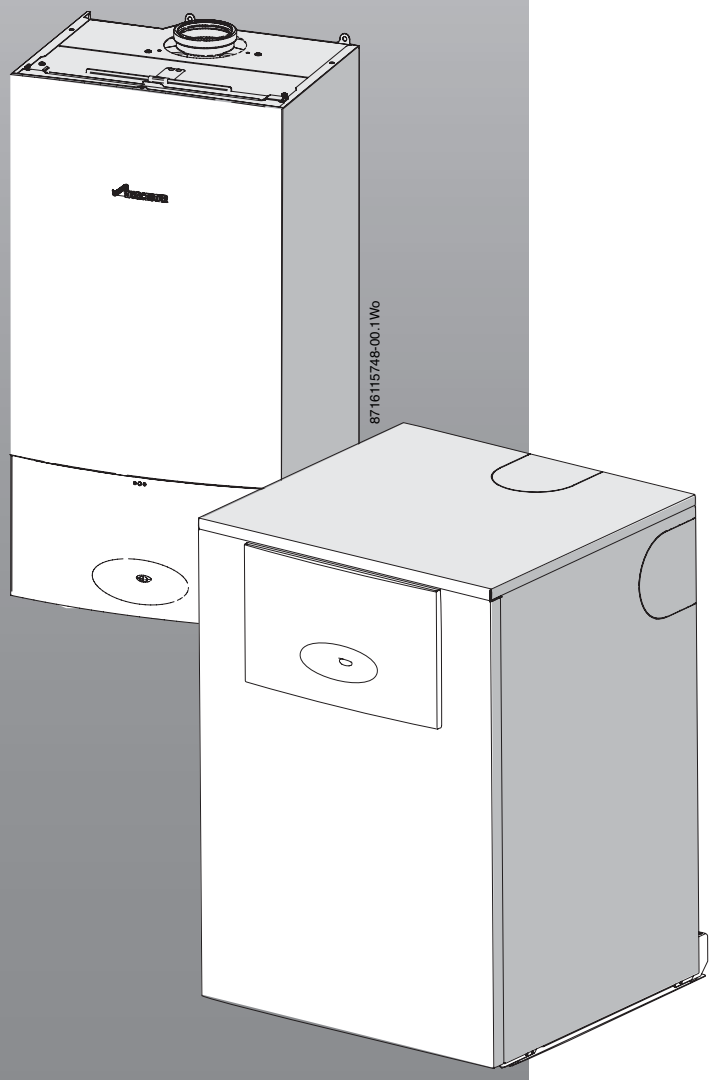
ENGINEER'S SERVICE BOOKLET

FLOOR MOUNTED & WALL HUNG RSF GAS FIRED CONDENSING BOILERS

GREENSTAR CDi RANGE

FOR CENTRAL HEATING SYSTEMS AND INDIRECT FED DOMESTIC HOT WATER



This Service booklet covers the following boiler ranges:

CDi Combi N.G.

CDi Combi L.P.G.

CDi System N.G.

CDi System L.P.G.

CDi Regular N.G.

CDi Regular L.P.G.

Highflow CDi N.G.

Highflow CDi L.P.G.

FS CDi Regular N.G.

FS CDi Regular L.P.G.

UK/IE

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

WORCESTER
Bosch Group

8 716 115 748 (2009/09)

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1 EXPLANATION OF SYMBOLS AND SAFETY PRECAUTIONS

1.1 EXPLANATION OF SYMBOLS

WARNING SYMBOLS

Safety instructions in this document are framed and identified by a warning triangle which is printed on a grey background.

Electrical hazards are identified by a lightning symbol surrounded by a warning triangle.

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

- **NOTICE** indicates possible damage to property or equipment, but where there is no risk of personal injury.
- **CAUTION** indicates possible personal injury.
- **WARNING** indicates possible severe personal injury.
- **DANGER** indicates possible risk to life.

IMPORTANT INFORMATION

Notes contain important information in cases where there is no risk of personal injury or material losses and are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

ADDITIONAL SYMBOLS

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

Tab. 1

1.2 SAFETY PRECAUTIONS

IF YOU SMELL GAS

- ▸ Do not smoke or strike matches
- ▸ Do not turn electrical switches on or off
- ▸ Put out naked flames
- ▸ Open doors and windows
- ▸ Keep people away from the affected area
- ▸ Turn off the control valve at the meter
- ▸ Call your gas company

or

- ▸ Call 0800 111 999

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 LAYOUT OF BOILER

2.1 CDi COMBI BOILERS

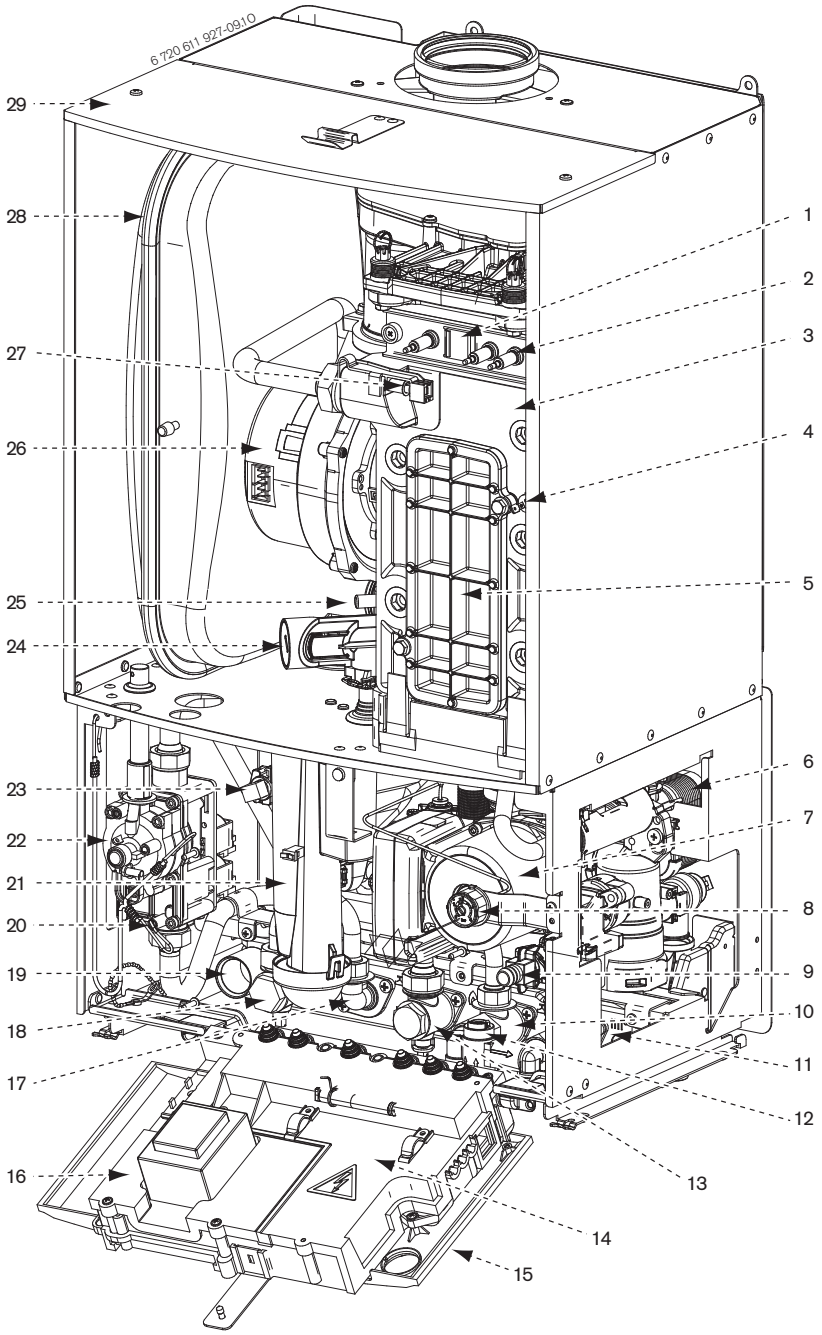


Fig. 1 CDi combi layout

1 Flame viewing window
2 Ignition electrode and flame sense electrode
3 Heat exchanger
4 Overheat thermostat
5 Access point for cleaning heat exchanger
6 Plate to plate DHW heat exchanger
7 Pump
8 System pressure gauge
9 Drain point
10 Mains cold water in
11 CH return
12 Charging link assembly
13 Gas inlet connection 22 mm compression
14 Cover for external wiring connections
15 Control panel in service position
16 Access cover for transformer & PCB
17 DHW out
18 CH flow
19 Trap / syphon outlet connection (22 mm plastic pipe)
20 Inlet pressure test point
21 Trap / syphon
22 Gas valve
23 DHW temperature sensor
24 Air / gas adjustment screw
25 Testing point for fan pressure
26 Fan
27 Primary sensor
28 Expansion vessel
29 Removable top case panel for servicing

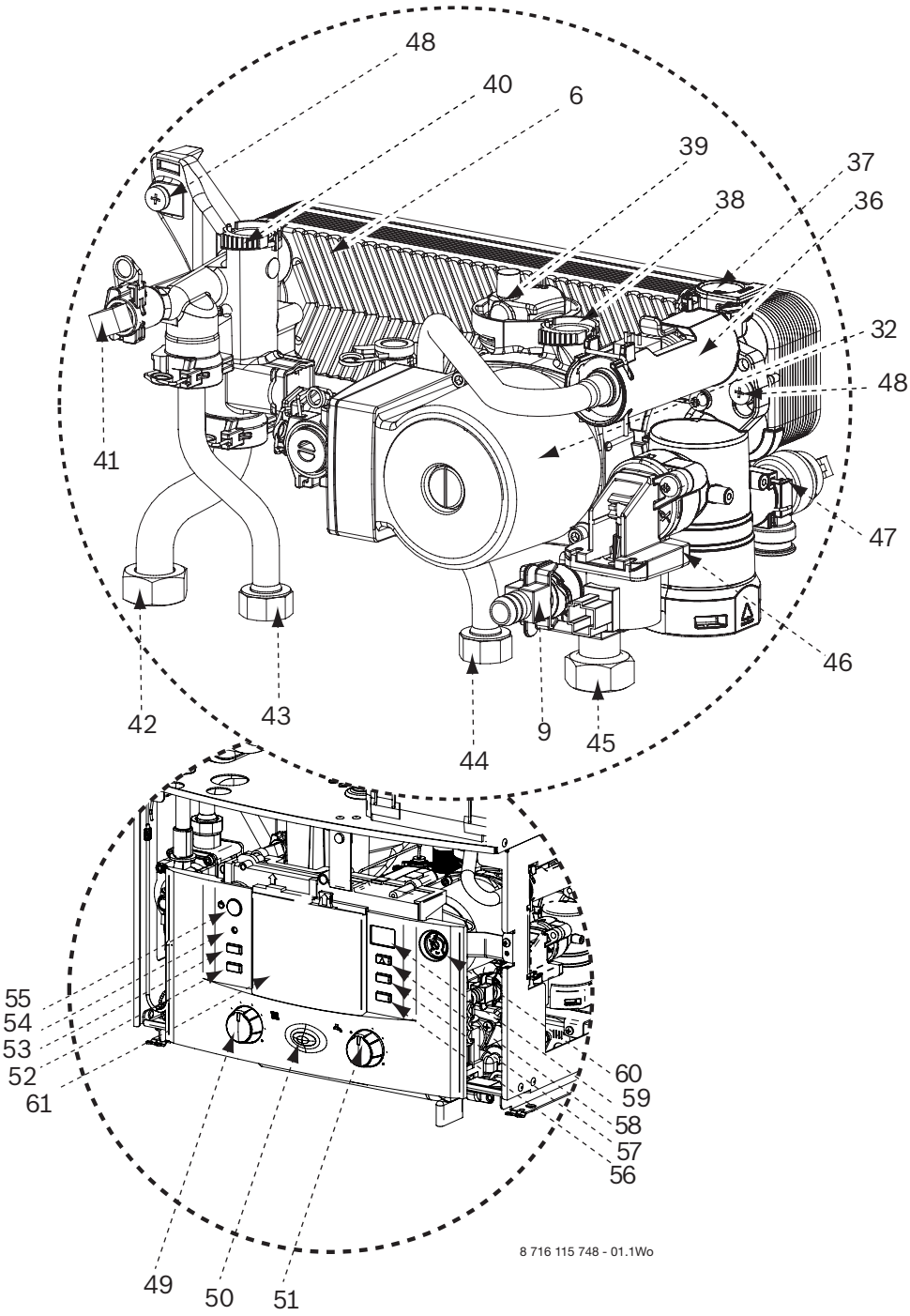


Fig. 2 This diagram shows the compact hydraulics and controls with the mantel and fascia panel removed

6 Plate to plate DHW heat exchanger
9 Drain point
32 Pump, modulating
36 Flow turbine
37 Unused port
38 Return connection to boiler heat exchanger
39 Auto air vent
40 Flow connection from boiler heat exchanger
41 DHW sensor
42 CH flow connection to isolation valve
43 DHW out connection
44 Cold water in connection
45 CH return connection to isolation valve
46 Diverter valve housing
47 Pressure relief valve
48 Compact hydraulic mounting screw (2) to boiler
49 CH temperature control
50 Mains on/off indicator/diagnostic light (blue)
51 DHW temperature control
52 Central heating boost button
53 Service button
54 Burner on indicator light (green)
55 Master switch on/off
56 Holiday button
57 ECO button
58 Fault reset button
59 Display
60 System pressure gauge
61 Position for optional programmer

2.2 CDi SYSTEM BOILERS

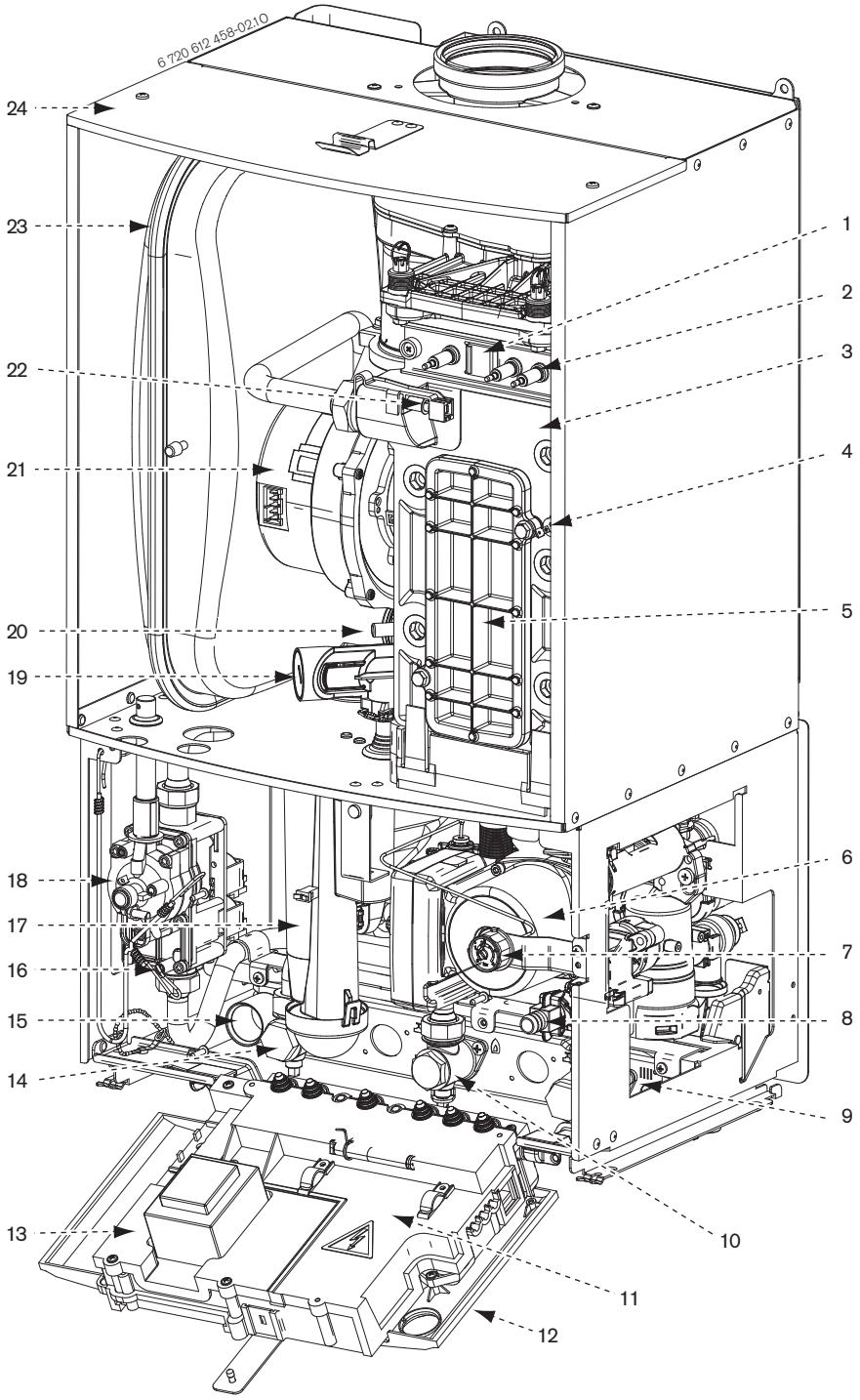


Fig. 3 CDi System layout

1 Flame viewing window
2 Ignition electrode and flame sensing electrode
3 Heat exchanger
4 Overheat thermostat
5 Access point for cleaning heat exchanger
6 Pump
7 System pressure gauge
8 Drain point
9 Central Heating return
10 Gas inlet connection (22mm compression)
11 Cover for external wiring connections
12 Control panel in service position
13 Access cover for transformer and PCB
14 Central Heating flow
15 Trap /Syphon outlet connector (22mm plastic pipe)
16 Inlet pressure test point
17 Trap / Syphon
18 Gas valve
19 Air / Gas adjustment screw
20 Test point for fan pressure
21 Fan
22 Primary sensor
23 Expansion vessel
24 Removable top panel for servicing

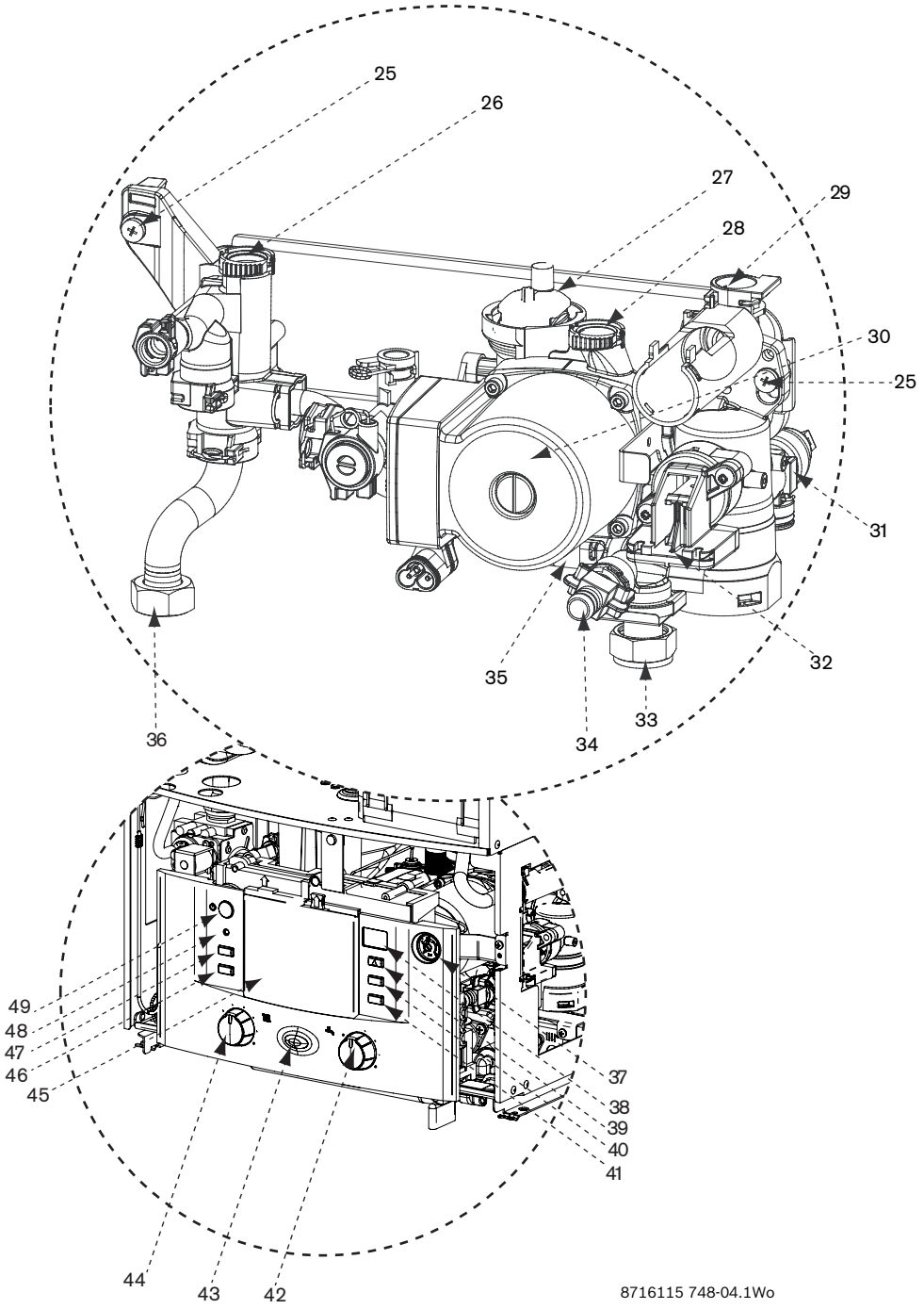


Fig. 4 This diagram shows the compact hydraulics and controls with the mantel and fascia panel removed

25 Compact hydraulic mounting screw (2) to boiler
26 Flow unit
27 Auto air vent
28 Return connection to boiler heat exchanger
29 Unused port
30 Pump
31 Pressure relief valve
32 Diverter valve housing
33 Central Heating return connection to service valve
34 Drain point
35 Internal bypass within plastic moulding
36 Central Heating flow connection to service valve
37 System pressure gauge
38 Display
39 Fault reset button
40 ECO button
41 Holiday button
42 DHW temperature control
43 Power ON/OFF indicator / diagnostic light (blue)
44 Central Heating temperature control
45 Position for option controller
46 Central heating boost button
47 Service button
48 Burner on indicator light (green)
49 Power ON/OFF switch

2.3 CDi REGULAR BOILERS

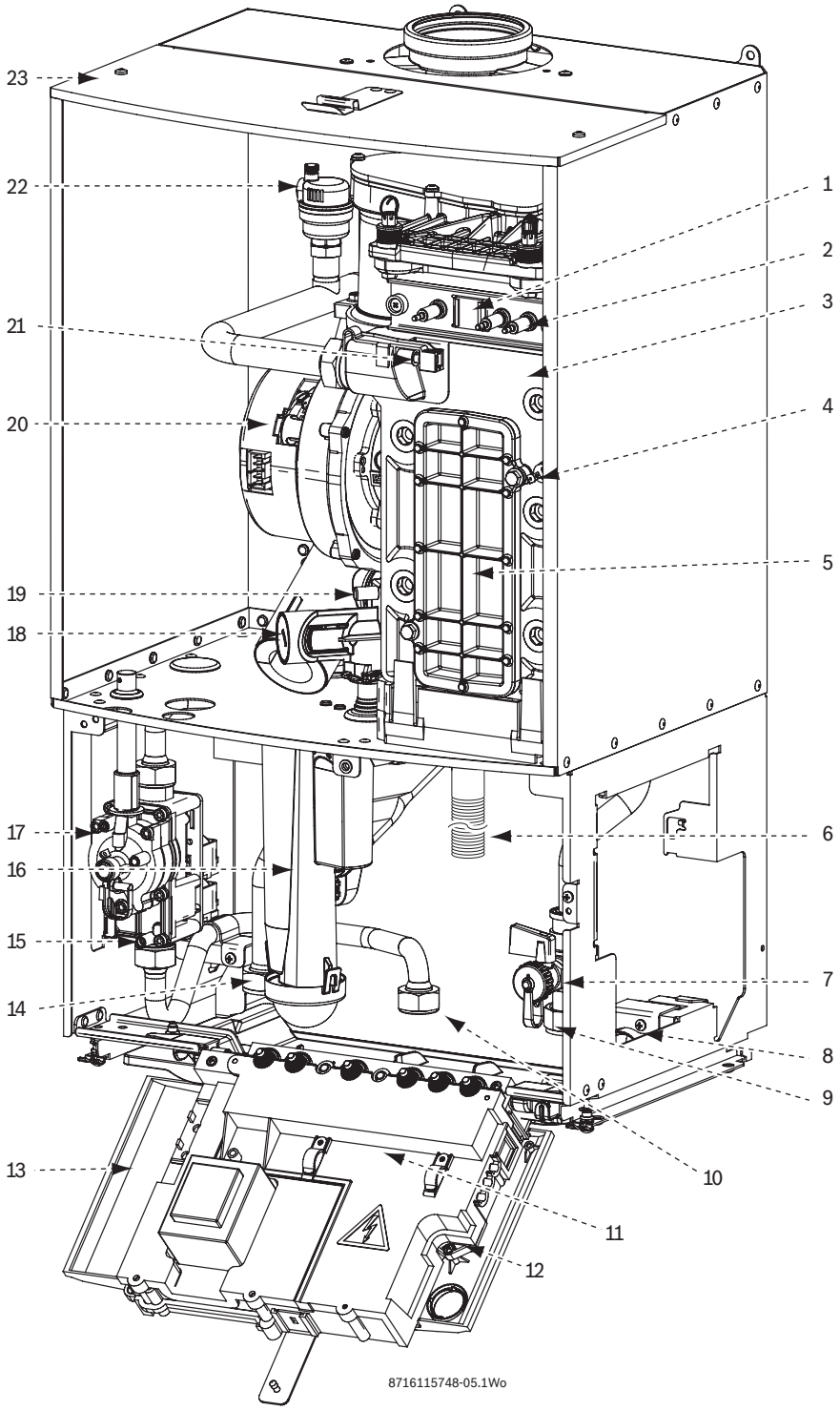


Fig. 5 The diagram shows the controls in the service position with the mantle and fascia panel removed

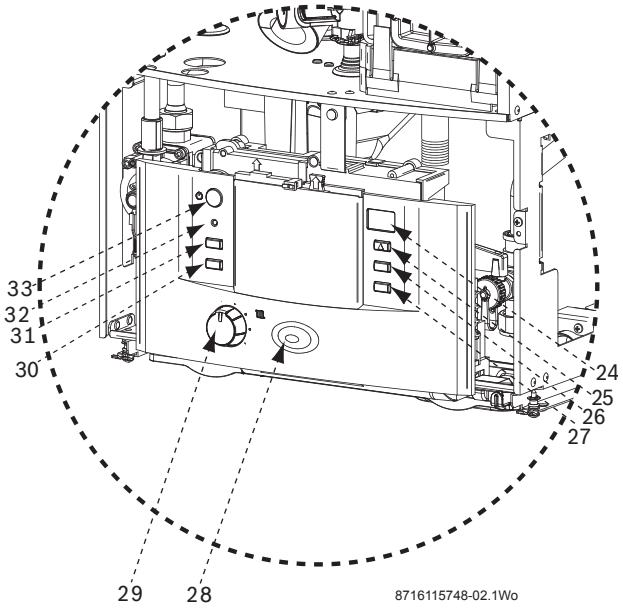


Fig. 6 Front of the control panel

1 Flame viewing window
2 Ignition electrode and flame sense electrode
3 Heat exchanger
4 Overheat thermostat
5 Access point for cleaning heat exchanger
6 Condensate hose
7 Drain point
8 Trap / syphon outlet connection (22 mm plastic pipe)
9 CH return
10 Gas inlet connection 22 mm compression
11 Cover for external wiring connections
12 Control panel in service position
13 Access cover for transformer & PCB
14 CH flow
15 Inlet pressure test point
16 Trap / syphon
17 Gas valve
18 Air / gas adjustment screw
19 Testing point for fan pressure
20 Fan
21 Primary sensor
22 Auto air vent
23 Removable top case panel for servicing
24 Display
25 Fault reset button
26 Non functional on CDi Regular
27 Holiday button
28 Mains On/off indicator/diagnostic light (blue)
29 CH temperature control
30 Central heating boost button
31 Service button
32 Burner on indicator light (green)
33 Master switch on/off

2.4 HIGHFLOW CDi COMBI BOILER

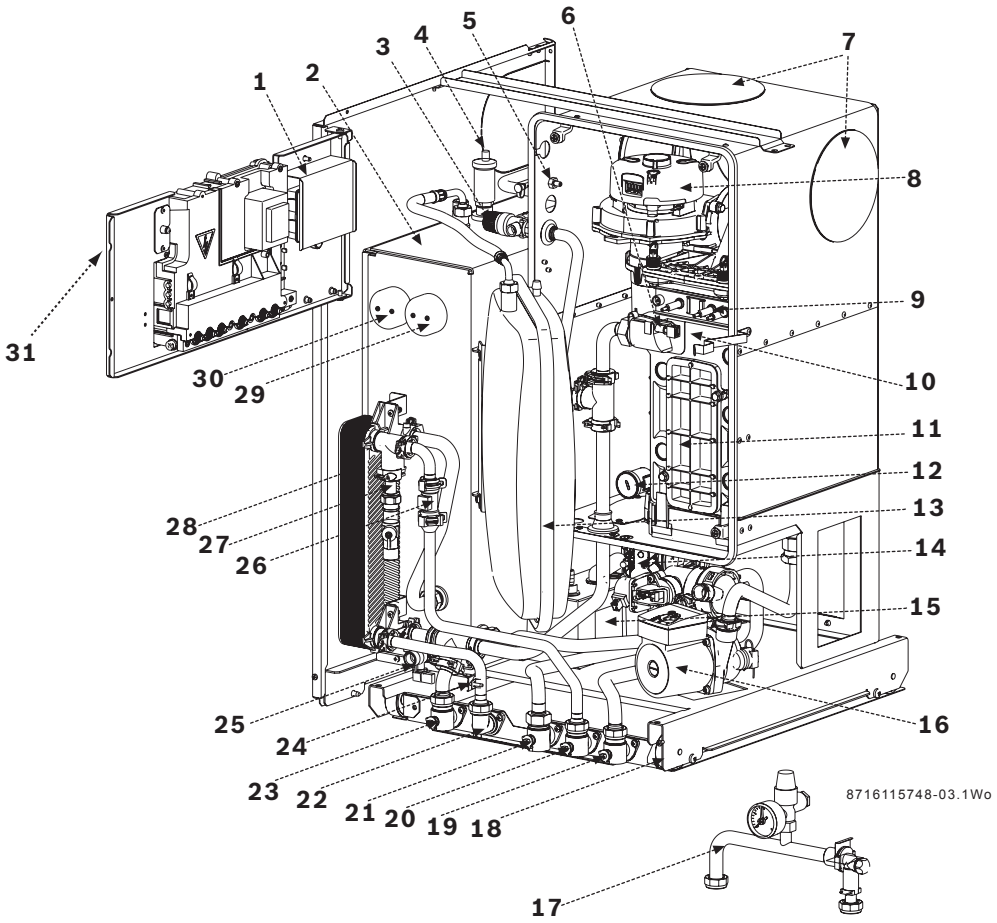


Fig. 7 Highflow CDi boiler, controls in service position

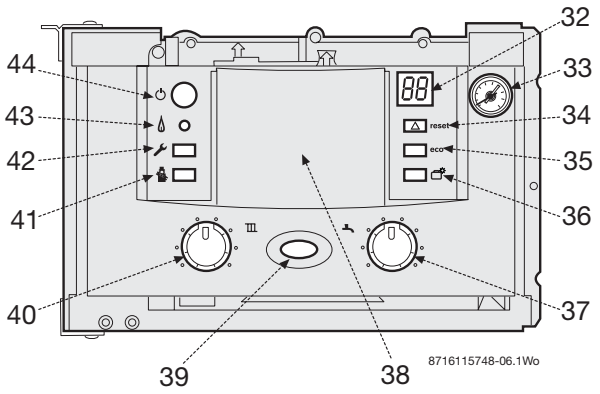


Fig. 8 Highflow CDi control panel

1 Cover - installer module
2 Heat store
3 Pressure relief valve
4 Auto air vent
5 Flue gas sampling point
6 Primary sensor
7 Flue blanking plate
8 Fan
9 Ignition electrodes & flame sensing electrode
10 Heat exchanger
11 Heat exchanger access panel
12 Air/Gas adjustment screw
13 Expansion vessel
14 Gas valve
15 Condensate pump assembly
16 Circulating pump
17 Optional filling link
18 Runner wheels on mounting frame
19 CH return isolating valve
20 Mains water inlet isolating valve
21 Gas isolating valve
22 DHW outlet
23 CH flow isolating valve
24 DHW sensor
25 Boiler/tank drain & connection point for filling link
26 Flow turbine
27 Filling link isolating valve
28 DHW heat exchanger
29 Tank overheat thermostat
30 Tank temperature sensor
31 Control panel
32 Display
33 System pressure gauge
34 Reset button
35 ECO button
36 Not used
37 DHW temperature control
38 Position of optional controller
39 Mains ON/OFF indicator & fault diagnostic light (blue)
40 CH temperature control
41 CH boost button
42 Service button
43 Burner ON indicator light (green)
44 Master ON/OFF switch

2.5 FS CDi REGULAR BOILERS

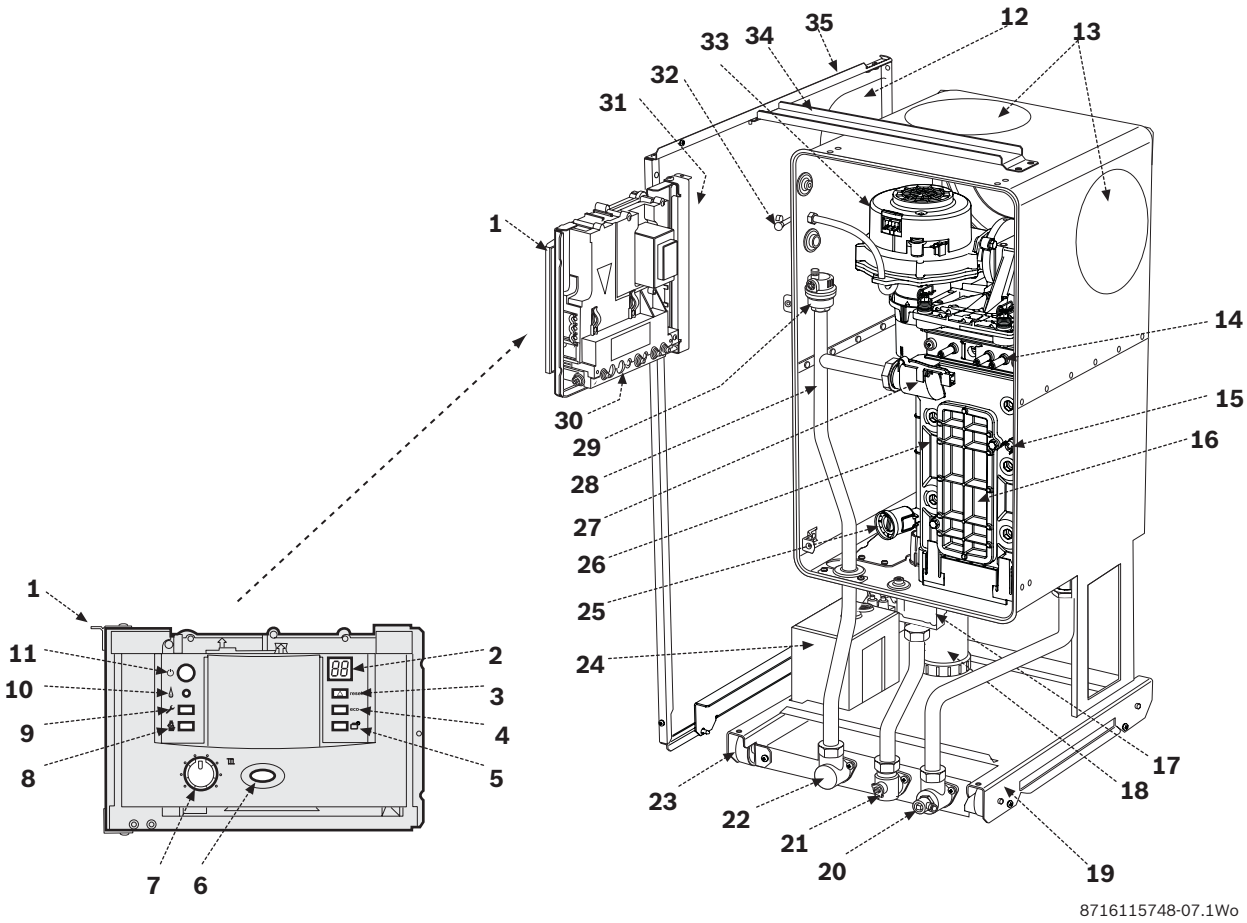


Fig. 9 FS CDi Regular boiler layout

1 Control panel
2 Display
3 Reset button
4 Service function only
5 Service function only
6 Mains ON/OFF indicator & fault diagnostic light (blue)
7 Temperature control
8 Boost button
9 Service button
10 Burner ON indicator light (green)
11 Master ON/OFF switch
12 Flue knock-out panel
13 Flue outlet blanking covers
14 Ignition electrodes & flame sensing electrode
15 Heat cell high limit thermostat
16 Inner case
17 Gas valve
18 Condensate syphon
19 Mounting frame
20 Return connector
21 Gas isolating valve
22 Flow connector
23 Runner wheel
24 Condensate pump assembly
25 Air/Gas adjustment screw (sealed)
26 Heat cell
27 Primary sensor
28 Flow pipe
29 Auto air vent
30 Heatronic III series control board
31 Data label
32 Flue gas sampling point
33 Combustion air modulating fan
34 Casing support strut
35 Left hand side panel

3 OPERATION - CDi

3.1 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.

3.2 Display messages

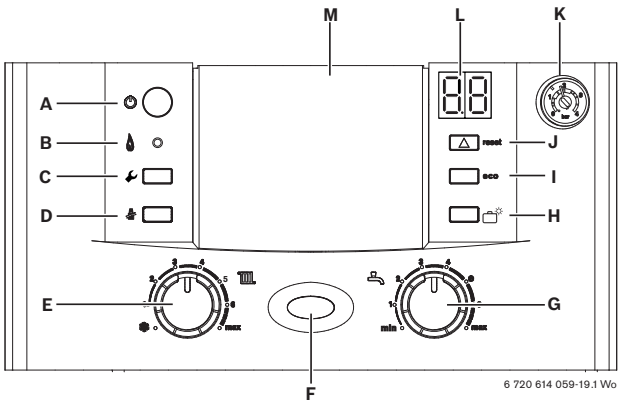
The 7-Segment-Display has following display messages (table 2 and 3):

Displayed value	Description	Range
digit, dot followed by letter	Service function	
letter followed by digit or letter	Error code	
two digits	decimal value e.g. flow temperature	00..99
U followed by 0..9	decimal value; 100..109 will be displayed as U0..U9	0..109
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.: 1...69..69 for 169)	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)	

Tab. 2 Display messages

Special messages	Description
0-	Key acknowledgement after pressing one button (except **reset** button)
--	Key acknowledgement after pressing two buttons simultaneously
C0	Key acknowledgement after pressing button longer than 3 seconds (storage function)
00	The display shows alternatively the CH flow temperature and 00. The appliance works continuously at the minimum power (see service function **2.F**).
ee	The display shows alternatively the CH flow temperature and ee. The appliance works continuously at the maximum power (see service function **2.F**).
b0	Appliance is in Air purge mode, see service function **2.C.**
AF	The display shows alternatively the CH flow temperature and AF . The Syphon-fill programme is active. See service function **4.F**
SE	The display shows alternatively the CH flow temperature and SE reminding that the next service is due. The burner service interval of 2324 hours has run out. See service function **5.F**.
01	The display shows alternatively the CH flow temperature and 01 . The pump is blocked. See error E9.
Cd	The display shows alternatively the CH flow temperature and Cd. The gradient limitation is active. The primary temperature is rising too fast and the burner has switched off for 2 minutes. See error E9.

Tab. 3 Special display messages



3.3 Operating elements CDi (Wall hung)

Fig. 10 CDi control panel

A On/off button
B Burner indicator (GREEN)
C Service button (ORANGE)
D Central heating boost button (ORANGE) (in service mode for displaying and storing values, for selection of max. or min. heat output)
E Central heating temperature control
F On/off and fault indicator (BLUE)
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 ECO button (GREEN) (in service mode for selecting upwards)
J Reset button (RED)
K System pressure gauge
L Display
M Cover or optional programmer

Modifications of appliance parameters only become active after saving.

3.4 First service level

3.4.1 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.

3.4.2 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.

3.4.3 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.

3.5 Second service level

3.5.1 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.

3.5.2 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 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.

3.5.3 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.

3.6 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 3.1).

3.7 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.

3.8 RESET THE APPLIANCE

- Press the **reset** button for 3 seconds and release. After releasing button the appliance re-starts without parameter reset. (For a parameter reset see section 3.6).

4 OPERATION - HIGHFLOW CDi and FS CDi REGULAR

4.1 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.

4.2 Display messages

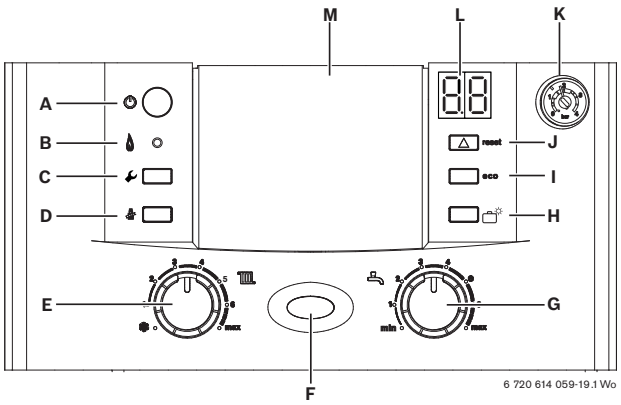
The 7-Segment-Display has following display messages (table 2 and 3):

Displayed value	Description	Range
digit, dot followed by letter	Service function	
letter followed by digit or letter	Error code	
two digits	decimal value e.g. flow temperature	00..99
U followed by 0..9	decimal value; 100..109 will be displayed as U0..U9	0..109
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.: 1...69..69 for 169)	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)	

Tab. 4 Display messages

Special messages	Description
88	Key acknowledgement after pressing one button (except **reset** button)
88	Key acknowledgement after pressing two buttons simultaneously
88	Key acknowledgement after pressing button longer than 3 seconds (storage function)
88	The display shows alternatively the CH flow temperature and 88. The appliance works continuously at the minimum power (see service function **2.F**).
88	The display shows alternatively the CH flow temperature and 88. The appliance works continuously at the maximum power (see service function **2.F**).
88	Appliance is in Air purge mode, (see service function **2.C**)
88	The display shows alternatively the CH flow temperature and 88. The Syphon-fill programme is active. See service function **4.F**.
88	When the control is in internal heat bank demand and syphon fill is not active, then the seven segment display will alternate between the primary temperature and the tank demand symbol

Tab. 5 Special display messages



4.3 Operating elements

Fig. 11 Highflow CDi control panel

A On/off button
B Burner indicator (GREEN)
C Service mode button (ORANGE)
D Central heating boost button (ORANGE) (in service mode for displaying and storing values, for selection of max. or min. heat output)
E Central heating temperature control
F On/off and fault indicator (BLUE)
G DHW temperature control (Highflow only)
H Holiday button (Service mode back button)
I ECO button (GREEN) (Service mode, next button)
J Reset button (RED)
K System pressure gauge
L Display
M Cover or optional programmer

Modifications of appliance parameters only become active after saving.

4.4 First service level

4.4.1 Display the value of the service function

- Press the button for more than 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 up (service next) or button for going down (service previous) 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.

4.4.2 Set and store values in 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 longer than 4 seconds until appears on the display. After releasing the button goes out and the value is stored. The first service level is active.

4.4.3 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.

4.5 Second service level

4.5.1 Display the value of the service function

- Press the button for more than 10 seconds or (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.

4.5.2 Set and store values in 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 4 seconds until appears on the display. After releasing, the button goes out and the value is stored. The second service level is active.

4.5.3 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 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.

4.6 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 3.1).

4.7 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.

4.8 RESET THE APPLIANCE

- Press the **reset** button for 3 seconds and release. After releasing button the appliance re-starts without parameter reset. (For a parameter reset see section 3.6).

5 BOILER SERVICE FUNCTIONS - CDi COMBI & SYSTEM BOILER

5.1 FIRST SERVICE LEVEL (PRESSING THE BUTTON FOR APPROX. 10 SECONDS)

	Description	Display	Range adjustable from - to/ Description	Reset value (after parameter reset)
1.A	Max. output (heating)	*-U0	min adjustable output - 100% (not on 37 and 42 Combis)	depends on appliance type
1.b	Max. output (hotwater - combi only)	*-U0	min adjustable output - 100%	U0
1.C	Pump map (heating) (wall hung combi & system only) (see section 5.3.1, **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	01-03	1 - 3	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: 1K ≙ 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

Tab. 6 CDi Service - first level

5.2 SECOND SERVICE LEVEL (ENTER AT THE FIRST SERVICE LEVEL AND PRESS THE ECO BUTTON AND SIMULTANEOUSLY FOR 3 SECONDS)

	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 41**1 062** 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-U0	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)	00-03	0-3 min	03

Tab. 7 CDi Service - second level

5.3 EXPLANATION OF SERVICE FUNCTIONS

5.3.1 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 **U0**.

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)

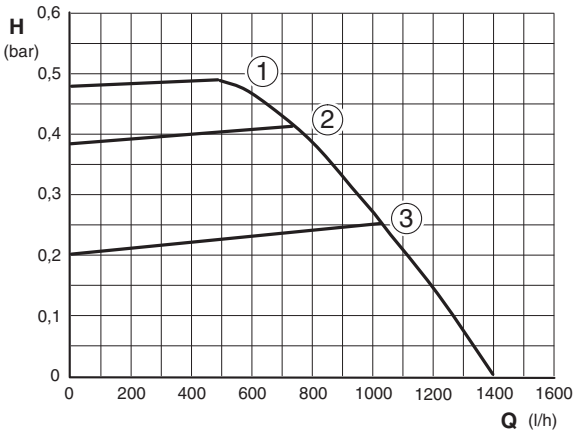


Fig. 12 Constant pressure

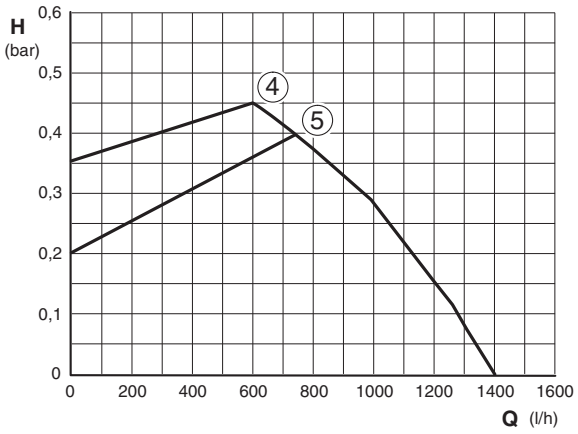


Fig. 13 Proportional pressure

1-5 Characteristics
H Pressure
Q Water circulation rate

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**

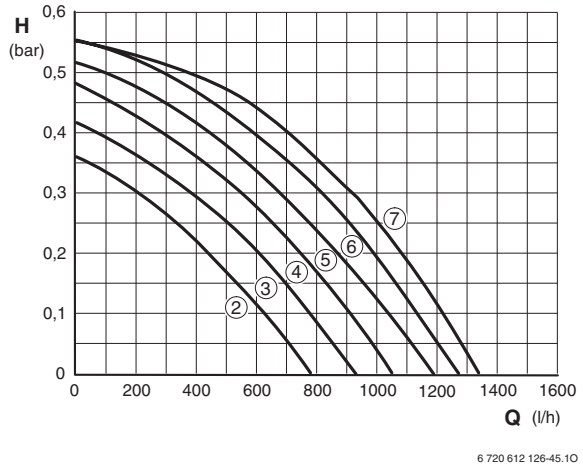


Fig. 14 Characteristics

2-7 Characteristics
H Pressure
Q Water circulation rate

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

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  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 . 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  . 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: 1K ≙ 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.

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 DT10/20. 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).

5.3.2 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 3.6.

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.

6 BOILER SERVICE FUNCTIONS CDi, HIGHFLOW CDi & FS CDi REGULAR

6.1 FIRST SERVICE LEVEL (PRESSING THE BUTTON FOR APPROX. 10 SECONDS)

	Description	Display	Range adjustable from - to/ Description	Reset Value (after parameter reset)
1.A	Max. output (heating)	*-U0	min adjustable output - 100%	depends on appliance type
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: 1K ≙ 1 °C)	10 K
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.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

Tab. 8 Highflow CDi & FS CDi Regular service - first level

6.2 SECOND SERVICE LEVEL (ENTER AT THE FIRST SERVICE LEVEL AND PRESS THE ECO BUTTON AND SIMULTANEOUSLY FOR 3 SECONDS)

	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 41**1 062** 0	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-U0	read only
AA	Primary hot water temperature			
AB	Domestic hot water temperature			

Tab. 9 Highflow CDi & FS CDi Regular service - second level

6.3 EXPLANATION OF SERVICE FUNCTIONS

6.3.1 FIRST SERVICE LEVEL

1.A MAX. OUTPUT (HEATING)

The heating output can be set to any level between minimum rated heat output and maximum 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, depending on appliance type.

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 alternates between  and 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” (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**.
- **Minimal mode**: the appliance runs constantly at minimum output.
  The display shows **1**. The 2-digit display alternates between the CH flow temperature and . 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  . 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: 1K ≙ 1 °C.

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

3.F BURNER OFF AFTER DHW DEMAND (HOT WATER) (CDi COMBI & HIGHFLOW CDi ONLY)

The appliance is supplied with the hot water duration set to one 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

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

▸ Only deactivate the syphon filling program in order to carry out service work.

▸ Always re-activate syphon filling program once servicing is complete.

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.

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 DT10/20. 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.

6.3.2 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 7 to 10 of order number) 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 3.6.

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.

7 RECTIFYING FAULTS

7.1 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 3.1).

7.2 Summary

7.2.1 APPLIANCE FAULTS

Appliance faults	Category	Page
A1	1	29
A5	3	30
A6	2	31
A7	3	32
A8	2	33
b1	2	35
C6	2	36
CC	2	37
d5 CDi HF & FS	2	38
d6 CDi HF only	2	39
E2	2	40
E9	4	41
EA	4	44
F0	2/4	48
F7	4	49
FA	4	50
Fd	4	51

7.2.2 Faults that are not displayed

Appliance faults	Page
Excessive burner noise, rumbling noises	50
Flow noises	50
Heating up of last radiators in system too slow	51
Flue gas levels incorrect, CO level too high	51
Ignition too harsh, ignition poor	52
Condensation in the flue pipe	53
Inadequate hot water outlet temperature (combi boiler)	54

Tab. 10 Undisplayed faults

CONDENSATE PUMP (Floor standing appliances) - OPERATING LIGHTS AND FAULT CONDITIONS **Ready for operation = Steady green light** **Fault = Steady red light** **Pump running = Flashing green light**			
Operating lights		Cause	Solution
Green	Red		
Off	Off	Mains power missing	Insert plug Check mains and fuse
Flashing	Flashing	Dry - run (possible air in system)	Pump starts automatically after 1 minute
On	Flashing	Pump blocked	Inspect tank pump inlet remove dirt
On	On	Level exceeds alarm level	Pressure hose / non return valve blocked (clean or unkink)
Off	Flashing	Pump blocked and alarm level exceeded	Inspect tank pump inlet remove dirt

Tab. 11 Condensate pump

Programmer faults	Page
Set room temperature not reached	54
Set room temperature exceeded by a large amount (230V on/off room stat)	55
Excessive fluctuations in room temperature	55

Tab. 12 Programmer faults

7.3 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 CO_2 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

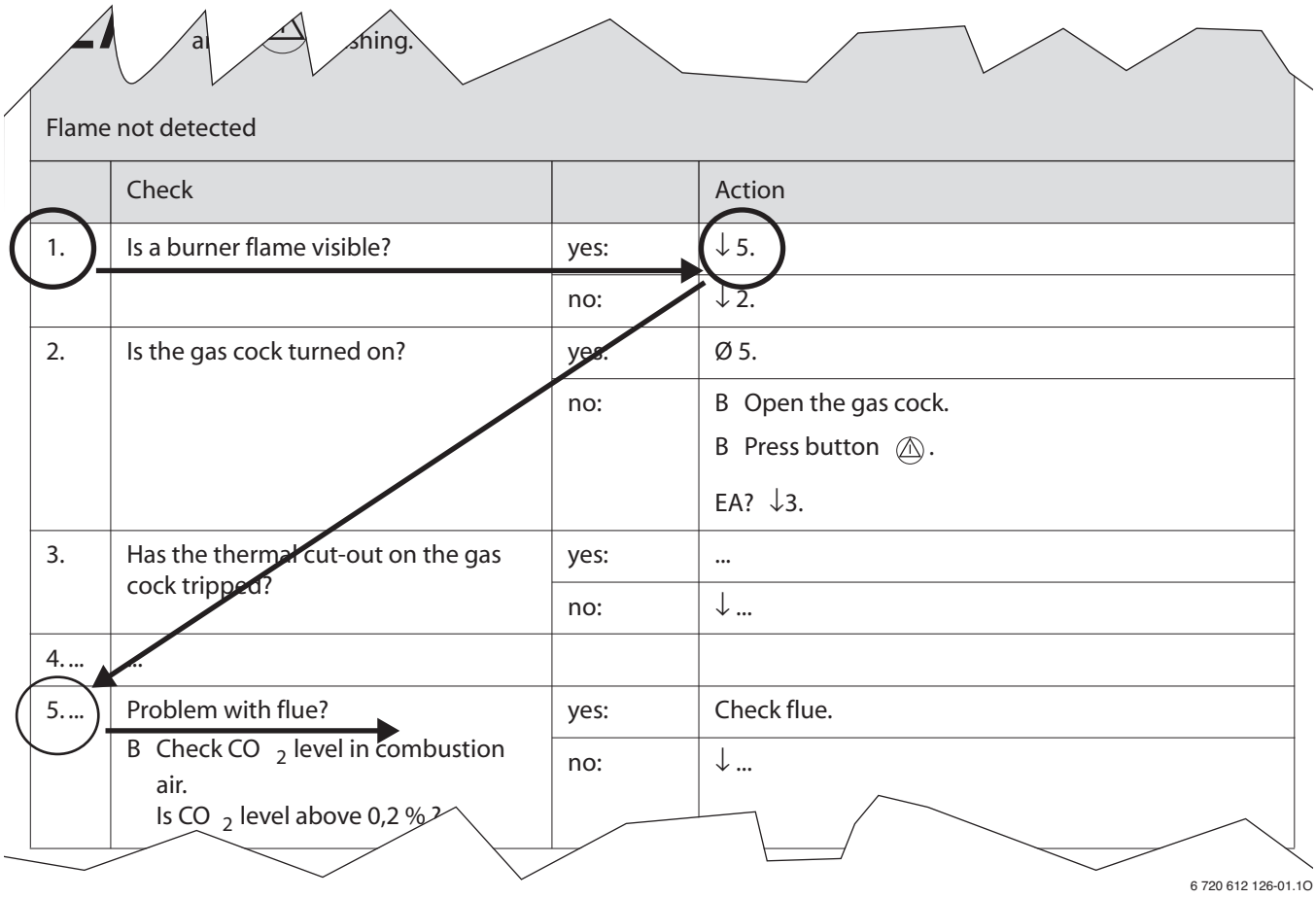


Fig. 15 Example of fault code table

7.4 ERROR CODES ON THE DISPLAY

A1 **and fault indicator LED are 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. ▶ Fill system, bleed and re-pressurise (see Installation Instructions). ▶ Turn ON appliance A1? go to 2
		no:	go to 2
2.	Pump seized or sticking?	yes:	Free/release pump
		no:	go to 3
3.	Audible bearing damage on pump	yes:	▶ 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 4
4.	Activate venting sequence	yes.	▶ Select in the first service level, service function 2.C (Air Purge mode - see page 25). ▶ Select the value 1 and store. ▶ Exit the service function. ▶ The boiler vents for eight minutes. ▶ Vent radiators manually.

Tab. 13 A1 Error codes

A5 **and fault indicator LED are flashing. Appliance still available for heating demands.**

Tank (Heat Bank) NTC sensor defective.

	Check		Action
1.	Is the tank NTC sensor connection corroded, damaged or dirty?	yes:	Change relevant parts A5? go to 2
		no:	go to 2
2.	▶ 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 43?	yes:	▶ 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 3
3.	▶ Unplug the NTC sensor from the cable. ▶ Check the resistance of the NTC sensor. Does the value match the one in table 43?	yes:	▶ Change the 20 pin connector lead assembly. ▶ Reconnect the appliance. ▶ Turn the appliance ON.
		no:	▶ Change the NTC sensor. ▶ Reconnect the appliance. ▶ Turn the appliance ON.

Tab. 14 A5 Error codes

A6 **and fault indicator LED are flashing. Appliance NOT available for demands.**

External under floor heating thermostat defective.

	Check		Action
1.	▶ 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 2
		no:	▶ Ensure that the link is securely connected to ST8/8-9 ▶ Reconnect the appliance electrical connection. ▶ Power ON the appliance. A6? go to 4
2.	▶ Disconnect lead to thermostat. Check the thermostat for continuity?	yes:	▶ Reconnect lead to thermostat. go to 3
		no:	▶ Change thermostat. ▶ Reconnect the lead to thermostat. ▶ Reconnect the appliance electrical connection. ▶ Turn the appliance ON. A6? go to 4
3	▶ Unplug the harness connector that connects the thermostat to the control board. Check the harness for continuity?	yes	A6? go to 4
		no	▶ Change or repair wiring to the thermostat. ▶ Reconnect the appliance electrical connection. ▶ Power ON the appliance. A6? go to 4
4	The control board is damaged.		▶ 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.

Tab. 15 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.

	Check		Action
1.	▸ Check if the water NTC connector corroded, damaged or dirty.	**yes:**	▸ Change relative parts. A7? go to 2
		no:	go to 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 38, page 71?	**yes:**	▸ Connect the boiler electrical connection. ▸ Switch ON the appliance. ▸ Make a note of the altered service function settings (see table 6 on page 18) 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 3
3.	▸ Un-plug NTC sensor from cable. ▸ Check resistance of NTC sensor. Does the value match the ones described in table 38, page 71?	**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.

Tab. 16 A7 Error codes

A8 and fault indicator LED are flashing.

Bus communication to the programmer interrupted (set value not received)

	Check		Action
1.	▶ 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. Are terminals B being used, the centre terminal must not be used for bus connections. Check that terminals B are connected on the appliance and programmer. ▶ Is there continuity	**yes:**	A8? go to 2
		no:	▶ Wire up or correct bus cable. ▶ Reconnect appliance power. ▶ Switch on appliance. A8? go to 2
2.	Where multiple bus modules are installed: ▶ 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 3
		no:	▶ Cable between bus module and branch box is defective. ▶ Repair or replace cable. ▶ Reconnect appliance power. ▶ Switch on appliance. A8? go to 3
3.	Where multiple bus modules are installed: ▶ 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 4
		no:	▶ Cable between the branch box and programme is defective. ▶ Repair or replace cable. ▶ Reconnect appliance power. ▶ Switch on appliance. A8? go to 4
4	Has the programmer been replaced?	**yes:**	A8? go to 5
		no:	▶ Switch off appliance ▶ Disconnect electrical power ▶ Replace programmer ▶ Reconnect appliance power ▶ Switch on appliance A8? go to 5

Tab. 17 A8 Error codes

A8 and fault indicator LED are flashing.

Bus communication to the programmer interrupted (set value not received)

	Check		Action
5	Has the bus module been replaced	**yes:**	A8? go to 6
		no:	▶ Switch off appliance ▶ Disconnect electrical power ▶ Replace bus module ▶ Reconnect appliance power ▶ Switch on appliance A8? go to 5
6	The PCB control board is faulty		▶ 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

Tab. 17 A8 Error codes

b1 **and fault indicator LED are flashing**

Code plug not detected.

	Check		Action
1.	▶ 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 2
		no:	go to 3
2.	Code plug loose, incorrect or defective.		▶ Switch OFF the appliance. ▶ Fit code plug (correctly), making sure code number is correct (see Appendix). ▶ Switch ON the appliance. b1? go to 3
3.	The PCB is damaged.		▶ Make a note of the altered service function settings (see table 6 on page 18) 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.

Tab. 18 b1 Error codes

C6 and fault indicator LED are flashing.

Fan speed too low

	Check		Action
1.	Fan cable connector correctly connected on fan?	**yes:**	go to 2
		no:	▶ Switch OFF the appliance. ▶ Reconnect connector. ▶ Switch ON the appliance. C6? go to 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 3
		no:	▶ Switch off some electrical appliances. go to 3
3.	Is fan cable defective? ▶ 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 4
		no:	▶ Replace fan cable. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. C6? go to 4
4.	Fan defective.	**yes:**	▶ 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 5
5.	The PCB is damaged.		▶ Make a note of the altered service function settings (see table 6 on page 18) 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.

Tab. 19 C6 Error codes

CC and fault indicator LED are flashing.

Outside temperature sensor fault (open or short circuit)

	Check		Action
1.	▶ 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 2
		no	▶ 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 2
2.	▶ 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 44?	yes	go to 3
		no	▶ Replace the outside temperature sensors. ▶ Power ON the appliance CC? go to 3
3.	▶ 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 4
		no	▶ Replace the cable. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance. CC? go to 4
4.	The PCB control board is damaged.		▶ 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.

Tab. 20 CC Error codes

d5 and fault indicator LED are flashing. (Boiler not available for demands) **Condensate float switch in condensate pump defective**			
	Check		**Action**
1.	▶ Power OFF the appliance. ▶ Disconnect the boiler mains connection. Check if condensate float switch is connected on PCB via ST19 4-5	yes	go to 2
		no	▶ Ensure that ST19 is plugged onto the PCB and the wires properly tightened on the terminal block. ▶ Reconnect the boiler electrical mains ▶ Power ON the appliance d5? go to 4
2.	▶ Disconnect plug on condensate pump. Measure the float switch for continuity. Is there continuity?	yes	▶ Reconnect plug on condensate pump. go to 3
		no	▶ Change condensate pump. ▶ Reconnect condensate pump. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance d5? go to 4
3.	▶ unplug connector ST19. Test harness for continuity. Is there continuity?	yes	d5? go to 4
		no	▶ Change or fix wiring to condensate pump. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance. d5? go to 4
4.	The PCB control board is damaged.		▶ 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.

Tab. 21 d5 Error codes

d6 and fault indicator LED are flashing. (Boiler not available for demands)

Tank overheat thermostat defective

	Check		Action
1.	▶ Power OFF the appliance. ▶ Disconnect the boiler mains connection. Check if thermostat is connected on PCB via ST9	yes	go to 2
		no	▶ Ensure that ST9 is plugged onto the PCB. ▶ Reconnect the boiler electrical mains. ▶ Power ON the appliance d6? go to 4
2.	▶ Disconnect lead on thermostat. Measure the thermostat for continuity. Is there continuity?	yes	▶ Reconnect lead on thermostat. go to 3
		no	▶ Change thermostat. ▶ Reconnect lead on thermostat. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance d6? go to 4
3.	▶ unplug connector ST9. Test harness for continuity. Is there continuity?	yes	d6? go to 4
		no	▶ Change or fix wiring to thermostat. ▶ Reconnect the boiler electrical mains connection. ▶ Power ON the appliance. d6? go to 4
4.	The PCB control board is damaged.		▶ 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.

Tab. 22 d6 Error codes

E2 and fault indicator LED are flashing. **Flow temperature NTC sensor defective.**			
	Check		**Action**
1.	▶ Check if the flow temperature NTC sensor connector is corroded, damaged or dirty.	**yes:**	▶ Change relative parts. E2? go to 2
		no:	go to 2
2.	▶ 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 38, page 71?	**yes:**	▶ Reconnect the boiler electrical connection. ▶ Switch ON the appliance. ▶ Make a note of the altered service function settings (see table 6 on page 18) 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 3
3.	▶ Un-plug NTC sensor from cable. ▶ Check resistance of NTC sensor. Does the value match the ones described in table 38, page 71? ▶ Reconnect the appliance power connection.	**yes:**	▶ 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.

Tab. 23 E2 Error codes

E9 **and button reset and fault indicator LED are flashing.**

Safety temperature circuit has tripped.

	Check		Action
1.	Type of CH system: Is the appliance installed in a fully pumped sealed system?	**yes:**	go to 3
		no:	go to 2
2.	Open vented CH system: Is there enough water in the feed and expansion tank?	**yes:**	go to 4
		no:	▶ Top up system. ▶ Vent appliance. ▶ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to 4
3.	Fully pumped sealed system: Is the heating pressure between 1 and 2 bar (sealed systems)?	**yes:**	go to 4
		no:	▶ Top up system. ▶ Vent appliance. ▶ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. E9? go to 4
4.	Is the pump seized?	**yes:**	▶ 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 5
		no:	go to 5
5.	Lead disconnected from flue safety temperature limiter and/or CH flow safety temperature limiter?	**yes:**	▶ 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 4
		no:	go to 4

Tab. 24 E9 Error codes

E9 **and button reset and fault indicator LED are flashing.**

Safety temperature circuit has tripped.

	Check		Action
6.	▶ 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:**	Connect flue gas safety temperature limiter lead. go to 5
		no:	▶ 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 5
7.	▶ Disconnect lead to CH flow safety temperature limiter. ▶ Measure the CH flow safety temperature limiter for continuity. Resistance small?	**yes:**	Connect CH flow safety temperature limiter. go to 6
		no:	▶ 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 6
8.	▶ 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:**	Reconnect connector. go to 7
		no:	Harness defective. ▶ 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 7
9.	▶ Disconnect the boiler power connection. ▶ Remove fuse SI 3 from appliance PCB control board and test for continuity. Is there continuity?	**yes:**	▶ Remount the fuse. ▶ Reconnect the appliance power connection. ▶ Switch ON the appliance. go to 8
		no:	▶ 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 8

Tab. 24 E9 Error codes

E9 **and button reset and fault indicator LED are flashing.**

Safety temperature circuit has tripped.

	Check		Action
10.	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.

Tab. 24 E9 Error codes

EA and RESET button and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
1.	Is a burner flame visible?	**yes:**	go to 5
		no:	go to 2
2.	Is the gas cock turned on?	**yes:**	go to 3
		no:	▸ Open the gas valve. ▸ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to 3
3.	Is there air in the supply pipe?	**yes:**	▸ Vent supply pipe. ▸ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to 4
		no:	go to 4
4.	**Natural gas models**: measure gas supply at gas valve. Is the pressure OK according to technical data?	**yes:**	▸ 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 5
		no:	▸ 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 5
	LPG models: is the flow rate of the gas supply to the appliance correct?	**yes:**	go to 5
		no:	▸ 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 5

Tab. 25 EA Error codes

EA and RESET button and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
5.	▸ Switch OFF the appliance. ▸ Disconnect the boiler power connection. Is the earth connection correct?	**yes:**	▸ Reconnect the appliance power connection. ▸ Switch ON the appliance. EA? go to 6
		no:	▸ 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 6
6.	Is the condensate trap blocked?	**yes:**	▸ 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 7
		no:	go to 7
7.	Is diaphragm in air/gas manifold fitted correctly (see installation instructions)? ▸ Open air/gas manifold. ▸ Check diaphragm for correct orientation, soiling and splitting. Is diaphragm OK?	**yes:**	▸ Close air/gas manifold (see installation instructions). go to 8
		no:	▸ 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 8
8.	Check the gas valve. ▸ Switch OFF the appliance. ▸ Un-plug the connectors from the gas valve. ▸ Measure the gas valve coils **I** and **II** electrical resistance. R = 164± 40 Ω? ▸ Remove gas valve and check inlet filter for blockage.	**yes:**	▸ 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 9
		no:	▸ 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 9

Tab. 25 EA Error codes

EA and RESET button and fault indicator LED are flashing.

During operation: flame not detected.

	Check		Action
9.	Problem with flue? ▸ Check CO_2 level in combustion air in the flue (with outer casing fitted). Is the CO_2 level above 0.2%? ▸ Perform a fan pressure test (as described in the installation manual). ▸ Open up heat exchanger - is it dirty?	**yes:**	▸ Check flue installation for agreement with the instruction manual. **Then:** ▸ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to 10
		no:	go to 10
10.	Is flue gas CO_2 level incorrect?	**yes:**	▸ Adjust to correct level. ▸ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. EA? go to 11
		no:	go to 11
11.	▸ 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:**	▸ Select the value **0** and store. Exit the service function. go to 12
		no:	▸ Select the value **0** and store. Exit the service function. go to 15
12.	Ignition cable connected to ignition electrodes?	**yes:**	go to 13
		no:	▸ 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 14
		no:	▸ 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 14
14.	Is the ignition cable damaged?	**yes:**	▸ 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 15
		no:	go to 15

Tab. 25 EA Error codes

EA and RESET button and fault indicator LED are flashing.

During operation: flame not detected.

	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 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 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 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.

Tab. 25 EA Error codes

F0 **and fault indicator LED (and possibly RESET button) are flashing.**

Internal failure

	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 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.

Tab. 26 F0 Error codes

F7 **and RESET button and fault indicator LED are flashing.**

Although appliance switches off, flame still detected

	Check		Action
1.	Electrode(s) dirty or defective? ▶ Switch OFF the appliance. ▶ Remove electrode assembly and bracket and check for wear, deposits and mechanical damage.	**yes:**	▶ 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 2
		no:	▶ 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 2
2.	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 are flue gases in the combustion air. ▶ Check flue and repair or replace if necessary. F7? go to 3
		no:	go to 3
3.	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.

Tab. 27 F7 Error codes

FA and RESET button and fault indicator LED are flashing.

After appliance switches off flame is detected

	Check		Action
1.	Is the condensate trap blocked?	**yes:**	▶ 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 2
		no:	go to 2
2.	Electrode assembly defective? ▶ Switch OFF the appliance. ▶ Remove electrode assembly. Electrode assembly burnt out?	**yes:**	▶ 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 3
		no:	go to 3
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 are flue gases in the combustion air. ▶ Check flue, clean if necessary. ▶ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. FA? go to 4
		no:	go to 4
4.	Is the gas valve damaged?	**yes:**	▶ 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 5
		no:	go to 5
5.	▶ 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. FA? go to 6

Tab. 28 FA Error codes

FA and RESET button and fault indicator LED are flashing.

After appliance switches off flame is detected

	Check		Action
6.	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.

Tab. 28 FA Error codes

Fd and RESET button and fault indicator LED are flashing.

Reset button pressed inadvertently

	Check		Action
1.	**reset** button flashing?		▶ Press the **reset** button for 3 seconds and release it. After releasing the appliance re-starts. Fd? go to 2
2.	The PCB is damaged.		▶ Make a note of the altered service settings (see table 6 on page 18). ▶ 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.

Tab. 29 Fd Error codes

7.5 FAULTS THAT ARE NOT DISPLAYED

7.5.1 APPLIANCE FAULTS

Excessive burner noise, rumbling noises			
	Check		**Action**
1.	Does the gas supply type match the specifications on the appliance type plate?	**yes:**	go to 2
		no:	▸ Convert appliance to correct gas type. Rumbling noises? go to 2
2.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	go to 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 4
		no:	go to 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 5
		no:	go to 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.

Flow noises			
	Check		**Action**
1.	Pump map/pump 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.

Heating up of last radiators in system too slow			
	Check		**Action**
1.	Pump map/pump 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.

Flue gas levels incorrect, CO level too high			
	Check		**Action**
1.	Does the gas supply type match the specifications on the appliance type plate?	**yes:**	go to 2
		no:	▸ Convert appliance to correct gas type. Flue gas levels **incorrect**? go to 2
2.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	↓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. Flue gas levels **incorrect**? go to 4
		no:	go to 4
4.	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. Flue gas levels **incorrect**? go to 5
		no:	go to 5
5.	Gas rate too high when CO_2 level correctly set.	**yes:**	▸ Reduce gas rate by means of adjusting screw on gas valve and/or gas flow restrictor. ▸ Check CO_2 adjustment. Flue gas levels **incorrect**? go to 6
		no:	go to 6
6.			▸ Switch OFF the appliance. ▸ Turn off gas valve. ▸ Change the gas valve. ▸ Open the gas valve. ▸ Switch ON the appliance. ▸ Check appliance for leaks.

Ignition too harsh, ignition poor			
	Check		**Action**
1.	▸ 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:**	▸ Select the value **0** and store. ▸ Exit the service function. go to 6
		no:	▸ Select the value **0** and store. ▸ Exit the service function. go to 2
2.	Ignition cable connected to ignition electrodes?	**yes:**	go to 3
		no:	▸ 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 3
3.	Ignition cable connector engaged in control panel?	**yes:**	go to 4
		no:	▸ 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 4
4.	Is the ignition cable damaged?	**yes:**	▸ 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 5
		no:	go to 5
5.	Electrode assembly defective? ▸ Switch OFF the appliance. ▸ Remove electrode assembly. Electrode assembly burnt out?	**yes:**	▸ 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 6
		no:	▸ 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 6
6.	Does the gas supply type match the specifications on the appliance type plate?	**yes:**	go to 7
		no:	▸ Convert appliance to correct gas type. ignition poor? go to 7

Ignition too harsh, ignition poor			
	Check		**Action**
7.	▸ Test gas supply pressure - OK? Does pressure match figure specified in installation instructions?	**yes:**	go to 8
		no:	▸ De-commission appliance. In case of natural gas: ▸ Notify gas utility.
8.	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. Ignition poor? go to 9
		no:	go to 9
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 10
		no:	go to 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.

Condensation in the air box			
	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).

Inadequate hot water outlet temperature (combi boiler)			
	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 2
2.	Compare flow rate from boiler with showed flow rate in service function **6.d.** Are they equal?	**yes:**	go to 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 6 on page 18). ▸ 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.

7.5.2 PROGRAMMER FAULTS

Set room temperature not reached (DT10/DT20)			
	Check		**Action**
1.	Thermostatic valve(s) set too low?	**yes:**	▸ Turn up thermostatic valve(s). go to 2
		no:	go to 2
2.	Set time periods for channel 1 at the timer DT10/20 correct?	**yes:**	go to 3
		no:	▸ Correct the time periods for channel 1.
3.	Check the channel 1 at DT10/20 with the service function **6.E**. Is the left digit set to 1?	**yes:**	go to 4
		no:	▸ Change DT10/20.
4.	CH flow temperature control on boiler set too low?	**yes:**	▸ Turn up CH flow temperature control. go to 5
		no:	go to 5

Set room temperature not reached (DT10/DT20)			
	Check		**Action**
5.	Air in the heating system.		▸ 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.

Set room temperature exceeded by large amount			
	Check		**Action**
1.	Do radiators get too hot?	**yes:**	▸ Decrease setting of “Heating” control. go to 2
		no:	go to 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 3
		no:	go to 3
3.			▸ Turn down thermostatic valve(s).

Excessive fluctuations in room temperature			
	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.

8 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.

8.1 TROUBLESHOOTING USING THE DISPLAY

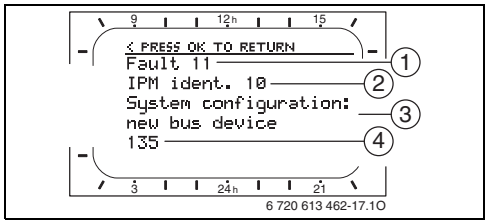


Fig. 16 Fault display

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.16)			
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.	

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Information displayed (→ Pos. 1, 3 and 4 in fig.16)			
Text	**Code**	**Cause**	**Remedy**
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.	170 171	HLC has tripped or is faulty.	Check HLC. 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		Check system configuration for heating circuit
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).	

Tab. 30

Information displayed (→ Pos. 1, 3 and 4 in fig.16)			
Text	**Code**	**Cause**	**Remedy**
Fault 50 Solar pump jammed or air in system	121 126 140	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.
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 (TA).	
	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	125 128	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 maximum temperature for the solar cylinder higher → limit cylinder temperature, page 49.
		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.	

Tab. 30

Information displayed (→ Pos. 1, 3 and 4 in fig.16)			
Text	**Code**	**Cause**	**Remedy**
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.	

Tab. 30

8.2 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.

Tab. 31

9 TROUBLESHOOTING - FR110

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.

9.1 TROUBLESHOOTING USING THE DISPLAY

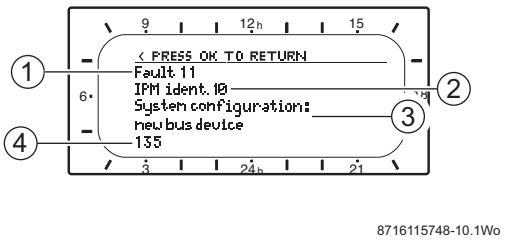

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Fig. 17 Fault display

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. 17)			
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 FR110 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.	

Tab. 32

Information displayed (→ items 1, 3 and 4 in Fig. 17) Text	Code	Cause	Remedy
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.	170 171	HLC has tripped or is faulty.	Check HLC. 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 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.	118 119	Incompatible BUS device:	Set IPM for cylinder to coding 3 or higher.
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).	

Tab. 32

Information displayed (→ items 1, 3 and 4 in Fig. 17) 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.
		Air in solar thermal system.	Bleed solar system and top up with heat transfer fluid if necessary.
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”.

Tab. 32

Information displayed (→ items 1, 3 and 4 in Fig. 17)			
Text	**Code**	**Cause**	**Remedy**
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.	

Tab. 32

9.2 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.

Tab. 33

10 TROUBLESHOOTING - RT10

In the event of a fault in the heating appliance, the display will show e.g.
A7 E.
In the event of a fault in the FW 100, the display will show e.g. **1A4 E**.
Here the figure **1** stands for a fault in the FW 100 and the letter **E** for Error (= fault):

Display	Cause	Remedy
1A4 E	Temperature sensor in the FW 100 defective.	Replace FW 100.
1A8 E	TD 200 using the bus no longer responds.	Check bus connection and, if necessary, rectify interruption.
	Heating appliance using the bus no longer responds.	Check bus connection and, if necessary, rectify interruption.
e.g.: **A7 E** **...**	Error display for the heating appliance.	Rectify the fault in accordance with the heating appliance documentation.

Tab. 34

Complaint	Cause	Remedy
Required temperature not reached	Thermostatic valve(s) in the room set to low	Open the thermostatic valve(s).
	Flow temperature controller on the heating appliance set too low	Set flow temperature controller higher.
	Air lock in the heating system	Vent radiator and heating system.
Required room temperature is greatly exceeded	Installation location of the FW 100 not suitable, e.g. outer wall, proximity to window, draught, ...	Choose a better installation location move the FW 100.
Excessive room temperature fluctuations	Temporary effect of heat from other sources on the room, e.g. from sunshine, room lighting, TV, fireplace etc.	Choose a better installation location and move the FW 100.
Temperature rise instead of fall	Time of day set incorrectly on the TD 200	Check setting.
Room temperature too high in low mode	Building has high degree of heat storage	Select low mode earlier.
Incorrect or no control	Bus connection defective for the devices using the bus	Check the bus connection and, if necessary, rectify according to the connection diagram.

Tab. 35

11 TROUBLESHOOTING - TD 200

Faults in the devices using the bus are displayed.

A fault in the heating appliance is shown in the display with corresponding help texts.

Display	Cause	Remedy
TD 200 defect	Temperature sensor in the TD 200 defective	Emergency mode: The heating automatically goes into On / Off mode.
		If **Room temperature** continues to be displayed during the standard display: Set **RT10 equipped?** to **No.**
		Check the bus connection and if necessary rectify the interruption.
		Have TD 200 replaced by a professional.
No Bus communication	The TD 200 using the bus no longer responds.	Check the bus connection and if necessary rectify the interruption.
	Heating appliance using the bus no longer responds.	Check the bus connection and if necessary rectify the interruption.
On/Off instead of Room temperature	TD 200 not detected during commissioning. Set	Set **RT10 equipped?** to **Yes.**
Only Service modes are displayed, e.g.: **Service 1.A:** **and maximum central heating heatout.**	No error: Service mode at heating appliance active.	Press the Service button on the heating appliance.
The following appears each time the button is pressed: **◄ press ok to go back** **Key lock function is active...**	Key lock is active.	Deactivate key lock.
No display	Heating appliance is switched off.	Switch on heating appliance.
	A “YS Plan” is connected	No function for TD 200 possible.

Tab. 36

Complaint	Cause	Remedy
Required temperature not reached	Thermostat valve(s) in the control room set to low	Fully open the thermostat valve(s) or replace them with manual valve(s).
	Flow temperature controller on the heating appliance set too low	Set flow temperature controller higher.
	Air lock in the heating system	Vent radiator and heating system.
Required room temperature is greatly exceeded	Installation location of the TD 200 not suitable, e.g. outer wall, proximity to window, draught, ...	Choose a better installation location for TD 200 (see Installation Instructions of the TD 200).
Excessive room temperature fluctuations	Temporary effect of heat from other sources on the room, e.g. from sunshine, room lighting, TV, fireplace etc.	Choose a better installation location for TD 200 (see Installation Instructions of the TD 200).
Temperature rise instead of fall	Time of day incorrectly set	Check setting.
Room temperature too high in Economy mode	Building has high degree of heat storage	Select Economy mode earlier.
Incorrect or no control	Bus connection defective for the devices using the bus	Check the bus connection, if necessary, rectify according to the connection diagram.
Only Automatic mode can be set	Operating switch defective	Replace the TD200

Tab. 37

12 APPENDIX

12.1 NTC SENSOR VALUES, CDi APPLIANCES

12.1.1 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

Tab. 38 Central heating flow & hot water sensors

12.2 CDi fan speeds

Appliance	Fan speed ranges (Hz)
27CDi N.G.	29 - 78
30CDi N.G.	29 - 91
37CDi N.G.	32 - 84
42CDi N.G.	31 - 82
27CDi L.P.G.	36 - 74
30CDi L.P.G.	36 - 84
37CDi L.P.G.	41 - 78
42CDi L.P.G.	41 - 78
30CDi Conventional N.G.	29 - 91
40CDi Conventional N.G.	29 - 91
30CDi Conventional L.P.G.	36 - 84
40CDi Conventional L.P.G.	36- 84

Tab. 39 CDi fan speed range

12.3 HIGHFLOW CDi & FS CDi Regular fan speeds

APPLIANCE	SPEED RANGE MIN - MAX (Hz)
HIGHFLOW 440CDi N.G.	36 - 96
HIGHFLOW 440CDi L.P.G.	40 - 93
HIGHFLOW 550CDi N.G.	36 - 111
HIGHFLOW 550CDi L.P.G.	36 - 108
FS 30CDi Regular N.G.	38 - 101
FS 30CDi Regular N.G.	40 - 98
FS 42CDi Regular N.G.	36 - 109
FS 42CDi Regular N.G.	39 - 106

Tab. 40 Fan speed range

12.4 NTC SENSOR CHARACTERISTICS HIGHFLOW CDi & FS CDi REGULAR APPLIANCES

Description	Characteristic
Primary NTC	Siemens NTC
Domestic hot water NTC	Elmwood NTC
Internal heat bank NTC	Elmwood NTC
Outdoor NTC	Outdoor NTC

Tab. 41 Thermisters

12.4.1 SIEMENS NTC SENSOR CHARACTERISTIC TABLE

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

Tab. 42 Siemens thermisters

12.4.2 ELMWOOD NTC CHARACTERISTIC TABLE

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

Tab. 43 Elmwood thermisters

12.4.3 OUTDOOR NTC SENSOR CHARACTERISTIC TABLE

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

Tab. 44 Outdoor thermisters

12.4.4 FLOW TURBINE HORIZONTAL

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

Tab. 45 Flow turbine

12.5 ELECTRICAL WIRING DIAGRAMS

12.5.1 CDi COMBI APPLIANCES

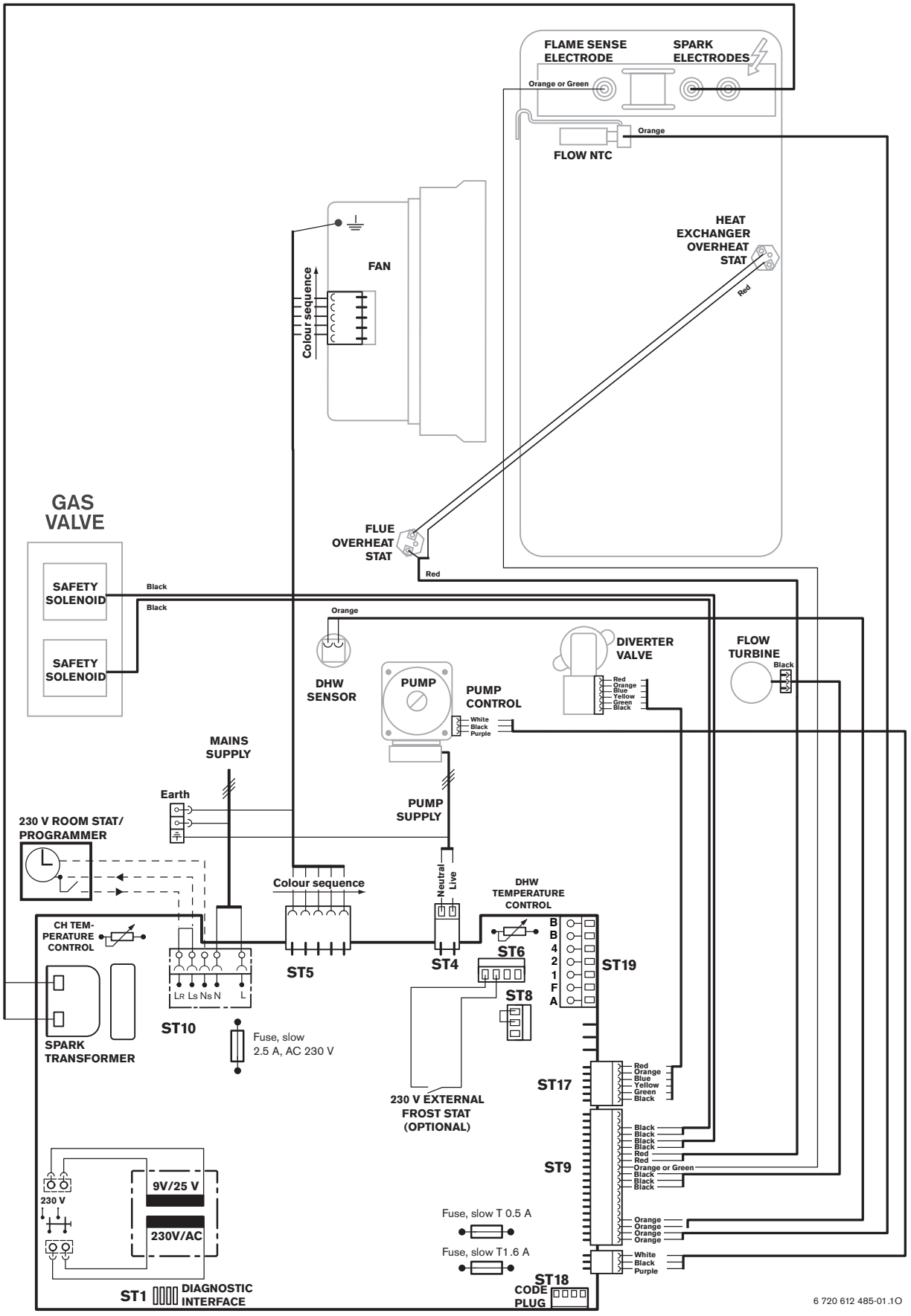

Fig. 18 CDi combi electrical diagram

12.5.2 CDi SYSTEM APPLIANCES

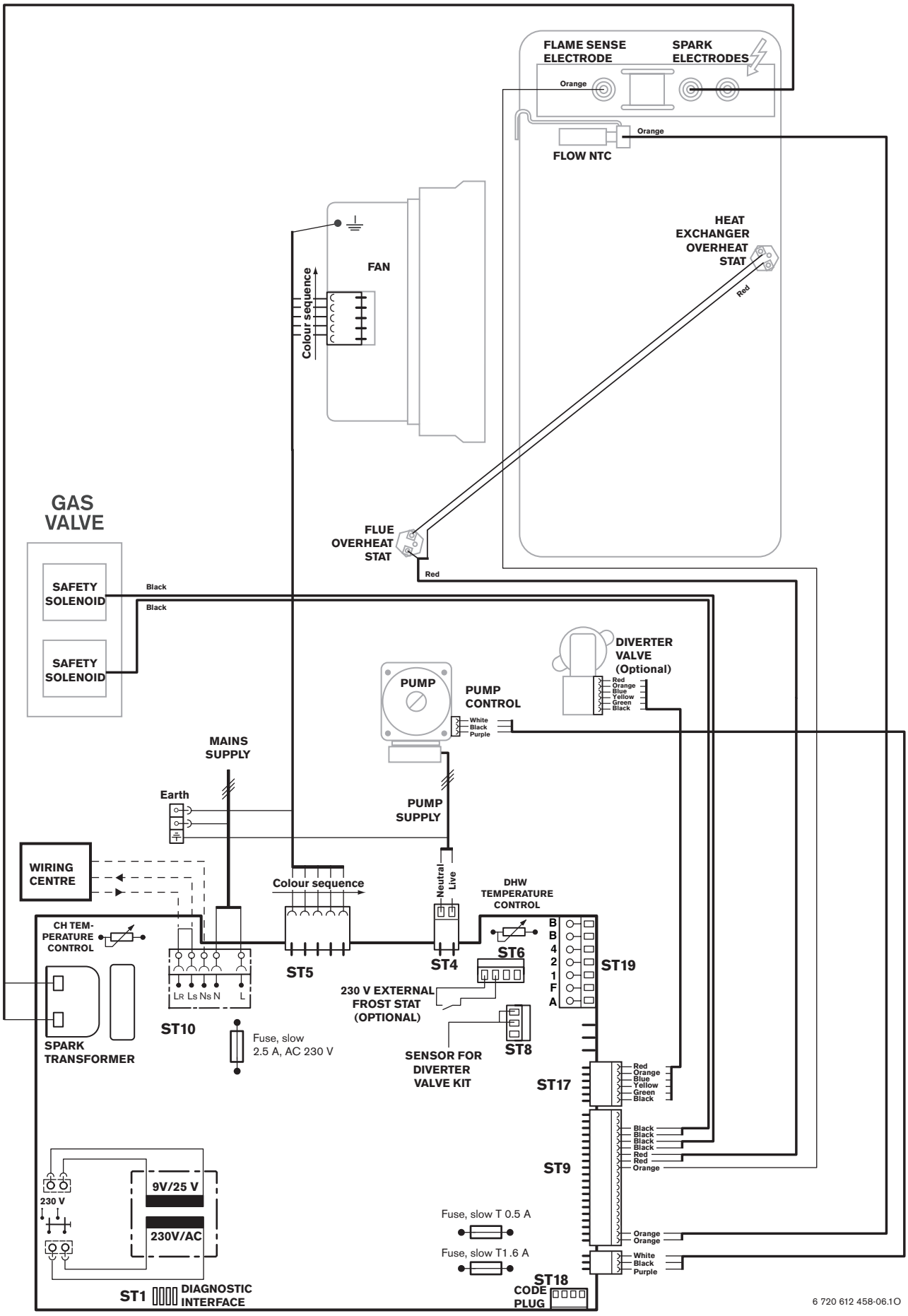

Fig. 19 CDi System electrical diagram

12.5.3 CDi REGULAR APPLIANCES

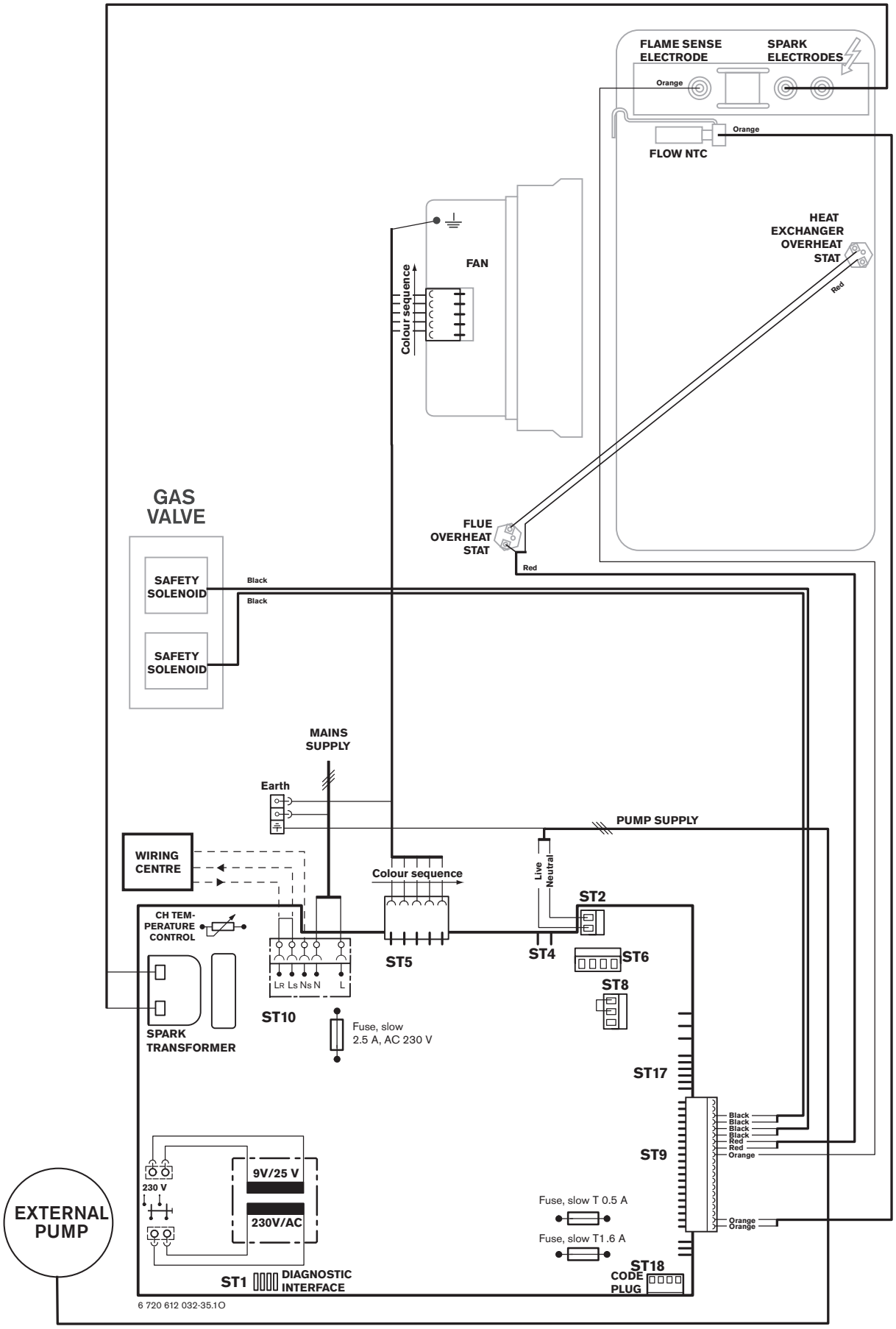

Fig. 20 CDi Regular electrical diagram

12.5.4 HIGHFLOW CDi APPLIANCES

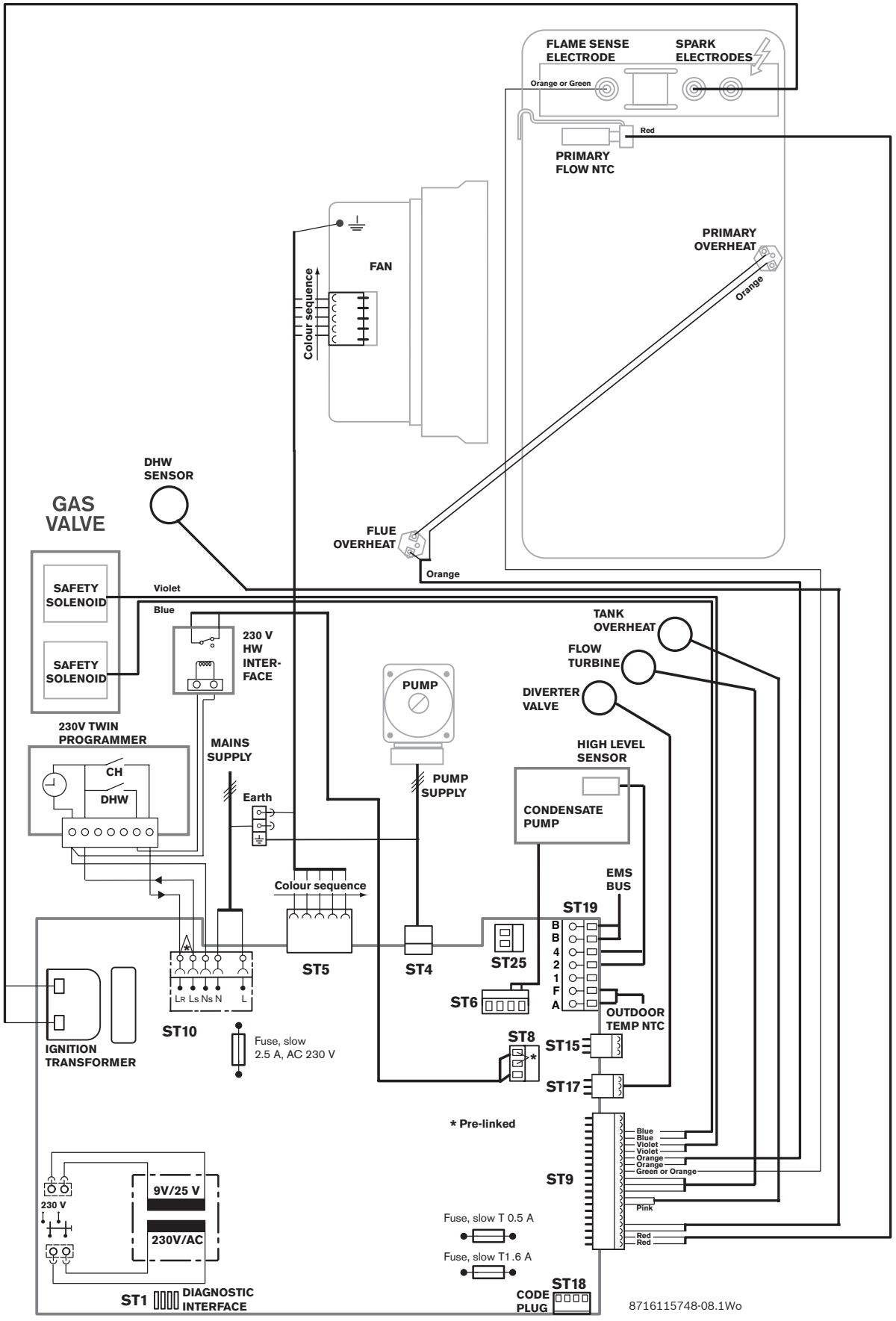

Fig. 21 Highflow CDi electrical diagram

12.5.5 FS CDi APPLIANCES

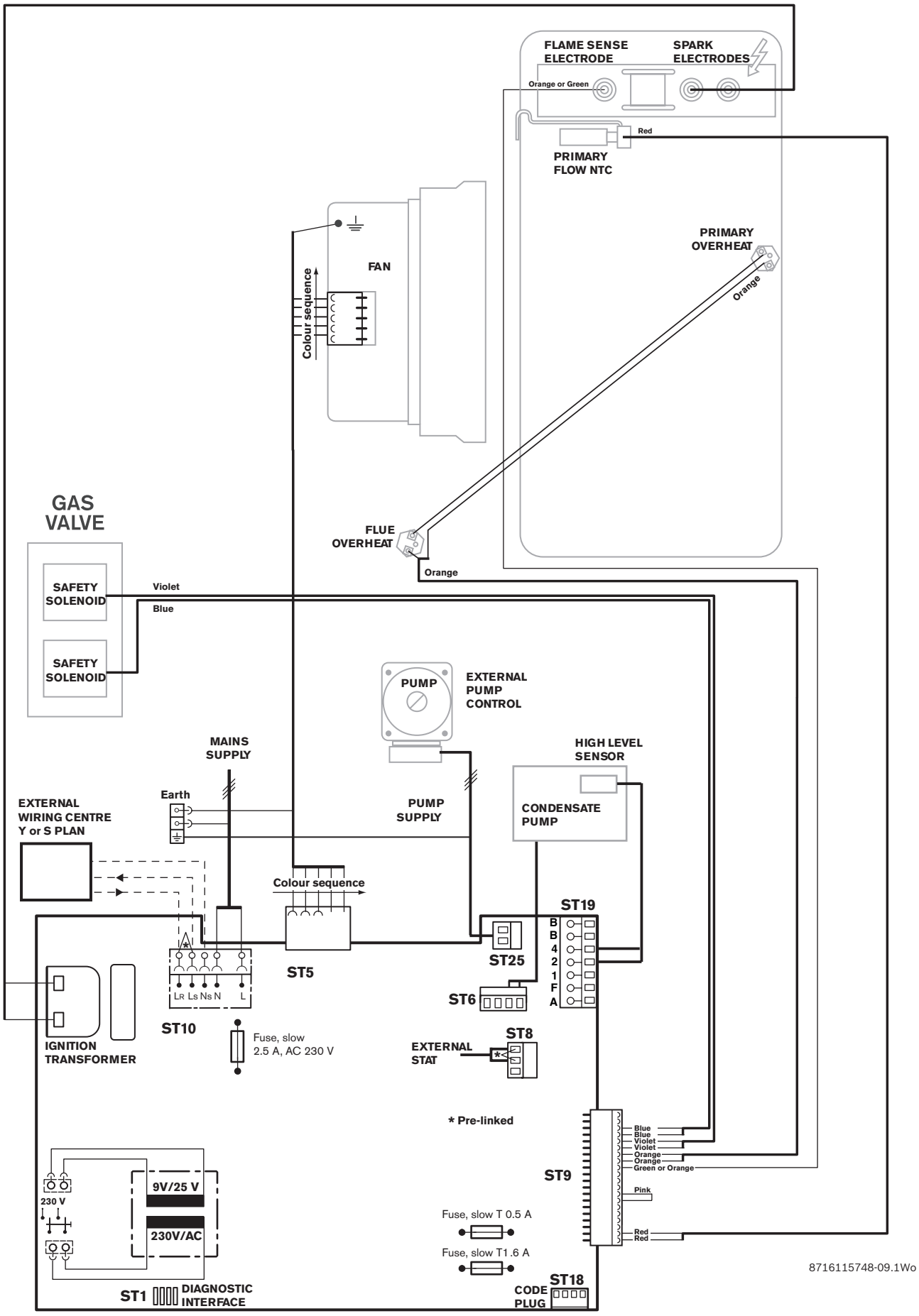

Fig. 22 FS CDi electrical diagram

12.6 CODE PLUGS USED WITH CDi APPLIANCES

Component	Order no.	Remarks
Code plug		
27CDi N.G.	8 714 431 020 0	-
30CDi N.G.	8 714 431 012 0	
37CDi N.G.	8 714 431 014 0	-
42CDi N.G.	8 714 431 016 0	
27CDi L.P.G.	8 714 431 021 0	-
30CDi L.P.G.	8 714 431 013 0	
37CDi L.P.G.	8 714 431 015 0	-
42CDi L.P.G.	8 714 431 017 0	
30CDi system N.G. **without** diverter valve	8 714 431 018 0	
30CDi system L.P.G. **without** diverter valve	8 714 431 019 0	
30CDi system N.G. **with** diverter valve	8 714 431 002 0	
30CDi system L.P.G. **with** diverter valve	8 714 431 003 0	
30CDi Regular N.G.	8 714 431 008 0	Mid position diverter valve systems and Zone valves systems
40CDi Regular N.G.	8 714 431 010 0	
30CDi Regular L.P.G.	8 714 431 009 0	
40CDi Regular L.P.G.	8 714 431 011 0	

Tab. 46 CDi code plug part numbers

12.7 CODE PLUGS USED WITH HIGHFLOW CDi & FS CDi REGULAR APPLIANCES

Component	Order no.	Remarks
Code plug		
Highflow 440CDi N.G.	8 714 431 700 0	-
Highflow 440CDi L.P.G..	8 714 431 701 0	
Highflow 550CDi N.G.	8 714 431 702 0	-
Highflow 550CDi N.G.	8 714 431 703 0	
FS 30CDi Regular N.G.	8 714 431 704 0	-
FS 30CDi Regular L.P.G.	8 714 431 705 0	
FS 42CDi Regular N.G.	8 714 431 706 0	-
FS 42CDi Regular L.P.G.	8 714 431 707 0	

Tab. 47 Highflow CDi & FS CDi Regular code plug part numbers

12.8 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

12.9 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)
Sources in the home	
Cleaning and degreasing agents	Perchloroethylene, methyl chloroform, trichloroethylene, methylene chloride, carbon tetrachloride, hydrochloric acid
Home workshops	
Solvents and thinners	Various chlorinated hydrocarbons
Spray cans	Chlorofluorohydrocarbons (freons)

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