Figure 1: Wallas SafeFlame 96 D Diesel Oven

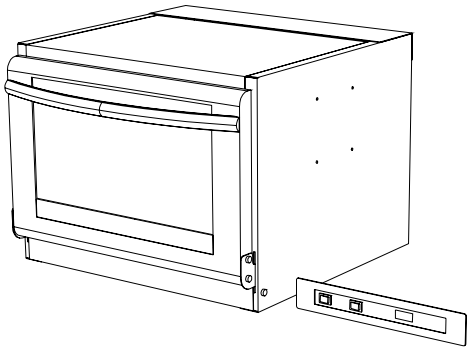


Figure 2: Wallas SafeFlame 97 D Diesel Stove

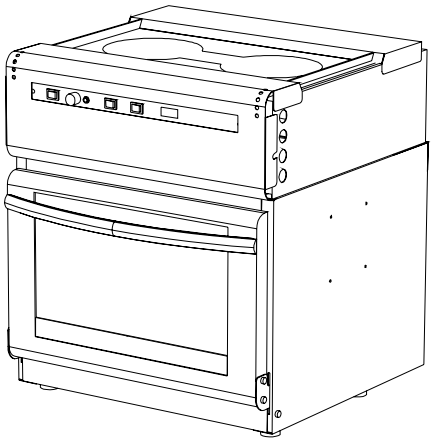
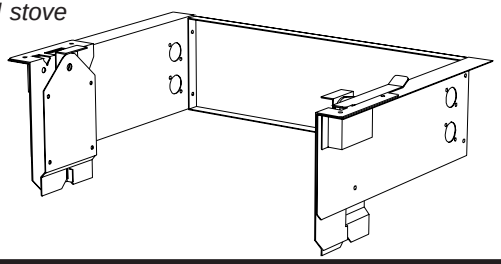


Figure 3: Optional gimbal-mounting 113 for both the oven and stove



A 4-metre long electric cable and a 4-metre long fuel pipe with a cork and an internal filter are delivered as standard.

INSTALLATION INSTRUCTIONS

Considerations on the installation place and on its effect on the installation

Space Requirements

- The dimensions of the space required for installation are illustrated in figures 4 and 5.
- Drilling cooling air holes in the bottom of the installation opening is recommended. Collective area of the holes should be about 30 cm^2.
- The dimensions of the space required for installation of the 96 D oven's control panel are illustrated in figure 6.
- The gimbal-mounting frame defines the amount of space required for a gimbal-mounted appliance.
- To remove the burner unit for service, the oven has to be removed from its position.
- The installation opening must be manufactured from a fire-resistant material or be lined with a fire-resistant material.
- Note that the control panel cable for the basic 96 D is 1.5 m long.

Fuel hoses

- The maximum length of the fuel hose is 8 m; the standard fuel hose is 4 m.
- The recommended position for the fuel tank is 0.5 – 1 m below the oven.

Exhaust pipes

- The maximum length of the exhaust pipe is 4 m. Exhaust pipe must be insulated with ø 45 mm insulation pipe.
- The Combination lead-through may be installed into the hull or deck.
- The hull lead-through should be situated as far aft as possible, preferably in the stern.
- **If it is possible that the deck lead-through transiently dips under water it has to be used a sealable deck lead-through (2460).**
- Air must be allowed to flow freely past the lead-through.
- Take care not to blow hot gases against other boats.

Important:

- You must not mount the 95D cooking range and the 96D oven to the same installation opening. 95D and 96D require an installation opening of their own.

Figure 4: Minimum dimensions of the space required for installation. If the oven is mounted in a closed space or covered by a board, the cooling air opening must be reserved above the oven for air circulation, minimum 100 cm^2.

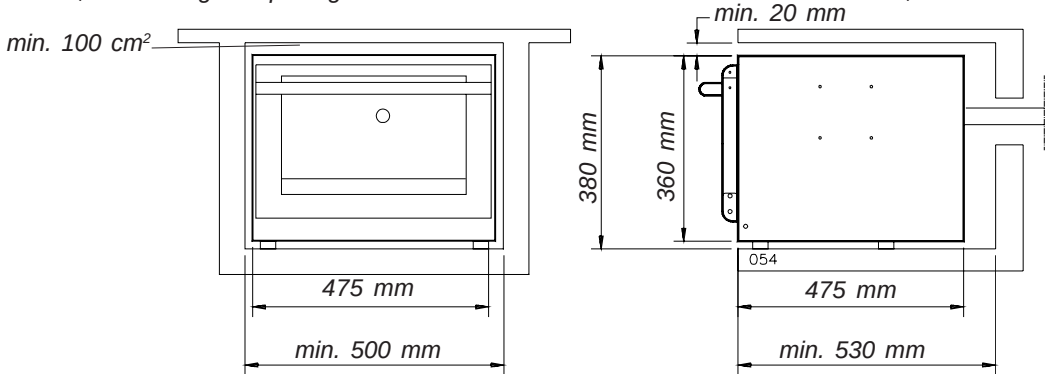


Figure 5: Minimum dimensions of the space required for installation of stove. When installing the stove into a fixed position, the width and depth measurements of the installation opening are identical to those shown in the oven installation diagram 495 mm and 530 mm. Figure 4. When installing a gimbal-mounted oven, the width and depth measurements of the installation opening are identical to those shown in the installation diagram for the stove 510 mm and 550 mm. Figure 5.

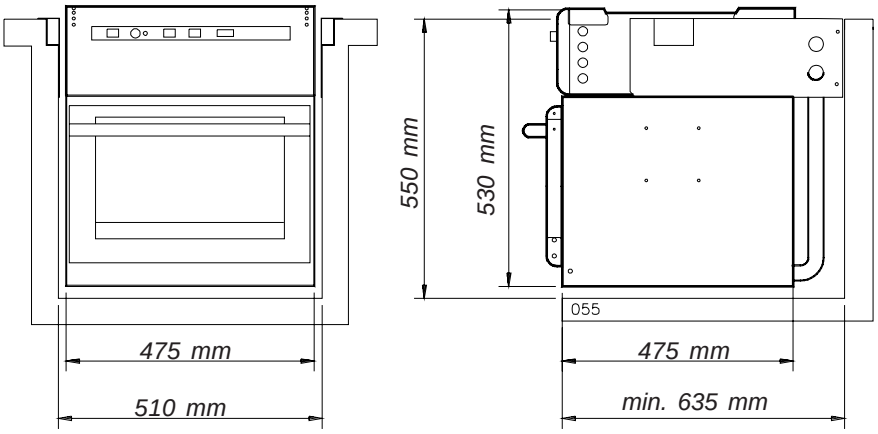
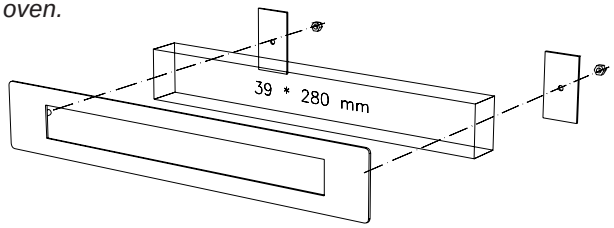


Figure 6: The dimensions of the space required for installation of the 96 D oven's control panel. Heat will make electronics life time shorter; It is not recommended to mount the control panel right above the shutter of the oven.

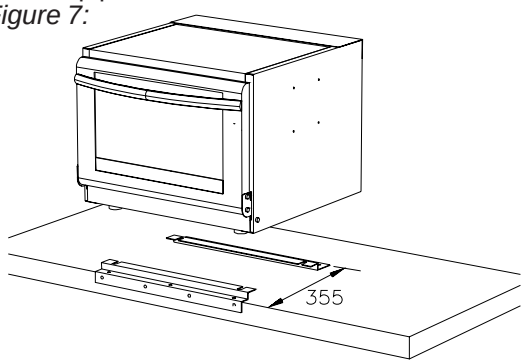


Fitting the Appliance into the Installation Opening

Fixed Installation of the Oven or Stove

1. Fit the back edge of the fastening cleat for the rear pads 355 mm from the front edge of the installation opening.
2. Lift the oven into the installation opening so that the rear pads slide into the grooves on the fastening cleat.
3. Fit the fastening cleat for the front pads onto the front edge of the installation opening.
4. Fit the oven with an exhaust pipe, which should follow the most direct route to the lead-through. The exhaust pipe are insulated with a second, larger diameter metal pipe.

Figure 7:



Gimbal-mounted Installation of the Oven or Stove

1. Do not fit pads underneath the oven.
2. Fit the gimbal-mounting frame into the installation opening.
3. Attach the gimbal-mounting rockers to the oven or stove.
4. Use screws to attach the rockers to the gimbal-mounting frame.
5. For exhaust pipes not to prevent the oven movements the pipes are formed into a loop behind the oven and led through the apertures in the frame to the lead-through. Figure 9.
6. Protect the exhaust pipe with a second, larger diameter metal pipe.
7. The fuel hose and the wires must allow the unit to swing freely in all conditions and they must not come into contact with the exhaust pipe. The play is best to turn under the oven.

Figure 8:

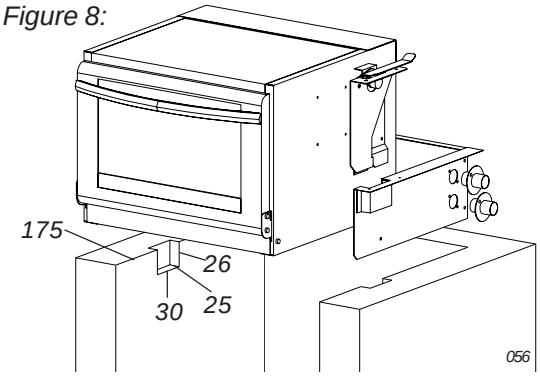
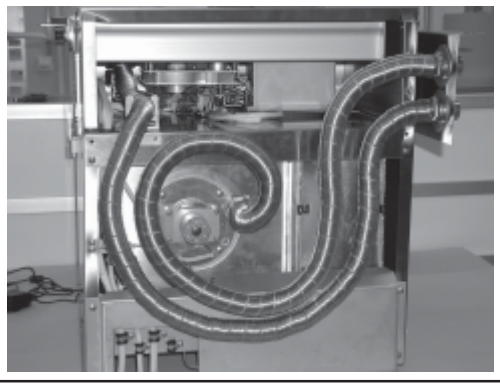


Figure 9: Installation of the exhaust pipes in a gimballed stove. Length of the exhaust pipe: to the right 900 mm and 1500 mm., to the left 1000 mm and 1200 mm.



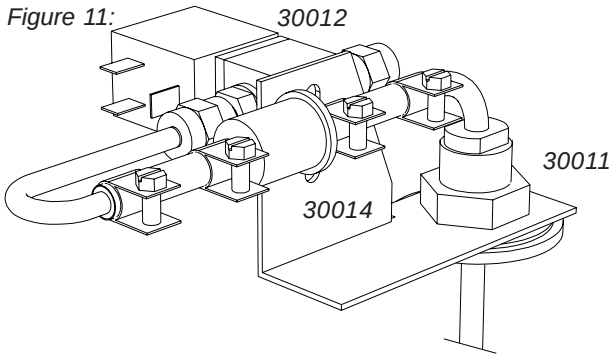
Installing the Lead-Through

Installation Considerations

- The exhaust pipe should be bent into the shape of a gooseneck to prevent water from splashing into the unit.
- The exhaust pipe must be insulated a bendable metal pipe that is larger in diameter than the normal exhaust pipe.
- The Insulation pipe is connected to the fresh air duct of combination lead-through.
- In a metal-hulled boat it is recommended to insulate the lead-through to prevent electro-chemical corrosion.
- There is an separate instruction for lead-throughs.

Connecting the Fuel System to the Boat's Main Tank

Figure 11:



- Inclusion of a solenoid valve in the fuel hose near the tank is necessary if the tank's fuel level is above the oven's or stove's bottom.
- If the fuel tank is more than 0.5 m above or 1.5 m below the oven or stove, check the fuel feed and make any necessary adjustments in accordance with the separate instructions.
- The fuel hose must always have a fuel filter.
- In the combined unit there is a T-connector for fue hoses. The common fuel hose of the oven and stove is connected into the branch downwards so the play can be turned under the oven.
- **The fuel hose joints must be fully tightened! Check the joining surfaces for dirt before tightening.**

Electrical Connection

Important:

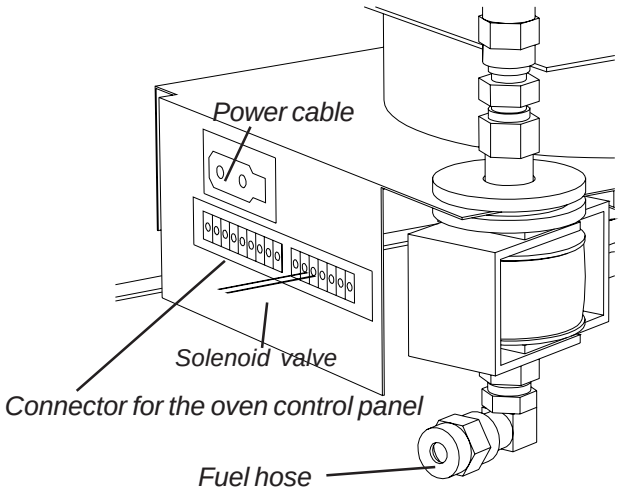
- During start-up, the appliance uses approx. 8 amps of current for 2.5 – 6 minutes.
- A 15 amp fuse must be mounted close to the battery.
- Take the appliance's power directly from the battery terminals, not the fuse box or distributing box, to minimise voltage loss.
- The cables must be protected if there is a risk of mechanical damage.
- Table 1 shows the minimum diameter of the cables.
- Connect the electric cable's red lead to the plus (+) terminal and the black lead to the minus (-) terminal.

Table 1:

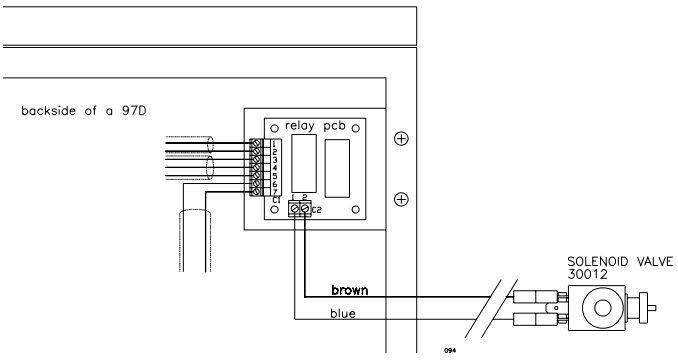
Length of electrical cable (m)	Cross-section of the cable (mm²)
0 - 4	4
4 - 6	6
over 6	10

- The cables are protected by rubber rings. In the protection balk down back there are fixing points for both oven and stove cables. Care must be taken that the wires don´t come into contact with the exhaust. Turn the play under the oven.

Figure 12: Oven connection.



Solenoid valve with 97D oven-stove unit



If solenoid valve must be installed to the fuel system, it must open when one or both appliances are used. 97D oven-stove unit has in build a relay pcb. Install solenoid valve wires to connection C2. Solenoid valve uses always two wires; these wires are included in the solenoid valve kit 30012.

OPERATION INSTRUCTIONS

Fuel

- The main fuels are diesel oil or furnace oil.
- Paraffin (kerosene) may also be used as fuel.
- Ensure the purity of the fuel by feeding it through a filter to the appliance.
- When starting the appliance for the first time, the fuel pipe is empty; it may take several starts before the fuel pipe fills.
- With a gimbal-mounted appliance, regularly check that the fuel pipe does not come into contact with the exhaust tube.

Important Safety Notes

- **Exhaust gas is very hot! Always before start ing check that exhaust gas can not damage anything for example ropes, fenders or neighbouring boat. The minimum distance of the side lead-through to another boat is 200 mm.**
- Always allow the oven and stove to cool down for about 15 minutes before switching off the main power.
- Fuel hoses and exhaust pipes of a gimbal-mounted unit must be checked regulary because the conections may be worn when they swing. It is recommended to lock the gimbal when it is not in use.
- When using the sealable deck lead-through, remember to open it before use and to close it while conditions demand that.

Using the Oven

Oven Control Panel Switches and Buttons

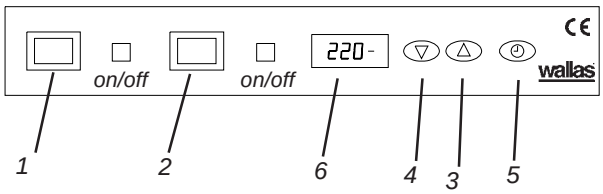


Figure 13:

1. *Oven Power Switch*
2. *Oven Internal Light Switch*
3. *Up Arrow Button*
4. *Down Arrow Button*
5. *Clock Button*
6. *Display*

General Instructions for Oven Use

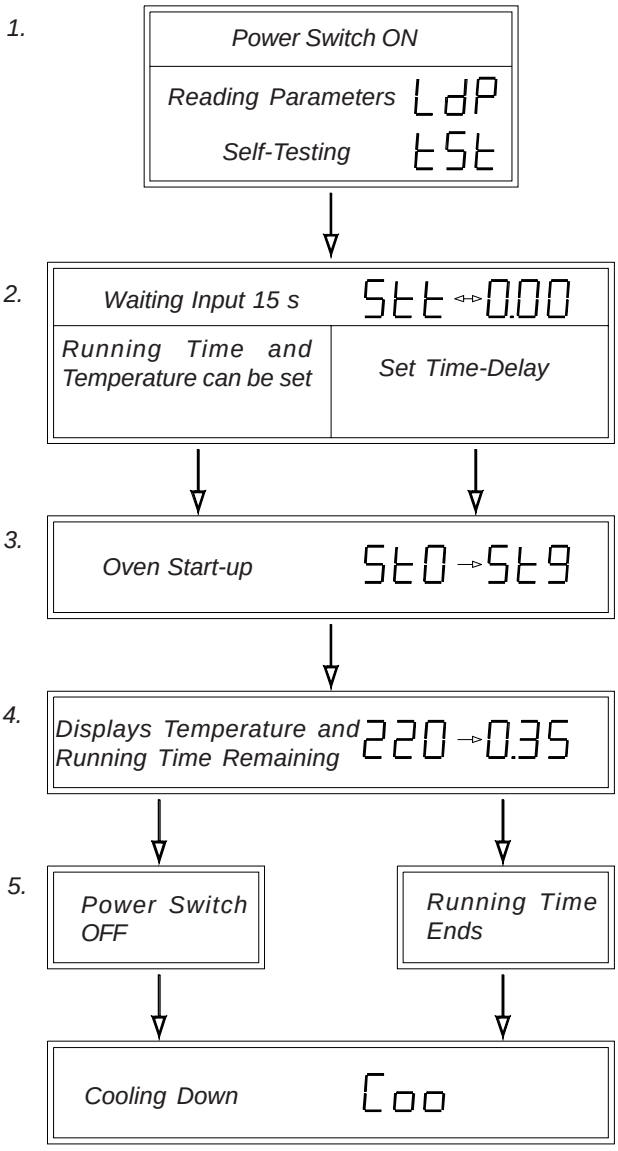
- Preheat the oven before putting food in.
- When heating the oven, remove the baking tray – the oven will heat faster and more evenly.
- When baking, cut off any unnecessary edges from, for example, greaseproof paper, as they disturb the flow of air in the oven.
- When using the oven, push both the rack and baking tray against the back of the oven.
- After use, clean the oven and the baking tray and rack with a damp cloth, and dry them in order to keep the oven clean.
- If necessary, use a liquid cleaner to clean the oven. After using the cleaner, wipe the oven down with a damp cloth and dry it.
- While the oven is on, it efficiently heats the boat's internal air. This extra heat can be removed with a Wallas extractor hood, if required.

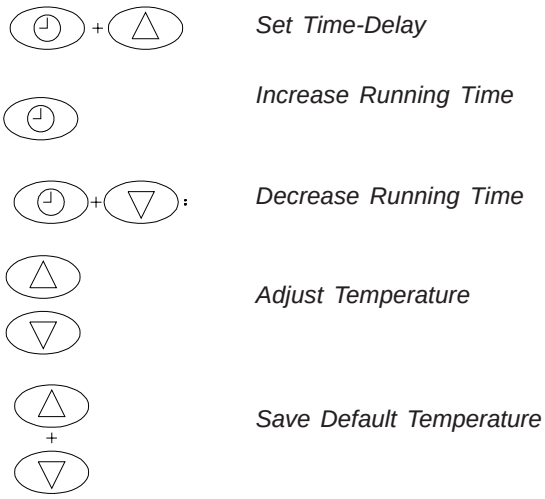
Turning the Oven on and off

The numbers in the text refer to the numbers in figure 14.

1. The recirculation fan heats the oven by cycling air from the heat exchanger to the oven. When the power switch is turned to the ON position, the oven reads the parameters on the electronics card and runs a diagnostics program, which takes about five seconds. After this, the oven switches to standby mode for user input. While reading the parameters, the display shows 'LdP', and 'tst' during the diagnostics.
2. While waiting for input for start timing, the display flashes the texts '0.00' and 'Stt'. It is possible to set a time-delay for start, if you want the oven to start at a later time. The time-delay must be set within 15 seconds after the diagnostics program has ended. The length of the time-delay is set in increments of 15 minutes by pressing the Up arrow button while keeping the clock button depressed. The time-delay can be cancelled with the power switch. When the time-delay has been set, the oven will start after the set time. The display shows 'Stt' and with 7 sec intervals the remaining time to the start. The maximum time-delay is 9 h 55 min. If setting the time-delay has not been started in 15 seconds, the oven will go into start-up mode.
3. As the oven starts, the display shows the start-up phases 'St0' – 'St9'.
4. Once the oven has started, the display shows the oven temperature . The temperature setting can be freely adjusted while the power is switched on. The temperature is set in increments of 5 °C between 100 °C and 250 °C by using the up and down buttons to raise or lower the temperature. When either of the arrows are pushed the display shows first current setting. The oven has a default temperature setting, which can be changed in increments of 5 °C. You can set a new default temperature by holding down both of the arrow buttons for 5 seconds. This will set the current temperature setting as the default. The control panel will acknowledge the new temperature by displaying 'Sat'.
5. You can set the running time for oven in increments of 5 minutes with the clock button and decrease it with the down button while keeping the clock button depressed. When the running time is set the display shows the remaining running time with 7 sec intervals. Otherwise the display shows the oven temperature. The maximum running time for the timer is 9 h 55 min.

Figure 14:





6. The oven is off when the power switch is turned to the OFF position or the running time ends. After this, the oven cools down for about 15 minutes and the display shows 'Coo'. If the running time is set to zero, the oven will remain on until it is turned off with the power switch. The oven's internal light can be switched on with a separate switch, but only while the oven is turned on.

Using the Stove

- Both appliances require an 8-amp glow current. Therefore it is recomended to start the appliances separately; approx. a 5-minute wait is necessary between start-ups.
- The oven in the stove works in exactly the same way as the basic oven but the control panel is combinated with the front panel of the stove.
- The cooking range primarily heats on the inside of the ring lines and its power can be freely adjusted.
- Both plates always heat up, but the left plate is approximately twice as powerful as the right one.
- The cooking range starts up and heats automatically when the cooking range's power switch is turned to the ON position.
- The power switch yellow indicator lights up to indicate that the appliance is turned on. A flashing yellow indicator indicates low voltage. If the flashing continues for 4.5 minutes, or starts flashing during use, the cooking range will shut down automatically.
- When turning the cooking range on, turn the power dial to maximum, so that the cooking range will heat up faster.
- The red burner light indicates that combustion has begun normally. The red light usually comes on 1–3 minutes after starting. If the red light does not come on, the cooking range will cool down about 10 minutes. Turn the power switch to OFF position.
- The burner light flashes when the cooking range is cooling down.
- The cooking range is turned off by turning the power switch to the OFF position.
- After being turned off, the cooking range will not restart until the 10-minute cooling down process is completed.
- Do not overheat the cooking range by leaving it on for more than 20 minutes if there is no cooking on it to cool it down. If the cooking range must be leaved on, turn the heat control to minimum.
- The stove's ceramic surface should always be cleaned after use with a damp cloth and then dried.
- If necessary, liquid cleaning agents or special ceramic cleaning agents may be used. After cleaning, wipe the surface down with a damp cloth and dry it. Do not use abrasive materials such as steel wool.

SERVICE INSTRUCTIONS

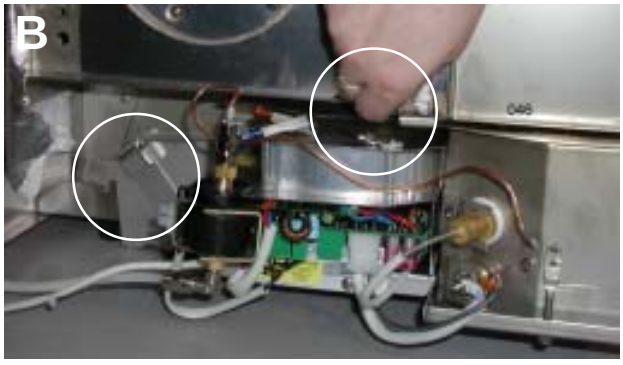
Regular service

- Possible crust from the burner should be cleaned in regular service. If necessary, the bottom carpeting of the burner and fuel needle should be changed.
- Crust develop around the bottom of the burner from the aromatic substances found in fuel. The rate at which this happens depends on the quality of fuel used and the output of the heater. As a result, the need for cleaning may vary.
- We recommend the first service after 500 hours of use. On the basis of the first service, you can then decide for yourself what would be an adequate maintenance interval.
- A 'Ser' sign appears in the display when 500 hours have passed. Acknowledge the service indication by turning the power on while keeping the clock button depressed, CLS sign on display.
- Instructions for cleaning the burner during the periodic service are given below.

Cleaning the Oven Burner

1. Open the burner unit protection beam behind the oven. Arrows in figure 15 a.
2. Disconnect the electrical wire, control cable, fuel hose and oven's temperature sensor. Circles in figure 15 a. Disconnect also the wire of the oven's circulation fan. The hand in Figure 15 a.
3. Remove the oven's burner unit by moving the two safety clamps to the side. Figure 15 b.

Figure 15:



4. Remove the glow plug, the burner temperature sensor and fuel needle by opening the fastener screws and pulling the parts out of the burner. Figure 16.
5. If the fuel needle is clogged, detach the needle from the fuel pump and screw in a new needle. The circle in figure 16 a.

Figure 16:

6. Open the bottom of the combustion chamber by removing the two nuts. Pressed against the bottom is a spring, which keeps the burner cylinder in place. Figure 17 a. Pull the burner cylinder out of the burner chamber.
7. Remove the reflector dome from the burner by pressing the locking tongues in the cylinder wall with e.g. a screwdriver and tilting the reflector dome. Figure 17 b.
8. Remove any crust on the base and walls of the burner by careful scraping. If needed clean burner's radiator, too.

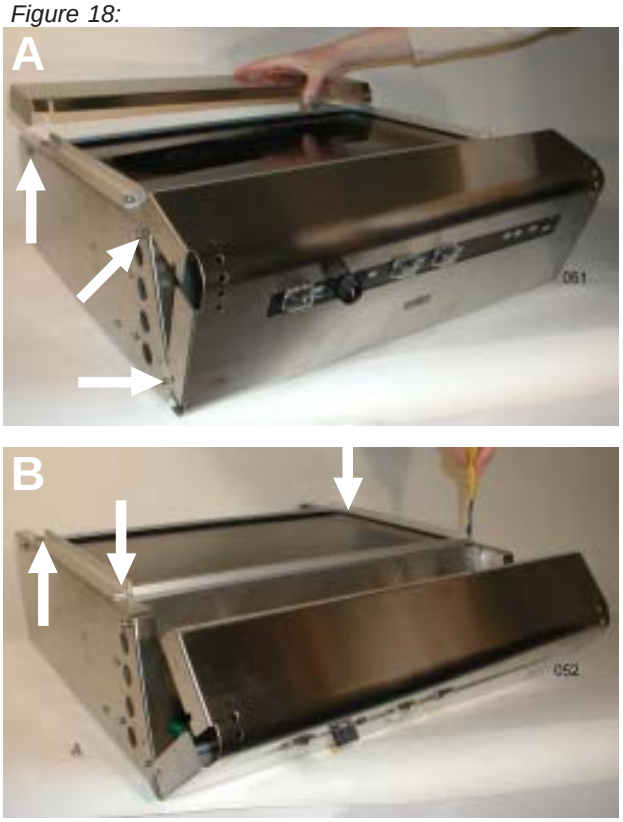
Figure 17:

9. If the bottom carpet remains intact, it can be re-used; otherwise, it must be replaced with a new one. The bottom carpet must be intact at least under the glow plug.

Cleaning the Cookin Range Burner

1. In order to clean the burner, you must remove the cooking range's outer shell. Open the screws and lift the shell off. Figure 18 a.
2. Remove the stove frame from the oven by removing the four screws on the cleats on either side of the stove frame. Figure 18 b. Disconnect electrical wire, fuel hose and exhaust pipe of the cooking range and lift it out from the frame.
3. Next, open and clean the cooking range's combustion chamber in the same way as the oven burner. See oven burner cleaning stages 4 – 9.

Figure 18:



Cleaning the Oven's shutter

- Possible dirt between the windows of the shutter should be cleaned.
- Open the shutter and remove the second screw from the both sides of the shutter. Arrows in figure 19. You do not need loose the shutter from the oven.
- Push the inside strips of the shutter downwards and lift the strips up at the same time. Figure 19. Remove the insidewindow of the shutter.
- Clean the windows and put the insidewindow back to its place. Close the screws of the shutter.

Figure 19.

Winter Storage

- In the spring, after winter storage, it is important to - remove any condensed water from the fuel tank before using the appliance. Depending on the fuel used, it is important to take into consideration the stability of the fuel in winter conditions.

Malfunctions

- If the heater does not start up, or stops by itself, this may be because one of the safety measures results in an error message. The appliance always stops after an error message. After the error has been corrected, the appliance can restart.
- In the event of a possible malfunction, the control panel will display the cause of the malfunction. A malfunction must always be cleared by turning the power switch to OFF. Table 2 shows explanations of the various indications.
- The stove's red burner light comes on if the burner temperature starts to drop. The burner light flashes while the stove cools down after use, but if the light flashes during use, the reason is a possible malfunction. A flashing power switch light is also a sign of a malfunction. Table 3 shows possible malfunctions and their corresponding indications.
- If your own measures do not help, contact the service point.

Table 2:

Malfunction	Sign	Actions
Glow Plug	Er.1	Has the glow plug short-circuited, or is it broken; check with multimeter. This display may also be caused by extremely low voltage.
Recirculation Fan	Er.3	If properly connected, contact the repair shop.
Combustion Air Fan	Er.4	If properly connected contact the repair shop.
Overheating	Er.5	The oven has overheated and the safety thermostat has cut off the fuel supply. In the case of overheating the safety thermostat will return automatically once the oven cools. The cause of the overheating must be found and repaired before continuing use
Flame Out	Er.6	Check that the fuel has not run out, or that the fuel pipe was empty and did not fill during start-up.
Undervoltage	Er.L	Check battery condition and charge. Check the diameter of the power cable and the connections of it.
Warning of drop in Voltage	Lo	Check for possible cause of drop in voltage.

Table 3:

Malfunction	Indication	Actions
Undervoltage	Flashing Power Switch Light	Check battery condition and charge. Check the diameter of the power cable and the connections of it.
Glow Plug	Flashing Burner Light	Has the glow plug short-circuited, or is it broken; check with a multimeter.
Fuel	Flashing Burner Light	Check that the fuel has not run out, or whether the fuel pipe was empty and did not fill during start-up.
Overheating	Flashing Burner Light	The stove has overheated and the safety thermostat has cut off the fuel supply. In the case of overheating the safety thermostat will be automatically reset once the stove cools. The cause of the overheating must be found and repaired before continuing use.

TECHNICAL SPECIFICATIONS

Table 4:

Fuel:	96 D / 97 D*	Diesel oil, light fuel oil or paraffin oil
Operating voltage:	96 D / 97 D	12 V; minimum voltage for electronic card 10,4 V
Consumption:	96 D	0,07 – 0,23 l/h
	95 D	0,09 – 0,18 l/h
Heating effect:	96 D	0,6 – 2,8 kW
	95 D	0,25 – 0,6 / 0,4 – 1,2 kW
Current Consumption:	96 D	0,8 A; with light on 1,2 A and during start-up 8 A for 2,5 – 8 minutes
	95 D	0,15 A; during start-up 8 A for approx. 4,5 min
Dimensions:	96 D	W 475 mm x D 500 mm x H 360 mm
	97 D	W 475 mm x D 500 mm x H 530 mm
Weight:	96 D	24,5 kg
	97 D	approx 33 kg

** 97 D = 96 D + 95 D*

WARNINGS

- If washing the boat with a pressurised hose, avoid spraying the lead-through; the appliance may get wet.
- If the appliance does not start even though there is fuel in the pump, do not start the appliance more than twice without checking for possible causes; danger of overflow.
- Avoid electrostatic damage when handling an electronics card that has been detached from the oven or stove.
- It is recomended to insulate all parts of the appliance, and the lead-through, in a metal-hulled boat to prevent electro-chemical corrosion.

TERMS OF GUARANTEE

Wallas-Marin Oy (manufacturer) assumes liability, through the distributor, for any defects in raw material and production for a period of twelve months from the date of sale on the conditions mentioned below.

1. The notice of a defect should be made immediately. A precondition for the guarantee is a valid guarantee certificate.
2. The guarantee covers defects in both raw material and manufacture on condition that the instructions for installation and use, provided by the manufacturer, have been complied with.
3. For the guarantee repair, the customer shall deliver the equipment to the nearest Wallas Dealer. No guarantee service shall be performed in the field or on-board a vessel.
4. The guarantee is invalid if parts of foreign origin have been added to the equipment or its structure has been changed without the distributor's or manufacturer's consent.
5. Natural wearing, faulty handling, unsuitable fuel,, under-pressure or a water damage as the cause of the fault do not entitle the customer to make a guarantee demand.
6. Repairs made during the guarantee period shall neither renew nor change the orginal period of guarantee.
7. In order for us to attain a capacity for high quality service, the seller must maintain a buyer's registry, with which it is possible to contact the buyer of the equipment when necessary, for possible technical information needs, adjustment needs or updating needs during or after the warranty period.

ACCESSORIES

Accessories for the 96 D Oven and the 97 D Oven with Stove:

111
Pot holders for Ceramic stove.

113
Gimbal-mounting for oven and oven with stove.

11011
Extension suction hose 4 m, to extend the fuel pipe if necessary.

2024
5 l fuel tank, if the fuel is not fed directly from the boat's main tank.

2448
Exhaust and suction pipe ø 28 / 45 mm.

2460
The sealable deck lead-through.

3468
The hull or deck lead-through.

30011
Connection pack, to feed fuel directly from the boat's main tank.

30012
Solenoid valve, to be installed close to the tank if the fuel level is above the appliance.

30014
External fuel filter, to be installed close to the tank to filter the fuel before the appliance.

854426
Fibreglass sock 8 mm, to insulate the fuel pipe on the inside of the installation opening.

602309
Insulating pack for metal-hulled boats, to prevent electrochemical corrosion.(3468, 3467)

The article numbers in the figures of this manual refer to the accessories listed here.