

## Wall-hung gas condensing boilers

**EMC-M 24**

**EMC-M 24/28 MI**

**EMC-M 30/35 MI**

**EMC-M 34/39 MI**



## Installation and Service Manual

# EG declaration of conformity

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The device complies with the standard type described in the EG declaration of conformity. It was manufactured and commissioned in accordance with European directives.

The original of the declaration of compliance is available from the manufacturer.

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# 1 Introduction

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## 1.1 Symbols used

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In these instructions, various danger levels are employed to draw the user's attention to particular information. In so doing, we wish to safeguard the user's safety, obviate hazards and guarantee correct operation of the appliance.



### DANGER

Risk of a dangerous situation causing serious physical injury.



### WARNING

Risk of a dangerous situation causing slight physical injury.



### CAUTION

Risk of material damage.



Signals important information.



Signals a referral to other instructions or other pages in the instructions.

## 1.2 Abbreviations

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- ▶ **3CE**: Combination of air supply and combustion gas discharge
- ▶ **DHW**: Domestic hot water
- ▶ **PCU**: Primary Control Unit - Electronic system to control burner function
- ▶ **SCU**: Secondary Control Unit - Additional electronic system

## 1.3 General

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### 1.3.1. Manufacturer's liability

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Our products are manufactured in compliance with the requirements of the various applicable European Directives. They are therefore delivered with **CE** marking and all relevant documentation.

In the interest of customers, we are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

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

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

### 1.3.2. Installer's liability

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The installer is responsible for the installation and initial start up of the appliance. The installer must respect the following instructions:

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

### 1.3.3. User's liability

---

To guarantee optimum operation of the appliance, the user must respect the following instructions:

- ▶ Read and follow the instructions given in the manuals provided with the appliance.
- ▶ Call on qualified professionals to carry out installation and initial start up.
- ▶ Get your installer to explain your installation to you.
- ▶ Have the required checks and services done.
- ▶ Keep the instruction manuals in good condition close to the appliance.

This appliance is not intended to be used by persons (including children) whose physical, sensory or mental capacity is impaired or persons with no experience or knowledge, unless they have the benefit, through the intermediary of a person responsible for their safety, of supervision or prior instructions regarding use of the appliance. Care should be taken to ensure that children do not play with the appliance.

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

## 1.4 Homologations

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### 1.4.1. Certifications

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CE identification no	<b>PIN 0063CM3019</b>
NOx classification	<b>5 (Standards EN)</b>
Type of connection	Chimney: B <sub>23</sub> , B <sub>23P</sub> , B <sub>33</sub>
	Flue gas outlet: C <sub>13(x)</sub> , C <sub>33(x)</sub> , C <sub>43(x)</sub> , C <sub>53</sub> , C <sub>63(x)</sub> , C <sub>83(x)</sub> , C <sub>93(x)</sub>

### 1.4.2. Additional Directives

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Apart from the legal provisions and Directives, the additional Directives described in these instructions must also be observed.

For all provisions and Directives referred to in these instructions, it is agreed that all addenda or subsequent provisions will apply at the time of installation.



#### **WARNING**

Installation of the appliance must be done by a qualified engineer in accordance with prevailing local and national regulations.

## 2 Safety instructions and recommendations

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### 2.1 Safety instructions

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#### DANGER

If you smell gas:

1. Do not use a naked flame, do not smoke, do not operate electrical contacts or switches ( doorbell, light, motor, lift, etc..).
2. Shut off the gas supply.
3. Open the windows.
4. Trace possible leaks and seal them immediately.
5. If the gas leak is before the gas meter, contact the gas supplier.



#### DANGER

If you smell flue gases:

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

### 2.2 Recommendations

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#### WARNING

- ▶ Installation and maintenance of the boiler must be carried out by a qualified professional in compliance with prevailing local and national regulations.
- ▶ When working on the boiler, always disconnect the boiler from the mains and close the main gas inlet valve.
- ▶ After maintenance or repair work, check all installations to ensure that there are no leaks.



#### CAUTION

The boiler must be installed in a frost-free environment.



Keep this document close to the place where the boiler is installed.

#### Casing components

Only remove the casing for maintenance and repair operations. Put the casing back in place after maintenance and repair operations.

**Instructions stickers**

The instructions and warnings affixed to the appliance must never be removed or covered and must remain legible during the entire lifespan of the appliance. Immediately replace damaged or illegible instructions and warning stickers.

**Modifications**

Modifications may only be made to the boiler after the written permission of **De Dietrich Thermique** to do so.

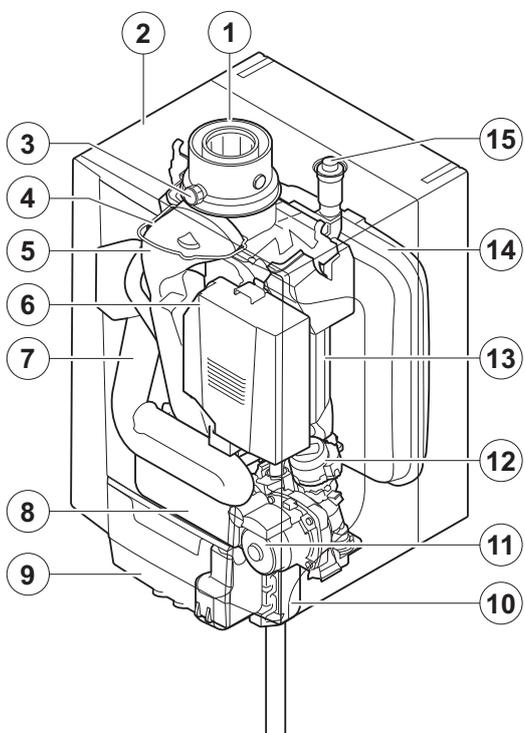
## 3 Technical description

### 3.1 General description

#### Wall-hung gas condensing boilers

- ▶ High efficiency heating.
- ▶ Low pollutant emissions.
- ▶ Installation and connection facilitated by the mounting frame delivered with the appliance.
- ▶ Flue gas discharge via a forced flue, chimney, bi-flow or 3CE type connection.
- ▶ **EMC-M 24:** Heating only (Possibility of producing domestic hot water via an independent tank which has been installed separately).
- ▶ **EMC-M 24/28 MI - 30/35 MI - 34/39 MI:** Heating and domestic hot water production.

### 3.2 Main parts

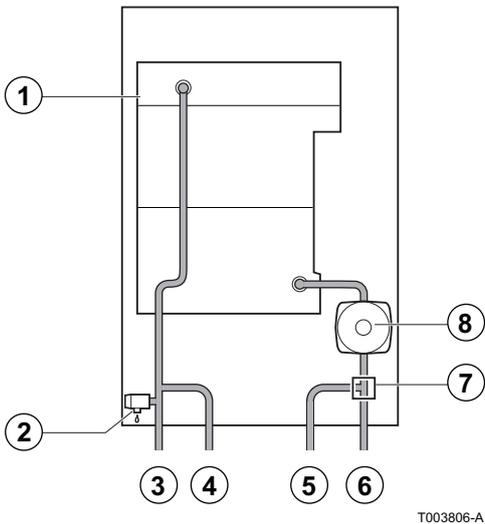


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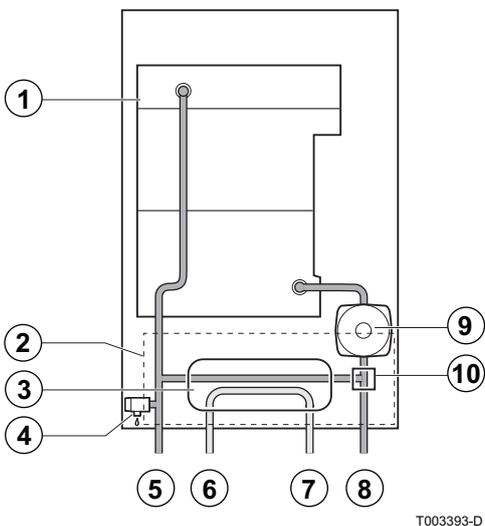
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|----|--|
| 1  | Flue gas outlet/Air intake   |
| 2  | Casing/air box   |
| 3  | Outlet for measuring combustion gases  |
| 4  | Ignition/ionization electrode  |
| 5  | Flue gas discharge pipe  |
| 6  | Gas/air system with a fan, gas block and automatic burner unit                 |
| 7  | Air intake silencer  |
| 8  | Plate heat exchanger (DHW) (Only on models with domestic hot water production) |
| 9  | Connection box   |
| 10 | Siphon   |
| 11 | Shunt pump   |
| 12 | 3-way valve  |
| 13 | Heat exchanger (Central heating)   |
| 14 | Expansion vessel   |
| 15 | Automatic air vent   |

### 3.3 Skeleton Diagrams

#### EMC-M 24



- 1 Heat exchanger (Central heating)
- 2 Safety valve
- 3 Heating flow (Primary circuit)
- 4 Heating flow (Secondary circuit)
- 5 Heating return (Secondary circuit)
- 6 Heating return (Primary circuit)
- 7 3-way valve
- 8 Shunt pump (Central heating)



**EMC-M 24/28 MI - 30/35 MI - 34/39 MI**

- 1 Heat exchanger (Central heating)
- 2 Hydroblock
- 3 Plate heat exchanger (DHW)
- 4 Safety valve
- 5 Heating flow
- 6 Domestic hot water outlet (DHW)
- 7 Domestic cold water inlet
- 8 Heating return
- 9 Shunt pump (Central heating)
- 10 3-way valve

**3.4 Operating principle**

**3.4.1. Regulation of the water temperature**

The boiler is fitted with an electronic temperature regulator having an outlet and return temperature probe. The flow temperature can be set between 20°C and 90°C. The boiler reduces its power when the set outlet-temperature is attained. The cutout temperature is the set heating outlet-temperature + 5 °C.

**3.4.2. Protection against a shortage of water**

The boiler is fitted with a safety device to prevent the shortage of water based on temperature measurements. By reducing its output when the water flow rate is in danger of becoming insufficient, the boiler continues to operate as long as possible. In case of insufficient  $\Delta T \geq 50^\circ\text{C}$  flow or an excessive increase in flow temperature, the boiler will enter shutdown mode for 10 minutes. When there is no water in

the boiler, or if the pump is not running, the system is locked (breakdown)



In the event of a fault, the status signal for the **i** button on the connection box flashes red.



For more detailed information, see chapter: "Shutdowns and lock-outs", page 60.

### 3.4.3. Maximum temperature protection

The maximum temperature protection locks the boiler if the water temperature becomes too high (110 °C).



In the event of a fault, the status signal for the **i** button on the connection box flashes red.



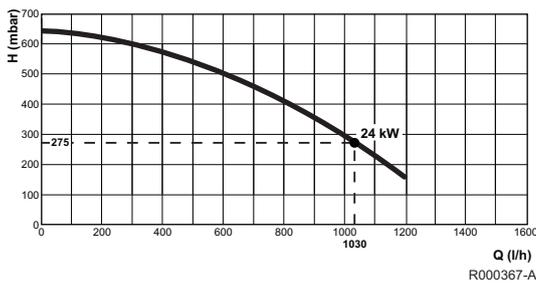
For more detailed information, see chapter: "Shutdowns and lock-outs", page 60.

## 3.5 Circulating pump

The boiler is fitted with an on/off circulation pump.

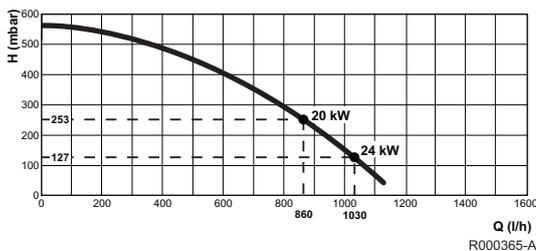
### EMC-M 24

- H** Manometric height central heating circuit
- Q** Water flow (  $\Delta T=20K$  )



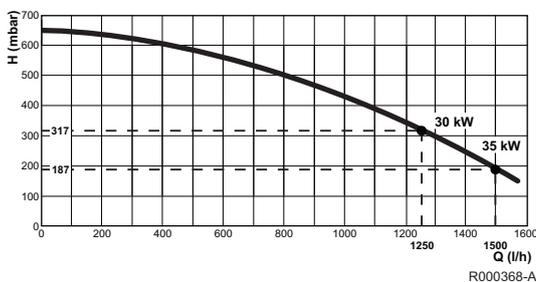
### EMC-M 24/28 MI

- H** Manometric height central heating circuit
- Q** Water flow (  $\Delta T=20K$  )



### EMC-M 30/35 MI - 34/39 MI

- H** Manometric height central heating circuit
- Q** Water flow (  $\Delta T=20K$  )



## 3.6 Technical specifications

Boiler type	EMC- M		24	24/28 MI	30/35 MI	34/39 MI
<b>General</b>						
EC identification no.	PIN		0063CM3019			
Flow rate setting	Adjustable		Modulating, Start/Stop			
Nominal output (Pn) Heating System (80/60 °C)	minimum- maximum	kW	5,5 - 23,4	5,5 - 23,4	7,7 - 29,2	7,7 - 33,8
	Factory setting	kW	23,4	19,5	29,2	29,1
Nominal output (Pn) Heating System (50/30 °C)	minimum- maximum	kW	6,1 - 24,8	6,1 - 24,8	8,5 - 31,0	8,5 - 35,7
	Factory setting	kW	24,8	20,7	31,0	30,7
Nominal output (Pn) DHW System	minimum - maximum	kW	-	5,5 - 27,5	7,7 - 33,9	7,7 - 37,8
	Factory setting	kW	-	27,5	33,9	37,8
Nominal input (Qn) Heating System (Hi)	minimum - maximum	kW	5,6 - 24,0	5,6 - 24,0	7,8 - 30,0	7,8 - 34,9
	Factory setting	kW	24,0	20,0	30,0	30,0
Nominal input (Qn) Heating System (Hs)	minimum - maximum	kW	6,2 - 26,7	6,2 - 26,7	8,7 - 33,3	8,7 - 38,8
	Factory setting	kW	26,7	22,2	33,3	33,3
Nominal input (Qnw) DHW System (Hi)	minimum- maximum	kW	-	5,6 - 28,2	7,8 - 34,9	7,8 - 39
Nominal input (Qnw) DHW System (Hs)	minimum- maximum	kW	-	6,2 - 31,3	8,7 - 38,8	8,7 - 43,3
Nominal input (Qn) Propane (Hi)	minimum	kW	7,1	7,1	10	10
Nominal input (Qn) Propane (Hs)	minimum	kW	7,7	7,7	10,9	10,9
Heating efficiency under full load (Hi) (80/60 °C)	-	%	97,6	97,6	97,2	96,9
Heating efficiency under full load (Hi) (50/30 °C)	-	%	103,3	103,3	103,3	102,4
Heating efficiency under partial load (Hi) (Return temperature 60°C)	-	%	97,8	97,8	98,4	98,4
Heating efficiency under partial load (Hi) (92/42 EEG) (Return temperature 30°C)	-	%	109,2	109,2	108,8	108,8
<b>Data on the gases and combustion gases</b>						
Equipment categories		-	II <sub>2</sub> ESI3P			
Type of air/flue gas connection			B <sub>23</sub> , B <sub>23</sub> P, B <sub>33</sub> , C <sub>13</sub> x, C <sub>33</sub> x, C <sub>43</sub> x, C <sub>53</sub> , C <sub>63</sub> x, C <sub>83</sub> x, C <sub>93</sub> x			
Gas inlet pressure G20 (Gas H)	minimum- maximum	mbar	17 - 30	17 - 30	17 - 30	17 - 30
	Connecting pressure	mbar	20	20	20	20
Gas inlet pressure G25 (Gas L)	minimum- maximum	mbar	20 - 30	20 - 30	20 - 30	20 - 30
	Connecting pressure	mbar	25	25	25	25
Gas inlet pressure G31 (Propane)	minimum- maximum	mbar	30- 50	30- 50	30- 50	30- 50
	Connecting pressure	mbar	37	37	37	37
Gas consumption G20 (Gas H)	minimum- maximum	m <sup>3</sup> /h	0,59 - 2,54	0,59 - 2,98	0,83 - 3,68	0,83 - 4,13
Gas consumption G25 (Gas L)	minimum- maximum	m <sup>3</sup> /h	0,69 - 2,95	0,69 - 3,47	0,96 - 4,28	0,96 - 4,80
(1) Front panel removed						

Boiler type	EMC- M		24	24/28 MI	30/35 MI	34/39 MI
Gas consumption G31 (Propane)	minimum- maximum	m <sup>3</sup> /h	0,29 - 0,98	0,29 - 1,15	0,41 - 1,42	0,41 - 1,47
NOx annual emission (n=1)		mg/kWh	58	58	52	56
NOx classification (EN 297 pr A3, EN 483)			5	5	5	5
Mass flue gas flow rate	minimum- maximum	kg/h	9,4 - 38,7	9,4 - 45,5	13,1 - 56,2	13,1 - 62,9
Flue gas temperature	minimum- maximum	°C	32 - 78	32 - 84	31 - 82	31 - 86
Maximum counter pressure		Pa	80	116	105	120
<b>Characteristics of the heating circuit</b>						
Water content		l	1,4	1,6	1,7	1,7
Water operating pressure	minimum	bar	0,8	0,8	0,8	0,8
Water operating pressure (PMS)	maximum	bar	3,0	3,0	3,0	3,0
Water temperature	maximum	°C	110	110	110	110
Operating temperature	maximum	°C	90	90	90	90
<b>Characteristics of the domestic hot water circuit</b>						
Specific hot water flow ( $\Delta T = 30K$ )		l/min	-	14	17	19
Domestic water resistance (without flow restrictor)		mbar	-	123	215	260
Flow rate threshold	minimum	l/min	-	1,2	1,2	1,2
Water content		l	-	0,16	0,18	0,18
Operating pressure (Pmw)	maximum	bar	-	8	8	8
<b>Electrical characteristics</b>						
Power supply voltage		VAC	230	230	230	230
Power consumption Full load	maximum	W	117	117	145	159
Power consumption Part load	maximum	W	96	82	101	101
Power consumption - Standby	maximum	W	3	3	3	3
Electrical protection index		IP	X4D	X4D	X4D	X4D
<b>Other characteristics</b>						
Weight (empty)	Total	kg	24,5	26	28,5	28,5
	Mounting <sup>(1)</sup>	kg	23	24	27	27
Acoustic level at 1 metre	maximum Heating System	dB(A)	40	38	42	42
	maximum DHW System	dB(A)	-	42	45	46
(1) Front panel removed						

# 4 Installation

## 4.1 Regulations governing installation

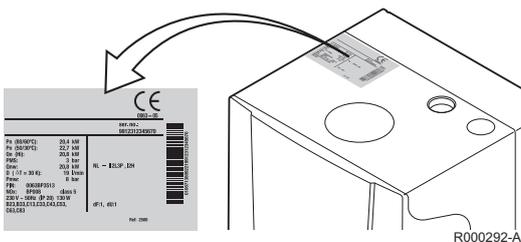


### WARNING

Installation of the appliance must be done by a qualified engineer in accordance with prevailing local and national regulations.

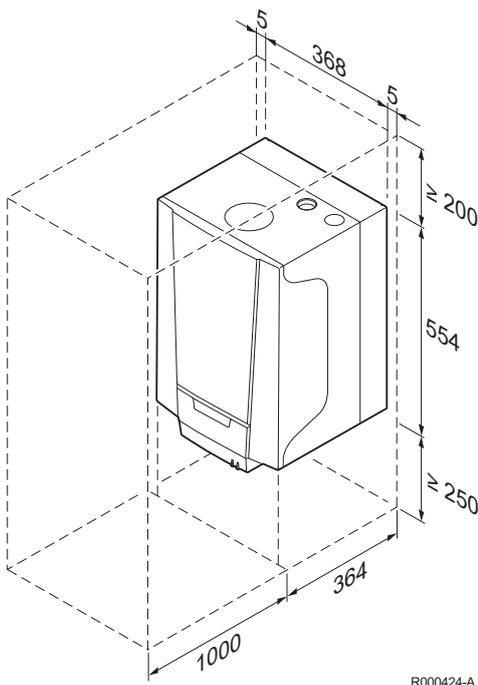
## 4.2 Choice of the location

### 4.2.1. Data plate



The identification plate on top of the boiler features the boiler serial number and important boiler specifications, for example the model and unit category. The dF and dU codes are also stated on the type plate.

### 4.2.2. Location of the boiler



- ▶ Before mounting the boiler, decide on the ideal position for mounting, bearing the Directives and the dimensions of the appliance in mind.
- ▶ When choosing the position for mounting the boiler, bear in mind the authorised position of the combustion gas discharge outlets and the air intake opening.
- ▶ Make sure there is enough room underneath the boiler for the connection box.
- ▶ To ensure adequate accessibility to the appliance and facilitate maintenance, leave enough space around the boiler.
- ▶ Mount the boiler onto a flat surface.

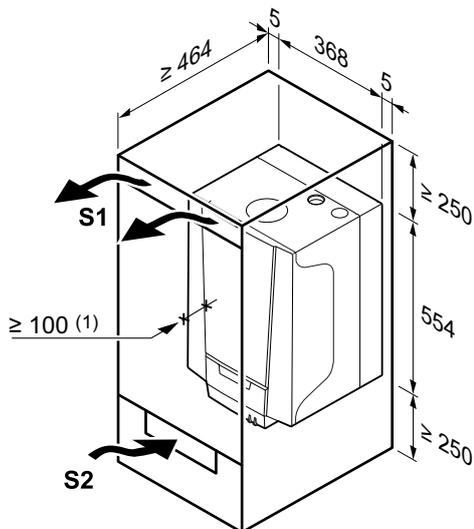
**WARNING**

- ▶ Fix the appliance to a solid wall capable of bearing the weight of the appliance when full of water and fully equipped.
- ▶ Do not place the appliance above a heat source or a cooking appliance.
- ▶ Do not locate the boiler in direct or indirect sunlight.
- ▶ It is forbidden to store inflammable products and materials in the boiler room or close to the boiler, even temporarily.

**CAUTION**

- ▶ The boiler must be installed in a frost-free environment.
- ▶ An earthed electrical connection must be available close to the boiler.
- ▶ A connection to the mains drainage system for the discharge of condensate must be available close to the boiler.

### 4.2.3. Ventilation



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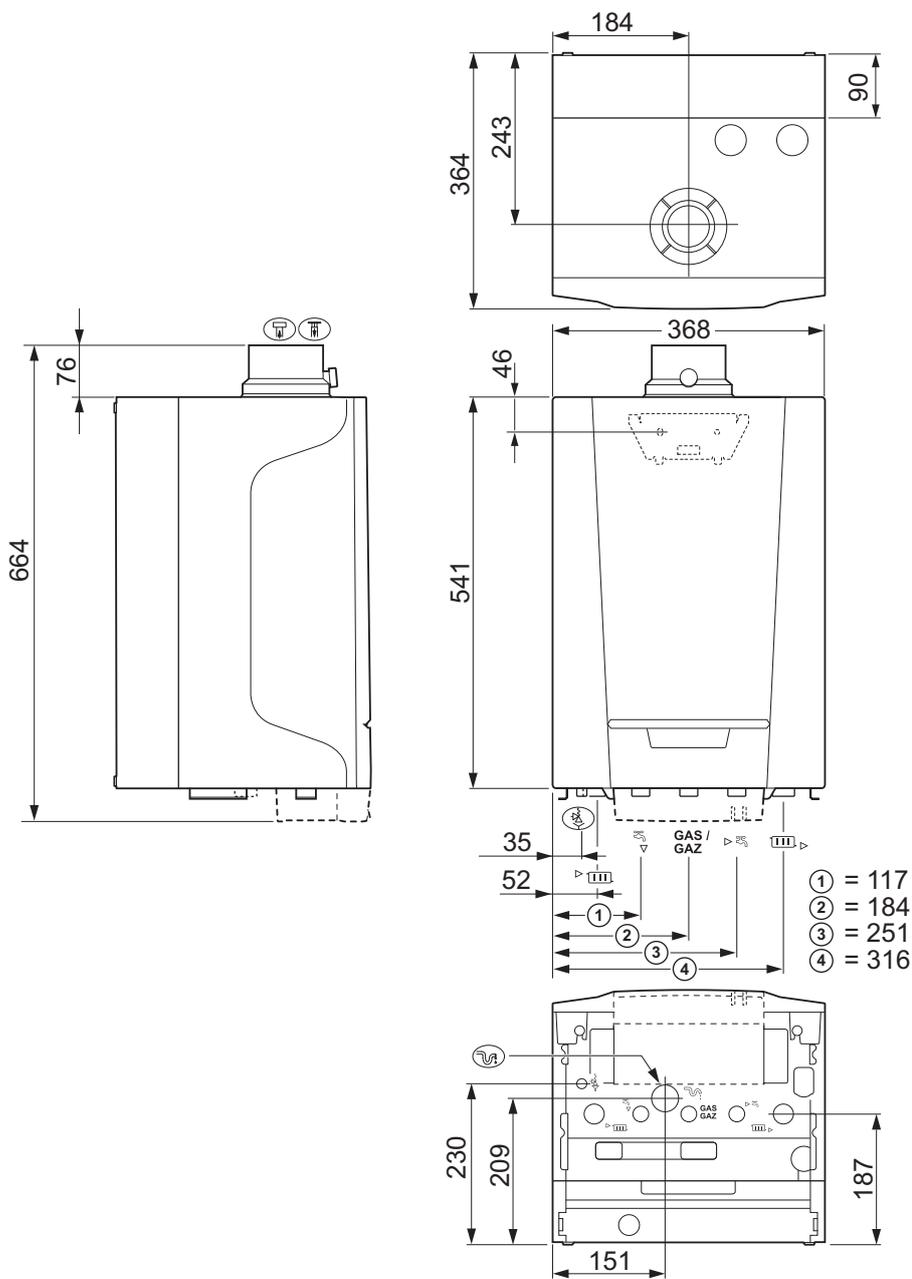
- (1) Distance between the front of the boiler and the internal wall of the casing box.

If the boiler is installed in a closed casing, respect the minimum dimensions given in the diagram opposite. Also allow openings to obviate the following hazards:

- ▶ Accumulation of gas
- ▶ Heating of the box

Minimum cross section of the openings: **S1 + S2 = 150 cm<sup>2</sup>**

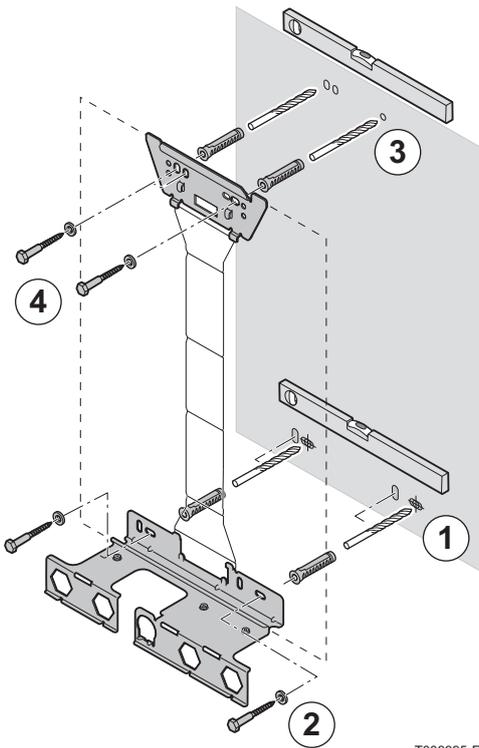
### 4.3 Main dimensions



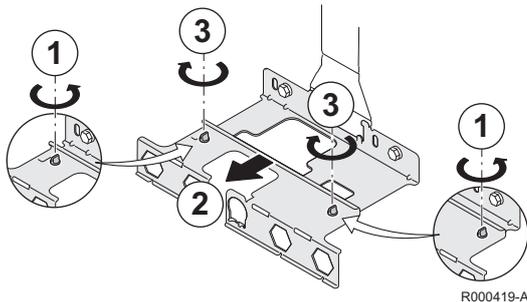
R000354-A

- Connection of the combustion gas exhaust pipe; Ø 60 mm
- Connection of the air intake pipe; Ø 100 mm
- Safety valve outlet pipe; Ø 15 mm
- Condensates discharge; Ø 25 mm
- Heating circuit flow; G<sup>3</sup>/<sub>4</sub>"
- Domestic hot water outlet; G<sup>1</sup>/<sub>2</sub>"
- Gas / Gaz** Gas connection; G<sup>1</sup>/<sub>2</sub>"
- Domestic cold water inlet; G<sup>1</sup>/<sub>2</sub>"
- Heating circuit return; G<sup>3</sup>/<sub>4</sub>"

## 4.4 Installing the mounting frame



T003395-F



R000419-A

1. Drill 2 holes with  $\varnothing$  10 mm for the lower part of the mounting frame. Put the plugs in place.



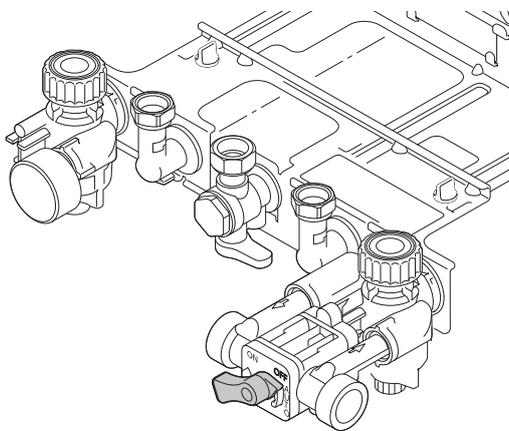
### CAUTION

Make sure that all the drill holes are level.

2. Affix the lower part of the mounting frame to the wall using 2 of the screws supplied.
3. Open out the mounting frame and mark out the 2 drill holes for the upper part of the mounting frame on the wall. Drill 2 holes with a  $\varnothing$  of 10 mm. Put the plugs in place.
4. Affix the upper part of the mounting frame to the wall using 2 of the screws supplied.

5. Extend the mounting frame to its maximum depth to install a boiler with a built-in expansion vessel. To do so, remove the plastic screws from the lower bracket, and once it has been extended, replace the screws to fix the mounting frame.

## 4.5 Positioning the boiler



T002375-D

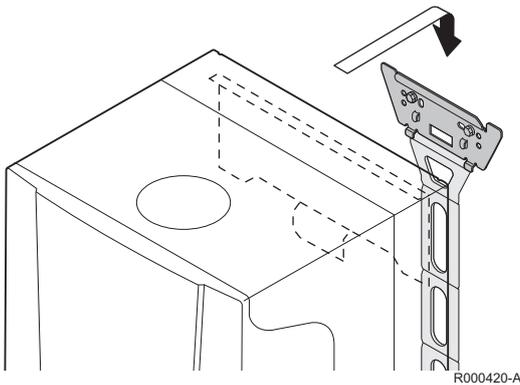
1. Remove the protective caps from all of the hydraulic inlets and outlets on the boiler.



### CAUTION

The cock from the filling loop must be closed.

2. Fit a fibre gasket to each joint on the valve plate.



3. Position the boiler above the plumbing fixtures plate and locate it against the mounting frame. Gently lower the boiler. Mount the boiler using the suspension bracket on the back of the boiler.
4. Tighten the valve nuts on the boiler.

## 4.6 Hydraulic connections

### 4.6.1. Flushing the system

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

#### Installing the boiler in new installations (installations less than 6 months old)

- ▶ Clean the installation with a universal cleaner to eliminate debris from the appliance (copper, hemp, flux).
- ▶ Thoroughly flush the installation until the water runs clear and shows no impurities.

#### Installing the boiler in existing installations

- ▶ Remove sludge from the installation.
- ▶ Flush the installation.
- ▶ Clean the installation with a universal cleaner to eliminate debris from the appliance (copper, hemp, flux).
- ▶ Thoroughly flush the installation until the water runs clear and shows no impurities.

### 4.6.2. Water flow rate

The boiler's modulating control system limits the maximum difference in temperature between the heating flow and return and the maximum speed at which the flow temperature increases. In this way, the boiler does not require a minimum water flow rate.



If using a heating and domestic hot water production type boiler on an installation in which the flow can be fully disconnected from the return (e.g. by using thermostatic valves), you should either fit a bypass or fit an expansion vessel to the heating flow conduit.

### 4.6.3. Connection of the heating circuit

1. Connect the heating water return pipe to the heating return connection .
2. Connect the heating water outlet pipe to the heating flow connection .



#### CAUTION

- ▶ The heating pipe must be mounted in accordance with prevailing provisions.
- ▶ Carry out any welding work required at a safe distance from the boiler or before the boiler is fitted.
- ▶ Install a drain under the safety valve leading to the sewage system .

### 4.6.4. Connection of the water circuit for domestic use

1. Connect the cold water inlet pipe to the domestic cold water connection .
2. Connect the domestic hot water outlet pipe to the domestic hot water connection .



#### CAUTION

- ▶ The domestic water pipes must be connected in accordance with prevailing provisions.
- ▶ Carry out any welding work required at a safe distance from the boiler or before the boiler is fitted.
- ▶ If using synthetic pipes, follow the manufacturer's (connection) instructions.

### 4.6.5. Connecting the expansion vessel

The boiler is fitted as standard with an 8-litre expansion vessel.

If the water volume is greater than 100 litres or the static height of the system exceeds 5 metres, an additional expansion vessel must be fitted. Refer to the table below to determine the expansion vessel required for the installation.

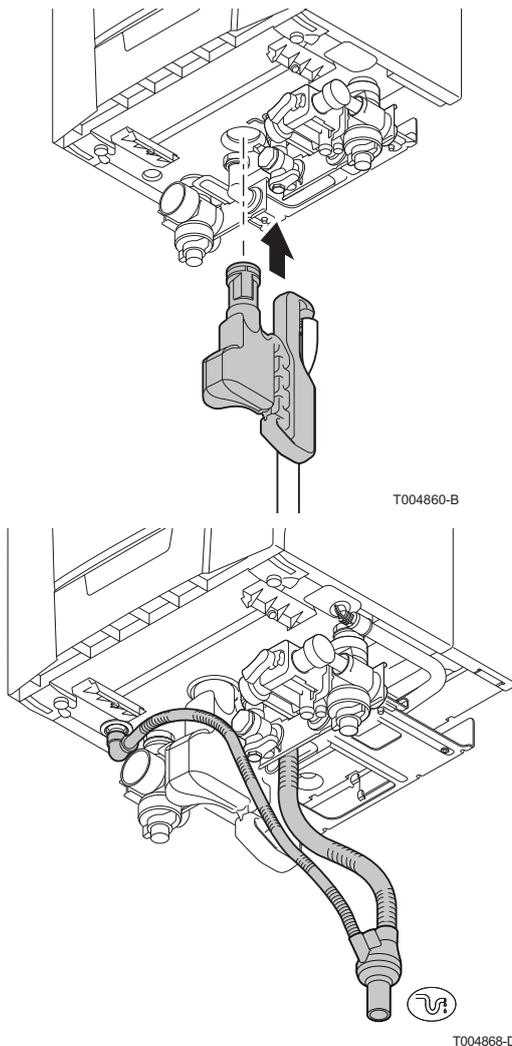
#### Conditions of validity of the table:

- ▶ 3-bar safety valve
- ▶ Average water temperature: 70 °C  
Supply temperature: 80 °C  
Return temperature: 60 °C
- ▶ The filling pressure in the system is lower than or equal to the initial pressure in the expansion vessel

Initial pressure of the expansion vessel	Volume of the expansion vessel depending on the volume of the installation (in litres)							
	100	125	150	175	200	250	300	> 300
0.5 bar	4,8	6,0	7,2	8,4	9,6	12,0	14,4	Volume of the installation x 0,048
1 bar	8,0 <sup>(1)</sup>	10,0	12,0	14,0	16,0	20,0	24,0	Volume of the installation x 0,080
1.5 bar	13,3	16,6	20,0	23,3	26,6	33,3	39,9	Volume of the installation x 0,133

(1) Factory configuration

#### 4.6.6. Connecting the condensate discharge pipe



The syphon is supplied separately as standard with the boiler (Includes flexible plastic drain hose). Fit these parts underneath the boiler. To do this, proceed as follows:

1. Fill the syphon with water up to the mark.



#### CAUTION

Fill the water syphon before starting the boiler to avoid combustion products escaping from the boiler.

2. Press the syphon firmly into the  opening provided for it underneath the boiler. The syphon must click into place.



#### CAUTION

Check whether the syphon is solidly fitted in the boiler.

3. Mount a standard drainage pipe, Ø 32 mm or more, leading to the mains drainage system.
4. Mount the flow collector.
5. Insert the hoses from the syphon drain  and safety valve .
6. Mount a trap or a siphon in the discharge pipe.



#### CAUTION

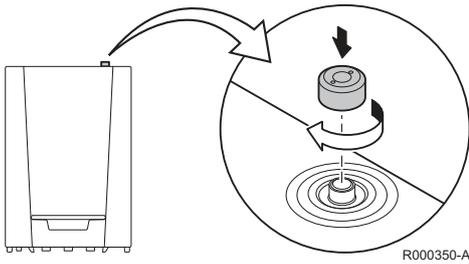
Do not make a fixed connection owing to maintenance work on the syphon.



- ▶ Do not plug the condensate discharge pipe. Make an open connection with the drain.
- ▶ Set the discharge pipe at a gradient of at least 30 mm per metre, maximum horizontal length 5 metres.
- ▶ Do not drain condensation water into a roof gutter at any time.
- ▶ Connect the condensate discharge pipe in accordance with prevailing standards.

### 4.6.7. Automatic air bleed

Check that the automatic bleed valve is open: This is visible on the right on top of the boiler. If necessary, the air vent can be closed off with the cap that can be found next to it.



## 4.7 Gas connection

1. Connect the gas inlet pipe **GAS / GAZ**.
2. Connect the gas pipe to the gas shut off valve.



The diameters of the pipes must be defined in accordance with the standards in force in your country.



#### WARNING

- ▶ Close the main gas valve before starting work on the gas pipes.
- ▶ Before mounting, check that the gas meter has sufficient capacity. To do this, you should keep in mind the consumption of all domestic appliances.
- ▶ If the gas meter has too low a capacity, inform the energy supply company.

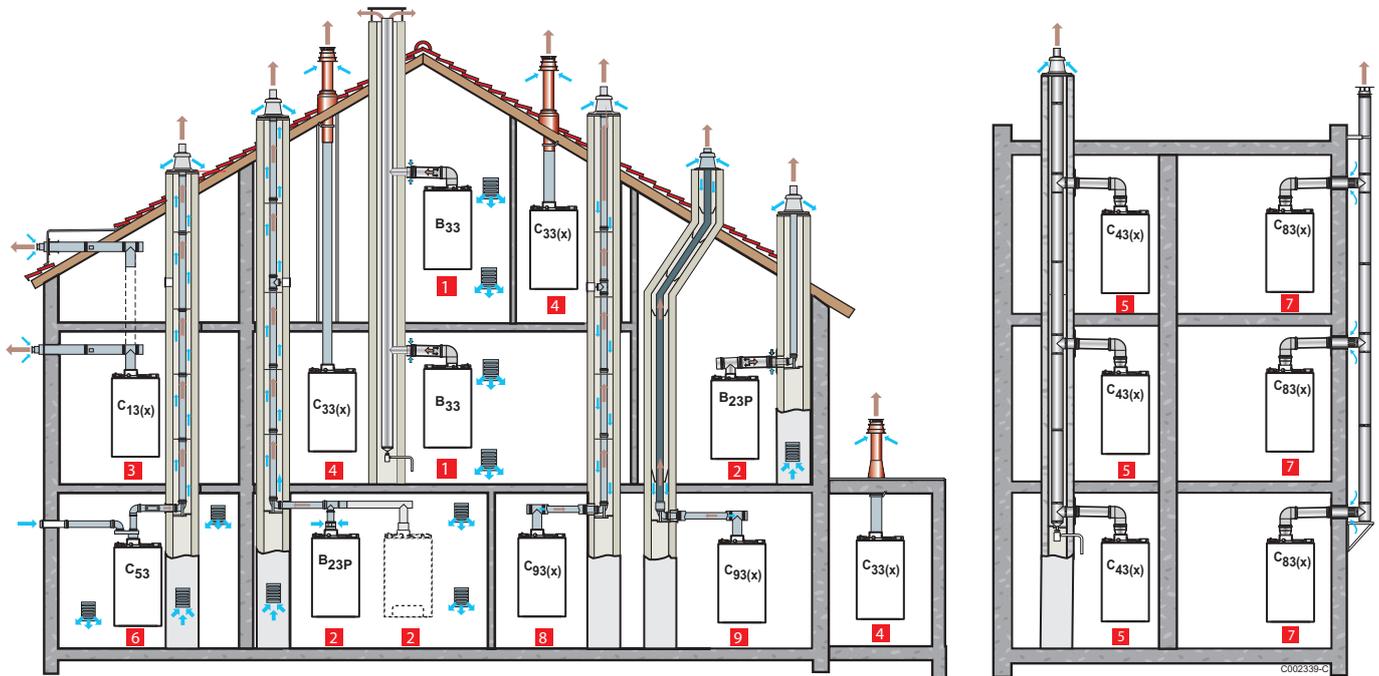


#### CAUTION

- ▶ Connect the gas pipe in accordance with prevailing standards and regulations.
- ▶ Carry out any welding work required at a safe distance from the boiler or before the boiler is fitted.
- ▶ Ensure that there is no dust in the gas pipe. Blow into the pipe or shake it before mounting.
- ▶ We recommend installing a gas filter on the gas pipe to prevent clogging of the gas valve unit.

## 4.8 Flue gas system connections

### 4.8.1. Classification



- 1 Configuration B<sub>33</sub>**  
 Connection to a collective pipe via a concentric pipe (combustive air taken from the boiler room)  
 All of the pressurised parts of the appliance are surrounded by air.
- 2 Configuration B<sub>23</sub> - B<sub>23P</sub>**  
 Connection to a chimney using a connection kit (combustive air taken from the boiler room)
- 3 Configuration C<sub>13(x)</sub>**  
 Air/flue gas connection by means of concentric pipes to a horizontal terminal (so-called forced flue)
- 4 Configuration C<sub>33(x)</sub>**  
 Air/flue gas connection by means of concentric pipes to a vertical terminal (roof outlet)
- 5 Configuration C<sub>43(x)</sub>**  
 Air/flue gas connection to a collective conduit for watertight boilers (3CE P system)
- 6 Configuration C<sub>53</sub>**  
 Air and flue gas connection separated by means of a bi-flow adapter and single pipes (combustive air taken from outside)
- 7 Configuration C<sub>83(x)</sub>**  
 Flue gas connection to a collective conduit for sealed boilers. The air supply is individual via a terminal coming from outside the building.

- 8 Configuration C<sub>93(x)</sub>**  
Air/flue gas connection by concentric pipes in the boiler room and single pipes in the chimney (combustive air in counter current in the chimney)
- 9 Configuration C<sub>93(x)</sub>**  
Air/flue gas connection by concentric pipes in the boiler room and single flex in the chimney (combustive air in counter current in the chimney)



**WARNING**

- ▶ Only factory components are authorised for connecting the boiler and the terminal.
- ▶ The clear section must comply with the standard.
- ▶ The chimney must be swept before the installation of the evacuation conduit.

### 4.8.2. Lengths of the air/flue gas pipes

**i** For configurations B23 and C93, the lengths given in the table are valid for horizontal conduits with a maximum length of 1 metre. For each additional metre of horizontal conduit, subtract 1.2 m from the vertical length L<sub>max</sub>

Type of air/flue gas connection			Diameter	Maximum length in metres			
				EMC-M			
				24	24/28 MI	30/35 MI	34/39 MI
C <sub>13</sub>	Concentric pipes connected to a horizontal terminal	Alu or PPS	60/100 mm	7,0	7,0	3,0	3,0
			80/125 mm	21,5	25,5	11,5	9,5
C <sub>33</sub>	Concentric pipes connected to a vertical terminal	Alu or PPS	60/100 mm	2,5	3,0	-	-
			80/125 mm	19,5	24,0	13,5	11,5
C <sub>93</sub>	Concentric pipes in the boiler room Single conduits in the chimney (combustive air in counter-current)	Alu or PPS	80/125 mm	18,0	23,0	19,0	17,0
			80 mm (Rigid duct)				
	Concentric pipes in the boiler room Flexible single conduit in the chimney	PPS	60/100 mm	19,0	21,0	6,5	4,5
			80 mm (Flexible duct)				
C <sub>53</sub>	Bi-flow adapter and separate single air/flue gas ducts (combustive air taken from outside)	Alu	60/100 mm	40,0	40,0	21,5	18,0
			2 x 80 mm				
B <sub>23</sub>	Chimney (rigid or flexible duct in chimney, combustive air taken from the premises)	PPS	80 mm (Rigid duct)	40,0	40,0	21,0	17,0
			80 mm (Flexible duct)	31,0	32,0	13,0	10,0
C <sub>43</sub>	Collective conduit for sealed boiler (3 CEP) <sup>(1)</sup>	To determine the size of such a system, consult the supplier of the 3 CEP conduit.					

(1) The boiler's parameter settings will need to be changed.  For more detailed information, see chapter: "Changing the settings", page 45.

**WARNING**

Maximum length = lengths of the straight air/flue gas ducts  
+ equivalent lengths of other components

The max length in the flue gas pipe (configurations C<sub>93</sub>, B<sub>23P</sub>) of the elbow bracket at the outlet must not exceed:

- ▶ 30 m for rigid PPS
- ▶ 25 m for flexible PPS

If longer lengths are used, holding clamps must be added per sections of 25 or 30 metres.

For the list of flue gas system accessories and the equivalent lengths, refer to the current price list.

### 4.8.3. Additional Directives

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- ▶ Please refer to the manufacturer's instructions for the material in question when installing the flue gas discharge and air supply materials. If the flue gas discharge and air supply materials are not installed according to the instructions (e.g. they are not leakproof, not clamped in place etc.), this may cause hazardous situations and/or result in bodily injury. After assembly, check at least all flue gas and air-carrying parts for tightness.
- ▶ Connection of the combustion gas exhaust directly to the buildings brick chimneys or flues is forbidden for condensation reasons.
- ▶ Always clean the ducts thoroughly in cases where lining pipes are used and/or a connection of the air-supply.
- ▶ It must be possible to inspect the flue or chimney.
- ▶ In cases where condensate coming from the stainless steel or plastic sections of the flue gas pipe can be driven back towards the aluminium section, this condensate must be removed using a collecting device before the aluminium section is reached.
- ▶ For long, aluminium, combustion-gas exhaust pipes it is initially necessary to consider the relatively high quantity of corrosive products which are brought together with the condensate from the exhaust pipe. The siphon on the equipment requires regular cleaning or, preferably, an additional condensate collector can be installed above the equipment.
- ▶ The combusted gas discharge pipe must be sufficiently inclined towards the boiler (at least 50 mm per metre) and an adequate condensate collection tank and discharge system constructed (at least 1 m before the boiler opening). The elbows fitted must be at more than 90° to guarantee the provision of an adequate gradient and tightness on the lip rings.



Please contact us for further information.

## 4.9 Electrical connections

### 4.9.1. Control unit

The boiler is not line- and neutral sensitive. The control unit is fully integrated with the fan, venturi and gas block. The boiler is fully pre-wired. The PCB has a connection to the connection box with instrument panel, via the **HMI** connector. The PCB has a **RS232** connection for a PC/laptop via the **RS232** connector. The main characteristics of the control unit are described in the table below.

Power supply voltage	230 VAC/50Hz
Fuse rating F1 (230 VAC)	1,6 AT

The boiler is fitted with a 3-wire power supply cable (cable length 1,5 m) suitable for a 230VAC/50Hz power supply with phase/neutral/earth system. The power supply cable is connected to the **MAINS** connector. A spare fuse can be found in the housing of the control system.



#### WARNING

Use an isolating transformer for connection values other than those stated above.



#### CAUTION

- ▶ When the power supply cable has to be replaced, it must be ordered from **DeDietrich**. The power supply cable should only be replaced by **DeDietrich**, or by an installer certified by **DeDietrich**.
- ▶ The switch must be easily accessible

### 4.9.2. Recommendations



#### WARNING

- ▶ Only qualified professionals may carry out electrical connections, always with the power off.
- ▶ The boiler is entirely pre-wired. Do not modify the connections inside the control panel.
- ▶ Earth the appliance before making any electrical connections.

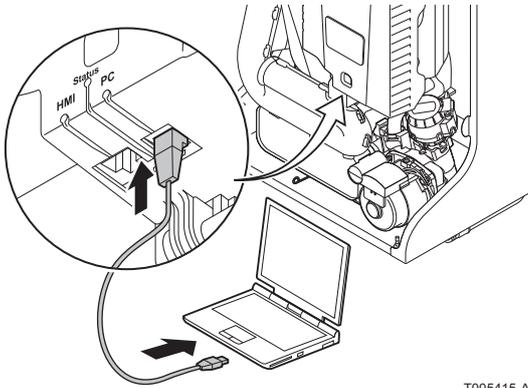
Make the electrical connections of the boiler according to:

- ▶ The instructions of the prevailing standards.
- ▶ The instructions on the electrical diagrams provided with the boiler.
- ▶ The recommendations in the instructions.

**CAUTION**

- ▶ Separate the sensor cables from the 230 V cables.
- ▶ Outside the boiler: Use 2 pipes or cable guides at least 10 cm apart.

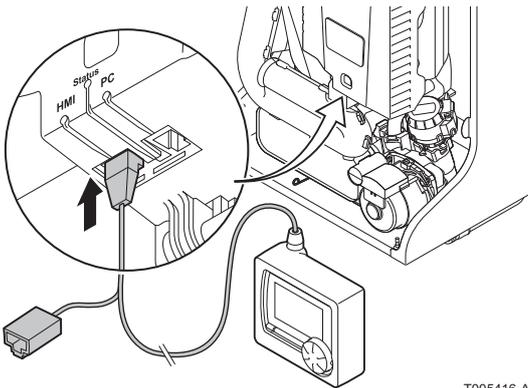
### 4.9.3. PC/Laptop connection



T005415-A

The PCB for the automatic control unit has a **RS232** connection for a PC/laptop via the **RS232** connector (This connection is therefore not in the connection box). Using the **Recom** service software, you can enter, change and read out various boiler settings.

### 4.9.4. Connecting service tool



T005416-A

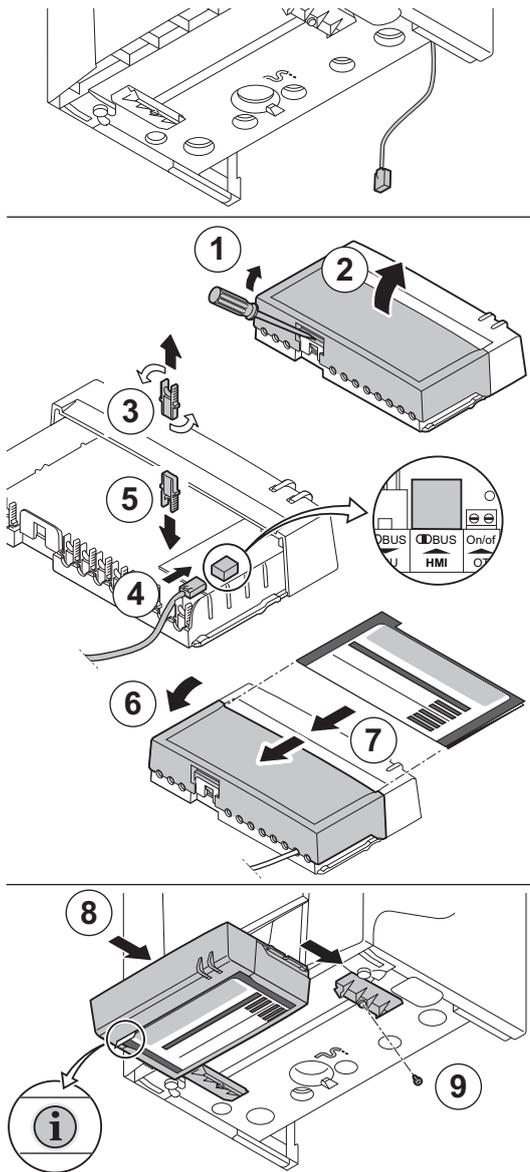
The PCB for the automatic control unit has a **HMI** connection. This connection is used to connect the control panel for the boiler. Connector **HMI** is also used to connect the service tool (Accessory). Herewith various settings can be imported, changed and exported. For example:

- ▶ Temperature display.
- ▶ Number of operating hours.
- ▶ State boiler.
- ▶ Parameter settings.



For the installation or mounting of any accessories, refer to the mounting instructions delivered with the accessories in question.

### 4.9.5. Access to the connector block



R000411-B

The connection box with instrument panel is supplied separately as standard with this unit. The connection box must be connected to the automatic control unit using the cable supplied. To do this, proceed as follows:

**i** The cable with the plug from the automatic control unit exits underneath the boiler.

1. Carefully open the latch on the rear of the connection box using a screwdriver.
2. Open the cover of the connection box.
3. Disconnect a pull relief clip. Turn the pull relief clip round.
4. Insert the plug from the cable into the **HMI** plug on the PCB for the connection box.
5. Press the pull relief clip firmly into place.
6. Now connect the required external controllers to the remaining connectors. To do this, proceed as follows:
  - Disconnect a pull relief clip.
  - Turn the pull relief clip round.
  - Place the cable underneath the pull relief clip.
  - Press the pull relief clip firmly into place.
  - Connect the connection box and check that the box is sealed properly.
7. Slide the User instruction card supplied into the guides underneath the connection box.
8. Slide the connection box into the guides underneath the boiler once all the connections have been made.
9. Secure the connection box using the screw found in the guides.

**i** The connection box can also be attached to the wall using the screw holes on the back of the connection box. The connection box should be screwed to the wall using the point indicated inside it.

The connection options for the PCB are explained in the following paragraphs.

### 4.9.6. Connection options

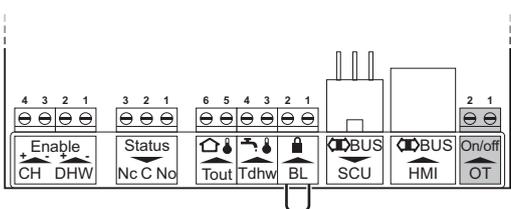
Various thermostats and controllers can be connected to the control PCB:

#### ■ Connecting modulating controller

The boiler is fitted with a **OpenTherm** connection as standard.

As a result, modulating **OpenTherm** controllers can be connected without further modifications. The boiler is also suitable for **OpenTherm Smart Power**.

- ▶ In the case of a room temperature controller or a controller with room temperature compensation, fit the controller in a reference area (generally the living room).



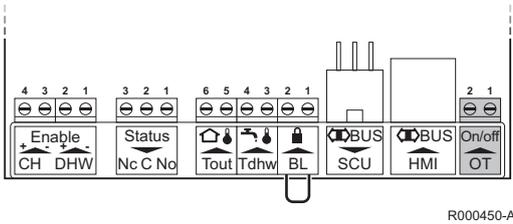
R000450-A

- ▶ Connect the two-wire cable to terminals **On/off-OT** of the connector.
- ▶ The boiler can also be put into operation without a controller. To do so, connect the bridge (supplied) to the terminals **On/off-OT** of the connector.

■ **Connect on/off thermostat**

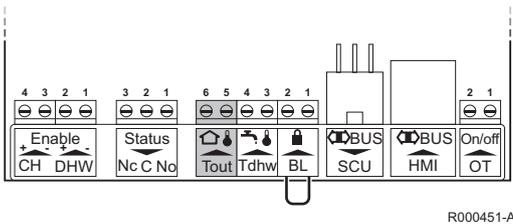
The boiler is suitable for connecting a 2 wire on/off room thermostat or weather compensator.

- ▶ In the case of a room temperature controller or a controller with room temperature compensation, fit the controller in a reference area (generally the living room).
- ▶ Connect the 2 wire room thermostat to the **On/off-OT** terminals of the connector.
- ▶ The boiler can also be put into operation without a controller. To do so, connect the bridge (supplied) to the terminals **On/off-OT** of the connector.



■ **Connecting the outside temperature 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.
- ▶ The boiler can also be put into operation without a controller. To do so, connect the bridge (supplied) to the terminals **On/off-OT** of the connector. In this case the boiler will control the temperature with the set point from the internal heating curve.



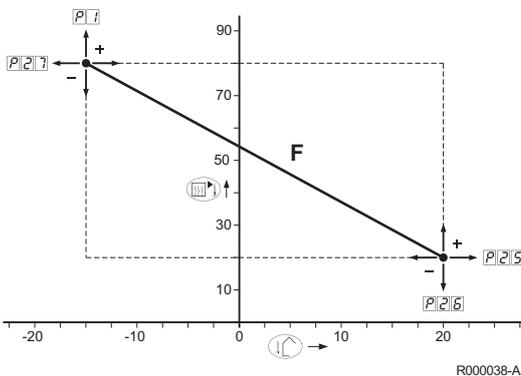
**CAUTION**

Check whether the outside sensor is suitable for this boiler. A suitable outside sensor can be obtained as an accessory.

**i** A OpenTherm controller can also use this outside sensor. The heating curve required must then be set on the controller.

**Heating curve setting**

If an outside temperature sensor is connected, it is possible to adapt the heating curve. The setting can be modified using parameters **P1**, **P25**, **P26** and **P27**.



### ■ Connect frost protection

#### Frost protection in combination with on/off thermostat

If an on/off thermostat is used, it is advisable to protect any rooms where there is risk of frost by using a frost thermostat. The radiator valve in a room where there is a risk of frost must, however, be open.

- ▶ In rooms where there is a risk of frost, a frost thermostat (**Tv**) should preferably be installed.
- ▶ Connect the frost thermostat in parallel with an on/off room thermostat (**Tk**) to the **On/off-OT** terminals of the connector.

**i** When using a **OpenTherm** thermostat, a frost thermostat cannot be connected in parallel to the **On/off - OT** terminals. Implement frost protection for the central heating system in combination with an external sensor.

#### Frost protection in combination with an outside sensor

The central heating system can also be protected against frost in combination with an outside sensor. The radiator valve in a room where there is a risk of frost must, however, be open. Connect the outside sensor to the **Tout** terminals of the connector. The frost protection functions as follows where an outside sensor is used:

- ▶ At an outside temperature lower than -10°C (can be set with parameter **P30**): the circulation pump switches on.
- ▶ At an outside temperature higher than -10°C (can be set with parameter **P30**): the circulation pump continues to run and then switches off.

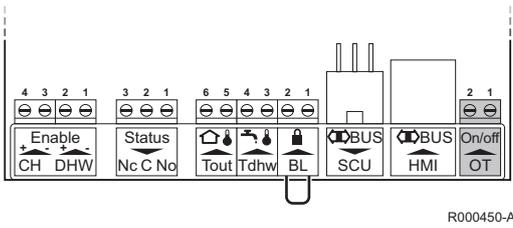
### ■ Connecting the calorifier sensor/thermostat

Connect the calorifier sensor or thermostat to the **Tdhw** terminals of the connector.

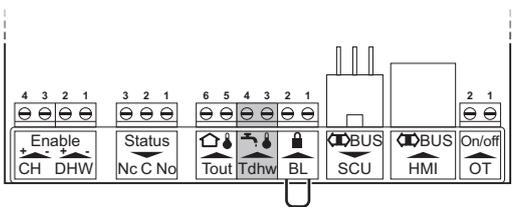
### ■ Operation signal and failure signal (Status)

The alarm or operation signal is selected using parameter **P40**.

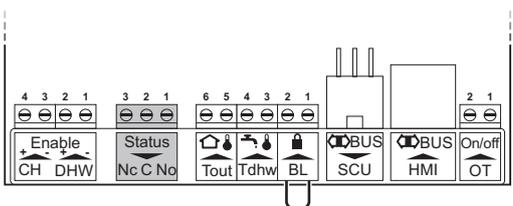
- ▶ If the boiler is operating, the operation signal can be switched via a potential-free contact (maximum 230 VAC, 1 A) on the **No** and **C** terminals of the connector.
- ▶ If the boiler locks out, the alarm can be transmitted via a potential-free contact (maximum 230 VAC, 1 A) on the **Nc** and **C** terminals of the connector.
- ▶ The external 3-way valve (230 VAC, 1 A) can be used when connecting an indirectly heated calorifier via a volt-free contact. The neutral position of the three-way valve can be set using parameter **P34**. The three-way valve is connected as follows:
  - **Nc** = Central heating



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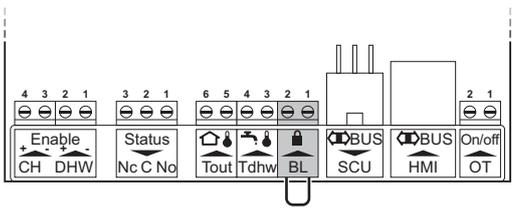
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R000453-A

- **No** = Domestic hot water
- **C** = Phase on

### ■ Shutdown input



R000455-A

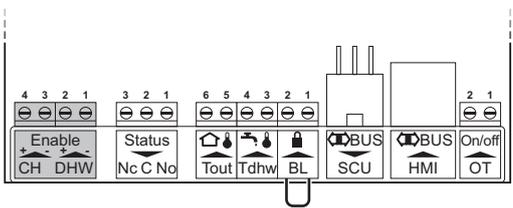
An external gas pressure switch, for example, or a safety thermostat for an underfloor heating unit can be connected to the **BL** connector. This connection replaces the connection to the **BL** connector.



### CAUTION

The connection must be potential-free.

### ■ Connect on/off contact (Enable)



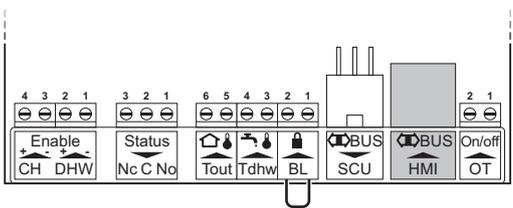
R000454-A

A 10-230 V signal can be connected to the **CH** and **DHW** connectors to switch the production of heating water or sanitary warm water on or off.



The production of heating water or domestic hot water is switched on as standard. The automatic control unit will only respond to the switch and control the heating/ domestic hot water function once a 10-230 V signal has been connected to the connectors.

### ■ Connecting control panel



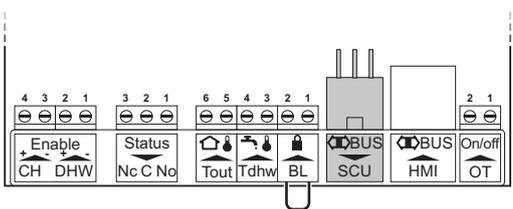
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The control panel for the boiler is connected to connector **BUS HMI**.



See chapter: "Access to the connector block", page 29

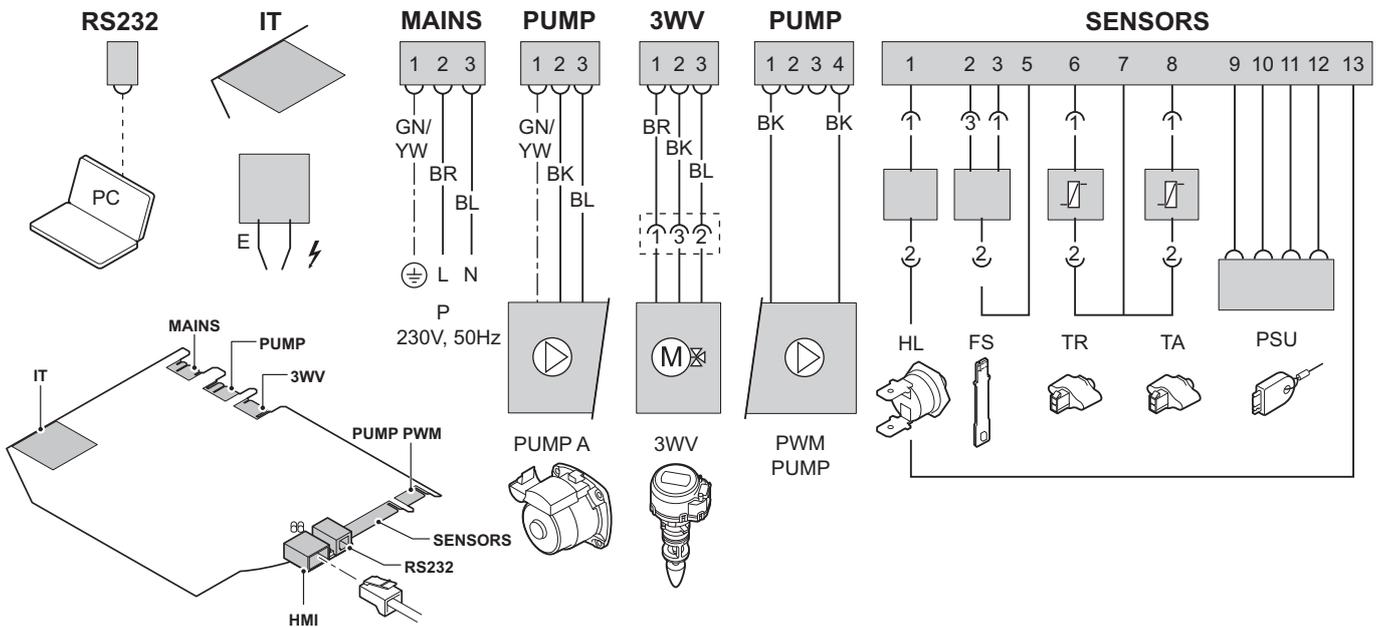
### ■ Connections for optional control PCBs



R000449-A

Connector **BUS SCU** is used to communicate with optional control PCBs. These control PCBs are used for a range of accessories. For the installation or mounting of any accessories, refer to the mounting instructions delivered with the accessories in question.

### 4.10 Electrical diagram



R000291-A

<b>RS232</b>	Connecting a computer	<b>PUMP A</b>	Shunt pump	<b>TR</b>	Return sensor
<b>IT</b>	Ignition transformer	<b>3WV</b>	3-way valve	<b>TA</b>	Flow sensor
<b>E</b>	Ignition/ionization electrode	<b>HL</b>	Safety thermostat	<b>PSU</b>	Storage parameter
<b>P</b>	Power supply	<b>FS</b>	Flow switch	<b>HMI</b>	Connection box

### 4.11 Filling the system

#### 4.11.1. Water treatment

In most cases, the boiler and the central heating installation can be filled with normal tap water and no water treatment will be necessary.



#### WARNING

Do not add chemical products to the central heating water without first consulting a water treatment professional. For example: antifreeze, water softeners, products to increase or reduce the pH value, chemical additives and/or inhibitors. These may cause faults in the boiler and damage the heat exchanger.



Rinse the central heating installation with at least 3x the volume of the central heating installation. Flush the DHW pipes with at least 20 times the volume of the pipes.

For an optimum functioning of the boiler, the water of the installation must comply with following characteristics:

		Total installed heat output (kW)			
		≤ 70	70 - 200	200 - 550	> 550
Degree of acidity (water non-treated)	pH	7 - 9	7 - 9	7 - 9	7 - 9
Degree of acidity (water treated)	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 <sup>(1)</sup>	°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 and for above 200 kW a maximum total water hardness of 2,8 °dH (0,5 mmol/l, 5 °f) applies



If a water treatment is necessary, **De Dietrich Thermique** recommends the following manufacturers:

- ▶ Cillit
- ▶ Climalife
- ▶ Fernox
- ▶ Permo
- ▶ Sentinel

#### 4.11.2. Filling the syphon

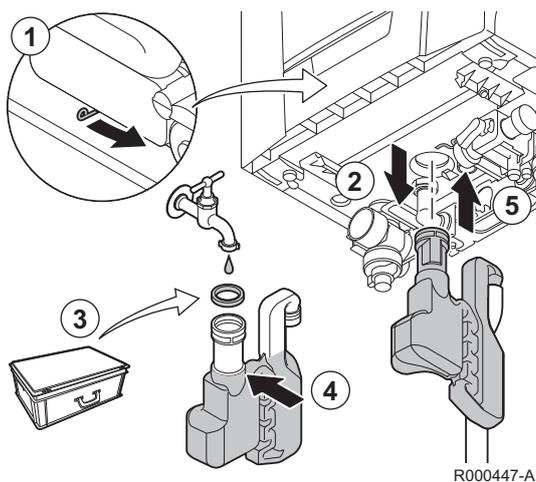
Check whether the syphon is filled up to the mark. If the syphon has to be topped up, proceed as follows:



#### CAUTION

First remove the front housing of the boiler so that you can disconnect the syphon.

👉 See paragraph: "Open the boiler", page 50



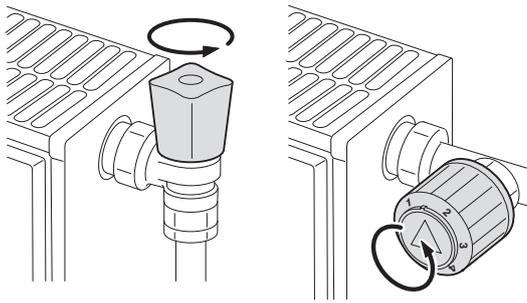
1. Move the lever underneath the hydroblock to the right to disconnect the syphon.
2. Remove the syphon and clean it.
3. Replace the seal ring for the syphon.
4. Fill the syphon with water up to the mark.
5. Press the syphon firmly into the  opening provided for it underneath the boiler. The syphon must click into place.



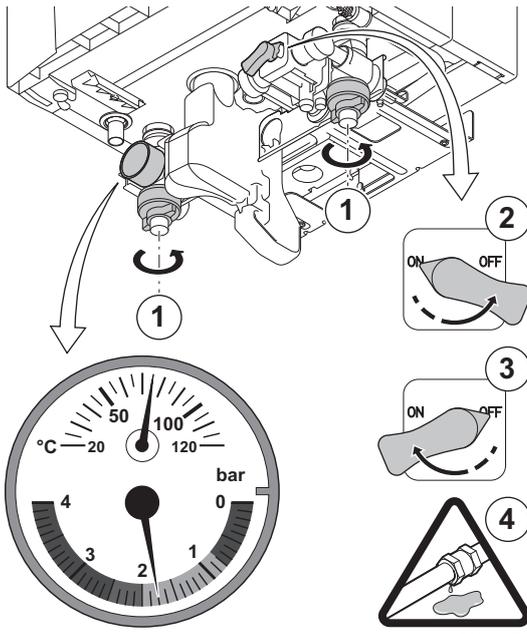
#### CAUTION

- ▶ Fill the water syphon before starting the boiler to avoid combustion products escaping from the boiler.
- ▶ Check whether the syphon is solidly fitted in the boiler.

### 4.11.3. Filling the system



T000181-B



R000441-B



**CAUTION**

- ▶ Before filling, open the valves on every radiator in the installation.
- ▶ Ensure that the boiler is switched off.

1. Open the central heating shut-off valves underneath the boiler.
2. Open the cock from the filling loop (During filling, air can escape from the system via the automatic air vent).
3. Turn off the tap on the filling loop if the pressure gauge indicates a pressure between 1,5 and 2 bar.
4. Check the tightness of the water connections.
5. Turn the boiler on.



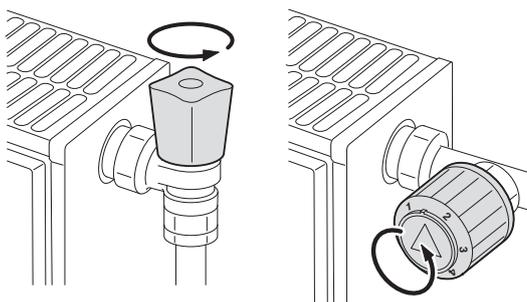
After the power is switched on, the boiler always runs through an automatic venting programme lasting approx. 4 minutes (During filling, air can escape from the system via the automatic air vent). If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1,5 and 2 bar).



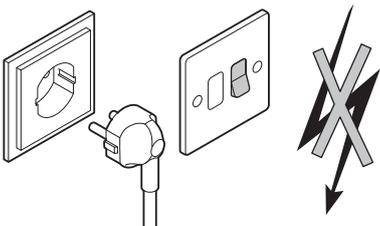
**CAUTION**

When venting, ensure that no water enters or makes contact with the casing and electrical parts of the boiler.

### 4.11.4. Venting the system



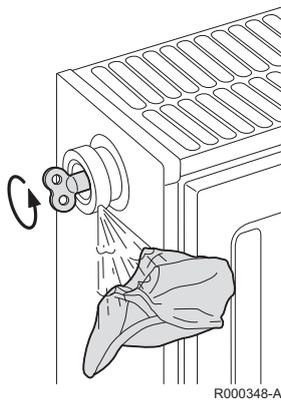
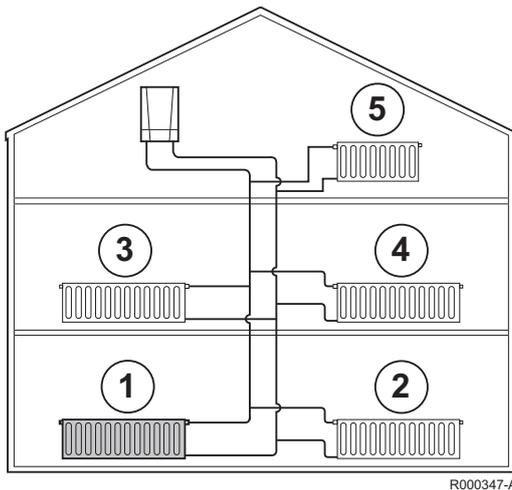
T000181-B



T000155-A

It is essential that you bleed any air in the calorifier, the conduits or the taps to prevent the annoying noises likely to be produced during heating or when tapping water. To do this, proceed as follows:

1. Open the valves on all radiators connected to the heating system.
2. Set the room thermostat as high as possible.
3. Wait until the radiators are hot.
4. Ensure that the boiler is switched off.
5. Wait around 10 minutes until the radiators are cold.



6. Bleed the radiators. Start with the lower floors.

7. Open the bleed connection using the bleed key provided whilst keeping a rag pressed against the bleed connection.



### CAUTION

The water may still be hot.

8. Wait until water comes out of the bleed valve and then close the bleed connection.
9. Turn the boiler on. A vent cycle of a duration of around 4 minutes is carried out automatically.
10. After venting, check whether the pressure in the installation is still sufficient.



If the water pressure is lower than 0,8 bar, more water should be added. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1,5 and 2,0 bar).



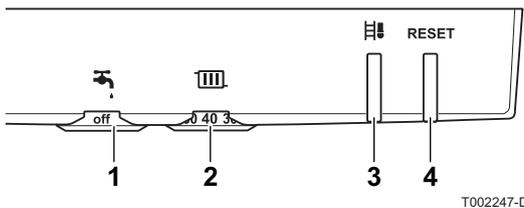
See chapter: "Filling the system", page 35

11. Set the room thermostat or the regulator.

# 5 Commissioning

## 5.1 Connection box

### 5.1.1. Control panel



- 1 Sanitary hot water temperature rotary knob
- 2 Heating water temperature rotary knob
- 3 Sweep key and Status signals
- 4 **RESET**-button and on/off signal

The instrument panel for the connection box has 2 push buttons with signals. The signals provide information about the operating condition of the boiler. The **RESET** button lights up green when the boiler is connected to the mains. The status signal for the button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler. See also: "User instruction card", page 76



**CAUTION**

The instruction card must be slid underneath the connection box after the boiler installation or use of the card.

The instrument panel for the connection box also has 2 rotary knobs. The rotary knob can be used to set the temperature of the sanitary warm water. The rotary knob can be used to set the maximum flow temperature of the heating water. The heating/ domestic hot water function can be switched off by turning the rotary knob to position **off**.



**CAUTION**

The temperature of domestic hot water and central heating water is limited by the maximum values set under parameters and .

See chapter: "Parameter descriptions", page 46

## 5.2 Check points before commissioning

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### 5.2.1. Preparing the boiler for commissioning

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**WARNING**

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

**Preparatory procedure for boiler commissioning:**

- ▶ Check that the gas type supplied matches the data shown on the boiler's data plate.
- ▶ Change the settings for the gas block if the gas type supplied and/or the inlet gas pressure do not correspond to the factory settings for the boiler.  
See chapter:  "Gas settings", page 40
- ▶ Check the hydraulic circuit.
- ▶ Check the water pressure in the heating system.
- ▶ Check the electrical connections to the thermostat and the other external controls.
- ▶ Check the other connections.
- ▶ Test the boiler at full load. Check the setting of the gas/air ratio and, if necessary, correct it.
- ▶ Test the boiler at part load. Check the setting of the gas/air ratio and, if necessary, correct it.
- ▶ Finalizing work.

### 5.2.2. Hydraulic circuit

---

- ▶ Use the pressure gauge to check the water pressure in the heating system. The hydraulic pressure must reach a minimum of 0,8 bar. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1,5 and 2 bar).
- ▶ Check the condensate discharge siphon; it must be filled with clean water up to the mark.
- ▶ Check that there are no leaks on the hydraulic connections.

### 5.2.3. Electrical connections

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- ▶ Check the electrical connections.

## 5.3 Commissioning the boiler



### WARNING

Initial commissioning must be done by a qualified professional.



### CAUTION

On first firing the boiler, a smell may be present for a short period.

1. Open the main gas supply.
2. Turn the boiler on.
3. Open the gas valve on the boiler.
4. Set the controls (thermostats, control system) so that they request heat.
5. The boiler will begin an automatic venting-programme (which lasts approx. 4 minutes) and will do this every time the power supply is isolated. Both push buttons on the instrument panel light up green during the venting cycle.
6. Check the boiler pump venting. Remove the middle screw if necessary before venting the pump (Central heating pump).
7. Check the gas connections into and out of the gas block in the boiler for tightness.

The current operating condition of the boiler is shown by the status signal on the instrument panel. The status signal for the **i** button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler.

See also:



"User instruction card", page 76



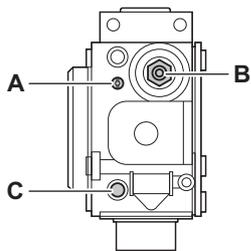
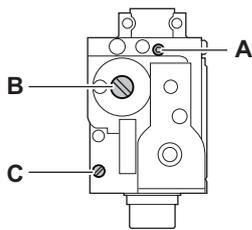
"Error codes", page 60

Error during the start-up procedure:

- ▶ Both buttons on the instrument panel are in the out position:
  - Check the mains supply voltage
  - Check the main fuses
  - Check the connection cable to the connection box.
  - Check the fuses on the control panel: (F1 = 1,6 AT 230VAC)
  - Check the connection between the mains lead and the **MAINS** connector for the automatic control unit.
- ▶ In the event of a fault, the status signal for the **i** button flashes red. Press the **RESET** button for 5 seconds to restart the boiler.

## 5.4 Gas settings

### 5.4.1. Gas circuit



T003759-C



#### WARNING

Ensure that the boiler is switched off.

1. Remove the front panel.  
 See paragraph: "Open the boiler", page 50
2. Check that the boiler is properly set for the type of gas used (See the identification plate on top of the boiler).



#### WARNING

 To ascertain the gas types permitted, see chapter: "Technical specifications", page 13

3. Open the main gas supply.
4. Open the gas valve on the boiler.
5. Check the gas supply pressure at the pressure outlet **C** on the gas valve unit. The pressure must be the same as the one shown on the rating plate.



The boiler is supplied with two types of gas blocks. See the diagram for the position of measuring point **C** for the inlet gas pressure.

6. Purge the gas supply pipe within the boiler by unscrewing the pressure outlet on the gas block. Tighten the measurement point when the pipe has been sufficiently purged.
7. Check the leak tightness of the gas pipe, including the gas block.

### 5.4.2. Adapting to another gas type

The boiler is preset in the factory to operate on natural gas H (G20).



If the boiler is converted, for example, to:

- ▶ G25 (Gas L)
- ▶ G31 (Propane)

It is necessary to mention on the sticker provided: This boiler has been set for.... This sticker must be affixed to the top of the boiler next to the identification plate.



#### WARNING

Only a qualified engineer may carry out the following operations.

For operation on another group of gases, carry out the following operations:

- ▶ Set the volume flow of the fan as indicated in the parameter table (if required). The setting can be modified using parameters **P17**, **P18**, **P19** and **P20**.
  - ☞ See chapter: "Parameter descriptions", page 46
- ▶ Set the air/gas ratio. For more detailed information:
  - ☞ See chapter: "Setting the air/gas ratio (Full load)", page 41
  - ☞ See chapter: "Setting the air/gas ratio (Part load)", page 42

### 5.4.3. Setting the air/gas ratio (Full load)

1. Unscrew the plug of the flue gas measurement point.
2. Connect the flue gas analyser.



#### WARNING

Ensure that the opening around the sensor is completely sealed when taking measurements.

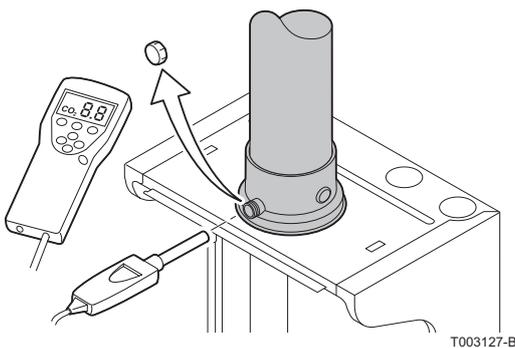
3. Set the boiler to full load:
 

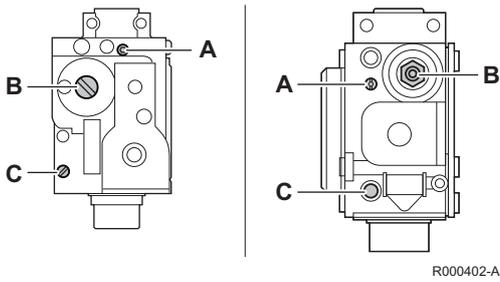
Continue pressing for around 3 seconds on the **i** key. The status signal for the **i** button is orange and always flashes green briefly; The low speed mode is parameterised.

Press the **i** button again 2 times. The status signal for the **i** button is orange and always goes off briefly 2 times; Full load is set.



The full load status can only be reached via the part load status.





4. Measure the percentage of O<sub>2</sub> or CO<sub>2</sub> in the flue gases (Front panel removed).

**i** The boiler is supplied with two types of gas blocks. See drawing for the position of control screw **A** for a full load.

5. If this rate does not match the required value, correct the gas/air ratio using the adjustment screw **A** on the gas valve unit:  
If the level is too high, turn the screw **A** clockwise to reduce the gas flow rate.  
If the level is too low, turn the screw **A** anti-clockwise to increase the gas flow rate.

O <sub>2</sub> / CO <sub>2</sub> control and setting values at full load for G20 (Gas H)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	4,3 ± 0,3	9,3 ± 0,1	4,3 ± 0,5	9,3 ± 0,3
EMC-M 24/28 MI	4,3 ± 0,3	9,3 ± 0,1	4,3 ± 0,5	9,3 ± 0,3
EMC-M 30/35 MI	4,3 ± 0,3	9,3 ± 0,1	4,3 ± 0,5	9,3 ± 0,3
EMC-M 34/39 MI	4,3 ± 0,3	9,3 ± 0,1	4,3 ± 0,5	9,3 ± 0,3

O <sub>2</sub> / CO <sub>2</sub> control and setting values at full load for G25 (Gas L)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	4,0 ± 0,3	9,3 ± 0,1	4,0 ± 0,5	9,3 ± 0,3
EMC-M 24/28 MI	4,0 ± 0,3	9,3 ± 0,1	4,0 ± 0,5	9,3 ± 0,3
EMC-M 30/35 MI	4,0 ± 0,3	9,3 ± 0,1	4,0 ± 0,5	9,3 ± 0,3
EMC-M 34/39 MI	4,0 ± 0,3	9,3 ± 0,1	4,0 ± 0,5	9,3 ± 0,3

O <sub>2</sub> / CO <sub>2</sub> control and setting values at full load for G31 (Propane)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	5,2 ± 0,3	10,3 ± 0,1	5,2 ± 0,5	10,3 ± 0,3
EMC-M 24/28 MI	5,2 ± 0,3	10,3 ± 0,1	5,2 ± 0,5	10,3 ± 0,3
EMC-M 30/35 MI	5,2 ± 0,3	10,3 ± 0,1	5,2 ± 0,5	10,3 ± 0,3
EMC-M 34/39 MI	5,2 ± 0,3	10,3 ± 0,1	5,2 ± 0,5	10,3 ± 0,3

#### 5.4.4. Setting the air/gas ratio (Part load)

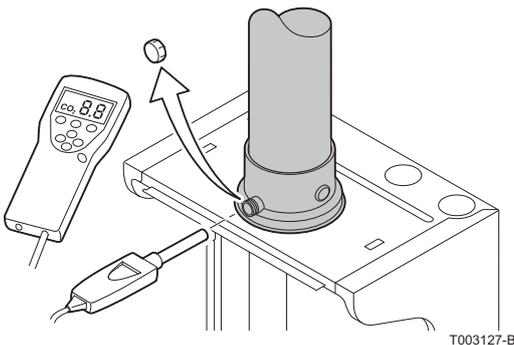
1. Unscrew the plug of the flue gas measurement point.
2. Connect the flue gas analyser.

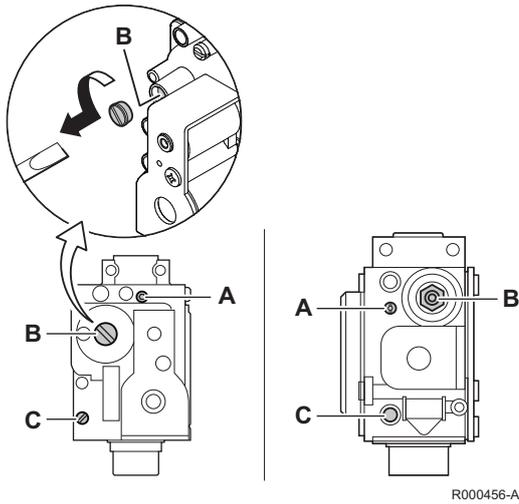


**WARNING**

Ensure that the opening around the sensor is completely sealed when taking measurements.

3. Set the boiler to part load:  
Continue pressing for around 3 seconds on the **i** key. The status signal for the **i** button is orange and always flashes green briefly; The low speed mode is parameterised.





R000456-A

4. Measure the percentage of O<sub>2</sub> or CO<sub>2</sub> in the flue gases (Front panel removed).

**i** ▶ The boiler is supplied with two types of gas blocks. See drawing for the position of control screw **B** for a low load.

5. If this rate does not match the required value, correct the gas/air ratio using the adjustment screw **B** on the gas valve unit:  
 If the rate is too low, turn the screw **B** clockwise to increase the gas flow.  
 If the rate is too high, turn the screw **B** anti-clockwise to reduce the gas flow.

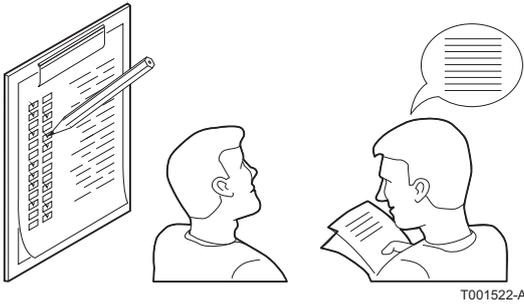
Repeat the high speed test and the low speed test as often as necessary until the correct values are obtained without having to make additional adjustments. Briefly press the **i** button to switch from full load to part load or vice versa. Briefly press the **RESET** button to return the boiler to normal operating status.

O <sub>2</sub> / CO <sub>2</sub> control and setting values at part load for G20 (Gas H)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	5,0 ± 0,3	8,9 ± 0,1	5,0 ± 0,5	8,9 ± 0,3
EMC-M 24/28 MI	5,0 ± 0,3	8,9 ± 0,1	5,0 ± 0,5	8,9 ± 0,3
EMC-M 30/35 MI	5,0 ± 0,3	8,9 ± 0,1	5,0 ± 0,5	8,9 ± 0,3
EMC-M 34/39 MI	5,0 ± 0,3	8,9 ± 0,1	5,0 ± 0,5	8,9 ± 0,3

O <sub>2</sub> / CO <sub>2</sub> control and setting values at part load for G25 (Gas L)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	5,2 ± 0,3	8,9 ± 0,1	5,2 ± 0,5	8,9 ± 0,3
EMC-M 24/28 MI	5,2 ± 0,3	8,9 ± 0,1	5,2 ± 0,5	8,9 ± 0,3
EMC-M 30/35 MI	5,2 ± 0,3	8,9 ± 0,1	5,2 ± 0,5	8,9 ± 0,3
EMC-M 34/39 MI	5,2 ± 0,3	8,9 ± 0,1	5,2 ± 0,5	8,9 ± 0,3

O <sub>2</sub> / CO <sub>2</sub> control and setting values at part load for G31 (Propane)				
Boiler type	Setting value		Checking value	
	O <sub>2</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	CO <sub>2</sub> (%)
EMC-M 24	5,8 ± 0,3	9,9 ± 0,1	5,8 ± 0,5	9,9 ± 0,3
EMC-M 24/28 MI	5,8 ± 0,3	9,9 ± 0,1	5,8 ± 0,5	9,9 ± 0,3
EMC-M 30/35 MI	5,8 ± 0,3	9,9 ± 0,1	5,8 ± 0,5	9,9 ± 0,3
EMC-M 34/39 MI	5,8 ± 0,3	9,9 ± 0,1	5,8 ± 0,5	9,9 ± 0,3

## 5.5 Finalizing work



1. Remove the measuring equipment.
2. Put the flue gas sampling plug back in place.
3. Refit the front panel.
4. Raise the temperature in the heating system to approximately 70°C.
5. Shut down the boiler.
6. After about 10 minutes, vent the air in the heating system.
7. Switch on the boiler.
8. Check the tightness of the flue gases evacuation and air inlet connections.
9. Checking the hydraulic pressure. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1,5 and 2 bar).
10. Tick the gas category used on the data plate.
11. Explain the operation of the installation, the boiler and the regulator to the users.
12. Slide the User instruction card supplied into the guides underneath the connection box.
13. Give all the instruction manuals to the user.

## 5.6 Reading out measured values

### 5.6.1. Status and sub-status

Boiler status information can be read using a service tool. The information menu **i** gives the following status and sub-status numbers:

State <b>S</b> <b>E</b>		Sub-status <b>S</b> <b>U</b>	
<b>0</b>	Rest	<b>0</b>	Rest
<b>1</b>	Boiler start (Heat demand)	<b>1</b>	Anti-hunting
		<b>2</b>	Control three-way valve
		<b>3</b>	Start pump
		<b>4</b>	Wait for the correct temperatures for burner start
<b>2</b>	Burner start	<b>10</b>	Open flue gas damper/external gas valve
		<b>11</b>	Increase fan speed
		<b>13</b>	Pre-ventilation
		<b>14</b>	Wait for release signal
		<b>15</b>	Burner on
		<b>17</b>	Pre-ignition
		<b>18</b>	Main ignition
		<b>19</b>	Flame detection
		<b>20</b>	Intermediate ventilation

State <b>SE</b>	Sub-status <b>SL</b>
<b>3</b> / <b>4</b> Burner for central heating operation / DHW System	<b>30</b> Temperature control
	<b>31</b> Limited temperature control (ΔT safety)
	<b>32</b> Output control
	<b>33</b> Increase protection level 1 (Modulate down)
	<b>34</b> Increase protection level 2 (Part load)
	<b>35</b> Increase protection level 3 (Blockage)
	<b>36</b> Modulate up for flame control
	<b>37</b> Temperature stabilisation time
	<b>38</b> Cold start
<b>5</b> Burner stop	<b>40</b> Burner off
	<b>41</b> Post ventilation
	<b>42</b> Close flue gas damper/external gas valve
	<b>43</b> Recirculation protection
	<b>44</b> Stop fan
<b>6</b> Boiler stop (End of heat demand)	<b>60</b> Pump post circulation
	<b>61</b> Pump off
	<b>62</b> Control three-way valve
	<b>63</b> Start anti-hunting
<b>8</b> Control stop	<b>0</b> Wait for burner start
	<b>1</b> Anti-hunting
<b>9</b> Blocking	<b>XX</b> Shutdown code <b>XX</b>
<b>11</b> Bleed	<b>0</b> Rest
	<b>2</b> Control three-way valve
	<b>3</b> Start pump
	<b>61</b> Pump off
	<b>62</b> Control three-way valve

## 5.7 Changing the settings

The boiler control panel is set for the most common heating systems. With these settings, practically all heating systems operate correctly. The user or installer can optimise the parameters according to own preferences.



Parameters can be adjusted using a service tool.

Parameters **P27** and **P30** can also be set to a negative value. This negative value can be read or changed directly using **Recom**. If you are using the service tool or a controller suitable for the service tool, this negative value is not displayed. Use the following formula to read or change the required negative value: **Setting value - 256 = Desired value**



**Setting value 0 = Desired value 0**

<b>Desired value</b>	0	-1	-5	-10	-15	-20	-25	-30
<b>Setting value</b>	0	255	251	246	241	236	231	226

### 5.7.1. Parameter descriptions

Parameter	Description	Adjustment range	Factory setting			
			EMC-M			
			24	24/28 MI	30/35 MI	34/39 MI
P11	Supply temperature: T <sub>SET</sub>	20 to 90 °C	80	80	80	80
P12	Domestic hot water temperature: T <sub>SET</sub>	40 to 65 °C	55	55	55	55
P13	Heating / DHW mode	0 = Heating deactivated / DHW deactivated 1 = Heating activated / DHW activated 2 = Heating activated / DHW deactivated 3 = Heating deactivated / DHW activated	1	1	1	1
P14	ECO mode	0 = Comfort 1 = Energy-saving mode 2 = Management using a programmable thermostat	2	2	2	2
P15	Post-circulation of the pump	1 to 98 minutes 99 minutes = continuous	2	2	2	2
P17	Maximum fan volume flow (Heating)	G20 (Gas H) <sup>(1)</sup> (x100)	47	39	60	60
		G25 (Gas L) (x100)	47	39	60	60
		G31 (Propane) (x100)	46	39	60	60
P18	Maximum fan volume flow (DHW)	G20 (Gas H) <sup>(1)</sup> (x100)	47	56	70	78
		G25 (Gas L) (x100)	47	56	70	78
		G31 (Propane) (x100)	46	50	69	71
P19	Minimum fan volume flow (Heating+DHW)	G20 (Gas H) <sup>(1)</sup> (x100)	11	11	15	15
		G25 (Gas L) (x100)	11	11	15	15
		G31 (Propane) (x100)	14	14	20	20
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G25 (Gas L) (x100)	15	15	18	18
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G20 (Gas H) (x100)	15	15	18	18
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G31 (Propane) (x100)	15	15	20	20
P20	Minimum fan volume flow (offset)	G20 (Gas H) <sup>(1)</sup>	80	80	60	60
		G25 (Gas L)	80	80	60	60
		G31 (Propane)	20	20	0	0
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G25 (Gas L)	0	0	60	60
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G20 (Gas H)	0	0	60	60
		<sup>(2)</sup> CLV overpressure (combusted gas discharge systems) G31 (Propane)	0	0	0	0
P21	Starting volume flow	Do not modify (x100)	23	23	30	30
P23	Maximum flow temperature of system	20 to 90 °C	90	90	90	90

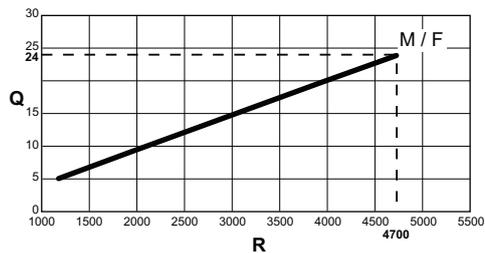
(1) Do not modify these factory settings unless absolutely necessary. E.g. to adapt the boiler to: G25 (Gas L) or G31 (Propane)  
(2) Please contact us for further information

Parameter	Description	Adjustment range	Factory setting			
			EMC-M			
			24	24/28 MI	30/35 MI	34/39 MI
P24	Time factor of average flow calculation	Do not modify (x10 seconds)	35	35	35	35
P25	Heat curve set point (Maximum outside temperature)	0 to 30 °C (Only with an outside temperature sensor)	20	20	20	20
P26	Heat curve set point (Supply temperature)	0 to 90 °C (Only with an outside temperature sensor)	20	20	20	20
P27	Heat curve set point (Minimum outside temperature)	-30 to 0 °C (Only with an outside temperature sensor)	-15	-15	-15	-15
P28	Minimum pump speed for central heating operation (Setting the pump speed)	2 - 10 (x 10 %)	3	3	3	3
P29	Maximum pump speed for central heating operation (Setting the pump speed)	2 - 10 (x 10 %)	10	7	10	10
P30	Antifreeze temperature	from - 30 to 0°C	-10	-10	-10	-10
P31	Legionella protection	0 = Stop 1 = Start (After commissioning, the boiler will operate once a week at 65°C for DHW) 2 = Management using a programmable thermostat	0	0	0	0
P32	Set point increase for calorifier	0 to 25 °C	20	20	20	20
P33	DHW cut-in temperature DHW sensor	from 2 to 15°C	4	4	4	4
P34	Control of external 3-way valve (Accessory)	0 = Normal 1 = Reverse	0	0	0	0
P35	Boiler type	0 = Heating and instant domestic hot water 1 = Heating only	1	0	0	0
P36	Shutdown input function	1 = Shutdown without frost-protection 2 = Shutdown with frost protection 3 = Lock-out with frost protection (Pump only)	1	1	1	1
P37	Minimum gas pressure switch (GpS)	0 = Not connected 1 = Connected	0	0	0	0
P38	Heat recovery unit (HRU)	0 = Not connected 1 = Connected	0	0	0	0
P39	Flue gas damper running time	0 to 255 seconds	0	0	0	0
P40	Fault relay function	0 = Operation signal 1 = Alarm signal 2 = External 3-way valve	2	2	2	2
P41	Maintenance message	Do not modify	1	1	1	1
P42	Service operating hours	Do not modify	175	175	175	175
P43	Service burning hours	Do not modify	30	30	30	30
P44	Venting cycle	0 = Stop 1 = Multiple speed pump 2 = Modulating pump	1	1	1	1

(1) Do not modify these factory settings unless absolutely necessary. E.g. to adapt the boiler to: G25 (Gas L) or G31 (Propane)

(2) Please contact us for further information

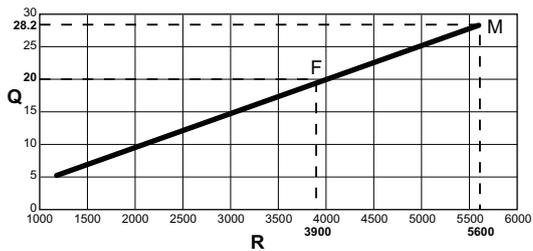
### 5.7.2. Setting the maximum heat input for central heating operation



T004787-B

#### EMC-M 24

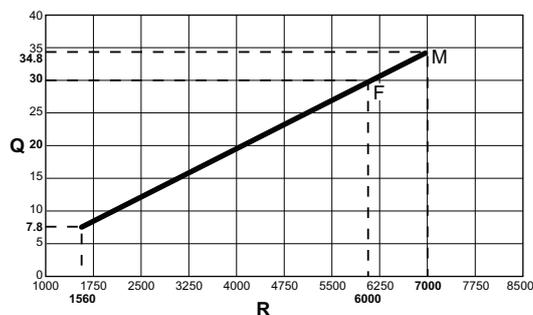
- M** Maximum heat input
- F** Factory setting
- Q** Power input (kW)
- R** Fan volume flow



T004786-A

#### EMC-M 24/48 MI

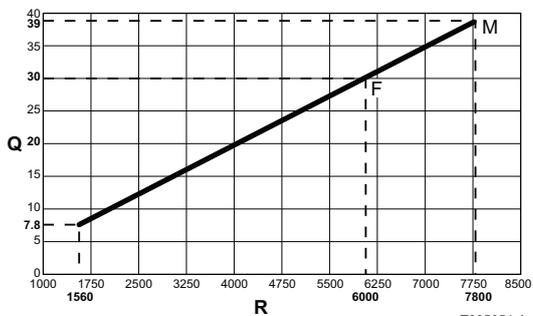
- M** Maximum heat input
- F** Factory setting
- Q** Power input (kW)
- R** Fan volume flow



T005053-A

#### EMC-M 30/35 MI

- M** Maximum heat input
- F** Factory setting
- Q** Power input (kW)
- R** Fan volume flow



T005054-A

#### EMC-M 34/39 MI

- M** Maximum heat input
- F** Factory setting
- Q** Power input (kW)
- R** Fan volume flow

See graphs for the input/volume flow ratio for natural gas. The volume flow can be changed using the  $\boxed{P} \boxed{!} \boxed{7}$  parameter.

# 6 Switching off the boiler

## 6.1 Installation shutdown

If the central heating system is not used for a long period, we recommend switching the boiler off.

- ▶ Switch off the boiler electrical power supply.
- ▶ Shut off the gas supply.
- ▶ Ensure that the boiler and system are protected against frost damage.

## 6.2 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.

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

To prevent radiators and the system from freezing in rooms where there is a risk of frost (e.g. a garage or storage room), a frost thermostat or outside sensor can be connected to the boiler.

 See also: "Connection options", page 29.



### CAUTION

- ▶ The antifreeze protection does not function if the boiler is switched off.
- ▶ The integrated protection system only protects the boiler, not the installation.
- ▶ Open the valves on all radiators connected to the heating system
- ▶ If the boiler has been placed in a room at risk of frost, the condensate drain and syphon should preferably be protected against freezing with a frost protection cable.

When the heating water temperature in the boiler falls by too much, the integrated protection system in the boiler starts up. This protection functions as follows:

- ▶ If the water temperature is lower than 7°C, the heating pump starts up.
- ▶ If the water temperature is lower than 4°C, the boiler starts up.
- ▶ If the water temperature is higher than 10°C, the boiler shuts down and the circulation pump continues to run for a short time.

# 7 Checking and maintenance

## 7.1 General instructions



### WARNING

- ▶ Maintenance operations must be done by a qualified engineer.
  - ▶ An annual inspection is compulsory.
  - ▶ Only original spare parts must be used.
- 
- ▶ Have the flues swept **at least once a year** or more, depending on the regulations in force in your country. Check the combustion each time the flues are swept. See chapter:
    - ▶ "Setting the air/gas ratio (Full load)", page 41
    - ▶ "Setting the air/gas ratio (Part load)", page 42
  - ▶ Carry out the inspection and standard maintenance operations once a year.
  - ▶ Carry out specific maintenance operations if necessary.

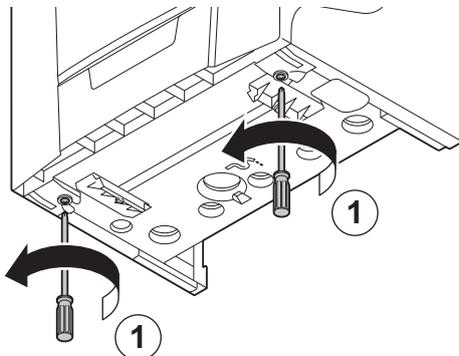
## 7.2 Standard inspection and maintenance operations



### CAUTION

- ▶ During inspection and maintenance operations, always replace all gaskets on the parts removed.
- ▶ Use only original spare parts that are intended for use with this type of boiler.

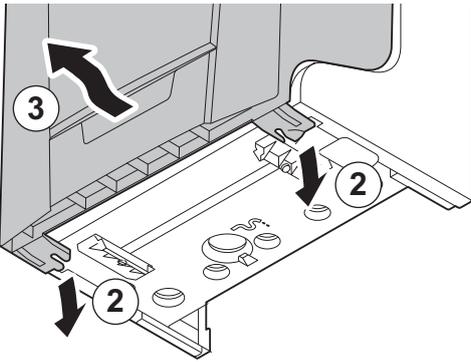
### 7.2.1. Open the boiler



### WARNING

Ensure that the boiler is switched off.

1. Unscrew the 2 screws, located on the front panel.



R000405-A

2. Remove the front panel.

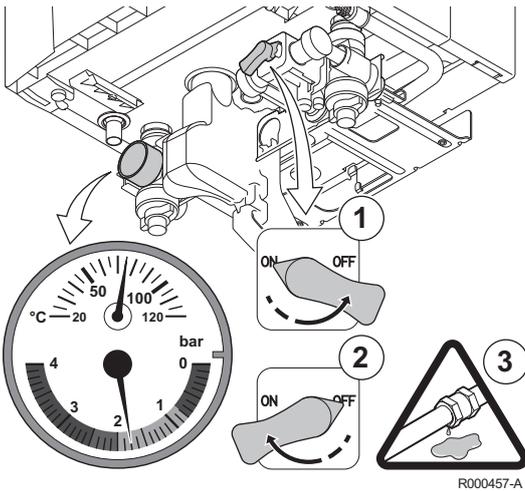
### 7.2.2. Checking the hydraulic pressure

The hydraulic pressure must reach a minimum of 0,8 bar. If necessary, top up the water level in the heating system (recommended hydraulic pressure between 1,5 and 2 bar).



#### CAUTION

- ▶ Before filling, open the valves on every radiator in the installation.
- ▶ Ensure that the boiler is switched off.



R000457-A

1. Open the cock from the filling loop (During filling, air can escape from the system via the automatic air vent).
2. Turn off the tap on the filling loop if the pressure gauge indicates a pressure between 1,5 and 2 bar.
3. Check the tightness of the water connections.
4. Turn the boiler on.

### 7.2.3. Checking the expansion vessel

Check the expansion vessel and replace it if necessary.

### 7.2.4. Checking the ionization current

Check the ionization current at full load and low load. The value is stable after 1 minute. If the value lies below 3  $\mu$ A, replace the ignition electrode.

See chapter: "Replacing the ionization/ignition electrode", page 55.



Use a service tool to read the value.

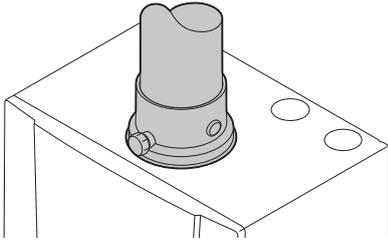
### 7.2.5. Checking the transfer capacity

If tap capacity falls significantly (due to insufficient temperature and/or flow rate), clean the plate heat exchanger (hot water side) and the tap water cartridge:

 See chapter: "Cleaning the plate exchanger", page 56.

### 7.2.6. Checking the flue gas discharge and the air supply

Check the tightness of the flue gases evacuation and air inlet connections.



R000406-A

### 7.2.7. Checking combustion

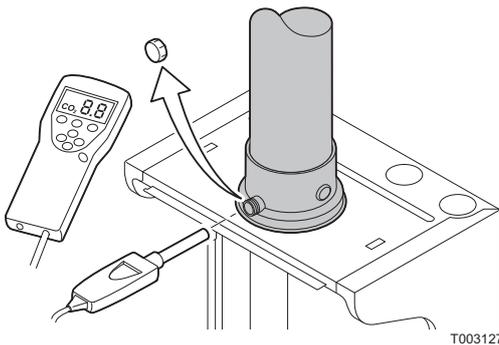
Measure the  $O_2$ /  $CO_2$  contents and the temperature of the flue gases at the flue gas measuring point. To do this, proceed as follows:

- ▶ Heat the water in the boiler to a temperature of approx. 70 °C.
- ▶ Unscrew the plug of the flue gas measurement point.
- ▶ Measure the smoke content in  $O_2$ /  $CO_2$  using the measuring equipment. Compare this with the control value.

 See following chapters:

"Setting the air/gas ratio (Full load)", page 41

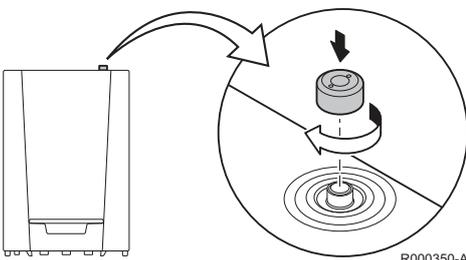
"Setting the air/gas ratio (Part load)", page 42



T003127-B

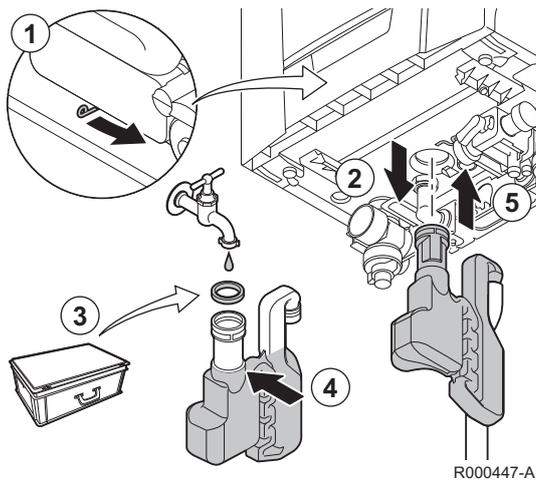
### 7.2.8. Checking the automatic air vent

1. Check that the automatic bleed is working (This is visible on the right on top of the boiler).
2. The air vent can be closed off with the cap that can be found next to it.
3. If any leaks are detected, replace the air vent.



R000350-A

### 7.2.9. Checking the syphon



#### CAUTION

First remove the front housing of the boiler so that you can disconnect the syphon.

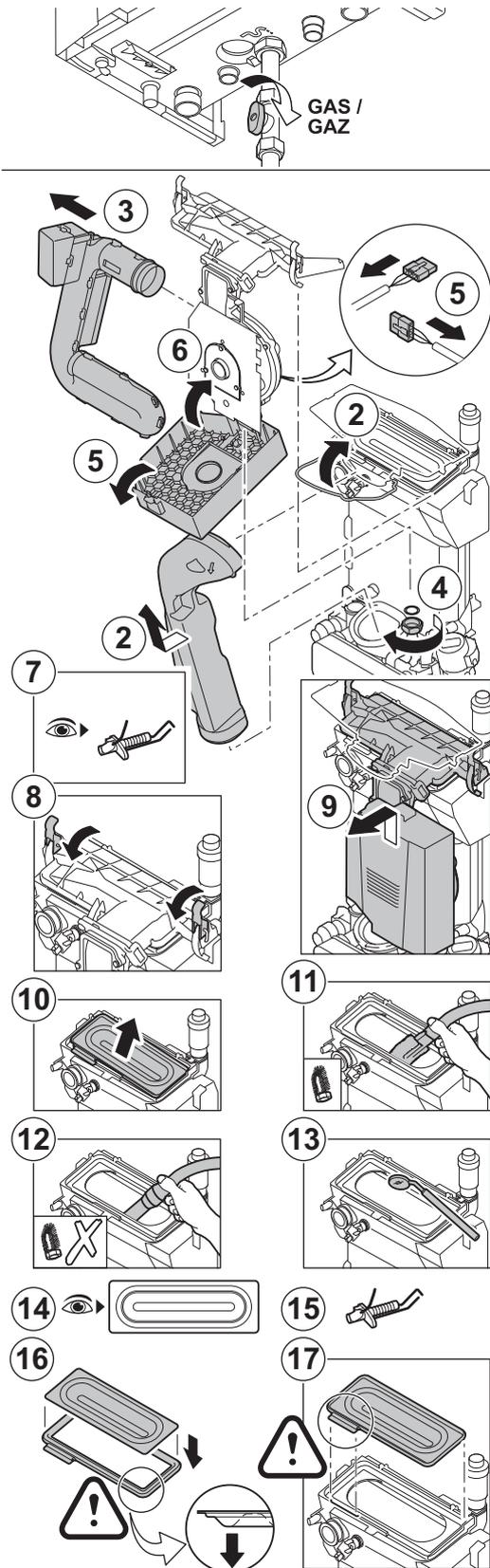
1. Move the lever underneath the hydroblock to the right to disconnect the syphon.
2. Remove the syphon and clean it.
3. Replace the seal ring for the syphon.
4. Fill the syphon with water up to the mark.
5. Press the syphon firmly into the  opening provided for it underneath the boiler. The syphon must click into place.



#### CAUTION

Check whether the syphon is solidly fitted in the boiler.

### 7.2.10. Checking the burner and cleaning the heat exchanger



T004777-B



#### CAUTION

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

1. Close the gas valve of the boiler. Ensure that the boiler is switched off. Remove the front panel.
2. Take the bracket off the flue gas discharge pipe. Remove the flue gas discharge pipe.
3. Remove the air inlet flue on the venturi.
4. Unscrew the gland underneath the gas block.
5. Open the protective cover for the fan on the top and remove all the plugs from the PCB.
6. Close the fan's protective cover.
7. Disassemble the ignition electrode. Check the ignition electrode for wear. Replace if necessary.  
 See also: "Replacing the ionization/ignition electrode", page 55
8. Unclip the 2 locking clips that attach the gas/air unit to the heat exchanger.
9. Remove the gas/air unit by moving the gas/air unit upwards and then forwards.
10. Tilt the burner and remove it, along with the heat exchanger gasket.
11. Use a vacuum cleaner fitted with a special endpiece (accessory) to clean the top part of the heat exchanger (combustion chamber).
12. Thoroughly clean with the vacuum cleaner again without the top cleaning brush on the endpiece.
13. Check (using a mirror, for example) whether any dust can still be seen. If so, Hoover it up.
14. The burner does not require any maintenance, it is self-cleaning. Check that there are no cracks and/or other tears on the surface of the dismantled burner. If this is not the case, replace the burner.
15. Install the ignition electrode.
16. To re-assemble, perform the above actions in reverse order.



#### CAUTION

- ▶ Remember to replace the plugs on the PCB for the gas/air unit.
- ▶ Check that the gasket is correctly positioned between the mixing elbow and the heat exchanger. (Completely flat in the appropriate groove means it is leak proof).

17. Open the gas inlet valves and switch on the mains supply to the boiler.

## 7.3 Specific maintenance operations



### WARNING

Ensure that the boiler is switched off.



### CAUTION

- ▶ During inspection and maintenance operations, always replace all gaskets on the parts removed.
- ▶ Use only original spare parts that are intended for use with this type of boiler.

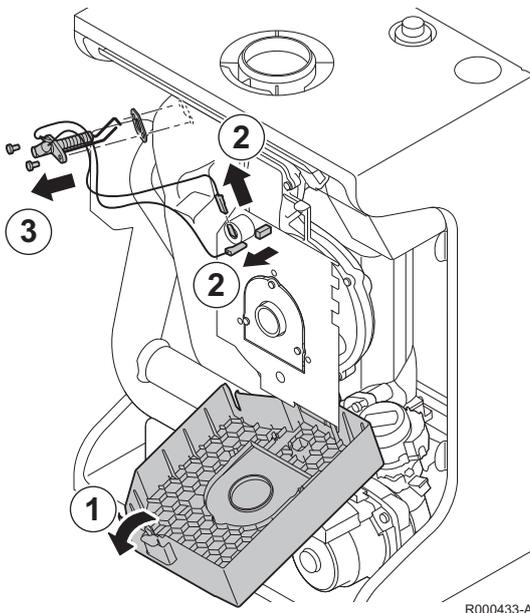
If the standard inspection and maintenance operations have revealed the necessity to carry out additional maintenance work, proceed as follows, depending on the nature of the work:

### 7.3.1. Replacing the ionization/ignition electrode

Replace the ionization/ignition electrode in the following cases:

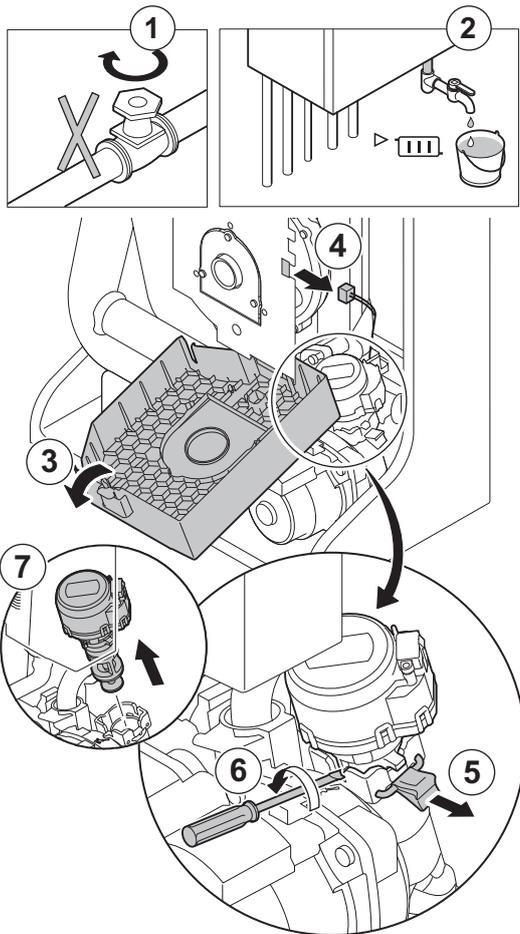
- ▶ Ionization current  $< 3 \mu\text{A}$ .
- ▶ Electrode worn.

1. Open the protective cover for the fan at the top.
2. Remove the ignition electrode plugs from the PCB.
3. Unscrew the 2 screws on the ignition electrode. Remove the unit.
4. Fit the new ionisation/ignition electrode.
5. To re-assemble, perform the above actions in reverse order.



R000433-A

### 7.3.2. Replacing the 3-way valve



R000400-A

If it becomes necessary to replace the 3-way valve, proceed as follows:

1. Close the main water valve.
2. Drain the boiler.
3. Open the protective cover for the fan at the top.
4. Disconnect the three-way valve cable from the automatic control unit.
5. Unclip the locking clip that holds the 3-way valve.
6. Dismantle the 3-way valve by rotating a screwdriver.
7. Remove the 3-way valve.
8. To re-assemble, perform the above actions in reverse order.



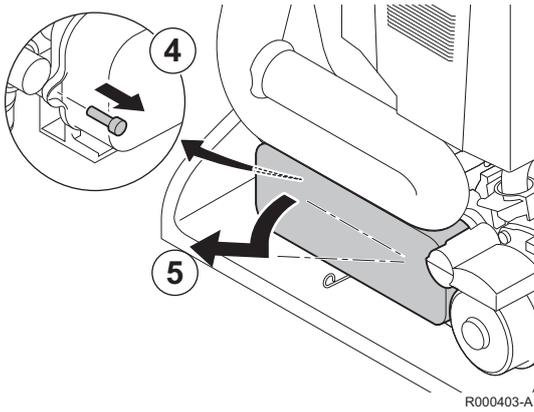
#### CAUTION

Be careful of the positioning cams on the 3-way valve.

### 7.3.3. Cleaning the plate exchanger

Depending on the water quality and the operating mode, limescale deposits may form in the plate exchanger. As a general rule, a periodic inspection, along with cleaning, if necessary, is sufficient. The following factors may affect the periodicity:

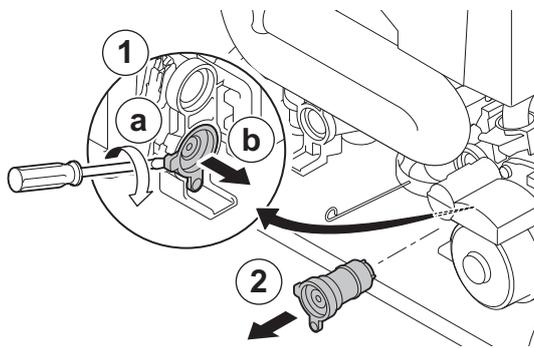
- ▶ Water hardness.
- ▶ Composition of the limescale.
- ▶ Number of hours' operation of the boiler.
- ▶ Draw-off rate.
- ▶ Domestic hot water set point temperature.



If descaling of the plate exchanger is necessary, proceed as follows:

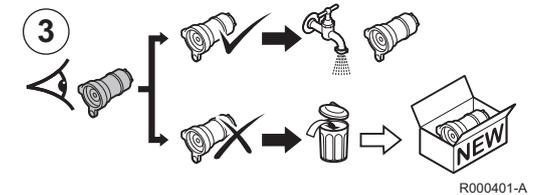
1. Ensure that the boiler is switched off.
2. Close the gas valve of the boiler.
3. Close the main water valve. Drain the boiler.
4. Unscrew the screw on the left-hand side of the heat exchanger.
5. Remove the plate heat exchanger by moving the left-hand side forwards and tipping the right-hand side out of the bracket.
6. Clean the plate heat exchanger with a descaling product (citric acid pH 3). To do this, a specific cleaning appliance is available as an accessory. After cleaning, rinse thoroughly under running water.

### 7.3.4. Cleaning the domestic water cartridge



The plate heat exchanger should be removed in order to clean the tap water cartridge. Then proceed as follows:

1. Dismantle the domestic water cartridge by rotating a screwdriver.
2. Remove the domestic water cartridge.
3. Clean or replace the domestic water cartridge if required.
4. Re-assemble all of the components.



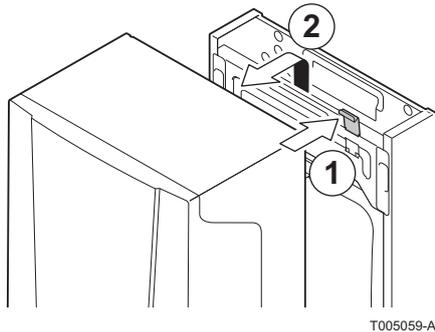
### 7.3.5. Replacement of the expansion vessel

The following procedures have to be carried out before the expansion vessel can be replaced:

- ▶ Close the gas valve of the boiler.
- ▶ Close the main water valve.
- ▶ Close the flow central heating pipe and the return central heating pipe.
- ▶ Tap the boiler.

The expansion vessel is inside the boiler at the rear. To replace the expansion vessel, the front of the boiler should be removed first.

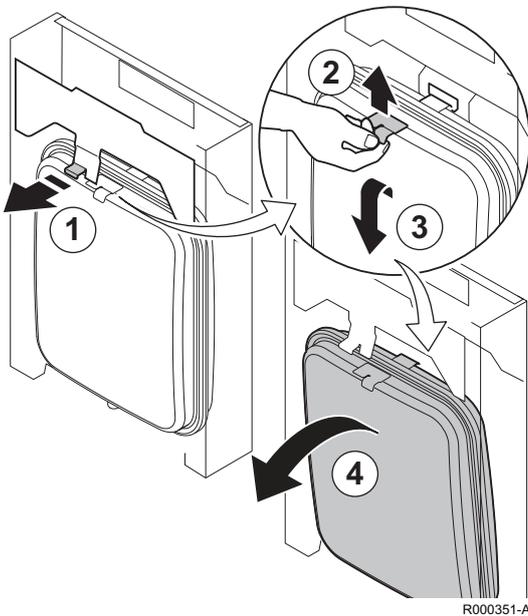
### ■ Removing the front of the boiler



T005059-A

1. Disconnect the flue gas discharge and air flow pipes from the boiler.
2. Remove the connection box.
3. Disconnect all incoming and outgoing pipes from the underside of the boiler.
4. Disconnect the gas supply pipe **GAS / GAZ** from the boiler.
5. Remove the syphon and condensate drain hose.  
To check how to remove the syphon, see: "Checking the syphon", page 53.
6. Disconnect the expansion vessel hose from the underside of the boiler.
7. Press down the mounting clip on top of the boiler and remove the front of the boiler.

### ■ Remove the expansion vessel



R000351-A

1. Bring the tab above the expansion vessel forwards and hold onto it while disconnecting the expansion vessel.
2. Move the expansion vessel slightly upwards and lift the vessel from the mounting bracket.
3. Tip the expansion vessel forwards and allow it drop slightly.
4. Carefully lift the expansion vessel out of the boiler.
5. Replace the defective expansion vessel.
6. To re-assemble, perform the above actions in reverse order.



#### CAUTION

- ▶ Replace all removed gaskets.
- ▶ Fill the system with clean tap water (advised water pressure is between 1,5 and 2 bar). "Water treatment", page 33

### 7.3.6. Re-assembling the boiler

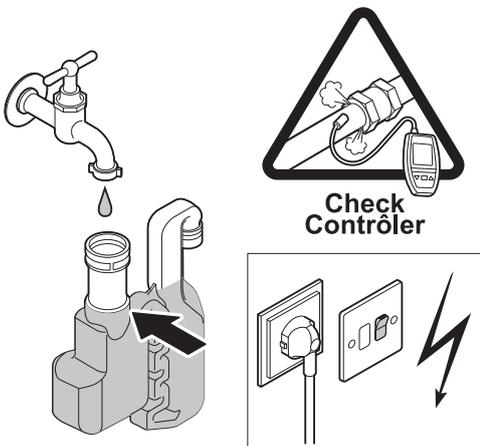
1. Follow the procedure in reverse to re-assemble all of the components.



#### CAUTION

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

2. Fill the syphon with water up to the mark.
3. Put the siphon back in place.
4. Carefully open the main water valve, fill the installation, vent it and, if need be, top it up with water. The hydraulic pressure must be a minimum of 0,8 bars. Check for any water leaks.
5. Check the seals on the gas and water connections.
6. Switch the boiler back on.



T002415-B

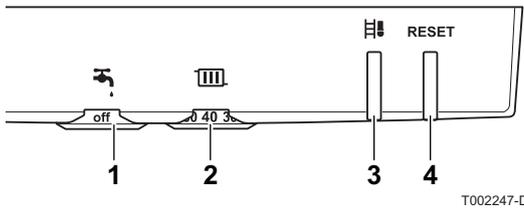
7. Check the setting of the gas/air ratio and, if necessary, correct it.

 See chapter: "Setting the air/gas ratio (Full load)", page 41

 See chapter: "Setting the air/gas ratio (Part load)", page 42

# 8 Troubleshooting

## 8.1 Error codes



- 1 Sanitary hot water temperature rotary knob
- 2 Heating water temperature rotary knob
- 3 Sweep key **i** and Status signals
- 4 **RESET**-button and on/off signal

The status signal for the **i** button can flash in a range of colours and at different frequencies. The meaning of these signals can be found in the User instruction card supplied with the boiler.

See also: "User instruction card", page 76.



### CAUTION

The instruction card must be slid underneath the connection box after the boiler installation or use of the card.

## 8.2 Shutdowns and lock-outs

### 8.2.1. Blocking

A (temporary) blocking mode is a boiler operating function caused by an unusual situation. The boiler control will try to re-start several times. The boiler will start up again after the blocking conditions have been eliminated.

In the event of a shutdown, the status signal for the **i** button flashes green. The meaning of the shutdown codes can be found in the shutdown table.

Status signals	Description	Code
Shutdown code 1 (1 times green signal)	Temperature protection	SU:1 / SU:2 / SU:7
Shutdown code 2 (2 times green signal)	Shutdown input	SU:10 / SU:11
Shutdown code 3 (3 times green signal)	Flame loss	SU:22
Shutdown code 4 (4 times green signal)	Communication fault	SU:12 / SU:13 / SU:21
Shutdown code 5 (5 times green signal)	Parameter or identification fault	SU:0 / SU:16 / SU:17 / SU:18 / SU:19
Shutdown code 6 (6 times green signal)	Miscellaneous	SU:15 / SU:25



The boiler starts up again automatically when the reason for the blocking has been removed.

The shutdown codes from the status signals are related to the shutdown codes that can be read by a service tool. The meaning of the shutdown codes can be found in the shutdown table:

Shutdown code	Description	Probable causes	Checking / solution
Su:0	Parameter error	▶ Parameters faulty	▶ Reset <b>dF</b> and <b>dU</b> ▶ Restore parameters with Recom
Su:1	Maximum flow temperature exceeded	▶ Non-existent or insufficient circulation	▶ Check the circulation (direction, pump, valves) ▶ Reasons for the heat demand
Su:2	Maximum increase of the flow temperature has been exceeded	▶ Non-existent or insufficient circulation ▶ Sensor error	▶ Check the circulation (direction, pump, valves) ▶ Check the water pressure ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Check the cleanliness of the heat exchanger
Su:7	Maximum difference between the flow and return temperature exceeded	▶ Non-existent or insufficient circulation ▶ Sensor error	▶ Check the circulation (direction, pump, valves) ▶ Check the water pressure ▶ Check that the sensors are operating correctly ▶ Check that the sensor has been correctly fitted ▶ Check the cleanliness of the heat exchanger
Su:10	Shutdown input is open	▶ External cause ▶ Parameter error ▶ Bad connection	▶ Suppress the external cause ▶ Check the parameters ▶ Check the wiring
Su:11	Shutdown input active or frost protection active	▶ External cause ▶ Parameter error ▶ Bad connection	▶ Suppress the external cause ▶ Check the parameters ▶ Check the wiring
Su:12	Communication error with the HMI PCB	▶ Connection box not connected	▶ Check the wiring
Su:13	Communication error with the SCU PCB	▶ Bad connection with BUS ▶ SCU PCB missing from connection box	▶ Check the wiring ▶ Carry out automatic detection
Su:15	Gas pressure too low	▶ Non-existent or insufficient circulation ▶ Incorrect gas switch Gps adjustment (connected to PCB SCU)	▶ Check that the gas valve is fully opened ▶ Check the supply pressure ▶ Check whether the Gps gas pressure control system has been correctly fitted ▶ Replace the Gps gas pressure control system if need be
Su:16 <sup>(1)</sup>	Configuration error	▶ Internal fault in gas/air unit	▶ Replace the gas/air unit
Su:17 <sup>(1)</sup>	Configuration fault or default parameter table incorrect	▶ Parameter fault in gas/air unit	▶ Replace the gas/air unit
Su:18 <sup>(1)</sup>	Configuration error (Boiler/ PSU not recognised)	▶ Incorrect PSU for this boiler	▶ Replace the PSU

(1) These lock-outs are not stored in the fault memory

Shutdown code	Description	Probable causes	Checking / solution
50:19 <sup>(1)</sup>	Configuration fault or parameters dF-dU unknown	▶ Reset dF and dU	▶ Reset dF and dU
50:20 <sup>(1)</sup>	Configuration procedure active	▶ Active for a short time after switching on the boiler	▶ No action required (Normal behaviour)
50:21	Communication fault	▶ Internal fault in gas/air unit	▶ Replace the gas/air unit
50:22	No flame during operation	▶ No ionization current	<ul style="list-style-type: none"> <li>▶ Purge the gas supply to remove air</li> <li>▶ Check that the gas valve is fully opened</li> <li>▶ Check the supply pressure</li> <li>▶ Check the operation and setting of the gas valve unit</li> <li>▶ Check that the air inlet and flue gas discharge flues are not blocked</li> <li>▶ Check that there is no recirculation of flue gases</li> </ul>
50:25	Internal fault in gas/air unit		▶ Replace the gas/air unit

(1) These lock-outs are not stored in the fault memory

### 8.2.2. Lock out

If the blocking conditions still exist after several start up attempts, the boiler will switch into locking mode (fault). The boiler can only start operating again once the causes of the lock-out have been rectified and after pressing the **RESET** key.

In the event of a fault, the status signal for the **i** button flashes red. The meaning of the error codes is given in the error table:

Status signals	Description	Code
Error code 1 (1 times red signal)	Sensor error	E:02 / E:03 / E:04 / E:05 / E:06 / E:07 / E:08 / E:09 / E:10 / E:11 / E:35
Error code 2 (2 times red signal)	Maximum temperature protection	E:12 / E:41
Error code 3 (3 times red signal)	Ignition fault	E:14 / E:16 / E:36
Error code 4 (4 times red signal)	Fan fault	E:34
Error code 5 (5 times red signal)	Parameter error	E:00 / E:01
Error code 6 (6 times red signal)	Miscellaneous	Fault codes can be read using a service tool.

**i** Press the **RESET** key for 5 seconds: The status signals will flash red quickly and the boiler will start its reset procedure. The boiler will also start an automatic venting cycle lasting around 4 minutes. If the error code continues to display, search for the cause in the error table and apply the solution.

The shutdown codes from the status signals are related to the shutdown codes that can be read by a service tool. The meaning of the error codes is given in the error table:

Lock out (Status signals)			
Status signals	Description	Probable causes	Checking / solution
Error code 1 (1 times red signal)	Sensor fault, temperature fault or flow fault	<ul style="list-style-type: none"> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Non-existent or insufficient circulation</li> <li>▶ Water circulation direction reversed</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Replace the sensor if necessary</li> </ul>
Error code 2 (2 times red signal)	Maximum temperature of heat exchanger or control unit exceeded	<ul style="list-style-type: none"> <li>▶ Non-existent or insufficient circulation</li> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> <li>▶ No air supply or insufficient air supply</li> <li>▶ No flue gas flow or insufficient flue gas flow</li> <li>▶ Circulation</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> <li>▶ Check air supply</li> <li>▶ Check flue gas flow</li> <li>▶ Replace seals</li> </ul>
Error code 3 (3 times red signal)	Ignition fault: <ul style="list-style-type: none"> <li>▶ 5 burner start-up failures</li> <li>▶ False flame signal</li> <li>▶ 5x Flame loss</li> </ul>	<ul style="list-style-type: none"> <li>▶ No ignition</li> <li>▶ Ignition arc, but no flame formation</li> <li>▶ Presence of the flame but insufficient ionization (&lt;1 <math>\mu</math>A)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Check breakdown to earth</li> <li>▶ Check the condition of the burner set</li> <li>▶ Check the earthing</li> <li>▶ Check that the gas valve is fully opened</li> <li>▶ Check the supply pressure</li> <li>▶ Purge the gas supply to remove air</li> <li>▶ Check the operation and setting of the gas valve unit</li> <li>▶ Check that the air inlet and flue gas discharge flues are not blocked</li> <li>▶ Replace the ionization/ignition electrode</li> </ul>
Error code 4 (4 times red signal)	Fan fault	<ul style="list-style-type: none"> <li>▶ External draught over the boiler</li> <li>▶ Defective gas/air unit</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check for adequate draw on the chimney connection</li> <li>▶ Replace the gas/air unit</li> </ul>
Error code 5 (5 times red signal)	Parameter error	<ul style="list-style-type: none"> <li>▶ Bad connection</li> <li>▶ Safety parameters not found</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Reset dF/dU code with a service tool</li> </ul>
Error code 6 (6 times red signal)	Miscellaneous	<ul style="list-style-type: none"> <li>▶ Several possible causes</li> </ul>	<ul style="list-style-type: none"> <li>▶ Fault codes can be read using a service tool</li> </ul>

Lock out (Error code - E:□□)			
Error code	Description	Probable causes	Checking / solution
E:00	Storage unit PSU parameter not found	<ul style="list-style-type: none"> <li>▶ Bad connection</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> </ul>
E:01	The safety parameters are incorrect	<ul style="list-style-type: none"> <li>▶ Bad connection</li> <li>▶ PSU defective</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Replace PSU</li> </ul>
E:02	Flow temperature sensor short circuited	<ul style="list-style-type: none"> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>
E:03	Flow temperature sensor open circuit	<ul style="list-style-type: none"> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>
E:04 E:05	Flow temperature too low Flow temperature too high	<ul style="list-style-type: none"> <li>▶ No circulation</li> <li>▶ Bad connection</li> <li>▶ Sensor not or badly connected</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the wiring</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>
E:06	Return temperature sensor short circuited	<ul style="list-style-type: none"> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> </ul>
E:07	Return temperature sensor open circuit	<ul style="list-style-type: none"> <li>▶ Sensor not or badly connected</li> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Check the wiring</li> <li>▶ Check that the sensors are operating correctly</li> </ul>
E:08 E:09	Return temperature too low Return temperature too high	<ul style="list-style-type: none"> <li>▶ No circulation</li> <li>▶ Bad connection</li> <li>▶ Sensor not or badly connected</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the wiring</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>
E:10 E:11	Difference between the flow and return temperatures too great	<ul style="list-style-type: none"> <li>▶ No circulation</li> <li>▶ Sensor not or badly connected</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the wiring</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>

Lock out (Error code - E:□□)			
Error code	Description	Probable causes	Checking / solution
E:12	Temperature of heat exchanger above normal range (high-limit thermostat STB)	<ul style="list-style-type: none"> <li>▶ No circulation</li> <li>▶ Bad connection</li> <li>▶ Sensor not or badly connected</li> <li>▶ Sensor fault</li> </ul>	<ul style="list-style-type: none"> <li>▶ Vent the air in the heating system</li> <li>▶ Check the water pressure</li> <li>▶ Check the wiring</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check the cleanliness of the heat exchanger</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> <li>▶ Replace the sensor if necessary</li> </ul>
E:14	5 burner start-up failures	<ul style="list-style-type: none"> <li>▶ No ignition</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check cabling of ignition transformer</li> <li>▶ Replace the ionization/ignition electrode</li> <li>▶ Check breakdown to earth</li> <li>▶ Check the condition of the burner set</li> <li>▶ Check the earthing</li> <li>▶ Defective gas/air unit</li> </ul>
		<ul style="list-style-type: none"> <li>▶ Ignition arc, but no flame formation</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check that the gas valve is fully opened</li> <li>▶ Check the supply pressure</li> <li>▶ Purge the gas supply to remove air</li> <li>▶ Check the operation and setting of the gas valve unit</li> <li>▶ Check that the air inlet and flue gas discharge flues are not blocked</li> <li>▶ Check the wiring on the gas valve unit</li> <li>▶ Defective gas/air unit</li> </ul>
		<ul style="list-style-type: none"> <li>▶ Presence of the flame but insufficient ionization (&lt;1 <math>\mu</math>A)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check that the gas valve is fully opened</li> <li>▶ Check the supply pressure</li> <li>▶ Replace the ionization/ignition electrode</li> <li>▶ Check the earthing</li> <li>▶ Check the wiring on the ionization/ignition electrode</li> </ul>
E:15	False flame signal	<ul style="list-style-type: none"> <li>▶ Ionization current present when there should not be a flame</li> <li>▶ Defective gas/air unit</li> <li>▶ The burner remains very hot: CO<sub>2</sub> too high</li> </ul>	<ul style="list-style-type: none"> <li>▶ Replace the ionization/ignition electrode</li> <li>▶ Check the gas/air unit and replace it if necessary</li> <li>▶ Set the CO<sub>2</sub></li> </ul>
E:17	Problem on the gas valve	<ul style="list-style-type: none"> <li>▶ Defective gas/air unit</li> </ul>	<ul style="list-style-type: none"> <li>▶ Replace the gas/air unit</li> </ul>
E:34	Fan fault	<ul style="list-style-type: none"> <li>▶ External draught over the boiler</li> <li>▶ Defective gas/air unit</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check for adequate draw on the chimney connection</li> <li>▶ Check the gas/air unit and replace it if necessary</li> </ul>
E:35	Flow and return reversed	<ul style="list-style-type: none"> <li>▶ Bad connection</li> <li>▶ Sensor fault</li> <li>▶ Sensor not or badly connected</li> <li>▶ Water circulation direction reversed</li> </ul>	<ul style="list-style-type: none"> <li>▶ Replace the sensor if necessary</li> <li>▶ Check the circulation (direction, pump, valves)</li> <li>▶ Check that the sensors are operating correctly</li> <li>▶ Check that the sensor has been correctly fitted</li> </ul>

Lock out (Error code - E:□□)			
Error code	Description	Probable causes	Checking / solution
E:36	5x Flame loss	<ul style="list-style-type: none"> <li>▶ No ionization current</li> </ul>	<ul style="list-style-type: none"> <li>▶ Purge the gas supply to remove air</li> <li>▶ Check that the gas valve is fully opened</li> <li>▶ Check the supply pressure</li> <li>▶ Check the operation and setting of the gas valve unit</li> <li>▶ Check that the air inlet and flue gas discharge flues are not blocked</li> <li>▶ Check that there is no recirculation of flue gases</li> </ul>
E:37	Communication fault	<ul style="list-style-type: none"> <li>▶ Internal fault in gas/air unit</li> </ul>	<ul style="list-style-type: none"> <li>▶ Replace the gas/air unit</li> </ul>
E:38	Communication error with the SCU PCB	<ul style="list-style-type: none"> <li>▶ Bad connection</li> <li>▶ Defective SCU PCB</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the wiring</li> <li>▶ Replace SCU PCB</li> </ul>
E:39	Shutdown input in locked-out mode	<ul style="list-style-type: none"> <li>▶ External cause</li> <li>▶ Bad connection</li> <li>▶ Parameter incorrectly set</li> </ul>	<ul style="list-style-type: none"> <li>▶ Suppress the external cause</li> <li>▶ Check the wiring</li> <li>▶ Check the parameters</li> </ul>
E:40	HRU/URC unit test error	<ul style="list-style-type: none"> <li>▶ HRU/URC unit test error</li> <li>▶ External cause</li> <li>▶ Bad connection</li> <li>▶ Parameter incorrectly set</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check the HRU/WTW unit</li> <li>▶ Suppress the external cause</li> <li>▶ Check the wiring</li> <li>▶ Check the parameters</li> </ul>
E:41	Maximum control unit temperature exceeded	<ul style="list-style-type: none"> <li>▶ No air supply or insufficient air supply</li> <li>▶ No flue gas flow or insufficient flue gas flow</li> <li>▶ Recirculation</li> </ul>	<ul style="list-style-type: none"> <li>▶ Check air supply</li> <li>▶ Check flue gas flow</li> <li>▶ Replace seals</li> </ul>

# 9 Spare parts

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## 9.1 General

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When it is observed subsequent to inspection or maintenance work that a component in the appliance needs to be replaced, use only original spare parts or recommended spare parts and equipment.



To order a spare part, give the reference number shown on the list.

## 9.2 Spare parts

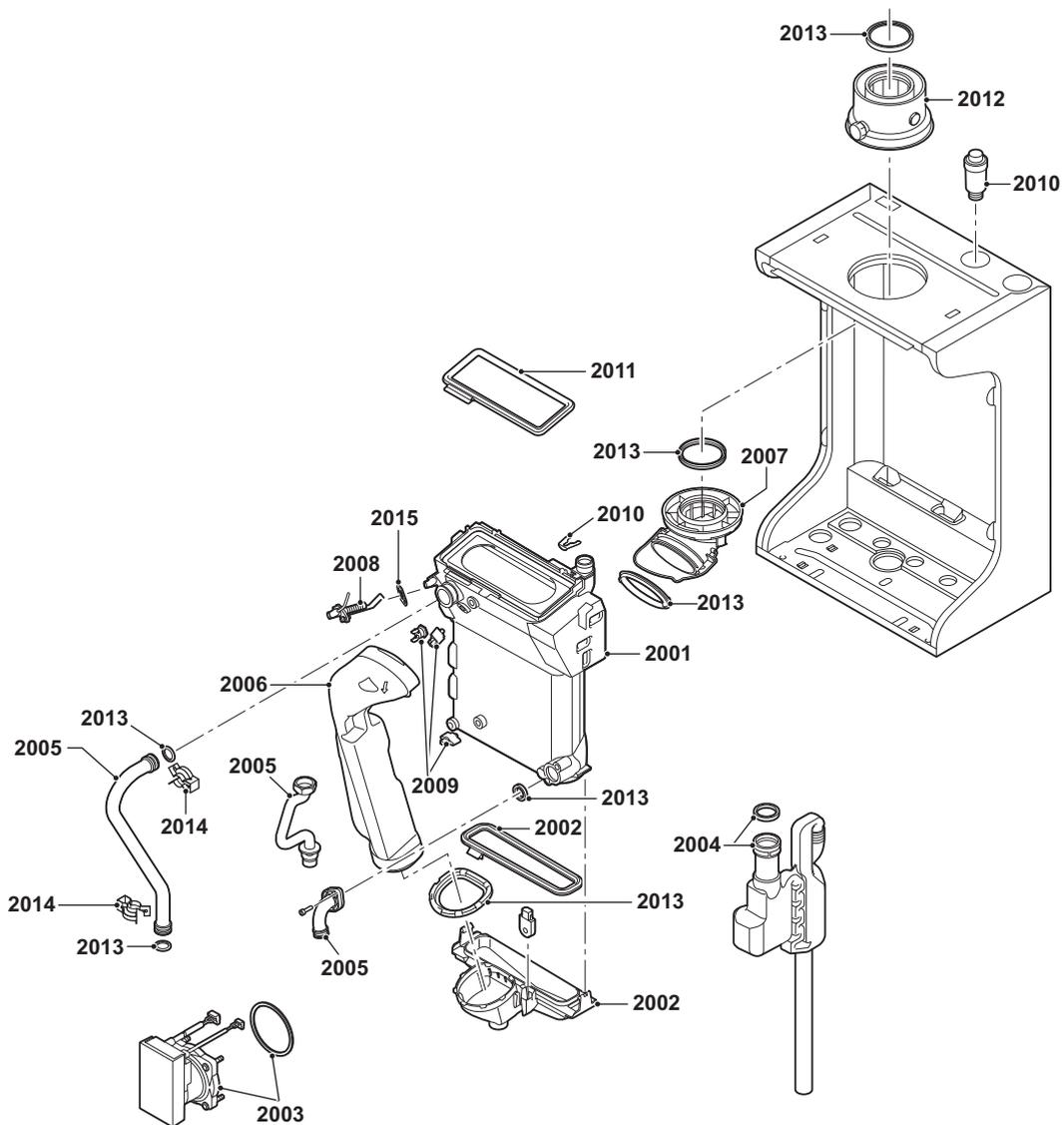
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## 9.2.2. Heat exchanger

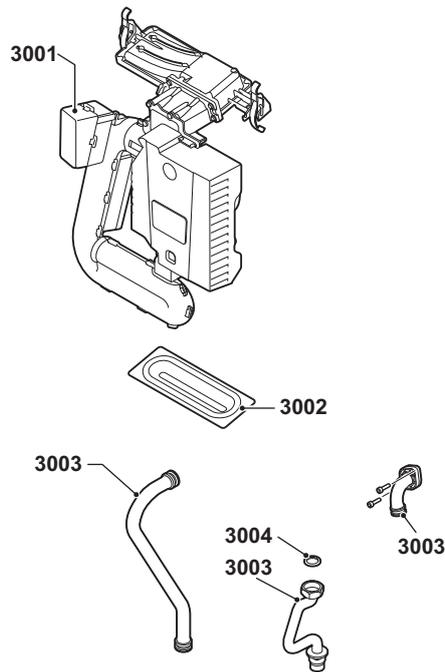
2



### 9.2.3. Gas/air system

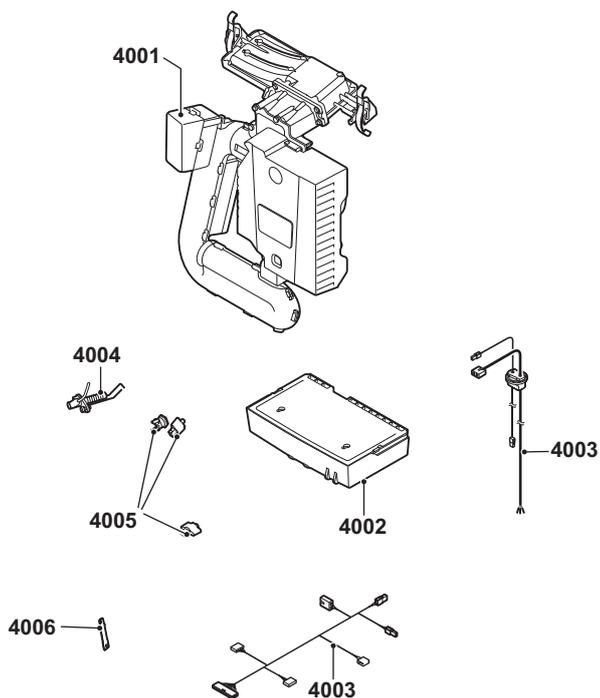
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3



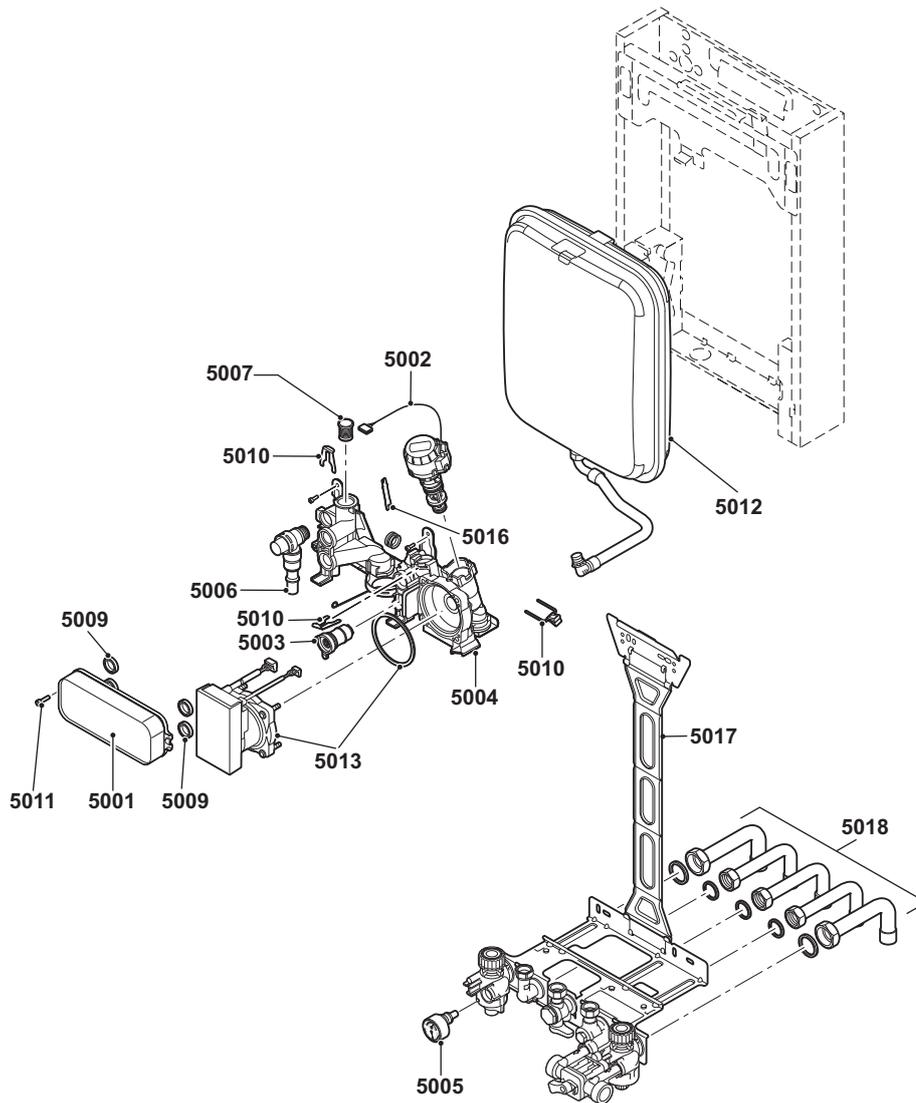
### 9.2.4. Connection box

4



### 9.2.5. Hydraulic unit/Connecting pipes

5



### 9.2.6. Spare parts list

Casing				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
1001	7600123	Front casing	1	x	x	x	x
1002	S103362	Fastening screws for front housing	1	x	x	x	x
1003	7600078	Sealing for front casing	1	x	x	x	x

Heat exchanger and burner				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
2001	S101760	Heat exchanger 28kW	1	x	x		
2001	S101761	Heat exchanger 40kW	1			x	x
2002	S101758	Condensate tank 28kW	1	x	x		
2002	S101759	Condensate tank 40 kW	1			x	x
2003	S101747	Pump	1		x		
2003	S101748	Pump	1	x		x	x
2004	S101731	Siphon	1	x	x	x	x
2005	S101729	Set of pipes	1	x	x	x	x
2006	S101727	Flue gas discharge pipe 28kW	1	x	x		
2006	S101734	Flue gas discharge pipe 40kW	1			x	x
2007	S103359	Connecting piece for flue gas discharge pipe	1	x	x	x	x
2008	S101764	Ignition/ionization electrode	1	x	x	x	x
2009	S101771	Set of sensors (HL/NTC)	1	x	x	x	x
2010	S101770	Automatic air vent	1	x	x	x	x
2011	S101754	Gasket for burner 28kW	1	x	x		
2011	S101755	Gasket for burner 40kW	1			x	x
2012	S101689	Combustion air/flue gas adapter 60/100 mm	1	x	x	x	x
2013	S101756	Set of Gaskets	1	x	x	x	x
2014	S101740	Set of fasteners	1	x	x	x	x
2015	S62105	Sealing plate for the ignition electrode	10			x	x

Gas/air				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
3001	S101732	Gas/air unit, including control PCB and fan 28kW	1	x	x		
3001	S101733	Gas/air unit, including control PCB and fan 40kW	1			x	x
3002	S101752	Burner 28kW	1	x	x		
3002	S101753	Burner 40kW	1			x	x
3003	S101729	Set of pipes	1	x	x	x	x
3004	S56155	Sealing ring Ø 23,8x17,7x2 mm	20	x	x	x	x

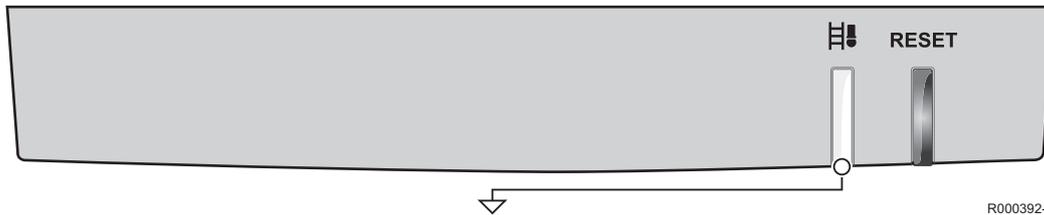
Electronic system				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
4001	S101732	Gas/air unit, including control PCB and fan 28kW	1	x	x		
4001	S101733	Gas/air unit, including control PCB and fan 40kW	1			x	x
4002	7600498	Connection box	1	x	x	x	x
4003	S103360	cable form	1	x	x	x	x

Electronic system				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
4004	S101764	Ignition/ionization electrode	1	x	x	x	x
4005	S101771	Set of sensors (HL/NTC)	1	x	x	x	x
4006	S101769	Hall sensor	1			x	x

Hydraulics				EMC			
Markers	Code no.	Description	Part	M 24	M 24/28 MI	M 30/35 MI	M 34/39 MI
5001	S101750	Plate heat exchanger			x		
5001	S101751	Plate heat exchanger	1			x	x
5002	S101765	Actuator with 3-way valve	1	x	x	x	x
5003	S101766	Cartridge	1		x		
5003	7600499	Cartridge	1			x	
5003	7600519	Cartridge	1				x
5004	S103225	Hydraulic module set 24kW	1	x			
5004	S101745	Hydraulic module set 28kW	1		x		
5004	7601214	Hydraulic module set 35kW	1			x	
5004	S101746	Hydraulic module set 39kW	1				x
5005	S101763	Thermo-pressure gauge	1	x	x	x	x
5006	S101772	Overflow valve	1	x	x	x	x
5007	S100805	Central heating inlet filter	1			x	x
5009	S101756	Set of Gaskets	1	x	x	x	x
5010	S101740	Set of fasteners	1	x	x	x	x
5011	S59141	Screw M5x18	15			x	x
5012	7600525	Expansion vessel	1	x	x	x	x
5013	S101747	Pump	1		x		
5013	S101748	Pump	1	x		x	x
5016	S101769	Hall sensor	1			x	x
5017	7600374	Mounting frame	1	x	x		
5017	7600371	Mounting frame	1			x	x
5018	7600630	Set of pipes	1	x	x	x	x

# 10 Appendix

## 10.1 User instruction card



R000392-A

Group	Signal	Meaning
Boiler in service (Intermittent green signal)		Central heating heat
		Hot tap water
Maintenance message <sup>(1)</sup> (Flashing orange signal)		Code A
		Code B
		Code C
Blockage (Flashing green signal)		Temperature protection
		Shutdown input
		Flame loss
		Communication fault
		Parameter error
		Miscellaneous
Repair (Flashing red signal)		Sensor error
		Maximum temperature protection
		Ignition fault
		Fan fault
		Parameter error
		Miscellaneous
		Reinitialisation
		Resetting...
Chimney-sweeping position (Intermittent orange signal)		Part load
		Full load Central heating heat
		Full load Hot tap water
		PC programming mode

(1) This function is not applicable to every type



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