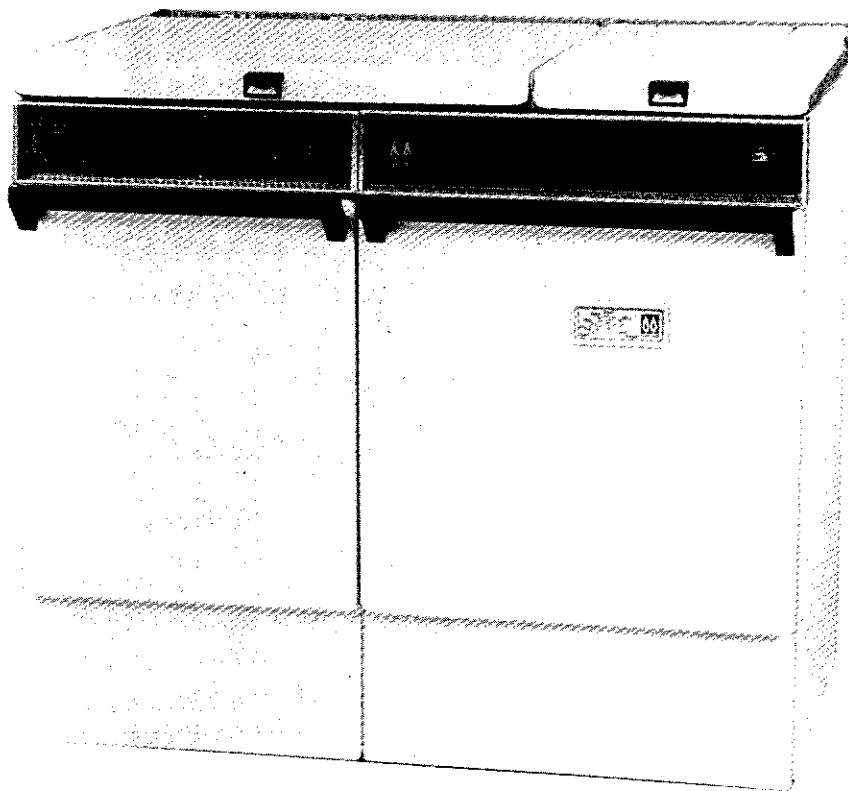


FOR THE
PROFESSIONAL INSTALLER ONLY

GRETALUX



Oil-Fired central heating cooker
Model 87.309

Fitted with an automatic «SILENTA» burner
Output variable from
40.000 to 100.000 Btu/hr

Please read and understand thoroughly before commencing installation.

Important ! The installation of this product must be in accordance with current building regulations and codes of practice.

**TECHNICAL
MANUAL**

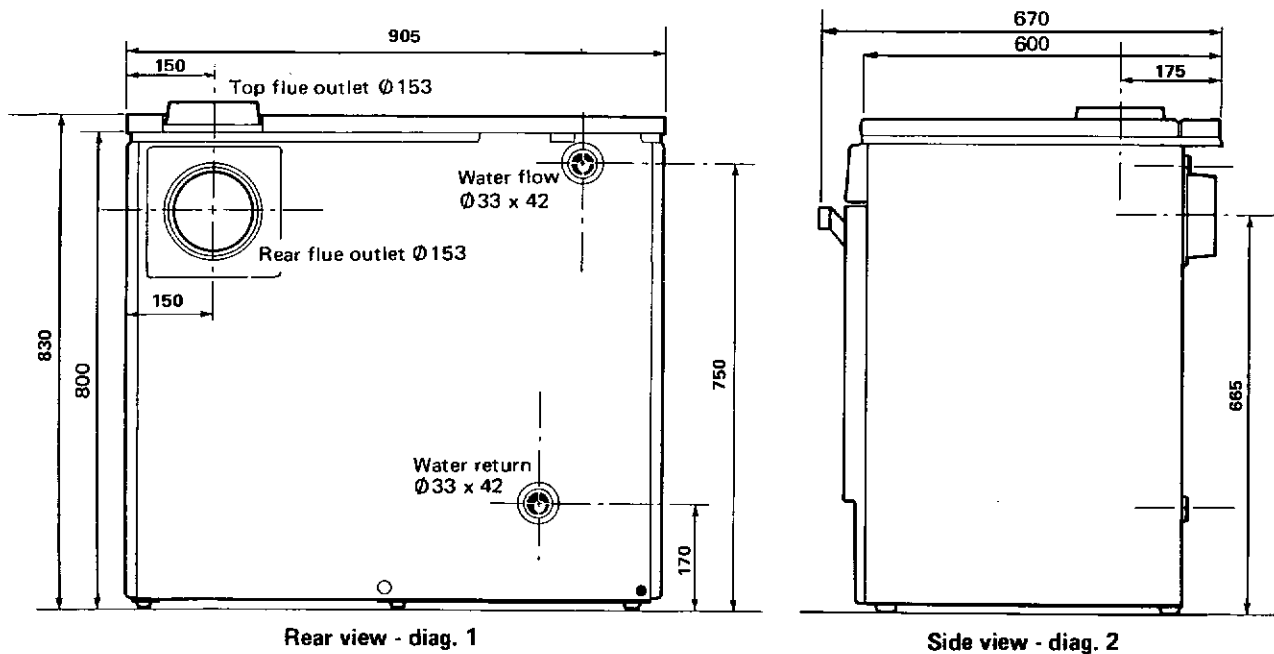


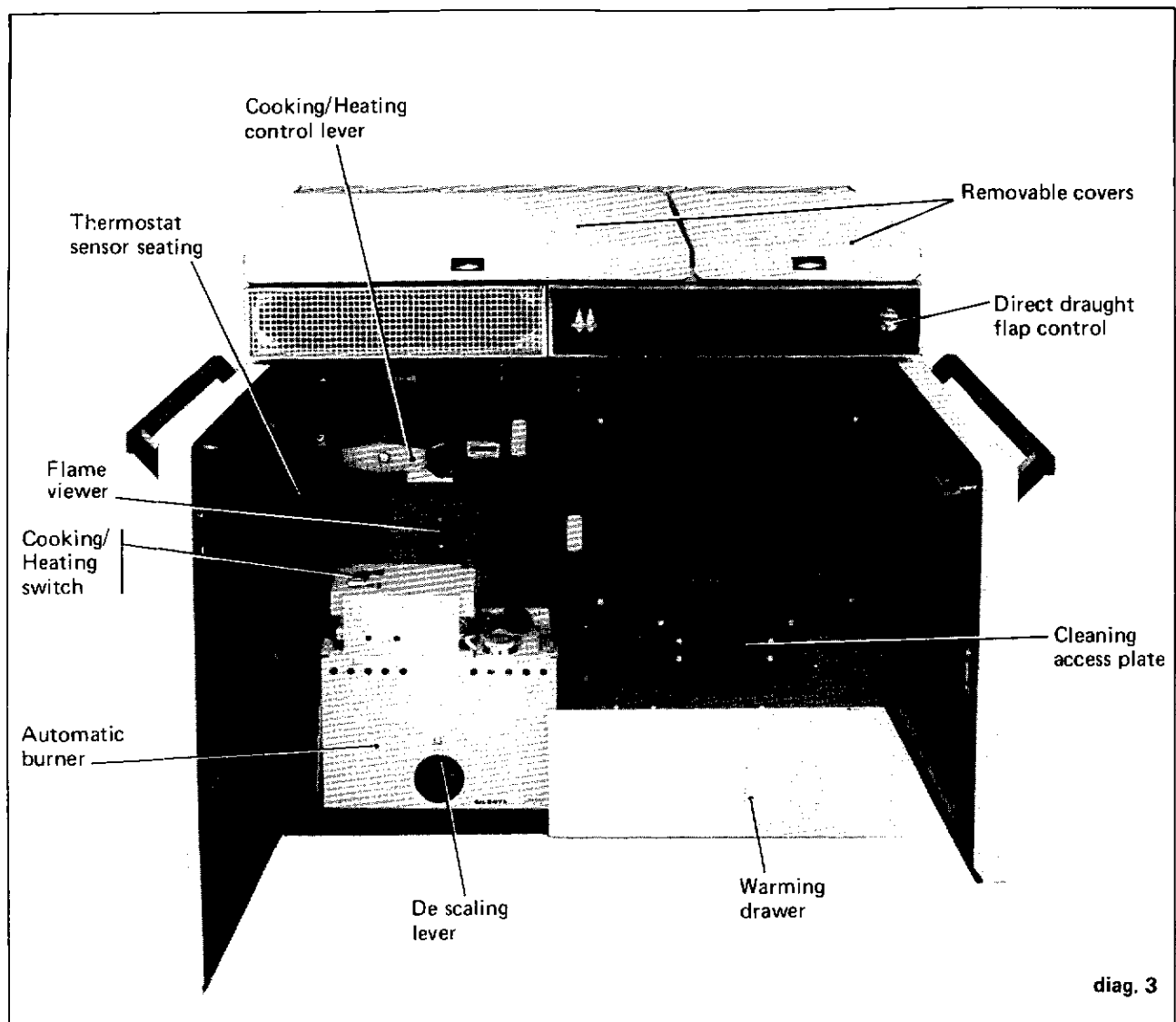
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1 Technical details

1 - 1 Dimensions (in mm)





diag. 3

2 Description

2 - 1 Description of the appliance

The GRETALUX cooker is a double use appliance for cooking and heating, fitted with an automatic vaporisation burner.

The GRETALUX is fitted with a double circuit cooking/heating that enables the heat to be directed, when required, between the radiators circuit and the cooking units of the appliance.

To select the position cooking/heating, the user will first operate a lever that controls a distribution flap and then the heating/cooking switch placed above the burner.

On cooking position, the burner operates under the working conditions selected by the calibration selector and suitable for the cooking units (oven and cooking plates).

On heating position, the burner is directly controlled by the room thermostat. According to heating demand, the room thermostat will select one of the three fire positions of the burner : maximum, minimum, off.

A heat insulated cover limits the radiation of the appliance on heating position.

The Silenta burner on the GRETALUX cooker has been designed in order to be accessible and is fitted with all the necessary operation, regulation and safety components.

The burner stops automatically when the water in the water jacket exceeds 90-95°C/194-203°F

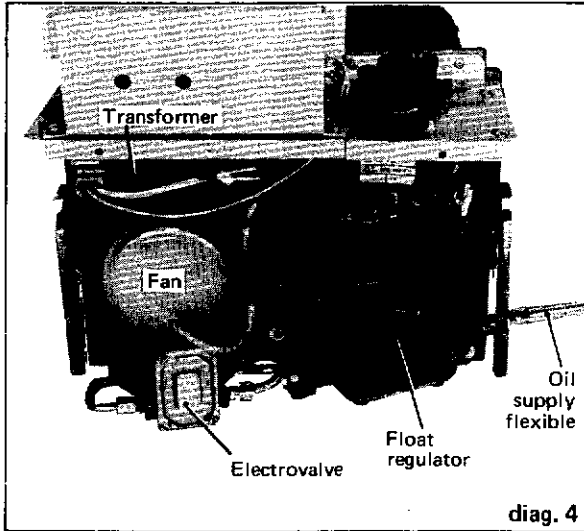
The burner is removable and is locked on the heat exchanger with a latch. A gasket prevents from leakage. Because of the wide output range of the burner, the appliance is able to adjust to the needs of the installation.

The maximum output of the burner is measured by means of a calibration selector fitted on the speed control lever (diag. 5)

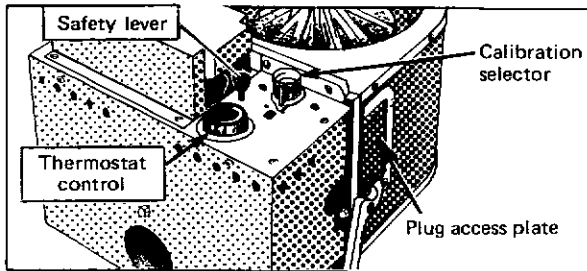
The selector enables the burner to reach the different levels of the maximum output and at each selected level to provide the fan the suitable voltage through a resistance (a variable speed fan).

All the electrical connections, mains, room thermostat are made on the upper terminal board of the burner, accessible after removing the protection cover.

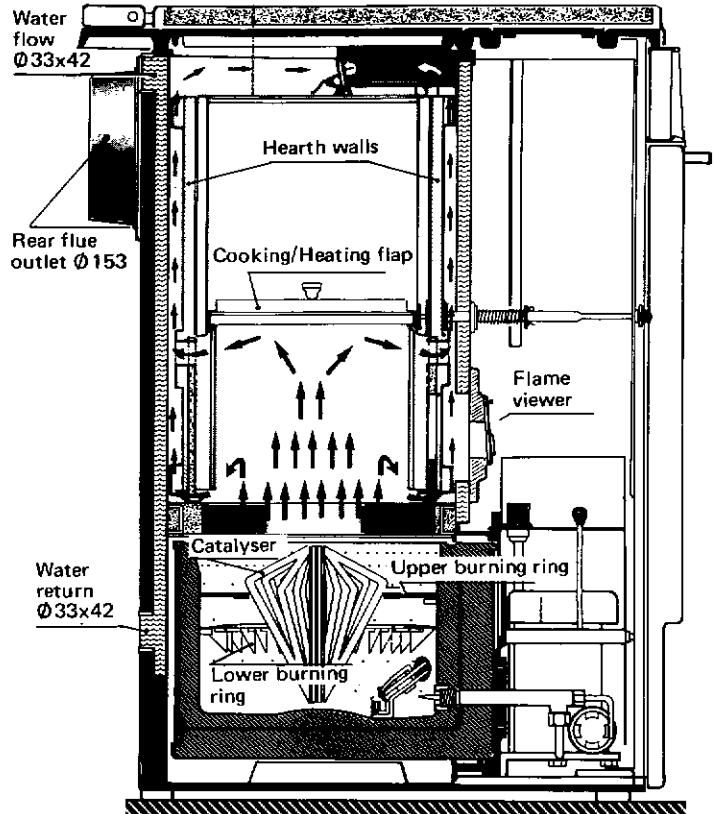
The GRETALUX can be used for cooking purposes and domestic hot water production during summer when a 40 gallons hot water cylinder is installed on a gravity circuit in accordance with the recommendations of paragraph 3 - 3



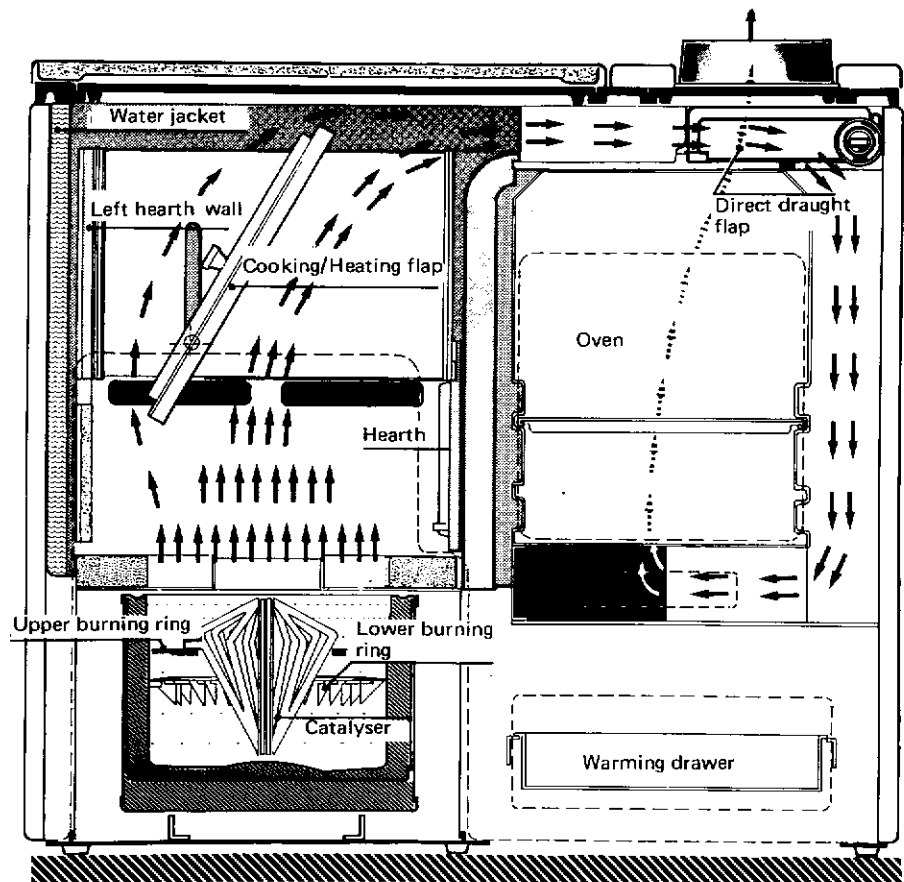
diag. 4



diag. 5



Side cross section (heating position) diag. 6



diag. 7 Front cross section (cooking position)

Diagram of the running cycle of the burner 127.309

No of stages	STAGES	Rough estimation of time in sec.	CONTROL UNITS			OPERATION UNITS								
			Room thermostat ASE 22 JN	Thermostat	Thermal sensor C (Cold) < 200°C/ 392°F H (Hot) > 310°C/ 590°F	O (Operating)			R (Reduced)			S (Stopping)		
			M (Maximum) R (Reduced) S (Stopping)	M (Maximum) R (Reduced) S (Stopping)		Fan	Electrovalve	Transformer	Thermal Relay	Relay RB 1	Relay RB 2	Heating circulator	Igniting Lamp	Electrovalve lamp
0	Stopping	0	S	M	C	S	S	S	S	S	S	S	S	S
1	Preventilation	30	M	M	C	O	O	O	S	O	S	O	O	O
2	Igniting	180	M	M	C	O	O	O	S	O	S	O	O	O
3	Hot burner	80	M	M	H	R	O	S	O	O	O	O	S	O
4	Maximum speed	80	M	M	H	O	O	S	O	O	O	O	S	O
MAXIMUM NORMAL RUNNING														
5	Reduced speed	100	R	M	H	O	O	S	S	O	O	O	S	O
6	Minimum speed	100	R	M	H	R	O	S	S	O	O	O	S	O
MINIMUM RUNNING														
7	Stopping	120	S	M	H	O	S	S	S	S	O	S	S	S
8	Putting out	120												
9	Postventilation	180	S	M	H	O	S	S	S	S	S	S	S	S
10	Final stopping	180	S	M	C	S	S	S	S	S	S	S	S	S

NOTE : This running cycle goes on under normal use conditions, without any reaction from the thermostat. To set the thermostat on «Reduced speed», proceed the same way as for the room thermostat (stage 5). Stopping the thermostat (stage 7) starts the heating circulator even if the latter has been switched off simultaneously by the room thermostat.

diag. 8

2 - 2 Operating principles

The room thermostat ASE 22 JN (diag. 11) is the control component of the burner on heating position.

In accordance with the temperature variations registered by the sensing element of the room thermostat, the burner will operate on one of the following fire positions : Maximum - Minimum - Off.

The integral thermostat of the burner reduces the speed (minimum position) when the heat exchanger reaches the required temperature. The latter stops the burner completely when the water temperature is 10°C over the required one on the thermostat (safety).

On cooking position, the room thermostat is switched off and the running of the burner is kept constant at the selected speed, nevertheless it remains under control of the thermostat which controls the temperature of the water jacket. On cooking position, the calories are diffused mainly on to the top plates and the oven as well.

Ignition of the burner.

To ignite the burner, the fan must reach its maximum speed and the igniting device and the electrovalve must be switched on (diag. 9-11)

The fuel oil released through the electrovalve is introduced into the burner at low flow rate (minimum flow rate of the float regulator diag. 13)

The fuel oil comes into contact with the vaporisation resistance of the sparking plug. When the fuel oil is hot, it turns into vapor. When mixed with combustive air, it ignites with the sparks of the sparking plug's electrode (diag. 10)

Normal operating.

After a few minutes, the thermal balance of the burner is obtained and the temperature of the flame acts upon the thermal sensor immersed into the combustion pot (diag 9-11). This thermal reverser stops the igniting system, the speed of the fan is back to minimum.

After the igniting stage, in accordance with the regulation component, the burner will operate at one the two fire positions : Maximum or minimum.

Stopping.

When the stopping is required by the regulation component, the electrovalve is locked out and the fan is at its maximum speed so that all the combustible particles that may have been in the burner can be discharged. This post ventilation goes on until the sensor cools down, the burner is then ready for the next ignition.

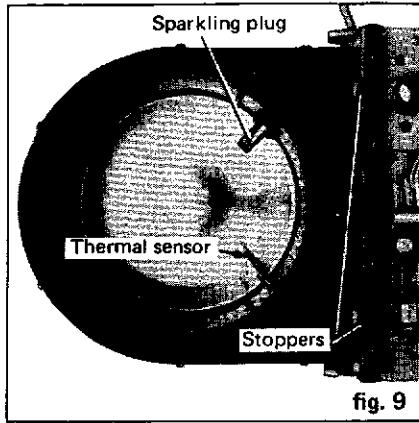


fig. 9

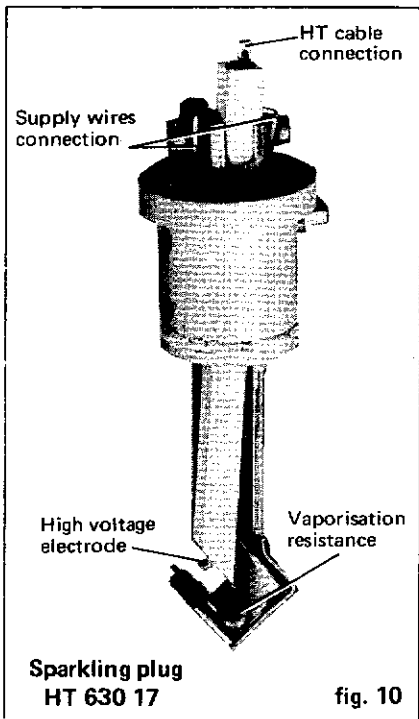
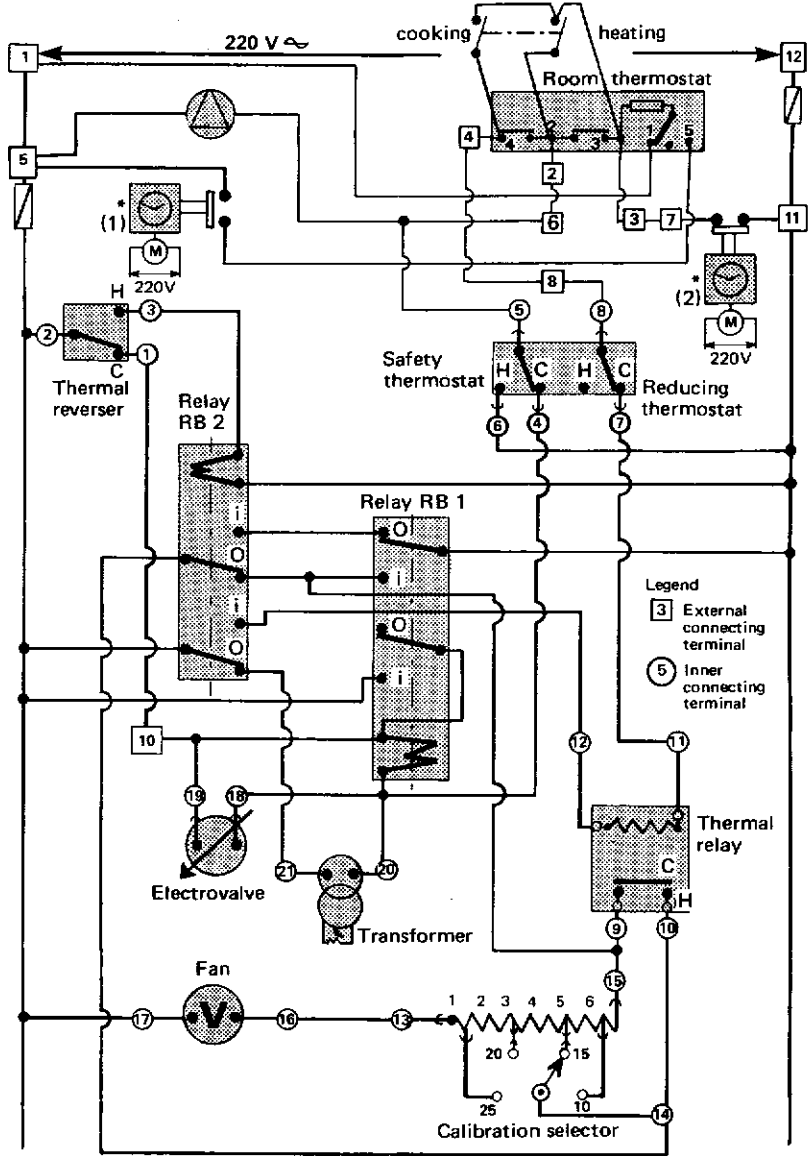


fig. 10



Schematic diagram of the Silenta Burner

fig. 11

* Connection of a time switch : Refer to paragraph 3 - 9

- (1) time switch giving automatic night set-back (closing contact)
- (2) time switch turning off the appliance (opening contact)

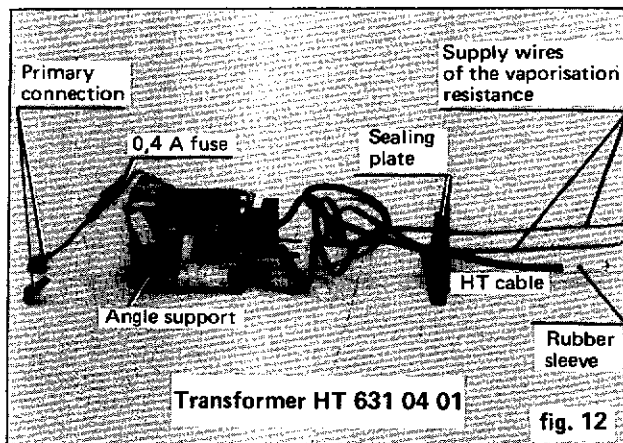


fig. 12

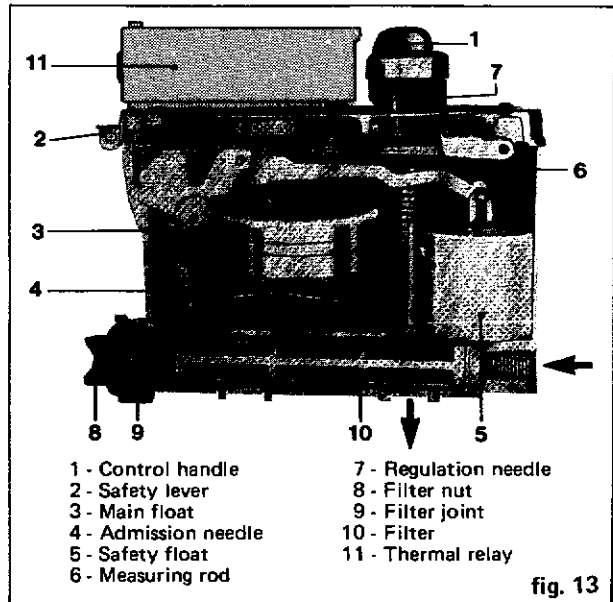


fig. 13

AP float regulator (Model 240 VR)

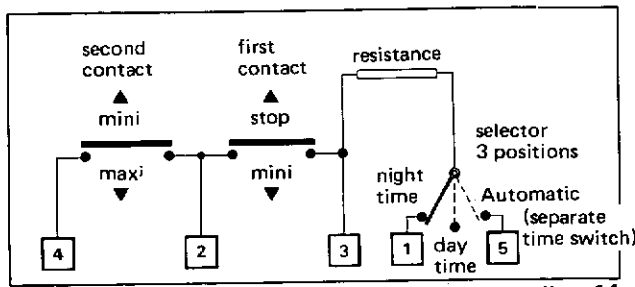
2 - 3 Regulation

The entire modulation of speed is obtained through the regulation system of the room thermostat ASE 22 JN (diag. 15). This thermostat ensures an entirely automatic running of the whole installation.

The sensing element of the thermostat reacts to two electrical contacts. The first contact starts the burner (reduced speed), the second contact ensures a maximum speed.

In accordance with the variation between the room temperature and the recorded one on the room thermostat, the first contact only or both contacts simultaneously are switched on by the thermostat in order to obtain one of the following fire positions : maximum - minimum - off.

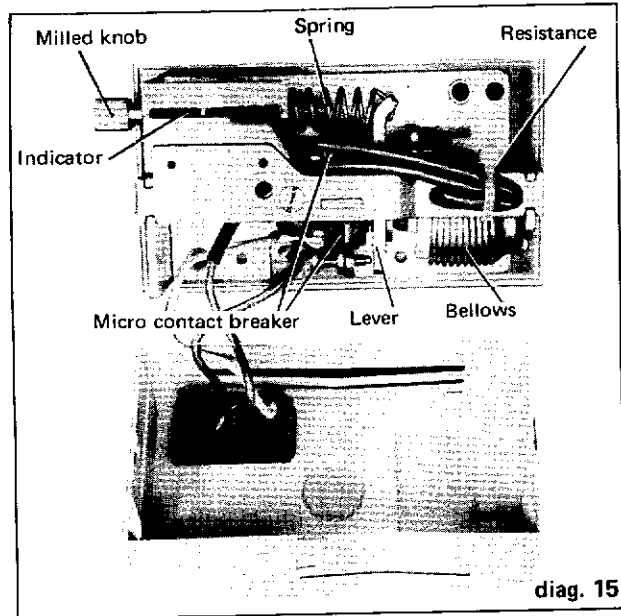
When the room temperature is far above the set point, the two contacts are disconnected and therefore the burner stops. The room temperature will be reduced of 40C/ 390F when the thermostat selector is on night position (diag. 14)



diag. 14

This may be achieved automatically when the appliance is fitted with a time switch (closing contact) and the thermostat selector is on automatic position.

The room temperature at night time is reduced by switching on a small resistance that provides an artificial warming up of the sensing element of the thermostat.



diag. 15

Diagram of the response of the burner and the heating circuit to the impulses of the room thermostat.

Outside conditions (Seasons)	Selected room temperature	Inside room temperature	Position of the electrical contacts.	Operating of the burner	Running of the heating circulator.	NOTE	Temperature of the heating circuit.
Temperature of no heating	20°C/68°F	23°C/73°F	1 off 2 off			No heating stopping of the burner.	NULL
Off season mild weather	20°C/68°F	20°C/68°F	1 on 2 off			Burner : Minimum speed	95°/113°F 35°/45°C
	20°C/68°F	21°C/70°F	1 off 2 off			No heating stopping of the burner.	NULL
	20°C/68°F	20°C/68°F	1 on 2 off			Burner : Minimum speed	95°/113°F 35°/45°C
Off season medium weather	20°C/68°F	19,5°C/67°F	1 on 2 on			Burner : Maximum speed time according to regulation of the thermostat.	122°/149°F 50°/65°C
	20°C/68°F	20°C/68°F	1 on 2 off			Burner : Minimum speed	95°/113°F 35°/45°C
	20°C/68°F	19,5°C/67°F	1 on 2 on			Burner : Maximum speed	122°/149°F 50°/65°C
Cold season	20°C/68°F	19,5°C/67°F	1 on 2 on			Burner : Maximum speed	according to the regulation of the thermostat of the burner. 149°/185°F 65°/85°C
Off season medium weather	20°C/68°F	20°C/68°F	1 on 2 off			Burner : Minimum speed	95°/113°F 35°/45°C
Temperature of no heating	20°C/68°F	21°C/70°F	1 off 2 off			No heating Entire stopping	NULL

NOTE : The temperatures shown on this diagram are given as a guide. The thermostat can be set at a lower temperature, for example 17°C/63°F. In this case, the installation will stop when the room temperature is above to 18,2°C/64°F ; the impulses MAXI-MINI will occur between 16,5°C/61°F and 17°C/63°F about.

3 Assembly and installation

3 - 1 Siting the cooker

The room in which the cooker is to be installed must satisfy all local regulations. These will stipulate an adequate fresh air inlet of at least 55 sq. in. The appliance must be level. If necessary blocks must be set under the supports.

The cooker should not be inserted nearby combustibles which do not withstand heat. It is recommended to keep a minimum clearance of 4 inches between the cooker and the environment.

3 - 2 The chimney

The chimney must be in good condition and must satisfy all local heating regulations. These are some essentials for a good chimney :

- To be cleaned and swept regularly to avoid build up of soot or tar.
 - To be well insulated, to remain warm under all conditions and to hold heat to give a stable draught.
 - To be airtight,
 - To be independent not be shared with any other appliance and not exhaust into a large void at the base.
 - To be at least 14 ft high to ensure satisfactory performance.
 - To be at least 3 ft above any obstructions within 25 ft radius or use a suitable cowl to avoid down draughts.
 - To have a fairly constant cross section, without sudden bends.
 - To have an optimum draught of 0,06 ins. w. g.
- NOTE : If the draught exceeds 0,12 ins. w. g. it is recommended to fit a draught regulator.
- Connection to chimney : Either horizontally from the back of the cooker or vertically from its top. In this case, remove the blanking plate of the cover.

3 - 3 Domestic hot water cylinder

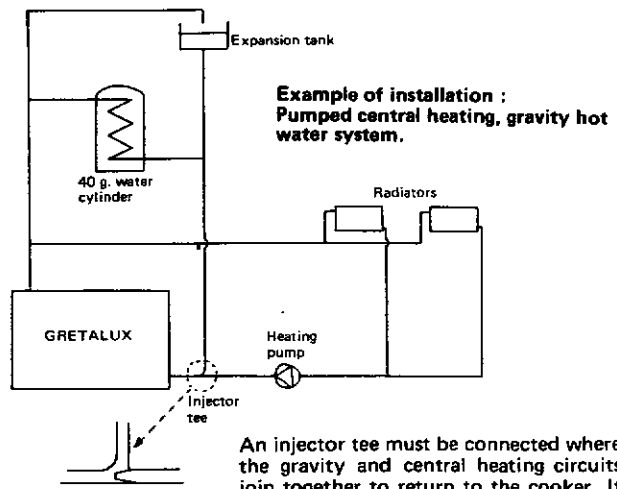
The following instructions have to be observed in order to produce domestic hot water with the GRETALUX. The hot water cylinder must be of the indirect type, having a capacity of 40 gallons and a large diameter heat exchanging coil running down the interior. The hot water cylinder must be engineered to work by gravity. Refer to paragraph 3 - 4 for plumbing.

A «Summer/Winter» switch must be connected on the power supply of the heating pump in order to switch it off during summer : the flow of hot water will be directed rather to the cylinder than to the radiators circuit. Refer to paragraph 3 - 8

3 - 4 Connecting the central heating circuit

In any installation building codes and practices must be observed. The appliance should be connected to the installation with joints and unions to make the dismantling easy.

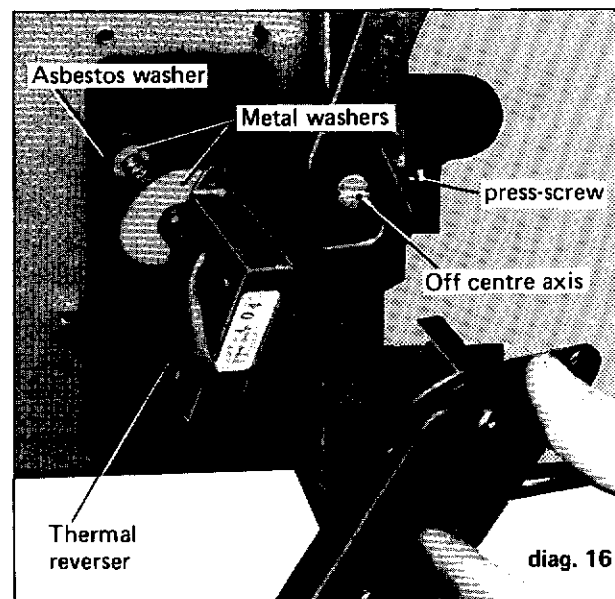
The layout of the heating circuit can be designed in any fashion that suits the house, as the pump will ensure circulation of hot water to all points, but the hot water cylinder must be engineered to work by gravity. Use 1 inch min. I.D. pipe (28 mm) to the cylinder, ensure that the cylinder has a 3/4 inch min. I.D. coil (22 mm) wound from top to bottom, and that the inlet is above the boiler. An expansion tank open to the atmosphere must be provided to ensure that no pressure build-up can occur, and this should be connected to the highest point of the circuit by 1 inch I.D. pipe (28 mm).



An injector tee must be connected where the gravity and central heating circuits join together to return to the cooker. It permits a stable circulation of hot water through both circuits and avoids priority to be given to the stronger flow (commonly to the pumped central heating circuit).

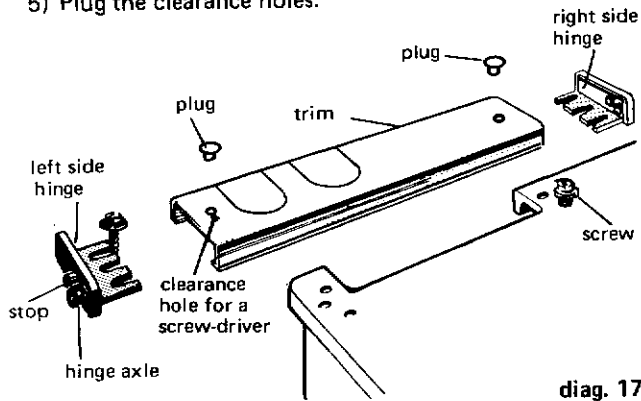
3 - 5 Checking of the burner

- * Remove the warming drawer and take off the burner to check the proper seating of its inner parts.
 - * Connect the flexible pipe at the back to the oil inlet pipe. **CAUTION ! Leave sufficient length at the back to take out the burner easily.**
 - * Lock the burner on the water jacket with the two latches and check the tightness of the gasket.
 - * The locking track can be corrected if necessary by turning the off centre pin round with a screwdriver after having first loosened the press-screw in order to increase or reduce the tightening of the latch on the locking pin of the burner.
 - * Check that the thermostat sensor of the burner is placed in the seating on the left of the front part of the water jacket.
- IMPORTANT !** Check the burner level with a water level placed on the specially provided stoppers (diag. 9). If possible the burner must be leaning to the right (sparkling plug side), and the level of the appliance must be corrected if necessary.

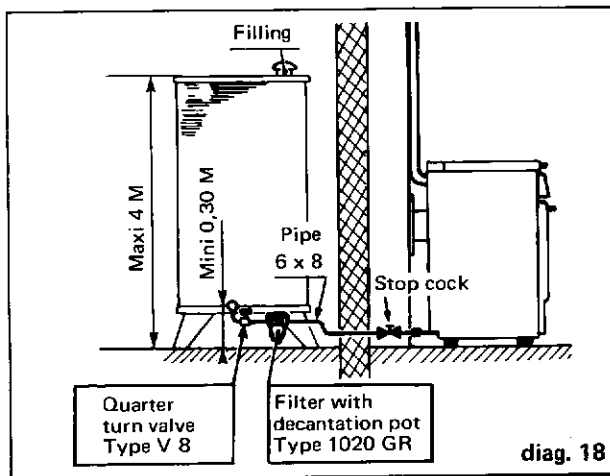


3 - 6 Adjustment of the covers

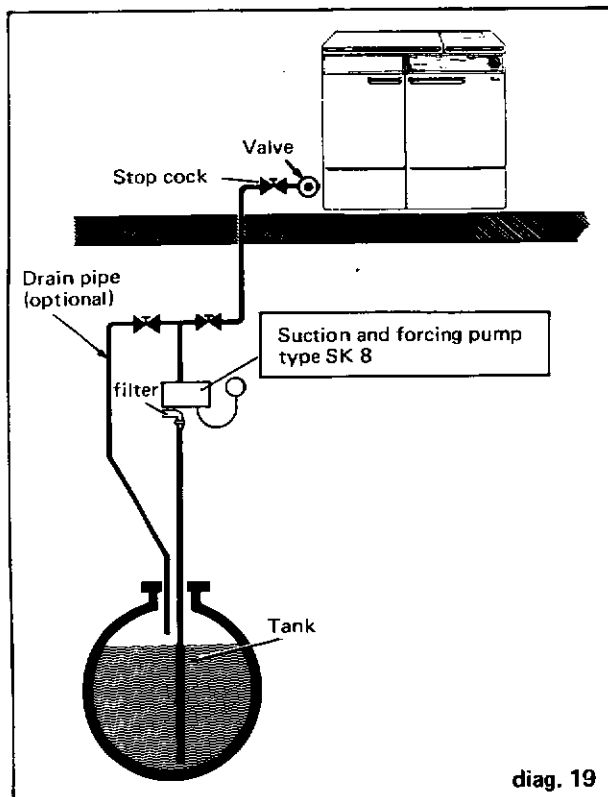
- 1) Insert one of the side hinge under the fixing screw (hinge axle towards the front)
- 2) Slide the trim into the fitted hinge (pipes shapes towards the back)
- 3) Slide the second hinge
- 4) Adjust the whole and lock the two fixing screws, accessible by the top of the trim (clearance hole for a screw-driver)
- 5) Plug the clearance holes.



diag. 17



diag. 18



diag. 19

3 - 7 Oil supply of the generator

The SILENTA burner can be supplied with oil, either by gravity when the tank is a gravity feed one, or through a suction and forcing pump (diag. 18 - 19). Those accessories are provided on request.

NOTE : The SK 8 pump can be connected to the burner (terminals 9 and 10). This allows pump to be switched off with burner.

3 - 8 Electrical connection

All the external electrical component will be connected onto the 12 terminals (external connection board) on the left side of the printed circuit : diag. 20

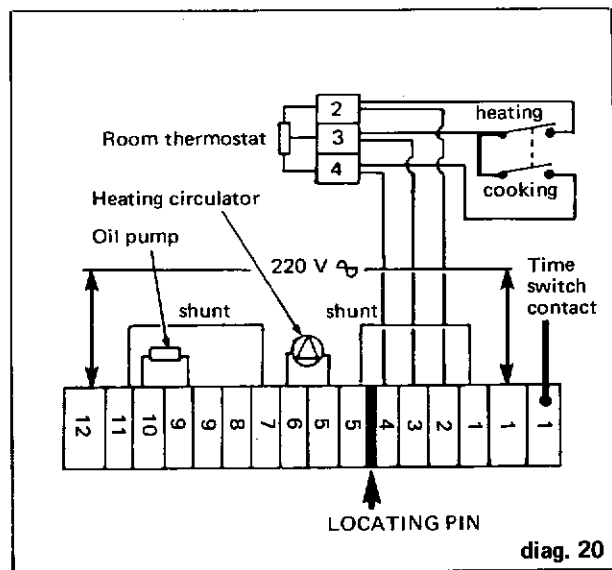
- power supply : terminals 1 and 12
- room thermostat : Terminal 1 and binding-post 2, 3, 4
- circulator : terminals 5 and 6
- oil supply pump : terminals 9 and 10

The electrical supply will be by means of a flexible cable and earthed plug-and-socket. Connect the earth wire to the screw provided for this purpose and located above the casing of the burner.

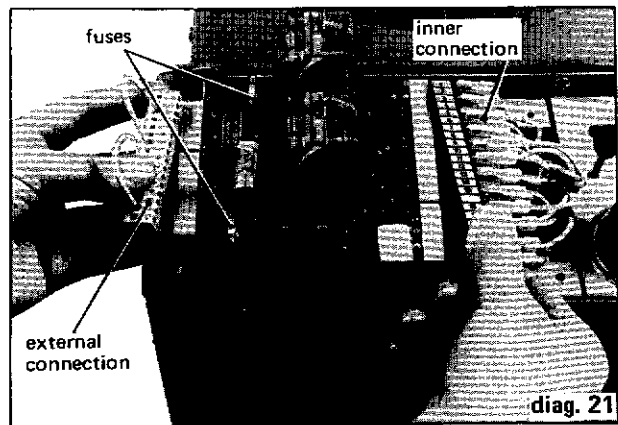
NOTE : The cables will have to be protected by a flexible sheath between the casing and the water jacket of the appliance. Leave sufficient length to be able to remove the burner easily.

Before plugging in the appliance, check the voltage of the main supply. The burner can operate only at 220 volts. If necessary add an autotransformer to provide the correct voltage.

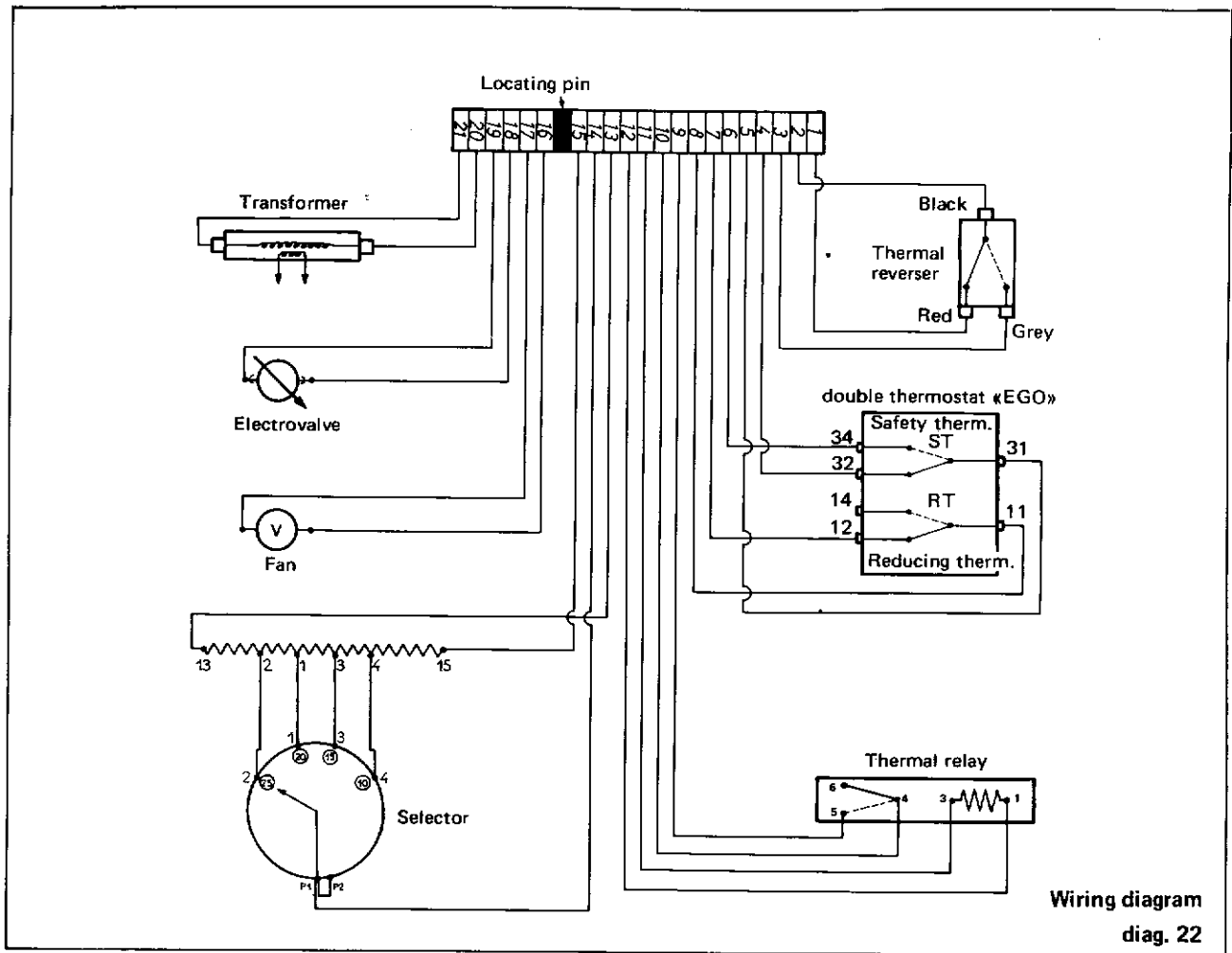
The power of the transformer must be at least 250 VA to supply the burner and circulator.



diag. 20

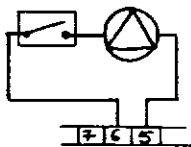


diag. 21

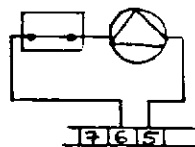


- in the case of an installation with a domestic hot water cylinder, a «Summer/Winter» switch must be provided and connected between the heating pump and terminal 6 :

- «Summer» position : opening contact in order to switch the heating pump off
- «Winter» position : closing contact in order to let the heating pump operate according to the running cycles of the burner



«Summer» position

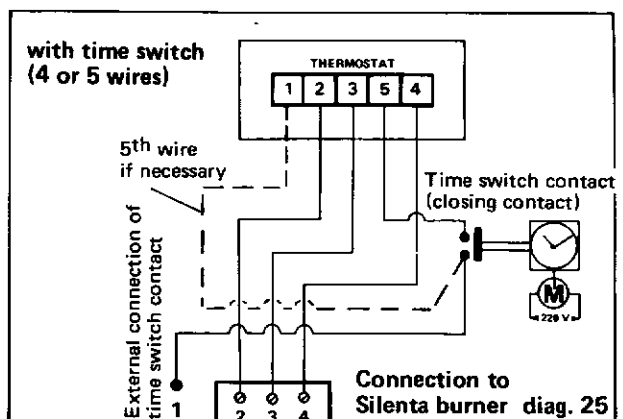
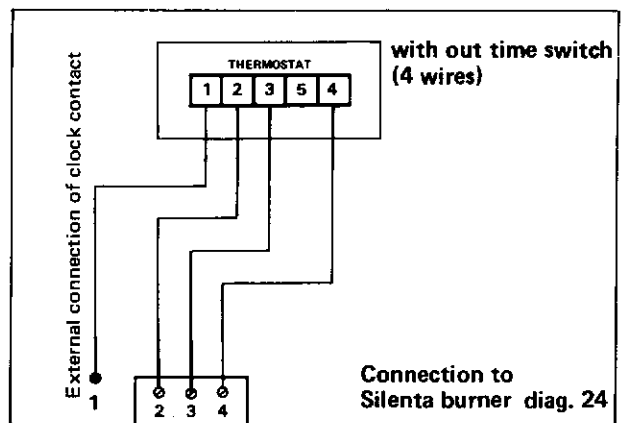


«Winter» position

3 - 9 Installation of the room thermostat.

The room thermostat must be placed about 1.5 metres above floor level on the inner wall of the main room. There must be a good air circulation in that place : avoid corners, hot places, such as near radiators, hot water pipes, smoke pipe and sunbeams. Avoid cold places as well such as outside walls, windows, draughts caused by opening doors.

Diagramms 24 and 25 show the connections without and with night set-back time switch respectively.



3-10 Connection of a time switch

The appliance can be fitted with a time switch to allow either (1) the room temperature under night time condition to be set-back automatically, or (2) the burner to switch out completely through it (diag. 11)

In the first case, the room temperature will be reduced by 4°C/39°F when the thermostat selector of the room thermostat is on the automatic position. Refer to diagramms 11 and 25 for connection to Silenta burner.

In the second case, the operation of the time switch is independent of the room thermostat. When the time switch setting calls for the burner to stop, a cool-down period occurs before the burner stops completely.

Refer to diagramms 11 and 20 for connection to Silenta burner. Remove the link between terminals 7 and 11 of the external connection board and connect the time switch contacts between terminals 7 and 11 (action «Contacts Open»).

4 Operation

4 - 1 Checks prior the igniting

Before leaving the factory, the top plate is protected with a blue plastic coating which must be peeled off before igniting. Check that all the inner parts are properly seated (diag. 6 - 7).

Ignite the cooker (see operators instructions).

4 - 2 Control of the draught of the chimney

The draught of the chimney must be measured when the cooker is first started and before the oil flow is adjusted.

- insert the measuring tube draught gauge (diag. 26) in the opening of the top plug ; having first taken off the top screw.
- the optimum draught is about 0,03 ins.w.g. at minimum speed and 0,06 ins.w.g. at maximum speed.
- if the draught is lower than the values stated, it will be necessary to modify the chimney (see paragraph 3-2).
- if the draught is far above, we advise the fitting of a draught regulator to ensure a good balance of the burner in operation and optimum efficiency of the boiler.

4 - 3 Adjustment of the operation of the burner.

The burner is checked at the factory to operate well under normal conditions :

- Mains voltage 220 volts $\pm 10\%$
- Draught at the plug : 0,04 ins.w.g. (about 0,06 in the chimney).

Under those conditions, the flame does not cling to the upper ring of the burner at minimum speed. The flame does not reach the cooking-heating flap when operating at maximum speed (selector on position 25).

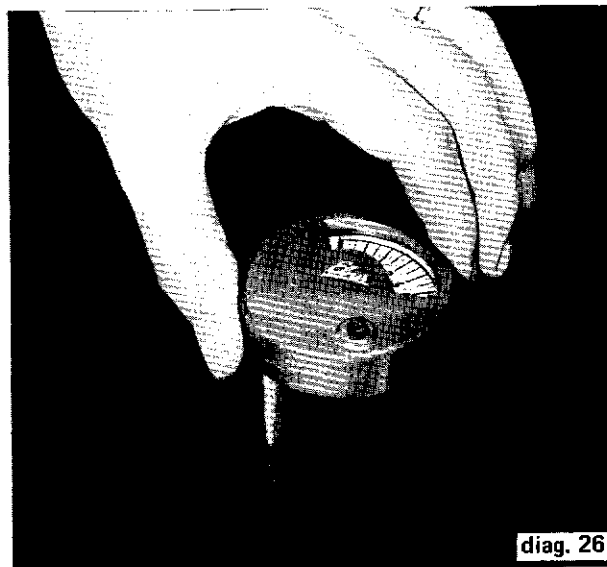
Adjusting the oil flows.

In case the maximum and minimum flows must be modified, see diag. 27

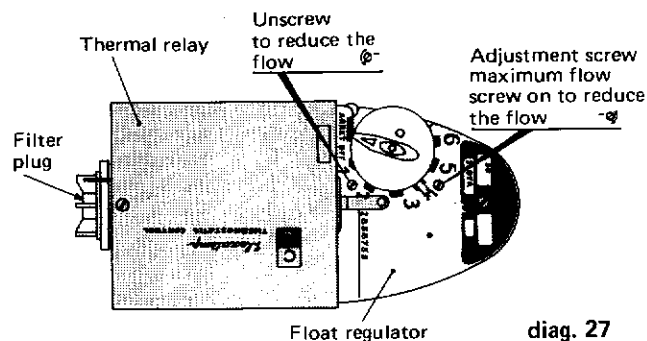
NOTE : In case the main voltage would provide excessive speed, the air capacity of the fan can be roughly reduced by adjusting the motor cap of the fan.

Control of the thermostat operation.

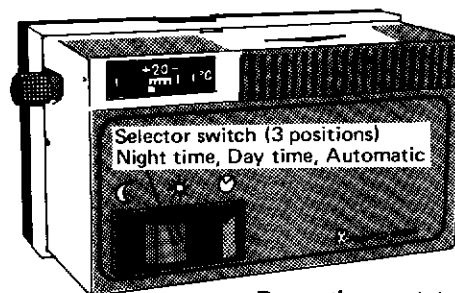
In accordance with a certain temperature of the water in the water jacket, operate and check that the thermostat control ensures a slow speed of the burner when its setting corresponds with the water temperature. The burner completely stops when the thermostat control is set 10°C/50°F below this temperature.



diag. 26



diag. 27



Room thermostat

The good operation of the appliance is guaranteed as long as the equipment has not been modified by the installer and the electrical connections have been properly made as described in this manual.

In order to constantly improve our products, our appliances are subject to modifications by our sales or technical services without any prior notice.

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