

# SUNFIRE<sup>®</sup>

## SF120 RADIANT HEATER

### Operation & Service Manual



4109 Capital Circle Drive | Janesville WI, 53546

[sunfireheaters.com](http://sunfireheaters.com) | +1 (855) 251-1649





## Safety Information:

**Before you begin...**



### SAFETY, CODES, AND REGULATIONS:

Thank you for purchasing a SunFire product. SunFire heaters are designed and tested for safe, reliable, long-term operation, though proper operation, fuel quality control, and regular maintenance are required. Please read and understand this manual completely before attempting to operate or service the product. Keep and maintain this instruction manual.

This manual provides instructions necessary to safely use the SunFire Radiant Heater. MISUSE OF THIS PRODUCT MAY RESULT IN SERIOUS OR FATAL INJURIES DUE TO BURNS, FIRE, EXPLOSION, ELECTRICAL SHOCK, OR ASPHYXIATION FROM CARBON MONOXIDE.

If you have any questions, please go to [www.sunfireheaters.com](http://www.sunfireheaters.com) or call 1 (855) 251-1649 for support.

### CONVENTIONS USED IN THIS MANUAL:

**For your safety, this manual uses the following definitions and signal words to identify hazards:**

- ▲ DANGER** - Indicates a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.
- ▲ WARNING** - Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- ▲ CAUTION** - Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
- NOTICE** - Indicates an unsafe practice which, if not avoided, may result in product or property damage. Also used for general alerts.

## Safety Information:

### **⚠ DANGER**

Failure to comply with specified requirements and minimum clearances can be dangerous and may become a fire hazard. Additional clearances may be necessary for accessibility or to comply with local codes.

### **⚠ DANGER**

This appliance is equipped with a three-prong grounding plug for your protection against electric shock hazard and should be plugged into a grounded, three-prong power supply capable of supplying proper voltage and amperage.

### **⚠ WARNING**

**USE ON LEVEL, NON-COMBUSTIBLE FLOORING ONLY**

### **⚠ DANGER**

Carbon Monoxide (CO) is a poisonous gas that cannot be seen nor smelled and can result in fatality within minutes. Not for use in residential living areas. Only use this product in a well-ventilated area.

Provide a minimum of 2.55 square feet (0.27 square meters) of ventilation to the outdoors into the operation area at the unit-height level. The first symptoms of carbon monoxide asphyxiation are similar to that of the flu: headaches, dizziness, and/or nausea. These symptoms could be caused by a malfunction of the Radiant Heater. In this case go outside immediately. Have the Radiant Heater repaired before continuing operation of the heater. Some people are more affected by the effects of carbon monoxide than others, especially pregnant women, those who suffer from heart or lung disease, or people with anemia; also those who have consumed alcoholic beverages and those who are at high altitudes. Be sure to read and understand all of the warnings. Save this manual for future reference: it will provide you with instructions to operate your radiant heater safely and correctly.

### **⚠ WARNING Ceramic fiber material**

This appliance may contain ceramic fiber and/or fiberglass materials. Ceramic fiber materials, such as chamber liners, may contain carcinogenic particles (cristobalites) after exposure to heat. Airborne particles from fiberglass or ceramic fiber components have been listed as potentially carcinogenic by the State of California.

Take the following precautions when removing, replacing and handling these items:

Avoid breathing dust and avoid contact with skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.

Use a NIOSH N95 certified respirator. This respirator meets requirements for protection from cristobalites. Actual job requirements or NIOSH regulations may require other or additional protection. For information, refer to the NIOSH website, <http://www.cdc.gov/niosh/homepage.html>.

To prevent airborne dust, thoroughly wet ceramic fiber with water before handling. Place ceramic fiber materials in a plastic bag and seal it for disposal. Avoid blowing, tearing, sawing, or otherwise causing fiberglass or ceramic fiber materials to become airborne. If such operations are necessary, wear extra protection to prevent yourself or others from breathing the dust. Wash work clothes separately from other laundry. Rinse clothes washer thoroughly afterwards to prevent contamination of other clothing.

NIOSH First aid procedures: Eye exposure – irrigate immediately; Inhalation – fresh air.



**! WARNING**

# NO GASOLINE!

**This product is designed for use with Diesel, No.2 heating oil, or kerosene ONLY!**

- To avoid added risk of fire or explosion, never use gasoline, crankcase drainings, naphtha, paint thinners, alcohol, or any other unapproved fuels.
- Never use the heater in areas where aerosol cans, gasoline, paint thinner, or other highly flammable materials are stored.
- Visually inspect the heater before each use. Never use a heater that has been damaged, broken, or modified from manufacturer's specifications.
- Before filling the fuel tank, extinguish all nearby flames, including the radiant heater and wait for the heater to cool down.
- While filling the tank inspect the fuel lines and their junctions to check for fuel losses. Any losses or leaks must be repaired before resuming operation of the radiant heater.
- Fuel should always be stored in compliance with safety regulations.
- When you move or store the heater, maintain it in a level position in order to avoid fuel loss or drain the fuel into an appropriate receptacle.
- Keep children and animals away from the heater.
- Disconnect the heater from electrical power when it is not in use and has completed a post-purge cycle after power button has been placed in the OFF position.
- When it is controlled by another device (like a thermostat or a timer), the heater could turn itself on at any time. Please be aware of this and observe all safety precautions.
- Never operate the heater in unoccupied or unattended areas.
- Do not block vents or openings on any part of the heater at any time.
- When the heater is in use and connected to the power supply, it should never be moved, handled, or refilled and no maintenance should be performed on it.

## **...in Canada:**

- Installation of the unit shall be in accordance with the regulations of the authorities having jurisdiction. Refer to CSA standard 39-1962: Installation Code for Oil-Burning Equipment, for Recommended Installation Practice.

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## Safety Labels:

### ⚠ WARNING

#### READ MANUAL BEFORE USE

1. Never use gasoline or waste oil.
2. Never push RESET button more than twice. If heater doesn't start, follow troubleshooting in manual.
3. Never use in the presence of flammable vapors or dust.
4. Never unplug unit before allowing unit to cycle through the 5 minute post-purge cool down period after turning unit off.
5. Do not touch the front or top of heater until completely cool.
6. Risk of shock: Unplug unit before removing burner cover.  
To be used only in well-ventilated commercial-industrial occupancies. Not for use where exposed to the weather.
7. Never move heater while running.
8. Do not start heater after excess fuel has accumulated in the front dome chamber. Allow time to dry.
9. Do not operate heater unattended.
10. Keep heater a minimum distance of 7 feet away in the front and 3 feet on both left and right sides from flammable and combustible materials.

**CAUTION:** Hot while in operation. Do not touch. Keep children, clothing, and combustibles away.

### ⚠ AVERTISSEMENT

#### LIRE LE MANUEL AVANT UTILISATION

1. Ne jamais utiliser d'essence ou d'huile usée.
2. Ne jamais appuyer plus de deux fois sur le bouton RESET. Si l'appareil de chauffage ne démarre pas, suivre les instructions de dépannage dans le manuel.
3. Ne jamais utiliser en présence de vapeurs ou de poussières inflammables.
4. Ne jamais débrancher l'appareil avant de le laisser passer par le cycle de refroidissement post-purge de 5 minutes après l'avoir éteint.
5. Ne pas toucher l'avant ou le dessus de l'appareil de chauffage avant qu'il ait complètement refroidi.
6. Risque de décharge : Débrancher l'appareil avant de retirer le couvercle du brûleur. Utiliser uniquement dans des locaux commerciaux et industriels bien ventilés. Ne pas utiliser dans des lieux exposés aux intempéries.
7. Ne jamais déplacer l'appareil de chauffage pendant qu'il fonctionne.
8. Ne pas démarrer l'appareil de chauffage après que l'excès de carburant s'est accumulé dans la chambre du dôme avant. Lui laisser le temps de sécher.
9. Ne pas faire fonctionner l'appareil de chauffage sans surveillance.
10. Garder l'appareil de chauffage à une distance minimale de 2 mètres à l'avant et de 90 cm de chaque côté de matériaux inflammables et combustibles.

**MISE EN GARDE:** Chaud pendant le fonctionnement. Ne pas toucher. Tenir les enfants, les vêtements et les combustibles à l'écart.

## SUNFIRE

LISTED FUEL TYPES: DIESEL/#2 FUEL OIL/KEROSENE  
FUEL TANK CAPACITY: 14.2 GALLONS  
GPH RATING: .85 (DIESEL/#2 FUEL OIL) .78 (KEROSENE)  
MAX OUTLET TEMP: 1,600°F  
ELECTRICAL RATING: 120V, 1.2A, 60HZ (MAX 15A CIRCUIT BREAKER)

**WARNING:** THIS APPLIANCE IS EQUIPPED WITH A THREE-PRONG (GROUNDING) PLUG FOR YOUR PROTECTION AGAINST ELECTRICAL SHOCK HAZARD AND SHOULD BE PLUGGED DIRECTLY INTO A GROUNDED THREE-PRONG OUTLET.

**MINIMUM REQUIRED CLEARANCES FROM COMBUSTIBLE PRODUCTS:**  
FRONT: 84" SIDES: 36" BACK: N/A  
NON-COMBUSTIBLE FLOORING ONLY

MANUFACTURED BY ROCK ENERGY SYSTEMS, LLC  
JANESVILLE, WI  
GOT QUESTIONS? 1-855-251-1649  
SUNFIREHEATERS.COM

MADE IN USA



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# Table of Contents

<b>Safety Information:</b>	<b>1</b>
Safety, Codes, and Regulations:	1
Conventions Used in this Manual:	1
<b>Safety Labels:</b>	<b>5</b>
<b>Key Features:</b>	<b>9</b>
<b>Specifications:</b>	<b>10</b>
Fuel Requirement:	10
Fuel Input:	10
Fuel Tank Capacity:	10
Electrical Requirement:	10
Operating Temperature Range*:	10
Minimum Clearance to Combustible Material:	10
Weight:	10
Dimensions:	10
<b>Getting Started:</b>	<b>11</b>
Identifying Terms:	11
Package Contents:	12
Assembly:	13
<b>Normal Operation:</b>	<b>17</b>
Controls:	18
Operation Procedure:	18
Operation in Sub-Freezing Temperatures:	19
<b>Optional Accessories:</b>	<b>19</b>
Fuel-Filter Heating Band:	19
Thermostatic Control:	19
<b>Maintenance &amp; Service:</b>	<b>20</b>
Filter & Fuel Tank:	20
Burner Service:	21
General Maintenance:	23
Flame Adjustment:	24
Wiring Diagram (High Voltage):	25
Wiring Diagram (Low Voltage):	26
<b>Troubleshooting:</b>	<b>27</b>
<b>Warranty &amp; Legal Information:</b>	<b>28</b>
WARRANTY INFORMATION	28
PRODUCT REGISTRATION	28
TRADEMARKS	28
COPYRIGHT	28

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# SUNFIRE®

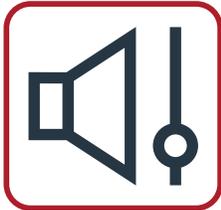
## SF120 RADIANT HEATER



*SUNFIRE: The most advanced, most durable portable multifuel radiant heater made in America*

### Key Features:

#### LOW NOISE



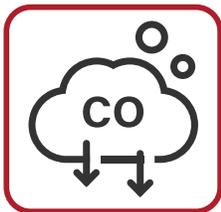
Turn up the heat without having to turn up the volume

#### ODORLESS



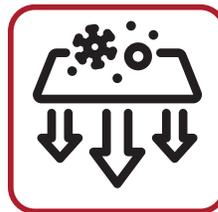
More heat  
Less noxious fumes

#### ZERO CO EMISSIONS



99%+ efficiency for carbon-monoxide-free operation

#### ZERO BREEZE/DUST



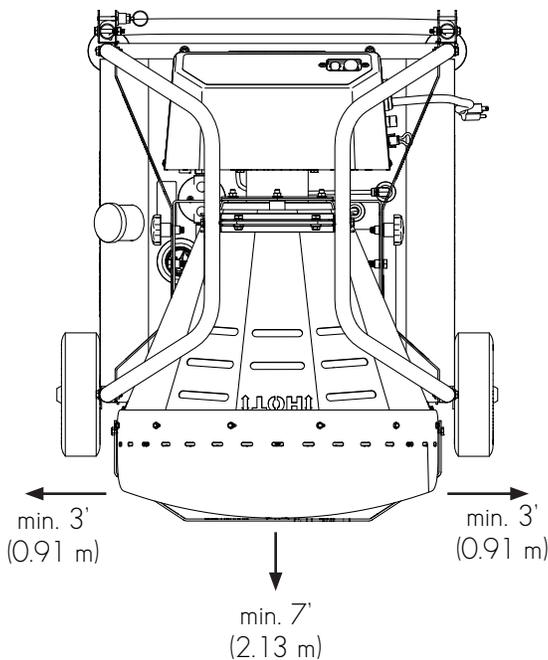
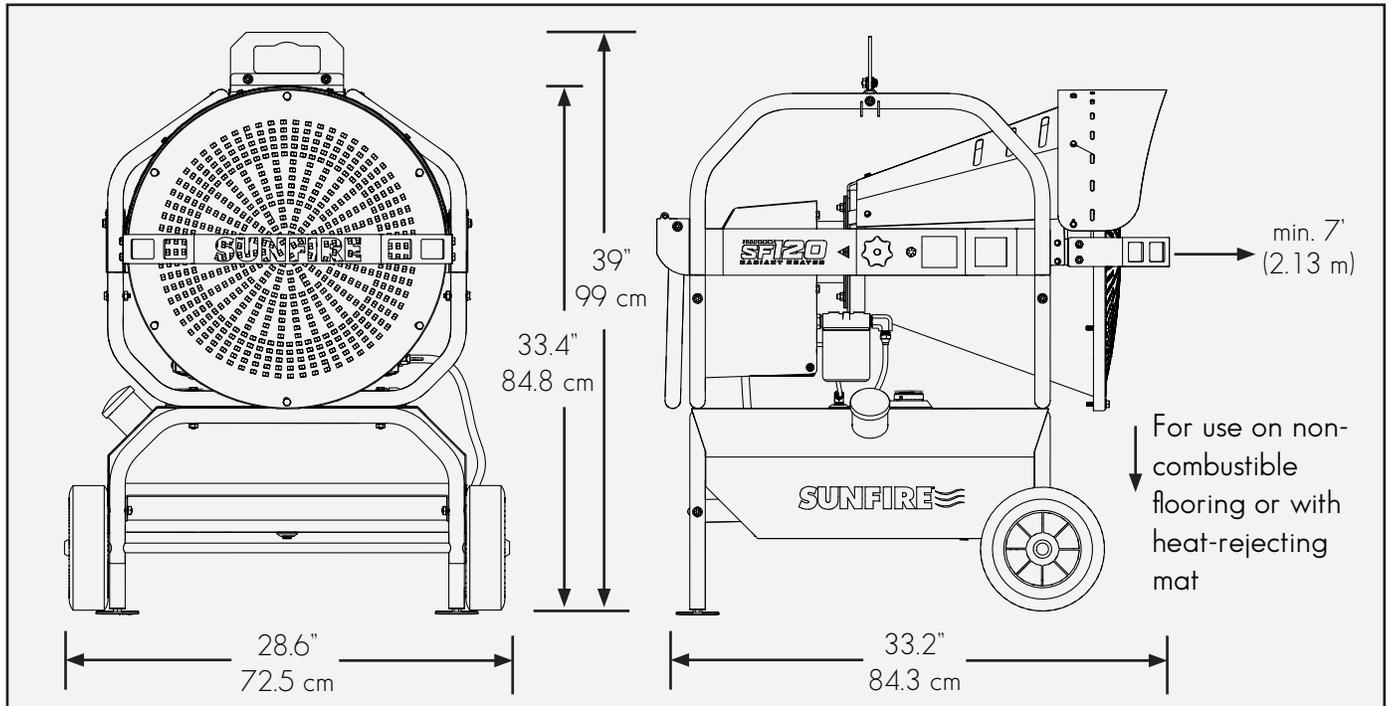
Radiant heat warms without kicking up a storm

SunFire Radiant Heaters are easy to setup and maintain...

...so you can sit back and soak up the glow... season after season.



## Specifications:



### MINIMUM CLEARANCE TO COMBUSTIBLE MATERIAL:

Front: 84" (213.36 cm)      Left/Right Side: 36" (91.4 cm)  
 Back: N/A      Below: For use on non-combustible flooring  
 or with heat-rejecting mat

### WEIGHT:

Empty of fuel: 125lbs (57kg); Fuel tank full: 220lbs (100kg)

### DIMENSIONS:

L: 33.2" (84.3cm)    W: 28.6" (72.5cm)    H: 33.4" (84.8cm)

### FUEL REQUIREMENT:

Diesel, No. 2 Heating Oil, Kerosene

### FUEL INPUT:

0.85 gal/h Diesel; 0.78 gal/h kerosene

### FUEL TANK CAPACITY:

14.2 U.S. gallons (53.8 L)

### ELECTRICAL REQUIREMENT:

1.2A, 120V / 60Hz 1-Phase

### OPERATING TEMPERATURE RANGE\*:

-20°F (-28.9°C) to 80°F (26.7°C)

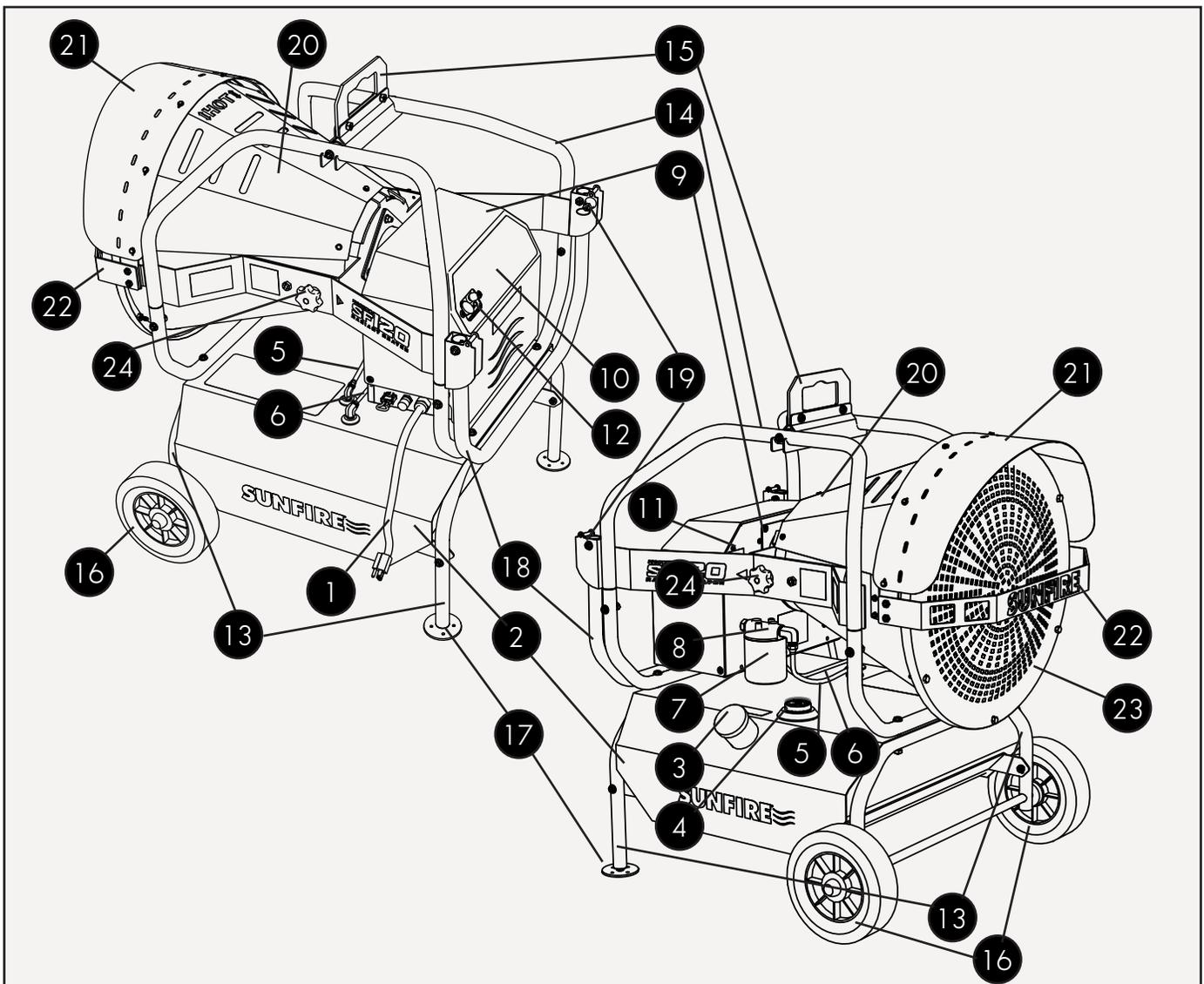
\*Fuel-temperature considerations are necessary when operating in sub-freezing temperatures. See product manual sections **NORMAL OPERATION** and **OPTIONAL ACCESSORIES** for more information.

## Getting Started:

### IDENTIFYING TERMS:

Please familiarize yourself with the parts of the heater as they will be referred to throughout this manual:

- |                        |   |                                 |
|------------------------|---|---------------------------------|
| 1. Power Cord          | 10. Burner Cover                            | 18. Adjustable Handle           |
| 2. Fuel Tank           | 11. PRIME Switch                            | 19. Handle-Position Locking Pin |
| 3. Fill Cap            | 12. Controls (See Normal Operation section) | 20. Heat Shield                 |
| 4. Fuel Gauge          | 13. Lower Support Frame                     | 21. Dome Visor                  |
| 5. Fuel Pickup Hose    | 14. Upper Support Frame                     | 22. Dome Guard                  |
| 6. Fuel Return Hose    | 15. Lifting Bracket (optional)              | 23. Dome Face                   |
| 7. Fuel Filter Element | 16. Wheels x2                               | 24. Tilt Adjustment Knob x2     |
| 8. Fuel Filter Head    | 17. Feet x2                                 |                                 |
| 9. Burner              |   |                                 |



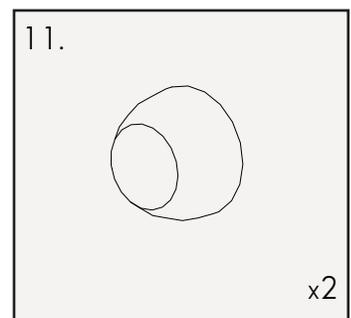
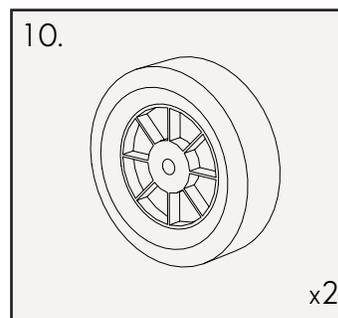
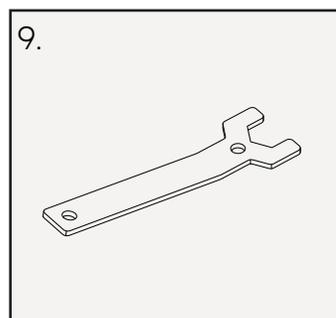
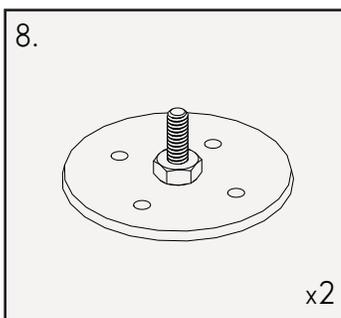
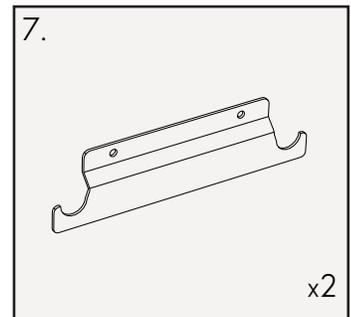
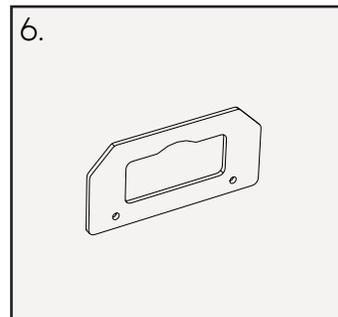
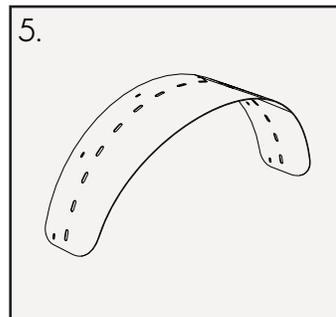
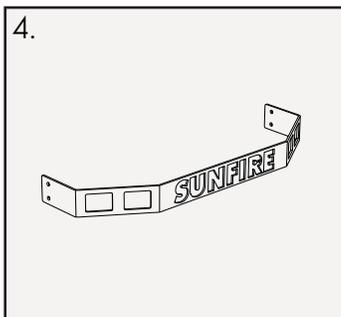
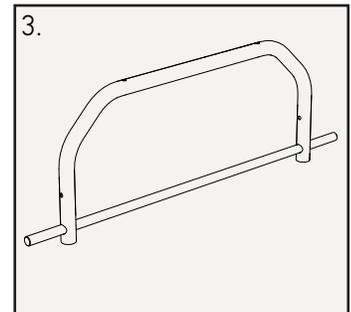
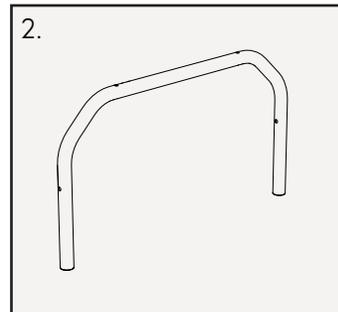
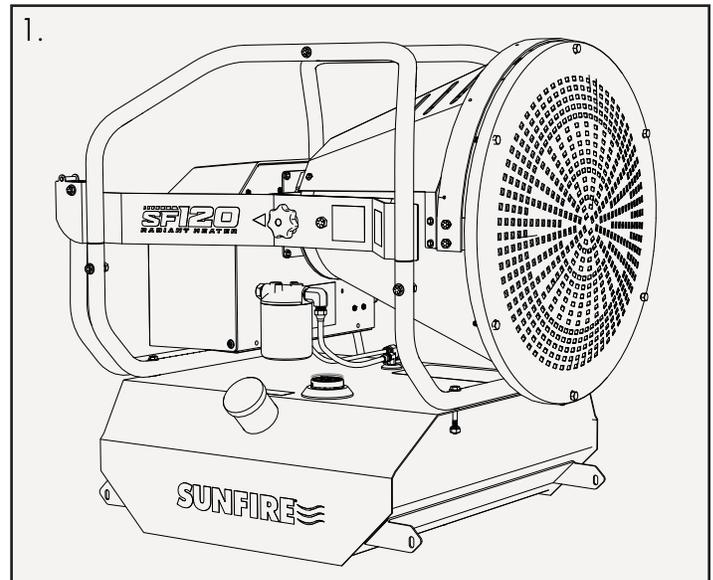
## Getting Started:

### PACKAGE CONTENTS:

Please review the package contents and ensure that all materials are present. If you find something is missing, contact SunFire for assistance. **DO NOT RETURN THE HEATER TO THE STORE** where it was purchased.

1. Heater Assembly
2. Lower Support Frame Leg Assembly
3. Lower Support Frame Axle Assembly
4. Dome Guard
5. Dome Visor
6. Optional Lifting Bracket
7. Optional Lifting Bracket Retainer x2
8. Leveling Foot x2
9. Foot-Adjustment Wrench
10. Wheel x2
11. Axle Cap x2
12. 1/4"-20 tpi x 1-1/2" Frame-Mount Bolts x4 (not shown)
13. 1/4"-20 tpi x 3/4" Lifting-Bracket Bolts x2 (not shown)
14. 1/4" Flat Washer x6 (not shown)
15. 1/4" Locking Washer x6 (not shown)
16. 1/4" Nut x6 (not shown)
17. #10 x 1/2" Visor Screw x6 (not shown)
18. Spare Parts (not shown)
19. Thermostat-connection Whip (not shown)
20. Operation & Service Manual (this booklet)

*Not to scale*



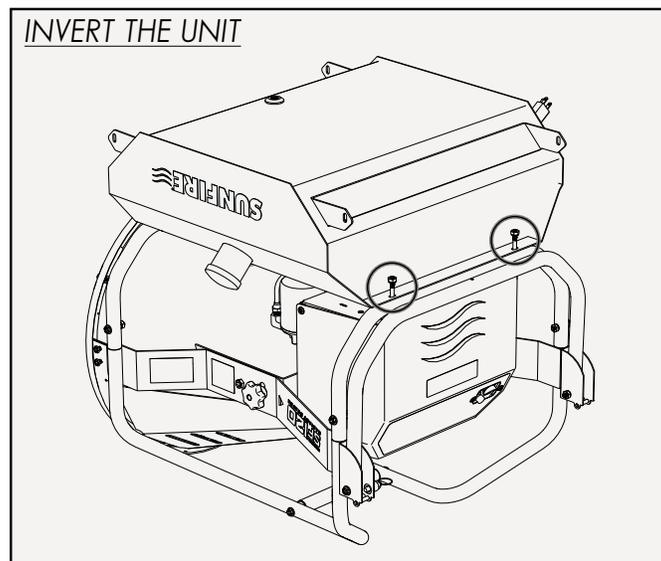
## ASSEMBLY:

When unpacking the unit, some assembly is required before initial use. This process can be completed individually, but a helper may be useful for some steps. Do not add fuel to the heater until the assembly process is complete. The following tools will be used in the assembly process:

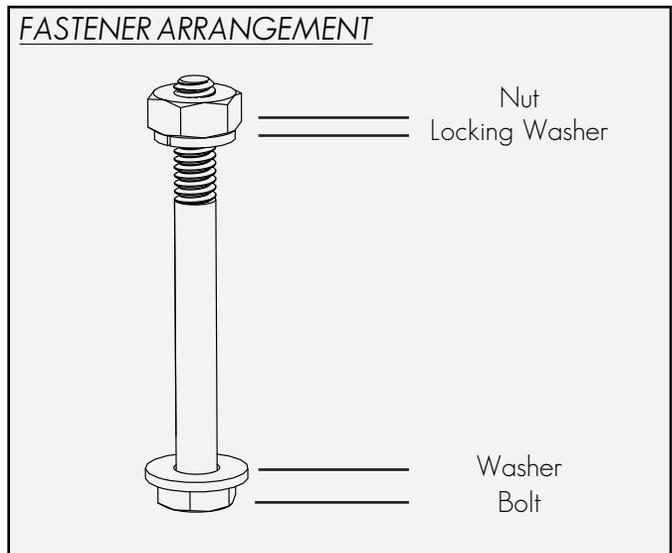
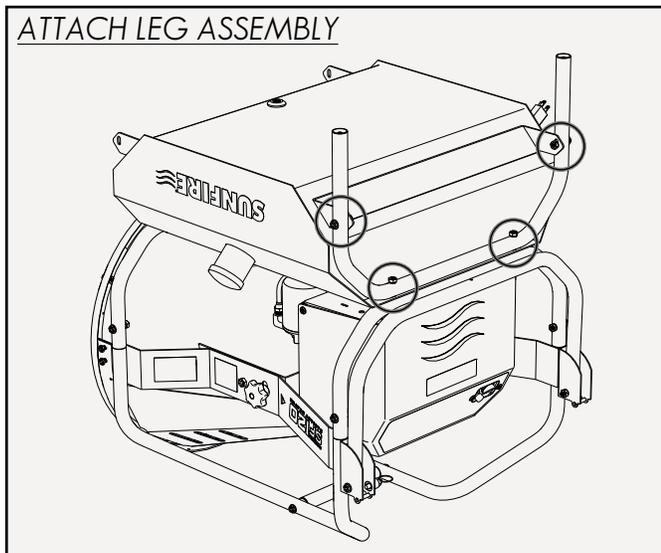
- 7/16" Wrench
- 1/2" Wrench
- Mallet / Hammer
- 5/16" Powered Driver

### TO ASSEMBLE THE UNIT:

1. Unpack the heater assembly onto a soft surface, like a rug or mat (or use a portion of the packaging), with room to work. Then, roll the heater sideways to invert it onto the work area, with the heater laying on its top. Do not lay the heater on the dome face at any time. Using a 7/16" wrench and a 1/2" wrench, locate and remove the two (2) nuts, locking washers, and spacers (not shown) from the bolts attaching the upper frame to the tank on the rear of the unit.



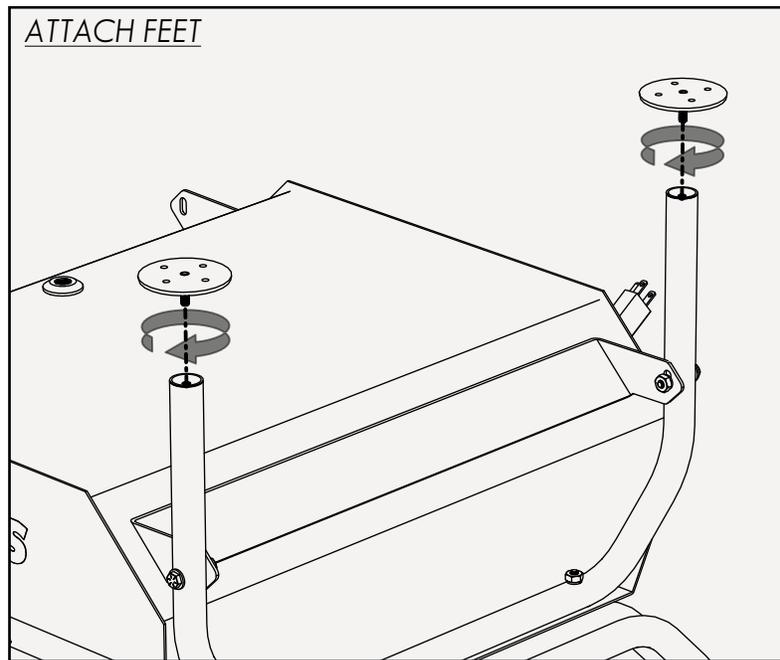
2. Discard the spacers and reuse the bolts, washers, locking washers, and nuts, plus two (2) each of the 1/4"-20tpi x 1-1/2" frame-mount bolts and associated washers and nut included in the packaging to affix the leg assembly to the unit. Observe the correct arrangement of the fasteners and ensure the fasteners are securely tightened before proceeding.



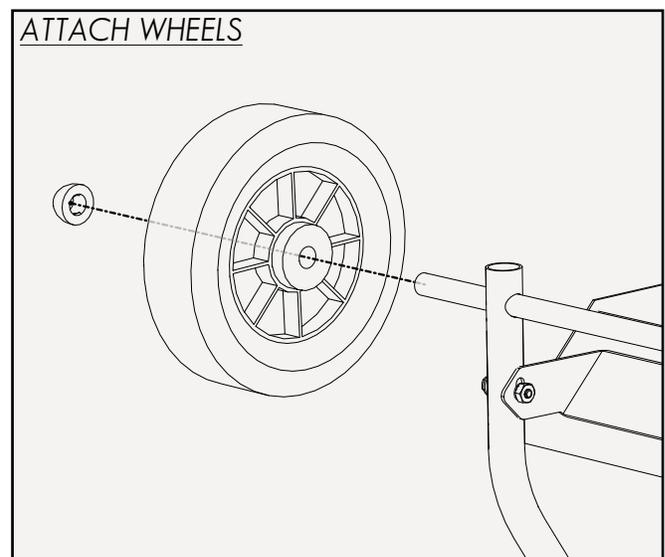
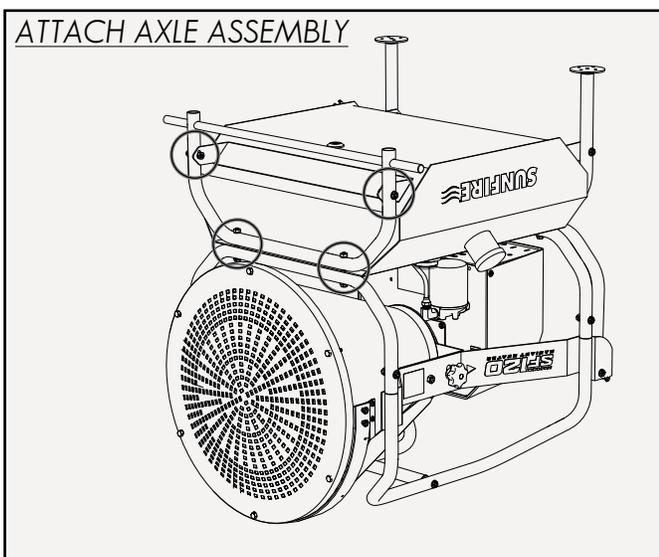
## Getting Started:

### TO ASSEMBLE THE UNIT (CONT.):

- When attaching the leg assembly to the heater, locate the two (2) leveling feet included in the packaging and screw them into the threads in the ends of the foot assembly frame.

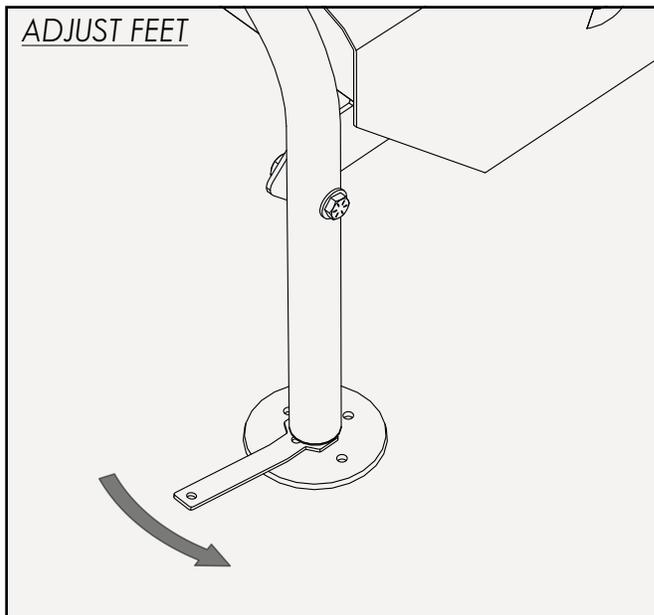
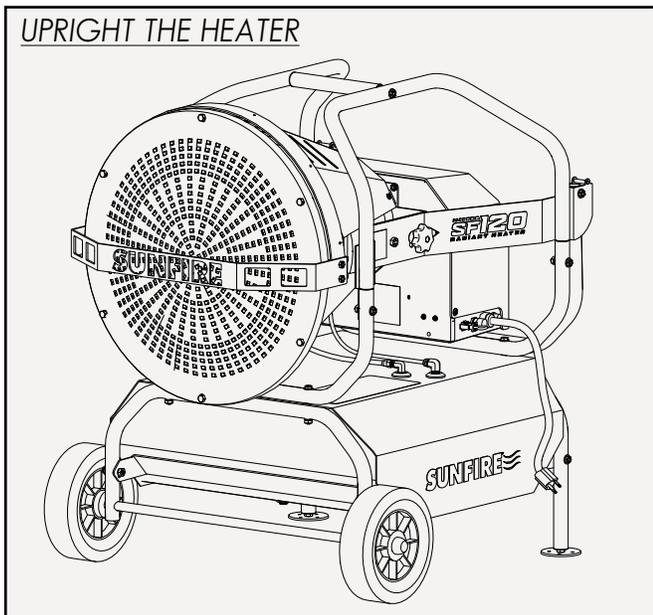


- Similarly to the leg assembly, locate and remove the nuts, locking washers, and spacers from the bolts attaching the upper frame to the tank on the front of the unit. Discard the spacers and reuse the bolts, washers, locking washers, and nuts, plus two (2) each of the 1/4"-20tpi x 1-1/2" frame-mount bolts and associated washers and nut included in the packaging to affix the foot assembly to the unit using the same fastener arrangement shown in the previous step. Ensure the fasteners are securely tightened before proceeding.
- After attaching the axle frame to the heater assembly, feed the raised hub of the wheels onto the axle (flatter side of the wheels facing away from the fuel tank) and use a mallet or hammer to install the cap nuts provided in the packaging to the ends of the axle, retaining the wheels.

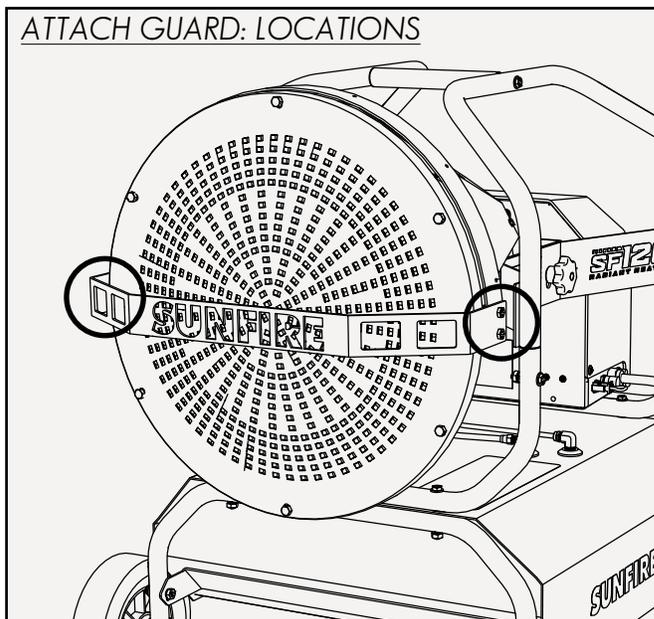
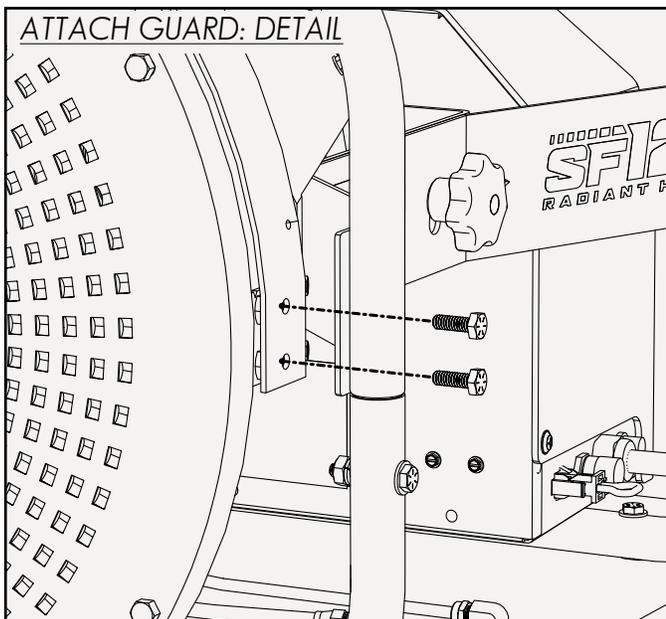


TO ASSEMBLE THE UNIT (CONT.):

6. Carefully, right the unit onto its lower support frame and wheels by rolling it sideways. Do not lay the heater on the dome face at any time. Check the stability of the heater as it sits on a level floor. If the heater rocks or is otherwise unstable, rotate the leveling feet to stabilize the heater. When the heater is stable, use the angled wrench included in the packaging to tighten the locking nut of the leveling feet to the foot-assembly frame, securing the leveling-feet adjustment setting.



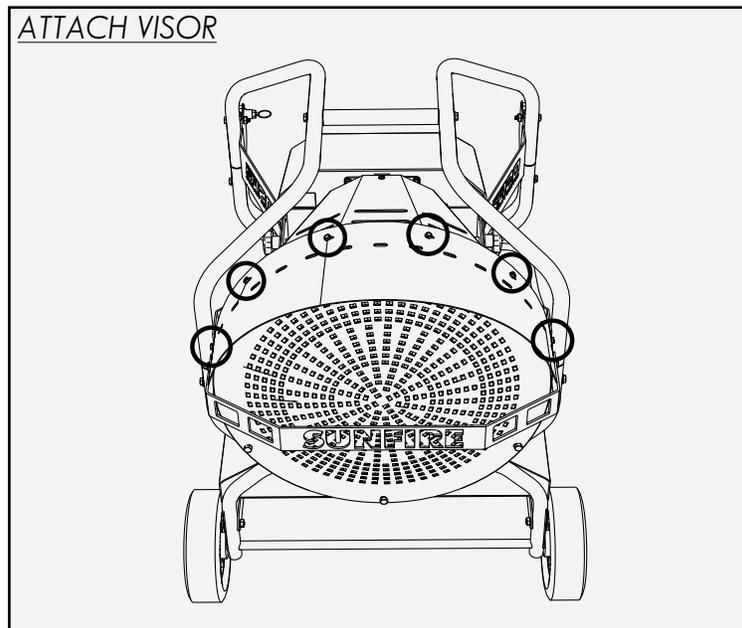
7. Use a 7/16" wrench or driver to **remove the bolts at one side of the dome face** and use them to loosely attach the dome guard to the front of the unit. Repeat this process to attach the other side of the guard, then tighten the fasteners on both sides.



## Getting Started:

### TO ASSEMBLE THE UNIT (CONT.):

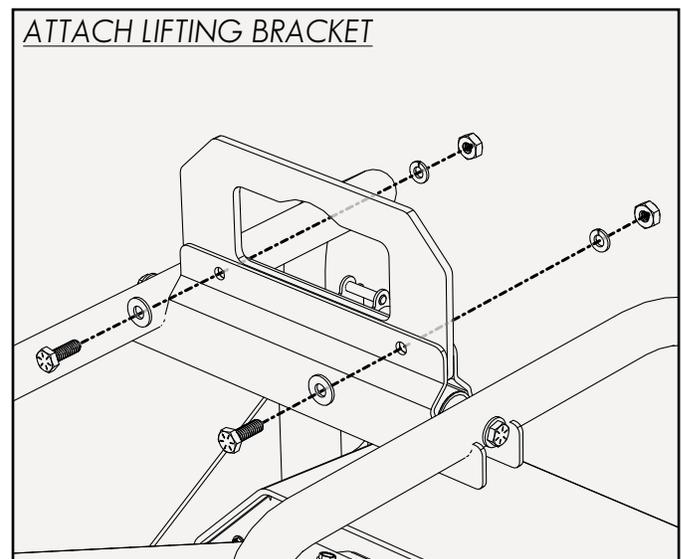
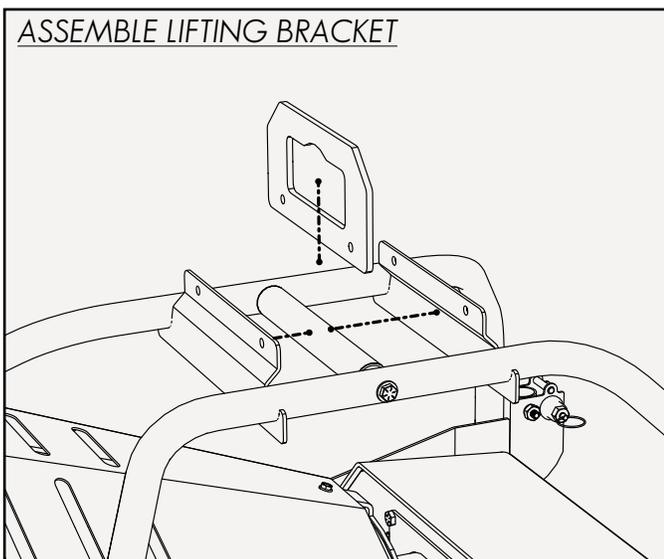
8. With a 5/16" powered driver, use the visor screws provided to affix the dome visor to the top of the dome face. **Start at one end of the visor** and move along the length of the visor to shape it to the dome. Do not tighten the screws completely until all fasteners have been started, then go back and finish securing all screws.



### **⚠ WARNING**

**DO NOT** operate the unit without the the dome guard and visor in place. These are important safety components and are required.

9. [OPTIONAL] Assemble the lifting bracket and use a 7/16" wrench and a 1/2" wrench to secure it with the bolt, washers, locking washers, and nuts provided in the packaging.



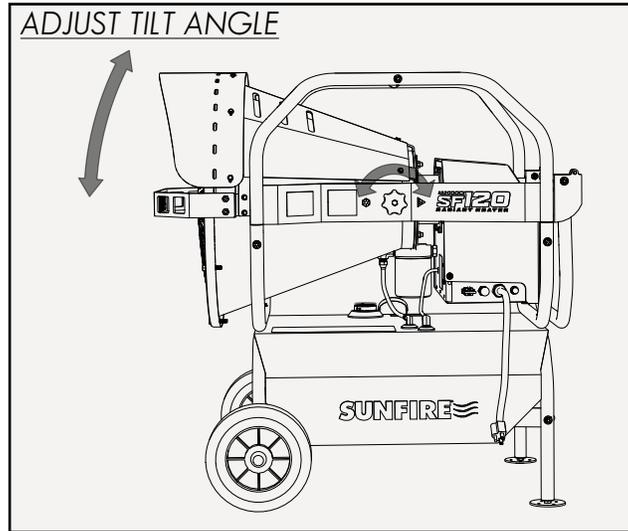
**The unit is now ready for normal operation.**

## Normal Operation:

This section will cover normal orientation and operation of the SunFire SF-120.

### TO ADJUST THE TILT ANGLE:

Use the knobs on the sides of the unit to adjust the tilt angle of the dome face. Tighten the knobs when adjustment is complete. **Return the tilt angle to its non-inclined position and tighten the adjustment knobs for storage or transport of the unit.**

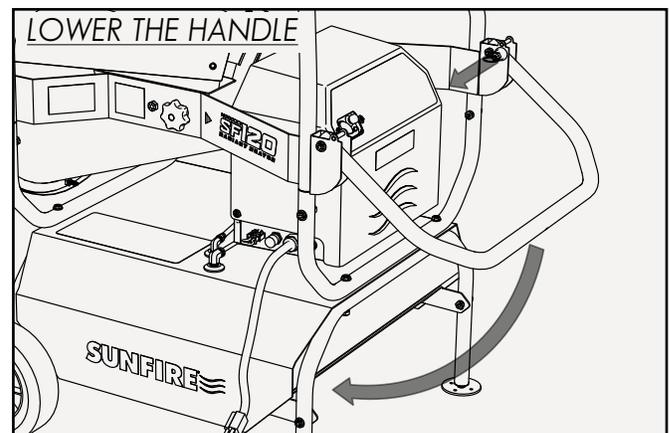
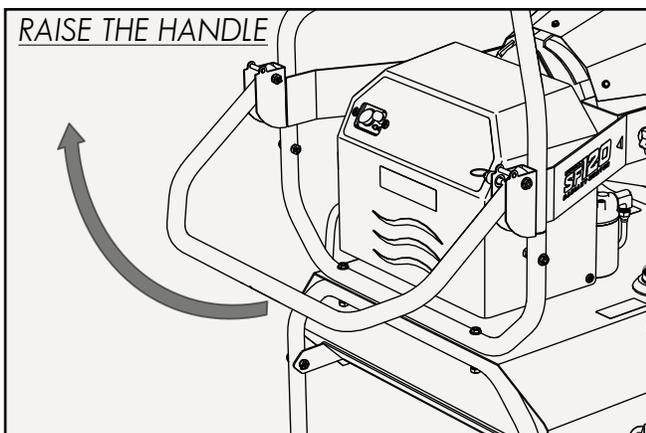


### TO OPERATE THE HANDLE:

The unit will ship with the handle secured in place by a hook and loop retaining strap (not shown). This should be left on the frame and reused when transporting the heater in the future. To raise the handle position, undo the retaining strap. Then, lift the handle until the spring-loaded pin engages (~90°), locking it in the raised position.

To lower the handle position, pull the ring of the pin on the hinge to release and lower the handle.

**Reuse the retaining strap to secure the handle in the lowered position when transporting the heater.**



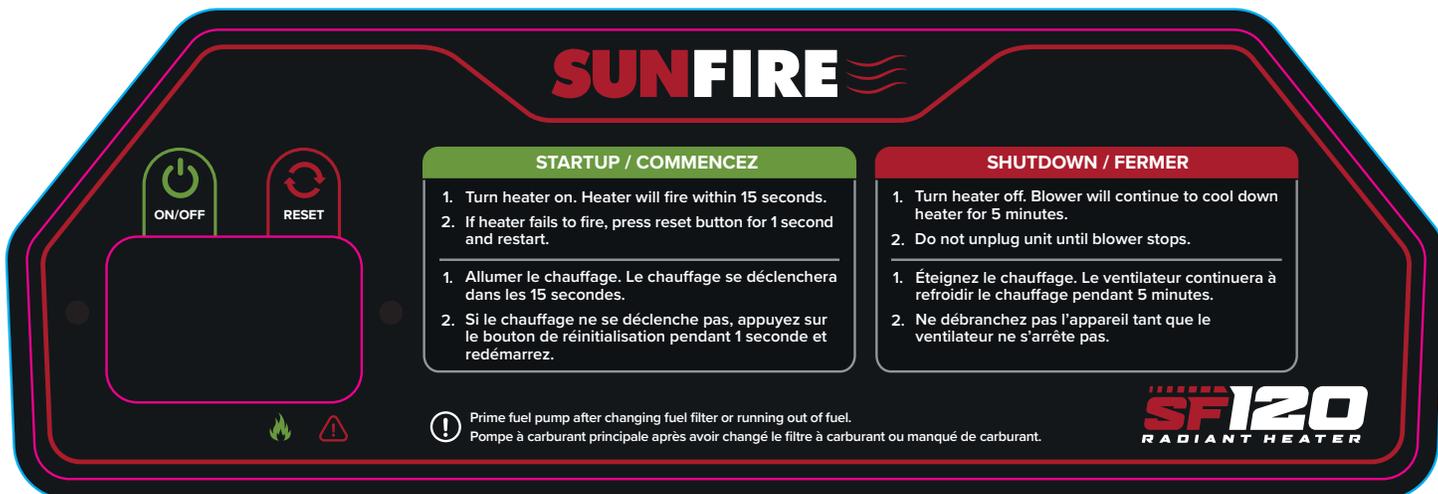
## **⚠ DANGER**

**When the heater is in use and connected to the power supply, it should never be moved, handled, or refilled and no maintenance should be performed on it. Allow the unit to cool completely before moving.**

## Normal Operation:

### CONTROLS:

The unit's controls are labeled and located on the burner cover.



### OPERATION PROCEDURE:

Keep the unit on a level, non-combustible surface at all times. If the unit is resting at a 25° angle or more, the tip switch will turn the heater off and/or prevent the heater from starting.

1. Add Diesel, No.2 heating oil, or kerosene to the fuel tank, if a need is indicated by the fuel gauge. Approved fuels can be mixed at any ratio.
2. Plug the unit's power cord into a grounded extension cord capable of supplying proper amperage and position the heater in a well ventilated area that provides safe clearances.
3. Press and hold the PRIME switch (located on the back side of the burner) until the fuel system is filled with fuel and purged of air (pump becomes quieter, fuel begins to flow through the return line).
4. Toggle the control switch to the ON position.
5. The blower will begin to operate and run for 15 seconds prior to ignition (pre-purge).
6. After the burner ignites, the GREEN LIGHT on the control panel will illuminate, indicating that the burner is on and the flame sensor can see the flame.
7. If the RED LIGHT on the control panel is illuminated, the unit must be reset (by pressing the RESET button) before resuming operation. Do not reset the unit more than two (2) times without troubleshooting (see Troubleshooting section) the root cause of the issue.
8. When shutting down the heater, turn power switch to the OFF position but **DO NOT UNPLUG THE HEATER**. Allow the burner to complete the post-purge cycle (5 minutes) before disconnecting power.

**For a new unit, the first hour of operation may produce light smoke and odor as dust and manufacturing lubricants are cleared from the system. This should dissipate with continued use.**

### **⚠ DANGER**

**Do not attempt to RESET the primary control of the heater more than twice. Stop and troubleshoot the cause of the issue. Repeated attempts to reset the unit can cause a risk of fire.**

### **⚠ WARNING**

**Allow the heater to complete its post-purge of heat and fuel vapors to reduce the risk of a fire hazard or damage to the unit.**

## OPERATION IN SUB-FREEZING TEMPERATURES:

Diesel and No.2 heating oil can begin to solidify at temperatures below 32°F (0°C). Kerosene can be mixed with Diesel fuel / No.2 heating oil in the tank to lower the freezing point of the fuel. If the heater will regularly be used in an environment where the unit has been allowed to cool to below 0°F (-18°C), a fuel-filter heating band will be necessary. On an initial cold start, with the unit plugged in and the heating band allowed to warm for ~30 minutes, use the prime switch to circulate warm oil through the system for a couple of minutes prior to starting. Use of 100% kerosene may also be necessary in this scenario.

## Optional Accessories:

### FUEL-FILTER HEATING BAND:

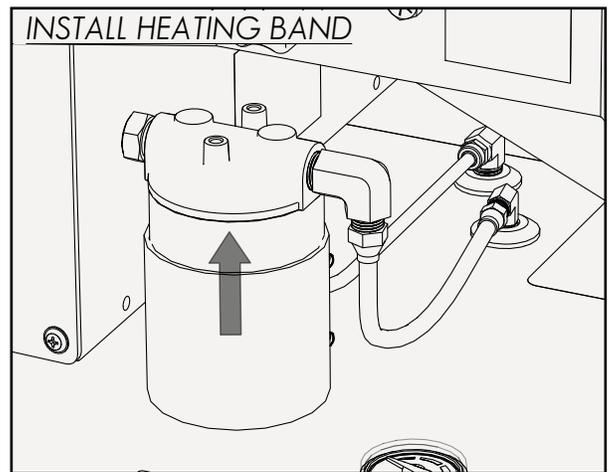
SunFire heaters can be fitted with a fuel-filter heating band to assist fuel flow in cold conditions.

#### HEATING BAND PLACEMENT:

Slip the heating band securely around the filter element. Remove the heating band before servicing or replacing the filter element.

#### HEATING BAND CONNECTION:

To connect the heating band, first **unplug the heater from its power source** and remove the cover from the burner housing (see Burner Service section). Feed the wire leads of the heating band through the grommets in the underside of burner housing and refer to the wiring diagram in this manual to connect them to the terminal block. Replace the housing cover when finished.



### ⚠ CAUTION

**Do not use the fuel-filter heating band in temperatures above 40°F (4.4°C), as volatile vapors may form in the fuel system, resulting in a hazard and/or damage to the product.**

### THERMOSTATIC CONTROL:

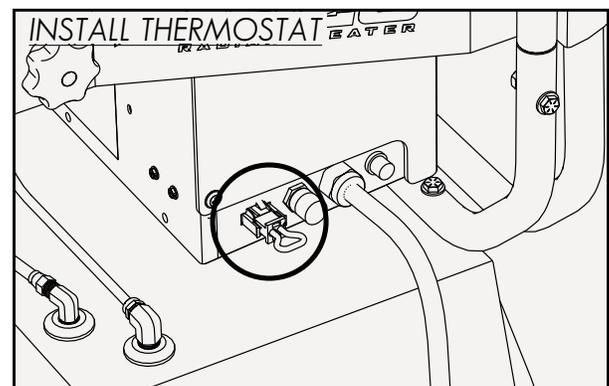
SunFire heaters can be connected to a thermostat to regulate the ambient temperature. Use a simple wall thermostat that does not require an external power source. Supplying power to the thermostat circuit will damage the primary control of the heater. Please use a basic, battery or mechanically-operated thermostat.

### ⚠ CAUTION

**When controlled by another device (like a thermostat or a timer), the heater could turn itself on at any time. Do not leave the operation-control switch in the "ON" position when unattended.**

#### THERMOSTAT WIRE CONNECTION:

With the control switch in the OFF position, disconnect the thermostat-bypass connector on the side of the unit (white plug with red wire) and keep in a safe place for future use. Use the thermostat cable and connector included in the manual packet to connect the thermostat to the burner (R & W terminals on most thermostats). The thermostat may then be set to the desired ambient temperature and placed at your desired location, taking care not to route the thermostat cable near hot surfaces of the heater.



## Maintenance & Service:

Maintaining your heater is important for prolonging the life of the product and keeping it operating in peak condition. Inspect the heater before each use and return the unit to optimal condition before resuming normal operation. Perform regular maintenance on the heater at the beginning and end of each heating season.

### **⚠ WARNING**

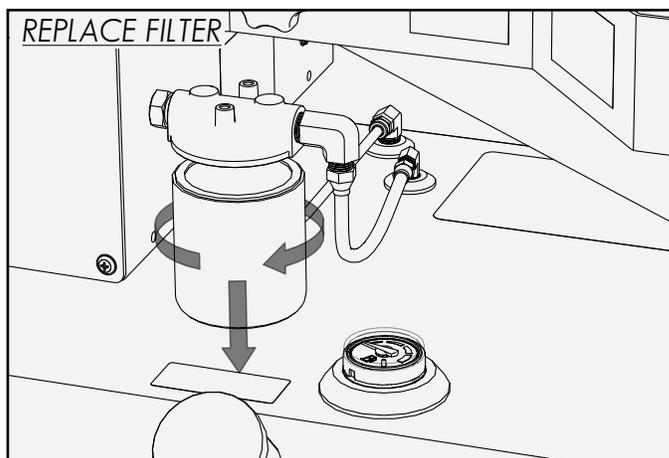
**Any time a component or any part of the burner is disassembled or replaced for service or maintenance, perform a complete operational test after reassembly to verify that the heater operates correctly. Failure to verify proper operation could result in severe personal injury, death, or substantial property damage.**

### FILTER & FUEL TANK:

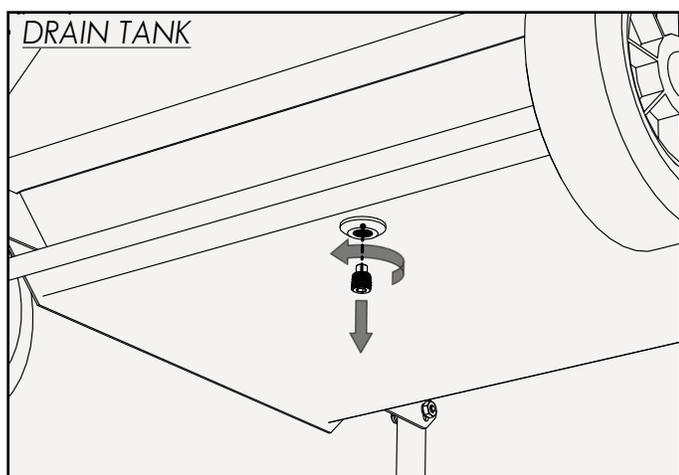
The fuel filter and tank should be serviced annually, at a minimum, or whenever a clog or poor fuel quality is suspected. Over time, water and silt can collect in the fuel tank and should be removed by draining the tank.

#### REPLACING THE FUEL FILTER:

The heater's fuel filter should be replaced before each heating season, after seasonal or long-term storage of the unit, or whenever a clog or poor fuel quality is suspected. Being careful to catch and contain any fuel that may spill, rotate the filter element to separate it from the filter head. Replace the filter with a genuine SunFire filter element. Apply a small amount of clean oil to the rubber o-ring. Tighten the filter snugly after the o-ring contacts the filter head. Do not over tighten.



#### DRAINING THE FUEL TANK:



The heater's fuel tank should be drained after each heating season, before long-term storage or transport, or whenever poor fuel quality is suspected. Being careful and prepared to catch and contain the entire contents of the tank, use a 1/4" hex key to remove the drain plug from the tank and allow the contents of the tank to drain completely. Apply fresh thread sealant, replace the drain plug, and confirm that it has sealed properly upon refueling.

**The heater's fuel system will need to be primed after the unit's fuel filter or tank is serviced, or when the heater has been run out of fuel. Use the PRIME switch on the back of the burner housing to prepare the heater for normal operation.**

## BURNER SERVICE:

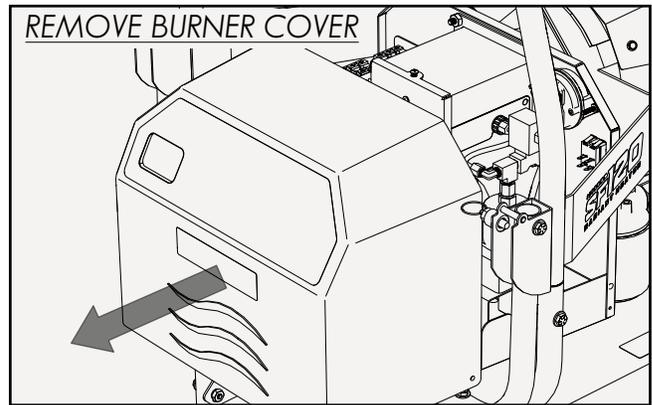
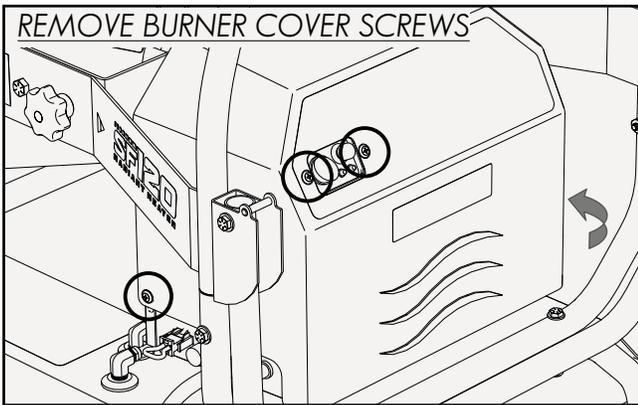
The burner assembly should be serviced seasonally, at a minimum, or whenever excess smoke is present or a clog or poor fuel quality is suspected. For inspection or service, the nozzle subassembly will need to be removed from the heater and the flame sensor, igniter electrode, and combustion chamber should be inspected.

### **⚠ WARNING**

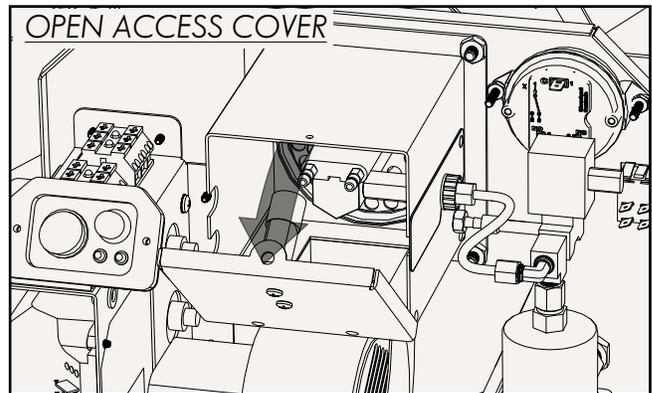
**Do not attempt to handle burner components unless the unit has been unplugged and cooled completely. Components can be hot and could cause severe personal injury.**

#### TO SERVICE THE BURNER ASSEMBLY:

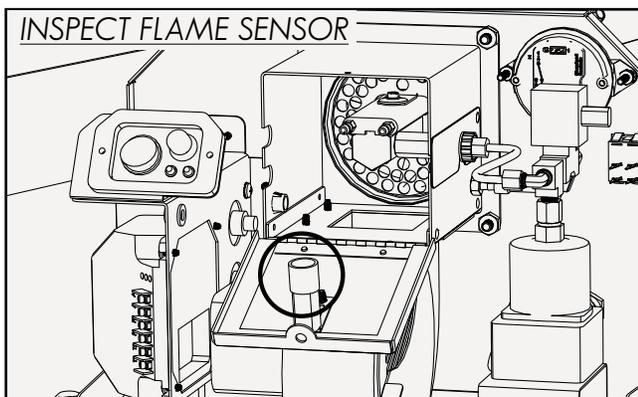
1. Use a Phillips-head screwdriver to remove the four (4) screws securing the burner cover to the unit. Then, remove the burner cover.



2. Use a Phillips-head screwdriver to remove the screw securing the square access door closed. Then, swing the door down.



3. Inspect the flame sensor for dirt or damage. Use a soft, damp rag or cotton swab to clean the sensor.



### **⚠ CAUTION**

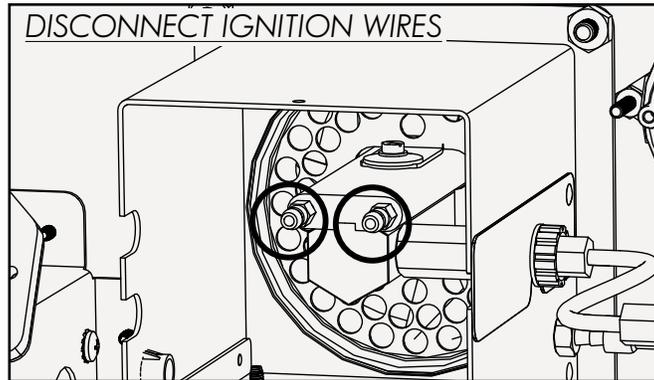
**If the flame sensor shows signs of damage, troubleshoot the unit to determine and correct the cause and replace the flame sensor before resuming operation of the unit.**

**Contact SunFire technical service for assistance.**

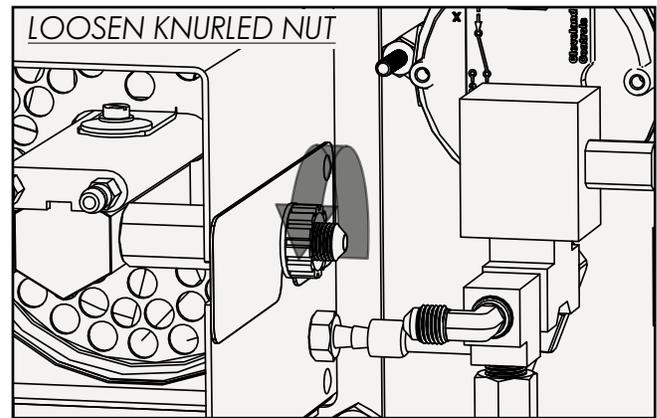
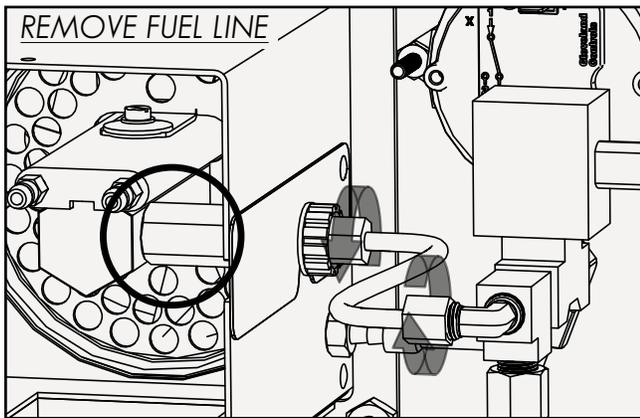
## Maintenance & Service:

### TO SERVICE THE BURNER ASSEMBLY (CONT.):

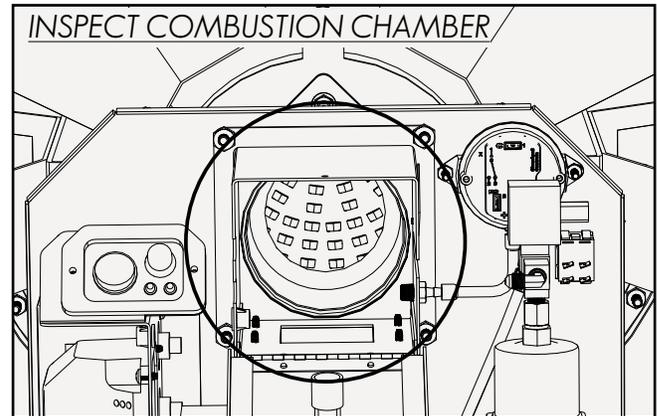
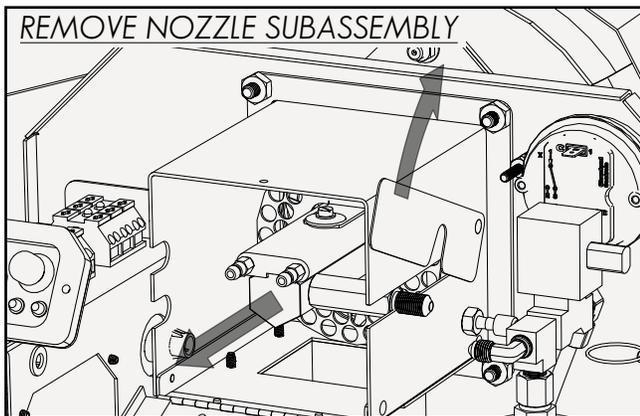
- Grab and pull the end of the ignition wires (not shown) to disconnect them from the electrode terminals.



- Use a  $9/16$ " wrench to avoid rotation of the bulkhead fitting of the nozzle subassembly inside the burner box (circled area) and use a  $7/16$ " wrench to remove the fuel line (outside the box). Then, loosen the knurled nut securing the nozzle subassembly to the burner housing.



- Lift the side-retaining plate to rotate it on its hinge. Then, lift the rear of the nozzle subassembly and pull to remove the nozzle subassembly from the burner assembly. With the nozzle subassembly removed, use an inspection mirror to visually inspect the interior of the combustion chamber for signs of fuel buildup or missing portions of the insulation lining.



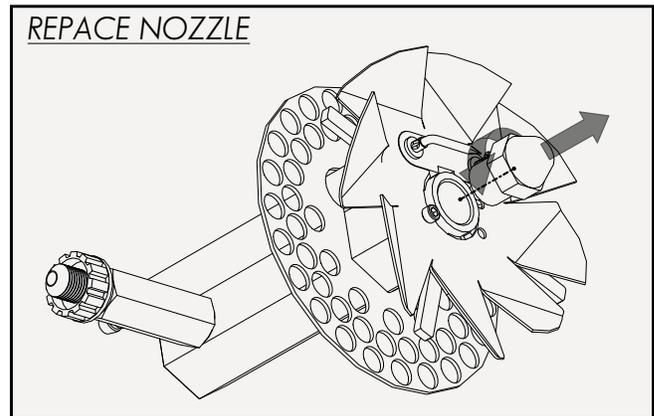
**Some visible cracks in the insulation material are normal. If portions of the insulation are broken or missing, replace the insulation before resuming operation of the unit. Contact SunFire technical service for assistance.**

## BURNER SERVICE (CONT.):

### TO SERVICE THE BURNER ASSEMBLY (CONT.):

- Using a 5/8" wrench, remove the nozzle and replace it with a new SunFire-OEM nozzle. Take care not to damage or disturb the igniter electrodes or metal spinner fins during this process. With the new nozzle in place, ensure that the electrode tips are aligned with the face of the nozzle. Use a slotted screwdriver or 1/4" driver to adjust the screw on the top of the electrode assembly to reposition the electrode, if necessary. Use a soft, damp rag to wipe any carbon buildup from the spinner and electrode.

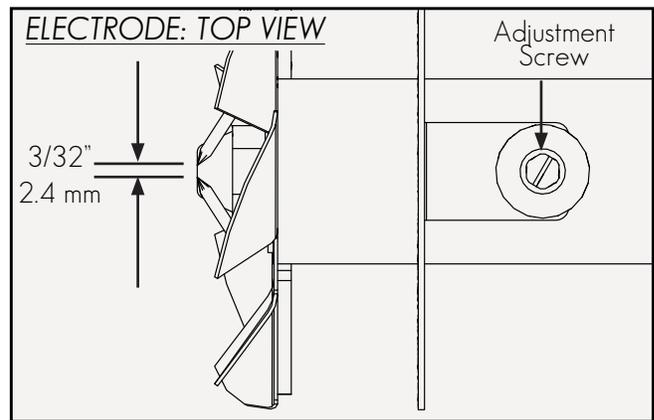
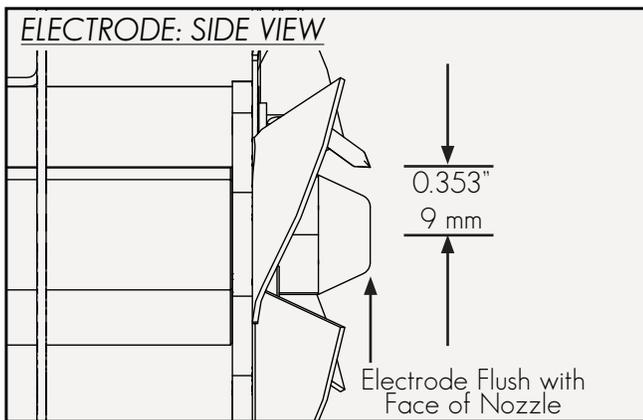
**If the electrode shows signs of damage or wear, replace the electrode assembly before resuming operation of the unit.**



### **⚠ WARNING**

**Only use authentic SunFire parts. Inspect the nozzle adapter before replacing the nozzle. If the threads have been damaged or show score marks, replace the entire nozzle-line assembly. Contact your local SunFire dealer or SunFire technical service for assistance.**

Confirm that the electrode tines are positioned properly before returning the nozzle subassembly to the burner.



**When inspection and service of the burner components has been completed, reverse the disassembly process and return all assemblies to their factory position before resuming normal operation.**

**NOTICE** Use care when tightening the oil line fitting to oil tube extension. Tighten securely, but do not crossthread or overtighten.

### GENERAL MAINTENANCE:

Inspect the heater for damage and wear before each use. **Do not attempt to operate a damaged heater.** To make inspection easier, regularly use a soft, damp rag to clean the heater.

Seasonally, or after heavy use or transit, inspect the fasteners and connections, especially around the dome face and fuel hoses, and tighten any fasteners, hoses, or wires that may have loosened.

## Maintenance & Service:

### FLAME ADJUSTMENT:

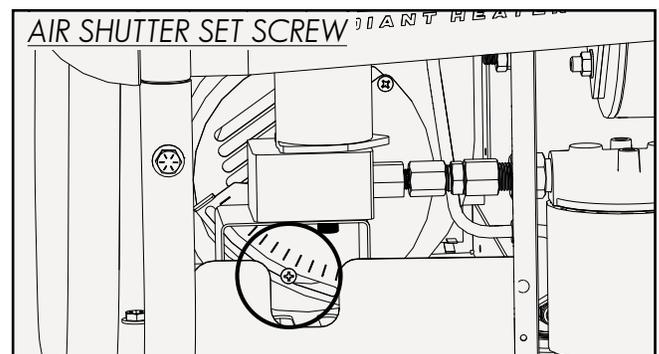
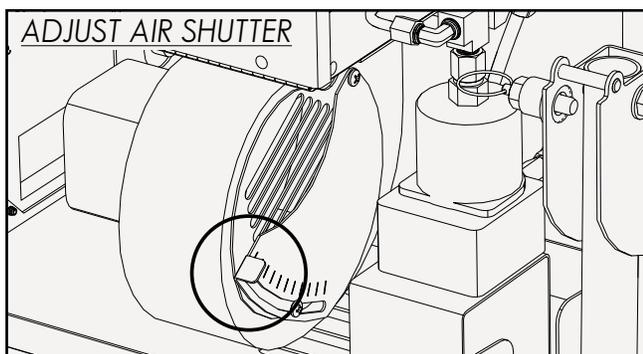
Due to variations in nozzle tolerances, fuel quality, and geographical location, adjustments may be required periodically to maintain optimal operational conditions.

#### **▲ DANGER**

**During this procedure, dangerous electrical voltage will be present at the wiring connections. Only qualified technicians should perform this procedure. Use proper safety equipment and practices. Only interact with the air shutter and set screw during this procedure. Securely reattach the burner cover before resuming normal operation.**

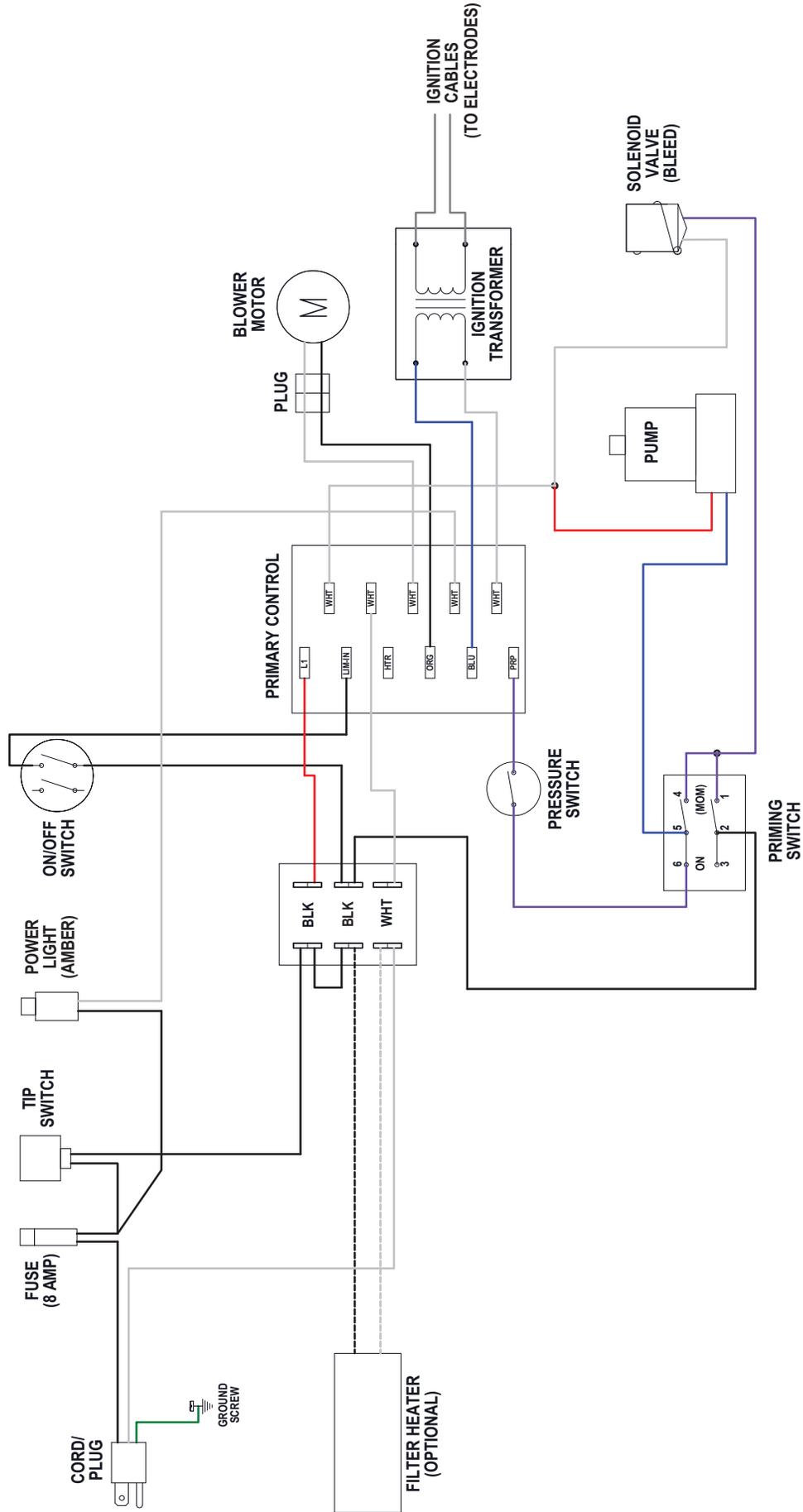
#### TO ADJUST THE FLAME:

1. With the heater off, remove the burner cover and locate the air shutter and set screw on the side of the burner-blower housing. If adjustment of the air shutter is needed, use a Phillips-head screwdriver to loosen the set screw and rotate the shutter open or closed. Re-tighten the set screw to secure the air shutter in its newly-adjusted position.
2. Start the unit and carefully watch the unit as it starts up. A small amount of white smoke at ignition is normal, but the smoke should not last more than a few seconds and should not be black. If the unit will not establish a flame, or the flame is very poor, set the air shutter to 50%-open and reattempt to start the unit. If the unit still will not establish a flame, it may require service. Refer to the Troubleshooting section in this manual or contact SunFire for assistance.
3. When the heater has established a flame, slowly close the air shutter until the flames approach and just begin to escape the dome face, then slowly open the air shutter until no flame or smoke is emitted from the dome face. Allow the unit to run for 5 minutes, to warm up.
4. If the air shutter is set to 90% open or closed and will not bring the flame into adjustment (especially after changing the nozzle), the fuel pump may need to be adjusted. To adjust the fuel pump, set the air shutter to 50% open. Then, use a slotted screwdriver (hex key on some models) to slowly adjust the pump-flow-rate screw (near the pump intake) until the flame is adjusted. If the flame is smoky, slowly adjust the pump screw counter-clockwise to reduce fuel flow. If the flame is weak, slowly adjust the pump screw clockwise to increase fuel flow. Only minor pump adjustments of ~1/4-turn or less should be required.
5. Once the heater is warm, repeat the air shutter adjustment by decreasing the opening until flames can just be seen coming through the dome face of the heater, then increase the opening until no flames or smoke are coming through the face. Replace the burner cover before resuming normal operation.
6. Inspect the flame again when the heater is starting from completely cool to ensure that it is well adjusted.

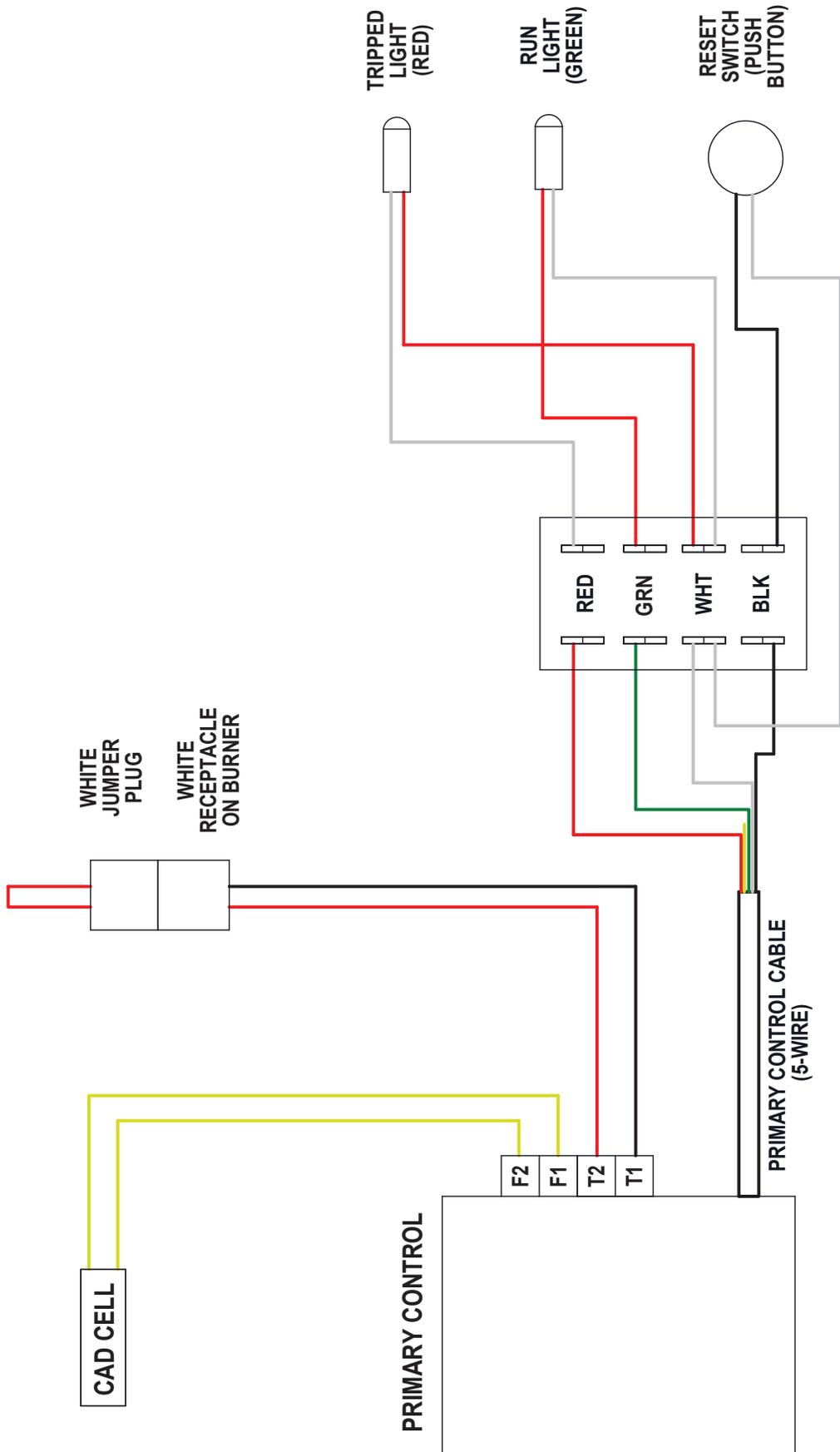


**Whenever operating conditions change substantially (i.e.: temperature, altitude, fuel mixture), check the flame and adjust it if needed.**

# WIRING DIAGRAM (HIGH VOLTAGE):



**WIRING DIAGRAM (LOW VOLTAGE):**



## Troubleshooting:

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Will not start.	Main electrical power circuit breaker tripped or blown light bulb or fuse (AMBER light off)	Reset breaker or replace fuse If power is present but AMBER light is off, replace bulb
	Primary control safety tripped (RED light illuminated)/primary control defective	Reset/test components, replace if needed
	Flame sensor is sensing light (GREEN light on)/flame sensor defective	Point the dome face away from any bright light sources. If problem persists, contact SunFire or your local dealer.
	Thermostat circuit is OPEN	Be sure the thermostat jumper is securely connected. If using a thermostatic control, be sure it is connected properly and set to call for heat.
	Tip switch contacts are open	If plugged in and AMBER light is on. It may be a tip switch issue. Make sure SunFire unit is level. If level, tip switch may be defective.
2. Attempts to fire but does not establish a flame	Unit is not primed	Use the PRIME switch to fill the fuel system.
	Clogged nozzle	Replace nozzle
	Dirty fuel filter	Change the fuel filter.
	Air bubble in fuel line	Use the PRIME switch to clear the fuel system of air.
	Suction Leak	Tighten all fuel-pickup pipe fittings and make sure the fuel filter is tightened snugly to the filter head.
	Ignition system defective	Replace defective component.
3. Fires and then persistently fails within 30 seconds	Flame sensor is dirty/defective	Clean flame sensor with a soft, damp cloth. Replace if defective.
4. Fires and then persistently fails after 30 seconds	Dirty fuel filter	Change the fuel filter.
	Clogged nozzle	Replace nozzle
	Contaminated fuel supply	Drain tank from plug, clean and fill with clean fuel.
	Improper power supply	Check power supply. If using a generator, run generator for 20 minutes and retry. If using an inverter, try a clean power supply. Try different power supply.
5. Black smoke or whisking flames protrude through holes in dome face	Nozzle is dirty or clogged	Replace nozzle
	Flame needs adjustment	See Flame Adjustment section
6. Small flame/low heat output	Flame needs adjustment	See Flame Adjustment section
	Dirty fuel filter	Change the fuel filter.
	Clogged nozzle	Replace nozzle
	Fuel pump defective	Contact SunFire or your local dealer.

If your issue was not described here, or for further assistance, please contact your local AUTHORIZED SUNFIRE DEALER or find more information at [sunfireheater.com/support](http://sunfireheater.com/support) where you can access the latest support information and manuals. Or call the manufacturer directly at (855) 251-1649.

## Warranty & Legal Information:

### WARRANTY INFORMATION

Rock Energy Systems, LLC (SUNFIRE) warrants that its Heaters and component parts will be free from defects in material and workmanship for a period of 12 months from date of purchase when properly assembled, operated, and maintained in accordance with the assembly 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, SUNFIRE at its option, may repair the defective part or equipment or replace the equipment or relevant parts. Proof of purchase and warranty qualification must be established at time of all claims.

**BILL OF SALE:** A copy of the bill of sale must be provided at time of return.

**CLAIM PROCEDURE:** Contact manufacturer at (855) 251-1649 or an AUTHORIZED SUNFIRE DEALER for all technical support and claims. You may also visit [sunfireheaters.com/warranty](http://sunfireheaters.com/warranty).

This limited warranty does not apply to heater, component or replacement part damage resulting from incorrect assembly, 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 SUNFIRE 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. SUNFIRE 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 SUNFIRE in connection with the equipment, including for claims based on negligence or strict liability, is limited to the purchase price.

### PRODUCT REGISTRATION

Help us serve you better by registering your heater.  
Receive product updates, future specials, and offers.

RAPID REGISTRATION QR CODE



[sunfireheaters.com/register-heater](http://sunfireheaters.com/register-heater)

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