

Engineer's Service Booklet

Wall hung RSF gas fired condensing boilers

Greenstar CDi Classic



This service booklet covers the following boiler ranges:

CDi Classic Combination N.G.
CDi Classic Combination L.P.G.
CDi Classic System N.G.
CDi Classic System L.P.G.
CDi Regular N.G.
CDi Regular L.P.G.



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1 Explanation of symbols and safety precautions

1.1 Explanation of symbols

Warning symbols

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

 **DANGER:**
DANGER indicates a situation that will result in severe injury or death.

 **WARNING:**
WARNING indicates a situation that could result in severe injury or death.

 **CAUTION:**
CAUTION indicates a situation that could result in minor to medium injury.

NOTICE:
NOTICE indicates a situation that could result in damage to property or equipment.

Important information



Notes contain important information in cases where there is no risk of personal injury or material losses and are identified by the information symbol.

Additional symbols

Symbol	Meaning
▶	a step in an action sequence
→	a reference to a related part in the document
•	a list entry
–	a list entry (second level)

Table 1

1.2 General safety precautions

If you smell gas

A gas leak could potentially cause an explosion. If you smell gas, observe the following rules.

- ▶ Prevent flames or sparks:
 - Do not smoke, use a lighter or strike matches.
 - Do not operate any electrical switches or unplug any equipment.
 - Do not use the telephone or ring doorbells.
- ▶ Turn off the gas at the meter or regulator.
- ▶ Open windows and doors.
- ▶ Warn your neighbours and leave the building.
- ▶ Prevent anyone from entering the building.
- ▶ Well away from the building: call the National Gas Emergency Service on 0800 111 999.
- ▶ L.P.G. boilers: Call the supplier's number on the side of the gas tank.

Boiler operation

This appliance must only be operated by a responsible adult who has been instructed in, understands and is aware of the appliance's operating conditions and effects.

Health and safety

The appliance contains no substances that contravene the COSHH Regulations (Control of Substances Hazardous to Health regulations 1988).

Combustible and corrosive materials

Do not store or use any combustible materials (paper, thinners, paint etc.) inside or close to the appliance.

Chemically aggressive substances, such as halogenated hydrocarbons. The presence of halogenated hydrocarbons in the combustion air causes surface corrosion on affected metals.

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.

Fitting and modification

Fitting the appliance and any controls to the appliance must only be carried out by a competent engineer in accordance with the current Gas Safety (installation and use) Regulations.

Servicing

Advise the user to have the system serviced annually by a competent, qualified engineer, such as British Gas or Gas Safe registered personnel, using approved spares.

This will help to maintain the economy, safety and reliability of the appliance.

2 Operation

2.1 Initialisation

When it is switched on, the appliance performs a self-test which takes about 10 seconds.

While the test is in progress, the display shows for the first two seconds **88**. Additionally buttons  and  light up orange and the reset button lights up red. Afterwards the display shows the CH flow temperature.

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

2.2 Display messages

The 7-Segment-Display has following display messages (table 2 and 3):

Displayed value	Description	Range
digit, dot followed by letter	Service function	
letter followed by digit or letter	Error code	
three digits	decimal value e.g. flow temperature	00..199
one digit (long displayed) followed by two digits twice (short displayed)	decimal value (triple-digit); first digit will be displayed alternating with two last digits (e.g.: 2...69..69 for 269)	0..999
two dashes followed by two digits twice	code plug number; the value is displayed in 3 steps: 1. two dashes 2. two first digits 3. two last digits (e.g.: -- 10 04)	1000..9999
two letters followed by two digits twice	version number; the value is displayed in 3 steps: 1. two first letters 2. two first digits 3. two last digits (e.g.: CF 10 20)	

Table 2 Display messages

Special messages	Description
	Key acknowledgement after pressing one button (except reset button)
	Key acknowledgement after pressing two buttons simultaneously
	Key acknowledgement after pressing button longer than 3 seconds (storage function)
	The display shows alternatively the CH flow temperature and . The appliance works continuously at the minimum power (see service function 2.F).
	The display shows alternatively the CH flow temperature and . The appliance works continuously at the maximum power (see service function 2.F).
	Appliance is in Air purge mode, see service function 2.C .
	The display shows alternatively the CH flow temperature and . The Syphon-fill programme is active. See service function 4.F
	The display shows alternatively the CH flow temperature and reminding that the next service is due. The burner service interval of 2324 hours has run out. See service function 5.A .
	The display shows alternatively the CH flow temperature and . The pump is blocked. See error E9.
	The display shows alternatively the CH flow temperature and . The gradient limitation is active. The primary temperature is rising too fast and the burner has switched off for 2 minutes. See error E9.

Table 3 Special display messages

2.3 Operating elements

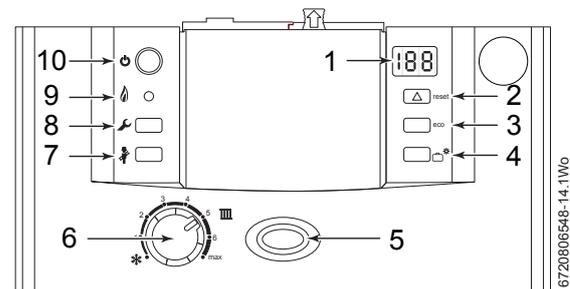


Fig. 1 CDi Classic Regular control panel

- 1 Display
- 2 Reset button (RED)
- 3 Not used
- 4 Not used
- 5 On/off and fault indicator (BLUE)
- 6 Central heating temperature control
- 7 Performance test button
- 8 Service button (ORANGE)
- 9 Burner indicator (GREEN)
- 10 On/off button

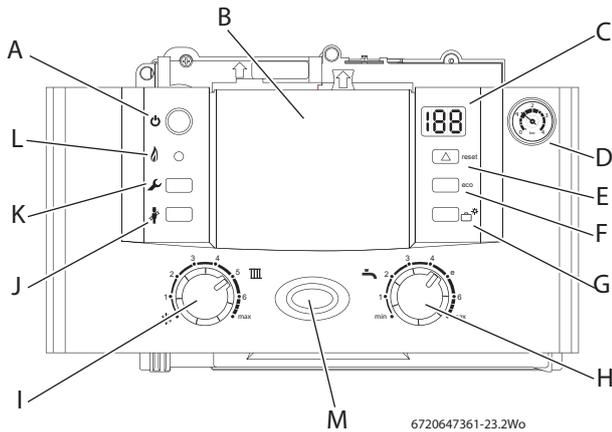


Fig. 2 CDI Classic Combination & System control panel

- A On/off button
- B Cover or optional programmer
- C Display
- D System pressure gauge
- E Reset button (RED)
- F ECO button (GREEN) (in service mode for selecting upwards)
- G DHW temperature control (Not used on Regular boilers) (Not used on System boilers unless the option integral diverter valve is fitted)
- H Holiday button (GREEN) (in service mode for selecting downwards)
- I Central heating temperature control
- J Central heating boost button (ORANGE) (in service mode for displaying and storing values, for selection of max. or min. heat output)
- K Service button (ORANGE)
- L Burner indicator (GREEN)
- M On/off and fault indicator (BLUE)



Modifications of appliance parameters only become active after saving.

2.4 First service level

2.4.1 Display the value of the service function

- ▶ Press the button for approximately 10 seconds (the display shows). When the button lights up orange, release it. In the display appears Digit. Letter e. g. 1.A.
- ▶ Press the **eco** button for going upwards or the button for going downwards to select the service function.
- ▶ Press the button and release it. After releasing the button will light up orange. The display shows the value of the service function.

2.4.2 Set and store values in the service function

- ▶ Display the value of the service function.
- ▶ Press the **eco** button for going upwards or the button for going downwards to select the value.
- ▶ Press the button for longer than 3 seconds until appears on the display. After releasing, the button goes out and the value is stored. The first service level is active.

2.4.3 Exit service function/service level without storing

- ▶ Press the button to exit the service function without storing. After releasing the button goes out.
- ▶ Press the button to exit service level. After releasing the button goes out. The display shows the flow temperature.

2.5 Second service level

2.5.1 Display the value of the service function

- ▶ Press the button for approx. 10 seconds (the display shows). When the button will light up orange, release it.
- ▶ Press **eco** button and simultaneously for approximately 3 seconds (the display shows) until in the display appears Digit. Letter e. g. 8.A.
- ▶ Press the **eco** button for going upwards or the button for going downwards to select the service function.
- ▶ Press the button and release it. After releasing the button will light up orange. The display shows the value of the service function.

2.5.2 Set and store values in the service function

- ▶ Display the value of the service function.
- ▶ Press the **eco** button for going upwards or the button for going downwards to select the value.
- ▶ Press the button for longer than 3 seconds until appears on the display. After releasing the button goes out and the value is stored. The second service level is active.

2.5.3 Exit service function/service level without storing

- ▶ Press the button to exit the service function without storing. After releasing the button goes out. First service level is active.
- ▶ Press **eco** button and simultaneously for approximately 3 seconds (the display shows) in order to go to the first service level. Afterwards the display shows the last selected service function.

-or-

- ▶ Press the button to exit all service levels. After releasing, the button goes out.

2.6 Resetting service functions to factory settings

To reset all settings on Service levels **1 and 2** to the factory settings:

- ▶ Display the value of the service function **8.E** (second service level, value = 0) and store it. The appliance re-starts with factory settings (see also section 2.1).

2.7 Select max. or min. heat output

- ▶ Press the button for approximately 10 seconds (the display shows). When the button will light up orange, release it.
- ▶ Turn the CH control knob on the right and adjust maximum heat output (the display shows alternatively the CH flow temperature and).

-or-

- ▶ Turn the CH control knob on the left and adjust minimum heat output (the display shows alternatively the CH flow temperature and).
- ▶ Press the button to exit the function. After releasing the button goes out.



Maximum or minimum heat output is only active for 15 minutes. After this time the appliance changes to normal mode.

To ensure that the maximum 15 minutes is achieved, remove the diverter valve motor and run a hot water tap.

2.8 Reset the appliance

- ▶ Press the **reset** button for 3 seconds and release it. After releasing the button the appliance re-starts without parameter reset. (For a parameter reset see section 2.6).

3 Boiler service functions

3.1 First service level

► To enter the first service level press the button  for approx. 10 seconds.

► To display, set or store values see section 2.4.2.

	Description	Display	Range adjustable from - to/ Description	Reset value (after parameter reset)
1.A	Max. output (heating)	* -100	min adjustable output - 100% (not on 37 and 42 Combis)	depends on appliance type
1.b	Max. output (hotwater - combi only)	* -100	min adjustable output - 100%	100
1.C	Pump map (heating) (wall hung combi & system only) (see section 3.3.1, 1.C/1.d)	00-05	0 Pump step adjustable 1 Constant pressure high 2 Constant pressure middle 3 Constant pressure low 4 Proportional pressure high 5 Proportional pressure low	04
1.d	Map pump step (heat.) (wall hung combi & system only)	02-07	2-7	07
1.E	Pump switch mode	01-04	1 - 4	02
2.b	Max. flow temperature	35-88	35 - 88 °C	88 °C
2.C	Air purge mode (burner keeps off while air purge mode is on)	00-02	0 off 1 on, automatic deactivation (on for 8 minutes, then off) 2 permanent on	01
2.F	Operating mode	00-02	0 Normal 1 Minimal (for 15 min) 2 Maximal (for 15 min)	00
3.b	Anti-cycle time	00-15	0 - 15 min	03 min
3.C	Anti-cycle flow temperature differential	00-30	0-30 K (Note: an increment of 1K corresponds to an increment of 1 °C)	10 K
3.E	Pre heat cycle time (hot water) (combi only)	20-60	20 - 60 min	20 min
3.F	Burner off after DHW demand (hot water) (combi only)	00-30	0 - 30 min (0 = 10sec)	01 min
4.F	Syphon-fill programme	00-01	0 off, 1 on, boiler min. output	01
5.A	Reset service reminder	00	0 must be stored in order to reset service reminder	00
5.b	Fan over-run time	01-18	1-18 (= 10 sec - 180 sec)	03 (30 sec)
6.A	Last fault	00 - FF	last fault code can be displayed	00
6.d	Actual flow rate turbine (combi only)	00-99	0-99 l/min	read only
6.E	Programmer input	00-11	00, 01, 10, 11 (left digit: heating, right digit: hotwater)	read only
7.A	Fault indicator LED on/off	00-01	0 off 1 on Flashes in case of error even when its setting is off (0).	01

Table 4 CDi Classic Service - first level

3.2 Second service level

► To enter the second service level enter the first service level and then press the **eco button** and  simultaneously for 3 seconds.

► To display or set and store values see section 2.5.2.

	Description	Display	Range adjustable from - to/ Description	Reset Value (after parameter reset)
8.A	Software version	CF ***	-	read only
8.b	Code plug number	-- **	1000-4000; corresponds to digits 7 to 10 of order number for example: 8 714 411 062 0	read only
8.C	GFA status (not applicable)	-	-	read only
8.d	GFA error (not applicable)	-	-	read only
8.E	Reset all parameters	00	0 (must be stored in order to set all parameters to factory settings)	00
8.F	Permanent ignition	00-01	0 = off 1 = on (Do not run for more than 2 minutes!)	00
9.A	Operation mode permanent	00-02	0 normal 1 min 2 max	00
9.b	Actual fan speed	*..** (Hz)	-	read only
9.C	Actual heat output	** (%)	0-100	read only
9.d	Start fan speed	45-55	45-55 Hz	50 Hz
9.E	Turbine signal delay (combi only)	02-08	2-8 [quarter seconds] (corresponds to 0.5-2 sec)	04 (corresponds to 1 sec)
9.F	Pump over-run time (CH mode)	00-10	0-10 min	03

Table 5 CDi Classic Service - second level

3.3 Explanation of service functions

3.3.1 First service level

1.A 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.

The factory setting is maximum rated output – it depends on appliance type.

1.b Max. output (hotwater - combi only)

The hot water output can be set to any level between minimum rated hot water output and maximum rated hot water output to limit it to the specific hot water requirements.

The factory setting is maximum rated output – display shows **100**.

1.C Pump map (heating - combi & system only)

The appliance is supplied with this function set to **4** (Proportional pressure high). 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.



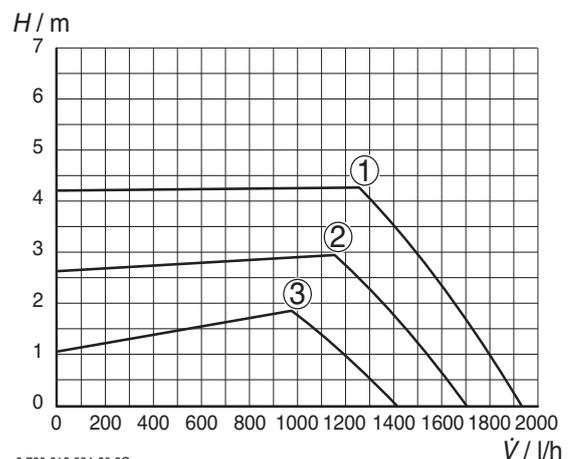
In order to save as much energy as possible and to minimise the possibility of water circulation noise, a low characteristic should be chosen.

The pump map can be selected within:

- **0** (Pump step adjustable), see service function **1.d** (Map pump step (heating))
- **1** (Constant pressure high)
- **2** (Constant pressure middle)
- **3** (Constant pressure low)
- **4** (Proportional pressure high)
- **5** (Proportional pressure low)

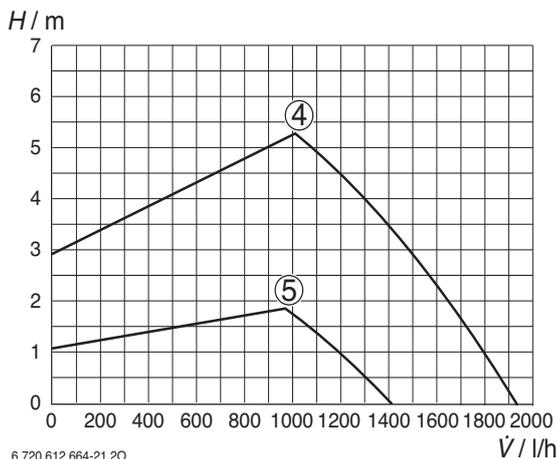
The factory setting is:

1.C Pump map (heating) **4** (Proportional pressure high)



6 720 612 664-20.20

Fig. 3 Constant pressure



6 720 612 664-21.20

Fig. 4 Proportional pressure

[1-5] Curves for switch positions 1-5
 [H] Residual head
 [\dot{V}] Amount of circulating water

If this parameter is set to **0** then the pump speed set under function **1.d** (Map pump step (heating)) is active.

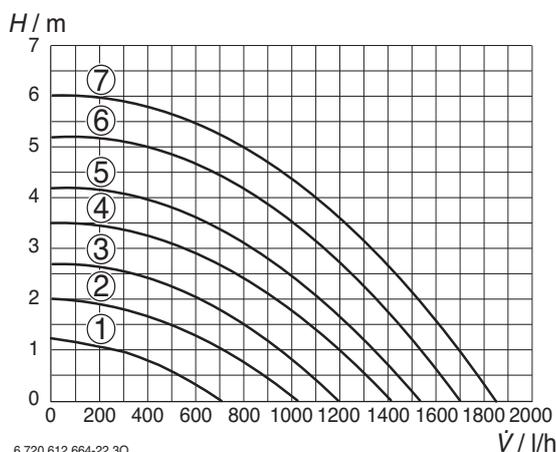
1.d Map pump step (heating - combi & system only)

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

However, the setting is only active if function **1.C** (Pump map (heating)), is set to **0**.

The factory setting is:

1.d Map pump step (heating) **7**



6 720 612 664-22.30

Fig. 5 Pump characteristics

[2-7] Curves for switch positions 2-7
 [H] Residual head
 [\dot{V}] Amount of circulating water

1.E Pump switch mode

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 over-run time of between 15 s and 3 min.

- **Control Mode 3**
 Not applicable
- **Control Mode 4**
 Intelligent switch-off at installations with weather dependent control.
 The pump is only switched on in case of heat demand.

2.b 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.b** (Max. flow temperature) is not exceeded.

2.C 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 2-digit display shows $\square\square$ in alternation with the CH flow temperature.

The automatic vent will open during venting and then close once the venting sequence is complete.



The venting function can be activated manually after servicing.

- If the venting function is set to "On" (with automatic deactivation), the function is set to "Off" once the sequence has been completed

2.F Operating mode

There are 3 operating modes to choose from.

- **Normal mode:** the appliance operates according to the commands received from the programmer. The display shows **0**.
- **Minimum mode:** the appliance runs constantly at minimum output. The display shows **1**. The 2-digit display alternates between the CH flow temperature and $\square\square$. After 15 min the minimal mode changes to normal mode.
- **Maximum mode:** the appliance runs constantly at maximum output. The display shows **2**. The 2-digit display alternates between the CH flow temperature and $\square\square$. After 15 min the maximal mode changes to normal mode.

3.b Anti-cycle time

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.

3.C Anti-cycle flow temperature differential

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 0 to 30 K (is factory set to 10 K). The minimum CH flow temperature is 35 °C.



Note: An increment of 1K corresponds to an increment of 1 °C.

- ▶ The switching difference setting should be entered on the commissioning record supplied with the appliance.

3.E Cycle time (hot water - combi only)

The appliance is supplied with the pre-heat cycle time set to 20 minutes. After pre-heating or DHW demand, this function will stipulate the period of time before the next permissible pre-heat. This will prevent excessive pre-heat cycling.

3.F Burner off after DHW demand (hot water - combi only)

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

The "hot water duration" time specifies how long, after hot water has been drawn, that the heating mode remains disabled.

4.F Syphon-fill programme

The syphon filling function ensures that the syphon trap is filled when the appliance is first installed or shut down for a long period. Flue gas is prevented from escaping into the room that the appliance is installed.

The syphon filling function is activated when:

- the appliance is switched on at the main 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 syphon filling programme remains active until the appliance has completed 15 minutes of operation at minimum output.

The 2-digit display alternates between  and the CH flow temperature.



CAUTION:

If the syphon is not filled, flue gas can escape!

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

5.A Reset service reminder

The burner service interval of 2324 hours has run out. After the service inspection store 0 for resetting the service interval.

5.b Fan over-run time

Set the time of fan over-run after a boiler demand.

6.A Last fault

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

6.d Actual flow rate turbine (combi only)

The actual flow rate of the turbine is displayed.

6.E Programmer input

Shows the status of channel 1 of the timer DT10/DT20.

Left digit is "Heat demand", heating mode will be activated according to the programmer commands.

Shows the status of channel 2 of the timer DT20.

Right digit is "DHW demand", hot water mode will be activated according to the programmer commands.

7.A Fault indicator LED on/off

The fault indicator LED flashes in case of error even when its setting is off (0).

3.3.2 Second service level

8.A Software version

The version number of the software is displayed.

8.b Code plug

The 4-digit part number of the code plug (digits no. 7 up to 10 of order no.) 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.

8.C GFA status

(not applicable)

8.d GFA error

(not applicable)

8.E Reset all parameters

Set all parameters to factory setting. See also section 2.6.

8.F 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!

9.A Operation mode permanent

Set a fixed operation mode even when boiler has been switched off.

9.b Actual fan speed

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

9.C Actual heat output

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

9.d Start fan speed

The actual start fan speed between 45 and 55 Hz is displayed in Hertz (Hz).

9.E Turbine signal delay (combi only)

Set a delay time relates to the beginning of DHW demand to avoid an undesired demand by water surge hammer.

9.F Pump over-run time (CH mode)

Set the time of pump over-run after the end of a heating demand.

4 Rectifying faults

4.1 Indication of faults

Faults are indicated simultaneously by a letter code in the display and by flashing of the fault indicator LED. This helps to identify and eliminate the cause of the fault quickly and reliably.

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 (button **reset** and fault indicator LED are flashing) until the cause of the fault has been eliminated and the appliance unlocked.



Unlocking the appliance:

- ▶ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. (See also section 2.1).

4.2 Summary

4.2.1 Appliance faults

Appliance faults	Category	Page
A1	1	11
A5	3	12
A6	2	12
A7	3	13
A8	2	14
b1	2	15
C6	2	15
CC	2	16
E2	2	16
E9	4	18
EA	4	21
F0	2/4	21
F7	4	22
FA	4	23
Fd	4	24
SE	3	24

Table 6

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. go to 5.!
- “go to 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 (**reset** button and the fault indicator LED are flashing), press the **reset** 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 reset action 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

4.2.2 Faults that are not displayed

Appliance faults	Page
Excessive burner noise, rumbling noises	25
Flow noises	25
Heating up of last radiators in system too slow	25
Flue gas levels incorrect, CO level too high	26
Ignition too harsh, ignition poor	28
Condensation in the flue pipe	28
Inadequate hot water outlet temperature (combi boiler)	28

Table 7 Undisplayed faults

Programmer faults	Page
Set room temperature not reached	29
Set room temperature exceeded by a large amount (230V on/off room stat)	29
Excessive fluctuations in room temperature	29

Table 8 Programmer faults

EA and RESET button and fault indicator LED are flashing.
During operation: flame not detected.

Step	Check		Action
1.	Is a burner flame visible?	yes:	go to step 5
		no:	go to step 2
2.	Is the gas cock turned on?	yes:	go to step 3
		no:	<ul style="list-style-type: none"> ▶ Open the gas valve. ▶ Press the reset button for 3 seconds and ... EA? go to step 3
3.	Is there air in the supply pipe?	yes:	...
		no:	...
4.
5.	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. Is the earth connection correct?	yes:	▶ ...
		no:	▶ ...

0 010 003 891

Fig. 6 Example of fault code table

4.4 Error codes on the display

A1 and fault indicator LED are flashing			
Controlled characteristic pump has run dry			
Step	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 appliance A1? go to step 2
		no:	go to step 2
2.	Pump seized or sticking?	yes:	Free/release pump
		no:	go to step 3
3.	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 Installation Instructions). ▶ Fill system, bleed and repressurise (see Installation Instructions). ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance.
		no:	go to step 4
4.	Activate venting sequence	yes.	<ul style="list-style-type: none"> ▶ Select in the first service level, service function 2.C (Air Purge mode - see page 8). ▶ Select the value 1 and store. ▶ Exit the service function. ▶ The boiler vents for eight minutes. ▶ Vent radiators manually.

Table 9 A1 Error codes

A5 and fault indicator LED a re flashing. Appliance still available for heating demands.			
Tank (Heat Bank) NTC sensor defective.			
Step	Check		Action
1.	Is the tank NTC sensor connection corroded, damaged or dirty?	yes:	Change relevant parts A5? go to step 2
		no:	go to step 2
2.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the appliance electrical connection. ▶ Unplug the 20 pin connector from the PCB. ▶ Check the resistance across connections 5 and 6 on the cable side. Does the value match the one in table 39 ?	yes:	<ul style="list-style-type: none"> ▶ Reconnect the appliance electrical connections. ▶ Turn ON the appliance ▶ Make a note of the altered service function settings. ▶ Power OFF the appliance. ▶ Disconnect the appliance electrical connections. ▶ Change the PCB control board. ▶ Reconnect the appliance. ▶ Turn the appliance ON. ▶ Restore the service setting noted previously.
		no:	go to step 3
3.	<ul style="list-style-type: none"> ▶ Unplug the NTC sensor from the cable. ▶ Check the resistance of the NTC sensor. Does the value match the one in table 39 ?	yes:	<ul style="list-style-type: none"> ▶ Change the 20 pin connector lead assembly. ▶ Reconnect the appliance. ▶ Turn the appliance ON.
		no:	<ul style="list-style-type: none"> ▶ Change the NTC sensor. ▶ Reconnect the appliance. ▶ Turn the appliance ON.

Table 10 A5 Error codes

A6 and fault indicator LED are flashing. Appliance NOT available for demands.			
External under floor heating thermostat defective.			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the appliance electrical connection. Check if the external under floor heating thermostat is connected on ST8/8-9?	yes:	go to step 2
		no:	<ul style="list-style-type: none"> ▶ Ensure that the link is securely connected to ST8/8-9 ▶ Reconnect the appliance electrical connection. ▶ Power ON the appliance. A6? go to step 4
2.	<ul style="list-style-type: none"> ▶ Disconnect lead to thermostat. Check the thermostat for continuity?	yes:	<ul style="list-style-type: none"> ▶ Reconnect lead to thermostat. go to step 3
		no:	<ul style="list-style-type: none"> ▶ Change thermostat. ▶ Reconnect the lead to thermostat. ▶ Reconnect the appliance electrical connection. ▶ Turn the appliance ON. A6? go to step 4
3	<ul style="list-style-type: none"> ▶ Unplug the harness connector that connects the thermostat to the control board. Check the harness for continuity?	yes	A6? go to step 4
		no	<ul style="list-style-type: none"> ▶ Change or repair wiring to the thermostat. ▶ Reconnect the appliance electrical connection. ▶ Power ON the appliance. A6? go to step 4
4	The control board is damaged.		<ul style="list-style-type: none"> ▶ Reconnect the appliance electrical connection. ▶ Power ON the appliance. ▶ Make a note of the altered service function settings. ▶ Power OFF the appliance. ▶ Disconnect the appliance electrical connections. ▶ Change the control board. ▶ Reconnect the appliance electrical connection. ▶ Turn the appliance ON. ▶ Restore the service settings previously noted.

Table 11 A6 Error codes

A7 and fault indicator LED are flashing. (Boiler still produces hot water but at a lesser degree of accuracy over the temperature.) Water NTC sensor defective.			
Step	Check		Action
1.	▶ Check if the water NTC connector corroded, damaged or dirty.	yes:	▶ Change relative parts. A7? go to step 2
		no:	go to step 2
2.	▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Un-plug 20-pin connector from PCB. ▶ Check resistance from connections 3 to 4 on the cable side. Does the value match the ones described in table 39, page 36?	yes:	▶ Connect the boiler electrical connection. ▶ Switch ON the appliance. ▶ Make a note of the altered service function settings (see table 4 on page 6) in order to keep the altered values. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted.
		no:	go to step 3
3.	▶ Un-plug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 39, page 36?	yes:	▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Switch ON the appliance.
		no:	▶ Change NTC sensor. ▶ Reconnect the boiler electrical connection. ▶ Switch ON the appliance.

Table 12 A7 Error codes

A8 and fault indicator LED are flashing.			
BUS communication to the programmer interrupted (set value not received)			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Switch off the appliance. ▶ Disconnect the appliance power. ▶ Remove the upper section of the programmer mount and slide the programmer out of the wall mount. ▶ Check the wiring between the programmer and the appliance. <p>Are terminals B being used, the centre terminal must not be used for BUS connections.</p> <p>Check that terminals B are connected on the appliance and programmer.</p> <ul style="list-style-type: none"> ▶ Is there continuity 	yes:	A8? go to step 2
		no:	<ul style="list-style-type: none"> ▶ Wire up or correct BUS cable. ▶ Reconnect appliance power. ▶ Switch on appliance. <p>A8? go to step 2</p>
2.	<p>Where multiple BUS modules are installed:</p> <ul style="list-style-type: none"> ▶ Check the wiring between BUS modules and the branch box. ▶ Ensure that the B terminals are employed. ▶ Switch off the appliance. ▶ Disconnect the appliance power. ▶ Is there continuity 	yes:	A8? go to step 3
		no:	<ul style="list-style-type: none"> ▶ Cable between BUS module and branch box is defective. ▶ Repair or replace cable. ▶ Reconnect appliance power. ▶ Switch on appliance. <p>A8? go to step 3</p>
3.	<p>Where multiple BUS modules are installed:</p> <ul style="list-style-type: none"> ▶ Check the wiring between branch box and the programmer. ▶ Ensure that the B terminals are employed. ▶ Switch off the appliance. ▶ Disconnect the appliance power. ▶ Is there continuity 	yes:	A8? go to step 4
		no:	<ul style="list-style-type: none"> ▶ Cable between the branch box and programme is defective. ▶ Repair or replace cable. ▶ Reconnect appliance power. ▶ Switch on appliance. <p>A8? go to step 4</p>
4	Has the programmer been replaced?	yes:	A8? go to step 5
		no:	<ul style="list-style-type: none"> ▶ Switch off appliance ▶ Disconnect electrical power ▶ Replace programmer ▶ Reconnect appliance power ▶ Switch on appliance <p>A8? go to step 5</p>
5	Has the BUS module been replaced	yes:	A8? go to step 6
		no:	<ul style="list-style-type: none"> ▶ Switch off appliance ▶ Disconnect electrical power ▶ Replace BUS module ▶ Reconnect appliance power ▶ Switch on appliance <p>A8? go to step 5</p>
6	The PCB control board is faulty		<ul style="list-style-type: none"> ▶ Reconnect electrical power ▶ Switch on appliance ▶ Make a note of the service function settings ▶ Switch off appliance ▶ Disconnect electrical power ▶ Change PCB control board ▶ Reconnect electrical power ▶ Switch on appliance ▶ Restore service settings noted previously

Table 13 A8 Error codes

b1 and fault indicator LED are flashing			
Code plug not detected.			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Select in the second service level the service function 8.b (Code plug). ▶ Compare number displayed with that shown in Appendix (only digits no. 7 up to 10 of order no.). No number or incorrect number displayed. ▶ Exit the service function. 	yes:	go to step 2
		no:	go to step 3
2.	Code plug loose, incorrect or defective.		<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Fit code plug (correctly), making sure code number is correct (see Appendix). ▶ Switch ON the appliance. b1? go to step 3
3.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 4 on page 6) in order to keep the altered values. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 14 b1 Error codes

C6 and fault indicator LED are flashing.			
Fan speed too low			
Step	Check		Action
1.	Fan cable connector correctly connected on fan?	yes:	go to step 2
		no:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Reconnect connector. ▶ Switch ON the appliance. C6? go to step 2
2.	Check power supply to appliance, check supply with all electrical appliances on. Is the supply voltage within tolerance (230 V AC ± 10)?	yes:	go to step 3
		no:	<ul style="list-style-type: none"> ▶ Switch off some electrical appliances. go to step 3
3.	Is fan cable defective? <ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Measure the fan lead for continuity. Is there continuity for each one of the cores? 	yes:	go to step 4
		no:	<ul style="list-style-type: none"> ▶ Replace fan cable. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. C6? go to step 4
4.	Fan defective.	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Un-plug the connection wire. ▶ Replace fan. ▶ Push on the connection wire. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. C6? go to step 5
5.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service function settings (see table 4 on page 6) in order to keep the altered values. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 15 C6 Error codes

CC and fault indicator LED are flashing.			
Outside temperature sensor fault (open or short circuit)			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler mains connection. Are the outside temperature sensors connected to A and F on the printed circuit board.	yes:	go to step 2
		no:	<ul style="list-style-type: none"> ▶ Connect the outside temperature sensors correctly to A and F on the PCB. ▶ Reconnect the boiler electrical mains ▶ Power ON the appliance CC? go to step 2
2.	<ul style="list-style-type: none"> ▶ Power off the appliance. At the outside temperature sensor cable connection, measure the resistance of the outside temperature sensor. Does the value match that in table 39?	yes:	go to 3
		no:	<ul style="list-style-type: none"> ▶ Replace the outside temperature sensors. ▶ Power ON the appliance CC? go to step 3
3.	<ul style="list-style-type: none"> ▶ Power OFF the appliance. ▶ Disconnect the boiler mains connection. ▶ Disconnect the outside temperature sensors at connectors A and F on the PCB. Check for continuity, is there continuity.	yes:	CC? go to step 4
		no:	<ul style="list-style-type: none"> ▶ Replace the cable. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance. CC? go to step 4
4.	The PCB control board is damaged.		<ul style="list-style-type: none"> ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance. ▶ Make a note of the altered service function settings. ▶ Power OFF the appliance. ▶ Disconnect the boiler electrical connection. ▶ Change the control board PCB. ▶ Reconnect the boiler electrical connection. ▶ Turn ON the appliance. ▶ Restore service settings previously noted.

Table 16 CC Error codes

E2 and fault indicator LED are flashing.			
Flow temperature NTC sensor defective.			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Check if the flow temperature NTC sensor connector is corroded, damaged or dirty. 	yes:	<ul style="list-style-type: none"> ▶ Change relative parts. E2? go to step 2
		no:	go to step 2
2.	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ 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 39, page 36? 	yes:	<ul style="list-style-type: none"> ▶ Reconnect the boiler electrical connection. ▶ Switch ON the appliance. ▶ Make a note of the altered service function settings (see table 4 on page 6) in order to keep the altered values. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.
		no:	go to step 3
3.	<ul style="list-style-type: none"> ▶ Un-plug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 39, page 36? ▶ Reconnect the appliance power connection. 	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change the 20-pin connector lead assembly. ▶ Reconnect the boiler electrical connection. ▶ Switch ON the appliance.
		no:	▶ Change NTC sensor.

Table 17 E2 Error codes

E9 and button reset and fault indicator LED are flashing. Safety temperature circuit has tripped.			
Step	Check		Action
1.	Type of CH system: Is the appliance installed in a fully pumped sealed system?	yes:	go to step 3
		no:	go to step 2
2.	Open vented CH system: Is there enough water in the feed and expansion tank?	yes:	go to step 4
		no:	<ul style="list-style-type: none"> ▶ Top up system. ▶ Vent appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 4
3.	Fully pumped sealed systems: Is the heating pressure between 1 and 2 bar?	yes:	go to step 4
		no:	<ul style="list-style-type: none"> ▶ Top up system. ▶ Vent appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 4
4.	Is the pump seized?	yes:	<ul style="list-style-type: none"> ▶ Free/release the pump. ▶ If pump won't start: ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Drain appliance. ▶ Change the pump (see Installation Instructions). ▶ Fill system, vent and re-pressurise (see installation instructions). ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 5
		no:	go to step 5
5.	Lead disconnected from flue safety temperature limiter and/or CH flow safety temperature limiter?	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Reconnect lead. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 4
		no:	go to step 4
6.	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Un-plug the connector from the flue safety temperature limiter. ▶ Measure the flue safety temperature limiter for continuity. Resistance small? 	yes:	<ul style="list-style-type: none"> ▶ Connect flue gas safety temperature limiter lead. go to step 5
		no:	<ul style="list-style-type: none"> ▶ Change the flue safety temperature limiter. ▶ Connect flue gas safety temperature limiter lead. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 5
7.	<ul style="list-style-type: none"> ▶ Disconnect lead to CH flow safety temperature limiter. ▶ Measure the CH flow safety temperature limiter for continuity. Resistance small? 	yes:	<ul style="list-style-type: none"> ▶ Connect CH flow safety temperature limiter. go to step 6
		no:	<ul style="list-style-type: none"> ▶ Change CH flow safety temperature limiter. ▶ Connect CH flow safety temperature limiter. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 6

E9 and button reset and fault indicator LED are flashing.			
Safety temperature circuit has tripped.			
Step	Check		Action
8.	<ul style="list-style-type: none"> ▶ Disconnect the boiler power connection. ▶ Unplug connector of harness that connects the limiters to PCB from control board. Test harness (including the two limiters) for continuity. Resistance small? 	yes:	<ul style="list-style-type: none"> ▶ Reconnect connector. go to step 7
		no:	Harness defective. <ul style="list-style-type: none"> ▶ Repair or replace the harness. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 7
9.	<ul style="list-style-type: none"> ▶ Disconnect the boiler power connection. ▶ Remove fuse SI 3 from appliance PCB control board and test for continuity. Is there continuity? 	yes:	<ul style="list-style-type: none"> ▶ Remount the fuse. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. go to step 8
		no:	<ul style="list-style-type: none"> ▶ Change the fuse. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to step 8
10.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 18 E9 Error codes

EA and RESET button and fault indicator LED are flashing.			
During operation: flame not detected.			
Step	Check		Action
1.	Is a burner flame visible?	yes:	go to step 5
		no:	go to step 2
2.	Is the gas cock turned on?	yes:	go to step 3
		no:	<ul style="list-style-type: none"> ▶ Open the gas valve. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 3
3.	Is there air in the supply pipe?	yes:	<ul style="list-style-type: none"> ▶ Vent supply pipe. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 4
		no:	go to step 4
4.	Natural gas models: measure gas supply at gas valve. Is the pressure OK according to technical data?	yes:	<ul style="list-style-type: none"> ▶ Is correct code plug fitted? If not, fit correct code plug (see Appendix). ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 5
		no:	<ul style="list-style-type: none"> ▶ Check working pressure at appliance to eliminate pipe work problems. ▶ Check pressure at the building supply pressure regulator, inform gas company if outside correct range. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 5
	LPG models: is the flow rate of the gas supply to the appliance correct?	yes:	go to step 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 supply pressure OK? (if supply pressure outside correct range, inform gas supplier) ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 5
5.	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. Is the earth connection correct?	yes:	<ul style="list-style-type: none"> ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. EA? go to step 6
		no:	<ul style="list-style-type: none"> ▶ Correct the electrical connection. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 6
6.	Is the condensate trap blocked?	yes:	<ul style="list-style-type: none"> ▶ Clean out condensation trap discharge pipe. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 7
		no:	go to step 7
7.	Is diaphragm in air/gas manifold fitted correctly (see installation instructions)? <ul style="list-style-type: none"> ▶ Open air/gas manifold. ▶ Check diaphragm for correct orientation, soiling and splitting. Is diaphragm OK? 	yes:	<ul style="list-style-type: none"> ▶ Close air/gas manifold (see installation instructions). go to step 8
		no:	<ul style="list-style-type: none"> ▶ Insert diaphragm in the fan intake tube as per installation instructions so that the flaps open upwards. ▶ Close air/gas manifold (see installation instructions). EA? go to step 8

EA and RESET button and fault indicator LED are flashing.			
During operation: flame not detected.			
Step	Check		Action
8.	Check the gas valve. <ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Un-plug the connectors from the gas valve. ▶ Measure the gas valve coils I and II electrical resistance. coil I: $R = 170 \pm 40 \Omega$ coil II: $R = 400 \pm 50 \Omega$ ▶ Remove gas valve and check inlet filter for blockage. 	yes:	<ul style="list-style-type: none"> ▶ Reconnect the connectors. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 9
		no:	<ul style="list-style-type: none"> ▶ Turn off gas valve. ▶ Disconnect the boiler power connection. ▶ Change the gas valve. ▶ Open the gas valve. ▶ Reconnect the connectors. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Check appliance for leaks. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 9
9.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air in the flue (with outer casing fitted). Is the CO₂ level above 0.2%? ▶ Perform a fan pressure test (as described in the installation manual). ▶ Open up heat exchanger - is it dirty? 	yes:	<ul style="list-style-type: none"> ▶ Check flue installation for agreement with the instruction manual. Then: <ul style="list-style-type: none"> ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 10
		no:	go to step 10
10.	Is flue gas CO ₂ level incorrect?	yes:	<ul style="list-style-type: none"> ▶ Adjust to correct level. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 11
		no:	go to step 11
11.	<ul style="list-style-type: none"> ▶ Select in the second service level the service function 8.F (Permanent ignition). ▶ Select the value 1 and store. Check the permanent ignition at the electrodes (without gas). Is it OK? 	yes:	<ul style="list-style-type: none"> ▶ Select the value 0 and store. ▶ Exit the service function. go to step 12
		no:	<ul style="list-style-type: none"> ▶ Select the value 0 and store. ▶ Exit the service function. go to step 15
12.	Ignition cable connected to ignition electrodes?	yes:	go to step 13
		no:	<ul style="list-style-type: none"> ▶ Reconnect lead. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to 13
13.	Ignition cable connector engaged in control panel?	yes:	go to step 14
		no:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Engage ignition cable connector in control panel. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 14
14.	Is the ignition cable damaged?	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Change the ignition cable. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 15
		no:	go to step 15

EA and RESET button and fault indicator LED are flashing.			
During operation: flame not detected.			
Step	Check		Action
15.	Electrode assembly defective? ▶ Switch OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out or cracked?	yes:	▶ Replace electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 16
		no:	▶ Refit electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 16
16.	▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Check if the 20-pin connector lead assembly is damaged.		▶ Change the connector lead assembly. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to step 17
17.	The PCB is damaged.		▶ Make a note of the altered service settings. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 19 EA Error codes

F0 and fault indicator LED (and possibly RESET button) are flashing.			
Internal failure			
Step	Check		Action
1.	Button reset flashing?	yes:	▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. ▶ Initiate demand for heat by pressing the boost button for 10 seconds and then press again after 30 seconds to cancel. ▶ Initiate two more demands for heat as above. F0? go to 2
		no:	go to 2
2.	The PCB is damaged.		▶ Make a note of the altered service settings. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 20 F0 Error codes

F7 and RESET button and fault indicator LED are flashing.			
Although appliance switches off, flame still detected			
Step	Check		Action
1.	Electrode(s) dirty or defective? <ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Remove electrode assembly and bracket and check for wear, deposits and mechanical damage. 	yes:	<ul style="list-style-type: none"> ▶ Replace electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. F7? go to step 2
		no:	<ul style="list-style-type: none"> ▶ Refit electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. F7 go to step 2
2.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air in the flue (with outer casing fitted). Is CO₂ level above 0.2%? 	yes:	There are flue gases in the combustion air. <ul style="list-style-type: none"> ▶ Check flue and repair or replace if necessary. F7? go to step 3
		no:	go to step 3
3.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 21 F7 Error codes

FA and RESET button and fault indicator LED are flashing.			
After appliance switches off flame is detected			
Step	Check		Action
1.	Is the condensate trap blocked?	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Clean out condensate trap discharge pipe. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to step 2
		no:	go to step 2
2.	Electrode assembly defective? <ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out? 	yes:	<ul style="list-style-type: none"> ▶ Replace electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to step 3
		no:	go to step 3
3.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air in the flue (with outer casing fitted). Is CO₂ level above 0.2%? 	yes:	There are flue gases in the combustion air. <ul style="list-style-type: none"> ▶ Check flue, clean if necessary. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to step 4
		no:	go to step 4
4.	Is the gas valve damaged?	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Turn off gas valve. ▶ Change the gas valve. ▶ Open the gas valve. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Check appliance for leaks. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to step 5
		no:	go to step 5
5.	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Check if the 20-pin connector lead assembly is damaged. 		<ul style="list-style-type: none"> ▶ Change the connector lead assembly. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to step 6
6.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings. ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 22 FA Error codes

Fd and RESET button and fault indicator LED are flashing.			
Reset button pressed inadvertently			
Step	Check		Action
1.	reset button flashing?		<ul style="list-style-type: none"> ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Fd? go to step 2
2.	The PCB is damaged.		<ul style="list-style-type: none"> ▶ Make a note of the altered service settings (see table 4 on page 6). ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 23 Fd Error codes

SE flashing alternately with flow temperature.			
The burner has run for 2324 hours since the boiler has been checked last.			
Step	Check		Action
1.	When was the boiler checked last? More than or exactly 12 months ago?	yes:	<ul style="list-style-type: none"> ▶ Do the annual combustion and safety check for the boiler. go to step 3
		no:	go to step 2
2.	The burner has been running longer than expected, probably at a lower output with a higher efficiency. This can happen, since the 2324 hours is an average burner run time over 12 months.		There is no need to check the boiler yet. <ul style="list-style-type: none"> ▶ Make sure to remember when to check the boiler. go to step 3
3.	Reset the SE code.		To reset the SE code do as follows: <ul style="list-style-type: none"> ▶ Press the  button for 10 seconds until the button glows orange and release. 1.A. appears on the display. ▶ Press the eco button repeatedly until 5A. appears on the display. ▶ Briefly press the  button. It glows orange and 00. appears on the display. ▶ Press the eco button once. ▶ Press and hold the  button until  appears. Release and  disappears. ▶ Press the  button to leave service mode. Buttons return to normal state. Boiler returns to normal function showing boiler temperature.

Table 24 SE Error codes

4.5 Faults that are not displayed

4.5.1 Appliance faults

Excessive burner noise, rumbling noises			
Step	Check		Action
1.	Does the gas supply type match the specifications on the appliance type plate?	yes:	go to step 2
		no:	▶ Convert appliance to correct gas type. Rumbling noises? go to step 2
2.	▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	yes:	go to step 3
		no:	▶ De-commission appliance. Natural gas models: ▶ Notify gas utility.
3.	Problem with flue? ▶ Check CO ₂ level in combustion air in the flue (with outer casing fitted). Is CO ₂ level above 0.2%?	yes:	There is flue gas in the combustion air. ▶ Check flue and repair or replace if necessary. Rumbling noises? go to step 4
		no:	go to step 4
4.	Is appliance's internal air/flue channel leaking or blocked? ▶ Check control pressure at test point as stated in installation instructions. If fan fails the test. ▶ 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. Ensure it is fitted in correct position. Rumbling noises? go to step 5
		no:	go to step 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:	▶ Switch OFF the appliance. ▶ Turn off gas valve. ▶ Change the gas valve. ▶ Open the gas valve. ▶ Switch ON the appliance. ▶ Check appliance for leaks.

Table 25

Flow noises			
Step	Check		Action
1.	▶ Check if system is balanced correctly. Pump map/step incorrect?		Wall hung combi and system appliances: ▶ Set appropriate pump map/pump step (service function 1.C/1.d). Conventional appliances: ▶ Set appropriate pump velocity on pump.

Table 26

Heating up of last radiators in system too slow			
Step	Check		Action
1.	▶ Check if system is balanced correctly. Pump map/step incorrect?		Wall hung combi and system appliances: ▶ Set appropriate pump map/pump step (service function 1.C/1.d). Conventional appliances: ▶ Set appropriate pump velocity on pump.

Table 27

Flue gas levels incorrect, CO level too high			
Step	Check		Action
1.	Does the gas supply type match the specifications on the appliance type plate?	yes:	go to step 2
		no:	<ul style="list-style-type: none"> ▶ Convert appliance to correct gas type. Flue gas levels incorrect ? go to step 2
2.	<ul style="list-style-type: none"> ▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	yes:	go to step step 3
		no:	<ul style="list-style-type: none"> ▶ De-commission appliance. Natural gas models: ▶ Notify gas utility.
3.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air in the flue (with outer casing fitted). Is CO ₂ level above 0.2%?	yes:	There is flue gas in the combustion air. <ul style="list-style-type: none"> ▶ Check flue and repair or replace if necessary. Flue gas levels incorrect ? go to step 4
		no:	go to step 4
4.	Flue gas CO ₂ levels measured at min. and max. load do not match specified levels? <ul style="list-style-type: none"> ▶ Measure the CO₂ or O₂ level. 	yes:	<ul style="list-style-type: none"> ▶ Adjust CO₂ level as per installation instructions. Flue gas levels incorrect ? go to step 5
		no:	go to step 5
5.	Gas rate too high when CO ₂ level correctly set.	yes:	<ul style="list-style-type: none"> ▶ Reduce gas rate by means of adjusting screw on gas valve and/or gas flow restrictor. ▶ Check CO₂ adjustment. Flue gas levels incorrect ? go to step 6
		no:	go to step 6
6.			<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Turn off gas valve. ▶ Change the gas valve. ▶ Open the gas valve. ▶ Switch ON the appliance. ▶ Check appliance for leaks.

Table 28

Ignition too harsh, ignition poor			
Step	Check		Action
1.	<ul style="list-style-type: none"> ▶ Select in the second service level the service function 8.F (Permanent ignition). ▶ Select the value 1 and store. Check the permanent ignition at the electrodes (without gas). Is it OK?	yes:	<ul style="list-style-type: none"> ▶ Select the value 0 and store. ▶ Exit the service function. go to step 6
		no:	<ul style="list-style-type: none"> ▶ Select the value 0 and store. ▶ Exit the service function. go to step 2
2.	Ignition cable connected to ignition electrodes?	yes:	go to step 3
		no:	<ul style="list-style-type: none"> ▶ Connect cable to ignition electrodes. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Ignition poor? go to step 3
3.	Ignition cable connector engaged in control panel?	yes:	go to step 4
		no:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Engage ignition cable connector in control panel. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Ignition poor? go to step 4
4.	Is the ignition cable damaged?	yes:	<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Change the ignition cable. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Ignition poor? go to step 5
		no:	go to step 5
5.	Electrode assembly defective? <ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out?	yes:	<ul style="list-style-type: none"> ▶ Replace electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Ignition poor? go to step 6
		no:	<ul style="list-style-type: none"> ▶ Refit electrode assembly. ▶ Switch ON the appliance. ▶ Press the reset button for 3 seconds and release it. After releasing the appliance re-starts. Ignition poor? go to step 6
6.	Does the gas supply type match the specifications on the appliance type plate?	yes:	go to step 7
		no:	<ul style="list-style-type: none"> ▶ Convert appliance to correct gas type. Ignition poor? go to step 7
7.	<ul style="list-style-type: none"> ▶ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	yes:	go to step 8
		no:	<ul style="list-style-type: none"> ▶ De-commission appliance. In case of natural gas: <ul style="list-style-type: none"> ▶ Notify gas utility.
8.	Problem with flue? <ul style="list-style-type: none"> ▶ Check CO₂ level in combustion air in the flue (with outer casing fitted). Is CO ₂ level above 0.2%?	yes:	There is flue gas in the combustion air. <ul style="list-style-type: none"> ▶ Check flue and repair or replace if necessary. Ignition poor? go to step 9
		no:	go to step 9

Ignition too harsh, ignition poor			
Step	Check		Action
9.	Flue gas CO ₂ levels measured at min. and max. load do not match specified levels? ▶ Measure the CO ₂ or O ₂ level.	yes:	▶ Adjust CO ₂ level as per installation instructions. Ignition poor? go to step 10
		no:	go to step 10
10.	Burner incorrectly fitted or defective? ▶ Switch OFF the appliance. ▶ Turn off gas valve. ▶ Remove burner. Cover fittings loose or seal defective or incorrectly fitted or burner defective?		▶ Replace burner and seal if necessary. ▶ Ensure seal is fitted in correct position. ▶ Open the gas valve. ▶ Switch ON the appliance. ▶ Check appliance for leaks.

Table 29

Condensation in the air box			
Step	Check		Action
1.	Is diaphragm in air/gas manifold fitted correctly (see installation instructions)? ▶ Open air/gas manifold. ▶ Check diaphragm for correct orientation, soiling and splitting.		▶ Fit diaphragm as per installation instructions or replace. ▶ Close air/gas manifold (see installation instructions).

Table 30

Inadequate hot water outlet temperature (combi boiler)			
Step	Check		Action
1.	Does pump run? ▶ Ensure the pump is not in ECO mode (default after power ON and after reset). ▶ Un-plug connector from pump; is voltage between terminal 1 and terminal 3 on connector 230 V AC?	yes:	▶ Try to start pump. ▶ If not successful, change pump.
		no:	go to step 2
2.	▶ Compare flow rate from boiler with showed flow rate in service function 6.d . Are they equal?	yes:	go to step 3
		no:	▶ Change turbine.
3.	▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Un-plug connector from Heatronic; ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Is voltage between terminal 1 and terminal 3 on Heatronic 230 V AC?	yes:	▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change the lead assembly. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance.
		no:	▶ Make a note of the altered service settings (see table 4 on page 6). ▶ Switch OFF the appliance. ▶ Disconnect the boiler power connection. ▶ Change PCB control board. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. ▶ Restore service settings previously noted down.

Table 31

4.5.2 Programmer faults

Set room temperature not reached (DT10/DT20)			
Step	Check		Action
1.	Thermostatic valve(s) set too low?	yes:	▶ Turn up thermostatic valve(s). go to step 2
		no:	go to step 2
2.	Set time periods for channel 1 at the timer DT10/DT20 correct?	yes:	go to step 3
		no:	▶ Correct the time periods for channel 1.
3.	Check the channel 1 at DT10/DT20 with the service function 6.E. Is the left digit set to 1?	yes:	go to step 4
		no:	▶ Change DT10/DT20.
4.	CH flow temperature control on boiler set too low?	yes:	▶ Turn up CH flow temperature control. go to step 5
		no:	go to step 5
5.	Air in the heating system.		<ul style="list-style-type: none"> ▶ Switch OFF the appliance. ▶ Check appliance and system for water leaks and repair as necessary. ▶ Top up system. ▶ Switch ON the appliance. ▶ Select in the first service level the service function 2.C (Air purge mode). ▶ Select the value 1 and store. ▶ Exit the service function. ▶ The appliance vents itself for 8 minutes. ▶ Vent radiators manually.

Table 32

Set room temperature exceeded by large amount			
Step	Check		Action
1.	Do radiators get too hot?	yes:	▶ Decrease setting of "Heating" control. go to step 2
		no:	go to step 2
2.	Bad choice of location for programmer, e.g. outside wall, near window, in draught, etc.	yes:	▶ Select better installation location. -or- ▶ Fit external room thermostat. go to step 3
		no:	go to step 3
3.			▶ Turn down thermostatic valve(s).

Table 33

Excessive fluctuations in room temperature			
Step	Check		Action
1.	Poor choice of location for roomstat e.g. outside wall, near window, in draught, on hollow wall, etc.		▶ Select better installation location.

Table 34

5 Troubleshooting - FW 100

BUS device faults are indicated.

If the controller shows **Fault 12**, the cylinder temperature is so high that the cylinder High Limit Thermal Cut-out has tripped.

- ▶ Reset the High Limit Thermal Cut-out.

5.1 Troubleshooting using the display

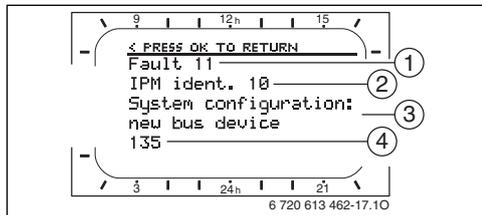


Fig. 7 Fault display

- [1] Fault number
- [2] BUS device which detected the fault and reported it to the controller
- [3] Description of fault
- [4] Code or additional information about fault

The current fault is displayed on the controller:

- ▶ Identify the BUS device affected by the current fault. The fault can only be rectified on the BUS device from which the fault originates.

Information displayed (→ Pos. 1, 3 and 4 in fig. 7)			
Text	Code	Cause	Remedy
Fault 01 BUS communication fault	200	Boiler no longer reporting.	Check BUS device, BUS connection and repair circuit break if necessary.
	201	Incorrect BUS subscriber connected.	Identify and replace incorrect BUS device.
Fault 02 Internal fault	42	Code switch on IPM in intermediate position.	Switch system off and correct coding.
	43	Coding switch position has been changed since initialisation phase.	
	100	ISM not responding.	Check BUS connection and repair circuit break if necessary.
Fault 02 Internal fault Some parameters reset to factory settings due to EEPROM problem	205	Some parameters reset to default.	Check parameter settings and readjust them as necessary. Replace faulty controller.
Fault 02 Internal fault FW 100 can no longer control the heating system!	255	FW 100 can no longer control the heating system.	Replace faulty controller.
Fault 03 Room temp sensor faulty	20	There is a circuit break on the room temperature sensor built into the FW 100.	Replace faulty controller.
	21	There is a short circuit on the room temperature sensor built into the FW 100.	
Fault 11 System configuration: new BUS device New ISM detected. Power up all ISMs simultaneously and start automatic system configuration.	131 132	New ISM detected.	Power up all ISMs simultaneously and start automatic system configuration.
Fault 12 System configuration: BUS device missing ISM1 not detected. Check connection.	170	HLC has tripped or is faulty.	Check HLC.
	171		Check solar parameter T2. Is thermal disinfection active?
		ISM1 no longer detected despite having been configured.	Check connection.
Fault 13 System configuration: BUS device changed or replaced Check system configuration for DHW or start automatic system configuration.	157	BUS device changed or replaced.	Check system configuration for domestic hot water system or start automatic system configuration.
Fault 13 System configuration: BUS device changed or replaced Check system configuration for heating circuit!			158 159
Fault 15 Outside temperature sensor not connected Outside temperature is not available.	30	Outside temperature sensor not recognised.	Check outside temperature sensor and remedy interruption, if necessary.
Fault 19 Unable to save parameter settings	202	BUS device is configured but not available at present.	Check system layout, check system configuration, modify if necessary and set parameter again.
Fault 20 System configuration: invalid	193	Invalid coding in remote control for the heating circuit.	In combination with FW 100 only coding 1 is possible in the remote control.
Fault 29 Unable to save parameter settings	202	BUS device is configured but not available at present.	Check system layout, check system configuration, modify if necessary and reset parameters on remote control.
Fault 30 Mixer temperature sensor faulty	7	Mixer temperature sensor (MF) connected to IPM faulty.	Check mixer temperature sensor (MF) and replace if necessary.
Fault 33 Temperature sensors incorrectly connected	22	A temperature sensor is connected to the IUM.	Remove the temperature sensor and insert a coding plug if necessary.
Fault 40 Temperature sensor T1 on collector group 1 faulty	101	Short circuit on the sensor lead (T ₁).	Check temperature sensor (T ₁) and replace if necessary.
	102	Break in the sensor lead (T ₁).	
Fault 41 Temperature sensor T2 at bottom of solar cylinder faulty	103	Short circuit on the sensor lead (T ₂).	Check temperature sensor (T ₂) and replace if necessary.
	104	Break in the sensor lead (T ₂).	

Information displayed (→ Pos. 1, 3 and 4 in fig. 7)			
Text	Code	Cause	Remedy
Fault 50 Solar pump jammed or air in system	121	Solar pump (SP) sticking due to physical blockage.	Unscrew and remove the slotted screw on the pump head and use a screwdriver to release the pump shaft. Do NOT strike the pump shaft with the screwdriver.
	126 140	Air in solar thermal system.	
Fault 51 Incorrect temperature sensor type connected	122	Collector temperature sensor type used as cylinder temperature sensor (T_2).	Use correct type of temperature sensor. → Technical data in ISM installation instructions.
	123	Cylinder temperature sensor type used as collector temperature sensor (T_1)	
	127	Cylinder temperature sensor type used as collector temperature sensor (T_A).	
	132	Temperature sensor type PTC 1000 used as cylinder temperature sensor (T_2).	
	133	Temperature sensor type PTC 1000 used as collector temperature sensor (T_1).	
Fault 52 Temperature sensors reversed	124	Temperature sensors (T_1 and T_2) reversed.	Check the temperature sensors and swap the connections if necessary.
Fault 53 Temperature sensor fitted in wrong location	125	Collector temperature sensor (T_1) fitted on collector array inlet.	Fit collector temperature sensor (T_1) close to collector array outlet.
	128		
Fault 54 Temperature for thermal disinfection not reached in solar cylinder	145	Maximum temperature for solar cylinder too low.	Set higher maximum temperature for the solar cylinder. → Limiting cylinder temperature.
		Delivery rate of disinfection pump (PE) too low.	Set higher pump speed on disinfection pump (PE) or, if possible, open flow restrictor more.
		Thermal disinfection cancelled manually before the required temperature was reached in the solar cylinder.	This is not a fault. Message is shown only for 5 minutes.
Fault 55 Solar system not yet commissioned	146	Solar system is not yet in operation.	Fill, bleed and prepare the solar thermal system for commissioning according to its documentation. Then start up the solar system.
Fault 56 At least one pump/valve in manual mode	147	Pump (SP) in manual mode.	Reset parameters for pump or valve to "Auto".
	154	Pump (PE) operated manually.	
Fault 59 Mass flow rate in solar system too high/low.	201	Mass flow rate in solar system for collector group 1 is too high.	Set mass flow in solar system correctly (e.g. increase/decrease pump speed) and if necessary open or close flow restrictor more on solar station. Guide figure: 20 - 40 kg/m ² of collector area per hour. Check setting for collector area, type and climate zone on Solar optimisation menu.
	202	Mass flow rate in solar system for collector group 1 is too low.	

Table 35

5.2 Troubleshooting without the display

Fault	Cause	Remedy
Required room temperature not achieved.	Thermostatic valve(s) set too low.	Set thermostatic valve(s) higher.
	Minimum outside temperature setting too low.	Adjust minimum outside temperature setting.
	Heating curve set too low.	"Heating levels" for "Comfort" - Correct heating curve.
	Flow temperature controller on the boiler set too low.	Set the flow temperature controller higher. Reduce influence of solar optimisation if necessary.
	Air in the heating system.	Bleed radiators and vent the heating system.
	Room temperature offset set incorrectly	Perform adjustment to room temperature sensor and correct Room temperature offset .
	The boilers holiday function is active.	Deactivate the boilers holiday function.
Heating up takes too long.	"Heating up speed" set too low.	Set "Heating up speed" e. g. to "Fast".
Flow temperature from boiler too low, radiators too cool.	Minimum outside temperature setting too low.	Adjust minimum outside temperature setting.
Required room temperature greatly exceeded.	Radiators become too hot.	Set thermostatic valve(s) lower. "Heating levels" for "Comfort" or ask your installer to correct heating curve.
	FW 100 installed in an unfavourable location, e.g. external wall, near windows, in a draught,	Select a better location for FW 100 and ask your heating engineer to reposition it.
	Room temperature offset set incorrectly	Perform adjustment to room temperature sensor and correct Room temperature offset .
Excessive room temperature fluctuations.	Temporary influence of external heat on the room, e.g. through solar radiation, lighting, TV, fireplace etc.	Increase "Room influence".
		Select a better location for FW 100.
Temperature rises instead of falling.	Clock time incorrectly set.	Check time setting.
Room temperature too high during "Economy" and/or "Frost" mode.	The building retains a lot of heat.	Set an earlier switching time for "Economy" and/or "Frost".
Incorrect or no control.	BUS connection or BUS subscriber faulty.	Check the BUS connection against the wiring diagram and correct it if required.
Controller can only be set to automatic mode.	Mode selector faulty.	Have FW 100 replaced by your installer.
Domestic hot water cylinder does not heat up.	Domestic hot water temperature control on boiler set too low.	Set domestic hot water temperature control higher. Reduce influence of solar optimisation if necessary.
	Flow temperature controller on the boiler set too low.	Turn the flow temperature control on the boiler clockwise as far as it will go.
	Domestic hot water programme fault.	Check/correct programme.
	Incorrect System configuration for domestic hot water system.	Correct the configuration to match the domestic hot water system connected.

Table 36

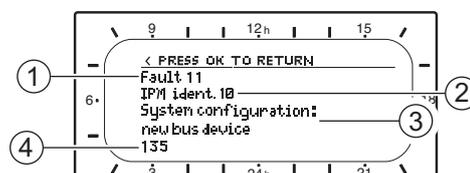
6 Troubleshooting - FR 110

BUS device faults are indicated.

If the controller shows **Fault 12**, the cylinder temperature is so high that the cylinder High Limit Thermal Cut-out has tripped.

- ▶ Reset the High Limit Thermal Cut-out.

6.1 Troubleshooting using the display



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Fig. 8 Fault display

- [1] Fault number
- [2] BUS device which detected the fault and reported it to the controller
- [3] Description of fault
- [4] Code or additional information about fault

The current fault is indicated on the controller:

- ▶ Identify the BUS device affected by the current fault. The fault can only be rectified on the BUS device from which the fault originates.

Information displayed (→ items 1, 3 and 4 in Fig. 8)			
Text	Code	Cause	Remedy
Fault 01 BUS communication fault	200	Boiler no longer reporting.	Check BUS device, BUS connection and repair circuit break if necessary.
	201	Incorrect BUS subscriber connected.	Identify and replace incorrect BUS device.
Fault 02 Internal fault	40	Incorrect module type detected.	Replace IPM.
	100	ISM not responding.	Check BUS connection and repair circuit break if necessary.
Fault 02 Internal fault Some parameters reset to factory settings due to EEPROM problem	205	Some parameters reset to default.	Check parameter settings and readjust them as necessary. Identify faulty controller and replace.
Fault 02 Internal fault FR 110 can no longer control the CH system	255	FR 110 can no longer control the heating system.	Identify faulty controller and replace.
Fault 03 Room temp sensor faulty	20	There is a circuit break on the room temperature sensor built into the FR 110.	Identify faulty controller and replace.
	21	There is a short circuit on the room temperature sensor built into the FR 110.	
Fault 11 System configuration: new BUS device New ISM detected. Power up all ISMs simultaneously and start automatic system configuration.	131	New ISM detected.	Power up all ISMs simultaneously and start automatic system configuration.
	132		
Fault 12 System configuration: BUS device missing ISM1 not detected. Check connection.	170	HLC has tripped or is faulty.	Check HLC. Check solar parameter T2 Is thermal disinfection active?
	171	ISM1 no longer detected despite having been configured.	Check connection.
Fault 13 System configuration: BUS device changed or replaced Check system configuration for DHW or start automatic system configuration.	157	BUS device changed or replaced.	Check system configuration for hot water system or start automatic system configuration.
Fault 13 System configuration: BUS device changed or replaced Check system configuration for heating circuit x and connections on IPM for heating circuit x.	159	BUS device changed or replaced.	Check system configuration for heating circuit x.
Fault 14 System configuration: incompatible BUS device DHW controlled by boiler. IPM control of DHW has no effect.	117	Incompatible BUS device:	Identify incompatible BUS device and remove from the system.
Fault 14 System configuration: incompatible BUS device IPM for cylinder must be set to identification 3 or higher.	118	Incompatible BUS device:	Set IPM for cylinder to coding 3 or higher.
	119		
Fault 19 Unable to save parameter settings	202	BUS device is configured but not available at present.	Check system layout, check system configuration, modify if necessary and set parameter again.
Fault 33 Temperature sensors incorrectly connected	22	A temperature sensor is connected to the IUM.	Remove the temperature sensor and insert a coding plug if necessary.
Fault 40 Temperature sensor T1 on collector group 1 faulty	101	Short circuit on the sensor lead (T ₁).	Check temperature sensor (T ₁) and replace if necessary.
	102	Break in the sensor lead (T ₁).	
Fault 41 Temperature sensor T2 at bottom of solar cylinder faulty	103	Short circuit on the sensor lead (T ₂).	Check temperature sensor (T ₂) and replace if necessary.
	104	Break in the sensor lead (T ₂).	
Fault 50 Solar pump jammed or air in system	121	Solar pump (SP) sticking due to physical blockage.	Unscrew and remove the slotted screw on the pump head and use a screwdriver to release the pump shaft. Do NOT strike the pump shaft with the screwdriver.
		Air in solar thermal system.	Bleed solar system and top up with heat transfer fluid if necessary.

Information displayed (→ items 1, 3 and 4 in Fig. 8)			
Text	Code	Cause	Remedy
Fault 51 Incorrect temperature sensor type connected	122	Collector temperature sensor type used as cylinder temperature sensor (T ₂).	Use correct type of temperature sensor. → Technical data in ISM installation instructions.
	123	Cylinder temperature sensor type used as collector temperature sensor (T ₁)	
	132	Temperature sensor type PTC 1000 used as cylinder temperature sensor (T ₂).	
	133	Temperature sensor type PTC 1000 used as collector temperature sensor (T ₁).	
Fault 52 Temperature sensors reversed	124	Temperature sensors (T ₁ and T ₂) reversed.	Check the temperature sensors and swap the connections if necessary.
Fault 53 Temperature sensor fitted in wrong location	125	Collector temperature sensor (T ₁) fitted on collector array inlet.	Fit collector temperature sensor (T ₁) close to collector array outlet.
Fault 54 Temperature for thermal disinfection not reached in solar cylinder	145	Maximum temperature for solar cylinder too low.	Set higher maximum temperature for solar cylinder. → Limiting cylinder temperature.
		Delivery rate of disinfection pump (PE) too low.	Set higher pump speed on disinfection pump (PE) or, if possible, open flow restrictor more.
		Thermal disinfection cancelled manually before the required temperature was reached in the solar cylinder.	This is not a fault. Message is shown only for 5 minutes.
Fault 55 Solar system not yet commissioned	146	Solar system is not yet in operation.	Fill, bleed and prepare the solar thermal system for commissioning according to its documentation. Then start up the solar system.
Fault 56 At least one pump/valve in manual mode	147	Pump (SP) in manual mode.	Reset parameters for pump or valve to "Auto".
Fault 59 Mass flow rate in solar system too high/low.	201	Mass flow rate in solar system for collector group 1 is too high.	Set mass flow in solar system correctly (e.g. increase/decrease pump speed) and if necessary open or close flow restrictor more on solar station. Guide figure: 20 - 40 kg/m ² of collector area per hour. Check setting for collector area, type and climate zone on Solar optimisation menu.
	202	Mass flow rate in solar system for collector group 1 is too low.	

Table 37

6.2 Troubleshooting without the display

Fault	Cause	Remedy
Required room temperature not achieved.	Thermostatic valve(s) set too low.	Set thermostatic valve(s) higher.
	Flow temperature controller on the boiler set too low.	Set the flow temperature controller higher. Reduce influence of solar optimisation if necessary.
	Air in the heating system.	Bleed radiators and vent the heating system.
	Holiday key on the boiler enabled.	Disable the holiday key on the boiler.
Required room temperature greatly exceeded.	Radiators become too hot.	Set thermostatic valve(s) lower. Set Heating levels for "Comfort" lower.
	FR 110 installed in an unfavourable location, e.g. external wall, near windows, in a draught,	Select a better location for FR 110 and reposition it.
Excessive room temperature fluctuations.	Temporary influence of external heat on the room, e.g. through radiant energy from the sun, lighting, TV, fireplace etc.	Select a better location for FR 110 and reposition it.
Temperature rises instead of falling.	Clock time incorrectly set.	Check time setting.
Room temperature too high during "Economy" and/or "Frost" mode.	The building retains a lot of heat.	Set an earlier switching time for "Economy" and/or "Frost".
Incorrect or no control.	BUS connection or BUS subscriber faulty.	Check the BUS connection against the wiring diagram and correct it if required.
Controller can only be set to automatic mode.	Mode selector faulty.	Have FR 110 replaced by your heating engineer.
Hot water cylinder does not heat up.	Hot water temperature control on boiler set too low.	Set hot water temperature control higher. Reduce influence of solar optimisation if necessary.
	Flow temperature controller on the boiler set too low.	Turn the flow temperature control on the boiler clockwise as far as it will go.
	Hot water programme fault.	Check/correct programme.
	Incorrect System configuration for hot water system.	Correct the configuration to match the hot water system connected.
Heating on during the night.	Heat-up optimisation starts the heating early so that the home reaches the desired room temperature by the set time.	Set a later time for the desired room temperature. Switch off heat-up optimisation.

Table 38

7 Appendix

7.1 NTC sensor values for CDi Classic appliances

7.1.1 CH flow NTC sensor 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 39 Central heating flow & hot water sensors

7.2 CDi Classic fan speeds

Appliance	Gas	Fan speed range (Hz)	
		CH	DHW
30CDi Classic Regular	NG	28 - 91	n/a
40CDi Classic Regular	NG	30 - 110	n/a
30CDi Classic Regular	LPG	35 - 84	n/a
40CDi Classic Regular	LPG	40 - 103	n/a
30CDi Classic System	NG	28 - 91	28 - 91
35CDi Classic System	NG	28 - 103	28 - 103
30CDi Classic System	LPG	36 - 84	36 - 84
35CDi Classic System	LPG	35 - 96	35 - 96
29CDi Classic	NG	28 - 91	28 - 91
34CDi Classic	NG	28 - 91	28 - 103
38CDi Classic	NG	30 - 82	30 - 105
42CDi Classic	NG	30 - 82	30 - 110
29CDi Classic	LPG	35 - 84	35 - 84
34CDi Classic	LPG	35 - 84	35 - 96
38CDi Classic	LPG	40 - 78	40 - 98
42CDi Classic	LPG	40 - 78	40 - 103

Table 40 CDi Classic fan speed range

7.3 NTC sensor characteristics

7.3.1 Primary NTC

RESISTANCE (Ω)	TEMPERATURE (°C)
>= 35975	0
22763	10
14772	20
9786	30
6652	40
4607	50
3243	60
2332	70
1703	80
1261	90
<= 949	100

Table 41 Primary NTC sensor thermistors

7.3.2 Domestic hot water NTC

RESISTANCE (Ω)	TEMPERATURE (°C)
33242	0
19947	10
12394	20
7947	30
5242	40
3548	50
2459	60
1740	70
1256	80
923	90

Table 42 Domestic hot water NTC sensor thermistors

7.3.3 Outdoor NTC

RESISTANCE (Ω)	TEMPERATURE (°C)
>= 4111	-40
3669	-35
3218	-30
2775	-25
2360	-20
1983	-15
1650	-10
1363	-5
1122	0
922	5
759	10
624	15
515	20
427	25
354	30
296	35
247	40
207	45
<= 174	50

Table 43 Outdoor NTC sensor thermistors

7.3.4 Flow turbine

FREQUENCY (Hz)	FLOW RATE (L/m)
0	0
7.7	1.5
69.2	10
104.1	15
140.5	20
176.4	25

Table 44 Flow turbine

7.4 Code plugs used with CDi Classic appliances

Order no.	Code plug
7 719 002 724	Greenstar 25CDi Combi - NG → LPG
8 719 001 063 0	Greenstar 25CDi Combi - LPG → NG
7 719 003 100	Greenstar 27CDi Combi - NG → LPG
8 719 001 104 0	Greenstar 27CDi Combi - LPG → NG
7 719 002 725	Greenstar 29CDi/30CDi Combi - NG → LPG
8 719 001 064 0	Greenstar 29CDi/30CDi Combi - LPG → NG
7 719 003 101	Greenstar 30CDi Combi (7 713 331 023) - NG → LPG
8 719 001 105 0	Greenstar 30CDi Combi (7 713 331 024) - LPG → NG
7 719 002 726	Greenstar 34CDi/35CDi Combi - NG → LPG
8 719 001 065 0	Greenstar 34CDi/35CDi Combi - LPG → NG
7 719 002 815	Greenstar 37CDi Combi - NG → LPG
8 719 001 078 0	Greenstar 37CDi Combi - LPG → NG
7 719 002 727	Greenstar 38CDi/40CDi Combi - NG → LPG
8 719 001 066 0	Greenstar 38CDi/40CDi Combi - LPG → NG
7 719 002 816	Greenstar 42CDi Combi - NG → LPG
8 719 001 079 0	Greenstar 42CDi Combi - LPG → NG
7 719 002 728	Greenstar 30CDi Conventional - NG → LPG
8 719 001 067 0	Greenstar 30CDi Conventional - LPG → NG
7 719 002 729	Greenstar 40CDi Conventional - NG → LPG
8 719 001 068 0	Greenstar 40CDi Conventional - LPG → NG
7 719 002 812	Greenstar 30CDi System - NG → LPG
8 719 001 075 0	Greenstar 30CDi System - LPG → NG
7 719 002 813	Greenstar 30CDi System (with optional diverter valve) - NG → LPG
8 719 001 076 0	Greenstar 30CDi System (with optional diverter valve) - LPG → NG
7 738 112 023	Greenstar 35CDi System (with or without optional diverter valve) - NG → LPG
8 737 706 419 0	Greenstar 35CDi System (with or without optional diverter valve) - LPG → NG
7 719 002 814	British Gas 532, 532/i - NG → LPG
8 719 001 077 0	British Gas 532, 532/i - LPG → NG
7 719 002 815	British Gas 537, 537/i - NG → LPG
8 719 001 078 0	British Gas 537, 537/i - LPG → NG
7 719 002 816	British Gas 542, 542/i - NG → LPG
8 719 001 079 0	British Gas 542, 542/i - LPG → NG
7 719 002 812	British Gas 430/i System - NG → LPG
8 719 001 075 0	British Gas 430/i System - LPG → NG
7 719 002 813	British Gas 430/i System (with optional diverter valve) - NG → LPG
8 719 001 076 0	British Gas 430/i System (with optional diverter valve) - LPG → NG

Table 45 CDi Classic code plug part numbers

7.5 Approved corrosion inhibitors and anti-freeze for central heating water

Corrosion inhibitor

- ▶ Add a suitable* inhibitor (or combined inhibitor/anti-freeze if the system is exposed to freezing conditions) to the heating system in accordance with the DWTa Code of Practice and the manufacturers instructions.

**The inhibitor or combined inhibitor/anti-freeze must not cause damage to the materials within the appliance and any other materials/components within the system.*

Manufacturer		
Fernox	01799 550811	fernox.com
Sentinal	1800 882 373	sentinel-solutions.net

Table 46

7.6 Possible sources of corrosive 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)

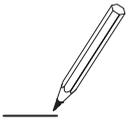
Table 47

Sources in the home	
Cleaning and degreasing agents	Perchloroethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid

Table 48

Home workshops	
Solvents and thinners	Various chlorinated hydrocarbons
Spray cans	Chlorofluorohydrocarbons (freons)

Table 49



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Cotswold Way, Warndon, Worcester WR4 9SW.
Tel. 0330 123 9559

Worcester, Bosch Group is a brand name of Bosch Thermotechnology Ltd.
worcester-bosch.co.uk

6 720 830 033

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LITERATURE: 0330 123 9119
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