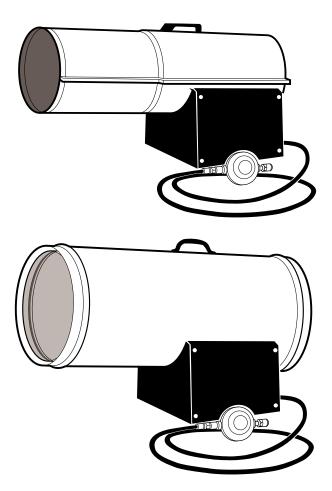
# Sun Heat PROPANE CONSTRUCTION HEATERS OWNER'S MANUAL



# SH42 and SH68 Models

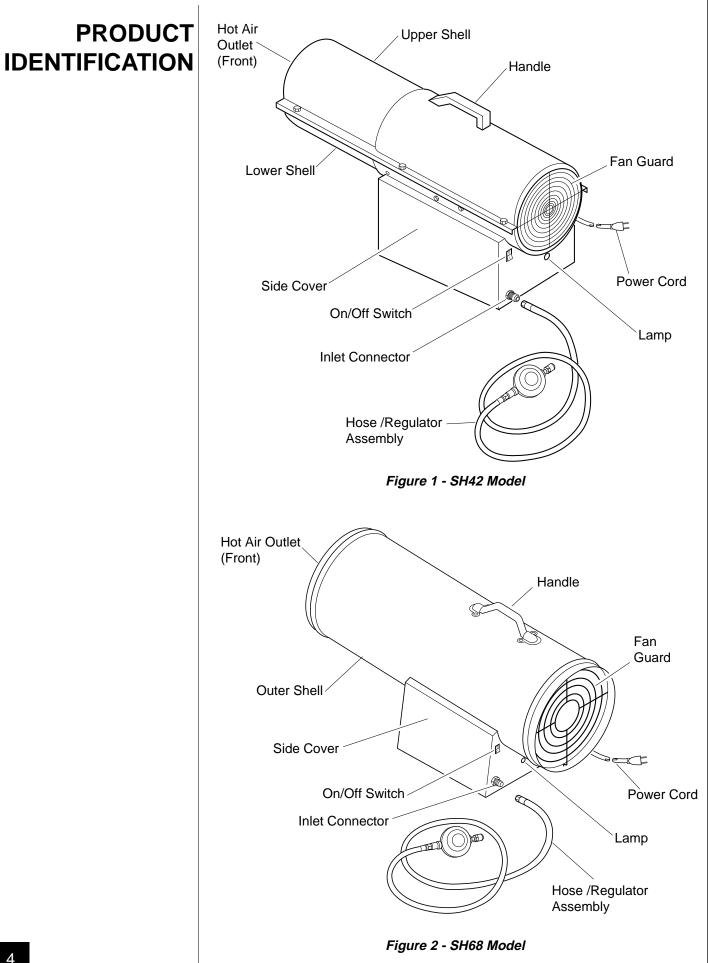
#### IMPORTANT

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.



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SAFETY INFORMATION	<b>WARNINGS</b> 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 mon			
	<b>Carbon Monoxide Poisoning:</b> 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. <b>Get fresh air at once!</b> Have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.			
	<b>Propane Gas:</b> Propane gas is odorless. An odor-m gas. The odor helps you detect a propane gas leal propane gas can fade. Propane gas may be present	k. However, the odor added to		
	Make certain you read and understand all warnings. It is your guide to safe and proper operation of this	-		
	Safety In	formation continues on next page		

SAFETY	WARNINGS Continued				
INFORMATION	• Not for domestic use (inside living areas). Use heater for space heating only.				
Continued	• Primarily 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 <sub>2</sub> ) 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 minimum size is as follows:				
	SH42 model: $550 \text{ cm}^2$ SH68 model: $875 \text{ cm}^2$				
	• 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 below ground level. 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.				
	• 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.				
	• When used with thermostat, heater may start anytime.				
	• 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.				
UNPACKING	<ol> <li>Remove all packing items applied to heater for shipment. Keep packing items and carton for storing heater.</li> <li>Remove all items from carton.</li> </ol>				
	3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.				
	3				



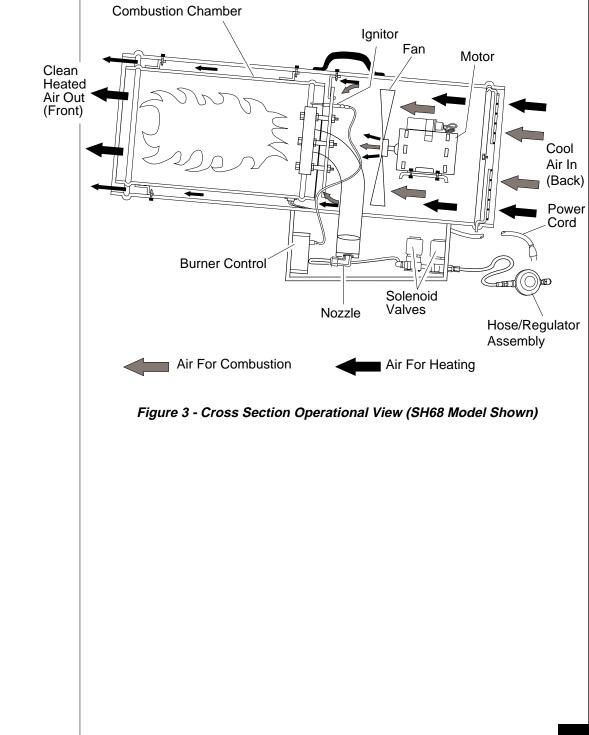
# THEORY OF OPERATION

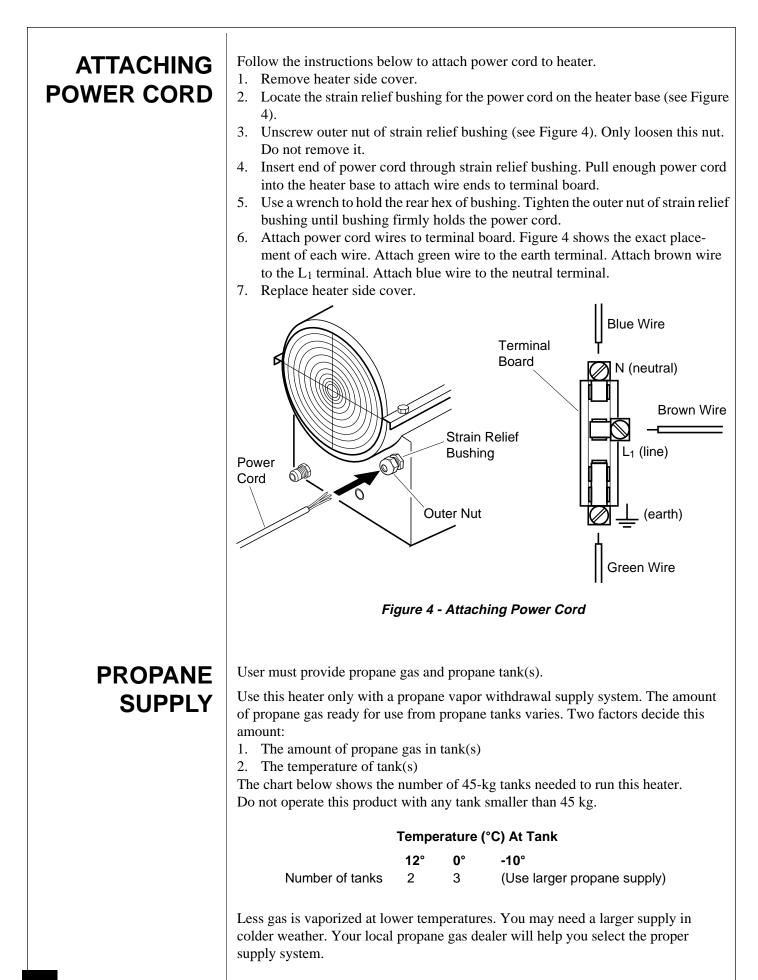
**The Fuel System:** The hose/regulator assembly attaches to the propane gas supply. The propane gas moves through the solenoid valves and out the nozzle.

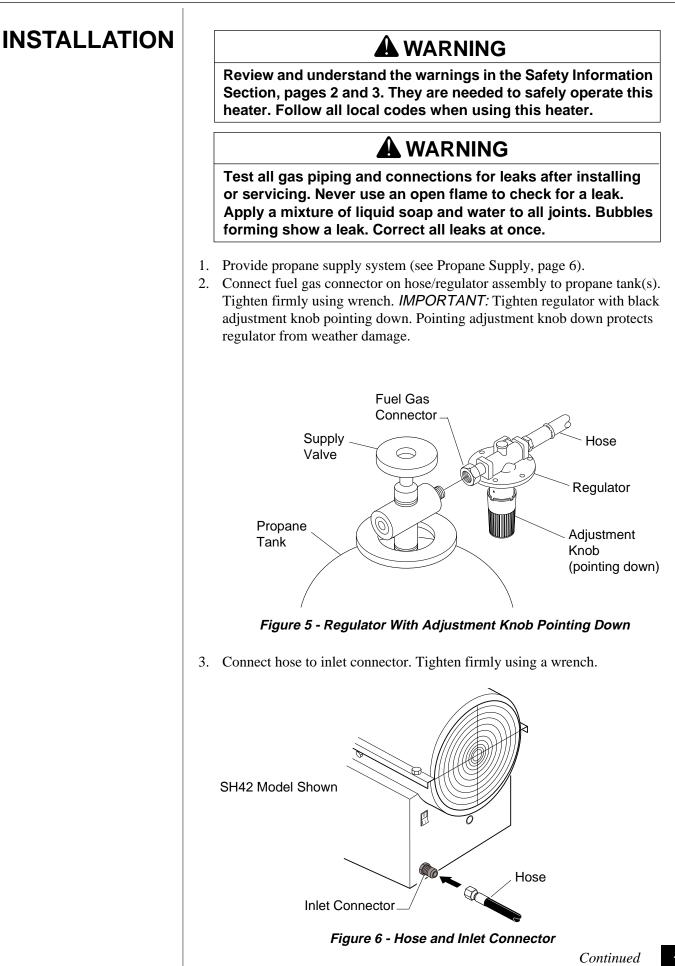
**The Air System:** The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

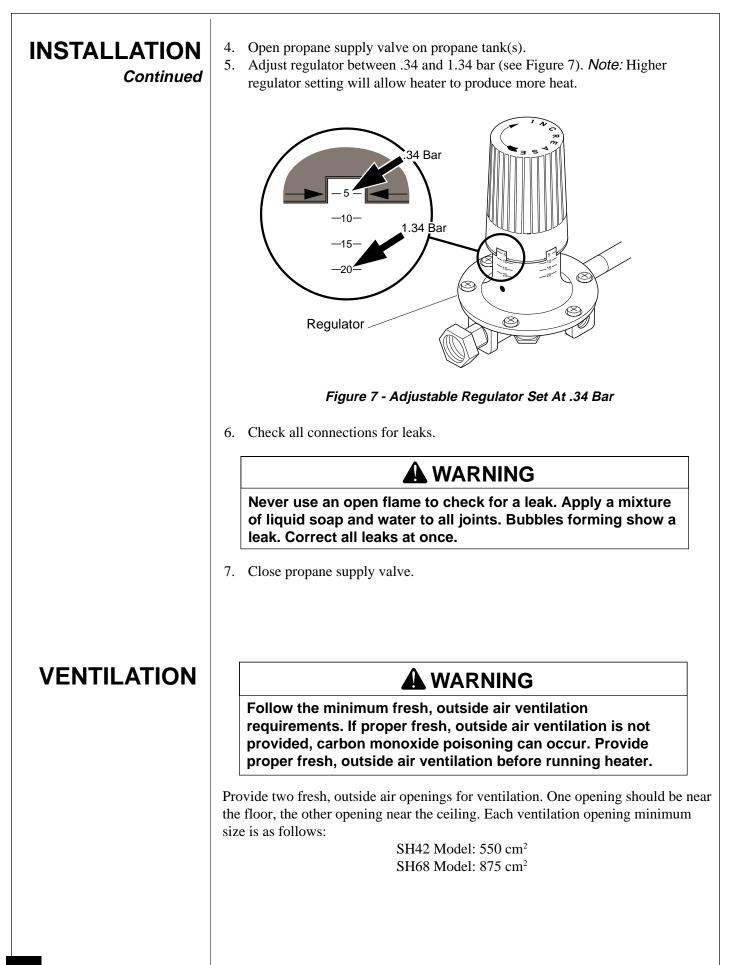
**The Ignition System:** The burner control sends voltage to the ignitor. The ignitor ignites the fuel and air mixture.

**The Burner Control System:** This system causes the heater to shut down if the flame goes out. The motor will continue to run, but no heat is produced.









# **OPERATION**

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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. *Note:* Red light indicates heater may not operate due to phase reversal. Reverse plug or check your installation to operate heater. Phase sensitivity is required by CE standards for this appliance.
- 4. Open propane supply valve on propane tank(s).
- 5. Make sure regulator is set between .34 and 1.34 bar. *Note:* Higher regulator setting will allow heater to produce more heat.
- 6. Turn on/off switch to the ON position. Heater will start within six seconds. *Note:* If heater does not start, turn on/off switch to the OFF position. Wait ten seconds for burner control to reset, then try again.

### **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. Turn on/off switch to the OFF position.
- 4. Unplug heater power cord.

#### **To Restart Heater**

If burner control stops gas flow to heater, motor will continue to run. To restart heater:

- 1. Turn on/off switch to the OFF position.
- 2. Wait ten seconds, then turn on/off switch to the ON position.

If heater does not restart

- Check manual valves (if any) and supply valves (on propane tank). Make sure they are open.
- Check fuel level in propane tank(s). If fuel level is too low, contact local propane gas company.

If heater still does not restart, contact your local service center.

### 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.

# 

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	<b>A</b> CAUTION Disconnect heater from propane supply tank(s).
	<ol> <li>Store propane tank(s) in safe manner.</li> <li>Place packing items on the heater and hose/regulator assembly. Place heater and hose/regulator assembly into heater carton.</li> <li>Store in dry, clean, and safe place. Do not store hose/regulator assembly in heater combustion chamber.</li> <li>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.</li> </ol>
MAINTENANCE	<b>A</b> WARNING Never service heater while it is plugged in, connected to propane supply, operating, or hot. Severe burns and electrical shock can occur.
	<ol> <li>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.</li> <li>Inspect heater before each use. Check connections for leaks. Apply mixture liquid soap and water to connections. Bubbles forming show a leak. Correct</li> </ol>
	<ol> <li>leaks at once.</li> <li>Inspect hose/regulator assembly before each use. If hose is highly worn or cut, replace.</li> <li>Have heater inspected yearly by service person.</li> <li>Keep inside of heater free from combustible and foreign objects.</li> <li>Clean fan every 500 hours of operation or as needed.</li> </ol>

# SERVICE PROCEDURE

# 

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

## Cleaning Fan

#### SH42 Model

- 1. Remove upper shell of heater. Remove screws along each side of heater using 5/16" nut-driver (see Figure 8). These screws attach upper and lower shells together.
- 2. Lift or slide upper shell off.
- 3. Remove fan guard.

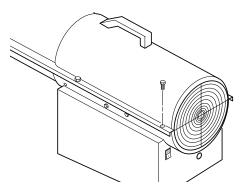


Figure 8 - Upper Shell Removal, SH42 Model

- 4. Use 1/8" Allen wrench to loosen setscrew which holds fan to motor shaft (see Figure 9).
- 5. Slip fan off motor shaft.
- 6. Clean fan using soft cloth moistened with kerosene or solvent.
- 7. Dry fan thoroughly.
- 8. Replace fan on motor shaft. Make sure set screw is touching back of flat surface on motor shaft (see Figure 10).
- 9. Place setscrew on flat of shaft. Tighten setscrew firmly (4.5-5.6 n-m).
- 10. Replace fan guard and upper shell.

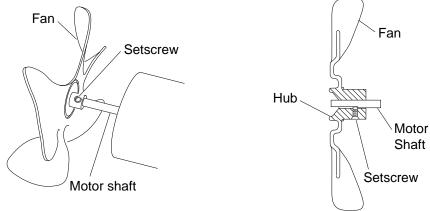


Figure 9 - Fan, Motor Shaft, and Setscrew Location

Figure 10 - Fan Cross Section

# SERVICE PROCEDURE

Continued

## Cleaning Fan

#### SH68 Model

Clean fan every 500 hours of operation or as needed.

- 1. Remove screws on side cover using 5/16" nut-driver.
- 2. Remove side cover.
- 3. Detach the four motor wires from parts under heater shell (see Figure 11). Be sure to detach only wires coming from motor. The four motor wires are:
  - black wire—to burner control
  - blue wire—to terminal boardgreen wire—to terminal board

On/Off

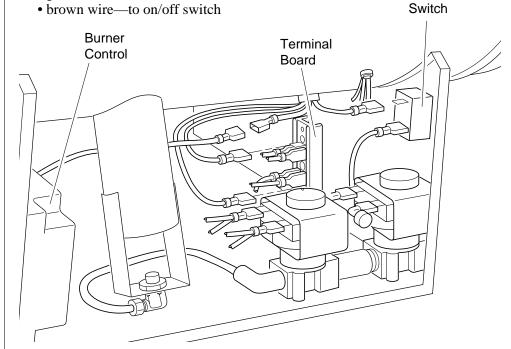
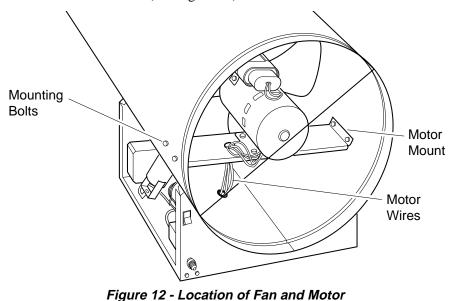


Figure 11 - Location of Motor Wires

- 4. Remove fan guard screw from top rear of heater shell. Remove fan guard.
- 5. Reach into rear of heater shell. Carefully pull motor wires through hole in bottom of shell (see Figure 12). *Note:* Pull wires through hole one at a time.
- 6. Remove nuts and mounting bolts holding motor mount to shell. Use 3/8" nutdriver and 7/16" wrench (see Figure 12).



## SERVICE PROCEDURE Continued

- 7. 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 damage fan pitch.
- 8. Turn motor and fan around. Place motor and fan into shell backwards. *Note:* Motor will go into shell first (see Figure 13).
- 9. Line up rear mounting holes in shell with first hole on each side of motor mount (see Figure 13). *Note:* When holes are lined up, fan should be outside of shell.
- Holding mounting bolt, carefully reach through fan blades into rear of heater. Be careful not to damage fan pitch. Insert bolt through motor mount and shell. With free hand, attach nut finger tight. Repeat process for other mounting hole.

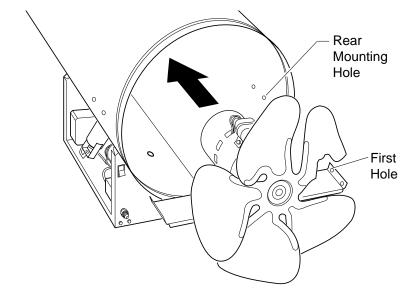
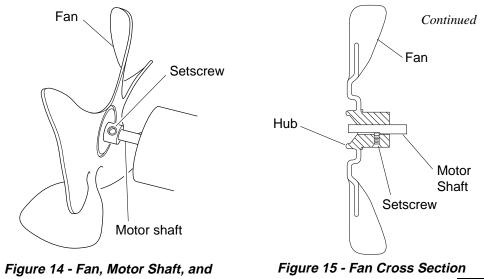


Figure 13 - Fan and Motor Turned Around

- 11. Use 1/8" Allen wrench to loosen setscrew which holds fan to motor shaft (see Figure 14).
- 12. Slip fan off motor shaft.
- 13. Clean fan using soft cloth moistened with kerosene or solvent.
- 14. Dry fan thoroughly.
- 15. Replace fan on motor shaft. Make sure set screw is touching back of flat surface on motor shaft (see Figure 15).
- 16. Place setscrew on flat of shaft. Tighten setscrew firmly (4.5-5.6 n-m).



Setscrew Location

100684

## SERVICE PROCEDURE Continued

- 17. Remove two nuts and bolts securing motor mount to shell.
- 18. Pull motor and fan from shell. Turn motor and fan around. Carefully place back in shell. *Note:* Fan will go into shell first.
- 19. Line up mounting holes in shell with holes on motor mount. Replace four bolts through shell and motor mount. Insert bolts from outside of heater. Tighten nuts firmly.
- 20. Route motor wires through hole in bottom of shell (see Figure 12, page 12).
- 21. Connect motor wires as follows (see Figure 11, page 12):
  - black wire—to burner control
    - blue wire—to terminal board (see Wiring Diagram, page 15, for correct terminal location)
    - green wire—to terminal board (see Wiring Diagram, page 15, for correct terminal location)
    - brown wire—to on/off switch
- 22. Replace side cover.
- 23. Replace fan guard.

#### Ignitor

Make sure gap between ignitor electrode and burner nozzle is 4.8 mm. Access ignitor electrode from inside combustion chamber. No other maintenance is needed for ignitor.

## If a Gas Leak Occurs

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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.

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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, turn heater on/off switch to the OFF position. 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 you local service center.

## SPECIFICATIONS

Model	SH42	SH68
Electrical Input	220/240 volt, 50 hertz, 200 watts IP20	220/240 volt, 50 hertz, 200 watts IP20
Maximum Input, net	44 KW at 1.34 bar	70 KW at 1.34 bar
Minimum Input, net	20 KW at .34 bar	31 KW at .34 bar
Regulator Output (max./min.)	1.34 bar/.34 bar	1.34 bar/.34 bar
Burner Rate	44 KW, 3400 g/hr max. 20 KW, 1550 g/hr min.	70 KW, 5400 g/hr max. 31 KW, 2400 g/hr min.
Supply Pressure (min.)	2 bar	2 bar
Ventilation	1100 cm <sup>2</sup>	$1750 \text{ cm}^2$
Room Size	440 cubic meters	700 cubic meters
Air Delivery Class	Type A	Type A

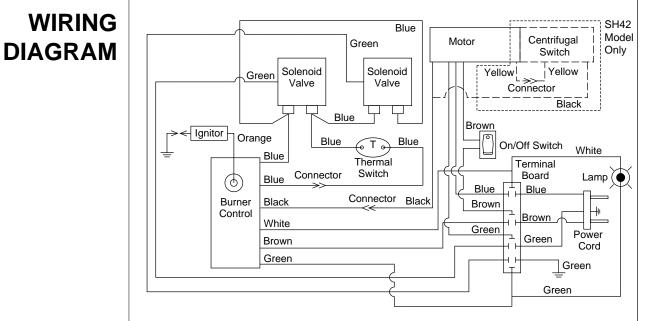
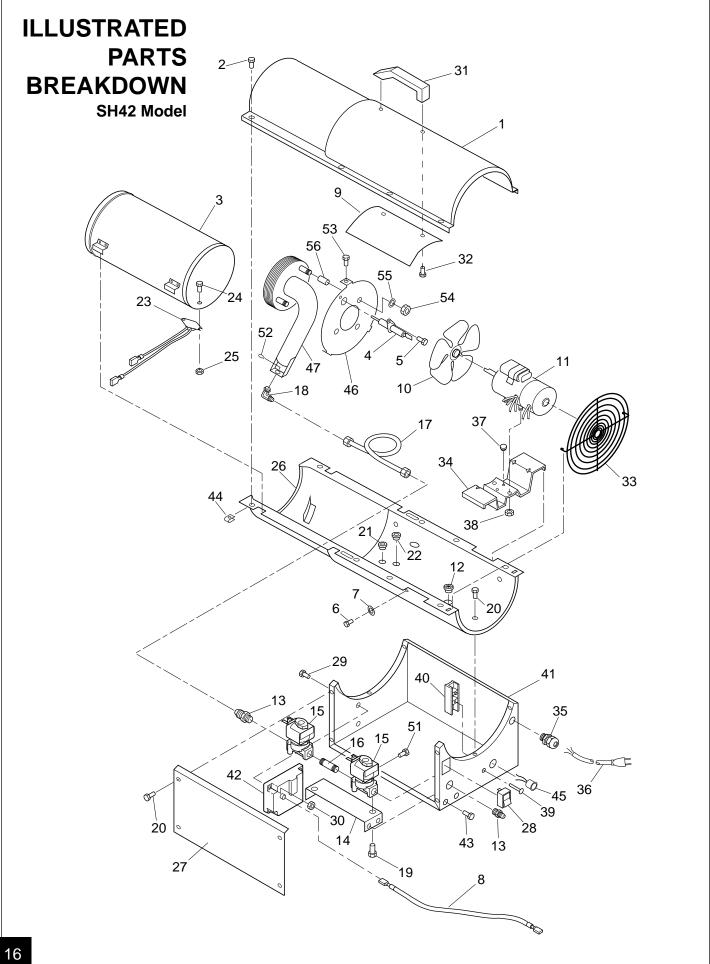


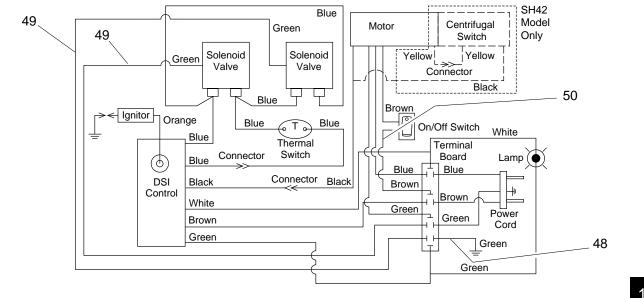
Figure 16 - Wiring Diagram

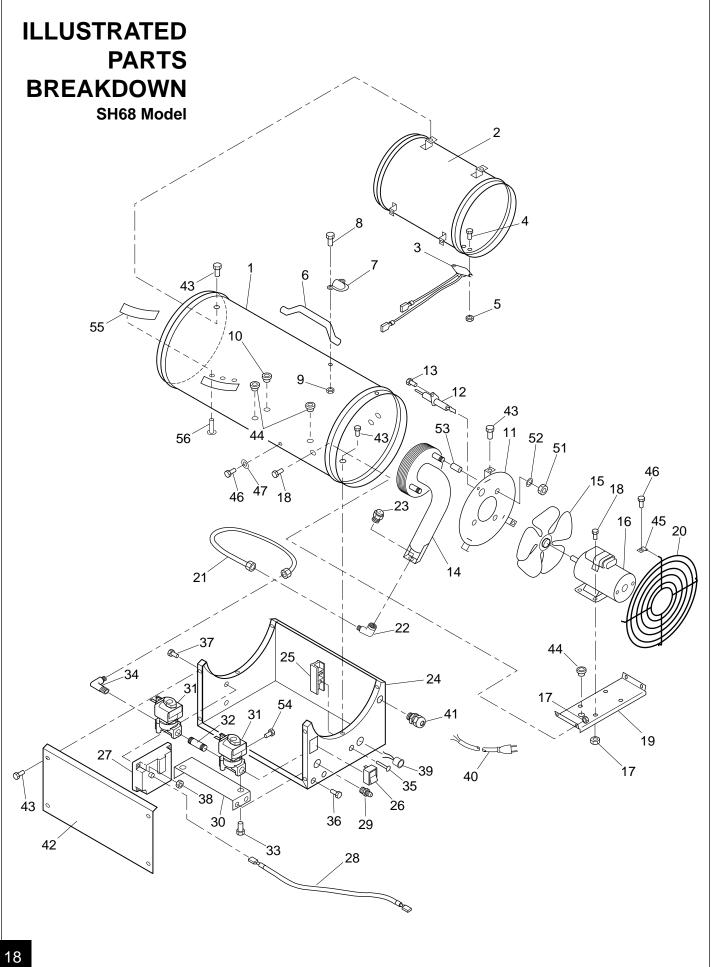


## PARTS LIST SH42 Model

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.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	M51072-02BN	Upper Shell	1	34	M51074-01	Motor Mounting Bracket	1
2	M15823-27	Screw, #10-16 x 1/2"	8	35	M50400	Strain Relief Bushing	1
3	099443-01	Combustion Chamber	1	36	097545-01	Power Cord	1
4	097805-01	Ignitor	1	37	M50631	Rubber Bumper	2
5	M10908-1	Screw, #6-32 x 1/4"	1	38	NTC-4C	Lock Nut, 1/4-20	2
6	M11084-39	Screw, #8 x 1/2"	1	39	099157-01	Aluminum Rivet	1
7	WLI-2BL	Washer	1	40	099125-06	Terminal Board	1
8	097806-02	Ignitor Cable	1	41	097966-08AA	Base	1
9	M51108-01	Heat Shield	1	42	M51605-04	Burner Control	1
10	M51153-01	Fan	1	43	M10908-27	Screw, #10-32 x 1/2"	2
11	100298-01	Motor	1	44	M11271-8	U-Nut, #10	8
12	097776-01	Bushing	1	45	100371-01	Lamp	1
13	097809-01	Male Fitting	2	46	100299-01	Rear Plate	1
14	100301-01	Valve Bracket	1	47	097849-02	Burner Assembly	1
15	097803-01	Solenoid Valve	2	48	M16841-62	Wire Assembly, Green	1
16	097153-02	Pipe Nipple, 1/4 x 2"	1	49	M16841-55	Wire Assembly, Green	2
17	097905-02	Fuel Tube	1	50	097951-04	Wire Assembly, Brown	1
18	098425-01	Nozzle	1	51	M11084-37	Screw, #8 x 1/4"	2
19	M12461-25	Screw, #10-32 x 1/4"	2	52	098428-01	Clip	1
20	M11084-26	Screw, #10 x 3/8"	10	53	098406-01	Rivet	3
21	M50104-05	Bushing	1	54	NPC-4C	Nut, 1/4-20	3
22	M50104-01	Bushing	1	55	WLI-4C	Lock Washer	3
23	097952-07	Thermal Switch	1	56	098434-01	Spacer	3
24	097968-01	Screw, #4-40 x 1/4"	2				
25	NPC-00C	Nut, #4-40	2	PARTS AVAILABLE – NOT SHOWN			
26	M51073-06BN	Lower Shell	1				
27	097965-02AA	Side Cover	1		100685-01	Tradename Decal	2
28	097462-01	On/Off Switch	1		100181-02	General Information Decal	1
29	M12461-7	Screw, #6-32 x 1"	2		100462-01	Operation Decal	1
30	099432-01	Nut, #6-32	2		100372-01	Lamp Decal	1
31	M51104-01	Handle	1		100168-01	Wiring Diagram Decal	1
32	M11084-29	Screw, #10 x 3/4"	2		097953-02	Regulator/Hose Assembly	1
33	097964-03AA	Fan Guard	1				





## PARTS LIST SH68 Model

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.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.	
1	097963-01BN	Outer Shell	1	34	098825-01	Male Compression Elbow	1	
2	097847-01	Combustion Chamber	1	35	099157-01	Aluminum Rivet	1	
3	097952-06	Thermal Switch	1	36	M10908-27	Screw, #10-32 x 1/2"	2	
4	097968-01	Screw, #4-40 x 1/4"	2	37	M12461-7	Screw, #6-32 x 1"	2	
5	NPC-00C	Nut, #4-40	2	38	099432-01	Nut, #6-32	2	
6	097917-01	Handle	1	39	100371-01	Lamp	1	
7	097918-01	Handle Cleat	2	40	097545-01	Power Cord	1	
8	M12461-26	Screw, #10-32 x 3/8"	4	41	M50400	Strain Relief Bushing	1	
9	NTF-3C	Torque Nut, #10-32	4	42	097965-01AA	Side Cover	1	
10	097930-01	Bushing	1	43	M11084-26	Screw, #10-16 x 3/8"	19	
11	097848-01	Rear Plate	1	44	M50104-02	Bushing	3	
12	097805-01	Ignitor	1	45	100373-01	Clamp	1	
13	M10908-1	Screw, #6-32 x 1/4"	1	46	M11084-39	Screw, #8-18 x 1/2"	2	
14	097849-01	Burner Assembly	1	47	WLI-2BL	Washer	1	
15	097811-01	Fan	1	48	M16841-62	Wire Assembly, Green	1	
16	100144-01	Motor	1	49	M16841-55	Wire Assembly, Green	2	
17	NTC-4C	Torque Nut, 1/4-20	8	50	097951-04	Wire Assembly, Brown	1	
18	M12461-62	Screw, 1/4-20 x 3/8"	8	51	NPC-4C	Nut, 1/4-20	3	
19	097829-02	Motor Mount	1	52	WLI-4C	Lock Washer	3	
20	097964-01AA	Fan Guard	1	53	097839-01	Spacer	3	
21	100311-01	Fuel Tube	1	54	M11084-37	Screw, #8 x 1/4"	2	
22	100146-01	Female Elbow	1	55	097916-01	Baffle	1	
23	099679-02	Nozzle	1	56	099202-02	Rivet	3	
24	097966-05AA	Base	1					
25	099125-06	Terminal Board	1	PARTS AVAILABLE – NOT SHOWN				
26	097462-01	On/Off Switch	1					
27	M51605-04	Burner Control	1		100686-01	Tradename Decal	2	
28	097806-02	Ignitor Cable	1		100180-02	General Information Decal	1	
29	097809-01	Male Fitting	1		100462-01	Operation Decal	1	
30	100301-02	Valve Bracket	1		100372-01	Lamp Decal	1	
31	097803-01	Solenoid Valve	2		100168-01	Wiring Diagram Decal	1	
32	097153-02	Pipe Nipple	1		097953-02	Regulator/Hose Assembly	1	
33	M12461-25	Screw, #10-32 x 1/4"	2					
	49、			Blue	Motor	Centrifugal   Model		
		49	Green	1	Motor	Switch Only		
		Green Solenoid	Sc	olenoid	Yellow			
		Green Valve		/alve		onnector		
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	50 V Blue V V II III '50							
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			Theri or Swit			erminal Board Lamp		
		Blue Connecti	-			Blue		
		DSI Black	Conne	ector Bla				
	I I	Control				Brown I III		

White

Brown Green

48

Brown

Green

Power Cord

Green

Green

Green

# WARRANTY AND REPAIR SERVICE

**KEEP THIS WARRANTY** 

#### LIMITED WARRANTY

DESA International 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.

DESA International 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