

BAXI

INSTRUCTIONS

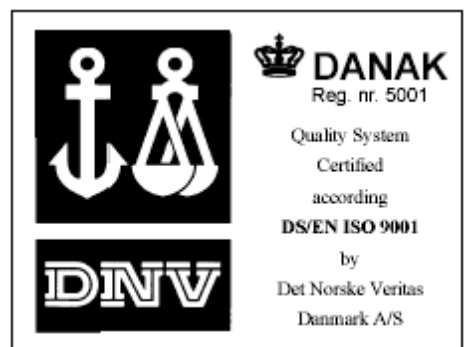
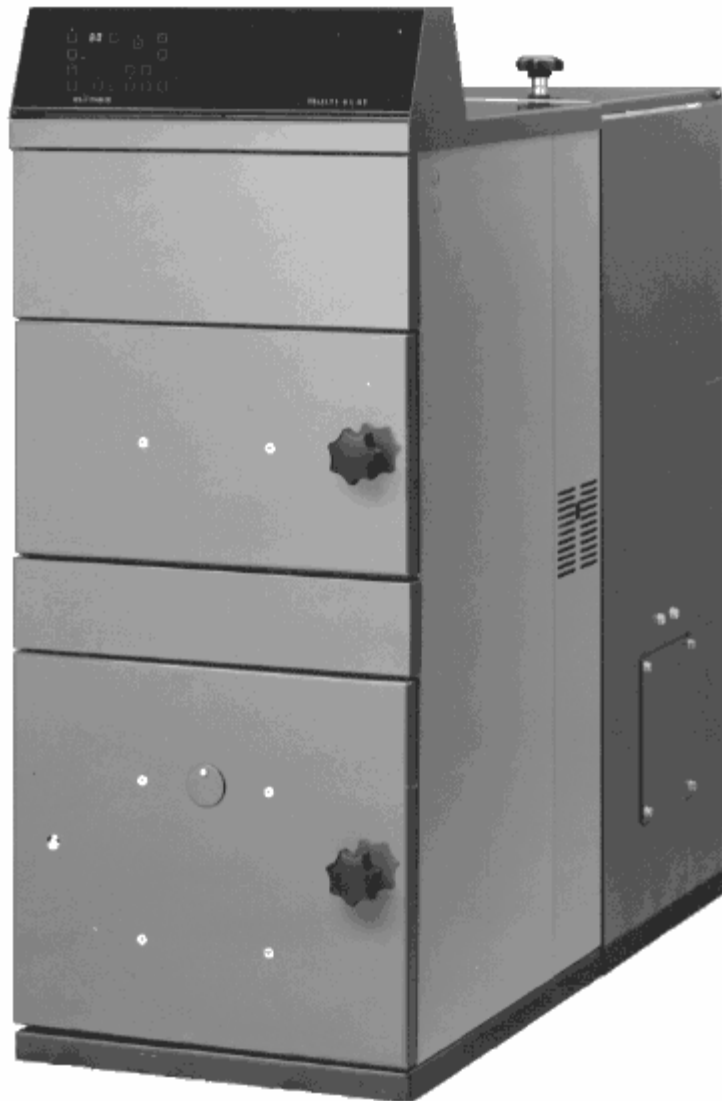
MULTI-HEAT

INSTRUCTION FOR INSTALLATION AND USE OF
BAXI MULTI-HEAT



List of sections

	Section
<u>Operating and owner instructions</u>	<u>1</u>
<u>Possibilities for automation</u>	<u>2</u>
<u>Installation instructions</u>	<u>3</u>
<u>Technical data and wiring diagram</u>	<u>4</u>
<u>Setup and test report</u>	<u>5</u>



It is hereby declared that below BAXI product:

Multi-Heat

complies with the EEC directives mentioned below.

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility and 92/31/EEC and 93/68/EEC)
Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits and 93/68/EEC
Directive 98/37/EEC of the European Parliament and of the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery

The photograph shows MULTI-HEAT 2.5

Page 1

List of contents

This instruction is divided into sections - the figure numbers refer to the corresponding section

Section

1 USE AND THE USER'S TASK / RESPONSIBILITY / POSSIBILITIES

1.1 OVERVIEW OF THE BOILER AND THE EQUIPMENT

1.2 RESPONSIBILITY AND SAFETY

1.3 DESCRIPTION OF OPERATION

1.4 STARTING UP THE BOILER

1.5 IGNITION

1.6 EXTINGUISHING

1.7 BOILER AND RETURN TEMPERATURE

1.8 DAILY FIRING

1.9 USER EXPERIENCES

1.10 RECOMMENDED ADJUSTMENT OF OPERATION

1.11 CLEANING THE BOILER

1.12 OPERATING THE PUMP

1.13 OPERATING THE MIXING VALVE (SHUNT VALVE) - (EXTRA EQUIPMENT)

1.14 USE OF PRESSURE GAGE

1.15 FILLING UP WITH WATER

1.16 SAFETY SPRINKLER DEVICE

1.17 TROUBLE SHOOTING

1.18 PREVENTIVE MAINTENANCE

1.19 SUMMER STOP

2 AUTOMATION

3 INSTALLATION INSTRUCTIONS

3.1 STANDARD EQUIPMENT AND OPTIONAL EXTRAS

3.2 ARRANGEMENT CONDITIONS - AIR SUPPLY

3.3 CHIMNEY CONNECTION

3.4 EXPANSION, SAFETY VALVES AND PUMP CONNECTION

3.5 ELECTRICITY CONNECTION

3.6 ASSEMBLY GUIDELINES

3.7 SYSTEM DIAGRAM

4 TECHNICAL DATA AND ELECTRICAL DIAGRAMS

4.1 TECHNICAL DATA

4.2 ELECTRICAL DIAGRAM

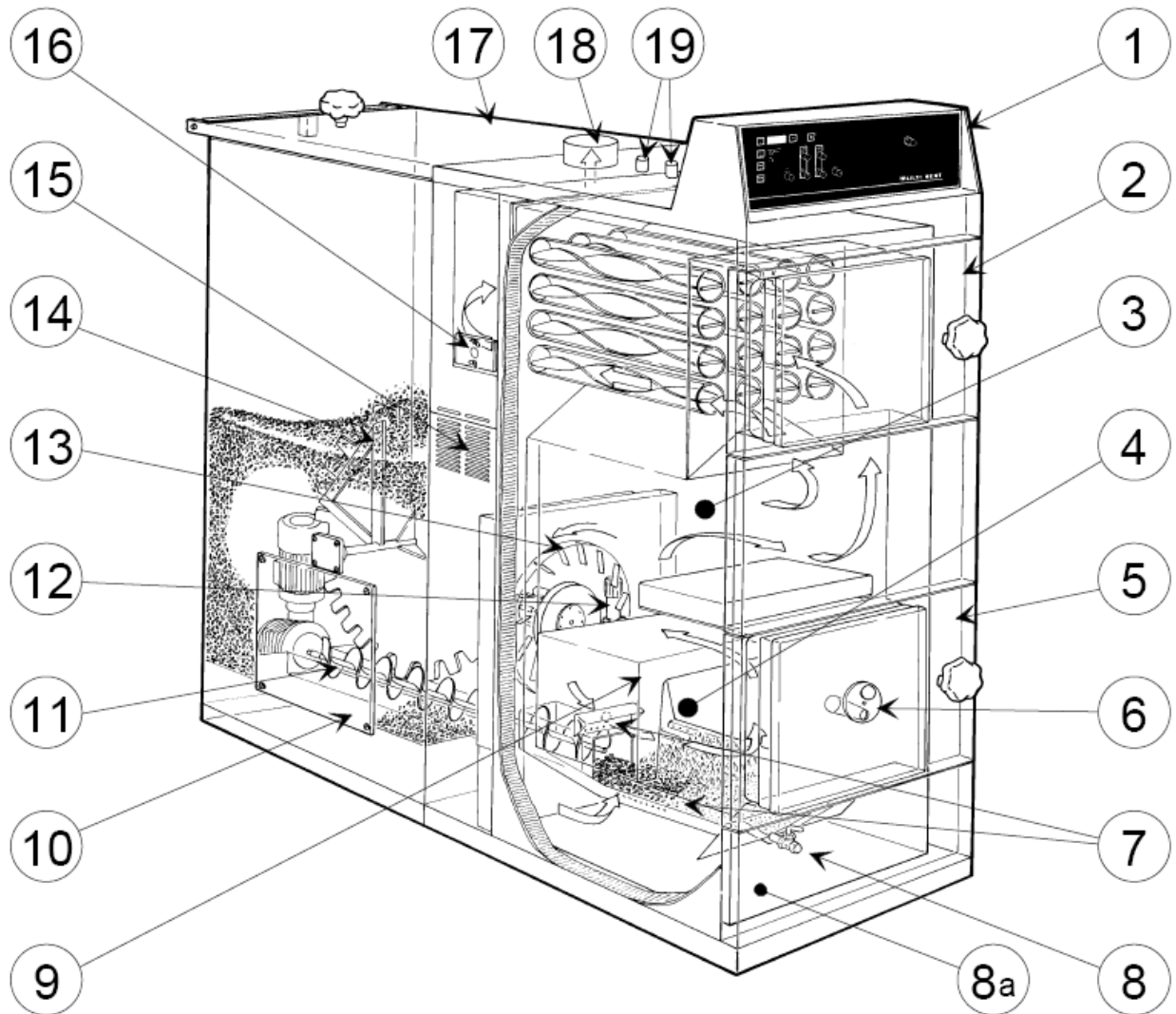
5 GENERAL DELIVERY SURVEY REPORT FOR BOILER SYSTEM
5.1 MEASURED AND ADJUSTED VALUES

Due reservations are made regarding construction amendments and possible printing errors.

Page 2

1 Use and the user's task / responsibility / possibilities

1.1 Overview of the boiler and the equipment



1. Control Panel

2. Cleaning door, top
3. Combustion chamber
4. Burner
5. Cleaning door, bottom
6. Observation flap
7. Air apertures for the combustion
8. Blow-off faucet (on type 2.5 this is placed between the fire box and the hopper)
- 8a. Delivery screw for air chamber (on type 2.5 this is placed directly over the bottom frame on the right-hand side.
9. Ignition / striking arc
10. Cleaning opening (for hopper)
11. Fuel worm conveyor/auger (transports the fuel inwards)
12. Back-burn safety valve
13. Blower (provides air for the combustion)
14. Stirrer/agitator (only for the version firing with wood chips)
15. Air intake (there is one of these on both sides)
16. Cleaning flap (there is one of these on both sides)
17. Covers for hopper (reversible)

18. Smoke nozzle

19. Flow and return

Fig. 1.1 (This shows MULTI-HEAT 4,0)

Page 3

1.1.1 Fuel forms (see also [page 1](#))

Wood pellets

MULTI-HEAT is delivered as a standard for firing with wood pellets. MULTI-HEAT 1.5 is principally designed for wood pellets.

The wood pellets must be pure wood.

1. Without additives or chemical or synthetic binders
2. Water content below 10%
3. Max. 1% dirt/dust
4. Calorific value approx. 5 kW/kg

To determine whether the wood pellets are suitable:

1. The smell must be as for pure wood
2. The smell when burning must be as for pure wood
3. The colour must be as for wood, without particles of a clear of other colour such as white, green or blue.

Please ask your supplier for a description of contents

Grain (barley and wheat)

When firing with grain the co-delivered worm conveyor/auger extension must be mounted in order to counteract the inconveniences caused by cinders which can be formed in the combustion chamber. The boiler is tested with barley and wheat with a water/moisture content of 15%.

Corn (maize)

When firing with corn (maize) the co-delivered worm conveyor/auger extension must be mounted in order to counteract the inconveniences caused by cinders which can be formed in the combustion chamber. The boiler is tested in USA with maize with a water/ moisture content of 15% or less.

Wood chips

The version for firing with wood chips (model F) has a hopper in the stirrer or agitator system which transports the fuel to the worm conveyor/auger. We recommend a chip size of 5-30 mm with a water/moisture content of 25% or less.

Change-over

When changing fuel-type it is important to switch over the boiler corresponding to the correct equipment and the new operation setting.

Use of equipment

	Wood pellets	Grain	Corn (Maize)	Wood chips
worm conveyor/auger extension	÷	+	+	÷
Stirrer / agitator	÷	÷	÷	+

+ = must be used

÷ = must not be used

Usage of other and less suitable fuel types for MULTI-HEAT - over and above the wood pellets indicated above, grain (wheat and barley), corn (maize) as well as wood chips can result in less problem-free operation, more work for the user and possibly a greater fuel consumption. Consult the factory for advice with regard to the possibilities of using other types of fuel.

1.1.2 Function (Refer if necessary to [fig. 1.1](#))

The fuel worm conveyor/auger (11) "screws" the fuel into the boiler's combustion chamber (4).

The combustion air is supplied via the built-in blower (13) down through holes (7) at the back and up into the fuel.

The flue gas passes upwards through the boiler's combustion chamber (3) and via a well-dimensioned number of horizontal fire tubes with stirrers or turbo-mixers, the flue gas is returned to the return/cleaning chamber (16) and leaves the boiler via the vertical smoke nozzle (18).

Page 4

Safety: Insofar as the fire moves backwards into the fuel supply pipe, the retrograde combustion (back burn) safety device (12) will extinguish the fire with water.

If the fire goes out, a built-in smoke gas sensor will turn off the boiler and sound an alarm. The boiler must not run with the doors to the hopper door (17) open.

The control (1) is an electronically built-up 2-stage control. The 2 stages can be set according to the heat requirement: 30-100%. It is also possible to make a setting for high or low output.

The boiler will run at a high output until the set temperature is close to being achieved.

Then the automatic control will switch to reduced output. If the temperature then drops slightly again, the automatic control will couple up to full output again.

When the set temperature has been achieved, the blower will be switched off and the automatic control will switch over to intermittent operation. This means that the fire is kept alight by adding a little fuel at considerable intervals and simultaneously briefly setting the blower in action.

1.1.3 Service and guarantees:

The guarantee is described more closely in the BAXI Guarantee Certificate which is delivered together with the boiler.

Complaints: You ought always refer to the fitter or dealer who has installed / delivered the central heating boiler for you. After this, the fitter / dealer will, if necessary, pass on your complaint to the factory. However, complaints can also be made directly to the factory.

1.2 Responsibility and safety

1.2.1 Responsibility The user is responsible for correct operation of the boiler and that the firing guidelines from BAXI A/S are followed. Circumvention of the guidelines can, amongst other things, result in a lower useful effect and increased environmental strain, as it is not possible to achieve the clean smoke gases which are aimed at. Furthermore, incorrect operation can reduce the lifetime of the boiler.

Correct operation (and installation) are the best guarantee for a well-functioning boiler with a long lifetime and a good immediate environment.

It is a precondition that the user has the necessary will and correct attitude to firing with wood pellets, grain, maize, wood chips, and such like since, after all, it is necessary to carry a piece of work in order to "harvest the fruits" of this environmentally friendly and economically advantageous form of heating.

1.2.2 Safety: If faults or deficiencies are ascertained, these must be rectified as quickly as possible by a heating and ventilation fitter.

Outlet pipes, ventilation channels, fresh air openings, etc must not be closed or blocked.

The water supply for the boiler's retrograde combustion (back burn) safety device must not be shut off. Inflammable liquids or easily combustible materials must not come dangerously close to the boiler.

All stoking must take place via the stoker system.

1.2.3 Maintenance: If irregularities on the system's safety valves, expansion tanks or automatics are ascertained, the owner / user must immediately ensure that the equipment in question is examined and put right by an expert.

The owner / user must ensure that fitted safety valves, if any, are not blocked up by incrustation and suchlike.

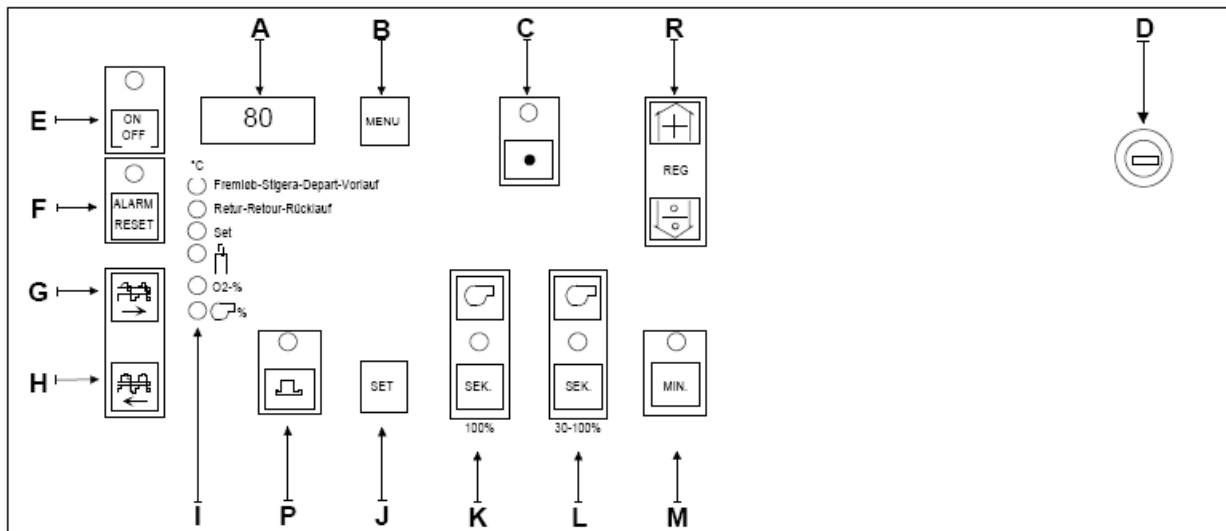
It is the responsibility of the owner or user that the boiler and equipment, if any, are cleaned and maintained in accordance with:

- normal practice
- indications in this instruction
- instructions for equipment / accessories, if any
- as well as conditions described in the appurtenant guarantee certificate

(See section 1.18 Preventive maintenance as well as the boiler's guarantee certificate).

Page 5

1.3 Description of operation



042916

Side

A.	Display	7
B.	Menu	7

C.	Form of operation	7
D.	Ebullition thermostat	10
E.	ON / OFF button - ignite / extinguish Error! Unknown switch argument.	6
F.	Alarm reset - cancel alarm	9
G.	Manual worm conveyor/auger - forwards	8
H.	Manual worm conveyor/auger - backwards	8
I.	Light diodes	7
J.	Set = boiler temperature.	6
K.	High output	8
L.	Low output	8
M.	Firing at intervals	8
P.	Pump	10
R.	REG Error! Unknown switch argument.	7

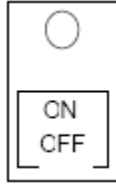
Fig. 1.3

Remember:

Always ensure that you have a pen and paper ready every time you adjust the settings on the control. *Suggestions for tables can be seen on the last page of this instruction.*

When an adjustment is made on a setting, the information regarding this will be shown in the display for approx. 10 seconds after the last adjustment or until another function is carried out.

(E) Ignite



takes place by **pressing the ON/OFF** button (E) and this will be displayed in the light diode above the button..

(J) Boiler temp. is adjusted by keeping set (J) pressed in and simultaneously pressing on + or – on REG



(R). The temperature can be adjusted from 60 to 85°C. The ideal temperature is 80°C since it is "good for the boiler" to have a comparatively high temperature. (When "set" is pressed, the diode will light up - "set" and the adjusted temperature is shown on the display.

Page 6

(R) Regulation



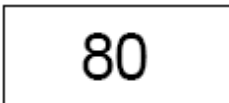
Here the adjustable parameters can be adjusted up and down in value.

(B) Menu



With this button it is possible to switch between which of the 4 temperatures you wish to have shown in the display. However, in the set-up menu, it is used to "step" through the set-up points. - (See temperature display on the next page). This is also used for programming, as shown on page Error! Unknown switch argument. **Error! Unknown switch argument.9.**


(A) (I) Temp. indication - with the menu button (B) it is possible to set the desired temperature in the display (A).



• Every time you press the menu button this will switch to the next temperature (displayed on the light diodes (I)).

The temperatures which can be shown are:

- Supply pipe temperature = boiler temperature.
- Return temperature = return temperature to the boiler
- Set temperature = the set, desired boiler temperature
- Smoke temperature = the temperature in the boiler's fire tubes

(Symbols for O₂% and the ventilator's actual  % only apply for the model with oxygen control. – see separate instruction.

When everything is in full swing it is a good idea to have the smoke temperature displayed so that you can keep an eye on what the smoke temperature is so that it is possible to see whether the boiler needs to be cleaned.

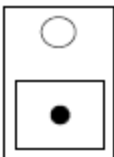
Neither must the smoke temperature be too low since this can cause condensation in the chimney.

How low the temperature is depends on the chimney, but temperatures below 120°C are not normally to be recommended..

Note: If you press on one of the buttons (J - M), the adjusted value will be shown for 5 seconds - after which the value which you have chosen will be shown once again.

(C) Operation form

Here it is possible to switch automatic mode (Fixed-diode switched off) or constant high or low output mode (Fixed-diode lit up)



Choose with the button (C) between 2-step operation = light diode switched off) or constant operation (light diode lit up).

There are three possibilities which can be set by pressing button (C):

1. **2-step operation** = no light above the button
2. **Fixed high output** = light above button and light on row 100%

3. **Fixed low output** = light above button and light on row 30-100%

The greatest advantage can be achieved by choosing the form of operation called 2-step operation..

2-step operation: Here, the boiler must run at a high output until the temperature is just 3 degrees below the desired temperature, and then switched down to a low output. The operation will thus continue on a low output until the temperature is achieved.

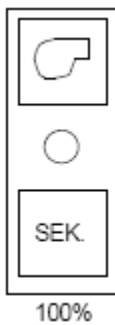
If the temperature cannot be maintained with a low output, the boiler will once again switch to a high output when the temperature has dropped to 6 degrees below the adjustment value.

During 2-step operation, the lowest smoke temperature and the highest useful effect are achieved.

Letters in brackets () see fig. 1.3

Page 7

(K) High Output This is set by means of the 2 push buttons above the 100% symbol.



The lowest button is used to set the number of seconds between each worm conveyor/ auger delivery - this can be set between 5 and 30 seconds. This setting is shown in the display. (Press in and hold "SEC" and adjust up or down by pressing on + or - on REG (R).

In the same manner, the uppermost button is used to set the blower's air quantity from 0 to 100, where 100 corresponds to maximum air quantity. The adjustment is shown in the display.

The firing quantity and the air quantity must be adjusted according to each other.

It is possible to choose how big a "high output" you want to have. High output does not necessarily need to be the boiler's maximum output, but it must just be greater than the heat requirement of the house.

Suggestions for adjustment - see, if necessary, section 1.10 - recommended adjustment of the control.

(L) Low Output This is set by means of the 2 push buttons above the 30-100% symbol.



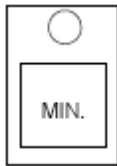
The lowest button is used to set the number of seconds between each worm conveyor/ auger delivery - this can be set between 10 and 60 seconds, but never below the setting of the high output. The setting is shown in the display. Press in and hold "SEC" and adjust up or down by means of pressing on + or -. Using the uppermost button, set the blower's air quantity from 0 to 100, where 100 corresponds to maximum air quantity. The adjustment is shown in the display.

The firing quantity and the air quantity must be adjusted according to each other. Minimum output is 30% of full output. See also technical data.

Suggestions for adjustment - see, if necessary, [section 1.10](#) - recommended adjustment of the control.

(M) Firing at intervals

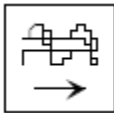
This is set by means of the push button (M)



Set the number of minutes between each worm conveyor/auger delivery. This is only active when the boiler temperature is rising. Set between 1 and 60 min so that the fire can just be kept alight without firing so much that the temperature rises - this is experience value.

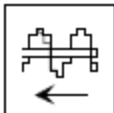
Suggestions for adjustment - see, if necessary, [section 1.10](#) - recommended adjustment of the control.

(G) Manual worm conveyor - forward



This takes place by pressing on the symbol for the fuel worm conveyor/auger with the arrow key to the right. As long as the key is activated, the worm conveyor/auger will run inwards. However, this will not take place when the hopper is open.

(H) Manual worm conveyor/auger- backward



This takes place by pressing on the symbol for the worm conveyor/auger with the arrow key to the left. As long as this key is activated, the worm conveyor/auger will run outwards. However, not when the hopper door is open. Furthermore, the worm conveyor/ auger can only run for 3 seconds if the key is depressed for a longer time.

Bogstav i parentes () se [fig. 1.3](#)

(F) Alarm re-set-

Here, the alarm is re-set. If there is no alarm, use the button to come into the set-up menu (but simultaneously with the (C)-button). The following are the alarms which can appear:



A-1

There is no fire! The smoke temperature has been below 100°C during operation for more than 30 minutes of operation, or after intermittent firing and starting up. Check the smoke gas sensor and remove any coating.

A-2

The ebullition thermostat (D) is switched off. This can be reconnected by pressing when the cover is removed. (Situating in the boiler's operation panel). The circuit breaker on the back of the control panel (see [4.2](#) - electrical diagram) has blown.

A-3

The motor protection for the worm conveyor/auger has failed. This can be reconnected when the motor is no longer over-burdened.

A-4

The flow temperature has exceeded 94°C.

A-5

Error during communication with the more sensitive parts of the control, i.e. the program cannot be saved or read.

Programming -

The programming situation arises when the ON/OFF button (E) has been switched off by keeping the alarm re-set (F) and the operation form (C) buttons pressed down for 3 seconds. Then 3 horizontal lines will appear in the display and it will be ready for programming.

By "stepping" with the menu key, the data which have been set can be seen.

(-XX) By pressing on + or - on REG (R), the minimum air quantity of the blower is adjusted.

Possible settings are 10-20-30-40-50.

The factory setting is (- 20) = 20%

When the desired value is shown in the display, save by pressing button (C).

(HX.X) Here, the worm conveyor/auger's running-in time is adjusted at "high output" - i.e. the time which the worm conveyor/auger is running each time. Adjustment area: 0.1-6.0 corresponding to 0.1-6.0 seconds.

Save with button (C).

(LX.X) Here, the worm conveyor/auger's adjustment time is adjusted at "low output" - i.e. the time which the worm conveyor/auger is running each time. Adjustment area: 0.1-6.0, corresponding to 0.1-6.0 seconds.

Factory setting::

MULTI-HEAT Type	HX.X (high output)	LX.X (low output)
1,5	H1,7 = 1,7 sec.	L1,7 = 1,7 sec.
2,5	H0,5 = 0,5 sec.	L0,3 = 0,3 sec.
4,0	H1,0 = 1,0 sec.	L0,6 = 0,6 sec.

(PXX) Here, the time which the blower is to run with maximum air quantity is adjusted when the fuel worm conveyor/auger is in the interval situation.

(Possible setting: 0-10 seconds).

Factory setting (P05) = 5 seconds

The settings can be changed by pressing on + or minus on REG (R).

By means of the operation form button (C), the desired setting can be saved, and it is possible to "step" further in the menu.

Step through the program with the menu button (B).

NB: You must "step" at least one level further before you "save". (If you do not do this, the latest figure will not be saved)

Save data

New data are saved by closing down and pressing the ON/OFF button (E).

Regret

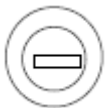
If, nevertheless, you do not want to save the new input data which have been entered, you can regret by pressing the alarm/reset button (F).

Letters in brackets () see fig. 1.3

Page 9

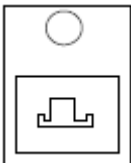
(D) Ebullition thermostat

If the boiler temperature reaches up to approx. 100°C the ebullition thermostat will switch off the boiler, and the display will show (A-2). In order to reconnect, unscrew the protective cap and press in the pin which has sprung. The alarm is then re-set by pressing in (F).



(P) Pump

The circulation pump for the heating plant can be ignited (light diode = ON) or switched off.



1.4 Starting up the boiler

- Prior to starting up the boiler, it is necessary to ensure that there is sufficient water in the system.

- Prior to starting up the boiler, it is necessary to ensure that the water supply is connected to the retrograde combustion (back burn) valve. (See [section 1.16](#) - retrograde combustion (back burn) valve).
- It is necessary to ensure that the ignition/fuel arc (pos. 9, [fig. 1.1](#)) is pushed right back.
- The hopper lid must be closed, since this hinders retrograde combustion (back burn). The packing in the hopper lid must be closed and air-tight, and this must be controlled regularly (once per year).

The built-in micro-switch likewise ensures that the boiler cannot run without the lid being closed.

Suggested settings are indicated on [page 13](#).

- You ought to aim that the smoke temperature does not exceed 220°C.
- You must likewise ensure that the smoke temperature does not fall so low that condensation is formed in the chimney. (Remove 1-2 turbulators if necessary.)

This temperature is dependent on the chimney's diameter and insulation.

The recommended smoke gas temperature setting for firing with grain is min. 130°C.

- There is a built-in alarm in the control which will indicate an alarm if the smoke temperature is below 100° C for more than 30 min.
- If the house's chimney is such that condensation forms, some turbulators can be removed to increase the smoke gas temperature in order to counter the condensation. The boiler has, however, been tested and approved with all turbulators installed. Efficiency is reduced and fuel consumption increased when turbulators are removed.

1.5 Ignition

1.5.1 Wood chips and pellets:

- Move the fuel forwards so that there is a pile of about 5-6 handfuls inside the combustion chamber and the control is set on OFF.
- Pour lighter fuel over the fuel and ignite.
- When the fuel is ignited and in flame, with an open door, set the control to ON, then close the door and the boiler is in operation.
- (Here it is possible to open the hopper door slightly so that the combustion worm conveyor/auger does not start up immediately). When a proper "blaze" has been established in the combustion chamber, carefully close the hopper door again.

NB: Never leave the boiler with an open hopper door.

- ❑ If the boiler is fitted with oxygen control, set the control to OFF (button E), and a "sea of flames" can be created by pressing fan symbols K and L simultaneously. The fan will run at a lower speed and the augur will not start. When combustion is well underway, set the control to ON (button E).

1.5.2 Corn/grain:

Move the fuel towards the opening of the combustion chamber and switch the control to OFF.

Insert 5-6 handfuls of easily combustible material (e.g. wood chips or pellets) into the combustion chamber at the fuel entrance. Then follow the instructions above.

Page 10

1.6 Extinguishing

When extinguishing, set the control to OFF. Cinders and live coals must be removed from the combustion chamber.

1.7 Boiler and return temperature

As already mentioned in [section 1.3](#), we suggest that the boiler temperature should be kept at 80°C.

In order to minimise the risk of corrosion in the boiler, the return temperature ought to be min. 60°C.

1.8 Daily firing

1.8.1 Running in period

- In the beginning, it is recommended that you should regularly (daily) inspect your boiler system and check the fuel hopper, and fill this up, if necessary.
- Check flow temperature, return temperature, as well as smoke temperature. See, amongst other things, [sections 1.3 to 1.7](#).
- At the beginning, you ought regularly to open the lowest door and check the quantity of ash in the bottom of the combustion chamber, in order to ascertain how often it is necessary to remove the ash. (Let a little bit of the ash remain so that the air holes in the bottom of the combustion chamber are just covered by ash).

1.8.1 Adjustment

The boiler ought to be adjusted first at high output (K) which only ought to be slightly higher than the maximum heating requirement of the house. The recommended heat loss in an elderly house is approx. 80-160 W/m² and in a more modern house, approx. 50 W/m².

After this, set at low output - see technical data and use the recommended adjustment data from the PC-diskette from BAXI A/S.

The colour of the flame ought to be yellow and slightly bluish.

- If the flame is short and blue, either the interval time or the air quantity must be reduced.
- If the flame is long and reddish-yellow, either the interval time or the air quantity must be reduced.

Colour of the flue gas

- If the flue gas is black or dark-coloured, this is because the combustion is getting insufficient air. The flue gas must be white or light-coloured or completely transparent.

1.8.2 This is how the uppermost and lowest doors must be opened:

- When opening the doors you ought, for the sake of safety, to stand so that the doors are between you and the boiler opening.
- Open the door approx. 2 cm. - Wait for approx. 20 seconds. - Open the door slowly.
- If the boiler is fitted with oxygen control, the door may not be open for more than max. 1 min. without disturbing the control's operation.

1.9 User experiences

By means of regular (daily) supervision at the beginning, you will obtain an indication of how often you must fill up the hopper as well as removing ashes from the combustion chamber.

There must always be enough fuel in the magazine to keep it from running dry.

The risk of back-burning is increased if the magazine runs out of fuel and/or fuel other than that specified in [section 1.1.1](#) is used.

NB: Poorer fuel gives more problematic operation.

Wood pellets composed of pure wood residues produce comparatively little ash.

Grain is more difficult and time-demanding due to greater contents of non-combustible constituents (salts) which form ash and often also cinders. The quantity depends, amongst other things, on the growth conditions of the grain, its chemical composition and the extent of the fuel consumption.

If the indications in these guidelines are followed and if the surroundings of the boiler are kept more or less clean you will, as a rule, be ensured a problem-free operation of the plant.

Page 11

1.10 Recommended adjustment of operation

The values shown below are guidelines - check flame colour and smoke colour - see [section 1.8.2](#). If the colour is not correct, modify the adjustment until a satisfactory colour is achieved.

	Large heat requirement	Small heat requirement	

		Output	Time between worm conveyer / auger filling-up	Air quantity	Average pulse Run time	Output	Time between worm conveyer / auger filling-up	Air quantity	worm conveyer / auger running time	Intermittent firing
Type	Output step	kW	Sec.	%	Sec.	kW	Sec.	%	Sec.	Min.
Adjustment for firing with wood pellets and grain – (moisture content see <u>point 1.1.1</u>) (MULTI-HEAT 1.5 only wood pellets):										
MH 1,5	High (K)	15	16	25	1,7	7,7	29	9	1,5*	-
	Low (L)	4,6	56	4	1,7	4,6	56	4	1,7	-
	Pause (M)	-	-	-	1,7	-	-	-	1,7	30
MH 2,5	High (K)	25	24	47	0,5	13	29	19	0,3*	-
	Low (L)	7,5	50	8	0,3	7,5	50	8	0,3	-
	Pause (M)	-	-	-	0,3	-	-	-	0,3	30
MH 4,0	High (K)	40	27	81	1	20	27	36	0,5*	-
	Low (L)	12	56	19	0,6	12	56	19	0,6	-
	Pause (M)	-	-	-	0,6	-	-	-	0,6	30

Adjustment of operation for corn (maize) - moisture content see [point 1.1.1](#)

MH 2,5	High (K)									-
	Low (L)									-
	Pause (M)	-	-	-		-	-	-		
MH 4,0	High (K)									-
	Low (L)									-
	Pause (M)	-	-	-		-	-	-		

Adjustment of operation for wood chips (fine chips) - moisture content see [point 1.1.1](#)

MH 2,5 F	High (K)	23	10	46	2,5*	11,7	13	18	1,5*	-
	Low (L)	6,8	25	7	1,5*	6,8	25	7	1,5*	-
	Pause (M)	-	-	-	1,5	-	-	-	1,5	10
MH 4,0 F	High (K)	37	9	80	4,0*	18,9	13	36	2,5*	-
	Low (L)	11	24	18	2,5	11	24	18	2,5*	-

Pause (M)	-	-	-	2,5	-	-	-	2,5	30
--------------	---	---	---	-----	---	---	---	-----	----

*) Remember to alter the factory adjustment on the boiler control - see [pages 6-9](#).

When making an adjustment, we recommend a smoke gas temperature of at least 120°C for wood pellets and chips and at least 140°C for grain.

Oxygen control

Fitting an oxygen control (BX part no. 089200, optional extra) automatically controls the amounts of air and fuel, ensuring optimal combustion at higher efficiency when heating requirements change. See separate manual.

Page 12

1.11 Cleaning the boiler

Cleaning takes place according to requirement with the cleaning tools supplied which comprise the following: 1 cleaning brush, 1 shovel for ash.

1. Set the control on OFF.

2. Open the front door(s).

3. Clean the sides of the boiler. Remove the ash which has been cleaned off- however, a layer of ash may well be left at the bottom of the boiler, as this improves the combustion.

4. Cleaning the fire tubes On MULTI-HEAT 1.5 and 4.0, turn the smoke gas turbolators approx. 15 times so that the ash particles are sucked backwards into the smoke box.

On MULTI-HEAT 2.5, take the smoke gas turbolators out and clean the smoke gas tubes and the turbolators with a cleaning brush.

After cleaning, the smoke gas turbolators must be placed once again in the fire tubes.

After this, remove the cleaning cover on the side of the boiler. Clean the rearmost tube plate and remove the cleaned off ash.

5. Removing cinders

Removing cinders from the boiler's combustion chamber takes place as required. This requirement is dependent on the ash contents of the fuel.

6. Cleaning the vent pipe

NB: the smoke gas sensor is removed.

While cleaning the vent pipe from the boiler to the chimney, it is important that the smoke gas sensor is meanwhile removed so that it does not get bent or damaged.

1.12 Operating the pump

If the pump "gurgles", this means that there is air in the system. **During ventilation, the pump must be switched off.** Ventilate the radiators.

If the pump "howls" or "wails" this can be because there is insufficient water in the system. The pump's bearings are lubricated by water, and they will be ruined if there is insufficient water. The pump must normally be in operation the whole year in order to provide heat for the radiators or the under-floor heating pipes. In the event of an external hot water tank, it is a prerequisite that the pump is in operation in order to obtain domestic hot water.

1.13 Operating the mixing valve (shunt valve) - (*extra equipment*)

By means of this, the temperature of the water for the radiators can be adjusted. This takes place by mixing more or less return water into the boiler water. The mixing valve can be supplied with motor control in connection with a weather compensation system. (See [automation](#)).

1.14 Use of pressure gage

The heating and ventilation fitter will have, in connection with the installation, fitted a pressure gage which shows the water pressure in the central heating system. Set the red mark above the movable indicator when the system is filled up with water. Then when, during the course of time, the water has dropped somewhat below this adjustment, the system must be filled up with water.

1.15 Filling up with water

The faucet for filling up (pos. 8, [fig. 1.1](#)) is, for type 1.5 and 4.0, situated behind the removable plate. For type 2.5, it is situated between the hopper and the boiler.

Filling up with water takes place while the pump is switched off.

Filling up with water takes place by means of a hose which is screwed onto the filling faucet and connected with a water faucet. First, fill up the hose with water prior to filling up the boiler, otherwise the air content in the hose will be pressed into the boiler system. Remove the hose after filling up and start the pump again.

Normally, it is necessary to fill up with water twice a year.

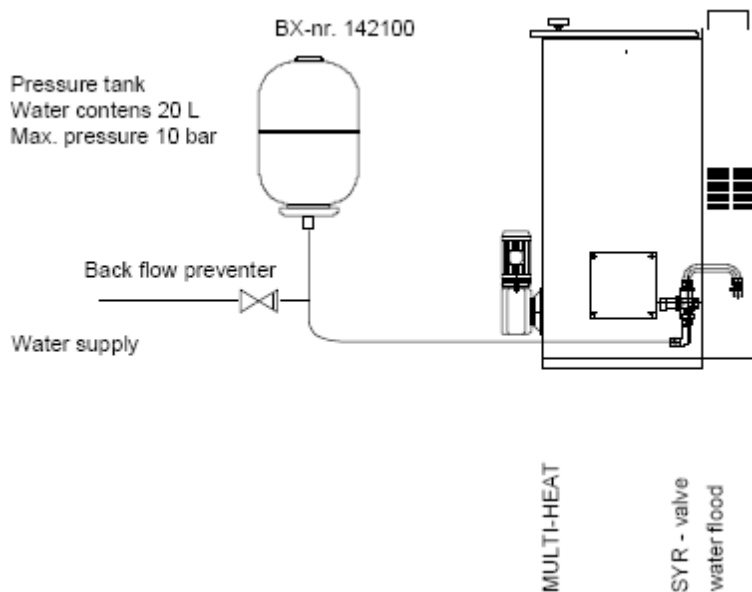
Filling up the boiler with water ought, after some time, to be followed by ventilation, since new water contains air which is released by heating.

1.16 Safety sprinkler device

Valve type SYR (fixed setting) safety sprinkler device.

The safety sprinkler device is fitted and adjusted by the factory and the heating and ventilation fitter will have fitted this to the domestic water supply. If the temperature on the outside of the worm conveyor pipe exceeds 95°C, the valve will be activated and water will be allowed to enter.

Water connection must take place via a tank with a float needle valve (an elevated tank) with a capacity of 20 liters, and a connection to the water supply. Corresponding function can be achieved with an pressurized tank set for water sprinkling. (Refer to sketch below).



After extinguishing, if necessary, with water, the combustion chamber must be dried out:

- Remove the water and empty the air chamber by dismantling the "drain screw" (pos. 8a - [fig. 1.1](#), situated behind the lowest front plate). REMEMBER to mount the "drain screw" again.
- Remove wet fuel, if any, from the worm conveyor/auger and hopper before this can expand and thus block the worm conveyor/auger.
- Before starting up the boiler, examine why the backfire safety sprinkler has been activated.

1.17 Trouble shooting

If the following conditions take place, the reason can perhaps be found below:

	See under point
Error A1 (<i>there is no fire</i>)	1, 6, 7, 8, and 9
Error A2 (<i>ebullition thermostat</i>)	4 and 10
Error A3 (<i>motor protection</i>)	4 and 11
Error A4 (<i>flow temperature >94°C</i>)	10
The fuel is not conveyed forwards	1, 2, 3, 4, 6, 9 and 11
The backfire safety sprinkler has been released	1, 5 and 11
No heat on the system	12 and 13

Pkt.

1. Check whether the hopper lid is closed.
2. Check whether the worm conveyor/auger is turning the right way round.
3. Check whether there is voltage for the boiler.
4. Check the safety devices on the PC board.
5. Check whether the hopper lid closes tight (the packing must be intact and there must not be any pellets, branches and suchlike lying on the packing surface).
6. Check the micro-switch on the hopper lid.
7. Check whether the flue gas temperature is not too low.
8. Check that the backfire safety sprinkler device has not opened.

9. Check whether there is fuel in the hopper.
10. Check whether the pivot (J) functions.
11. Check that the worm conveyor/auger can turn.
12. If necessary, increase the boiler temperature and check that the shunt, if any, is open.
13. If the smoke gas temperature exceeds 260°C, the augur stops for reasons of operating economy. The augur couples in again at a smoke gas temperature of 230°C. The boiler must be cleaned.

1.18 Preventive maintenance

⇒ The packing round the hopper lid must close up and be air-tight, and this must be checked regularly (at least once per year).

⇒ We also recommend an annual check of the back-burning protection function and a check of the pre-pressure in the high container/pressure tank (must be 0.2-0.3 bar without water content, which is valid for a waterworks pressure of min. 2.0 bar).

For best boiler function, operating economy and boiler life, we recommend taking out a service contract with a competent service company authorised by BAXI for annual inspection and servicing of the boiler.

1.19 Summer stop

The boiler must be thoroughly cleaned if it is stopped completely in summer. Leave the bottom door open so that air can circulate and keep the boiler dry.

If the boiler is fitted with an oxygen probe, the probe must be calibrated before firing is resumed.

Leave the boiler with power connected for about 10 minutes until calibration is completed. The boiler may then be lit. (See instructions for oxygen control.)

Page 15

2 Automation

Nevertheless, money can be saved by automating your heating system so that heating is not used to warm up the whole house at times when this is unnecessary.

We recommend mounting automatic shunt regulation equipment - Danfoss ECL.

The regulator for the weather compensation system can be mounted in the boiler control system on MULTI-HEAT 2.5 and 4.0 (but not on MULTI-HEAT 1.5). Electrical connection is traditionally carried out without a Multi-plug, by means of the bottom-side's terminal strips.

By this means, it is possible to achieve a regulation of the flow temperature in comparison with the outside temperature, as well as a possibility for programming, so that it is possible to turn down the temperature during periods when this is of no use.

As a special precaution against a false alarm on alarm 1, min. output should not be set lower than 50% of maximum. The pause interval should also be reduced for intermittent firing. The boiler is highly efficient and well insulated.

3 Installation instructions

3.1 Standard equipment and optional extras

Standard equipment	Optional extras
User guide	Agitator for 600 litre magazine
Cleaning brush	Pressure tank for water sprinkler (protection against back-burning)
Ash scoop	Draft limiter for smoke tube
Cleaning handle	Draft limiter for chimney
Augur extension for grain	Safety copper heat exchanger for thermal outflow safety device
Agitator (for model F)	Cover with 2" collar for electric heating cartridges for MH 1.5 and 2.5
2 ash boxes (only for MH 2.5)	Lambda control
	Automatic loading unit for wood pellets and grain type RSE

3.1.1 Standards and regulations

Please observe guidelines, and local and national requirements.

MULTI-HEAT boilers are designed and approved for hot water heating systems with permissible outflow temperatures of up to 95°C.

Running-dry protection (optional extra)

Closed heating-systems can be fitted with running-dry protection. The running-dry protection is connected to terminal strip J2, terminal 3 in series with the overheating thermostat B12. See wiring diagram.

The running-dry protection should be fitted directly to the outflow pipe such that it cannot be blocked.

3.1.2 Who may install

It is the responsibility of the person installing the system that he or she has the necessary training and authorisation in order to install the boiler.

3.2 Arrangement conditions - air supply

The boiler must be placed in a boiler room with an un-blockable, significant supply of fresh air. The size of the air-intake must correspond to the chimney's diameter, however at least 0.02 m^2 .

If the boiler is placed in a room from which there is direct access to the inhabited rooms, so that flue gas can easily penetrate into these rooms, a carbon monoxide alarm must be fitted which can give a warning regarding possible escapes of carbon monoxide into the inhabited rooms.

Page 16

3.3 Chimney connection

The boiler flue for the chimney must be placed on the exterior of the boiler's smoke stub and a boiler flue with an internal dimension of 130 or 150 mm respectively is used - see technical data.

As the boiler has a built-in blower, there are only small demands made on the chimney draft.

The dimensions for the diameter and height must comply with the Building Regulations.

The chimney draft must be at least 10 Pascal and max. 25 Pascal.

Excessively high chimney draft can be reduced by means of a draft stabiliser.

Chimney draft for high draft stabiliser

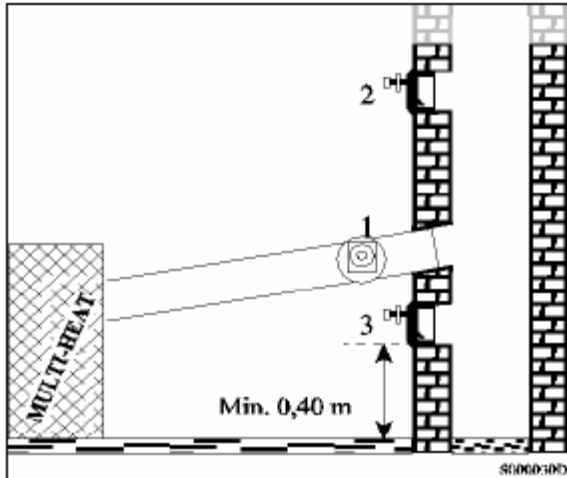
Strong directional wind or a very high chimney can cause excessive draft. The solution is to build in a draft stabiliser so that the chimney can be limited to 10-25 Pascal.

An appropriate and stable chimney draft also reduces the risk of back-burning in the magazine.

Please consult your chimney sweep before building in a draft stabiliser.

A draft stabiliser can be bought from BAXI as an accessory (see figure below – secure draft stabiliser in appropriate material with external bearings with good accuracy of adjustment).

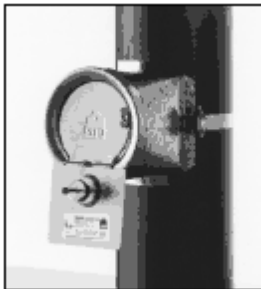
The draft stabiliser can be built in, in positions 1, 2 or 3 (see sketch at bottom left).



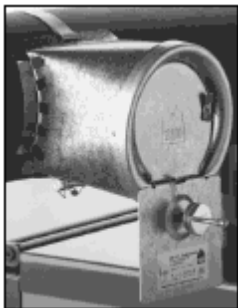
BAXI draft stabiliser:

Fitted on boiler flue, BAXI-no. 082330

2+3) Built into chimney, BAXI-no. 291657



Draft stabiliser on vertical chimney



Draft stabiliser on horizontal chimney

3.4 Expansion, safety valves and pump connection

3.4.1 Expansion tank

The size of the expansion tank is determined on the basis of the total water contents in the heating system.

Open expansionstank: App. 8% of total water content of the heating system.

The open expansion tank can be replaced with a closed expansion tank.

Insofar as a system has been established with a closed expansion tank, manual stoking of the boiler is not permitted

3.4.2 Thermal outflow safety device (optional extra)

To ensure that the boiler can be switched off quickly, a safety heat exchanger with thermal outflow safety device must be fitted in closed systems:

Safety device for type	1,5	Bx part no.	080248
	2,5	Bx part no.	080247
	4,0	Bx part no.	080249

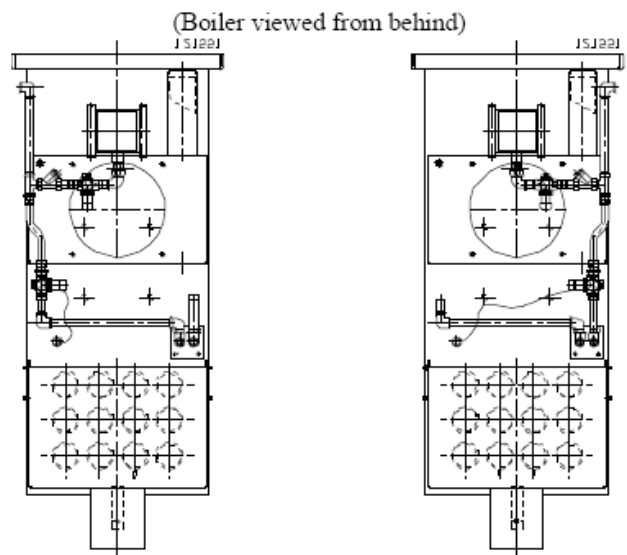
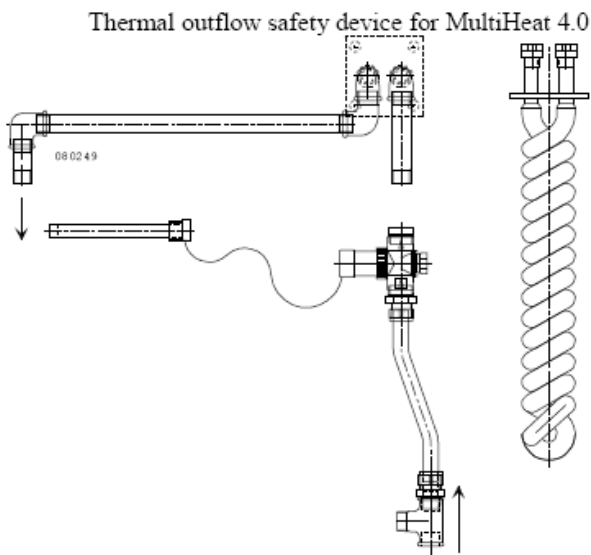
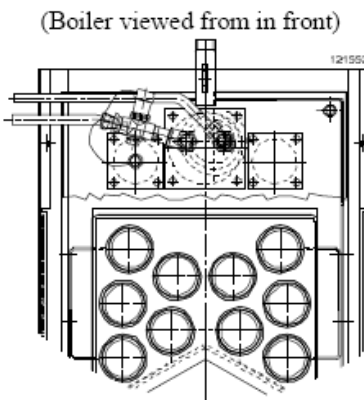
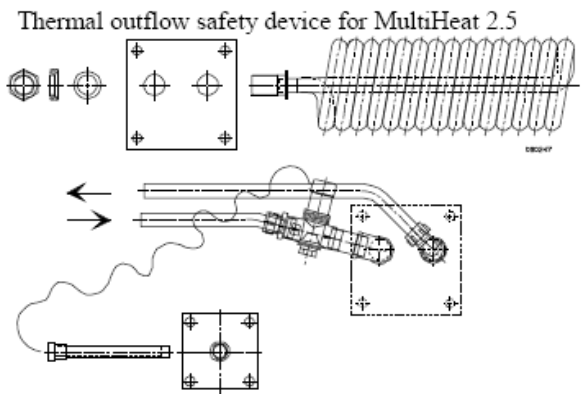
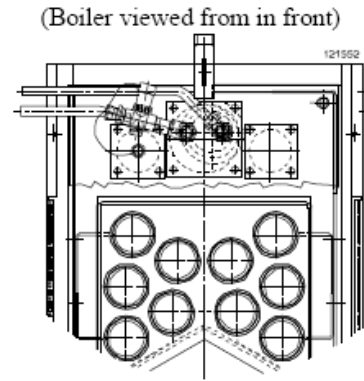
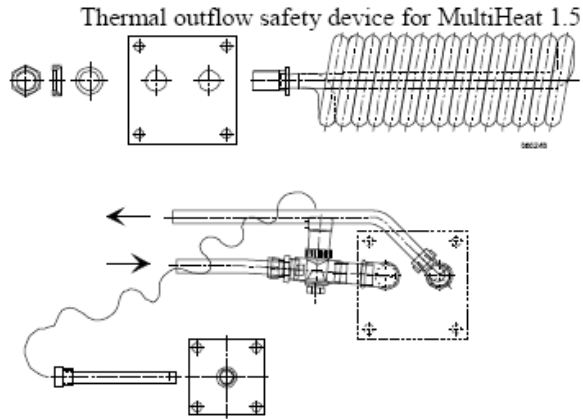
Connection width Ø 18 mm.

Water connection pressure min. 2.0 bar

The water inflow line may not be blockable and the outflow line must be free.

Check the outflow safety device yearly.

3.4.3 Fitting the thermal outflow safety device



Install in accordance with applicable standards and regulations.

No blocking devices, valves, pumps, armatures or reducing devices may be fitted to safety lines, extension lines to open systems or feeder pipes to safety valves in closed systems.

Safety valves and running-dry protection devices should be fitted directly to the outflow pipe (no valves).

3.4.5 Overflow from safety valve and expansion tank

Install in accordance with applicable standards and regulations.

3.4.6 Safety valves and safety pipe

These are carried out in accordance with the water norm and the National Labour Inspection's directions.

The overflow from the safety valve and the expansion tank

These are carried out in accordance with the National Labour Inspection's directions.

3.4.7 Pump

The size of the circulation pump ought to be determined by calculation on the basis of the size of the system, pipe dimension and execution. The pump can be connected to the boiler control by means of the plug supplied.

3.4.8 Protection against freezing

The central heating system can be protected against freezing with anti-freeze, but remember that the hot water tank (if connected) is not protected. We recommended having a plumber add the anti-freeze if protection against freezing is required.

3.5 Electricity connection

Here, the normal trade guidelines are valid.

Electricity connection to the boiler takes place by means of the cable which is supplied.

3 x Phase + Zero and earth. There must be a cut-out switch in the permanent installation.

Type MULTI-HEAT Standard model (400 V)

(1) = L1, (2) = L2, (3) = L3, (4) = zero, yellow/green = earth - see relevant technical data.

Type MULTI-HEAT Special model (230 V)

(Brown) = L1, (Blue) = Neutral, (Yellow/green) = earth

() = cable colour(s).

For electrical diagrams - see [section 4.2](#) - Electrical Diagrams.

The pump is attached to the plug enclosed in a plastic bag (no. 100350).

NB: Before the electrician tests the running direction of the worm conveyor/auger, it must be ensured that all pieces of wood and/or iron, if any, have been removed from the hopper, which otherwise could prevent the worm conveyor/auger from rotating.

Electrical test of the running direction of the worm conveyor/auger:

- Close the lid over the hopper and open the lowest cleaning door.
- Start the boiler by pressing on the ON/OFF button on the controls. Refer, if necessary, to the description of the controls on [page 6](#).
- Press briefly on manual fuel introduction (worm conveyor/auger with arrow to the right).
- The worm conveyor/auger must thus run clockwise.
- If the worm conveyor/auger runs in the wrong direction, switch the 2 phases in the inlet. (only on Multi Heat standard (3 x 400 Volt)).

Page 19

3.5.1 Installation menu (programming)

Switch off the boiler, i.e., switch the ON/OFF switch (E) to OFF. Press the ALARM RESET key (F) and the MENU key (B) together and keep them depressed for about three seconds. The INSTALLATION MENU will then appear. There are three points which can be selected as required via MENU key (B). The values can be adjusted +/- with the SET KEY (R).

XXX	[1.07] PROM version (code [1.07] means release 1 version 7). The menu text changes automatically when the PROM is changed.
PXX	[P15] Minimum interval (factory setting P15 = minimum 15 seconds). Range: 10-30 seconds. The boiler's maximum output can be limited with this parameter/ function.
bXX	[b75] Setting for maximum fan output. Range: 1% - 99% (Factory setting b75 = 75%, valid for type Multi Heat 4.0). Standard values: Multi Heat 1,5 = b35 – b40 (35-40%) Multi Heat 2,5 = b50 – b60 (50 - 60 %) Multi Heat 4,0 = b75 – b99 (75 – 99%)

When all values have been set correctly, they are stored with the aid of the ON/OFF key (E).

If the new values are not to be stored, exit the menu by pressing the ALARM RESET key (F). The old values which were active before the menu was opened will then remain in operation.

3.5.2 Alarm connection

External alarm with own electricity supply (max. 24 V - 3 Amp) can be connected to clamps 11 and 12 (see electrical diagram).

Page 20

3.6 Assembly guidelines

3.6.1 The pipe connections - choice of materials

For the central heating side, it is possible to use a mixed material consisting of copper - steel. The flow and return pipe must be carefully insulated in order to avoid heat loss.

3.6.2 Back-burn safety valve

Must be connected to the domestic water supply and a pressure tank for flood water storage. In the piping run between the flood water storage tank and the burn back safety valve, there must **NOT** any valve(s) installed which could be inadvertently closed or shut off.

On the one side panel, there is a cut-out for the pipe assembly - this can be moved or exchanged to the side where the assembly is needed.

3.6.3 Frost protection

The central heating system can be protected against frost by means of an anti-freeze mixture.

3.6.4 Boiler and return temperature

As noted in [section 1.3](#) we recommend keeping the boiler temperature at 80°C.

The return temperature must be at least 60°C to minimise the risk of corrosion in the boiler.

The by-pass valve in the drawing, [point 3.7](#) must be fitted and adjusted in order to ensure this return temperature.

3.6.5 Arrangement

The boiler must be set up on a stable foundation.

The boiler must be mounted as shown on [fig. 3.7](#).

It is important to ensure that the worm-conveyor can be removed during service.

Type 1,5 If there is insufficient space for this, the worm conveyor/auger can be taken up through the hopper, by first leading the worm conveyor/auger 160 mm further back than the gear motor, and then subsequently leading the worm conveyor/auger up through the hopper.

Types 2,5 and 4,0 With these types, the worm conveyor/auger can be taken out at both ends.

3.6.6 Starting up and adjustment

The boiler is started up as indicated in (sections 1.4 to 1.10). Adjustments of the quantities of air and fuel are carried out in accordance with the following guidelines.

<u>Fuel type:</u>	<u>CO₂ at high output</u>	<u>CO₂ at low output</u>
Wood pellets	13-14	9-12
Grain	13-14	9-12
Wood chips	10-12	9-12

Combustion is controlled by an oxygen control if this is fitted. See separate instructions.

3.7 System diagram

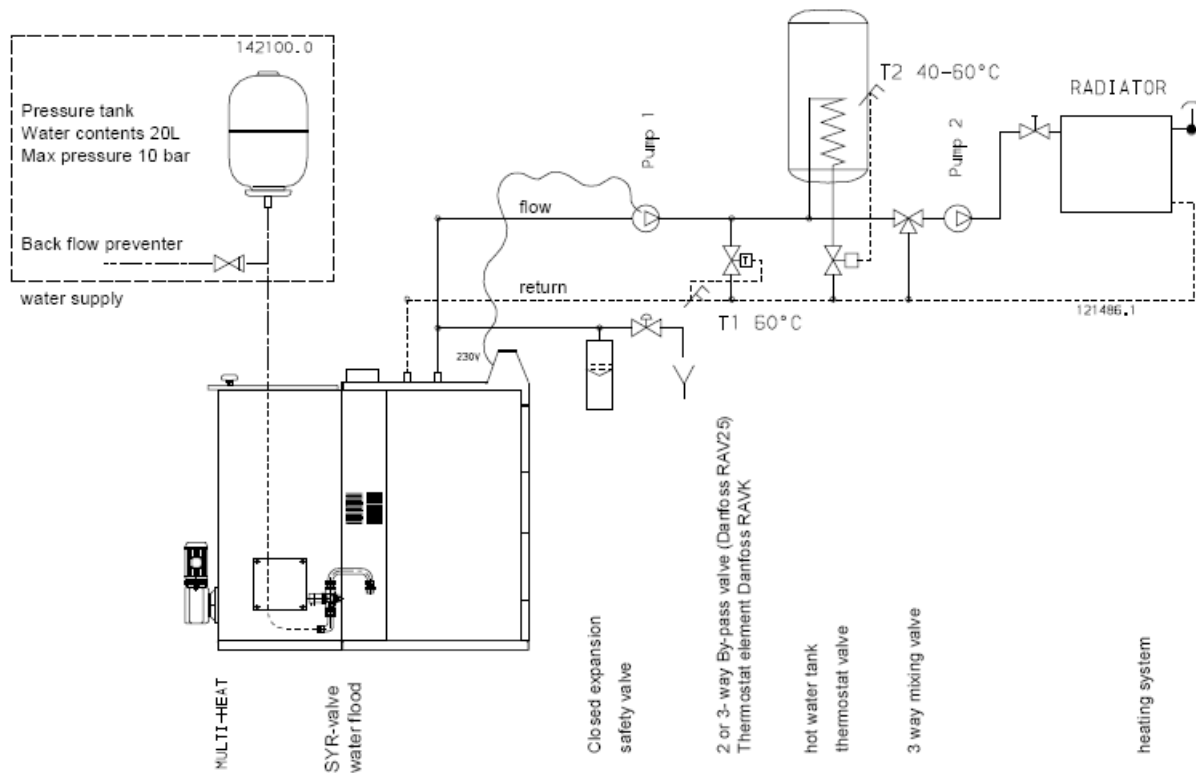


Figure 3.7

4 Technical data and electrical diagrams

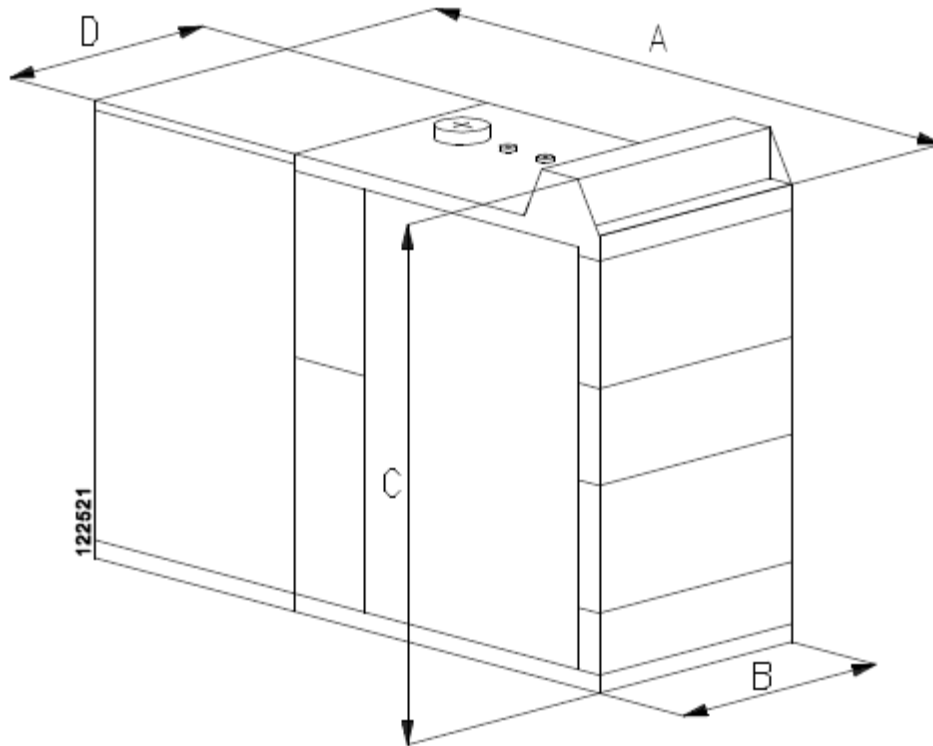


Figure 4

Page 22

4.1 Technical data

			Type 1,5	Type 2,5	Type 4,0
A	Depth - Total	mm	1435	1578	1693
B	Breadth - Boiler	mm	504	600	600
C	Height	mm	1165	1475	1475

D	Breadth - Hopper	mm	504 / 910	600 / 1000	600 / 1000
(Door width required in house = D + 30 mm)					
-	Hopper Size	liters	200 / 350	360 / 600	360 / 600
-	Magazine door dimensions (l x w)	mm	402x402	521x521	521x521
-	Height to smoke pipe stub	mm	1110	1455	1455
-	Smoke pipe stub ext. diameter	mm	130	150	150
Weight - empty		kg	340 / 385	530 / 630	580 / 680
Water contents		liters	50	125	150
Necessary space for taking out the worm conveyor					
at the end of the hopper		mm	800	1000	1000
- " -	<i>(Or the door end)</i>	mm	<i>(see point 3.6.5)</i>	1000	1000
Necessary distance to open cleansing door		mm	500	600	600
Minimum service distance at the hopper end		mm	100	100	100
Operating temperature		°C	60-85	60-85	60-85
Output (nominal output)	Wood pellets	kW	15	25	43
	Grain/Maize	kW	-	23	37

	Chips	kW	-	23	37
Output minimum	Wood pellets	kW	4,6	7,5	12
	Grain/Maize	kW	-	6,8	12
	Chips	kW	-	6,8	12
Output (stand by) guideline **		approx. kW	0,5	0,8	1,0
Smoke temperature at nominal output	Wood pellets	°C	130	170	158
	Grain/Maize	°C	-	167	152
	Chips	°C	-	178	183
Smoke temperature at minimum output	Wood pellets ***	°C	60	80	75
	Grain/Maize ***	°C	-	85	80
	Chips	°C	-	85	80
Smoke gas volume at nominal output	Wood pellets	m ³ pr hour	36	58	93
	Grain/Maize	m ³ pr hour		60	97
Fuel consumption at nominal output	Wood pellets	kg pr hour	3,4	5,7	10
	Grain/Maize	kg pr hour	-	6,0	11

	Chips	kg pr hour	-	7,2	11
Gear motor effect		kW	0,12	0,37	0,37
Blower motor effect		W	90	90	90
Electricity consumption		kW	0,3	0,46	0,46
Electrical connection / fuse size	3 × 400 V + earth - 50 Hz / 10 A		✓	✓	✓
	1 × 230 V + earth - 50 Hz / 10 A		✓	✓	✓
Setting for line circuit breaker 400V/230V		A	0,6	1,2	1,2
Approved fuel types	Wood pellets	approx. 8 % water	5-20 mm	5-20 mm	5-20 mm
	Grain/Maize	approx. 15 % water	-	X	X
(see also section 1.1.1)	Chips (fine)	approx. 25% vand	-	X	X
Test pressure, boiler		bar	4,0	4,0	4,0
Test pressure, coil (extra equipment)		bar	25	25	Not supplied
Flow and expansion		inches	1	1	1
Return		inches	1	1	1
Noise level		dB(A)	<70	<70	<70

Retrograde combustion safety device	inches	½	½	½
Tapping-faucet is fitted by the factory	inches	½	½	½

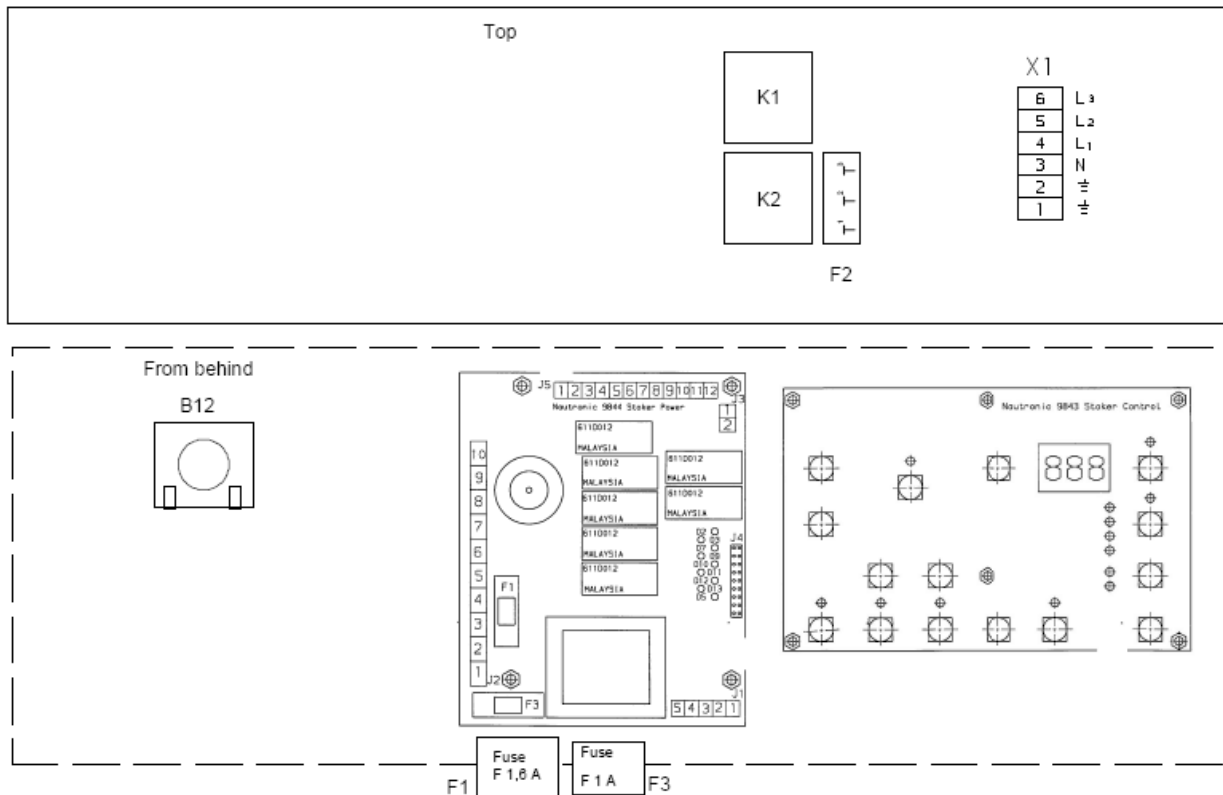
***) Minimum recommended stand-by output during intermittent operation during which the fire can be maintained. In order to maintain the fire outside of the heating season there must always, as a minimum, be a hot water tank as well as 1-2 radiators connected (open)..

****) These are the minimum smoke temperatures which are achieved by means of the approval with the above mentioned 24-hour operation at minimum output. This smoke temperature is too low for ordinary operation, with ordinary chimneys. We consider a smoke temperature of 100°C as being the absolute minimum for ordinary chimneys. We have therefore built-in an alarm on the smoke temperature at 100°C. This means that if the smoke temperature has been below 100°C for half an hour the boiler will stop. This alarm function also ensures against continuing to feed fuel into the boiler, if the fire has gone out

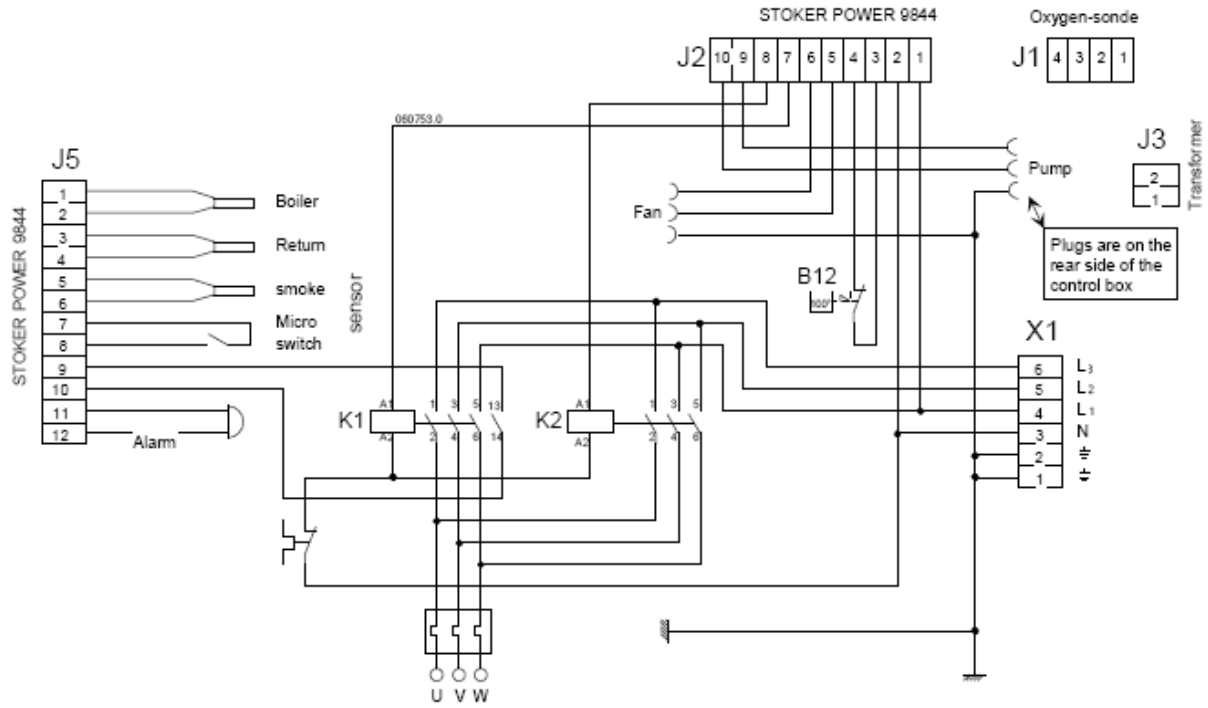
Page 23

4.2 Electrical diagram

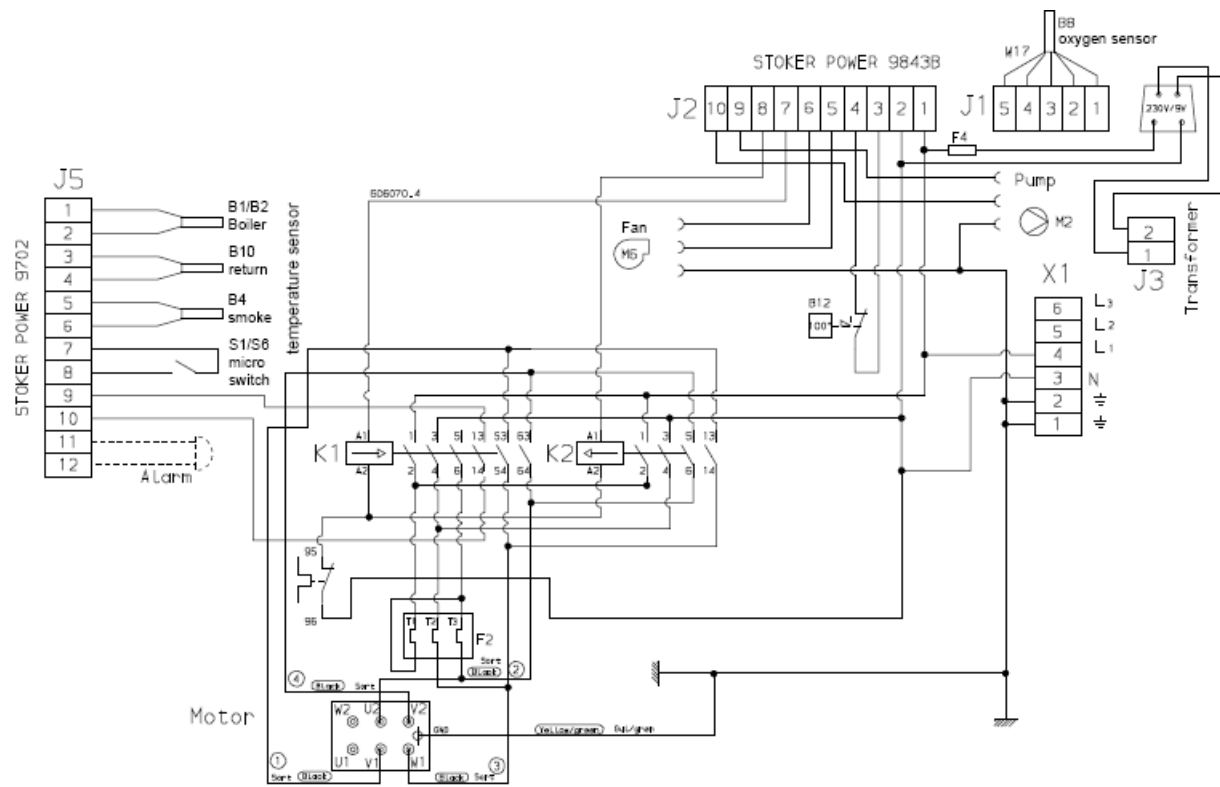
4.2.1 Panel



4.2.2 Multi Heat standard (400V)



4.2.3 Multi Heat (Special model - 230 V)



4.2.4 Explanation for Electrical Diagram

- B 12 - Ebullition thermostat
- F1 - Fuse 1.6A
- F2 - Motor protection
- F3 - Fuse 1A
- J1 - Oxygen probe
- J2 - Power tag block 230V DC
- J3 - Electric current for the oxygen sensor 9V AC
- J4 - Connection between power and control printed circuit

- J5 - Low voltage tag block
- K1 & K2 Relay (with mechanical barring)
- L1-L3 - Phases
- M2 - Pump (Plugs are on the rear side of the control board)
- M6 - Fan
- N - Zero
- T1-T3 - Motor connection
- X1 - Tag block
- Alarm - Potential-free exit maximum 24 Volt - 3 Amp

See [section 3.5](#) for electrical connection.

Page 25

5 General delivery survey report for boiler system

Installation carried out by:

Boiler data:

Make Type designation

BAXI MULTI-
HEAT _____

Size Type / Serial no.

_____ / _____

Boiler system installed and adjusted: date

Guarantee / warranty certificate filled in and sent: date

5.1 Measured and adjusted values

	Date	Date	Date	Date
Fuel type Moisture				
Programmed min. air quantity-adjustment (see page 9)				
Programmed fuel worm-conveyor running-in time high indkøringstid (see page 9) low				
Programmed time with max. air (in intermittent setting) (see page 9)				
High output: time between worm-conveyor feeding seconds				
High output: air quantity in % %				
Intermittent firing: adjusted time between worm-conveyor feeding minutter				

Low output: time between worm-conveyor feeding sek				
Low output: air quantity in % %				
Pump adjustment, pump 1				
Pump adjustment, pump 2				
Other data / adjustments				
Adjustment carried out by:				