Service Booklet for the Engineer for Gas Condensing Boilers



 ZSBR 7-28 ICS1
 GC-Number: 41 108 04

 ZWBR 8-30 ICC2
 GC-Number: 41 108 09

 ZBR 8-35 ICS1
 GC-Number: 41 108 05

 ZWBR 11-37 ICC1
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WORCESTER Bosch Group

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Safety precautions

Repairs

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

Instructions to the customer

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

Symbols



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

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

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

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

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

1 Layout of Appliance (ZSBR/ZWBR)



2 Operation

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



Fig. 1 Controls

- a Display
- **b** "Up" or "More" button
- c "Down", or "Less" button
- d "Back" button
- e "Nest" button
- f "Delete" button

2.1 Standard display

The text display shows the time, the CH flow temperature and the measured outside temperature in plain English.

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

2.2 Displaying service functions

- Press any button to activate the main menu.
- Press or button until the arrow cursor is pointing to Settings.
- Press the button.
- Press or button until the arrow cursor is pointing to Service.
- ▶ Press the ▶ button.
- Press button to select Display service parameters.

Service function 0.0, Last fault is displayed.

- Press or <u>button</u> button to cycle through the current settings.
- ▶ Press 🕤 button to exit the menu.

2.3 Setting service functions

- Press any button to activate the main menu.
- Taste or button until the arrow cursor is pointing to Settings.
- Press the button.
- Press or button until the arrow cursor is pointing to Service.

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

-or-

Press the button to exit the menu.

2.4 Resetting service functions to factory settings

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

- ▶ Power OFF the appliance.
- ▶ Press the button () and keep it pressed.
- Switch on the appliance, press and hold the button until the

display shows r1 followed by [].

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

- Power OFF the appliance.
- $\blacktriangleright\,$ Simultaneously press and hold buttons $\swarrow\,$ and $\circledast\,$.
- Switch on appliance, press and hold the *i* and *i* buttons until the display shows r2 followed by [].

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

 Press and hold the C button until the settings are deleted.

3 Boiler service functions

3.1 Summary

	Text display message	Display	Range adjustable from - to	Reset Value
0.0	Last fault	00 - FF	Clear only	0
0.1	Flow temp. sensor	0 - 99 °C	-	-
0.2	Hot water temp. sensor	0 - 99 °C	-	-
0.3	Stor. tank temp. sensor1	0 - 99 °C	-	-
0.4	Stor. tank temp. sensor2	0 - 99 °C	-	-
1.2	Code plug 8714411 XXX	0 - 255	-	-
1.5	Required flow temp.	0 - 99 °C	-	-
1.9	Module detection	no module detected bus module	-	-
2.0	Operating mode	-	normal Min Max	normal
2.2	Pump switch mode	-	1 - 3	2
2.3	Stor. tank charge output	-	0 - 100%	100 %
2.4	Anti-cycle mode	-	0 - 15 min	3 min
2.5	Max. flow temperature	-	35 - 88 °C	88 °C
2.6	Switch.diff.flow temperature	-	0 - 30 °C	0 °C
2.7	Autom. anti-cycle mode	-	on off	on
2.9	Actual output	0 - 100 %	-	-
3.0	Fan speed	0 - 255 U/s	-	-
3.3	Ionisations current	no low middle high	-	-
3.4	Pump mode	-	0 - 3	0 ¹⁾
3.5	Pump blocking time	-	0 - 240 s in 15-s increments	0 s
3.6	Software version	BF 11.XX	-	-

	Text display message	Display	Range adjustable from - to	Reset Value
3.9	Link 8 - 9	open closed	-	-
	Link Ls-Lr	open closed	-	-
4.0	Stor. tank. therm (7-9)	blocked heat demand	-	-
4.1	Room therm. LSM	blocked heat demand	-	-
	LSM release	blocked heat demand	-	-
4.2	Timer ch. 1 (heating)	blocked heat demand	-	-
	Timer ch. 2 (hot wat.)	blocked heat demand	-	-
4.4	Heat demand (heating).	yes no	-	-
	Heat demand (stor. tank).	yes no	-	-
4.5	Heat demand (hot water).	yes no	-	-
	Keep hot period	yes no	-	-
4.6	Internal regulator	blocked heat demand	-	-
5.0	Max. output (heating)	-	27 - 100%	100 %
5.1	Permanent ignition	-	no yes	no
5.2	GFA status / error	00h - FFh	-	-
5.5	Min. output	-	27 - 100 %	27 %
5.8	Cyclic boiler starts	-	on off	on
5.9	Fan speed (start)	-	low high	low
6.7	Pump off (hot water).	-	off on	off

	Text display message	Display	Range adjustable from - to	Reset Value
6.8	Cycle time (hot water)	-	0 - 60 min	0 min
6.9	Duration (hot water)	-	0 - 30 min	1 min
7.0	Pump map (heating)	-	 0 Pump step adjustable 1 Const. pressure high 2 Const. pressure middle 3 Const. pressure low 4 Prop.pressure high 5 Prop.pressure low 	4 Prop. pres- sure high
7.1	Map pump step (heat.).	-	2 - 7	7
7.2	Antiblock. map pump.	-	off on	on
7.3	Air purge mode	-	off on autom. deaktivat. permanent on	on autom. deaktiv at./ off
7.4	Actual map pump step	1 - 8	-	-
7.5	Map pump load index	0 255	-	-
7.6	Map pump type	099	-	-
7.7	Output reduction	-	off only in heating mode only in hot water mode in heat./hot water mode.	only in heating mode
8.5	Siphonfillprogram	-	on, boiler min.output, on, adjust. min output, off	on, boiler min. output
9.2	Hot water on demand	-	off on	on
9.3	GFA-Asic-error	00h - FFh	-	-

Table 1

1) The reset value depends on the code plug.

3.2 Explanation of service functions

0.0 Last fault

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

- To delete the stored fault:
- Delete fault (no fault displayed).
- Press the \bigcirc button.
- ► Use the 💽 or ▲ button to select **yes**.
- Press the button.

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

0.1 Flow NTC

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

0.2 Hot water NTC

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

0.3 Storage tank NTC 1

Indirectly heated heat store (SO..., SK..., ST...): The temperature measured by NTC sensor 1 in the heat store is indicated.

Stratified-charge tank (ST...S):

The temperature measured by NTC sensor 2 at the **bottom** of the heat store is indicated.

0.4 Storage tank NTC 2

Stratified-charge tank (ST...S): The temperature measured by NTC sensor 2 at the **top** of the heat store is indicated.

1.2 Code plug

The 10-digit part number of the code plug is indicated.

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

1.5 Desired flow temp.

The CH flow temperature demanded by the text display module or a programmer connected to the bus module is displayed.

1.9 Module detection

The text display module shows the modules detected by the appliance.

2.0 Operating mode

There are 3 operating modes to choose from.

• Normal mode: the appliance operates according to the commands received from the programmer.

• **Min mode**: the appliance runs constantly at minimum output.

The text display shows **MIn mode**. The 2-digit display alternates between the CH flow temperature and $_{--}$.

• Max mode: the appliance runs constantly at maximum output.

The text display shows **Max mode**. The 2-digit display alternates between the CH flow temperature and $^{-}$.

2.3 Stor. tank charge outp

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

► Enter the heat store charging output setting on the commissioning record enclosed with the appliance.

2.4 Anti-cycle mode

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

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

The shortest possible period is 1 minute (recommended for single-pipe and hot-air heating systems).

The setting 0 means that the anti-cycle time is disabled.

If an outside-temperature controlled heating programmer is used, no setting is required. The anti-cycle time is optimised by the programmer.

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

2.5 Max. flow temperature

The maximum CH flow temperature can be set to between 35 °C and 88 °C (factory setting).

2.6 Switch diff. flow NTC



If an outside-temperature controlled heating programmer is used, no setting is required on the appliance.

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

- ► Disable anti-cycle time (setting 0).
- The switching difference setting should be entered on the commissioning record supplied with the appliance.

2.7 Autom. anti-cycle mode

If an outside-temperature controlled programmer is connected to the appliance, the anti-cycle time is adjusted automatically.

Automatic adjustment of the anti-cycle time can be disabled. This may be necessary in the case of unfavourably dimensioned heating systems.

If automatic adjustment of the anti-cycle time is disabled, the length of the anti-cycle time must be set under service function 2.4.

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

2.9 Actual output

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

3.0 Fan speed

The current fan speed is displayed.

3.3 Ionisation current

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

3.4 Pump mode (ZBR.. models only)

The possible settings are:

- **Pump mode 1**: if a heating pump and a 3-way valve for charging the heat store are connected. The 3-way valve is de-energised when the heat store circuit is open.
- Pump mode 2 (factory setting): if a circulation pump and a heat store charging pump are connected. In ECO mode, if the circulation pump and the heat store charging pump call for heat simultaneously, the system alternates between 12 minutes heating and 12 minutes hot water.
- Pump mode 3: if a circulation pump and a heat store charging pump are connected. In ECO mode, if the circulation pump and the heat store charging pump call for heat at the same time, both pumps run simultaneously. The heat store charging temperature has priority (up to 85 °C). The hydraulic configuration must be matched to this pump mode (use of a mixer unit and hydraulic balancing).
- The pump mode setting should be entered on the commissioning record enclosed with the appliance.

3.5 Pump blocking time (ZBR.. models only)

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Only applies if service function 3.4, Pump mode, is set to Pump mode 1 (external 3way valve for heat store charging is connected). Otherwise has no function.

If the system incorporates a 3-way valve external to the appliance, the heating pump is disabled while the 3-way valve is being actuated. therefore, the blocking time of the heating pump should be \geq the actuation time of the 3-way valve.

The blocking time has an adjustment range of 0 to 16, with each increment equivalent to 15 seconds. The adjustment range therefore equates to 0 to 240 seconds.

Factory setting is 30 seconds.

• Enter the pump blocking time on the commissioning record enclosed with the appliance.

3.6 Software version

The version number of the software is displayed.

3.9 Jumper 8 - 9 / 3.9 Jumper Ls - Lr

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

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

4.0 Stor. tank therm. (7 - 9)

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

4.1 Room therm. LSM/ 4.1 LSM release

When supplied, a jumper is fitted across terminals LZ - L1 on the LSM (= Heat demand). If that connection is opened (e.g. by a connected room thermostat), heating mode is disabled.

LSM release shows the total number of all possible enable signals connected via the LSM. As soon as a module connected to it (e.g. mechanical limiter for underfloor heating, limit switch on flue flap, combustion air flap, etc.) shuts off, heating and hot water modes are disabled.

4.2 Timer ch. 1 (heating)/ 4.2 Timer ch. 2 (hot water)

Shows the status of channel 1 of the timer integrated in the text display module or the separate programmer. If that channel's status is "Heat demand", heating mode will be activated according to the programmer commands. Shows the status of channel 2 of the timer integrated in the text display module or the separate programmer. If that channel's status is "Heat demand", hot water mode will be activated according to the programmer commands.

4.4 Heat demand (heating)/ Heat demand (stor. tank) (ZSBR.. only)

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

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

Heat demand (stor. tank) shows the heat demand status for charging the heat store.

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

4.5 Heat demand (hot water)/ Keep hot period (ZWBR... models only)

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

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

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

4.6 Internal regulator

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

It will subsequently switch on again

- · after 5 seconds in hot water mode
- · after 30 seconds in heat store charging mode
- after 0 to 15 minutes in heating mode (depending on the setting for service function 2.4 Anti-cycle mode).

The anti-cycle function is cancelled by

- switching the appliance off and on again at the master switch,
- another demand for heat,
- activating Min or Max mode
- or briefly switching to summer mode on the temperature control for CH flow.

5.0 Max. output (heating)

Some gas suppliers demand an output-dependent basic charge.

The heating output can be limited to any level between the min. rated heat output and the max. rated heat output to suit the specific heat requirements.



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

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

5.1 Permanent ignition

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

5.2 GFA status/error

The status of the automatic ignition module integrated in the PCB control board is indicated.

5.5 Min. output

The min. heat input is factory set, see technical data. The modulation range can be extended at the top end to suit the chimney conditions.

- Refer to settings table for heating and heat store charging output for details of the min. heat output in kW and the corresponding percentage (see installation instructions for boiler).
- ► Enter percentage on text display module and confirm.
- Measure gas flow rate and compare with the figures quoted for the percentage shown. If different, correct the percentage figure!
- Enter min. rated heat output on the commissioning record enclosed with the appliance.

5.8 Cyclic boiler starts (ZSBR 3/5-16 A... only)

When supplied, this function is activated on the above appliances and prevents start-up problems caused by poor ignition characteristics.

A truncated start cycle is activated if the burner has not been in operation for more than 3 hours.

During a truncated start cycle, the fan runs and the gas valve is opened long enough to completely fill the gas pipe with gas (approx. 1 - 2 seconds) but the burner is not ignited.

This function is not required, and can not be activated, on any other models.

6.7 Pump off (hot water)

The appliance is supplied with this function activated, i.e. there is a delay before the pump switches on in hot water mode. This means that cold water comes out of the pipe to begin with, followed by hot water once the pump switches on.

If the pump is set to switch on immediately (Pump off function deactivated), the hot water temperature rises gradually until the set temperature is reached. If a stratified-charge tank is connected, it is useful to have the function activated.

The delayed cut-in of the pump then prevents cold water being pumped through the tank and cooling it down.

6.8 Cycle time (hot water) (ZWBR... only)

The appliance is supplied with the hot water cycle time set to 3 minutes.

The hot water cycle time specifies how long after hot water is drawn the pump continues to pump water through the internal hot water system.

6.9 Duration (hot water) (ZWBR... only)

The appliance is supplied with the hot water duration set to 3 minutes.

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

7.0 Pump map (heating) (not ZBR...)

The appliance is supplied with this function set to "4 Prop. pressure high" (see pump characteristic in boiler installation instructions).

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. (The current setting can be viewed by means of service function 7.4.)

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 (see installation instructions).

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

If this parameter is set to "0 Pump step adjustable", then the pump speed set under function 7.1 is active.

7.1 Map pump step (heat.) (not ZBR...)

The appliance is supplied with this function set to 1 (see pump characteristic in boiler installation instructions). However, the setting is only active if function 7.0, Pump map (heating), is set to "0 Pump step adjustable".

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

7.2 Antiblock. map pump (not ZBR...)

The appliance is supplied with this function activated.

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

7.3 Aeration mode (not ZBR...)

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 and the text display shows "Aeration mode". The 2-digit display shows "_o^o" in alternation with the CH flow temperature. The automatic vent must be opened and then closed again once the venting sequence is complete.



The venting function can be activated manually after servicing.

• If the venting function is set to "On, autom. deactivat.", once the sequence has been completed.

7.4 Actual map pump step (not ZBR...)

The currently active pump speed is displayed (see function 7.0).

7.5 Map pump load index (not ZBR...)

The load index is displayed.

7.6 Map pump type (not ZBR...)

The pump type code of the pump fitted is displayed.

7.7 Output reduction

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

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

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

8.5 Siphon fill program

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

The trap filling programme is activated:

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

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

The text display shows "Siphon fill program" and the 2-digit display alternates between "-II-" and the CH flow temperature.

The factory setting is "1" (activated).



Warning: if the condensation trap is not filled, flue gas can escape!

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

9.2 Hot water on demand

The appliance is supplied with this function activated.

This function relates to mode, the 💿 button lights up.

The demand detection function enables maximum gas and water economy.

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

Hot water is then available at short notice.

9.3 GFA-Asic error (automatic ignition module, extended messages)

The status of, or an error message from the automatic ignition module integrated in the PCB control board is displayed.

4 Rectifying faults

4.1 Boiler failure codes indication

4.1.1 ... on the boiler

In order to identify the specific boiler failure a two digit alphanumeric code is used. This allows a quick fault identification and solution.

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

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

The failures can be divided into four basic typologies, as described:

- The appliance continues to work at a minimum function level (e. g. with error codes A5, A7, A8, AC, Ad, CC, FC).
- The appliance is locked until the failure is repaired (e. g. with error codes (b1, C1, d1, d3, E2, F0)).
- The appliance is locked, until the ON/OFF switch is turned (A1).
- The boiler has shut down and locked out (flashes) and remains so until the cause of the fault has been eliminated and the lock-out cancelled (e.g. E9, EA, F0, F7, FA,Fd).

To unblock the appliance:

Press the unblock button (1) until the digit – appears on the display.
 Once the appliance starts up successfully, the fault disappears from the text display.

4.1.2 ... on the programmer (optional accessory)

A TW 2 remote control unit can also be connected to the text display module.

If other/more functions are required, another programmer must be connected. Those programmers are then controlled via the bus module BM1.

For more detailed information, refer to the installation instructions for the boiler and the installed programmer.

Faults on this programmer are indicated by text messages on the programmer display.

Once the fault has been put right, the programmer reverts to its normal display.

4.2 Summary

4.2.1 Appliance faults

	3R A	SBR A	VBRA	Ige
Appliance faults	ZE	ñ	NZ	Pa
A1		Х	Х	17
A5		Х		18
A7	Х	Х	Х	19
A8	Х	Х	Х	20
Ad	Х	Х	Х	21
b1	Х	Х	Х	22
C1	Х	Х	Х	23
d3	Х	Х	Х	24
E2	Х	Х	Х	25
E9	Х	Х	Х	26
EA	Х	Х	Х	28
F0	Х	Х	Х	32
F7	Х	Х	Х	33
FA	Х	Х	Х	34
FC	Х	Х	Х	35
Fd	Х	Х	Х	35

Table 2

4.2.2 Faults that are not indicated on any display

Appliance faults	ZBR A	ZSBR A	A ABWZ	Page
Excessive burner noise, rum- bling noises	Х	Х	Х	36
Flue gas levels incorrect, CO level too high	Х	Х	Х	37
Ignition too harsh, ignition poor	Х	Х	Х	38
Boiler indicates P1, P2, P3 at start-up and then restarts with P1,	х	Х	х	36

Appliance faults	ZBR A	ZSBR A	ZWBRA	Page
Loose or broken contact on heat store NTC sensor	Х	х		39
Specified CH flow tempera- ture from TA programmer exceeded	Х	Х		40

Table 3

Programmer faults	TR 2	Page
Set room temperature not reached	х	41
Set room temperature exceeded by large amount	х	43
Set room temperature not reached		41
Temperature rises instead of falling	х	43
Room temperature too high in Economy mode		43
Incorrect or no modulation	Х	43
Heat store fails to heat up		44

4.3 How to use the fault tables

The procedure is explained using the fault code EA as an example:

The table heading shows the fault code and a general description of the fault.

In the example shown, you are instructed to note the current settings before going any further. If you can see the flame (answer to question is "yes") you move on to Step 5. (\downarrow 5.). The question asked in Step 5 is "Is there a problem with the flue". The flue must then be checked.

If the answer to the first question ("Is burner flame visible?") was "no"", then you go to and answer Question 2, "Is the gas cock turned on?". If the gas cock is turned off, it must be turned on and the appliance reset. To do so, you press the 🛆 button. **Restart the appliance** and run through a complete heat-demand cycle until the appliance switches off.



Flame not detected

Check Action 1. Is burner flame visible? ↓5. yes: ↓2. no: ↓з. 2. Is the gas cock turned on? yes: no: Turn on the gas cock. ▶ Press (△), does appliance restart??? EA? ↓3. З. Did the thermal security of the gas yes: ▶ ... cock lock out? ↓... no: 4. 5. Is there a problem with the flue? yes: Check the flue. Check CO₂ level in combustion ↓.... no: air. > 0,2 % CO₂?

If the fault is now cured, the appliance will revert to normal operation and the fault-finding process is complete. Now simply re-check the setting of the two temperature controls.

If the fault EA recurs **during** the heat-demand cycle, it will be shown on the display again. In that case continue the fault finding procedure from Step 3 (thermal cut-out in gas cock) as described above.

If a different fault code is displayed after the heatdemand cycle, find the appropriate section of the fault finding table and work through the procedure described step by step.

4.4 Faults indicated on display

A1 flashing.

Controlled-characteristic pump has run dry

	Check		Action
1.	System pressure below 1.2 bar?	yes:	 Power OFF the appliance. Check appliance and system for water leaks and repair as necessary. Top up system. Turn ON the appliance. A1? ↓2.
		no:	↓2.
2.	Activate venting sequence.		 Activate menu option Show service parameters. Select 7.3 Aeration mode select setting On, autom. deactivat. and confirm. Vent appliance¹⁾. Vent radiators. 3.
3.	Audible bearing damage on pump?	yes:	 Power OFF the appliance. Drain appliance. Replace pump. Top up system. Turn ON the appliance.



Heat store NTC sensor 2 defective

	Check		Action
1.	 Activate menu option Show service parameters. Select 4 Stor.tank temp.sensor2 . Is a temperature between 0. and 5. displayed? 	yes: no:	 Is the connector for heat store NTC sensor 2 corroded¹⁾, damaged or dirty? Replace affected components. 12. 13.
2.	 Disconnect connector for heat store NTC sensor 2. Short-circuit the 2-pin connector on the end of the 20-pin connector lead assembly. After max. 60 sec: Display changes to temperature between 100. and 95.? 	yes: no:	 Power OFF the appliance. Change heat store NTC sensor 2. Plug the connection wire. Turn ON the appliance. A7? ↓3. Change the 20-pin connector lead assembly. ↓3.
3.	 Temperature between 95. and 100. is displayed. Unplug the connector. After max. 60 sec.: Does the displayed code change to a value between 0. and 5.? 	yes:	 Power OFF the appliance. Change heat store NTC sensor 2. Plug the connection wire. Turn ON the appliance. A7? ↓4. ↓4.
4.	► Unplug the 20-pin connector lead	yes:	 Change the 20-pin connector lead assembly.
	assembly from the Heatronic. After max. 60 sec.: Does the displayed code change to a value between 0. and 5 .?	no:	 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

1) For notes, refer to Appendix.

A7 flashing.

Hot water NTC sensor defective

	Check		Action
1.	 Activate menu option Show service parameters. Select 2 Hot water temp.sensor . Is a temperature between 0. and 5. 	yes:	 Is the connector for hot water NTC sensor corro- ded¹⁾, damaged or dirty? Replace affected com- ponents. 12.
Disconnect connector for hot water NTC sensor. yes: Short-circuit the 2-pin connector on the end of the 20-pin connector lead assembly. Display changes to temperature Image: Content of the		 ↓3. Power OFF the appliance. Change hot water NTC sensor. Plug the connection wire. Turn ON the appliance. A7? ↓3. 	
	between 100. and 95. ?	no:	 Change the 20-pin connector lead assembly. 3.
3.	 Temperature between 95. and 100. is displayed. Unplug the connector. After max. 60 sec.: Does the displayed code change to a value between 0. and 5.? 	yes:	 Power OFF the appliance. Change hot water NTC sensor. Plug the connection wire. Turn ON the appliance. A7? ↓4.
		no:	↓4.
4.	 Unplug the 20-pin connector lead assembly from the Heatronic 	yes:	 Change the 20-pin connector lead assembly.
	After max. 60 sec.: Does the displayed code change to a value between 0. and 5 .?	no:	 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

1) For notes, refer to Appendix.



No correct electrical connection

	Check		Action
1.	Mode selector switch is between two settings		 Turn switch until it clicks into position.
2.	 Power OFF the appliance. Wiring between TR 2 and text- display OK? 	yes:	 ► Turn ON the appliance. ↓3.
	 Terminal 3 on TR 2 connected to Terminal 3 on textdisplay ? Terminal 4 Terminal 4 etc. 	no:	 Rewire correctly as specified in the installation instructions. Turn ON the appliance. after 90 sek.: A8? ↓3.
3.	Lead(s) defective.		 Check leads for continuity and replace as necessary. A8? ↓4.
4.	TR 2 defective.		 Power OFF the appliance. Change TR 2 . Turn ON the appliance.

Ad flashing.

Heat store NTC sensor 1 not detected

	Check		Action
1.	Is lead for heat store NTC sensor correctly routed, i.e. not through cable clamp?	yes: no:	 ↓2. ▶ Route connecting lead for heat store temperature sensor as specified in installation instructions.
2.	 Activate menu option Show service parameters. Select 3 Stor.tank temp.sensor1 . Is a temperature between 0. and 5. displayed? 	yes:	 Connector on end of NTC sensor lead: Flue gas connector corroded¹⁾, damaged or dirty? Change relative parts. Press button Ad? ↓3.
		no:	↓4.
3.	 Heat store -NTC 1: Unplug connector from PCB control board. Short circuit the connector using wire jumper. After max. 60 sec: Display changes to temperature between 100. and 95. 	yes: no:	 Replace heat store NTC sensor 1. Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.
4.	 Temperature between 95. and 100. is displayed. Unplug the connector. After max. 60 sec.: Does the displayed code change to a value between 0. and 5.? 	yes: no:	 Replace heat store NTC sensor 1. Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

1)

b1 flashing.

Code plug not detected.

	Check		Action
1.	No fault or fault code FC displayed on text display?	yes:	 Power OFF the appliance. Fit code plug (correctly), making sure code number (see Appendix) is correct. Turn ON the appliance. b1? ↓2.
		no:	↓2.
2.	► Activate menu option Show serv-	yes:	↓2.
 ice parameters. Select 1.2 Code plug. Compare number displayed w that shown in Appendix. No number or incorrect number (last three digits) displayed. 	 ice parameters. Select 1.2 Code plug. Compare number displayed with that shown in Appendix. No number or incorrect number (last three digits) displayed. 	no:	↓4.
3.	Code plug loose, incorrect or defec- tive.		 Power OFF the appliance. Replace code plug¹⁾, making sure code number is correct. Turn ON the appliance. b1? ↓4.
4.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

1) For order no., refer to Appendix

C1 flashing.

Fan speed too low

	Check		Action
1.	Fan lead connector properly con-	yes:	↓2.
	nected?	no:	 Power OFF the appliance. Plug in connector. Turn ON the appliance. C6? ↓2.
2.	Fan lead defective?	yes:	 Power OFF the appliance. Replace fan lead. Turn ON the appliance. C6? ↓3.
		no:	↓3.
3.	Fan defective?	yes:	 Power OFF the appliance. Plug the connection wire. Replace fan. Plug the connection wire. Turn ON the appliance. C6? ↓4.
		no:	↓4.
4.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.



Wrong signal from pin 8-9.

	Check		Action
1.	Jumper 8 - 9 fitted correctly?	yes:	↓2.
		no:	 Power OFF the appliance. Fit jumper 8 - 9 correctly, tighten screw. Turn ON the appliance. d3? ↓2.
2.	► Turn ON the appliance.	yes:	↓3.
	 Measure voltage between Termi- nal 4 and Terminal 8. 24 V DC? 	no:	↓5.
3.	Heat store NTC sensor connected to terminals 7, 8 and 9?	yes:	 Power OFF the appliance. Plug heat store NTC sensor connector into PCB control board (303, page 46, Pos. 303). If lead has no connector: replace heat store NTC sensor. Turn ON the appliance. d3? ↓4.
		no:	↓ 4 .
4.	Existing heat store thermostat con- nected to Terminals 7, 8 and 9?	yes:	 Power OFF the appliance. Fix the additional bridge 8-9 in the right position and close the screws. Turn ON the appliance. d3? ↓5.
		no:	↓5.
5.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

E2 flashing.

The heating outlet NTC sensor is damaged.

	Check		Action
1.	 Activate menu option Show service parameters. Select .1 Flow temp.sensor. Is a temperature between 0. and 5. displayed? 	yes:	 The heating outlet NTC sensor is in short circuit: Power OFF the appliance. Replace CH flow NTC sensor; observe fitting instructions for NTC sensor when doing so. Turn ON the appliance. E2? ↓2.
		no:	↓ 2.
2.	Heating outlet NTC sensor: Temperature between 95 . and 100. is displayed.	yes:	 The CH flow NTC sensor is interrupted: Power OFF the appliance. Replace CH flow NTC sensor; observe fitting instructions for NTC sensor when doing so. Turn ON the appliance. E2? ↓3.
		no:	↓3.
3.	Check if the 20-pin connector lead assembly is damaged.		 Power OFF the appliance. Change the 20-pin connector lead assembly. Turn ON the appliance. E2? ↓4.
4.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.



Safety temperature limiter has tripped.

	Check		Action
1.	Is the heating pressure between 1 and 2 bar?	yes:	 ► Top up system. ► Vent appliance. ► Press , does appliance restart??? E9?↓2.
		no:	↓2.
2.	Is the pump blocked?	yes:	 Unblock the pump. If pump won't start: Power OFF the appliance. Disconnect the boiler electrical connection. Change the pump. Reconnect the boiler electrical connection. Turn ON the appliance. Press , does appliance restart??? E9? ↓3.
		no:	↓3.
3.	Is lead disconnected from one/both safety temperature limiters?	yes:	 Power OFF the appliance. Connect lead. Turn ON the appliance. Press , does appliance restart??? E9? ↓4.
		no:	↓4.
4.	 Power OFF the appliance. Unplug the connector from the cut-off device. Measure the NTC electrical resistance. 	yes:	 Change the over heating cut-off device. Connect flue gas safety temperature limiter lead. Turn ON the appliance. Press Press , does appliance restart??? E9? ↓5.
		no:	 Connect flue gas safety temperature limiter lead. Turn ON the appliance. E9? \$\sqrt{5}\$.

E9 and flashing.

Safety temperature limiter has tripped.

	Check		Action
5.	 Power OFF the appliance. Remove fuse SI 3 from appliance PCB control board and test for continuity. R = ∞? 	yes: no:	 Change the fuse. Turn ON the appliance. Press , does appliance restart??? E9? ↓6. Remount the fuse.
			► Turn ON the appliance.
6.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.



During operation: flame not detected

	Check		Action
1.	Is the flame present?	yes:	↓6.
		no:	↓2.
2.	Is the gas cock open?	yes:	↓3.
		no:	 Open the gas cock Press , does appliance restart??? EA? ↓3.
3.	Is there air in the supply pipe?	yes:	 Vent supply pipe. Press , does appliance restart??? EA? ↓4.
		no:	↓4.
4.	Did the thermical security of the gas cock lock out?	yes:	 ▶ Reset security. ▶ Press , does appliance restart??? EA? ↓5.
		no:	↓5.
5.	Natural gas models: does the building have a supply pres- sure regulator?	yes:	 Check that it is fitted correctly and functioning properly and correct if necessary. Check supply pressure, inform gas company if outside correct range. Press , does appliance restart??? EA? ↓6.
		no:	↓6.
	LPG models:	yes:	↓6.
	is the flow rate of the gas supply to the appliance correct?	no:	 Is there enough gas in the supply cylinder? Is there air in the supply pipe? Is the solenoid valve in the "meter cabinet" opening? Is the supply pressure OK? (if the supply pressure is too high, check the pressure regulator in the "meter cabinet" and on the LPG supply cylinder). Press , does appliance restart??? EA? ↓6.

$\mathbf{EA}_{\mathrm{and}} \otimes \mathbf{flashing}.$

During operation: flame not detected

	Check		Action
6.	Is the ground connection correct?	yes:	↓7.
		no:	 Rewire correctly as specified in the installation instructions. Press △, does appliance restart??? EA? ↓7.
7.	Two phase net:	yes:	↓8.
	Is there a resistor fitted between Pe and N?	no:	 Power OFF the appliance. Disconnect the boiler electrical connection. Insert resistance (Order no. 8 900 431 516) between the ground and the N connection. Reconnect the boiler electrical connection. Turn ON the appliance. Press , does appliance restart??? EA? ↓10.
8.	Is condensation trap in condensing boiler blocked?	yes:	 ► Unscrew condensation trap and clean. ► Press △, does appliance restart??? EA? ↓12.
		no:	↓9.
9.	 9. Check the gas valve? Power OFF the appliance. Unplug the connectors from the gas valve. 	yes:	 Reconnect the gas valve. Turn ON the appliance. Press , does appliance restart??? EA? ↓10.
	Il electrical resistance. $R = 164 \pm 40 \Omega$?	no:	 Change the gas valve. Reconnect the gas valve. Turn ON the appliance. Press (A), does appliance restart??? EA? ↓10.
10.	 Is flue blocked? ► Check CO₂ level in combustion air. > 0,2 % CO₂? 	yes:	 Check the flue. Press , does appliance restart??? EA? ↓11.
		no:	↓11.



During operation: flame not detected

	Check		Action
11.	Is flue gas CO ₂ level incorrect ¹⁾ ?	yes:	 Adjust to correct level. Press , does appliance restart??? EA? ↓12.
		no:	↓12.
12.	► Activate menu option Show serv-	yes:	↓13.
	 ice parameters. Select 5.1 Permanent ignition. Continuous ignition OK? 	no:	↓16.
13.	Ignition lead connected to ignition	yes:	↓14.
electrodes?	electrodes?	no:	 Connect cable to ignition electrode. Press , does appliance restart??? EA? ↓14.
14. Ignition cable conne	Ignition cable connector engaged in	yes:	↓15.
	switchbox?	no:	 Power OFF the appliance. Engage ignition cable connector in switchbox. Turn ON the appliance. Press , does appliance restart??? EA? ↓15.
15.	Ignition cable defective?	yes:	 Power OFF the appliance. Replace ignition cable. Turn ON the appliance. Press , does appliance restart??? EA? ↓16.
10	Colored 2.2 Ionization summer t		
16.	Select 3.3 Ionisation current.	yes:	↓18.
	Measured ionisation current medium or high?	no:	↓↓17.

$\textbf{EA}_{\text{and}} \textcircled{flashing.}$

During operation: flame not detected

	Check		Action
17.	 Electrode assembly defective? Power OFF the appliance. Remove electrode assembly. Electrodes worn out? 	yes:	 Replace electrode assembly. Turn ON the appliance. Press (a), does appliance restart??? EA? ↓18.
		no:	 ▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press , does appliance restart??? EA? ↓18.
18.	Check if the 20-pin connector lead assembly is damaged.		 Power OFF the appliance. Change the 20-pin connector lead assembly. Turn ON the appliance. Press , does appliance restart??? EA? ↓19.
19.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

FO (and possibly) flashing.

Internal failure

	Check		Action
1.	 Activate menu option Show service parameters. Select 9.3 GFA-Asic-error. A message is displayed. 		 Record figure displayed in service report. 2.
2.	 Select 5.2 GFA status / error. A message is displayed. 		 Record figure displayed in service report.
3.	 Select Settings -> Service -> Further options -> Fault history. 	yes:	 Deal with fault(s) displayed as instructed in relevant fault table(s).
	Other faults apart from F0 dis- played?	no:	↓3.
4.		yes:	 Press button (2). Initiate demand for heat by pressing the (2). button and then cancel after 30 seconds by pressing the button again. Initiate demand for heat twice more as described above.
		no:	↓4.
5.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.



Although appliance switches off, flame still detected

	Check		Action		
1.	Electrode(s) dirty or defective.		 Power OFF the appliance. Replace electrode assembly. Turn ON the appliance. Press , does appliance restart??? F7? ↓2. 		
2.	 Power OFF the appliance. Disconnect the boiler electrical connection. Remove PCB control board. PCB control board damp? 	yes:	 Dry PCB control board (e.g. with hair dryer). Refit PCB control board. Reconnect the boiler electrical connection. Press ▲, does appliance restart??? F7? ↓3. 		
		no:	↓3.		
3.	 Is there a problem with the flue? ► Check CO₂ level in combustion air. > 0,2 % CO₂? 	yes:	 Check flue and repair or replace if necessary. 		
		no:	↓4.		
4.	The PCB control board is damaged.		 Power OFF the appliance. Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance. 		



After appliance switches off flame is detected

	Check		Action
1.	Is condensation trap in condensing boiler blocked?	yes:	 ► Clean condensation trap discharge pipe. ► Press , does appliance restart??? FA? ↓2.
2.	Electrodes faulty.	no:	 ↓2. ▶ Replace electrode assembly. ▶ Turn ON the appliance. ▶ Press , does appliance restart??? FA? ▶ Power OFF the appliance. ↓3.
3.	 Problem with flue? ▶ Check CO₂ level in combustion air. > 0,2 % CO₂? 	yes:	 Check flue and repair or replace if necessary. Press , does appliance restart??? FA? Power OFF the appliance. ↓4.
4.	The gas valve is damaged.	no:	 ↓4. Change the gas valve. Turn ON the appliance. Press , does appliance restart??? FA? Power OFF the appliance. ↓5.
5.	Check if the 20-pin connector lead assembly is damaged.		 Change the 20-pin connector lead assembly. Turn ON the appliance. Press , does appliance restart??? FA? Power OFF the appliance. \$\frac{1}{6}\$.
6.	The PCB control board is damaged.		 Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

FC flashing.

Text display module not detected

	Check		Action	
1.	No fault or fault code FC displayed on text display?		 Power OFF the appliance. Fit code plug (correctly), making sure code number is correct (see Appendix). Turn ON the appliance. FC? ↓2. 	
2.	 Unplug text display module connector. Connecting lead between text display module and Heatronic OK.? 	yes:	Plug in connector.FC? ↓3.	
		no:	 ▶ Replace text display module. FC? ↓3. 	
3.	Text display module defective.		 Replace text display module. 	



Reset button pressed inadvertently

	Check	Action
1.		► Press button ⓓ again.
2.	The PCB control board is damaged.	 Disconnect the boiler electrical connection. Change PCB control board. Reconnect the boiler electrical connection. Turn ON the appliance.

4.5 Faults that are not displayed

4.5.1 Appliance faults

Boiler indicates P1, P2, P3 at start-up and then restarts with P1			
	Check		Action
1.	Fuse T 1.6 A (312) defective.	yes:	 Turn ON the appliance. Change the fuse. Power OFF the appliance. Start sequence not completed? \$\12\$.
		no:	↓2.
2.	The PCB control board is damaged.		► Change PCB control board.

Excessive burner noise, rumbling noises			
	Check		Action
1.	Does the gas supply type match the	yes:	↓2.
	specifications on the appliance iden- tification plate?	no:	► Convert appliance to correct gas type ¹⁾ .
2.	► Test gas supply pressure - OK? ¹⁾ ?	yes:	↓3.
		no:	Decommission appliance.Notify gas company.
3.	Problem with flue?	yes:	 Check flue and repair or replace if necessary.
 Check CO₂ level in combustion air. > 0,2 % CO₂? 	 Check CO₂ level in combustion air. > 0,2 % CO₂? 	no:	↓4.
4.	 Remove silencer, flue pipe and mixer unit. Is internal flue pipe/silencer dirty or clogged or are seals defective or incorrectly fitted? 	yes:	 Repair or replace components. Grease seal before fitting, Make sure it is fitted in correct position.
		no:	↓5.
5.	Flue gas CO ₂ levels measured at	yes:	► Adjust CO ₂ levels.
	 min. and max. load do not match specified levels¹⁾. ▶ Measure CO₂ levels. 	no:	 Power OFF the appliance. Change the gas valve. Turn ON the appliance.

Flue gas levels incorrect, CO level too high			
	Check		Action
1.	1. Does the gas supply type match the	yes:	↓2.
	tification plate?	no:	► Convert appliance to correct gas type ¹⁾ .
2.	► Test gas supply pressure ¹⁾ , - OK?	yes:	↓3.
		no:	Decommission appliance.
			 Notify gas company.
3.	 3. Problem with flue? ▶ Check CO₂ level in combustion air. > 0,2 % CO₂? 	yes:	• Check flue and repair or replace if necessary.
		no:	↓4.
4. Flue gas CO ₂ levels measured at	yes:	► Adjust CO ₂ levels.	
	min. and max. load do not match specified levels? ¹⁾ .	no:	↓5.
5.	Gas volumetric flow too high when CO_2 level correctly set ¹⁾ .	yes:	 Reduce gas volumetric flow rate by means of adjusting screw on gas valve and/or gas flow restrictor. Check CO₂ adjustment.
		no:	↓6.
6.			 Change the gas valve.

Ignition too harsh, ignition poor			
	Check		Action
1.	 Activate menu option Show service parameters. Select 5.1 Permanent ignition. Continuous ignition OK? 	yes: no:	↓6. ↓2.
2.	2. Ignition lead connected to ignition	yes:	↓3.
	electrodes?	no:	 Connect cable to ignition electrode. Press button ▲. Ignition poor? ↓3.
3.	Ignition cable connector engaged in	yes:	↓4.
	switchbox'?	no:	 Power OFF the appliance. Engage ignition cable connector in switchbox. Turn ON the appliance. Press button . Power OFF the appliance. Ignition poor? ↓4.
4.	Ignition cable defective?	yes:	 Power OFF the appliance. Replace ignition cable. Turn ON the appliance. Press button ▲. Power OFF the appliance. Ignition poor? ↓5.
		no:	↓5.
5.	 Electrode assembly defective? Power OFF the appliance. Remove electrode assembly. Electrodes worn out? 	yes:	 Replace electrode assembly. Turn ON the appliance. Press , does appliance restart??? Ignition poor? ↓6.
		no:	 ▶ Refit electrode assembly. ▶ Turn ON the appliance. ▶ Press , does appliance restart??? Ignition poor? ↓6.
6.	Does the gas supply type match the specifications on the appliance iden- tification plate?	yes: no:	 ↓7. Carry out gas type conversion as described in installation instructions. Ignition poor? ↓7.

Ignition too harsh, ignition poor			
	Check		Action
7.	► Test gas supply pressure ¹⁾ - OK?.	yes:	↓8.
		no:	Decommission appliance.Notify gas company.
8.	Problem with flue?	yes:	• Check flue and repair or replace if necessary.
	 Check CO₂ level in combustion air 		Ignition poor? \downarrow 8.
	>0,2 % CO ₂ ?	no:	↓9.
9.	Flue gas CO ₂ levels measured at min. and max. load do not match specified levels.	yes:	► Adjust CO ₂ levels.
		no:	↓9.
	► Measure CO ₂ levels.		
10.	Burner not correctly fitted or defec- tive? ► Remove burner.		 Replace burner and seal if necessary Ensure seal is fitted in correct position.
	Cover fixings not tight		
	or		
	seal detective or not correctly fitted		
	burner defective.		

1) See installation instructions

Loose or broken contact on heat store NTC sensor Check Action Heat store NTC sensor lead is not fitted as described in the installation instructions (i.e. the cable does not pass through the cable grip in the switchbox). Route cable as specified in installation instructions. Rout

Text display fails to respond, no display or display incorrect			
	Check		Action
	Ignition lead is not fitted as specified in installation instructions (i.e. the lead should be routed through the clip on the underside of the air box).		 Route cable as specified in installation instruc- tions.

Specified CH flow temperature from TA programmer exceeded			
	Check		Action
	If outside-temperature controlled programmer (TA) is connected to boiler:		
	• The anti-cycle time is adjusted by th	e programme	r to the suit the system.
	• The factory setting for the anti-cycle time (3 min.) and the heating mode hysteresis setting, if applicable are deactivated.		
	 In cyclic mode, the switching of the boiler on or off is subject to a time delay in order to prevent divergence between the average CH flow temperature and the specified CH flow temperature. As a result (depending on the heat draw), the specified CH flow temperature is briefly exceeded. In extreme cases, it can happen that the burner does not switch off until the maximum CH flow temperature is reached even though a lower CH flow temperature has been specified. 		
1.	 Activate menu option Show service parameters. 		 Disable automatic anti-cycle time, i.e. change setting to 0.
	 Select 2.7 Autom. anti-cycle mode. Read off status of automatic anti- cycle time (0 = Disabled, 1 = Enabled) 		
2.	 Select 2.4 Anti-cycle mode. Read off anti-cycle time setting (0 15 min) 		 Set anti-cycle time as required, e.g. factory set- ting 3 min.

4.5.2 Programmer faults

Set room temperature not reached (TR 2)					
	Check		Action		
1.	Thermostatic valve(s) set too low?	yes:	► Turn up thermostatic valve(s).		
			↓2.		
		no:	↓2.		
2.	CH flow temperature control on boiler set too low?	yes:	► Turn up CH flow temperature control.		
		no:	↓3.		
3. Air in the heating system.			► Power OFF the appliance.		
			 Check appliance and system for water leaks and repair as necessary. 		
			► Top up system.		
			 Activate menu option Show service parame- ters. 		
			 Select 7.3 Aeration mode , select setting On, autom. deactivat. and confirm. 		
			▶ Vent appliance ¹⁾ .		
			► Vent radiators.		
			► Turn ON the appliance.		

Set	Set room temperature not reached			
	Check		Action	
1.	Thermostatic valve(s) set too low?	yes:	► Turn up thermostatic valve(s).↓2.	
		no:	↓2.	
2.	Heating characteristic set too low?	yes:	 Correct heating characteristic. 3. 	
		no:	↓3.	
3.	CH flow temperature control on boiler set too low?	yes:	 Turn up CH flow temperature control. ↓4. 	
		no:	↓4.	
4.	Heat store connected via HSM?	yes:	↓5.	
		no:	↓6.	
5.	Is heat store temperature unreacha- ble (CH flow temperature control set too low)?	yes:	 Turn up CH flow temperature control. ↓6. 	
		no:	↓6.	
6.	Air in the heating system.		 Power OFF the appliance. Check appliance and system for water leaks and repair as necessary. Top up system. Activate menu option Show service parameters. Select 7.3 Aeration mode , select setting On, autom. deactivat. and confirm. Vent appliance¹⁾. Vent radiators. Turn ON the appliance. 	

Set	Set room temperature exceeded by large amount				
	Check		Action		
1.	Do radiators get too hot?	yes:	 TR 2: ▶ Decrease setting of "Heating" control ↓2. 		
		no:	↓2.		
2.	Bad choice of location for program- mer, e.g. outside wall, near window,	yes:	 Select better installation location¹⁾. ↓3. 		
		no:	↓3.		
3.			 Turn down thermostatic valve(s).n 		

Temperature rises instead of falling						
	Check Action					
	Timer clock (DT 2) incorrectly set		 Check setting and correct as necessary. 			
Room temperature too high in Economy mode						

Check		Action
Building retains heat well	yes:	 Set economy temperature lower. -or-
		 Set earlier start time for Economy mode.

Incorrect or no modulation			
	Check		Action
	Programmer incorrectly wired		 Check wiring against wiring diagram and correct as necessary.

Heat store fails to heat up				
	Check		Action	
1.	with TR 2: CH flow temperature control on boiler set too low.		 Increase CH flow temperature control setting. 	
2.	Hot water temperature control on boiler set too low		 Increase hot water temperature control setting. 	

5 Appendix

5.1 NTC values

5.1.1 Outside temperature sensor

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

Table 5

5.1.2 CH flow NTC sensor, heat store NTC sensor, constant hot water 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

5.2 **Electronic schemes**



Fig. 2

- 4.1 Ignition transformer
- Temperature limiter, heat exchanger 6
- 9 Flue gas temperature limiter
- 18 Pump
- 32 Flame sensing electrode
- 33 Ignition electrode 36
- Temperature sensor in CH flow
- Solenoid valve 1 52 Solenoid valve 2 52.1
- 56 Gas valve CE 427
- Reset button 61
- Motor, 3-way valve (ZSBR) 84
- 135 Master switch
- 136 Temperature control for CH flow
- Fuse, slow 2.5 A, AC 230 V 151
- 153 Transformer
- 161 Link

- 226 Fan
- 300 Code plug
- 302 Earth connection
- Temperature control for hot water 310
- 312 Fuse, slow T 1,6 A
- 313 Fuse, slow T 0,5 A
- 317 Digital display
- Terminal block for AC 230 V Mains supply 328
- 328.1 Link
- 363 Indicator lamp for burner
- 364 Indicator lamp for power supply
- 365 "Chimney sweep" button
- Service button 366
- 367 ECO button
- 400 Textdisplay
- 422 Connecting TR2

List of most important replacement parts 5.3

Component	Order no.	Remarks
Switchbox	L	L
PCB control board	8 748 300 385	
Transformer	8 747 201 358	
Ignition lead	8 714 401 878	
20-pin connector lead assembly	8 714 401 912	
Fuse	1 904 522 730	T 0,5 A
Fuse	1 904 522 740	T 1,6 A
Fuse	1 904 521 342	T 2,5 A
Code plug include	ed in	
Conversion kit G20 -> 31	7 710 149 050	ZWBR 8-30
Conversion kit G31 -> G20	7 710 239 086	ZWBR 11- 30
Conversion kit G20 -> G31	7 710 149 051	ZWBR 11 - 37
Conversion kit G31 -> G20	7 710 239 087	ZWBR 14 - 37
Conversion kit G20 -> G31	7 710 149 052	ZSBR 7-28
Conversion kit G31 -> G20	7 710 239 088	ZSBR 11-28
Conversion kit G20 -> G31	7 710 149 053	ZBR 8-35
Conversion kit G31 -> G20	7 710 239 089	ZBR 11-35
Conversion kit G20 -> G31	7 710 149 046	ZWBR 7-28
Conversion kit G31 -> G20	7 710 239 082	ZWBR 11-35
Conversion kit G20 -> G31	7 710 149 047	ZWBR 11-35
Conversion kit G31 -> G20	7 710 239 083	ZWBR 14-35

Component	Order no.	Remarks				
Heat exchanger						
Temperature lim- iter STB	8 729 000 144	110 ℃				
Flue gas temper- ature limiter	8 729 000 144					
Temperature sensor, CH flow	8 714 500 054	NTC				
Burner						
Electrode assembly	8 718 107 064					
Gas valve						
Gas valve	8 747 003 516					
Gas valve	8 747 003 515	ZBR 11/ 1442A				
Other component	S					
Fan	8 717 204 325					
Gas supply pipe	8 714 401 885					
Textdisplay	8 747 208 081					
Plate-type heat exchanger	8 715 406 659	ZWBR 7/11-28 A.				
Table 7						

Table 7

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

Manufacturer	Description	Remarks	Mixing concentra- tion % by weight			
With all anti-freeze flu mended concentration In the case of anti-free the anti-freeze concer	With all anti-freeze fluids and corrosion inhibitors, it is extremely important to observe the manufacturer's recom- mended concentration levels and to check the concentration regularly. In the case of anti-freeze fluids, it should be noted that the efficiency of fluid-to-fluid heat transfer diminishes as the anti-freeze concentration increases.					
Anti-freeze fluid						
Hüls	llexan E	Anti-freeze fluid, equivalent to Antifrogen N.				
Tyforop Chemie GmbH, Hamburg	Tyfocor L	Anti-freeze fluid based on propylene glycol.	25-80			
Schilling Chemie	Varidos FSK	Anti-freeze fluid based on ethylene glycol with good corrosion-inhibiting properties. Also suitable for aluminium.	22-55			
Hoechst	Antifrogen N	Anti-freeze fluid based on ethylene glycol with good corrosion-inhibiting properties.	20-40			
Fernox	Alphi-11	Anti-freeze fluid with corrosion inhibitor, also suit- able for aluminium.				
BASF	Glythermin NF	Anti-freeze fluid based on ethylene glycol with good corrosion-inhibiting properties, also suitable for aluminium.	20-62			
Corrosion inhibitor						
Schilling Chemie	Varidos KK	Corrosion inhibitor	0,5			
Schilling Chemie	Varidos 1+1	Corrosion inhibitor	1-2			
Schilling Chemie	Varidos AP	Corrosion inhibitor, also suitable for aluminium.	1-2			
Benckiser Wassertechnik	Randophos HS Universal	Corrosion inhibitor				
Geminox, Frankreich	Inibal	Corrosion inhibitor, suitable for aluminium.	1-2			
Betz Dearborn, Belgien	Sentinel X 100	Corrosion inhibitor for hot water heating systems, also suitable for aluminium.	1,1			
Fernox	Copal	Corrosion inhibitor, also suitable for aluminium.	1			
Cillit Wassertechnik	Cillit-HS Combi	Corrosion inhibitor	0,5			
Other additives						
Fernox	Restorer Superfloc Universal Cleanser	Cleaning agent (for sludge removal), also suitable for aluminium.	1-2			
Fernox	Superconcentrate Central heating Protector	Reduces limescale precipitation, also suitable for aluminium.				

5.5 Detecting corrosion by CFCs

Halogenated hydrocarbons in the combustion air cause surface corrosion of the affected metal components. The combustion chamber and the boiler heating surfaces (including stainless steel) are particularly susceptible to this type of attack as are the metal components in the flue socket, flue joints and the chimney.

The presence of halogenated hydrocarbons in the combustion air results in the production of highly caustic hydrochloric acid and - depending on the composition of the combustion air - hydrofluoric acid which build up inside the boiler and remain active over long periods of time.

In order to limit the damage, the source of the contamination must be located and sealed off. If this is not possible, the combustion air must be brought to the appliance from an unaffected area.

Industrial sources	
Dry cleaners	Trichloroethylene, tetrachlo- roethylene, fluorinated hydro- carbons
Degreasing baths	Perchloroethylene, trichlo- roethylene, methyl chloroform
Printers	Trichloroethylene
Hairdressers	Aerosol propellants, hydrocar- bons containing chlorine and fluorine (Freon)
Sources in the home	
Cleaning and degreasing agents	Perchloroethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid
Hobby workshops	
Solvents and thin- ners	Various chlorinated hydrocarb
Aerosol sprays	Chlor-fluorinated hydrocar-

Halogens can occur in the following areas:



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