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ClarkeTM

PARAFFIN/DIESEL HEATERS

Model Nos.

XR75 - XR105 - XR 155

Part Nos.

6920270- 6920280 - 6920290



**OPERATING & MAINTENANCE
INSTRUCTIONS**



Thank you for purchasing this CLARKE, Paraffin fired Space Heater.

This range of portable heaters is designed for **industrial applications only**. As with all mechanical equipments, optimum performance will only be achieved if the correct application and servicing procedures are followed. Please read this leaflet thoroughly and follow the instructions carefully before attempting to use the heater. In doing so you will ensure the safety of yourself and that of others around you, and you can look forward to it giving you long and reliable service.

GUARANTEE

This CLARKE product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt as proof of purchase. This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission. This guarantee does not effect your statutory rights.

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TROUBLE-SHOOTING

FAULT	CAUSE	REMEDY
Motor does not start	<ol style="list-style-type: none"> 1. No power 2. Faulty Motor/Capacitor 3. Lock out of appliance due to overheating. 4. Internal Fuse Blown 	<ol style="list-style-type: none"> 1. Check power supply, power cable and fuse, and replace if necessary. Check External Thermostat if fitted. 2. Check and if necessary, replace 3. Detect cause of overheating. Check air inlet and outlet. Wait for 5 minutes, and restart. If condition persists contact your Clarke dealer 4. Check and replace fuse
Motor runs, but the heater does not ignite.	<ol style="list-style-type: none"> 1. Empty fuel tank, dirty or wrong fuel. 2. Fuel filter clogged 3. Air leaks in fuel line 4. Burner nozzle Clogged 5. Oil viscosity increased due to low temperature. 	<ol style="list-style-type: none"> 1. Drain dirty or wrong fuel, clean filter and fill with clean paraffin or equivalent. 2. Clean or replace fuel filter 3. Check pipes, tighten connections, if necessary replace pipe. 4. Clean nozzle with compressed air. Replace if necessary 5. Mix with 10-20% paraffin.
Flames emitted from Air Outlet	<ol style="list-style-type: none"> 1. Insufficient air flow into combustion chamber. 2. Pump pressure too high. 	<ol style="list-style-type: none"> 1. Check air inlet is not blocked. Check fan is not damaged and is operating correctly. 2. Check air pump pressure, and reduce to nominal value.
Heater starts normally, but flame-out control system shuts off the	<ol style="list-style-type: none"> 1. Dirty photocell 2. Faulty photocell 3. Defective connection between photocell and flame-out control 4. Faulty flame-out control 	<ol style="list-style-type: none"> 1. Check photocell and ensure it acknowledges the flame. (Contact your Clarke dealer) 2. Replace photocell. 3. Check, and connect properly. 4. Check and replace if necessary.

cont.

No.	Description	Part No. XR75	Part No. XR105	Part No. XR155
31	Cable	AX2005002000	AX2005002000	AX2005002000
32	Combustion Chamber	AX2003173511	AX2003173611	AX2003173711
33	Air Diffuser	AX2003135211	AX2003135411	AX2003135611
34	Fuel Tank	AX2003176511	AX2003177511	AX2003176711
35	Wheel End Cap	AX1004047911	AX1004048011	AX1004048011
36	Wheel	AX1001040111	AX1001040211	AX1001002000
37	Washer	AX1004050511	AX1004050511	AX1004050411
38	Axle	AX2002022511	AX2002022611	AX2002022711
39	Fuel Cap	AX1006029811	AX1006029811	AX1006029811
40	Lower Frame	AX2002021411	AX2002022111	AX2002021511
41	Cable	AX1005102600	AX1005102600	AX1005102600
42	Instrument Panel	AX2003177211	AX2003177911	AX2003178011
43	Cable Cover	AX1005001021	AX1005001021	AX1005001021
44	Switch Cover	AX1005092955	AX1005092955	AX1005092955
45	Switch	AX1005092855	AX1005092855	AX1005092855
46	Fuse Carrier	AX1005099600	AX1005099600	AX1005099600
47	Fuse	AX1005002700	AX1005002700	AX1005002700
48	Cover	AX1001040411	AX1001040411	AX1001040411
49	Terminal Block (12 pole)	AX1005002400	AX1005002400	AX1005002400
50	PCBoard	AX1014064311	AX1014064311	AX1014064311
51	Flame Control Board	AX1005106011	AX1005106011	AX1005106011
52	Nut	AX1004051011	AX1004051011	AX1004051011
53	Plug	#	#	#
54	Drain Plug	#	#	#
55	Screw	AX1004049811	AX1004049811	AX1004049811
56	Spring	AX1008101111	AX1008101111	AX1008101111
57	Ball	AX1004049711	AX1004049711	AX1004049711
58	Blanking Plate	#	#	#
59	Blanking Plate Screw	#	#	#
-	Clarke Labels /Decals	#	#	#

#...See your Clarke dealer

SAFETY PRECAUTIONS

WARNING!

Lack of ventilation can cause Carbon Monoxide poisoning.

CARBON MONOXIDE CAN KILL

Signs of Carbon Monoxide poisoning are, headaches, dizziness and/or nausea. Should anyone show these signs, they must GET FRESH AIR IMMEDIATELY.

Turn off the heater and have it serviced before using again.

Pregnant women, persons with a heart or lung condition, anaemia or under the influence of alcohol, or those at high altitudes, are more likely to be effected by Carbon Monoxide than others.

Read, and make sure you fully understand the following precautions and the hazards associated with this type of equipment.

- Use ONLY clean paraffin, Diesel Oil.
- NEVER use Gasoline, Naphtha, Paint thinners, Alcohol or other highly flammable fuels.
- Use ONLY with the electrical voltage specified
- NEVER use the heater where Gasoline, Paint thinner or other highly flammable vapour or high dust content is present.
- Ensure the appliance is properly earthed.
- Use ONLY in well ventilated areas. Provide ventilation of at least 2.75 square feet of fresh air for every 100,000 BTU/ hr of rating.
- The minimum clearance from any combustibile materials is 8 feet (250cm) from hot air outlet and 4 feet (125cm) from the top and sides.
- Maintain the heater on a stable, level surface whilst hot or operating, or a fire could occur.
- Keep children and animals away from heater at all times.
- When used with a thermostat, bear in mind, the heater may start at anytime.
- Store the heater in a level position when filled, or fuel leakage may occur.
- Use heater in accordance with all fire regulations.
- NEVER use heater in living or sleeping areas.
- NEVER leave a heater plugged in without adult supervision if children or animals are likely to be present.
- NEVER move, handle, refuel or service the heater when it is hot, operating or plugged in.
- NEVER cover or impede air flow into or out of heater.
- NEVER attach duct work to the front of heater.
- Disconnect the heater from the power supply when not in use.

ELECTRICAL CONNECTIONS

Connect the mains lead to a standard, 230 Volt (50Hz) electrical supply through an approved 13 amp BS 1363 plug, or a suitably fused isolator switch.

WARNING! THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in the mains lead are coloured in accordance with the following code:

Green & Yellow - Earth
 Blue - Neutral
 Brown - Live

As the colours of the flexible cord of this appliance may not correspond with the coloured markings identifying terminals in your plug proceed as follows:

Connect GREEN & YELLOW cord to terminal marked with a letter "E" or Earth symbol "⏚" or coloured GREEN or GREEN & YELLOW.

Connect BROWN cord to terminal marked with a letter "L" or coloured RED

Connect BLUE cord to terminal marked with a letter "N" or coloured BLACK

If this appliance is fitted with a plug which is moulded onto the electric cable (i.e. non-rewirable) please note:

1. The plug must be thrown away if it is cut from the electric cable. There is a danger of electric shock if it is subsequently inserted into a socket outlet.
2. Never use the plug without the fuse cover fitted.
3. Should you wish to replace a detachable fuse carrier, ensure that the correct replacement is used (as indicated by marking or colour code).
4. Replacement fuse covers can be obtained from your local dealer or most electrical stockists.

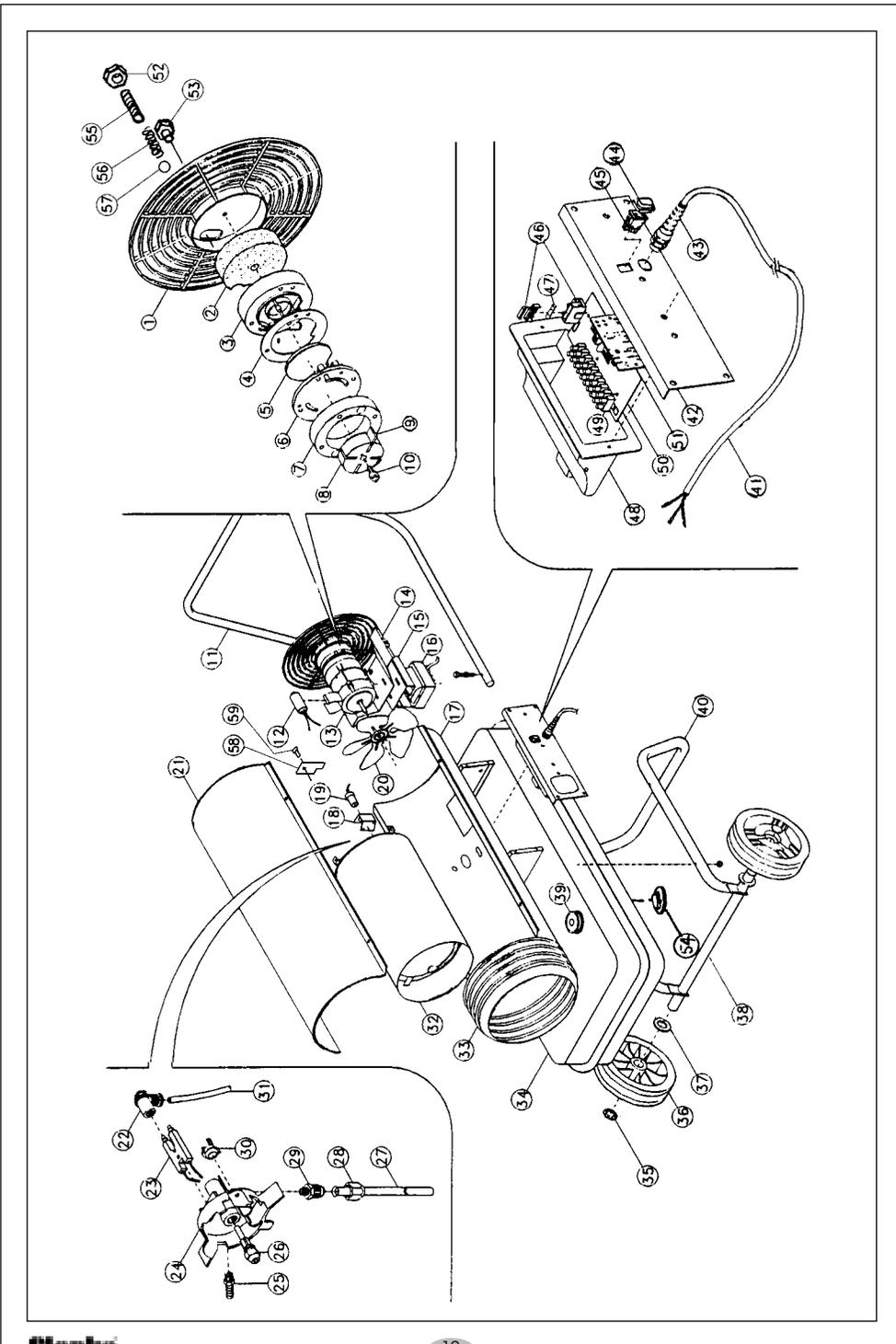
We recommend that this machine is connected to the mains supply through a Residual Current Device (RCD).

Fuse Rating

The fuse in the plug must be replaced with one of the same rating (**13 amps**) and this replacement must be ASTA approved to BS1362.

If in doubt, consult a qualified electrician. Do not attempt any electrical repairs yourself.

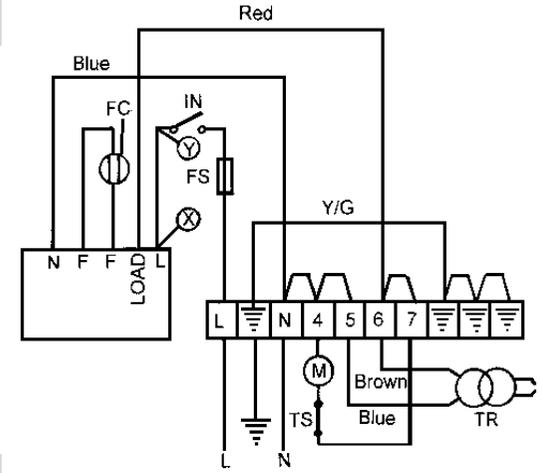
No.	Description	Part No. XR75	Part No. XR105	Part No. XR155
1	Grille	AX1001039711	AX1001039811	AX1001039911
2	Air Intake Filter	AX1008100911	AX1008100911	AX1008100911
3	Air Pump End Plate	AX2003162911	AX2003162911	AX2003162911
4	Gasket	AX1001039611	AX1001039611	AX1001039611
5	Air Output Filter	AX1001039511	AX1001039511	AX1001039511
6	Air Pump Cover	AX2003162811	AX2003162811	AX2003162811
7	Air Pump Ring	AX1008100711	AX1008100711	AX1008100811
8	Air Pump Rotor	AX1008112511	AX1008112511	AX1008113211
9	Air Pump Blade	AX1008112411	AX1008112411	AX1008100311
10	Coupling	AX1001042011	AX1001042011	AX1001042011
11	Handle	AX2002022211	AX2002022311	AX2002022411
12	Capacitor	AX1005108900	AX1005011432	AX1005011432
13	Motor	AX1005103211	AX1005103311	AX1005103411
14	Bracket	AX2003174511	AX2003174611	AX2003174711
15	Bracket	AX2003176311	AX2003176311	AX2003176411
16	Transformer	AX1005106111	AX1005106111	AX1005106111
17	Lower Body	AX2003174111	AX2003174211	AX2003174311
18	Bracket	AX2003176611	AX2003176611	AX2003176611
19	Photocell	AX1005105911	AX1005105911	AX1005105911
20	Fan	AX1008101611	AX1008101711	AX1008101811
21	Top Cover	AX2003173811	AX2003173911	AX2003174011
22	Spark Plug Cap	AX1001000521	AX1001000521	AX1001000521
23	Electrode	AX1005103111	AX1005103111	AX1005103111
24	Burner Head	AX2003162711	AX2003162711	AX2003162711
25	Holder	AX1006029111	AX1006029111	AX1006022911
26	Nozzle	AX1008100511	AX1008100411	AX1008100611
27	Hose	AX200202911	AX2002021011	AX2002021111
28	Screw Fitting	AX1006028811	AX1006028811	AX1006028811
29	Coupling	AX1006028711	AX1006028711	AX1006028711
30	Thermostat	AX1005107911	AX1005107911	AX1005107911



Wiring Diagram

Legend

- FC - Photocell
- FS - In-Line Fuse
- M - Motor
- T/R - Transformer
- IN - ON/OFF Switch
- TS - Thermostat



External Thermostat

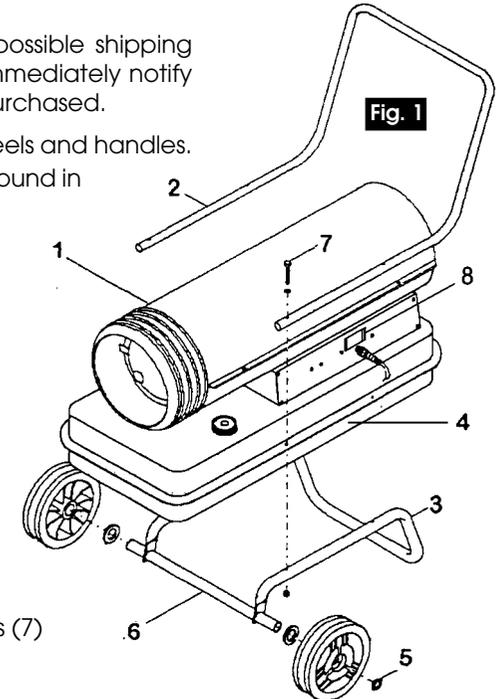
A suitable external thermostat for measuring ambient temperature, should be fitted between points X and Y (Wiring diagram), **by a qualified electrician only.**

UNPACKING ref. Fig.1

Unpack and check the heater for possible shipping damage. If any damage is found, immediately notify the dealer from whom heater was purchased.

These models are equipped with wheels and handles. The loose items listed below, can be found in the shipping carton.

1. Handle (2)
2. Wheel Support Frame (3)
3. Wheels - 2 pcs
4. Axle (6)
5. End Caps - 2 PCs (5)
6. Washers - 2 pcs
7. Screws w/nuts and washers 6 sets (7)



ASSEMBLY ref. Fig.1

- Slide the axle (6) through the wheel support frame (3), and install the wheels on the axle.

NOTE: The extended wheel hubs should be facing inwards.

Position the caps (5) on the axle ends and gently tap with a hammer to secure.

- Position heater on the wheel support frame assembly, with air outlet end over the wheels.
- Use the screws and nuts (7) to attach the handle (2), to the top of the fuel tank flange. The screws will go through the handles, the fuel tank flange, and the wheel support frame.
- Tighten all nuts.

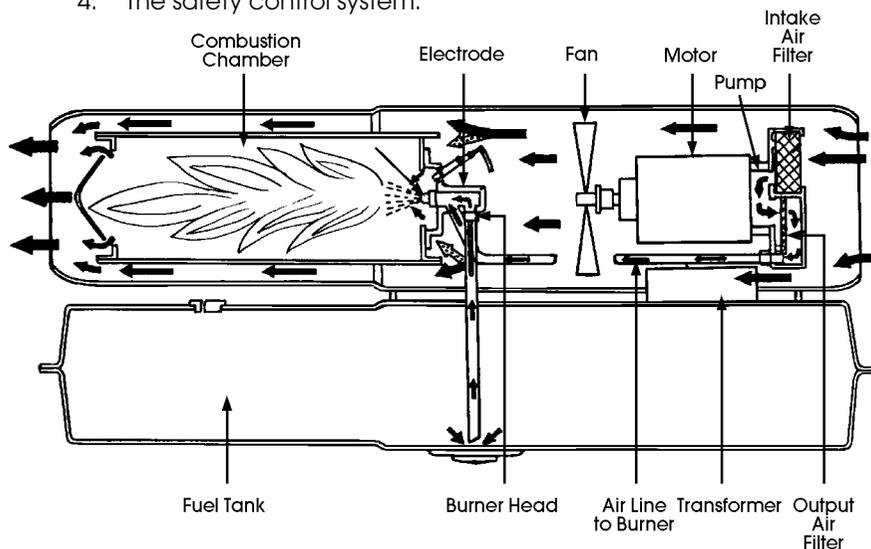
OPERATION

Understanding the basic operation of the heater, will reinforce the need to maintain the unit in top condition at all times, whilst **always** observing the safety precautions.

The heater comprises four basic systems:

- The fuel system.
- The air system.
- The ignition system.
- The safety control system.

Fig. 2



Fuel Filter

Removal of the fuel filter should it become blocked or contaminated, and require cleaning, involves the removal of the burner head complete. The fuel pipe, complete with filter, may then be detached, cleaned, using a good quality solvent, and dried with compressed air. It is recommended however, that if the filter becomes blocked, the complete assembly - fuel pipe with filter- should be renewed.

General

It should be noted that should the heater be used with Diesel oil or 35 second oil, the interval between servicing will be less, due to the fact that these fuels do not burn as cleanly as paraffin, and some 'sooting up' will therefore occur.

It is recommended, that paraffin be used wherever possible

Storage

Drain all fuel from tank before storing.

- Drain the fuel tank completely and add approximately one gallon of clean paraffin. Attach the fuel cap and move the heater forwards and backwards to circulate the fuel. Remove fuel cap or drain plug and drain tank completely
- Replace fuel cap or drain plug and properly dispose of the old and dirty fuel.
- Store the heater in a dry location free from corrosive fumes and dust.
- Do not store kerosene over summer months for next seasons usage.

SPECIFICATIONS

	XR75	XR105	XR155
Thermal Power (kW)	19.0	26.7	40.7
Thermal Power (BTU/hr)	79,000	96,000	150,000
Air Delivery (m ³ /hr)	400	500	1050
Fuel Cons. (Paraffin - ltr/hr - approx.)	2.3	2.8	4.3
Motor Voltage	230V 50Hz	230V 50Hz	230V 50Hz
Power - Watts	100	160	250
Current Rating (Input) - Amps	0.68	0.95	2
Length (mm)	830	860	930
Width (mm)	430	485	560
Height (mm)	465	530	615

Please note that the details and specifications contained herein, are correct at the time of going to print. However, CLARKE International reserve the right to change specifications at any time without prior notice. Always consult the machine's data plate

Bi-Monthly

Fan.

Having removed the top cover, thoroughly clean the fan using a cloth moistened with paraffin or light solvent, and dry using an air line if possible.

Output Air Filter.

Remove the grille, and pull off the Intake Air Filter, revealing the 3 screws securing the filter housing. Remove the screws and pull off the housing to reveal the Output Air Filter. If contaminated, this filter must be renewed.

In dusty environments this procedure should be carried out, monthly

Nozzle.

Having removed the top cover, gently unscrew and remove the burner head, and unscrew the nozzle. Clean, using compressed air and a soft brush, if necessary. DO NOT prod or poke the nozzle in any way, with a metal tool.

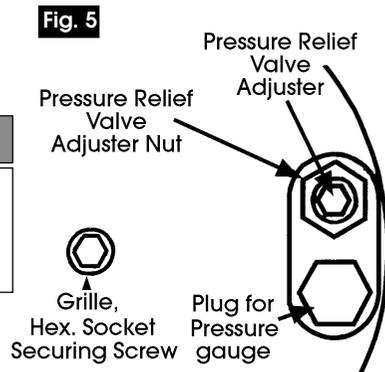
Following a period of Storage.

Pump Pressure.

Before putting the heater back into service, following a period of storage, you should carry out all checks previously specified. In addition, you should test and adjust if necessary, the Air Pump Pressure, as follows:

Near the centre of the Grille, is a cut-out to accommodate the Air Pump Pressure Relief Valve, and a plug for installing a Pressure Gauge as shown in fig. 5.

Remove the plug, and install a gauge with a resolution of at least 0.02 bar (0.3psi). Start the heater, and observe the pressure reading, which should be as follows:



Model	Air Pump Pressure
XR75	0.26 - 0.33bar (3.84 - 4.8psi)
XR105	0.30 - 0.36bar (4.45 - 5.3psi)
XR155	0.30 - 0.39bar (4.45 - 5.7psi)

To adjust the pressure, insert an Allen key into the hex socket in the end of the Relief Valve Adjuster, and undo the Adjuster Nut. Turn the Allen key clockwise to increase pressure, and anticlockwise to decrease. Tighten the securing nut when the correct pressure is reached, ensuring the Allen key does not turn in the process.

1. The Fuel System.

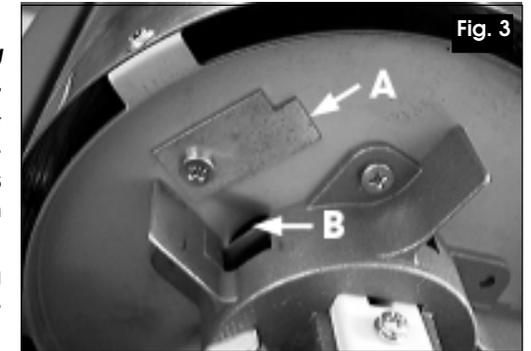
Fuel is held in the tank at the base of the system, at atmospheric pressure. An air pump, mounted on the end of the motor, draws air through a filter, compresses it, and forces it through a second filter, and via an air line, directly to the burner head nozzle. The speed of the air over the nozzle, causes a depression. Fuel is therefore forced up the tube by atmospheric pressure, through a filter, and out of the nozzle in the form of a spray.

It is important to ensure that the vent in the filler cap is not blocked at any time, otherwise fuel will not reach the nozzle.

This heater is capable of burning Paraffin or Diesel oil. NEVER use petrol.

As these fuels burn at different rates, provision is made to ensure that the correct volume of air is allowed into the combustion chamber for each type of fuel.

This is achieved by means of a blanking plate, at the rear of the burner, shown in Fig. 3,



The blanking plate is factory set to burn PARAFFIN, so that tab 'A' covers vent 'B'

WARNING!

TO BURN DIESEL, THE BLANKING PLATE *MUST* BE MOVED TO THE POSITION SHOWN IN FIG. 3, OTHERWISE DAMAGE TO THE COMBUSTION CHAMBER WILL OCCUR

NOTE: In the case of MODEL XR75, there is insufficient room to store the blanking plate in the position shown. The plate should therefore be removed and retained for possible future use.

2. The Air System.

Additional air is supplied to the combustion chamber by a fan, which is mounted on the opposite end of the motor shaft to the Air Pump. Openings around the burner head allow a portion of this air to be drawn into the combustion chamber, where it mixes with the air and fuel from the nozzle, and ensures that all the fuel is burned, preventing the emission of black smoke.

The remaining air is directed around and over the combustion chamber, until it finally mixes with the heated air from the combustion chamber, and is ejected as a jet of clean hot air.

3. The Ignition System.

A constant arc is struck between the electrodes, which ignites the air and fuel mixture. It is important that the electrode gap is correctly maintained, otherwise arcing will not take place...see Maintenance.

4. The Safety Control System.

A light sensitive photo cell (flame sensor) trips the motor if the flame goes out for any reason, causing the heater to shut down.

STARTING PROCEDURE

Warning!

Before starting the heater, you MUST ensure that the minimum ventilation requirements are observed, to avoid the risk of carbon monoxide poisoning.

Ensure the fuel tank is filled with the correct fuel, before plugging in to a suitably earthed supply. If you are changing the type of fuel, ensure the blanking plate at the rear of the burner is set to the correct position (see Notes on page 7).

It will be necessary to remove the top cover, by removing its 6 securing screws, to gain access to the rear of the burner, and the blanking plate.

If necessary, slacken off the blanking plate securing screw, turn the plate to its required position and tighten the securing screw. Replace the top cover, then, observing all precautions previously stated, push the start switch - '1' located on the left side of the machine, and shown at 8, fig. 1.

It is important to ensure that adequate ventilation is provided. The following chart gives the MINIMUM requirements

Minimum fresh air opening requirements

Heater Model	Minimum Ventilation ft ²	Minimum Ventilation mtrs ²
XR75	2.5	0.23
XR105	3.00	0.28
XR155	4.6	0.43

eg. For XR75, a 3ft window must be open by 10" minimum

PARTS & SERVICE

Please contact your nearest dealer, or
CLARKE International, on one of the following numbers.

PARTS & SERVICE TEL: 020 8988 7400

PARTS & SERVICE FAX: 020 8558 3622

or e-mail as follows:

PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com

MAINTENANCE (ref. Parts List)

IMPORTANT

Before carrying out any adjustment or maintenance, ensure the heater is switched OFF, disconnected from the mains supply, and has been given adequate time to cool down, unless otherwise stated.

It is essential that the heater is correctly maintained and kept in top condition at all times.

Those items requiring regular maintenance comprise,

1. Intake Air Filter (Item 2)
2. Output Air Filter (Item 5)
3. Fan (Item 20)
4. Fuel Nozzle (Item 26)
5. Ignition Electrodes (Item 23)
6. Fuel Filter (Integral part of item 27)

The Intake and Output Air Filters, are accessible by removing the Grille (by removing the single hex socket centre screw), whereas accessibility to the remaining items requires the removal of the top cover (by removing the six screws at the centre joint).

Monthly

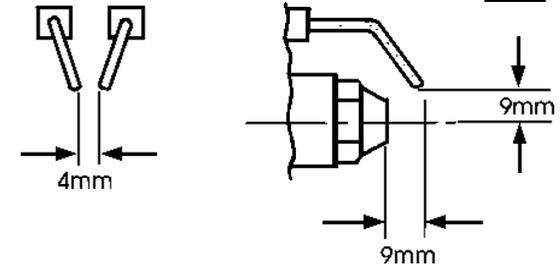
Intake Air Filter

Pull off the Intake Air Filter, which lies directly behind the Grille, and wash in a light detergent. Thoroughly dry before re-installing.

In dusty environments it may be necessary to carry out this procedure weekly. Never allow the filter to get blocked..

Ignition Electrodes

Having removed the heaters' top cover, remove the single screw retaining the electrode holder. Withdraw the holder, clean and adjust the gap between the electrodes, to 4mm.



When re-installing the electrode holder, there must be a gap of 9mm between the electrodes and the nozzle (see fig. 4). If this adjustment needs to be re-set, it is preferable to remove the burner head complete, by removing the securing screws around its' edge, taking care not to damage the photocell. The electrodes may then be adjusted to their correct clearance before replacing the Burner Head.