

HeatMaster®

HM

*Installation, operating and
servicing instructions*

HeatMaster® 71

HeatMaster® 101

HeatMaster® 201



INDEX

IMPORTANT NOTES	3
Who should read these instructions	3
Symbols	3
Recommendations	3
Certification	3
Important notes	3
DESCRIPTION	4
Working principle	4
Temperature control	4
Building characteristics	4
Frost protection	4
Packaging	4
USER GUIDE	6
Use of the boiler	6
Setting the parameters	7
TECHNICAL CHARACTERISTICS	8
General characteristics	8
Water quality	8
Gas category	9
Domestic hot water performance	9
ELECTRICAL CONNECTION	10
Electrical supply	10
Alarm module	10
HeatMaster® 71-101 wiring diagram	12
HeatMaster® 201 wiring diagram	13
INSTALLATION	14
Dimensions	14
Boiler Room	15
Chimney connection	16
Domestic hot water connection	18
Heating connection	19
Gas connection	19
BURNER CHARACTERISTICS	20
ACV BG 2000-M air/gas pre-mix burners	20
INSTALLATION AND COMMISSIONING	22
Filling of domestic hot water and heating circuits	22
MAINTENANCE	23
Annual maintenance	23
Boiler maintenance	23
Maintenance of safety devices	23
Burner maintenance	23
Draining of the boiler	23
MCBA PARAMETERS FOR THE SPECIALIST	24
Standby Mode	24
Setting the parameters	25
System information	26
Entry of the maintenance code	26
Setting the parameters: only accessible using the code	27
Communication mode	30
Error Mode	30
List of error codes + solutions	31
PARTS LIST	at the end of the instructions

IMPORTANT NOTES

WHO SHOULD READ THESE INSTRUCTIONS

These instructions should be read by:

- the design engineer/consultant
- the user
- the installer
- the service engineer

SYMBOLS

The following symbols are used in this manual:



Essential instruction for the correct operation of the installation.



Essential instruction for the safety of persons and the environment.



Electrocution hazard: use a qualified technician.



Burn hazard.

RECOMMENDATIONS



- Before installing and bringing the boiler into service, first carefully read this manual.
- It is prohibited to modify the interior of the appliance in any way, without the manufacturer's prior written agreement.
- The boiler must be installed by a qualified engineer, in accordance with applicable local standards and local codes in force.
- Failure to follow the instructions describing test operations and procedures could result in personal injury or a risk of environmental pollution.
- In order to ensure the appliance operates safely and correctly, it is important to have it serviced by an approved contractor.
- If there is a problem please contact your contractor for advice.
- 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 contractor of any faults. Remember to indicate the fault code as it appears on the screen.

- Defective parts can only be replaced with original factory parts. You will find a list of spare parts and their ACV reference number at the end of this manual.
- The burners are pre-adjusted in the factory for natural gas [equivalent to G20].
- Specific regulation in Belgium:
The CO₂, gas flow, air flow and air/gas supply parameters are adjusted in the factory and cannot be changed in Belgium, except for type 1 2E(R)B boilers.



- Before carrying out any work on the boiler, it is important to isolate the electrical supply to the unit.
- The user must not attempt to gain access to the components inside the boiler or the control panel.

CERTIFICATION

The appliances bear the "CE" mark, in accordance with the standards in force in the various countries [European Directives 92/42/EEC "Efficiency", 90/396/CEE "Gas Appliances"].

These appliances also bear the Belgian gas boiler quality label "HR+" [gas boiler].



IMPORTANT NOTES

IF YOU SMELL GAS:

- Isolate the gas supply immediately.
- Ventilate the room (Open the windows).
- Do not use electrical appliances and do not operate switches.
- Notify your gas supplier and/or your installer immediately.

This manual forms part of the items delivered with the appliance and must be given to the user to keep in a safe place!

The system must be installed, commissioned, serviced and repaired by an approved installer, in accordance with current standards in force.

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.



The manufacturer reserves the right to change the technical characteristics and features of its products without prior notice.



The availability of certain models as well as their accessories may vary according to markets.

DESCRIPTION

WORKING PRINCIPLE

The **HeatMaster**[®] is a high performance hot water producer using indirect heat transfer due to its Tank-in-Tank technology.

At the centre of the **HeatMaster**[®] there is a stainless steel cylinder through which the flue tubes pass. It is surrounded by a mild steel shell containing the primary water (neutral fluid). The outer shell extends down to the combustion chamber and also surrounds the flue gas tubes. The heat exchange surface is therefore larger than that of traditional direct fired hot water boilers.

A circulating pump installed on the primary circuit moves the water around the tank, heating rapidly and maintaining it at a constant temperature across the primary circuit.

The burner heats the primary fluid which indirectly heats the stainless steel cylinder containing the hot water. As with all Tank-in-Tank systems, the cylinder is corrugated over its full height and suspended in the **HeatMaster**[®] by its hot and cold water connections.

The fact that the cylinder expands and contracts during use and that the cold water is not in contact with the intense heat from the burner flame means that the build-up of lime scale is prevented.

This resistance to lime scale, along with the corrosion resistance of the stainless steel, eliminates the need for sacrificial anodes.

The **HeatMaster**[®] has a major advantage over other hot water boilers: it heats hot water with a primary circuit, which allows the primary fluid to also be used for heating.

The connection of two, three, four or more **HeatMaster**[®] in a cascade meets the most demanding requirements in hot water and in heating.

Indeed, if it is used in combination with Smart, HR and Jumbo cylinders, the **HeatMaster**[®] can respond to the most demanding hot water requirements.

TEMPERATURE CONTROL

The **HeatMaster**[®] 201 are equipped with an electronic controller MCBA [Microprocessor Burner Automate], which handles both the safety functions (ignition, flame monitoring temperature limitation, etc,...) and the temperature control of the boiler. This MCBA can also operate as a regulator governed by outdoor temperature when the outside temperature sensor is fitted.

However, this regulator can also operate with a standard room thermostat (on/off). Combining this regulator with a room thermostat provides temperature control governed by outdoor weather conditions, with indoor compensation.

The user may access four parameters to adjust all the necessary settings. By entering a specific maintenance code into the unit, qualified installers may access certain parameters, in order to adapt the boiler to special requirements. In principle, these are factory preset for all normal applications.

CONSTRUCTION FEATURES

Outer body

The outer body containing the primary fluid is constructed from carbon steel (STW 22).

TANK-IN-TANK accumulator/heat exchanger

The internal large surface ring-shaped inner tank for the production of hot water is constructed from Chrome/Nickel 18/10 stainless steel. It is corrugated over its height by an exclusive manufacturing process and is entirely argon arc welded using the TIG (Tungsten Inert Gas) method.

Combustion gas circuit

The gas combustion circuit is protected by paint and includes:

• Flue tubes

The **HeatMaster**[®] include 8 tubes (**HeatMaster**[®] 71-101) and 15 tubes (**HeatMaster**[®] 201) in steel with an internal diameter of 64 mm. Each tube is equipped with a stainless steel turbulator designed to improve thermal exchange and reduce flue gas temperature.

• Combustion chamber

The combustion chamber of the **HeatMaster**[®] models is entirely water cooled.

Insulation

The boiler body is fully insulated by rigid polyurethane foam with a high coefficient thermal insulation, sprayed on without the use CFC's.

Casing

The boiler is covered with a steel jacket which has been de-greased and phosphated before being stove enamelled at 220 °C.

Burner

The **HeatMaster**[®] 71 - 101 - 201 models are always supplied with a low NOx air/gas pre-mix burner **ACV BG 2000-M**.

FROST PROTECTION

The boiler is equipped with an integrated frost protection: as soon as the boiler temperature [NTC1 probe] drops below 7°C, the central heating pump is activated. As soon as the NTC1 temperature is lower than 3°C, the burner ignites until the temperature exceeds 10°C. The pump continues to turn for approximately 10 minutes. If an outside temperature sensor is connected, the pump is activated as soon as the external temperature goes under the pre-defined threshold.

In order to enable the **HeatMaster**[®] boiler to protect the system against freezing, all the valves of the radiators and the convectors should be completely open.

PACKAGING

HeatMasters[®] 71 and 101 are supplied completely assembled and ready for use.

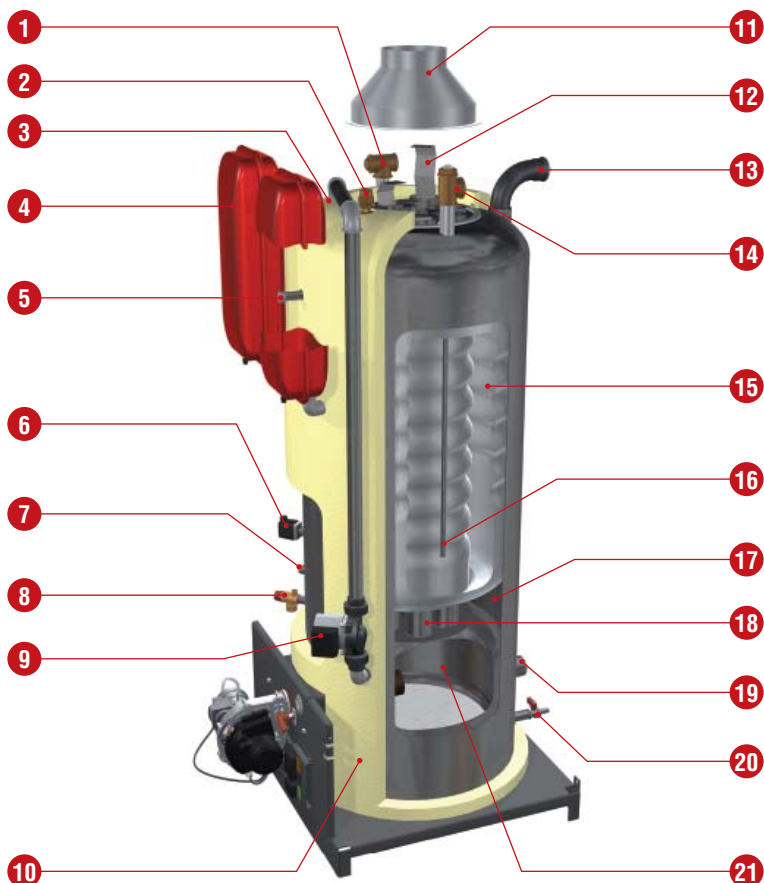
The **HeatMaster**[®] 201 is supplied in four separate packages.

- Package N° 1: Foam insulated body + hydraulic accessories + control board.
- Package N° 2: Flue reducer.
- Package N° 3: The jacket.
- Package N° 4: The burner and its cover, door insulation and sealing cord.

DESCRIPTION

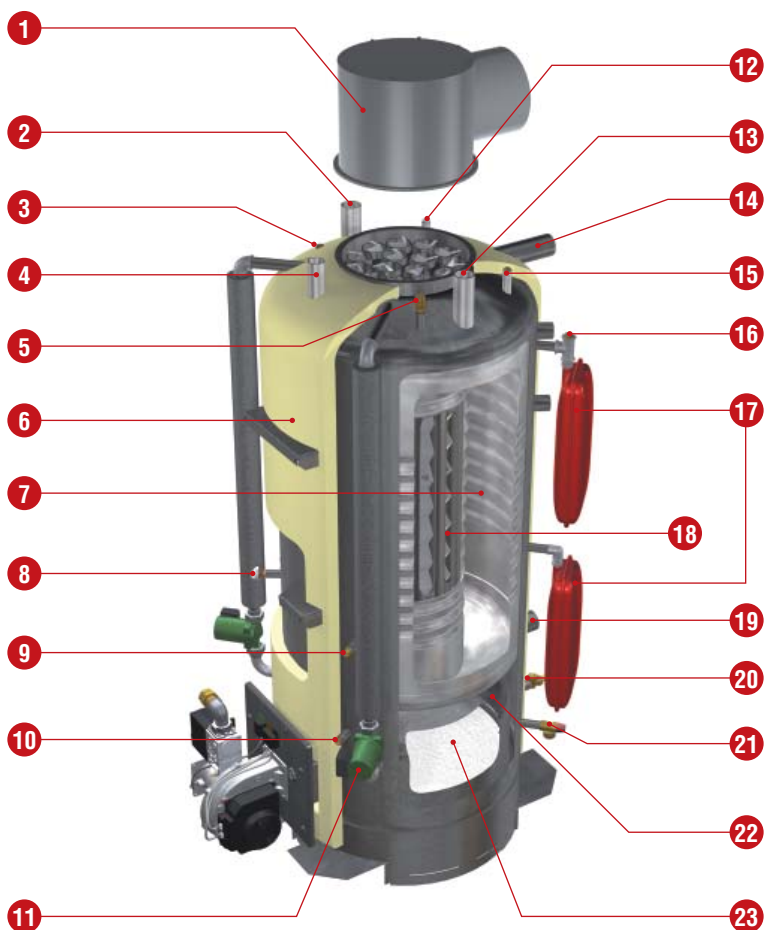
HeatMaster® 71 / 101

1. Cold water inlet and filling loop connection
2. Auto-air vent
3. Primary NTC 1 and 2 sensors
4. Primary expansion tank (2x)
5. Filling loop connection to primary circuit
6. Low-water pressure switch
7. Thermometer bulb and pressure gauge connection
8. Primary safety valve
9. Charging pump
10. Rigid polyurethane foam insulation
11. Chimney reduction with vertical outlet
12. Turbulators
13. Heating flow
14. Domestic hot water outlet
15. Internal stainless steel tank
16. Stainless steel dry-well with ECS NTC 3 sensor
17. Primary tank
18. Flue tubes
19. Heating return
20. Drain cock
21. Combustion chamber




HeatMaster® 201

1. Chimney reduction with horizontal outlet (vertical outlet optional)
2. Cold water inlet
3. Primary NTC 1 and 2 sensors
4. T&P valve connection (optional)
5. Auto-air vent
6. Rigid polyurethane foam insulation
7. Internal stainless steel tank
8. Low-water pressure switch
9. Pressure gauge connection
10. Thermostat control bulb
11. Charging pump (2x)
12. Stainless steel dry-well with ECS NTC 3 sensor
13. Domestic hot water outlet
14. Heating flow
15. Filling loop connection
16. Filling of primary circuit
17. Primary expansion vessel (4x)
18. Flue gas tubes and turbulators
19. Heating return
20. Drain cock
21. Primary safety valve
22. Primary circuit tank
23. Combustion chamber



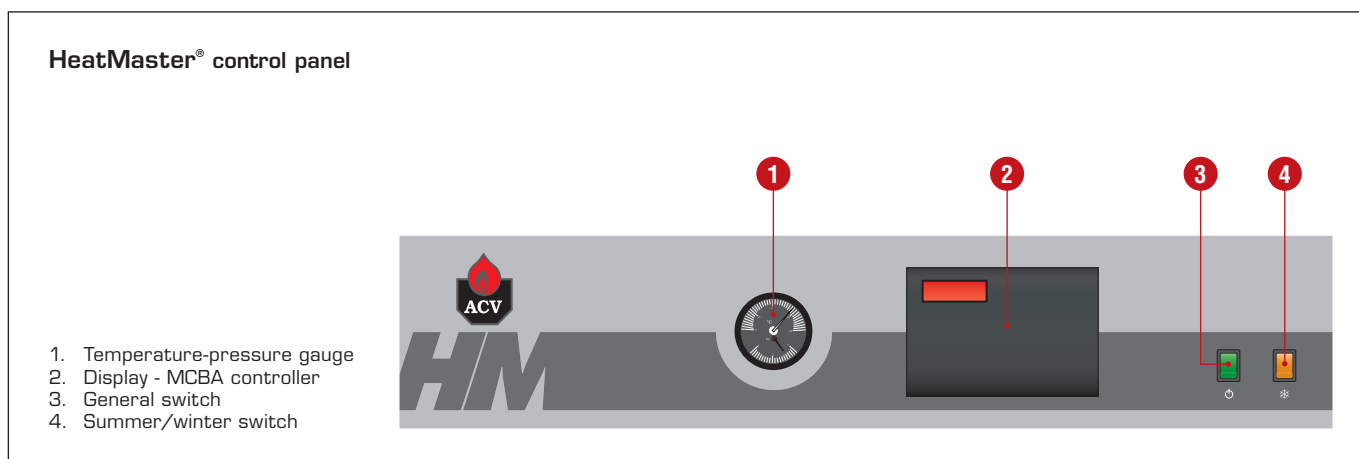
USE OF THE BOILER

 ACV recommends that the boiler is inspected and serviced, if required, at least once a year by a competent and qualified engineer. More frequent servicing may be required depending on boiler use, if this is the case consult your installer for advice.


Starting the burner:

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

The user must not attempt to gain access to the components inside the control panel.



Heating circuit pressure

 It may be necessary to add water to obtain the correct pressure required in the heating system. This pressure is displayed on the temperature-pressure gauge on the boiler control panel.

The minimum cold fill pressure should be 1 bar. The precise operational pressure will depend on the height of the building (See *Bringing Into Service section - Filling up of DHW and heating circuits*).

If the pressure falls to below 1 bar, the boiler low water pressure switch will stop the boiler until the pressure is re-established.

Safety valves

If water is discharged from one of the safety valves, stop the boiler and call an engineer.

SETTING THE PARAMETERS

• Domestic hot water temperature instruction:

- (Hot water temperature)
- Press the **"mode"** key once: the screen indicates **"PARA"**.
 - Press the **"step"** key: the first digit is **1** and the last two digits indicate the current hot water temperature setting.
 - To change this temperature, press **"+"** or **"-"** keys until the temperature indicated by the last two digits is the desired temperature.
 - Press **"store"** to save the setting.
 - Press the **"mode"** key twice to return to normal operating mode [Stand-by].

• Enabling and disabling hot water mode:

- (Hot water)
- Press **"mode"** once: the screen displays **"PARA"**.
 - Press the **"step"** button twice: the first digit is **2** and the last two digits indicate the current setting.
00 = disabled; **01** = enabled.
 - To change this parameter, press the **"+"** or **"-"** keys until you reach the desired value:
00 = disabled; **01** = enabled.
 - Press **"store"** key to save the setting.
 - Press the **"mode"** key twice to return to normal operating mode [Stand-by].

• Enabling and disabling central heating mode:

- (Central heating)
- Press **"mode"** key once: the screen displays **"PARA"**.
 - Press the **"step"** key three times: the first digit is **3** and the last two digits indicate the current setting.
00 = disabled; **01** = enabled.
 - To change this parameter, press the **"+"** or **"-"** keys until you reach the desired value:
00 = disabled; **01** = enabled.
 - Press **"store"** key to save the setting.
 - Press the **"mode"** key twice to return to normal operating mode [Stand-by].

• Setting the temperature of the central heating:

- (the maximum temperature for the heating circuit)
- Press **"mode"** once: the screen displays **"PARA"**.
 - Press the **"step"** key four times: the first digit is **4** and the last two digits indicate the current temperature setting for the central heating.
 - To change this temperature, press the **"+"** or **"-"** keys until the temperature indicated by the last two digits is the desired temperature.
 - Press **"store"** to save the setting.
 - Press the **"mode"** key twice to return to normal operating mode [Stand-by].

MCBA Display



Fault:

The temperature setting of the appliance and the safety functions of its various parts are constantly monitored by the MCBA controller. If a fault occurs, the MCBA turns the unit off and indicates an error code: the display flashes and the first character is an **"E"** followed by the fault code (see list of faults).

To reset the unit:

- Press the **"reset"** key on the display panel.
- If the fault code appears again, contact your contractor.

TECHNICAL CHARACTERISTICS

		HeatMaster® 71	HeatMaster® 101	HeatMaster® 201
Central heating				
Input power (Input)	kW	20.0 - 69.9	25.0 - 107.0	60.0 - 220.0
Useful nominal power (output)	kW	18.4 - 63.0	23.0 - 96.8	56.4 - 200.2
Maintenance loss of the nominal value at 60°C	%	0.60	0.65	0.30
Flue gas				
Flue gas circuit loss	Mbar	0.6	1.4	2.4
Net flue gas temperature	°C	172	165	190
Mass flow rate of combustion products	g/sec.	9.2 - 32.1	11.5 - 49.2	27,6 - 101,2
CO ₂ natural gas	% CO₂	9.0	9,0	9.0
Gas				
Gas flow rate G20 - 20 mbar	M³/h	2.17 - 7.40	2.64 - 11.32	6.35 - 25.40
Gas flow rate G25 - (25 mbar)	M³/h	2.46 - 8.60	3.08 - 13.17	7.38 - 29.54
Gas flow rate G31 (30 / 37 / 50 mbar)	M³/h	0.82 - 2.86	0.94 - 4.50	2.45 - 9.81
Gas connection [F]	Ø	3/4"	1"	1"1/4
Hydraulic parameters				
Max operating temperature	°C	95	95	95
Total capacity	L	239	330	641
Heating circuit capacity	L	108	130	241
DHW cylinder heat exchange surface	m²	3.14	3.95	5.30
Max operating pressure of the heating circuit	Bar	3	3	3
Max operating pressure of the secondary circuit	Bar	10	10	10
Primary circuit pressure drop	Mbar	46	83	240
Electrical connection				
Class	IP	30	30	30
Supply voltage	V/Hz	230 / 50	230 / 50	230 / 50
Maximum electrical consumption.	W	180	200	800
Drained weight	Kg	282	320	550

WATER QUALITY

- Chlorides: < 150 mg/l (304)
< 2000 mg/l (Duplex)
- 6 ≤ ph ≤ 8

TECHNICAL CHARACTERISTICS

GAS CATEGORY

Natural gas categories	BE	FR	NL	LU	DE	AT - CH - CZ - DK - ES - IT - FI - UK - IE - PT - SE - GR	HU
I 2E(S)B * [G20] 20 mbar - [G25] 25 mbar	●						
I 2E(R)B ** [G20] 20 mbar - [G25] 25 mbar	●						
I 2Er [G20] 20 mbar - [G25] 25 mbar		●					
I 2L [G25] 25 mbar			●				
I 2E [G20] 20 mbar				●	●		
I 2ELL [G20] 20 mbar - [G25] 20 mbar					●		
I 2H [G20] 20 mbar						●	
I 2HS [G20] 25 mbar							●

(*) HeatMaster® 71 - (**) HeatMaster® 101 - 201

Propane gas categories	DK - NL NO - IT	BE - CH - ES FR - UK - IE PT - FI - SE IT - GR	AT - CH CZ - ES NL - DE LU - HU	BE - CH ES - FR UK - IE IT - PT	CZ - DK - ES FI - FR - UK IE - IT - NL NO - PT - SE	AT - CH CZ - DE FR
I 3P [G31] 30 mbar	●					
I 3P [G31] 37 mbar		●				
I 3P [G31] 50 mbar			●			
I 3+ *** [G30 + G31] 28 / 30 / 37 mbar				●		
I 3B/P *** [G30] 28 / 30 mbar					●	
I 3B/P *** [G30] 50 mbar						●

(***) HeatMaster® 201

DOMESTIC HOT WATER PERFORMANCE

System operating at 80°C		HeatMaster® 71	HeatMaster® 101	HeatMaster® 201
Peak flow rate at 40°C [ΔT = 30°C]	L/10'	646	905	1745
Peak flow rate at 45°C [ΔT = 35°C]	L/10'	543	777	1489
Peak flow rate at 60°C [ΔT = 50°C]	L/10'	346	514	971
Peak flow rate at 70°C [ΔT = 60°C]	L/10'	268	385	763
Peak flow rate at 80°C [ΔT = 70°C]	L/10'	203	290	586
Peak flow rate at 40°C [ΔT = 30°C]	L/60'	2133	3172	6690
Peak flow rate at 45°C [ΔT = 35°C]	L/60'	1794	2680	5667
Peak flow rate at 60°C [ΔT = 50°C]	L/60'	1219	1813	3534
Peak flow rate at 70°C [ΔT = 60°C]	L/60'	971	1378	2554
Peak flow rate at 80°C [ΔT = 70°C]	L/60'	710	1003	1723
Continuous flow rate at 40°C [ΔT = 30°C]	L/h	1835	2776	6117
Continuous flow rate at 45°C [ΔT = 35°C]	L/h	1573	2379	5039
Continuous flow rate at 60°C [ΔT = 50°C]	L/h	1101	1665	2914
Continuous flow rate at 70°C [ΔT = 60°C]	L/h	918	1241	2128
Continuous flow rate at 80°C [ΔT = 70°C]	L/h	675	903	1468
Reheat time at 60°C	Minutes	23	22	23

ELECTRICAL CONNECTION

Electrical supply

The boiler uses a single phase supply at 230V - 50 Hz. A double pole isolator with a 6 Amp fuse or a 6 Amp MCB must be fitted outside the boiler to allow the power to be shut off during servicing and before any repairs are carried out.

Compliance

The installation must comply with current technical standards and legislation in force.

Safety

The stainless steel cylinder must be connected separately to earth.



The power to the boiler must be isolated before any work is carried out on it.

Alarm module

- Connect the alarm module ribbon cable "X7" to the MCBA connector "X8".

The volt free relays on the alarm module are activated as described below.

1 - Alarm:

This contact closes if the MCBA is in safety shutdown position.

2 - External / burner gas valve - indication of function:

This contact closes if there is a heating request and the burner is operating.

- Technical data:
- Ambient temperature: 0...60 °C
- Contact values: $I_{RMS} \leq 1A$
230 V (+10% / -15%) 50 Hz



If the inductor loads are connected it is necessary to protect them against peak voltages (e.g. RC network).

Internal MCBA connections

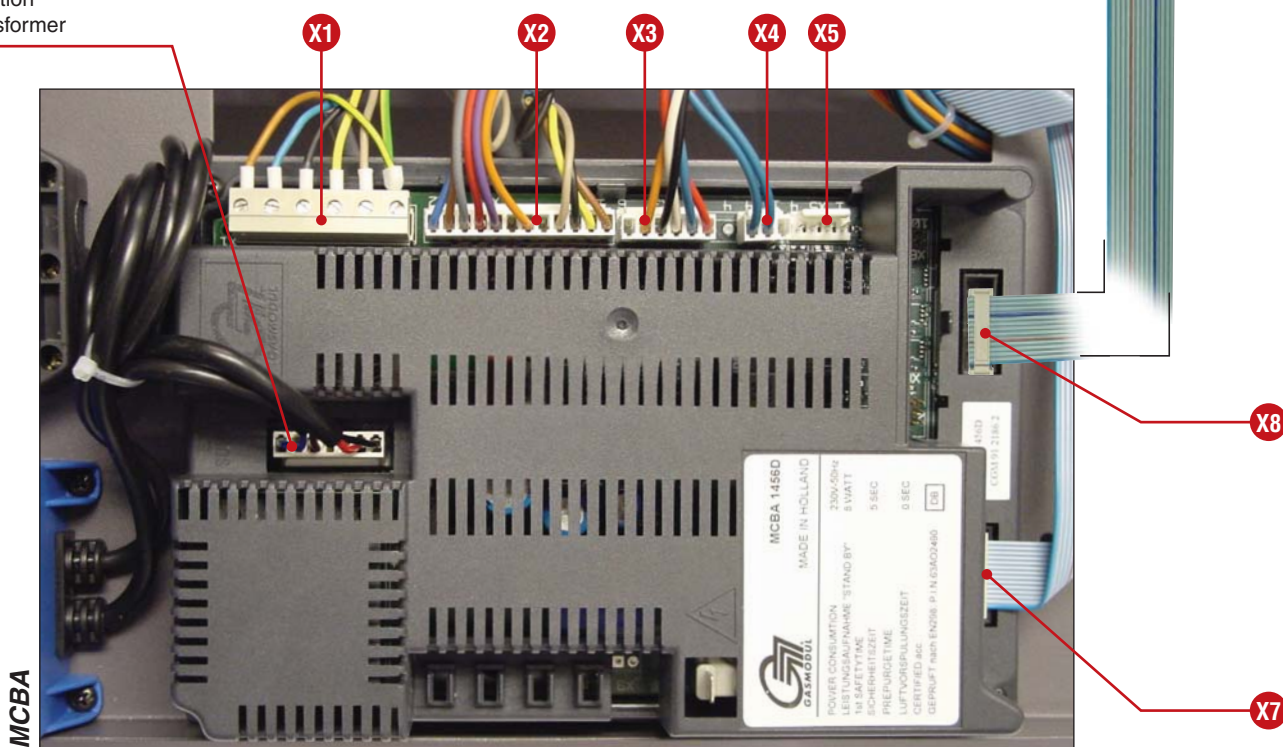
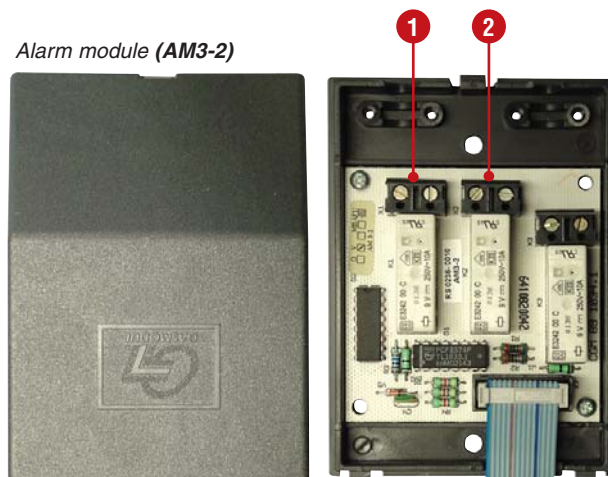
- X1: MCBA 230 V connection
- X2: 24 V connector
- X3: NTC connector
- X4: NTC 6
- X5: Communication
- X7: Display connection
- X8: Flat cable connection for alarm module AM3-2 and / or AM3-11 heating circuit control module



The AM3-2 and AM3-11 alarm modules are only an option for the HeatMaster® 71 / 101 models.

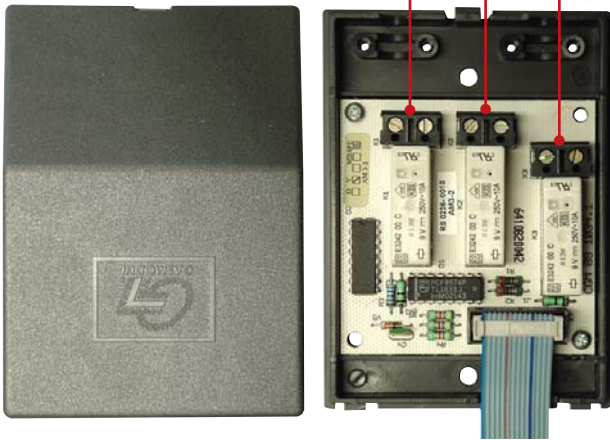
Connection for transformer

Alarm module (AM3-2)



ELECTRICAL CONNECTION

Second circuit module
(AM3-11)



1 - Heating pump switch:

This switch closes when there is a heating request.

2 - Four way valve closing switch (Three ways):

This switch closes if the MCBA regulator has to close the four (3) way valve in accordance with the heating circuit start set point.

3 - Four way (3 way) valve opening switch:

This switch closes if the MCBA regulator has to open the four (3) way valve in accordance with the heating circuit start set point.

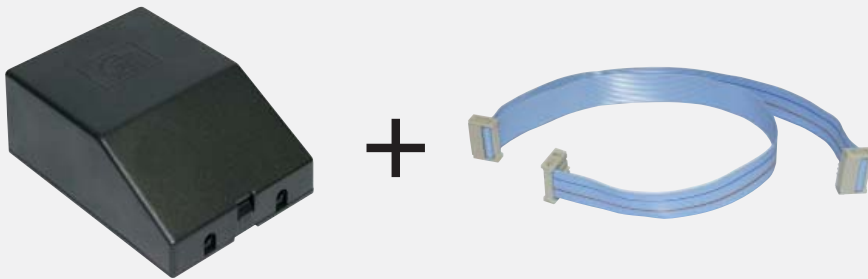


From delivery the heating circuit controlled by Module AM3-11 is de-activated; to bring into service parameter 34 needs to be modified (50 in place of 00) see pages 20 to 22.



ATTENTION: This parameter can only be changed by approved ACV contractors.

Alarm module kit (optional)

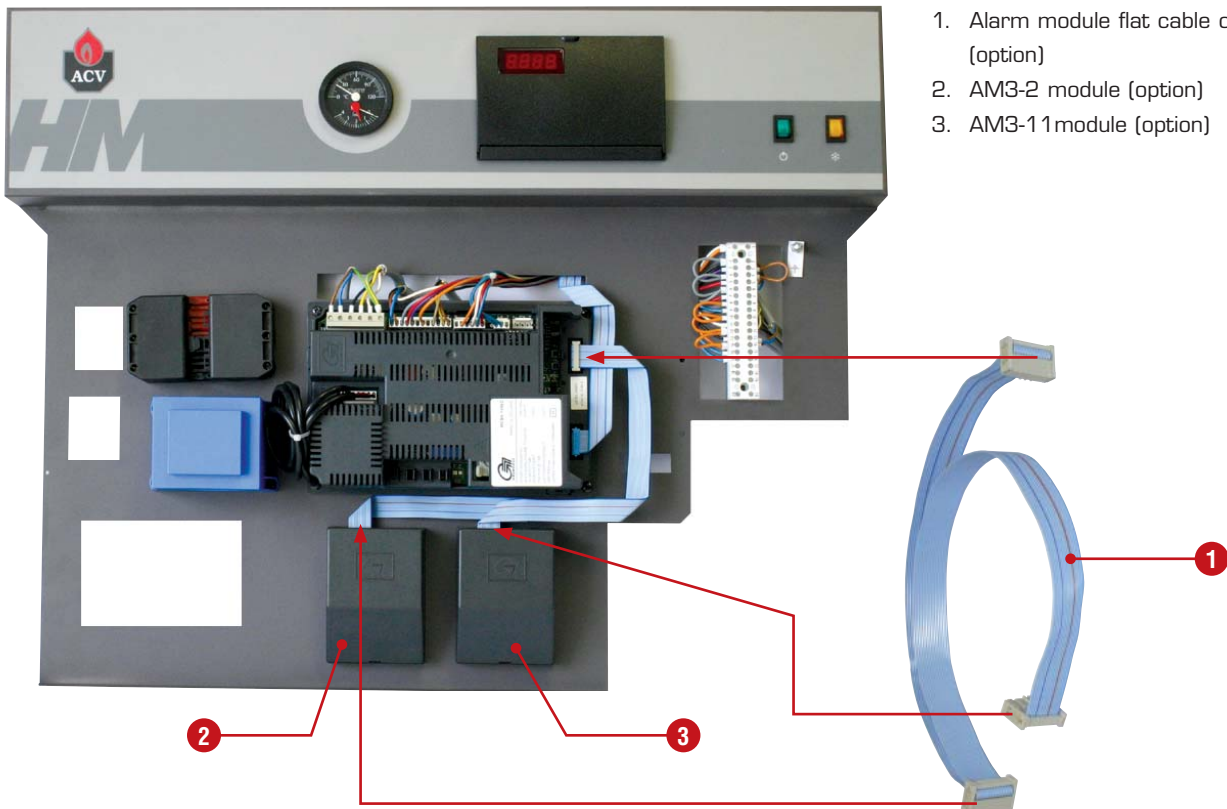


Codes

AM3-2 : 10800094

AM3-11 : 10800095

HeatMaster® 71 / 101 Panel

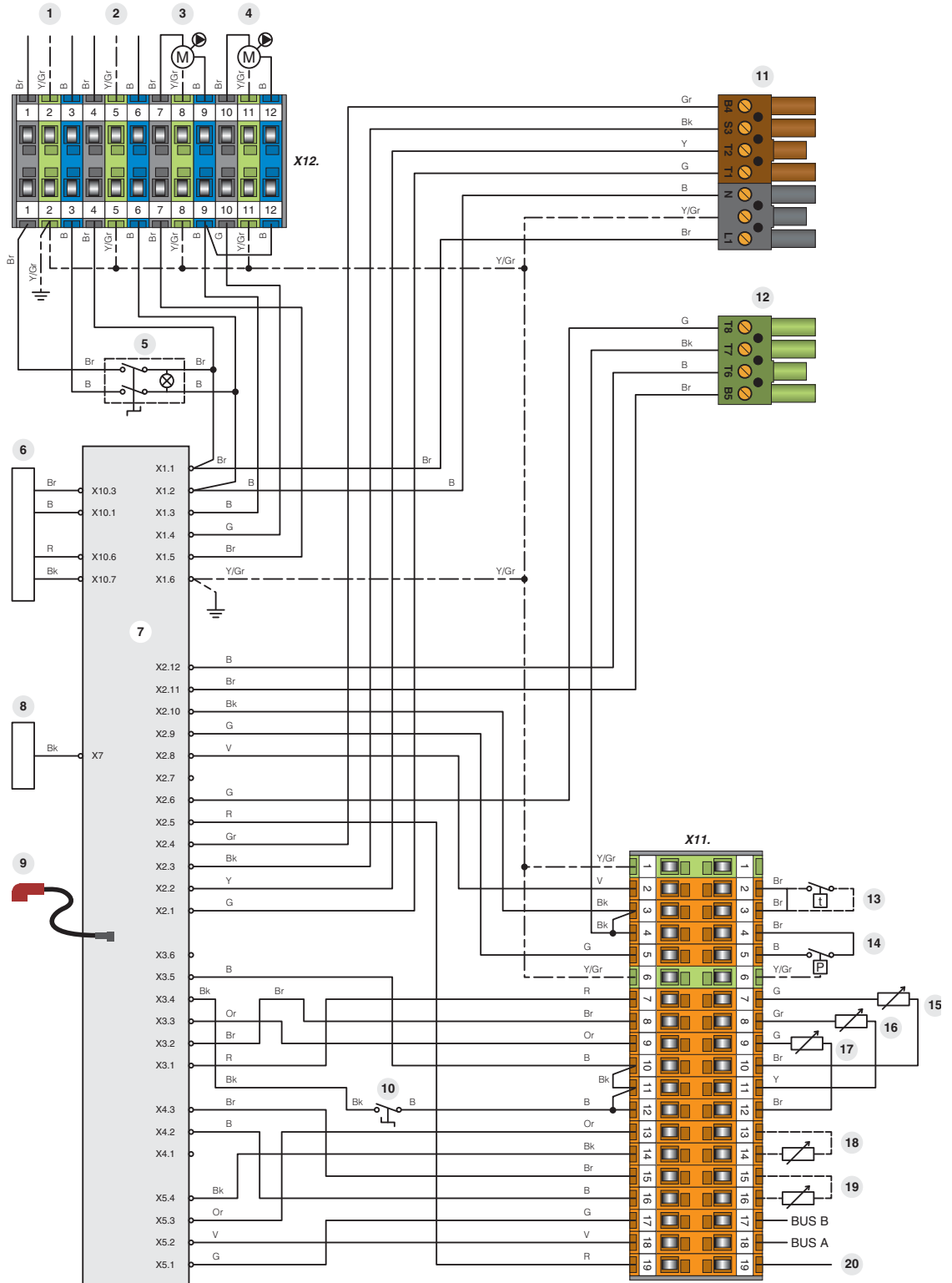


1. Alarm module flat cable connection (option)
2. AM3-2 module (option)
3. AM3-11 module (option)

ELECTRICAL CONNECTION

WIRING DIAGRAM: Heatmaster® 71 / 101

1. 230 Volt supply
2. 230 Volt outlet for AM3-11 module (optional)
3. Charging pump
4. Heating pump
5. General switch
6. 230 Volt - 24 Volt transformer
7. MCBA controller
8. MCBA Display
9. Ignition and ionisation cable
10. SUMMER/winter switch
11. 7 pin burner plug
12. 4 pin burner plug
13. Room thermostat (optional)
14. Low water pressure safety switch
15. Primary NTC1 temperature sensor
16. Primary NTC2 temperature sensor
17. NTC3 hot water temperature sensor
18. NTC4 external temperature sensor (optional)
19. NTC6 2nd heating circuit temperature sensor (optional)
20. Zero volt of 24V circuit



- B. Blue
- Bk. Black
- Br. Brown
- G. Grey
- Gr. Green
- Or. Orange
- Pk. Pink
- R. Red
- V. Violet
- W. White
- Y. Yellow
- Y/Gr. Yellow/Green

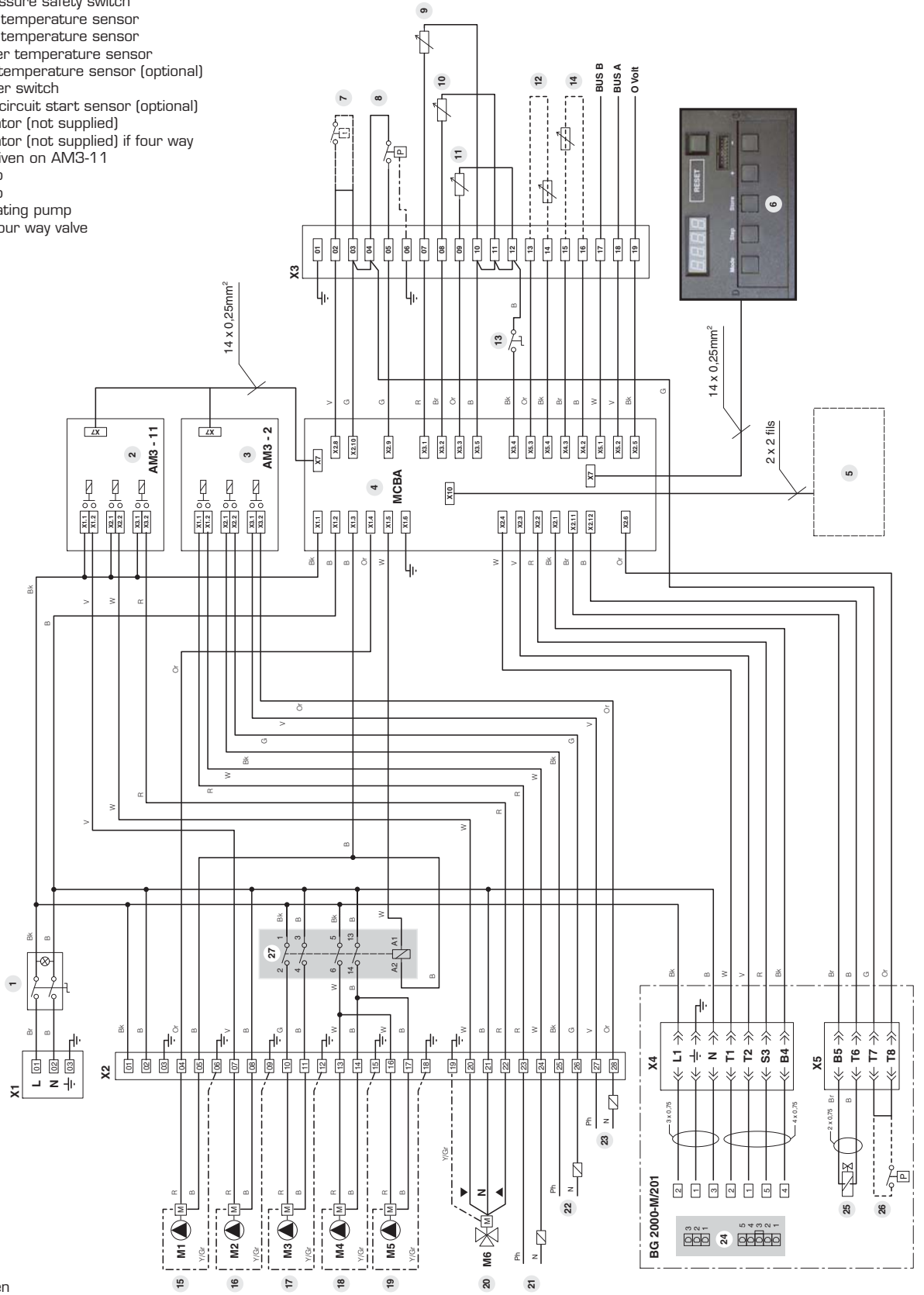
ENGLISH
 FRANCAIS
 NEDERLANDS
 ESPAÑOL
 ITALIANO
 DEUTSCH

WIRING DIAGRAM: Heatmaster® 201

1. General switch
2. Module AM3-11:
3. Module AM3-2:
4. MCBA controller
5. 24 Volt Transformer
6. MCBA Display
7. Room thermostat (optional)
8. Low water pressure safety switch
9. NTC1 primary temperature sensor
10. NTC2 primary temperature sensor
11. NTC3 hot water temperature sensor
12. NTC4 outside temperature sensor (optional)
13. Summer/winter switch
14. NTC6 heating circuit start sensor (optional)
15. Heating circulator (not supplied)
16. Heating circulator (not supplied) if four way valve motor driven on AM3-11
17. Charging pump
18. Charging pump
19. Booster circulating pump
20. Motor driven four way valve
21. Alarm switch
22. External gas valve switch/burner function
23. DHW mode function switch
24. Fan (BG 2000-M / 201)
25. Gas valve (BG 2000-M / 201)
26. Gas pressure switch (BG 2000-M / 201) (optional)
27. Charging pump control relay



- B. Blue
- Bk. Black
- Br. Brown
- G. Grey
- Or. Orange
- R. Red
- V. Violet
- W. White
- Y./Gr. Yellow/Green



INSTALLATION

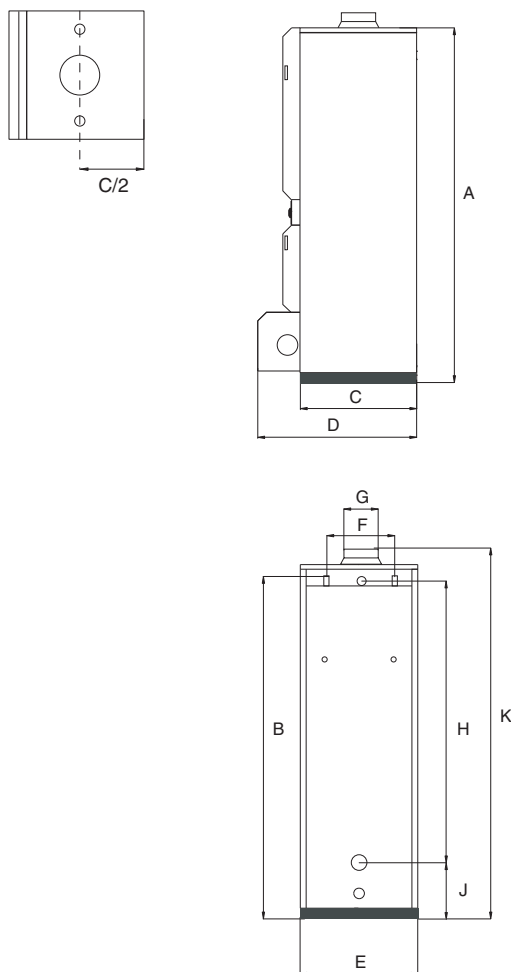
DIMENSIONS

The boiler is delivered completely assembled, tested and packaged on a wood support with anti-shock edges and protected by a heat-shrunk plastic film.

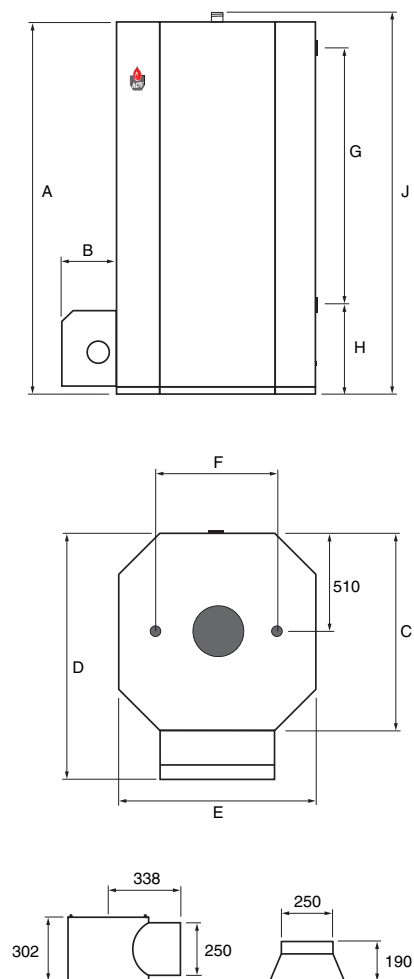
On receipt and after having removed the packaging, check that the boiler is not damaged.
For transport, please refer to sizes and weights mentioned below.

		HeatMaster® 71	HeatMaster® 101	HeatMaster® 201
A	Mm	1743	2093	2085
B	Mm	1630	2030	300
C	Mm	680	680	1020
D	Mm	937	937	1320
E	Mm	680	680	1020
F	Mm	390	390	600
G	Mm	—	—	1383
H	Mm	1355	1750	590
J	Mm	285	285	2117
K	Mm	1720	2120	—
Weight when empty [kg]	Kg	282	335	550
Heating connection [F]	Ø	1"1/2	1"1/2	2"
DHW connection [M]	Ø	1"	1"	2"
Gas connection [F]	Ø	3/4"	1"	5/4"

HeatMaster® 71 - 101



HeatMaster® 201



INSTALLATION

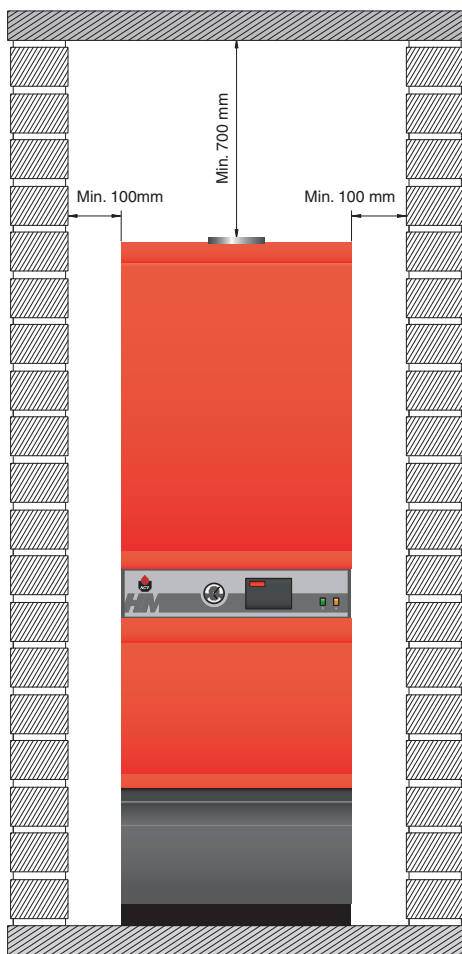
INSTALLATION AREA

- Make sure that all air vents are unobstructed.
- The boiler must be placed on a non-combustible surface.
- Do not store any flammable materials in this room.
- Do not store any corrosive materials, paint, solvents, salts, chlorine products or any other detergent products in the vicinity of this appliance.
- If you smell gas, do not operate electrical switches, close the gas valve on the meter, ventilate the rooms and contact your installer.

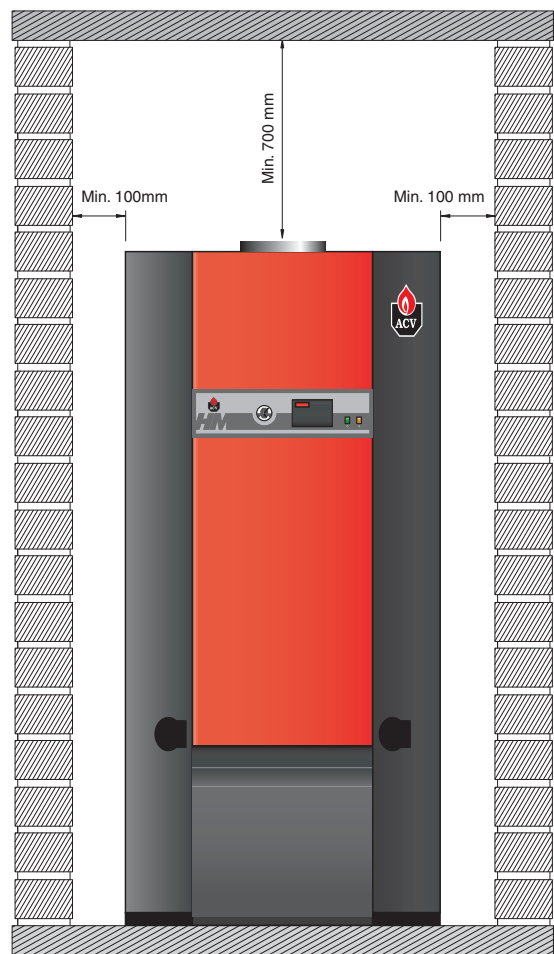
ACCESSIBILITY

The appliance must be placed in such a way that it is always easily accessible. Furthermore, the unit must have the following minimum clearance around it.

HeatMaster® 71 - 101



HeatMaster® 201



INSTALLATION

FLUE CONNECTION

- The flue connection must be carried out in compliance with the standards in force, (example: Belgium NBN B61-001), taking account of local energy supplier and fire regulations as well as regulations relating to "noise pollution".
- The flue pipe size must not be smaller than the size of the boiler outlet connection.

Type of B23 chimney connection

The flue connection shall be achieved by means of a metal pipe rising at an angle from the boiler towards the chimney. **A flue disconnection piece is necessary.** It must be easily removable to allow access to the flue gas tubes for boiler maintenance.

The high performance of our boilers involves an exit of flue gas at a low temperature. Accordingly, there is a risk that the flue gasses may condense. In order to avoid this risk, it is strongly recommended that your chimney is insulated.

Ventilations		HM 71	HM 101	HM 201
Minimum supply of fresh air	m ³ /h	126	194	436
High ventilation	dm ²	2,4	3,20	2,45
Low ventilation	dm ²	2,0	2,0	7,30

Ø minimum from the chimney duct

E = 5 m Ø F min.	mm	189	234	350
F = 10 m Ø F min.	mm	159	178	300
E = 15 m Ø F min.	mm	150	150	270



Comment:

Given that regulations vary from one country to another, the table above is given by way of indication only.

Type C boiler connection type:

- C13: horizontal balanced flue connection
- C33: vertical balanced flue connection
- C53: connection in different pressure zones



• In concentric connection, the total length of the connection is limited to 6 metres.

• In parallel connection, the total length of the connection is limited to 12 metres.



A condensate recovery device must be provided for in the boiler flue outlet, so as to avoid flue condensate entering the boiler.



To avoid condensation water flowing from the terminal, all horizontal pipe lengths must fall back towards the boiler.



The total load loss (air inlet + flue gas outlet) cannot exceed the value (Pa) indicated in the table below showing the pressure drops for the various components.

PRESSURE DROP TABLE

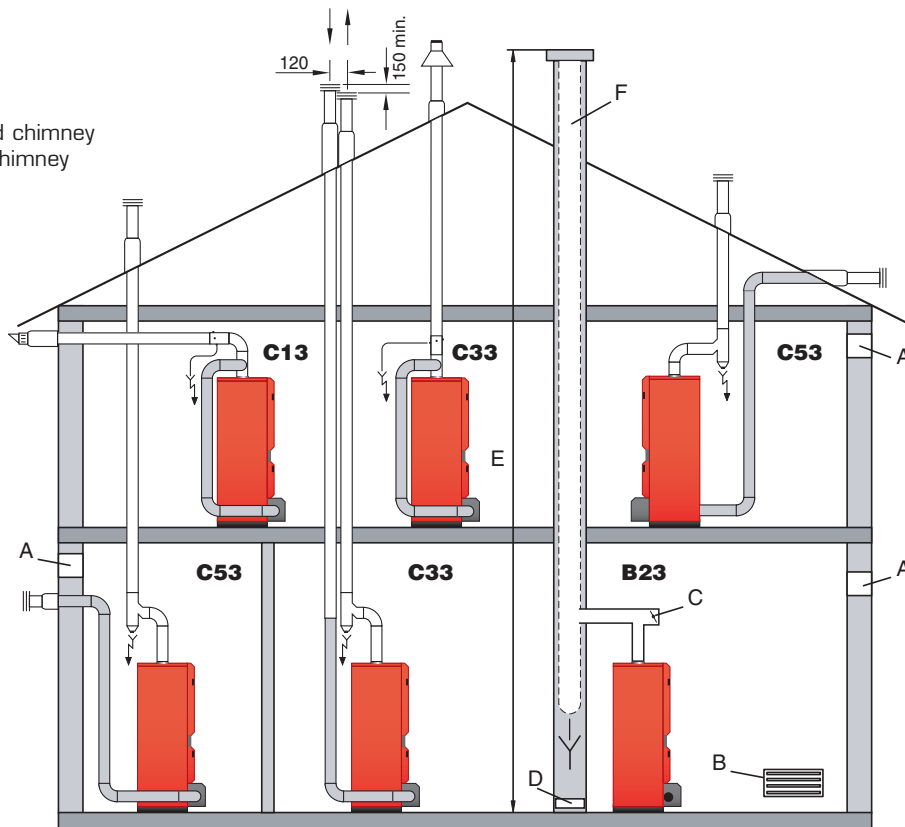
	HeatMaster® 71		HeatMaster® 101		HeatMaster® 201	
	Air 80 mm	Flue gases 150 mm	Air 100 mm	Flue gases 150 mm	Air 150 mm	Flue gases 250 mm
Straight pipe 1 m	6	3	6	4	3	3
90° bend	15	5	15	10	14	10
45° bend	6	1	6	2	6	—
Condensates recovery device	—	2	—	4	—	5
Terminal	20	10	10	10	22	20
Maximum pressure drop. (Pa)	100		100		130	

This table is based on ACV equipment and cannot be applied elsewhere.

INSTALLATION

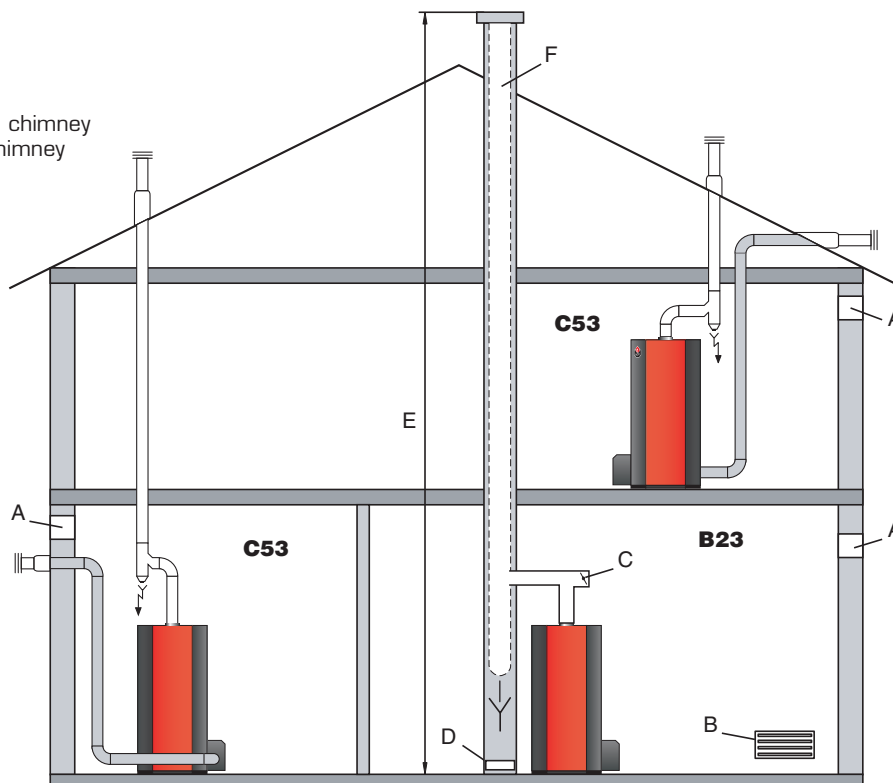
HeatMaster® 71 - 101

- A. High ventilation
- B. Low ventilation
- C. Draught regulator
- D. Inspection cover
- E. Height of the lined chimney
- F. Diameter of the chimney



HeatMaster® 201

- A. High ventilation
- B. Low ventilation
- C. Draught regulator
- D. Inspection cover
- E. Height of the lined chimney
- F. Diameter of the chimney



INSTALLATION

DOMESTIC HOT WATER CONNECTION



The DHW tank (secondary) must be filled and pressurised before filling and pressurising the heating circuit (primary).

The HeatMaster® can be connected directly to the DHW circuit.

Flush the system before connecting the DHW circuit.

The system must be equipped with an approved safety unit including a 7 bar safety valve, a non-return valve and a stop valve.

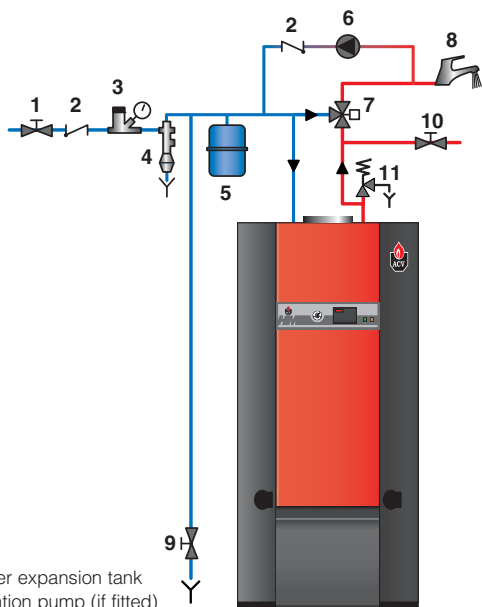
During the heating process, the domestic water expands and the pressure increases. As soon as the pressure exceeds the safety valve setting, the valve opens and ejects a small quantity of water. The use of a DHW expansion tank, which must be calculated according to storage volume, will avoid this and reduce water hammer.



The hot water will reach temperatures greater than 60°C, which can cause burns. Therefore, the installation of a temperature control valve on the hot flow immediately after the appliance is advised.



If stop valves are used in the installation, they can cause pressure waves when they are closed. To avoid this, use devices to reduce water hammer.



1. Stop valve
2. Non-return valve
3. Pressure reducer
4. Safety valve
5. Domestic hot water expansion tank
6. Secondary circulation pump (if fitted)
7. Temperature control valve
8. Hot water outlet
9. Drain down valve
10. Stop valve for cleaning
11. Primary circuit filling valve
12. Temperature and pressure safety valve (UK only)



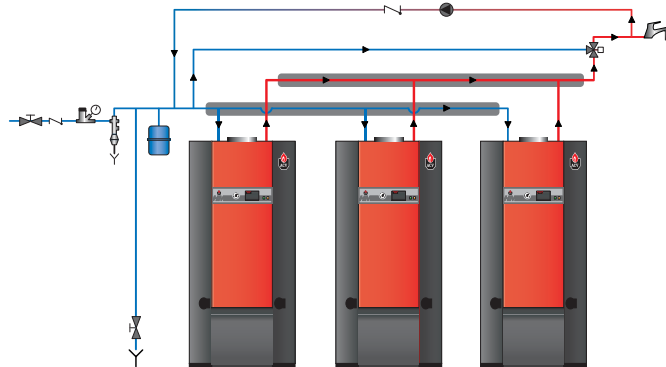
If there is a risk of low pressure in the hot water circuit (installation of HeatMaster® on the roof of a building), it is essential to install a vacuum breaker device onto the cold water supply.

Example of parallel connection

Recommended for applications with high continuous flow rate.

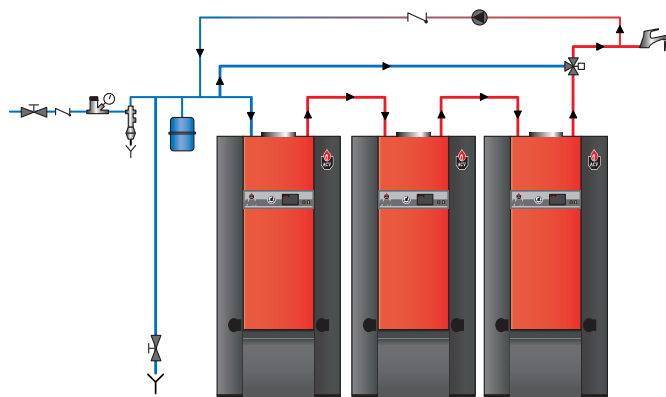


So as to balance out the passage of water in the three boilers, equalising valves are compulsory in this type of system.



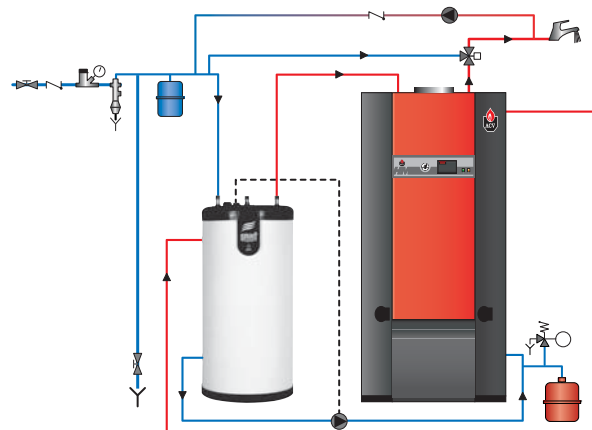
Example of series connection

Preferable for high temperature applications with up to three units.



Example of connection of HeatMaster® + storage cylinder

Recommended for applications requiring a high peak flow rate.



INSTALLATION

HEATING CONNECTION



The DHW tank (secondary) must be filled and pressurised before filling and pressurising the heating circuit (primary).

The HeatMaster® has two couplings at the rear which can serve as a central heating circuit connection. Coupling to a heating distribution network may reduce the hot water performance.

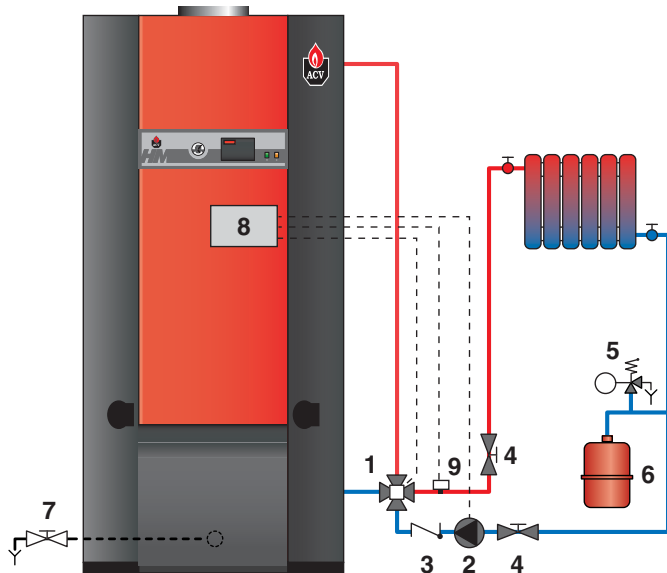
Expansion

The HeatMaster® 201 models are equipped with 4 8L tanks. The expansion tanks are sized only for the "hot water" function. In the case of primary circuit connection, it is necessary to calculate the expansion capacity necessary for the total heating system volume [Refer to the expansion tank manufacturer's technical instructions for a broader explanation].



The pressure of the HeatMaster® expansion tanks must be adjusted to the same pressure as the heating circuit expansion tanks.

1. Four way mixer valve
2. Circulator
3. Non-return valve
4. Heating isolating valves
5. Safety valve calibrated to 3 bar, with pressure gauge
6. Expansion tank
7. Drain valve
8. Primary circuit filling valve
9. MCBA Regulator, AM3-11 module
9. Pipe sensor (optional)



ATTENTION

The primary safety valve is supplied with a plastic discharge tube - this is a temporary fitting and should be replaced.

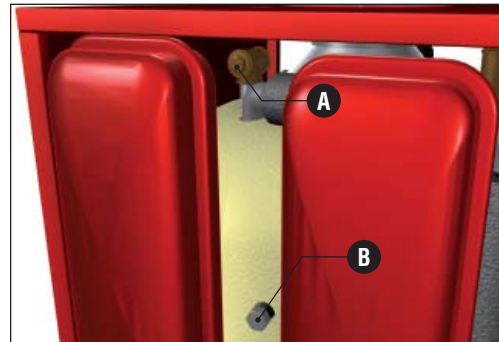
The safety valve must be connected to the drain by a rigid tube, in copper for example.

If a low heating temperature is required, the use of the kit (code: 10800099) is required.

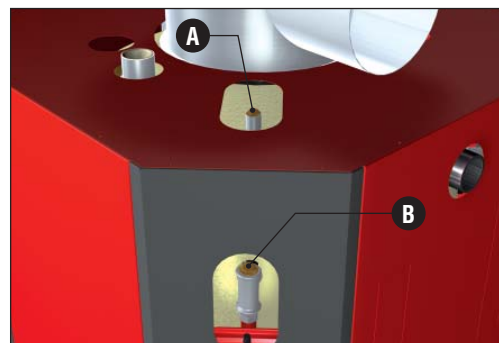
Connection for filling

- A. Cold inlet connection and filling point.
- B. Primary circuit filling point (heating).

HeatMaster® 71 - 101



HeatMaster® 201



GAS CONNECTION

- The HeatMaster® 71/101/201 boilers are equipped with a BG 2000-M 71/101/201 burner with a gas \varnothing 3/4" - 1" and 1 1/4" connection [F] to connect a gas supply valve.
- The gas connections must comply with all applicable standards (in Belgium: NBN D51-003).
- If there is a risk of dirt stemming from the gas network, place a gas filter upstream of the connection.

- Purge the gas pipe and carefully check that there are no leaks on the boiler's internal and external pipes.
- Check the system's gas pressure. Please refer to the technical data table.
- Check the gas pressure and consumption when commissioning the appliance.

BURNER CHARACTERISTICS

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

Description

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 NO_x pre-mix air/gas burners

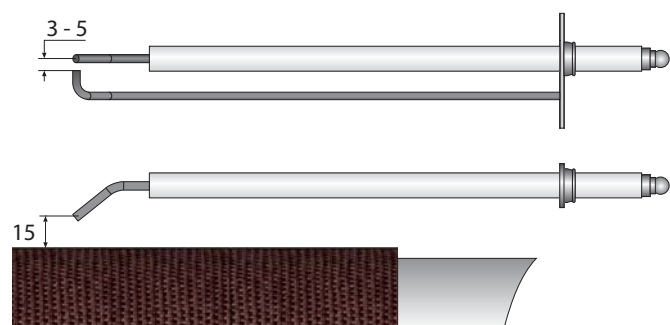
Gas pressure in the gas valve outlet is kept equal to the absolute air pressure in the venturi tube inlet, corrected by the offset adjustment on the regulator.

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 **HeatMaster**[®] models is controlled by a MCBA Honeywell controller which manages both the burner safety function and its modulation according to temperature.

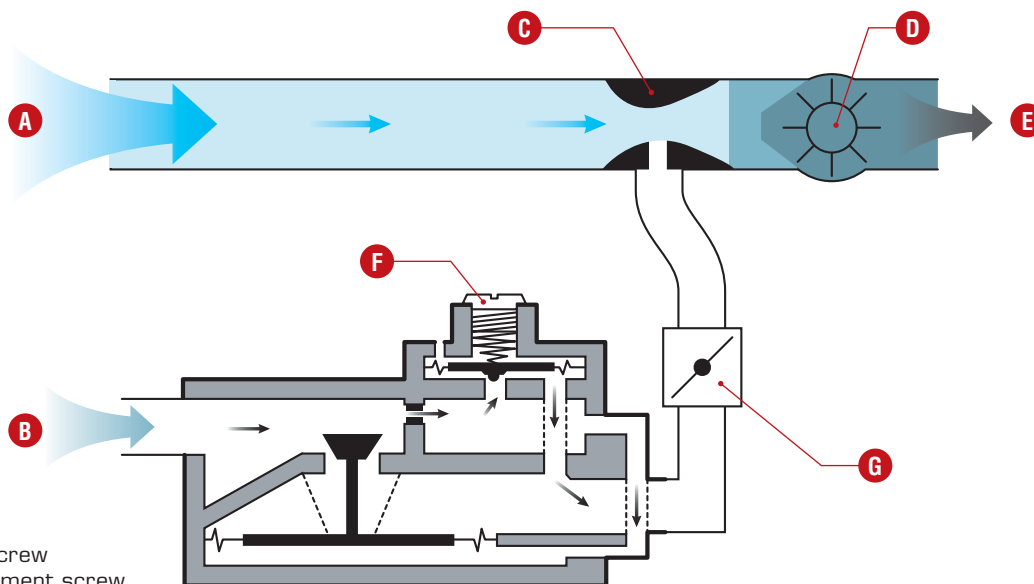
HeatMaster[®] 71 - 101



HeatMaster[®] 201



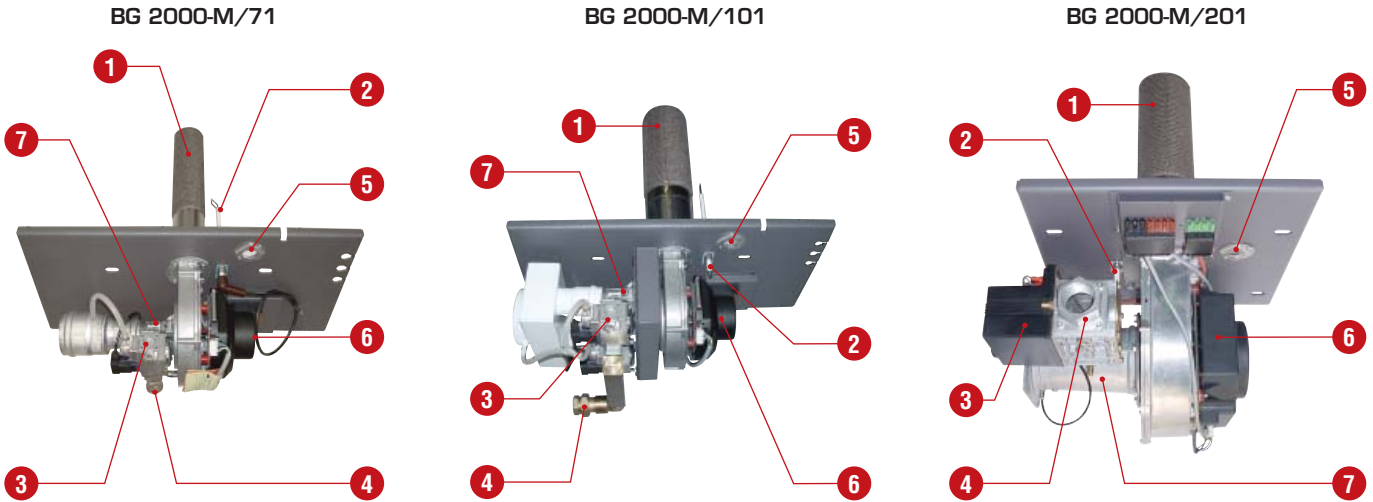
Air/gas mix control principle



- A. Air
- B. Gas
- C. Venturi tube
- D. Fan
- E. Air - Gas mix
- F. Offset adjustment screw
- G. Gas flow rate adjustment screw

BURNER CHARACTERISTICS

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



Burner adjustment

When the burner operates at full power, the CO₂ must be 8.8% to 9.2% (natural gas) or 10.5% to 10.6% (propane).

If necessary adjust the CO₂ by turning the screw in the clockwise direction to reduce and the anti-clockwise to increase. (see photo)



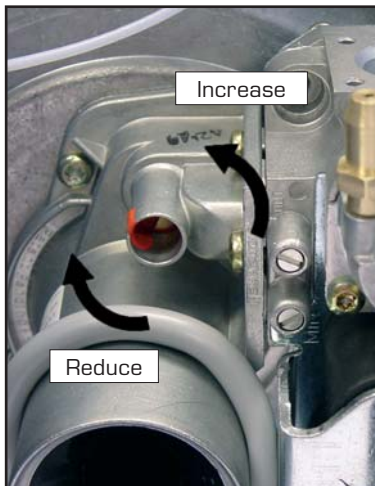
The BG 2000-M burners are pre-adjusted for natural gas in the factory.

Conversion to propane:

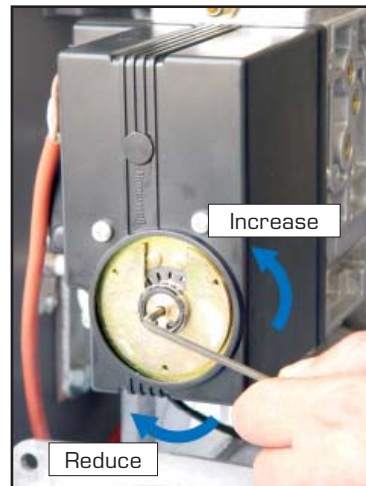


Prohibited in Belgium.

BG 2000-M/71 - 101



BG 2000-M/201



BRINGING INTO SERVICE

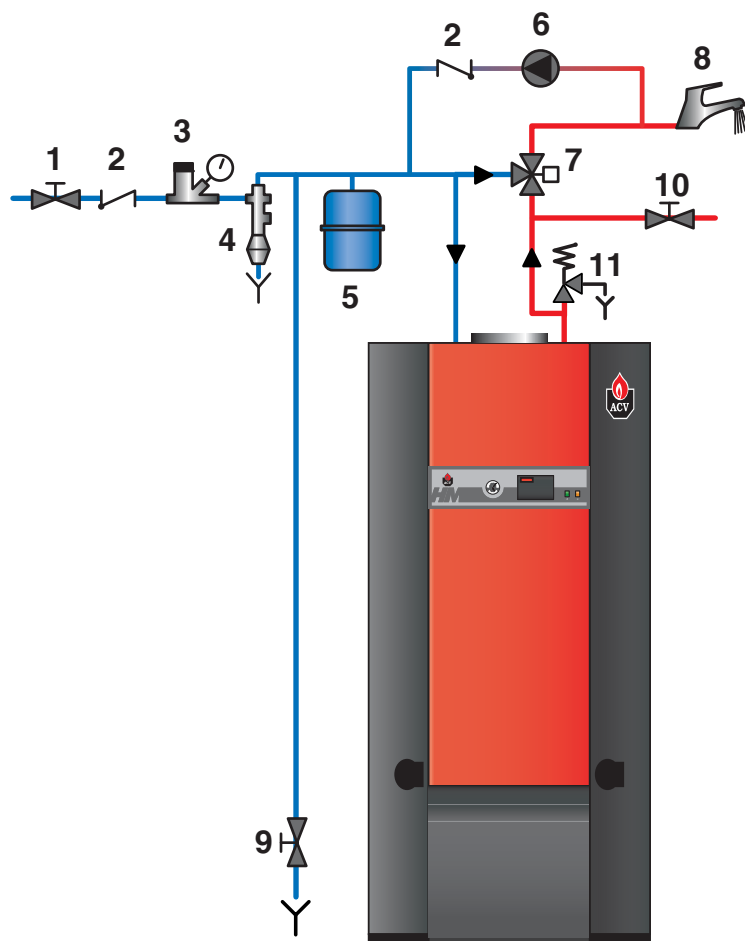
FILLING OF DHW AND HEATING CIRCUITS



IMPORTANT

It is essential that the DHW cylinder is filled and pressurised before filling the heating circuit.

1. Open the stop valve **(1)** and the outlet **(8)**.
When the water flows from the outlet, the DHW cylinder is filled and the outlet can be closed **(8)**.
2. Fill the primary circuit (heating) and pressurise to 1 Bar.
3. Open the automatic air vent situated in the upper part of the boiler.
IMPORTANT: the screw cap must be left loose to allow future automatic venting to take place.
4. After venting the air from the system, bring the pressure up to the static head plus 0.5 bar:
1.5 bar = 10m and 2 bar = 15 m.
5. Check that the electrical connection and the boiler room ventilation are in accordance with the relevant standards.
6. Put the general switch to the ON position.
7. Adjust temperature set points via the MCBA display.
8. Check the gas supply pressure.
9. When the boiler is in operation, check that the flue connections are gas tight.
10. After operating for five minutes, switch the boiler off and vent the heating circuit again, maintaining a pressure of 1 bar.
11. Turn the appliance back on and check the combustion.



ANNUAL MAINTENANCE

ACV recommends that the boiler is inspected and serviced, including the burner, at least once a year by a competent and qualified engineer...

More frequent servicing may be required depending on boiler use, if this is the case consult your installer for advice.

BOILER MAINTENANCE

1. Turn the general switch on the control panel to OFF and isolate the external electrical supply.
2. Close the gas supply valve.

Vertical flue gas outlet reduction:

3. Disengage and remove the flue connection to the boiler
4. Remove the flue reducer by un-tightening the nuts.
5. Extract the turbulators from the flue gas tubes for cleaning.
6. Dismantle the fire door and withdraw the burner.
7. Brush the flue gas tubes.
8. Clean the combustion chamber and the burner.
9. Replace the turbulators, chimney reduction and flue connection, and check that the seal on the flue reducer is in good condition. Replace the seal if necessary.

Horizontal flue gas outlet reduction:

3. Remove the cover from the flue reducer by un-tightening the nuts.
4. Extract the turbulators from the flue gas tubes for cleaning.
5. Dismantle the fire door and withdraw the burner.
6. Brush the flue gas tubes.
7. Clean the combustion chamber and the burner.
8. Replace the turbulators, chimney reduction and flue connection, and check that the seal on the flue reducer is in good condition. Replace the seal if necessary.

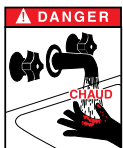
MAINTENANCE OF SAFETY DEVICES

- Check that all thermostats and safety devices are working well.
- Check the safety valves of the heating and DHW circuits.

BURNER MAINTENANCE

- Check that the insulation and seal of the fire door are in good condition - replace them if necessary.
- Check and clean the boiler and the electrodes. Replace the electrodes if necessary (once a year for normal use).
- Check that the safety valves are in good working order.
- Check the combustion (CO₂, CO and burner pressure).

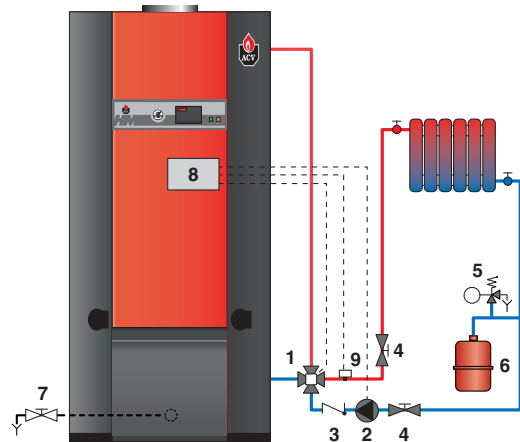
DRAINING OF THE BOILER



The water flowing from the drain valve is very hot and can cause very serious burns. Make sure that nobody is near the hot water discharge.

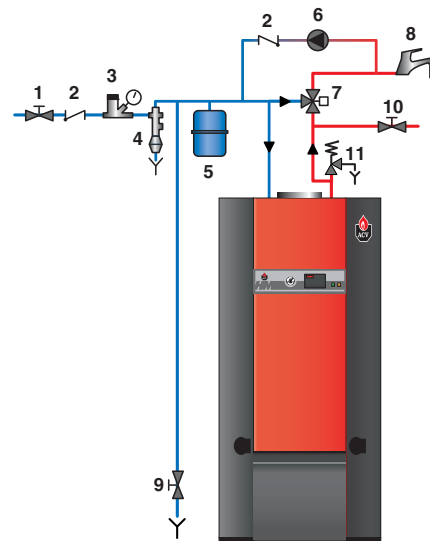
Drainage of the heating circuit

1. Turn the general switch on the control panel to OFF position, isolate the external electrical supply and close the gas supply valve.
2. Close the isolation valves (4) or manually position the four way valve (1) onto "0".
3. Connect a flexible pipe to the drain valve (7).
4. Open the drain valve to empty the primary circuit.



Drainage of the DHW circuit

1. Turn the general switch on the control panel to OFF position, isolate the external electrical supply and close the gas supply valve.
2. Lower the heating circuit pressure until the pressure gauge indicates zero bar.
3. Close the valves (1) and (8).
4. Open the valves (9) and (10) (first of all 9 then 10).
5. Allow the hot water to flow to the drain.



The drain valve (9) must be at ground level to allow the cylinder to drain.

MCBA PARAMETERS FOR THE SPECIALIST

STANDBY MODE

Standby Mode

5t64

When the boiler is switched on, it starts up in Stand-by mode, as shown in the figure above.

This is the standard mode of the MCBA. The MCBA automatically returns to this mode after 20 minutes if no key is pressed on the display. When one or more parameters were stored, the new parameters will become active.

The first digit indicates the boiler's current status, depending on the situation of the boiler and the burner. The last two digits indicate the boiler temperature.

Status	Boiler function
0 388	Standby, no heat demand
1 388	Fan pre-purge / post-purge
2 388	Ignition
3 388	Operation of the burner for heating
4 388	Operation of the burner for domestic hot water
5 388	Waiting for signal from the air pressure switch or to obtain number of start revolutions
6 388	The burner is off because the set value has been reached. There is still a demand for heat
7 388	Pump over run after the heating demand
8 388	Pump over run after the hot water demand
9 388	Blocked burner: <ul style="list-style-type: none"> • 6 18 : T1 > 95°C • 6 19 : T2 > 95°C • 6 24 : T2 - T1 > 10°C after 90 seconds • 6 25 : dT1/dt > maximum gradient T1 • 6 26 : low water pressure switch not closed • 6 28 : no tachometer signal • 6 29 : erroneous tachometer signal • 6 30 : T1 - T2 > Δ max. • 6 33 : Short circuit NTC 3 • 6 38 : interruption NTC 3 • 6 65 : waiting for fan to start

Once the cause of the blocking has been resolved, the burner starts up automatically after a maximum of 150 seconds.

Status	Boiler function
A 388	Internal adjustment — Three-way valve
0 388	Burner on for holding boiler warm
H 388	Test function: max RPM in CH mode
L 388	Test function: min RPM in CH mode
t 388	Test function: burner on with fixed fan speed

If the burner is blocked for one of the above reasons, the screen display alternates between 9 and the temperature (last two digits) and b with the error code (last two digits).

MCBA PARAMETERS FOR THE SPECIALIST

SETTING THE PARAMETERS



Parameter mode 




To access Parameter mode when the system is in Standby mode, press the "MODE" key once.

To scroll through the list of parameters press "STEP". To modify the value of the parameter, use the "+" or "-" keys.

Next, press the "STORE" to record the modified value. The screen will flash once to confirm the data has been saved.

To activate the modified parameters, press "MODE" key again (this will switch you to Info mode). However, if you do not press any key, the system returns to Standby mode after 20 minutes and activates the changes.

Key	Display
 MODE	

Key	Display	Description of the parameters	Factory setting		
			HM 71	HM 101	HM 201
 STEP		Setting the hot water temperature			
 STEP		Hot water generation 00 = Off 01 = On			
 STEP		Switching heating On / Off 00 = Off 01 = On			
 STEP		Maximum temperature in central heating mode			



MCBA PARAMETERS FOR THE SPECIALIST

INFORMATION ON THE INSTALLATION











Info mode

INFO

To switch from **Standby** mode to **Info** mode, press twice on "MODE"

Key	Display
	PARA
MODE	
	INFO
MODE	

Press the "STEP" key until you see the desired information. The dot located behind the first position flashes to indicate that the boiler is in **Info** mode.

Key	Display	Description of the parameters
	1.80	T1 boiler temperature in °C
STEP		
	2.50	T2 boiler temperature in °C
STEP		
	3.65	Domestic hot water temperature T3 in °C
STEP		
	4.03	Outside temperature T4 in °C
STEP		
	5.55	Not used
STEP		
	6.45	Calculated boiler temperature in °C
STEP		
	7.00	Speed of increase of T1 temperature in °C/s
STEP		
	8.00	Speed of increase of T2 temperature in °C/s
STEP		
	9.00	Rate of increase of hot water temperature in °C/s
STEP		
	A.34	Central heating circuit temperature [with AM3-11 module only]
STEP		

ENTERING THE CODE

Code mode



CODE

You can access the following parameters by entering the service code:



- Parameters 5 through 42
- Communication mode
- Fan speed mode
- ERROR mode

Stby

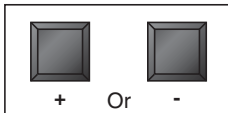

To access Code mode, simultaneously press the **MODE** and **STEP** keys. (Only from Stand-by mode!)


→




Press **STEP** once and the screen indicates "C" in the first position, then random characters in the third and fourth positions.


→


Press on the "+" or "-" key to select the code.


→


Press the **STORE** key and the screen flashes briefly to indicate that the code has been accepted.


→


Press the **MODE** key until the desired mode appears.

 Only ACV approved installers know the access code.

For more information, please contact our after-sales service.

MCBA PARAMETERS FOR THE SPECIALIST

SETTING THE PARAMETERS: only accessible with the code












Key	Display	Description of the parameters	Factory setting			
			HM 71	HM 101	HM 201	
STEP	P.05	Minimum boiler temperature using outdoor sensor To avoid problems with the hot water function it is not advised to adjust this parameter below 60°C	60	60	60	
STEP	P.06	Minimum external temperature [adjustment of the heating curve]	10	10	00	
STEP	P.07	Maximum external temperature [adjustment of the heating curve]	25	25	20	
STEP	P.08	Frost protection temperature	05	05	05	
STEP	P.09	Correction based on external temperature	00	00	00	
STEP	P.10	Tblocking 0 = Disabled	00	00	00	
STEP	P.11	Booster 00 = Stop - [minute]	00	00	00	
STEP	P.12	Night time central heating reduction (°C)	10	10	10	
STEP	P.13	Max. fan speed in heating mode [rpm x 100]	Natural gas	46	60	52
			Propane	42	54	47
STEP	P.14	Max. fan speed in central heating mode [rpm]	Natural gas	00	00	00
			Propane	00	00	00
STEP	P.15	Max fan speed in domestic hot water mode (rpm x 100)	Natural gas	46	60	59
			Propane	42	54	53
STEP	P.16	Max fan speed in domestic hot water mode (rpm)	Natural gas	00	00	00
			Propane	00	00	50
STEP	P.17	Min. fan speed [rpm x 100]	Natural gas	14	15	15
			Propane	14	15	15

MCBA PARAMETERS FOR THE SPECIALIST

Key	Display	Description of the parameters	Factory setting			
			HM 71	HM 101	HM 201	
STEP	P. 18	Min. fan speed [rpm]	Natural gas	8800	8800	8800
			Propane	8800	8800	8800
STEP	P. 19	Max fan speed during ignition [rpm x 100]	Natural gas	8835	8842	8837
			Propane	8832	8838	8832
STEP	P. 20	Central heating pump over run 0 = 10 sec. [min.]	8800	8800	8800	
STEP	P. 21	Domestic hot water pump over run [sec. x 10.2]	8811	8811	8811	
STEP	P. 22	CH hysteresis on	8801	8801	8801	
STEP	P. 23	CH hysteresis off	8803	8803	8803	
STEP	P. 24	DHW hysteresis on	8801	8801	8801	
STEP	P. 25	DHW hysteresis on	8802	8802	8803	
STEP	P. 26	DHW detection hysteresis on	8804	8804	8804	
STEP	P. 27	DHW detection hysteresis off	8801	8801	8801	
STEP	P. 28	Central heating block time [sec. x 10.2]	8800	8800	8800	
STEP	P. 29	Domestic hot water block time [sec. x 10.2]	8800	8800	8800	
STEP	P. 30	DHW → CH blocking time [sec. x 10.2]	8800	8800	8800	

MCBA PARAMETERS FOR THE SPECIALIST







Factory setting

Key	Display	Description of the parameters	HM 71	HM 101	HM 201
 STEP	P.31	Difference T1 - T2 for modulation	05	05	05
 STEP	P.32	BUS -1address = de-activated	-01	-01	-01
 STEP	P.33	Increase of the primary temperature set point to generate hot water	02	02	05
 STEP	P.34	00 = high temperature circuit - circulator controlled by room thermostat - DHW priority active. 50 = controlled circuit [external sensor and AM3-11 module] - circulator controlled by the room thermostat - DHW priority is not active.	00	00	00
 STEP	P.35	DHW production type: This parameter cannot be modified in any way on a HeatMaster®	12	12	12
 STEP	P.36	Manual fan speed (- 01 = modulation enabled)	-01	-01	-01
 STEP	P.37	Not used	11	11	11
 STEP	P.38	Maintenance temperature	00	00	00
 STEP	P.39	Maximum temperature of the heating circuit (AM3-11 - four way valve)	60	60	60
 STEP	P.40	Minimum temperature of the heating circuit (AM3-11 - four way valve)	10	10	30
 STEP	P.41	Heating circuit hysteresis temperature (AM3-11 - four way valve)	01	01	01
 STEP	P.42	1st position: special pump [0 = disabled] 2nd position: minimum disabling cycle [0 = disabled]	00	00	00





MCBA PARAMETERS FOR THE SPECIALIST

COMMUNICATION MODE [with code]

This mode displays communication between the boiler and the control module, the optional interface kit or the optional programmable room thermostat.










Key	Display	Description of the parameters
 MODE		
 STEP		No communication
		Communication between the boiler module and the optional control module
		Communication between all the connected devices

Fan mode [with code]

Key	Display	Description of the parameters
 MODE		Fan speed
 STEP		The fan's current speed is 5500 rpm.

ERROR MODE [with code]

The **ERROR** mode indicates the most recent error, as well as the status of the boiler and the temperature values at the time of this error.

Key	Display	Description of the parameters
 MODE		
 STEP		Error code at last lockout.
		Status of the boiler at the time of the error
		T1 temperature at the time of the error
		T2 temperature at the time of the error
		Hot water temperature T3 at the time of the error
		Outdoor temperature T4 at the time of the error

MCBA PARAMETERS FOR THE SPECIALIST

LIST OF ERROR CODES + SOLUTIONS [in ERROR mode]

If a fault occurs during operation, the system locks out and the screen starts to flash.
The first character is an "E" and the following two indicate the fault code, as indicated in the table below.










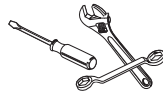
To unlock the system:

- Press "RESET" on the screen.
- If the fault is repeated continually, contact your installer.

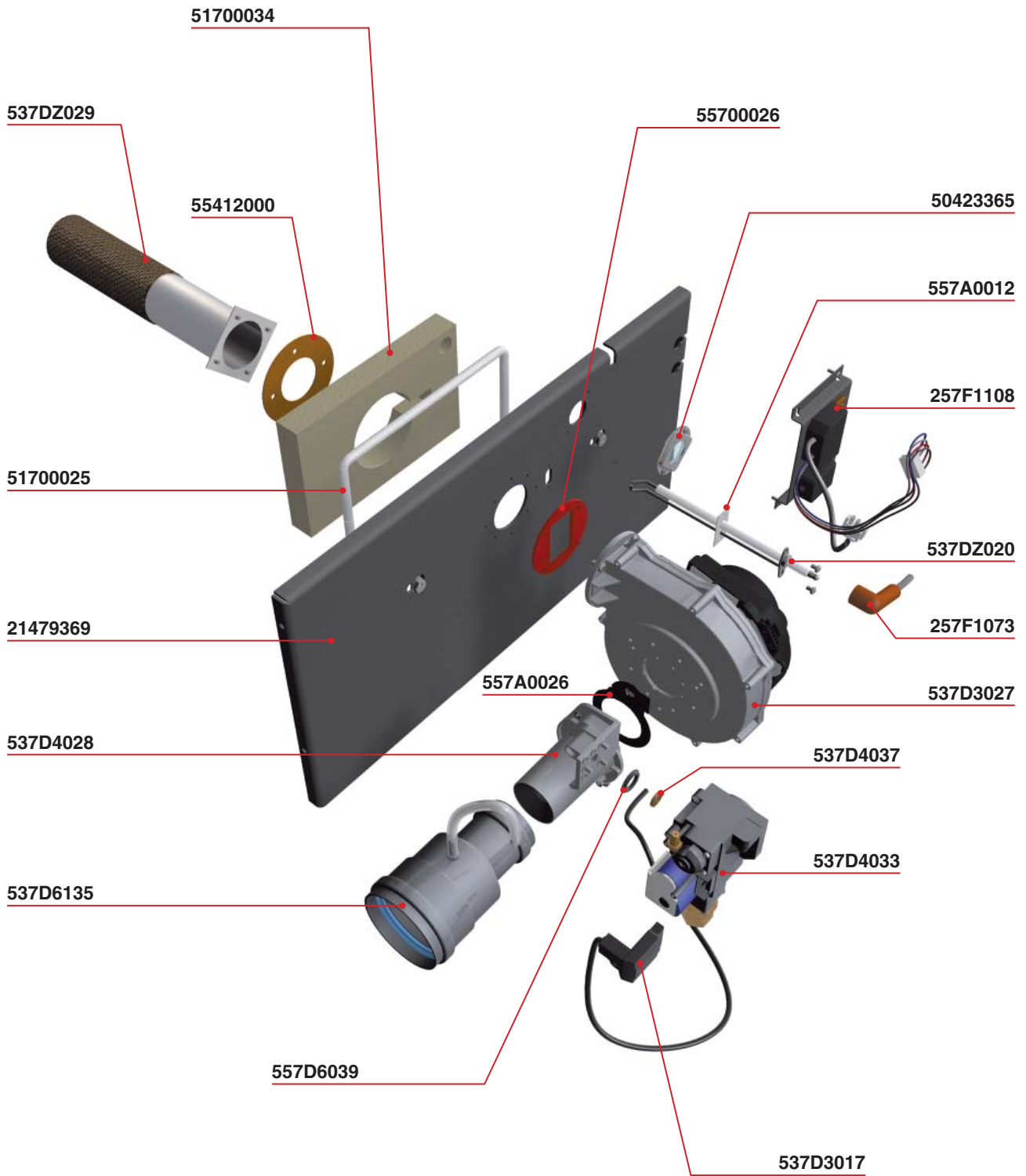
Codes	Description of the fault	Resolution of the fault
E800	Abnormal flame signal detected	<ul style="list-style-type: none"> - Check the wiring (short circuit in the 24V wiring) - Check the electrode - Replace the MCBA (water damage)
E802	No flame presence after five start-up attempts	<ul style="list-style-type: none"> - Check the ignition wiring - Check the electrode and its position - Check the gas supply to the burner
E803	Rectifier or gas valve error	Replace the rectifier or gas valve
E804	Persistent lockout	Press "RESET"
E805 ↓ E807	Internal error	If the problem persists after two "RESET" attempts, replace the MCBA
E811	EPROM error	If the problem persists after two "RESET" attempts, replace the MCBA
E812	Low water safety or 24 V fuse damaged	<ul style="list-style-type: none"> - If the primary water pressure is lower than 0.5 bar, re-establish the pressure to a minimum of 0.8 bar by adding water to the system - Check the wiring - Check the 24 Volt fuse of the MCBA
E813 ↓ E817	Internal error	If the problem persists after two "RESET" attempts, replace the MCBA
E818	T1 > 110°C	<ul style="list-style-type: none"> - Check the NTC wiring and replace it if necessary - If the NTC 1 sensor is OK, check if there is water flow in the boiler
E819	T2 > 110°C	<ul style="list-style-type: none"> - Check the NTC wiring and replace it if necessary
E825	T1 gradient too high	<ul style="list-style-type: none"> - Check if the pump is running - If there is no problem with the pump, vent the system
E828	No tachometer signal from the fan	<ul style="list-style-type: none"> - Check the PWM connection - Check the fan's wiring <p>If the problem persists after two "RESET" attempts, replace the fan, otherwise, change the MCBA</p>
E829	The fan's tachometer signal does not drop back to "0"	<ul style="list-style-type: none"> - Check the draft in the chimney. <p>If the draught is correct replace the ventilator</p>
E831	Short circuit NTC 1	<ul style="list-style-type: none"> - Check the connection of the NTC 1 sensor - Check the wiring of the NTC 1 sensor <p>If the problem persists replace the NTC 1 sensor</p>
E832	Short circuit NTC 2	<ul style="list-style-type: none"> - Check the connection of the NTC 2 sensor - Check the wiring of the NTC 2 sensor <p>If the problem persists, replace the NTC 2 sensor</p>

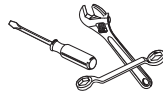
MCBA PARAMETERS FOR THE SPECIALIST

Codes	Description of the fault	Resolution of the fault
	Short circuit NTC 3	<ul style="list-style-type: none">- Check the connection of the NTC 3 sensor- Check the wiring of the NTC 3 sensor If the problem persists replace the NTC 3 sensor
	NTC 1 connection open	<ul style="list-style-type: none">- Check the connection of the NTC 1 sensor- Check the wiring of the NTC 1 sensor If the problem persists replace the NTC 1 sensor
	NTC 2 connection open	<ul style="list-style-type: none">- Check the connection of the NTC 2 sensor- Check the wiring of the NTC 2 sensor If the problem persists replace the NTC 2 sensor
	NTC 3 connection open	<ul style="list-style-type: none">- Check the connection of the NTC 3 sensor- Check the wiring of the NTC 3 sensor If the problem persists replace the NTC 3 sensor
	Internal error	If the problem persists after two "RESET" attempts, replace the MCBA
	Error during reading of the parameters	Press RESET If the error persists, replace the MCBA
	Fan power supply problems	<ul style="list-style-type: none">- Check the supply voltage of the MCBA If you detect no problems with it, replace the fan

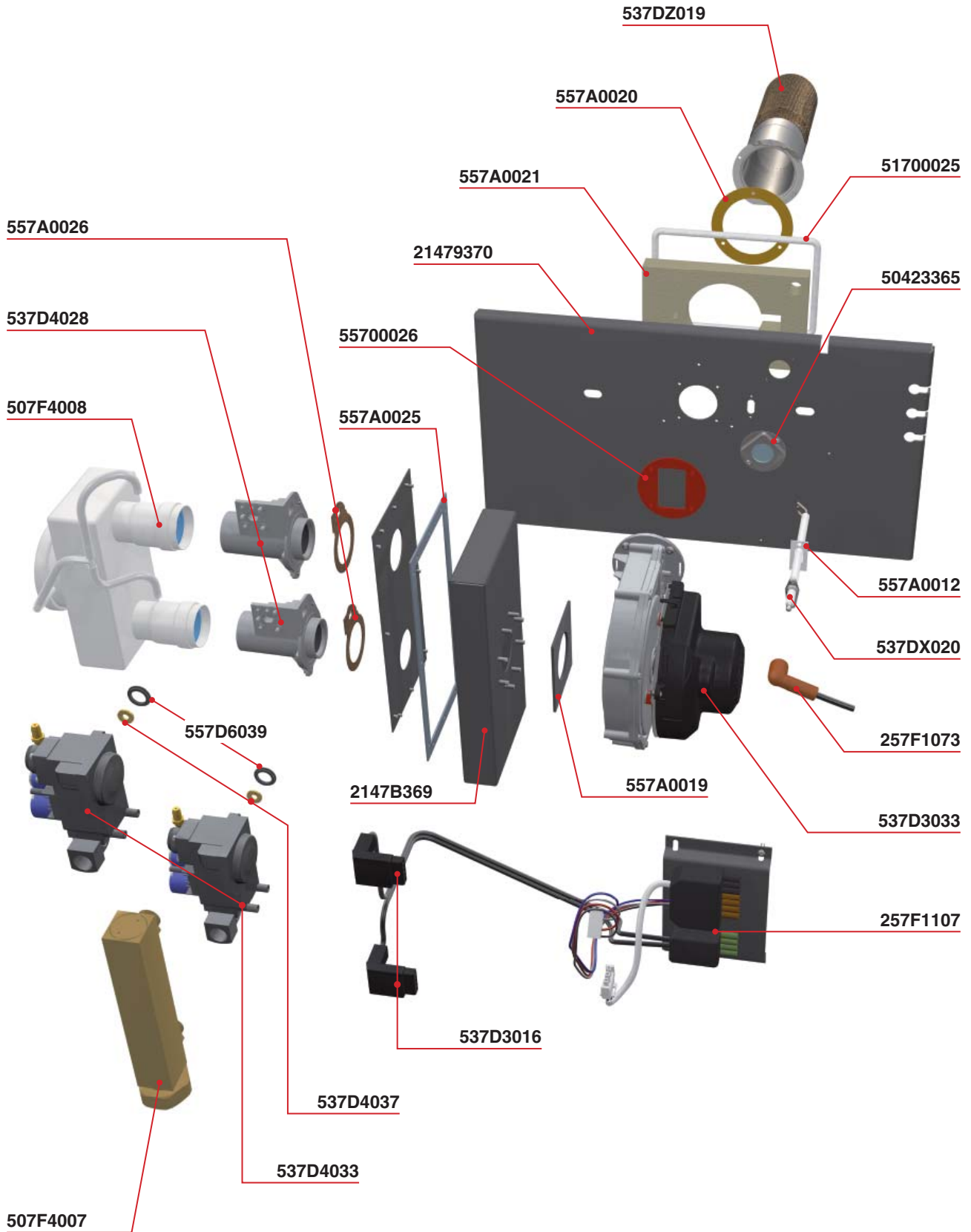


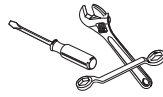
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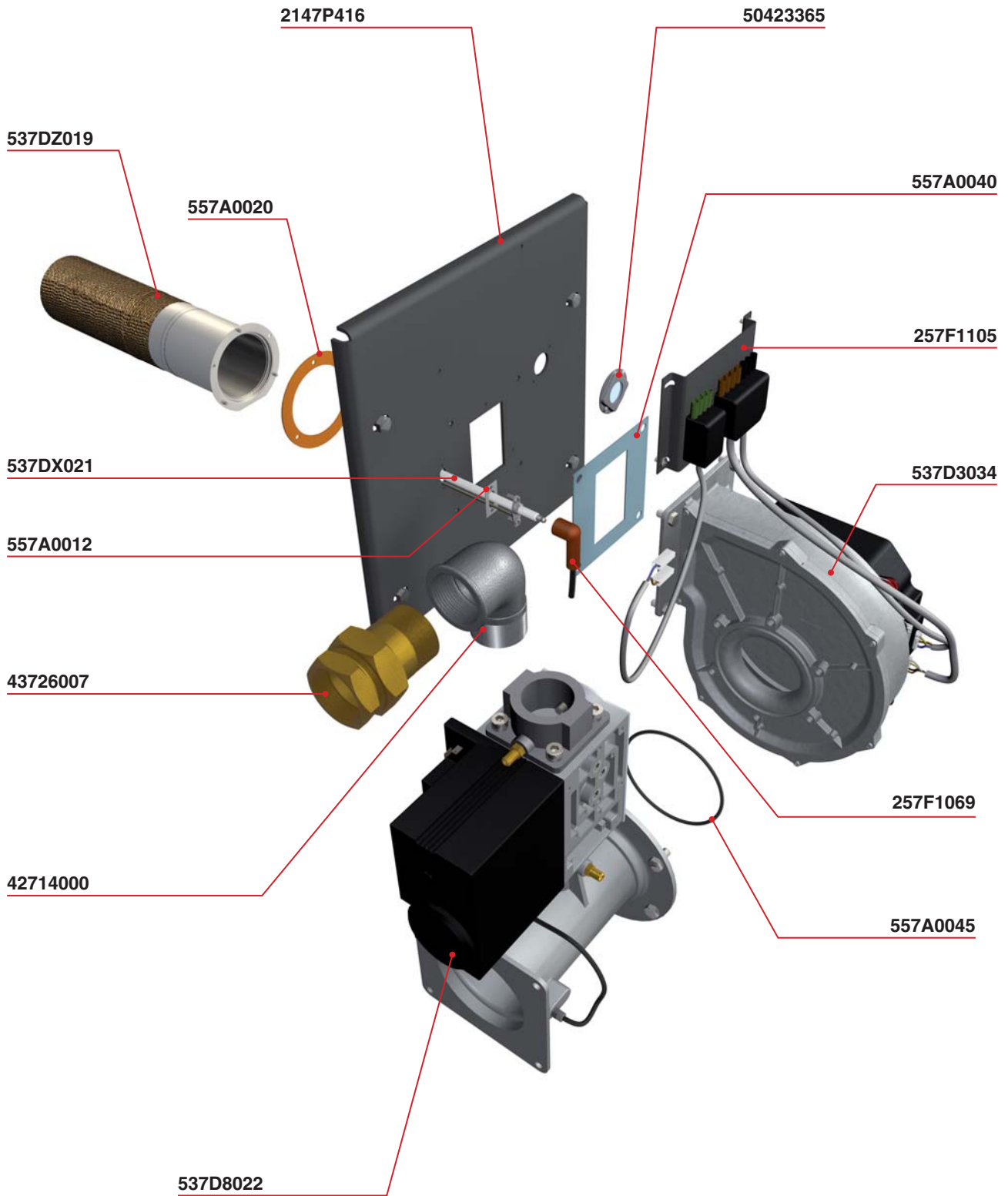


BG 2000 - M / 101



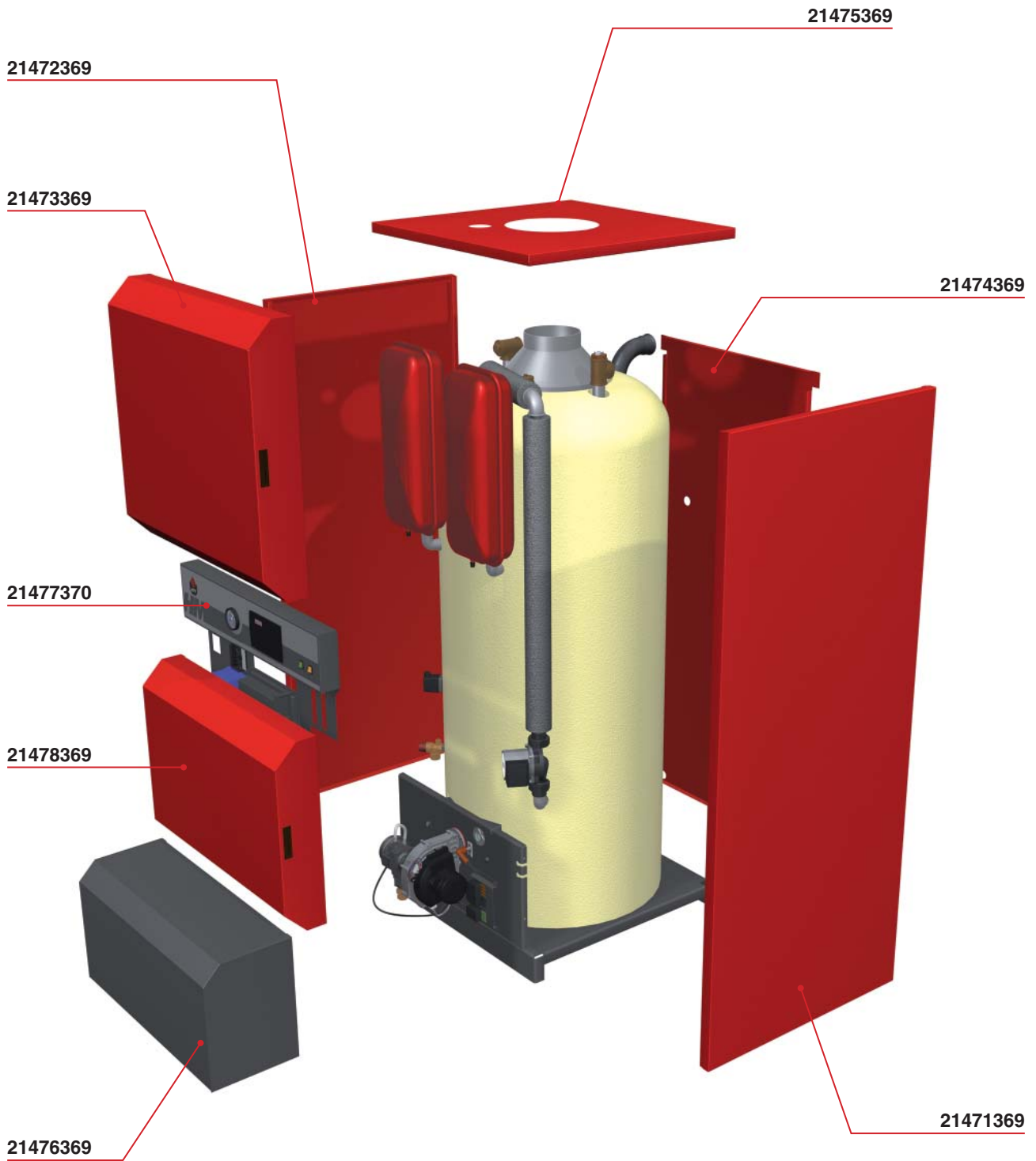


BG 2000 - M / 201



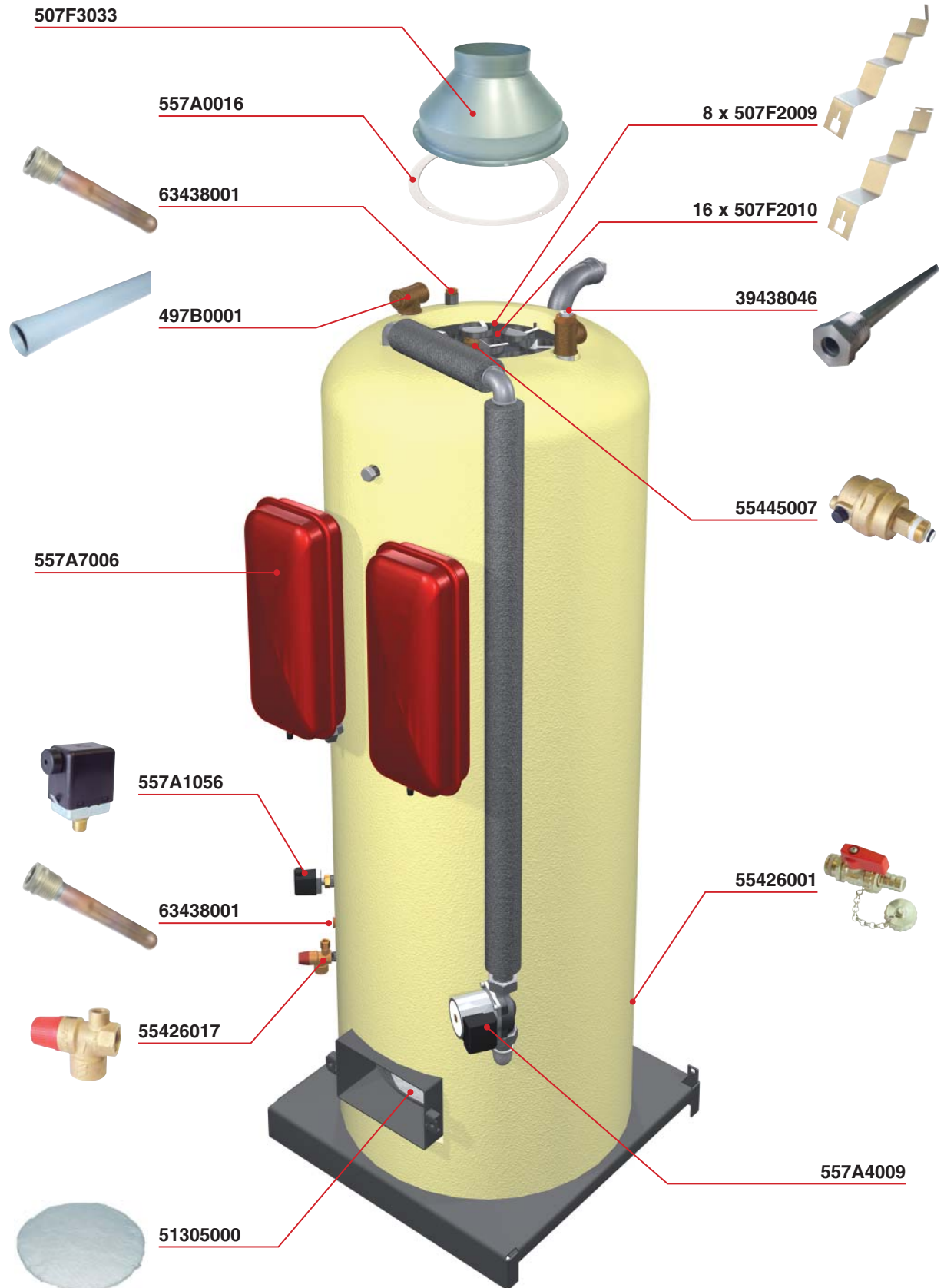


HeatMaster® 71



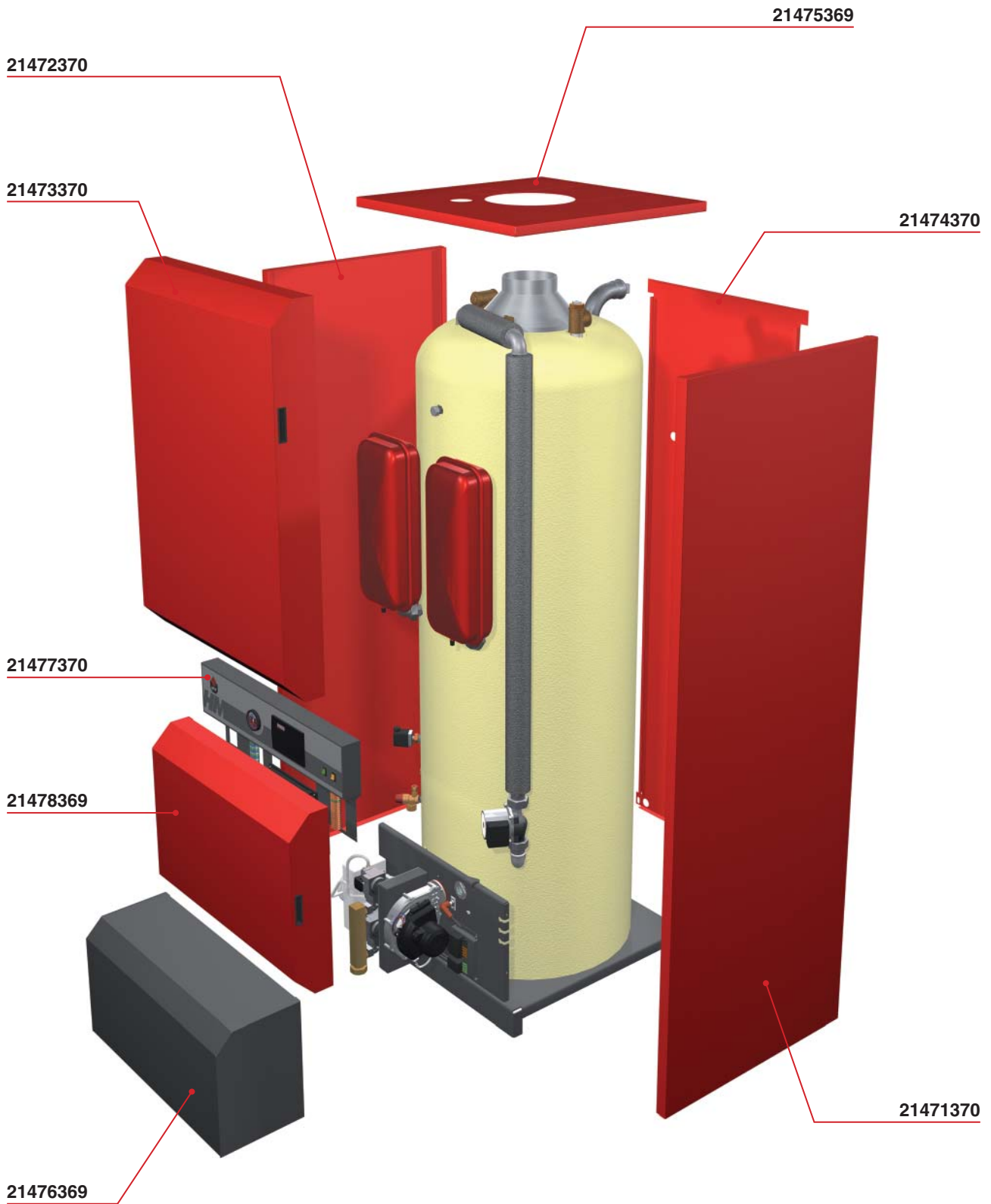


HeatMaster® 71



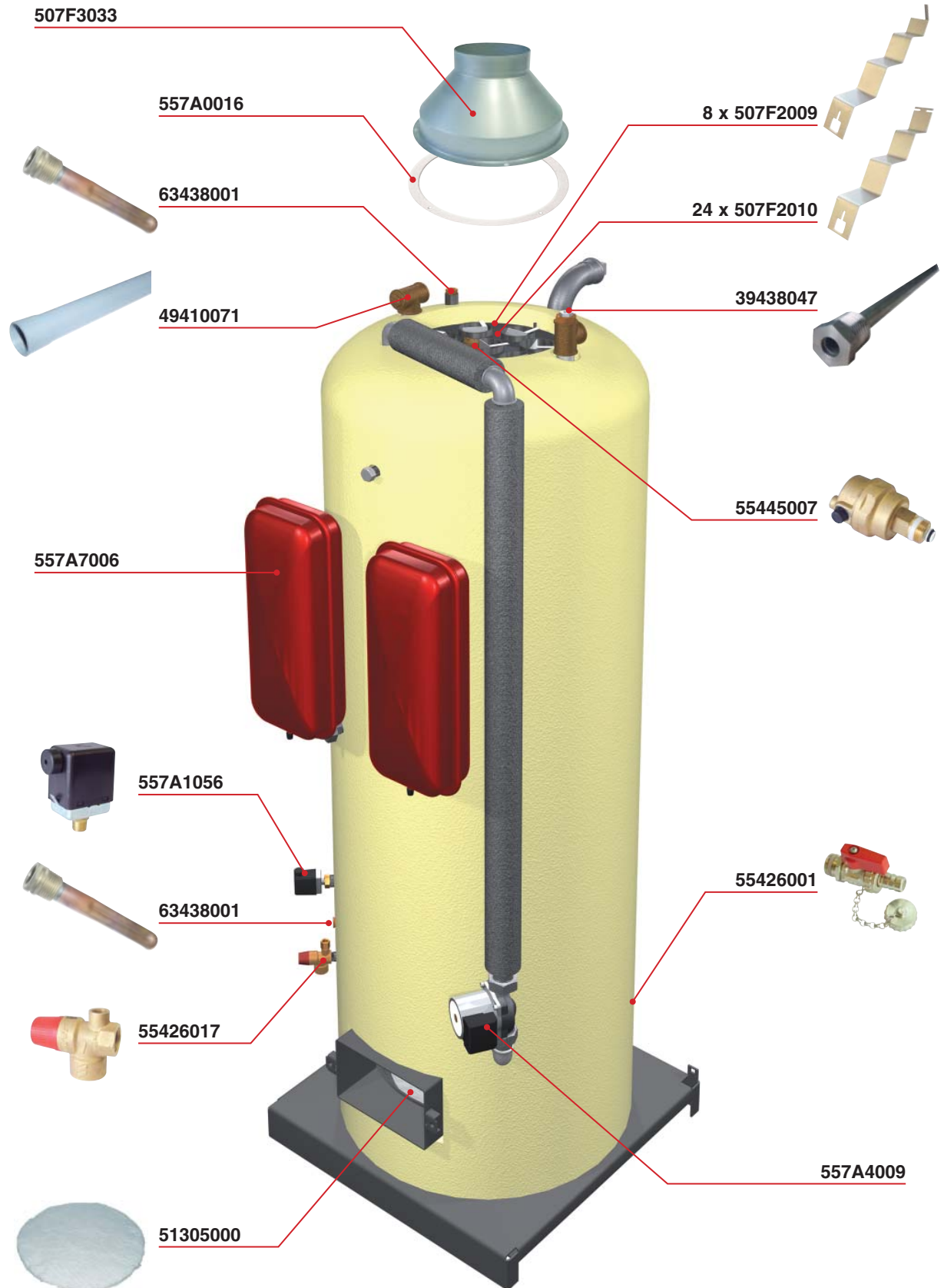


HeatMaster® 101



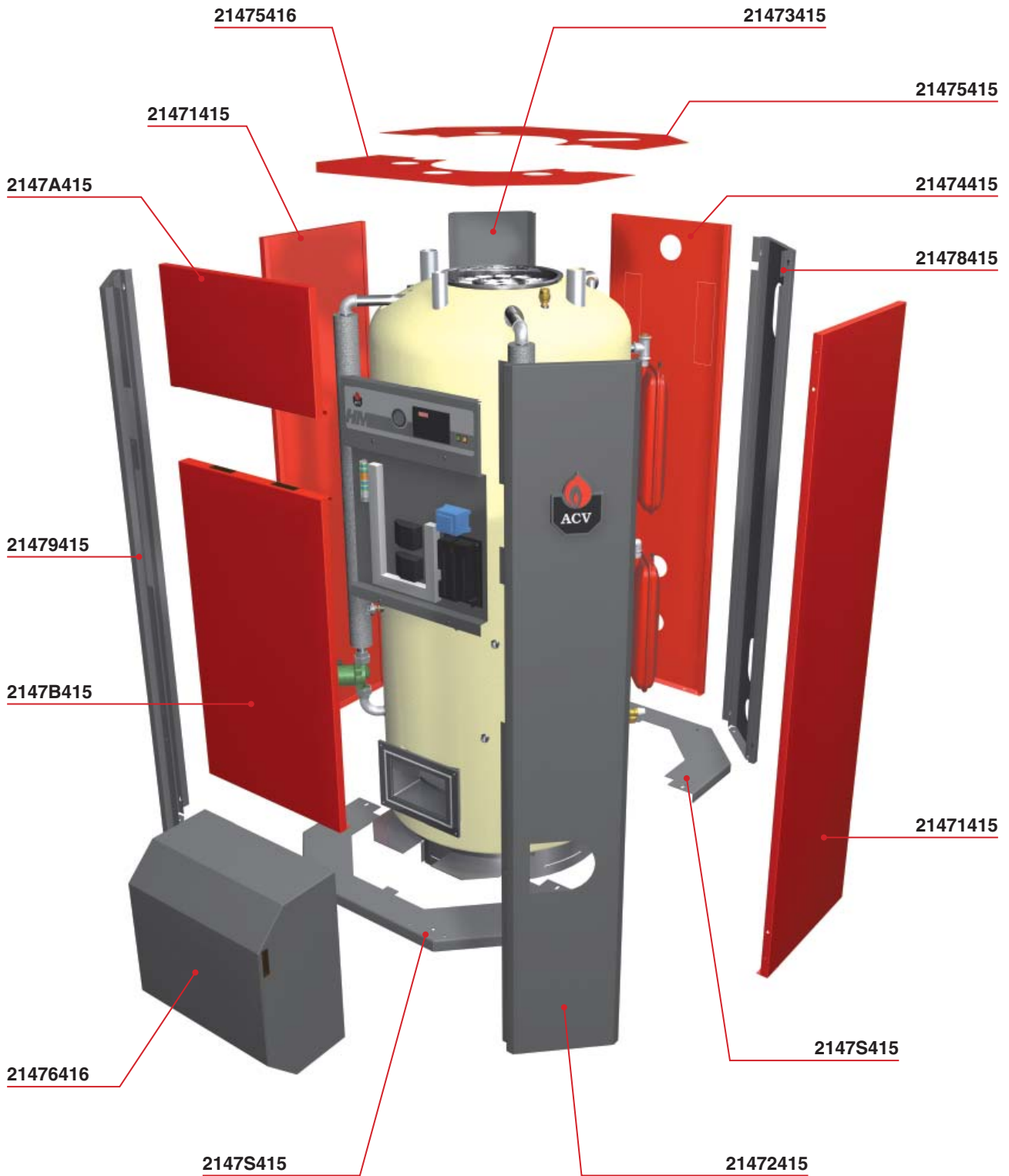


HeatMaster® 101



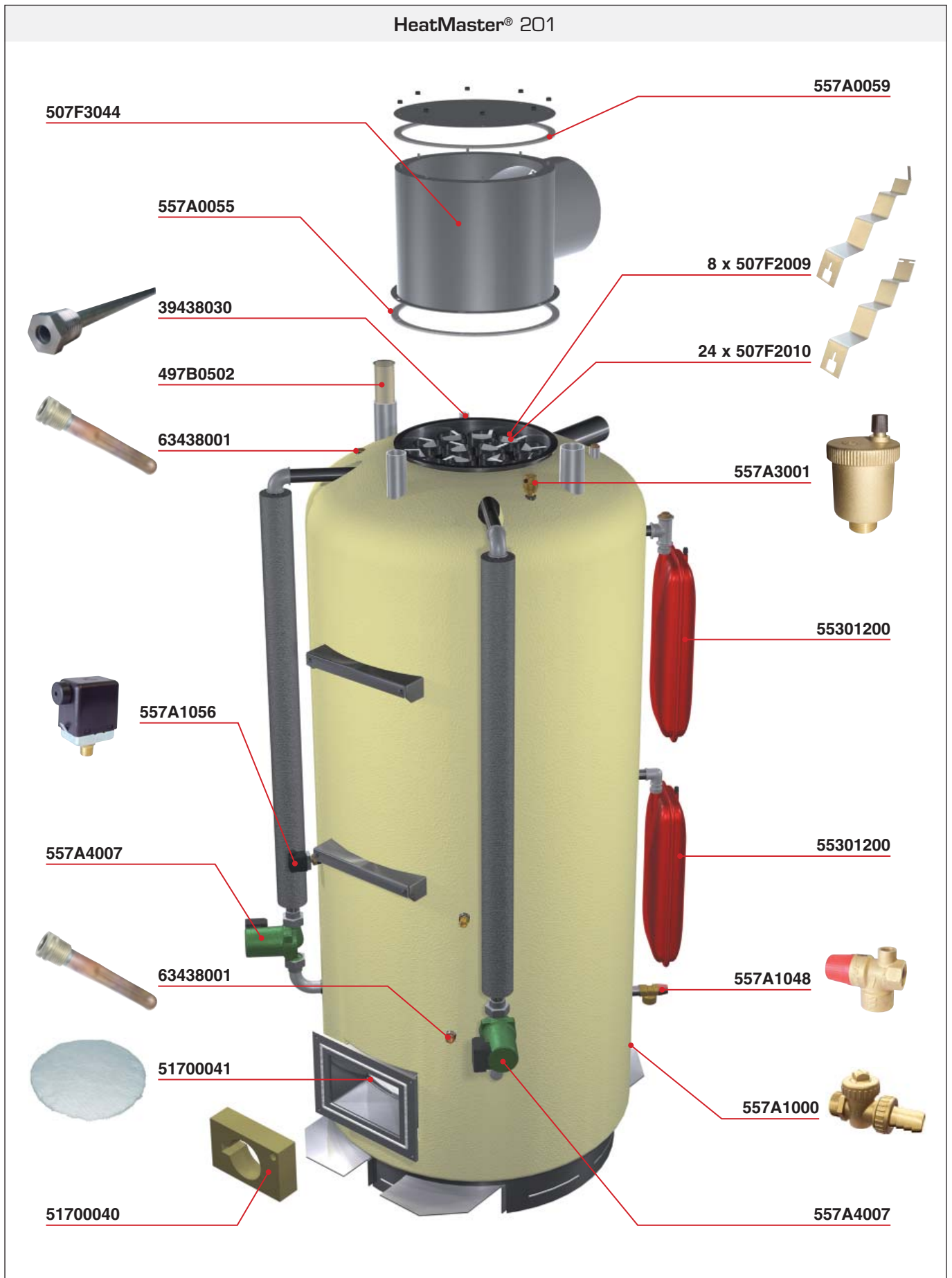


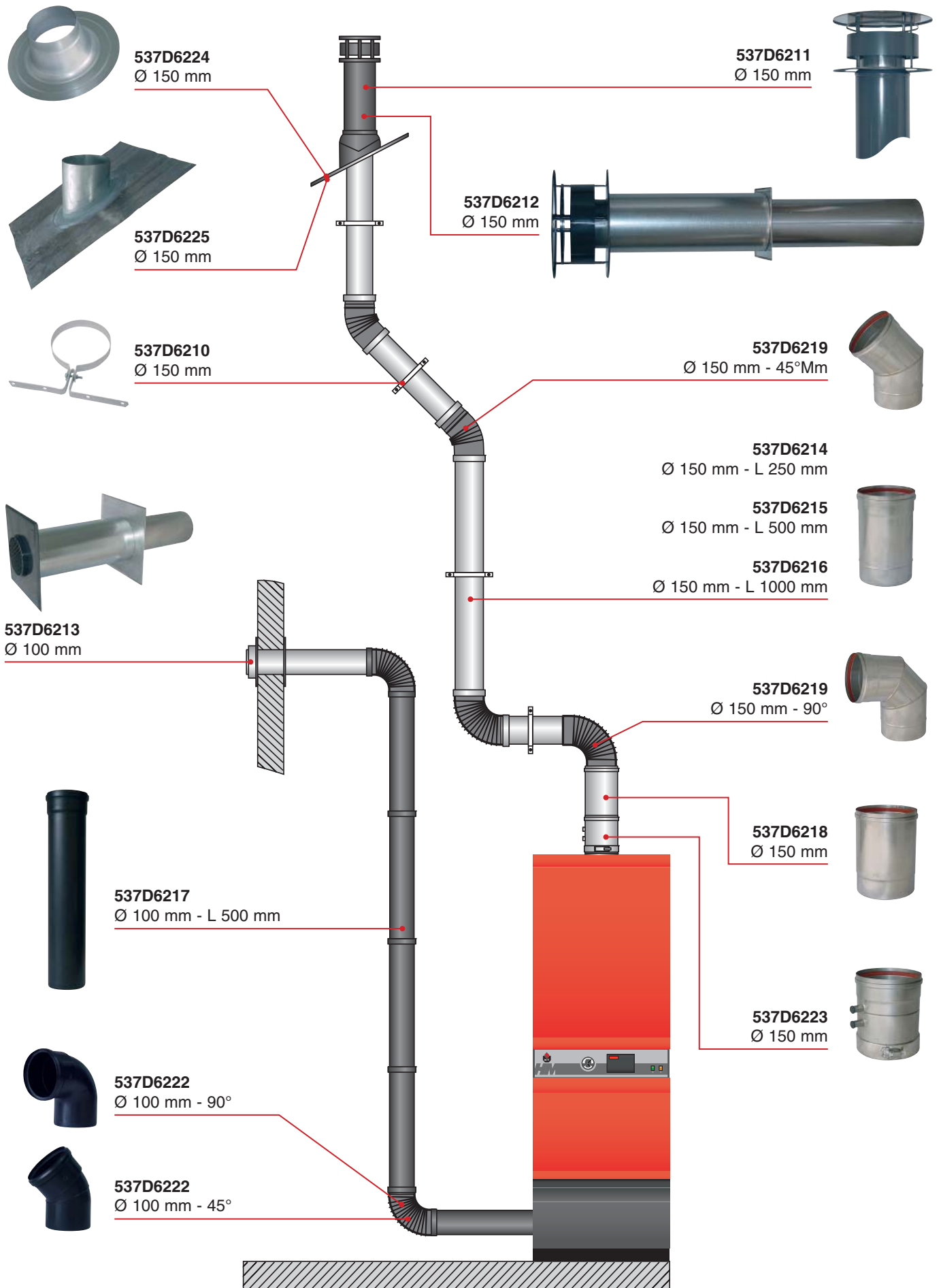
HeatMaster® 201





HeatMaster® 201







HeatMaster® 71 / 101

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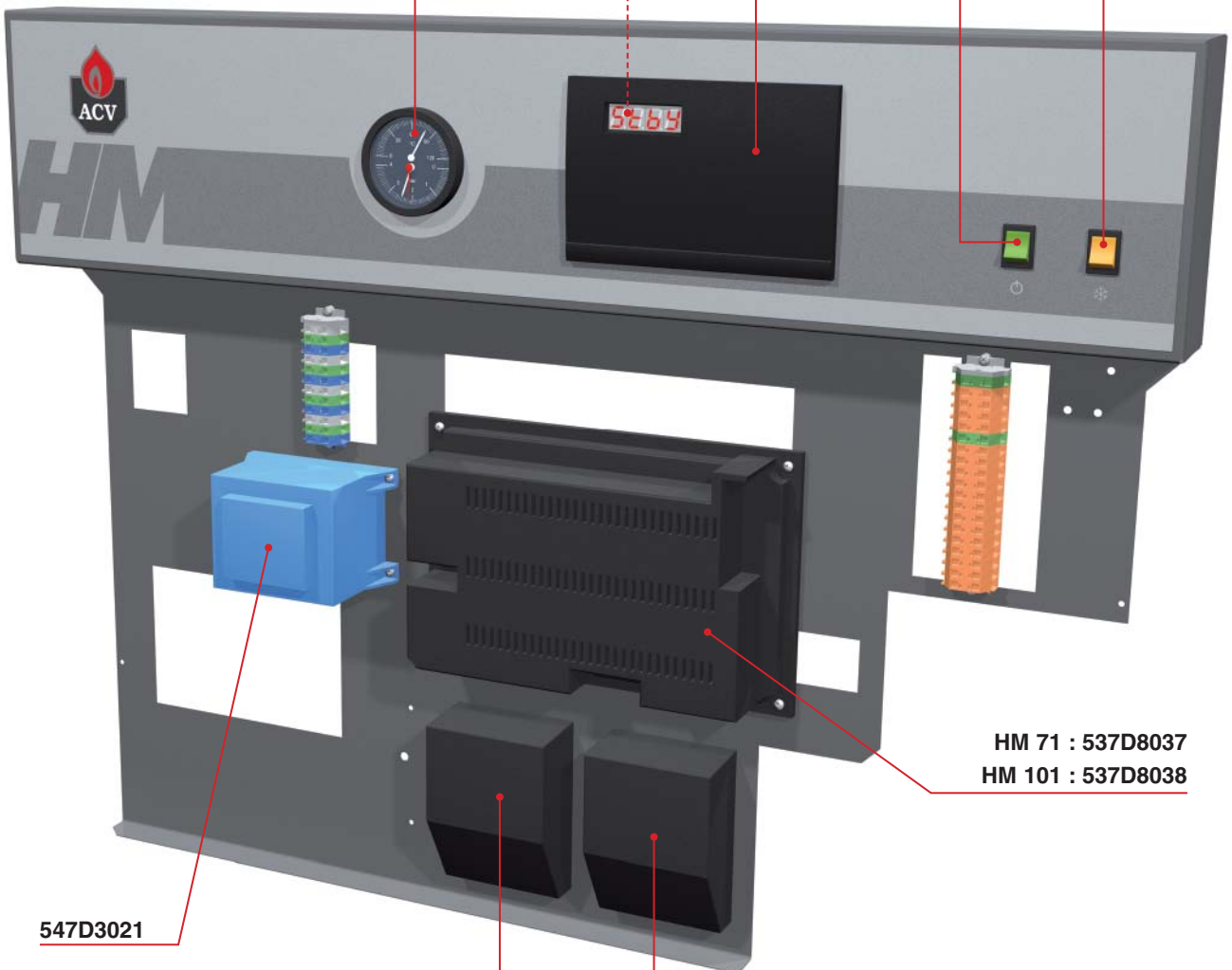
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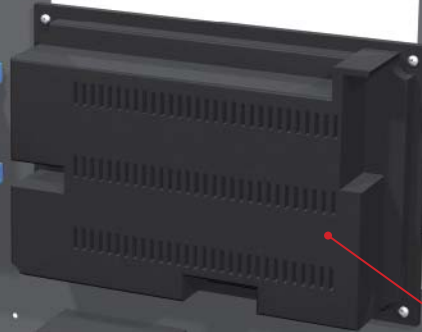
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AM3-2
10800060



AM3-11
10800080

HM 71 : 537D8037
HM 101 : 537D8038



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