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Read carefully through this instruction book before assembling and using the boiler. Before installing the Central Heating Boiler Art.No. 2921 please note!
This is a general installation and operation instruction for the Central Heating Boiler Art.No. 2921.
As regulations vary from country to country, Alde can not be held responsible for any descripancy between this general instruction and specific requirements in your country.

1:0 How the boiler is constructed.

The boiler operates according to the so called constant temperature principle. i.e that there should always be hot water in the boiler ready to be circulated in the system whenever the room thermostat calls for heating. Therefore no heating-up time is necessary. There is an inlet pipe in the bottom of the boiler which leads air to the combustion chamber. The control board and automatic equipment are placed on an easily dismantled plate, screwed to the combustion chamber on the lower part of the boiler. The water jacket is placed above the combustion chamber. It consist of an interior, and an exterior pipe. The space between these pipes constitutes the water storage. The flame damper is placed inside the interior pipe. It consists of a pleated metal sheet which is mounted in the flue. The purpose of flame damper is to lead out the hot chimney gas which comes from the boiler to the water jacket so the water is heated. There is a pipe leading to the expansion vessel from the water jacket's top. In the expansion vessel there is a 12 volt electric pump which circulates the hot water in the system. At the very top of the boiler the top cap with the switchboard panel for electric connection to the boiler is to be found. A ventilation duct is attached beside the boiler, this takes in air from the outside and leads it to the boiler but outside the combustion chamber. The fresh air is heated up by the radiation heat from the boiler body and is led into the room through the ventilator grill in the front plate. In this way you avoid letting in fresh air in through the floor with coldness as a result.

1:1 How the boiler operates.

When the room thermostat requires heat, the circulation pump starts. Then water in the system begins to circulate and cold water comes into the boiler. The indicator on the boiler senses that the water is colder than the temperature which has been set on the boiler thermostat. The main burner ignites and heats up the water which circulates in the system and in its turn heats up the caravan. The circulation pump stops when the heat in the caravan has reached the temperature set on the room thermostat. The indicator on the boiler then senses that the water has reached the temperature set on the boiler thermostat. It then turns off the main burner and reduces to "pilot light". When the water temperature has dropped 8–10° C in the boiler the main flame is turned on again and heats up the water. In this way there is always hot water whenever the room thermostat request it.

1:2 Technical information

Dimension:	Height	Width	Depth
The boiler measurement:	1710 mm	132 mm	220 mm
Min. installation measurement:	1820 mm	132 mm	310 mm
Min. inst. measurement with immersion heater:	1820 mm	132 mm	420 mm
Min. inst. measurement as above + water heater:	1820 mm	132 mm	450 mm

2:0 Assembling the boiler.

Mark the place where the boiler is to be. If the boiler is placed next to a wall or some such of inflammable material, a 1 mm air gap should be left. Make a hole in the floor, one for the inlet pipe and one for the ventilation duct (see fig 1). Put a string of silicone around where the boiler is to be. Put the boiler in place and screw it to the floor and the wall (see fig 2C). The inlet pipe should pass at least 25 mm under the opening for the ventilation duct (see fig 3). Screw the grey inlet funnel to the inlet pipe under the boiler. The ventilation duct can be placed on either the right or left side, depending on the space. Remove the square shaped covering plate from the boiler where the ventilation duct will be placed. Cover the hole made in the floor with a close-meshed net. Screw the ventilation duct to the floor and the boiler. Pull out the plastic hose which is folded behind the upper front plate. Cut the end of the hose so that it is pointed. Pull the hose out through the ventilation duct, net and floor. The function of the hose is to evacuate superfluous water from the expansion vessel.

Fig 1

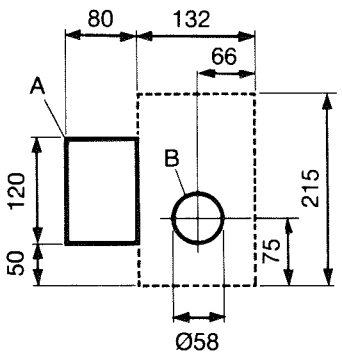


Fig 3

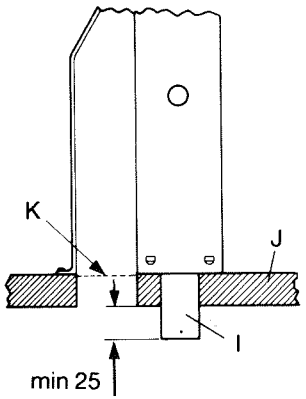


Fig 2

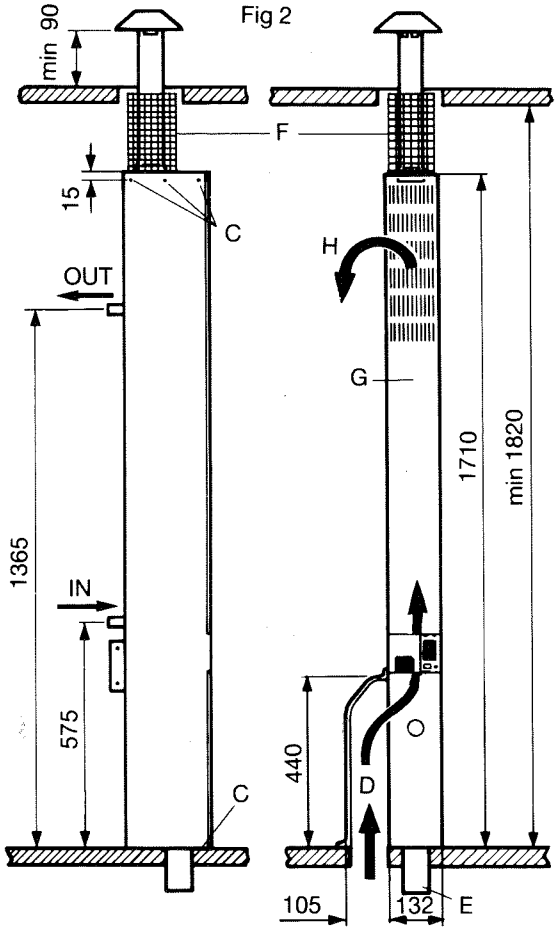


Fig 1
A. Hole for ventilation duct
B. Hole for inlet pipe

Fig 3
I. Inlet pipe
J. Floor
K. Close-meshed net

Fig 2
C. Hole for fastening the boiler
D. Fresh air
E. Air of combustion
F. Protection net or plate for the exhaust
G. Service hatch for filling
H. Preheated fresh air

2:1 Assembling the chimney

Mark the centre where the hole is to be made (see fig 4). Make a 125 mm hole in the ceiling and the insulating material and an 82 mm hole in the roof. Then assemble the parts and fasten the nuts (see fig 5). Then bring the exhaust in from underneath and screw it to the boiler.

N.B! When the exhaust is pulled up or down it should at the same time be twisted (grease it with suds if necessary). Put on the cap and bend the edge inwards. Minimum distance between the roof and the chimney cap should be 90 mm. The free part of the exhaust should be covered with a net or plate (see fig 2F). Retighten the nuts necessary. Note that the assembling of the chimney ought to be done before the boiler is put in place.

Fig 4

Boiler seen from the top

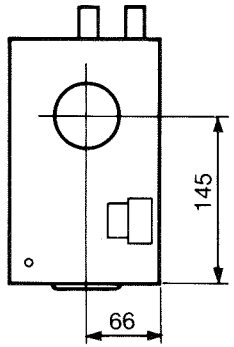
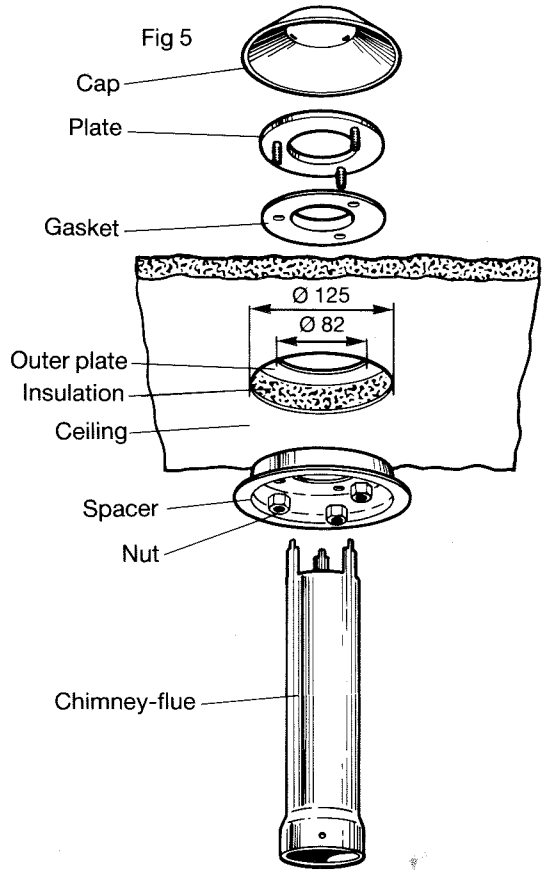


Fig 5



2:2 LP-gas installation.

The boiler is attached by an 8 mm gas tube. The clips should be placed at 300 mm intervals. When passing through walls, floor etc the pipe should be protected against wear by a tube or something similar.
If the gas pipe is drawn under the caravan (fig 6):
Dismantle the lower front plate. Drill a hole in the floor where the gas pipe should pass through. There are already two holes punched in the bottom plate. Pull the gas pipe through the floor and the bottom plate (do not forget to protect it against wear), and fasten it to the automatic equipment. Pack the passage in the floor with silicone or something similar.
If the gas pipe is drawn inside the caravan (fig 7):
Dismantle the lower front plate. Take away the cover washer on either the left or right side, depending on which side the gas pipe comes from. Cut a hole in the enclosed rubber washer and put it where the cover washer has been. Pass the gas pipe through and pull it up to the connection, and fasten it to the automatic equipment.

Fig 6

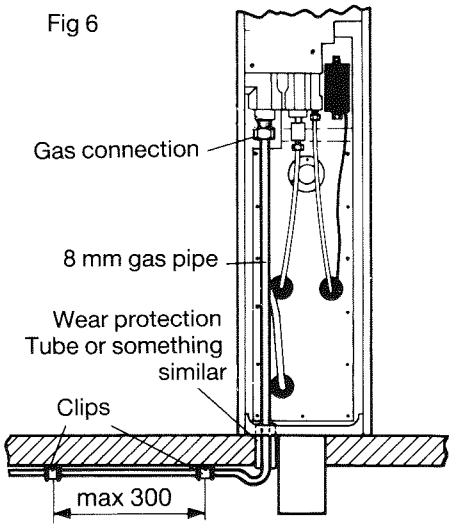
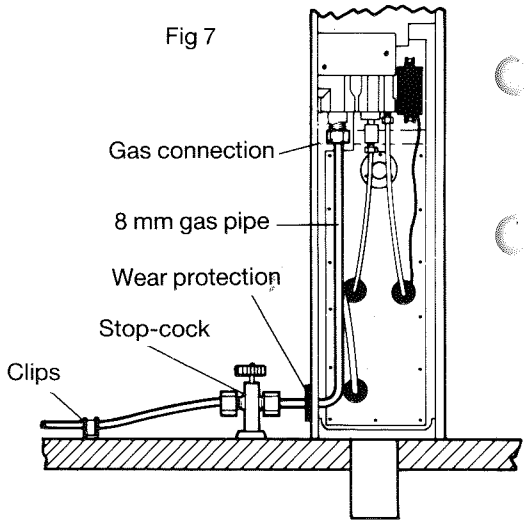


Fig 7

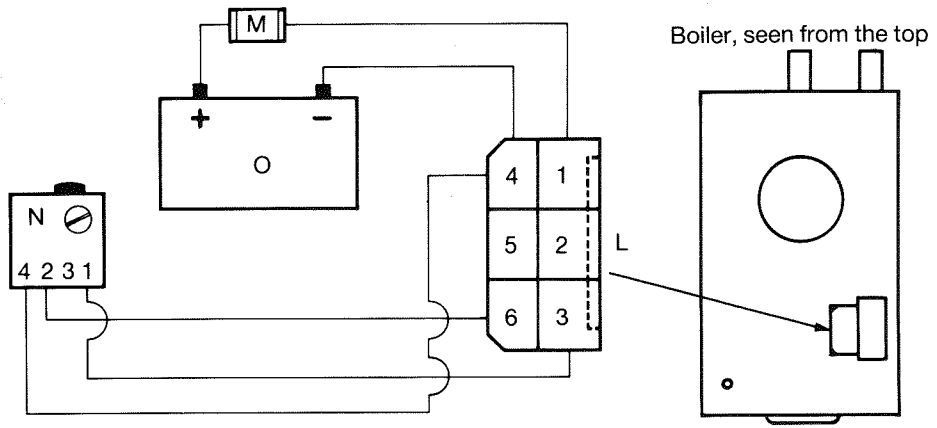


2:3 Electric installation.

The electric connection is screwed to the top of the boiler, with a six pole connection terminal board. Use the enclosed connection terminal board and the six flat connection pins. A 1.5 mm^2 cable should be used from the battery and a 1 mm^2 from the room thermostat. The connection should be to a 12 volt car battery or a special battery eliminator (art.no 2921 520). The connection should be done according to fig 9.

L. Connection terminal board
M. Fuse 1 ampere
N. Room thermostat
O. Battery 12 volt

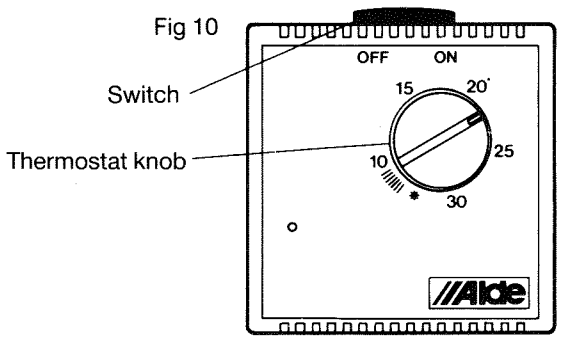
Fig 9



2:4 Installing the room thermostat.

The room thermostat should be placed in a suitable place in the room, at least 1 metre above the floor but not too high up. Neither should it be placed on an outer wall or next to the boiler, fridge or chimney. The room thermostat starts and stops the pump as required, just like in a house system. At the top of the thermostat there is a switch for turning the system on and off, (see fig 10).

Fig 10



2:5 Installation of pipes and radiators.

To get the best result from the heating system the radiators ought to be placed alongside the outer walls. To obtain good air circulation and correct heat emission, air should be able to pass freely between the bed bases – floor and back cushions – outer walls (see fig 11). It is of the utmost importance that the air gets free access to the radiators, as these supply the main part of the heat which will be diffused in the caravan. If .holes are not made for the air according to fig 12, the radiators can not give .heating, which results in coldness and condensation near the windows and outer walls. The installation should be done with 22 mm (outer diam) pipes and radiators of an optional make. Radiators constructed of copper pipes are the most efficient. Each metre has a heat emitting capacity of 400 watts. How many metres of radiators are then needed in the caravan? Count, the caravans length x 1.5 = number of metres of radiators. But, the more metre of radiators the better the heat emission. Then the boiler can keep a lower working temperature and still emit the same heat. It both saves gas and gives a more pleasant warmth.
The installation of the pipes should be done horizontally. The air relief screws should be placed in suitable places where the air can not escape on its own, for example over the wheel. All bends should be made as smooth as possible, otherwise the circulation is obstructed. Make sure that the radiators and pipes are firmly fastened with brackets. Short rubber connections made of special rubber should be used as a connection between the radiators and the pipes (art.no 1900 120 or 1900 121). Permatex Form-a-Gasket no 3 (art.no 1900 174) ought to be used as tightening material between the rubber connections. A tap for emptying the system should be put at the pipes lowest point.

N.B! Copper and aluminium can not be used in the same system. Never use for instance copper radiators together with aluminium pipes as this can cause severe corrosion damages.

P. Outgoing water
Q. Return water
R. Ventilation drum
S. Radiator
T. Air relief screw
U. Tapping-cock
V. Room thermostat

Fig 11

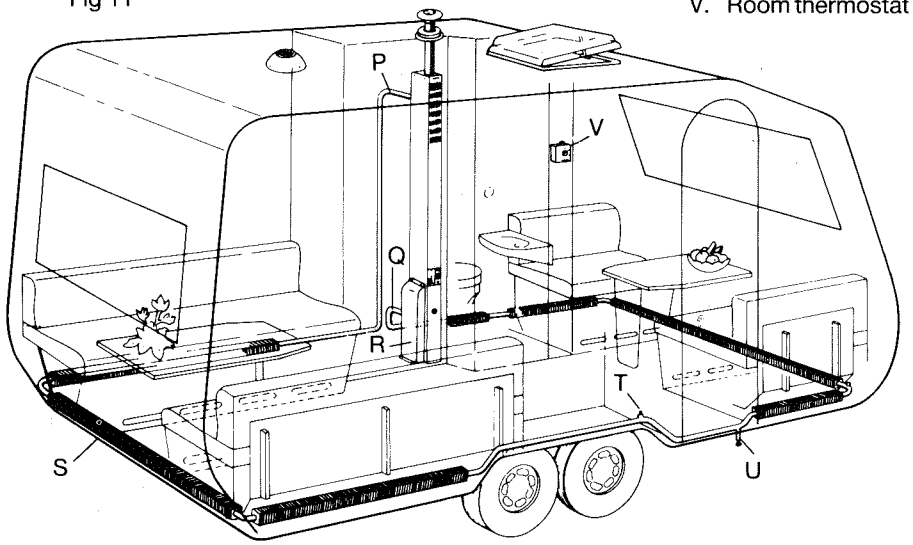
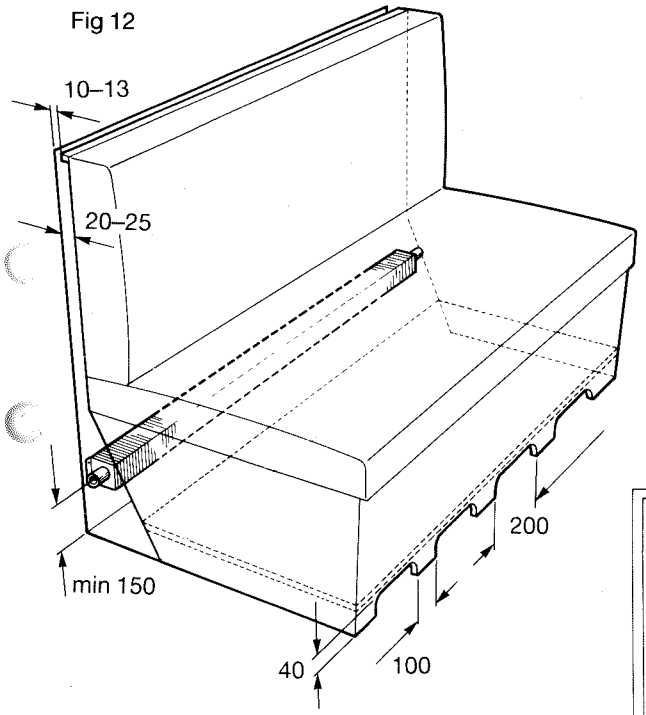
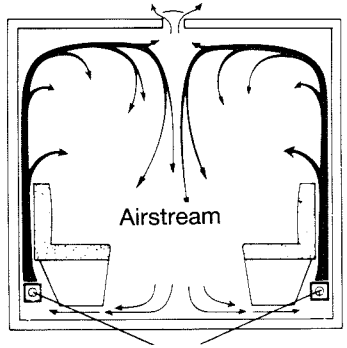


Fig 12



Principle how the warm air should circulate in the caravan.



2:6 Filling the system.

The system is filled with min 25–max 50% glycol of a quality suitable for the purpose. Make sure that the caravan is level before filling the system so no air pockets can be formed. Check that the air relief screws and tapping-cock are closed. Dismantle the upper front plate (press the catch above the automatic box). Loosen the pump's nut and lift up the pump. If a water heater is installed, put the stop-cock for summer and winter use in the centre position.
Fill the system slowly with the glycol mixture so that all the air can escape through the boiler. Fill the system to about 1 cm above the minimum mark in the expansion tank. There should always be glycol in the system to get safe protection against frost and corrosion. Do not ever let the system be empty. The glycol mixture ought to be exchanged at least every second year, as the quality of the glycol deteriorates. Check that all joints are tight. If glycol has leaked out, rinse with water and wipe up carefully.

ALCOHOL MAY NEVER BE USED FOR FROST PROTECTION.
N.B. Radiator cement may not for any reason be mixed with the water.

2:7 Airing of the system.

On filling the system air pockets can form depending on how the pipe system is installed. One way of noticing that there is air in the system is that the heat only goes out about 1/2 metre in the pipe from the boiler, in spite of the fact that the circulation pump is on. Air it thus: The boiler should be on and the circulation pump off. Start by opening the air relief screws and keep them open until water comes out of the pipe on the air relief screw. Start the circulation pump and leave it on a while. See if the pipes get warm all around the caravan. If there is still air left in the system, you can do the following: Stop the circulation pump. Roll down the support wheel as far as it goes, so that the caravan leans towards the front (see fig 13). Leave it this way for about 5 minutes, so that the air bubbles can travel upwards in the system, open the air screw at the highest point in the system and keep open until all the air has come out. Then roll up the support wheel to maximum position and proceed in the same way at this position (see fig 14). Repeat this a few times. Place the caravan level and start the circulation pump. When the outgoing and incoming pipe are almost as warm as each other (10–20° C difference) the system is free from air. It is easier to air a caravan with bogie wheel if you park on a hill.

Fig 13

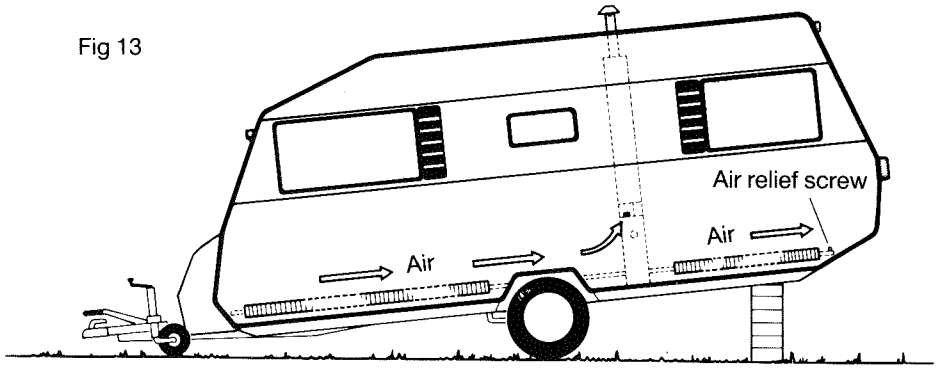
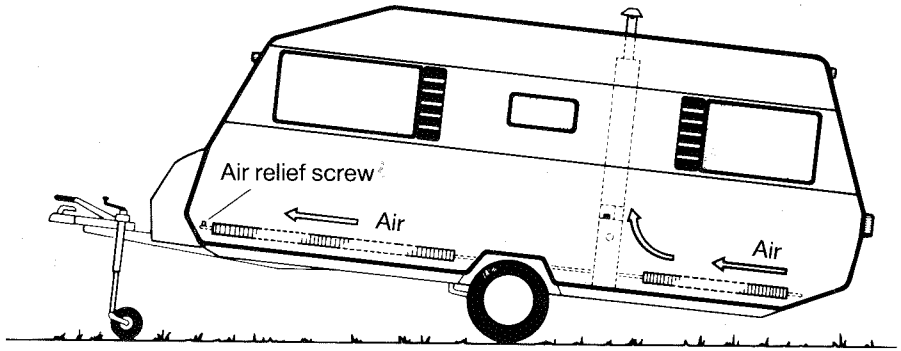


Fig 14



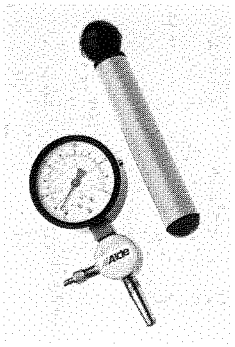
2:8 Installation check.

Test the LP-gas installation with a pressure tester. If there is a leak, check with the leak spray or soapy water where the leak is.
N.B. Naked fire should not be used when looking for the gas leak.
To further increase the safeness we recommend installation of the gas leak tester 4071. This is installed near the reduction vent. By pressing the button you can easily check if the installation is tight.
Check that:
all the joints in the system are tight.
the chimney is in place.
the ventilation drum is not blocked.
the reduction vent is at the correct pressure.
the circulation pump rotates in the right direction (anti-clockwise).

Leak spray

Gas leak tester

Pressure tester



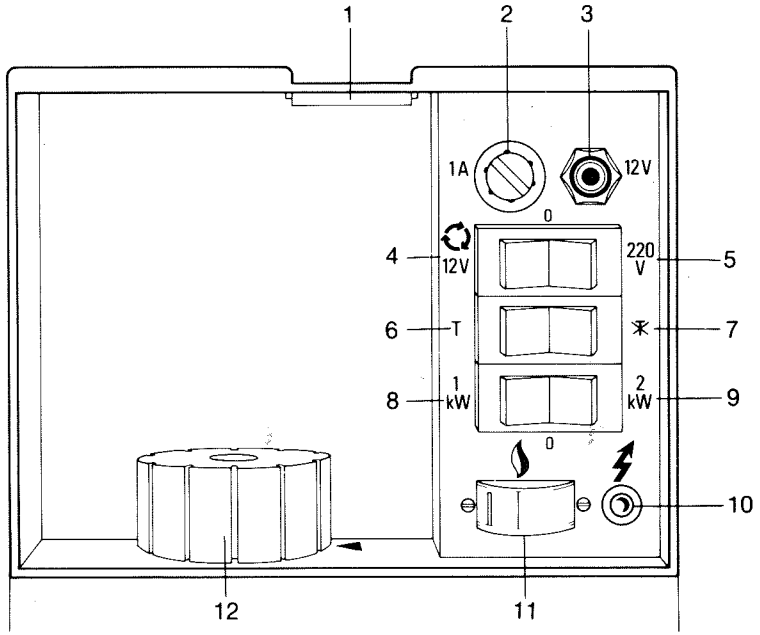
3:0 The instrument panel's different functions.

There are two different types of boilers. One with three and one with four switches in the panel. It is explained below what the various switches are for and what happens when they are switched on.

3:1 Boiler with three switches (fig 15).

1. Catch.
2. Fuse 1 ampere.
3. Power inlet.
4. 12 volts circulation pump.
5. 220 volts circulation pump.
6. 12 or 220 volts circulation pump, whichever is chosen, switches off at the same time as the heating coil in the immersion heater via the room thermostat. The monitor lamp turns off when the room thermostat switches off.
7. The 12 or 220 volts circulation pump, whichever is chosen, switches off via the room thermostat. The heating coil in the immersion heater continues to heat the water until the built – in thermostat turns off. In this position there can be a "boiling sound" in the immersion heater. The switch should be in this position when the water heater is to be used.
8. 1000 watts effect on the immersion heater.
9. 2000 watts effect on the immersion heater.
10. Monitor lamp.
11. Indicator instrument.
12. Thermostat knob.

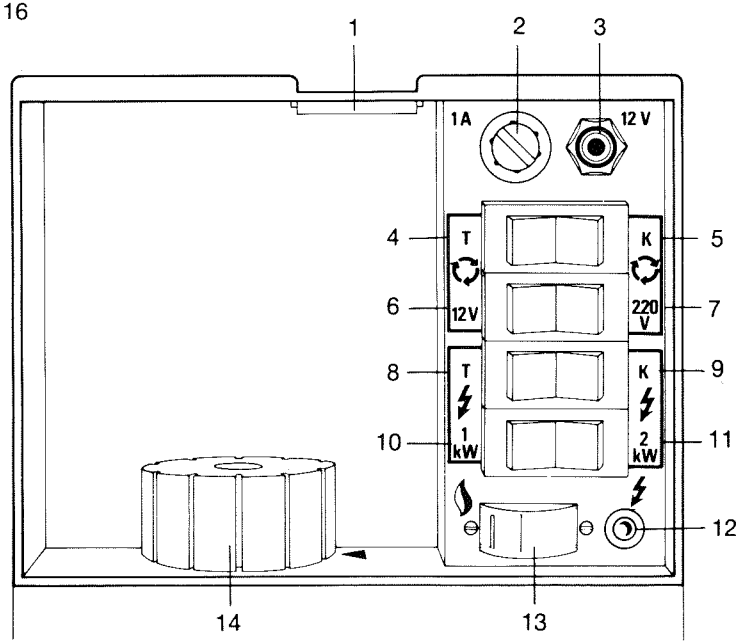
Fig 15



3:2 Boiler with four switches.

1. Catch.
2. Fuse 1 ampere.
3. Power inlet.
4. 12 or 220 volts circulation pump, whichever is chosen, switches off via the room thermostat.
5. The 12 or 220 volts circulation pump, whichever is chosen, is constantly on. It should be in this position in the winter time when it is cold outside and when there are many persons in the caravan. Each person emits a certain amount of heat. Therefore if one sits near the room thermostat it can switch the circulation pump off, with cold areas near the windows and floor as a result. In this position the pump is constantly on and coldness is avoided.
6. 12 volts circulation pump.
7. 220 volts circulation pump.
8. The heating coil in the immersion heater switches off via the room thermostat. The monitor lamp turns off when the room thermostat switches off.
9. The heating coil in the immersion heater switches off via the built in thermostat. In this position there can be a "boiling sound" in the immersion heater. The switch should be in this position when the water heater is to be used.
10. 1000 watts effect on the immersion heater.
11. 2000 watts effect on the immersion heater.
12. Monitor lamp.
13. Indicator instrument.
14. Thermostat knob.

Fig 16



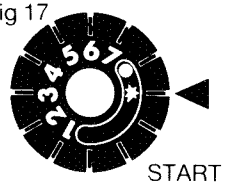
3:3 How to start the boiler.

1. Turn on the main gas tap.
2. Turn the thermostat to ignition position.
3. Press the thermostat knob to the very end. (A ticking sound should be heard from the igniter).
4. Hold the knob completely down until the needle on the indicator instrument has gone up at least to the middle of the green area, this means that the boiler is lighting. You can also check through the peep pane in the front plate if the pilot light is burning. When the boiler is lit and the needle is furthest to the right in the green area, the thermostat knob can be let up. If the needle does not stay on the green area, it means that the boiler has quenched. Turn the knob back to stop position (see fig 19).

The boiler should not be relit for 3 minutes.

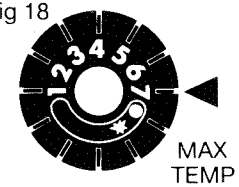
5. If the needle remains on the green area after 10 seconds, the thermostat knob is turned to the working position (see fig 18) and desired boiler temperature is set (min 30° C max 80° C). If for any reason the boiler should quench, even if it is due to having run out of gas, the thermostat knob should be turned to the stop position (see fig 19). The boiler should not be relit for 3 minutes as gas remaining in the combustion chamber may cause a ignition puff.

Fig 17



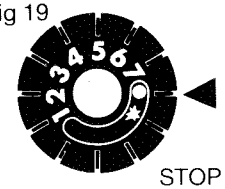
START

Fig 18



MAX TEMP

Fig 19



STOP

3:4 Temperature setting.

For more pleasant and economical heating adjust the water temperature in the system with the thermostat knob. If the outdoor temperature is low you need a higher water temperature than if it is for example a relatively warm autumn night. When heating up a very cold boiler you should not set the thermostat at max, set it in middle position for the first 15 to 20 minutes. The various markings on the thermostat knob correspond to the number of degrees in the temperature of the water in the boiler according to the following (see fig 20):

1 corresponds to about 30° C water temperature.
2 corresponds to about 35° C water temperature.
3 corresponds to about 40° C water temperature.
4 corresponds to about 50° C water temperature.
5 corresponds to about 60° C water temperature.
6 corresponds to about 70° C water temperature.
7 corresponds to about 80° C water temperature.

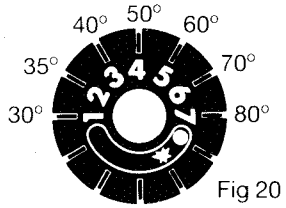


Fig 20

3:5 Turning off the boiler.

1. Turn the thermostat knob to the stop position (see fig 19). After about 20 seconds you should hear a "click" from the automatic equipment, this means that the ignition fuse has turned off the gas supply.
2. Stop the circulation pump.
3. Turn off the main gas tap.

N.B. Quenched boiler should not be relit for 3 minutes.

4:0 The boiler fittings.

The boiler is .ready to be equipped with an electric coil or a water heater.

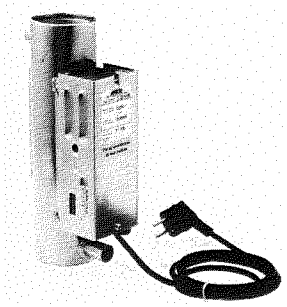
Electric coil: In most camping sites there is now days the possibility of a 220 volts socket. Under normal temperature conditions the heating of a caravan and van can be managed with only the electric coil. You are also free to choose and can combine together various alternatives eg. using only gas – using only electricity or using both gas and electricity at the same time. You save both money and work by avoiding having to change many gas drums. It is a great advantage, expecially when maintaining heat, to prevent dampness when the caravan is not being used. They come in a range of different models, both with and without a 220 volts circulation pump. The immersion heaters have a maximum heating capacity of 2000 watts.

Water heater: It need not be a luxury to do the washing-up or take a shower in warm water in mobile situations. The Alde-boiler offers the possibility of being combined it with a modern water heater which does not require storage of warm water, like in a water heater with a storage tank. With an Alde water heater fresh water is heated as it is being used. The boiler is from the beginning ready for the installation of a water heater.

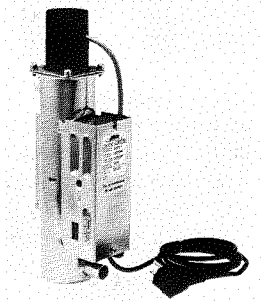
Battery eliminator:

Is the battery broken or not charged so that the boiler can not start? If your c.amping site neighbour or caretaker should put the heating on a few hours before the caravan is to be used, without having to go into it, then the battery eliminator is an excellent accessory. The heating system can also be started and worked without a battery if there is only access to 220 volts.

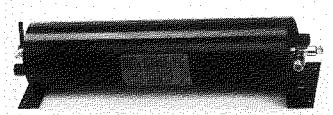
Immersion heater without a 220 volts circulation pump



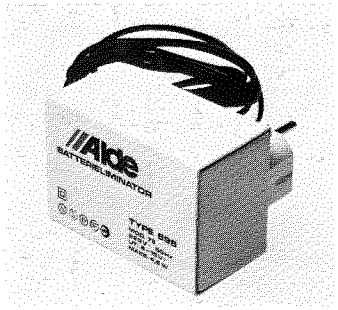
Immersion heater with a 220 volts circulation pump



Water heater



Battery eliminator



5:0 Things worth knowing about LP-gas.

LP-gas is a petroleum product which is officially called "liquified petroleum gas". It consists mainly of propane and butane gas. The propane gasifies right down to –40° C while the butane can only take 0° C. When LP-gas is burning only carbon dioxide (CO_2) and steam are emitted, exactly like the air we exhale. But in order for the combustion to be complete a good supply of air is required. LP-gas is good for the environment and does not decarbonize with a sufficient air supply. LP-gas is non-poisonous and completely free from pollutants and poisonous additives. The scent of a foul-smelling substance is added to it, to warn against possible leakage. It can be kept in a bottle for an indefinite period of time without the quality deteriorating. The temperature in a LP-gas air flame is about 1900° when burning properly. The LP-gas burner as a rule works with lower pressure than the bottle pressure. The most usual pressure is low pressure (max 5 kPa). Low pressure can be got by letting the LP-gas pass through a reduction valve. Appliances which works with low pressure are usually quieter than appliances which have a higher working pressure.

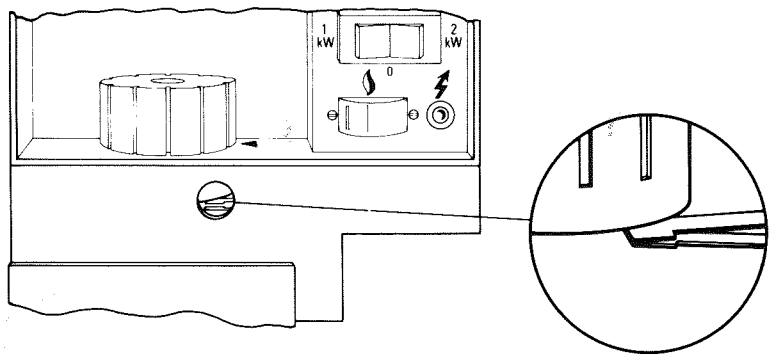
6:0 Tracing faults.

Below follows a little fault tracing scheme which can be of help for small faults.

A spark appears but the boiler does not start.
1. Out of LP-gas?
2. Is the main tap fully open?
3. If the boiler has not been working for a long time it takes longer to light than is normal.
4. The thermostat knob must be at lighting position and be pressed down to the very end at the beginning (a certain resistance should be felt when the knob is pressed down in the right position).
5. If this does not help, contact the service workshop.

A spark does not appear.
1. Check that there are 12 volts to the boiler.
2. Check that the fuse to the boiler has not blown.
3. The thermostat knob must be pressed down to the end.
4. Remove the lower front plate. Check through the inspection hole in the automatic box that the contacts meet when the knob is pressed down (see fig 21).
5. If this does not help, contact the service workshop.

Fig 21



The boiler lights but quenches when the thermostat knob is released.
1. Repeat the lighting procedure according to the instruction (wait 3 minutes before the boiler is lit again). Make sure the thermostat knob is pressed down to the bottom. Hold it in that position until the needle on the indicator instrument has gone up to the middle of the green area.
2. Check that you are not running out of gas.
3. Check that the pilot light strikes the thermoelement tip (to the right of the pilot burner).
4. If this does not help, contact the service workshop.

The boiler is boiling.
1. Turn the thermostat knob to min. position (lowest temp) and check if the main flame quenches, which it should do.
2. Check that the sensor is tightly fastened in the right place. It should be fastened with a spring clip to the boiler body and a heat conducting cement between.
3. If this does not help, contact the service workshop.

Vibrations in the circulation pump.
1. Loosen the nut which holds the circulation pump.
2. Turn the pump a little and tighten the nut again.
3. Check that the rubber connection between the motor and the shaft is straight and that it does not wobble when running.
4. Check that nothing lies in the way at the bottom of the expansion vessel.
5. If this does not help, contact the service workshop.

A noise in the motor of the circulation pump (screeching noise).
1. Drop in one or two drops of light machine oil in the centre hole on the top of the motor.
2. If the noise does not stop or if it comes back after a while the motor has to be changed.

The circulation pump does not start.
1. Check that the switch on the room thermostat is at the "ON" position and that the set temperature is higher on the thermostat than in the caravan.
2. Check that the switch on the panel is set for a 12 volts pump.
3. Take off the yellow cap on the top of the pump and check that the cables are properly secured and that there is a 12 volts current.
4. If this does not help, contact the service workshop.

Adjusting the room thermostat.
1. Check the temperature in the caravan with a thermometer that works correctly.
2. Take the cap off the room thermostat (press in the catch on the left and pull out the cap).
3. Pull out the knob and move it as many degrees up or down as required and press in it again.
4. Put on the cap and check that the temperature matches the scale on the thermostat.

Too big a difference in the room thermostat between the on and off switch.
1. Check that you have followed the circuit diagram.
2. Check that there are no loose cables and if there is bad contact.
3. If this does not help, contact the service workshop.

7:0 Warranty.

Alde Intrnational's warranty is valid one year from the delivery date and covers only material or manufacture defects provided that these instructions have been followed.

Notes: