li>Put back the fuel line assembly on to the tank and check no fuel leakage.</li> </ul>	
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>PETC 50361-200009

### ③ Caution Label

<b>Read Owner's manual before using.</b>																										
<b>Warning</b>	<ol style="list-style-type: none"> <li>Do not repeat on and off switching more than 3 times. If no ignition, consult your dealer.</li> <li>Do not operate heater in the presence of flammable gas.</li> <li>Do not touch heater while still hot.</li> </ol>	<b>Operation</b> <i>Never smoke until heater shuts down completely.</i> <b>&lt; Starting the heater &gt;</b> • Turn ignition on and ignition will start in 10 seconds. • If no ignition, turn off the ignition and on again. <b>&lt; Charge consumption mode, combustion level, and off-timer &gt;</b> • Push "Mode" button to change the combustion mode. • In Manual mode, push "On/Off" button to change combustion level. • In Auto mode, push "On/Off" button to change target temperature. • Push "PP-Check" button to prepare heater to be off. <b>Reset data</b> • Combustion level is manually resettable. Auto Control Mode: Combustion level is automatically adapted to program temperature setting. <b>&lt; Switching off &gt;</b> • Turn ignition off. • Fan motor runs for 5 minutes to cool down heater. Fan automatically shuts off.																								
<b>Caution</b>	<ol style="list-style-type: none"> <li>Always keep heater away from flammable material at least 5 feet.</li> <li>Always operate heater on non-combustible floor.</li> <li>Never operate heater in rain, snow, or very high ambient temperature.</li> <li>Never refuel heater while it is hot, operating, or plugged in.</li> <li>Never move heater while in operation.</li> </ol>	<b>&lt; Alarm &gt;</b> <table border="1"> <tr> <th>Alarm</th> <th>Reason</th> </tr> <tr> <td>A 1</td> <td>Blowfire</td> </tr> <tr> <td>A 2</td> <td>Out of fuel</td> </tr> <tr> <td>A 3</td> <td>Overheat</td> </tr> <tr> <td>A 4</td> <td>Tip-over</td> </tr> <tr> <td>A 5</td> <td>Blocked air vent</td> </tr> <tr> <td>A 6</td> <td>Low ambient</td> </tr> <tr> <td>A 7</td> <td>3 consecutive failures</td> </tr> <tr> <td>H 0</td> <td>High voltage</td> </tr> <tr> <td>L 0</td> <td>Low voltage</td> </tr> <tr> <td>B</td> <td>Water was left</td> </tr> <tr> <td>L</td> <td>Low water level</td> </tr> </table>	Alarm	Reason	A 1	Blowfire	A 2	Out of fuel	A 3	Overheat	A 4	Tip-over	A 5	Blocked air vent	A 6	Low ambient	A 7	3 consecutive failures	H 0	High voltage	L 0	Low voltage	B	Water was left	L	Low water level
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>PETC 50361-200009

### ④ Specifications Label

<b>VAL6 FIR-X5</b>	
OUTPUT	Level I: 75,100 BTU/h, 22.0 kW Level II: 80,100 BTU/h, 17.6 kW
FUEL CONSUMPTION	Level I: 0.53 GAL/h, 1.72 kg/h Level II: 0.42 GAL/h, 1.38 kg/h
FUEL OIL	Kerosene or Fuel oil no heavier than No.2 (Class)
POWER CONSUMPTION	100W with ignition, 75-80W with combustion
ELECTRIC REQUIREMENTS	120V, 60Hz
SERIAL NO.	50361
<b>Shimadzu Seiki Co., Ltd.</b> Made in Japan	
The requirements of local authorities having jurisdiction shall be followed.	

### ⑤ Floor Temperature Caution Label

	<b>Caution</b> Protect floor if floor temperature exceeds 140 °F.
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>PETC 50361-200005

### ⑥ Caution Label (PP65)

<b>Warning / Avertissement</b>
This product can expose you to chemicals including ceramic fiber, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov. Ce produit peut vous exposer à des produits chimiques, y compris la fibre de céramique, qui est connue dans l'état de Californie pour provoquer des cancers. Pour plus d'informations, consultez le site www.P65Warnings.ca.gov.

>PETC 50361-200009

## WARRANTY POLICY

### **VAL6 Far Infrared Heater series**

SHIZUOKA SEIKI warrants that its heaters and component parts will be free from defects in material and workmanship for a period of 24 months from date of purchase, when properly installed, operated, and maintained in accordance with the installation and Maintenance Instructions, safety guides and labels contained with each unit. If any component proves defective in either material or workmanship during the limited warranty period, Shizuoka Seiki, at its option, repair the defective part or equipment, or replace it with a new part or equipment.

#### **Proof of purchase and warranty qualification must be established at time of return.**

*\*A copy of the bill of sale must be provided at time of return.*

### **Claim Procedure**

All claims are to be submitted to the warranty processing center at 1-360-226-3637 (in the USA) and 1-424-286-0111 (in Canada). After the initial evaluation by phone discussion, the most appropriate agent or specific procedure will be informed.

This limited warranty does not apply to heater, component or replacement part damage resulting from incorrect installation, misuse, abuse, accident, act of God, neglect, mishandling, contaminated fuel, modification, incorrect environments, or wear from ordinary use.

The warranty set forth above is the exclusive warranty provided by Shizuoka Seiki and all other warranties, including any implied warranties or merchantability or fitness for a particular purpose, are expressly disclaimed. In the event any implied warranty is not hereby effectively disclaimed due to operation of law, such implied warranty is limited in duration to the duration of the applicable warranty stated above. The remedies set forth above are the sole and exclusive remedies available hereunder. Shizuoka Seiki will not be liable for any incidental or consequential damages directly or indirectly related to the sales, handling or use of the equipment, and in any event Shizuoka Seiki in connection with the equipment, including for claims based on negligence or strict liability, is limited to the purchase price.

Some states do not allow limitation on how long and implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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**SHIZUOKA SEIKI CO., LTD.** 1300 Moroi, Fukuroi, Shizuoka-pref 437-1121 Japan  
**Contact in U.S.A** 1-360-226-3637  
**Contact in Canada** 1-424-286-0111



## USER REGISTRATION

Please scan QR code or visit the site below and complete the registration and questionnaire in order to activate warranty.

This also allows you to download the owner's manual and/or parts list from our website.



<https://www.shizuoka-seiki.co.jp/english/login>

Manufacturer

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