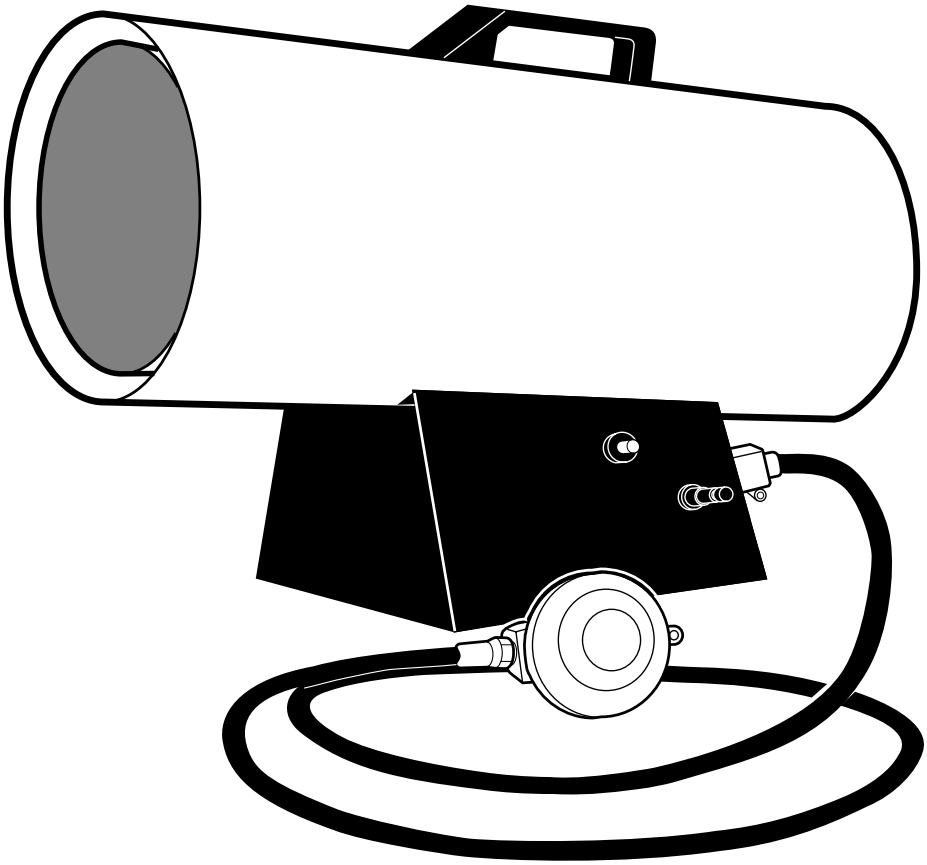
PROPANE CONSTRUCTION HEATER

OWNER'S MANUAL



Model: SH10E

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.

CONTENTS

FOR YOUR SAFETY

Do not use this heater in a space where gasoline or other liquids having flammable vapors are stored or used.

SAFETY INFORMATION

⚠ WARNINGS

IMPORTANT: Read this owner's manual carefully and completely before trying to assemble, operate, or service this heater. Improper use of this heater can cause serious injury or death from burns, fire, explosion, electrical shock, or carbon monoxide poisoning.

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, people with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

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.

Safety Information continues on next page

SAFETY INFORMATION
Continued

⚠ WARNINGS *Continued*

- Not for domestic use (inside living areas). Use heater for space heating only.
- Intended for temporary heating of buildings under construction, alteration, or repair.
- Install and use heater with care. Follow all local ordinances and codes.
- Use only in a well-vented area away from combustible materials.
- Provide proper ventilation. If not, excessive levels of carbon monoxide (CO) and carbon dioxide (CO_2) will form. Provide two fresh, outside air openings for ventilation. One opening should be near the floor, the other opening near the ceiling. Each ventilation opening must be at least 130 cm^2.
- Never use heater where gasoline, paint thinner, or other highly flammable vapors are present. Use only in places free of flammable vapors or high dust content.
- Do not use heater in basements. Propane gas is heavier than air. If a leak occurs, propane gas will sink to the lowest possible level.
- Keep heater away from strong drafts, water spray, rain, or dripping water.
- Check heater for damage before each use. Do not use a damaged heater.
- Use only propane gas, I3P.
- Keep propane tank(s) below 38° C.
- Do not pull or twist gas hose.
- Unhook heater from propane and electrical supply before moving or when not in use.
- Use only the electrical voltage and frequency specified on model plate.
- Use only the hose and regulator provided with the heater.
- Inspect hose before each use. If cut, worn, or damaged, replace before using heater. Use the replacement hose assembly specified in this manual.
- Keep heater at least two meters from propane tank(s). Do not point heater at propane tank(s).
- Minimum heater clearances from combustibles:
  Outlet: 3 meters Sides: 1 meter Top: 2 meters Rear: 1 meter
- Locate heater on stable and level surface if heater is hot or running.
- Keep children and animals away from heater.
- Never block air inlet (rear) or air outlet (front) of heater.
- Never move, handle, or service a hot, operating, or plugged-in heater.
- Do not alter heater. Keep heater in its original state.
- Do not use heater if altered.
- Never attach duct work to front or rear of heater.
- Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries.
- Electrical installer: Follow all national and local codes.

UNPACKING

1. Remove all packing items applied to heater for shipment.
2. Remove all items from carton.
3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

PRODUCT IDENTIFICATION

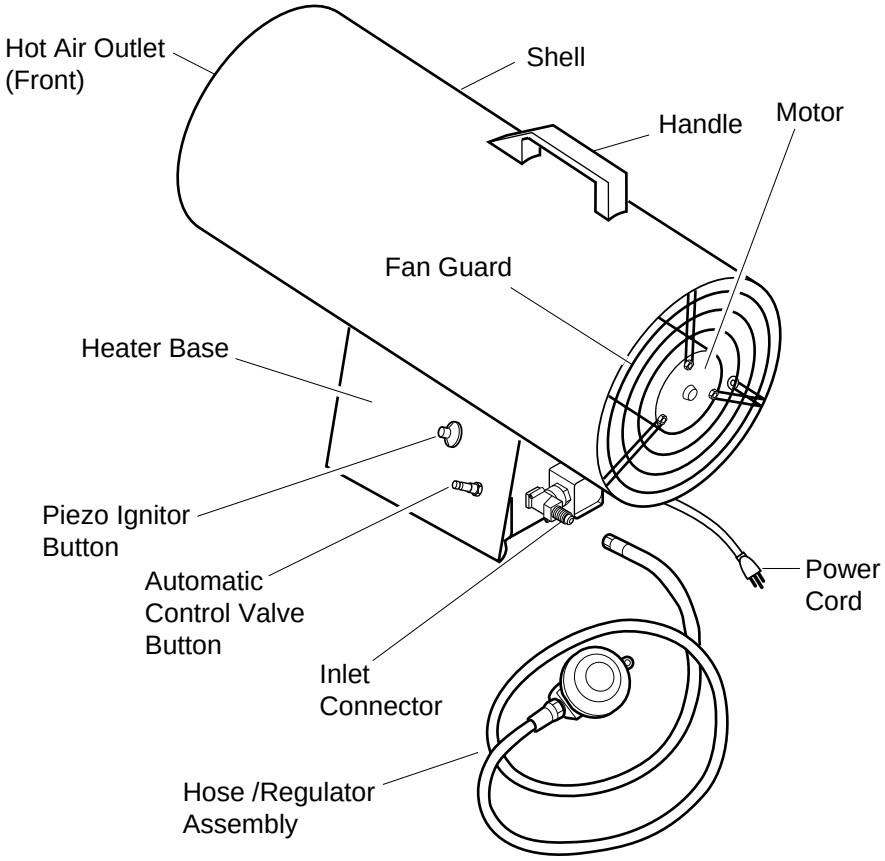


Figure 1 - Model SH10E

THEORY OF OPERATION

The Fuel System: The hose/regulator assembly attaches to the propane gas supply. This provides fuel to the heater.

The Air System: The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

The Ignition System: The piezo ignitor lights the burner.

The Burner Control System: This system causes the heater to shut down if the flame goes out.

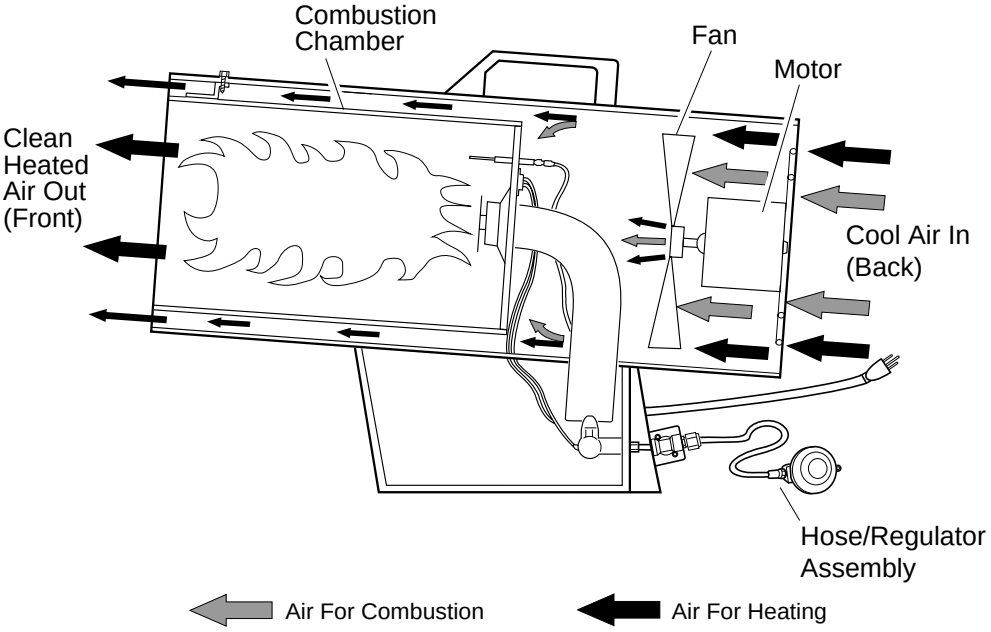


Figure 2 - Cross Section Operational View

PROPANE SUPPLY

User must provide propane gas and propane tank(s).

Use this heater only with a propane vapor withdrawal supply system. 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)

This heater is designed to operate with a minimum 9-kg propane tank. You may need two or more tanks or one larger tank in colder weather. Use a 45-kg tank for longer operation or in very cold weather. Less gas is vaporized at lower temperatures. Your local propane gas dealer will help you select the proper supply system.

Average Temperature (°C) At Tank Location	5°	0°	-7°	-12°	-18°
Number Of Tanks (45-kg)	1	1	1	1	1

INSTALLATION

⚠ WARNING

Review and understand the warnings in the Safety Information Section, pages 2 and 3. They 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 installation 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.

1. Provide propane supply system (see *Propane Supply*, above).
2. Connect fuel gas connector on hose/regulator assembly to propane tank(s). Tighten firmly using wrench. *IMPORTANT:* Position regulator so that hose leaving the regulator is in a horizontal position (see Figure 3). This places the regulator vent in the proper position to protect it from the weather.

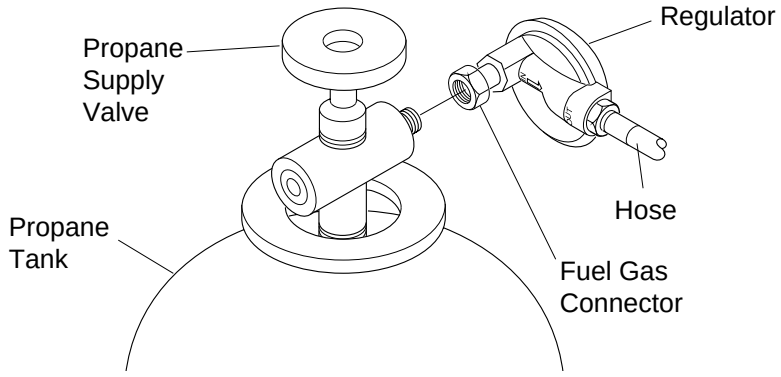


Figure 3 - Regulator Position

Continued

INSTALLATION
Continued

3. Connect hose to inlet connector. Tighten firmly using a wrench.
   IMPORTANT: Use extra hose or piping if needed. Install extra hose or piping between hose/regulator assembly and propane tank. You must use the regulator supplied with heater.

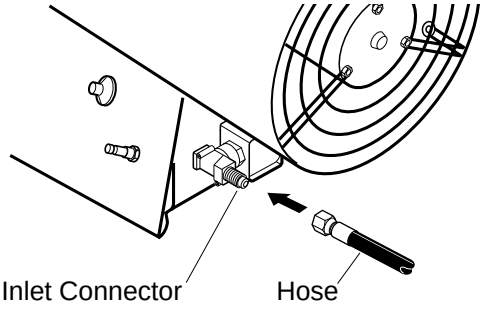


Figure 4 - Hose and Inlet Connector

4. Open propane supply valve on propane tank(s).
5. Check all connections for leaks. Apply mixture of liquid soap and water to gas joints. Bubbles forming show a leak that must be corrected.

⚠ WARNING

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 that must be corrected. Correct all leaks at once.

6. Close propane supply valve.

IF GAS LEAK OCCURS

⚠ WARNING

If you detect a gas leak, turn off propane supply at once. Ventilate the area. Wait until five minutes after propane odor is not present. Follow steps below to check for gas leak.

⚠ WARNING

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.

1. After turning off propane supply and ventilating area, unplug heater power cord.
2. Turn propane supply on.
3. Apply a mixture of liquid soap and water to hose and connections between propane tank(s) and heater inlet. Bubbles forming show a leak.
4. Turn propane supply off and ventilate the area. Repair leak.
5. Wait until five minutes after propane odor is not present before restarting heater.
6. If you cannot repair leak, contact your local service center.

VENTILATION

⚠ WARNING

Provide proper ventilation. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide two fr esh, outside air openings for ventilation. One opening should be near the floor, the other opening near the ceiling. Each ventilation opening must be at least 130 cm². Provide proper fresh, outside air ventilation before running heater.

OPERATION

⚠ WARNING

Review and understand the warnings in the Safety Information section, pages 2 and 3. 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. Locate heater on stable and level surface. Make sure strong drafts do not blow into front or rear of heater.
3. Plug heater power cord into electrical source. Motor will start. Fan will turn, forcing air out front of heater. Electric gas valve will open.
4. Open propane supply valve on propane tank(s).

⚠ WARNING

Be sure motor and fan are running before pushing in automatic control valve button.

5. Push in and hold automatic control valve button (see Figure 5). Push piezo ignitor button (see Figure 5). You may need to push piezo ignitor button 3-8 times until the burner lights. When burner lights, keep automatic control valve button pushed in for 30 seconds.

   Note: If heater fails to ignite, hose may have air in it. If so, keep automatic control valve button pressed and wait 20 seconds. Release automatic control valve button and wait 20 seconds for unburned fuel to exit heater. Repeat step 5.

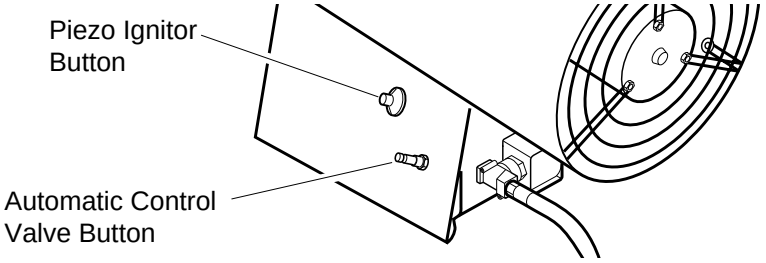


Figure 5 - Automatic Control Valve Button and Piezo Ignitor Button

Visually check combustion in heater. Be sure the flame is blue in color. Flames must not extend beyond the heater outlet.

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 hose.
3. Unplug heater.

To Restart Heater

1. Wait five minutes after stopping heater.
2. Repeat steps under *To Start Heater*, above.

To Change Propane Tank(s)

Change propane tank(s) in a flame-free area. Use only propane gas, I3P.

1. Tightly close the propane supply valve(s) on the propane tank(s).
2. Disconnect the hose/regulator assembly from the propane tank(s).
3. Connect the hose/regulator assembly to the new propane tank(s). Tighten firmly.
4. Check all connections for leaks.

⚠ WARNING

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.

STORAGE

⚠ CAUTION

Disconnect heater from propane supply tank(s).

1. Store propane tank(s) in safe manner. Follow all local codes. Always store propane tanks outdoors.
2. Store in dry, clean, and safe place. Do not store hose/regulator assembly inside heater combustion chamber.
3. When taking heater out of storage, always check inside of heater. Insects and small animals may place foreign objects in heater. Keep inside of heater free from combustible and foreign objects. Remove motor and other internal parts if needed to remove foreign objects (see *Service Procedures*, page 10).

MAINTENANCE

⚠ WARNING

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

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.
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 leaks at once.
3. Inspect hose/regulator assembly before each use. If hose is highly worn or cut, replace.
4. Have heater inspected yearly by service person.
5. Keep inside of heater free from combustible and foreign objects. Remove motor and other internal parts if needed to clean inside of heater (see *Service Procedures*, page 10).
6. Clean fan every 500 hours of operation or as needed.

WIRING DIAGRAM

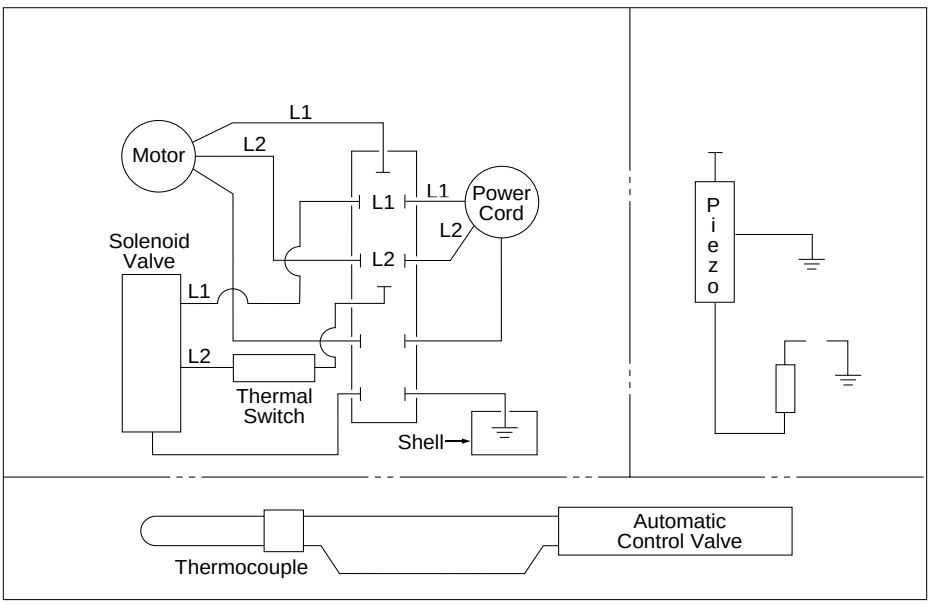


Figure 6 - Wiring Diagram

TROUBLE-SHOOTING

⚠ WARNING

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

OBSERVED FAULT	POSSIBLE CAUSE	REMEDY
Fan does not turn when heater is plugged in.	No electrical power to heater	Check current to electrical outlet. If current is good, check heater power cord for breaks.
	Fan hitting inside of heater shell	Adjust motor/fan guard to keep fan from hitting inside of heater shell. Bend fan guard if necessary.
	Heater electrical wiring improperly connected	Relocate wires using wiring diagram.
	Fan blades bent	Replace fan. See *Motor and Fan,* page 10.
	Defective motor	Replace motor. See *Motor and Fan,* page 10.
Heater will not ignite.	User did not follow installation or operation instructions properly	Repeat installation and operation instructions. See *Installation,* page 5 and *Operation,* page 7.
	No spark at ignitor. To test for spark, follow step 8 under *Ignitor,* page 11. If you see spark at ignitor, have heater serviced by qualified service person. If no spark seen: A) Loose or disconnected ignitor wire B) Wrong spark gap C) Piezo ignitor loose D) Bad ignitor electrode	A) Check ignitor wire. Tighten or reattach loose ignitor wire. See Figure 11, page 11 for ignitor wire location. B) Set gap between ignitor electrode and target plate to 4.3 mm. C) Tighten nut holding piezo ignitor to base of heater. D) Replace ignitor electrode. See *Ignitor,* page 11.
Heater shuts down while running.	High surrounding air temperature causing thermal limit device to shut down heater.	This can happen when running heater in temperatures above 29° C. Run heater in cooler temperatures.
	Restricted air flow	Check heater inlet and outlet. Remove any obstructions.
	Damaged fan	Replace fan. See *Motor and Fan,* page 11.
		⚠ WARNING **Use only in areas free of high dust content.**
	Excessive dust or debris in surrounding area	Clean heater. See *Maintenance,* page 8.

SERVICE PROCEDURES

Motor and Fan

1. Remove three screws that attach fan guard to heater shell.
2. Remove motor and fan guard from heater shell (see Figure 7).
3. Use pliers to remove the fan nut from front of motor shaft (see Figure 8).
4. Remove fan. Be careful not to damage fan blade pitch.
5. Remove three nuts that attach fan guard to motor using nut-driver. Remove fan guard from motor (see Figure 9).
6. Discard old motor.
7. Attach fan guard to new motor with three nuts (see Figure 9). Tighten nuts firmly.
8. Place fan onto motor shaft of new motor. *IMPORTANT:* When placing fan onto motor shaft, make sure part number stamped on fan is facing motor. Attach fan nut to end of motor shaft. Tighten fan nut firmly.
9. Place motor and fan guard into rear of heater shell (see Figure 10).
10. Insert three screws through heater shell and into fan guard. Tighten screws firmly.

⚠ WARNING

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

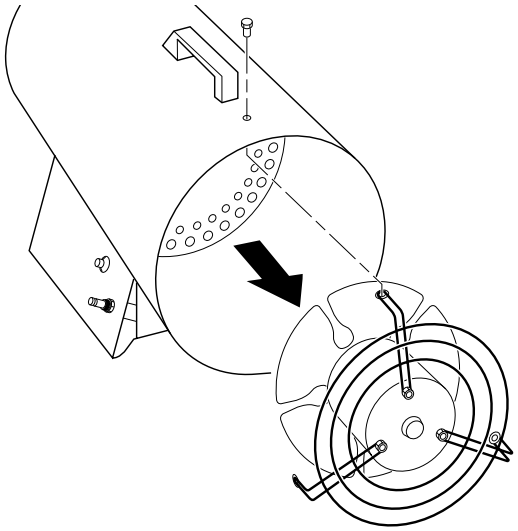


Figure 7 - Removing Motor and Fan Guard from Heater

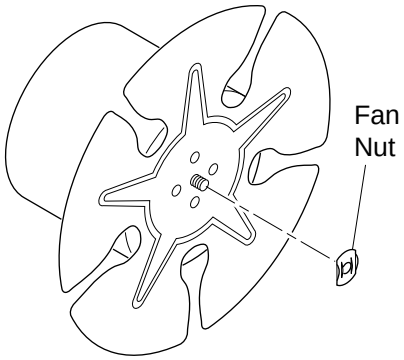


Figure 8 - Removing Fan Nut from Motor Shaft

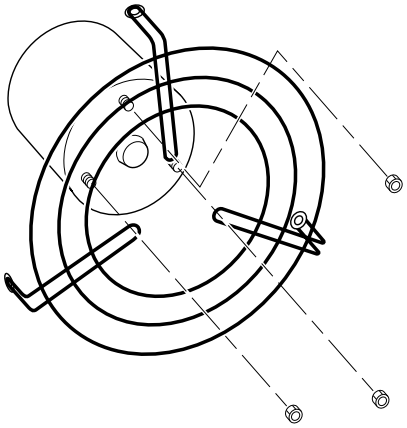


Figure 9 - Removing or Attaching Fan Guard from Motor

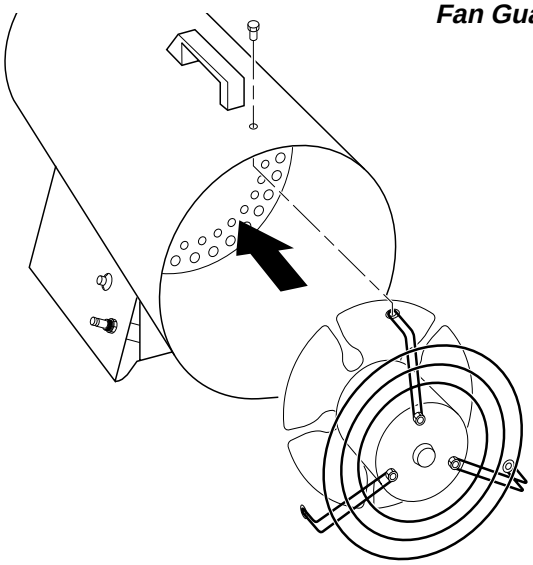


Figure 10 - Replacing Motor and Fan Guard into Heater

Ignitor

1. Remove motor and fan guard from heater (see *Motor and Fan*, page 10, steps 1 and 2).
2. Remove black ignitor wire from piezo ignitor. Access ignitor wire through underside of heater base (see Figure 11). Push wire up through bushing in heater shell.
3. Remove ignitor mounting screw from rear head using nut-driver or standard screwdriver (see Figure 12).
4. Remove ignitor from rear head.
5. Install new ignitor. Attach ignitor to rear head with ignitor mounting screw.
6. Run ignitor wire from new ignitor through bushing in heater shell. Attach ignitor wire to piezo ignitor.
7. Set gap between ignitor electrode and target plate to 4.3 mm (see Figure 13).
8. Test for spark.
   WARNING: Make sure heater is disconnected from propane supply. Heater could ignite causing severe burns.
   Push piezo ignitor button and watch for spark between ignitor electrode and target plate.
9. Place motor and fan guard into rear of heater shell (see *Motor and Fan*, page 10, steps 9 and 10).

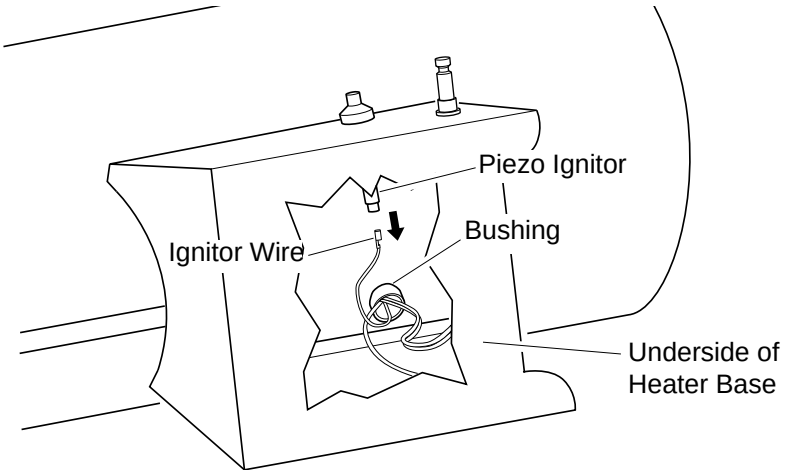


Figure 11 - Removing Ignitor Wire from Piezo Ignitor

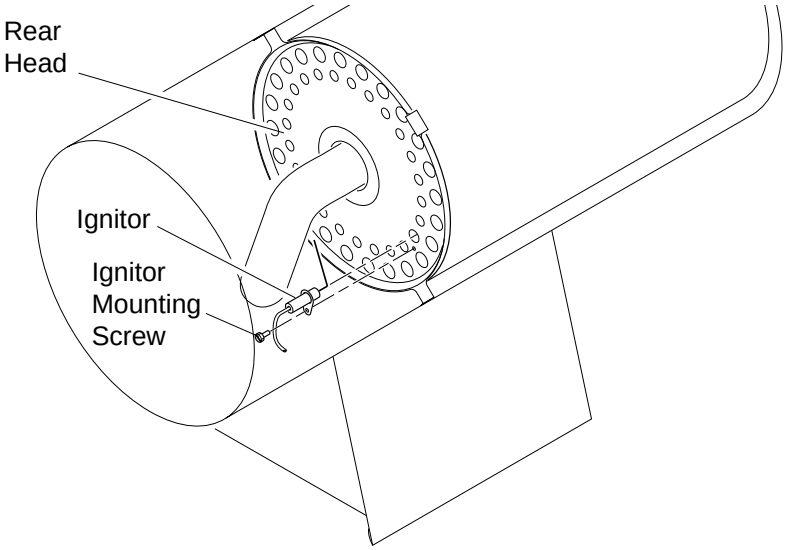


Figure 12 - Removing Ignitor Mounting Screw and Ignitor

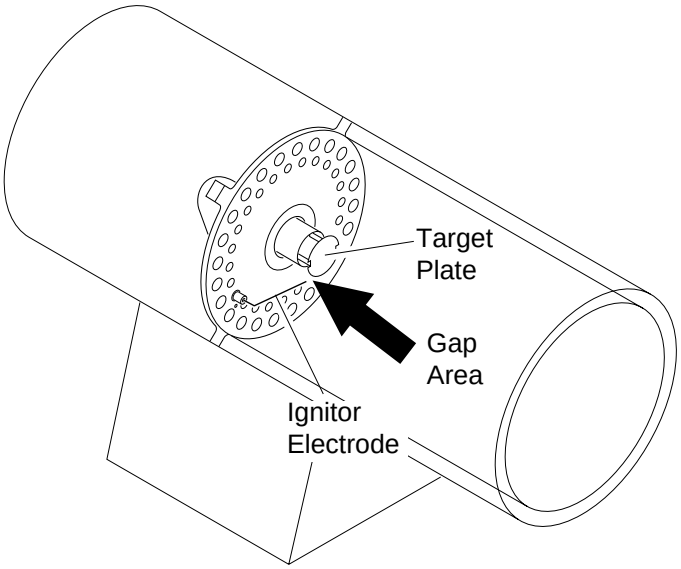


Figure 13 - Clearance between Ignitor Electrode and Target Plate

Thermocouple

1. Make sure unit is unplugged.
2. Remove three screws that attach fan guard to heater shell.
3. Remove motor and fan guard from heater shell (see Figure 14). Be careful not to damage fan.
4. Remove thermocouple nut located inside the combustion chamber (see Figure 15).
5. Place unit on its side, and remove the thermocouple wire from the gas valve (see Figure 16).
6. Remove thermocouple from the unit.
7. Install first of two nuts on new thermocouple (see Figure 17). Position nut about 40mm from tip of thermocouple.
8. Insert tip of thermocouple through the thermocouple hole in rear head (see Figure 18).
9. Install second nut onto thermocouple. Attach this nut to thermocouple from inside combustion chamber (see Figure 18). Adjust both thermocouple nuts until tip of thermocouple is 40mm from rear head.
10. Tighten thermocouple nuts and confirm 40mm tip location.
11. Thread the thermocouple wire back through unit to gas valve. Tighten thermocouple wire into gas valve until snug (do not over tighten).
12. Place motor and fan guard into rear of heater shell (see Figure 19).
13. Insert three screws through heater shell and into fan guard. Tighten screws firmly.

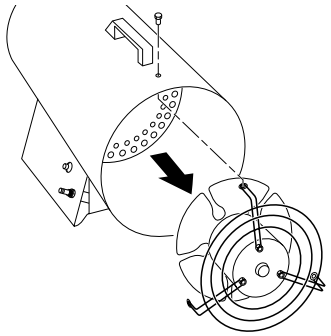


Figure 14 - Removing Motor and Fan Guard from Heater

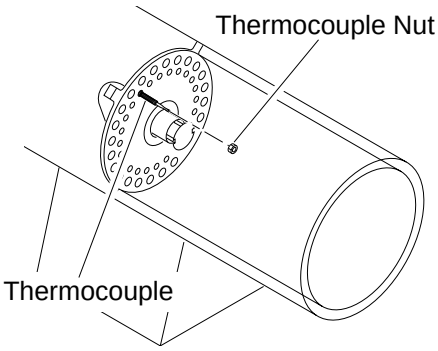


Figure 15 - Thermocouple Nut Location

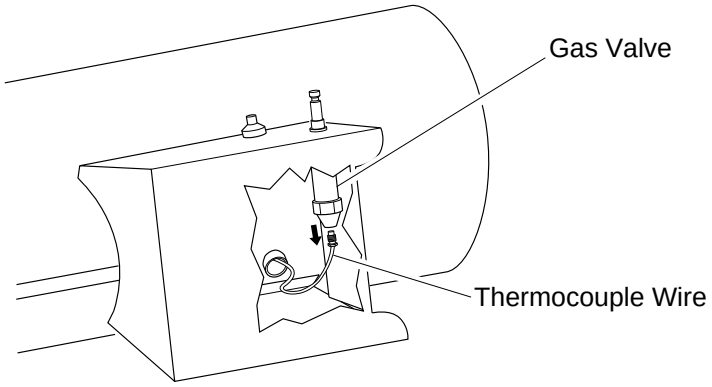


Figure 16 - Removing Thermocouple Wire from Gas Valve

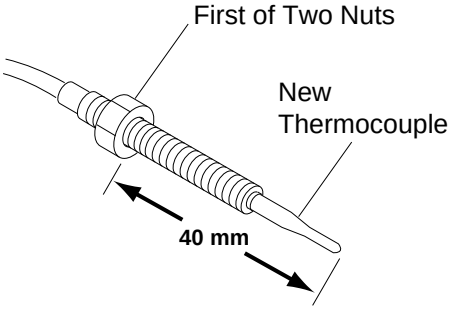


Figure 17 - Installing First Nut on New Thermocouple

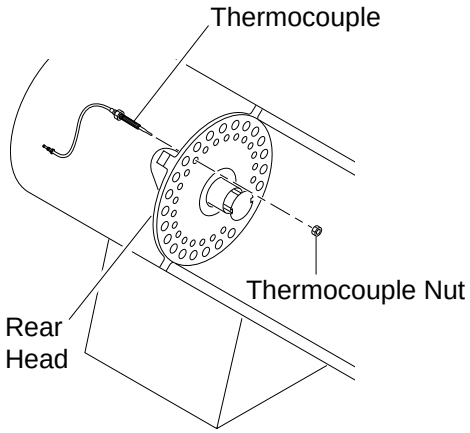


Figure 18 - Installing New Thermocouple

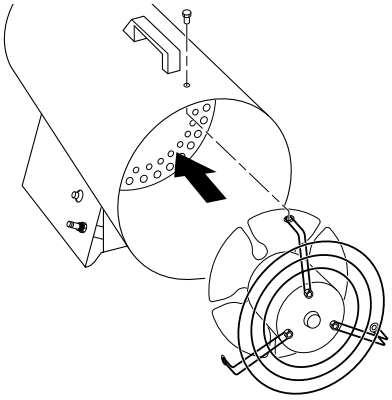


Figure 19 - Replacing Motor and Fan Guard into Heater

Thermoswitch

1. Make sure unit is unplugged.
2. Remove three screws that attach fan guard to heater shell.
3. Remove motor and fan guard from heater shell (see Figure 20). Be careful not to damage fan.
4. Remove two nuts and star washers from thermoswitch (see Figure 21).
5. Disconnect the blue thermoswitch leads in base of heater.
6. Remove the thermoswitch assembly.
7. Insert new thermoswitch wires down through hole at bottom of heater shell.
8. Mount new thermoswitch onto the two mounting bolts on rear head (see Figure 22).
9. Replace star washers and nuts onto bolts.
10. **Recommended for accurate results:** Torque the nuts to 4-6 inch/lbs.
11. Place motor and fan guard into rear of heater shell (see Figure 23).
12. Insert three screws through heater shell and into fan guard. Tighten screws firmly.
13. Attach blue thermoswitch leads to terminal block and solenoid valve wire lead (see Wiring Diagram, page 8).

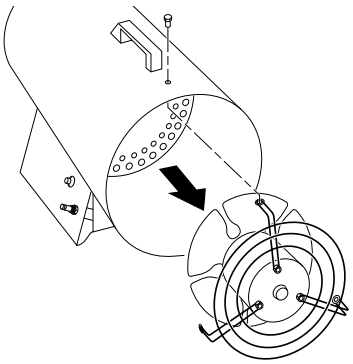


Figure 20 - Removing Motor and Fan Guard from Heater

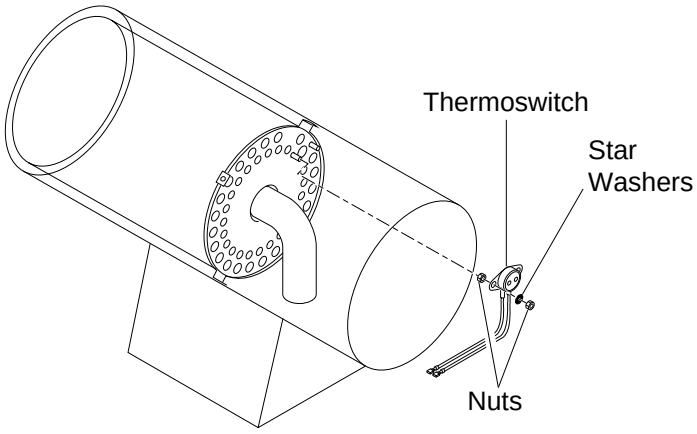


Figure 21 - Removing Nuts and Star Washers from Thermoswitch

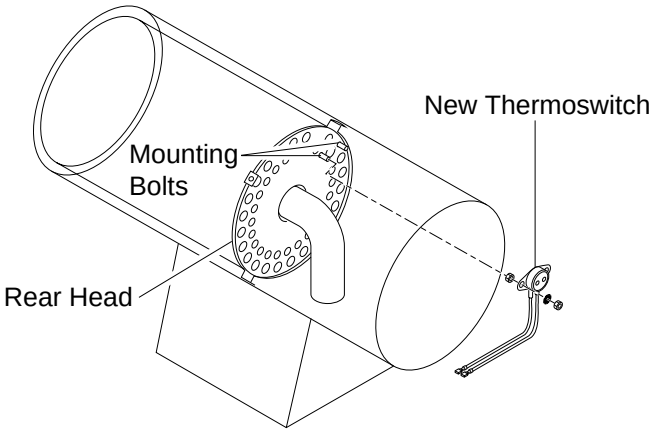


Figure 22 - Mounting New Thermoswitch onto Mounting Bolts

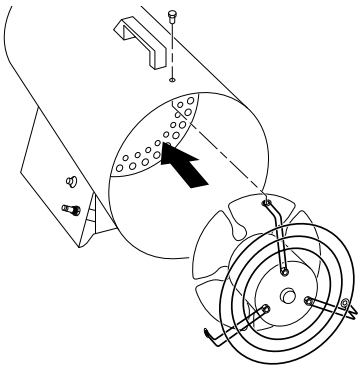
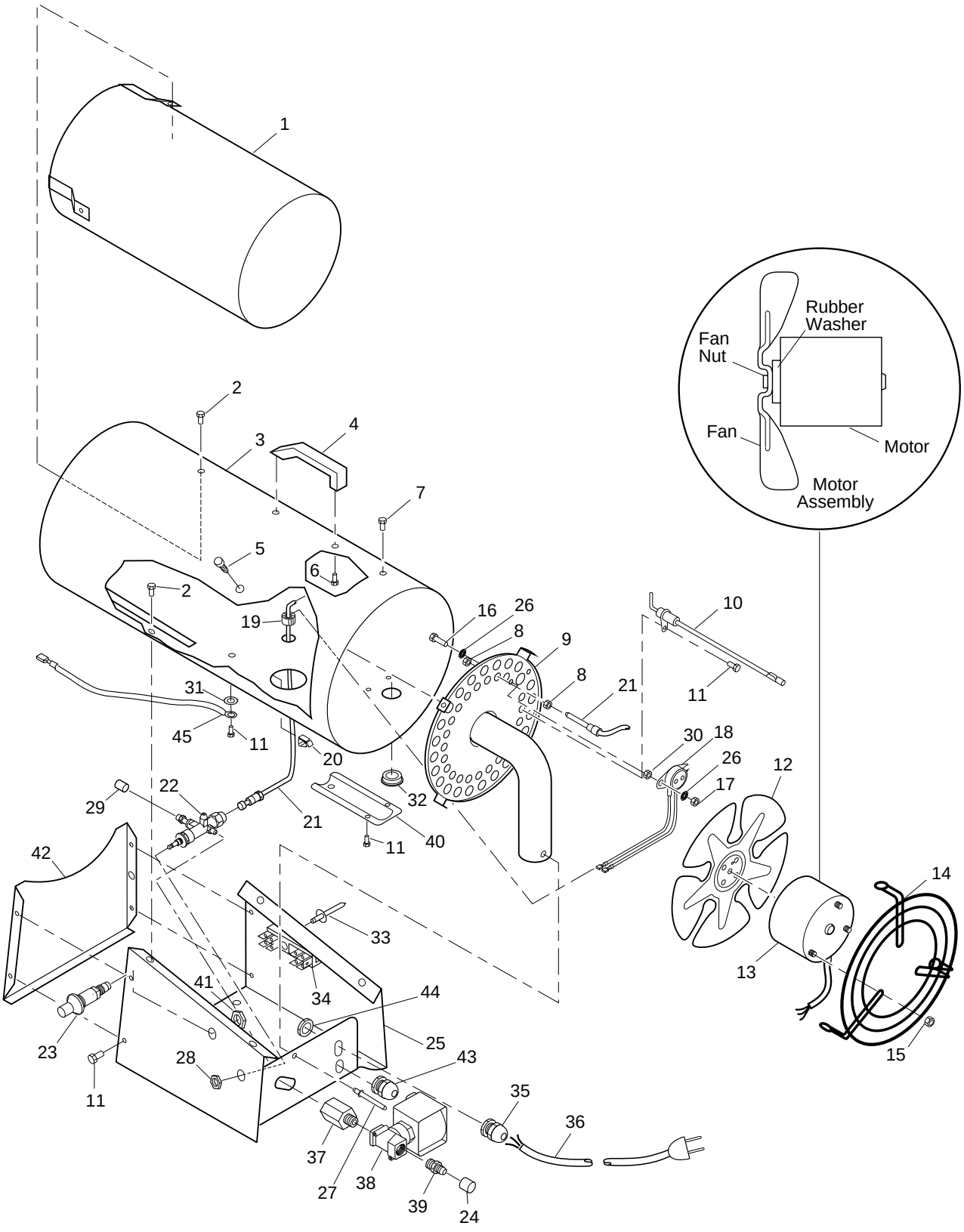


Figure 23 - Replacing Motor and Fan Guard into Heater

ILLUSTRATED PARTS BREAKDOWN



PARTS LIST

This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and serial numbers (from the model plate), then the part number and description of the desired part.

KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	099568-01	Inner Shell (Combustion Chamber)	1
2	M11084-26	Hex Tap Screw, #10-16 x 3/8"	7
3	099599-02CF	Outer Shell	1
4	M51104-01	Handle	1
5	099230-01	Hex Tap Shoulder Screw	4
6	M11084-29	Hex Tap Screw, #10-16 x 3/4"	2
7	M11084-27	Hex Tap Screw, #10-16 x 1/2"	3
8	102592-01	Nut, M6 x .75	2
9	099727-01	Burner Assembly	1
10	099539-01	Ignitor Electrode	1
11	M11084-38	Hex Tap Screw, #8-18 x 3/8"	8
12	099537-02	Fan	1
13	100398-02	Motor Assembly (Includes Rubber Washer and Fan Nut)	1
14	099540-02	Fan Guard	1
15	097384-02	Captive Washer Nut	3
16	097968-05	Hex Screw, #4-40 x 1/2"	2
17	NPC-00C	Hex Nut, #4-40	2
18	097952-08	Thermal Switch Assembly	1
19	097776-01	Universal Bushing	1
20	099542-01	Wire Clip	1
21	102607-01	Thermocouple	1
22	099541-01	Valve/Orifice	1
23	102445-01	Piezo Ignitor	1
24	078978-03	Sleeve Cap	1
25	099598-04AA	Base	1
26	100397-01	Lock Washer, #4	4
27	099202-02	Steel Rivet, 1/8"	1
28	098835-01	Valve Nut	1
29	099460-01	Hex Cap	1
30	NPF-3C	Nut (Spacer)	2
31	WLE-2BL	Lock Washer, #8	1
32	M50104-01	Bushing, Shorty	1
33	099157-01	Rivet, Aluminium	1
34	099125-10	Terminal Board	1
35	M50400	Strain Relief Bushing	1
36	097545-01	Power Cord	1
37	102559-01	Adapter, 1/4 x 1/4	1
38	102957-01	Valve, Solenoid	1
39	097809-01	Male Fitting	1
40	100596-01CF	Guard, Wire	1
41	102334-01	Nut, Pal	1
42	100594-01AA	Cover	1
43	101520-01	Strain Relief Bushing	1
44	102861-01	Bushing Nut	1
45	M16841-62	Wire Assembly	1
PARTS AVAILABLE - NOT SHOWN			
	100685-03	Tradename Decal	2
	100400-05	General Information Decal	1
	100404-05	Operation Decal	1
	100399-01	Regulator & Hose Assy.	1
	100168-02	Electrical Decal	1

SPECIFICATIONS

Model	SH10E
Electrical Input	220/240 volt, 50 hertz, 55 watts IP21
Maximum Input, net	10.3 KW at 27 millibar
Regulator Output	27 millibar
Burner Rate	10.3 KW, 796 g/hr
Supply Pressure (min.)	2 bar
Ventilation	260 cm^2
Room Size	103 cubic meters
Air Delivery Class	Type A
Temperature Range for Heater Operation	-29° C to 29° C*

* When running heater in temperatures above 29° C, high internal temperatures may cause thermal limit device to shut down heater.

WARRANTY AND REPAIR SERVICE

KEEP THIS WARRANTY

LIMITED WARRANTY

Van Cranenbroek B.V. warrants this product and any parts thereof, to be free from defects in materials and workmanship for six (6) months from the date of first purchase when operated and maintained in accordance with instructions. This warranty is extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty parts are not reimbursable under this warranty.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

This express warranty is given in lieu of any other warranty either expressed or implied, including warranties of merchantability and fitness for a particular purpose.

Van Cranenbroek B.V. assumes no responsibility for indirect, incidental or consequential damages.

We reserve the right to amend these specifications at any time without notice. The only warranty applicable is our standard written warranty. We make no other warranty, expressed or implied.

Model _____

Serial No. _____

Date of Purchase _____

Van Cranenbroek B.V.
Keunenhoek 4
6021 CX BUDEL
The Netherlands