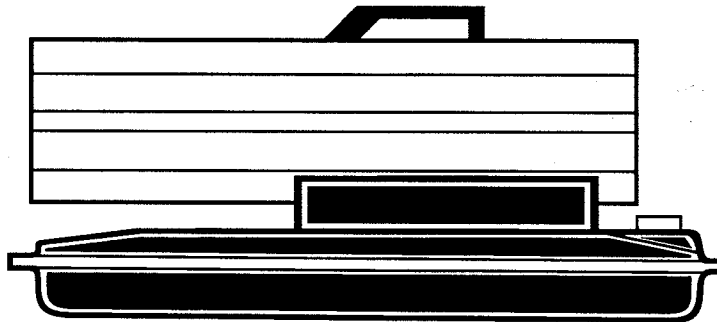


PORTABLE FORCED AIR HEATERS

OWNER'S MANUAL



Heater Sizes:

35,000 Btu/Hr (REM35A, R35B)

50,000 Btu/Hr (REM50B, B50G)

55,000 Btu/Hr (REM55-W, REM55, R55)

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.



35,000, 50,000, And 55,000 Btu/Hr PORTABLE FORCED AIR HEATERS

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, and carbon monoxide poisoning.

 DANGER: Carbon monoxide poisoning may lead to death!

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, persons with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

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.

- Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.
- Fueling
 - a) Personnel involved with fueling shall be qualified and thoroughly familiar with the manufacturer's instructions and applicable federal, state, and local regulations regarding the safe fueling of heating units.
 - b) Only the type of fuel specified on the heater's data plate shall be used.
 - c) All flame, including the pilot light, if any, shall be extinguished and the heater allowed to cool, prior to fueling.

- d) During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the heater to service.
 - e) At no time shall more than one day's supply of heater fuel be stored inside a building in the vicinity of the heater. Bulk fuel storage shall be outside the structure.
 - f) All fuel storage shall be located a minimum of 25 feet from heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the heater unit).
 - g) Whenever possible, fuel storage shall be confined to areas where floor penetrations do not permit fuel to drip onto or be ignited by a fire at lower elevation.
 - h) Fuel storage shall be in accordance with the federal, state, or local authority having jurisdiction.
- Never use heater where gasoline, paint thinner, or other highly flammable vapors are present.
 - Follow all local ordinances and codes when using heater.
 - Heaters used in the vicinity of tarpaulins, canvas, or similar enclosure materials shall be located a safe distance from such materials. The recommended minimum safe distance is 10 feet. It is further recommended that these enclosure materials be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the heater due to wind action.
 - Use only in well-vented areas. Before using heater, provide at least a three-square-foot opening of fresh, outside air for each 100,000 Btu/Hr of rating. This heater produces carbon monoxide, which is listed by the State of California as a reproductive toxin under Proposition 65.

- Use only in places free of flammable vapors or high dust content.
- Use only the electrical voltage and frequency specified on model plate.
- Use only a three-prong, grounded extension cord.
- Minimum heater clearances from combustibles:
Outlet: 8 Ft. Sides: 4 Ft.
Top: 4 Ft. Rear: 4 Ft.
- Locate heater on a stable and level surface if heater is hot or running or a fire may occur.
- When moving or storing heater, keep heater in a level position or fuel spillage may occur.
- Keep children and animals away from heater.
- Unplug heater when not in use.
- When used with thermostat, heater may start anytime.
- Never use heater in living or sleeping areas.
- Never block air inlet (rear) or air outlet (front) of heater.
- Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
- Never attach duct work to front or rear of heater.

UNPACKING

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

OWNER'S MANUAL

PRODUCT IDENTIFICATION

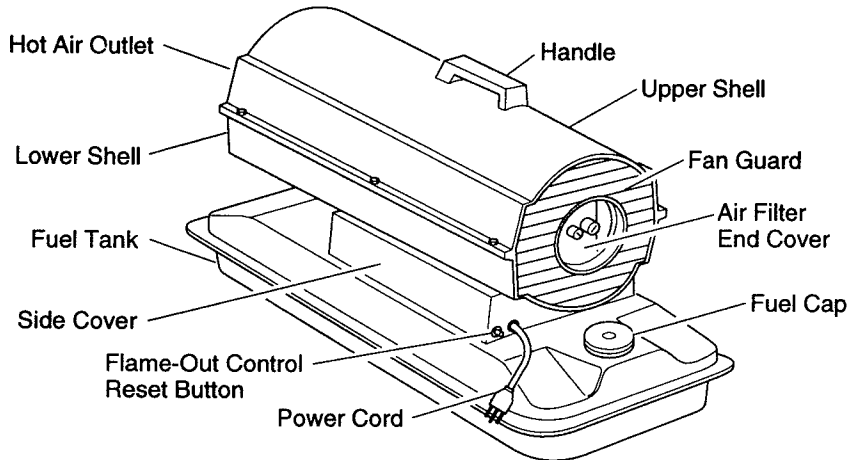


Figure 1

THEORY OF OPERATION

The Fuel System: The air pump forces air through the air line. The air is then pushed through the burner head nozzle. This air causes fuel to lift from the tank. A fine mist of fuel is sprayed into the combustion chamber.

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 electronic ignitor sends voltage to the spark plug. The spark plug ignites the fuel and air mixture.

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

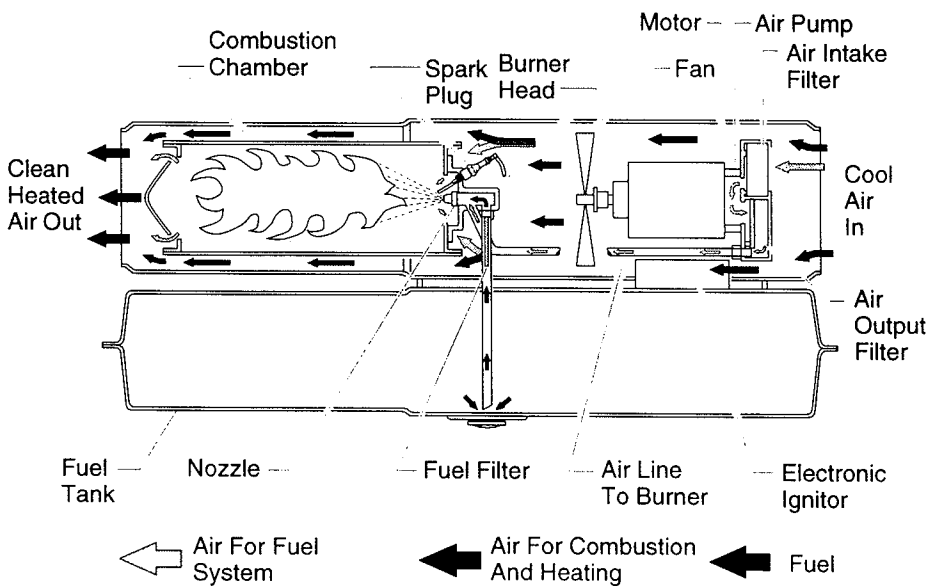


Figure 2 - Cross Section Operational View

FUELS

WARNING: Use only kerosene or No. 1 fuel oil to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.

Do not use heavy fuels such as No. 2 fuel oil or No. 2 Diesel. Using heavy fuels will result in:

- clogged fuel filter and nozzle
- carbon build up on spark plug
- the need of non-toxic anti-icer in fuel during very cold weather

IMPORTANT: Use a KEROSENE ONLY storage container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause the flame-out control to shut down heater. Foreign matter may also require you to clean fuel system often.

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 at least a three-square-foot opening of fresh, outside air for each 100,000 Btu/Hr rating. Provide extra fresh air if more heaters are being used.

Example: A 55,000 Btu/Hr heater requires one of the following:

- a two-car garage door (16-feet-wide opening) raised two inches
- a single-car garage door (9-feet-wide opening) raised three inches
- two windows (30-inches-wide opening) raised five inches

35,000, 50,000, And 55,000 Btu/Hr PORTABLE FORCED AIR HEATERS

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 ventilation and safety information.
2. Fill fuel tank with kerosene or No. 1 fuel oil.
3. Attach fuel cap.
4. Plug power cord of heater into three-prong, grounded extension cord. Extension cord must be at least six feet long.

Extension Cord Wire Size Requirements

- 6 to 10 feet long, use 18 AWG rated cord
- 11 to 100 feet long, use 16 AWG rated cord
- 101 to 200 feet long, use 14 AWG rated cord

5. Plug extension cord into standard 120 volt/60 hertz, three-hole, grounded outlet. Heater will start when extension cord is plugged into outlet. If not, push in flame-out control reset button (see Figure 3).

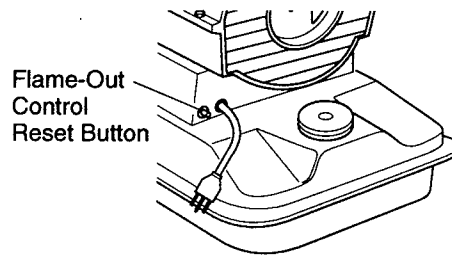


Figure 3 - Flame-Out Control Reset Button

TO STOP HEATER

Unplug extension cord from outlet.

TO RESTART HEATER

1. Wait two minutes after stopping heater.
2. Repeat steps under *To Start Heater*.

STORING, TRANSPORTING, OR SHIPPING

Note: If shipping, transport companies require fuel tanks to be empty.

1. Drain fuel tank.

Note: Some models have drain plug on underside of fuel tank. If so, remove drain plug to drain all fuel. If heater does not have drain plug, drain fuel through fuel cap opening. Be sure all fuel is removed.
2. Replace drain plug if provided.
3. If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir, and drain again. This will prevent excess debris from clogging filters during future use.
4. Replace fuel cap or drain plug. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.
5. If storing, store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

IMPORTANT: Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

PREVENTATIVE MAINTENANCE SCHEDULE


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

Item	How Often	How To
Fuel tank	Flush every 150-200 hours of operation or as needed.	See <i>Storing, Transporting, or Shipping</i> , above.
Air output and lint filters	Replace every 500 hours of operation or once a year.	See <i>Air Output, Air Intake, and Lint Filters</i> , page 6.
Air intake filter	Wash and dry with soap and water every 500 hours of operation or replace as needed.	See <i>Air Output, Air Intake, and Lint Filters</i> , page 6.
Fuel filter	Clean twice a heating season or replace as needed.	See <i>Fuel Filter</i> , page 6.
Spark plug	Clean and regap every 600 hours operation or replace as needed.	See <i>Spark Plug</i> , page 7.
Fan blades	Clean each season or as needed.	See <i>Fan</i> , page 6.
Motor	Not required/permanently lubricated	

OWNER'S MANUAL

TROUBLESHOOTING

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

OBSERVED FAULT	POSSIBLE CAUSE	REMEDY
Heater ignites, but flame-out control shuts off heater after a short period of time.	<ol style="list-style-type: none">1. Wrong pump pressure2. Dirty air output, air intake and lint filters3. Dirty fuel filter4. Dirt in nozzle5. Dirty photocell lens6. Bad flame-out control	<ol style="list-style-type: none">1. See <i>Pump Pressure Adjustment</i>, page 6.2. See <i>Air Output, Air Intake and Lint Filters</i>, page 6.3. See <i>Fuel Filter</i>, page 6.4. See <i>Nozzle</i>, page 7.5. Clean photocell lens.6. Replace flame-out control.
Heater will not ignite, but motor runs for a short period of time.	<ol style="list-style-type: none">1. Wrong pump pressure2. Carbon deposits on spark plug and/or improper gap3. Dirty fuel filter4. Dirt in nozzle5. Water in fuel tank	<ol style="list-style-type: none">1. See <i>Pump Pressure Adjustment</i>, page 6.2. See <i>Spark Plug</i>, page 7.3. See <i>Fuel Filter</i>, page 6.4. See <i>Nozzle</i>, page 7.5. Drain and flush fuel tank with clean kerosene. See <i>Storing, Transporting, or Shipping</i>, page 4.
<p> WARNING: High voltage!</p>		
	<ol style="list-style-type: none">6. Electronic ignitor not grounded7. Bad electronic ignitor	<ol style="list-style-type: none">6. Make sure electronic ignitor mounting is tight.7. Replace electronic ignitor.
Motor does not start when heater is plugged in, fan rotates slowly or does not turn.	<ol style="list-style-type: none">1. Flame-out control not reset2. Binding pump rotor	<ol style="list-style-type: none">1. Press flame-out control reset button.2. If fan is hard to turn, see <i>Pump Rotor</i>, page 8.

35,000, 50,000, And 55,000 Btu/Hr PORTABLE FORCED AIR HEATERS

SERVICE PROCEDURES

Continued

PUMP ROTOR (Procedure if Rotor is Binding)

1. Remove upper shell (see *Upper Shell Removal*, page 6).
2. Remove filter end cover screws using 5/16" nut-driver.
3. Remove filter end cover and air filters.
4. Remove pump plate screws using 5/16" nut-driver.
5. Remove pump plate.
6. Remove rotor, insert, and blades.
7. Check for debris in pump. If debris is found, blow out with compressed air.
8. Install insert and rotor.
9. Check gap on rotor. Adjust to .003"/.004" if needed (see Figure 17).
10. Install blades, pump plate, air filters, and filter end cover.
11. Replace fan guard and upper shell.
12. Adjust pump pressure (see *Pump Pressure Adjustment*, page 6).

Note: Rotate rotor one full turn to insure the gap is .003"/.004" at tightest position. Adjust if needed.

Note: If rotor is still binding, proceed as follows.

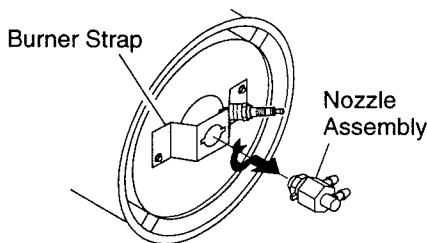


Figure 14 - Removing Nozzle Assembly

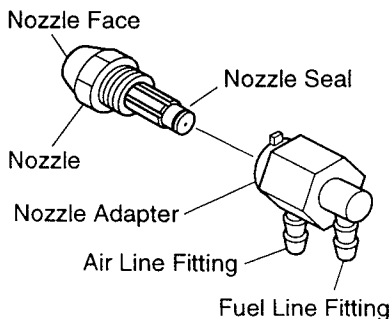


Figure 15 - Nozzle and Nozzle Adapter

13. Perform steps 1 through 6 (see above).
14. Place fine grade sandpaper (600 grit) on flat surface. Sand rotor lightly in "figure 8" motion four times (see Figure 18).
15. Reinstall insert and rotor.
16. Perform steps 10 through 12 above.

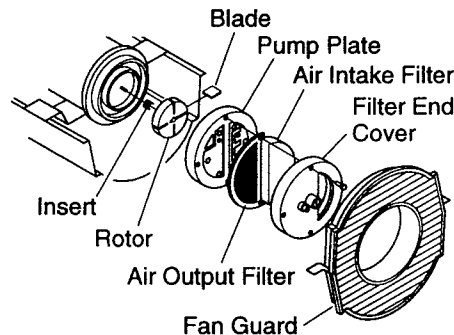


Figure 16 - Rotor Location

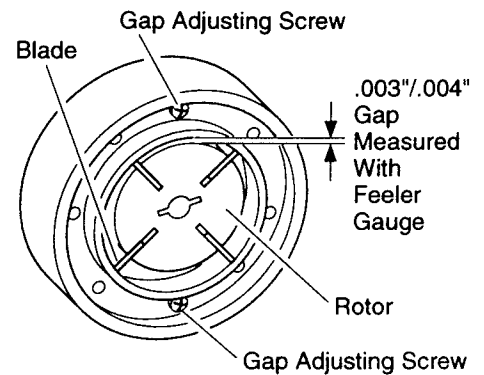


Figure 17 - Gap Adjusting Screw Locations

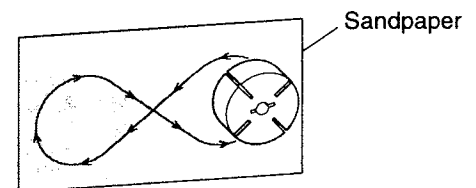
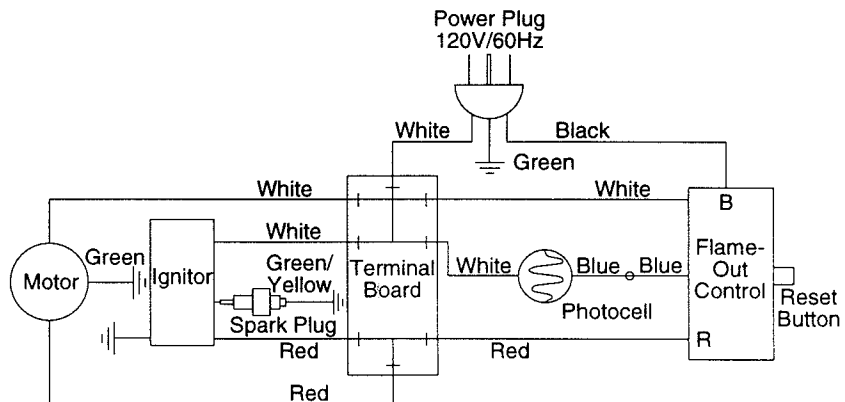


Figure 18 - Sanding Rotor

WIRING DIAGRAM



SPECIFICATIONS

Output Rating (Btu/Hr.)	35,000	50,000	55,000
Fuel	Use Only Kerosene or No. 1 Fuel Oil		
Fuel Tank Capacity (U.S. Gal.)	3.0	4.0	5.0
Fuel Consumption (Gal. Per Hr.)	.26	.40	.40
Electric Requirements	120 V/60 Hz (Same All Models)		
Amperage (Normal Run)	2.0	2.0	2.0
Hot Air Output (CFM)	165	175	175
Motor RPM	1725	1725	1725
Motor HP	1/15	1/15	1/15
Shipping Weight (Approximate Pounds)	34	35	36
Heater Weight without Fuel (Approximate Pounds)	29	30	31

OWNER'S MANUAL

TECHNICAL SERVICE

You may have further questions about installation, operation, or troubleshooting.

If so, contact DESA International's Technical Service Department at 1-800-323-5190.

REPLACEMENT PARTS

Note: Use only original replacement parts. This will protect your warranty coverage for parts replaced under warranty.

PARTS UNDER WARRANTY

Contact authorized dealer from whom you purchased this product. If they cannot supply original replacement part(s), call DESA International's Technical Service Department at 1-800-323-5190 for referral information.

When contacting your dealer or DESA International, have ready:

- your name
- your address
- model number of your heater
- how heater was malfunctioning
- purchase date

Usually, we will ask you to return the defective part to the factory.

PARTS NOT UNDER WARRANTY

Contact authorized dealers of this product. If they cannot supply original replacement part(s), call DESA International's Parts Department at 1-800-972-7879 for referral information.

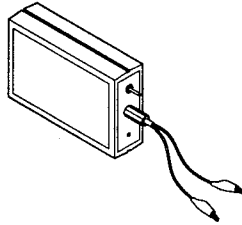
When calling DESA International, have ready:

- model number of your heater
- the replacement part number

ACCESSORIES

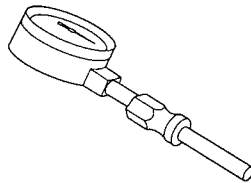
Purchase accessories and parts from your nearest dealer or service center. If they can not supply these accessories or parts, either contact your nearest Parts Central or DESA International for referral information. Parts Centrals are listed in the Authorized Service Center booklet supplied with heater.

DESA International
P.O. Box 90004
Bowling Green, KY
42102-9004
1-800-972-7879
Parts Department



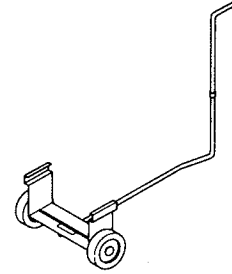
FLAME-OUT CONTROL/PHOTOCELL TESTER - HA1170

Special tool used to test the flame-out control and photocell.



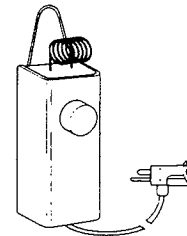
AIR GAUGE KIT - HA1180

Special tool to check pump pressure.



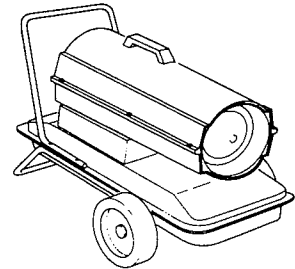
STANDARD WHEELS AND HANDLE KIT - HA1206

Makes heater even more portable and convenient. Easy to assemble.



THERMOSTAT KIT - HA1210

Keeps your building at the temperature you select day and night. Helps economize on fuel.



HEAVY DUTY WHEELS AND HANDLE KIT - HA1202

For heavy duty applications. Makes your heater even more portable and convenient.

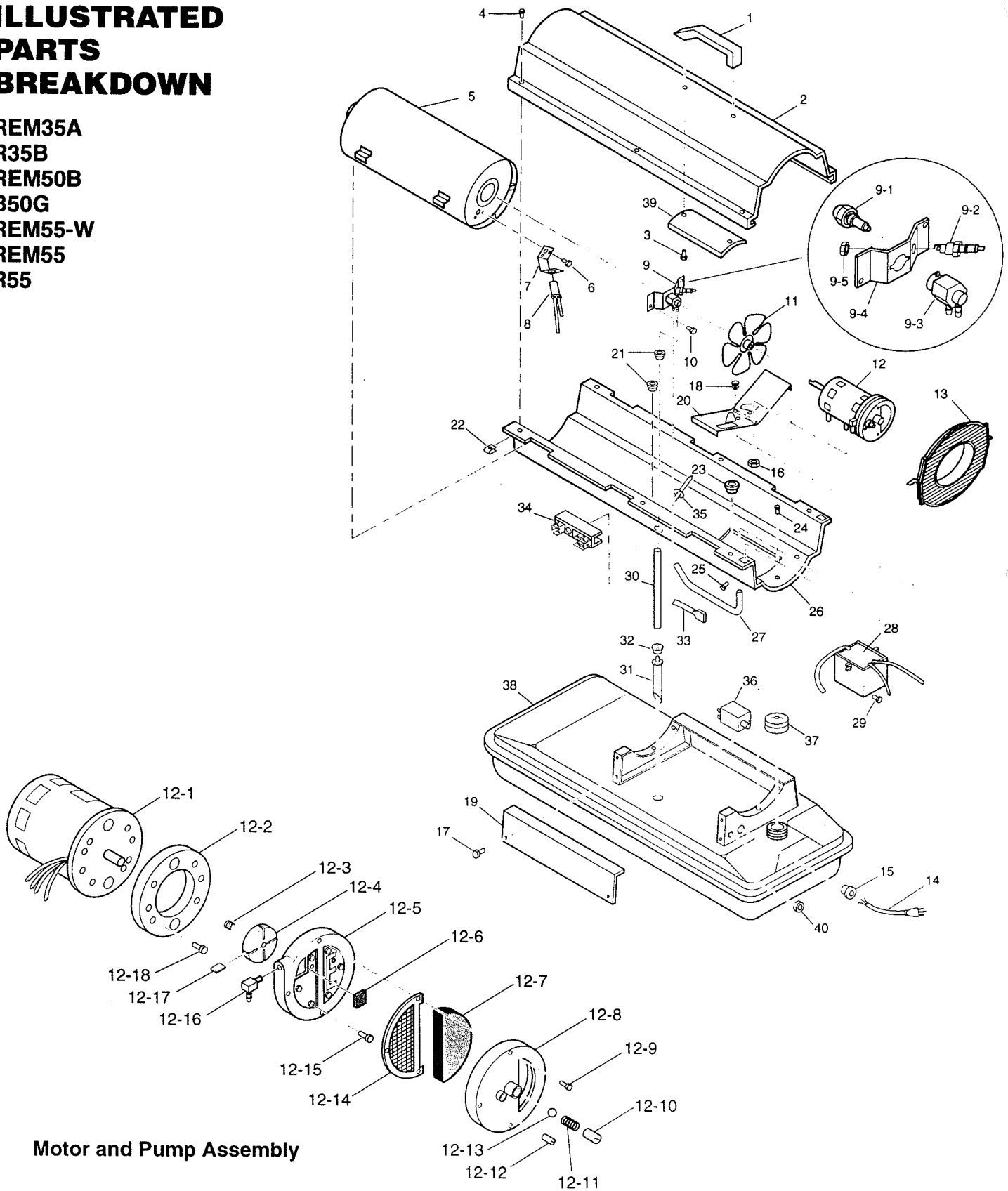
MAINTENANCE KITS

Btu/Hr	35,000	50,000	55,000
Flame-Out Control Part No.	HA3003	HA3003	HA3003
Spark Plug Part No.	HA3013	HA3013	HA3013
Filter Kit Part No.	HA3014	HA3014	HA3014
Nozzle Kit Part No.	HA3006	100735-17	100735-17
Rotor/Air Pump Kit Part No.	HA3004	HA3005	HA3005
Photocell Part No.	HA3019	HA3019	HA3019
Pump Adjustment Part No.	HA3020	HA3020	HA3020
Fuel Tank Filter Screen	HA2210	HA2210	HA2210

35,000, 50,000, And 55,000 Btu/Hr PORTABLE FORCED AIR HEATERS

ILLUSTRATED PARTS BREAKDOWN

REM35A
R35B
REM50B
B50G
REM55-W
REM55
R55



Motor and Pump Assembly

OWNER'S MANUAL

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.

REM35A, R35B

REM50B, B50G

REM55-W, REM55, R55

KEY NO.	PART NUMBER	DESCRIPTION	QTY.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.
1	M51104-01	Handle	1	13	M51105-01	Fan Guard	1
2	098511-36	Upper Shell (white)	1	14	098219-18	Power Cord	1
	098511-54	Upper Shell (yellow)	1	15	M11143-1	Strain Relief Bushing	1
	098511-67	Upper Shell (black)	1	16	NTC-4C	Hex Lock Nut, 1/4-20	2
3	M11084-29	Screw, #10-16 x 3/4"	2	17	M11084-26	Screw, #10-16 x 3/8"	2
4	100647-01	Screw, #10-16 x 1/2"	6	18	M50631	Rubber Bumper	2
5	098512-40	Combustion Chamber (35 model)	1	19	M50899-03AA	Side Cover	1
	098512-32	Combustion Chamber (50/55 models)	1	20	101205-01	Motor Bracket	1
6	M10908-2	Screw, #6-32 x 3/8"	2	21	M30865-02	Bushing	2
7	M16660	Photocell Bracket	1	22	M11271-8	Clip Nut	6
8	HA3019	Photocell Assembly	1	23	M50104-02	Bushing	1
9	***	Burner Head Assembly	1	24	M11084-26	Screw, #10-16 x 3/8"	6
9-1	HA3006	Nozzle (35 model)	1	25	M10908-14	Screw, #8-32 x 3/8"	1
	100735-17	Nozzle (50/55 models)	1	26	098511-18	Lower Shell (white)	1
9-2	HA3013	Spark Plug	1		098511-12	Lower Shell (yellow)	1
9-3	079980-01	Nozzle Adapter	1	27	098511-81	Lower Shell (black)	1
9-4	097124-01	Bracket	1	28	M29652-04	Rubber Airline	1
9-5	M29824	Nut, 14 mm	1	29	102482-01	Ignitor Kit	1
10	M11084-26	Screw, #10-16 x 3/8"	2	30	M11084-29	Screw, #10-16 x 3/4"	2
11	M30884	Fan	1	31	M29652-05	Fuel Line (35 model)	1
12	***	Motor and Pump Assembly	1		079973-01	Fuel Line (50/55 models)	1
12-1	102001-01	Motor	1		M50876-04	Fuel Filter (35 model)	1
12-2	079975-02	Pump Body (35 model)	1	32	M50876-02	Fuel Filter (50 model)	1
	079975-03	Pump Body (50/55 models)	1		M50876-05	Fuel Filter (55 model)	1
12-3	M22009**	Insert	1	33	M10990-3	Rubber Bushing	1
12-4	M22456-1	Rotor (35 model)	1	34	M16841-57	Wire Assembly (Red, 6")	1
	M22456-2**	Rotor (50/55 models)	1	35	099125-02	Terminal Board	1
12-5	M29608	Pump End Cover	1	36	099157-01	Rivet	1
12-6	M29632**	Lint Filter	1	37	HA3003	Flame-Out Control	1
12-7	M29633**	Intake Filter	1	38	097702-01	Fuel Cap (Includes Gasket)	1
12-8	M29609	Filter End Cover	1		098513-23	Fuel Tank (35 model)	1
12-9	M12461-31	Screw, #10-32 x 1"	3		098513-27	Fuel Tank (50 model)	1
12-10	M27694**	Adjusting Screw	1		098513-24	Fuel Tank (55 model)	1
12-11	M10993-1**	Pressure Relief Spring	1	39	M51108-01	Shell Heat-Shield	1
12-12	M22997**	Plug	1	40	099177-01	Hex Nut	1
12-13	M8940**	Steel Ball, 1/4" Diameter	1	PARTS AVAILABLE - NOT SHOWN			
12-14	M29612-01**	Output Filter	1		097204-01	Tradename Decal (R35B)	2
12-15	M12461-31	Screw, #10-32 x 1"	6		097204-08	Tradename Decal (R55)	2
12-16	M50016	Elbow, 90°	1		097764-01	Tradename Decal (REM35A)	2
12-17	M8643	Blade (35 model)	4		097764-02	Tradename Decal (REM50B)	2
	M8643-2**	Blade (50/55 models)	4		097764-05	Tradename Decal (REM55)	2
12-18	FHPF3-5C	Screw, #10-32 x 5/8" (35 model)	2		097646-01	Tradename Decal (B50G)	2
	FHPF3-6C	Screw, #10-32 x 3/4" (50/55 models)	2		098493-01	General Information Decal	1
					M9900-192	Combustion Chamber Grounding Wire	1

** See MAINTENANCE KITS, Page 9.

*** Not available as an assembly.

WARRANTY AND REPAIR SERVICE

LIMITED WARRANTY

DESA International warrants this product and any parts thereof, to be free from defects in materials and workmanship for one (1) year 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 and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

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. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA International will repair or replace the heater without charge.

REPAIR SERVICE

Return the heater to your nearest authorized service center. Repairs not covered by the warranty will be billed at standard prices.

Illustrated parts lists can be obtained free of charge. Send a self addressed stamped envelope to the address listed below. List the heater model number and the date located in the lower right corner of this page. A service manual may be purchased from the address listed below. Send a check for \$5.00 payable to DESA International.

When writing for information regarding your heater, be sure to include the model number and serial number as shown on the model plate.

Each Service Center is independently owned and operated. We reserve the right to amend these specifications at any time without notice.

KEEP THIS WARRANTY

Model No. _____

Serial No. _____

Date of Purchase _____

(To be filled in by purchaser)

DESA

INTERNATIONAL
Corporate Headquarters

2701 Industrial Drive
P.O. Box 90004
Bowling Green, KY 42102-9004



102437 01
NOT A UPC

For information, write: DESA International, P.O. Box 90004
Bowling Green, Kentucky 42102-9004 ATTN: Customer Service Department
When writing, always include model number and serial number.

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