

# HeatMaster

201

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS



for the Installer and the User

<b>GENERAL RECOMMENDATIONS</b> .....	<b>3</b>	Removal and Installation of the Front Panel and the burner cover .....	29
<b>USER'S GUIDE</b> .....	<b>4</b>	Gas connection .....	29
Meaning of Symbols .....	4	<b>CONFIGURATION AND SYSTEM SET-UP</b> .....	<b>30</b>
Appliance Marking .....	4	Basic Configuration - HeatMaster 201 : High Temperature Heating Circuit with Control by Room Thermostat and Optional Outdoor Sensor .....	30
Control Panel and Display .....	5	<b>STARTING UP</b> .....	<b>31</b>
Stand-by Screen .....	6	Safety Instructions for Starting up .....	31
Lockout Screen .....	6	Tools Required for Starting up .....	31
Status Messages .....	6	Checks before Starting up .....	31
What to Check on a Regular Basis .....	7	Filling the system.....	31
In case of Problem... ..	7	Starting up the appliance.....	32
Setup Guide .....	7	Checking and Adjusting the Burner .....	32
<b>APPLIANCE DESCRIPTION</b> .....	<b>14</b>	<b>MAINTENANCE</b> .....	<b>33</b>
HeatMaster® 201 .....	14	Safety Instructions for the Maintenance .....	33
Configuration in a system.....	14	Tools Required for Maintenance.....	33
HeatMaster® 201 overview.....	14	Appliance shut down for Maintenance.....	33
Connections - at the back and on the top .....	15	Periodic Appliance Maintenance Tasks .....	33
AIR/GAS pre-mix burners ACV BG 2000-M/201.....	16	Draining the Appliance .....	34
<b>TECHNICAL CHARACTERISTICS</b> .....	<b>17</b>	Removal and Installation of the Burner .....	34
Dimensions.....	17	Removal, Check and Installation of the Burner Electrode.....	35
Clearance.....	17	Restarting after Maintenance .....	35
Combustion characteristics .....	18	<b>LOCKING CODES</b> .....	<b>36</b>
Chimney connection characteristics.....	18	<b>DECLARATION OF CONFORMITY</b> .....	<b>40</b>
Gas categories .....	19		
Electrical Characteristics HeatMaster®201.....	20		
Hydraulic Characteristics.....	22		
Hydraulic Pressure Drop Curve of the appliances.....	22		
DHW performance .....	22		
Maximum Operating Conditions.....	22		
Recommendations for the Prevention of Corrosion and Scaling in Heating Systems .....	23		
G3 Requirements and Guidance - UK Only.....	24		
<b>INSTALLATION</b> .....	<b>26</b>		
Safety Instructions for the Installation.....	26		
Package contents.....	27		
Tools Required for the Installation .....	27		
Appliance preparation .....	27		
Hydraulic Connections .....	28		
DHW Connection.....	28		

## GENERAL RECOMMENDATIONS

### NOTE

This manual contains important information with respect to the installation, the starting up and the maintenance of the appliance.

This manual must be provided to the user, who will read it carefully and keep it in a safe place.

We accept no liability should any damage result from the failure to comply with the instructions contained in this technical manual.



#### Essential recommendations for safety

- It is prohibited to carry out any modifications to the appliance without the manufacturer's prior and written agreement.
- The product must be installed by a qualified engineer, in accordance with applicable local standards and regulations.
- The installation must comply with the instructions contained in this manual and with the standards and regulations applicable to heating systems.
- Failure to comply with the instructions in this manual could result in personal injury or a risk of environmental pollution.
- The manufacturer declines all liability for any damage caused as a result of incorrect installation or in the event of the use of appliances or accessories that are not specified by the manufacturer.



#### Essential recommendations for the correct operation of the appliance

- In order to ensure that the appliance operates correctly, it is essential to have it serviced by a certified installer or maintenance contractor every year.
- In case of anomaly, please call your service engineer.
- Faulty parts may only be replaced by genuine factory parts.



#### General remarks

- The availability of certain models as well as their accessories may vary according to markets.
- The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice. Please check for an updated version of this manual in the documentation page on the website [www.acv.com](http://www.acv.com).
- In spite of the strict quality standards that ACV applies to its appliances during production, inspection and transport, faults may occur. Please immediately notify your approved installer of any faults.

## GENERAL SAFETY INSTRUCTIONS FOR GAS APPLIANCES

### If you smell gas:

- Immediately isolate the gas supply.
- Open windows and doors to ventilate the area.
- Do not use any electrical appliances and do not operate any switches.
- Immediately notify your gas supplier and/or your installer.

**DO NOT STORE ANY FLAMMABLE OR CORROSIVE PRODUCTS, PAINT, SOLVENTS, SALTS, CHLORIDE PRODUCTS AND OTHER DETERGENT PRODUCTS NEAR THE APPLIANCE.**

**THIS APPLIANCE CAN BE USED BY CHILDREN AGED FROM 8 YEARS OLD AND ABOVE AND PERSONS WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES OR LACK OF EXPERIENCE AND KNOWLEDGE, IF THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING THE USE OF THE APPLIANCE IN A SAFE WAY AND UNDERSTAND THE HAZARDS INVOLVED.**

**CLEANING AND USER MAINTENANCE SHALL NOT BE PERFORMED BY CHILDREN WITHOUT SUPERVISION.**

**CHILDREN SHALL NOT PLAY WITH THE APPLIANCE.**

**A BYPRODUCT OF ANY GAS FIRED APPLIANCE IS CARBON MONOXIDE. ACV RECOMMENDS THE INSTALLATION OF A MINIMUM OF TWO (2) HARD-WIRED CARBON MONOXIDE DETECTORS WITH AN ALARM AND BATTERY BACK-UP; ONE IN THE MECHANICAL ROOM WHERE THE BOILER IS LOCATED AND ANOTHER INSTALLED IN THE LIVING AREA OUTSIDE THE BEDROOM(S) FOR ALL INSTALLATIONS.**



#### General remarks

- The end user is only allowed to carry out the basic set-up operations mentioned in "Setup Guide" on page 7, after he has received all relevant instructions from the installer. Any other set-up must be carried out by an approved installer.
- If the end user misuses the installer code to access installer-specific parameters and makes changes that cause a system failure, any warranty claim will be void.
- To get additional information on how to use the ACVMAX interface, refer to the installer-specific settings and the detailed error codes, in the "Installer's Handbook" available on [www.acv.com](http://www.acv.com), under the "Documentation" tab, with your product manual(s).

## MEANING OF SYMBOLS

Symbols on the packaging	Meaning
	Fragile, handle with care
	Keep away from rain
	This way up
	Danger of tipping over
	Hand truck or pallet truck required for transport

Symbols on the appliance	Meaning
	Gas connection
	Domestic Hot Water circuit
	Primary circuit
	Connection to the sewage system
	Electricity
	Alarm

## Symbols in the manual

Symbols in the manual	Meaning
	Essential recommendation for safety (of persons and equipment)
	Essential recommendation for electrical safety (electrical hazard)
	Essential recommendation for the correct operation of the appliance or the system
	General remark
	Safety valve connected to the sewage system
	Connection to the sewage system

## APPLIANCE MARKING

Location: Back panel



The part number (Code) and serial number (N°) of the appliance are indicated on its rating plate and must be provided to ACV in case of warranty claim. Failure to do so will make the claim void.



DES1 - 2025 mbar	RS
DN - 20 mbar	AT, DN, CY, CE, DR, EE, ES, GB, GR, HR, IE
DELL - 2025 mbar	DS
DE - 20 mbar	DE, LU, PL, RO
DEA - 2025 mbar	FR
DN5 - 20 mbar	HJ
DN4 - 20 mbar	IE, IT, LI, LV, NO, PT, RO, SE, SI, SK, TR

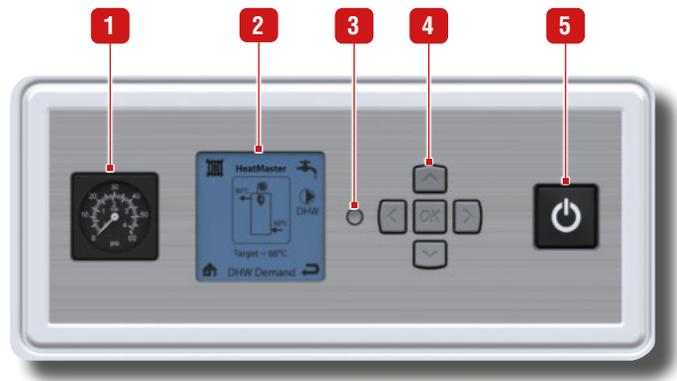
S/N:	19/A157074	
ANNO	2019	
PROD. DATE	18/11/2020	
CODE	A1004779	
CL. NOx	5	
PERFORMANCE	★★	
PIN	0461B00767	
MODEL	HeatMaster 201	

Adjusted - Régulé - Abgestimmt		G20 - 20 mbar	
Type: B23-B23P-C53v1			
- 230 V	PMS ± 3 bar	PMW ± 0,5 bar	
50 Hz	T max ± 90 °C	T max ± 90 °C	
800 W	D4L	400L	
	G20	G25	
Qn (H)	220	220	kW
Pin (90-60°C)	198	200,2	kW
Qmin (H)	58,4	62	kW
Pmin (90-60°C)	58,4	58	kW
	-	-	kW

\*DEK INNOBEE(4)4 - 43.3.MWSP(C)P

HeatMaster 201

## CONTROL PANEL AND DISPLAY



### Panel Description

1. **Pressure gauge** - Indicates the primary circuit pressure (min. 1 bar when cold).
2. **ACVMAX LCD Display** - It is the setup interface of the appliance and indicates the parameter values, the error codes and the set-up status of the parameters. It displays a series of screens, each showing information and/or icons. The main icons are detailed on the right.
3. **Installer button** - Allows the installer to access the menus of the ACVMAX controller to set up the system.
4. **Arrow keys and OK key** - to browse through the screens of the ACVMAX controller, set up the appliance, increase and decrease the displayed values and validate the selections and access the Easy set-up screens. The OK key is also used to RESET the appliance after a locking (follow the instructions on the screen).
5. **ON/OFF master switch of the appliance** - To turn the appliance ON and OFF.

### Main settings of ACVMAX Display

- **Screen backlight** - it will illuminate when any button is depressed, and remain illuminated for five minutes.
- **Screen contrast** - it can be adjusted at the Home screen by pressing and holding the OK button, then pressing and holding the LEFT button along with the OK button. Press the UP and DOWN button to increase or decrease the contrast while holding the OK and LEFT buttons depressed. All buttons must be released and the procedure performed again to switch between increasing and decreasing contrast.

### Main Icons of ACVMAX display

- Central Heating** - indicates information related to the CH circuit.
- DHW** - indicates information related to the Domestic Hot Water circuit.
- Home** - to go back to the main menu screen.
- Back** - to go back to the previous screen.
- Warm weather shutdown** - displays on the home screen when the outdoor temperature reaches the Warm Weather Shutdown preset temperature.
- Reset** - to reset the system to the factory settings.
- Parameters** - to access to the setup of controller parameters (language, units, etc.).
- Easy setup** - Indicates parameters that can be accessed through the EZ setup.
- CH/DHW operation** - To enable/disable the concerned circuit.
- Information** - To get information on the appliance.

### Typical items shown on the Home screen:

The appliance type is indicated at the top of the screen. The type and model are factory preset.

The appliance is represented in the centre of the Home Screen. Basic operating information such as supply and return temperatures are displayed as well as current burner status.

**Radiator icon:** indicates that a central heating call has been received. A small number 1 or 2 indicates which CH calls are active.

A flame symbol is displayed when the unit is fired. The flame size changes to indicate the current firing rate.

**Basic information.** The user can toggle the items using the LEFT and RIGHT keys and view target, Supply, Return, Domestic, Outdoor and System temperatures.

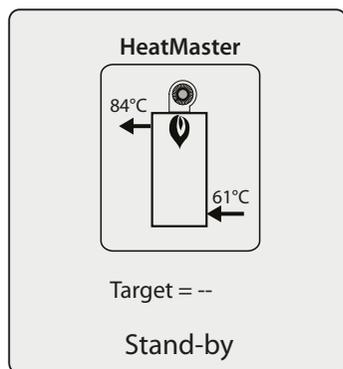
**Tap icon:** indicates that a DHW call has been received.

**Circulator icons:** indicate which circulators are currently powered.

**Status line:** displays the current operating state of the appliance. See "Status Messages" on page 7.

## STAND-BY SCREEN

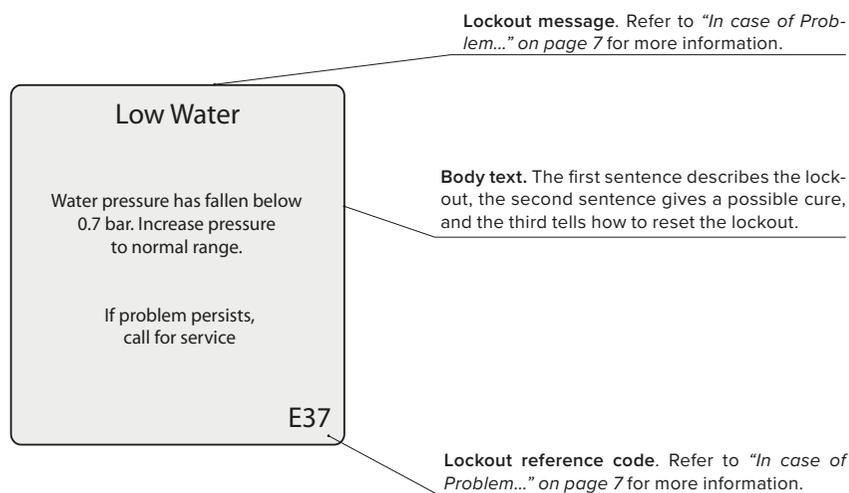
This screen is displayed at start-up. It indicates that the appliance is ready to respond when a demand is received.



## LOCKOUT SCREEN

If a problem occurs, the Lockout screen replaces the Home screen. The backlight also remains on as long as the problem is not solved. Pressing any arrow button will return to the Home screen.

Using the code located in the right bottom corner of the screen, troubleshoot the problem, either with the table located in paragraph "In case of Problem..." on page 7, or with the Lockout code table in the Installer's Handbook (for the installer only).



## STATUS MESSAGES

<b>Stand-by</b>	Indicates that the appliance is ready to respond when a demand is received.
<b>CH Demand</b>	A central heating call has been received.
<b>DHW Demand</b>	A domestic hot water call has been received.
<b>CH / DHW Demand</b>	Central heating and domestic hot water calls are being received simultaneously. Both calls are being satisfied simultaneously because domestic hot water priority has been disabled.
<b>DHW Priority</b>	Central heating and domestic hot water calls are being received simultaneously. Domestic hot water call is being satisfied first because it has priority over central heating calls.
<b>Priority Timeout</b>	Central heating and domestic hot water calls are being received simultaneously. The domestic hot water priority time limit has been exceeded. Priority will now switch back and forth between central heating and domestic hot water calls until one call is satisfied.
<b>External Demand</b>	An external modulation call has been received.
<b>Manual Operation</b>	The burner or circulators have manually been enabled in the Installer Menu.
<b>CH Burner Delay</b>	The burner will not fire until the call blocking time has elapsed.
<b>DHW Burner Delay</b>	The burner will not fire until the call blocking time has elapsed.
<b>CH Setpoint Reached</b>	The burner is not fired because the supply/system water temperature exceeds the setpoint. The central heating circulator continues to operate and the burner will fire again once the supply/system water temperature drops below the setpoint.
<b>DHW Setpoint Reached</b>	The burner is not fired because the supply/system water temperature exceeds the setpoint. The domestic circulator continues to operate and the burner will fire again once the supply/system water temperature drops below the setpoint.
<b>CH Post Pump</b>	The central heating circulator is running to remove heat from the HeatMaster at the completion of a call.
<b>DHW Post Pump</b>	The domestic hot water circulator is running to remove heat from the HeatMaster at the completion of a call.
<b>Freeze Protection</b>	The burner is fired because the freeze protection feature has been activated. Freeze protection will end once the supply/system water temperature is raised to 16°C.
<b>Boiler Protection</b>	The burner firing rate is being reduced because of an excessive difference between the appliance supply and return temperatures. The firing rate will begin increasing once the temperature difference is less than 25°C.
<b>Lockout Description</b>	The lockout which currently has the HeatMaster shut down is displayed

## WHAT TO CHECK ON A REGULAR BASIS

### Essential recommendations for the correct operation of the appliance

ACV recommends to check the system at least every 6 months as follows:

- Check that the system water pressure is at least 1 bar when cold. If the pressure drops below 0.7 bar, the built-in pressure sensor blocks the appliance until the pressure exceeds 1.2 bar.
- If it is required to top up the system to maintain the minimum recommended water pressure, always turn the appliance off and only add small amounts of water at a time. If a large amount of cold water is added in a hot appliance, the appliance can be damaged definitively.
- If the system needs to be refilled repeatedly with water, please contact your installer.
- Check that there is no water on the floor under the appliance. If there is, please call your installer.
- Check regularly that there is no error message (lockout) on the screen. A typical lockout screen is explained on the previous page. Refer also to the Troubleshooting table below or call your installer as required.

### IN CASE OF PROBLEM...

Check the list of faults and corresponding codes below to get the solution(s). If no solution is provided here, please contact your installer who will determine the correct solution by referring to "Locking Codes" on page 36.

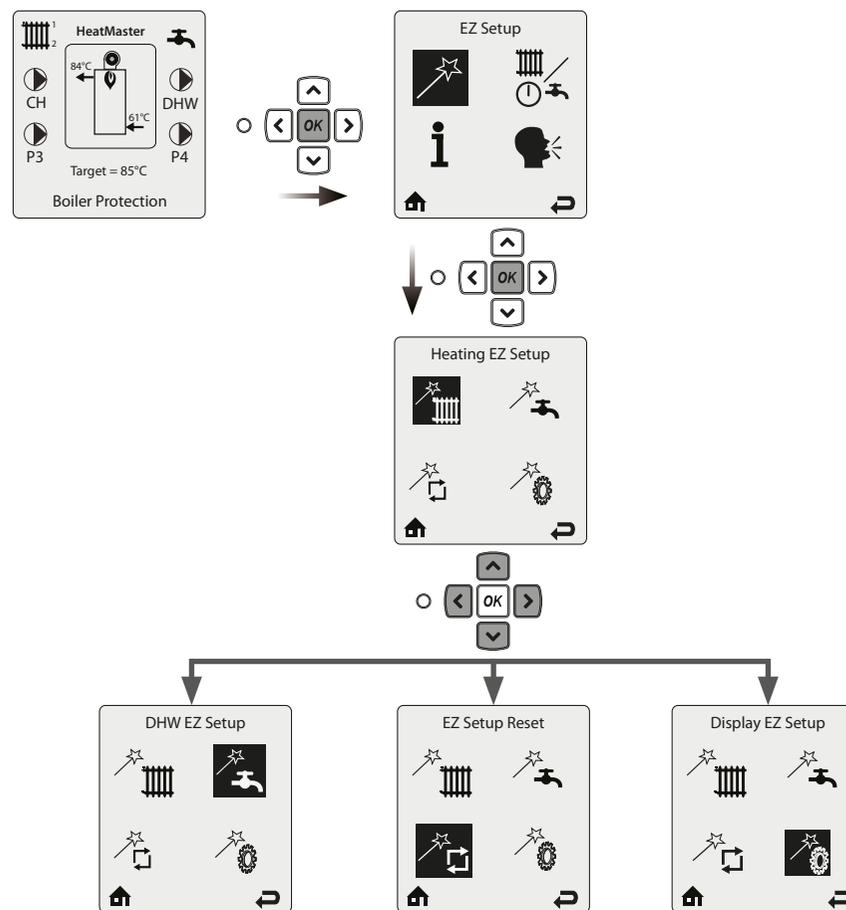
Fault code	Problem	Possible Cause(s)	Solution
-	The appliance does not turn on when pressing the ON/OFF Master switch	No power supply	Check the power supply and that the appliance power plug is connected to the network.
E 01	Failed ignition	The burner failed to light after 5 ignition attempts	Check gas supply to the appliance.
E 13	Reset limit reached	Resets are limited to 5 every 15 minutes	Turn unit OFF and ON to resume normal operation.
E 34	Low voltage	Line voltage has fallen below an acceptable operating level	The appliance will automatically reset once line voltage returns to normal.
E 37	Low Water	Water pressure has fallen below an acceptable operating level (0.7 bar)	Refill the system to reach a normal range pressure. The appliance will automatically reset once water pressure returns to normal.
E 94	Internal Display Fault	Display memory error	Turn appliance off and on to resume normal operation.

## SETUP GUIDE

The main parameters of the HeatMaster boiler can be set up using the EZ (easy) setup function of the ACVMax controller. The EZ setup function allows the user/installer to quickly set up the appliance for immediate operation according to the system configuration\*.

### General remarks

- To navigate on the screen, use the **UP**, **DOWN**, **LEFT** and **RIGHT** keys, then the **OK** key to validate a selection. A selection is marked by a black background under the selected icon/text.
- To increase/decrease values, use the **UP** and **DOWN** keys or the **LEFT** and **RIGHT** keys according to the situation.

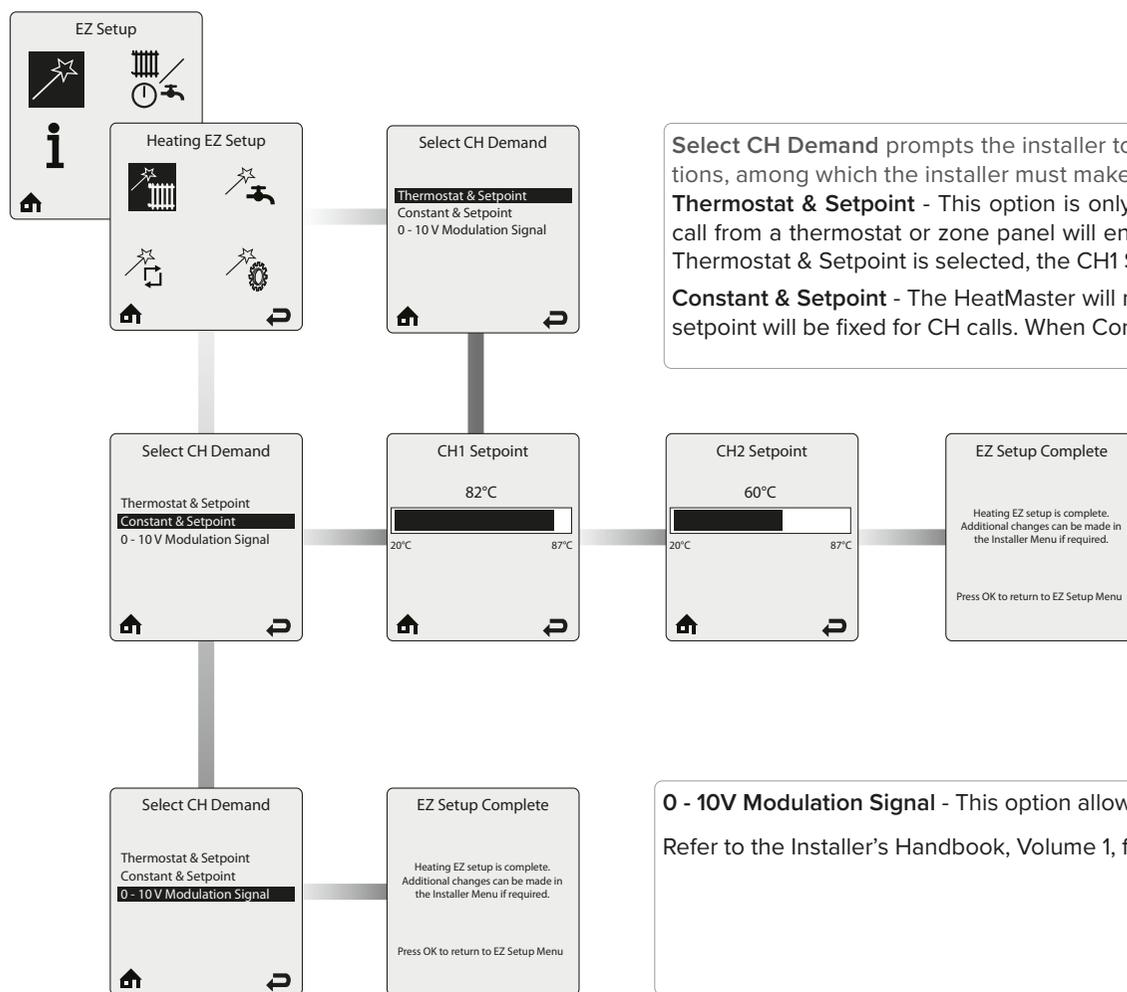


\* In case of complex systems, the setup must be performed by an approved installer using the Installer's Handbook.



## Heating Easy setup (no outdoor sensor connected)

- To navigate on the screen, use the **UP**, **DOWN**, **LEFT** and **RIGHT** keys,
- Use the **OK** key to validate a selection.
- To increase/decrease values, use the **UP** and **DOWN** keys, or **LEFT** and **RIGHT**, according to the situation.



**Select CH Demand** prompts the installer to select how a CH Demand is generated. There are three Select CH Demand options, among which the installer must make a selection.

**Thermostat & Setpoint** - This option is only displayed when no outdoor temperature sensor is connected. A central heating call from a thermostat or zone panel will enable the HeatMaster and the setpoint will be fixed for central heating calls. When Thermostat & Setpoint is selected, the CH1 Setpoint screen appears.

**Constant & Setpoint** - The HeatMaster will maintain setpoint without an external CH call from a thermostat or zone panel. The setpoint will be fixed for CH calls. When Constant & Setpoint is selected, the CH1 Setpoint screen appears.

**CH1 Setpoint** prompts to enter the fixed setpoint for a CH1 heating call when a Setpoint option is chosen in Select CH Demand. Press on **LEFT** or **RIGHT** button to adjust the required temperature setpoint then press **OK** to store the setting. The **CH2 Setpoint** screen appears.

**CH2 Setpoint** prompts to enter the fixed setpoint for a CH2 heating call when a Setpoint option is chosen in Select CH Demand. Press on **LEFT** or **RIGHT** button to adjust the required temperature setpoint then press **OK** to store the setting and complete the Heating setting.

**CH1 Default: 82°C.**

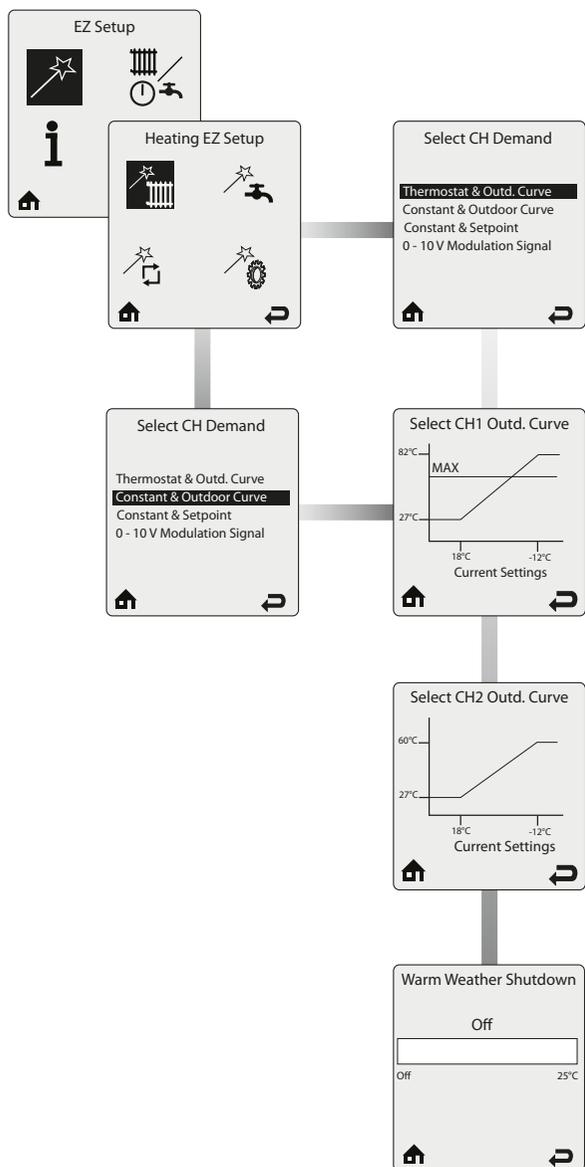
**CH2 Default: 60°C**

**0 - 10V Modulation Signal** - This option allows the HeatMaster firing rate to be controlled by an external control system.

Refer to the Installer's Handbook, Volume 1, for more information.



Heating Easy Setup (outdoor sensor connected)



**Select CH Demand** prompts the installer to select how a CH Demand is generated. There are several Select CH Demand options, among which the installer must make a selection.

**Thermostat & Outd. Curve** – This option is only displayed when the outdoor temperature sensor is connected. A central heating call from a thermostat or zone panel will enable the appliance and the setpoint will vary with the outdoor temperature for central heating calls.

**Constant & Outdoor Curve** - This option is only displayed when the outdoor temperature sensor is connected. The HeatMaster will maintain the setpoint without an external call from a thermostat or zone panel. The setpoint will vary with the outdoor temperature for central heating calls.

**Select CH1 Outd. Curve** prompts to select an outdoor curve for a CH1 heating call when an Outdoor Reset option is chosen in Select CH Demand. Outdoor curve presets are available to cover most applications. The outdoor curve can also be adjusted to any desired settings in the Installer Menu (refer to Installer's Handbook).

Press on **UP** or **DOWN** button to select the outdoor reset curve appropriate for the type of heating system, then press **OK** to store the setting.

**Default: Systems with a temperature between 27°C and 82 °C.**

**Select CH2 Outd. Curve** prompts to select an outdoor curve for a CH2 heating call when an Outdoor Reset option is chosen in Select CH Demand. Outdoor curve presets are available to cover most applications. The outdoor curve can also be adjusted to any desired settings in the Installer Menu (refer to Installer's Handbook).

Press on **UP** or **DOWN** button to select the outdoor reset curve appropriate for the type of heating system, then press **OK** to store the setting.

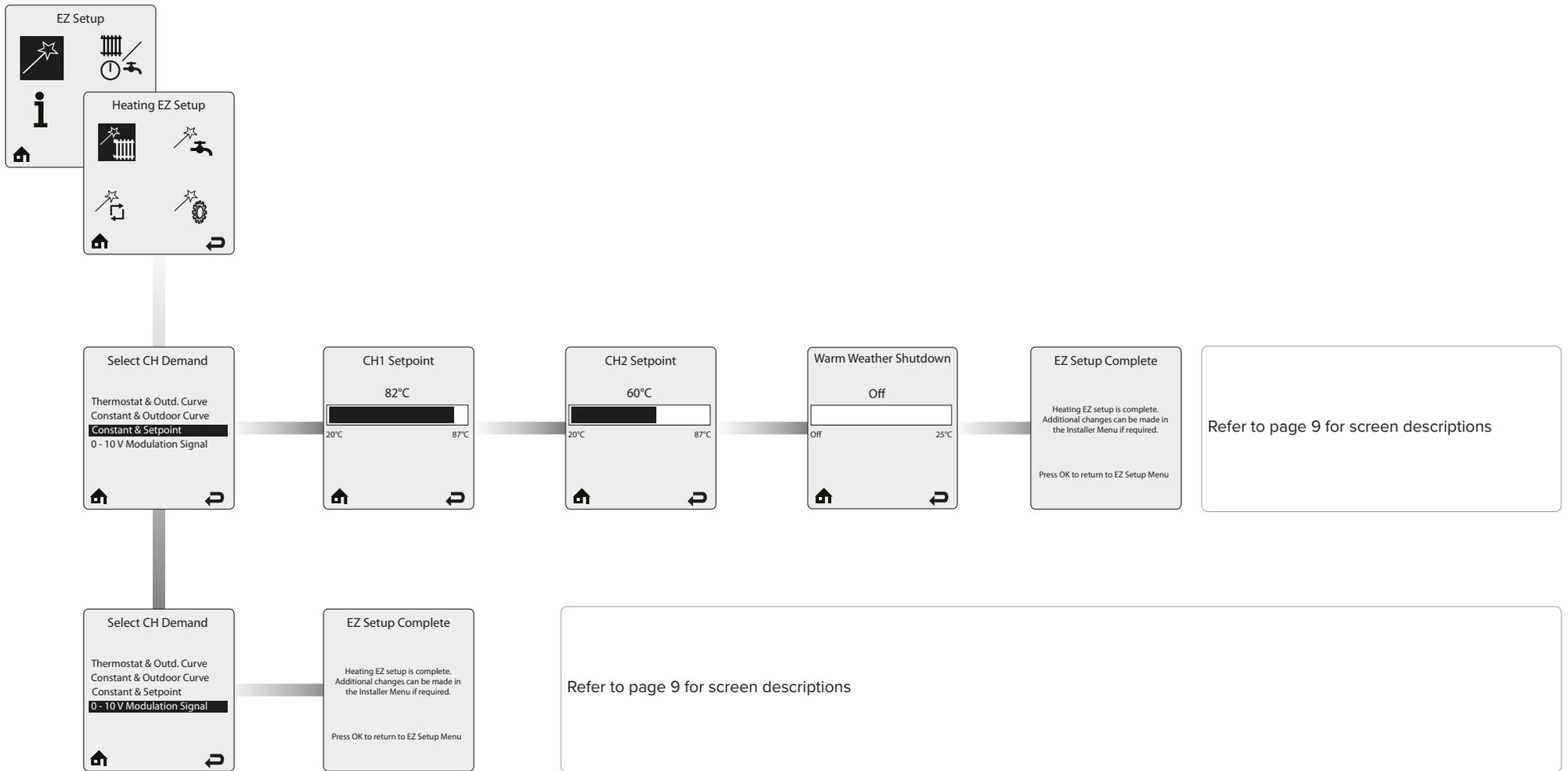
**Default: Systems with a temperature between 27°C and 60 °C**

**Warm Weather Shutdown** allows to enter an optional outdoor temperature at which to disable the central heating function. The HeatMaster will continue to respond to a domestic hot water call or a 0- 10V Modulation Signal when the outdoor temperature exceeds the Warm Weather Shutdown Temperature setting.

Press the **LEFT** or **RIGHT** buttons to adjust the Warm Weather Shutdown Temperature then press the **OK** button to store the setting and complete the Heating setting.

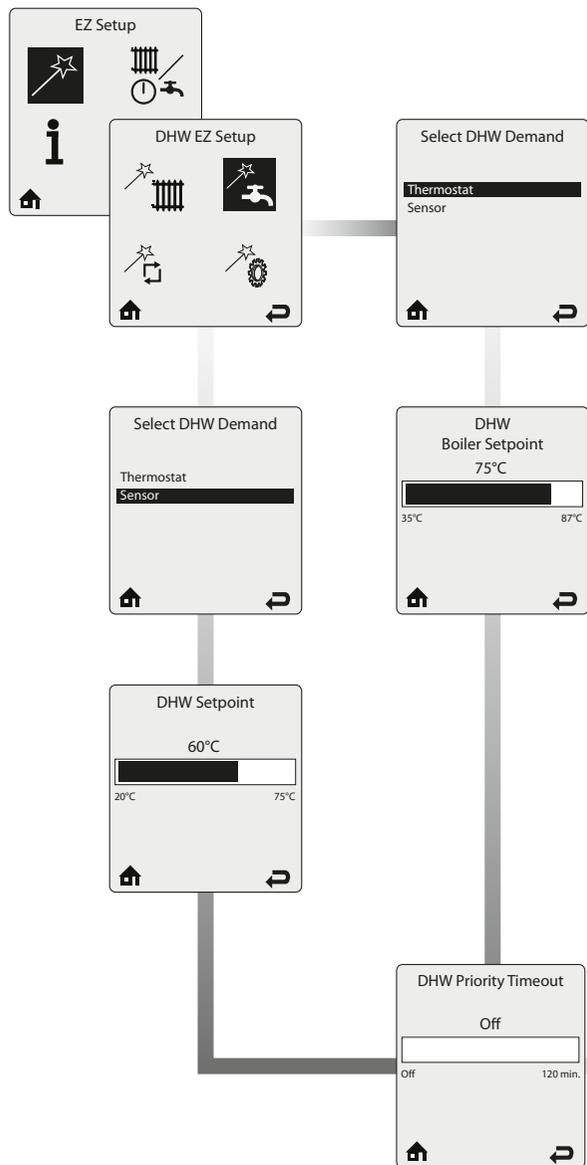
The Warm Weather Shutdown icon (🌡️) is displayed on the home screen when the outdoor temperature reaches the Warm Weather Shutdown preset temperature.

**Default: OFF.**





DHW Setup



**Select DHW Demand** prompts the installer to select how a DHW Demand is generated. There are two Select DHW Demand options, among which the installer must make a selection.

When **Thermostat** is selected in Select DHW Demand, a domestic hot water call from an aquastat or dry contact switch will enable the appliance with a fixed setpoint for a domestic hot water call..

When **Sensor** is selected in Select DHW Demand, it requires the use of an optional Indirect Water Heater Sensor. The appliance monitors the DHW storage temperature and generates a DHW call whenever the temperature drops below the DHW storage setpoint by 3°C.

**Default : Sensor**

**DHW Boiler Setpoint** prompts to enter the fixed appliance setpoint temperature during a hot water call when the Thermostat option is selected.

Press on **LEFT** or **RIGHT** button to adjust the required temperature setpoint then press **OK** to store the setting.

**Default: 75°C.**

**DHW Setpoint** prompts to enter the DHW storage setpoint temperature.

Press on **LEFT** or **RIGHT** button to adjust the required temperature setpoint then press **OK** to store the setting.

**Default: 60°C.**

**i** The Boiler DHW Setpoint will automatically be set 15°C higher than the DHW Setpoint setting

**DHW Priority Timeout** prompts to enter an optional time limit that a domestic hot water call has priority over central heating call (HeatMaster only).

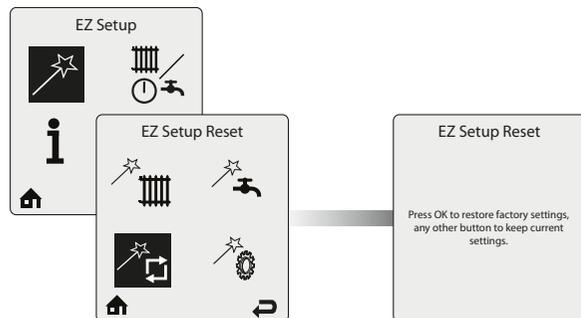
Press on **LEFT** or **RIGHT** button to adjust the required timeout value, if required, then press **OK** to store the setting and complete the DHW setting.

**Default: Off**

**EZ Setup Complete**  
 DHW EZ setup is complete. Additional changes can be made in the Installer Menu if required.  
 Press OK to return to EZ Setup Menu

Starting from the Home screen :

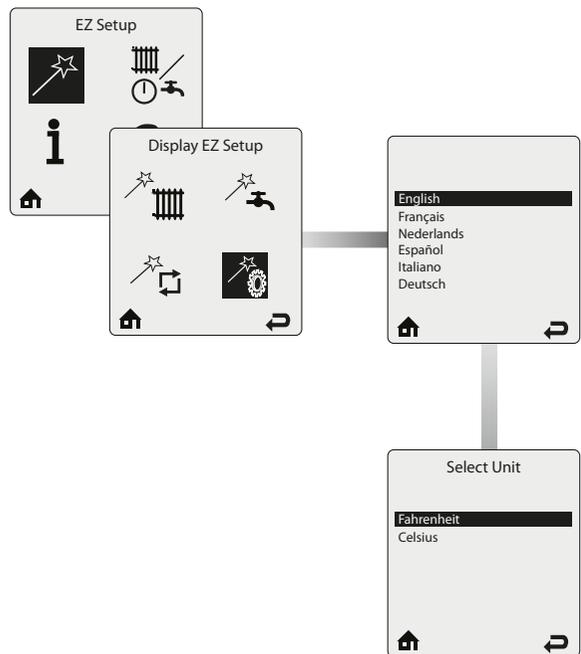
 Easy Setup Reset



**EZ Setup Reset** allows to reset all EZ setup settings back to the original factory defaults.

Follow the on-screen instructions to reset all EZ setup settings.

 Display Easy Setup

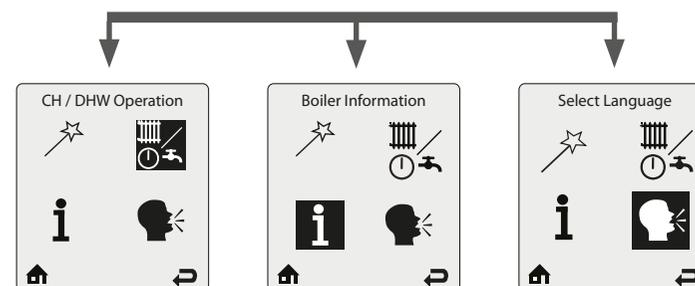
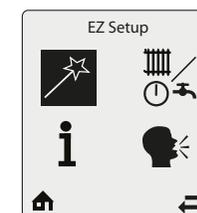
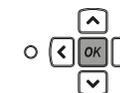
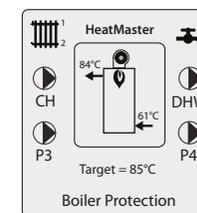


**Display EZ Setup** allows to select the interface language (Nine different languages: English, French, Dutch, Spanish, Italian, German, Czech, Polish and Russian).

Press on **UP** or **DOWN** button to select the required language then press **OK** to store the setting.

**Display EZ Setup** allows to select the interface temperature unit.

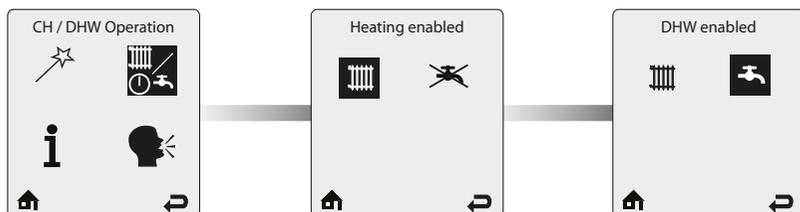
Press on **UP** or **DOWN** button to select the required unit then press **OK** to store the setting.



Selecting this icon and validating the selection with the OK key allows to access directly to the language selection page (see on the left)



CH/DHW Operation



**CH/DHW Operation** provides a simple way to enable/disable either the CH or the DHW function of the appliance.

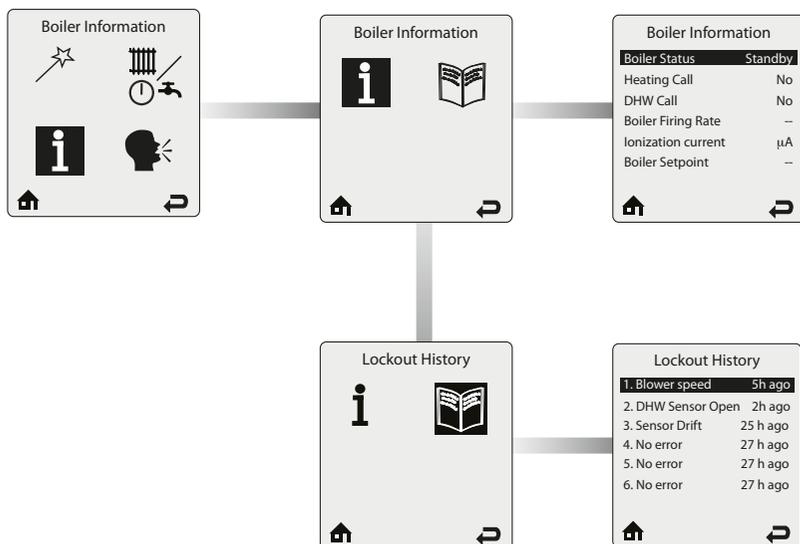
Press on **LEFT** or **RIGHT** button to select the object (CH or DHW icon), then press **OK** to toggle between the enabled/disabled status. The status of the circuit is displayed at the top of the screen.

Using the arrow keys, select the **HOME** or **RETURN** icon at the bottom of the screen to go back either to the home page or to the previous screen respectively.

Default:  



Boiler Information



**Boiler Information** screen provides real time operating information of the appliance. Each line contains an information item followed by its current value. Six lines are displayed on the screen at one time.

Press on **UP** or **DOWN** button to scroll through the items. For more information, refer to the Installer's Handbook of the appliance.

Boiler Information	
Boiler Status	Standby
Heating Call	No
DHW Call	No
Boiler Firing Rate	--
Ionization current	µA
Boiler Setpoint	--

Lockout History	
1. Blower speed	5h ago
2. DHW Sensor Open	2h ago
3. Sensor Drift	25 h ago
4. No error	27 h ago
5. No error	27 h ago
6. No error	27 h ago

Lockout Details	
Blower speed	
Boiler Status	--
Heating Call	--
DHW Call	--
Boiler Firing Rate	44%
Ionization current	44µA

**Lockout History** records the last eight lockouts. Six lines are displayed on the Lockout History screen at one time. Each line contains a lockout description followed by how long ago the lockout occurred.

Press on **UP** or **DOWN** button to scroll through the items and on **OK** to select any of them and get more details through the **Lockout Details** screen. For more information, refer to the Installer's Handbook of the appliance.

## HEATMASTER® 201

The **HeatMaster® 201** boiler is equipped with ACV's "Tank-in-Tank" concept, as well as high efficiency charging pumps and with an ACV air/gas premix burner BG-2000 M with low NOx emissions. During operation, the burner starts automatically as soon as the appliance temperature gets lower than the preset temperature and stops as soon as the preset temperature is reached.

The **HeatMaster® 201** features a built-in frost protection mechanism: as soon as the flow temperature [NTC1 probe] drops below 7°C, the central heating pumps are activated. As soon as the flow temperature is at 5°C, the burner starts up until the flow temperature rises above 15°C. The pumps continue to run for around 10 minutes. The function can be enabled or disabled through the installer menu. When the frost protection is disabled, only the pumps operate.

An anti-freeze function is also available if an outdoor temperature sensor is connected, the pumps are activated when the outside temperature drops below the threshold defined through the Freeze protection function in the installer menu. In order to enable the appliance to protect the whole system against freezing, all the valves of the radiators and the convectors should be completely open.

## CONFIGURATION IN A SYSTEM

The boiler can be set up in different types of systems, either high or low temperature, or both, with or without external Domestic Hot Water tank. It is up to the installer to determine the best solution and reach the results the user is expecting.

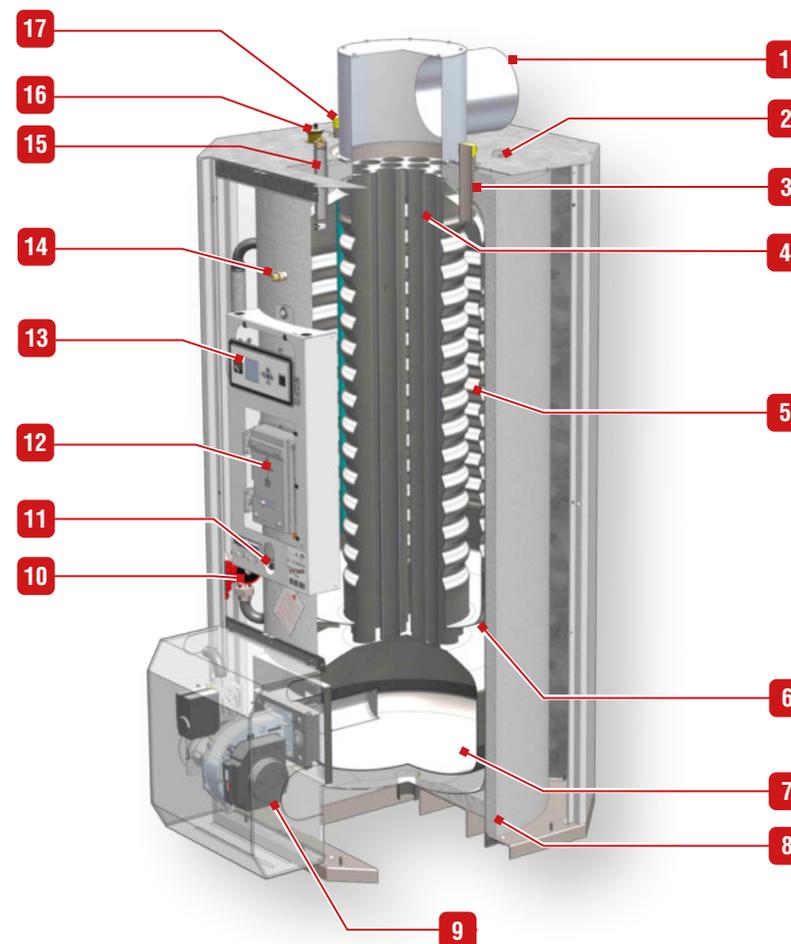
A basic configuration is shown in this manual for HeatMaster 201 (see "Configuration and system set-up" on page 30), with the required accessories, required electrical connections and ACVMax set up using the EZ setup function.

Additional configurations requiring a more advanced setup are shown in the Installer's Handbook, available on the ACV website ([www.ACV.com](http://www.ACV.com)). The setup of those systems must be made exclusively by the installer using the installer code.

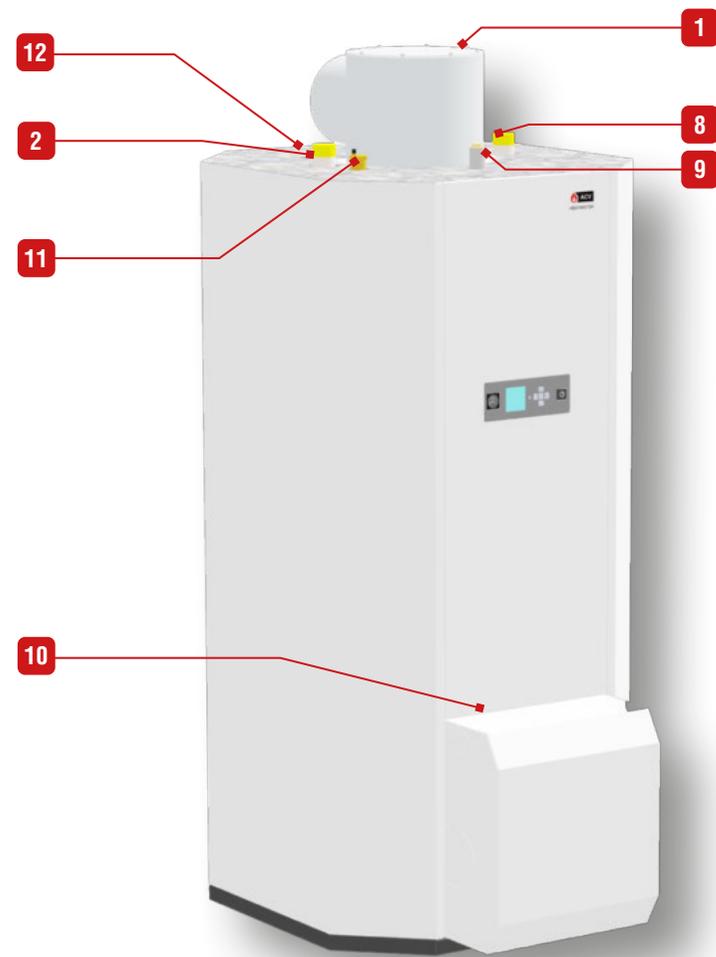
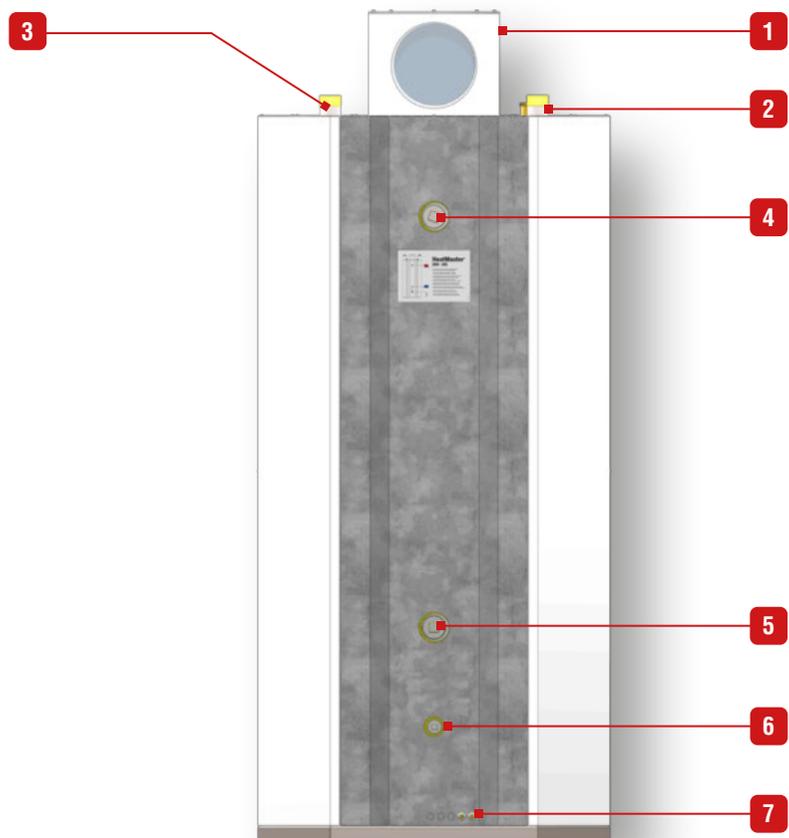
For any other configuration that is not mentioned in either manual, please contact your ACV representative.

- |  |   |
|--|---|
| 1. Chimney reduction with horizontal outlet Ø 250 mm | 10. Circulator pump (2x - only one shown)           |
| 2. DHW tank dry-well + NTC3 sensor                   | 11. Pressure sensor                                 |
| 3. DHW hot water outlet                              | 12. Electrical panel (with spare fuses at the back) |
| 4. Flue gas tubes and turbulators                    | 13. ACVMax Control panel                            |
| 5. Stainless steel hot water production tank         | 14. Pressure gauge (primary circuit)                |
| 6. Primary circuit tank                              | 15. Connection for recirculation (DHW)              |
| 7. Combustion chamber                                | 16. Automatic air vent                              |
| 8. Foam insulation                                   | 17. Cold water inlet + dip tube                     |
| 9. Air/gas premix burner                             |   |

## HEATMASTER® 201 OVERVIEW



CONNECTIONS - AT THE BACK AND ON THE TOP



- |   |   |
|---|---|
| 1. Chimney reduction with horizontal outlet Ø 250mm     | 8. NTC primary supply sensor                                |
| 2. Cold Water inlet [M]                                 | 9. Connection for recirculation (DHW) (optional)            |
| 3. Domestic Hot Water outlet [M]                        | 10. Pre-cut panel for gas connection (left and right sides) |
| 4. Heating supply connection [F]                        | 11. Auto air vent   |
| 5. Heating return connection [F]                        | 12. Filling loop connection                                 |
| 6. Drain valve  |   |
| 7. Grommets for electrical connection (to be installed) |   |

## AIR/GAS PRE-MIX BURNERS ACV BG 2000-M/201

### Operation

The power continually adjusts itself according to demand; this greatly improves the operating efficiency for heating and hot water.

The burner tube is covered with a metal fibre (NIT), which, besides its remarkable heat exchange capacity, guarantees longer burner life.

The burner's main components are:

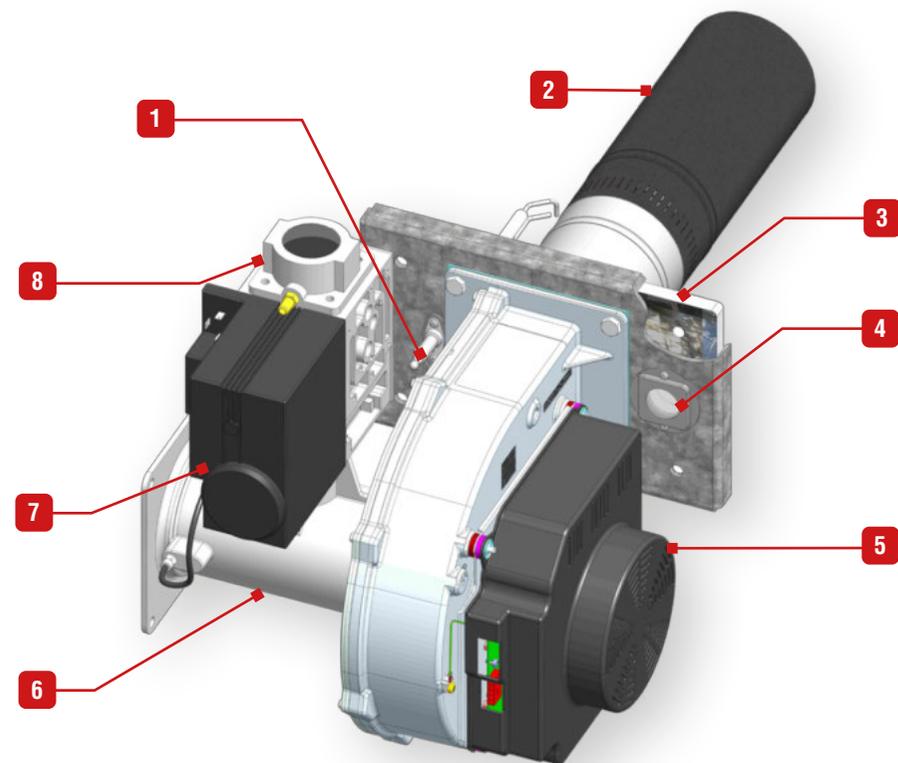
- a variable speed fan
- an automatic ignition and flame detection system
- a gas valve and venturi tube set specially developed for low NOx pre-mix air/gas burners

Gas pressure in the gas valve outlet is kept equal to the absolute air pressure in the venturi tube inlet, corrected by the offset adjustment on the regulator.

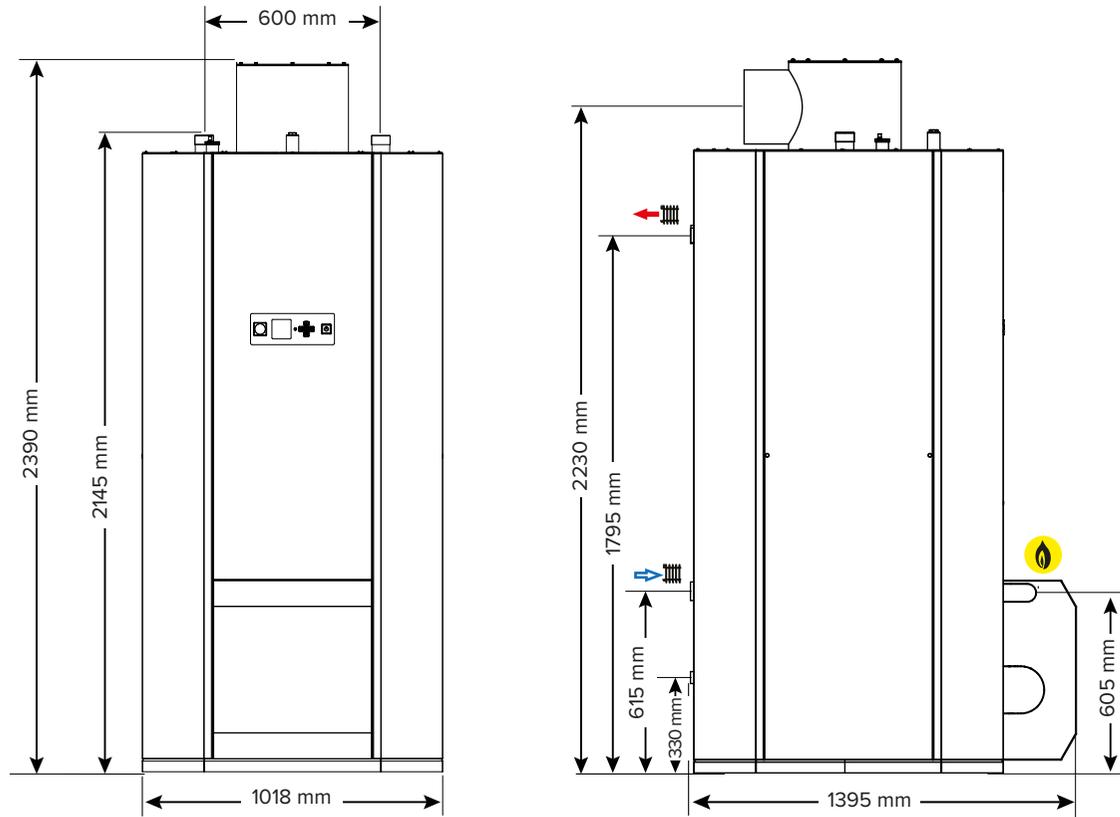
The fan pulls the combustion air through the venturi tube whose neck is connected to the gas valve outlet. The pressure differential created at the neck of the venturi tube by the airflow rate induces gas intake proportional to its level (the larger the air flow rate, the greater the differential and there is a larger quantity of gas intake). The air/gas combination is then introduced into the burner via the fan.

### THIS PRINCIPLE GUARANTEES SAFE AND QUIET OPERATION:

- In the event of low air flow, the differential across the venturi tube falls, the gas flow rate diminishes, the flame extinguishes and the gas valve closes: the burner is then in safety mode.
- In the event of flue blockage or restriction, the air flow rate falls, and there are then the same reactions as those described before causing burner stop in safety mode.
- The BG 2000-M burner installed on the HeatMaster® 201 model is controlled by an ACVMax Honeywell controller which manages both the burner safety function and its modulation according to temperature.



1. Ignition and ionisation electrode
2. Burner tube
3. Burner insulation
4. Flame sight glass
5. Fan
6. Venturi tube
7. Gas valve
8. Gas connection

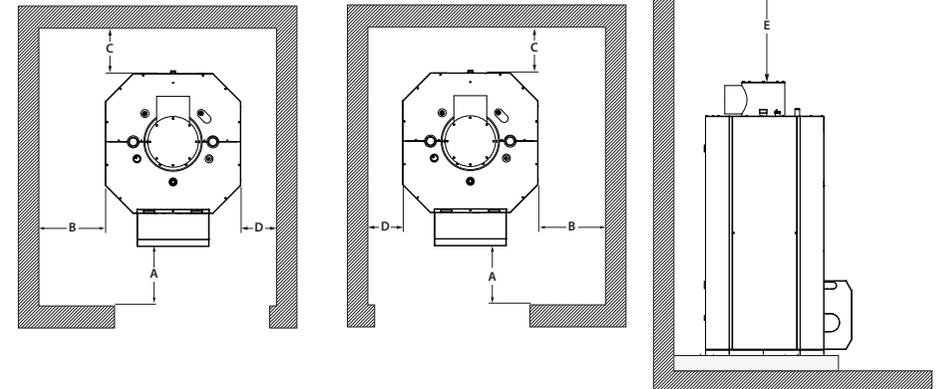
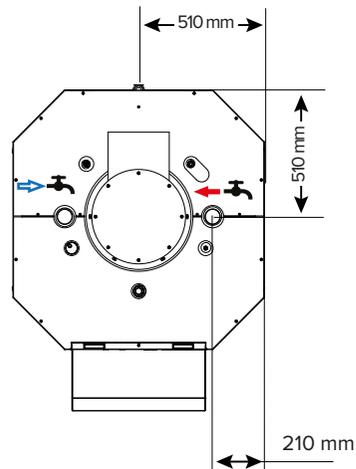


**DIMENSIONS**

Appliance Dimensions		HM 201
Heating Connection [F]	"	2
DHW Connection [M]	"	2
Gas connection [M]	"	1 1/4
min. Ø of flue pipe	mm	150
Drained weight	Kg	635

**CLEARANCE**

Appliance Clearance		HM 201
A (mm)	Recommended	1000
	Minimum	800
B (mm)	Recommended	800
	Minimum	700
C (mm)	Recommended	1000
	Minimum	800
D (mm)	Recommended	300
	Minimum	250
E (mm)	Recommended	1300
	Minimum	1100



## COMBUSTION CHARACTERISTICS

Main Characteristics			HM201
			G20/G25
Input (PCI)	max	kW	220.0
	min	kW	58.4
Output at 100%	(80/60°C)	kW	198.0
	(50/30°C)	kW	—
Efficiency at 100%	(80/60°C)	%	91.0
	(50/30°C)	%	—
Efficiency at 30% load (EN677)		%	94.0
Combustion efficiency	at 100%	%	91.5
	Max. output	mg/kWh	68.0
NOx (Class 5)	Min. output	mg/kWh	45.0
	Weighted	mg/kWh	43.0
	Max. output	ppm	4
CO	Min. output	ppm	2
	Max. output	%CO <sub>2</sub>	9.5
CO <sub>2</sub>	Min. output	%CO <sub>2</sub>	8.9
	Max gas flow rate G20/G25	20 mbar	m <sup>3</sup> /h
25 mbar		m <sup>3</sup> /h	29.5
Temp of flue gases	Average	°C	150
	Max.	°C	194
	Min.	°C	92
	Average temp. of combustion products	DHW mode	°C
Mass flow rate* of flue gases	Nominal	g/s	113
	ΔT = 45 K	W	678
Standby loss	ΔT = 30 K	W	408

\* Mass flow rate values were calculated for G20 with an air factor of 1.3.

## CHIMNEY CONNECTION CHARACTERISTICS

Main Characteristics			HM201
Air/flue pipe Ø	Parallel	mm	250
Max. allowed flue pipe pressure drop		Pa	130
Max recommended length (corresponding length in meters of straight pipes)			12 m
Available connection types			B23 - B23P - C53(x)

## FLUE PIPE CONNECTION TYPES

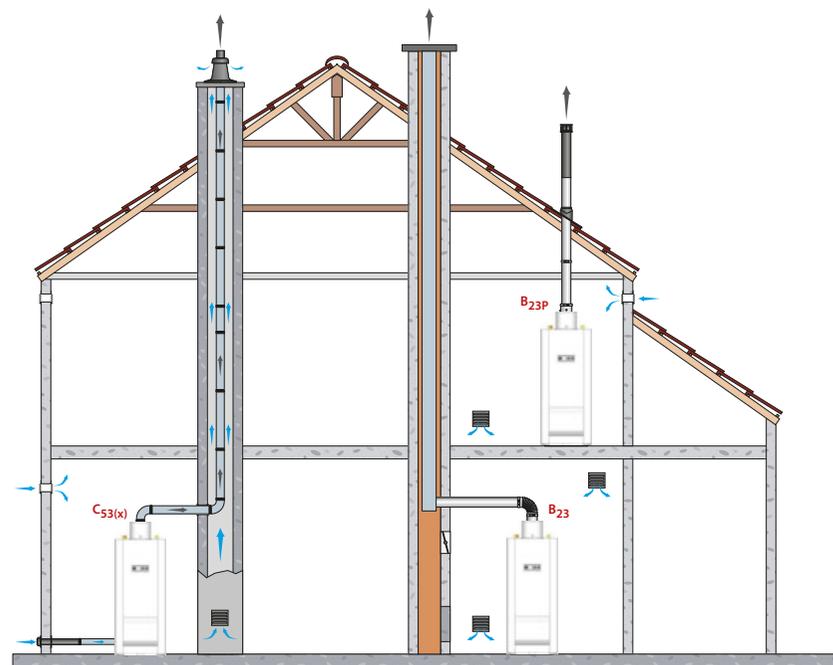
 It is mandatory to use ACV flue systems to connect the appliance.

**B23** : Connection to an exhaust duct that discharges the combustion products outside the room where it is installed, with the combustion air being drawn directly from the boiler room.

**B23P** : Connection to a combustion product exhaust system designed to operate with positive pressure.

**C53(x)** : Connection to separate ducts for supplying combustion air and discharging combustion products; these ducts may end in zones with different pressure levels, but are not allowed to be installed on opposite walls of the building.

 It is mandatory to ventilate the boiler room. The high or low air vent opening dimensions depend on the appliance power and the boiler room size. Refer to the local regulations in force.



**GAS CATEGORIES**

Gas type		G20	G25		G20 ⇄ G25
Pressure (mbar)		20	20	25	20 ⇄ 25
Country code	Category				
AT	l2H	●			
	l3P				
	l3B/P				
BE	l2E(S)				●
	l2E(R)				
	l3P				
CH	l2H	●			
	l3P				
	l3B/P				
CY	l2H	●			
	l3B/P				
CZ	l2H	●			
	l3P				
DE	l2E	●			
	l2ELL	●	●		
	l3P				
	l3B/P				
DK	l2H	●			
	l3B/P				
EE	l2H	●			
	l3B/P				
ES	l2H	●			
	l3P				
FR	l12Er	●		●	
	l3P				
	l3B/P				
GB	l2H	●			
	l3P				
GR	l2H	●			
	l3P				
HR	l2H	●			
	l3P				
	l3B/P				
HU	l2HS	●			
	l3B/P				

Gas type		G20	G25		G20 ⇄ G25
Pressure (mbar)		20	20	25	20 ⇄ 25
Country code	Category				
IE	l2H	●			
	l3P				
IT	l2H	●			
	l3P				
	l3B/P				
LT	l2H	●			
	l3P				
	l3B/P				
LU	l2E	●			
	l3B/P				
LV	l2H	●			
NL	l2L			●	
	l3P				
	l3B/P				
NO	l2H	●			
	l3B/P				
PL	l2E	●			
	l3P				
PT	l2H	●			
	l3P				
RO	l2E	●			
	l2H	●			
	l3P				
SE	l3B/P				
	l2H	●			
	l3B/P				
SI	l2H	●			
	l3P				
SK	l3B/P				
	l2H	●			
	l3P				
TR	l3B/P				
	l2H	●			

## ELECTRICAL CHARACTERISTICS HEATMASTER® 201

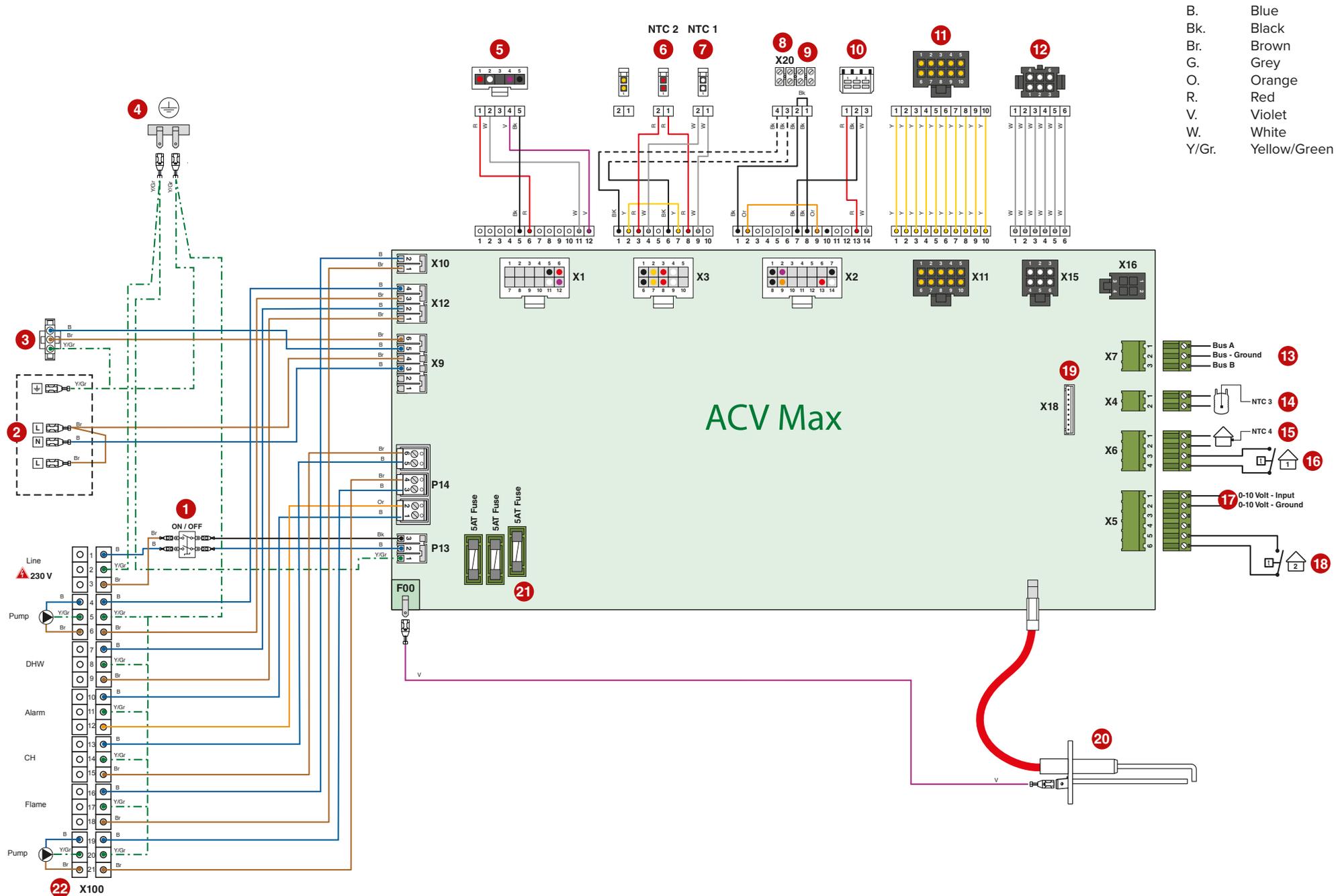
			HM 201
<b>Main Characteristics</b>			
Rated voltage	V~		230
Rated frequency	Hz		50
Electrical consumption	Max.	W	525
	Min.	W	210
Electrical consumption at 30% load	W		240
Electrical consumption in standby	W		5
Rated current (Fuse)	A		10
Class	IP		40

## Key

1. ON/OFF master switch
  2. Gas valve
  3. Burner power supply
  4. Ground
  5. Burner PWM plug
  6. NTC2 return sensor
  7. NTC1 supply sensor
  8. NTC - Low temperature circuit
-  **For low temp circuit operation, black wires from X3, terminals 1 & 6 must be routed to X20, terminals 3 & 4.**
9. High limit switch
  10. Low water pressure sensor
  11. PCB (Display)
  12. ACVMax programming plug
  13. A & B Modbus (option)
  14. NTC3 DHW sensor
  15. NTC4 outdoor temperature sensor (option)
  16. Room thermostat 1 (option)
  17. 0-10 Volt (option)
  18. Room thermostat 2 (option)
  19. Ignition and ionization cable
  20. Connection for Interface Control Unit (option)
  21. 5AT slow-blow fuse (3x) for internal and optional circuits\*
  22. Terminal block :
    - Line  **230 VAC OUTPUT !**
    - Pump
    - DHW
    - Alarm
    - CH
    - Flame
    - Pump

\* 5AT slow-blow fuse (2x) for internal circuits and connection of CH, DHW and Flame output + 5AT slow-blow fuse (1x) for connection of Alarm, P3 and P4 (connector P14).

 2 spare 5AT slow-blow fuses are located on the back side of the electrical box, for fuse replacement, if required.

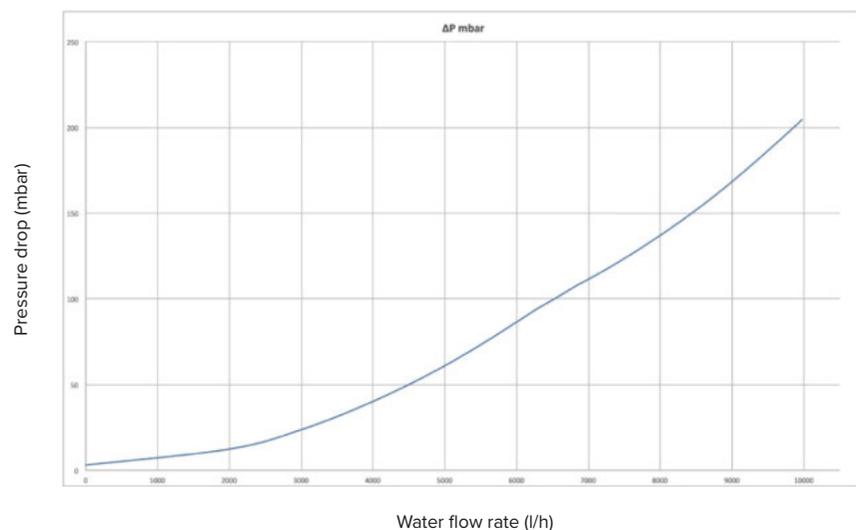


## HYDRAULIC CHARACTERISTICS

Main Characteristics		HM 201
Capacity (primary)	L	241
Capacity (DHW)	L	400
Water pressure drop (primary circuit) ( $\Delta t = 20$ K)	mbar	240

## HYDRAULIC PRESSURE DROP CURVE OF THE APPLIANCES

HeatMaster® 201



## DHW PERFORMANCE

## Domestic hot water performance\* (cold drink water at 10°C)

Operating conditions at 85°C			HM 201
Constant flow at	40 °C [ $\Delta T = 30$ K]	L/h	6117
	60 °C [ $\Delta T = 50$ K]	L/h	2914
Peak flow at	40 °C [ $\Delta T = 30$ K]	L/10'	1745
	60 °C [ $\Delta T = 50$ K]	L/10'	971
Peak flow 1st hour at	40 °C [ $\Delta T = 30$ K]	L/60'	6690
	60 °C [ $\Delta T = 50$ K]	L/60'	3534
Reheat time from 10°C to 80°C		min.	25
DHW efficiency at $\Delta T = 30$ K		%	92

## MAXIMUM OPERATING CONDITIONS

*Maximum Service Pressure (tank full of water) \**

- Primary circuit : ..... 3 bar
- DHW circuit : ..... 8.6 bar

*Maximum Operating temperatures*

- Maximum temperature (primary) : ..... 87°C
- Maximum temperature (DHW) : ..... 75°C

*Water Quality*

See "Recommendations for the Prevention of Corrosion and Scaling in Heating Systems" on the following page.

\* The hydraulics of the HeatMaster 201 boiler have been tested according to EN-15502, and the boiler is classified as a pressure class 3 appliance.

## RECOMMENDATIONS FOR THE PREVENTION OF CORROSION AND SCALING IN HEATING SYSTEMS

### How oxygen and carbonates can affect the heating system

Oxygen and dissolved gasses in the water of the primary circuit contribute to the oxidation and the corrosion of the system components that are made of ordinary steel (radiators, ...). The resulting sludge is then deposited in the appliance exchanger.

The combination of carbonates and carbon dioxide in the water results in the formation of scale on the hot surfaces of the installation, including those of the appliance exchanger.

These deposits in the heat exchanger reduce the water flow rate and thermally insulate the exchange surfaces, which is likely to damage them.

### Sources of oxygen and carbonates in the heating circuit

The primary circuit is a closed circuit; the water it contains is therefore isolated from the mains water. When maintaining the system or filling up the circuit, water renewal results in the addition of oxygen and carbonates in the primary circuit. The larger the water volume in the system, the larger the addition.

Hydraulic components without an oxygen barrier (PE pipes and connections) admit oxygen into the system.

### Prevention Principles

#### 1. Clean the existing system before installing a new appliance

- Before the system is filled, it must be cleaned in accordance with standard EN14336. Chemical cleaning agents can be used.
- If the circuit is in bad condition, or the cleaning operation was not efficient, or the volume of water in the installation is substantial (e.g. cascade system), it is recommended to separate the appliance from the heating circuit using a plate-to-plate exchanger or equivalent. In that case, it is recommended to install a hydrocyclone or magnetic filter on the installation side.

#### 2. Limit the fill frequency

- Limit fill operations. In order to check the quantity of water that has been added into the system, a water meter can be installed on the filling line of the primary circuit.
- Automatic filling systems are not recommended unless the fill frequency is monitored and the scale and corrosion inhibitor remain at the correct levels.
- If your installation requires frequent water refilling, make sure your system is free of water leaks.
- Inhibitors may be used in accordance with standard EN 14868.

#### 3. Limit the presence of oxygen and sludge in the water

- A deaerator (on the appliance flow line) combined with a dirt separator (upstream of the appliance) must be installed according to the manufacturer's instructions.
- ACV recommends using additives that keep the oxygen in solution in the water, such as Fernox ([www.fernox.com](http://www.fernox.com)) and Sentinel ([www.sentinel-solutions.net](http://www.sentinel-solutions.net)) products.
- The additives must be used in accordance with the instructions issued by the manufacturer of the water treatment product.

#### 4. Limit the carbonate concentration in the water

- The fill water must be softened if its hardness is higher than 20° fH (11,2° dH).
- Check regularly the water hardness and enter the values in the service log.
- Water hardness table :

Water hardness	°fH	°dH	mmolCa(HCO3)2 / l
Very soft	0 - 7	0 - 3.9	0 - 0.7
Soft	7 - 15	3.9 - 8.4	0.7 - 1.5
Fairly hard	15 - 25	8.4 - 14	1.5 - 2.5
Hard	25 - 42	14 - 23.5	2.5 - 4.2
Very hard	> 42	> 23.5	> 4.2

#### 5. Control the water parameters

- In addition to the oxygen and the water hardness, other parameters of the water must be checked.
- Treat the water if the measured values are outside the range.

Acidity	6,6 < pH < 8,5
Conductivity	< 400 µS/cm (at 25°C)
Chlorides	< 125 mg/l
Iron	< 0,5 mg/l
Copper	< 0,1 mg/l

## G3 REQUIREMENTS AND GUIDANCE - UK ONLY

UK

### Discharge pipe from safety valves

The *Building Regulation G3* requires that any discharge from an unvented system is conveyed to where it is visible, but will not cause danger to persons in or about the building.

The tundish and discharge pipes should be fitted in accordance with the requirements and guidance notes of Building Regulation G3. The G3 Requirements and Guidance sections 3.50 - 3.63 are detailed below.

For discharge pipe arrangements not covered by G3 Guidance advice should be sought from your local Building Control Officer.

#### Main characteristics :

- Any discharge pipe connected to the pressure relief devices (Expansion Valve and Temperature/Pressure Relief Valve) must be installed in a continuously downward direction and in a frost free environment.
- Water may drip from the discharge pipe of the pressure relief device.
- This pipe must be left open to the atmosphere.
- The pressure relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.

A typical discharge pipe arrangement is shown on next page.



#### General remarks

- Discharge pipe-work D2 can now be a plastic pipe but only pipes that have been tested to a minimum 110°C must be used.
- Discharge pipe D2 can now be plumbed into the soil stack but only soil stacks that can handle temperatures of 99°C or greater should be used.

#### Extract from "The Building Regulation G3" :

##### Discharge pipe D1

- 3.50 *Safety devices such as temperature relief valves or combined temperature and pressure and pressure relief valves (see paragraphs 3.13 or 3.18) should discharge either directly or by way of a manifold via a short length of metal pipe (D1) to a tundish.*
- 3.51 *The diameter of discharge pipe (D1) should be not less than the nominal outlet size of the temperature relief valve.*
- 3.52 *Where a manifold is used it should be sized to accept and discharge the total discharge from the discharge pipes connected to it.*
- 3.53 *Where valves other than the temperature and pressure relief valve from a single unvented hot water system discharge by way of the same manifold that is used by the safety devices, the manifold should be factory fitted as part of the hot water storage system unit or package.*

##### Tundish

- 3.54 *The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible to, and lower than, the valve, with no more than 600mm of pipe between the valve outlet and the tundish.*

**Note:** *To comply with the Water Supply (Water Fittings) Regulations, the tundish should incorporate a suitable air gap.*

- 3.55 *Any discharge should be visible at the tundish. In addition, where discharges from safety devices may not be apparent, e.g. in dwellings occupied by people with impaired vision or mobility, consideration should be given to the installation of a suitable safety device to warn when discharge takes place, e.g. electronically operated.*

UK

##### Discharge pipe D2

- 3.56 *The discharge pipe (D2) from the tundish should:*
- have a vertical section of pipe at least 300mm long below the tundish before any elbows or bends in the pipework; and*
  - be installed with a continuous fall thereafter of at least 1 in 200.*
- 3.57 *The discharge pipe (D2) should be made of:*
- metal; or*
  - other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard (e.g. as specified in the relevant part of BS 7291)*
- 3.58 *The discharge pipe (D2) should be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long, i.e. for discharge pipes between 9m and 18m the equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device; between 18 and 27m at least 3 sizes larger, and so on; bends must be taken into account in calculating the flow resistance. See figure, table and the worked example.*
- 3.59 *Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.*
- 3.60 *The discharge pipe should not be connected to a soil discharge stack unless it can be demonstrated that the soil discharge stack is capable of safely withstanding temperatures of the water discharged, in which case, it should:*
- contain a mechanical seal, not incorporating a water trap, which allows water into the branch pipe without allowing foul air from the drain to be ventilated through the tundish;*
  - be a separate branch pipe with no sanitary appliances connected to it;*
  - if plastic pipes are used as branch pipes carrying discharge from a safety device they should be either polybutylene (PB) to Class S of BS 7291-2:2006 or cross linked polyethylene (PE-X) to Class S of BS 7291-3:2006; and*
  - be continuously marked with a warning that no sanitary appliances should be connected to the pipe.*

##### Note:

1. *Plastic pipes should be joined and assembled with fittings appropriate to the circumstances in which they are used as set out in BS EN ISO 1043-1.*
2. *Where pipes cannot be connected to the stack it may be possible to route a dedicated pipe alongside or in close proximity to the discharge stack.*

##### Termination of discharge pipe

- 3.61 *The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge.*
- 3.62 *Examples of acceptable discharge arrangements are:*
- to a trapped gully with the end of the pipe below a fixed grating and above the water seal;*
  - downward discharges at low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility; and*
  - discharges at high level: e.g. into a metal hopper and metal downpipe with the end of the discharge pipe clearly visible or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering system that would collect such discharges.*

3.63 The discharge would consist of high temperature water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges.

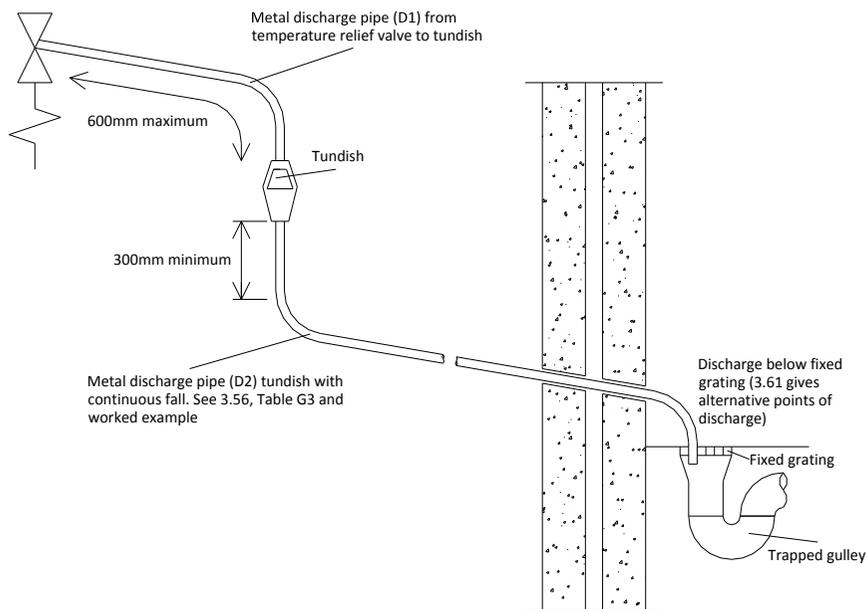


Figure G3: Typical discharge pipe arrangement

Table G3 – Sizing of copper discharge pipe ‘D2’ for common temperature relief valve outlet sizes

Valve outlet size	Minimum size of discharge pipe D1	Minimum size of discharge pipe D2 from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend.
G½	15mm	22mm	Up to 9m	0.8m
		28mm	Up to 8m	1.0m
		35mm	Up to 27m	1.4m
G¾	22mm	28mm	Up to 9m	1.0m
		35mm	Up to 8m	1.4m
		42mm	Up to 27m	1.7m
G1	28mm	35mm	Up to 9m	1.4m
		42mm	Up to 8m	1.7m
		54mm	Up to 27m	2.3m

Worked example of discharge pipe sizing



Figure on the left shows a G1/2 temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.

From Table:

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is 9.0m.

- Subtract the resistance for 4 No. 22mm elbows at 0.8m each = 3.2m
- Therefore the permitted length equates to: 5.8m
- 5.8m is less than the actual length of 7m therefore calculates the next largest size.

Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valves equates to 18m.

- Subtract the resistance of 4 No. 28mm elbows at 1.0m each = 4.0m
- Therefore the maximum permitted length equates to: 14m
- As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.



Essential recommendations for safety

- The temperature/pressure relief valve should only be replaced by a competent person.
- No control or safety valves should be tampered with or used for any other purpose.
- The discharge pipe should not be blocked or used for any other purpose.
- The tundish should not be located adjacent to any electrical components

## SAFETY INSTRUCTIONS FOR THE INSTALLATION



### Essential recommendations for safety

- Install the boiler on level base or vertically plumb support made of non-combustible materials and of sufficient strength to support its weight.
- Use extreme care not to drop the boiler or cause bodily injury while lifting or mounting the boiler onto the wall bracket or base. Once mounted, verify that the boiler is securely attached to the bracket and wall or safely set on its base.
- Do not use or store any flammable or corrosive products, such as paint, solvents, salts, chloride products and other detergent products near the appliance.
- Make sure that the condensate outlet is never obstructed and that a condensate neutralisation system is installed if required.
- Make sure that all air vents are unobstructed at all times.
- In the event of small amounts of hot water repeatedly being drawn off, a stratification effect can develop in the tank. The upper hot water layer may then reach very high temperatures.
- Hot water can cause scalding! The temperature of the domestic hot water can be adjusted up to 75 °C in the boiler. However, the temperature of the domestic hot water at the drawing off point must comply with local regulations.
- The risk of developing bacteria exists, including "Legionella pneumophila", if a minimum temperature of 60°C is not maintained in both the DHW tank and the hot water distribution network.
- In order to avoid exposure to extremely hot water that can cause serious burns, never leave children, old people, disabled or handicapped people in the bath or shower alone. Never allow young children to turn on the hot water or fill their own bath.
- ACV recommends using a pre-set thermostatic mixing valve in order to provide hot water at a maximum of 60°C.



### Essential recommendations for the electrical safety

- Only an approved installer is authorized to carry out the electrical connections.
- Make sure that the appliance is connected to the earth.
- Install a 2-way switch and a fuse or circuit breaker of the recommended rating outside the appliance, so as to be able to shut power down when servicing the appliance or before performing any operation on it.
- Isolate the external electrical supply of the appliance before performing any operation on the electrical circuit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless supervised or unless they have been given instruction concerning the use of the appliance by a person responsible for their safety.



### Essential recommendations for the correct operation of the appliance

- The connections (electrical, flue pipe, hydraulic) must be carried out in accordance with local standards and regulations in force.
- The boiler must be installed in a dry and protected area, with an ambient temperature comprised between 0 and 45°C.
- Install the appliance to ensure easy access at all times.
- To avoid any risk of corrosion, connect the stainless steel DHW production tank directly to the earth.
- Make sure that the mains water used to fill the boiler has a minimum pressure of 1.2 bar.
- Make sure to install a pressure reducing valve set at 4.5 bar if the mains supply pressure is in excess of 6 bar.
- The DHW circuit must be fitted with an approved safety group, comprised of a 7 bar safety valve, a check valve and a shut-off valve.
- If works need to be performed (in the boiler room or close to the air vents), make sure to turn off the boiler to prevent dust from entering and accumulating in the boiler heating system.



### General remark

- If the water drawing off point is far from the tank, installing an auxiliary DHW loop can allow to get hot water more quickly at all times.

\* For UK specific requirements for the discharge from safety valves, refer to «G3 Requirements and Guidance - UK Only» on page 30.

## PACKAGE CONTENTS

The HeatMaster® 201 boilers are delivered tested and in several packages (Burner, casing, safety valve kit and chimney connection to be installed).

**i** At product reception and after removal of packaging, check the package contents and that they are free of damages.

## CONTENTS

### Package 1

- Boiler
- Installation, Operation and Maintenance Instructions
- 2 grommets for electrical cables (to be installed)
- A safety valve kit (to be installed), comprised of:
  - A primary safety valve Ø 3/4" F
  - A brass T union - Ø 3/4" F
  - 1x brass nipple - Ø 3/4" M
  - A draining valve Ø 3/4" M
  - Silicone hose Ø 12x16 mm of 2,7 meters

### Package 2

- A BG 2000-M air/gas premix burner (to be installed) and hardware
- A burner installation manual

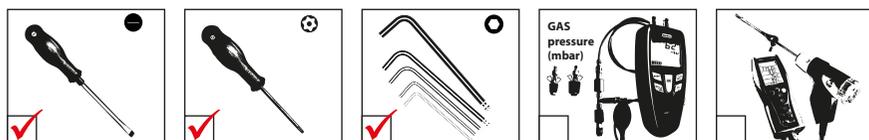
### Package 3

- Casing (to be assembled)
- Hardware
- Casing and chimney connection assembly manual

### Package 4

- Chimney connection (to be installed)
- Hardware

## TOOLS REQUIRED FOR THE INSTALLATION



## APPLIANCE PREPARATION

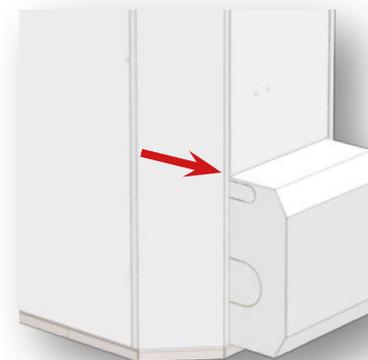
Place the appliance in its final position and install:

1. The casing and chimney connection. *Refer to the Casing Installation Manual* provided with the casing.
2. The safety valve kit at the back



3. The burner. *Refer to the Burner Installation Manual* provided with the burner.
4. The burner cover, refer to the *Casing Installation Manual* provided with the casing or "Removal and Installation of the Front Panel and the burner cover" on page 29 :

**i** For gas connection, remove the pre-cut section from the burner cover, according to the side from which gas pipe arrives to the appliance



## RECOMMENDATIONS FOR DHW CONNECTIONS



### Essential recommendations for safety

- The hot water output may reach temperatures in excess of 60°C, which can cause scalding! It is therefore necessary to install a thermostatic mixing valve after the appliance.
- The system must be fitted with an approved safety group, comprised of a 7 bar safety valve, a check valve and a shut-off valve.\*



### Essential recommendations for the correct operation of the appliance

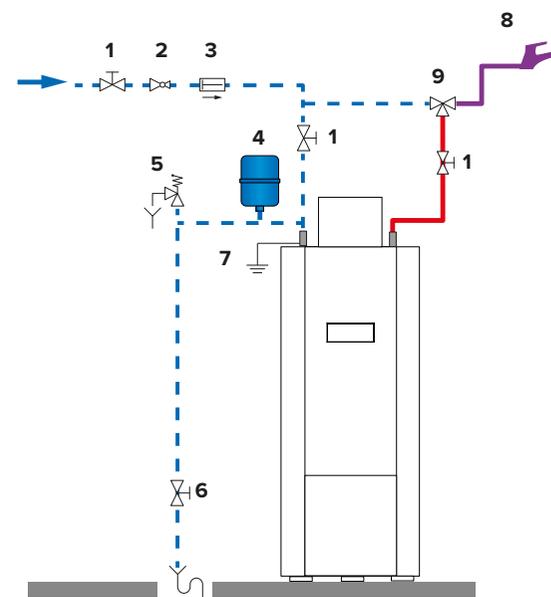
- Flush the system before connecting the domestic hot water circuit. Refer to the installation instructions.
- Make sure to install a pressure reducing valve set at 4.5 bar if the mains supply pressure is in excess of 6 bar.
- It is recommended to install an expansion vessel in the DHW circuit to prevent the safety valve from opening constantly and reduce the water hammer effect in the system.
- If the appliance is used as a domestic hot water preparation tank, a primary expansion vessel adapted to the boiler power/size and to the type of system must be fitted in the heating circuit (if there is no built-in expansion vessel, or if the built-in expansion vessel size is not sufficient).

## DHW CONNECTION

### Description

1. Isolating valve
2. Pressure reducing valve
3. Check valve
4. DHW expansion vessel
5. Safety valve
6. Drain valve
7. Grounding
8. Draw-off tap
9. Thermostatic mixing valve

— Cold water  
— Hot water

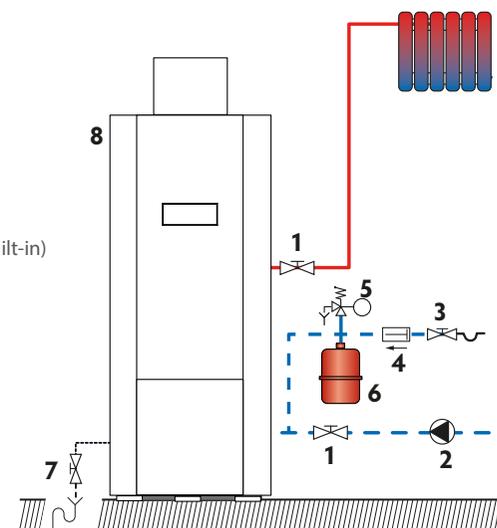


## HEATING CONNECTION

### Typical connection - high temperature

### Description

1. Isolating valve
2. Heating pump
3. Filling valve
4. Check valve
5. Safety valve
6. Expansion vessel
7. Drain valve
8. Automatic air vent (built-in)



## REMOVAL AND INSTALLATION OF THE FRONT PANEL AND THE BURNER COVER

### Set-up conditions

- External power supply isolated

### Removal Procedures

#### Front panel

1. Release 1 screw (1) from the top of the panel. Retain it for reinstallation.
2. Pull the top of the panel towards you to disengage the studs located on the left and right edges.
3. Lift the panel to remove its bottom lugs from the burner cover slots.

#### Burner cover

**i** To access the top screws of the burner cover, the front panel must be removed first

1. Release 3 screws (2) from the top of the cover. Retain them for cover reinstallation.
2. Pull the cover carefully away from the appliance

### Installation procedures

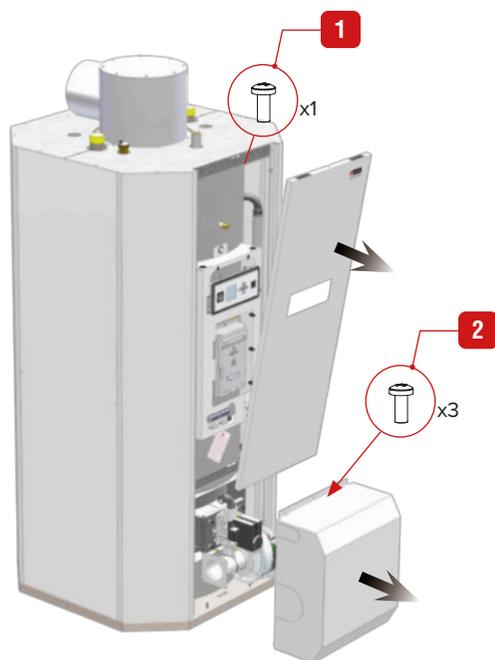
#### Burner cover

**i** The burner cover must be installed before placing the front panel in position.

1. Put the burner cover in position carefully over the burner.
2. Install and tighten 3 screws (2) at the top of the cover.

#### Front panel

1. Place the bottom of the front panel in position and engage the lugs in their slot, then push studs back into place.
2. Install and tighten 1 screw (1) at the top of the panel.



## GAS CONNECTION

**!** Essential recommendations for safety

- The gas connection must comply with all applicable local standards and regulations, and the circuit will be equipped with a gas pressure regulator as required.
- The gas burner is factory preset for use with natural gas [equivalent to G20].
- The natural gas to propane conversion or the reverse is not authorized.
- The CO<sub>2</sub>, gas flow rate, air flow rate and air/gas supply parameters are factory-preset and may not be modified in Belgium, except for type I 2E(R)B appliances.
- Do not change the OFFSET setting of the gas valve: it is factory-preset and sealed.



**!** Essential recommendations for the correct operation of the appliance

- Refer to the technical characteristics of this manual or to the burner documentation to know the connection diameters.
- Bleed the gas duct and check thoroughly if all the appliance tubes, both internal and external, are tight.
- Check that the gas type and pressure from the distribution network are compatible with the appliance settings. Refer to the table containing all relevant data in the section "Technical characteristics".
- Check the appliance electrical connection, the boiler room air vent system, the tightness of flue gas outlet pipes and of the burner chamber plate.
- Control the gas pressure and consumption at appliance start up.
- Check the appliance CO<sub>2</sub> adjustment (refer to the adjustment procedure and the technical data).

## BASIC CONFIGURATION - HEATMASTER 201 : HIGH TEMPERATURE HEATING CIRCUIT WITH CONTROL BY ROOM THERMOSTAT AND OPTIONAL OUTDOOR SENSOR.

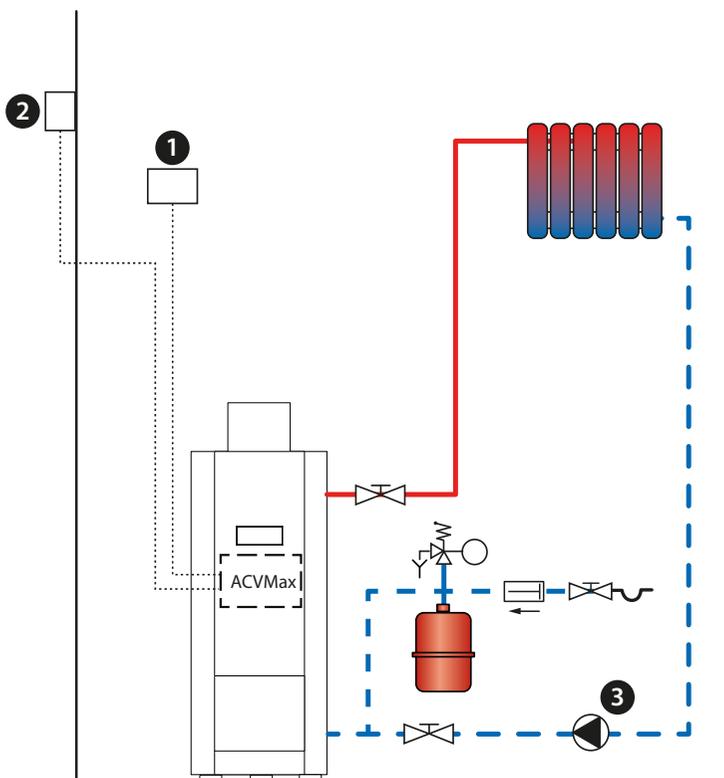
### BLOCK DIAGRAM

The heating system (radiators) is controlled by an On/Off room thermostat.

The domestic hot water tank is controlled by an intermediate NTC sensor (optional). The domestic hot water priority is always active.

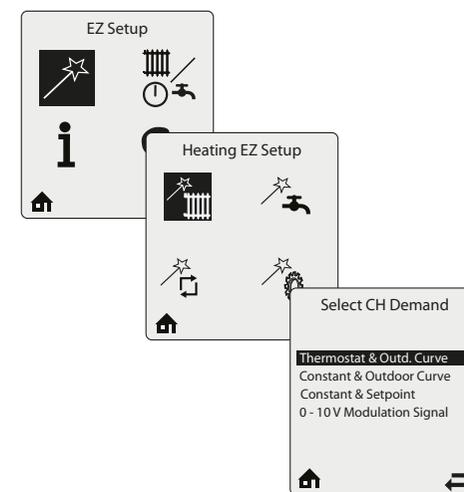
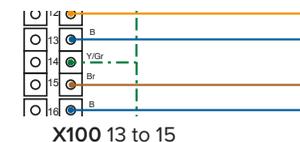
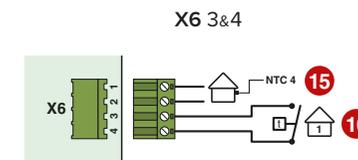
In this configuration, the appliance constantly adapts its operation to the outdoor temperature if an outdoor temperature sensor is connected.

The heating pump is triggered as soon as the room thermostat generates a heat demand.



\* The illustrations are for information only. For more details on the required accessories, refer to the latest ACV price list.

ITEM	DESCRIPTION	QTY	ELECT. TERMINALS TO CONNECT TO**
1	Room thermostat	1	X6 3&4
2	Outdoor temperature sensor, 12kΩ	1	X6 1&2
3	Circulator pump	1	CH X100 13 to 15
	By-pass kit : To read the flow rate more easily. To be installed in the HT or LT circuit, as required.	1	--



## STARTING UP

### SAFETY INSTRUCTIONS FOR STARTING UP

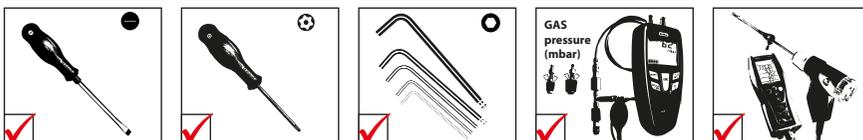
 Essential recommendations for safety

- The components inside the control panel may only be accessed by an approved installer.
- Set the water temperature in accordance with usage and local plumbing codes.
- Make sure that the heating circuit filling valve is closed once the starting up process is complete.
- If there is a drain assembly, make sure that the condensate drain assembly is filled with water before starting up the boiler. Fill with water as necessary.
- Make sure that all connections are made and tight.

 General remark

- In normal operation, the burner starts automatically as soon as the boiler temperature drops below the preset temperature.

### TOOLS REQUIRED FOR STARTING UP



### CHECKS BEFORE STARTING UP

 Essential recommendation for safety

- Check the tightness of the flue pipe connections.

 Essential recommendation for the correct operation of the appliance

- Control the tightness of the hydraulic circuit connections.

### FILLING THE SYSTEM

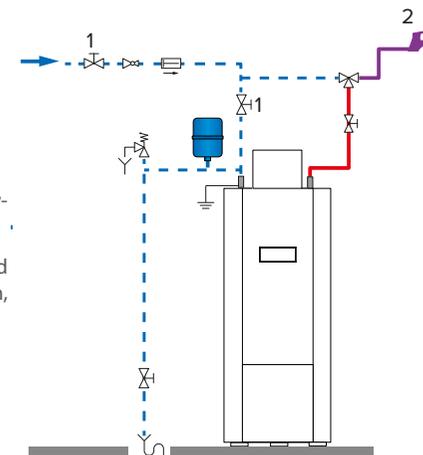
 Put the DHW tank under pressure before pressurizing the heating (primary) circuit.

Set-up conditions

- External power supply isolated

DHW circuit filling procedure

1. Open the isolating valves (1) and the draw-off tap (2).
2. Once the water flow rate has stabilized and the air is totally evacuated from the system, close the draw-off tap (2).
3. Check all the connections for leaks.

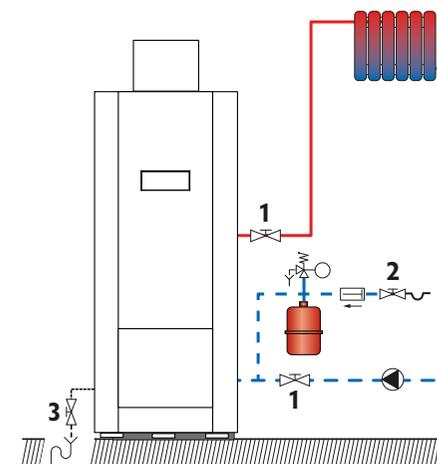


 Cold water

 Hot water

Heating circuit filling procedure

1. Open boiler front panel (refer to applicable procedure in the manual).
2. Open the isolating valves (1).
3. Make sure that the drain valve (3) is tightly closed.
4. Open the filling valve (2).
5. Once the system is bled from air, bring the pressure to the static pressure between 1.5 bar and 2 bar.
6. Close the filling valve (2).
7. Disconnect filling device from water supply.\*



Follow-on tasks

1. Check there is no leak.

\* UK specific reference G24.1 & G24.2 of the Water Regulations Guide.

## STARTING UP THE APPLIANCE

### Set-up conditions

- All connections made
- Electrical power supply on
- Gas supply open
- Hydraulic circuit(s) full of water

### Procedure

1. Check that there is no gas leak.
2. Push in the ON/OFF master switch (⏻).
3. If a room thermostat is installed, possibly increase the temperature set point to generate a demand.
4. Check the gas pressure and allow the appliance to heat up for a few minutes
5. Check and adjust the burner according to local standards and regulations, refer to *“Checking and Adjusting the Burner”* on page 32.
6. Set the central heating temperature to the required value using the control panel. Refer to *“Setup Guide”* on page 7 and to the Installer’s Handbook.
7. After 5 minutes of operation, bleed the heating circuit until all air is evacuated and restore a 1.5 bar pressure.
8. Bleed the central heating circuit once again and top it up with water to get the required pressure if necessary.
9. Make sure that the central heating system is properly balanced and, if needed, adjust the valves to prevent certain circuits or radiators from getting a flow rate that is far above or below the set rate.

### Follow-on tasks

1. Close the heating circuit filling valve and disconnect the filling connection as required.
2. Check that there are no leaks.
3. Check that the flow rate in the appliance is sufficient as follows :
  - Operate the appliance at maximum power
  - Once the temperatures are stable, read out the supply and return temperatures
  - Check that the difference between the supply and return temperature is equal to or less than 20k.
  - If the Delta T is higher than 20k, check the pump settings/specifications.

## CHECKING AND ADJUSTING THE BURNER

 When the burner operates at full power, the CO<sub>2</sub> rate must be within the limits mentioned in the technical characteristics, (see *“Combustion characteristics”* on page 18).

### Set-up conditions

- Operating appliance

### Procedure

1. Check if the ACVMAX parameters are set to meet the user's requirements (refer to *“Setup Guide”* on page 7), and change them if required.
2. Put the appliance to maximum power mode (Refer to the Installer’s Handbook).
3. Using a pressure tester, check that the dynamic gas pressure at the gas valve is at least 18 mbar.
4. Allow the appliance to heat for a few minutes until it reaches at least 60°C.
5. Measure the burner combustion by placing the flue gas analyzer probe in the measurement unit port on the flue pipe and compare the CO and CO<sub>2</sub> values displayed with those indicated in the combustion characteristics table.
6. If the CO<sub>2</sub> value differs by more than 0.3%, carry out the adjustment mentioned in the procedure below.
7. Then put the appliance to the minimum power mode (Refer to the Installer’s Handbook provided with the appliance). Allow the appliance to stabilize for a few minutes.
8. Measure the CO<sub>2</sub> level. It must be equal to the value at full power, or lower than that value by 0.5% maximum. If there is a significant deviation, please contact ACV’s support department.

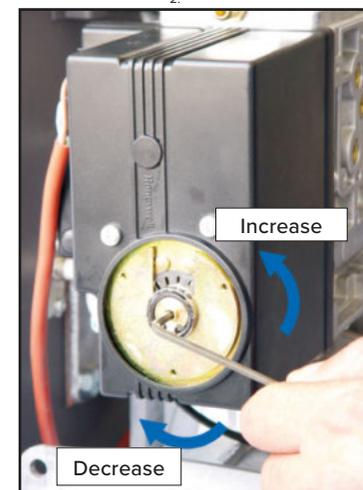
### CO<sub>2</sub> adjustment procedure

To adjust the CO<sub>2</sub> rate, rotate the throttle screw (1) :

- to the left (counterclockwise) to **increase the** CO<sub>2</sub> rate.
- to the right (clockwise) to **decrease the** CO<sub>2</sub> rate.

### Follow-on tasks

None



## SAFETY INSTRUCTIONS FOR THE MAINTENANCE



### Essential recommendations for the electrical safety

- Before opening the boiler for maintenance, turn off the boiler by pushing on the ON/OFF master switch.
- Isolate the external power supply of the appliance before performing any operation, unless it is required to take measurements or perform system setup.



### Essential recommendations for safety

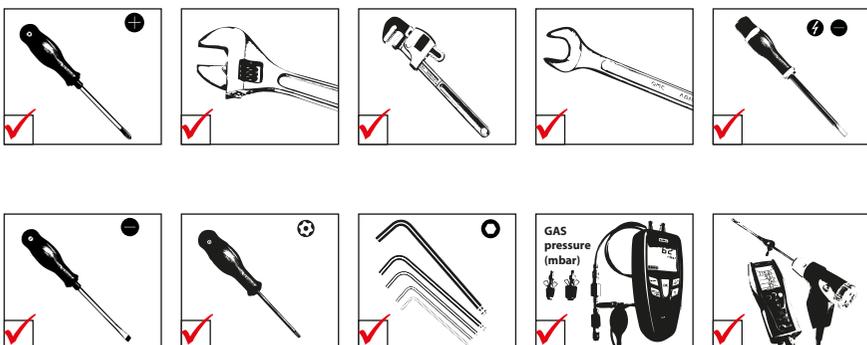
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding.
- Do not use solvents to clean any of the burner components. The components could be damaged, resulting in unreliable or unsafe operation.
- Check the tightness of the flue pipe connections.



### Essential recommendations for the correct operation of the appliance

- It is recommended to have the boiler and the burner serviced at least once a year or every 1,500 hours by a qualified technician, preferably at the start of the heating season. More frequent servicing may be required depending on boiler use. Please consult your installer for advice.
- The boiler and burner maintenance will be carried out by a qualified engineer, and the defective parts may only be replaced by genuine factory parts.
- Make sure to replace any gaskets or seals on the removed components before reinstalling them.
- To ensure maximum efficiency and reliability of the unit, it is recommended that the end-user perform the periodic checks mentioned in the Safety section of this manual.
- Control the tightness of the hydraulic circuit connections.

## TOOLS REQUIRED FOR MAINTENANCE



## APPLIANCE SHUT DOWN FOR MAINTENANCE

1. Switch the appliance off using the ON/OFF master switch and isolate the external power supply.
2. Close the gas supply valve of the appliance.

## PERIODIC APPLIANCE MAINTENANCE TASKS

Tasks	Frequency		
	Periodic inspection	1 year	2 years
		End-user	Professional
1. Make sure that the system water pressure is at least 1 bar when cold. Top up the system if necessary, adding small quantities of water at a time. In case of repeated fills, call your installer.	X	X	
2. Check that there is no water on the floor under the appliance. Call your installer if there is.	X	X	
3. Check that no error code is displayed on the control panel. Call your installer if necessary.	X	X	
4. Check that all gas, hydraulic and electrical connections are correctly fastened and tight.		X	
5. Check the flue gas exhaust: correct fastening, correct installation, no leaks or clogging.		X	
6. Check that there is no discoloured or cracked area on the burner chamber plate .		X	
7. Check the combustion parameters (CO and CO <sub>2</sub> ), see “Checking and Adjusting the Burner” on page 32.		X	
8. Check visually the heating body: no evidence of corrosion, soot deposits or damages. Carry out all required cleaning tasks, repairs and replacements that might be required.		X	
9. Check visually the burner insulation condition. Replace if cracked or damaged. Refer to “Removal and Installation of the Burner” on page 34.			X
10. Check the electrode, see “Removal, Check and Installation of the Burner Electrode”, page 35.			X

## DRAINING THE APPLIANCE

**!** Essential recommendations for safety

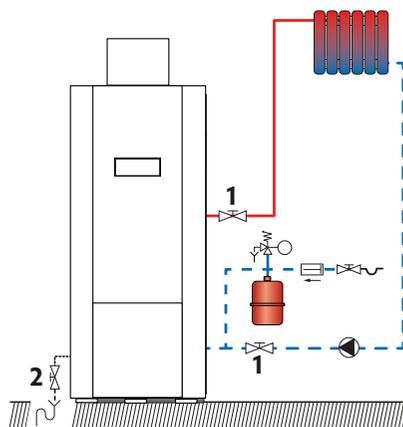
- Before draining the DHW tank, drain the heating (primary) circuit or bring its pressure to 0 bar.
- Water flowing out of the drain valve may be extremely hot and could cause severe scalding. Keep people away from the hot water discharge.

### Set-up conditions

- Boiler switched off using the ON/OFF master switch
- External power supply isolated
- Fuel/gas supply closed

### Heating circuit draining procedure

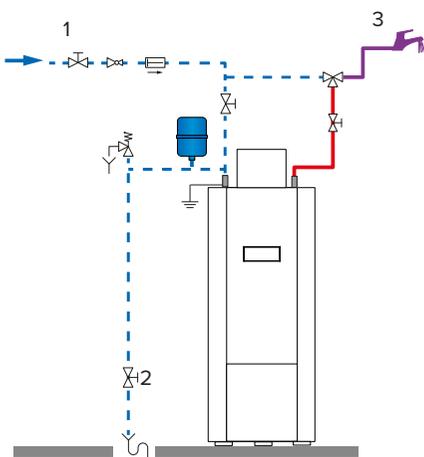
1. Close the isolating valves (1).
2. Connect the drain valve (2) to the sewer with a hose.
3. Open the drain valve (2) to empty the heating circuit of the boiler.
4. Close the drain valve (2) once the heating circuit of the boiler is empty.



### DHW circuit draining procedure

**!** Before draining the DHW tank, make sure that the heating (primary) circuit pressure is null.

1. Open fully a draw-off tap (3) for about 60 minutes to make sure that the DHW tank has cooled down.
2. Close the isolating valves (1).
3. Connect the drain valve (2) to the sewer with a hose.
4. Open the drain valve (2) and drain the DHW tank water to the sewer.
5. Open the draw-off tap (3) to accelerate the draining process. If it is located lower than the tank connection, open a draw-off tap located higher in the system.
6. Close the drain valve (2) and the draw-off tap (3) once the DHW tank of the boiler is empty.



## REMOVAL AND INSTALLATION OF THE BURNER

### Set-up conditions

- Appliance shut down
- External power supply isolated
- Gas supply closed
- Front panel and burner cover removed (refer to "Removal and Installation of the Front Panel and the burner cover" on page 29).

### Removal procedure

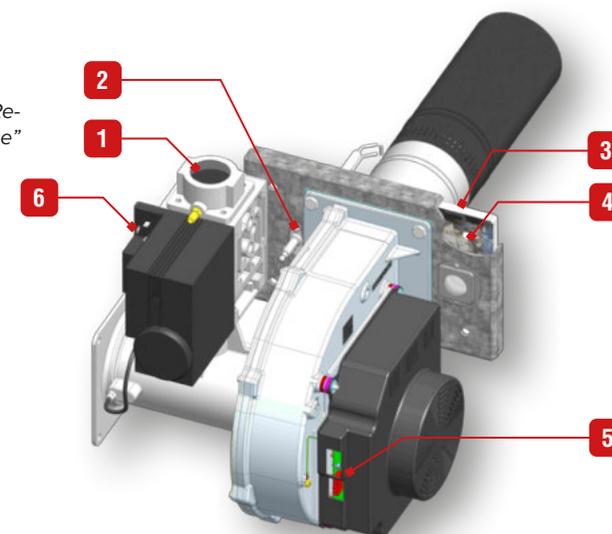
1. Disconnect all plugs from the gas valve (6), the electrode (2), and the fan assembly (5).
2. Release the gas connection (1).
3. Using a socket wrench, release the four burner hood attaching hex. screws (4) and retain them for reinstallation.
4. Pull the burner assembly out of the combustion chamber.
5. Check visually the burner insulation plate (3) condition. Replace if cracked or damaged.
6. Remove, check and reinstall the electrode, refer to "Removal, Check and Installation of the Burner Electrode" on page 35, as required.

### Installation procedure

1. Reinstall the burner assembly into the combustion chamber, using four retained hex. screws (4).
2. Reconnect all disconnected plugs, to the gas valve (6), the electrode (2), and the fan assembly (5), refer to the *Burner Installation Manual* provided with the burner for connection details.
3. Reconnect the gas connection (1).

### Follow-on tasks

1. Restart boiler, refer to "Re-starting after Maintenance" on page 35



## REMOVAL, CHECK AND INSTALLATION OF THE BURNER ELECTRODE

### Set-up conditions

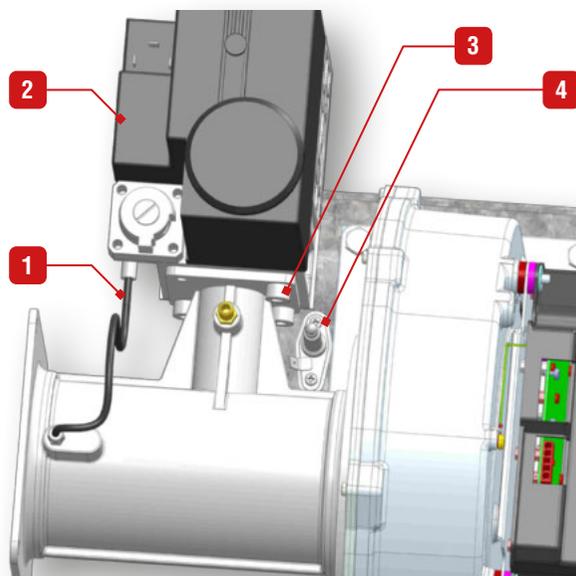
- Burner removed (refer to "Removal and Installation of the Burner" on page 34).

### Removal procedure

1. Disconnect the hose (1) from the gas valve (2).
2. Remove 4 socket head screws (3) from the bottom of the gas valve (2). Retain the screws for reinstallation.
3. Remove two screws (4) from the electrode. Retain the screws for reinstallation.

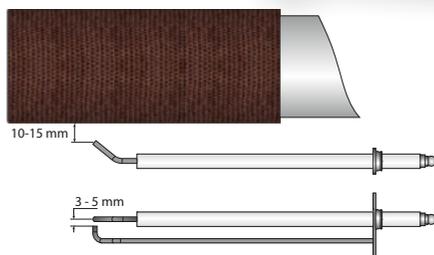
### Check and installation procedure

1. Check the condition and correct distance between electrode tips, according to illustration below. Replace electrode if required.
2. Install the electrode in the provided location, with a new gasket and the 2 retained screws (4).
3. Check the correct position and distances of the electrode, according to the illustration below. Adjust as required.
4. Install the gas valve (2) on its support using the 4 retained screws (3).
5. Connect the hose (1) to the gas valve (2).



### Follow-on tasks

- Reinstall the burner. Refer to "Removal and Installation of the Burner" on page 34.



## RESTARTING AFTER MAINTENANCE

### Set-up conditions

- All removed components reinstalled
- All connections made
- Power supply
- Gas supply open
- Hydraulic circuit(s) full of water

### Procedure

1. Make sure there is no gas leak at the gas connections.
2. Switch the appliance on using the ON/OFF master switch.
3. Set the appliance at maximum power and check the absence of gas leaks.
4. Check the gas pressure and CO<sub>2</sub> adjustment in accordance with "Checking and Adjusting the Burner" on page 32.

### Follow-on tasks

None

Codes	Description of the fault	Solution for the fault
E 01	<b>Failed ignition:</b> The burner failed to light after 5 ignition attempts.	<ol style="list-style-type: none"> <li>1. Check gas supply to appliance.</li> <li>2. Check Ignition cable connection in control box.</li> <li>3. Check electrode for defects, and distance between the pins.</li> <li>4. Check gas valve and electrical connections to gas valve.</li> </ol>
E 02	<b>False flame:</b> Flame detected prior to ignition.	<ol style="list-style-type: none"> <li>1. Check good electrical ground connection to unit.</li> <li>2. Check electrode for pollution and deposition of dirt.</li> </ol>
E 03	<b>High Boiler temp.:</b> The boiler temperature exceeds 105°C	<p>Correct condition which caused high temperature or limit to open.</p> <ol style="list-style-type: none"> <li>1. Check water flow in the system (radiator valves).</li> <li>2. Check Pump and pump electrical connections.</li> </ol>
E 05	<b>Blower speed:</b> Blower speed not correct or speed signal is not received by ACVMax.	<ol style="list-style-type: none"> <li>1. Check blower and wiring harness.</li> <li>2. Under normal condition if actual fan speed is 1000 rpm different from set fan speed an error is displayed (after 60sec in running and after 30 sec. at startup).</li> <li>3. Only exception when actual fan speed &gt; 3000 rpm at max. PWM.</li> </ol>
E 07	<b>High Flue temp.:</b> Flue temperature exceeds high limit.	<ol style="list-style-type: none"> <li>1. Heat exchanger may require cleaning.</li> <li>2. Appliance will automatically reset once flue temperature returns to normal range.</li> </ol>
E 08	<b>Flame Circuit Error:</b> Flame circuit test failed	<ol style="list-style-type: none"> <li>1. Turn appliance off.</li> <li>2. Check and clean the electrode.</li> <li>3. Check ignition and grounding cables are firmly connected.</li> </ol>
E 09	<b>Gas valve circuit error:</b> Gas valve circuit test failed.	<ol style="list-style-type: none"> <li>1. Check the gas valve and wiring harness.</li> <li>2. If the problem persists replace the "ACVMax" circuit board.</li> </ol>
E 12	<b>Internal Fault:</b> EEPROM misconfiguration	<ol style="list-style-type: none"> <li>1. Turn unit off and on to resume normal operation.</li> <li>2. If the problem persists replace the "ACVMax" circuit board.</li> </ol>
E 13	<b>Reset limit reached:</b> Resets are limited to 5 every 15 minutes.	<ol style="list-style-type: none"> <li>1. Turn unit off and on to resume normal operation.</li> <li>2. If the problem persists replace the "ACVMax" circuit board.</li> </ol>
E 15	<b>Sensor Drift:</b> Supply or return sensor reading has drifted.	Check supply and return temperature sensors and wiring harness.
E 16	<b>Supply Sensor Stuck:</b> Supply sensor reading is not changing.	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor and wiring harness for shortcuts or other defects.</li> <li>2. Check waterflow and the temperature balance in the system, because CH supply temperature does not change.</li> </ol>
E 17	<b>Return Sensor Stuck:</b> Return sensor reading is not changing.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor and its position, check wiring harness for shortcuts or other defects.</li> <li>2. Check waterflow and the temperature balance in the system, because CH return temperature does not change.</li> <li>3. Failure may happen at low output capacity when supplying from a big tank!</li> </ol>
E 18	<b>Sensor Failure:</b> Supply or return sensor reading changed very rapidly.	Check supply and return temperature sensors and wiring harness.
E19	<b>Flame Failure:</b> Flame failure during start up phase	<p>Flame loss after start up of the appliance.</p> <ol style="list-style-type: none"> <li>1. Check the flue system for blockage and check the adjustment of the appliance (CO2 high 8.8 +/-0.2%, CO2 low 8.6+/-0.2% measured with front casing open).</li> <li>2. Also check the Ignition / Ionisation rod (distance to the burner / pollution)</li> </ol>
E 21	<b>Internal Control Fault:</b> A / D conversion error.	Turn unit off and on then press OK to resume normal operation.
E 25	<b>Internal Control Fault:</b> CRC check error.	Turn unit off and on to resume normal operation.
E 30	<b>Supply Sensor Shorted:</b> A short circuit has been detected in the appliance supply temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>

Codes	Description of the fault	Solution for the fault
E 31	<b>Supply Sensor Open:</b> An open circuit has been detected in the appliance supply temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check supply temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 32	<b>DHW Sensor Shorted:</b> A short circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check DHW temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 33	<b>DHW Sensor Open:</b> An open circuit has been detected in the DHW temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check DHW temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 34	<b>Low Voltage:</b> Line voltage has fallen below an acceptable operating level.	The appliance will automatically reset once line voltage returns to normal.
E 37	<b>Low Water:</b> Water level has fallen below 0.7 bar.	<ol style="list-style-type: none"> <li>1. Increase pressure to normal range.</li> <li>2. The appliance will automatically reset once water level returns to normal.</li> </ol>
E 43	<b>Return Sensor Shorted:</b> A short circuit has been detected in the appliance return temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>
E 44	<b>Return Sensor Open:</b> An open circuit has been detected in the appliance return temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check return temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem, reset the appliance and resume normal operation.</li> </ol>
E 45	<b>Flue Sensor Shorted:</b> A short circuit has been detected in the appliance flue temperature sensor circuit	<ol style="list-style-type: none"> <li>1. Check flue temperature sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 46	<b>Flue Sensor Open:</b> An open circuit has been detected in the appliance flue temperature sensor circuit.	<ol style="list-style-type: none"> <li>1. Check flue temperature sensor, connectors and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 47	<b>Water pressure sensor error:</b> Water pressure sensor is disconnected or broken	<ol style="list-style-type: none"> <li>1. Check water pressure sensor, connectors and wiring harness.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 76	<b>Gas pressure switch open</b>	<ol style="list-style-type: none"> <li>1. Check both the static and the dynamic gas pressures.</li> <li>2. Correct condition which caused the pressure switch to open</li> <li>3. Appliance will automatically reset once the pressure switch is closed.</li> </ol>
	<b>External Limit Open:</b> An external automatic reset appliance limit has opened.	<ol style="list-style-type: none"> <li>1. Correct condition which caused limit to open.</li> <li>2. Appliance will automatically reset once external limit closes</li> </ol>
E 77	<b>High temperature mixing circuit</b>	Check if the mixing valve functions correctly.
E 78	<b>Mix circuit sensor shorted</b>	<ol style="list-style-type: none"> <li>1. Check Mix circuit temp. sensor and wiring harness for a short circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 79	<b>Mix-circuit sensor Open</b>	<ol style="list-style-type: none"> <li>1. Check Mix circuit temp. sensor and wiring harness for an open circuit.</li> <li>2. If necessary replace the sensor, or the wire harness.</li> <li>3. After fixing the problem reset the appliance and resume normal operation.</li> </ol>
E 80	<b>Return &gt; Supply:</b> Return temperature is higher than supply temperature.	Confirm water flows in appliance return and out appliance supply.
E 81	<b>Sensor Drift:</b> Supply and return temperatures are not equal.	<ol style="list-style-type: none"> <li>1. Check water is flowing through appliance.</li> <li>2. Wait a few minutes for the water to equalise the temperature, the appliance will automatically reset once temperatures become equal.</li> <li>3. If appliance doesn't reset, check the NTC's and check the wire harness, replace if necessary.</li> </ol>

Codes	Description of the fault	Solution for the fault
E82	<b>Delta T protection blocking</b> - Delta T too high	1. Verify flow in the system. 2. Check pump for blockage and obstructions, unblock it as required. Replace if necessary.
E83	<b>Delta T protection Lock-out</b> - Lock-out due to Delta T value.	1. Verify flow in the system. 2. Check pump for blockage and obstructions, unblock it as required. Replace if necessary.
E 85	<b>Pump operation: warning</b> - Appliance pump is running out of limits.	Pump is running out of its limits. Check pump for blockage and obstructions, replace if necessary
E 86	<b>Pump hard fault:</b> Pump Failure	Pump Failure, check if pump PWM-feedback wire is properly connected, replace pump when necessary
E 87	<b>External Limit Open:</b> An external appliance limit has opened.	1. Correct condition which caused limit to open, then reset appliance. 2. The appliance needs to be reset once external limit closes.
E88	<b>Pump Blocking:</b> Pump attempts to restart.	Check pump for blockage and obstructions, unblock it as required. Replace if necessary.
E 89	<b>Incorrect Setting:</b> A parameter setting is outside the settings range.	1. Review CH & DHW settings and correct as necessary. 2. The appliance will automatically reset once corrected.
E 90	<b>Firmware Mismatch:</b> Control module and display firmware versions are incompatible.	One or several components are not compatible with the system. Replace mismatched component(s).
E 91	<b>System Sensor Shorted:</b> A short circuit has been detected in the system temperature sensor circuit	1. Check system temperature sensor and wiring for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 92	<b>System Sensor Open:</b> An open circuit has been detected in the system temperature sensor circuit.	1. Check system temperature sensor and wiring for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 93	<b>Outdoor Sensor Shorted:</b> A short circuit has been detected in the outdoor temperature sensor circuit.	1. Check outdoor temperature sensor and wiring for a short circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 94	<b>Internal Display Fault:</b> Display memory error	Turn unit off and on to resume normal operation.
E 95	<b>Supply Sensor Error:</b> Supply sensor reading is invalid	1. Check wiring between display and control module. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 96	<b>Outdoor Sensor Open:</b> An open circuit has been detected in the outdoor temperature sensor circuit.	1. Check outdoor temperature sensor and wiring for an open circuit. 2. If necessary replace the sensor, or the wire harness. 3. After fixing the problem reset the appliance and resume normal operation.
E 97	<b>Cascade Mismatch:</b> Cascade configuration has changed.	1. Run autodetection if change was intentional, or else check wiring between appliances. 2. Appliance will automatically reset once repaired.
E 98	<b>Cascade Bus Error:</b> Communication with other appliances has been lost.	1. Check wiring between appliances. 2. Appliance will automatically reset once repaired.
E 99	<b>Controller Bus Error:</b> Communication between appliance display and control module has been lost.	1. Check wiring between components. 2. Appliance will automatically reset once repaired.





## DECLARATION OF CONFORMITY TO STANDARDS

1/1

Product type: **Low Temperature Boiler**Name and address of manufacturer: **ACV International SA / NV  
Oude Vijverweg, 6  
B-1653 Dworp  
Belgium**

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Model: **HeatMaster 201**

We declare hereby that the appliance specified above is conform to the following directives:

Directives	Description	Date
2009/142/EC	Gas Appliance Directive	30.11.2009
2006/95/EC	Voltage Limits Directive	12.12.2006
2004/108/EC	Electromagnetic Compatibility Directive	15.12.2004

Relevant harmonised standards :

EN 15502-1	EN 55014-1	EN 61000-3-2
EN 15502-2-1	EN 55014-2	EN 61000-3-3
EN 60335-2-102		

The notified body, (Technigas [0461], Chaussée de Vilvoorde 156, B-1120 Brussels) performed a Type examination and issued the certificate(s) : E0767/5015 - Rev. 6, ID # **0461BO0767**

Signed for and on behalf of  
ACV International SA/NV

Dworp, 09/02/2018

R&D Director  
Sara Stas