

HM

HeatMaster

Installation, Operating and Servicing Instructions

**HM 71
HM 101**



excellence in hot water

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INTRODUCTION

INTENDED USERS OF THESE INSTRUCTIONS

These instructions are intended for

- specifying engineers
- installing engineers
- end-users
- servicing engineers

SYMBOLS

The following symbols are used in these instructions:



Essential instruction for operating the system correctly.



Essential instruction for personal safety or environmental protection.



Danger of electrocution.



Risk of scalding.

APPLICABLE STANDARDS

The products have received the "CE" certificate in accordance with the standards prevailing in different countries (European Directives 92/42/EEC, "efficiency", 90/396/EEC "gas appliances"). These products have also received the Belgian "HR+" (gas boilers) marks.



WARNINGS

These instructions are an integral part of the equipment to which they refer and must be supplied to the user.

The product must be installed and serviced by qualified engineers, in compliance with the prevailing standards.

ACV accepts no liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by ACV.



Failure to observe instructions regarding tests and test procedures can result in personal injury or pollution risks.

Note:

ACV reserves the right to modify the technical specifications and components of its products without prior notice.

DESCRIPTION

OPERATING PRINCIPLE

The HeatMaster is a high performance, direct fired hot water storage heater, which has indirect heat transfer due to its Tank-in-Tank construction.

At the heart of the HeatMaster is a stainless steel cylinder through which the flue tubes pass. This is surrounded by a mild steel shell containing the primary water (neutral fluid). The outer shell extends down to the combustion chamber and even around the flue tubes. The area of the heat transfer surface is therefore much greater than that of standard direct fired water heaters.

A circulating pump fitted to the primary circuit moves the water around the tank, heating it faster and maintaining an even temperature across the primary jacket.

The burner, either gas or oil, fires onto the primary water which indirectly heats the stainless steel cylinder containing the DHW. As with all Tank-in-Tanks, this is corrugated over its full height and suspended in the HeatMaster by its hot and cold water connections.

The cylinder expands and contracts during use and this, together with the fact that cold water does not come into contact with the intense heat of the burner flame, means that limescale buildup is prevented.

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

The HeatMaster has one very major advantage over other direct fired water heaters - because it heats the DHW with a primary circuit, this primary water can be used to provide central heating as well.

By connecting two, three, four or more HeatMasters together in a module, most hot water and heating demands can be met.

Indeed, when used in conjunction with HR and Jumbo hot water storage tanks the Heatmaster can supply even the largest hot water requirement.

Standard equipment

The HeatMaster 71/101 has the following items as standard :

- On/off switch
- Summer/Winter switch
- MCBA controller, incorporating
 - electronic control and high limit thermostats
 - burner modulation
- primary circulating shunt pump
- primary expansion vessels
- primary safety valve
- pressure and temperature gauge
- drain valve
- body completely insulated in rigid polyurethane foam

CONSTRUCTION FEATURES

Outer body

The outer body containing the primary fluid is made of carbon steel (STW 22).

TANK-IN-TANK heat exchanger

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

Combustion gas circuit

The combustion gas circuit is paint protected and comprises:

- **Flue pipes**

HeatMaster 71/101 models contain 8 steel flue pipes with an internal diameter of 64 mm. Each pipe is fitted with a turbulator of stainless steel designed to improve heat exchange and to reduce flue gas temperature.

- **Combustion chamber**

The combustion chamber on HeatMaster models is entirely water cooled.

Insulation

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

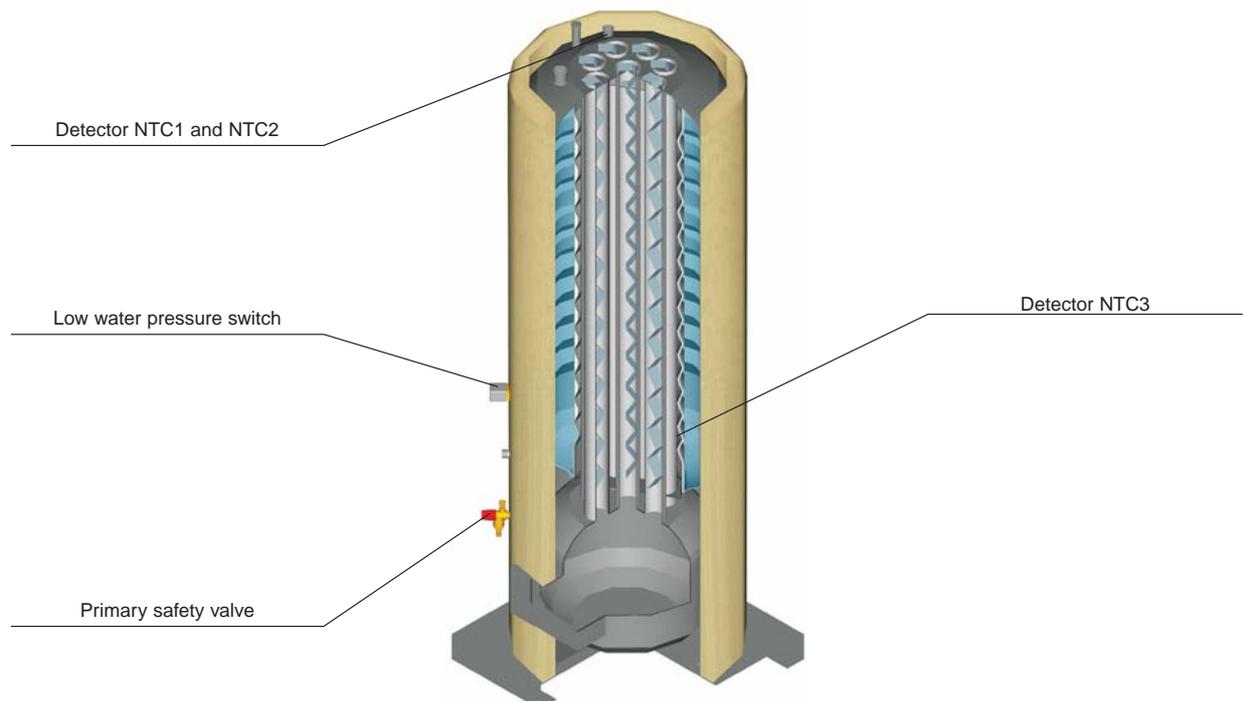
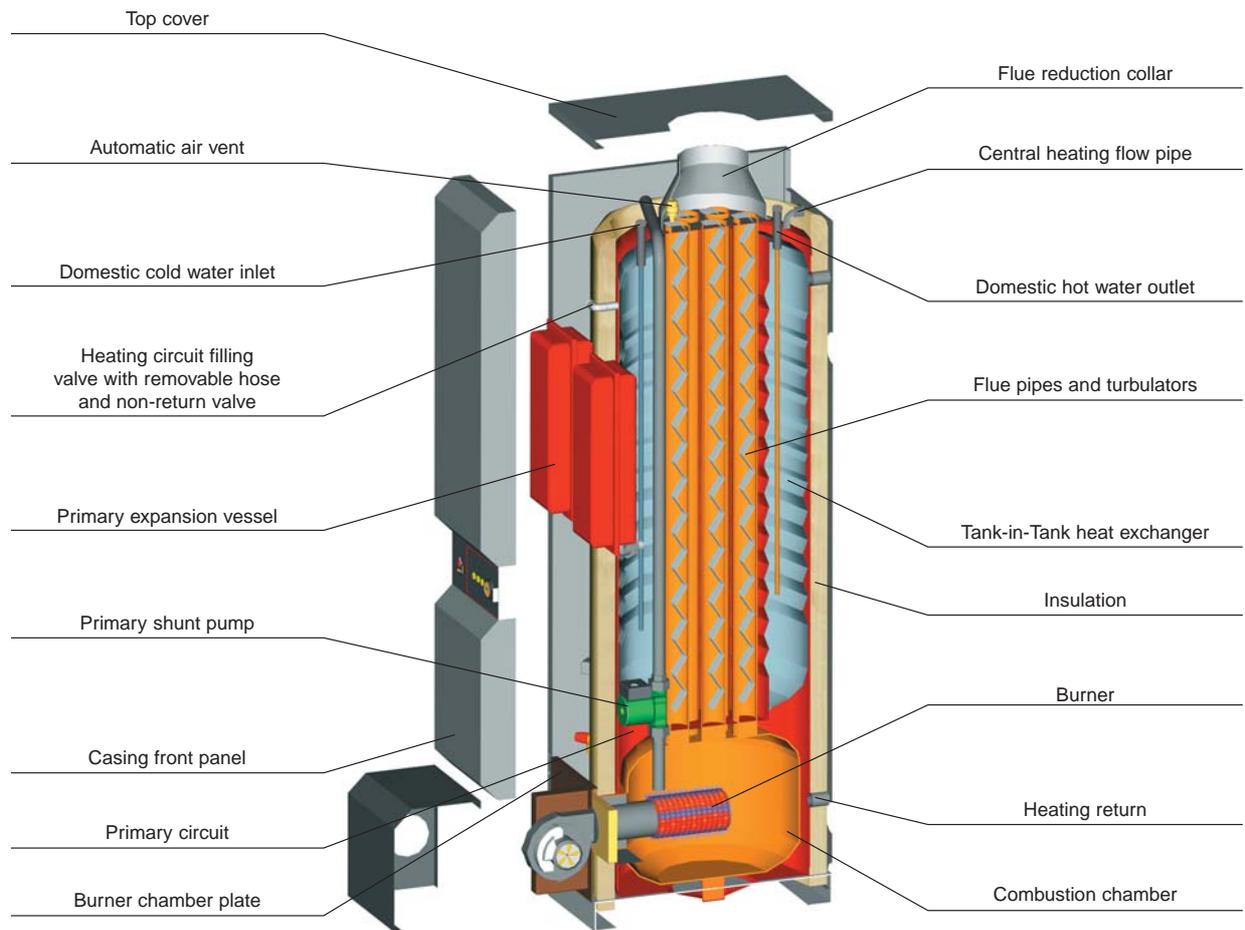
Casing

The boiler is covered by a steel casing which has been scoured and phosphated before being stove enamelled at 220 °C.

Burner

71 and 101 models are always delivered with ACV BG 2000-M 71 and 101 air/gas premix burners.

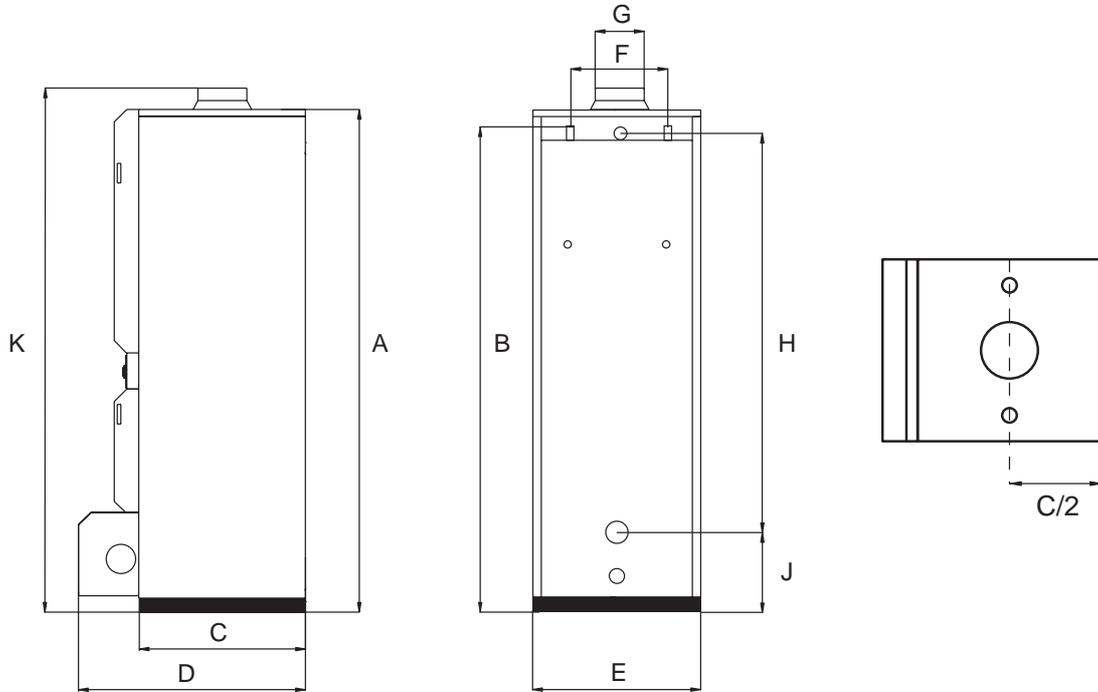
DESCRIPTION



TECHNICAL SPECIFICATION

DIMENSIONS

The units are delivered fully assembled, tested and packed on a timber base with shockproof edges and protected by heat-shrunk plastic film. On delivery and after unpacking, check the equipment for damage. For transport purposes, refer to the weights and dimensions given below.



	A mm	B mm	C mm	D mm	E mm	F mm	G Ø mm	H mm	J mm	K mm
HM 71	1743	1630	680	937	680	390	150	1289	285	1720
HM 101	2093	2030	680	937	680	390	150	1693	285	2120

GENERAL FEATURES

		HM 71	HM 101
Fuel	type	Natural gas / propane	Natural gas / propane
Maximum Input	kW	20 - 69.9	25 - 107 / 22 - 110
Maximum Output	kW	63.0	96.8
Maintenance loss at 60 °C of rated value	%	0.5	0.4
Total capacity	L	239.0	330.0
Primary circuit capacity	L	108.0	130.0
Hot water connection	Ø	1"	1"
Heating connection	Ø	1 1/2"	1 1/2"
Flue connection	Ø mm	150	150
Hot water tank heat exchange surface	m²	3.14	3.95
Weight empty	Kg	282	335
Pressure drop primary circuit	mbar	46	83

TECHNICAL SPECIFICATION

MAXIMUM OPERATING CONDITIONS

Maximum service pressure (tank full of water)

- Primary circuit: 3 bar
- Secondary circuit: 10 bar

Test pressure (tank full of water)

- Primary circuit: 4.5 bar
- Secondary circuit: 13 bar

Operating temperature

Maximum temperature: 90 °C

Water quality

- Chlorures: < 150 mg/l (304)
< 2000 mg/l (Duplex)
- $6 \leq \text{ph} \leq 8$

DOMESTIC HOT WATER PERFORMANCES

		HM 71	HM 101
Peak delivery at 40 °C	L/10'	646	905
Peak delivery at 45 °C	L/10'	543	777
Peak delivery at 60 °C	L/10'	346	514
Peak delivery at 70 °C	L/10'	268	385
Peak delivery at 80 °C	L/10'	203	290
Peak delivery at 40 °C	L/60'	2133	3172
Peak delivery at 45 °C	L/60'	1794	2680
Peak delivery at 60 °C	L/60'	1219	1813
Peak delivery at 70 °C	L/60'	971	1378
Peak delivery at 80 °C	L/60'	710	1003
Continuous delivery at 40 °C	L/60'	1835	2776
Continuous delivery at 45 °C	L/60'	1573	2379
Continuous delivery at 60 °C	L/60'	1067	1665
Continuous delivery at 70 °C	L/60'	715	1241
Continuous delivery at 80 °C	L/60'	675	903
Reheat time to 60 °C	min	16	13

HEATMASTER CONTROL SETTINGS

Description

The 71/101 series is fitted with an electronic controller (MCBA) which controls burner operation (ignition, safety and modulation), and provides facilities to adapt the controller to the desired application.

The MCBA has three levels of settings : manufacturer, installer and user. There are three temperature detectors located in the primary and secondary circuits.

It provides two operating modes.**1. Heating mode**

Temperature set by the user at between 60 and 90 °C.

- Differential "ON", burner starts.
- Differential "OFF", burner stops.
- PI (Proportionnel Integral) regulator in "heating" mode.
- The regulator compares the primary temperature with the setting and modulates.

The room thermostat detects the heating demand

2. Hot water mode (with hot water priority)

The detector located in the secondary tank detects the hot water demand.

When a draw-off is detected the controller goes to "hot water demand" mode:

- The primary shunt pump starts.
- The heating pump switches off.
- The burner starts and the controller uses the data from the primary detector to control modulation.

User-accessible parameters

1. "Hot water" setting adjustable from 20 to 90 °C.
2. "Hot water" mode: ON/OFF.
3. "Heating" mode: ON/OFF.
4. "Heating" setting adjustable from 60 to 90 °C.

Parameters accessible in servicing

Main default settings:

- Hot water priority active.
- Heating demand detection by room thermostat.
- A single heating circuit.

An access code is required for "service" access.

For more technical information, contact your ACV dealer.