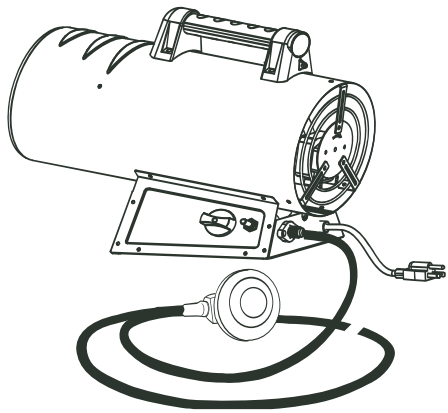
NORTHSKY

Instruction Manual

Propane Forced Air Heater

H3-1001 **H3-1002** **H3-1003**



ANSI Z83.7 2011 / CSA 2.14-2011

VARIABLE:

H3-1001: 50,000-85,000 BTU/HR
H3-1002: 75,000-125,000 BTU/HR
H3-1003: 40,000-60,000 BTU/HR

SCAN ME

NorthSky Supply Inc.
Mfd for NorthSky Supply Inc. The Woodlands, TX 77380 www.northskysupply.com

IMPORTANT: Read and understand this manual before assembling, starting or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

⚠ GENERAL HAZARD WARNING:

-Failure to comply with the precaution and instructions provided with this heater, 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.
-Only persons who can understand and follow the instructions should use or service this heater.
-Do nol slore or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
-Service must be performed by a qualified service agency.
-This is an unvented portable heater. It uses air(oxygen)from the area in which it is used. Adequate combustion and ventilation air must be provided.

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For More Information, visit www.northskysupply.com

SAFETY INFORMATION

⚠ **WARNING:** This product contains and/ or generates chemicals known to the state of California to cause cancer or birth defects or other reproductive harm.

⚠ **WARNING:** Fire, burn, inhalation and explosion hazard. Keep solid combustibles, such as building materials, paper or cardboard, a safe distance away from the heater as recommended by the instructions. Never use the heater in spaces which do or may contain volatile or airborne combustibles or products such as gasoline, solvents, paint thinner, dust particles or unknown chemicals.

⚠ **WARNING:** Not for home or recreational vehicle use.

The heater is designed for use as a construc tion heater in accordance with ANSI Z83.7/ CGA2.14. Other standards govern the use of fuel gases and heating products for specific uses your local authority can advise you about these. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration or repair. Properly used, the heater provides safe economical heating. Products of combustion are vented into the area being heated.
We cannot foresee every use which may be made of our heaters. Check with your local fire safety authority if you have questions about heater use.

Propane Gas: Propane gas is odorless. An odor-making agent is added to propane gas. The odor helps you detect a propane gas leak. However, the odor added to propane gas can fade. Propane gas may be present even though no odor exists.
Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu with headache, dizziness and /or nausea. If you have these signs, the heater may not be working properly. Get fresh air at once. Check for proper ventilation and have the heater serviced.

1. Install and use heater with care. Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the standard for storage and Handling of Liquefied petroleum Gas, ANSI/NFPA 58 and the propane Gas Installation Code, CAN/CGAB149.2. This instructs on the safe storage and handling of propane gases.
2. Use only the electrical voltage and frequency specified on the model plate. The electrical connections and grounding of the heater shall follow the National Electric Code, ANSI/NFPA 70 or the Canadian Electrical Code, Part 1.
3. Electrical Grounding Instructions-This appliance is equipped with a three-prong (grounding)plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle or extension cord.
4. Use only the hose and factory preset regulator provided with the heater.
5. Use only propane gas set up for vapor withdrawal.
6. Provide adequate ventilation. Before using heater, provide at least a three square foot opening of fresh, outside air for each 100,000 Btu/Hr (105,500KJ/Hr) of rating.

7. For well-ventilated indoor use or outdoor use.
8. Do not use the heater in a basement or below ground level. Propane gas is heavier than air. If a leak occurs, propane gas will sink to the lowest possible level.
9. Keep the appliance area clear and free from combustible materials, gasoline, paint thinner, and other flammable vapors and liquids.
10. Do not use the heater in areas with high dust content, Dust is combustible.
11. Minimum heater clearances from combustible materials:
outlet 8 Ft.(2.4 m),sides:2 Ft.(0.6 m), TOP:6 Ft.(1.8 m),Rear:2 Ft.(0.6 m)
12. Keep heater at least six feet from propane tank(s). Do not point heater at propane tank(s) within 20 feet (6.1 m).
13. Check hose before each use of heater. If highly worn or cut, replace with hose specified by manufacturer before using heater.
14. Ensure heater is on a stable and level surface before operating.
15. To prevent injury, wear gloves when handling heater.
16. Never attach duct work to heater.
17. Do not alter heater. Keep heater in its original state.
18. Never move, handle or service the heater before it is plugged out from the socket and cool down thoroughly.
Otherwise, electric shock hazards, burning hazards might occur.
19.Keep children and animals away from the heater.
20.Keep heater away from strong drafts, water spray, rain or dripping water.
21.Do not leave the heater unattended.
22.Never block the air outlet(rear) or the air outlet(front)on the heater.

PRODUCT IDENTIFICATION

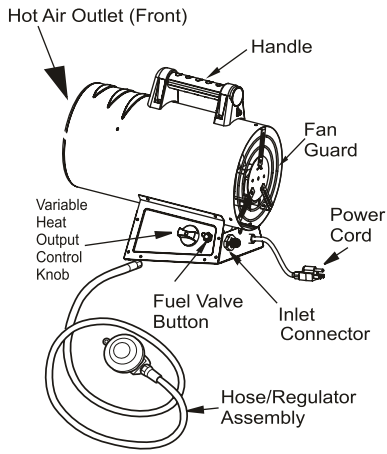


Figure 1 - Variable 75-125,000 Btu/Hr (Heater may vary from illustration)

UNPACKING

1. Remove all packing items applied to heater for shipment. Keep plastic cover caps (attached to inlet connector and hose/regulator assembly) for storage.
2. Remove all items from carton.
3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

THEORY OF OPERATION

The Fuel System: The hose/regulator assembly attaches to the propane gas supply. The propane gas moves through the automatic control valve and out the nozzle.

The Ignition System: The spark transformer and spark plug lights the main burner
The Safety Control System: This system causes the heater to shut down if the flame goes out.

Note: Some parts are located differently on some models.

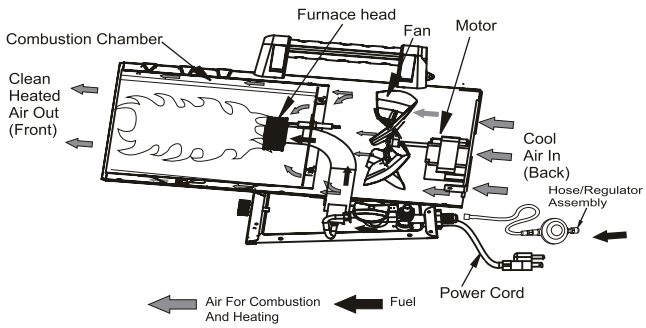


Figure 2 - Cross Section Operational View (Heater may vary from illustration)

PROPANE SUPPLY

The amount of propane gas ready for use from propane tanks varies. Two factors decide this amount:
1. The amount of propane gas in tank(s)
2. The temperature of tank(s)
The chart below shows the number of 100 lb (45 kg) tanks needed to run this heater.

Temperature at tank location	Number of tanks Models 55K/60K	85K	125K/150K
above 20° F (-7° C)	1	1	2
20° F (-7° C) to -0 (-18° C)	1	2	3
below -0° F (-18° C)	2	2	(Use larger tank)

Smaller tanks can be used for limited run times but it is recommended to use larger tanks for optimum performance.

INSTALLATION

⚠ **WARNING:** Review and understand the warnings in the Safety Information section, page2. Thev are needed to safely operate this heater. Follow all local codes when using this heater.

⚠ **WARNING:** Test all gas piping and connections for leaks after installing or servicing. Never use an open flame to check for a leak.
Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once

INSTALLATION

Continued

1.Provide propane supply system (see Propane Supply, page 4).
2.Connect fuel gas connector fitting on hose/regulator assembly to propane tank(s). Turn counterclockwise into threads on tank valve. Tighten firmly using wrench. IMPORTANT: Tighten regulator with vent pointing down.
Pointing vent down protects regulator from weather damage.
3.Connect hose to inlet connector. Tighten firmly using a wrench. IMPORTANT: Extra hose or piping may be used if needed. Install extra hose or piping between hose/regulator assembly and propane tank. You must use the regulator supplied with heater.

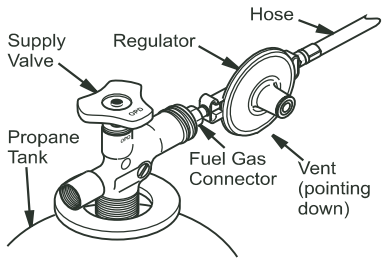


Figure 3 - Regulator With Vent Pointing DOWN

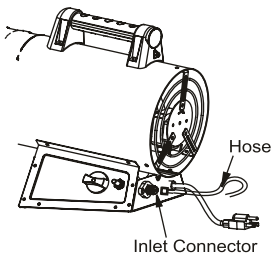


Figure 4-Hose and Inlet Connector (Heater may vary from illustration)

VENTILATION

⚠ **WARNING:** Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide a fresh air opening of at least three square feet for each 100,000 Btu/Hr (105,500KJ/Hr) rating. Provide extra fresh air if more heaters are being used.

OPERATION

⚠ **WARNING:** Review and understand the warnings in the Safety Information section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

TO START HEATER

1. Follow all installation, ventilation and safety information.
2. Place heater on stable and level surface. Make sure strong drafts do not blow into front or rear of heater.
3.Plug power cord of heater into a three-prong, grounded extension cord. Extension cord must be at least six feet (1.83 m) long UL/CSA listed and of a proper size.
Extension Cord Size Requirement
Up to 100 feet (30.5 m) long, use 16 AWG rated cord.
101 to 200 feet (30.78 to 61 m) long, use 14 AWG rated cord.
4.Plug extension cord into a 120 volt/60 hertz, three-hole, grounded outlet. Motor will start. Fan will turn, forcing air out front of heater.

OPERATION

Continued

5. Press the control valve button to light the heater. After the heater ignites, keep holding the control valve button for about 20 more seconds and then release. The automatic control system is activated.

TO STOP HEATER

1. Tightly close propane supply valve on propane tank(s).
2. Wait a few seconds. Heater will burn gas left in supply hoses.
3. Unplug heater.

STORAGE

⚠ **CAUTION:** Disconnect heater from propane supply tank(s).

1. Store propane tank(s) in safe manner. see chapter 5 of standard for storage and Handling of Liquefied petroleum Gases, ANSI/NFPA 58 and the propane Installation code CAN/CGA B149.2 ·Follow all local codes. Always store propane tanks outdoors.
2. Place plastic cover caps over brass fittings on inlet connector and hose/regulator assembly.
3. Store in dry, clean and safe place. Do not store hose/regulator assembly inside heater combustion chamber.

MAINTENANCE

⚠ **WARNINGS:**

- Never service heater while it is plugged in, connected to propane supply, operating or hot. severe burns and electrical shock can occur.
- Keep heater clear and free from combustible materials, gasoline and other flammable vapor sand liquids.
- Do not block the flow of combustion or ventilation air.

1. Keep heater clean. Clean heater annually or as needed to remove dust and debris. If heater is dirty or dusty, clean heater with a damp cloth. **Use gentle household cleaner on difficult spots.**
2. Inspect heater before each use. check connections for leaks. Apply mixture of liquid soap and water to connections. Bubbles forming show a leak. correct all leak s at once.
3. Inspect hose/regulator assembly before each use. If hose is highly worn or cut, replace with hose specified by manufacturer.
4. Have heater inspected yearly by a qualified service agency.

TROUBLESHOOTING

⚠ **WARNING:** Never service heater while it is plugged in, connected to propane supply, operating or hot. Severe burns and electrical shock can occur.

OBSERVED PROBLEM	POSSIBLE CAUSE	REMEDY
Fan does not turn when heater is plugged in	1. No electrical power to heater 2. Fan hitting inside of heater shell	1. Check voltage to electrical outlet. If voltage is good check heater power cord for breaks 2. Adjust motor/fan mount to keep fan from hitting inside of heater shell. Bend fan mount if necessary
Heater will not ignite	1. Propane cylinder valve is not on. 2. Empty propane cylinder/ Cylinder frosted at its bottom. 3. The igniter does not spark. 4. Defective regulator, The Propane wont flow when fuel Valve button depressed. 5. Overheat protection is activated. 6.The concentration of propane inside the hose is too low.	1. Turn on the propane cylinder valve on slowly. 2. Change for a full cylinder 3. Check if the igniter cable is loose, if yes, replug it onto the main board. Check if the gap between the igniter electrode and target plate is correct (0.17) 4.Replace with new regulator. 5.Wait 5 minutes before restarting the heater. 6.Press the control valve button for about 20 seconds to flush out the unburned propane. The automatic control system is then activated.
Heater shuts down while running	1.Propane supply may be inadequate 2.High surrounding air temperature causing thermal limit device to shut down heater 3.Restricted air flow	1. A) Refill tank B) Provide additional and/or larger tanks. see propane supply, page 4 2.This can happen when running heater in temperatures above 85 ℉ (29 ℃).Run heater in cooler temperatures 3.Check heater inlet and outlet. Remove any obstructions

⚠ **WARNING:** Use only in areas free of high dust content.

SERVICE PROCEDURES

⚠ WARNING: Never service heater while it is plugged in, connected to propane supply, operating or hot. Severe burns and electrical shock can occur.

MOTOR

1. With heater on its side,remove access panel.
2.Access ground screw through underside of heater base.Remove ground screw. Disconnect the green motor wire and the green power cord wire from underside of shell (see Figure 5).
3.Remove two black wires from motor to terminal board.
4.Carefully push motor wires through hole in bottom of shell.
5.Remove screws holding motor mount to shell.Use nut-driver (see Figure 5).
6.Carefully pull motor and fan out of shell. IMPORTANT:Be careful not to damage fan.Do not set motor and fan down with the weight resting on fan.This could dam age fan pitch.
7.Use hex wrench to loosen setscrew which holds fan to motor shaft.
8.Remove fan.Be careful not to damage the fan blade pitch.
9.Use nut driver to remove two nuts that attach motor to motor mount.
10. Discard old motor.
11..Attach motor to motor mount with two nuts.Tighten nuts firmly.
12. Replace fan on motor shaft. Make sure set screw contacts flat surface on motor shaft.
13.Tighten set screw firmly(40-50 inch-pounds [46.08-57.60 kilogram-centimeters]).
14. Carefully route motor wires through hole guard into rear of heater shell,as shown in Figure 5 in shell.Place motor,motor mount and fan.

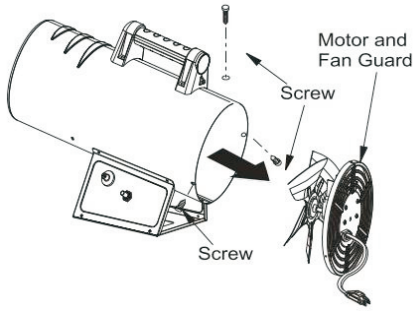


Figure 5-Removing Motor and Fan Guard from Heater (Heater may vary from illustration)

FAN

1.Remove motor,motor mount and fan(see Motor,steps 1 through 8).
2.Clean fan using soft cloth moistened with kerosene or solvent.
3.Dry fan thoroughly.
4.Replace fan on motor shaft.Make sure setscrew is touching back of flat surface on motor shaft (see Figure 6).

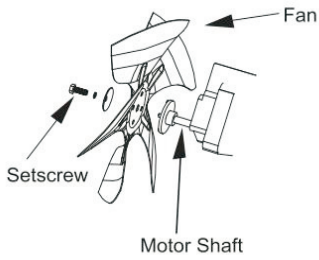


Figure 6 - Fan, Motor Shaft and Setscrew Location

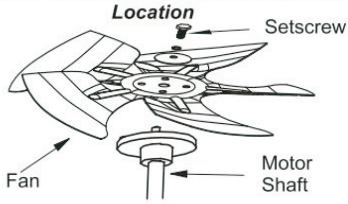


Figure 7 - Fan Cross Section

SPECIFICATIONS

All Models

- Electrical Input: 115V,60 Hz,1Φ,2a
  Direct Spark Ignition
- Primary Flame Control:
  Thermocouple operated gas valve
- Minimum Ambient Temp. Rating:
  0°F(-17.8°C)

55,000 Btu/Hr Models

- 30-55,000 Btu/Hr(8.8-16.1 kW)
- Fuel Consumption:
  1.4-2.6 pounds/hr(0.63-1.15 kg/hr)
- Fuel Orifice Port No.:18
- Fuel Orifice Port Size:0.0374"(0.95mm)
- Average Air Temp.Rise:200°F(111°C)
- Propane/LP Gas
- Gas Supply Pressure to Regulator:
  Max-Bottle Pressure,Min-10 psig (68.9 kPa）
- Gas Supply Pressure Regulator Out:
  10psig (68.9 kPa)

60,000 Btu/Hr Models

- 40-60,000 Btu/Hr(11.7-17.5 kW)
- Fuel Consumption:
  1.8-2.7 pounds/hr(0.84 -1.26 kg/hr)
- Fuel Orifice Port No.:18
- Fuel Orifice Port Size:0.0401"(1.02mm)
- Average Air Temp.Rise:200°F(111°C)
- Propane/LP Gas
- Gas Supply Pressure to Regulator:
  Max-Bottle Pressure,Min-10 psig (68.9 kPa)
- Gas Supply Pressure Regulator Out:
  10psig(68.9 kPa)

85,000 Btu/Hr Models

- 50-85,000 Btu/Hr(14.6-25.0 kW)
- Fuel Consumption:
  2.3-3.9 pounds/hr(1.05 -1.78 kg/hr)
- Fuel Orifice Port No.:18
- Fuel Orifice Port Size:0.0476"(1.21 mm
- Average Air Temp. Rise:200°F(111°C)
- Propane/LP Gas
- Gas Supply Pressure to Regulator:
  Max-Bottle Pressure,Min -10 psig (68.9 kPa)
- Gas Supply Pressure Regulator Out:
  10psig(68.9 kPa)

125,000 Btu/Hr Models

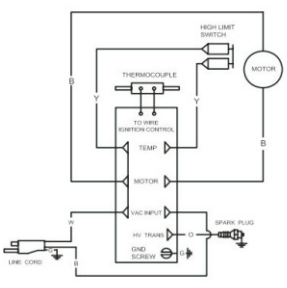
- 75-125,000 Btu/Hr(21.9-36.6 kW)
- Fuel Consumption:
  3.5-5.8 pounds/hr (1.57 -2.62 kg/hr)
- Fuel Orifice Port No.:18
- Fuel Orifice Port Size：0.0488"（1.24mm）
- Average Air Temp,Rise：400℉（232℃）
- Propane/LP Gas
- Gas Supply Pressure to Regulator:
  Max -Bottle Pressure, Min -20 psig (137.8 kPa)
- Gas Supply Pressure Regulator Out:
  20psig(137.8 kPa)

150,000 Btu/Hr Models

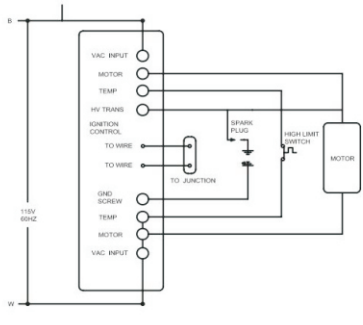
- 85-150,000 Btu/Hr(25-44 kW)
- Fuel Consumption:
  3.9-6.9 pounds/hr (1.78 -3.15 kg/hr)
- Fuel Orifice Port No.:18
- Fuel Orifice Port Size:0.054"(1.38 mm)
- Average Air Temp.Rise:550°F(290°C
- Propane/LP Gas
  Gas Supply Pressure to Regulator:
- Max-Bottle Pressure,Min-20 psig (137.8 kPa)
  Gas Supply Pressure Regulator Out:
  20psig(137.8 kPa)

WIRING DIAGRAM

CONNECTION DIAGRAM



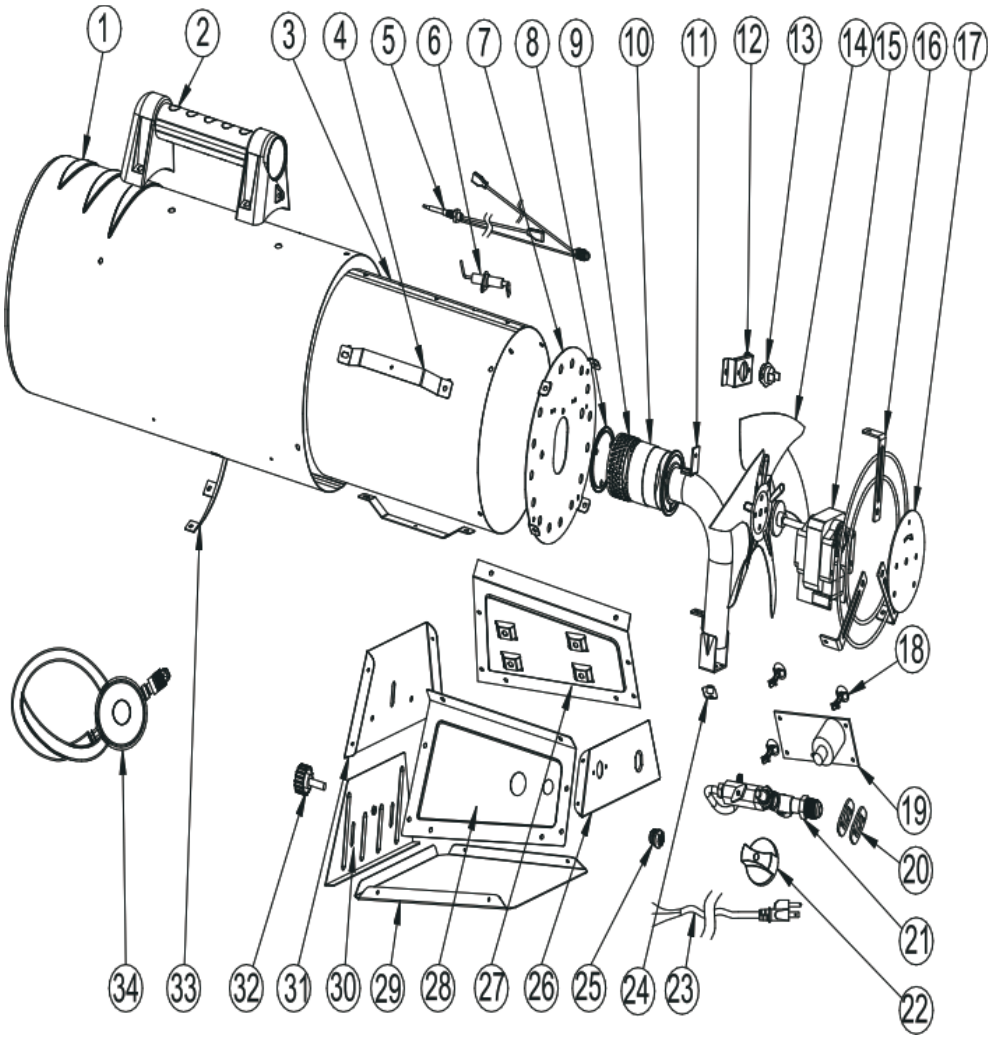
SCHEMATIC DIAGRAM



· If any original wiring as supplied with the heater must be replace,it must be replaced with type AWG 105℃ wire or its equivalent except as indicated ('Type SF2-200."SGI-250℃)

ILLUSTRATED PARTS BREAKDOWN

MODELS: H3-1001 H3-1002 H3-1003



PARTS LIST

This list contains replaceable parts used in your heater.When ordering parts,follow the instructions listed under Replacement Parts on page 11 of this manual.

MODELS: H3-1001 H3-1002 H3-1003

No.	Description	Qty.
1	Outer Casing	1
2	Handle	1
3	Inner Shell	1
4	Insulation Shell Support	4
5	Thermocouple	1
6	Ignition Needle	1
7	Burner Disc	1
8	Before Burning Baffle	1
9	Burner Outside Network	1
10	Burner Inner Network	2
11	Air Inlet Pipe Assembly	1
12	Safety Thermostat Bracket	1
13	Reset Thermostat	1

No.	Description	Qty.
14	Fan	1
15	Motor	1
16	Air Inlet Grill	1
17	Fixing Plate	1
18	PCB Isolation Column	3
19	Power PCB	1
20	Fixing Plate For Gas Inlet Connector Nut	2
21	Control Valve Assembly	1
22	Knob	1
23	Cord Power Supply	1
24	Nozzle Stents	1
25	Cable Fastener	1
26	Back Plate	1

No.	Description	Qty.
27	Left Plate	1
28	Right Plate	1
29	Lower Plate	1
30	Height Controller	1
31	Front Plate	1
32	Pinching Screw	1
33	Bottom Stop Plate	1
34	Hose/Regulator Assembly	1

**Not a field replaceable part.