United Kingdom
en

remeha

Service Manual

High-efficiency floor-standing gas boiler

Gas 220 Ace

160 - 200 - 250 - 300
HMI T-control

Dear Customer,

Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

Contents

1 About this manual

1.1 Additional documentation

The following documentation is available in addition to this manual:

- Installation and user manual
- Water quality instructions

1.2 Symbols used in the manual

This manual contains special instructions, marked with specific symbols. Please pay extra attention when these symbols are used.

Danger
Risk of dangerous situations that may result in serious personal injury.

Danger of electric shock
Risk of electric shock that may result in serious personal injury.

Warning
Risk of dangerous situations that may result in minor personal injury.

Caution
Risk of material damage.

Important
Please note: important information.

The symbols mentioned below are of lower importance, but they can help you navigate or give useful information.

See
Reference to other manuals or pages in this manual.

Helpful information or extra guidance.

▶▶ Direct menu navigation, confirmations will not be shown. Use if you are familiar with the system.

2 Description of the product

2.1 General description

The boiler is a high-efficiency standing gas boiler with the following properties:

- High-efficiency heating.
- Cast aluminium heat exchanger.
- Limited emissions of polluted substances.
- Has transport wheels as standard.

The following boiler types are available:

Tab.1 Boiler types

Name	Output(1)
Gas 220 Ace 160	162 kW
Gas 220 Ace 200	210 kW
Gas 220 Ace 250	261 kW
Gas 220 Ace 300	311 kW

(1) Nominal output P_n 50/30 °C

2.2 Operating principle

2.2.1 Gas/air regulation

The boiler is equipped with a casing that also serves as an air box. The fan draws in the combustion air. The gas is injected into the venturi and mixed with the combustion air. The fan speed is controlled on the basis of the settings, the heat demand and the prevailing temperatures measured by the temperature sensors. The gas/air ratio control ensures an accurate mixture of the required amounts of gas and air. This provides optimum combustion over the entire heat input range. The gas/air mixture goes to the burner, where it is ignited by the ignition electrode.

Important
The combustion air supply is checked before each burner start, and at least once every 24 hours. During continuous operation (e.g. supplying process water), please note that the boiler control will reset every 24 hours.

2.2.2 Combustion

The burner heats the central heating water flowing through the heat exchanger. If the temperature of the flue gases is lower than the dew point (approx. 55°C), the water vapour condenses in the heat exchanger. The heat released during this condensation process (referred to as the latent or condensation heat) is also transferred to the central heating water. The cooled flue gases are discharged through the flue gas discharge pipe. The condensed water is discharged through a trap.

2.2.3 Control system

The **e-Smart** electronic control system ensures that your heating system is smart and reliable. This means that the boiler responds practically to negative environmental influences (such as limited water flow and air flow problems). In the event of such influences, the boiler will not go into lockout mode, but in the first instance will modulate back. Depending on the nature of the circumstances, a warning, blocking or lock-out may occur. The boiler continues to supply heat provided the situation is not dangerous. With this control system, your boiler is also equipped for remote control and monitoring.

2.2.4 Control

- **On/off control**
  The heat input varies between the minimum and the maximum values on the basis of the flow temperature set on the boiler. It is possible to connect a 2-wire on/off thermostat or a power stealing thermostat to the boiler.
- **Modulating control**
  The heat input varies between the minimum and the maximum values on the basis of the flow temperature determined by the modulating controller. The boiler output can be modulated with an appropriate modulating controller.
- **Analogue control (0 - 10 V)**
  The heat input varies between the minimum and the maximum values on the basis of the voltage present at the analogue input.

2.2.5 Regulating the water temperature

The boiler is fitted with an electronic temperature control with a flow and return temperature sensor. The flow temperature can be adjusted between 20°C and 90°C. The boiler modulates back when the set flow temperature is reached. The switch-off temperature is the set flow temperature + 5°C.

2.2.6 Protection against shortage of water

The boiler is fitted with low water level protection based on temperature measurements. By modulating back when the water flow threatens to become insufficient, the boiler remains operational as long as possible. The boiler issues a warning in the event of no or too little water. With an insufficient flow ΔT ≥ 25 K or too great an increase in the heat exchanger temperature sensor, the boiler goes into blocking mode.

2.2.7 Water flow

The modulating control of the boiler limits the maximum difference between the flow temperature and return temperature. In addition, a heat exchanger temperature sensor is mounted to monitor the minimum water flow. This limits the maximum increase in the heat exchanger temperature and monitors the maximum temperature difference between the flow, return and heat exchanger temperatures. As a result, the boiler is not affected by low water flow.

2.2.8 Hydraulic pressure sensor

The hydraulic pressure sensor records the water pressure in the boiler. Change the threshold value for the hydraulic pressure sensor using parameter **AP006**.

2.2.9 Air pressure differential switch

The air pressure differential switch is a protection against a blocked trap or blocked air supply/flue gas outlet.

Before start-up and when the boiler is in operation, the air pressure differential switch **APS** measures the difference in pressure between the measuring points on the condensate collector p^+ and the air box p^-. If the pressure difference is greater than 6 mbar, then the boiler will lock out. After eliminating the cause of the breakdown, the boiler can be unlocked.

2.2.10 Circulating pump

Fig.1 Hydraulic resistance Gas 220 Ace 160

ΔP Boiler resistance (mbar)
Q Flow rate (m^3/h)

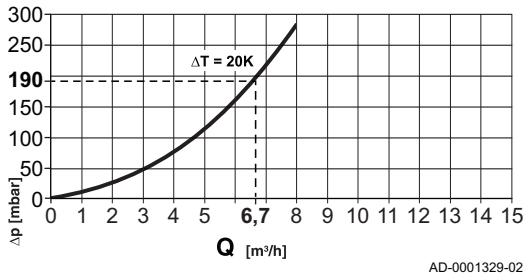
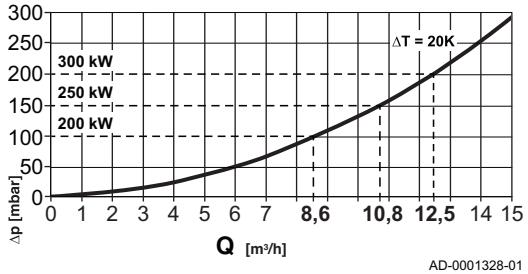


Fig.2 Hydraulic resistance Gas 220 Ace 200 - 250 - 300

ΔP Boiler resistance (mbar)
Q Flow rate (m^3/h)



The boiler is supplied without a pump. Take the boiler resistance and system resistance into account when selecting a pump.

Caution
Maximum power consumption may be 300 VA. Use an auxiliary relay for a pump with greater power.

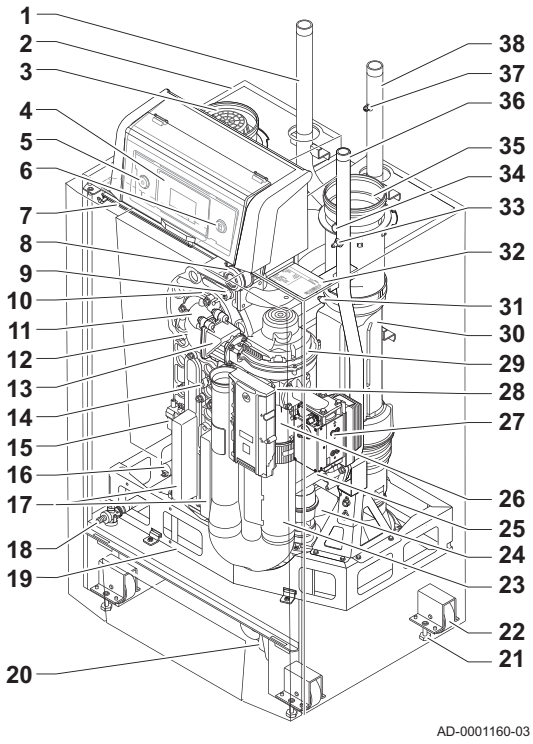
2.2.11 Calorifier connection

A calorifier can be connected to the boiler. Our range includes various calorifiers.

Important
Contact us for more information.

2.3 Main components

Fig.3 Main components

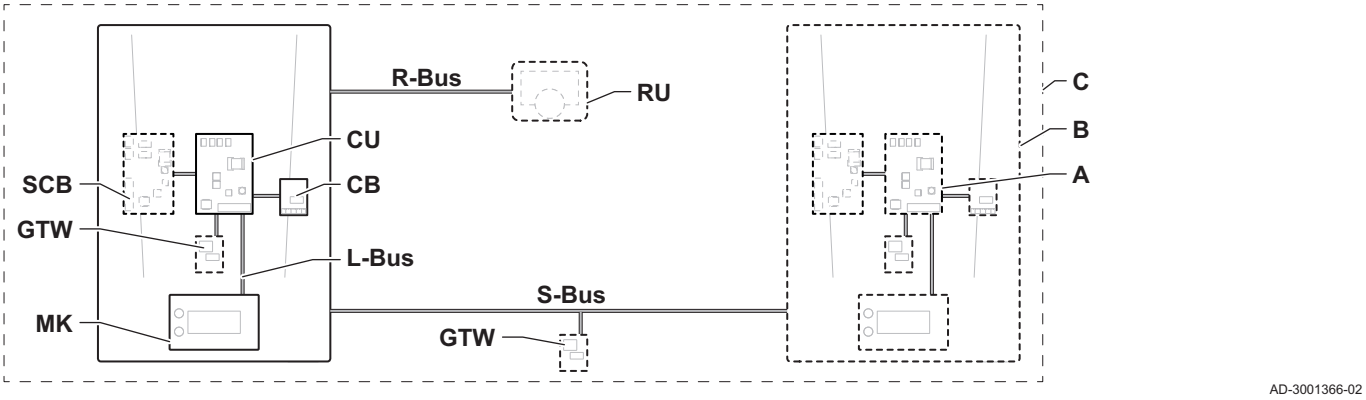


1 Central heating return pipe
2 Casing/air box
3 Air inlet connection
4 Control panel
5 On/off switch
6 Service connector (PC connection)
7 LED interior light
8 Air pressure differential switch
9 Flow temperature sensor
10 Burner
11 Adapter
12 Heat exchanger
13 Non-return valve
14 Temperature sensor for heat exchanger
15 Ignition transformer
16 Hydraulic pressure sensor
17 Heat exchanger inspection cover
18 Fill and drain valve
19 Frame
20 Trap
21 Adjustment bolt
22 Transport wheel
23 Air intake silencer
24 Condensate collector
25 Gas pressure measuring point
26 Venturi
27 Gas control valve
28 Main PCB (CU-GH)
29 Fan
30 Flue gas connection pipe
31 Flue gas temperature sensor
32 Type plate
33 Gas pressure measuring point
34 Flue gas measuring point
35 Flue gas connection
36 Gas connection
37 Manual air vent
38 Central heating flow pipe

2.4 Introduction to the e-Smart controls platform

The Gas 220 Ace boiler is equipped with the e-Smart controls platform. This is a modular system, and offers compatibility and connectivity between all products that make use of the same platform.

Fig.4 Generic example



Tab.2 Components in the example

Item	Description	Function
CU	Control Unit: Control unit	The control unit handles all basic functionality of the appliance.
CB	Connection Board: Connection PCB	The connection PCB provides easy access to all connectors of the control unit.
SCB	Smart Control Board: Expansion PCB	An expansion PCB provides extra functionality, like an internal calorifier or multiple zones.
GTW	Gateway: Conversion PCB	A gateway can be fitted to an appliance or system, to provide one of the following: • Extra (wireless) connectivity • Service connections • Communication with other platforms
MK	Control panel: Control panel and display	The control panel is the user interface to the appliance.
RU	Room Unit: Room unit (for example, a thermostat)	A room unit measures the temperature in a reference room.
L-Bus	Local Bus: Connection between devices	The local bus provides communication between devices.
S-Bus	System Bus: Connection between appliances	The system bus provides communication between appliances.
R-Bus	Room unit Bus: Connection to a room unit	The room unit bus provides communication to a room unit.
A	Device	A device is a PCB, control panel or a room unit.
B	Appliance	An appliance is a set of devices connected via the same L-Bus
C	System	A system is a set of appliances connected via the same S-Bus

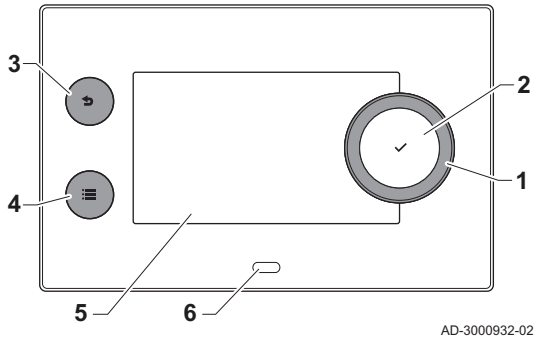
Tab.3 Specific devices delivered with the Gas 220 Ace boiler

Name visible in display	Software version	Description	Function
FSB-WHB-HE-150-300	2.1	Control unit **CU-GH06c**	The CU-GH06c control unit handles all basic functionality of the Gas 220 Ace boiler.
MK3	1.85	Control panel **HMI T-control**	The HMI T-control is the user interface to the Gas 220 Ace boiler.
SCB-01	1.3	Expansion PCB **SCB-01**	The SCB-01 provides a 0-10 V connection for a PWM system pump and two potential-free contacts for status notification.

3 Use of the control panel

3.1 Control panel components

Fig.5 Control panel components



1 Rotary knob to select a tile, menu or setting
2 Confirm button ✔ to confirm the selection
3 Back button ⮌:
- **Short button press**: Return to the previous level or previous menu
- **Long button press**: Return to home screen

4 Menu button ☰ to go to the main menu
5 Display
6 Status LED

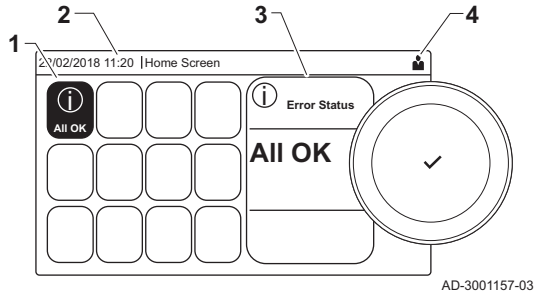
3.2 Description of the home screen

This screen is shown automatically after start-up of the appliance. The control panel automatically enters standby mode (black screen) if the buttons are not used for 5 minutes. Press one of the buttons on the control panel to activate the screen again.

You can navigate from any menu to the home screen by pressing the back button ⮌ for several seconds.

The tiles on the home screen provide quick access to the corresponding menus. Use the rotary knob to navigate to the desired item and press the button ✔ to confirm the selection.

Fig.6 Icons on home screen

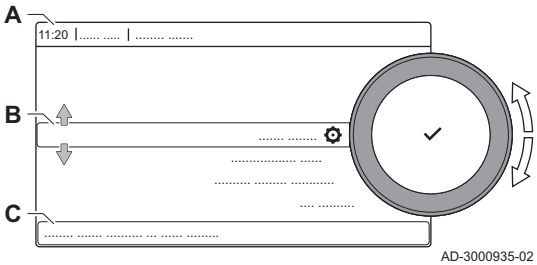


1 Tiles: the selected tile is highlighted
2 Date and time | Name of the screen (actual position in the menu)
3 Information about the selected tile
4 Icons indicating navigation level, operating mode, errors and other information.

3.3 Description of the main menu

You can navigate from any menu directly to the main menu by pressing the menu button ☰. The number of accessible menus depends on the access level (user or installer).

Fig.7 Items in the main menu



A Date and time | Name of the screen (actual position in the menu)
B Available menus
C Brief explanation of the selected menu

Tab.4 Available menus for the user

Description	Icon
Enable installer access	
System Settings	
Version Information	

Tab.5 Available menus for the installer

Description	Icon
Disable installer access	
Installation Setup	
Commissioning Menu	
Advanced Service Menu	
Error History	
System Settings	
Version Information	

3.4 Description of the icons in the display

Tab.6 Icons

Icon	Description
	User menu: user-level parameters can be configured.
	Installer menu: installer-level parameter can be configured.
	Information menu: read out various current values.
	System settings: system parameters can be configured.
	Error indicator.
	Gas boiler indicator.
	Domestic hot water tank is connected.
	The outdoor temperature sensor is connected.
	Boiler number in cascade system.
	The solar calorifier is on and its heat level is displayed.
	Burner output level (1 to 5 bars, with each bar representing 20% output).
	The pump is running.
	Three-way valve indicator.
	Display of the system water pressure.
	Chimney sweep mode is enabled (forced full load or low load for O_2/CO_2 measurement).
	Energy-saving mode is enabled.
	DHW boost is enabled.
	Timer program is enabled: The room temperature is controlled by a timer program.
	Manual mode is enabled: The room temperature is set to a fixed setting.
	Temporary overwrite of the timer program is enabled: The room temperature is changed temporarily.
	The holiday program (including frost protection) is active: The room temperature is reduced during your holiday to save energy.
	Frost protection is enabled: Protect the boiler and installation from freezing in winter.
	Service notification: service needed. Installer contact details are displayed or can be filled in.

Tab.7 Icons - On/off

Icon	Description	Icon	Description
	CH operation is enabled.		CH operation is disabled.
	DHW operation is enabled.		DHW operation is disabled.
	The burner is on.		The burner is off.
	Bluetooth enabled and connected (icon is non-transparent).		Bluetooth enabled and disconnected (icon is transparent).

Icon	Description	Icon	Description
	Heating enabled.		
	Cooling enabled.		
	Heating/cooling enabled.		Heating/cooling disabled.

Tab.8 Icons - Zones

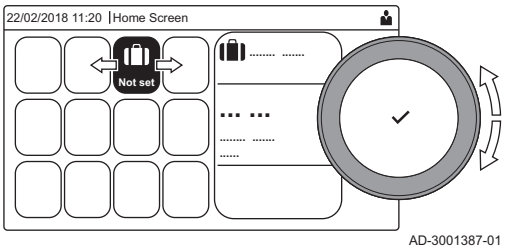
Icon	Description
	All zones (groups) icon.
	Living room icon.
	Kitchen icon.
	Bedroom icon.
	Study icon.
	Cellar icon.

4 Installer instructions

4.1 Accessing the user level menus

The tiles on the home screen provide quick access for the user to the corresponding menus.

Fig.8 Menu selection



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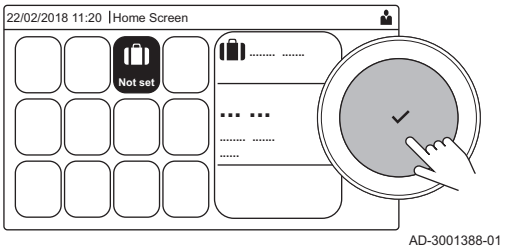
1. Use the rotary knob to select the required menu.

Fig.9 Confirm menu selection



AD-3001388-01

2. Press the ✔ button to confirm the selection.
   ⇨ The available settings of this selected menu appear in the display.
3. Use the rotary knob to select the desired setting.
4. Press the ✔ button to confirm the selection.
   ⇨ All options for change will appear in the display (if a setting cannot be changed, **Cannot edit read-only datapoint** will appear in the display).
5. Use the rotary knob to change the setting.
6. Press the ✔ button to confirm the selection.
7. Use the rotary knob to select the next setting or press the ⮌ button to return to the home screen.

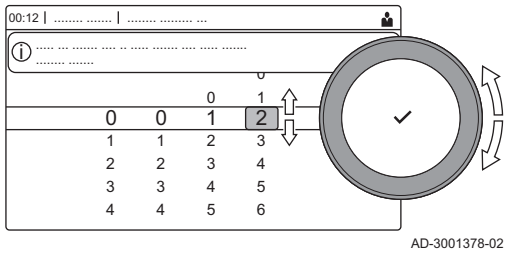
4.2 Accessing the installer level

Some settings are protected by installer access. Enable installer access in order to change these settings.

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

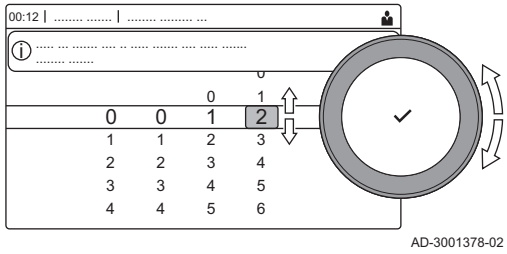
1. Access the installer level via the tile:
   1.1. Select the tile [ ].

Fig.10 Installer level



1.2. Use code: **0012**.
⇨ The tile [ ] shows that the installer access is **On**, and the icon in the top right of the display changes into .

Fig.11 Installer level



2. Access the installer level via the menu:
   2.1. Select **Enable installer access** from the **Main Menu**.
   2.2. Use code: **0012**.
   ⇨ When the installer level is enabled or disabled, the status of the tile [ ] changes into **On** or **Off**.

When the control panel is not used for 30 minutes, the installer access is disabled automatically. You can manually disable installer access by:

- Selecting the tile [ ].
- Selecting **Disable installer access** from the **Main Menu**.

4.3 Commissioning the appliance

At first start-up of the appliance, the display will show the commissioning wizard. Depending on the appliance, some steps take a few minutes to complete, for example appliances that need to deaerate after installation or need to configure a boiler.

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Start up the appliance.
2. Follow the instructions on the display.

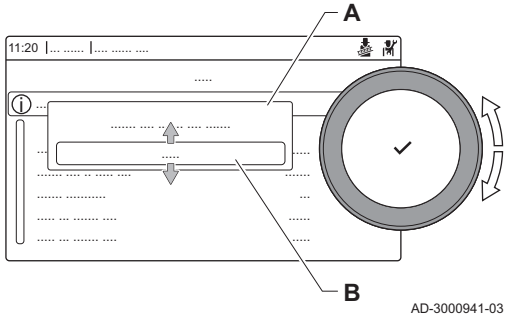
Important
The appliance might take a few minutes during certain steps while commissioning. Do not shut off the appliance or try to bypass steps, unless stated otherwise on the display.

3. You can access individual commissioning steps:
   3.1. Press the ≡ button.
   3.2. Select **Commissioning Menu**.
   3.3. Select the commissioning step you wish to perform.

4.3.1 Chimney sweep menu

Select the tile [ ] to open the chimney sweep menu. The **Change load test mode** menu will appear:

Fig.12 Load test



A Change load test mode
B Load test mode

Tab.9 Load tests in the chimney sweep menu

Change load test mode	Settings
Off	No test
Low power	Part load test
Medium power	Full load test for Central Heating mode
High power	Full load test for Central Heating + Domestic Hot Water mode

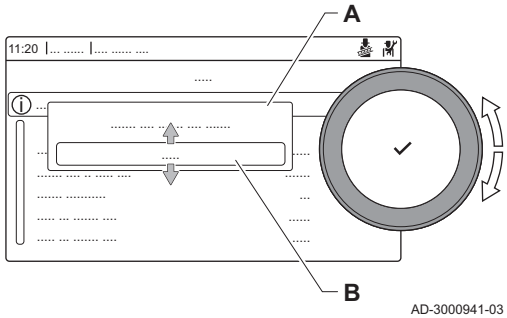
Tab.10 Load test settings

Load Test menu	Settings
Func test status	Select the load test to start the test.
System Flow Temp	Read the central heating flow temperature
T return	Read the central heating return temperature
Actual fan RPM	Read the actual fan speed
Actual flame current	Read the actual flame current
Fan RPM Max CH	Adjust the maximum fan speed during Central Heating mode
Fan RPM Min	Adjust the minimum fan speed during Central Heating + Domestic Hot Water mode
Fan RPM Start	Adjust the start fan speed

■ Performing the full load test

1. Select the tile [ ].
   ⇨ The **Change load test mode** menu appears.
2. Select the test **Medium power**.

Fig.13 Full load test



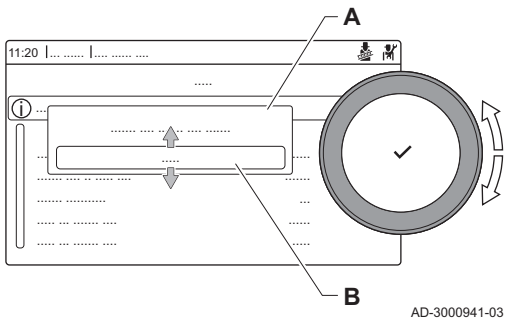
A Change load test mode
B Medium power

   ⇨ The full load test starts. The selected load test mode is shown in the menu and the icon appears in the top right of the screen.
3. Check the load test settings and adjust if necessary.
   ⇨ Only the parameters shown in bold can be changed.

■ Performing the low load test

1. If the full load test is still running, press the ✔ button to change the load test mode.
2. If the full load test was finished, select the tile [ ] to restart the chimney sweep menu.

Fig.14 Low load test



A **Change load test mode**
B **Low power**

3. Select the **Low power** test in the menu **Change load test mode**.
   ⇨ The low load test starts. The selected load test mode is shown in the menu and the icon appears in the top right of the screen.
4. Check the load test settings and adjust if necessary.
   ⇨ Only the parameters shown in bold can be changed.
5. End the low load test by pressing the ⮌ button.
   ⇨ The message **Running load test(s) stopped!** is displayed.

4.3.2 Saving the commissioning settings

You can save all current settings on the control panel. These settings can be restored if necessary, for example after replacement of the control unit.

▶▶ ☰ > **Advanced Service Menu** > **Save as commissioning settings**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Advanced Service Menu**.
3. Select **Save as commissioning settings**.
4. Select **Confirm** to save the settings.

When you have saved the commissioning settings, the option **Revert commissioning settings** becomes available in the **Advanced Service Menu**.

4.4 Configuring the installation at installer level

Configure the installation by pressing the ☰ button and selecting **Installation Setup** 🔧. Select the control unit or circuit board you want to configure:

Tab.11

Icon	Zone or function	Description
|||	**CIRCA / CH**	Central heating circuit
🔥	**Commercial boiler**	Gas boiler

Tab.12 Configuring a zone or function of CU-GH08

Parameters, counters, signals	Description
Parameters	Set the parameters at installer level
Counters	Read the counters at installer level
Signals	Read the signals at installer level

4.4.1 Changing the control panel settings

You can change the control panel settings within system settings.

▶▶ ☰ > **System Settings**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **System Settings** ⚙.
3. Perform one of the operations described in the table below:

Tab.13 Control panel settings

System Settings menu	Settings
Set Date and Time	Set the current date and time
Select Country and Language	Select your country and language
Daylight Saving Time	Enable or disable daylight saving time. When enabled daylight saving time will update the systems internal time to correspond with summer and winter time.
Installer Details	Read out the name and phone number of the installer
Set Heating Activity Names	Create the names for the activities of the timer program
Set Screen Brightness	Adjust the brightness of the screen
Set click sound	Enable or disable the click sound of the rotary knob
License Information	Read out detailed license information from the device platform application

4.4.2 Setting the installer details

You can store your name and phone number in the control panel to be read by the user. When an error occurs these contact details will be displayed.

▶▶ ☰ > **System Settings** > **Installer Details**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
   Enable installer access if it is not enabled.
   1.1. Select **Enable installer access**.
   1.2. Use code **0012**.
2. Select **System Settings** ⚙.
3. Select **Installer Details**.
4. Enter the following data:

Installer name	Your company's name
Installer phone	Your company's phone number

4.4.3 Setting the parameters

You can change the settings of the control unit and the connected expansion boards, sensors etc. to configure the installation. The factory settings support the most common heating systems. The user or the installer can optimise the parameters as required.

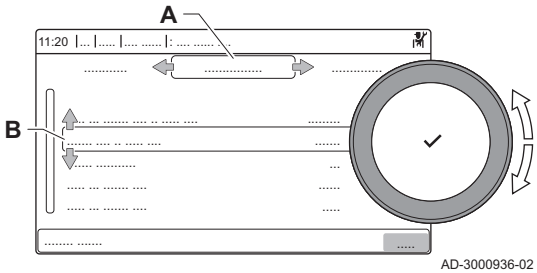
Important
Changing the factory settings may adversely affect the operation of the installation.

▶▶ ☰ > **Installation Setup** > select zone or device > **Parameters, counters, signals** > **Parameters**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Installation Setup**.
3. Select the zone or device you want to configure.
4. Select **Parameters, counters, signals**.
5. Select **Parameters**.

Fig.15 Parameters, counters, signals



A - **Parameters**
- **Counters**
- **Signals**

B List of settings or values

⇨ The list of available parameters is displayed.

4.4.4 Setting the heating curve

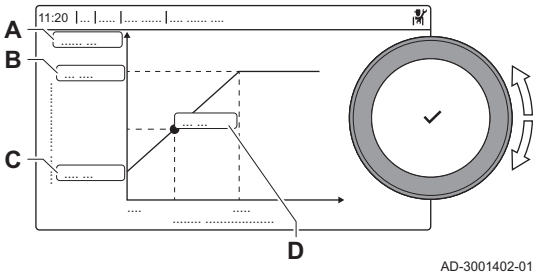
When an outdoor temperature sensor is connected to the installation, the relation between the outdoor temperature and the central heating flow temperature is controlled by a heating curve. This curve can be adjusted to the requirements of the installation.

▶▶ Select zone > **Heating Curve**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Select the tile of the zone you want to configure.
2. Select **Control strategy**.
3. Select the setting **Outdoor temp based** or **Outdoor & room based**.
   ⇨ The option **Heating Curve** appears in the **Zone setup** menu.
4. Select **Heating Curve**.
   ⇨ A graphic display of the heating curve is shown.
5. Adjust the following parameters:

Fig.16 The heating curve



Tab.14 Settings

A	**Slope:**	Slope of the heating curve: • Underfloor heating circuit: slope between 0.4 and 0.7 • Radiator circuit: slope at approximately 1.5
B	**Max:**	Maximum temperature of the heating circuit
C	**Base:**	Ambient temperature setpoint
D	xx°C ; xx °C	Relationship between the heating circuit flow temperature and the outdoor temperature. This information is visible throughout the slope.

4.4.5 Increasing the domestic hot water temperature temporarily

You can temporary increase the hot water temperature when the time program is active with the reduced temperature setpoint. Use this to deviate from the time program or testing of the hot water production.

▶▶ ☰ > **Installation Setup** > **Internal DHW** > **Hot water boost** > **Duration of temporary overwrite**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Installation Setup**.
3. Select **Internal DHW**.
4. Select **Hot water boost**.
5. Select **Duration of temporary overwrite**.
6. Set the duration in hours and minutes.
   ⇨ The hot water temperature is increased to the **DHW comfort setpoint**.

You can abort the temporary increase by selecting **Reset**.

4.5 Maintaining the installation

4.5.1 Viewing the service notification

When a service notification appears on the display, you can view the details of the notification.

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Select the tile [🔧].
   ⇨ The **View Service Notification** menu opens.
2. Select the parameter or value you want to view.

4.5.2 Reading out measured values

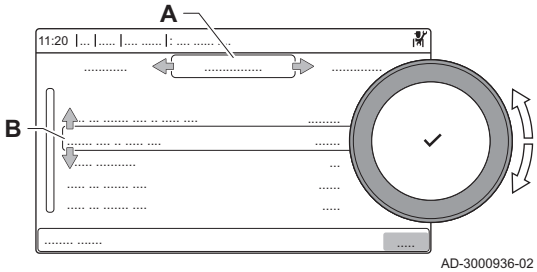
The appliance continually registers various measured values from the system. You can read these values on the control panel.

▶▶ ☰ > **Installation Setup** > select zone or device > **Parameters, counters, signals** > **Counters** or **Signals**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Installation Setup**.
   Enable installer access if **Installation Setup** is not available.
   2.1. Select **Enable installer access**.
   2.2. Use code **0012**.
3. Select the zone or device you want to read out.
4. Select **Parameters, counters, signals**.
5. Select **Counters** or **Signals** to read out a counter or signal.

Fig.17 Parameters, counters, signals



A - **Parameters**
- **Counters**
- **Signals**

B List of settings or values

4.5.3 Viewing production and software information

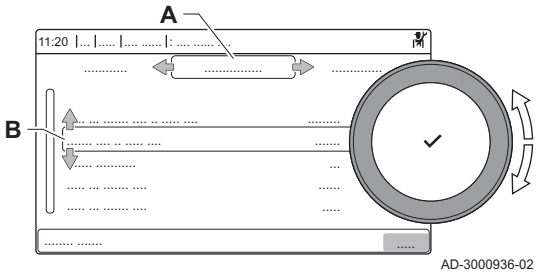
You can read details about the production dates, hardware and software versions of the appliance and all connected devices.

▶▶ ☰ > **Version Information**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Version Information**.
3. Select the appliance, control board or any other device you want to view.

Fig.18 Version information



A Select the appliance, control board or device
B List of information

4. Select the information you want to view.

4.5.4 Manual deaeration

You can manually deaerate your appliance.

▶▶ ☰ > **Commissioning Menu** > **Deaeration program**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Commissioning Menu**.
3. Select **Deaeration program**.
   ⇨ The manual de-aeration menu opens.

4. Follow the instructions on the display.

You can press and hold ⮌ to abort the procedure.

4.6 Resetting or restoring settings

4.6.1 Resetting the configuration numbers CN1 and CN2

The configuration numbers must be reset when indicated by an error message or when the control unit has been replaced. The configuration numbers can be found on the data plate of the appliance.

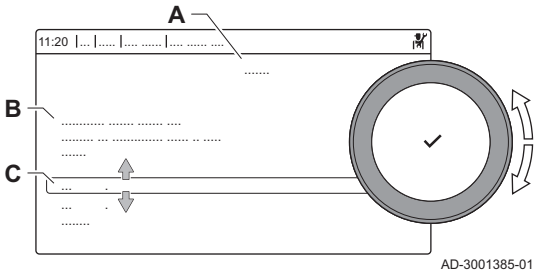
Important
All custom settings will be erased when the configuration numbers are reset. Depending on the appliance, there can be factory set parameters to enable certain accessories.

- Use the saved commissioning settings to restore these settings after the reset.
- If no commissioning settings were saved, write down custom settings before resetting. Include all relevant accessory related parameters.

▶▶ ☰ > **Advanced Service Menu** > **Set Configuration Numbers**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

Fig.19 Configuration numbers



A Select the control unit
B Extra information
C Configuration numbers

1. Press the ☰ button.
2. Select **Advanced Service Menu**.
3. Select **Set Configuration Numbers**.
4. Select the device you want to reset.
5. Select and change the **CN1** setting.
6. Select and change the **CN2** setting.
7. Select **Confirm** to confirm the changed numbers.

4.6.2 Carrying out an auto detect

The auto detect-function scans the installation for devices and other appliances connected to the L-Bus and S-Bus. You can use this function when a connected device or appliance has been replaced or removed from the installation.

▶▶ ☰ > **Advanced Service Menu** > **Auto Detect**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Advanced Service Menu**.
3. Select **Auto Detect**.
4. Select **Confirm** to carry out the auto-detect.

4.6.3 Restoring the commissioning settings

This option is only available when the commissioning settings were saved on the control panel and allows you to restore these settings.

▶▶ ☰ > **Advanced Service Menu** > **Revert commissioning settings**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Advanced Service Menu**.
3. Select **Revert commissioning settings**.
4. Select **Confirm** to restore the commissioning settings.

4.6.4 Resetting to factory settings

You can reset the appliance to the default factory settings.

▶▶ ☰ > **Advanced Service Menu** > **Reset to Factory Settings**

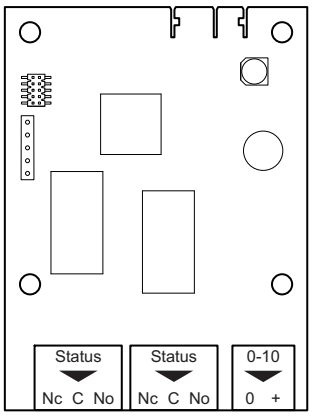
Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ☰ button.
2. Select **Advanced Service Menu**.
3. Select **Reset to Factory Settings**.
4. Select **Confirm** to restore the factory settings.

5 Installation examples

5.1 The SCB-01 expansion PCB

Fig.20 SCB-01 PCB



AD-3001514-01

The SCB-01 has the following features:

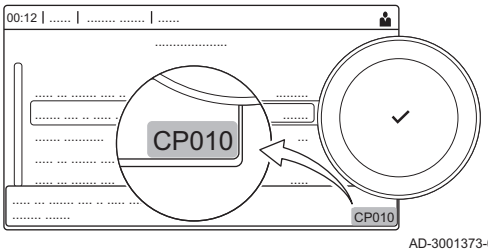
- Two potential free contacts for status notifications
- 0–10 V output connection for a PWM system pump

Expansion PCBs are automatically recognised by the control unit of the boiler. If expansion PCBs are removed, the boiler will show an error code. To resolve this error, an auto-detect must be carried out after removal.

6 Settings

6.1 Introduction to parameter codes

Fig.21 Code on a HMI T-control



AD-3001373-02

The controls platform makes use of an advanced system to categorise parameters, measurements and counters. Knowing the logic behind these codes, makes it easier to identify them. The code consists of two letters and three numbers.

Fig.22 First letter

AD-3001375-01

The first letter is the category the code relates to.

A Appliance: Appliance
C Circuit: Zone
D Domestic hot water: Domestic hot water
E External: External options

G Gas fired: Gas-fired heat engine
P Producer: Central heating

Category D codes are appliance controlled only. When the domestic hot water is controlled by an SCB, it is handled like a circuit, with C-category codes.

Fig.23 Second letter

AD-3001376-01

The second letter is the type.

P Parameter: Parameters
C Counter: Counters
M Measurement: Signals

Fig.24 Number

AD-3001377-01

The number is always three digits. In certain cases, the last of the three digits relates to a zone.

6.2 Searching the parameters, counters and signals

You can search and change data points (Parameters, counters, signals) of the appliance, connected control boards and sensors.

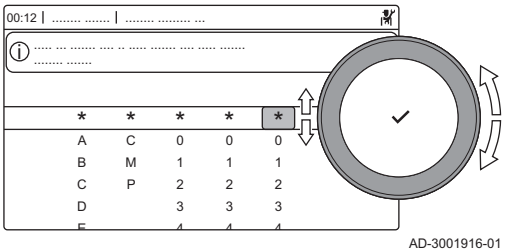
▶▶ ≡ > **Installation Setup** > **Search datapoints**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ≡ button.
2. Select **Installation Setup**.
3. Select **Search datapoints**.
4. Select the search criteria (code):
   4.1. Select the first letter (datapoint category).
   4.2. Select the second letter (datapoint type).
   4.3. Select the first number.
   4.4. Select the second number.
   4.5. Select the third number.

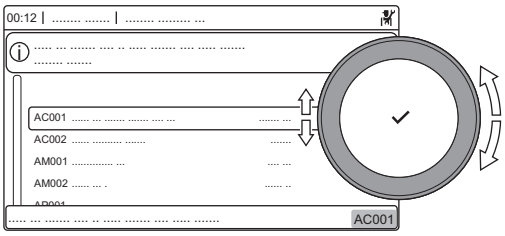
The ***** symbol can be used to indicate any character within the search field.

Fig.25 Search



AD-3001916-01

Fig.26 List of datapoints



AD-3001917-01

⇨ The list of datapoints appears in the display. Only the first 30 results are shown when searching.
5. Select the desired datapoint.

6.3 List of parameters

6.3.1 CU-GH06c control unit parameters

All tables show the factory setting for the parameters.

Important
The tables also list parameters that are only applicable if the boiler is combined with other equipment.

Tab.15 Navigation for basic installer level

Level	Menu path
Basic installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Parameters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The parameters are grouped in specific functionalities.	

Tab.16 Factory settings at basic installer level

Code	Description	Adjustment range	Submenu	160	200	250	300
AP016	Enable central heating heat demand processing	0 = Off 1 = On	Commercial boiler	1	1	1	1
AP017	Enable domestic hot water heat demand processing	0 = Off 1 = On	Commercial boiler	1	1	1	1
AP081	Shortname of the device		System Functionality	CU6	CU6	CU6	CU6
CP080 CP081 CP082 CP083 CP084 CP085	Room setpoint temperature of the user zone activity	5 - 30 °C	CH	16 20 6 21 22 20	16 20 6 21 22 20	16 20 6 21 22 20	16 20 6 21 22 20
CP200	Manually setting the room temperature setpoint of the zone	5 - 30 °C	CH	20	20	20	20
CP320	Operating mode of the zone	0 = Scheduling 1 = Manual 2 = Off	CH	1	1	1	1
CP550	Fire Place mode is active	0 = Off 1 = On	CH	0	0	0	0
CP570	Time Program of the zone selected by the user	0 = Schedule 1 1 = Schedule 2 2 = Schedule 3	CH	0	0	0	0
CP660	Choice icon to display this zone	0 = None 1 = All	CH	1	1	1	1

Tab.17 Navigation for installer level

Level	Menu path
Installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Parameters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The parameters are grouped in specific functionalities.	

Tab.18 Factory settings at installer level

Code	Description	Adjustment range	Submenu	160	200	250	300
AP001	BL input function selection	1 = Full blocking 2 = Partial blocking 3 = User reset locking	Commercial boiler	1	1	1	1
AP006	Appliance will report low water pressure below this value	0 - 7 bar	Commercial boiler	0.7	0.7	0.7	0.7
AP008	Waiting time after closing the release contact to start the heat generator.	0 - 255 Sec	Commercial boiler	0	0	0	0
AP009	Number of heat generator operating hours for raising a service notification	24 - 51000 Hours	Commercial boiler	17400	17400	17400	17400

Code	Description	Adjustment range	Submenu	160	200	250	300
AP010	Select the type of service notification	0 = None 1 = Custom notification 2 = ABC notification	Commercial boiler	2	2	2	2
AP011	Hours powered to raise a service notification	24 - 51000 Hours	Commercial boiler	17400	17400	17400	17400
AP073	Outdoor temperature; Upper limit for heating	1.5 - 60 °C	Outdoor temperature	22	22	22	22
AP074	The heating is stopped, Hot water is maintained, Force summer mode	0 = Off 1 = On	Outdoor temperature	0	0	0	0
AP079	Inertia of the building used for heat up speed	0 - 255	Outdoor temperature	0	0	0	0
AP080	Outside temperature below which the antifreeze protection is activated	-32 - 32 °C	Outdoor temperature	0	0	0	0
AP102	Configuration of the boiler pump as zone pump or system pump (feed lowloss header)	0 = No 1 = Yes	Commercial boiler	0	0	0	0
AP110	Parameter to activate the 2nd return sensor	0 = Inactive 1 = Active	Commercial boiler	0	0	0	0
CP000	Maximum Flow Temperature setpoint zone	0 - 90 °C	CH	90	90	90	90
CP010	Zone flow temperature setpoint, used when the zone is set to a fixed flow setpoint.	0 - 90 °C	CH	90	90	90	90
CP020	Functionality of the zone	0 = Disable 1 = Direct	CH	1	1	1	1
CP060	Wished room zone temperature on holiday period	5 - 20 °C	CH	6	6	6	6
CP070	Max Room Temperature limit of the circuit in reduced mode, that allows switching to comfort mode	5 - 30 °C	CH	15	15	15	15
CP210	Comfort footpoint of the temperature of heat curve of the circuit	15 - 90 °C	CH	15	15	15	15
CP220	Reduced footpoint of the temperature of heat curve of the circuit	15 - 90 °C	CH	15	15	15	15
CP230	Heating curve temperature gradient of the zone	0 - 4	CH	2.5	2.5	2.5	2.5
CP340	Type of reduced night mode, stop or maintain heating of circuit	0 = Stop heat demand 1 = Continue heat demand	CH	0	0	0	0
CP470	Setting of the screed drying program of the zone	0 - 30 Days	CH	0	0	0	0
CP480	Setting of the start temperature of the screed drying program of the zone	20 - 50 °C	CH	20	20	20	20
CP490	Setting of the stop temperature of the screed drying program of the zone	20 - 50 °C	CH	20	20	20	20
CP750	Maximum zone preheat time	0 - 65000 Min	CH	0	0	0	0
CP780	Selection of the control strategy for the zone	0 = Automatic 1 = Room temp based 2 = Outdoor temp based 3 = Outdoor & room based	CH	1	1	1	1
DP003	Maximum fan speed on Domestic Hot Water	1000 - 8500 Rpm	Commercial boiler	6700	4650	5700	5800

Code	Description	Adjustment range	Submenu	160	200	250	300
DP010	Temperature hysteresis for the heat generator to start on domestic hot water production	0 - 60 °C	Commercial boiler	7	7	7	7
DP011	Temperature offset to stop heat generator on domestic hot water production	0 - 60 °C	Commercial boiler	5	5	5	5
EP014	Smart Control Board function 10 Volt PWM input	0 = Off 1 = Temperature control 2 = Power control	0-10 volt input	0	0	0	0
GP007	Maximum fan speed during Central Heating mode	1000 - 8500 Rpm	Commercial boiler	6700	4650	5700	5800
GP008	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 - 8500 Rpm	Commercial boiler GVC Pneumatic	1900	1450	1550	1650
GP009	Fan speed at appliance start	900 - 5000 Rpm	Commercial boiler GVC Pneumatic	2200	2200	2200	2200
GP010	Gas Pressure Switch check on/off	0 = No 1 = Yes	Commercial boiler	0	0	0	0
GP021	Modulate back when delta temperature is larger than this threshold	5 - 25 °C	Commercial boiler	25	25	25	25
GP022	Tau factor for average flow temperature calculation	0 - 255	Commercial boiler	1	1	1	1
GP024	Valve Proofing System check on / off	0 = No 1 = Yes	Commercial boiler GVC Pneumatic	0	0	0	0
PP007	Minimum heat generator holding time that can be reached after a stop	0 - 20 Min	Commercial boiler	3	3	3	3
PP012	Stabilization time after heat generator start for central heating	5 - 180 Sec	Commercial boiler	30	30	30	30
PP015	Central heating pump post run time	1 - 99 Min	Commercial boiler	1	1	1	1
PP016	Maximum central heating pump speed (%)	20 - 100 %	Commercial boiler	100	100	100	100
PP018	Minimum central heating pump speed (%)	20 - 100 %	Commercial boiler	20	20	20	20
PP023	Temperature hysteresis for the generator to start on central heating	1 - 25 °C	Commercial boiler	10	10	10	10

Tab.19 Navigation for advanced installer level

Level	Menu path
Advanced installer	≡ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Parameters** > **Advanced**
(1) See the column "Submenu" in the following table for the correct navigation. The parameters are grouped in specific functionalities.	

Tab.20 Factory settings at advanced installer level

Code	Description	Adjustment range	Submenu	160	200	250	300
AP002	Enable manual heat demand function	0 = Off 1 = With setpoint 2 = Outdoor temp based	Commercial boiler	0	0	0	0
AP026	Flow temperature setpoint for manual heat demand	7 - 90 °C	Commercial boiler	40	40	40	40

Code	Description	Adjustment range	Submenu	160	200	250	300
AP056	Enable outdoor sensor	0 = No outside sensor 1 = AF60	Outdoor temperature	1	1	1	1
AP089	Name of the installer		Mandatory bus master				
AP090	Telephone number of the installer		Mandatory bus master	6	6	6	6
CP040	Pump post runtime of the zone	0 - 20 Min	CH	0	0	0	0
CP240	Adjustment of the influence of the zone room unit	0 - 10	CH	3	3	3	3
CP250	Calibration of Zone Room Unit	-5 - 5 °C	CH	0	0	0	0
CP290	Configuration of Zone Pump Output	0 = Zone output 1 = CH mode 2 = DHW mode 3 = Cooling mode 4 = Error report 5 = Burning 6 = Service flag 7 = System error 8 = DHW looping	CH	0	0	0	0
CP510	Temporary room setpoint per zone	5 - 50 °C	CH	20	20	20	20
GP030	Maximum flue gas temperature	20 - 200 °C	Commercial boiler	120	120	120	120
GP048	Minimum Pulse Width Modulation for the fan controller	0 - 100 %	GVC Pneumatic	10	5	5	5
GP050	Minimum power in kilo Watt for RT2012 calculation	0 - 300 kW	Commercial boiler	5.3	12.5	19	15.6
GP056	Factor of power reduction when temperature gradient > parHeDThMaxLevel1 is detected	0 - 1000	Commercial boiler	1	1	1	1
PP017	Maximum central heating at minimum load as percentage of max pump speed	0 - 100 %	Commercial boiler	30	30	30	30

6.3.2 SCB-01 expansion PCB parameters

All tables show the factory setting for the parameters.

Important
The tables also list parameters that are only applicable if the boiler is combined with other equipment.

Tab.21 Navigation for installer level

Level	Menu path
Installer	☰ > **Installation Setup** > **SCB-01** > Submenu(1) > **Parameters, counters, signals** > **Parameters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The parameters are grouped in specific functionalities.	

Tab.22 Factory settings at installer level

Code	Description	Adjustment range	Submenu	Default setting
EP018	Status relay function	0 = No Action 1 = Alarm 2 = Alarm Inverted 3 = Generator on 4 = Generator off 5 = Reserved 6 = Reserved 7 = Service request 8 = Generator on CH 9 = Generator on DHW 10 = CH pump on 11 = Locking or Blocking 12 = Cooling mode	Status information	No Action
EP019	Status relay function	0 = No Action 1 = Alarm 2 = Alarm Inverted 3 = Generator on 4 = Generator off 5 = Reserved 6 = Reserved 7 = Service request 8 = Generator on CH 9 = Generator on DHW 10 = CH pump on 11 = Locking or Blocking 12 = Cooling mode	Status information	No Action
EP028	Selects the function of the 0-10 Volt output	0 = 0-10V 1 (Wilo) 1 = 0-10V 2 (Gr GENI) 2 = PWM signal (Solar) 3 = 0-10V 1 limited 4 = 0-10V 2 limited 5 = PWM signal limited 6 = PWM signal (UPMXL)	0-10 volt or PWM out	0-10V 1 (Wilo)
EP029	Selects the source signal for the 0-10 Volt output	0 = PWM 1 = Requested power 2 = Actual power	0-10 volt or PWM out	PWM

6.4 List of measured values

6.4.1 CU-GH06c control unit counters

Tab.23 Navigation for basic installer level

Level	Menu path
Basic installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Counters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The counters are grouped in specific functionalities.	

Tab.24 Counters at basic installer level

Code	Description	Range	Submenu
AC001	Number of hours that the appliance has been on mains power	0 - 65534Hours	System Functionality
AC002	Number of hours that the appliance has been producing energy since last service	0 - 131070Hours	Commercial boiler
AC003	Number of hours since the previous servicing of the appliance	0 - 131070Hours	Commercial boiler

Code	Description	Range	Submenu
AC004	Number of heat generator starts since the previous servicing.	0 - 4294967295	Commercial boiler
AC005	Energy consumed for central heating	0 - 4294967295kWh	Commercial boiler
AC006	Energy consumed for domestic hot water	0 - 4294967295kWh	Commercial boiler
AC007	Energy consumed for cooling	0 - 4294967295kWh	Commercial boiler
AC026	Counter that shows the number of pump running hours	0 - 4294967295Hours	Commercial boiler
AC027	Counter that shows the number of pump starts	0 - 4294967295	Commercial boiler
DC002	Numbers of Domestic Hot Water diverting valve cycles	0 - 4294967295	Commercial boiler
DC003	Number of hours during which the diverting valve is in DHW position	0 - 4294967295Hours	Commercial boiler
DC004	Number of starts for domestic hot water	0 - 4294967295	Commercial boiler
DC005	Total number of hours that the appliance has been producing energy for domestical hot water	0 - 4294967295Hours	Commercial boiler
PC003	Total Number of hours that the appliance has been producing energy for central heating and DHW	0 - 65534Hours	Commercial boiler

Tab.25 Navigation for installer level

Level	Menu path
Installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Counters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The counters are grouped in specific functionalities.	

Tab.26 Counters at installer level

Code	Description	Range	Submenu
DC001	Total power consumption used by Domestic Hot Water	0 - 4294967295kW	Commercial boiler
PC002	Total number of heat generator starts for heating and domestic hot water	0 - 65534	Commercial boiler
PC004	Number of burner flame loss	0 - 65534	Commercial boiler

Tab.27 Navigation for advanced installer level

Level	Menu path
Advanced installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Counters** > **Advanced**
(1) See the column "Submenu" in the following table for the correct navigation. The counters are grouped in specific functionalities.	

Tab.28 Counters at advanced installer level

Code	Description	Range	Submenu
PC001	Total power consumption used by Central Heating	0 - 4294967295kW	Commercial boiler

6.4.2 SCB-01 expansion PCB counters

Tab.29 Navigation for basic installer level

Level	Menu path
Basic installer	≡ > **Installation Setup** > **SCB-01** > Submenu (1) > **Parameters, counters, signals** > **Counters** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The counters are grouped in specific functionalities.	

Tab.30 Counters at basic installer level

Code	Description	Range	Submenu
AC001	Number of hours that the appliance has been on mains power	0 - 4294967295Hours	System Functionality

6.4.3 CU-GH06c control unit signals

Tab.31 Navigation for basic installer level

Level	Menu path
Basic installer	≡ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Signals** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The signals are grouped in specific functionalities.	

Tab.32 Signals at basic installer level

Code	Description	Range	Submenu
AM001	Is the appliance currently in domestic hot water production mode?	0 = Off 1 = On	Commercial boiler
AM010	The current pump speed	0 - 100%	Commercial boiler
AM012	Current main status of the appliance.	**See** Status and sub-status, page 32	Status information System Functionality
AM014	Current sub status of the appliance.	**See** Status and sub-status, page 32	Status information System Functionality
AM015	Is the pump running?	0 = Inactive 1 = Active	Commercial boiler
AM016	Flow temperature of appliance.	-25 - 150°C	Zone manager Producer Generic Commercial boiler Prod manager bridge
AM017	The temperature of heat exchanger	-25 - 150°C	Commercial boiler
AM018	Return temperature of appliance. The temperature of the water entering the appliance.	-25 - 150°C	Zone manager Commercial boiler
AM019	Water pressure of the primary circuit.	0 - 25.5bar	Commercial boiler
AM022	On / Off heat demand	0 = Off 1 = On	Commercial boiler
AM024	Actual relative power of the appliance	0 - 655.35%	Commercial boiler

Code	Description	Range	Submenu
AM027	Instantaneous outside temperature	-60 - 60°C	Outdoor temperature Commercial boiler
AM028	Value of the 0 to 10 Volt input, meaning is dependant on the current input function setting.	0 - 25V	0-10 volt input
AM037	Status of the three way valve	0 = CH 1 = DHW	Commercial boiler
AM040	Temperature used for hot water control algorithms.	-25 - 150°C	Commercial boiler
AM101	Internal system flow temperature setpoint	0 - 120°C	Commercial boiler
AP078	Outside sensor detected in the application	0 = No 1 = Yes	Outdoor temperature
GM001	Actual fan RPM	0 - 8500Rpm	Commercial boiler
GM002	Actual fan RPM setpoint	0 - 8500Rpm	Commercial boiler
GM006	Gas Pressure Switch status	0 = Open 1 = Closed 2 = Off	Commercial boiler
GM008	Actual flame current measured	0 - 25µA	Commercial boiler
GM012	Release signal for the CU	0 = No 1 = Yes	Commercial boiler
GM015	Valve Proving System switch open / closed	0 = Open 1 = Closed 2 = Off	Commercial boiler

Tab.33 Navigation for installer level

Level	Menu path
Installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Signals** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The signals are grouped in specific functionalities.	

Tab.34 Signals at installer level

Code	Description	Range	Submenu
AM011	Is service currently required?	0 = No 1 = Yes	Commercial boiler
AM033	Next service indication	0 = None 1 = A 2 = B 3 = C 4 = Custom	Commercial boiler
AM036	Temperature of the exhaust gas leaving the appliance	0 - 250°C	Commercial boiler
AM044	Number of sensors supported by the device	0 - 255	Commercial boiler
AM045	Water pressure sensor present?	0 = No 1 = Yes	Commercial boiler
AM091	Seasonal mode active (summer / winter)	0 = Winter 1 = Frost protection 2 = Summer neutral band 3 = Summer	Outdoor temperature
CM030	Measure of the room temperature of the zone	-60 - 60°C	CH

Code	Description	Range	Submenu
CM120	Zone Current Mode	0 = Scheduling 1 = Manual 2 = Off 3 = Temporary	CH
CM130	Current activity of the zone	0 = Off 1 = Reduced 2 = Comfort 3 = Anti legionella	CH
CM140	OpenTherm controller is connected to the zone	0 = No 1 = Yes	CH
CM150	State of On Off heat demand per zone	0 = No 1 = Yes	CH
CM160	Presense of modulating heat demand per zone	0 = No 1 = Yes	CH
CM170	Zone OpenTherm smart power function is avaible	0 = No 1 = Yes	CH
CM180	Presense of Room Unit in this zone	0 = No 1 = Yes	CH
CM190	Wished room temperature setpoint of the zone	-60 - 60°C	CH
CM200	Displaying current operating mode of the zone	0 = Standby 1 = Heating 2 = Cooling	CH
CM210	Current outdoor temperature of the zone	-60 - 60°C	CH
CM230	Outdoor temperature average long time per zone	-60 - 60°C	CH
CM260	Measurement of the room sensor temperature of the zone	-60 - 60°C	CH
GM004	Gas valve 1	0 = Open 1 = Closed 2 = Off	Commercial boiler
GM005	Gas valve 2	0 = Open 1 = Closed 2 = Off	Commercial boiler
GM010	Available power in % of maximum	0 - 100%	Commercial boiler
GM044	Possible reason for Controlled Stop	0 = None 1 = CH Blocking 2 = DHW Blocking 3 = Wait for burner 4 = TFlow > absolute max 5 = TFlow > start temp. 6 = Theat exch > Tstart 7 = Avg Tflow > Tstart 8 = TFlow > max setpoint 9 = T difference too big 10 = TFlow > stop temp. 11 = Anti cycle on off HD 12 = Poor combustion 13 = Solar T above stop T	Commercial boiler
NM001	Cascade system flow temperature	-60 - 125°C	Producer<>Consumer
PM002	Central heating setpoint of the appliance	0 - 125°C	Commercial boiler

Tab.35 Navigation for advanced installer level

Level	Menu path
Advanced installer	☰ > **Installation Setup** > **FSB-WHB-HE-150-300** > Submenu (1) > **Parameters, counters, signals** > **Signals** > **Advanced**
(1) See the column "Submenu" in the following table for the correct navigation. The signals are grouped in specific functionalities.	

Tab.36 Signals at advanced installer level

Code	Description	Range	Submenu
AM043	A power down reset is needed	0 = No 1 = Yes	Commercial boiler
CM070	Current Flow temperature setpoint of zone	0 - 100°C	CH
GM003	Flame detection	0 = Off 1 = On	Commercial boiler
GM007	Appliance is igniting	0 = Off 1 = On	Commercial boiler
GM011	Power setpoint in % of maximum	0 - 100%	Commercial boiler
GM013	Blocking input status	0 = Open 1 = Closed 2 = Off	Commercial boiler
GM025	High limit status (0 = open, 1 = closed)	0 = Open 1 = Closed 2 = Off	Commercial boiler
PM003	Actual average flow temperature	-25 - 125°C	Commercial boiler

6.4.4 SCB-01 expansion PCB signals

Tab.37 Navigation for basic installer level

Level	Menu path
Basic installer	☰ > **Installation Setup** > **SCB-01** > Submenu (1) > **Parameters, counters, signals** > **Signals** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The signals are grouped in specific functionalities.	

Tab.38 Signals at basic installer level

Code	Description	Range	Submenu
AM010	The current pump speed	0 - 100%	0-10 volt or PWM out
AM012	Current main status of the appliance.	**See** Status and sub-status, page 32	System Functionality
AM014	Current sub status of the appliance.	**See** Status and sub-status, page 32	System Functionality
AM015	Is the pump running?	0 = Inactive 1 = Active	0-10 volt or PWM out
GM011	Power setpoint in % of maximum	0 - 655.35%	0-10 volt or PWM out

Tab.39 Navigation for installer level

Level	Menu path
Installer	☰ > **Installation Setup** > **SCB-01** > Submenu (1) > **Parameters, counters, signals** > **Signals** > **General**
(1) See the column "Submenu" in the following table for the correct navigation. The signals are grouped in specific functionalities.	

Tab.40 Signals at installer level

Code	Description	Range	Submenu
AM200	Status of status contact 1, meaning is dependant on the current function setting.	0 = Off 1 = On	Status information
AM201	Status of status contact 1, meaning is dependant on the current function setting.	0 = Off 1 = On	Status information

6.4.5 Status and sub-status

Tab.41 AM012 - Status

Code	Display text	Explanation
0	Standby	The appliance is in standby mode.
1	Heat Demand	A heat demand is active.
2	Generator start	The appliance starts.
3	Generator CH	The appliance is active for central heating.
4	Generator DHW	The appliance is active for domestic hot water.
5	Generator stop	The appliance has stopped.
6	Pump Post Run	The pump is active after the appliance stopped.
7	Cooling Active	The appliance is active for cooling.
8	Controlled Stop	The appliance does not start because the starting conditions are not met.
9	Blocking Mode	A blocking mode is active.
10	Locking Mode	A locking mode is active.
11	Load test min	Low load test mode for central heating is active.
12	Load test CH max	Full load test mode for central heating is active.
13	Load test DHW max	Full load test mode for domestic hot water is active.
15	Manual Heat Demand	Manual heat demand for central heating is active.
16	Frost Protection	Frost protection mode is active.
17	Deaeration	The deaeration program operates.
18	Control unit Cooling	The fan runs to cool the inside of the appliance.
19	Reset In Progress	The appliance resets.
20	Auto Filling	The appliance fills the installation.
21	Halted	The appliance has stopped. It must be reset manually.
200	Device Mode	The service tool interface controls the functions of the appliance.

Tab.42 AM014 - Sub status

Code	Display text	Explanation
0	Standby	The appliance waits for a process or an action.
1	AntiCycling	The appliance waits to restart, because there were too many consecutive heat demands (anti-short cycle).
2	CloseHydraulicValve	An external hydraulic valve is opened, when this option is connected to the appliance. An external option board must be connected to drive the valve.
3	ClosePump	The appliance starts the pump.
4	WaitingForStartCond.	The appliance waits for the temperature to meet the start conditions.
10	CloseExtGasValve	An external gas valve is opened, when this option is connected to the appliance. An external option board must be connected to drive the valve.
11	StartToGlueGasValve	The fan runs faster, before the flue gas valve is opened.

Code	Display text	Explanation
12	CloseFlueGasValve	The flue gas valve opens.
13	FanToPrePurge	The fan runs faster to pre-purge.
14	WaitForReleaseSignal	The appliance waits for the release input to close.
15	BurnerOnCommandToSu	A burner start command is sent to the safety core.
16	VpsTest	Valve proving test is active.
17	PreIgnition	Ignition starts before the gas valve opens.
18	Ignition	Ignition is active.
19	FlameCheck	The flame detection is active after the ignition.
20	Interpurge	The fan runs to purge the heat exchanger after a failed ignition.
30	Normal Int.Setpoint	The appliance operates to reach the desired value.
31	Limited Int.Setpoint	The appliance operates to reach the reduced internal desired value.
32	NormalPowerControl	The appliance operates on the desired power level.
33	GradLevel1PowerCtrl	The modulation is stopped due to a faster heat exchanger temperature change than gradient level 1.
34	GradLevel2PowerCtrl	The modulation is set to low load due to a faster heat exchanger temperature change than gradient level 2.
35	GradLevel3PowerCtrl	The appliance is in blocking mode due to a faster heat exchanger temperature change than gradient level 3.
36	ProtectFlamePwrCtrl	The burner power is increased due to a low ionisation signal.
37	StabilizationTime	The appliance is in stabilisation time. Temperatures should stabilise and temperature protections are switched off.
38	ColdStart	The appliance runs at start load to prevent cold start noise.
39	ChResume	The appliance resumes central heating after a domestic hot water interruption.
40	SuRemoveBurner	Burner demand is removed from safety core.
41	FanToPostPurge	The fan runs to purge the heat exchanger after the appliance stopped.
42	OpenExtFlueGasValve	External gas valve closes.
43	StopFanToFlueGVRpm	The fan runs slower, before the flue gas valve is closed.
44	StopFan	The fan has stopped.
45	LimitedPwrOnTflueGas	The power of the appliance is decreased to lower the flue gas temperature.
60	PumpPostRunning	The pump is active after the appliance stopped in order to bring the remaining heat into the system.
61	OpenPump	The pump has stopped.
62	OpenHydraulicValve	The external hydraulic valve closes.
63	SetAntiCycleTimer	
200	Initialising Done	Initialisation is finished.
201	Initialising Csu	The CSU is initialising.
202	Init identifiers	The identifiers are initialising.
203	Init.BL.Parameter	The blocking parameters are initialising.
204	Init safety unit	The safety unit is initialising.
205	Init blocking	The blocking is initialising.

7 Maintenance

7.1 Maintenance regulations

Important
The boiler must be maintained by a qualified installer in accordance with local and national regulations.

Important
Adjust the frequency of inspection and service to the conditions of use. This applies especially if the boiler is:

- In constant use (for specific processes).
- Used with a low supply temperature.
- Used with a high **ΔT**.

Caution

- Replace defective or worn parts with original spare parts. Not doing so will void warranty.
- During inspection and maintenance work, always replace all gaskets on the parts removed.
- Check whether all gaskets have been positioned properly (absolutely flat in the appropriate groove means they are gas, air and water tight).
- During the inspection and maintenance work, water (drops, splashes) must never come into contact with the electrical parts.

Warning
Always wear safety goggles and a dust mask during cleaning work (involving compressed air).

Danger of electric shock
Ensure that the boiler is switched off.

7.2 Maintenance message

The boiler display will clearly indicate that a service is required at the appropriate time. Use the automatic maintenance message for preventive maintenance, to keep faults to a minimum. The service messages show which service kit must be used. These service kits contain all parts and gaskets that are required for the relevant service. These service kits (A, B or C) put together by Remeha are available from spare parts suppliers.

Important
Maintenance messages must be followed up within 2 months.

Important
If the eTwist modulating thermostat is connected to the boiler, this thermostat can also display the maintenance message. Consult the thermostat manual.

Caution
Reset the maintenance message following every service.

7.3 Standard inspection and maintenance operations

For a service, always perform the following standard inspection and maintenance operations.

7.3.1 Checking the water pressure

1. Check the water pressure.

Important
The water pressure is shown on the display of the control panel.

⇨ The water pressure must be at least 0.8 bar
2. If the water pressure is lower than 0.8 bar, top up the central heating system.

7.3.2 Checking the water quality

1. Fill a clean bottle with some water from the system/boiler from the filling and drain cock.
2. Check the quality of this water sample or have it checked.

See
More information is available in our **Water quality instructions**. This manual forms part of the set of documents supplied with the boiler. Always adhere to the instructions in the aforementioned document.

7.3.3 Checking the ionisation current

1. Check the ionisation current at full load and at low load.
⇨ The value is stable after 1 minute.
2. Clean or replace the ionisation/ignition electrode if the value is lower than 4 µA.

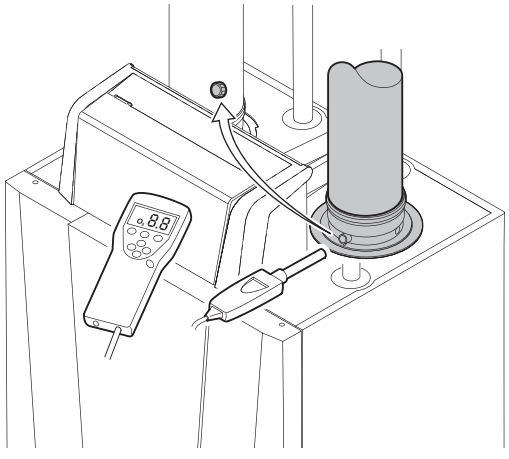
7.3.4 Check the flue gas outlet/air supply connections

1. Check the flue gas outlet and air supply connections for condition and tightness.

7.3.5 Checking the combustion

Combustion is checked by measuring the O_2/CO_2 percentage in the flue gas outlet duct.

Fig.27 Flue gas measuring point



AD-0001179-01

1. Unscrew the cap from the flue gas measuring point.
2. Insert the probe for the flue gas analyser into the measurement opening.

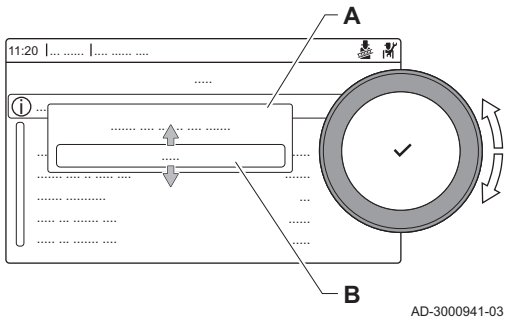
Warning
Fully seal the opening around the sensor during measurement.

Important
The flue gas analyser must have a minimum accuracy of ±0.25% O_2/CO_2.

3. Measure the percentage of O_2/CO_2 in the flue gases. Take measurements at full load and at part load.

Important
- This appliance is suitable for category I_{2H} containing up to 20% Hydrogen gas (H_2). Due to variations in the H_2 percentage, the O_2/CO_2 percentage can vary over time. (For example: a percentage of 20% H_2 in the gas can lead to an increase of 1,5% of O2 in the flue gasses)
- A significant adjustment of the gas valve may be needed. Adjustment can be done using the standard O_2/CO_2 values of the gas used.

Fig.28 Full load test



Performing the full load test

1. Select the tile [ ].
   ⇨ The **Change load test mode** menu appears.
2. Select the test **Medium power**.

   A Change load test mode
   B Medium power

   ⇨ The full load test starts. The selected load test mode is shown in the menu and the icon appears in the top right of the screen.
3. Check the load test settings and adjust if necessary.
   ⇨ Only the parameters shown in bold can be changed.

Checking/setting values for O_2/CO_2 at full load

1. Measure the percentage of O_2/CO_2 in the flue gases.
2. Compare the measured value with the checking values in the table.

Tab.43 Checking/setting values for O_2/CO_2 at full load for G20 (H gas)

Values at full load for G20 (H gas)	O_2 %(1)	CO_2 %(2)
Gas 220 Ace 160	4.8 - 5.2(1)	8.8(2) - 9.0
Gas 220 Ace 200	4.8 - 5.2(1)	8.8(2) - 9.0
Gas 220 Ace 250	4.8 - 5.2(1)	8.8(2) - 9.0
Gas 220 Ace 300	4.8 - 5.2(1)	8.8(2) - 9.0

(1) Nominal value
(2) Nominal value

Tab.44 Checking/setting values for O_2/CO_2 at full load for BREEAM with G20 (H gas)

Values at full load for G20 (H gas)	O_2 %(1)(2)	CO_2 %(3)(4)
Gas 220 Ace 160	6.1 - 6.5(1)	8.1(3) - 8.3
Gas 220 Ace 200	4.8 - 5.2(1)	8.8(3) - 9.0
Gas 220 Ace 250	5.2 - 5.6(1)	8.6(3) - 8.8
Gas 220 Ace 300	5.7 - 6.1(1)	8.3(3) - 8.5

(1) Nominal value
(2) These values are only applicable when the fan speeds have been set for BREEAM.
(3) Nominal value
(4) These values are only applicable when the fan speeds have been set for BREEAM.

Tab.45 Checking/setting values for O_2/CO_2 at full load for G30/G31 (butane/propane)

Values at full load for G30/G31 (butane/propane)	O_2 %(1)	CO_2 %(2)
Gas 220 Ace 160	5.1 - 5.4(1)	10.2(2) - 10.4
Gas 220 Ace 200	5.2 - 5.5(1)	10.1(2) - 10.3
Gas 220 Ace 250	5.2 - 5.5(1)	10.1(2) - 10.3
Gas 220 Ace 300	5.2 - 5.5(1)	10.1(2) - 10.3

(1) Nominal value
(2) Nominal value

Tab.46 Checking/setting values for O_2/CO_2 at full load for BREEAM with G30/G31 (butane/propane)

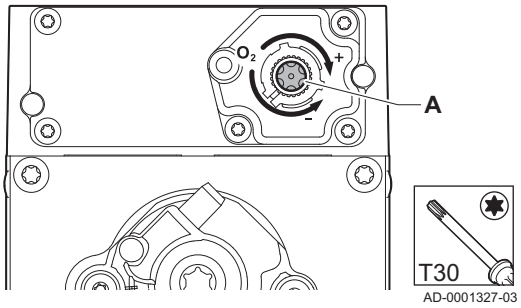
Values at full load for G30/G31 (butane/propane)	O_2 %(1)(2)	CO_2 %(3)(4)
Gas 220 Ace 160	6.6 - 6.9(1)	9.2(3) - 9.4
Gas 220 Ace 200	- - -(1)	-(3) - -
Gas 220 Ace 250	- - -(1)	-(3) - -
Gas 220 Ace 300	6.8 - 7.1(1)	9.1(3) - 9.3

(1) Nominal value
(2) These values are only applicable when the fan speeds have been set for BREEAM.
(3) Nominal value
(4) These values are only applicable when the fan speeds have been set for BREEAM.

Caution
- The O_2 values at full load must be lower than the O_2 values at low load.
- The CO_2 values at full load must be higher than the CO_2 values at low load.

3. If the measured value is outside of the values given in the table, correct the gas/air ratio.
4. Use adjusting screw **A** to set the percentage of O_2/CO_2 to the nominal value, for the gas type being used. This must always be between the highest and lowest setting limit.

Fig.29 Location of adjusting screw A



Important
The gas control valve differs per boiler type. Refer to the illustration for the location of adjusting screw **A** for full load.

5. Check the flame through the inspection glass. The flame must not blow off.
6. Measure the CO value in the flue gasses. If the CO level is above 400 ppm perform the following actions:

Important
The CO-concentration in the flue gasses must always comply with the installation regulations of the country in which the boiler is installed.

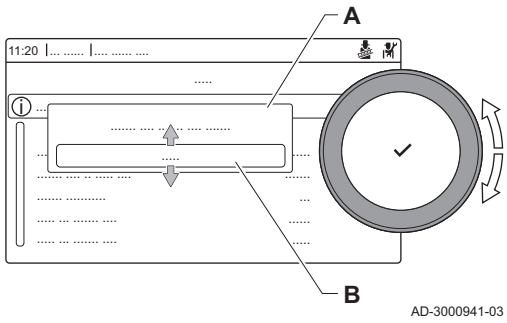
6.1. Check if the flue gas discharge system is installed correctly.
6.2. Check if the used gas type matches with the boiler settings.
6.3. Check the burner for damage and clean the burner.
6.4. Recheck the gas/air ratio setting.
6.5. Contact your supplier if the CO level is still above 400 ppm.

Danger
If the CO level is above 1000 ppm, switch off the boiler and contact your supplier.

■ Performing the low load test

1. If the full load test is still running, press the ✔ button to change the load test mode.

Fig.30 Low load test



2. If the full load test was finished, select the tile [🧹] to restart the chimney sweep menu.

A Change load test mode
B Low power

3. Select the **Low power** test in the menu **Change load test mode**.
   ⇨ The low load test starts. The selected load test mode is shown in the menu and the icon 🧹 appears in the top right of the screen.
4. Check the load test settings and adjust if necessary.
   ⇨ Only the parameters shown in bold can be changed.
5. End the low load test by pressing the ↩ button.
   ⇨ The message **Running load test(s) stopped!** is displayed.

■ Checking/setting values for O_2/CO_2 at low load

1. Measure the percentage of O_2/CO_2 in the flue gases.
2. Compare the measured value with the checking values in the table.

Tab.47 Checking/setting values for O_2/CO_2 at low load for G20 (H gas)

Values at low load for G20 (H gas)	O_2 %(1)	CO_2 %(2)
Gas 220 Ace 160	5.2(1) - 5.6	8.6 - 8.8(2)
Gas 220 Ace 200	5.2(1) - 5.6	8.6 - 8.8(2)
Gas 220 Ace 250	5.2(1) - 5.6	8.6 - 8.8(2)
Gas 220 Ace 300	5.2(1) - 5.6	8.6 - 8.8(2)

(1) Nominal value
(2) Nominal value

Tab.48 Checking/setting values for O_2/CO_2 at low load for BREEAM with G20 (H gas)

Values at low load for G20 (H gas)	O_2 %(1)(2)	CO_2 %(3)(4)
Gas 220 Ace 160	6.5(1) - 6.9	7.9 - 8.1(3)
Gas 220 Ace 200	5.2(1) - 5.6	8.6 - 8.8(3)
Gas 220 Ace 250	5.6(1) - 6.0	8.4 - 8.6(3)
Gas 220 Ace 300	6.1(1) - 6.5	8.1 - 8.3(3)

(1) Nominal value
(2) These values are only applicable when the fan speeds have been set for BREEAM.
(3) Nominal value
(4) These values are only applicable when the fan speeds have been set for BREEAM.

Tab.49 Checking/setting values for O_2/CO_2 at low load for G30/G31 (butane/propane)

Values at low load for G30/31 (butane/propane)	O_2 %(1)	CO_2 %(2)
Gas 220 Ace 160	5.4(1) - 5.7	10.0 - 10.2(2)
Gas 220 Ace 200	5.5(1) - 5.8	9.9 - 10.1(2)
Gas 220 Ace 250	5.5(1) - 5.8	9.9 - 10.1(2)
Gas 220 Ace 300	5.5(1) - 5.8	9.9 - 10.1(2)

(1) Nominal value
(2) Nominal value

Tab.50 Checking/setting values for O_2/CO_2 at low load for BREEAM with G30/G31 (butane/propane)

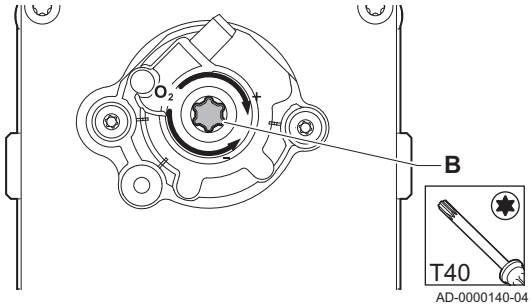
Values at low load for G30/31 (butane/propane)	O_2 %(1)(2)	CO_2 %(3)(4)
Gas 220 Ace 160	6.9(1) - 7.2	9.0 - 9.2(3)
Gas 220 Ace 200	-(1) - -	- - -(3)
Gas 220 Ace 250	-(1) - -	- - -(3)
Gas 220 Ace 300	7.1(1) - 7.4	8.9 - 9.1(3)

(1) Nominal value
(2) These values are only applicable when the fan speeds have been set for BREEAM.
(3) Nominal value
(4) These values are only applicable when the fan speeds have been set for BREEAM.

Caution
- The O_2 values at low load must be higher than the O_2 values at full load.
- The CO_2 values at low load must be lower than the CO_2 values at full load.

3. If the measured value is outside of the values given in the table, correct the gas/air ratio.
4. Use adjusting screw **B** to set the percentage of O_2/CO_2 to the nominal value, for the gas type being used. This must always be between the highest and lowest setting limit.

Fig.31 Location of adjusting screw B



Important
The gas control valve differs per boiler type. Refer to the illustration for the location of adjusting screw **B** for low load.

5. Check the flame through the inspection glass. The flame must not blow off.
6. Repeat the full load test and the low load test as often as necessary until the correct values are obtained.
7. Measure the CO value in the flue gasses. If the CO level is above 400 ppm perform the following actions:

Important
The CO-concentration in the flue gasses must always comply with the installation regulations of the country in which the boiler is installed.

7.1. Check if the flue gas discharge system is installed correctly.
7.2. Check if the used gas type matches with the boiler settings.
7.3. Check the burner for damage and clean the burner.
7.4. Recheck the gas/air ratio setting.
7.5. Contact your supplier if the CO level is still above 400 ppm.

Danger
If the CO level is above 1000 ppm, switch off the boiler and contact your supplier.

7.3.6 Checking the air pressure differential switch

Fig.32 Check the air pressure differential switch + side

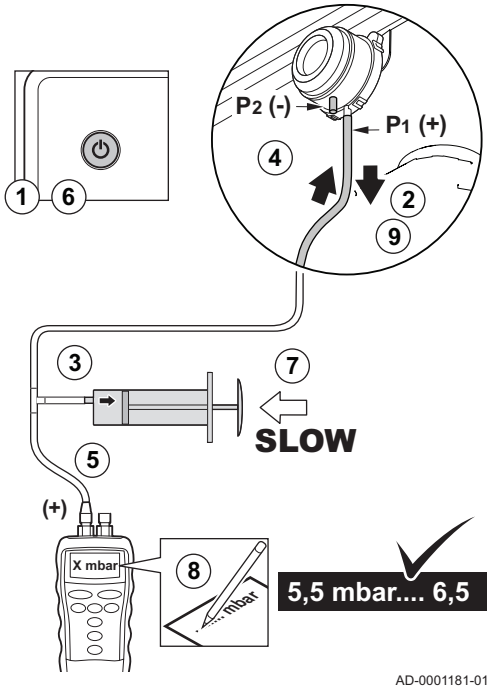
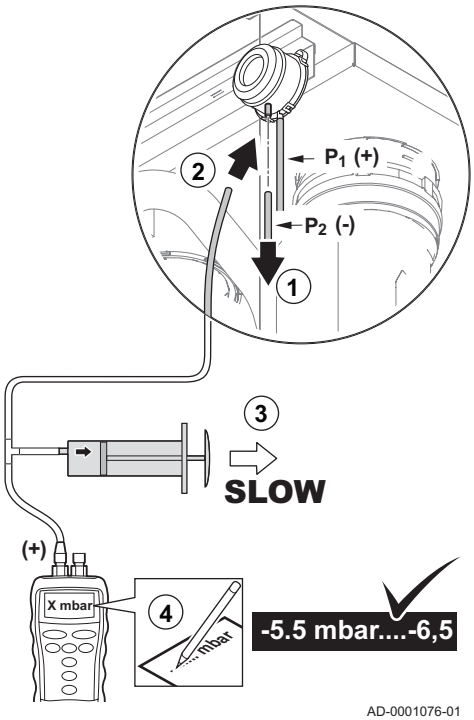


Fig.33 – side of the air pressure differential switch



■ Checking the air pressure differential switch + side

1. Switch off the boiler.
2. Disconnect the silicon hose on the + side (**P1**) of the air pressure differential switch.
3. Take a large plastic syringe or bellows and connect a T piece with a hose connected.
4. Connect the + side of the air pressure differential switch to one end of the T piece with a hose.
5. On the other end of the T piece, connect the + side of a pressure gauge.
6. Turn on the boiler
7. Push the syringe or bellows in very slowly until the boiler goes into failure mode.
8. Make a note of the pressure indicated by the pressure gauge at that point. A switch pressure of between 5.5 and 6.5 mbar is fine. A lower or higher switch pressure indicates a problem with the air pressure differential switch.
9. After taking a measurement, detach the silicon hose from the T piece on the + side and reconnect the hose that was previously removed.

Caution
Please note: The + side (**P1**) is the rear connector nipple of the air pressure differential switch.

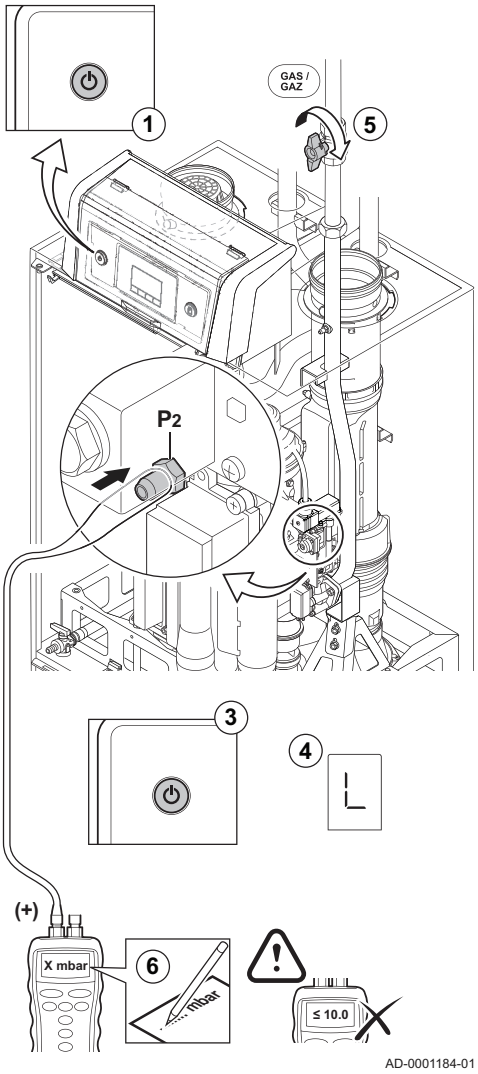
10. Remove any soiling from all connection points for hoses and the air pressure differential switch.
11. Check the condition and tightness of the hoses of the air pressure differential switch. Replace the hoses if necessary.

■ Checking the air pressure differential switch – side

1. Disconnect the short, coloured silicon hose on the – side (**P2**) of the air pressure differential switch.
2. Connect the – side of the air pressure differential switch to one end of the T piece with a hose.
3. Pull out the syringe until the boiler goes into failure mode.
4. Make a note of the pressure indicated by the pressure gauge at that point.
   ⇨ A switch pressure of between - 5.5 and - 6.5 mbar is fine. A lower or higher switch pressure indicates a problem with the air pressure differential switch.
5. After taking a measurement, detach the silicon hose from the T-piece on the – side and reconnect the coloured hose that was previously removed.
6. Remove any soiling from all connection points for hoses and the air pressure differential switch.
7. Check the condition and tightness of the hoses of the air pressure differential switch.
   ⇨ Replace the hoses if necessary.

7.3.7 Checking the minimum gas pressure switch GPS

Fig.34 Checking the GPS



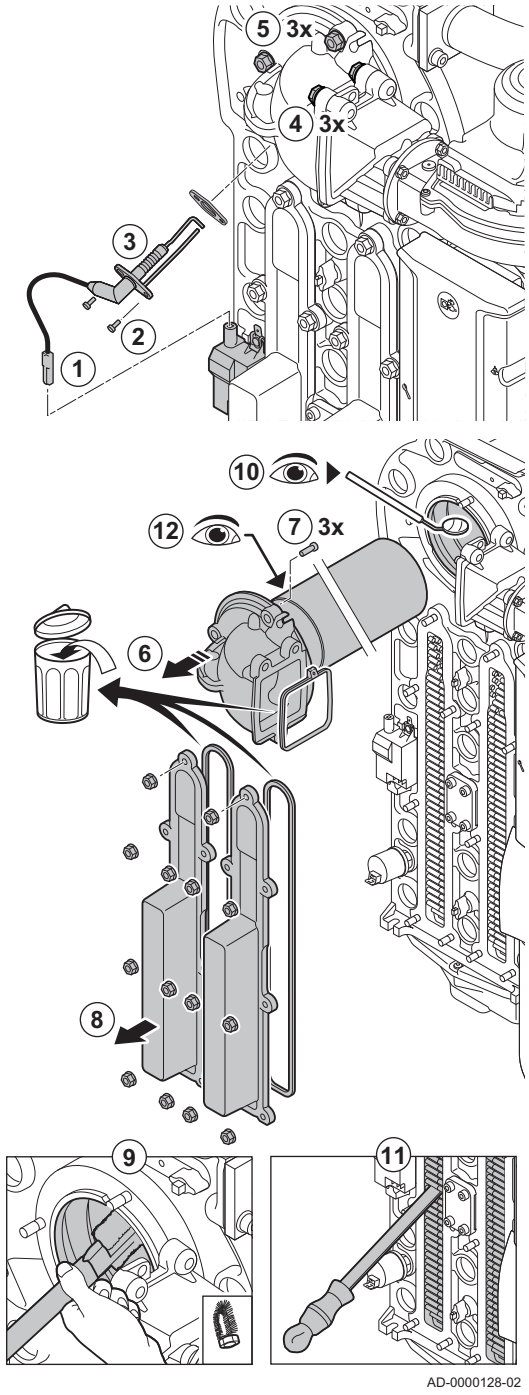
1. Switch off the boiler.
2. Open the screw in measuring point **2** of the gas valve unit.
3. Connect a pressure gauge to measuring point **2** of the gas valve unit.
4. Turn on the boiler.
5. Set the boiler to low load.
6. Close the boiler gas tap very slowly until the boiler goes into blocking mode.
7. Make a note of the pressure indicated by the pressure gauge at that point. Compare the measured values with the checking values in the table. If the measured pressure is lower, set the gas pressure switch to the correct value or replace it.

Tab.51 Minimum gas pressure switch value

	Minimum value (mbar)
Gas 220 Ace 160	14
Gas 220 Ace 200	14
Gas 220 Ace 250	14
Gas 220 Ace 300	13

7.3.8 Checking the burner and cleaning the heat exchanger

Fig.35 Checking the burner



1. Disconnect the plug of the ionisation/ignition electrode from the ignition transformer.

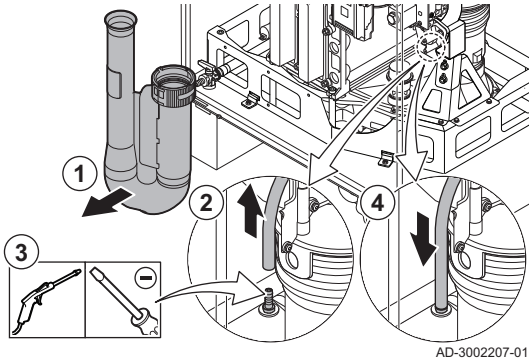
Caution
The ignition cable is fixed to the ionisation/ignition electrode and therefore may not be removed.

2. Loosen the 2 screws of the ionisation/ignition electrode.
3. Remove the ionisation/ignition electrode from the heat exchanger.
4. Undo the 3 bolts from the adapter on the non-return valve holder (15 Nm torque).
5. Undo the 3 nuts from the adapter on the heat exchanger (15 Nm torque).
6. Carefully remove the adapter with burner from the heat exchanger.
7. Remove the 3 bolts from the burner on the adapter and dismantle the burner.
8. Undo the nuts on the inspection ports (7.5 Nm torque).
   ⇨ Remove the inspection ports to reach the heat exchanger.
9. Use a vacuum cleaner to clean the top part of the heat exchanger (furnace).
10. Check (using a mirror) whether any visible contamination has been left behind. If it has, remove it with the vacuum cleaner.
11. Clean the lower section of the heat exchanger with the special cleaning blade (accessory).
12. Burner maintenance is almost never required:
    12.1. If necessary, carefully clean the cylinder-shaped burner with compressed air.
    12.2. Check that the burner surface of the dismantled burner is free from cracks and/or damage. If not, replace the burner.
13. Reassemble the unit in the reverse order.
14. Open the gas supply and insert the plug in the socket again.

Caution
- Use the specified torques when fitting nuts and bolts.
- Make sure the gaskets are in place when fitting nuts and bolts.

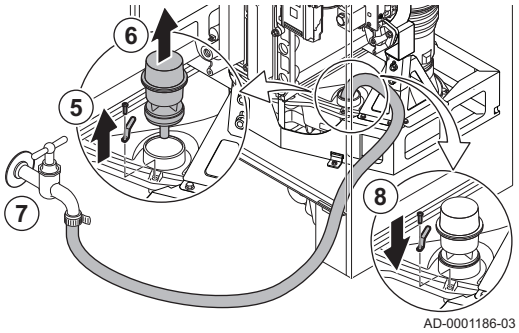
7.3.9 Cleaning the condensate collector

Fig.36 Clean the connection nipple



1. Remove the air intake silencer.
2. Disconnect the silicon hose of the air pressure differential switch from the connection nipple on the condensate collector.
3. Clean the opening of the connection nipple thoroughly (by blowing air or pushing an object through it).
4. Reconnect the silicon hose.

Fig.37 Clean the condensate collector



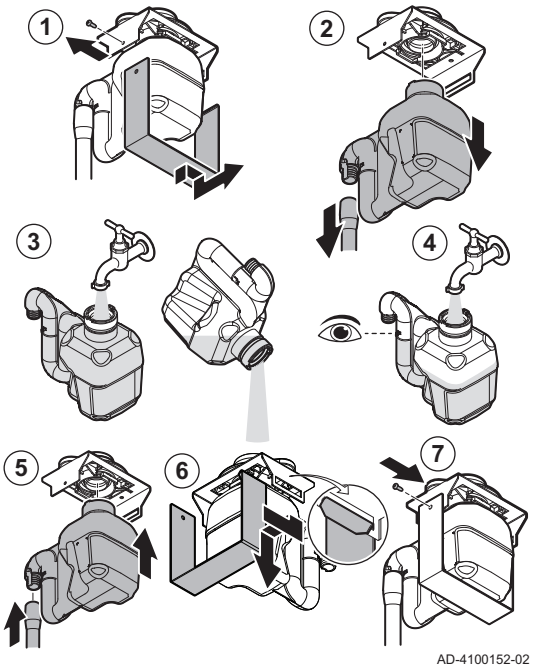
5. Remove the clip that locks the sealing cap.
6. Remove the sealing cap from the condensate collector.
7. Rinse the condensate collector thoroughly with a water flow that is as large as possible.

Warning
When flushing, prevent water from getting into the boiler.

8. Reassemble in reverse order.

7.3.10 Cleaning the condensate trap

Fig.38 Cleaning the condensate trap



1. Unfasten the screw and unhook the bracket.
2. Carefully pull the trap and trap hose downwards.
3. Clean the trap with water.
4. Fill the trap with water up to the mark.
5. Push the trap firmly into the designated opening and install the trap hose.
6. Hook the bracket onto the base.
7. Fasten the screw on the side of the bracket.

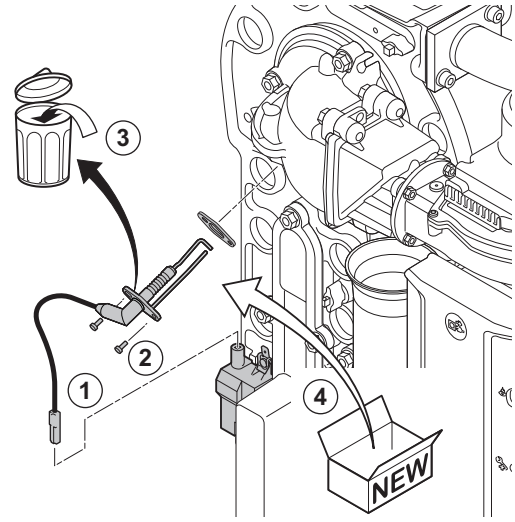
Danger
The trap must always be filled with water. This prevents flue gases from entering the room.

7.4 Specific maintenance work

Perform the specific maintenance work if this proves to be necessary following the standard inspection and maintenance work. To conduct the specific maintenance work:

7.4.1 Replacing the ionisation/ignition electrode

Fig.39 Replacing the ionisation/ignition electrode



The ionisation/ignition electrode must be replaced if:

- The ionisation current is < 4 µA.
- The electrode is damaged or worn.
- The electrode is included in the service kit.

1. Remove the plug of the electrode from the ignition transformer.

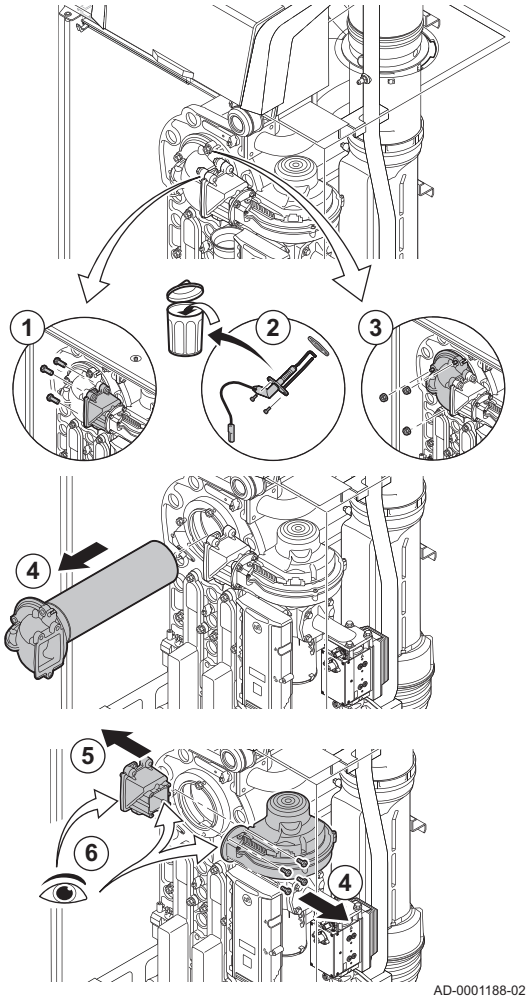
Important
The ignition cable is fixed to the electrode and therefore may not be removed.

2. Unscrew the two screws on the electrode.
3. Remove the entire component.
4. Fit the new ionisation/ignition electrode.
5. Reassemble the unit in reverse order.

7.4.2 Checking the non-return valve

Check the condition of the non-return valve. Replace the non-return valve if it is defective, there is one in the service kit, or if there are traces of condensation on the inside of the fan. Do this as follows:

Fig.40 Checking the non-return valve



1. Undo the 3 bolts from the adapter on the non-return valve holder (15 Nm torque).
2. Remove the ionisation/ignition electrode.
3. Undo the 3 nuts from the adapter on the heat exchanger (15 Nm torque).
4. Carefully remove the adapter with burner from the heat exchanger.
5. Remove the 4 bolts from the fan and remove the non-return valve holder (5.5 Nm torque).
6. Check whether traces of condensation are visible on the inside of the fan.
   ⇨ Always replace the non-return valve along with the holder in the event of visible traces of condensation or damage.
7. Reassemble in the reverse order.

Caution
- Use the specified torques when fitting nuts and bolts.
- Make sure the gaskets are in place when fitting nuts and bolts.

7.5 Finalising work

1. Fit all removed parts in the reverse order, but do not close the casing yet.

Caution
During inspection and maintenance operations, always replace all gaskets on the parts removed.

2. Fill the trap with water.
3. Put the trap back in place.
4. Carefully open all system and supply valves which were closed to carry out the maintenance.
5. Fill the central heating system with water if necessary.
6. Vent the central heating system.
7. Top up with more water if necessary.
8. Check the tightness of the gas and water connections.
9. Put the boiler back into operation.
10. Carry out an auto-detect when a control board has been replaced or removed from the boiler.
11. Set the boiler to full load and carry out a gas leak detection and a thorough visual check.
12. Set the boiler to normal operation.
13. Close the casing.

8 Troubleshooting

8.1 Error codes

The Gas 220 Ace is fitted with an electronic regulation and control unit. The heart of the control is a **e-Smart** microprocessor, which controls and also protects. In the event of an error, a corresponding code is displayed.

Tab.52 Error codes are displayed at three different levels

Code	Type	Description
A .00.00 (1)	Warning	The controls continue to operate, but the cause of the warning must be investigated. A warning can change into a blocking or lock-out.
H .00.00 (1)	Blocking	The controls will stop normal operation, and will check with set intervals if the cause of the blocking still exists.(2) Normal operation will resume when the cause of the blocking has been rectified. A blocking can become a lock-out.
E .00.00 (1)	Lock out	The controls will stop normal operation. The cause of the lock-out must be rectified and the controls must be reset manually.

(1) The first letter indicates the type of error.
(2) For some blocking errors, this checking interval is ten minutes. In those cases, it may seem that the controls do not start automatically. Wait ten minutes before resetting.

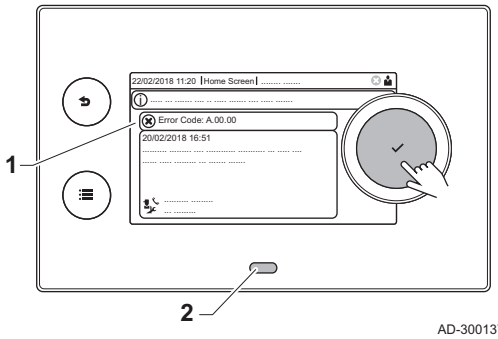
The meaning of the code can be found in the various error code tables.

Important
The error code is needed to find the cause of the error quickly and correctly and for any support from Remeha.

8.1.1 Display of error codes

When an error occurs in the installation, the control panel will show the following:

Fig.41 Error code display on HMI T-control



1 The display will show a corresponding code and message.
2 The status LED of the control panel will show:

- Continuous green = Normal operation
- Flashing green = Warning
- Continuous red = Blocking
- Flashing red = Lock out

When an error occurs, proceed as follows:

1. Press and hold the ✔ button to reset the appliance.
   ⇨ The appliance starts up again.
2. If the error code reappears, correct the problem by following the instructions in the error code tables.

Important
Only qualified professionals are authorised to work on the appliance and system.

   ⇨ The error code remains visible until the problem is solved.
3. Note the error code when the problem cannot be solved and contact your installer.

8.1.2 Warning

Tab.53 Warning codes

Code	Description	Solution
A.01.21	Maximum Dhw Temperature Gradient Level3 Exceeded	Temperature warning: • Check the flow.
A.02.06	Water Pressure Warning active	Water pressure warning: • Water pressure too low; check the water pressure
A.02.18	Object Dictionary Error	Configuration error: • Reset **CN1** and **CN2** **See** The data plate for the **CN1** and **CN2** values.
A.02.37	Uncritical device has been disconnected	SCB not found: • Bad connection: check the wiring and connectors • Faulty SCB: Replace SCB
A.02.45	Full Can Connection Matrix	SCB not found: • Carry out an auto-detect
A.02.46	Full Can Device Administration	SCB not found: • Carry out an auto-detect
A.02.49	Failed Initialising Node	SCB not found: • Carry out an auto-detect
A.02.55	Invalid or missing device serial number	Contact your supplier.
A.03.17	Periodically safety check ongoing	Safety check procedure active: • No action

8.1.3 Blocking

Tab.54 Blocking codes

Code	Description	Solution
H.00.36	Second return temperature sensor is either removed or measures a temperature below range	Second return temperature sensor open: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
H.00.37	Second return temperature sensor is either shorted or measures a temperature above range	Second return temperature sensor short-circuited: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
H.01.00	Communication Error occured	Communication error with the security kernel: • Restart the boiler • Replace the CU-GH
H.01.06	Maximum difference between heat exchanger temperature and flow temperature	Maximum difference between heat exchanger and flow temperature exceeded: • No flow or insufficient flow: - Check the circulation (direction, pump, valves). - Check the water pressure. - Check the cleanliness of the heat exchanger. - Check that the installation has been de-aired. - Check water quality according to supplier's specifications. • Sensor error: - Check that the sensors are operating correctly. - Check that the sensor has been fitted properly.
H.01.07	Maximum difference between heat exchanger temperature and return temperature	Maximum difference between heat exchanger and return temperature exceeded: • No flow or insufficient flow: - Check the circulation (direction, pump, valves). - Check the water pressure. - Check the cleanliness of the heat exchanger. - Check that the installation has been correctly vented to remove air. • Sensor error: - Check that the sensors are operating correctly. - Check that the sensor has been fitted properly.
H.01.08	Maximum CH temperature gradient level3 exceeded	Maximum heat exchanger temperature increase has been exceeded: • No flow or insufficient flow: - Check the circulation (direction, pump, valves) - Check the water pressure - Check the cleanliness of the heat exchanger - Check that the central heating system has been correctly vented to remove air • Sensor error: - Check that the sensors are operating correctly - Check that the sensor has been fitted properly
H.01.09	Gas Pressure Switch	Gas pressure too low: • No flow or insufficient flow: - Make sure that the gas valve is fully opened - Check the gas supply pressure - If a gas filter is present: Make sure that the filter is clean • Wrong setting on the gas pressure switch: - Make sure that the switch has been fitted properly - Replace the switch if necessary

Code	Description	Solution
H.01.13	Heat Exchanger temperature has exceeded the maximum operating value	Maximum heat exchanger temperature exceeded: • Check the circulation (direction, pump, valves). • Check the water pressure. • Check that the sensors are operating correctly. • Check that the sensor has been fitted properly. • Check the cleanliness of the heat exchanger. • Check that the central heating system has been correctly vented to remove air.
H.01.14	Flow temperature has exceeded the maximum operating value	Flow temperature sensor above normal range: • Bad connection: check the wiring and connectors • No flow or insufficient flow: - Check the circulation (direction, pump, valves) - Check the water pressure - Check the cleanliness of the heat exchanger
H.01.15	Flue gas temperature has exceeded the maximum operating value	Maximum flue gas temperature exceeded: • Check the flue gas outlet system • Check the heat exchanger to ensure that the flue gas side is not clogged • Faulty sensor: replace the sensor
H.02.00	Reset In Progress	Reset procedure active: • No action
H.02.02	Waiting For Configuration Number	Configuration error or unknown configuration number: • Reset **CN1** and **CN2**
H.02.03	Configuration Error	Configuration error or unknown configuration number: • Reset **CN1** and **CN2**
H.02.05	CSU does not match CU type	Configuration error: • Reset **CN1** and **CN2**
H.02.09	Partial blocking of the device recognized	Blocking input active or frost protection active: • External cause: remove external cause • Wrong parameter set: check the parameters • Bad connection: check the connection
H.02.10	Full blocking of the device recognized	Blocking input is active (without frost protection): • External cause: remove external cause • Wrong parameter set: check the parameters • Bad connection: check the connection
H.02.12	Release Signal input of the Control Unit from device external environment	Waiting time release signal has elapsed: • External cause: remove external cause • Wrong parameter set: check the parameters • Bad connection: check the connection
H.02.18	Object Dictionary Error	• Reset **CN1** and **CN2** **See** The data plate for the **CN1** and **CN2** values.
H.02.36	Functional device has been disconnected	Communication error with the SCB PCB: • Bad connection with BUS: check the wiring. • No PCB: reconnect PCB or retrieve from memory using auto-detect.
H.02.48	Function Group Configuration Fault	SCB not found: • Carry out an auto-detect
H.02.50	Function Group Communication Error	SCB not found: • Carry out an auto-detect.
H.03.00	Safety parameters level 2, 3, 4 are not correct or missing	Parameter error: security kernel • Restart the boiler • Replace the CU-GH

Code	Description	Solution
H.03.01	No valid data from CU to GVC received	Communication error with the CU-GH: • Restart the boiler
H.03.02	Measured ionisation current is below limit	No flame during operation: • No ionisation current: - Vent the gas supply to remove air - Check that the gas valve is fully opened - Check the gas supply pressure - Check the operation and setting of the gas valve unit - Check that the air supply inlet and flue gas outlet are not blocked - Check that there is no recirculation of flue gases
H.03.05	Gas Valve Control internal blocking occured	Security kernel error: • Restart the boiler • Replace the CU-GH

8.1.4 Locking codes

Tab.55 Locking codes

Code	Description	Solution
E.00.00	Flow temperature sensor is either removed or measures a temperature below range	Zone flow temperature sensor open: • Sensor is not present. • Wrong **Zone Function** setting: check the setting of parameter **CP02x**. • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: make sure that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E.00.01	Flow temperature sensor is either shorted or measures a temperature above range	Zone flow temperature sensor short-circuited: • Sensor is not present. • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E.00.04	Return temperature sensor is either removed or measures a temperature below range	Return temperature sensor open: • Bad connection: check the wiring and connectors • Incorrectly fitted sensor: check that the sensor has been correctly fitted • Faulty sensor: replace the sensor
E.00.05	Return temperature sensor is either shorted or measures a temperature above range	Return temperature sensor short-circuited: • Bad connection: check the wiring and connectors • Incorrectly fitted sensor: check that the sensor has been correctly fitted • Faulty sensor: replace the sensor
E.00.08	Heat exchanger temperature sensor is either removed or measures a temperature below range	Heat exchanger temperature sensor open: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E.00.09	Heat exchanger temperature sensor is either shorted or measures a temperature above range	Heat exchanger temperature sensor short-circuited: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.

Code	Description	Solution
E.00.40	Water pressure sensor is either removed or measures a temperature below range	Hydraulic pressure sensor open: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E.00.41	Water pressure sensor is either shorted or measures a temperature above range	Hydraulic pressure sensor short-circuited: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E.01.04	5x Error of unintended Flame Loss occurance	Flame loss occurs 5 times: • Vent the gas supply to remove air • Check that the gas valve is fully opened • Check the gas supply pressure • Check the operation and setting of the gas valve unit • Check that the air supply inlet and flue gas outlet are not blocked • Check that there is no recirculation of flue gases
E.01.12	Return temperature has a higher temperature value than the flow temperature	Flow and return reversed: • Bad connection: check the wiring and connectors • Water circulation in wrong direction: check the circulation (direction, pump, valves) • Incorrectly fitted sensor: check that the sensor has been correctly fitted • Malfunctioning sensor: check the Ohmic value of the sensor • Faulty sensor: replace the sensor
E.02.04	Parameter Error	Configuration error: • Reset **CN1** and **CN2** **See** The data plate for the **CN1** and **CN2** values.
E.02.13	Blocking Input of the Control Unit from device external environment	Blocking input is active: • External cause: remove external cause • Wrong parameter set: check the parameters
E.02.15	External CSU Timeout	CSU time out: • Bad connection: check the wiring and connectors • Faulty CSU: Replace CSU
E.02.17	Gas Valve Control unit communication has exceeded feedback time	Communication error with the security kernel: • Restart the boiler • Replace the CU-GH
E.02.35	Safety critical device has been disconnected	Communication fault • Carry out an auto-detect
E.02.47	Failed Connecting Function Groups	Function group not found: • Carry out an auto-detect • Restart the boiler • Replace the CU-GH
E.02.48	Function Group Configuration Fault	SCB not found: • Carry out an auto-detect.
E.02.52	Gvc Burner Profile Error	-
E.04.00	Safety parameters Level 5 are not correct or missing	Replace the CU-GH.
E.04.01	Flow temperature sensor is either shorted or measuring a temperature above range	Flow temperature sensor short circuited: • Bad connection: check the wiring and connectors • Incorrectly fitted sensor: check that the sensor has been correctly fitted • Faulty sensor: replace the sensor

Code	Description	Solution
E.04.02	Flow temperature sensor is either removed or measuring a temperature below range	Flow temperature sensor open: • Bad connection: check the wiring and connectors • Faulty sensor: replace the sensor
E.04.03	Measured flow temperature above savety limit	No flow or insufficient flow: • Check the circulation (direction, pump, valves) • Check the water pressure • Check the cleanliness of the heat exchanger
E.04.06	Measured flue temperature above limit	-
E.04.07	Deviation in flow sensor 1 and flow sensor 2 detected	Flow temperature sensor deviation: • Bad connection: check the connection • Faulty sensor: replace the sensor
E.04.08	Safety input is open	Air pressure differential switch activated: • Bad connection: check the wiring and connectors • Pressure in flue gas duct is or was too high: - Non-return valve does not open - Trap blocked or empty - Check that the air supply inlet and flue gas outlet are not blocked - Check the cleanliness of the heat exchanger
E.04.10	5 Unsuccessful burners starts detected	Five failed burner starts: • No ignition spark: - Check the wiring between the CU-GH and the ignition transformer - Check the ionisation/ignition electrode - Check breakdown to earth - Check the condition of the burner cover - Check the earthing - Replace the CU-GH • Ignition spark but no flame: - Vent the gas pipes to remove air - Check that the air supply inlet and flue gas outlet are not blocked - Check that the gas valve is fully opened - Check the gas supply pressure - Check the operation and setting of the gas valve unit - Check the wiring on the gas valve unit - Replace the CU-GH • Flame present, but ionisation has failed or is inadequate: - Check that the gas valve is fully opened - Check the gas supply pressure - Check the ionisation/ignition electrode - Check the earthing - Check the wiring on the ionisation/ignition electrode.
E.04.11	VPS Gas Valve proving failed	Gas leakage control fault: • Bad connection: check the wiring and connectors • Gas leakage control VPS faulty: Replace the valve proving system (VPS) • Gas valve unit faulty: Replace the gas valve unit
E.04.12	False flame detected before burner start	False flame signal: • The burner remains very hot: Set the O_2 • Ionisation current measured but no flame should be present: check the ionisation/ignition electrode • Faulty gas valve: replace the gas valve • Faulty ignition transformer: replace the ignition transformer
E.04.13	Fan speed has exceeded normal operating range	Fan fault: • Bad connection: check the wiring and connectors. • Fan operates when it should not be operating: check for excessive chimney draught • Faulty fan: replace the fan

Code	Description	Solution
E.04.14	The burner temperature and setpoint differ more than 60s regarding GVC configuration	-
E.04.15	The flue gas pipe is blocked	Flue gas outlet is blocked: • Check that the flue gas outlet is not blocked • Restart the boiler
E.04.17	The driver for the gas valve is broken	Gas valve unit fault: • Bad connection: check the wiring and connectors • Faulty gas valve unit: Replace the gas valve unit
E.04.23	Gas Valve Control internal locking	• Restart the boiler • Replace the CU-GH
E.04.250	Gas valve relay error detected	Internal error: • Replace the PCB.
E.04.254	Unknown	Unknown error: • Replace the PCB.

8.2 Error history

The control panel has an error history that stores the last 32 errors. Specific details are stored for each error, for example:

- Status
- Sub-status
- Flow temperature
- Return temperature

These details and others can contribute to the error solution.

8.2.1 Reading out and clearing the error history

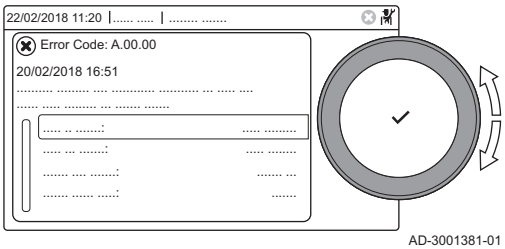
You can read out the errors on the control panel. The error history can also be cleared.

▶▶ ≡ > **Error History**

Use the rotary knob to navigate.
Use the ✔ button to confirm your selection.

1. Press the ≡ button.
2. Select **Error History**.
   Enable installer access if **Error History** is not available.
   2.1. Select **Enable installer access**.
   2.2. Use code **0012**.
   ⇨ A list up to 32 most recent errors is displayed with:
   - The error code.
   - A short description.
   - The date.
3. Select the error code you want to investigate.
   ⇨ The display shows an explanation of the error code and several details of the appliance when the error occurred.
4. To clear the error memory, press and hold the ✔ button.

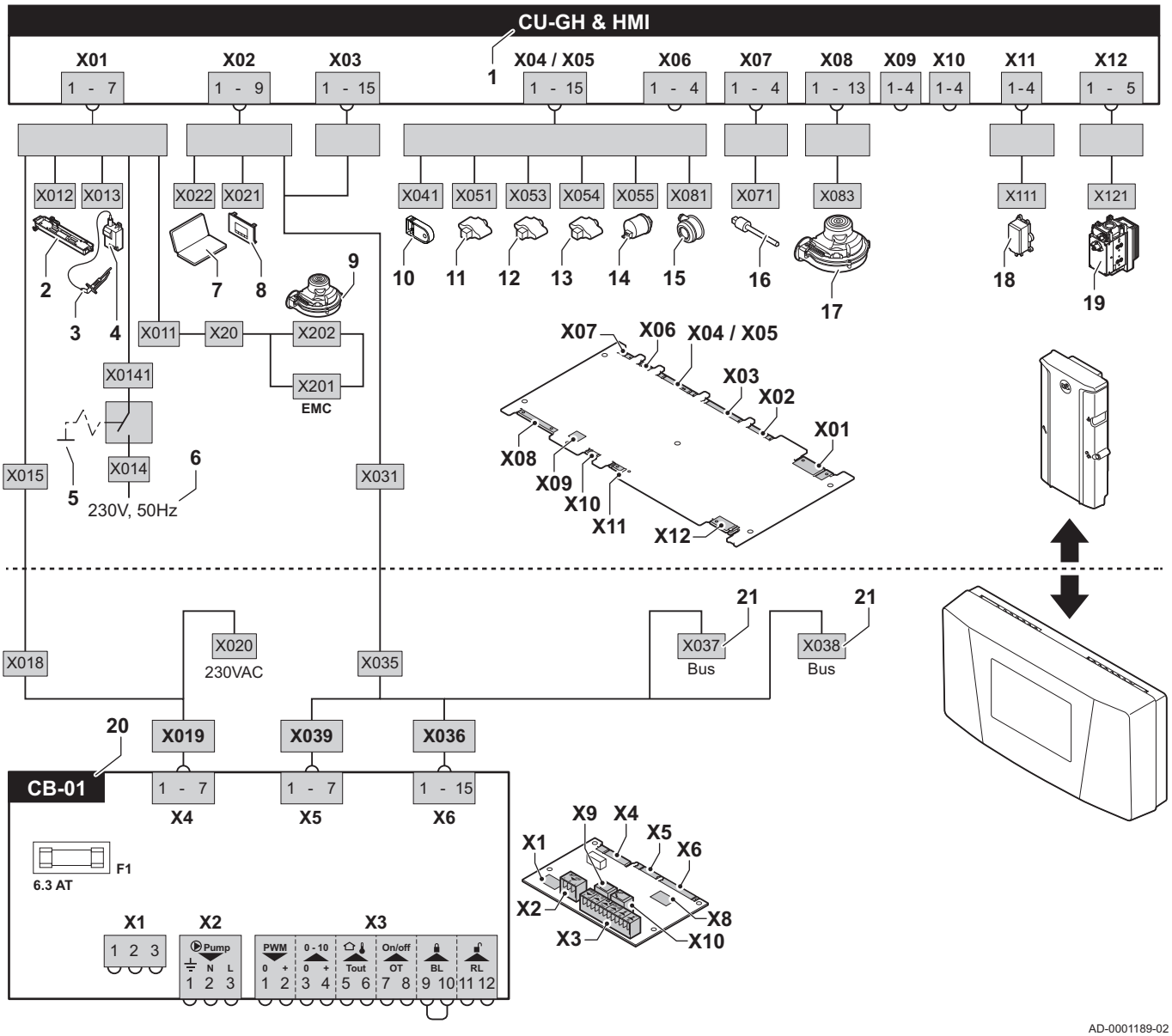
Fig.42 Error details



9 Technical specifications

9.1 Electrical diagram

Fig.43 Electrical diagram



AD-0001189-02

1 Boiler control unit
2 Lighting
3 Ionisation/ignition electrode (E)
4 Ignition transformer (IT)
5 On/Off switch (AU)
6 Power supply (P)
7 Service connector/computer connection (PC)
8 Control panel (HMI)
9 Fan supply (P)
10 Storage parameter (PSU)
11 Flow sensor (FTs)
12 Heat exchanger temperature sensor (HEs)
13 Return temperature sensor (RTs)
14 Hydraulic pressure sensor (WPs)
15 Air pressure differential switch (PS)
16 Flue gas sensor (FGs)
17 Fan control (PWM)
18 Gas pressure switch GPS
19 Gas valve
20 Standard PCB
21 L-Bus connections for additional control PCBs (depending on boiler model)

10 Spare parts

10.1 General

Only replace defective or worn boiler parts with original parts or recommended parts.

Send the part to be replaced to the Remeha Quality Control department if the relevant part is covered by the guarantee (see the General Terms of Sale and Delivery).

10.2 Parts

Fig.44 Gas 220 Ace 160

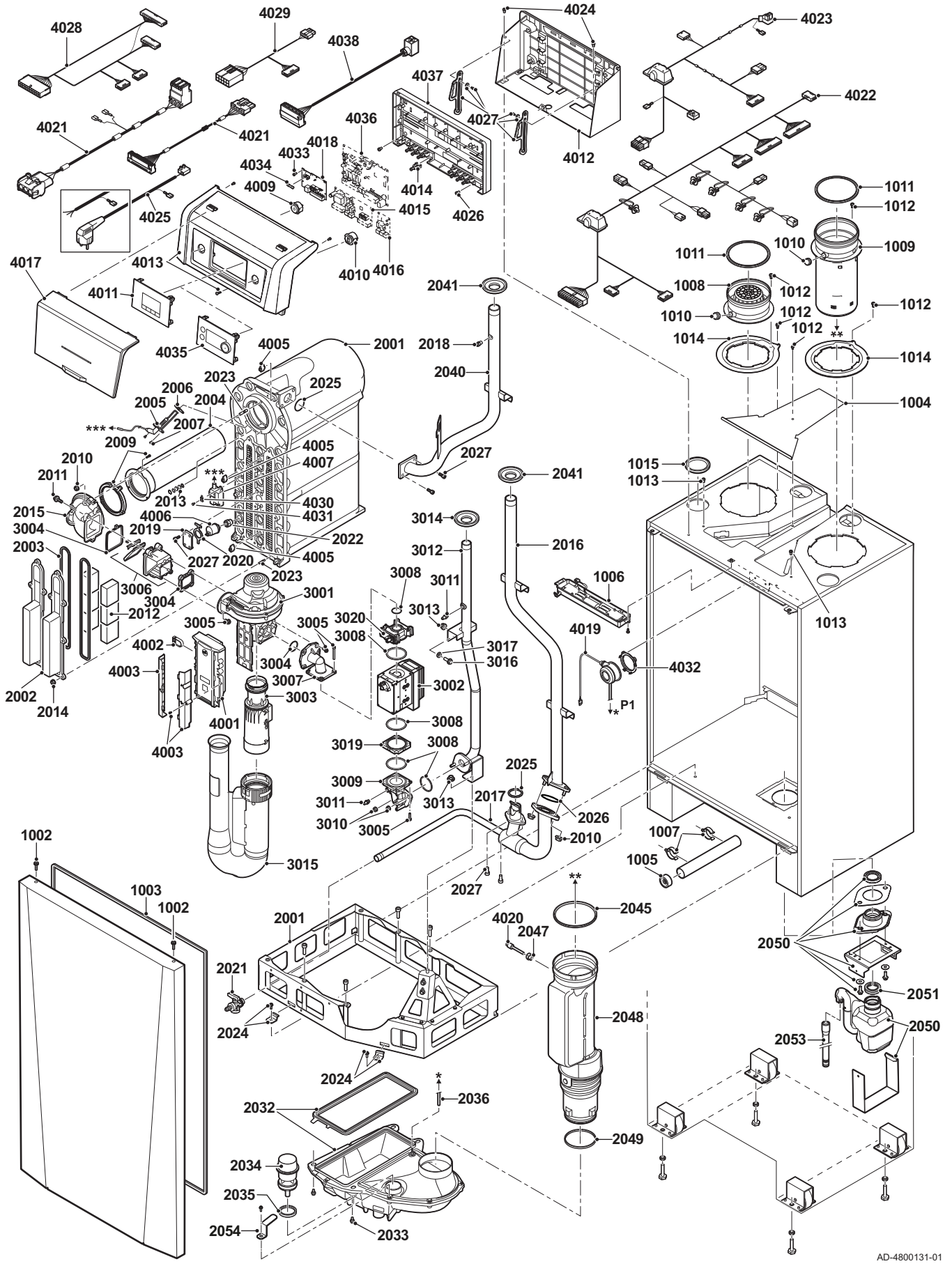
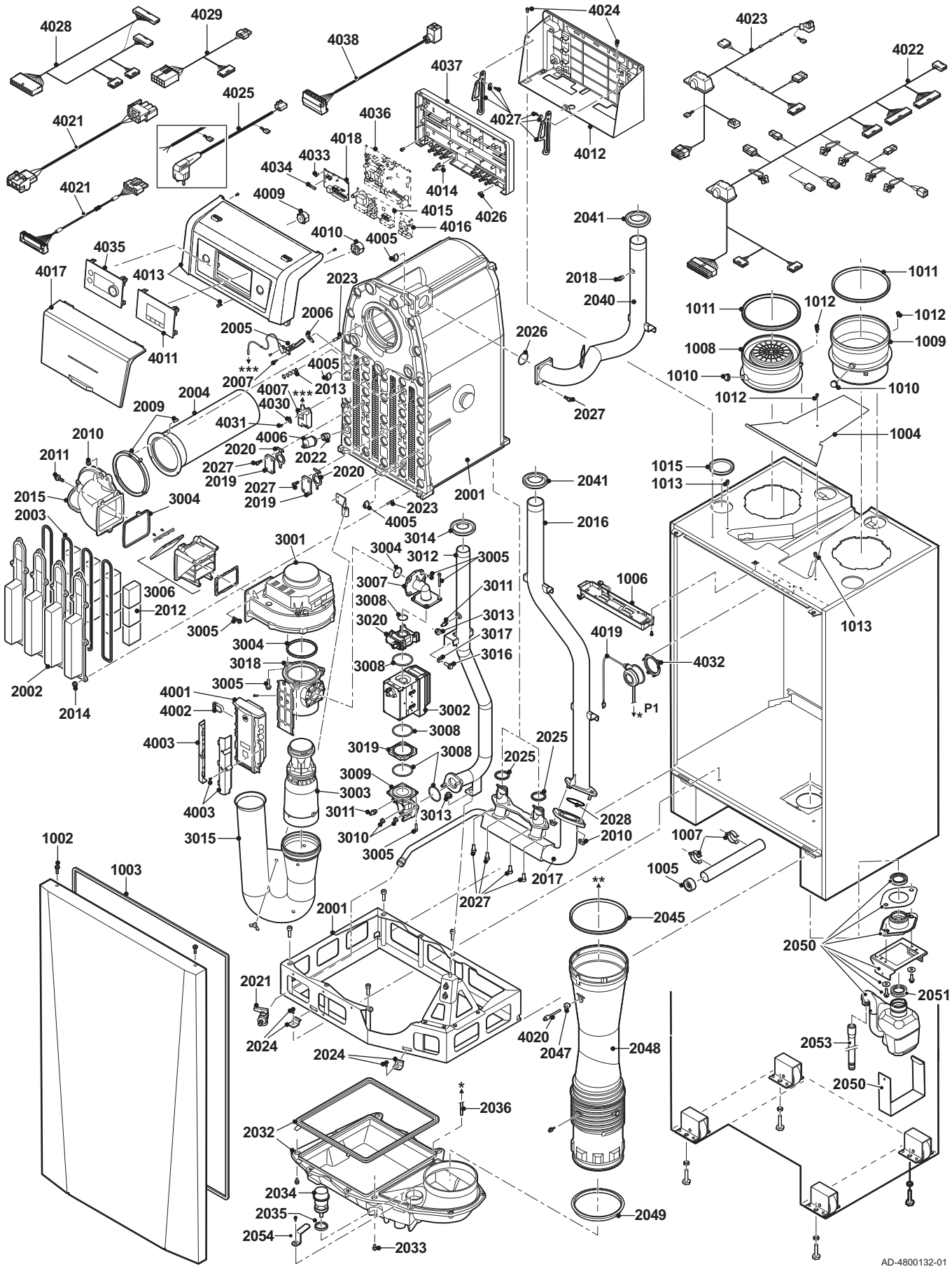


Fig.45 Gas 220 Ace 200 - 250 - 300



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