Operating Manual
Oil Fired Heaters
B 70 / B 125

CE

Wilms

Perfection is our aim.

DECLARATION OF CONFORMITY

according to machine directive 89 / 392 / EEC

appendix II A

Structure of the machine
Mobile oil-fired heaters (with and without heat exchanger)

Description:

B 70 – B 125

is designed, constructed and manufactured in accordance with the above mentioned directive and the low voltage directive 73/23 EEC 93/68 EEC and also EMV 89/336 EEC.

The following harmonized standards have been used:

- EN 55014 EMC Requirements for electric tools and similar apparatus
- DIN EN ISO 12100-1 / 2 Safety of machines
- EN 294 - Safety of machines, safety distance
- EN 60204.1 Electr. equipment for industrial machines

Note: The observance of EN 294 refers only to the protection against accidental contacts of the fan. For the complete fulfillment of EN 294 the user resp. installer is responsible.

The following national standards, directives and specifications have been used:

DIN EN 13842 Mobile oil-fired heaters (with and without heat exchanger).

Mönchengladbach,

25.01.2010 Managing Director

Place, Date Signature

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IMPORTANT NOTICE!

1. Use only clean (if possible filtered) Heating oil EL (Diesel).

2. Clean fuel filter regularly.

ATTENTION

Notice, that Heating oil EL changes viscosity in low temperature.

When ordering spare parts please name the type, serial number of heater and the part number, otherwise a correct delivery is not possible.

The admissible ambient temperature for securing the function of the control is -15 °C and max. +50 °C. This is to be especially taken into consideration whilst drying grain or using the heater outdoors. The heater resp. the flame control has to be protected against direct influence from bright sun light.

Technical specifications are subject to changes without notice.

Read carefully before starting your heater

IMPORTANT NOTICE

This unit is a direct fired space heater.
The heater may not be set up near explosive or flamable materials and may not be used in explosion or fire endangered rooms. It may also not be used in areas with high dust development. The heater should be positioned at adequate distance to flamable material such as wood etc. It is essential that there is a sufficient ventilation of the room. The heater may not be worked on or transported during operation.

When using these air heaters the relevant regulations for use of such heaters have to be obbeyed as well as the instruction and service directions and the local fire protection regulations.

It is essential that there is a sufficient ventilation of the room.

- For the combustion sufficient natural air exchange is given if for example the volume in m^3 equals minimum 30 times the rated capacity in kW of all machines operated in the room and a natural ventilation through windows and doors is secured, or

- not lockable openings for incoming and outgoing air are existing near ceiling and bottom whose size in m^2 equals minimum the 0.003 times rated capacity in kW of all machines operated in the room.

An excessive concentration of health endangering materials in the air will not be reached as long as the MAK values have not been reached and the oxygen concentration is more than 17 Vol.-%.

The heaters may be operated only by people who have been instructed in the use. This can be done also with the instruction manual.

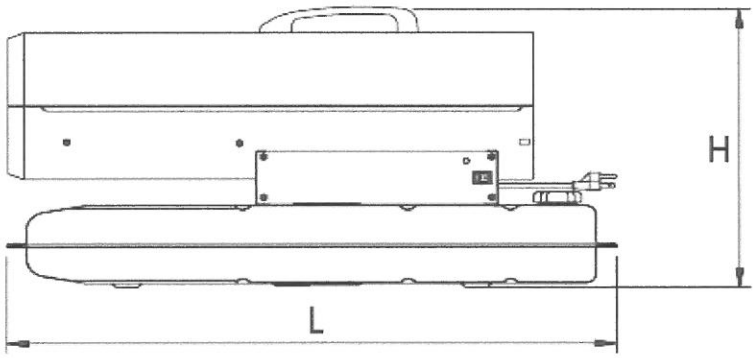
Instructed persons are those who have been informed about their duties and the possible dangers in case of misuse of the heater.

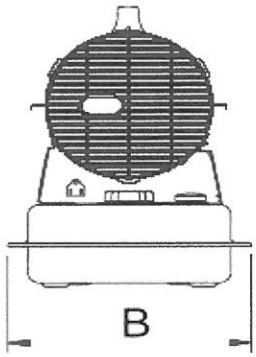
Repairs and service of electric components may be carried out by electrical specialists only.

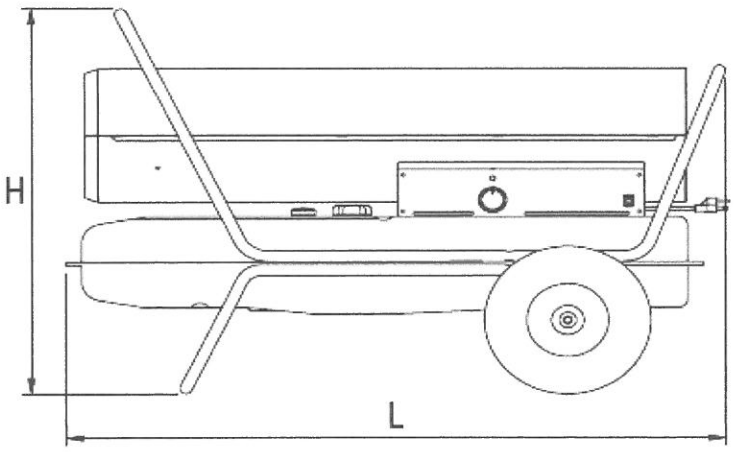
On construction sites the heater may generally be used only via a special socket, in general a distributor with FI protection switch (VDE 0100/5.73 § 55).

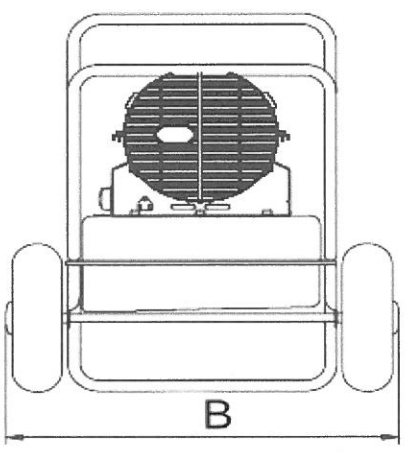
Mobile heaters have to be checked minimum once a year by an instructed person for possible faults. The results of this check have to be written down and kept until the next examination.

TECHNICAL DATA			
Type	B 70		B 125
Voltage	230 V		
	50 Hz		
Rated current	1,5 A		2,3 A
	93,3 W		149 W
Heating capacity	20,5 kW		40 kW
Air volume	410 m³/h		920 m³/h
Max. fuel consumption (35 SEC, Oil or Paraffin)	1,58 kg/h		3 kg/h
Fuel	Heating oil EL		
	IP 44		
Dimensions (L x W x H)	762 x 305 x 381 mm		990 x 584 x 660,5 mm
Weight dry	13 kg		24 kg
Tank Capacity	19 ltr.		38 ltr.
Cone Ø mm	200 mm		230 mm



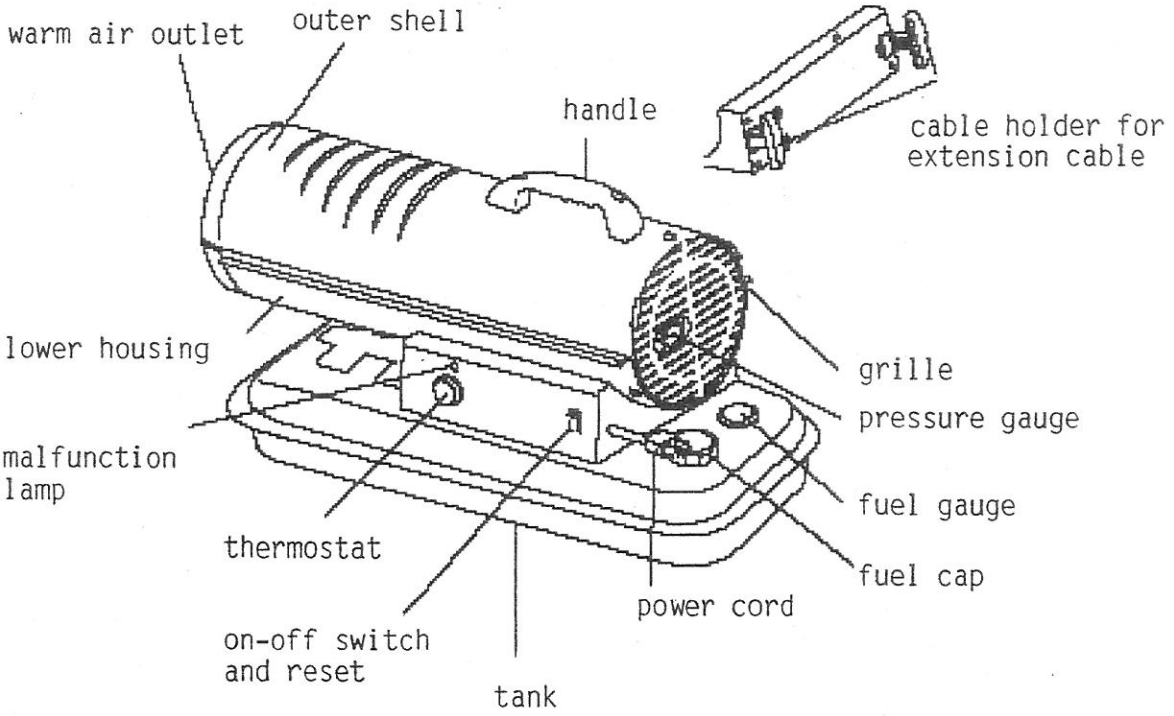




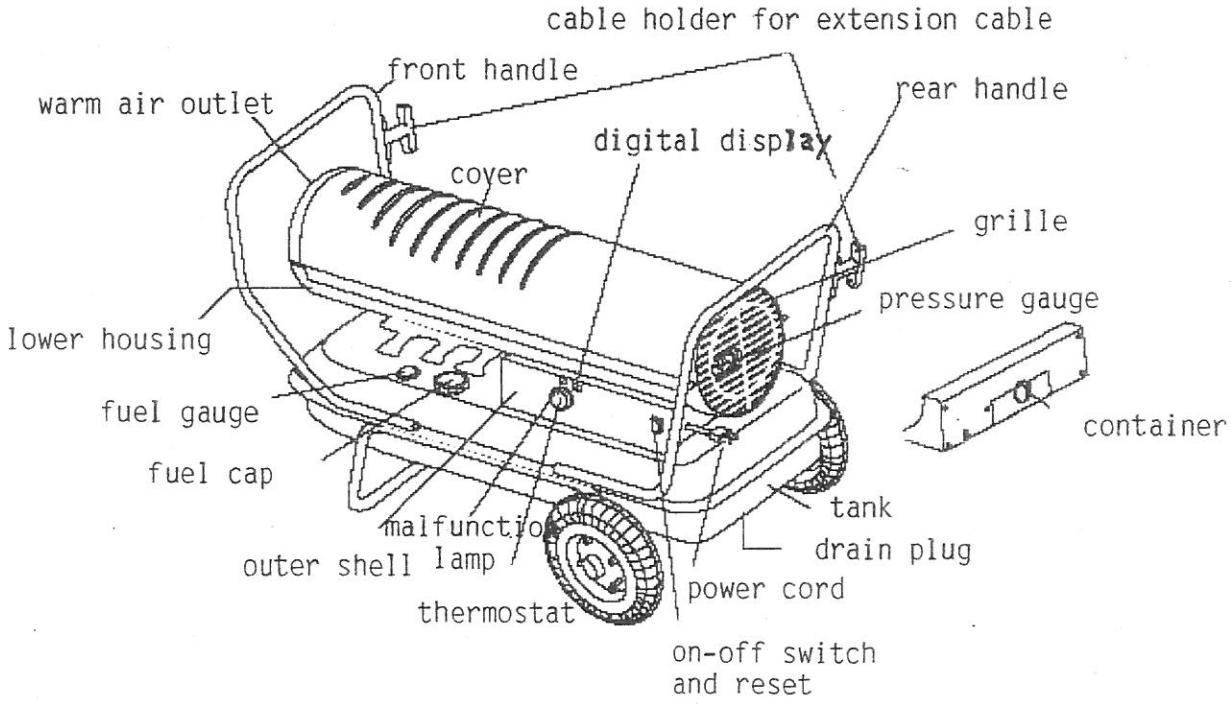


Unit structure

B 70



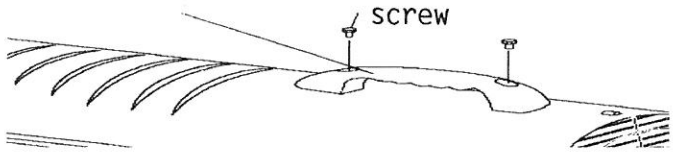
B 125

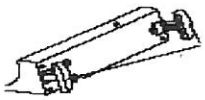


Assembly

B 70

Attach the handle with the screws provided in the corresponding holes in the hood.
The cable holder can be mounted on the right side of the housing as shown in the figure.

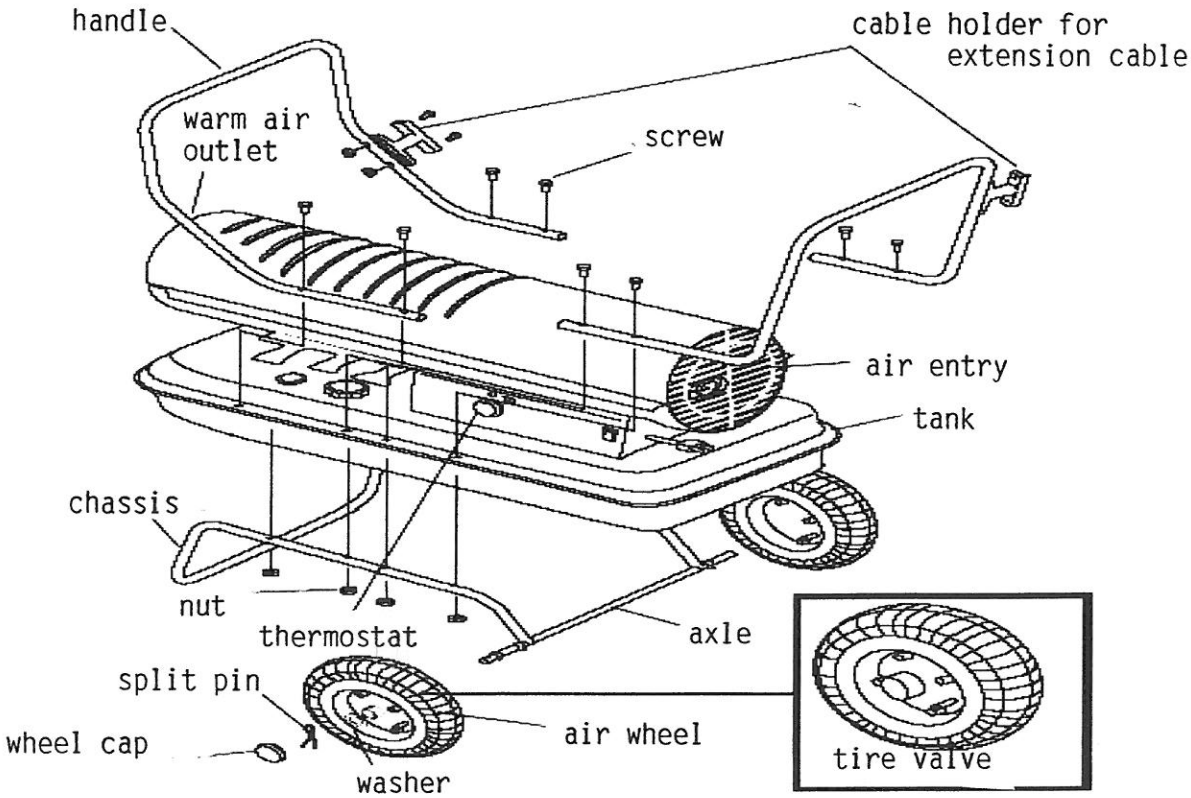




cable holder for extension cable

B 125

1.) Push the axle through the chassis.
2.) Slide on the wheels from the outside. Make sure that the air valves show to the outside.
3.) Add a washer on both sides and secure the wheel with a split pin.
4.) Push both wheel caps on the axle.
5.) Place the heater on the chassis so that the holes on the side of the tank match the holes in the chassis and that the air entry is on the rear side (at the wheels).
6.) Fasten the handle with the bolts and nuts through the holes in the side of the tank and chassis.
7.) Then mount the rear handle in the same mannor.
Attention! The front handle is longer than the rear handle.
8.) The cable holders for the extension cable can be fastened in the holes of the handles at the front and rear.



1. Functioning

The function of the portable heaters is easy to understand. The structure is divided into three systems.

1.1 Fuel system

A small compressor driven by the motor via the drive shaft presses compressed air through the nozzle. The vacuum which is created in the nozzle basket sucks fuel out of the tank. The fuel air mixture is injected into the combustion chamber in a very fine spray.

1.2 Ignition system

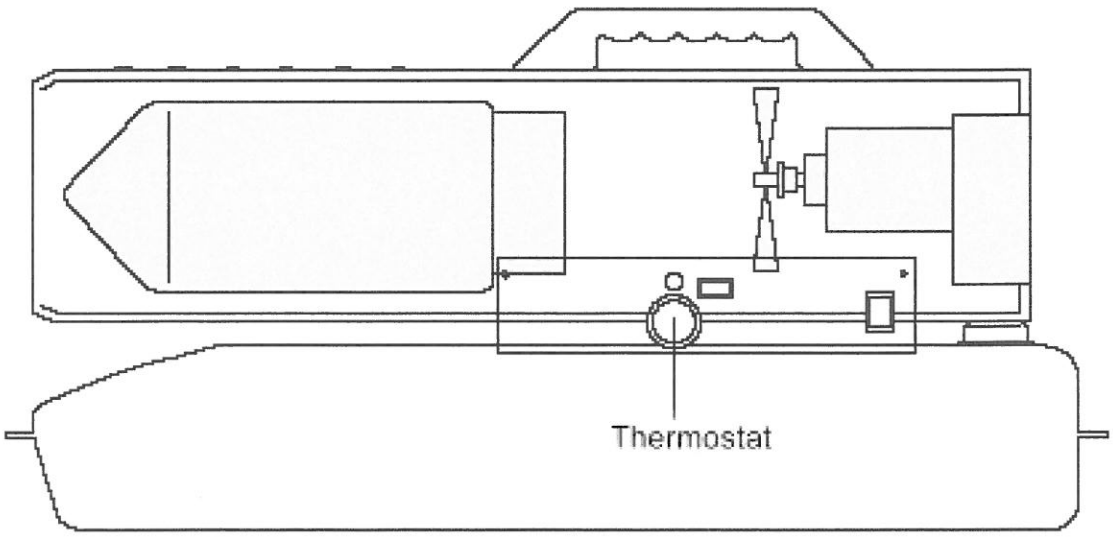
The light arc of the electrodes ignites the fuel-air mixture.

1.3 Air system

An axial fan mounted on the extended shaft generates the air volume of the heater. A part of this air reaches the combustion chamber via air flaps and slits. Practically formed segments of the nozzle basket let the incoming air whirl around the nozzle. The in that way reached good mixture of fuel and air guarantee a complete combustion. The remaining air from the fan is forced around the combustion chamber, is heated and is mixed at the air outlet with the air coming out of the combustion chamber to the hot air stream (picture 1).

1.4 Control

The heaters are equipped with a flame control, an overheating safety device and a built-in room thermostat. With this you can preset the desired room temperature. The control itself is secured by a fuse.



2. Operation notes

2.1 Fuel

Pay attention to a clean tank. Use only clean filtered Heating oil EL or kerosene. Other kinds of fuel may create malfunctions.

2.2 Starting

Put plug in a 230 Volt socket. Set on-off switch to position „ON“. Preset desired temperature on the thermostat.

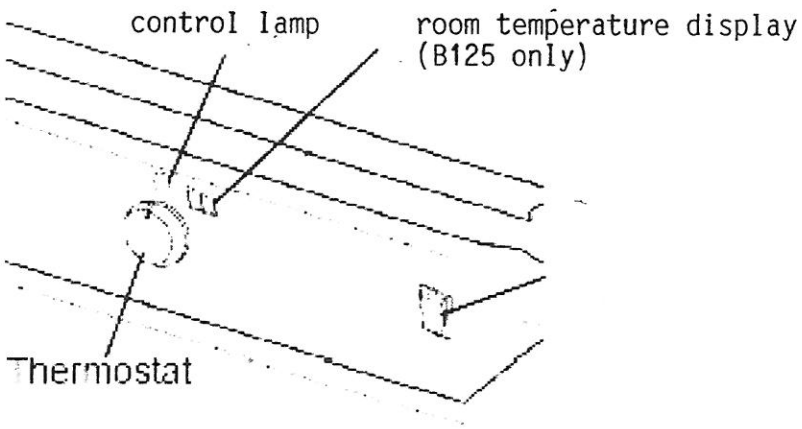
Attention! B 125 only:

A digital display on the heater shows the actual room temperature between a range of -17°C and + 37°C. Is the temperature lower the display shows „LO“, is the temperature higher the display shows „HI“.

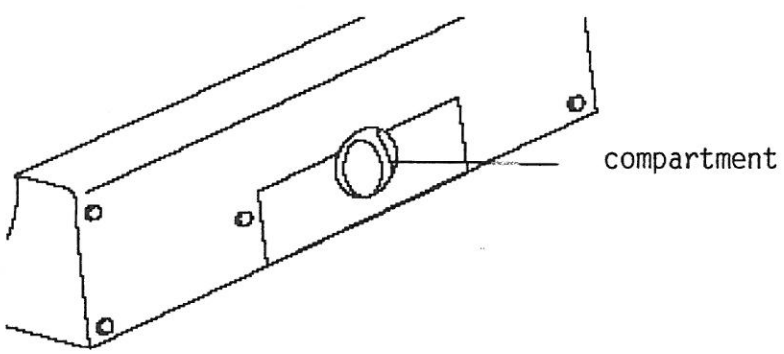
If the heater does not ignite the flame control will automatically set the heater on misfire after 10 seconds. The heater shuts off and the control light flashes. Wait a few minutes before you push the on-off switch again.

2.3 Stopping

Set the main switch the position „OFF“ (Cooling of the heater is not necessary).



The B 125 has on the right hand side a small compartment.



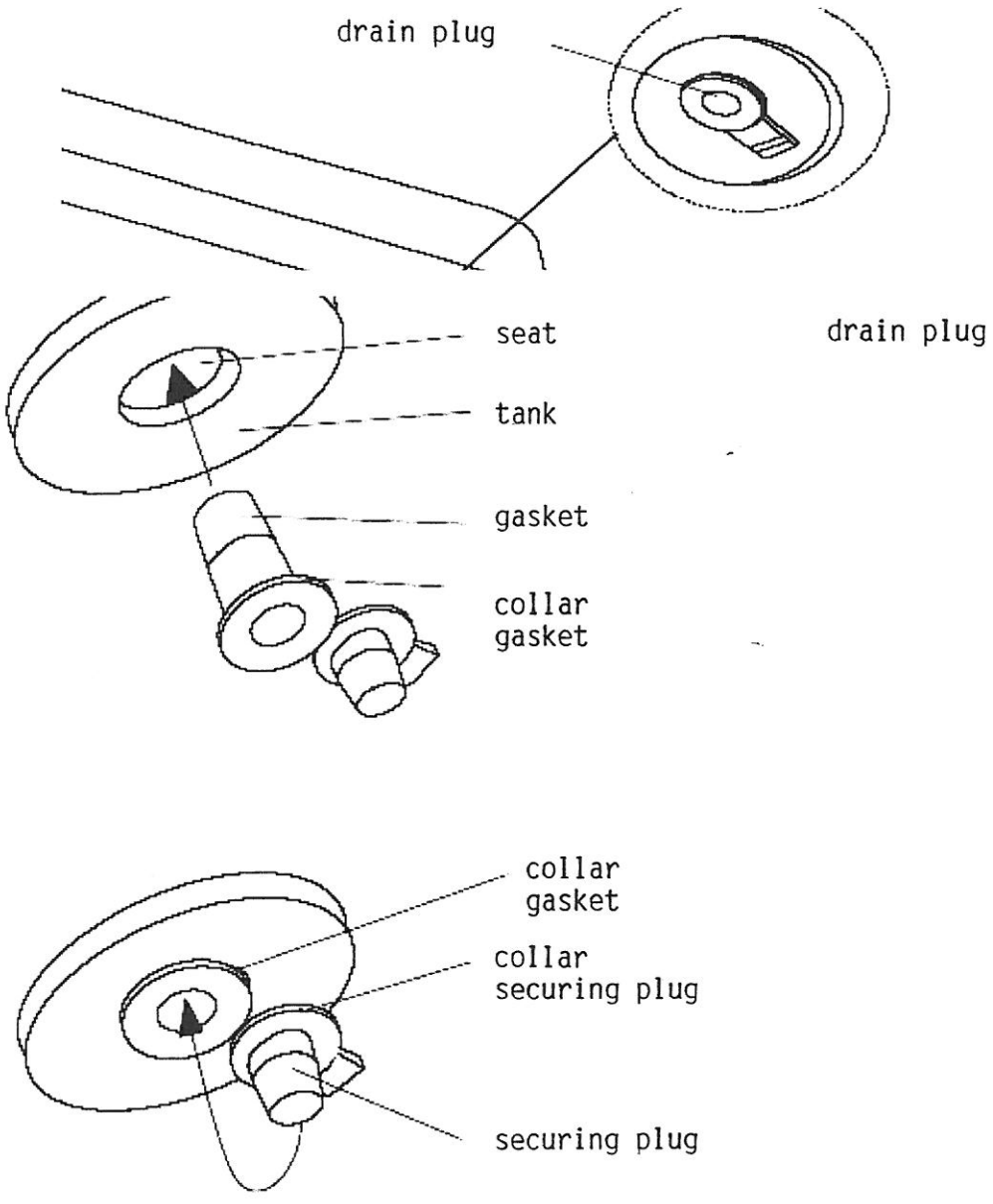
3. Fuel tank

After approximately 250 operating hours or a longer stopping period drain the tank and clean it with clean fuel.

The model B 70 has to be drained through the filler cap.

On the model B 125 you find on the bottom side a drain plug. In order to remove it you take the strip and pull it out. Then you can remove the complete plug. Collect the old fuel in a container and dispose it according to the regulations.

Then put the plug in reverse sequence in position again and press in securing plug. (Refer drawing)



Store the heater in a dry, dustfree and well vented surrounding.

4. Maintenance and checks

Before any repair or service pull the power plug!

In case your heater should fail in spite of thorough service please refer to chapter 5 „Possible faults and remedies".

4.1 General

This chapter covers the exchange of spares and the repair of the heater. Parts orders can be easily made according to the drawings and parts lists. Please give type of heater, part number and description of the spares.

4.2 Take off the housing

ATTENTION: Pull power plug!

For service it is necessary to open the heater. Therefore loosen the screws on the side. Top cover can now be raised.

4.3 Suction filter

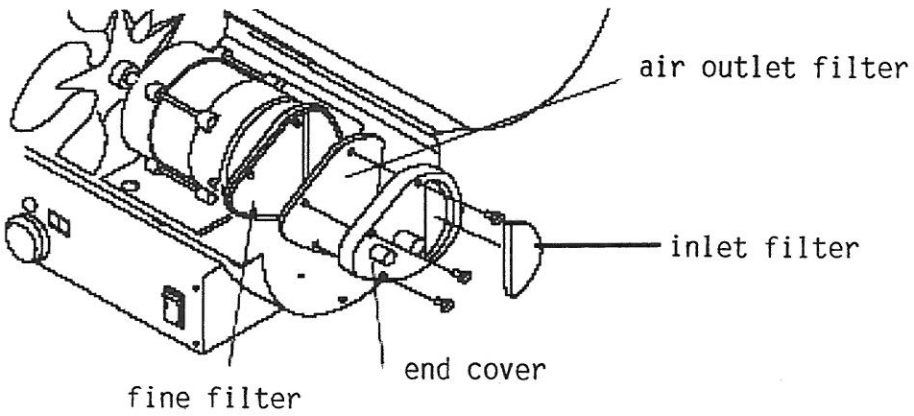
Check and clean the filter regularly. A cleaning is necessary as soon as the filter shows a dust film.

For cleaning simply take the filter out of the housing and wash it. Let it dry well before replacing.

ATTENTION: Keep the filter free from oil.

4.4 Delivery filter

Replace this filter before every heating period.
ATTENTION: Cleaning or exchanging of the air filter may change the air pressure. If the heater does not burn impeccably the air pressure has to be reset.



4.5. Air compressor

Let the air compressor repair only by an expert. The compressor consists of a rotor with 4 carbon blades. The rotor is fastened on the motor shaft with a driver and rotates in a housing ring.

This ring is excentrically mounted with 2 screws to the motor bearing cover which formes the rear end of the compressor. In front the compressor is closed by the backside of the filter housing which is mounted with 4 screws and has the suction- and outlet opening. From the outlet bore a hose leads the compressed air to the nozzle blast. The air outlet filter is located in the filter housing. It is sealed by the cover with the bore for the gage and the release valve with regulating screw. The flat grounded surfaces of the compressor parts and the number of screws guarantee a good sealing without extra seals or glue. All compressor parts have very low tolerances and have to be treated carefully. Dirt and oil affect a good performance of the compressor.

1 Exchange of carbon blades.

Worn out or sticking blades cause a pressure loss. Blades which are worn out or sticking in the rotor slits have to be replaced.
Clean rotor and housing thoroughly and blow it out with compressed air before putting new blades in. Do not use any kerosene or Heating oil.

Place the blades so that the straights ends touch the housing ring.

2 Disassembling the compressor.

Remove air intake filter. Loosen the 4 screws, remove the cover and take out air outlet filter. Remove hose clamp and pull off air hose. Loosen the 6 mounting bolts and the filter housing can be taken off.

Hold a clean cloth under the compressor in order to catch the carbon blades. Remove the two bolts and take off the housing ring.

The rotor with the driver can now be pulled off to the front.

3 Rotor installation.

Replace the rotor if its surface have deep scratches or unequal wear. Replace driver if it does not connect the rotor with the motor shaft solid. Push rotor together with the driver on the shaft.

4 Assembly of the compressor.

a) Place the driver in the rotor and push both on the motor shaft then fit the housing ring.

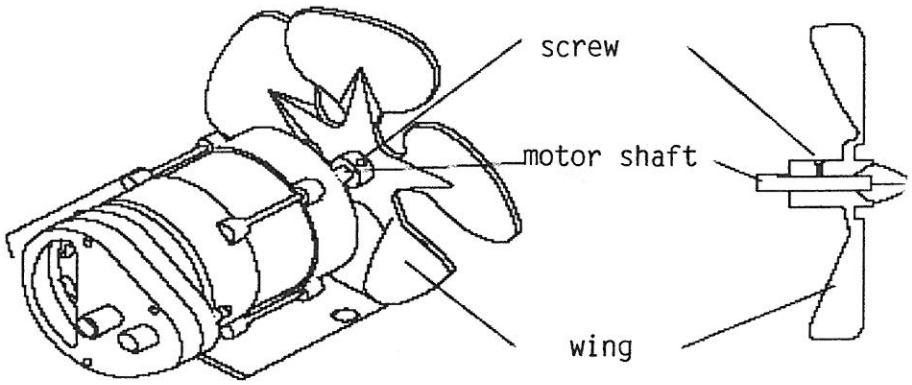
b) Adjust the housing ring so that the tightest air gap (top) has approx. 0,05 to 0,1 mm. Measure the air gap with a sliding calliper. Turn the motor by hand. It must rotate free. Tighten the housing screws.

c) Insert the carbon blades. Grind eventually stucking carbon blades with fine grinding paper (possible tolerances are around 0,01 mm).

d) Mount the filter housing, filter elements and lid thoroughly. Put the air hose back in place and secure it with the hose clamp.

4.6 Cleaning of the fan wings

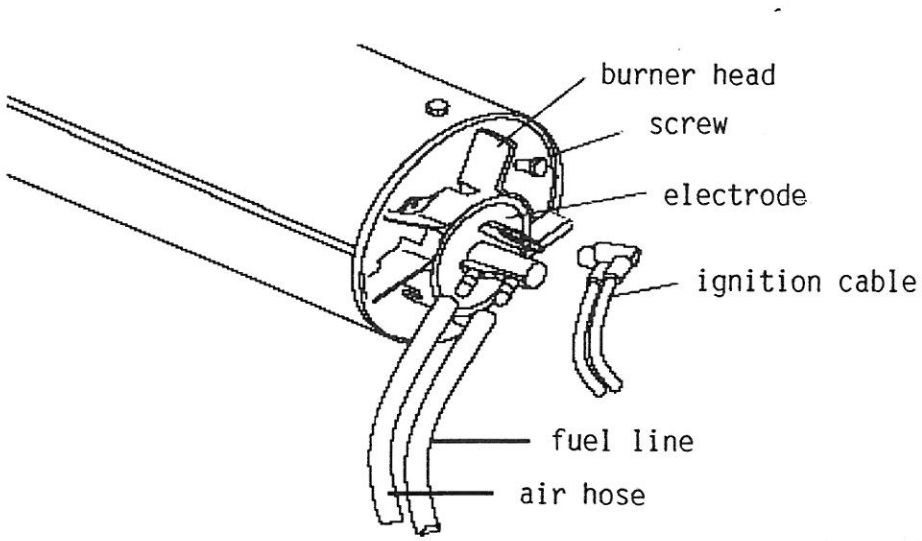
Clean the fan wings when they are covered with dust or show any corosion. Dirty wings influence the air capacity of the fan and therefore a troublefree operation of the heater.



4.7 Burner head, Cleaning and Disassembly

Pull power plug. Take out ignition cables. Loosen fuel line and air hose and remove hoses.

Take out the holding screw on top between the flaps of the burner head and take out burner head.



Remove ignition electrodes with holder by loosening the screw.

Remove nozzle with a socket spanner. Soak the nozzle and the burner head in an non flamable cleaning liquid, clean it with a brush and blow it dry with compressed air.

ATTENTION:

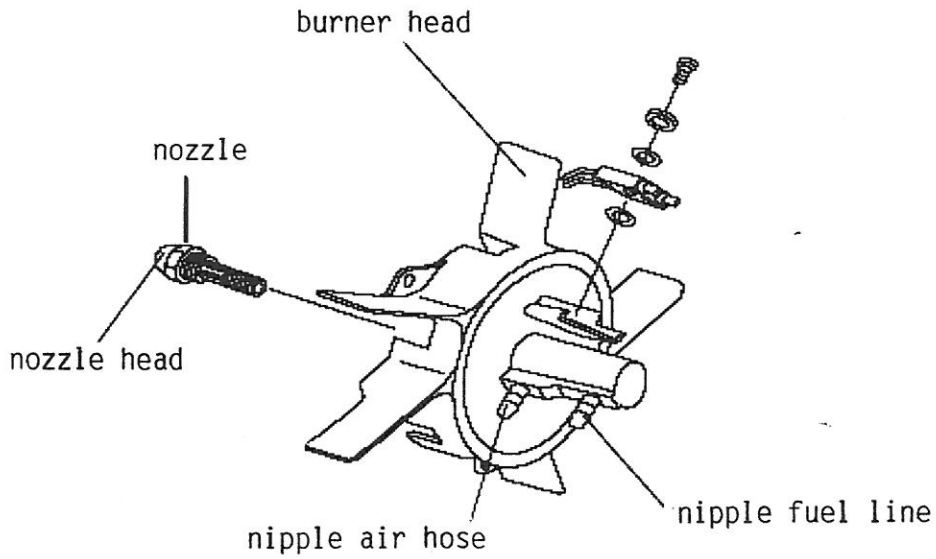
Do not try to clean the nozzle bore with a drill, wire or similar tool. Damages on form and size of the bore influence the vaporizing and therefore a clean combustion. Also disassembling the nozzle can influence the spray pattern of the nozzle. Keep the nozzle clean. Assure during a repair that the nozzle remains clean and undamaged. Work carefully, don't scratch or deform the nozzle by tightening it too much.

Replace defective nozzle. In order to clean the nozzle blow it out with compressed air from front to rear.

Adjust electrode distance after every repair or service.

Mount in reverse sequence. Watch for a tidy position of the nozzle basket on the combustion chamber (wrong air).

When mounting the ignition cables pay attention that the plugs catch properly.



4.8 Ignition transformer

ATTENTION: The transformer creates high voltage therefore pay special attention during testing.

Put power plug into a 230 V-alternating socket. Check the spark with a well isolated tool. Remove the ignition cable plug from the electrodes and hold the cable plugs with the inside (metal parts) together. A good transformer delivers a strong spark of about 8 – 10 mm, a defective one will not ignite.

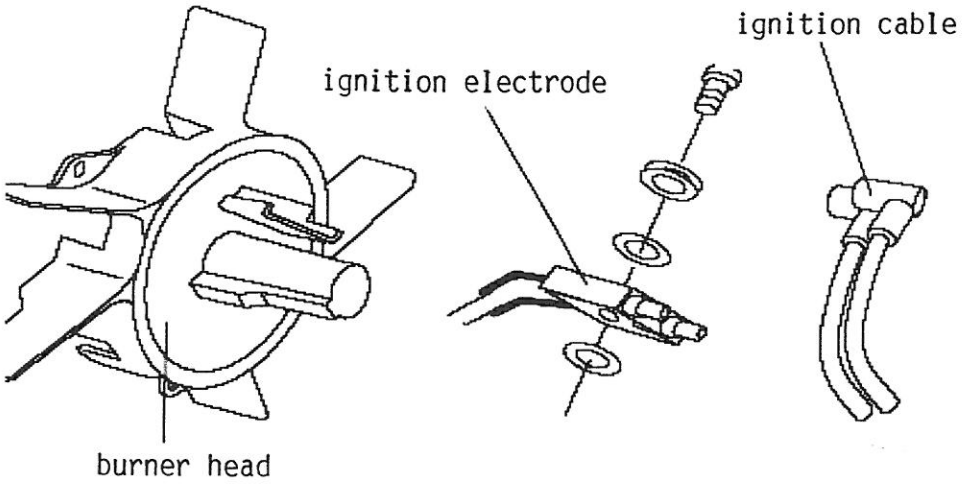
4.9. Ignition electrodes

ATTENTION: Pull power plug.

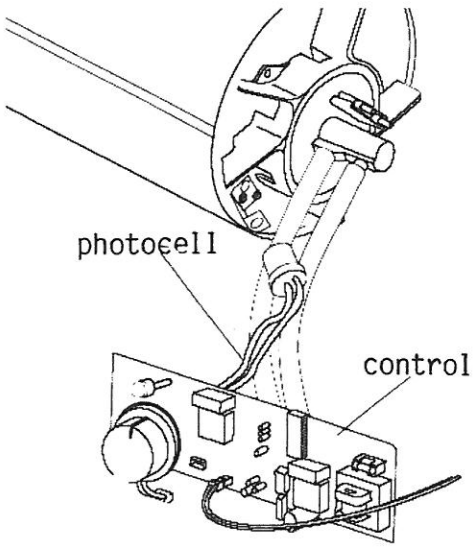
Ignition electrodes and ignition cable have high voltage.

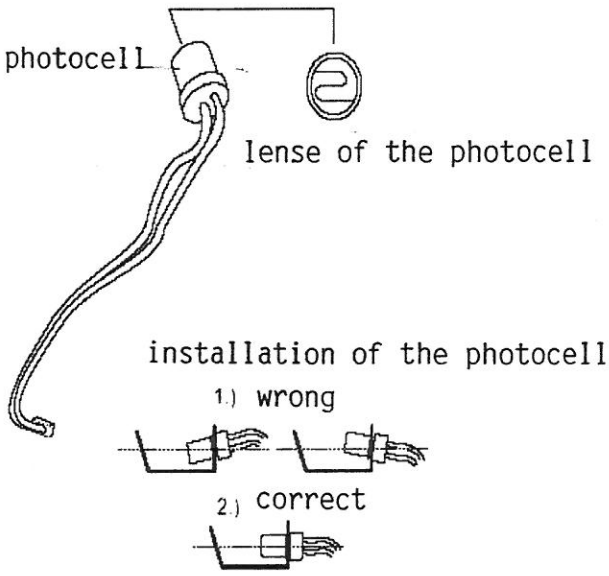
Remove ignition cable.

Remove the upper screw on the electrode holder, take out the electrodes and measure the distance. It should be 3 – 4 mm.



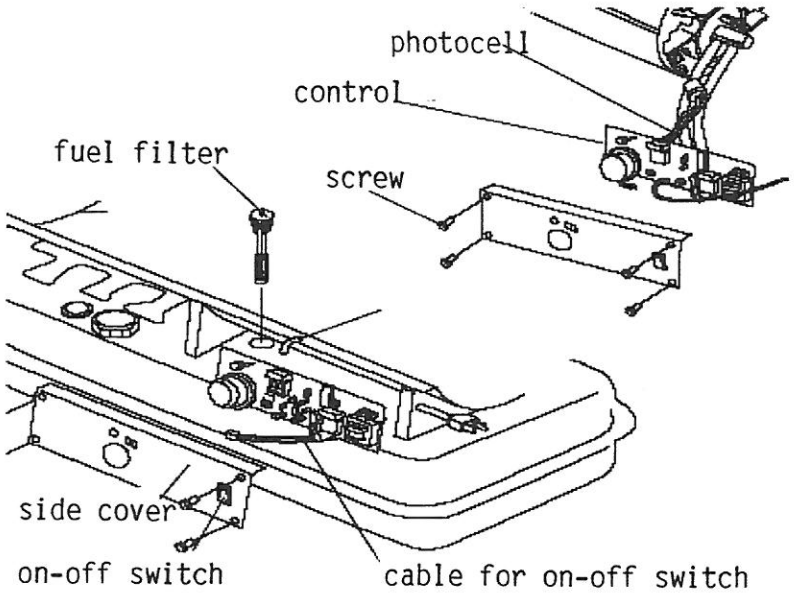
When assembling assure correct position of the photocell.





4.10 Cleaning of the fuel filters

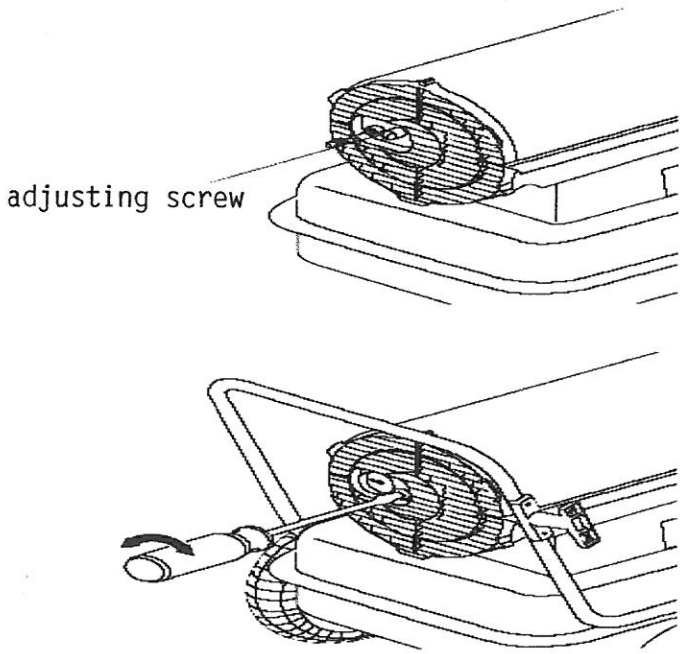
The fuel filter should be exchanged twice during the heating period. Depending on the dirt accumulation this can necessary more often.
In order to reach the fuel filter open the control box and take the control out. Then turn the filter 90° counterclockwise and clean the filter.
Assembly in reverse sequence.



4.11 Adjusting air pressure

Turn heater on, fuel tank should be full.

The compressor pressure must be 0,26 bar (3,7 psi).
The adjustment is made on the relief valve.
Clockwise turning increases the pressure,
counterclockwise turning reduces it.



4.12 Motor testing

If the motor does not start check as follows:

Turn the motor by hand. If the motor does not turn easily it is caused by a jam inside the compressor.

If the motor does not start or run free the motor is defective. Replace the motor.

4.13 Test run

After every repair or service the function of the heater has to be checked.

Fill the tank with clean heating oil EL or cerosine and let the heater run for some time. Assure trouble free operation before using the heaters.

Flame control

ATTENTION ! Pull power plug !

Test the flame control without fuel. Take out photocell and cover it by hand. Put power plug into socket. Heater must start. Hold photocell into daylight or under a lamp. If the heater runs continuously the photocell is all right. If the heater shuts off after approximately 10 seconds then the photocell is defective. Repeat this procedure with a new photocell. If the heater shuts off after 10 seconds again then also the control is defective and has to be replaced as well.

We reserve the right to alter specifications without notice.

5. Possible faults and remedies.

5.1 General

If the heater does not operate properly a check will be necessary.

5.2 Testing

1.) Check the fuel tank first. If you find water or dirt you have to assume a clogged nozzle or a clogged fuel filter.

2.) Assure by turning of the fan that the motor and air compressor run well. Heavy turning is the result of a defective motor bearing or dragging of the compressor rotor inside the housing.

3.) Check if the compressor, fan, and air filters are clean.

4.) Assure impeccable condition of the power plug and the electrical connections.

5.3 Test run

1.) Fill the cleaned tank with filtered fuel (minimum 10 litres).

2.) Clean the air intake filter.

3.) Put the power plug into a 230 Volt-alternating socket. The pressure gauge should show 0,26 bar (3,7 psi).

ATTENTION: Start heaters only with top cover mounted.

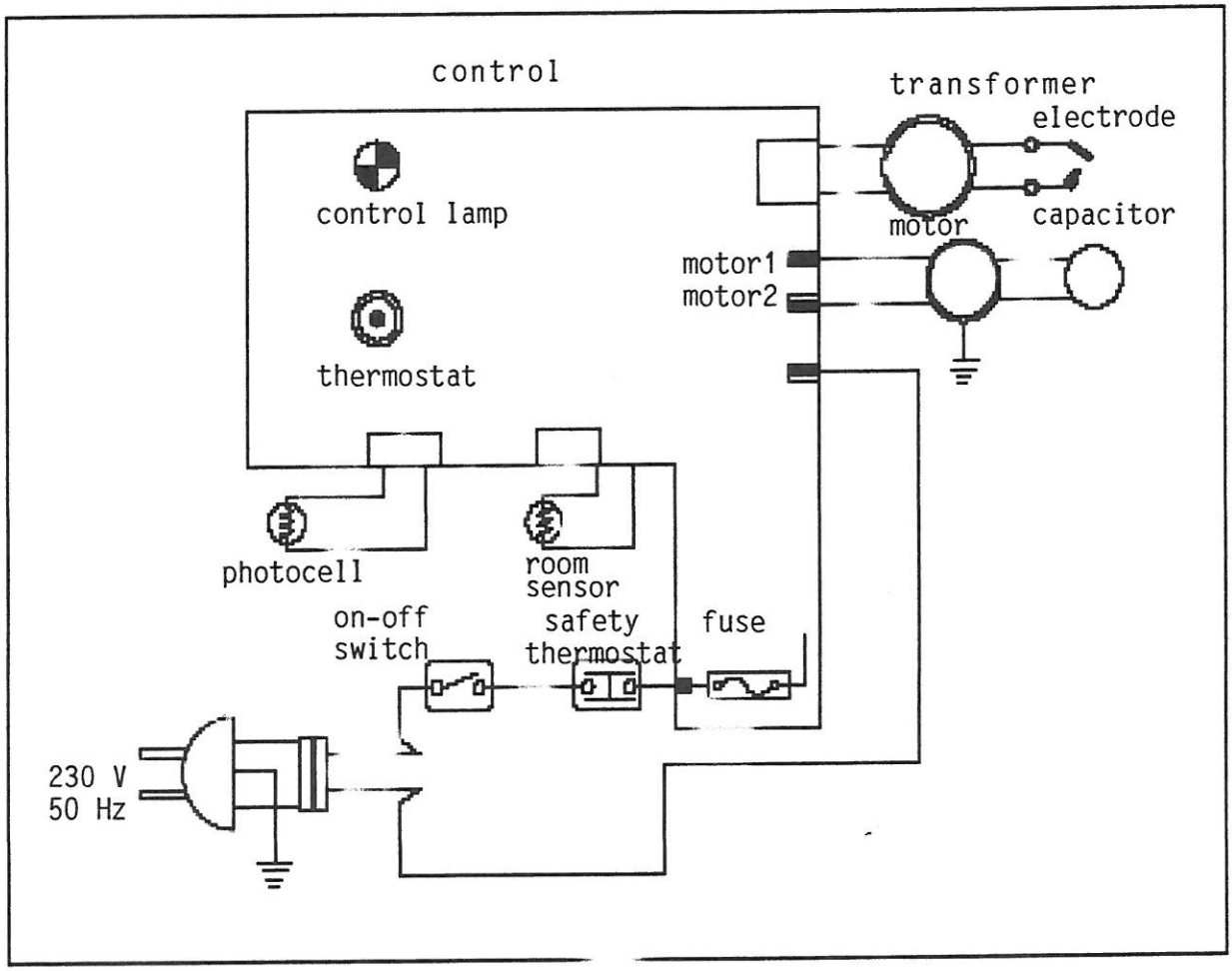
4.) Let the heater run approximately 15 minutes while watching.

5.4. Recognizing faults

When troubleshooting please consider that the air compressor and the air stream created by it are a part of the fuel system. The suction effect in the nozzle basket lifts the fuel out of the tank and the air stream presses it through the vaporizing nozzle.

Failure	Cause	Remedy
Heater runs but shuts down through the control after a short time. LED flashes and display shows „E1“.	1.) Wrong pump pressure. 2.) Dirty suction- or air outlet filter. 3.) Dirty fuel filter. 4.) Dirty nozzle. 5.) Lens of photocell dirty. 6.) Photocell positioned wrong. 7.) Photocell defective. 8.) Bad electrical connection between photocell and controll.	1.) Adjust pump pressure. (page 14) 2.) Clean/replace filter. (page 9) 3.) Clean/replace fuel filter. (page 14) 4.) Clean/replace nozzle. (page 11) 5.) Clean/replace photocell. (page 13) 6.) Adjust photocell. (page 13) 7.) Replace photocell. (page 13) 8.) Check connections according to wiring diagram. (page 18)
Heater does not run or just for a short time. LED flashes and display shows „E1“.	1.) Fuel tank empty. 2.) Wrong pump pressure. 3.) Dirty worn or wrong adjusted electrodes. 4.) Dirty fuel filter. 5.) Dirty nozzle. 6.) Water in fuel tank. 7.) Bad electrical connection between transformer and control. 8.) Ignition cable not connected. 9.) Defective electrode or transformer.	1.) Fill tank with clean Heizöl. 2.) Adjust pump pressure. (page 14) 3.) Clean/replace electrode. (page 13) 4.) Clean/replace fuel filter. (page 14) 5.) Clean/replace nozzle. (page 11) 6.) Clean/replace tank and fill with clean Heizöl. (page 8) 7.) Check electrical connection according to wiring diagram. (page 18) 8.) Connect ignition cable. (page 11) 9.) Replace electrode or transformer.
Fan does not run. Switch is „on“. LED flashes or is „on“. Display shows „E1“ or „E2“.	1.) Thermostat setting is too low. 2.) Power supply to motor is interrupted.	1.) Set thermostat to higher temperature. 2.) Check power supply.
LED flashes. Display shows „E3“.	1.) Thermostat defective.	1.) Replace thermostat.
Bad combustion or development of soot.	1.) Dirty air intake- or air outlet filter. 2.) Dirty fuel filter. 3.) Dirty fuel. 4.) Pressure too high or too low.	1.) Clean/replace air filter. (page 9) 2.) Clean/replace fuel filter. (page 14) 3.) Clean tank and fill it with clean Heizöl. 4.) Set pressure properly. (page 14)
Heater does not run and no display.	1.) Safety thermostat has shut off. 2.) No electricity. 3.) Defective fuse. 4.) Electrical supply interrupted.	1.) Shut off heater and let it cool for approximately 10 minutes. Reset on-off switch to position „ON“. 2.) Check electrical connections. 3.) Check/replace fuse. 4.) Check all power lines including extension cable.

6. Wiring diagram B 70 – B 125



7. Spare Part List B 70 / B 125				
Ref.	**Part. No. B 70**	**Part. No. B 125**	**Description**	**Quantity**
1	4700001	4700301	Fuel tank	1
2	-	4700302	Drain plug	1
3	4700003	4700303	Fuel gauge	1
4	4700004	4700304	Filter complete	1
5	4700005	4700005	Tank lid	1
6	4700006	4700306	Power cord	1
7	4700007	4700007	On-off switch	1
8	-	4700308	Cover	1
9	4700008	4700008	Thermostat knob	1
9a	4700009	4700009	Holder for thermostat knob	1
10	4700010	4700310	Housing lower part	1
11	4700011	4700311	Air line	1
11a	4700064	4700064	Nipple for air line	2
11b	4700065	4700065	Clamp for air line	2
12	4700012	4700012	Safety thermostat	1
12a	4700062	4700062	Holder safety thermostat	1
13	4700013	4700313	Combustion chamber	1
14	4700014	4700014	Holder photocell	1
15	4700015	4700315	Fuel line	1
15a	4700066	-	Nipple for fuel line	1
15b	4700067	-	Clamp for fuel line	2
16	4700016	4700016	Photocell	1
17	4700017	4700317	Burner head complete	1
18	4700018	4700318	Nozzle	1
19	4700019	4700019	Washer	2
20	4700020	4700020	Nozzle spring	1
21	4700021	4700021	Nozzle seal	1
22	4700022	4700322	Burner head	1
23	4700023	4700323	Electrode	1
24	4700024	4700324	Motor complete	1
25	4700025	4700325	Motor	1
25a	4700060	4700360	Motor holder	1
26	4700026	4700026	Compressor ring	1
27	4700027	4700027	Rotor	1
27a	4700063	4700063	Driver	1
28	4700028	4700028	Carbon blade	4
29	4700029	4700029	Compressor cover	1

30	4700030	470030	Air intake filter	1
31	4700031	4700031	Filter	1
32	4700032	4700032	Air outlet filter	1
33	4700033	4700033	Filter cover	1
34	4700034	4700034	Plug	1
35	4700035	4700035	Ball	1
36	4700036	4700036	Spring	1
37	4700037	4700037	Adjusting screw	1
38	4700064	4700064	Nipple	1
39	4700039	4700339	Capacitor	1
40	4700040	4700340	Fan wing	1
41	4700041	4700041	Transformer	1
42	4700042	4700342	Cover right	1
43	470043	4700343	Cover left	1
44	4700044	4700344	Fan guard	1
45	4700045	4700345	Control	1
45a	4700061	4700061	Holder for control	2
45b	4700068	4700068	Sensor	1
46	4700046	4700046	Fuse	1
47	4700047	4700047	Nut	4
48	4700048	4700348	Housing top	1
48a	4700069	4700369	Hinge	1
49	-	4700349	Compartment	1
50	4700050	4700350	Gauge	1
51	4700051	4700351	Grommet	1
52	4700052	-	Handle	1
53	-	4700353	Handle front	1
54	-	4700354	Handle rear	1
55	-	4700355	Chassis	1
56	-	4700356	Axle	1
57	-	4700357	Wheel	2
58	-	4700358	Wheel cap	2
59	4700059	4700359	Cable holder	2
	-	4700370	Screw set chassis	1
	4700371	4700371	Screw set (2 x cover 2 x side)	1