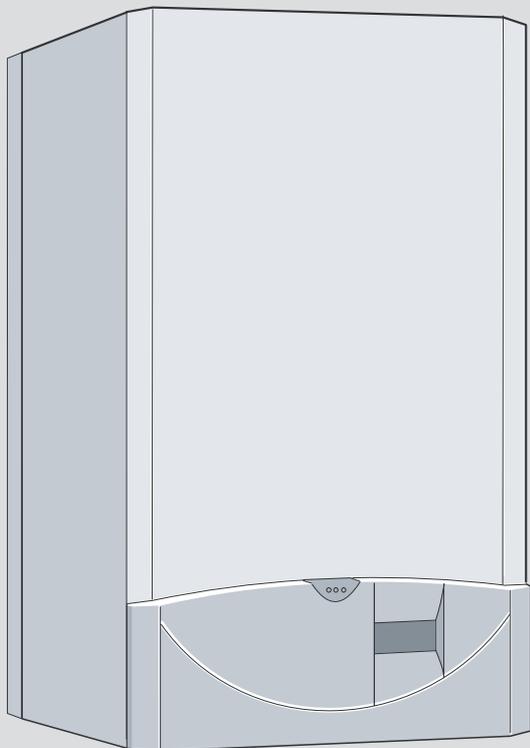


Service booklet for the Engineer
for Gas Condensing Boilers



6 720 611 400-00.10

ZWBR 7-30 R 30 HE plus combi GC-Number: 41 311 79

ZWBR 11-35 R 35 HE plus combi GC-Number: 41 311 80

ZWBR 11-40 R 40 HE plus combi GC-Number: 41 311 81

ZSBR 7-30 RD 430i system GC-Number: 41 108 06

ZWBR 7-32 RD 532i combi GC-Number: 41 108 10

ZWBR 11-37 RD 537i combi GC-Number: 41 108 11

ZWBR 11-42 RD 542i combi GC-Number: 41 108 12

Contents

Safety precautions	3	6 Appendix	50
Symbols	3	6.1 NTC values	50
1 Layout of Appliance	4	6.1.1 Flue sensor	50
2 Operation	5	6.1.2 Outside temperature sensor	50
2.1 Initialisation	5	6.1.3 CH flow NTC sensor, DHW cylinder NTC sensor 1 and hot water NTC sensor	50
2.2 Standard display	5	6.2 Electrical wiring diagram	51
2.3 Displaying service functions	5	6.3 Approved corrosion inhibitors and anti-freeze fluids for central heating water	52
2.4 Setting service functions	6	6.4 List of Code plugs used with this appliance	52
2.5 Resetting service functions to factory settings	6	6.5 Summary of BDH Information Sheet on Identifying Corrosion by CFCs	53
2.5.1 Resetting service functions 0.0 to 4.9 to their factory settings (Reset 1):	6		
2.5.2 Resetting service functions 0.0 to 9.9 to the factory setting (Reset 2):	6		
3 Boiler service functions	7		
3.1 Summary	7		
3.2 Explanation of service functions	10		
4 Rectifying faults	15		
4.1 Indication of faults	15		
4.1.1 ... on the boiler	15		
4.2 Summary	15		
4.2.1 Appliance faults	15		
4.2.2 Faults that are not displayed	16		
4.3 Notes on using the fault code tables	17		
4.4 Error codes on the display	18		
4.5 Faults that are not displayed	36		
4.5.1 Appliance faults	36		
4.5.2 Programmer faults	43		
5 Replacement of Parts	46		
5.1 PCB control board and transformer	46		
5.2 Fan Assembly	47		
5.3 Primary Heat exchanger/Burner	47		
5.4 Pump	48		
5.5 Clean condensation trap	48		
5.6 Motor of 3-way diverter valve (Fig. 14)	48		
5.7 3-way diverter valve	49		
5.8 Domestic Hot Water Heat Exchanger	49		
5.9 Electrode assembly	49		

Safety precautions

Repairs

- ▶ Repairs may only be carried out by an approved installer!
- ▶ Before carrying out any work on the appliance, switch it off at the master switch!
- ▶ Even when the appliance is switched off at the master switch, some components on the pcb inside the control box are still live.
Therefore:
- ▶ Before carrying out any work on the electrical parts of the appliance fully disconnect it from the power supply (e. g. by means of fuse or circuit breaker)!
- ▶ Flue ducting must not be modified in any way.
- ▶ Use only original spare parts!

Instructions to the customer

- ▶ Advise the customer that he/she must not make any modifications to the appliance or carry out any repairs on it.
- ▶ Draw attention to the need for an annual service (or maintenance contract if applicable).

Symbols



Safety instructions in this document are identified by a warning-triangle symbol and are printed on a grey background.

Signal words indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

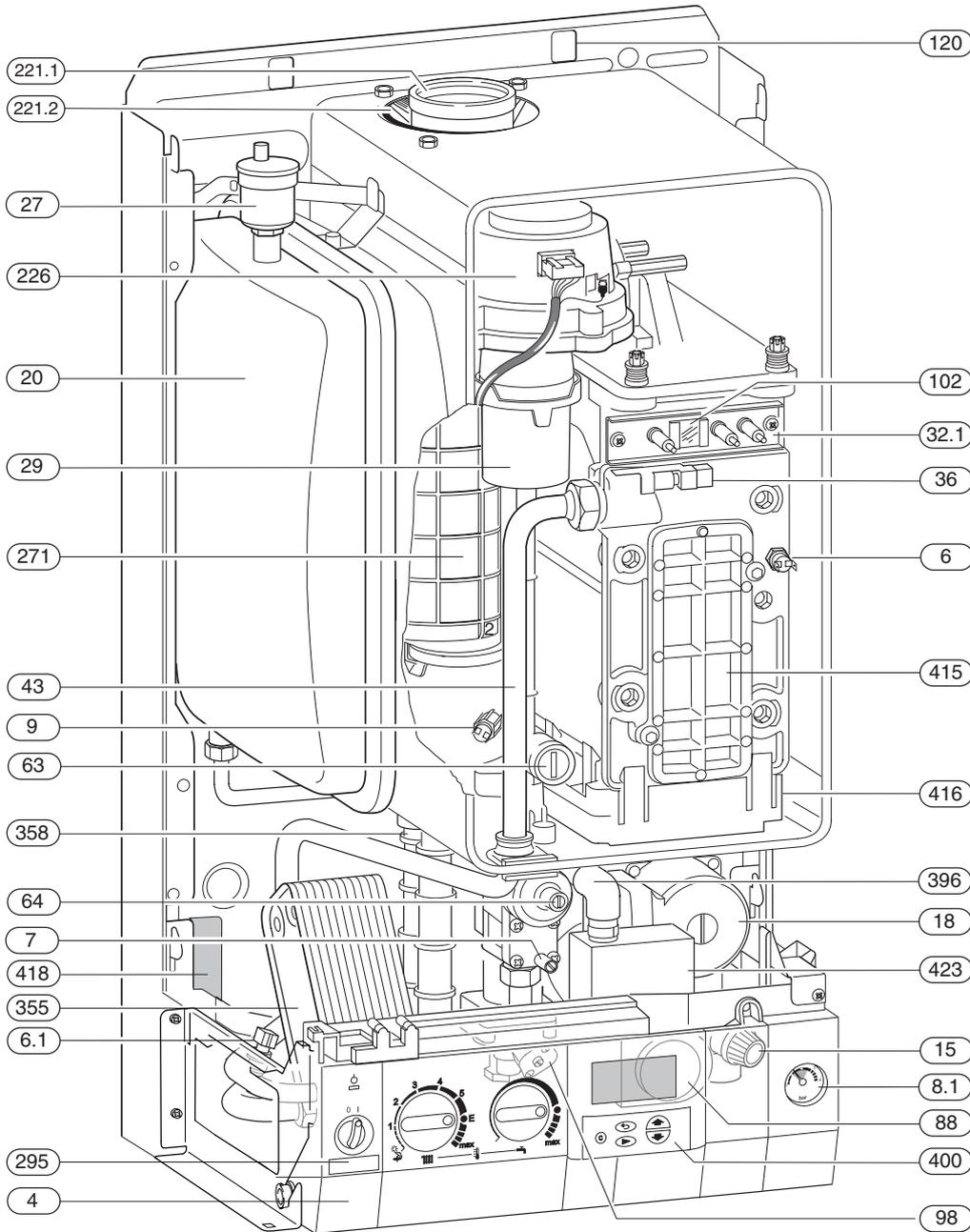
- **Caution** indicates that minor damage to property could result.
- **Warning** indicates that minor personal injury or serious damage to property could result.
- **Danger** indicates that serious personal injury could result. In particularly serious cases, lives could be at risk.



Notes are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

Notes contain important information in cases where there is no risk of personal injury or damage to property.

1 Layout of Appliance



7 181 465 347-02.20

Fig. 1

- | | | | |
|-------------|--|--------------|---|
| 4 | Bosch Heatronic | 102 | Inspection window |
| 6 | Temperature limiter for heat exchanger | 120 | Fixing points |
| 6.1 | Hot water NTC sensor (combi boiler) | 221.1 | Flue duct |
| 7 | Testing point for gas supply pressure | 221.2 | Combustion air intake |
| 8.1 | Pressure gauge | 226 | Fan |
| 9 | Flue gas temperature limiter | 271 | Flue duct |
| 15 | Relief valve | 295 | Appliance type sticker |
| 18 | Pump | 355 | Plate-type domestic hot water heat exchanger (combi boiler) |
| 20 | Expansion vessel | 358 | Condensate trap |
| 27 | Automatic air vent | 396 | Condensation trap hose |
| 29 | Air gas Mixer unit | 400 | Text display |
| 32.1 | Electrode assembly | 415 | Cover plate for cleaning access |
| 36 | Temperature sensor in CH flow | 416 | Condensate collector |
| 43 | CH flow | 418 | Data plate |
| 63 | Adjustable gas flow restrictor | 423 | Siphon |
| 64 | Adjusting screw for min. gas inlet flow volume | | |
| 88 | 3-way valve | | |
| 98 | DHW flow switch (combi) | | |

2 Operation

Instructions on the use of the text display module are given in the operating and installation instructions for the boiler.

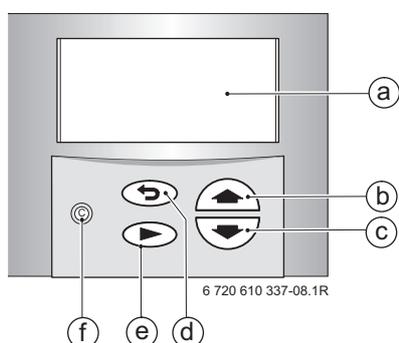


Fig. 2 Controls

- a Display
- b "Up"/"More" button
- c "Down"/"Less" button
- d "Back" button
- e "Next" button
- f "Delete" button

2.1 Initialisation

When the appliance is switched on it performs a self-test which takes about 5 seconds. While the self-test is in progress, the text display shows **Please wait... Initialising** and the two-digit display shows the following sequence of codes which appear for varying lengths of time:

(P0,)¹⁾ **P2, P3, P4, P6**

On completion of the test sequence the appliance is ready for operation.

2.2 Standard display

The text display shows the time, the CH flow temperature and the room temperature of TR2 location (if fitted).

In addition, the 2-digit display also shows the current CH flow temperature in Heating mode and Hot Water mode (display range 00°C to 99°C).

2.3 Displaying service functions

- ▶ Press any button to activate the main menu.
- ▶ Press or button until the arrow cursor is pointing to **Settings**.
- ▶ Press the button.
- ▶ Press or button until the arrow cursor is pointing to **Service**.
- ▶ Press the button.
- ▶ Press button to select **Display service param.**
Service function **0.0 Last fault** is displayed.
- ▶ Press or button to cycle through the current settings.
- ▶ Press button to exit the menu.

1) only for PCBs produced after 08/2004

2.4 Setting service functions

- ▶ Press any button to activate the main menu.
 - ▶ Press  or  button until the arrow cursor is pointing to **Settings**.
 - ▶ Press the  button.
 - ▶ Press  or  button until the arrow cursor is pointing to **Service**.
 - ▶ Press the  button.
The cursor is pointing to **Display service param.**
 - ▶ Press and hold the  button (for about 5 seconds) until the display shows **Adjust service parameters** and the first service function to be set, e. g. **2.0 Operating mode**. If a fault has occurred, the display will show 0.0 and the last fault.
 - ▶ Press  or  button until the desired service function is displayed.
 - ▶ Press the  button.
The first line of the display shows **Change value**, the second line shows the value that can be changed.
 - ▶ Use the  and  buttons to enter the required setting.
 - ▶ Press the  button.
The text display shows **ATTENTION**
Store settings ?
 - ▶ Press  or  to select **yes** or **no**.
 - ▶ Press  to confirm your selection.
The text display shows **Please wait...**, and the service function is then displayed with the new setting.
 - ▶ Press the  or  button until the next function you wish to change is displayed.
- or-**
- ▶ Press  button to exit the menu.

2.5 Resetting service functions to factory settings

2.5.1 Resetting service functions 0.0 to 4.9 to their factory settings (Reset 1):

- ▶ Power OFF the appliance.
- ▶ Press the button  and keep it pressed.
- ▶ Switch on the appliance, press and hold the  button until the display shows **r1** followed by [] .

2.5.2 Resetting service functions 0.0 to 9.9 to the factory setting (Reset 2):

- ▶ Power OFF the appliance.
- ▶ Simultaneously press and hold buttons  and .
- ▶ Switch on appliance, press and hold the  and  buttons until the display shows **r2** followed by [] .



To reset all parameters (except service settings) set on the text display module):

- ▶ Press and hold the  button until the settings are deleted.

3 Boiler service functions

3.1 Summary

	Text display message	Display	Range adjustable from - to	Reset Value
0.0	Last fault	00 - FF	last fault code can be deleted	0
0.1	Flow temp. sensor	0 - 99°C	-	-
0.2	Hot water temp. sensor	0 - 99°C	-	-
0.3	Stor. tank temp.sensor1 (system boiler)	0 - 99°C	-	-
0.4	Stor. tank temp.sensor2 (not applicable)	-	-	-
1.2	Code plug 8714411 XXX	0 - 255	-	-
1.4	Voltage at terminal 2 (not applicable)	-	-	-
1.5	Required flow temp. (for CH)	0 - 99°C	-	-
1.8	Power set by module (not applicable)	-	-	-
1.9	Module detection (not applicable)	-	-	-
2.0	Operating mode	-	normal Min Max	normal
2.2	Pump switch mode	-	1 - 3	3
2.3	Stor. tank charge outp.	-	0 - 100%	100 %
2.4	Anti-cycle mode	-	0 - 15 min	3 min
2.5	Max. flow temperature	-	35 - 88°C	88°C
2.6	Switch.diff.flow temp.	-	0 - 30°C	0,0 K
2.7	Autom. anti-cycle mode (not applicable)	-	on off	on
2.9	Actual output	0 - 100 %	-	-
3.0	Fan speed	0 - 255 Hz	-	-
3.3	Ionisation current	no low middle high	-	-

Table 1

Boiler service functions

	Text display message	Display	Range adjustable from - to	Reset Value
3.4	Pump mode (not applicable)	-	-	-
3.5	Pump blocking time (not applicable)	-	0 - 240 s in 15-s increments	0 s
3.6	Software version	BF 11.XX	-	-
3.9	Link 8-9	open closed	-	-
	Link Ls-Lr	open closed	-	-
4.0	Stor. tank. therm. (7-9) (system boiler)	blocked heat demand	-	-
4.1	Room therm. LSM/LSM release (not applicable)	-	-	-
4.2	Timer ch. 1 (heating)	blocked heat demand	-	-
	Timer ch. 2 (hot wat.)	blocked heat demand	-	-
4.4	Heat demand (heating)	yes no	-	-
	Heat demand (stor. tank) (system boiler)	yes no	-	-
4.5	Heat demand (hot water).	yes no	-	-
	Keep hot period	yes no	-	-
4.6	Internal regulator	blocked heat demand	-	-
5.0	Max. output (heating)	-	27 - 100%	100 %
5.1	Permanent ignition	-	no yes	no
5.2	GFA status/error (not applicable)	-	-	-
5.5	Min. output (not applicable)	-	27 - 100 %	depends on boiler type
6.0	Starting load	-	1 - 5	3
6.6	Thermostore satisfied (not applicable)	-	-	-

Table 1

	Text display message	Display	Range adjustable from - to	Reset Value
6.7	Pump off (hot water) (not applicable)	-	off on	on
6.8	Cycle time (hot water) (combi only)	-	20 - 60 min	20 min
6.9	Duration (hot water) (combi/system)	-	0 - 30 min	1 min
7.0	Pump map (heating)	-	0 Pump step adjustable 1 Const. pressure high 2 Const. pressure middle 3 Const. pressure low 4 Prop.pressure high 5 Prop.pressure low	3 Const. pressure low
7.1	Map pump step (heat.)	-	2 - 7	7
7.2	Antiblock. map pump.	-	off on	on
7.3	Air purge mode (burner keeps off while air purge mode is on)	-	off on autom. deactivat. permanent on	off
7.4	Actual map pump step	2 - 7	-	-
7.5	Map pump load index	0 - 255	-	-
7.6	Map pump type	0 - 99 (0 = no map pump detected)	-	-
7.7	Output reduction	-	off only in heating mode only in hot wat. mode in heat./hot wat. mode	in heat./hot wat. mode
8.5	Siphonfillprogram	-	on, boiler min.output, on, adjust. min. output, off	on, adjust. min. output
9.1	Min. fan overrun	-	10 - 600 sec	30 sec
9.2	Hot water on demand	-	off on	on
9.3	GFA-Asic-error (not applicable)			

Table 1

3.2 Explanation of service functions

0.0 Last fault

The last fault can also be recalled for servicing purposes when the appliance is functioning correctly.

To delete the stored fault:

- ▶ Delete fault (no fault displayed).
- ▶ Press the  button.
- ▶ Use the  button to select **yes**.
- ▶ Press the  button.

If a list of the last 10 indicated faults is required for servicing purposes, look under **Settings -> Service -> Further options -> Fault history**.

0.1 Flow NTC

The temperature measured by the NTC sensor on the CH flow pipe is indicated.

0.2 Hot water NTC

The temperature measured by the NTC sensor on the plate-type heat exchanger outflow is indicated.

0.3 Stor. tank temp.sensor 1 (system boiler only)

Indirectly heated DHW cylinder:

The temperature measured by NTC sensor 1 on the DHW cylinder is indicated.

0.4 Stor. tank temp.sensor 2

(not applicable)

1.2 Code plug

The 10-digit part number of the code plug is indicated. The code plug determines the appliance functions. If the appliance is converted from natural gas to LPG or vice versa (using conversion kit) the code plug also has to be changed.

1.4 Voltage at terminal 2

(not applicable)

1.5 Desired flow temp.

The CH flow temperature is displayed.

1.8 Power set by module

(not applicable)

1.9 Module detection

(not applicable)

2.0 Operating mode

There are 3 operating modes to choose from.

- **Normal mode:** the appliance operates according to the commands received from the programmer.
- **Min mode:** the appliance runs constantly at minimum output.
The text display shows **Min mode**. The 2-digit display alternates between the CH flow temperature

and --.

- **Max mode:** the appliance runs constantly at maximum output.
The text display shows **Max mode**. The 2-digit display alternates between the CH flow temperature and --.

2.2 Pump switch mode



If an outside temperature driven control unit is connected, pump control mode 3 is automatically activated.

The choice of settings is as follows:

- **Control Mode 1**
For heating equipment without a control unit.
The pump is controlled by the central heating flow temperature control.
- **Control Mode 2 (factory setting)**
For heating systems with room thermostat.
The central heating flow temperature control controls only the gas, the pump is not affected. The room thermostat controls both the gas and the pump.
The pump and fan have an overrun time of between 15 s and 3 min.
- **Control Mode 3**
The pump is controlled by the outside temperature driven control unit. In summer mode, the pump operates only for hot water mode.

2.3 Stor. tank charge output (system boiler only)

The DHW cylinder charging output can be set to any level between the minimum and maximum rated heat output for hot water according to the heat transfer capacity of the DHW cylinder.

- ▶ Enter the DHW cylinder charging output setting on the commissioning record enclosed with the appliance.

2.4 Anti-cycle mode

This function is only active if service function **2.7 Autom. anti-cycle mode** is **disabled**.

The anti-cycle time is factory set to 3 minutes.

The shortest possible anti-cycle time is 1 minute (recommended for single-pipe and hot-air heating systems). If the setting 0 is entered, the anti-cycle time is inactive.

- ▶ Enter the anti-cycle time on the commissioning record enclosed with the appliance.

2.5 Max. flow temperature

The maximum CH flow temperature can be set to between 35°C and 88°C (factory setting). Even if the CH flow temperature control is set higher, the setting entered for **2.5 Max. flow temperature** is not exceeded.

2.6 Switch diff. flow NTC

The switching difference is the permissible differential from the specified CH flow temperature. It can be set in increments of 1 K. The adjustment range is 1 to 30 K (is factory set to 0 K). The minimum CH flow temperature is 45°C.



Note: 1K $\hat{=}$ 1 °C.

- ▶ Disable anti-cycle time (setting **0.** of service function **2.4**).
- ▶ The switching difference setting should be entered on the commissioning record supplied with the appliance.

2.7 Autom. anti-cycle mode

With the textdisplay connected to the appliance, the anti-cycle time is adjusted automatically. With service funktion 2.7 automatic adjustment of the anti-cycle time can be disabled. This may be necessary in the case of unfavourably dimensioned heating systems. If automatic adjustment of the anti-cycle time is disabled, the length of the anti-cycle time must be set under service function **2.4 Anti-cycle mode**.

- ▶ If automatic adjustment of the anti-cycle time has been disabled, this should be entered on the commissioning record enclosed with the appliance.

2.9 Actual output

The actual output of the appliance at the time viewed is displayed.

3.0 Fan speed

The current fan speed is displayed in Hertz (Hz).

3.3 Ionisation current

The burner flame is monitored by measuring the ionisation current generated during combustion. If no ionisation current is detected, the gas valve shuts off. This ensures that unburned gas does not escape.

3.4 Pump mode (system boiler only)

(not applicable)

3.5 Pump blocking time

(not applicable)

3.6 Software version

The version number of the software is displayed.

3.9 Link 8-9 /

3.9 Link Ls-Lr

When supplied, the appliance has a link fitted across terminals 8-9 (= Heat demand). If that connection is opened (e.g. by a limiter for an underfloor heating system), heating mode is disabled.

When supplied, the appliance has a link fitted across terminals Ls-Lr (= Heat demand). If that connection is opened (e. g. by an external 2-point programmer), heating mode is disabled.

4.0 Stor. tank therm. (7-9) (system)

When supplied, the appliance has no link across terminals 7- 9 (= Disabled). If that connection is closed (e. g. by a DHW cylinder thermostat) DHW cylinder charging is enabled.

4.1 Room therm. LSM/LSM release

(not applicable)

4.2 Timer ch. 1 (heating) /

4.2 Timer ch. 2 (hot water)

Shows the status of channel 1 of the timer integrated in the text display.

If that channel's status is "Heat demand", heating mode will be activated according to the programmer commands.

Shows the status of channel 2 of the timer integrated in the text display.

If that channel's status is "Heat demand", hot water mode will be activated according to the programmer commands.

4.4 Heat demand (heating) /

4.4 Heat demand (stor. tank) (system only)

Heat demand (heating) shows the heat demand status for the central heating system.

If this channel's status is "Heat demand", heating mode will be activated according to the programmer commands.

Heat demand shows the heat demand status for charging the DHW cylinder.

If this channel's status is "Heat demand", the DHW cylinder will be charged according to the commands from the DHW cylinder thermostat or NTC sensor.

4.5 Heat demand (hot water) /

4.5 DHW pre-heat activated (combi only)

Heat demand (hot water) shows the heat demand status for the hot water function.

If this channel's status is "Heat demand", the hot water function operates according to the commands from the hot water NTC sensor.

Keep hot period shows the constant hot water circuit status of the heat exchanger (ECO or Comfort mode). If this channel's status is "Heat demand", Comfort mode is active. If the status is "Disabled", ECO mode with demand detection is active.

4.6 Internal regulator

The boiler has an internal anti-cycle function which prevents the burner overheating if the heat output can not be dissipated even in Min mode. The appliance will then switch off even when the system is calling for heat.

It will subsequently switch on again

- after 5 seconds in hot water mode,
- after 30 seconds in DHW cylinder charging mode,
- after between 25 and 60 minutes (depending on the setting of Service Function **6.8 Cycle time (hot water)**) in response to a call for heat for maintaining cylinder temperature,
- after 0 to 15 minutes in heating mode (depending on the setting for service function **2.4 Anti-cycle mode**).

The anti-cycle function is cancelled by another demand for heat.

If the anti-cycle function is to be switched off manually:

- ▶ switching the appliance off and on again at the master switch.
- ▶ activating Min or Max mode.
- ▶ briefly switching to summer mode on the temperature control for CH flow **IIII**.

5.0 Max. output (heating)

The heating output can be set to any level between min. rated heat output and max rated heat output to limit it to the specific heat requirements.



Even if the heating output is limited, the full rated heat output remains available for hot water or DHW cylinder charging.

The factory setting is maximum rated output – display shows „100 %“.

5.1 Permanent ignition

This function allows permanent ignition without gas supply to be activated for the purposes of checking the ignition mechanism.



Do not run for more than 2 minutes!

5.2 GFA status/error

(not applicable)

5.5 Min. output

(not applicable)

6.0 Starting load

The start speed of the combustion air fan can be increased, where problems with excessive flue lengths may interfere with ignition. Areas with variable wind conditions may also benefit from this facility.

6.6 Thermostore satisfied

(not applicable)

6.7 Pump off (hot water)

(not applicable)

6.8 Cycle time (hot water) (combi only)

The appliance is supplied with the pre-heat cycle time set to 20 minutes.

After pre-heating or a DHW demand, this function will stipulate the period of time before the next permissible pre-heat. This will prevent excessive pre-heat cycling.

6.9 Duration (hot water) (combi/system)

The appliance is supplied with the hot water duration set to 1 minute.

The hot water duration specifies how long after hot water is drawn heating mode remains disabled.

7.0 Pump map (heating)

The appliance is supplied with this function set to **3 Const. pressure low** (see pump characteristics below).

The pump map indicates how the pump is controlled in heating mode. The pump switches between the various pump speeds so as to reproduce the characteristic curve selected.

Changing the pump characteristic can be helpful if a lower pressure difference will guarantee the necessary circulation on the basis of the system dimensions and pump characteristic.



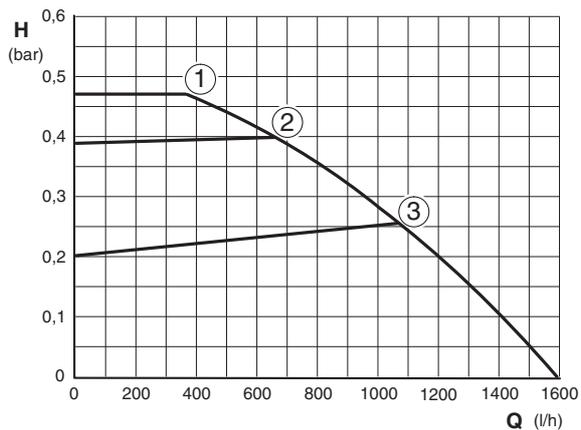
In order to save as much energy as possible and to minimise the possibility of water circulation noise, a low characteristic should be chosen.

The pump map can be selected within:

- **0 Pump step adjustable**, see service function **7.1 Map pump step (heat.)**
- **1 Const. pressure high**
- **2 Const. pressure middle**
- **3 Const. pressure low**
- **4 Prop. pressure high**
- **5 Prop. pressure low.**

The factory setting is:

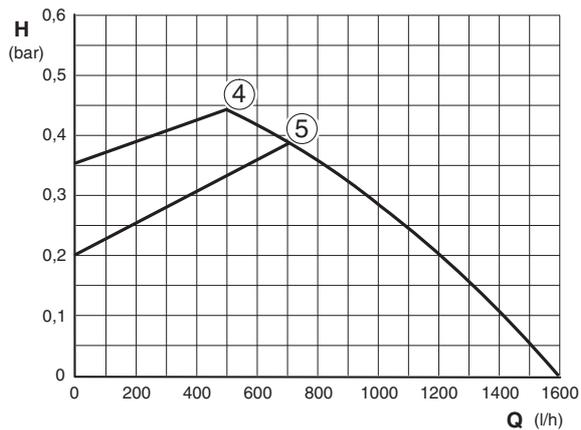
7.0 Pump map (heating) **3 Const. pressure low**



6 720 610 587-43.10

Fig. 3 Constant pressure

- 1-5 Characteristics
- H Pressure
- Q Water circulation rate



6 720 610 587-44.10

Fig. 4 Proportional pressure

If this parameter is set to **Pump step adjustable** then the pump speed set under function **7.1 Map pump step (heat.)** is active.

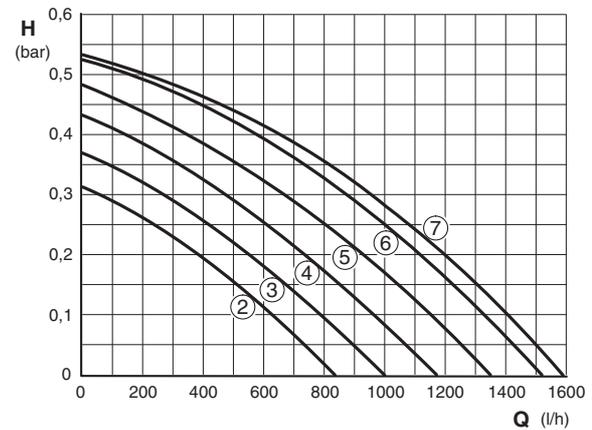
7.1 Map pump step (heat.)

This service function corresponds to the pump speed switch used on conventional heating pumps.

However, the setting is only active if function **7.0 Pump map (heating)**, is set to **Pump step adjustable**.

The factory setting is:

7.1 Map pump step (heat.) **7**



6 720 610 587-45.10

Fig. 5 Characteristics

- 2-7 Characteristics
- H Pressure
- Q Water circulation rate

7.2 Antiblock. map pump

The appliance is supplied with this function activated.

If the pump threatens to jam, an oscillating pump action is activated. Afterwards, the required operating mode is continued.

7.3 Air purge mode

The first time the appliance is switched on, a once-only venting function is activated. The heating pump then switches on and off at intervals. This sequence lasts about 8 minutes.

The text display shows **7.3 Air purge mode** and the 2-digit display shows 0⁰ in alternation with the CH flow temperature.

The automatic (27) vent must be opened and then closed again once the venting sequence is complete.



The venting function can be activated manually after servicing.

- If the venting function is set to “On, autom. deactivat.,” the function is set to “Off” once the sequence has been completed.

7.4 Actual map pump step

Actual value of this parameter.

7.5 Map pump load index

Actual value of this parameter.

7.6 Map pump type

Encoded type of installed map pump.

7.7 Output reduction

The appliance is supplied with this function activated. It prevents overload of the heat exchanger with high CH flow temperatures.

The output of the burner is reduced according to the CH flow temperature, i.e. up to 80°C flow temperature, full burner output is permitted. Above 80°C, the burner output is reduced as flow temperature increases up to 90°C at which only minimum output is available (even with maximum heat demand).

This function can be deactivated for hot water and/or central heating mode.

8.5 Siphon fill program

The trap filling programme ensures that the condensation trap is filled when the appliance is first installed or after it has been shut down for a long period: The condensation trap prevents flue gas escaping from the appliance into the room in which it is installed.

The trap filling programme is activated:

- the appliance is switched on at the master switch
- the burner has not been in operation for at least 48 hours
- the appliance is switched from summer to winter mode.

The next time the heating or hot water system calls for heat, the appliance is held at minimum output for 15 minutes. The trap filling programme remains active until the appliance has completed 15 minutes of operation at minimum output.

The text display shows **Siphonfillprogram on, adjust. min.output** and the 2-digit display alternates between **-II-** and the CH flow temperature.



If the condensation trap is not filled, flue gas can escape!

- ▶ Only deactivate the trap filling programme in order to carry out servicing work.
- ▶ Always re-activate trap filling programme once servicing is complete.

9.1 Min fan overrun

Minimal fan overrun time after a boiler demand.

9.2 Hot water on demand

The appliance is supplied with this function activated.

This function relates to ECO mode (the  button lights).

The demand detection function enables maximum gas and water economy.

Briefly turning a hot water tap on and then off again signals demand to the appliance which then heats up the water to the set temperature.

Hot water is then available at short notice.

9.3 GFA-Asic-error

(not applicable)

4 Rectifying faults

4.1 Indication of faults

Faults are indicated by a letter code. This helps to identify and eliminate the cause of the fault quickly and reliably.

4.1.1 ... on the boiler

The text display shows the message **Fault EA. Please call service**, for example. At the same time, the fault code appears on the 2-digit display, in this example: **EA**.

You can view an explanatory description of the fault indicated by going to **Settings -> Service -> Display service parameters**, in this example: **EA: During operation: Flame not detected**.

The fault codes displayed are grouped into four categories:

- **Category 1:**
The appliance is disabled until it has been switched off and then on again.
- **Category 2:**
The appliance is disabled until the cause of the fault has been eliminated.
- **Category 3:**
The appliance continues to operate with limited function.
- **Category 4:**
The appliance is disabled and locked (⚠ flashes) until the cause of the fault has been eliminated and the appliance unlocked.



Unlocking the appliance:

- ▶ Press the reset button (⏪) until the digit -- appears on the display.
Once the appliance starts up successfully, the fault disappears from the text display.

4.2 Summary

4.2.1 Appliance faults

Appliance faults	Category	system boiler	combi boiler	Page
A1	1	X	X	18
A7	3	X	X	19
A8	3	X	X	20
Ad	3	X	X	21
b1	2	X	X	22
C1	2	X	X	23
d3	2	X	X	24
E2	2	X	X	25
E9	4	X	X	26
EA	4	X	X	28
F0	2/4	X	X	32
F7	4	X	X	33
FA	4	X	X	33
FC	3	X	X	35
Fd	4	X	X	35

Table 2

4.2.2 Faults that are not displayed

Appliance faults	system boiler	combi boiler	Page
Boiler indicates P1, P2, P3 at start-up and then restarts with P1..	X	X	36
Excessive burner noise, rumbling noises	X	X	36
Flue gas levels incorrect, CO level too high	X	X	38
Ignition too harsh, ignition poor	X	X	39
Loose or broken contact on DHW cylinder NTC sensor	X		40
Hot water has unpleasant odour or is dark colour (system boiler)	X		41
Text display fails to respond, no display or display incorrect	X	X	41
Condensation in the flue pipe	X	X	41
Inadequate hot water outlet temperature (combi boiler)		X	42

Table 3

Programmer faults	Page
Set room temperature not reached (TR 2)	43
Set room temperature not reached (integrated text display)	43
Set room temperature exceeded by large amount (TR 2)	44
Heating up takes too long (integrated text display)	44
Excessive fluctuations in room temperature (integrated text display)	45
Room temperature too high in Economy mode	45
Incorrect or no modulation	45
No programmer display or programmer display does not react	45

Table 4

4.3 Notes on using the fault code tables

The procedure is best described with the aid of an example:

- Work through the table from top to bottom and from left to right.
- First make a note of the present settings and restore them before leaving the appliance.
- Read question 1. (Check column) and depending on the answer (yes or no) read the action required from the relevant box and carry out the instruction given; ignore the other answer. **For example:** if the burner flame is visible, follow the instructions for **yes**, i.e. ↓5.!
- ↓5. means go to number 5., ignoring the steps in between.

In this example: check the flue is clear by testing the CO₂ level.

- If the appliance is locked (⚠ button is flashing), press the ⚠ button.
- If the fault has been rectified, the appliance will then start up without indicating a fault and the fault isolation procedure is complete.
- If the fault is still present after performing the action specified and, if necessary, restarting the appliance, move on to the next step in the fault isolation procedure.
- If another fault code is displayed, work through the fault code table for that code.

Flame not detected

	Check		Action
1.	Is a burner flame visible?	yes:	↓ 5.
		no:	↓ 2.
2.	Is the gas cock turned on?	yes:	Ø 5.
		no:	▶ Open the gas cock. ▶ Press button ⚠. EA? ↓3.
3.	Has the thermal cut-out on the gas cock tripped?	yes:	...
		no:	↓ ...
4.		
5. ...	Problem with flue? ▶ Check CO ₂ level in combustion air. Is CO ₂ level above 0,2 %	yes:	Check flue.
		no:	↓ ...

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Fig. 6 Example of fault code table

4.4 Error codes on the display

<h1 style="margin: 0;">A1</h1> flashing.			
Controlled-characteristic pump has run dry			
	Check		Action
1.	System pressure below 1.2 bar?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Check appliance and system for water leaks and repair as necessary. ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Turn ON the appliance. A1? ↓2.
		no:	↓2.
2.	Audible bearing damage on pump?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Drain appliance. ▶ Change the pump (see chapter 5.4). ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ↓3.
		no:	↓3.
3.	Activate venting sequence.	yes:	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 7.3 Air purge mode select setting on, autom. deactivat. and confirm. ▶ Vent appliance. ▶ Vent radiators.

A7

 flashing.

Water NTC sensor defective

	Check		Action
1.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select service function 0.2 Hot water temp. sensor. Is a temperature between 0 and 5°C displayed? 	yes:	DHW temperature limiter connector corroded ¹⁾ , damaged or dirty? <ul style="list-style-type: none"> ▶ Change relative parts. A7?↓2.
		no:	↓2.
2.	<ul style="list-style-type: none"> ▶ Unplug 20-pin connector from PCB. E2 is displayed. ▶ Check resistance from connections 3 to 4 on the cable side. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.
		no:	↓3.
3.	<ul style="list-style-type: none"> ▶ Unplug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	▶ Change NTC sensor.

1) For notes, refer to Appendix

<h1 style="margin: 0;">A8</h1> flashing.			
No correct electrical connection			
	Check		Action
1.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Check Wiring between Textdisplay and TR 2: <ul style="list-style-type: none"> – Terminal 3 on Textdisplay connected to Terminal 3 TR 2? – Terminal 4 ...Terminal 4 – Terminal F ...Terminal F? 	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Rewire correctly as specified in the installation instructions. ▶ Turn ON the appliance. <li style="padding-left: 20px;">After 90 sec.: A8? ▶ Power OFF the appliance. ↓2.
2.	<ul style="list-style-type: none"> ▶ Check continuity on wiring to TR 2. Is there continuity? 	yes:	↓3.
		no:	<ul style="list-style-type: none"> ▶ Replace or repair wiring and/or connections. ▶ Turn ON the appliance. <li style="padding-left: 20px;">After 90 sec.: A8? ▶ Power OFF the appliance. ↓3.
3.	<ul style="list-style-type: none"> ▶ Check resistance from connections 4 to F and 3 to 4. ▶ Is resistance between XX and XX? 	yes:	▶ Replace TR 2.
		no:	↓4.
4.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

Ad flashing.

DHW cylinder NTC sensor not detected

	Check		Action
1.	Is lead for DHW cylinder NTC sensor correctly routed, i.e. not through cable clamp?	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Route connecting lead for DHW cylinder temperature sensor as specified in installation instructions. Ad? ↓2.
2.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 0.3 Stor. tank temp.sensor1. Is a temperature between 0 and 5°C displayed?	yes:	If DHW cylinder sensor connector corroded, damaged or dirty: <ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Change NTC sensor. ▶ Turn ON the appliance. ▶ Press button . Ad? ↓3.
		no:	↓3.
3.	<ul style="list-style-type: none"> ▶ Unplug DHW cylinder NTC connector from PCB control board. ▶ Check resistance from connections 3 to 4 on the cable side. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.
		no:	↓4.
4.	<ul style="list-style-type: none"> ▶ Unplug NTC sensor from cable in DHW cylinder. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the NTC sensor connection cable. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	▶ Change NTC sensor.

b1 flashing.

Code plug not detected.

	Check		Action
1.	b1 is shown on 2 digit display. (independent on what is shown on the text display).	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Fit code plug (correctly), making sure code number is correct (see Appendix). ▶ Turn ON the appliance. b1? ↓2.
		no:	↓2.
2.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 1.2 Code plug. ▶ Compare number displayed with that shown in Appendix. No number or incorrect number (last three digits) displayed. 	yes:	↓3.
		no:	↓4.
3.	Code plug loose, incorrect or defective.		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Fit code plug (correctly), making sure code number is correct (see Appendix). ▶ Turn ON the appliance. b1? ↓4.
4.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

C1 flashing.

Fan speed too low

	Check		Action
1.	Fan lead connector properly connected?	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Plug in connector. ▶ Turn ON the appliance. C1? ↓2.
2.	Is fan lead defective? ▶ Measure the fan lead for continuity. Is there continuity for each one of the cores?	yes:	↓3.
		no:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Replace fan lead. ▶ Turn ON the appliance. C1? ↓3.
3.	Fan defective.	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Unplug the connection wire. ▶ Replace fan. ▶ Plug the connection wire. ▶ Turn ON the appliance. C1? ↓4.
		no:	↓4.
4.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

d3 flashing.

Wrong signal from pin 8-9.

	Check		Action
1.	▶ Measure voltage between Terminal 4 and Terminal 8. Voltage \cong 24 V DC?	yes:	↓2.
		no:	↓3.
2.	Link between terminals 8 and 9 connected?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Check link across 8-9 properly fitted, tighten screws properly. ▶ Turn ON the appliance. d3? ↓3.
		no:	↓3.
3.	Terminal block defective.		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Replace terminal strip. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. d3? ↓4.
4.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

E2

 flashing.

The flow temp. NTC sensor is damaged.

	Check		Action
1.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 0.1 Flow temp. sensor. Is a temperature between 0 and 5°C displayed? 	yes:	The heating outlet NTC sensor is in short circuit: <ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Replace CH flow NTC sensor; observe fitting instructions for NTC sensor when doing so. ▶ Turn ON the appliance. E2? ↓2.
		no:	↓ 2.
2.	<ul style="list-style-type: none"> ▶ Unplug 20-pin connector from PCB. ▶ Check resistance from connections 8 to 9 on the cable side. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 1 on page 7) in order to keep the altered values. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.
		no:	↓3.
3.	<ul style="list-style-type: none"> ▶ Unplug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 7, page 50? 	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	▶ Change NTC sensor.

E9 and flashing.

Safety temperature limiter has tripped.

	Check		Action
1.	Is the heating pressure between 1 and 2 bar?	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Top up system. ▶ Vent appliance. ▶ Press , restart the appliance. E9? ↓2.
2.	Is the pump seized?	yes:	<ul style="list-style-type: none"> ▶ Unblock the pump. If pump won't start: ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Drain appliance. ▶ Change the pump (see chapter 5.4). ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓3.
		no:	↓3.
3.	Lead disconnected from safety temperature limiters?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Reconnect lead. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓4.
		no:	↓4.
4.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Unplug the connector from the cut-off device. ▶ Measure the of cut-off device for continuity. Resistance very high? 	yes:	<ul style="list-style-type: none"> ▶ Change the over heating cut-off device. ▶ Connect flue gas safety temperature limiter lead. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓5.
		no:	<ul style="list-style-type: none"> ▶ Connect flue gas safety temperature limiter lead. ▶ Turn ON the appliance. E9? ↓5.

E9

 and  flashing.

Safety temperature limiter has tripped.

	Check		Action
5.	Is lead disconnected from CH flow safety temp. limiter?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Reconnect lead. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓6.
		no:	↓6.
6.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect lead to CH flow safety temperature limiter. ▶ Measure the CH flow safety temperature limiter for continuity. Resistance very high? 	yes:	<ul style="list-style-type: none"> ▶ Change CH flow safety temperature limiter. ▶ Connect CH flow safety temperature limiter. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓7.
		no:	<ul style="list-style-type: none"> ▶ Connect CH flow safety temperature limiter. ▶ Turn ON the appliance. ↓7.
7.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Remove fuse SI 3 from appliance PCB control board and test for continuity. Resistance very high? 	yes:	<ul style="list-style-type: none"> ▶ Change the fuse. ▶ Turn ON the appliance. ▶ Press , restart the appliance. E9? ↓8.
		no:	<ul style="list-style-type: none"> ▶ Remount the fuse. ▶ Turn ON the appliance. ↓8.
8.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

EA and  flashing.			
During operation: flame not detected			
	Check		Action
1.	Is a burner flame visible?	yes:	↓5.
		no:	↓2.
2.	Is the gas cock turned on?	yes:	↓3.
		no:	<ul style="list-style-type: none"> ▶ Open the gas cock. ▶ Press , restart the appliance. EA? ↓3.
3.	Is there air in the supply pipe?	yes:	<ul style="list-style-type: none"> ▶ Vent supply pipe. ▶ Press , restart the appliance. EA? ↓4.
		no:	↓4.
4.	Natural gas models: does the building have a supply pressure regulator?	yes:	<ul style="list-style-type: none"> ▶ Check that it is fitted correctly and functioning properly and correct if necessary. ▶ Check supply pressure, inform gas company if outside correct range. ▶ Is correct code plug fitted? ▶ Press , restart the appliance. EA? ↓5.
		no:	↓5.
	LPG models: is the flow rate of the gas supply to the appliance correct?	yes:	↓5.
		no:	<ul style="list-style-type: none"> ▶ Is there enough gas in the supply cylinder? ▶ Is there air in the supply pipe? ▶ Is the solenoid valve in the "meter cabinet" opening? ▶ Is the supply pressure OK? (if the supply pressure is too high, check the pressure regulator in the "meter cabinet" and on the LPG supply cylinder) ▶ Press , restart the appliance. EA? ↓5.
5.	Is the earth connection correct?	yes:	↓6.
		no:	<ul style="list-style-type: none"> ▶ Correct the electrical connection. ▶ Press , restart the appliance. EA? ↓6.
6.	Is the condensation trap blocked?	yes:	<ul style="list-style-type: none"> ▶ Clean out condensation trap discharge pipe. ▶ Press , restart the appliance. EA? ↓11.
		no:	↓7.

EA

 and  flashing.

During operation: flame not detected

	Check		Action
7.	Is diaphragm in mixer unit fitted correctly (see installation instructions)? <ul style="list-style-type: none"> ▶ Open mixer unit (29). ▶ Check diaphragm for correct orientation, soiling and splitting. Is diaphragm OK? 	yes:	<ul style="list-style-type: none"> ▶ Close mixer unit. ↓8.
		no:	<ul style="list-style-type: none"> ▶ Insert diaphragm in the fan intake duct as per installation instructions so that the flaps open upwards. ▶ Close mixer unit. EA? ↓8.
8.	Check the gas valve. <ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Unplug the connectors from the gas valve. ▶ Measure the gas valve coils I and II electrical resistance at 20-pin connector. R = 164±40 Ω? 	yes:	<ul style="list-style-type: none"> ▶ Reconnect the connectors. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓9.
		no:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Turn off gas cock. ▶ Change the gas valve. ▶ Open the gas cock. ▶ Reconnect the boiler electrical connection. ▶ Reconnect the connectors. ▶ Turn ON the appliance. ▶ Check appliance for leaks. ▶ Press , restart the appliance. EA? ↓9.
9.	Problem with flue? <ul style="list-style-type: none"> ▶ Open up heat exchanger - is it dirty? ▶ Check CO₂ level in combustion air. Is CO₂ level above 0,2 % ? 	yes:	<ul style="list-style-type: none"> ▶ Check flue, clean if necessary. <p>Combined air/flue stack (LAS):</p> <ul style="list-style-type: none"> ▶ Check connection is fully inserted and not leaking. ▶ Is distance between flue entry and lowest combustion source at least 2.5 m?; PLEWA only: at least 1.25 m with 45° flue entry. ▶ Cross-sectional area adequate? If necessary contact chimney stack manufacturer. <p>Flue on outside of building:</p> <ul style="list-style-type: none"> ▶ Unrestricted cross-sectional area of air intake OK? <p>If Junkers flue used in stack (counter-flow) and solid-fuel boiler in adjacent stack:</p> <ul style="list-style-type: none"> ▶ Is flue for solid-fuel boiler raised as per ZIV recommendations? (does not apply if approved chimney terminal fitted) <p>Then:</p> <ul style="list-style-type: none"> ▶ Press , restart the appliance. EA? ↓10.
		no:	↓10.

EA and  flashing.			
During operation: flame not detected			
	Check		Action
10.	Is flue gas CO ₂ level incorrect ¹⁾ ?	yes:	<ul style="list-style-type: none"> ▶ Adjust to correct level. ▶ Press , restart the appliance. EA? ↓11.
		no:	↓11.
11.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 5.1 Permanent ignition (without Gas). Continuous ignition (without gas) OK? 	yes:	<ul style="list-style-type: none"> ▶ Press  button to select no. ↓12.
		no:	<ul style="list-style-type: none"> ▶ Press  button to select no. ↓15.
12.	Ignition lead connected to ignition electrodes?	yes:	↓13.
		no:	<ul style="list-style-type: none"> ▶ Reconnect lead. ▶ Press , restart the appliance. EA? ↓13.
13.	Ignition cable connector engaged in switchbox?	yes:	↓14.
		no:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Engage ignition cable connector in switchbox. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓14.
14.	Is the ignition electrical wire damaged?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Change the ignition electrical wire. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓15.
		no:	↓15.
15.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 3.3 Ionisation current . Measured ionisation current medium or high? 	yes:	↓17.
		no:	↓16.
16.	Electrode assembly defective? <ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out? 	yes:	<ul style="list-style-type: none"> ▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓17.
		no:	<ul style="list-style-type: none"> ▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓17.

EA

 and  flashing.

During operation: flame not detected

	Check		Action
17.	Check if the 20-pin connector lead assembly is damaged.		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Change the 20-pin connector lead assembly. ▶ Turn ON the appliance. ▶ Press , restart the appliance. EA? ↓18.
18.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

1) See installation instructions

<h1 style="margin: 0;">F0</h1> (and possibly ) flashing.			
Internal failure			
	Check		Action
1.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 9.3 GFA-Asic error (automatic ignition module, extended messages). A message is displayed.		<ul style="list-style-type: none"> ▶ Enter figure displayed in customer service record. ↓2.
2.	<ul style="list-style-type: none"> ▶ Select 5.2 GFA status/error . A message is displayed.		<ul style="list-style-type: none"> ▶ Enter figure displayed in customer service record. ↓3.
3.	<ul style="list-style-type: none"> ▶ Select Settings -> Further options-> Service->Display service param. Other faults apart from F0 displayed?	yes:	<ul style="list-style-type: none"> ▶ Deal with fault(s) displayed as instructed in relevant fault table(s).
		no:	↓4.
4.	 flashing?	yes:	<ul style="list-style-type: none"> ▶ Press button . ▶ Initiate demand for heat by pressing .button and then press again after 30 seconds to cancel. ▶ Initiate two more demands for heat as above. F0? ↓5.
		no:	↓5.
5.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

F7 and flashing.

Although appliance switches off, flame still detected

	Check		Action
1.	Electrode(s) dirty or defective? ▶ Power OFF the appliance. ▶ Remove electrode assembly and bracket and check for wear, deposits and mechanical damage.	yes:	▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press  , restart the appliance. F7? ↓2.
		no:	▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press  , restart the appliance. F7? ↓2.
2.	Problem with flue? ▶ Check CO ₂ level in combustion air. Is CO ₂ level above 0,2 % ?	yes:	▶ Check flue and repair or replace if necessary.
		no:	↓3.
3.	The PCB control board is damaged.		▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

FA and flashing.

After appliance switches off flame is detected

	Check		Action
1.	Is the condensation trap blocked?	yes:	▶ Power OFF the appliance. ▶ Clean out condensation trap discharge pipe. ▶ Turn ON the appliance. ▶ Press  , restart the appliance. FA? ↓2.
		no:	↓2.

FA and  flashing.			
After appliance switches off flame is detected			
	Check		Action
2.	Electrode assembly defective? ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out?		▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press  , restart the appliance. FA? ↓3.
3.	Problem with flue? ▶ Check CO ₂ level in combustion air. Is CO ₂ level above 0,2 % ?	yes:	▶ Check flue, clean if necessary. ▶ Press  , restart the appliance. FA? ↓4.
		no:	↓4.
4.	The gas valve is damaged.		▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Turn off gas cock. ▶ Change the gas valve. ▶ Open the gas cock. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Check appliance for leaks. ▶ Press  , restart the appliance. FA?↓5.
5.	Check if the 20-pin connector lead assembly is damaged.		▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Press  , restart the appliance. FA? ↓6.
6.	The PCB control board is damaged.		▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

FC flashing.

Text display module not detected

	Check		Action
1.	No fault or fault code FC displayed on text display ?		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Fit code plug (correctly), making sure code number is correct (see Appendix). ▶ Turn ON the appliance. FC? ↓2.
2.	<ul style="list-style-type: none"> ▶ Unplug text display module connector. ▶ Connecting lead between text display module and Heatronic OK.? 	yes:	<ul style="list-style-type: none"> ▶ Plug in connector. FC? ↓3.
		no:	<ul style="list-style-type: none"> ▶ Replace text display module. FC? ↓3.
3.	Text display module defective.		<ul style="list-style-type: none"> ▶ Replace text display module.

Fd and flashing.

Reset button pressed inadvertently

	Check		Action
1.	 flashing?		<ul style="list-style-type: none"> ▶ Press , restart the appliance. Fd? ↓2.
2.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

4.5 Faults that are not displayed

4.5.1 Appliance faults

Boiler indicates P1, P2, P3 at start-up and then restarts with P1..			
	Check		Action
1.	Fuse T 1,6 A (312) defective.	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the fuse. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. <p>Start sequence not completed? ↓2.</p>
		no:	↓2.
2.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

Excessive burner noise, rumbling noises			
	Check		Action
1.	Does the gas supply type match the specifications on the appliance identification plate?	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Convert appliance to correct gas type. <p>Rumbling noises? ↓2.</p>
2.	<ul style="list-style-type: none"> ▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions? 	yes:	↓3.
		no:	<ul style="list-style-type: none"> ▶ Decommission appliance. <p>Natural gas models:</p> <ul style="list-style-type: none"> ▶ Notify gas company.
3.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air. Is CO₂ level above 0,2 % ? 	yes:	<ul style="list-style-type: none"> ▶ Check flue and repair or replace if necessary. <p>Rumbling noises? ↓4.</p>
		no:	↓4.

Excessive burner noise, rumbling noises			
	Check		Action
4.	Is appliance's internal air/flue channel leaking or blocked? ▶ Open up heat exchanger and inspect. ▶ Remove silencer, flue duct and air flow limit. ▶ Open trap and inspect. Air channels dirty/clogged, seals defective or not correctly fitted?	yes:	▶ Repair or replace components. ▶ Grease seal before fitting. Make sure it is fitted in correct position. Rumbling noises? ↓5.
		no:	↓5.
5.	▶ Measure CO ₂ levels. CO ₂ levels in flue gas at min and max output do not match figures specified in installation instructions.	yes:	▶ Adjust CO ₂ level as per installation instructions.
		no:	▶ Power OFF the appliance. ▶ Turn off gas cock. ▶ Change the gas valve. ▶ Open the gas cock. ▶ Turn ON the appliance. ▶ Check appliance for leaks.

Flue gas levels incorrect, CO level too high			
	Check		Action
1.	Does the gas supply type match the specifications on the appliance identification plate?	yes:	↓2.
		no:	▶ Convert appliance to correct gas type. Flue gas levels incorrect? 2.
2.	▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	yes:	↓3.
		no:	▶ Decommission appliance. Bei Erdgas: ▶ Notify gas company. b
3.	Problem with flue? ▶ Check CO ₂ level in combustion air. Is CO ₂ level above 0,2 % ?	yes:	▶ Check flue and repair or replace if necessary. Flue gas levels incorrect? 4.
		no:	↓4.
4.	Flue gas CO ₂ levels measured at min. and max. load do not match specified levels? ▶ Measure CO ₂ levels.	yes:	▶ Adjust CO ₂ level as per installation instructions. Flue gas levels incorrect? 5.
		no:	↓5.
5.	Gas volumetric flow too high when CO ₂ level correctly set.	yes:	▶ Reduce gas volumetric flow rate by means of adjusting screw on gas valve and/or gas flow restrictor. ▶ Check CO ₂ adjustment. Flue gas levels incorrect? 6.
		no:	↓6.
6.			▶ Power OFF the appliance. ▶ Turn off gas cock. ▶ Change the gas valve. ▶ Open the gas cock. ▶ Turn ON the appliance. ▶ Check appliance for leaks.

Ignition too harsh, ignition poor			
	Check		Action
1.	<ul style="list-style-type: none"> ▶ Activate menu option Show service parameters. ▶ Select 5.1 Permanent ignition (without Gas). Continuous ignition (without gas) OK? 	yes:	↓6.
		no:	↓2.
2.	Ignition lead connected to ignition electrodes?	yes:	↓3.
		no:	<ul style="list-style-type: none"> ▶ Connect cable to ignition electrodes. ▶ Press button . Ignition poor? 3.
3.	Ignition cable connector engaged in switchbox?	yes:	↓4.
		no:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Engage ignition cable connector in switchbox. ▶ Turn ON the appliance. ▶ Press button . Ignition poor? 4.
4.	Is the ignition electrical wire damaged?	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Change the ignition electrical wire. ▶ Turn ON the appliance. ▶ Press button . Ignition poor? 5.
		no:	↓5.
5.	Electrode assembly defective? <ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out? 	yes:	<ul style="list-style-type: none"> ▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press , restart the appliance. Ignition poor? 6.
		no:	<ul style="list-style-type: none"> ▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press , restart the appliance. Ignition poor? 6.
6.	Does the gas supply type match the specifications on the appliance identification plate?	yes:	↓7.
		no:	<ul style="list-style-type: none"> ▶ Convert appliance to correct gas type. Ignition poor? 7.

Rectifying faults

Error Fd

Ignition too harsh, ignition poor			
	Check		Action
7.	▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	yes:	↓8.
		no:	▶ Decommission appliance. In case of natural gas: ▶ Notify gas company.
8.	Problem with flue? ▶ Check CO ₂ level in combustion air. Is CO ₂ level above 0,2 % ?	yes:	▶ Check flue and repair or replace if necessary. Ignition poor? 9.
		no:	↓9.
9.	Flue gas CO ₂ levels measured at min. and max. load do not match specified levels? ▶ Measure CO ₂ levels.	yes:	▶ Adjust CO ₂ level as per installation instructions. Ignition poor? 10.
		no:	↓10.
10.	Burner not correctly fitted or defective? ▶ Power OFF the appliance. ▶ Turn off gas cock. ▶ Remove burner. Cover fixings not tight or seal defective or not correctly fitted or burner defective?		▶ Replace burner and seal if necessary. ▶ Ensure seal is fitted in correct position. ▶ Open the gas cock. ▶ Turn ON the appliance. ▶ Check appliance for leaks.

Loose or broken contact on DHW cylinder NTC sensor			
	Check		Action
	DHW cylinder NTC sensor lead is not fitted as described in the installation instructions (i.e. the cable does not pass through the cable grip in the switchbox).		▶ Record condition of appliance as found in customer service record. ▶ Route cable as specified in installation instructions.

Hot water has unpleasant odour or is dark colour (system boiler)			
	Check		Action
This is generally caused by the formation of hydrogen sulphide by sulphate-reducing bacteria. Such bacteria are found in water which is very low in oxygen and live off the hydrogen produced by the anode.			
1.			<ul style="list-style-type: none"> ▶ Clean the hot water cylinder. ▶ Replace the sacrificial anode. ▶ Heat cylinder to a temperature $\geq 60^{\circ}\text{C}$
2.			<ul style="list-style-type: none"> ▶ Replace magnesium sacrificial anode with impressed-current anode. The conversion costs are payable by the operator!

Text display fails to respond, no display or display incorrect			
	Check		Action
	Ignition lead is not fitted as specified in installation instructions (i.e. the lead should be routed through the clip on the underside of the air box).		<ul style="list-style-type: none"> ▶ Hook igniter lead over clip on underside of air box. -or- ▶ Route igniter lead behind gas valve.

Condensation in the flue pipe			
	Check		Action
1.	Is diaphragm in mixer unit fitted correctly (see installation instructions)? <ul style="list-style-type: none"> ▶ Open mixer unit (29). ▶ Check diaphragm for correct orientation, soiling and splitting. 		<ul style="list-style-type: none"> ▶ Fit diaphragm as per installation instructions or replace. ▶ Close mixer unit.

Inadequate hot water outlet temperature (combi boiler)			
	Check		Action
1.	Pump set to mode 3?	yes:	↓2.
		no:	<ul style="list-style-type: none"> ▶ Set pump switch to setting 3. Inadequate hot water outlet temperature ? ↓2.
2.	<ul style="list-style-type: none"> ▶ Unplug connector from Heatronic; is voltage between terminal 1 and terminal 3 230 V AC? 	yes:	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 1 on page 7). ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change PCB control board. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted down.

4.5.2 Programmer faults

Set room temperature not reached (TR 2)			
	Check		Action
1.	Thermostatic valve(s) set too low?	yes:	▶ Turn up thermostatic valve(s). ↓2.
		no:	↓2.
2.	CH flow temperature control on boiler set too low?	yes:	▶ Turn up CH flow temperature control.
		no:	↓3.
3.	Air in the heating system.		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Check appliance and system for water leaks and repair as necessary. ▶ Top up system. ▶ Turn ON the appliance. ▶ Activate menu option Show service parameters. ▶ Select 7.3 Air purge mode select setting on, autom. deactivat. and confirm. ▶ Vent appliance. ▶ Vent radiators.

Set room temperature not reached (integrated text display)			
	Check		Action
1.	Thermostatic valve(s) set too low?	yes:	▶ Turn up thermostatic valve(s). ↓2.
		no:	↓2.
2.	Heating characteristic set too low?	yes:	▶ Correct heating characteristic. ↓3.
		no:	↓3.
3.	CH flow temperature control on boiler set too low?	yes:	▶ Turn up CH flow temperature control. ↓4.
		no:	↓4.

Set room temperature not reached (integrated text display)			
	Check		Action
4.	Air in the heating system.		<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Check appliance and system for water leaks and repair as necessary. ▶ Top up system. ▶ Turn ON the appliance. ▶ Activate menu option Show service parameters. ▶ Select 7.3 Air purge mode select setting on, autom. deactivat. and confirm. ▶ Vent appliance. ▶ Vent radiators.

Set room temperature exceeded by large amount (TR 2)			
	Check		Action
1.	Do radiators get too hot?	yes:	<ul style="list-style-type: none"> ▶ Decrease setting of "Heating" control. ↓2.
		no:	↓2.
2.	Bad choice of location for programmer, e.g. outside wall, near window, in draught, on hollow wall, etc.	yes:	<ul style="list-style-type: none"> ▶ Select better installation location. oder <ul style="list-style-type: none"> ▶ Fit external room thermostat. ↓3.
		no:	↓3.
3.			▶ Turn down thermostatic valve(s).

Heating up takes too long (integrated text display)			
	Check		Action
1.	Is fast heat-up switched off?	yes:	<ul style="list-style-type: none"> ▶ Switch on fast heat-up. ↓2.
		no:	↓2.
2.	Duration or output increase for fast heat-up set too low		▶ Increase setting.

Excessive fluctuations in room temperature (integrated text display)			
	Check		Action
1.	TR2 without room override: ▶ Periodic effect of external heat on room, e.g. from sunshine, lighting, TV, separate stove, fire, etc.	yes:	▶ Switch on room override. ↓2.
		no:	↓2.
2.	Room override has insufficient priority	yes:	▶ Increase room override priority (not text display). ↓3.
		no:	↓3.
3.	Bad choice of location for programmer, e.g. outside wall, near window, in draught, on hollow wall, etc.		▶ Select better installation location. -or- ▶ Fit external room thermostat.

Room temperature too high in Economy mode			
	Check		Action
	Building retains heat well	yes:	▶ Set economy temperature lower or ▶ Set to Frost Protection instead of Economy or ▶ Set start time for Frost protection/Economy earlier.

Incorrect or no modulation			
	Check		Action
	Programmer incorrectly wired		▶ Power OFF the appliance. ▶ Check wiring against wiring diagram and correct as necessary. ▶ Turn ON the appliance.

No programmer display or programmer display does not react			
	Check		Action
	Very brief power loss		▶ Power OFF the appliance. Wait approx. 1 minute, then: ▶ Turn ON the appliance.

5 Replacement of Parts



- ▶ Always disconnect the power supply to the appliance at the mains before carrying out any work on the electrical systems and components (fuse, circuit breaker).



- ▶ Always turn off the gas cock before carrying out any work on components which carry gas.

- ▶ The User should be recommended to have the appliance serviced regularly by a competent person.
- ▶ Information on servicing can be found in the installation instructions for the boiler.
- ▶ Use only genuine spare parts.
- ▶ Refer to the Spare Parts List when ordering spare parts.
- ▶ Always renew seals and O-rings removed during servicing or repair work.
- ▶ Use only the following types of grease:
 - Water valve: Unisilikon L 641 (8 709 918 413)
 - Unions: HFt 1 v 5 (8 709 918 010).

Re-assemble in reverse order of removal!

5.1 PCB control board and transformer

- ▶ Power OFF the appliance.
- ▶ Disconnect the boiler electrical connection.
- ▶ Unplug all connectors from the control box (inc. keyed plug). Access is gained by removing the covers).
- ▶ Remove text display and unplug connector from the PCB.
- ▶ Remove screw holding power connector earth lead and remove earth lead.
- ▶ Remove two top fixing screws from the control box.

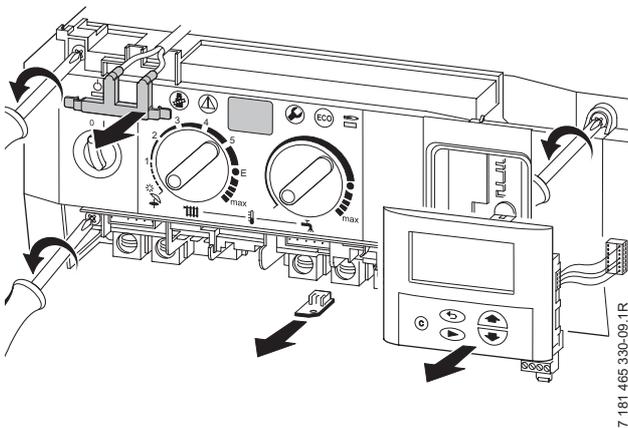


Fig. 7

- ▶ Lower the control box.
- ▶ Unscrew earth lead.
- ▶ Unscrew four fixing screws from cover plate.
- ▶ Prise off cover plate.
- ▶ Pull off transformer.
- ▶ Remove pcb holder.
- ▶ Remove the pcb control board.

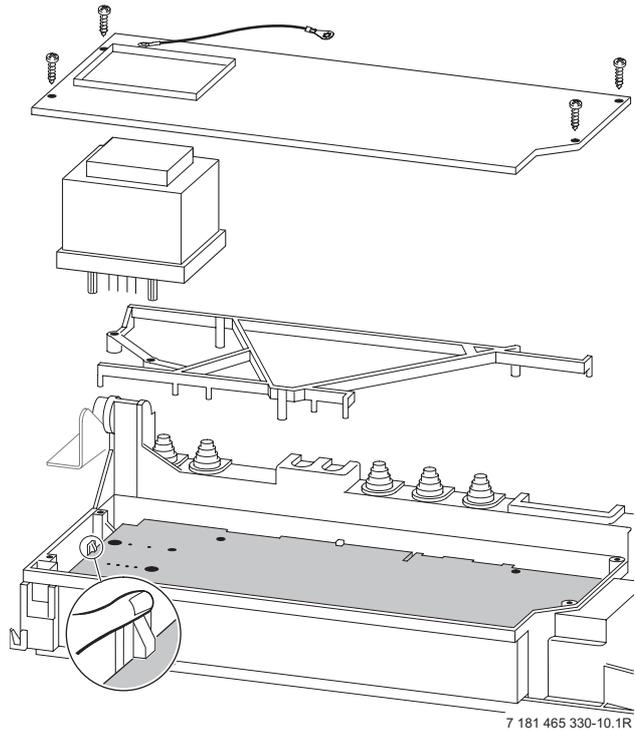


Fig. 8

If the Heatronic PCB is replaced:

- ▶ Re-enter the service function settings as recorded in the commissioning record.



If the text display is replaced, the set service functions will not be altered.

- ▶ Re-enter the remaining data (e.g. time, date, programmed switching points, heating curve, etc.) on text display.

5.2 Fan Assembly

- ▶ Power OFF the appliance.
- ▶ Undo lower pipe union on gas pipe (1.).
- ▶ Remove fan lead and earth connector (2.). The earth connector has a positive clip fixing.
- ▶ Remove fixing screws attaching fan to the burner cover (3.).
- ▶ Remove three fan fixing screws.
- ▶ Remove fan together with gas pipe and mixer unit.
- ▶ Separate the fan from the pipe and mixer unit by twisting the mixer unit to release it (4.).

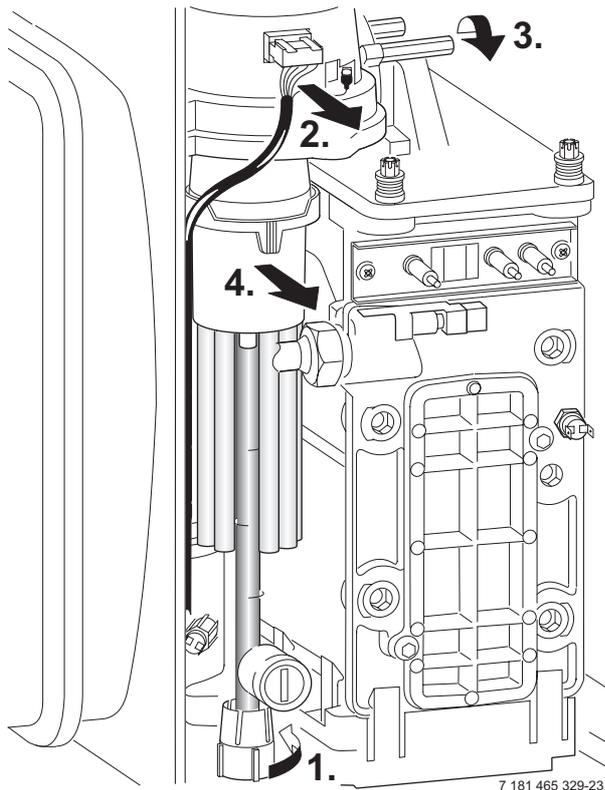
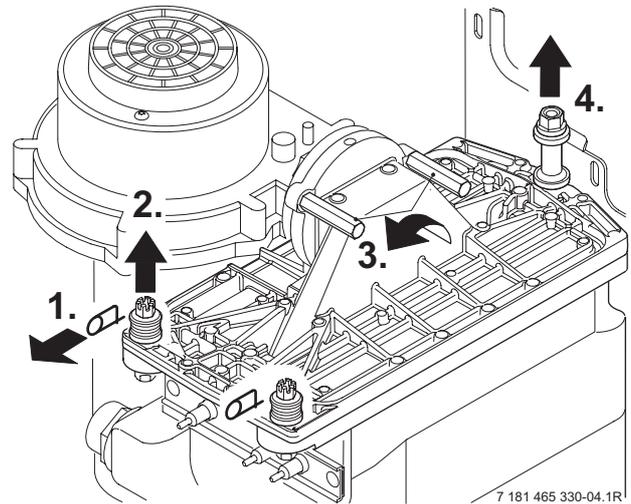


Fig. 9

7 181 465 329-23.

5.3 Primary Heat exchanger/Burner

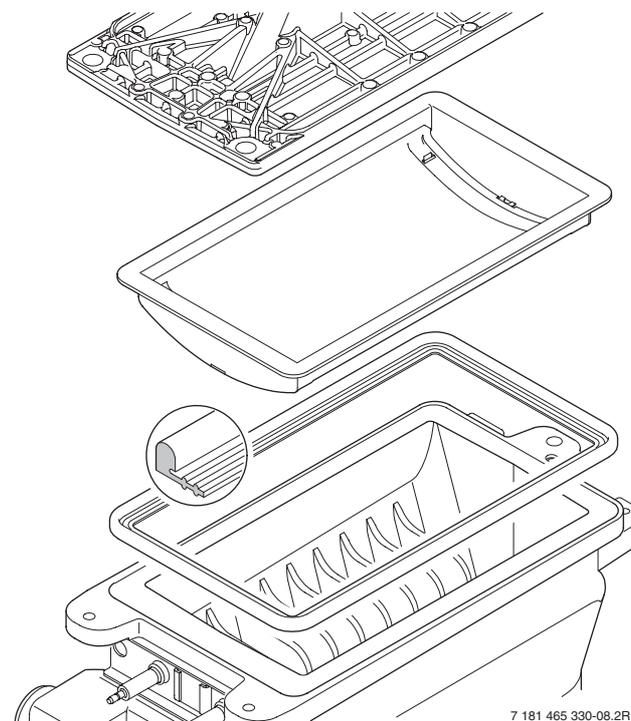
- ▶ Power OFF the appliance.
- ▶ Remove spring cotters from two front cover fixing assemblies.
- ▶ Unscrew the two front fixing assemblies.
- ▶ Slacken fully the rear securing bolt (4.).
- ▶ Undo the fan fixing screws.



7 181 465 330-04.1R

Fig. 10

- ▶ Remove the burner coverplate.



7 181 465 330-08.2R

Fig. 11

- ▶ Remove burner and seal.

5.4 Pump

- ▶ Power OFF the appliance.
- ▶ Disconnect the boiler electrical connection.
- ▶ Turn off service cocks.
- ▶ Drain appliance.
- ▶ Remove two top fixing screws from the control box.
- ▶ Lower the control box.
- ▶ Remove screw from underside of right-hand plastic cover plate.
- ▶ Pull cover plate forwards to remove.
- ▶ Unscrew the pump union nuts.

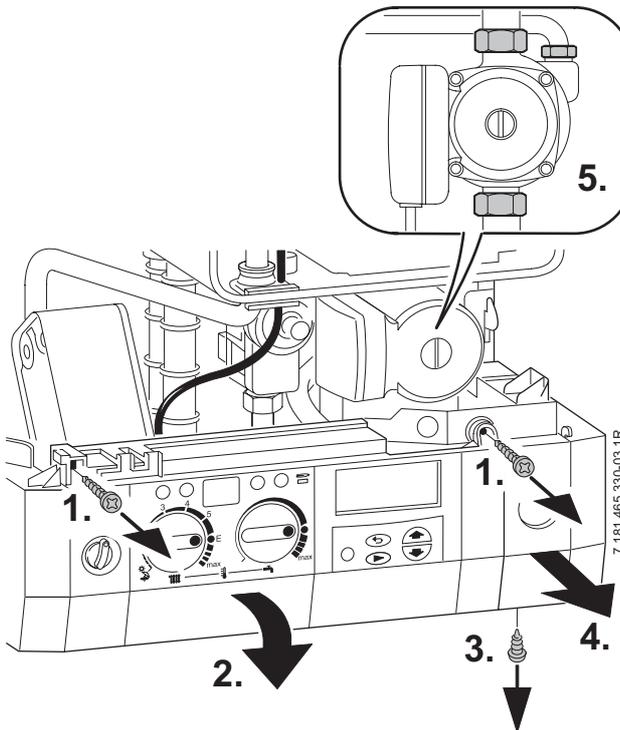


Fig. 12

After refitting:

- ▶ Fill system, bleed and re-pressurise (see Installation Instructions).

5.5 Clean condensation trap

In order to prevent spillage of condensate the condensation trap should be completely removed.

- ▶ Screw off the condensation trap and place a suitable container underneath.

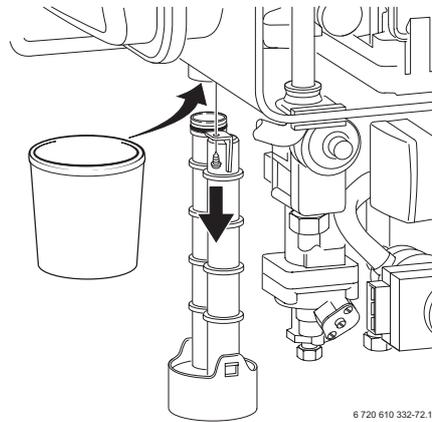


Fig. 13

- ▶ Fill condensation trap with approx. 1/4 l of water and refit.

5.6 Motor of 3-way diverter valve (Fig. 14)

- ▶ Power OFF the appliance.
- ▶ Unplug connector from 3-way valve motor.
- ▶ Pull out retaining clip.
- ▶ Remove motor.

5.7 3-way diverter valve

- ▶ Power OFF the appliance.
- ▶ Disconnect the boiler electrical connection.
- ▶ Turn off service cocks.
- ▶ Drain appliance.
- ▶ Unplug connector from 3-way valve motor.
- ▶ Pull out retaining clip.
- ▶ Remove motor.
- ▶ Open pipe joints.
- ▶ Remove 3-way valve.

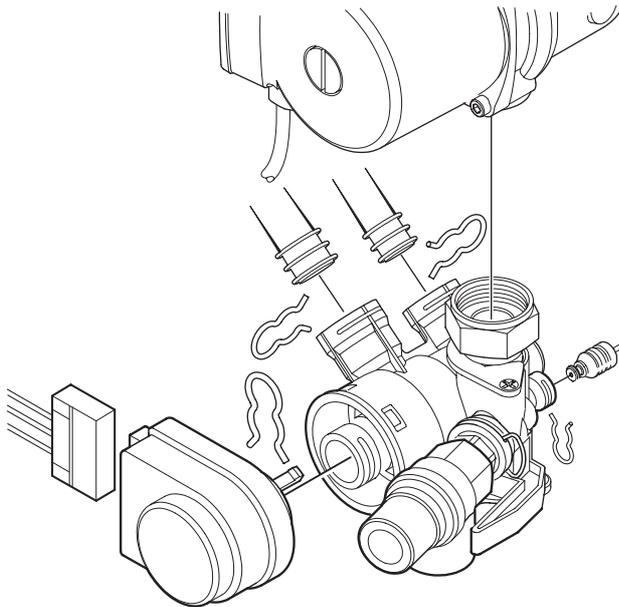


Fig. 14

After refitting:

- ▶ Fill system, bleed and re-pressurise (see Installation Instructions).

5.8 Domestic Hot Water Heat Exchanger

- ▶ Power OFF the appliance.
- ▶ Turn off service cocks.
- ▶ Drain appliance.
- ▶ Open pipe joints.

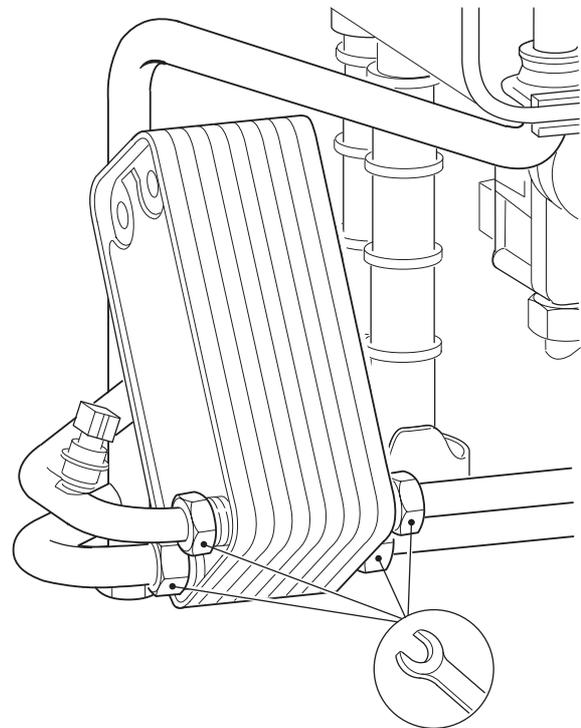


Fig. 15

- ▶ Remove the domestic hot water heat exchanger.

After refitting:

- ▶ Fill system, bleed and re-pressurise (see Installation Instructions).

5.9 Electrode assembly

- ▶ Power OFF the appliance.
- ▶ Disconnect the boiler electrical connection.
- ▶ Unscrew the two fixing screws and carefully remove the electrode assembly. Refer to fig. 1).
- ▶ Remove electrode assembly and bracket and check for wear, deposits and mechanical damage.
- ▶ Replace assembly if necessary.

6 Appendix

6.1 NTC values

6.1.1 Flue sensor

Flue temperature (°C) Measurement tolerance ±10%	Resistance (Ω)
20	124 900
40	53 290
60	24 890
80	12 550
100	6 777
120	3 873
140	2 328
160	1 455
180	948
200	540

Table 5

6.1.2 Outside temperature sensor

Outside temperature (°C) Measurement tolerance ±10%	Resistance (Ω)
-20	2 392
-16	2 088
-12	1 811
-8	1 562
-4	1 342
0	1 149
4	984
8	842
10	781
15	642
20	528
25	436

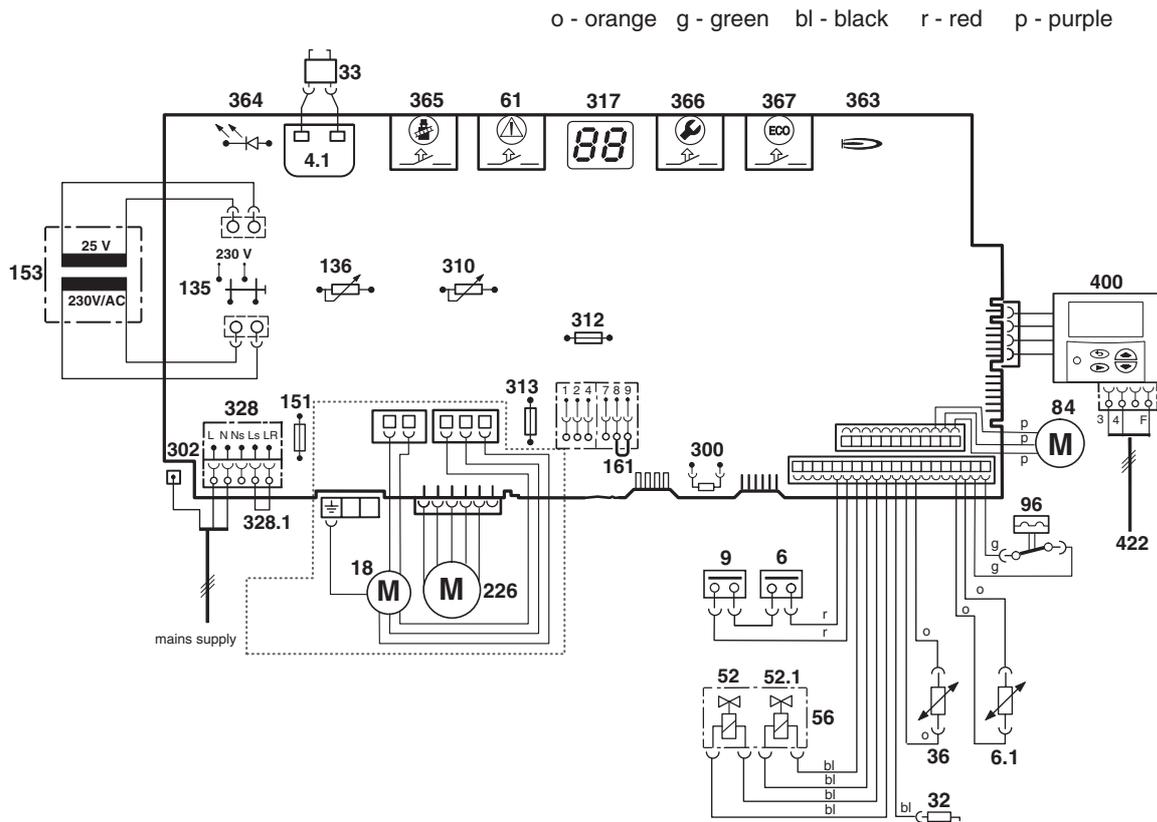
Table 6

6.1.3 CH flow NTC sensor, DHW cylinder NTC sensor 1 and hot water NTC sensor

Temperature (°C) Measurement tolerance ±10%	Resistance (Ω)
20	14 772
25	11 981
30	9 786
35	8 047
40	6 653
45	5 523
50	4 608
55	3 856
60	3 243
65	2 744
70	2 332
75	1 990
80	1 704
85	1 464
90	1 262
95	1 093
100	950

Table 7

6.2 Electrical wiring diagram



6 720 610 602 - 02.10

Fig. 16

4.1	Ignition transformer	365	"Chimney sweep" button
6	Temperature limiter, heat exchanger	366	Service button
6.1	Hot water NTC sensor (combi only)	367	ECO button
9	Flue gas temperature limiter	400	Text display
18	Pump	422	Connecting TR2
32	Flame sensing electrode		
33	Ignition electrode		
36	Temperature sensor in CH flow		
52	Solenoid valve 1		
52.1	Solenoid valve 2		
56	Gas valve CE 427		
61	Reset button		
84	Motor, 3-way valve		
96	Microswitch, hydraulic switch (combi only)		
135	Master switch		
136	Temperature control for CH flow		
151	Fuse, slow 2.5 A, AC 230 V		
153	Transformer		
161	Link		
226	Fan		
300	Code plug		
302	Earth connection		
310	Temperature control for hot water		
312	Fuse, slow T 1,6 A		
313	Fuse, slow T 0,5 A		
317	Digital display		
328	Terminal block for AC 230 V Mains supply		
328.1	Link		
363	Indicator lamp for burner		
364	Indicator lamp for power supply		

6.3 Approved corrosion inhibitors and anti-freeze fluids for central heating water

Corrosion inhibitor

The following corrosion inhibitors are permitted:

Manufacturer	Product	Concentration
Fernox	Copal	1 %
Schilling Chemie	Varidos AP	1 - 2 %

Table 8

Anti-freeze fluid

The following anti-freeze fluids are permitted:

Manufacturer	Product	Concentration
BASF	Glythermin NF	20 - 62 %
Schilling Chemie	Varidos FSK	22 - 55 %

Table 9

6.4 List of Code plugs used with this appliance

Component	Order no.	Remarks
Code plug included in		
Conversion kit G20 -> G31	8 714 411 062 0	ZWBR 7-30
Conversion kit G31 -> G20	8 714 411 059 0	
Conversion kit G20 -> G31	8 714 411 114 0	ZWBR 11-35
Conversion kit G31 -> G20	8 714 411 113 0	
Conversion kit G20 -> G31	8 714 411 123 0	ZWBR 11-40
Conversion kit G31 -> G20	8 714 411 122 0	
Conversion kit G20 -> G31	8 714 411 062 0	ZSBR 7-30
Conversion kit G31 -> G20	8 714 411 059 0	

Table 10

Component	Order no.	Remarks
Conversion kit G20 -> G31	8 714 411 064 0	ZWBR 7-32
Conversion kit G31 -> G20	8 714 411 063 0	
Conversion kit G20 -> G31	8 714 411 106 0	ZWBR 11-37
Conversion kit G31 -> G20	8 714 411 105 0	
Conversion kit G20 -> G31	8 714 411 123 0	ZWBR 11-42
Conversion kit G31 -> G20	8 714 411 122 0	

Table 10

6.5 Summary of BDH Information Sheet on Identifying Corrosion by CFCs

The presence of halogenated hydrocarbons in the combustion air causes surface corrosion on affected metals. Particularly susceptible is the combustion chamber and the heat exchanger surfaces (including stainless steel) as well as the metal components in the flue socket, flue pipe connections and in the chimney.

The halogen compounds present in the combustion air produce highly corrosive hydrochloric acid in the flame and in some cases - depending on the precise composition of the combustion air - hydrofluoric acid, both of which accumulate in the boiler and remain active over long periods.

In order to limit the damage, the source of the air contamination must be located and sealed off. If this is not possible, the combustion air must be drawn from an alternative clean source.

Halogens can occur in the following locations:

Commercial and industrial sources	
Dry cleaners	Trichloroethylene, tetrachloroethylene, fluorinated hydrocarbons
Degreasing baths	Perchloroethylene, trichloroethylene, methyl chloroform
Printers	Trichloroethylene
Hairdressers	Aerosol spray propellants, hydrocarbons containing fluorine and chlorine (freons)
Sources in the home	
Cleaning and degreasing agents	Perchloroethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid
Home workshops	
Solvents and thinners	Various chlorinated hydrocarbons
Spray cans	Chlorofluorohydrocarbons (freons)

Table 11



Worcester Heat Systems Ltd.
Cotswold Way
Warndon
Worcester WR4 9SW
Great Britain

www.thermotechnik.com