Ireland
en

PROJECT

INNOVENS PRO

Installation, User and Service Manual

High-efficiency wall-hung gas boiler

MCA 160

Diematic Evolution

De Dietrich
LE CONFORT DURABLE®

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 Safety

1.1 General safety instructions

For the installer:

Danger
If you smell gas:

1. Do not use naked flames, do not smoke and do not operate electrical contacts or switches (doorbell, lighting, motor, lift etc).
2. Shut off the gas supply.
3. Open the windows.
4. Trace possible leaks and seal them off immediately.
5. If the leak is upstream of the gas meter, notify the gas company.

Danger
If you smell flue gases:

1. Switch the boiler off.
2. Open the windows.
3. Trace possible leaks and seal them off immediately.

Caution
After maintenance or repair work, check the entire heating installation to ensure that there are no leaks.

For the end user:

Danger
If you smell gas:

1. Do not use naked flames, do not smoke and do not operate electrical contacts or switches (doorbell, lighting, motor, lift etc).
2. Shut off the gas supply.
3. Open the windows.
4. Evacuate the property.
5. Contact a qualified installer.

Danger
If you smell flue gases:

1. Switch the boiler off.
2. Open the windows.
3. Evacuate the property.
4. Contact a qualified installer.

Warning
Do not touch the flue gas pipes. Depending on the boiler settings, the temperature of the flue gas pipes can rise to over 60°C.

Warning
Do not touch radiators for long periods. Depending on the boiler settings, the temperature of the radiators can rise to over 60°C.

Warning
The use of the boiler and the installation by you as the end-user must be limited to the operations described in this manual. All other actions may only be undertaken by a qualified fitter/engineer.

Caution
Ensure that the boiler is regularly serviced. Contact a qualified installer or arrange a maintenance contract for the servicing of the boiler.

Caution
Only genuine spare parts may be used.

Important
Regularly check for the presence of water and pressure in the heating installation.

1.2 Recommendations

Danger
This appliance can be used by children aged eight and above and people with a physical, sensory or mental disability, or with a lack of experience and knowledge, provided they are supervised and instructed in how to use the appliance in a safe manner and understand the associated dangers. Children must not be allowed to play with the appliance. Cleaning and user maintenance should not be carried out by children without adult supervision.

Warning
Installation and maintenance of the boiler must be carried out by a qualified installer in accordance with local and national regulations.

Warning
The installation and maintenance of the boiler must be undertaken by a qualified installer in accordance with the information in the supplied manual, doing otherwise may result in dangerous situations and/or bodily injury.

Warning
Removal and disposal of the boiler must be carried out by a qualified installer in accordance with local and national regulations.

Warning
If the mains lead is damaged, it must be replaced by the original manufacturer, the manufacturer's dealer or another suitably skilled person to prevent hazardous situations from arising.

Warning
Always disconnect the mains supply and close the main gas tap when working on the boiler.

Warning
Check the entire system for leaks after maintenance and servicing work.

Danger
For safety reasons, we recommend fitting smoke and CO alarms at suitable places in your home.

Caution

- Make sure the boiler can be reached at all times.
- The boiler must be installed in a frost-free area.
- If the power cord is permanently connected, you must always install a main bipolar switch with an opening gap of at least 3 mm (EN 60335-1).
- Drain the boiler and central heating system if you are not going to use your home for a long time and there is a chance of frost.
- The frost protection does not work if the boiler is out of operation.
- The boiler protection only protects the boiler, not the system.
- Check the water pressure in the system regularly. If the water pressure is lower than 0.8 bar, the system must be topped up (recommended water pressure between 1.5 and 2 bar).

Important
Keep this document near to the boiler.

Important
Only remove the casing for maintenance and repair operations. Refit all panels when maintenance work and servicing are complete.

Important
Instruction and warning labels must never be removed or covered and must be clearly legible throughout the entire service life of the boiler. Damaged or illegible instructions and warning stickers must be replaced immediately.

Important
Modifications to the boiler require the written approval of **De Dietrich**.

1.3 Specific safety instructions

1.3.1 Additional guidelines

In addition to the legal requirements and guidelines, the supplementary guidelines in this manual must also be followed. Supplements or subsequent regulations and guidelines that are valid at the time of installation shall apply to all regulations and guidelines specified in this manual.

1.4 Liabilities

1.4.1 Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various Directives applicable. They are therefore delivered with the CE marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

Our liability as manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on installing the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

1.4.2 Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must observe the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Install the appliance in compliance with prevailing legislation and standards.
- Carry out initial commissioning and any checks necessary.
- Explain the installation to the user.
- If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
- Give all the instruction manuals to the user.

1.4.3 User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on a qualified professional to carry out installation and initial commissioning.
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.
- Keep the instruction manuals in good condition close to the appliance.

2 About this manual

2.1 General

This manual describes the installation, use and maintenance of the MCA boiler. This manual is part of all the documentation supplied with the boiler.

2.2 Additional documentation

The following documentation is available in addition to this manual:

- Installation and user manual for control panel
- Water quality instructions

2.3 Symbols used

2.3.1 Symbols used in the manual

This manual uses various danger levels to draw attention to special instructions. We do this to improve user safety, to prevent problems and to guarantee correct operation of the appliance.

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

Danger of electric shock
Risk of electric shock.

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

Caution
Risk of material damage.

Important
Please note: important information.

See
Reference to other manuals or pages in this manual.

3 Technical specifications

3.1 Homologations

3.1.1 Certifications

Tab.1 Certifications

CE identification number	**PIN 0063CQ3781**
NOx class	**6 (EN 15502-1)**
Type of connection	B_{23P}, B_{33}
	C_{13}, C_{33}, C_{43}, C_{53}, C_{63}, C_{83}, C_{93}

3.1.2 Unit categories

Tab.2 Unit categories

Country	Category	Gas type	Connection pressure (mbar)
Ireland	$II_{2H3B/P}$	G20 (H gas) G30/G31 (butane/propane)	20 30

3.1.3 Directives

In addition to the legal requirements and guidelines, the supplementary guidelines in this manual must also be followed.

Supplements or subsequent regulations and guidelines that are valid at the time of installation shall apply to all regulations and guidelines specified in this manual.

3.1.4 Factory test

Before leaving the factory, each boiler is optimally set and tested for:

- Electrical safety.
- Adjustment of (O_2).
- Water tightness.
- Gas tightness.
- Parameter setting.

3.2 Technical data

Tab.3 General

MCA			160
Nominal output (Pn) for central heating operation (80°C/60°C)	min. - max. (1)	kW	31.5 - 152.1 152.1
Nominal output (Pn) for central heating operation (50°C/30°C)	min. - max. (1)	kW	34.7 - 161.6 161.6
Nominal input (Qn) for central heating operation (Hi) G20 (H gas)	min. - max. (1)	kW	32.0 - 156.0 156.0
Nominal input (Qn) for central heating operation (Hi) G31 (Propane)	min. - max.	kW	40.0 - 156.0
Nominal input (Qn) for central heating operation (Hs) G20 (H gas)	min. - max. (1)	kW	35.6 - 173.3 173.3

MCA			160
Nominal input (Qn) for central heating operation (Hs) G31 (Propane)	min. - max.	kW	43.4 - 169.6
Full load central heating efficiency (Hi) (80/60°C) (92/42/EEC)		%	97.5
Full load central heating efficiency (Hi) (50°C/30°C) (EN15502)		%	103.6
Low load central heating efficiency (Hi) (return temperature 60°C)		%	98.4
Part load central heating efficiency (92/42/EEC) (return temperature 30°C)		%	108.5
(1) Factory setting.			

Tab.4 Gas and flue gas data

MCA			160
Gas inlet pressure G20 (H gas)	min. - max.	mbar	17 - 25
Gas inlet pressure G31 (propane)	min. - max.	mbar	37 - 50
Gas consumption G20 (H gas)(1)	min. - max.	m^3/h	3.4 - 16.5
Gas consumption G31 (propane)(1)	min. - max.	m^3/h	1.4 - 6.3
NO_X annual emissions G20 (H-gas) (EN 15502: O_2 = 0%)		mg/kWh	39
Flue gas mass flow rate	min. - max.	kg/h g/s	57 - 277 16 - 77
Flue gas temperature	min. - max.	°C	32 - 66
Maximum counter pressure		Pa	200
(1) Gas consumption based on lower heating value under standard conditions: T=288.15 K, p=1013.25 mbar. Gag 30.33; G25 29.25; G31 88.00 MJ/m^3			

Tab.5 Central heating circuit data

MCA			160
Water content		l	17
Water operating pressure	min	bar	0.8
Water operating pressure (PMS)	max	bar	4.0
Water temperature	max	°C	110
Operating temperature	max	°C	90
Pressure drop secondary circuit (ΔT=20 K)		mbar	170

Tab.6 Electrical data

MCA			160
Supply voltage		VAC	230
Power consumption – full load	max	W	275
Power consumption – low load	min	W	47
Power consumption – standby	min	W	5.3
Electrical protection index		IP	IPX1B
Fuses	Main	A A	6.3 1.6

Tab.7 Other data

MCA			160
Total weight (empty)		kg	147
Minimum mounting weight (without front panel)		kg	123
Average acoustic level at a distance of one metre from the boiler		dB(A)	59.5

Tab.8 Technical parameters

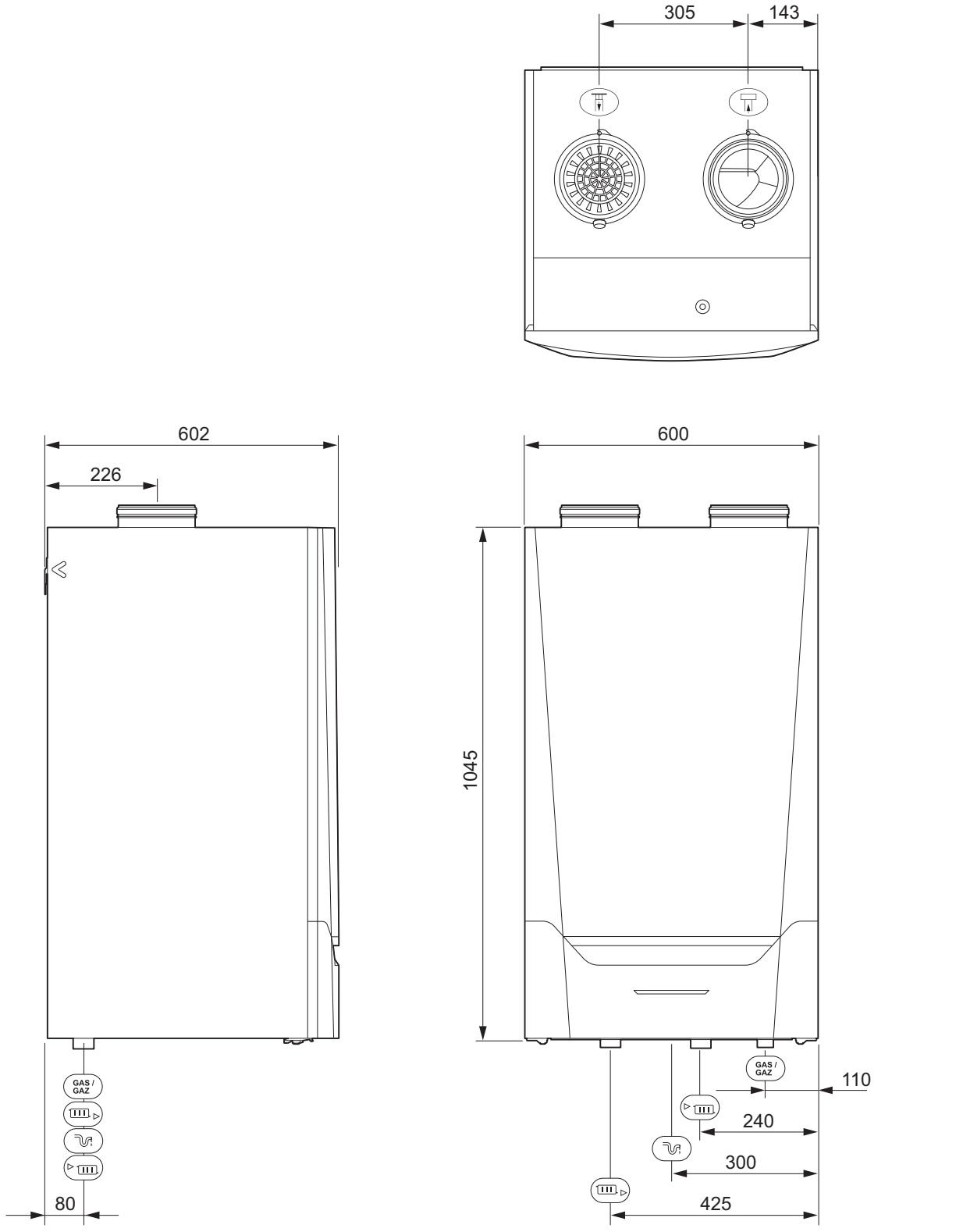
MCA			160
Condensing boiler			Yes
Low-temperature boiler(1)			No
B1 boiler			No
Cogeneration space heater			No
Combination heater			No
Rated heat output	*Prated*	kW	152
Useful heat output at nominal heat output and high temperature operation(2)	P_4	kW	152.1
Useful heat output at 30% of rated heat output and low temperature regime(1)	P_1	kW	50.8
Seasonal space heating energy efficiency	η_s	%	-
Useful efficiency at rated heat output and high temperature regime(2)	η_4	%	87.8
Useful efficiency at 30% of rated heat output and low temperature regime(1)	η_1	%	97.8
Auxiliary electricity consumption			
Full load	*elmax*	kW	0.275
Part load	*elmin*	kW	0.047
Standby mode	P_{SB}	kW	0.005
Other items			
Standby heat loss	P_{stby}	kW	0.191
Ignition burner power consumption	P_{ign}	kW	-
Annual energy consumption	Q_{HE}	kWh GJ	-
Sound power level, indoors	L_{WA}	dB	68
Emissions of nitrogen oxides	NO_X	mg/kWh	35

(1) Low temperature means 30°C for condensing boilers, 37°C for low temperature boilers and 50°C (at heater inlet) for other heating appliances.
(2) High temperature operation means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

See
Refer to the back cover for contact details.

3.3 Dimensions and connections

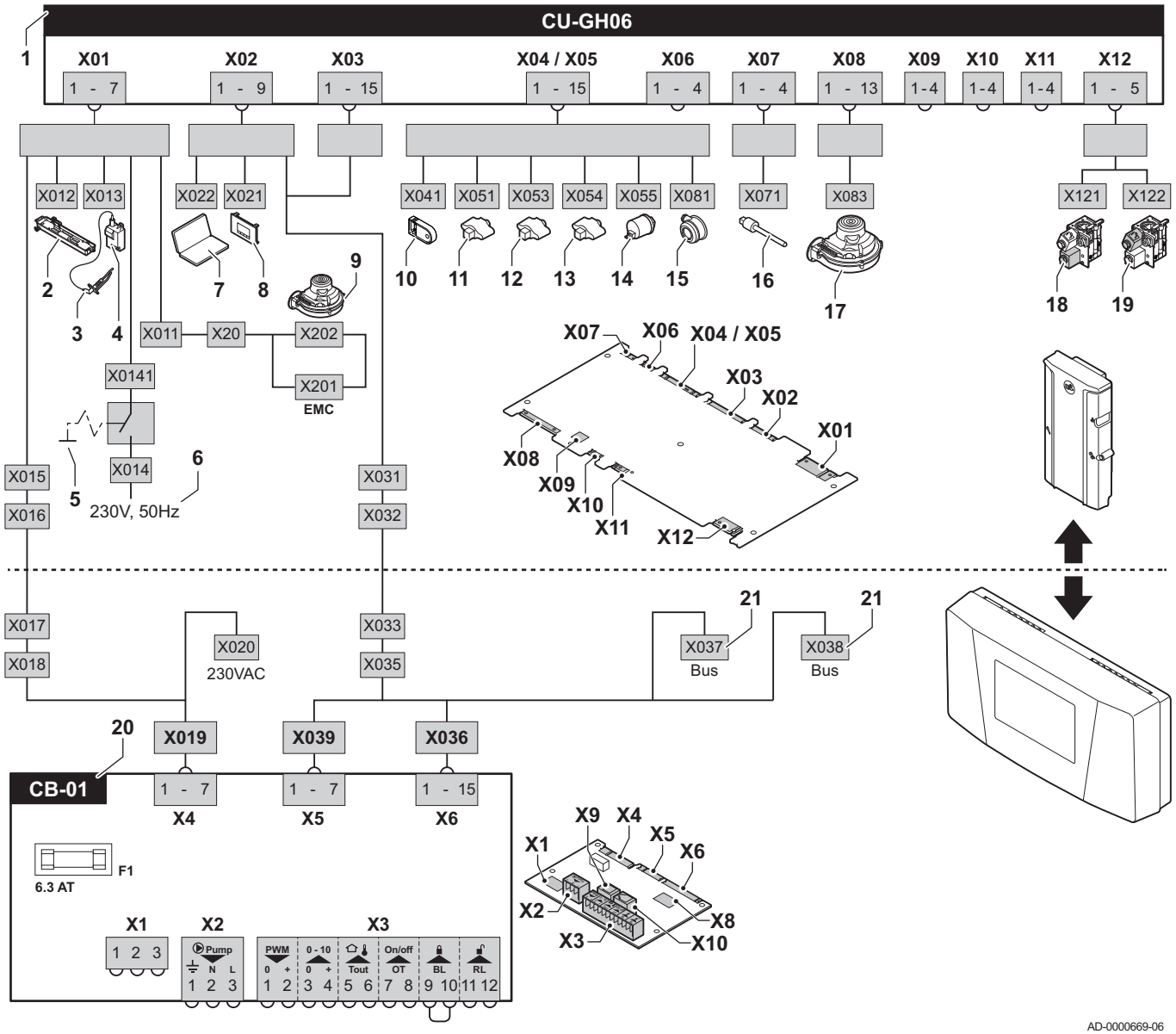
Fig.1 Dimensions



- Flue gas discharge connection; Ø 150 mm
- Air supply connection; Ø 150 mm
- Siphon connection
- CH flow connection; 1¼ inch male thread
- CH return connection; 1¼ inch male thread
- GAS/GAZ Gas connection; 1 inch male thread

3.4 Electrical diagram

Fig.2 Electrical diagram



1 Control unit
2 Lighting
3 Ignition pin
4 Ignition transformer
5 On/off switch
6 Power supply
7 Service connector / computer connection
8 Control panel
9 Fan supply
10 Storage parameter
11 Flow sensor
12 Heat exchanger sensor
13 Return sensor
14 Hydraulic pressure sensor
15 Air pressure differential switch
16 Flue gas sensor
17 Fan control
18 Gas valve 1
19 Gas valve 2
20 Standard PCB
21 L-bus connections for additional PCBs

4 Description of the product

The MCA 160 boiler is delivered with a combination of the control panel and control PCB. The combination is based on the following software and navigation information:

- Boiler MCA 160

Important
- Content of this manual is based on software version 0.17
- Name / navigate to: FSB-WHB-HE-150-300

- Control panel Diematic Evolution

Important
- Content of this manual is based on software version 1.8.2
- Name / navigate to: System Setting Menu

- Control PCB SCB-10

Important
- Content of this manual is based on software version 0.5
- Name / navigate to: SCB-10

4.1 General description

The MCA boiler is a high-efficiency wall-hung gas boiler with the following properties:

- High-efficiency heating.
- Limited emissions of polluting substances.
- Ideal choice for cascade configurations.

4.2 Operating principle

4.2.1 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.

4.2.2 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 siphon.

4.2.3 Control system

The 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, control stop 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.

4.2.4 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.

4.2.5 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.

4.2.6 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 $\Delta T \geq 25$ K or too great an increase in the heat exchanger temperature sensor, the boiler goes into blocking mode.

4.2.7 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.

4.2.8 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.

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

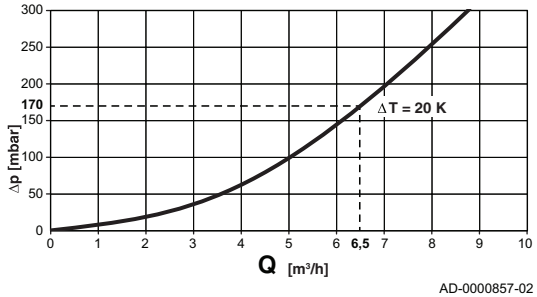
4.2.9 Air pressure differential switch

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.

4.2.10 Circulating pump

Fig.3 Water resistance



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.

See
Technical data, page 12.

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

4.2.11 Calorifier connection

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

Important
Contact us for more information.

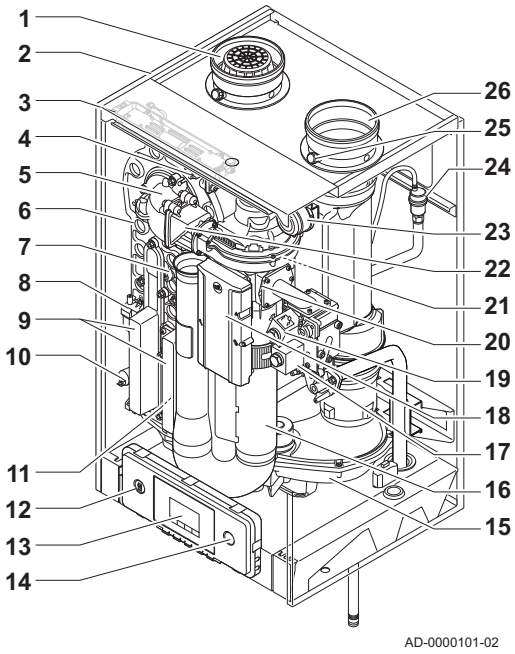
4.2.12 Cascade system

The boiler is ideally suited for a cascade system. There are a number of standard solutions available.

Important
Contact us for more information.

4.3 Main components

Fig.4 Main components

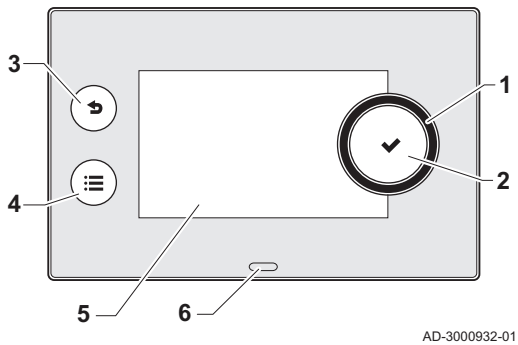


1 Air supply
2 Casing/air box
3 Interior light
4 Flow sensor
5 Adapter
6 Heat exchanger
7 Temperature sensor for heat exchanger
8 Ignition transformer
9 Inspection hatch for heat exchanger (x2)
10 Water pressure sensor
11 Return sensor
12 PC/laptop connection point
13 Control panel
14 On/off switch
15 Condensate collector
16 Air inlet silencer
17 Gas pressure measuring point
18 Control unit (CU-GH)
19 Gas valve unit
20 Venturi
21 Fan
22 Non-return valve
23 Air pressure differential switch
24 Automatic air vent
25 Flue gas measuring point
26 Flue gas outlet

4.4 Control panel description

4.4.1 Description of the components

Fig.5 Components of the control panel



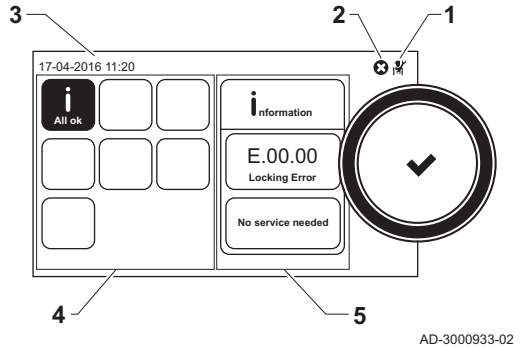
1 Rotary knob to select a menu or setting
2 Button ✔ to confirm the selection
3 Back button ⮌ to return to the previous level or previous menu
4 Menu button ☰ to return to the main menu
5 Display
6 LED for status indication:

- continuous green = normal operation
- flashing green = warning
- continuous red = shutdown
- flashing red = lockout

4.4.2 Description of the main screen

This screen is shown automatically after start-up of the appliance or when the control panel is used again with the display in standby mode (black screen). By using the back button ⮌ you can navigate to this screen.

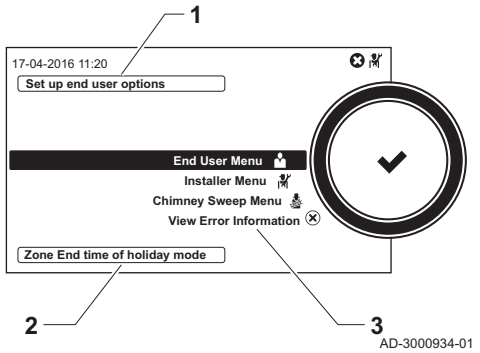
Fig.6 Icons on main screen



1 Icon showing the actual status of the appliance
2 Error indicator (only visible if an error has been found)
3 Date and time
4 Information tiles
5 Detailed information on selected information tile

4.4.3 Description of the main menu

Fig.7 Items in the main menu



1 Brief explanation of the selected menu
2 Brief explanation of a specific setting and the parameter number, if applicable
3 Available menus

4.4.4 Meaning of the icons in the display

Tab.9 Possible icons in the display (depending on available devices or functions)

	User menu		Micro co-generation boiler
	Installer menu		Heat pump
	Installer menu closed		Solar calorifier
	Chimney sweep menu		Cascade
	Chimney sweep menu closed		Fuel oil burner
	Error display		Burner output level (1 to 5 bars, with each bar representing 20% output)
	System settings		Burner on
	Information		Burner off
	Service		Central heating on
	Time display		Central heating off
	Timer program		DHW 1 on
	Temporary overwrite of the timer program		DHW 1 off
	Holiday program		DHW 2 on
	Manual		DHW 2 off
	Energy-saving mode		DHW boost on
	Frost protection		All zones (groups)
	Water pressure		General zone (group)(1)
	Outside temperature sensor		Living room(1)

	Pump		Kitchen(1)
	Three-way valve		Bedroom(1)
	DHW tank		Study(1)
	Gas boiler		Cellar(1)
(1) Adjustable icon for heating zone (group).			

4.5 Standard delivery

Tab.10 The delivery includes 2 packages

One package with:	One package with:
• The boiler, supplied with earthed mains plug	• Suspension bracket and fasteners for wall mounting • Mounting template • Siphon with condensate drain hose • Connection box with connector for external connections, including: - Standard control PCB **CB-01** - Expansion board **SCB-10** • Connection cables (230 V and 24 V) for connection between the connection box and boiler • Sticker: This central heating unit is set for... • Documentation

Important
This manual only deals with the standard scope of supply. For the installation or mounting of any accessories delivered with the boiler, refer to the corresponding mounting instructions.

4.6 Accessories and options

Various accessories can be obtained for the boiler.

Important
Contact us for more information.

5 Before installation

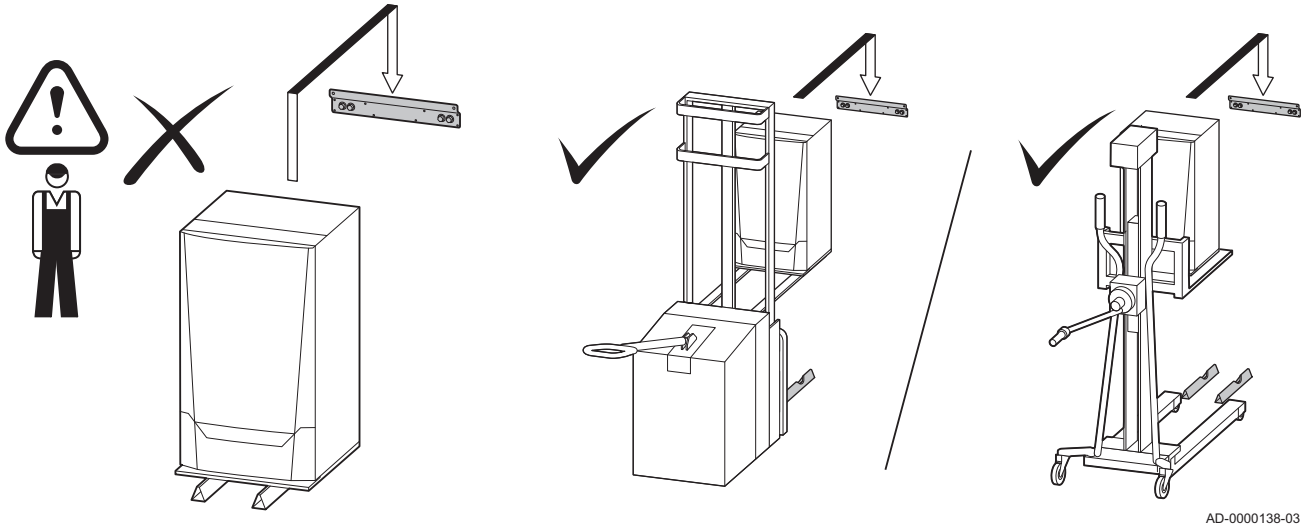
5.1 Installation regulations

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

5.2 Lifting instruction

The weight of the boiler exceeds the maximum lift weight for one person. We recommend the use of a lifting aid.

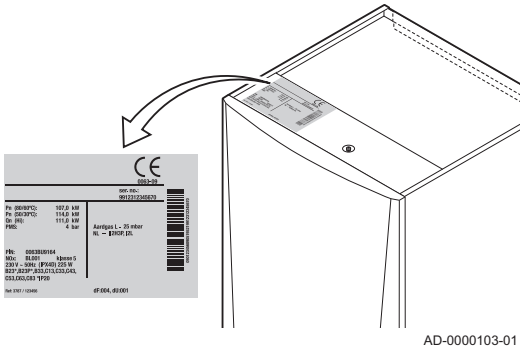
Fig.8 Lifting aids



5.3 Choice of the location

5.3.1 Type plate

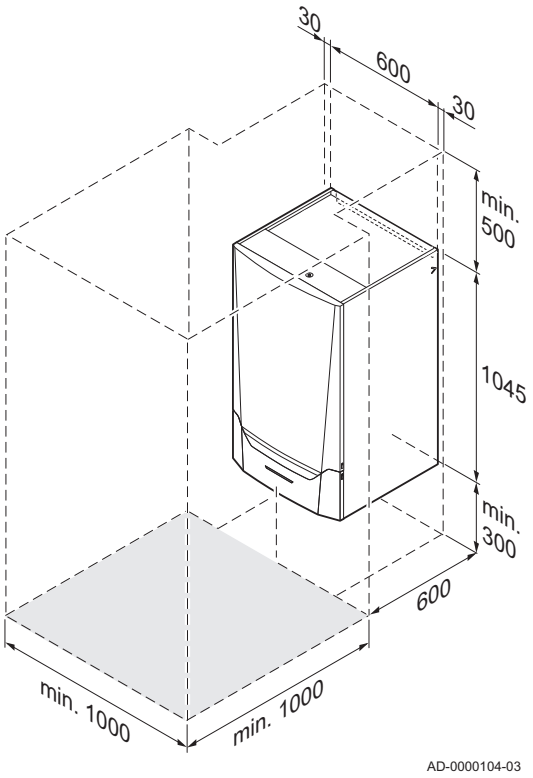
Fig.9 Position of type plate



The type plate on top of the boiler features the boiler serial number and important boiler specifications, for example the model and unit category. The factory setting codes CN 1 and CN 2 are also stated on the type plate.

5.3.2 Location of the boiler

Fig.10 Installation area



- Use the guidelines and the required installation space as a basis for determining the correct place to install the boiler.
  When determining the correct installation space, take account of the permitted position of the flue gas discharge and/or air supply outlet.
- Ensure that there is sufficient space around the boiler for good access and ease of maintenance.

Danger
It is forbidden to store, even temporarily, combustible products and substances in the boiler or near the boiler.

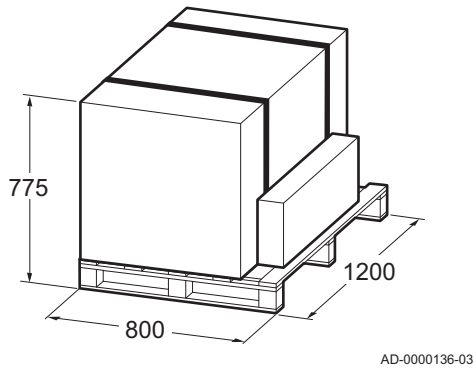
Caution

- Mount the boiler on a strong and solid wall (at least half-brick brickwork with calcium silicate bricks). Build a reinforcing structure if necessary.
- The boiler must be installed in a frost-free area.
- An earthed wall socket must be present with the boiler.
- A connection to the drain must be present for the condensate drain close to the boiler.
- The specified minimum space is required for standard maintenance work. For installation and extensive servicing work, there must be at least 1 m x 1 m of clear space in front of the boiler.

Caution
If the power cord is permanently connected, you must always install a main bipolar switch with an opening gap of at least 3 mm (EN 60335-1).

5.4 Transport

Fig.11 Boiler package

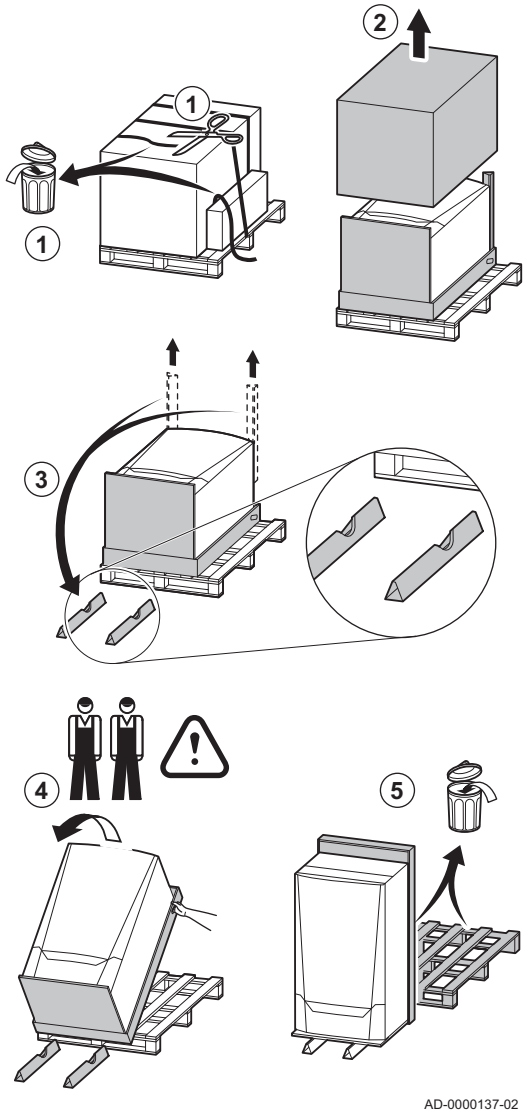


The boiler is delivered on a pallet. The delivery includes 2 packages. One package with the boiler and one package with individual parts and technical documentation. Without the packaging, the boiler will fit through all standard doorways.

Important
Always transport the boiler as close to the installation site as possible before the packaging is removed.

5.5 Unpacking & initial preparation

Fig.12 Unpacking the boiler



1. Cut the packaging straps and remove.
2. Remove the cardboard box.
3. Take the 2 floor stands out of the packaging and place them on the floor in front of the bottom of the boiler.
4. With 2 people, place the boiler upright on the floor stands.
5. Remove the pallet and the rest of the packaging.

Important
The boiler can now be moved with a lifting aid.

6 Installation

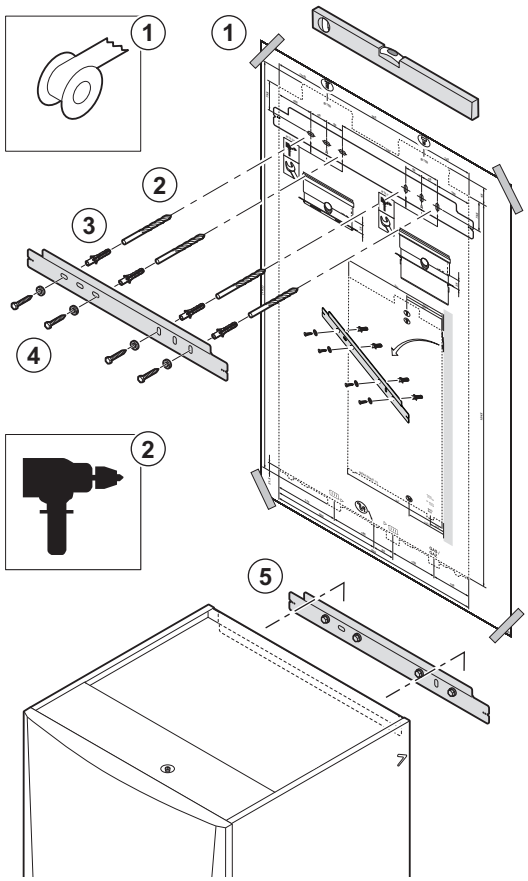
6.1 General

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

6.2 Preparation

6.2.1 Positioning the boiler

Fig.13 Mounting the boiler



The fitting bracket on the back of the casing can be used to mount the boiler directly on the suspension bracket.

The boiler is supplied with a mounting template.

1. Attach the mounting template of the boiler to the wall using adhesive tape.

Warning
- Use a level to check whether the mounting template is hanging perfectly horizontally.
- Protect the boiler against building dust and cover the flue gas outlet and air supply connection points. Only remove this cover to assemble the relevant connections.

2. Drill 4 holes of Ø 10 mm.
3. Fit the Ø 10 mm plugs.
4. Attach the suspension bracket to the wall with the Ø 10 mm bolts supplied.
5. Mount the boiler on the suspension bracket at the level of the arrows on the side of the boiler.

Warning
- The weight of the boiler exceeds the maximum lift weight for one person. Observe the applicable regulations. We recommend the use of a lifting aid. Please ensure all necessary care is taken when lifting the boiler on to the wall mounting bracket.
- The plugs supplied are only suitable for concrete. Select the correct plugs for installation on other materials.

6.3 Hydraulic connections

6.3.1 Rinsing the system

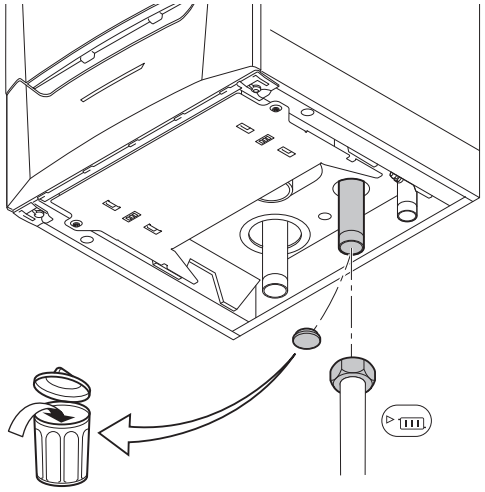
Installation must be carried out in accordance with the prevailing regulations, codes of practice and the recommendations in this manual.

Before a new CH boiler can be connected to an existing or new installation, the entire installation must be thoroughly cleaned and flushed. This step is absolutely crucial. The flushing helps to remove residue from the installation process (weld slag, fixing products etc.) and accumulations of dirt (silt, mud etc.)

Important
Flush the CH installation with a volume of water equivalent to at least three times the volume of the CH installation. Flush the DHW pipes with at least 20 times the volume of the pipes.

6.3.2 Connecting the heating circuit

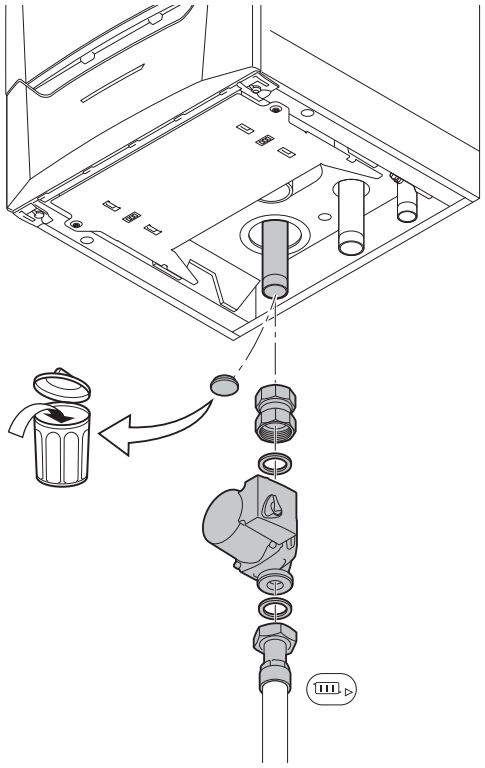
Fig.14 Connecting the CH flow



AD-0000108-01

1. Remove the dust cap from the CH flow connection ▸ at the bottom of the boiler.

Fig.15 Connecting the CH return



AD-0000109-01

2. Fit the outlet pipe for CH water to the CH flow connection.
3. Remove the dust cap from the CH return connection ▸ at the bottom of the boiler.
4. Fit the inlet pipe for CH water to the CH return connection.
5. For filling and tapping the boiler, install a filling and drain cock in the CH return pipe.
6. Install the system pump in the CH return pipe.

See
For the electrical connection of the system pump: Connecting the system pump, page 37

Important
Fit a service shut-off valve in the CH flow pipe and the CH return pipe to facilitate servicing work.

Caution
- When fitting service shut-off valves, position the filling and drain valve, the expansion vessel and the safety valve between the shut-off valve and the boiler.
- If using plastic pipes, follow the manufacturer's (connection) instructions.

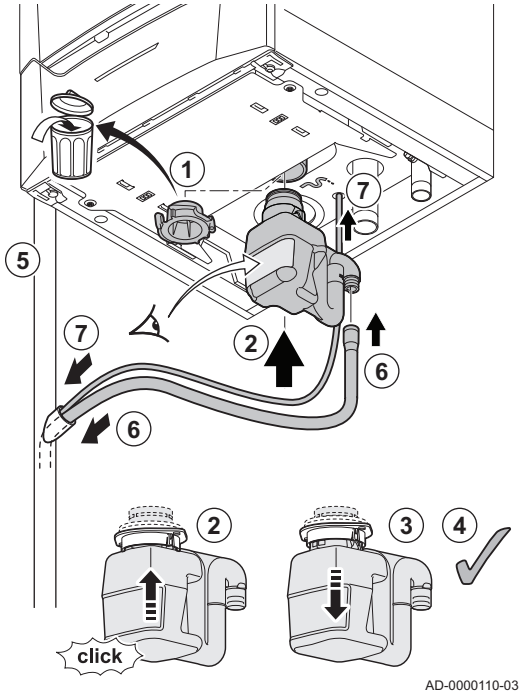
6.3.3 Connecting the expansion vessel

1. Ensure that there is an expansion vessel with the correct volume and inlet pressure.
2. Fit the expansion vessel on the central heating return pipe ▸.

6.3.4 Connecting the condensate drain pipe

The siphon is supplied separately with the boiler as standard (including a flexible plastic drain hose and a transparent extension hose for the automatic air vent). Fit these parts under the boiler.

Fig.16 Connecting the condensate drain



1. Remove the dust cap on the siphon connection at the bottom of the boiler.
2. Push the siphon firmly into the designated opening.
   ⇨ The siphon should snap shut with a click.
3. Carefully pull the siphon downwards.
4. Check whether the siphon is firmly fitted in the boiler.
5. Fit a plastic drain pipe of Ø 32 mm or larger, terminating in the drain.
6. Attach the siphon hose supplied to the output of the siphon and insert the other end into the plastic drain pipe.
7. Push the transparent hose supplied into the connecting grommet of the automatic air vent and insert the other end into the plastic drain pipe.
8. Fit a stench-trap or siphon in the drain pipe.

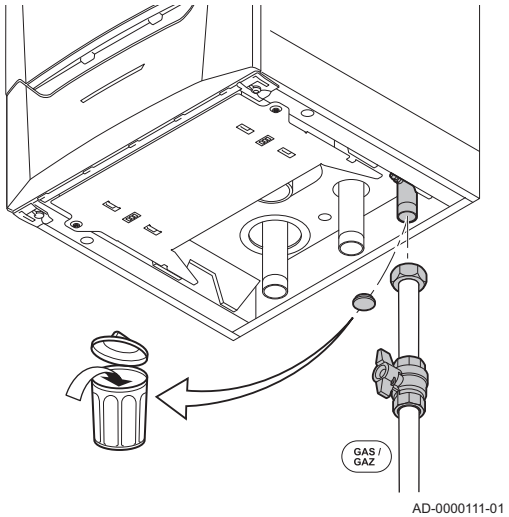
Danger
The siphon must always be filled with water. This prevents flue gases from entering the room.

Caution
- Never seal the condensate drain.
- The drain pipe must slope down at least 30 mm per metre, the maximum horizontal length is 5 metres.
- Condensed water must not be discharged into a gutter.

6.4 Gas connection

Warning
- Before starting work on the gas pipes, turn off the main gas tap. Before installing, check that the gas meter has sufficient capacity. Take into account the consumption of all appliances.
- Notify the local energy company if the gas meter has insufficient capacity.

Fig.17 Connecting the gas pipe



1. Remove the dust cap from the gas supply pipe GAS/GAZ at the bottom of the boiler.
2. Fit the gas supply pipe.
3. Fit a gas tap in this pipe, directly underneath the boiler.
4. Fit the gas pipe to the gas tap.

Caution
- Remove dirt and dust from the gas pipe.
- Always perform welding work at a sufficient distance from the boiler.

Important
We recommend installing a gas filter to prevent clogging of the gas valve unit.

6.5 Air supply/flue gas connections

The boiler is suitable for the following types of flue gas connections:

6.5.1 Classification

This classification is specified in more detail in the table in accordance with CE.

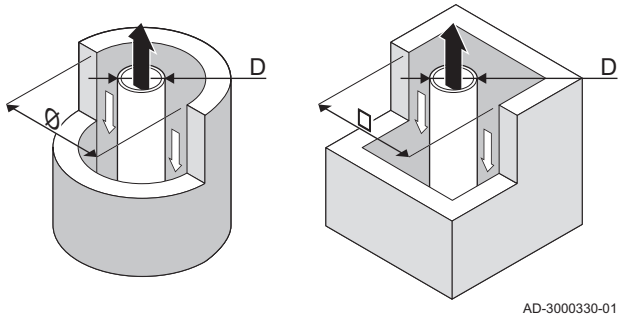
Tab.11 Types of flue gas connections

Type	Version	Description
B_{23} B_{23P}(1)	Open	• Without down-draught diverter. • Flue gas discharge via the roof. • Air from the installation area.
B_{33}	Open	• Without down-draught diverter. • Common flue gas discharge via the roof (depression). • Flue gas discharge rinsed with air, air from the installation area (special construction).
C_{13}	Closed	• Discharge in the outside wall. • Inlet opening for the air supply is in the same pressure zone as the discharge (e.g. a combined outside wall feed-through).
C_{33}	Closed	• Flue gas discharge via the roof. • Inlet opening for the air supply is in the same pressure zone as the discharge (e.g. a concentric roof feed-through).
C_{43}(2)	Closed/cascade	• Joint air supply and flue gas discharge duct (CLV system): - Concentric (preferably). - Parallel (if concentric is not possible). • Overpressure cascade
C_{53}	Closed	• Closed unit. • Separate air supply duct. • Separate flue gas discharge duct. • Discharging into different pressure areas.
C_{63}	Closed	• This type of unit is supplied by the manufacturer without a supply and discharge system.
C_{83}(3)	Closed	• The appliance can be connected to what is known as a semi-CLV system (common flue gas outlet and individual air supply).
C_{93}(4)	Closed	• Air supply and flue gas discharge duct in shaft or ducted: - Concentric. - Air supply from existing duct. - Flue gas discharge via the roof. - Inlet opening for the air supply is in the same pressure zone as the discharge.

(1) Also pressure class P1
(2) EN 15502-2-1: 0.5 mbar suction due to depression
(3) 4 mbar depression can occur
(4) See table for minimum dimensions of shaft or duct

■ Shaft dimensions

Fig.18 Minimum dimensions of shaft or duct



Tab.12 Shaft dimensions

Type	Version	Diameter	Minimum dimensions of shaft or duct			
			Without air supply		With air supply	
			Ø duct	□ duct	Ø duct	□ duct
C_{93}	Rigid	100 mm	150 mm	150 x 150 mm	150 mm	150 x 150 mm
		150 mm	200 mm	200 x 200 mm	220 mm	220 x 220 mm
		200 mm	250 mm	250 x 250 mm	280 mm	280 x 280 mm
C_{93}	Flexible	100 mm	150 mm	150 x 150 mm	150 mm	150 x 150 mm
		150 mm	200 mm	200 x 200 mm	220 mm	220 x 220 mm
		200 mm	250 mm	250 x 250 mm	280 mm	280 x 280 mm
C_{93}	Concentric	100/150 mm	200 mm	200 x 200 mm	-	-
		150/220 mm	270 mm	270 x 270 mm	-	-

6.5.2 Outlets

Flue systems (roof feed-through and outside wall feed-through) must be supplied by the following manufacturers:

- Cox Geelen
- Muelink & Grol
- Ubbink

Important
Where regulations stipulate that a wire grille must be fitted, use a suitable grille made from stainless steel.

Boiler-specific roof and outside wall feed-through kits are also available.

Note
Contact us for more information.

6.5.3 Material

Warning

- The coupling and connection methods may vary depending on the manufacturer. It is not permitted to combine pipes, coupling and connection methods from different manufacturers.
- The materials used must comply with the prevailing regulations and standards.

Tab.13 Flue gas outlet pipework materials

Design(1)	Material(2)
Single-wall, rigid	• Thick-walled, aluminium • Plastic T120 • Stainless steel
Flexible	• Plastic T120 • Stainless steel

(1) The sealing must conform to pressure class 1
(2) With CE marking

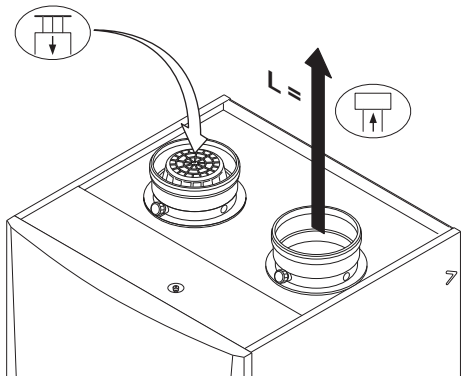
Tab.14 Air supply pipework materials

Version	Material
Single-wall, rigid	• Aluminium • Plastic • Stainless steel
Flexible	• Aluminium • Plastic • Stainless steel

6.5.4 Length of the air and flue gas pipes

■ Room-ventilated version (B_{23}, B_{23P}, B_{33})

Fig.19 Room-ventilated version



Connecting the flue gas outlet
Connecting the air supply

With a room-ventilated version, the air supply opening stays open; only the flue gas outlet opening is connected. This will ensure that the boiler obtains the necessary combustion air directly from the installation area. Use adapters when using air supply and flue gas outlet pipes with diameters other than 150 mm.

Caution

- The air supply opening must stay open.
- The installation area must be equipped with the necessary air supply openings. These openings must not be obstructed or shut off.
- If the boiler is operated in a dusty environment (e.g. during the construction phase), use of an air inlet filter is necessary.

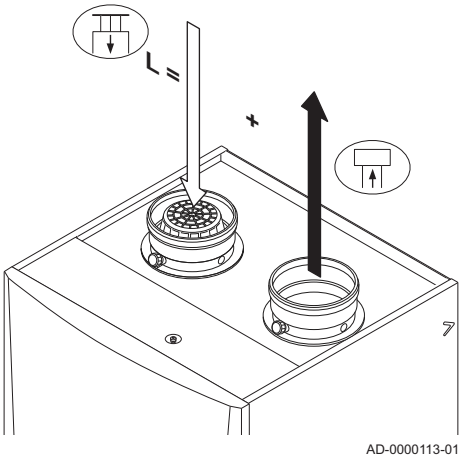
Tab.15 Maximum chimney length (L)

Diameter	90 mm	100 mm	110 mm	130 mm	150 mm
MCA 160	5 m	8 m	15 m	37 m	40 m(1)

(1) With retention of the maximum flue length it is possible to apply an extra 5 times 90º or 10 times 45º elbows.

■ Room-sealed version (C_{13}, C_{33}, C_{43}, C_{63}, C_{93})

Fig.20 Room-sealed version



Connecting the flue gas outlet
Air supply connection

With a room-sealed version, both the flue gas outlet and the air supply openings are connected (in parallel). Use adapters when using air supply and flue gas outlet pipes with diameters other than 150 mm.

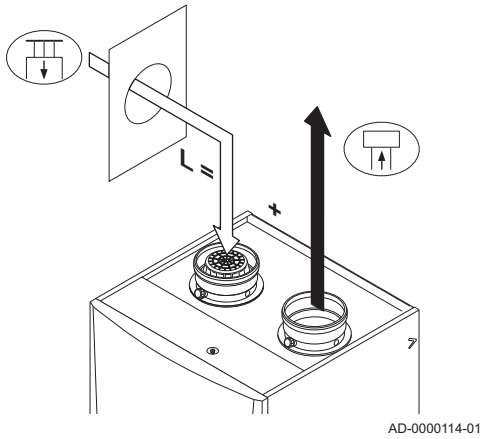
Tab.16 Maximum chimney length (L)

Diameter	90 mm	100 mm	110 mm	130 mm	150 mm
MCA 160	-	-	4 m	18 m	40 m(1)

(1) Retaining the maximum chimney length, it is possible to use an extra 5 x 90º or 10 x 45º elbows.

■ Connection in different pressure zones (C_{53}, C_{83})

Fig.21 Different pressure zones



Connecting the flue gas outlet
Air supply connection

Combustion air supply and flue gas discharge are possible in different pressure areas and semi-CLV systems, with the exception of the coastal area. The maximum permitted height difference between the combustion air supply and the flue gas outlet is 36 m.

Tab.17 Maximum chimney length (L)

Diameter	90 mm	100 mm	110 mm	130 mm	150 mm
MCA 160	-	-	9 m	27 m	40 m(1)

(1) With retention of the maximum flue length it is possible to apply an extra 5 times 90º or 10 times 45º elbows.

■ Reduction table

Tab.18 Pipe reduction for each element used (parallel)

Diameter	90 mm	100 mm	110 mm	130 mm	150 mm	250 mm	300 mm
45° bend	1.3 m	1.4 m	1.5 m	1.0 m	1.2 m	2.0	2.4
90° bend	4.5 m	4.9 m	5.4 m	1.8 m	2.1 m	3.5	4.2

Tab.19 Pipe reduction for each element used (concentric)

Diameter	100/150 mm	130/200 mm	150/220 mm
45° bend	1.0 m	1.5 m	1.5 m
90° bend	2.0 m	3.0 m	3.0 m

6.5.5 Specific air and flue gas applications

Important
If the boiler is used in a flue gas overpressure cascade, this must be stated on the sticker supplied: This central heating unit is set for... This sticker must be affixed on top of the boiler next to the type plate.
Contact us for more information.

6.5.6 Additional guidelines

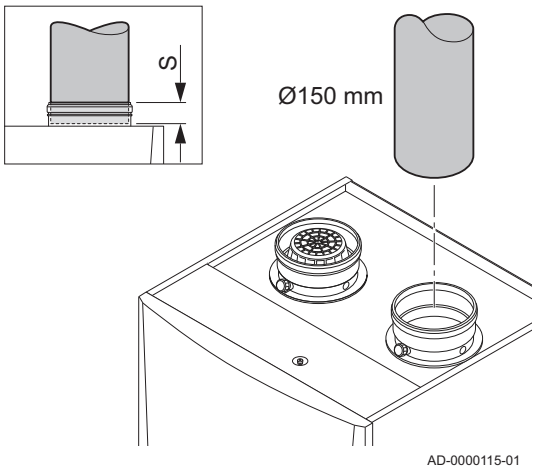
- For installing the flue gas outlet and air supply materials, refer to the instructions of the manufacturer of the relevant material. If the flue gas outlet and air supply materials are not installed in accordance with the instructions (e.g. not leakproof, not properly bracketed), this can result in dangerous situations and/or physical injury. After installation, check at least all flue gas outlet and air supply parts for tightness.
- Direct connection of the flue gas outlet to structural ducts is not permitted because of condensation.
- Always clean shafts thoroughly when using lining pipes and/or an air supply connection.
- It must be possible to inspect the lining duct.
- If condensate from a plastic or stainless steel pipe section can flow back to an aluminium part in the flue gas outlet, this condensate must be discharged via a collector before it reaches the aluminium.
- With longer lengths of aluminium flue gas outlet pipes, relatively large quantities of corrosion products flowing back out of the outlet pipes to-

gether with the condensate must be taken into account the first time. Clean the siphon of the appliance regularly or install an extra condensate collector above the unit.
- Make sure that the flue gas outlet pipe towards the boiler has a sufficient gradient (at least 50 mm per metre) and that there is a sufficient condensate collector and discharge (at least 1 m before the outlet of the boiler). The bends used must be larger than 90° to guarantee the gradient and a good seal on the lip rings.

Important
Contact us for more information.

6.5.7 Connecting the flue gas outlet

Fig.22 Connecting the flue gas outlet



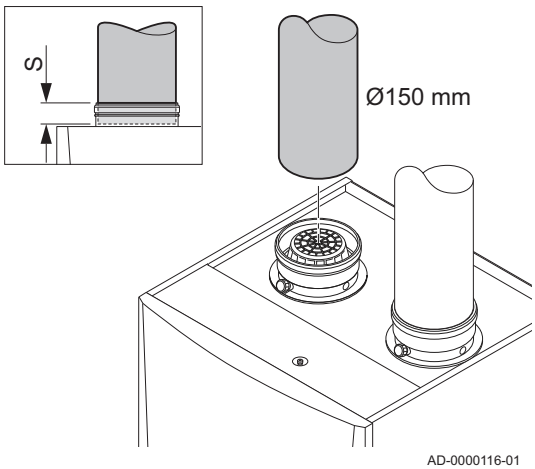
S insertion depth 50 mm

1. Fit the flue gas outlet pipe to the boiler.
2. Fit the subsequent flue gas outlet pipes in accordance with the manufacturer's instructions.

Caution
- The pipes must be flue gas-tight and corrosion-resistant.
- The flue gas outlet pipe must be smooth and deburred.
- Connect the pipes so that they are stress-free.
- The pipes must not rest on the boiler.
- Fit the horizontal parts sloping down towards the boiler, with a slope of 50 mm per metre.

6.5.8 Connecting the air supply

Fig.23 Connecting the air supply



S insertion depth 50 mm

1. Fit the air supply pipe to the boiler.
2. Fit the subsequent air supply pipes in accordance with the manufacturer's instructions.

Caution
- The pipes must be airtight and corrosion-resistant.
- The air supply pipe must be smooth and deburred.
- Connect the pipes so that they are stress-free.
- The pipes must not rest on the boiler.
- Fit the horizontal parts sloping down towards the air supply outlet.

6.6 Electrical connections

6.6.1 Recommendations

Warning

- Electrical connections must always be made with the power supply disconnected and only by qualified installers.
- The boiler is completely pre-wired. Never change the internal connections of the control panel.
- Make sure you establish an earth connection before connecting the electricity.

Establish the electrical connections in accordance with:

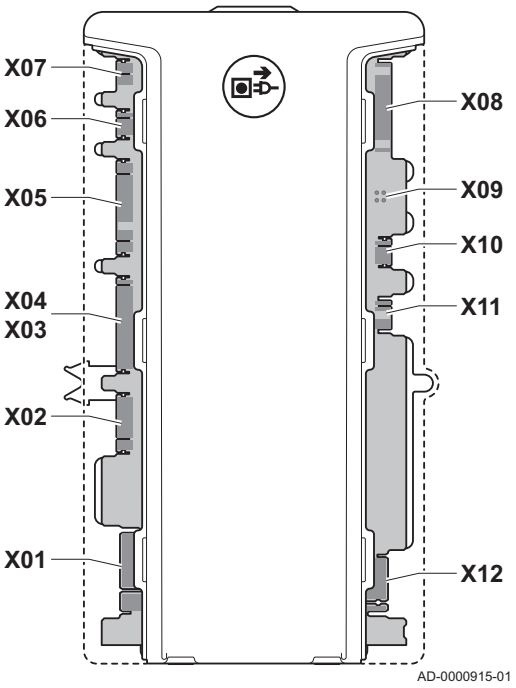
- The instructions of the current standards.
- The instructions of the wiring diagrams supplied with the boiler.
- The recommendations in this manual.
- Separate the sensor cables from the 230 V cables.

Caution

- Outside the central heating boiler: Use 2 cables spaced at least 10 cm apart.

6.6.2 Control unit

Fig.24 Connectors from the control unit CU-GH06 (front view)



The table gives important connection values for the control unit.

Supply voltage	230 VAC/50 Hz
Main fuse value F1 (230 VAC)	6.3 AT
Fan	230 VAC

Danger of electric shock

The following components of the boiler are connected to a 230 V power supply:

- (Electrical connection for) circulating pump
- (Electrical connection for) gas combination block 230 RAC
- (Electrical connection of) fan
- The majority of components in the control unit
- Ignition transformer
- Power supply cable connection
- Various connections in the connection box

The boiler has an earthed mains plug (lead length 1.5 m) and is suitable for a 230 VAC/50 Hz power supply with a phase/neutral/earth system. The boiler is not phase sensitive. The boiler is completely pre-wired.

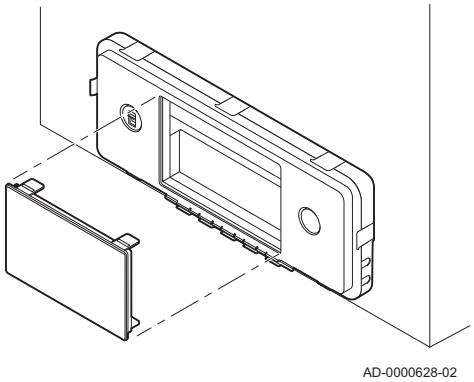
Caution

- Always order a replacement mains lead from De Dietrich. The power supply cable should only be replaced by De Dietrich, or by an installer certified by De Dietrich.
- The plug of the boiler must always be accessible.
- Use an isolating transformer for connection values other than those stated above.

The control panel and the connection box still need to be fitted. The PCBs are also placed in the connection box.

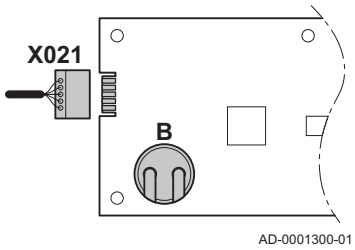
6.6.3 Assembly of the control panel

Fig.25 Control panel



The MCA boiler is supplied with a separate control panel. The control panel is mounted in the boiler. The cable in the box with connector **X021** must be slid onto the connector pin (5 pins, 24 V) of the PCB.

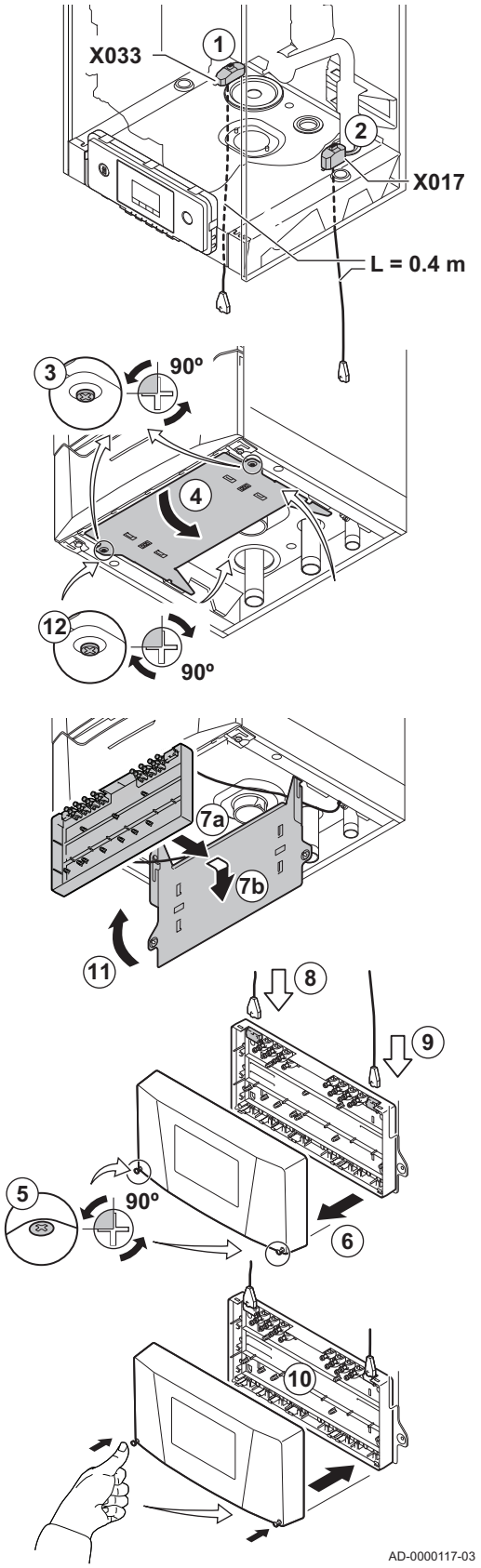
Fig.26 PCB



B Battery

There is also a back-up battery on the PCB for the internal clock. Check the battery voltage if the date and time are not displayed clearly.

Fig.27 Opening the connection box



6.6.4 Connecting the connection box

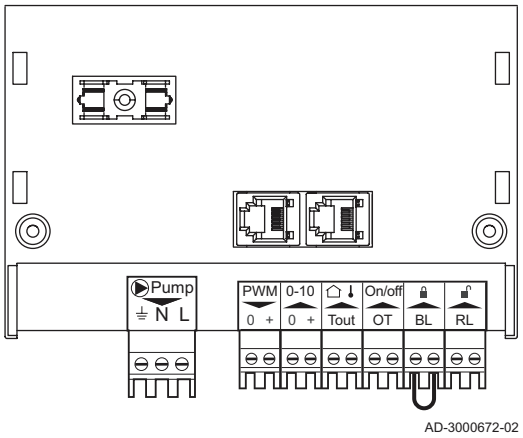
The connection box is included with the delivery of the boiler as standard. Use the connection cables supplied to connect the connection box to the control unit. Proceed as follows:

1. Connect the supplied connection cable **X033** to the connector underneath the boiler.
2. Connect the supplied connection cable **X017** to the connector underneath the boiler.
3. Loosen the 2 screws of the connection box holder underneath the boiler by a quarter of a turn.
4. Push the holder slightly back and fold it down.
5. Loosen the 2 screws in the connection box by a quarter of a turn.
6. Open the cover of the connection box.
7. Slide and click the connection box into position on the connection box holder.
8. Connect the connection cable **X033** with the connector in the connection box.
9. Connect the connection cable **X017** with the connector in the connection box.
10. Now connect the desired external controllers to the other connectors. Proceed as follows:
    - Lay the cable under the strain relief clip.
    - Press the strain relief clip firmly in place.
    - Close the connection box.
    - Press the 2 screws in the connection box.
11. Lift the holder up and slide it forward into position.
12. Tighten the 2 screws of the connection box holder underneath the boiler by a quarter of a turn.

Important
The connection box can also be mounted on the wall. Use the screw holes on the back of the connection box. The supplied connection cables must not be extended. Special extension cables are available as an accessory.

6.6.5 Connection possibilities for the standard PCB (CB-01)

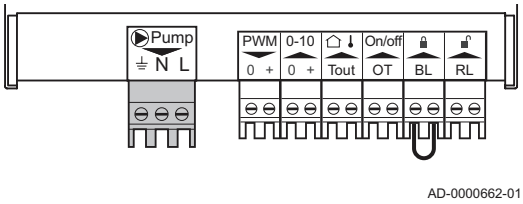
Fig.28 Standard PCB (CB-01)



Standard PCB **CB-01** can be found in the connection box. Various thermostats and regulators can be connected to the standard PCB.

■ Connecting the system pump

Fig.29 System pump



1. Connect a system pump to the **Pump** terminals of the connector.

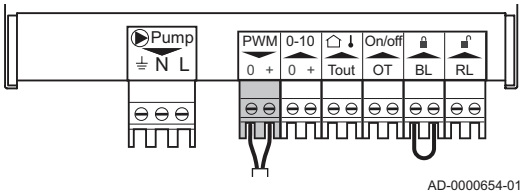
Important
The maximum power consumption is 300 VA.

The function of the system pump can be changed using parameters PP0 15, PP0 16 and PP0 18.

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

■ Connecting a PWM system pump

Fig.30 PWM system pump



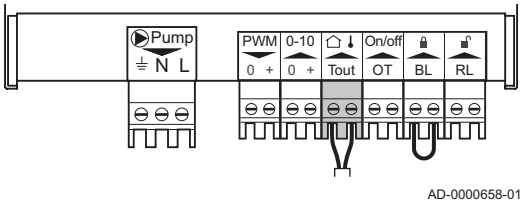
A system pump can be connected to the boiler and can be controlled in a modulating way from the boiler

1. Connect the PWM pump to the **PWM** terminals of the connector.

Note
Contact us for more information.

■ Connecting an outside sensor

Fig.31 Outside sensor

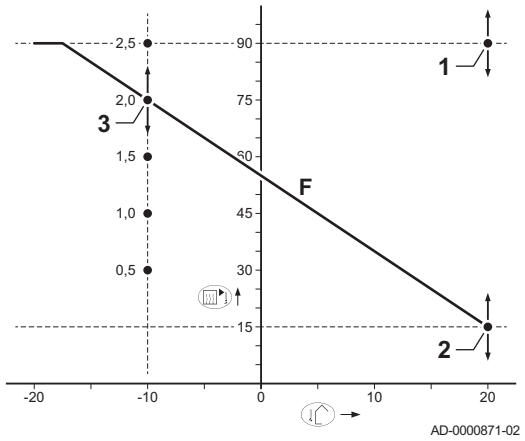


An outside sensor can be connected to the **Tout** terminals of the connector. In the case of an on/off thermostat, the boiler will control the temperature with the set point from the internal heating curve.

1. Connect the two-wire cable to the **Tout** terminals of the connector.

Important
An **OpenTherm** regulator can also use this outside sensor. In that case, the desired heating curve must be set on the regulator.

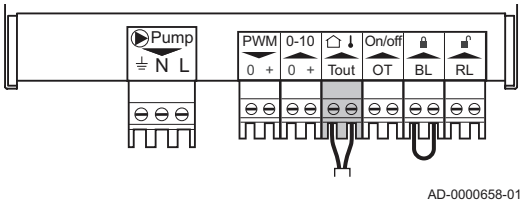
Fig.32 Internal heating curve



1 Setting point (parameter CP010)
2 Comfort base point (parameter CP210)
3 Gradient (parameter CP230)
F Heating curve
Outside temperature
Flow temperature

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

Fig.33 Outside sensor



Frost protection combined with outside sensor

The central heating system can also be protected against frost in combination with an outside sensor. The radiator valve in the frost-sensitive room must be open.

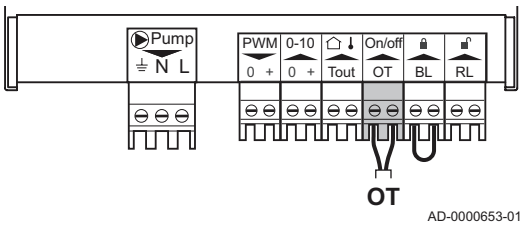
1. Connect the outside sensor to the **Tout** terminals of the connector.

The frost protection works as follows with an outside sensor:

- At outside temperatures below -10 °C: the circulation pump switches on.
- At outside temperatures above -10 °C: the circulation pump continues to run and then switches off.

Connecting the modulating regulator

Fig.34 Modulating regulator



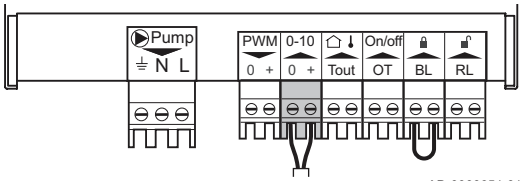
OT OpenTherm regulator

The boiler is fitted with an **OpenTherm** connection as standard. As a result, modulating **OpenTherm** thermostats (room-temperature, weather-compensated and cascade thermostats) can be connected without further modifications. The boiler is also suitable for OpenTherm Smart Power.

1. In the case of a room thermostat: install the thermostat in a reference room.
2. Connect the two-wire cable to the **On/Off OT** terminals of the connector. It does not matter which wire is connected to which cable clamp.

Analogue input

Fig.35 Analogue input



A choice can be made with this control between control based on temperature or heat output. If this input is used for 0-10 V control, the OT communication from the boiler is ignored.

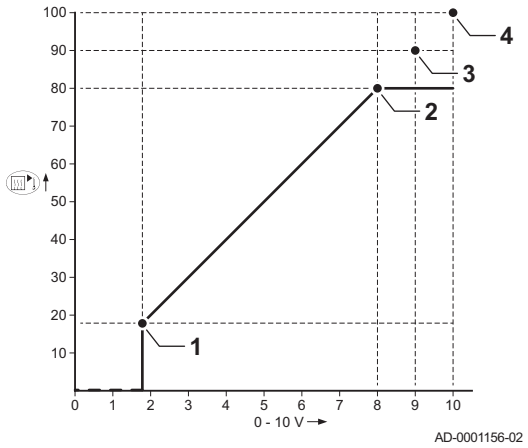
1. Connect the input signal to terminals **0–10** of the connector.

Change the mode of the analogue input using the parameter EP014.

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

– Analogue temperature regulation (°C)

Fig.36 Temperature regulation



1 Boiler on
2 Parameter CP010
3 Maximum flow temperature
4 Calculated value

The 0–10 V signal controls the boiler supply temperature. This control modulates on the basis of flow temperature. The output varies between the minimum and maximum value on the basis of the flow temperature set point calculated by the controller.

Tab.20 Temperature regulation

Input signal (V)	Temperature °C	Description
0–1.5	0–15	Boiler off
1.5–1.8	15–18	Hysteresis
1.8–10	18–100	Desired temperature

– Analogue output-based control

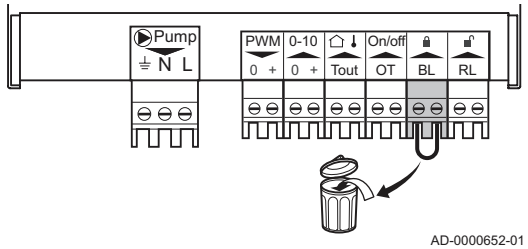
The 0 - 10 V signal controls the boiler output. This control modulates on the basis of the heat output. The minimum output is linked to the boiler's modulation depth. The output varies between the minimum and maximum value on the basis of the value defined by the controller.

Tab.21 Control based on heat output

Input signal (V)	Heat output (%)	Description
0–2.0	0	Boiler off
2.0–2.2	0	Heat demand
2.0–10	0–100	Desired heat output

■ Blocking input

Fig.37 Blocking input



The boiler has a blocking input. This input relates to the **BL** terminals of the connector.

Change the function of the input using parameter AP001.

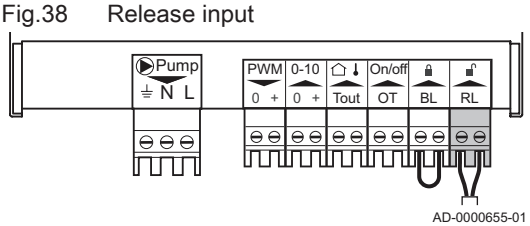
Warning
Only suitable for potential-free contacts.

Important
First remove the bridge if this input is used.

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

■ Release input

Fig.38 Release input



The boiler has a release input. This input relates to the **RL** terminals of the connector.

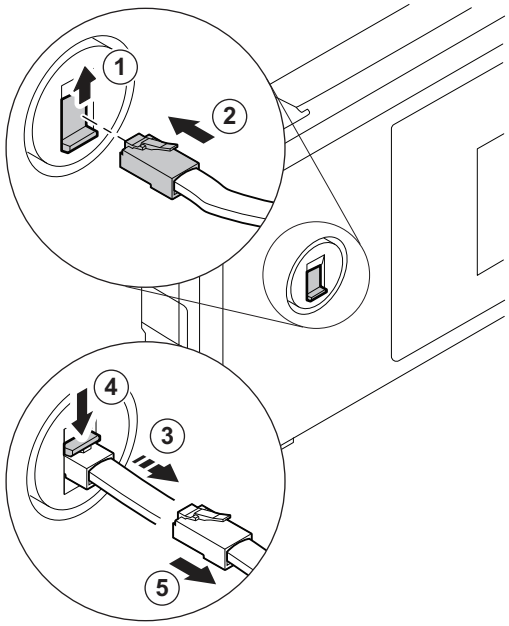
Change the function of the input using parameter AP008.

Warning
Only suitable for potential-free contacts.

For more information, see
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

6.7 Connecting a PC/laptop

Fig.39 Connecting an interface connector



There is a **Service** connector next to the control panel. A Service tool interface can be used here to connect a:

- PC
- Laptop
- Smart Service Tool

Using the Service tool service software, you can enter, change and read out various boiler settings.

Connecting and disconnecting an interface connector:

1. Move the Service connector slide upwards.
2. Push the interface connector into place. It should snap shut with a click.
   ⇨ The interface connector is connected.
3. Maintain slight tension on the interface connector
4. Push the slide downwards. The interface connector will now be released.
5. Pull the interface connector from the connector.
   ⇨ The interface connector is disconnected.

6.8 Filling the installation

6.8.1 Water treatment

In many cases, the boiler and central heating system can be filled with normal tap water and water treatment will not be necessary.

Warning
Do not add chemical agents to the central heating water without consulting De Dietrich. For example: antifreeze, water softeners, pH-increasing or lowering agents, chemical additives and/or inhibitors. Such agents can cause errors in the boiler and damage to the heat exchanger.

The water in the installation must comply with the following characteristics:

Tab.22 Total installed heat output (kW)

		≤ 70	70–200	200–550	> 550
Degree of acidity (untreated water)	pH	7–9	7–9	7–9	7–9
Degree of acidity (treated water)	pH	7–8.5	7–8.5	7–8.5	7–8.5
Conductivity at 25°C	µS/cm	≤ 800	≤ 800	≤ 800	≤ 800
Chlorides	mg/l	≤ 150	≤ 150	≤ 150	≤ 150
Other components	mg/l	< 1	< 1	< 1	< 1
Total water hardness(1)	°f	1–35	1–20	1–15	1–5
	°dH	0.5–20.0	0.5–11.2	0.5–8.4	0.5–2.8
	mmol/l	0.1–3.5	0.1–2.0	0.1–1.5	0.1–0.5

(1) For installations that are heated at constant high temperatures with a total installed heat output up to 200 kW, a maximum total water hardness of 8.4 °dH (1.5 mmol/l, 15 °f) applies; for outputs above 200 kW, a maximum total water hardness of 2.8 °dH (0.5 mmol/l, 5 °f) applies

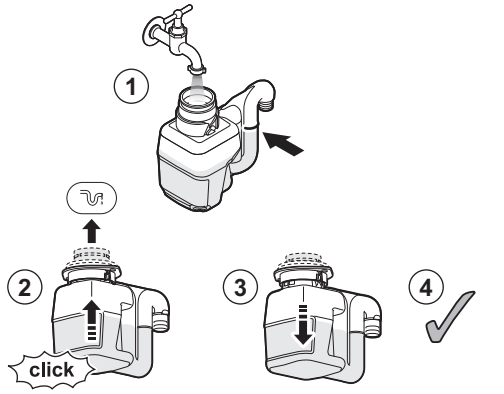
Important
Reputable manufacturers and their products include:

- Fernox
- Sentinel Performance Solution Ltd

6.8.2 Filling the siphon

The siphon is supplied separately with the boiler as standard (including a flexible plastic drain hose and a transparent extension hose for the automatic air vent). Fit the siphon under the boiler.

Fig.40 Filling the siphon



AD-0000231-02

1. Fill the siphon with water up to the mark.
2. Push the siphon firmly into the appropriate opening underneath the boiler.
   ⇨ The siphon should snap shut with a click.
3. Carefully pull the siphon downwards.
4. Check whether the siphon is firmly fitted in the boiler.

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

6.8.3 Filling the system

Important
In order to be able to read off the water pressure from the control panel, the boiler must be switched on. If the water pressure is too low, the boiler or the boiler pump will not start.

1. Fill the central heating system with clean tap water.

Important
The recommended water pressure is between 1.5 and 2 bar.

2. Check the water-side connections for tightness.

7 Commissioning

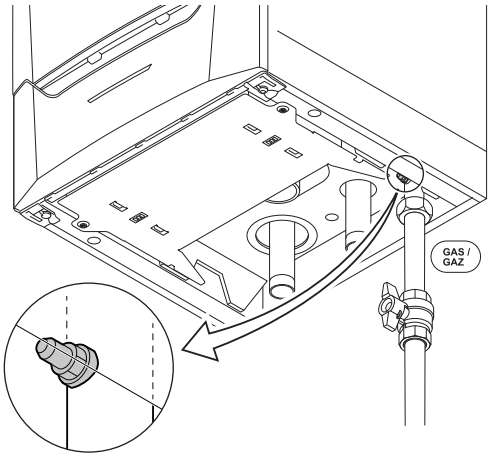
7.1 General

Follow the steps set out in the paragraphs below to put the boiler into operation.

Warning
Do not put the boiler into operation if the supplied gas is not in accordance with the approved gas types.

7.2 Gas circuit

Fig.41 Gas measuring point



AD-0000121-01

Warning
Ensure that the boiler is disconnected from the power supply.

1. Open the main gas tap.
2. Open the gas tap under the boiler.
3. Check the gas inlet pressure at the measuring point on the gas pipe.

Warning
For authorized gas pressures, see: Unit categories, page 12

4. Vent the gas supply pipe by unscrewing the measuring point.
5. Tighten the measuring point again when the pipe has been fully vented.
6. Check all connections for gas tightness. The test pressure may be a maximum of 60 mbar.

7.3 Hydraulic circuit

1. Check the siphon; it should be fully filled with clean water.
2. Check the water-side connections for tightness.

7.4 Electrical connections

1. Check the electrical connections.

7.5 Commissioning procedure

Warning
- Initial commissioning must be done by a qualified professional.
- If adapting to another type of gas, e.g. propane, the boiler must be adjusted before switching it on.

See
Adjusting to a different gas type, page 43

1. Open the main gas tap.
2. Open the boiler gas tap.
3. Switch the power on with the boiler's on/off switch.
4. Set the components (thermostats, control) so that heat is demanded.
   ⇨ The start-up program will start and cannot be interrupted. During the program, all segments of the display are shown briefly.

Important
In the event of an error during the start-up, a message with the corresponding code is displayed. The meaning of the error codes can be found in the error table.

For more information, see
Error codes, page 66

7.6 Gas settings

7.6.1 Adjusting to a different gas type

Warning
Only a qualified engineer may carry out the following operations.

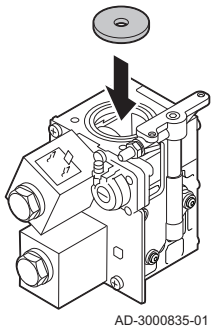
The factory setting of the boiler is for operation with the natural gas group G20 (H gas).

Before operating with a different type of gas, carry out the following steps:

1. Fit the gas disphragm in the gas block. If the boiler is modified, for G30/G31 (butane/propane):
   Tab.23 Gas diaphragm for G30/G31 (butane/propane)

Gas diaphragm for G30/G31 (butane/propane)	Ø (mm)
MCA 160	9.0

Fig.42 Installing gas diaphragm



AD-3000835-01

2. Set the fan speed as indicated in the table (if necessary). The setting can be changed with a parameter setting: **Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Gas fired heat engin > Parameters, counters, signals > Parameters**.

See
Description of the parameters - FSB-WHB-HE-150-300, page 49
Changing the parameters, page 51

Tab.24 Factory settings G20 (H-gas)

Code	Display text	Description	Range	160
DP003	Abs. max fan DHW	Maximum fan speed on Domestic Hot Water	1000 Rpm - 7000 Rpm	6700
GP007	Fan RPM Max CH	Maximum fan speed during Central Heating mode	1000 Rpm - 8500 Rpm	6700
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	1900
GP009	Fan RPM Start	Fan speed at appliance start	900 Rpm - 5000 Rpm	2200

Tab.25 Adjustment for gas type G30/G31 (butane/propane)

Code	Display text	Description	Range	160
DP003	Abs. max fan DHW	Maximum fan speed on Domestic Hot Water	1000 Rpm - 7000 Rpm	6400
GP007	Fan RPM Max CH	Maximum fan speed during Central Heating mode	1000 Rpm - 8500 Rpm	6400
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	2150
GP009	Fan RPM Start	Fan speed at appliance start	900 Rpm - 5000 Rpm	3000

Tab.26 Adjustment for CLV overpressure of 50 Pa for gas type G20 (H-gas)

Code	Display text	Description	Range	160
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	2200

Tab.27 Adjustment for CLV overpressure of 80 Pa for gas type G20 (H-gas)

Code	Display text	Description	Range	160
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	2400
GP009	Fan RPM Start	Fan speed at appliance start	900 Rpm - 5000 Rpm	2400

Tab.28 Adjustment for CLV overpressure of 50 Pa for gas type G30/G31 (butane/propane)

Code	Display text	Description	Range	160
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	2350

Tab.29 Adjustment for CLV overpressure of 80 Pa for gas type G30/G31 (butane/propane)

Code	Display text	Description	Range	160
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	2600

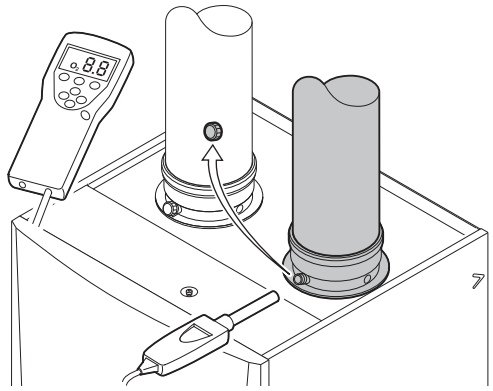
Code	Display text	Description	Range	160
GP009	Fan RPM Start	Fan speed at appliance start	900 Rpm - 5000 Rpm	3000

3. Check the setting of the gas/air ratio.

See
Checking/setting combustion, page 45

7.6.2 Checking/setting combustion

Fig.43 Flue gas measuring point



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

Warning
During measurement, seal the opening around the sensor fully.

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

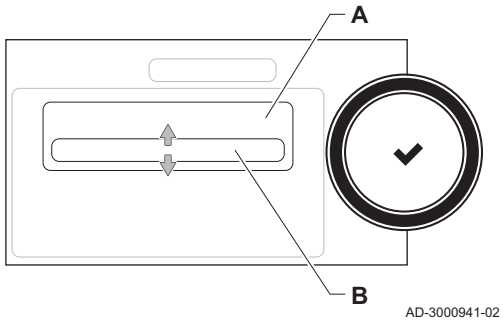
3. Measure the percentage of O_2 in the flue gases. Take measurements at full load and at part load.

Important
Measurements must be taken with the front casing off.

■ Performing the full load test

1. Select **Chimney Sweep Menu**.
2. Simultaneously press the ↩ button and the ☰ button.
   ⇨ The **Change load test mode** menu appears.
3. Select the **MaximumPowerCH** test.

Fig.44 Full load test



A Change load test mode
B MaximumPowerCH
⇨ The full load test starts and the following text appears briefly on the screen: **Load test mode accepted**

4. Change the full load test parameters, if necessary.
   ⇨ Only the parameters shown in bold can be changed.

■ Checking/setting values for O_2 at full load

1. Measure the percentage of O_2 in the flue gases at full load.
2. Compare the measured value with the checking values in the table.

Tab.30 Checking/setting values for O_2 at full load for G20 (H gas)

Values at full load for G20 (H gas)	O_2 (%)
MCA 160	4.8 - 5.2(1)

Values at full load for G20 (H gas)	O_2 (%)
(1) Nominal value	

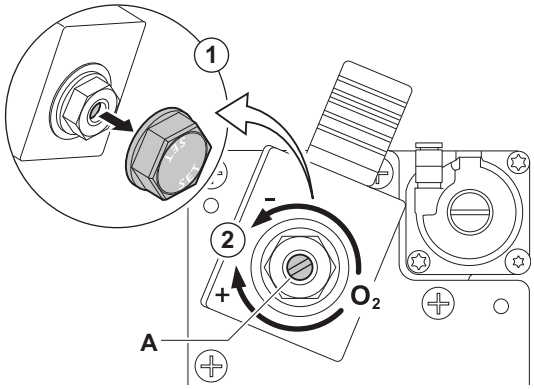
Tab.31 Checking/setting values for O_2 at full load for G30/G31 (butane/propane)

Values at full load for G30/G31 (butane/propane)	O_2 (%)
MCA 160	5.1 - 5.4(1)
(1) Nominal value	

Caution
The O_2 values at full load must be lower than the O_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. Using the adjusting screw **A**, set the percentage of O_2 for the gas type being used to the nominal value. This should always be inside the highest and lowest setting limit.

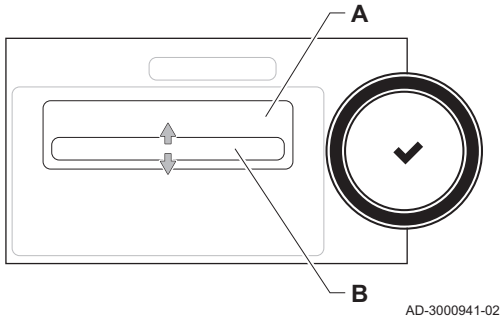
Fig.45 Position of adjusting screw A



Performing the part load test

1. When the full load test is still running, press the ✔ button to change the load test mode.
   ⇨ The **Change load test mode** menu appears.
2. When the full load test was stopped, select **Chimney Sweep Menu** and simultaneously press the ⮌ button and the ≡ button.
   ⇨ The **Change load test mode** menu appears.
3. Select the **MinimumPower** test.

Fig.46 Part load test



A Change load test mode
B MinimumPower

⇨ The part load test starts and the following text appears briefly on the screen: **Load test mode accepted**

4. Change the part load test parameters, if necessary.
   ⇨ Only the parameters shown in bold can be changed.
5. End the part load test by pressing the ⮌ button
   ⇨ The message **Running load test(s) stopped!** is displayed.
6. When all required load tests are run, press the ≡ button and select **Leave chimney mode** to close the chimney sweep function.

Checking/setting values for O_2 at part load

1. Measure the percentage of O_2 in the flue gases at part load.

2. Compare the measured value with the checking values in the table.

Tab.32 Checking/setting values for O_2 at part load for G20 (H gas)

Values at part load for G20 (H gas)	O_2 (%)
MCA 160	5.2(1) - 5.6
(1) Nominal value	

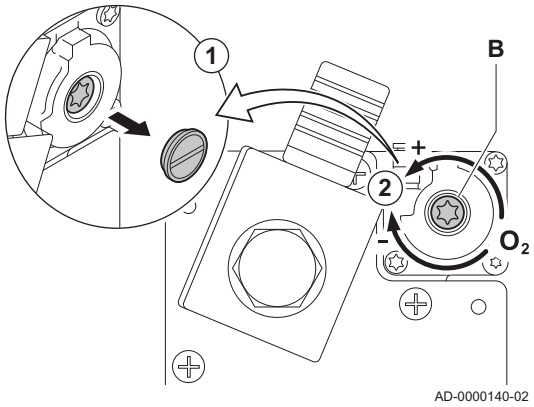
Tab.33 Checking/setting values for O_2 at part load for G30/G31 (butane/propane)

Values at part load for G30/G31 (butane/propane)	O_2 (%)
MCA 160	5.4(1) - 5.7
(1) Nominal value	

Caution
The O_2 values at part load must be higher than the O_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. Using the adjusting screw **B**, set the percentage of O_2 for the gas type being used to the nominal value. This should always be within the maximum and the minimum setting limits.

Fig.47 Position of adjusting screw B



7.7 Final instructions

1. Remove the measuring equipment.
2. Screw the cap on to the flue gas measuring point.
3. Put the front casing back.
4. Heat the CH system up to approximately 70°C.
5. Switch the boiler off.
6. Vent the central heating system after approx. 10 minutes.
7. Turn on the boiler.
8. Check the water pressure. If necessary: top up the central heating system.
9. Specify the gas type used on the type plate.
10. Instruct the user in the operation of the system, boiler and controller.
11. Inform the user of the maintenance to be performed.
12. Hand over all manuals to the user.
13. Confirm the commissioning with a signature and a company stamp.
    ⇨ The boiler is now ready for operation.

8 Operation

8.1 Use of the control panel

The display on the control panel provides information about the operating status of the boiler and any errors.

See
The control panel manual for extra information about:

- Changing, creating and resetting settings.
- Reading out values.
- Functions of the panel.
- Clearing the error memory.

8.2 Shutdown

If the central heating is not due to be used for a long period of time, it is recommended that the boiler be disconnected from the power supply.

1. Pull the boiler plug out of the socket.
2. Shut off the gas supply.
3. Keep the area frost-free.

8.3 Frost protection

Caution

- Drain the boiler and central heating system if you are not going to use your home or the building for a long time and there is a chance of frost.
- The frost protection does not work if the boiler is out of operation.
- The built-in boiler protection is only activated for the boiler and not for the system and radiators.
- Open the valves of all the radiators connected to the system.

Set the temperature control low, for example to 10°C.

If there is no heat demand, the boiler will only switch on to protect itself against frost.

If the temperature of the central heating water in the boiler drops too low, the built-in boiler protection system is activated. This system works as follows:

- At a water temperature lower than 7°C, the heating pump starts.
- If the water temperature is lower than 4°C, the boiler switches on.
- If the water temperature is higher than 10°C the boiler switches off and the circulation pump continues to run for a short time.

To prevent the system and radiators freezing in frost-sensitive areas (e.g. a garage), a frost thermostat or outside sensor can be connected to the boiler.

9 Settings

9.1 List of parameters

The parameters are arranged in three levels:

1 End user level
2 Installer level
3 Advanced installer level

The code of the parameters always contain two letters and three numbers. The letters stand for:

AP Appliance related parameters
BP Buffer related parameters
CP Zone related parameters
DP DHW related parameters
EP Smart Solutions parameters
GP Gas fired heat engine related parameters
HP Heat pump related parameters
MP Combustion engine parameters
NP EM platform related parameters
OP Oil fired related parameters
PP CH parameters

For more information, see
Changing the parameters, page 51

9.1.1 Description of the parameters - FSB-WHB-HE-150-300

Tab.34 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > CH (Zone disabled) > Parameters, counters, signals > Parameters

Code	Display text	Description	Range	160
CP020	Zone Function	Functionality of the zone	0 = Disable 1 = Direct 2 = Mixing Circuit 3 = Swimming pool 4 = High Temperature 5 = Fan Convector 6 = Domestic Hot Water tank 7 = Electrical Domestic Hot Water 8 = Time Program 9 = ProcessHeat 10 = Domestic Hot Water Layered 11 = Domestic Hot Water Boiler Internal tank 31 = DHW FWS EXT	1

Tab.35 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Gas fired heat engin > Parameters, counters, signals > Parameters

Code	Display text	Description	Range	160
AP001	BL input setting	Blocking input setting (1: Full blocking, 2: Partial blocking, 3: User reset locking)	1 = Full blocking 2 = Partial blocking 3 = User reset locking 4 = Backup Relieved 5 = Heat Pump Relieved 6 = Heat Pump And backup Relieved 7 = High Tariff Low Tariff 8 = Photovoltaic Heat Pump Only 9 = Photovoltaic Heat Pump And backup 10 = Smart Grid ready 11 = Heating Cooling	1
AP006	Min. water pressure	The appliance will report low water pressure below this value	0 bar - 6 bar	0.7
AP008	Time release signal	The appliance will wait x sec (0=off) for the release contact to close in order to start the burner	0 Sec - 255 Sec	0
AP009	Service hours burner	Burning hours before raising a service notification	100 Hours - 25500 Hours	17400
AP010	Service notification	The type of service needed based on burn and powered hours	0 = No service notification 1 = Custom service notification 2 = ABC service notification	2
AP011	Service hours mains	Hours powered to raise a service notification	100 Hours - 25500 Hours	17400
AP016	On/off CH function	Enable or disable central heating heatdemand processing	0 = Off 1 = On	1
AP017	On/off DHW function	Enable or disable domestic hot water heatdemand processing	0 = Off 1 = On	1
AP110	2nd return sensor	Parameter to activate the 2nd return sensor	0 = Inactive 1 = Active	0
DP003	Abs. max fan DHW	Maximum fan speed on Domestic Hot Water	1000 Rpm - 7000 Rpm	6700
GP007	Fan RPM Max CH	Maximum fan speed during Central Heating mode	1000 Rpm - 8500 Rpm	6700
GP008	Fan RPM Min	Minimum fan speed during Central Heating + Domestic Hot Water mode	900 Rpm - 8500 Rpm	1900
GP009	Fan RPM Start	Fan speed at appliance start	900 Rpm - 5000 Rpm	2200
GP010	GPS Check	Gas Pressure Switch check on/off	0 = No 1 = Yes	0
GP021	Temp diff Modulating	Modulate back when delta temperature is large then this treshold	5 °C - 25 °C	25
GP024	VPS Check	Valve Proofing System check on / off	0 = No 1 = Yes	0
PP015	CH Pump postrun time	Central heating pump post run time; 99 = Pump non stop.	1 Min - 99 Min	1
PP016	Max CH pump speed	Maximum central heating pump speed (%)	20 % - 100 %	100

Code	Display text	Description	Range	160
PP018	Min CH pump speed	Minimum central heating pump speed (%)	20 % - 100 %	20
PP023	Start hysteresis CH	Hysteresis to start burner in heating mode	1 °C - 25 °C	10

9.2 Changing the parameters

The boiler's control unit is set for the most common central heating systems. These settings will ensure that virtually every central heating system operates effectively. The user or the installer can optimise the parameters as required.

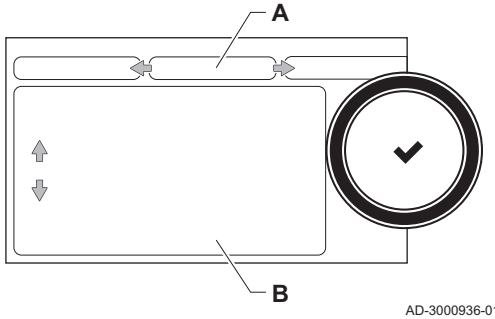
Caution
Changing the factory settings may adversely affect the operation of the boiler.

9.2.1 Configuring the installation parameters and settings

You can change the parameters and settings of the appliance and the connected control boards, sensors etc. to configure the installation.

1. Select **Installer Menu > Installation Setup**.
   ⇨ The zone(s) and all connected devices are displayed.
2. Select the zone or device you want to configure.
3. Select **Parameters, counters, signals > Parameters** to change a parameter.

Fig.48 Parameters, counters, signals



A Select parameters, counters or signals
B List of settings

4. If available, select **Parameters, counters, signals > Adv. Parameters** to change a parameter at the advanced installer level.

9.3 List of measured values

For more information, see
Reading out measured values, page 56

9.3.1 Counters - FSB-WHB-HE-150-300

Tab.36 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Gas fired heat engin > Parameters, counters, signals > Counters

Value	Display text	Description	Range
AC002	Service Burning hrs	Number of hours that the appliance has been producing energy since last service	0 Hours - 131070 Hours
AC003	Hrs OperationService	Number of hours since the previous servicing of the appliance	0 Hours - 131070 Hours
AC004	Burner Starts	Number of generator startings since the previous servicing.	0 - 4294967295
AC005	CH Energy Consumed	Energy consumed for Central Heating (kWh)	0 kWh - 4294967295 kWh

Value	Display text	Description	Range
AC006	DHW Energy Consumed	Enegy consumed for Domestic Hot Water (kWh)	0 kWh - 4294967295 kWh
AC007	Cool Energy Consumpt	Energy consumed for Cooling (kWh)	0 - 4294967295
AC026	Pump running hours	Counter that shows the number of pump running hours	0 Hours - 4294967295 Hours
AC027	Pump starts	Counter that shows the number of pump starts	0 - 4294967295
DC001	DhwTotalPower Cons	Total power consumption used by Domestic Hot Water	0 kW - 4294967295 kW
DC002	DHW valve cycles	Numbers of Domestic Hot Water diverting valve cycles	0 - 4294967295
DC003	Hrs DHW 3wv	Number of hours during which the diverting valve is in DHW position	0 Hours - 4294967295 Hours
DC004	DHW burner starts	Number of burner starts for Domestic Hot Water	0 - 4294967295
DC005	DHW burner hours	Number of burner hours in Domestic Hot Water	0 Hours - 4294967295 Hours
PC002	Burner starts total	Total number of burner starts. For heating and domestic hot water	0 - 65534
PC003	Hrs Burning total	Total number of burner hours. For heating and domestic hot water	0 Hours - 65534 Hours
PC004	Burner flame loss	Number of burner flame loss	0 - 65534

9.3.2 Signals - FSB-WHB-HE-150-300

Tab.37 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > CH (Zone Direct) > Parameters, counters, signals > Signals

Value	Display text	Description	Range
CM030	Zone RoomTemperature	Measure of the Room temperature of the zone	-60 °C - 60 °C
CM120	ZoneCurrentMode	Zone Current Mode	0 = Scheduling 1 = Manual 2 = Antifrost 3 = Temporary
CM130	ZoneCurrent activity	Current activity of the zone	0 = Anti frost 1 = Reduced 2 = Comfort 3 = Anti legionella
CM140	ZoneOTContr present	Open Therm Controller is connected to the zone	0 = No 1 = Yes
CM150	ZoneState Heatdemand	State of On Off Heat demand per zone	0 = No 1 = Yes
CM160	Zone Mod HeatDemand	Presense of modulating heat demand per zone	0 = No 1 = Yes
CM170	Zone OTSmartPower	Zone Open Therm smart power function is avaible	0 = No 1 = Yes
CM180	Zone RU present	Presense of Room Unit in this zone	0 = No 1 = Yes
CM190	Zone Troom Setpoint	Wished room temperature setpoint of the zone	-60 °C - 60 °C

Value	Display text	Description	Range
CM200	ZoneCurrentHeatMode	Displaying current operating mode of the zone	0 = Standby 1 = Heating 2 = Cooling
CM210	Zone T Outside	Current Outside Temperature of the zone	-60 °C - 60 °C
CM230	ZoneTOut AverageLong	Outside Temperature average long time per zone	-60 °C - 60 °C
CM260	Zone T Room Sensor	Measure of the room sensor temperature of the zone	-60 °C - 60 °C

Tab.38 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Status information > Parameters, counters, signals > Signals

Value	Display text	Description	Range
AM012	Status Appliance	Current main status of the appliance.	 **See** Status and sub-status - FSB-WHB-HE-150-300, page 54
AM014	Sub status Appliance	Current sub status of the appliance.	 **See** Status and sub-status - FSB-WHB-HE-150-300, page 54

Tab.39 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Outdoor temperature > Parameters, counters, signals > Signals

Value	Display text	Description	Range
AM027	Outside temperature	Instantaneous outside temperature	-60 °C - 60 °C
AM091	SeasonMode	Seasonal mode active (summer / winter)	0 = Winter 1 = Winter system frost protection acitve 2 = Summer neutral band 3 = Summer
AP078	Out sensor detected	Outside sensor detected in the application	0 = No 1 = Yes

Tab.40 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > 0-10 volt input > Parameters, counters, signals > Signals

Value	Display text	Description	Range
AM028	0to10Vinput	Value of the 0 to 10 Volt input. Meaning is dependant on the current input function setting.	0 V - 25 V

Tab.41 Installer Menu > Installation Setup > FSB-WHB-HE-150-300 > Gas fired heat engin > Parameters, counters, signals > Signals

Value	Display text	Description	Range
AM010	Pump speed	The current pump speed	0 % - 100 %
AM015	Pump running	Is the pump running?	0 = Inactive 1 = Active
AM016	System Flow Temp	Flow temperature of appliance.	-25 °C - 150 °C
AM017	T heat exchanger	The temperature of heat exchanger	-25 °C - 150 °C
AM018	T return	Return temperature of appliance. The temperature of the water entering the appliance.	-25 °C - 150 °C

Value	Display text	Description	Range
AM019	Water pressure	Water pressure of the primary circuit.	0 bar - 25.5 bar
AM027	Outside temperature	Instantaneous outside temperature	-60 °C - 60 °C
AM036	Flue gas temperature	Temperature of the exhaust gas leaving the appliance	0 °C - 250 °C
AM037	3 way valve	Status of the three way valve	0 = CH 1 = DHW
AM040	Control temperature	Temperature used for hot water control algorithms.	-327.68 °C - 327.67 °C
AM044	Nr sensors supported	Number of sensors supported by the device	0 - 255
AM045	Water P available	Is a water pressure sensor present?	0 = No 1 = Yes
AM101	Internal setpoint	Internal system flow temperature setpoint	0 °C - 120 °C
PM002	CH Setpoint	External winning Central Heating setpoint	0 °C - 125 °C

9.3.3 Status and sub-status - FSB-WHB-HE-150-300

Tab.42 Status numbers

Status	
0	Standby
1	Heat Demand
2	Burner Start
3	Burning Central heating
4	Burning Dhw
5	Burner Stop
6	Pump Post Run
7	Cooling Active
8	Controlled Stop
9	Blocking Mode
10	Locking Mode
11	Load test min
12	Load test CH max
13	Load test DHW max
15	Manual Heat demand Central heating On
16	Boiler Frost Protection
17	DeAiration
18	Control unit Cooling
19	Reset In Progress
20	Auto Filling
21	Halted
200	Device Mode

Tab.43 Sub-status numbers

Sub-status	
0	Standby
1	AntiCycling
2	CloseHydraulicValveRelay
3	ClosePump
4	WaitForBurnerStartConditions
10	CloseExtGasValveRelay
11	BurnerStartToGlueGasValveRpm
12	CloseFlueGasValveRelay
13	FanToPrePurge
14	WaitForReleaseSignal
15	BurnerOnCommandToSu
16	VpsTest
17	PreIgnition
18	Ignition
19	FlameCheck
20	Interpurge
30	NormalInternalSetpoint
31	LimitedInternalSetpoint
32	NormalPowerControl
33	PowerControlOnGradLevel1
34	PowerControlOnGradLevel2
35	PowerControlOnGradLevel3
36	PowerCtrlForFlameProtection
37	StabilizationTime
38	ColdStart
39	ChResume
40	RemoverBurnerOnSuRequest
41	FanToPostPurge
42	OpenExtGasAndFlueGasValveRelay
43	BurnerStopFanToFLueGasValveRpm
44	StopFan
45	LimitedPowerOnTflueGas
60	PumpPostRunning
61	OpenPump
62	Open?HydraulicValveRelay
63	SetBoilerAntiCycleTimer
200	Initialising Done
201	Initialising Csu
202	Initialising Identifiers
203	Initialising Blocking Parameters

Sub-status	
204	Initialising Safety Unit
205	Initialising Blocking

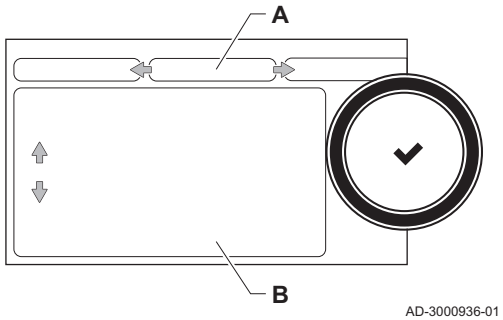
9.4 Reading out measured values

9.4.1 Reading out counters and signals

You can read out the counters and signals of the appliance and the connected control boards, sensors and so on.

1. Select **Installer Menu > Installation Setup**.
   ⇨ The programmable functions of the appliance and all connected devices are displayed.
2. Select a function, zone or device.
3. Select Parameters, counters, signals.

Fig.49 Parameters, counters, signals



A Select parameters, counters or signals
B List of settings

4. Select **Counters** or **Signals**.
   ⇨ A list of available counters or signals is shown.
5. Select the counter or signal you want to view.
   ⇨ A description and the number of the counter or signal is shown.
6. If available, select **Adv. Signals** or **Adv. Counters** to view a signal or counter at the advanced installer level.

10 Maintenance

10.1 General

- Perform the standard checking and maintenance procedures once a year.
- Perform the specific maintenance procedures if necessary.

Caution

- Maintenance operations must be completed by a qualified installer.
- During inspection or maintenance work, always replace all gaskets of the disassembled parts.
- Replace defective or worn parts with original spare parts.
- An annual inspection is mandatory.

10.2 Standard inspection and maintenance operations

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

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

Caution

- Check whether all gaskets have been positioned properly (absolutely flat in the appropriate groove means they are gas tight).
- During the inspection and maintenance operations, water (drops, splashes) must never come into contact with the electrical parts.

10.2.1 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.

10.2.2 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.

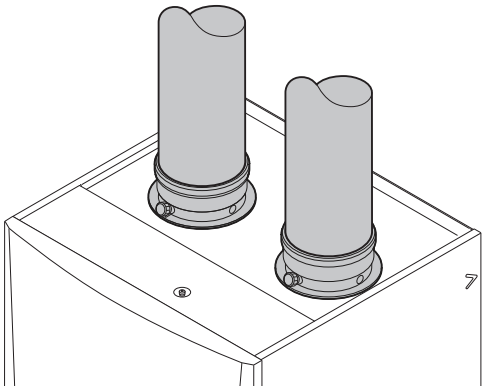
10.2.3 Checking the ionisation current

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.

For more information, see
Replacing the ionisation/ignition electrode, page 63

10.2.4 Checking the flue gas discharge/air supply connections

Fig.50 Checking flue gas discharge/air supply connections



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

10.2.5 Checking the combustion

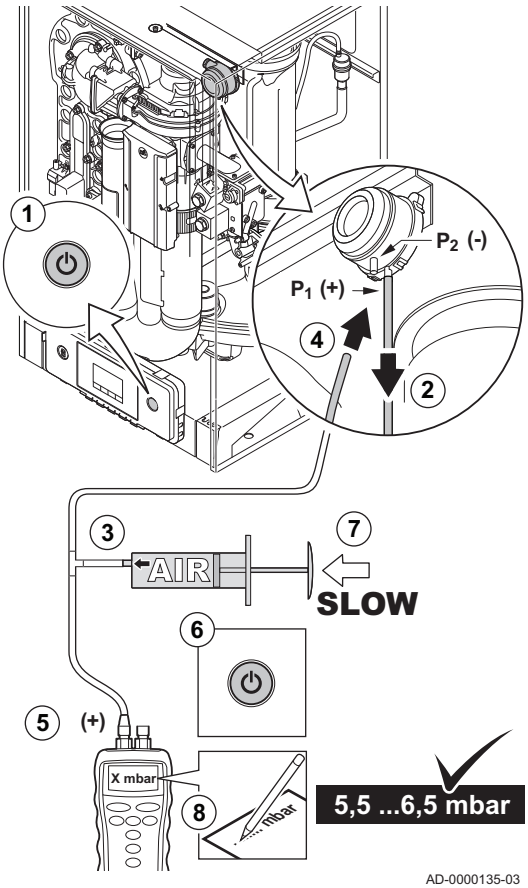
Combustion is checked by measuring the O_2percentage in the flue gas outlet duct.

For more information, see
Checking/setting combustion, page 45

10.2.6 Checking the PS air pressure differential switch

Checking the air pressure differential switch + side

Fig.51 Check the air pressure differential switch + side



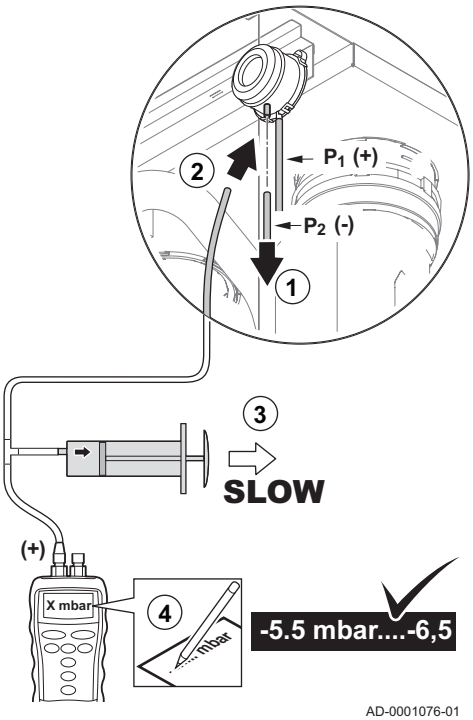
1. Switch off the boiler.
2. Disconnect the silicon hose on the + side (**P1**) of the air pressure differential switch.
3. Take a large plastic syringe or bellows and connect a T piece with a hose connected.
4. Connect the + side of the air pressure differential switch to one end of the T piece with 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

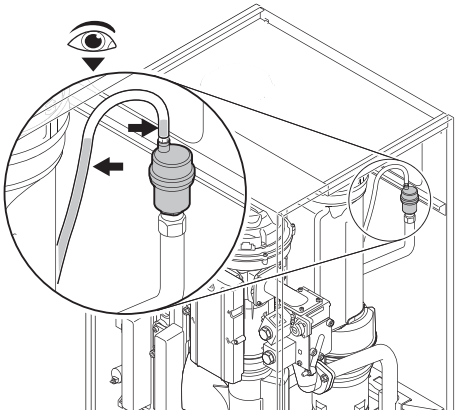
Fig.52 – side of the air pressure differential switch



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.

10.2.7 Checking the automatic air vent

Fig.53 Checking the automatic air vent



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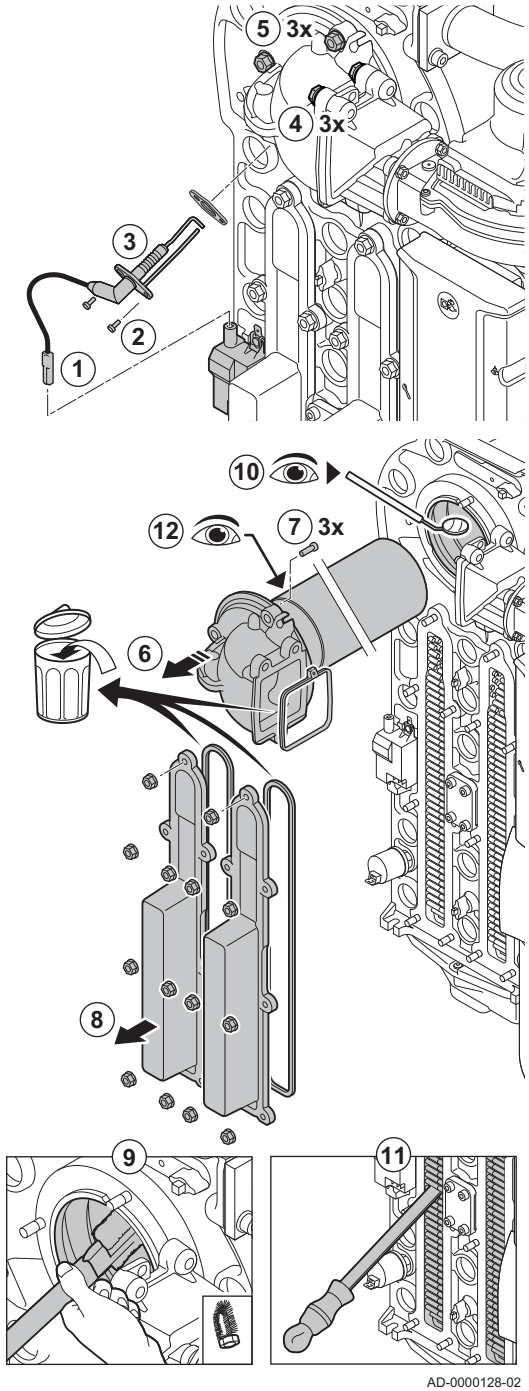
1. Check the hose on top of the air vent.
2. The automatic air vent is leaking if water can be seen in the connected hose.
3. In the event of a leak, replace the air vent.

10.2.8 Checking the burner and cleaning the heat exchanger

Fig.54 Checking the burner



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

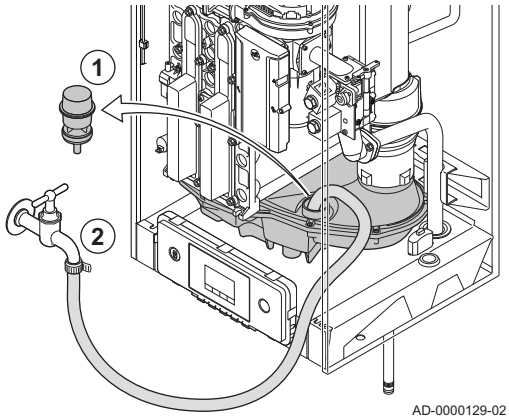
Caution
The ignition cable is fixed to the ionisation/ignition electrode and therefore may not be removed.

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 (e.g. 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; it is self-cleaning:
    - If necessary, carefully clean the cylinder-shaped burner with compressed air.
    - Check that the burner cover 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.

10.2.9 Clean the condensate collector

Fig.55 Clean the condensate collector



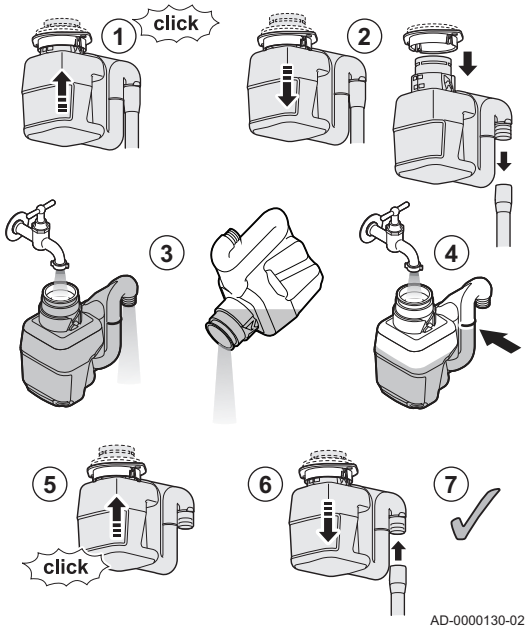
1. Remove the sealing cap from the condensate collector.
2. Rinse the condensate collector thoroughly with a water flow that is as large as possible.

Warning
During rinsing, avoid penetration of water into the boiler or the control panel.

3. Put the sealing cap back on the condensate collector.
4. Disconnect the silicon hose of the air pressure differential switch from the connection nipple on the condensate collector.
5. Clean the opening of the connection nipple thoroughly (by blowing air or pushing an object through it).
6. Reconnect the silicon hose.

10.2.10 Cleaning the siphon

Fig.56 Cleaning the siphon



1. Push the siphon upwards:
   ⇨ The siphon should release with a click.
2. Carefully pull the siphon downwards.
3. Clean the siphon with water.
4. Fill the siphon with water up to the mark.
5. Push the siphon firmly into the designated opening underneath the boiler.
   ⇨ The siphon should snap shut with a click.
6. Carefully pull the siphon downwards.
7. Check whether the siphon is firmly fitted in the boiler.

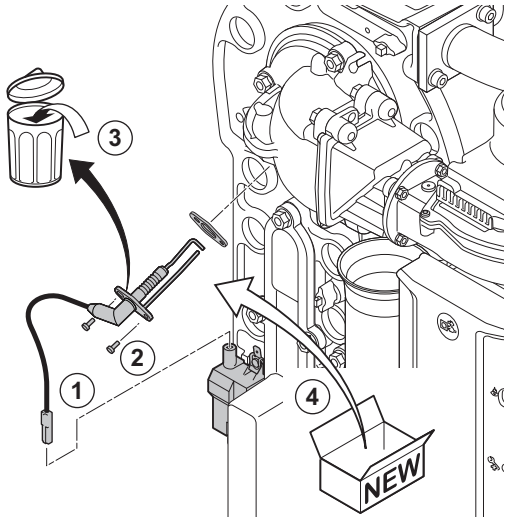
Danger
The siphon must always be filled with water. This prevents flue gases from entering the room.

10.3 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:

10.3.1 Replacing the ionisation/ignition electrode

Fig.57 Replacing the ionisation/ignition electrode



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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.

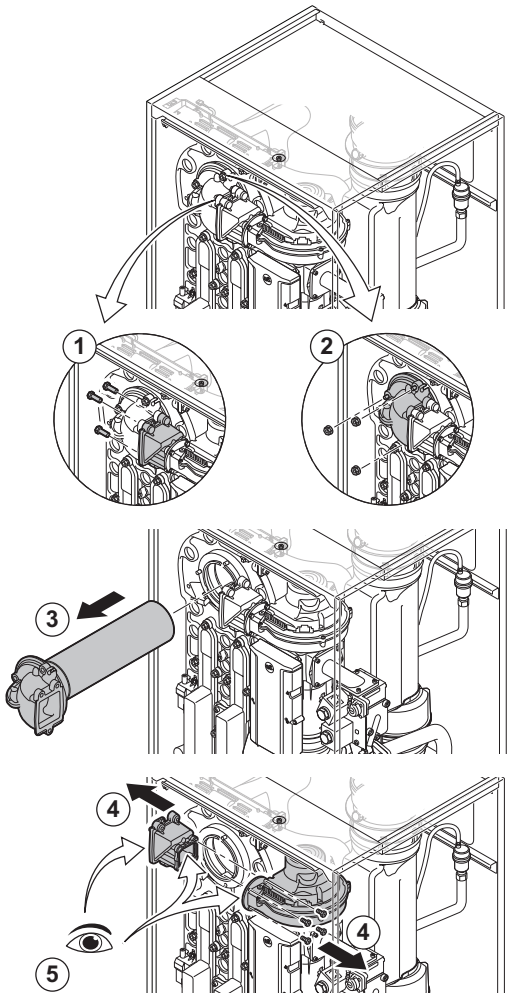
Important
The ignition cable is fixed to the electrode and therefore may not be removed.

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.

10.3.2 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.58 Checking the non-return valve



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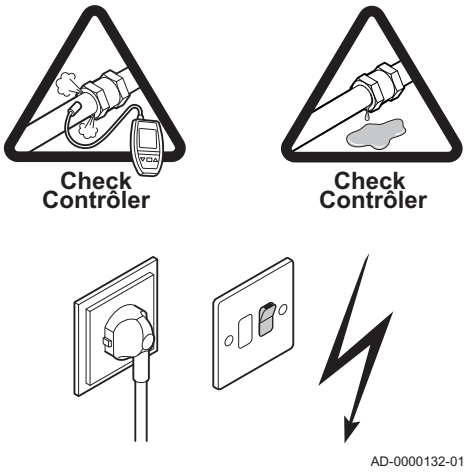
1. Undo the 3 bolts from the adapter on the non-return valve holder (15 Nm torque).
2. Undo the 3 nuts from the adapter on the heat exchanger (15 Nm torque).
3. Carefully remove the adapter with burner from the heat exchanger.
4. Remove the 4 bolts from the fan and remove the non-return valve holder (5.5 Nm torque).
5. Check whether traces of condensation are visible on the inside of the fan. Replace the non-return valve if there are visible traces of condensation.
6. Inspect the non-return valve and replace it in the event of a defect or damage.
7. When replacing the non-return valve, loosen the fixing screw of the non-return valve and remove it.
8. 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.

Fig.59 Putting the boiler into operation



10.3.3 Reassembling the boiler

1. Fit all removed parts in the reverse order.
2. During inspection or maintenance work, always replace all gaskets of the disassembled parts.
3. Check the tightness of the gas and water connections.
4. Put the boiler back into operation.

11 Disposal

11.1 Removal/recycling

Important
Removal and disposal of the boiler must be carried out by a qualified person in accordance with local and national regulations.

To remove the boiler, proceed as follows:

1. Pull the boiler plug out of the socket.
2. Shut off the gas supply.
3. Shut off the water supply.
4. Drain the installation.
5. Remove the siphon.
6. Remove the air supply/flue gas outlet pipes.
7. Disconnect all pipes on the boiler.
8. Remove the boiler.

12 Troubleshooting

12.1 Error codes

The boiler is fitted with an electronic regulation and control unit. The heart of the control system is a microprocessor, which controls and also protects the boiler. In the event of an error, a corresponding code is displayed.

Error codes are displayed at three different levels:

- Warning (A00.00)

Important
The boiler continues to operate but the cause of the warning must be investigated. A warning can change into a blocking or lock-out.

- Blocking (H00.00)

Important
The boiler starts up again automatically only when the cause of the blocking has been rectified. A blocking can change into a lock-out

- Lock-out (E00.00)

Important
The boiler starts up again automatically only when the cause of the lock-out has been rectified

The meaning of the code can be found in the various error code tables. Make a note of the code displayed.

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

12.1.1 Warning - FSB-WHB-HE-150-300

Tab.44 Warning codes

Code	Display text	Description	Solution
A01.21	Dhw Temp GradLevel3	Maximum Dhw Temperature Gradient Level3 Exceeded	Temperature warning: • Check the flow.
A02.06	Water Press Warning	Water Pressure Warning active	Water pressure warning: • Water pressure too low; check the water pressure.
A02.18	OBD Error	Object Dictionary Error	Configuration error: • Reset CN1 and CN2.
A02.37	Uncritic device lost	Uncritical device has been disconnected	SCB PCB not found: • Check the connection.
A02.45	Full Can Conn Matrix	Full Can Connection Matrix	SCB PCB not found: • Carry out an auto-detect.
A02.46	Full Can Device Adm	Full Can Device Administration	SCB PCB not found: • Carry out an auto-detect.
A02.49	Failed Init Node	Failed Initialising Node	SCB PCB not found: • Carry out an auto-detect.
A03.17	Safety check	Periodically safety check ongoing	No action required; device restarts itself.

12.1.2 Blocking - FSB-WHB-HE-150-300

Tab.45 Blocking codes

Code	Display text	Description	Solution
H00.36	T 2nd Return Open	Second return temperature sensor is either removed or measure 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.
H00.37	T 2nd Return Closed	Second return temperature sensor is either shorted or measure 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.
H01.00	Comm Error	Communication Error occured	Communication error with the CU-GH PCB: • Restart boiler
H01.06	Max Delta TH-TF	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 correctly vented to remove air. • Sensor error: - Check that the sensors are operating correctly. - Check that the sensor has been fitted properly.
H01.07	Max Delta TH-TR	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.

Code	Display text	Description	Solution
H01.08	Delta T Max 3	Delta T Max 3	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 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.
H01.09	Gas Pressure Switch	Gas Pressure Switch	Gas pressure too low: • Gas pressure too low: - Check the gas supply pressure. - Check whether the gas tap is properly open. • Wiring fault: check the wiring. • Faulty gas valve: check the gas valve and replace it if necessary.
H01.13	Max THeat Ex	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 installation has been correctly vented to remove air.
H01.14	Max Tflow	Flow temperature has exceeded the maximum operating value	Flow temperature sensor above normal range (high-limit thermostat): • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor. • No flow or insufficient flow: - Check the circulation (direction, pump, valves). - Check the water pressure. - Check the cleanliness of the heat exchanger.
H01.15	Max Tflue Gas	Flue gas temperature has exceeded the maximum operating value	Maximum flue gas temperature exceeded: • Faulty sensor: replace the sensor. • Check the flue gas outlet system • Check the heat exchanger to ensure that the flue gas side is not clogged.
H02.00	Reset In Progress	Reset In Progress	No action required; await reinitialisation.

Code	Display text	Description	Solution
H02.02	Wait Config Number	Waiting For Configuration Number	Configuration error or unknown configuration number: • Reset CN 1 and CN2.
H02.03	Conf Error	Configuration Error	Configuration error or unknown configuration number: • Reset CN 1 and CN2.
H02.05	CSU CU mismatch	CSU does not match CU type	Configuration error: • Reset CN 1 and CN2.
H02.09	Partial block	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.
H02.10	Full Block	Full blocking of the device recognized	Blocking input is active: • External cause: remove external cause. • Wrong parameter set: check the parameters. • Bad connection: check the connection.
H02.12	Release Signal	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.
H02.36	Funct device lost	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.
H03.00	Parameter Error	Safety parameters level 2, 3, 4 are not correct or missing	Configuration error or unknown configuration number: • Reset CN 1 and CN2. • Replace the control panel if it is defective.
H03.01	CU to GVC data error	No valid data from CU to GVC received	-
H03.02	Flame loss detected	Measured ionisation current is below limit	No flame during operation: • No ionisation current: - Purge the gas supply to remove air. - Check whether the gas tap is properly open. - Checking the gas supply pressure. - Check the operation and setting of the gas valve unit. - Check that the air inlet and flue gas discharge flues are not blocked. - Check that there is no recirculation of flue gases.
H03.05	Internal blocking	Gas Valve Control internal blocking occured	-

12.1.3 Lock-out - FSB-WHB-HE-150-300

Tab.46 Lock out codes

Code	Display text	Description	Solution
E00.00	TFlow Open	Flow temperature sensor is either removed or measure a temperature below range	Flow 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.
E00.01	TFlow Closed	Flow temperature sensor is either shorted or measure 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.
E00.04	TReturn Open	Return temperature sensor is either removed or measure a temperature below range	Open circuit in return temperature sensor: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E00.05	TReturn Closed	Return temperature sensor is either shorted or measure 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.
E00.08	THeat Ex Open	Heat exchanger temperature sensor is either removed or measure 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.
E00.09	THeat Ex Closed	Heat exchanger temperature sensor is either shorted or measure 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.
E00.20	TFlue Gas Open	Flue gas temperature sensor is either removed or measure a temperature below range	Open circuit in flue gas sensor: • Bad connection: check the wiring and connectors. • Incorrectly fitted sensor: check that the sensor has been correctly fitted. • Faulty sensor: replace the sensor.
E00.21	TFlue Gas Closed	Flue gas temperature sensor is either shorted or measure a temperature above range	Flue gas 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	Display text	Description	Solution
E00.40	WaterPressureOpen	Water pressure sensor is either removed or measure 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.
E00.41	WaterPressureClosed	Water pressure sensor is either shorted or measure 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.
E01.04	5x Flame Loss Error	5x Error of unintended Flame Loss occurance	Flame loss occurs 5 times: • Purge the gas supply to remove air. • Check whether the gas tap is properly open. • Check the gas supply pressure. • Check the operation and setting of the gas valve unit. • Check that the air inlet and flue gas discharge flues are not blocked. • Check that there is no recirculation of flue gases.
E01.12	Return Higher Flow	Return tempearture has a higher temperature value then 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.
E02.04	Parameter Error	Parameter Error	Configuration error or factory settings incorrect: • Parameters are not correct: - Restart boiler - Reset CN1 and CN2. - Replace the control panel if it is defective.
E02.13	Blocking Input	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.
E02.15	Ext CSU Timeout	External CSU Timeout	CSU time out: • Bad connection: check the wiring and connectors. • Faulty CSU: replace CSU.

Code	Display text	Description	Solution
E02.17	GVC CommTimeout	Gas Valve Control unit communication has exceeded feedback time	Communication error with the safety PCB: • Bad connection: check the wiring and connectors. • Control unit failure: replace the control unit.
E02.35	Safety device lost	Safety critical device has been disconnected	-
E02.47	Failed Conn Funct Gr	Failed Connecting Function Groups	-
E02.48	Funct Gr Conf Fault	Function Group Configuration Fault	-
E02.51	Gvc Parameter Error	Parameter error from the Gvc	-
E02.52	Gvc Burner Prof Err	Gvc Burner Profile Error	-
E04.00	Parameter error	Safety parameters Level 5 are not correct or missing	Safety parameters not OK: • Bad connection: check the wiring and connectors.
E04.01	TFlow Closed	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.
E04.02	TFlow Open	Flow temperature sensor is either removed or measuring a temperature below range	Flow 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.
E04.03	Max Flow temp	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.
E04.04	TFlue Closed	Flue temperature sensor is either shorted or measuring a temperature above range	Flue gas 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.
E04.05	TFlue Open	Flue temperature sensor is either removed or measuring a temperature below range	Flue gas 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.
E04.06	Max Flue temp	Measured flue temperature above limit	-
E04.07	TFlow Sensor	Deviation in flow sensor 1 and flow sensor 2 detected	Flow temperature sensor deviation: • Bad connection: check the connection. • Faulty sensor: replace the sensor.

Code	Display text	Description	Solution
E04.08	Safety input	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. - Siphon blocked or empty. - Check that the air inlet and flue gas discharge flues are not blocked. - Check the cleanliness of the heat exchanger.
E04.09	TFlue Sensor	Deviation in flue sensor 1 and flue sensor 2 detected	Flue gas temperature sensor deviation: • Bad connection: check the connection. • Faulty sensor: replace the sensor.
E04.10	Unsuccessful start	5 Unsuccessful burners starts detected	Five failed burner starts: • No ignition spark: - Check the wiring between the PCU electronic PCB and the ignition transformer. - Check that the SU electronic PCB is correctly in place. - Check the ionisation/ignition electrode. - Check breakdown to earth. - Check the condition of the burner set. - Check the earthing. - SU electronic PCB faulty: replace the electronic PCB. • Ignition spark but no flame: - Vent the gas pipes to remove air. - Check that the air inlet and flue gas discharge flues are not blocked. - Check whether the gas tap is properly open. - Check the gas supply pressure. - Check the operation and setting of the gas valve unit. - Check the wiring on the gas valve unit. - SU electronic PCB faulty: replace the electronic PCB. • Presence of the flame but insufficient ionization (<4 µA): - Check whether the gas tap is properly open. - Check the gas supply pressure. - Check the ionisation/ignition electrode. - Check the earthing. - Check the wiring on the ionization/ignition electrode.
E04.11	VPS	VPS Gas Valve proving failed	Gas leakage control fault: • Bad connection: check the wiring and connectors. • VPS gas leakage control defective: replace the GPS. • Gas valve unit faulty: replace the gas valve unit.

Code	Display text	Description	Solution
E04.12	False flame	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.
E04.13	Fan	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.
E04.14	The burner temperatu	The burner temperature and burner setpoint differ more than a parameter defined by the GVC for more	-
E04.15	The flue gas pipe is	The flue gas pipe is blocked	-
E04.17	The driver for the g	The driver for the gas valve is broken	Gas valve fault: • Bad connection: check the wiring and connectors. • Faulty gas valve: replace the gas valve.
E04.18	The flow temperature	The flow temperature is less than the minimum defined by the GVC parameter	-
E04.19	Mass flow sensor	Mass Flow Sensor Communciation	-
E04.20	Mass flow sensor	MassFlowSensor Deviation	-
E04.21	Burner temperature	Deviation in burner sensor 1 and burner sensor 2 detected	-
E04.23	Internal Error	Gas Valve Control internal locking	-
E04.24	No Gas Family	No gas family found during gas family detection mode	-

12.2 Error memory

The boiler control unit has an error memory. It stores the last 32 errors that have occurred.

13 Spare parts

13.1 General

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

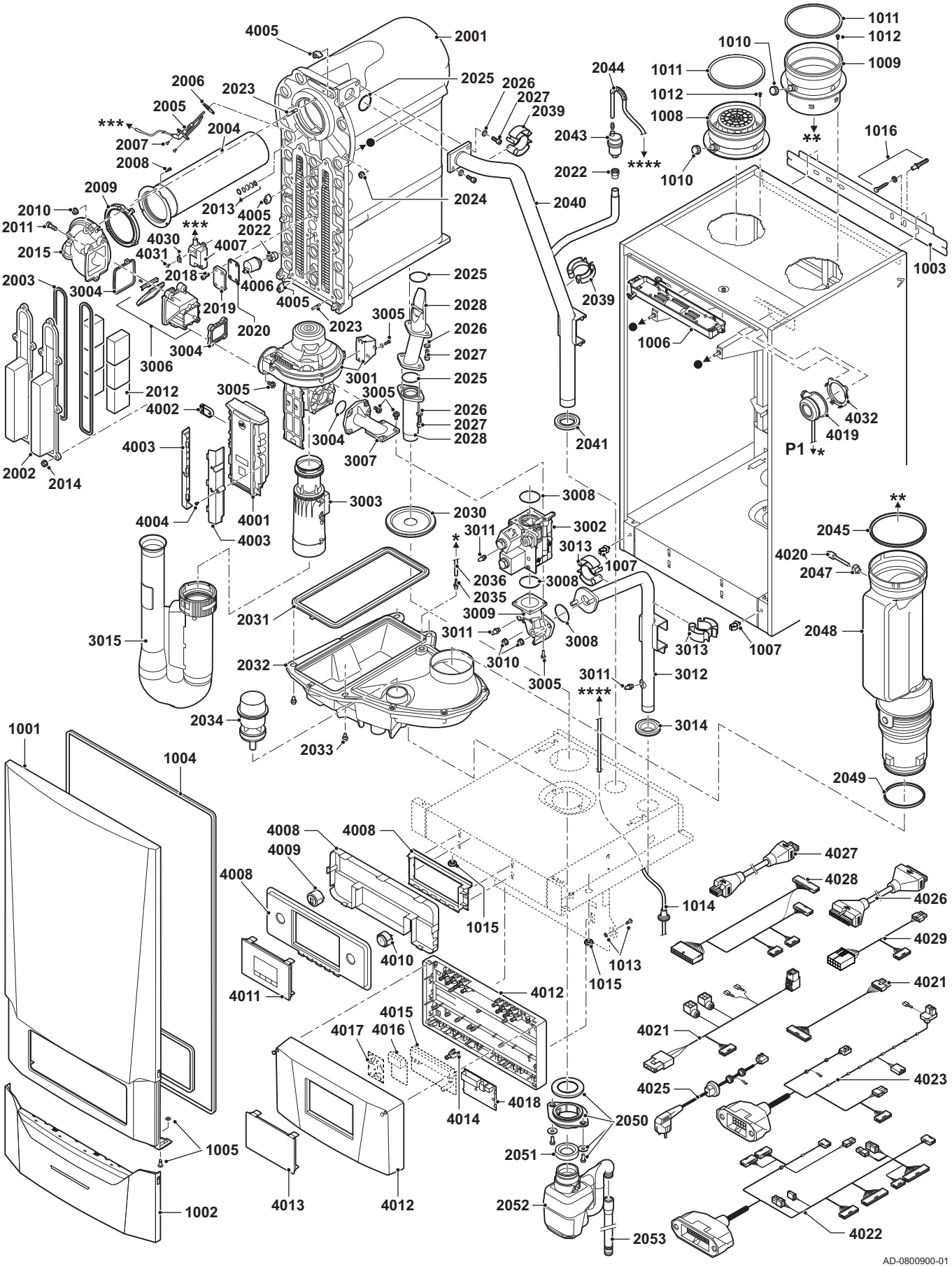
Information about available parts can be found via the website for professionals.

Fig.60 http://pieces.dedietrich-thermique.fr

MW-3000456-01

Important
When ordering a part, you must state the part number of the required part.

13.2 Parts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14 Appendix

14.1 ErP information

14.1.1 Product fiche

Tab.47 Product fiche

De Dietrich - MCA		160
Seasonal space heating energy efficiency class		-
Rated heat output *(Prated or Psup)*	kW	152
Seasonal space heating energy efficiency	%	-
Annual energy consumption	GJ	-
Sound power level L_{WA} indoors	dB	63

See
For specific precautions in relation to assembly, installation and maintenance: Safety, page 6

14.2 EC declaration of conformity

The unit complies with the standard type described in the EC declaration of conformity. It has been manufactured and commissioned in accordance with European directives.

The original declaration of conformity is available from the manufacturer.

14.3 Checklist for commissioning

Tab.48 Checklist

No.	Commissioning tasks	Confirmation
1	Fill the system with water and check the water pressure	
2	Fill the siphon with water	
3	Vent the central heating system	
4	Check water-side connections for tightness	
5	Check the gas supply pressure	
6	Check the capacity of the gas meter	
7	Check the gas tightness of the connections and gas pipes	
8	Vent the gas supply pipe	
9	Check the electrical connections	
10	Check the flue gas outlet/air supply connections	
11	Checking the function and operational status of the boiler	
12	Check the air-gas ratio	
13	Remove the measuring equipment and close the measuring points	
14	Correctly fit the front housing of the boiler	
15	Set the room thermostat or the control	
16	Instruct the user and hand over the necessary documents	
17	Complete the guarantee card online	
18	Confirm the commissioning	
	Date . .	dd-mm-yy
	Company name, signature of engineer . .	

14.4 Checklist for annual maintenance

Tab.49 Checklist for annual maintenance

No.	Inspection and/or servicing work	Confirmation		
1	Check the water pressure			
2	Check the water quality			
3	Check the ionisation current			
4	Check the air supply/flue gas discharge connections			
5	Check the combustion (O_2) at full load and low load			
6	Checking the automatic air vent			
7	Checking the burner and cleaning the heat exchanger			
9	Cleaning the siphon			
10	Assembly of the boiler (replace removed gaskets)			
11	Boiler inspected visually			
12	Extra maintenance work that was undertaken			
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	. . .			
	. . .			
	. . .			
	. . .			
13	Confirmation of inspection			
	Date . .	dd-mm-yy	dd-mm-yy	dd-mm-yy
	Company name, signature of engineer . .			

DE DIETRICH THERMIQUE SAS
FRANCE

Direction des Ventes France
57, rue de la Gare - F-67580 Mertzwiller

03 88 80 27 00
03 88 80 27 99
www.dedietrich-thermique.fr

De Dietrich
SERVICE CONSOMMATEURS
0 825 120 520 Service 0,15 € / min + prix appel

DE DIETRICH REMEHA GMBH
DE

Rheiner Strasse 151
D-48282 EMSDETTEN

+49 (0)25 72 / 9161-0
+49 (0)25 72 / 9161-102
info@remeha.de
www.remeha.de

VAN MARCKE
BE

Weggevoerdenlaan 5
B-8500 KORTRIJK

+32 (0)56/23 75 11
www.vanmarcke.be

DE DIETRICH THERMIQUE Iberia S.L.U
ES

C/Salvador Espriu, 11
08908 L'HOSPITALET de LLOBREGAT

+34 935 475 850
info@dedietrich-calefaccion.es
www.dedietrich-calefaccion.es

WALTER MEIER Klima Schweiz AG
CH

Bahnstrasse 24 - CH-8603 SCHWERZENBACH

+41 (0) 44 806 41 41
+41 (0) 44 806 41 00
group@waltermeier.com
+41 (0)8 00 846 846 Serviceline
www.waltermeier.com

WALTER MEIER Climat Suisse SA
CH

Z.I de la Veyre B, St-Légier
CH-1800 VEVEY 1

+41 (0) 21 943 02 22
+41 (0) 21 943 02 33
group@waltermeier.com
+41 (0)8 00 846 846 Serviceline
www.waltermeier.com

ООО «БДР Термия Рус»
RU

129164, Россия, г. Москва
Зубарев переулок, д. 15/1
Бизнес-центр «Чайка Плаза»,офис 309

8 800 333-17-18
info@dedietrich.ru
www.dedietrich.ru

NEUBERG S.A.
LU

39 rue Jacques Stas - B.P.12
L-2549 LUXEMBOURG

+352 (0)2 401 401
www.neuberg.lu
www.dedietrich-heating.com

DE DIETRICH SERVICE
AT

0800 / 20 1608 freecall
www.dedietrich-heiztechnik.com

DUEDI S.r.l
IT

Distributore Ufficiale Esclusivo
De Dietrich-Thermique Italia Via Passatore, 12
12010 San Defendente di Cervasca CUNEO

+39 0171 857170
+39 0171 687875
info@duediclima.it
www.duediclima.it

DE DIETRICH
CN

Room 512, Tower A, Kelun Building
12A Guanghua Rd, Chaoyang District
C-100020 BEIJING

+86 (0)106 581 4017
+86 (0)106 581 4018
+86 (0)106 581 7056
+86 (0)106 581 4019
contactBJ@dedietrich.com.cn
www.dedietrich-heating.com

BDR THERMEA Czech Republic s.r.o
CZ

Jeseniova 2770/56 - 130 00 Praha 3

+420 271 001 627
dedietrich@bdrthermea.cz
www.dedietrich.cz

MW-8000005-10

CE

De Dietrich
DE DIETRICH THERMIQUE
57, rue de la Gare F-67580 MERTZWILLER - BP 30

PART OF BDR THERMEA

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