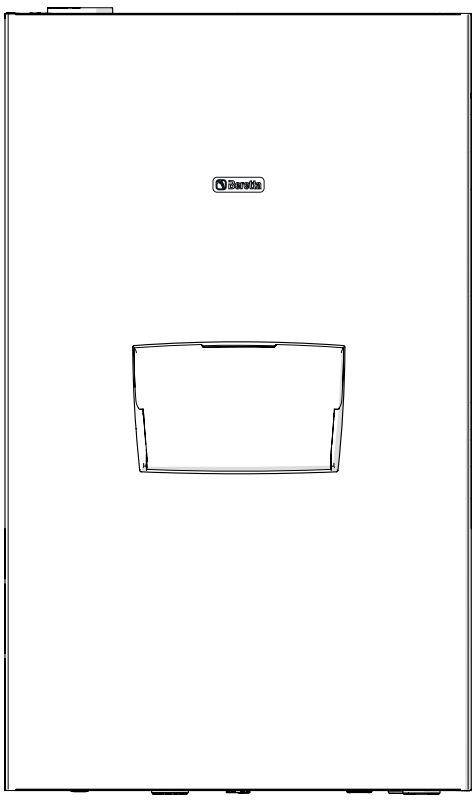
Installation and Operation Manual

Beretta

POWER MAX

Condensation | Heating module



EN Installation and Operation Manual

RANGE

MODEL	CODE
POWER MAX 50 P DEP	20128429
POWER MAX 50 P	20128430
POWER MAX 65 P	20128431
POWER MAX 80 P	20128432
POWER MAX 100	20128433
POWER MAX 110	20128434
POWER MAX 130	20128435
POWER MAX 150	20128436

ACCESSORIES
For a complete list of accessories and details of their compatibility, refer to the Catalogue.

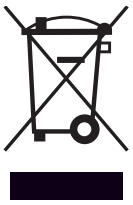
Dear heating engineer,
congratulations on having chosen a thermal module **Beretta**, a quality product that is designed to give dependable, efficient and safe service and to provide comfort in the home for many years to come.
This manual provides information that is essential to the installation of the appliance. Used in conjunction with your own knowledge and expertise it will enable you to install the appliance quickly, easily, and correctly.

Please accept our thanks and our congratulations on your choice of product.
Beretta

CONFORMITY

thermal modules **POWER MAX** comply with:
- Regulation (EU) 2016/426
- Directive 92/42/EEC on efficiency requirements and Annex E and Pres. Republic Decree n. 412, 26 August 1993 (****)
- Electromagnetic Compatibility Directive 2014/30/EU
- Low Voltage Directive 2014/35/EU
- Ecodesign Directive 2009/125/CE for energy-related products
- Regulation (EU) 2017/1369 Energy labelling
- Delegated Regulation (EU) N. 811/2013
- Delegated Regulation (EU) N. 813/2013
- Standard for gas-fired heating boilers - General requirements and tests - EN 15502-1
- Specific standard for type C appliances and type B2, B3 and B5 appliances of nominal heat input not exceeding 1000 kW - EN 15502-2/1
- SSIGA Gas Appliance Directive G1
- AICAA Fire prevention requirements
- CFST LPG Directive Part 2
- VARIOUS cantonal and communal provisions on air quality and energy saving.

CE



At the end of its life, the product should be not be disposed of as solid urban waste, but rather it should be handed over to a differentiated waste collection centre.

CONTENTS

The following symbols are used in this manual:

⚠ **CAUTION! =** Identifies actions that require caution and adequate preparation.

⛔ **STOP! =** Identifies actions that you MUST NOT do.

This manual, Code 20133145 - Rev. 7 (02/20) comprises 64 pages.

1 GENERAL INFORMATION

1.1 General Safety Information

⚠ After removing the packaging, check the condition and completeness of the supply. If there are any problems, contact the company **Beretta** that sold the equipment.

⚠ This product must be installed by a legally qualified heating engineer. On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **Beretta** in this instruction manual, and that it conforms to all applicable laws and standards.

⚠ This product must only be used for the purpose for which it is designed and made, as specified by **Beretta**. **Beretta** declines all responsibility, contractual or other, for damage to property or injury to persons or animals caused by improper installation, adjustment, maintenance or use.

⚠ In the event of a water leak, disconnect the thermal module from the main power supply, shut off the water supply and promptly notify the Technical Assistance Centre **Beretta** or professionally qualified personnel.

⚠ Periodically check that operating pressure in the water circuit is over 1 bar but below the maximum limit specified for the boiler. If this is not the case, contact Technical Assistance Centre **Beretta** or a professionally qualified heating engineer.

⚠ The following operations shall be necessary if the thermal module is not used for a long period of time:
- Switch the boiler OFF at the control panel
- Turn the main system switch "off"
- Close the fuel cock and heating circuit water cock
- Drain the central heating circuit if there is any risk of freezing.

⚠ Maintenance must be performed on the thermal module at least once a year.

⚠ This manual is an integral part of the appliance and must therefore be kept with care and must ALWAYS accompany the thermal module, even when it is passed on to another owner or user or transferred to another installation. If it is lost or damaged, please contact your local Technical Assistance Centre **Beretta** for a new copy.

⚠ This manual must be read carefully so as to ensure the correct and safe installation, operation and maintenance of the appliance. The Owner must be adequately informed and trained on how to operate the appliance. Make sure that he/she is familiar with all the information required for safe system operation.

⚠ The thermal module, before being connected to the hydraulic system, the gas network, and the electrical system, may be exposed to temperatures ranging from 4°C to 40°C. After it can activate the Frost Protection function, it can be exposed to temperatures ranging from -20°C to 40° C

⚠ Regularly check that the condensate drain is free from obstruction.

⚠ We recommend cleaning inside the exchanger once a year, extracting jet and burner and removing any installation debris by suction. This operation should be done by personnel from the Technical Assistance Centre only.

1.2 Precautions

The operation of any appliance that uses fuel, electrical power and water demands that a number of fundamental safety precautions be respected:

⛔ Do not allow children or infirm persons to operate the system unsupervised.

⛔ It is forbidden to use electrical devices or equipment, such as switches, appliances, etc. if there is a smell of gas or un-burnt products. If so:
- Ventilate the room, opening doors and windows
- Close the fuel shut-off cock
- Report the fault immediately to the **Beretta**'s Technical Assistance Centre or a professionally qualified heating engineer.

⛔ Do not touch the boiler while barefoot or wet.

⛔ Any technical or cleaning activity is forbidden before disconnecting the appliance from the main power supply by switching the system's master switch and the appliance's main switch to the "OFF" position.

⛔ Do not tamper with or adjust the safety or control devices without prior authorisation and instructions from the manufacturer.

⛔ Do not plug or block the condensate drain outlet.

⛔ Never pull, disconnect, or twist the electrical cables coming from the appliance even if it is disconnected from the mains electricity supply.

⛔ Do not obstruct or restrict the vents in the room where the boiler is installed. Adequate ventilation is essential for correct combustion.

⛔ Do not expose the appliance to weather elements (without using the dedicated accessory). It has been designed for indoor use.

⛔ Do not switch off the appliance if the outdoor temperature may drop to below ZERO (frost hazard).

⛔ Do not leave flammable containers and substances in the room where the device is installed.

⛔ Do not dispose of packaging material into the environment, or leave it within the reach of children, since it can become a potential hazard. Dispose of packaging material in compliance with applicable legislation.

⛔ Do not activate the thermal module without water.

⛔ Individuals without specific qualifications and skills are not allowed not remove the thermal module's casing.

1.3 Description of the appliance

POWER MAX it is a condensing, pre-mixed thermal module consisting in a modulating thermal element.
It is available in various models, ranging from 34,9kW to 131kW.
Optimal combustion management supports high yields (over 109%, calculated over NVC, in condensation regime) and low polluting emissions (Class 6 pursuant to EN 15502).
The thermal module is designed for open chamber operation, but can be converted to sealed chamber operation by fitting a dedicated accessory.
The appliance in standard configuration is envisaged for indoor installation to guarantee an IPX4D protection level.

⚠ **POWER MAX** appliances may be cascaded to reach a maximum power of 1.12 MW.

The appliance's key technical features are
- pre-mix burner with constant air-gas ratio;
- helical type heat-exchanger, coil with smooth stainless steel tube (single coil for models POWER MAX 50 P DEP - POWER MAX 50 P, double coil for models POWER MAX 65 P ÷ POWER MAX 150), to guarantee a good corrosion resistance and the possibility of working with high Δ t (up to 40°C) reducing the time of set-up;
- power from 34,9 to 131 kW;
- maximum flue gas output temperature 100°C;
- microprocessor management and control with self-diagnostics, shown by means of a display, and logging of main errors;
- Anti-Frost function;
- provision for room thermostat / heat request on high or low temperature zones;
- option to manage a CH circuit and a DHW circuit with storage tank;
- high-efficiency and high residual discharge head circulator (for models up to 68kW; a circulator is available as an accessory upon request for other models);
- climate control function (available only when using the outdoor temperature sensor accessory).

1.4 Safety devices

All appliance functions are electronically controlled by a dual processor technology board approved for safety functions.
Any malfunction results in the appliance being shut down and the automatic closure of the gas valve.

The following is installed on the water circuit:
- **Safety thermostat**.
- **Flow sensor** capable of monitoring the main circuit's flow on an ongoing basis and of stopping the appliance in the event of insufficient flow.
- **Temperature probes** on delivery and return lines that measure the temperature difference (Δt) between input and output fluid and enable activation of the control.
- **Minimum pressure switch**.

The following is installed on the combustion circuit:
- **Gas solenoid** in class B+C , with pneumatic gas flow compensation depending on the suction line's air flow rate.
- **Ignition/detection electrode**.
- **Flue gases temperature probe**.

⚠ The triggering of safety devices indicates the malfunction of a potentially hazardous thermal module. Therefore, contact Technical Assistance Centre immediately. After a brief pause, it is possible to try and restart the appliance (see Paragraph "Initial startup").

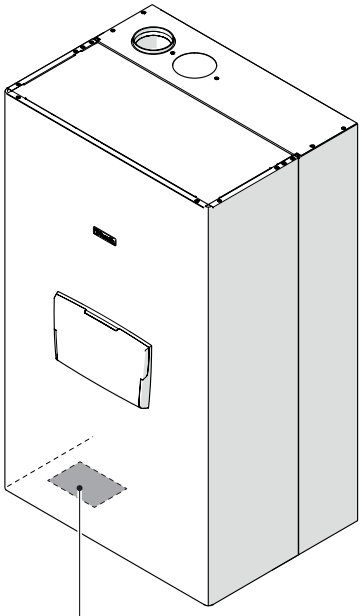
⚠ Safety devices must be replaced by Technical Assistance Centre, using only original parts. Refer to the spare parts catalogue supplied with the appliance. After making the repair, check that the appliance is working properly.

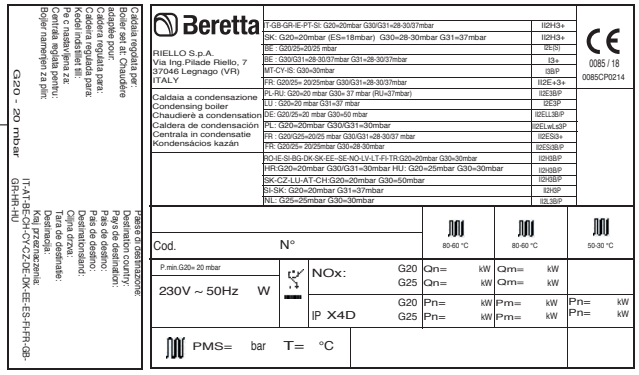
⛔ The appliance must not be put in service, even temporarily, when tampered safety devices are not in operation or have been tampered with.

1.5 Identification

The products are identified by:

Technical data plate
It indicates the technical and performance data.



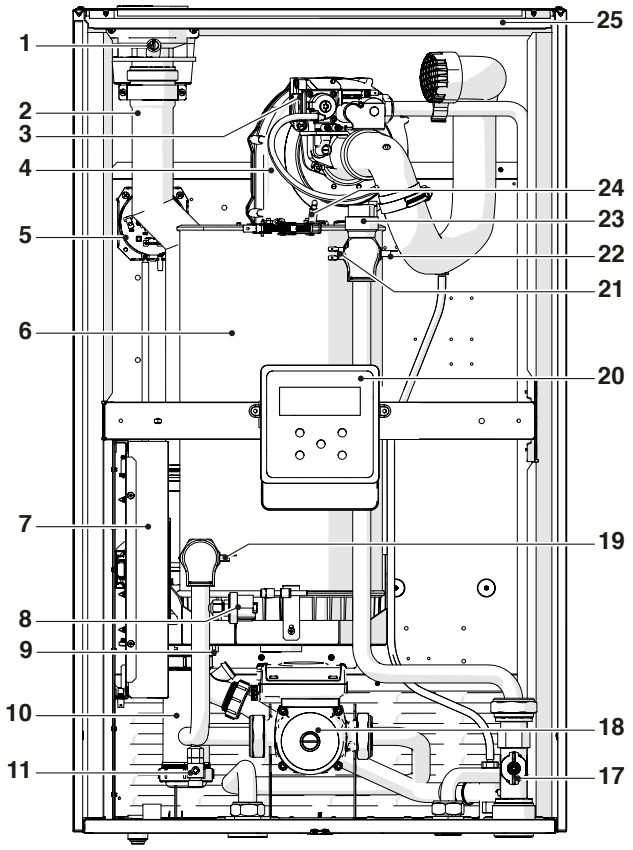


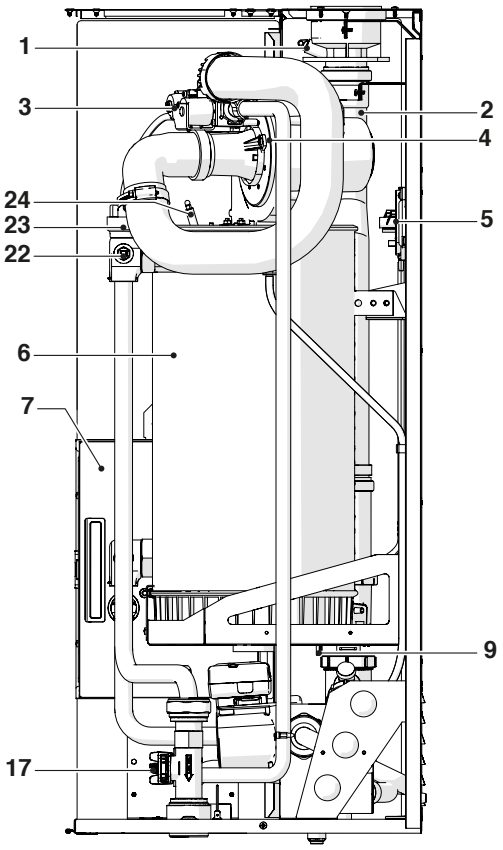
	Central heating section
Qn	Rated heat input
Pn	Rated useful heat output
IP	Electric degree of protection
PMS	Maximum operating pressure, CH circuit
T	Temperature
η	Efficiency
NOx	NOx class

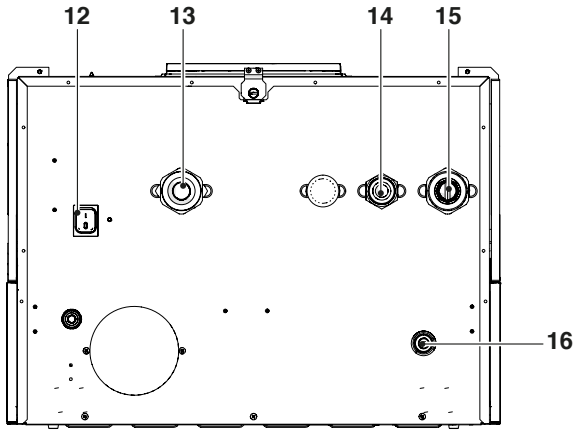
⚠ If these plates or any other means of clearly identifying the product are defaced, removed or lost, proper installation and servicing may be rendered difficult.

1.6 System layout

POWER MAX 50 P DEP - 50 P

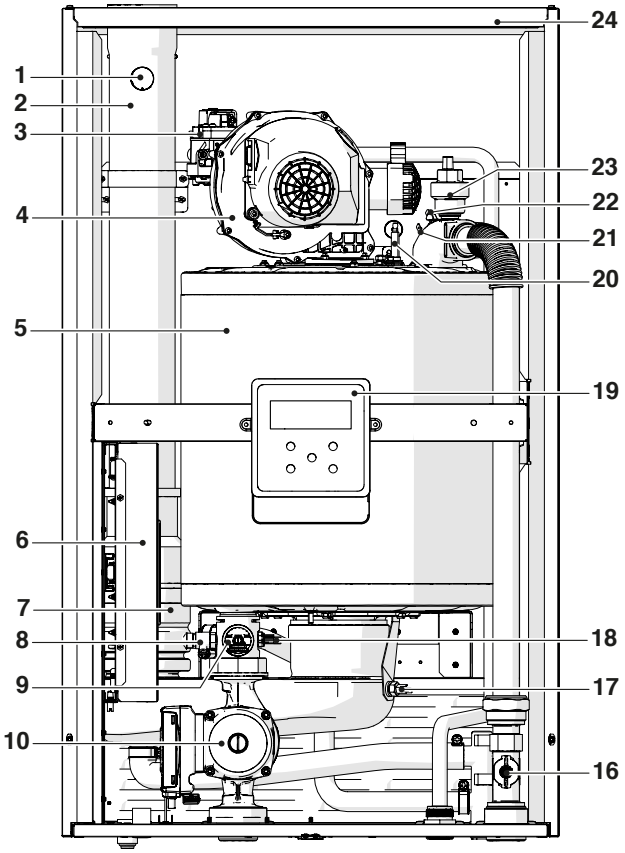


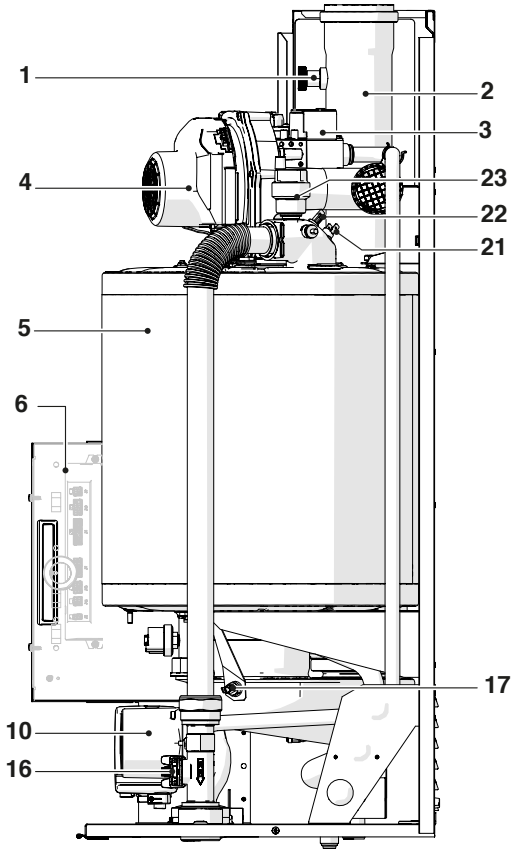


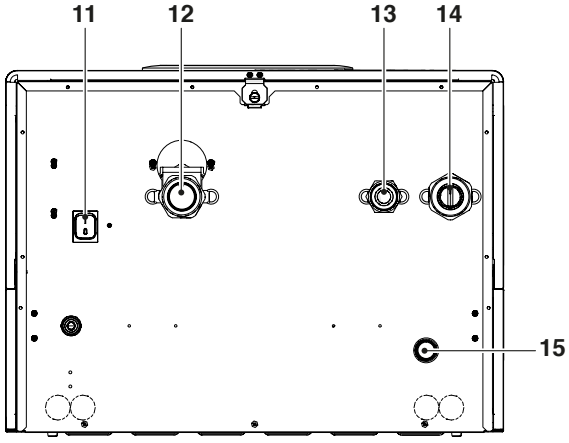


1 Flue gas analysis outlet
2 Flue gas exhaust connection
3 Gas valve
4 Fan
5 Flue gases pressure switch
6 Combustion chamber
7 Electrical panel
8 Minimum Pressure Switch set at 0,7 bar
9 Exhaust flue probe
10 Condensate drain siphon
11 Drain cock
12 Main switch
13 Central heating return
14 Gas supply
15 Central heating flow
16 Condensate drain connection
17 Flow-meter
18 Pump
19 Return probe
20 Control panel
21 Safety Thermostat with manual reset by PCB
22 Flow probe
23 Automatic bleed valve
24 Ignition/detection electrode
25 Casing

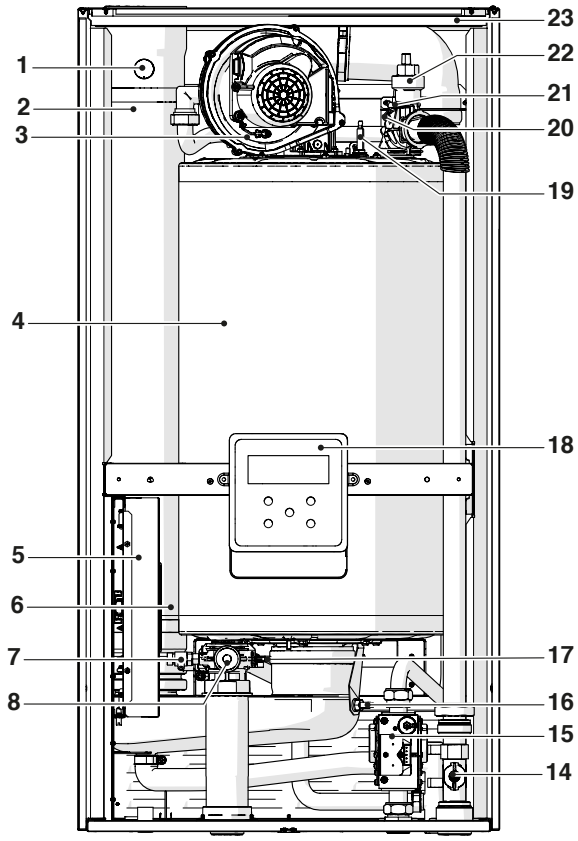
POWER MAX 65 P - 80 P

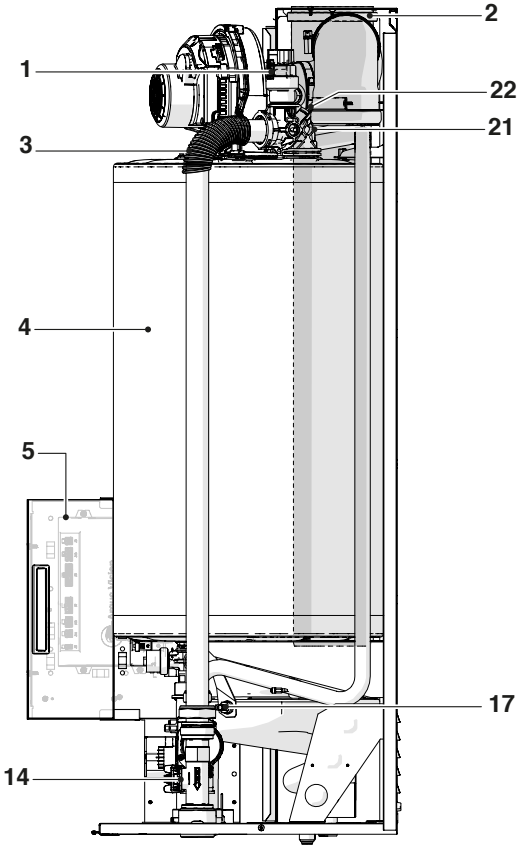


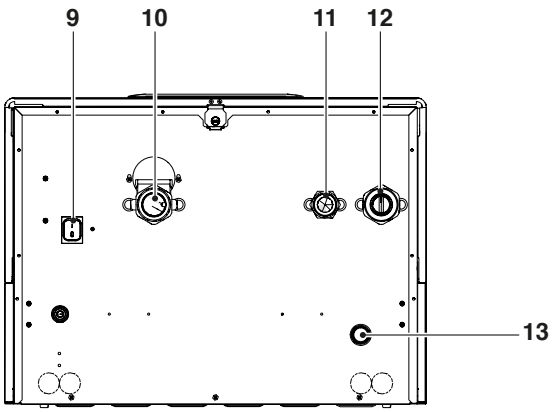




1 Flue gas analysis outlet
2 Flue gas exhaust connection
3 Gas valve
4 Fan
5 Combustion chamber
6 Electrical panel
7 Smoke-exhaust flue non-return valve
8 Drain cock
9 Minimum Pressure Switch set at 0,7 bar
10 Pump
11 Main switch
12 Central heating return
13 Gas supply
14 Central heating flow
15 Condensate drain connection
16 Flow-meter
17 Exhaust flue probe
18 Return probe
19 Control panel
20 Ignition/detection electrode
21 Safety Thermostat with manual reset by PCB
22 Flow probe
23 Automatic bleed valve
24 Casing







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1.7 Technical specifications

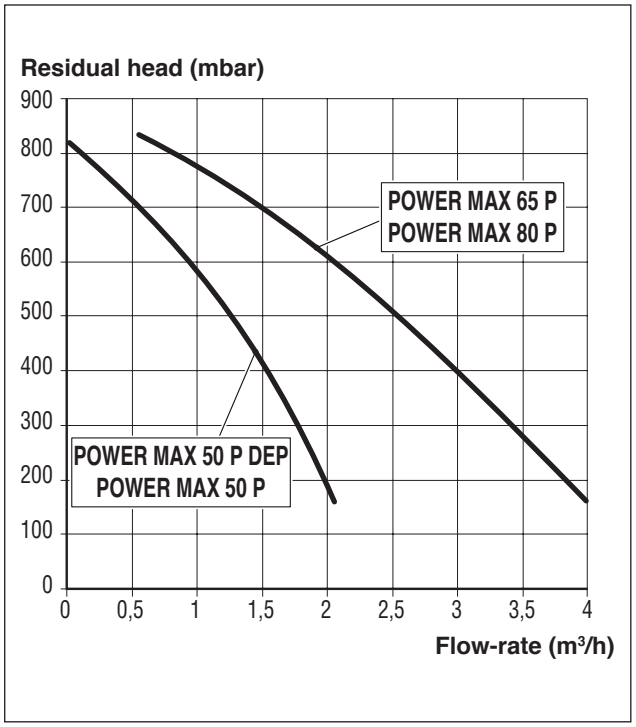
Description			POWER MAX								U.M.
			50 P DEP	50 P	65 P	80 P	100	110	130	150	
Appliance type			Condensing boiler heating system B23; B53; B53P; C13*; C33*; C53*; C63*								
Fuel - Device category			IT-GB-GR-IE-PT-SI: G20=20mbar G30/G31=28-30/37mbar; II2H3+ SK: G20=20mbar G30=28-30mbar G31=37mbar; II2H3+ ES: G20=18mbar G30=28-30mbar G31=37mbar; II2H3+ BE: G20/25=20/25mbar; I2E(S) BE: G30/G31=28-30 /37mbar G31=28-30/37mbar; I3+ MT-CY-IS: G30=30mbar; I3B/P FR: G20/G25= 20/25mbar G30/G31=28-30/37mbar; II2E+3+ PL-RU: G20=20 mbar G30= 37 mbar (RU=37mbar); II2E3B/P LU: G20=20 mbar G31=37 mbar; I2E3P DE: G20/G25=20 mbar G30=50 mbar; II2ELL3B/P PL: G20=20mbar G30/G31=30mbar; II2ELwLs3P FR: G20/G25=20/25 mbar G30/G31=28-30/37mbar; II2ESi3+ FR: G20/G25= 20/25mbar G30=28-30mbar; II2ESi3B/P RO-IE-SI-BG-DK-SK-EE: G20=20mbar G30=30mbar; II2H3B/P SE-NO-LV-LT-FI-TR: G20=20mbar G30=30mbar; II2H3B/P HR: G20=20mbar G30/G31=30mbar; II2H3B/P HU: G20=25mbar G30=30mbar; II2H3B/P SK-CZ-LU-AT-CH: G20=20mbar G30=50mbar; II2H3B/P SI-SK: G20=20mbar G31=37mbar; II2H3P NL: G25=25mbar G30=30mbar; II2L3B/P								
Combustion chamber			vertical								
Maximum rated heat input at furnace referred to HVC (LCV)			38,7 (34,9)	50P (45)	63 (57)	76 (68)	100 (90)	108 (97)	124 (112)	146 (131)	kW
Minimum rated heat input at furnace referred to HVC (LCV)			10 (9)	10 (9)	15 (14)	15 (14)	21,6 (19,4)	21,6 (19,4)	24,9 (22,4)	29,2 (26,2)	kW
Useful (rated) heat output			34,4	44,2	56	68	88	95	110	129	kW
Maximum rated heat output (80-60°C)	P4	G20	34,4	44,2	55,7	67,0	88,3	95,3	109,8	129,0	kW
Maximum rated heat output (80-60°C)	P4	G20	34,4	44,2	55,7	67,0	88,3	95,3	109,8	129,0	kW
Maximum nominal heat output (60-40°C)	-	G20	36,6	47,0	59,6	71,4	93,8	101,1	116,2	137,3	kW
30% heat output with return at 30°C	P1	G20	11,5	14,7	18,7	22,3	29,4	31,7	36,6	43,0	kW
Minimum rated heat output (80-60°C)	-	G20	8,9	8,9	13,5	13,5	19,2	19,2	22,1	26	kW
Efficiency class in central heating mode			A	A	A	A	-	-	-	-	
Seasonal energy efficiency in central heating mode	ηs		94	94	94	94	94	94	94	94	%
Efficiency at rated heat input and High temperature GCV (NCV) regime	η4	useful Pn (60-80°C)	88,5 (98,4)	88,4 (98,3)	88,4 (98,3)	88,2 (97,9)	88,3 (98,0)	88,2 (97,9)	88,6 (98,3)	88,2 (97,9)	%
Efficiency at 30% of the nominal thermal flow and on low PCS temperature regime	η1	useful 30% of Pn	98,4 (109,5)	98,2 (109,2)	98,2 (109,2)	98 (108,8)	98,1 (108,9)	98 (108,8)	98 (108,8)	98,1 (108,9)	%
Chimney losses with burner on at max. Pn (80-60°C)			2,3	2,3	2,3	2,3	2,5	2,6	2,5	2,6	%
Chimney losses with burner on at max. 30% Pn (50-30°C)			0,5	0,5	0,5	0,5	0,6	0,6	0,5	0,6	%
Heat loss in standby mode	Pstby		45	57	72	87	115	124	143	168	W
			0,1								%
Annual energy consumption	QHE		71	91	117	141	-	-	-	-	GJ
Noise level (sound power)	LWA	at P max	51	52	53	54	55	56	57	57	dB(A)
Emissions (**)	NOx	(referred to HCV)	42,0	43,9	34,2	36,4	38,1	38,7	39,3	46,1	mg/kWh
Emissions at max./min. heat input, G20	CO_2		9 - 9 (*****)								%
	CO		63/2,3	73/2,3	79/6,5	90/6,5	81/7,5	91,5/7,5	89/4,6	91,5/5,6	ppm
Maximum rated heat input (LCV)	G25		34,9	45	53	65	85	93	107	127	kW
Minimum rated heat input (LCV)	G25		9	9	13	13	18,1	18,5	21,4	24,5	kW
Emissions at max./min. heat input, G25	CO_2		9 - 9								%
	CO		72/3,2	80/3,2	92/7	93,5/7	84/8	94/8	92/6	95/7	ppm

Description		POWER MAX								U.M.
		50 P DEP	50 P	65 P	80 P	100	110	130	150	
Emissions at max./min. power G30	CO_2	10,4-9,9		10,4-10,4						%
	CO	132/6	137/6	138/10	142/10	148/11	159/11	172/13	180/15	ppm
Emissions at max./min. power G31	CO_2	10,4-9,9		10,4-10,4						%
	CO	136/8	141/8	142/11	147/11	153/12	163/12	177/14	185/16	ppm
Gas consumption (min-max)	G20	0,95÷3,69	0,95÷4,76	1,43÷6,0	1,43÷7,24	2,06÷9,53	2,06÷10,29	2,37÷11,82	2,5÷13,91	mc/h
	G30	0,73÷2,82	0,73÷3,64	1,09÷4,58	1,09÷5,53	1,57÷7,28	1,57÷7,86	1,81÷9,02	1,91÷10,62	kg/h
	G31	0,71÷2,77	0,71÷3,57	1,07÷4,50	1,07÷5,43	1,54÷7,15	1,54÷7,72	1,78÷8,86	1,87÷10,43	kg/h
Flue gas temperature at max. power and min. power 80-60°C		66,5/61	67,5/61	71/61	72/61	76/62	78/62	75/61	77/61	°C
Flue gas temperature at max. power and min. power 50-30°C		44/32	45/32	45/33	46/33	47/35	49/35	45/33	48/35	°C
Flue gas mass flow rate (***)		0,015	0,02	0,025	0,03	0,04	0,046	0,05	0,06	Kg/s
Water-side resistance (ΔT 20°C)		-	-	-	-	160	210	350	510	mbar
Available useful discharge head (ΔT 20°C)		420	250	490	390	-	-	-	-	mbar
Maximum working pressure		6								bar
Minimum supply pressure		0,7								bar
Maximum permitted temperature		100								°C
Lockout thermostat activation temperature		95								°C
Adjustment temperature (min / max)		30 / 80 (****)								°C
Thermal module water content		5	5	15	15	17	17	23	25	l
Maximum condensation at 100% rated heat output (50-30°C)		5,4	7,0	8,9	10,1	13,6	15,0	17,5	19,8	l/h
Power supply		230-50								V-Hz
Index of protection		IPX4D								IP
Consumption at full load	Elmax	75	105	63	77	150	203	205	302	W
Consumption at part load	Elmin	31	34	30	30	36	31	44	45	W
Electrical consumption in standby mode	Psb	9	9	13	13	6	6	6	8	W

(*) Accessory.
(**) Weights calculated according to EN 15502.
(***) Values referred to atmospheric pressure at sea level.
(****) Up to 85°C if combined with the plate heat exchanger accessory.
(*****) To adjust the POWER MAX 110 model in **Belgium and Switzerland**, please refer to the chapeter "Adjustments".

1.8 Pumps

The thermal modulesPOWER MAX 50 P DEP, POWER MAX 50 P, POWER MAX 65 P and POWER MAX 80 P are fitted with a circulator.



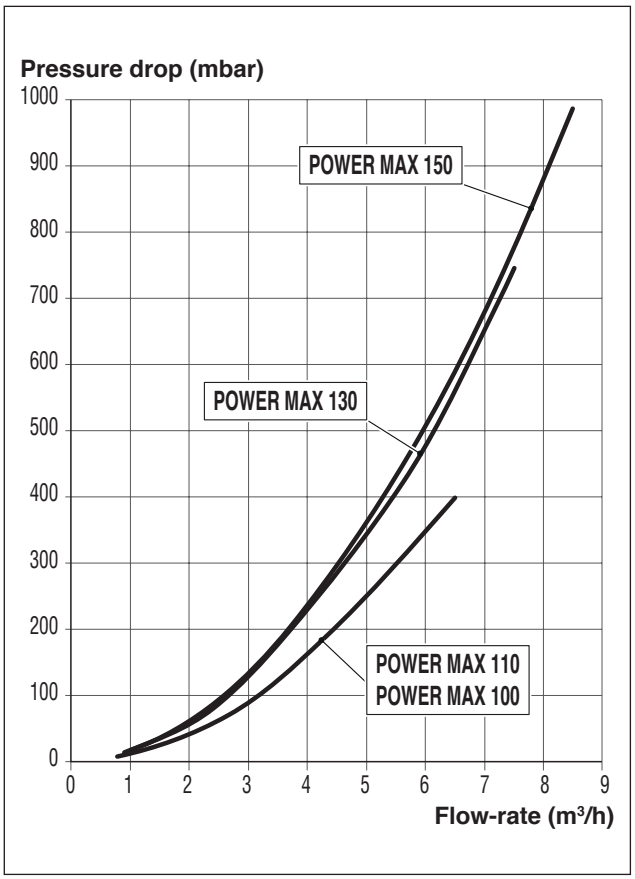
⚠ At the first start-up, and at least once a year, the rotation of the circulator shaft should be checked as, especially after long periods of not being operated, deposits and/or residuals could impede its free rotation.

⚠ Before loosening or removing the circulator cap, protect the electric devices located underneath from any water that exits.

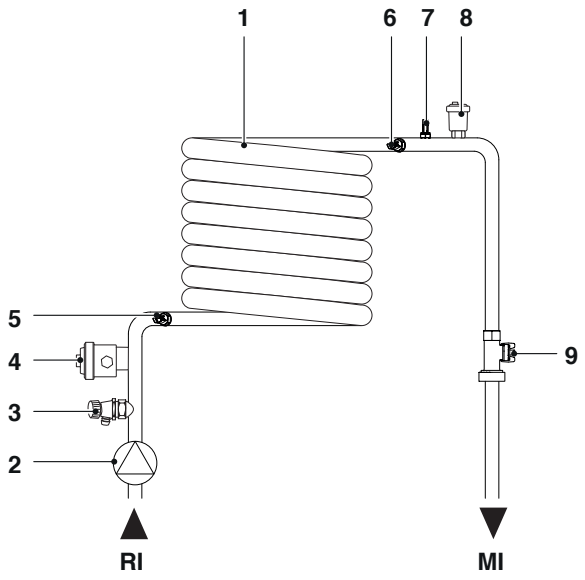
⛔ It is prohibited to operate the circulators without water.

Thermal modules POWER MAX 100, POWER MAX 110, POWER MAX 130 and POWER MAX 150 are not equipped with a circulator, which must be inside or outside the appliance (see accessories).
For its sizing, consider the thermal module's water-side pressure drops, which are shown in the chart below.

Water-side pressure drop



1.9 Water circuit



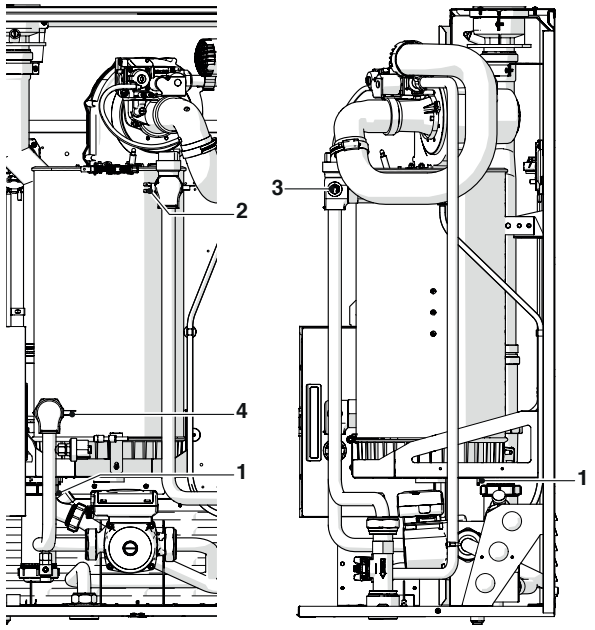
1 Heat exchanger
2 Circulator (only for models POWER MAX 50 P DEP - POWER MAX 80 P)
3 Drain cock
4 Minimum pressure switch
5 NTC return probe
6 NTC delivery probe
7 Safety thermostat temperature sensor
8 Automatic bleed valve
9 Flow-meter
MI Central heating flow
RI Central heating return

Values of NTC probes' resistors with changing temperatures.

Temperature °C Tolerance test ±10%	Resistor Ω	Temperature °C Tolerance test ±10%	Resistor Ω
-40	191908	45	4904
-35	146593	50	4151
-30	112877	55	3529
-25	87588	60	3012
-20	68471	65	2582
-15	53910	70	2221
-10	42739	75	1918
-5	34109	80	1663
0	27396	85	1446
5	22140	90	1262
10	17999	95	1105
15	14716	100	970
20	12099	105	855
25	10000	110	755
30	8308	115	669
35	6936	120	594
40	5819	125	529

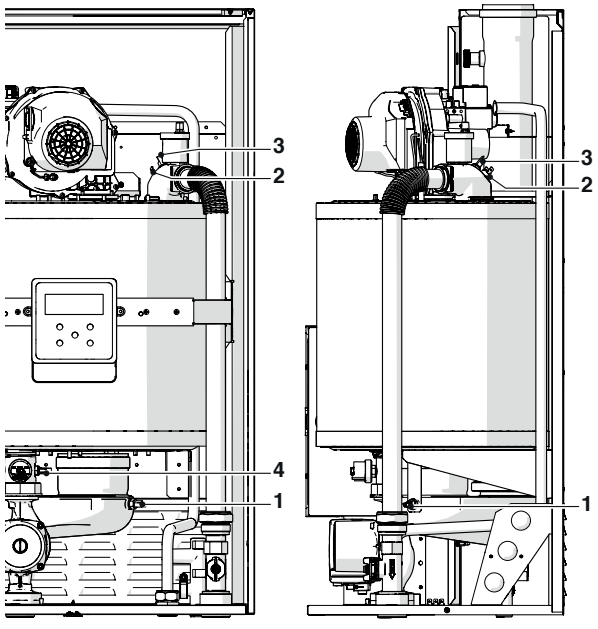
1.10 Positioning the temperature sensors

Probes placed on the related sockets of the thermal module (POWER MAX 50 P DEP - POWER MAX 50 P):
1 Exhaust flue probe
2 Safety thermostat
3 CH flow temperature sensor
4 Return probe



Front view **Side view**

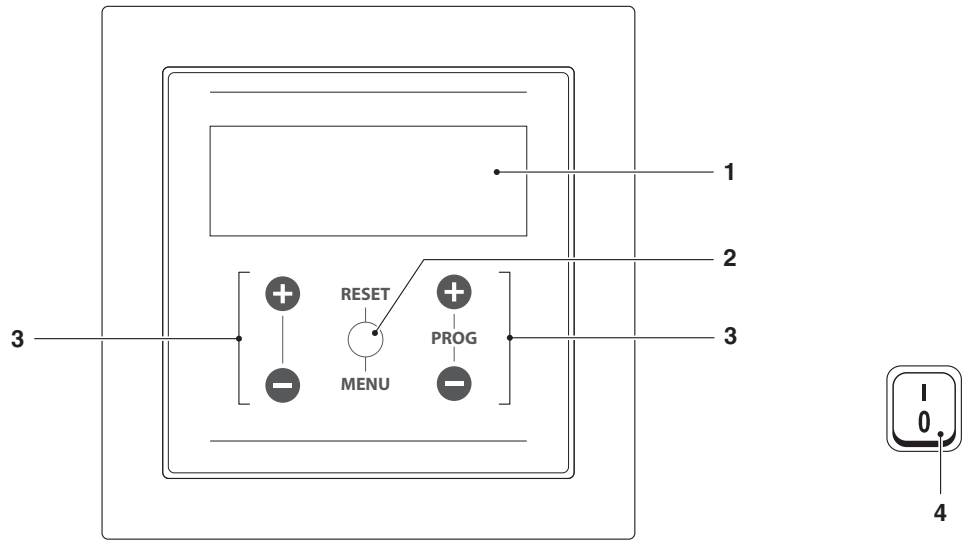
Probes placed on the related sockets of the thermal module (POWER MAX 65 P ÷ POWER MAX 150):
1 Exhaust flue probe
2 Safety thermostat
3 CH flow temperature sensor
4 Return probe



Front view **Side view**

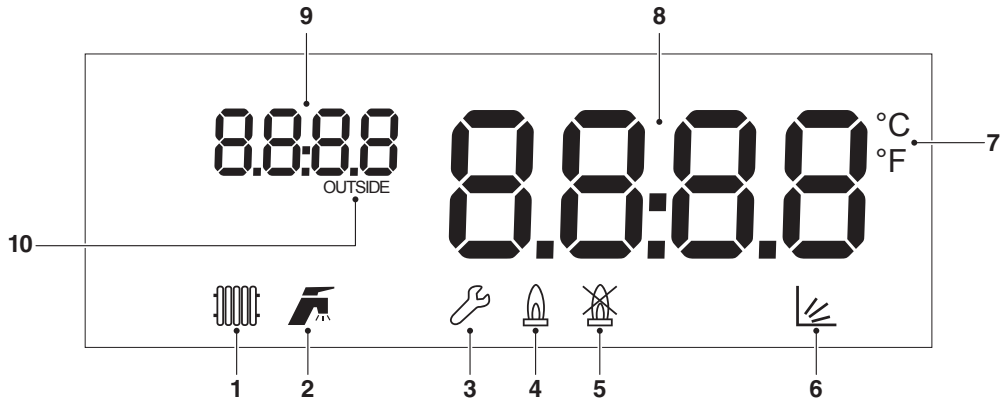
1.11 Control panel

CONTROL PANEL AND SYMBOLS



1 Rear light display
2 MENU/Reset key: access to the main menu and restore functioning further to a failure lock-out
3 Navigation keys
4 Main switch (located on the lower part of the appliance)

SECONDARY INFORMATION/DISPLAY VISUALISATION



1 Icon displayed when heating mode is enabled. Blinking when there is a heat demand
2 Icon displayed when DHW mode is enabled. Blinking when there is an DHW Demand
3 Icon displayed when entering the "Installer" or "Manufacturer" menu
4 Icon displayed when the appliance burner is on
5 Icon displayed when a Permanent or Temporary error occurs
6 Icon displayed when the climatic mode is on (Par. 2001= 1 o 2)
7 Celsius/Fahrenheit temperature
8 Large numeric display: current value
9 Small numeric display: system pressure display or parameter number
10 Icon displayed when the outdoor probe is connected

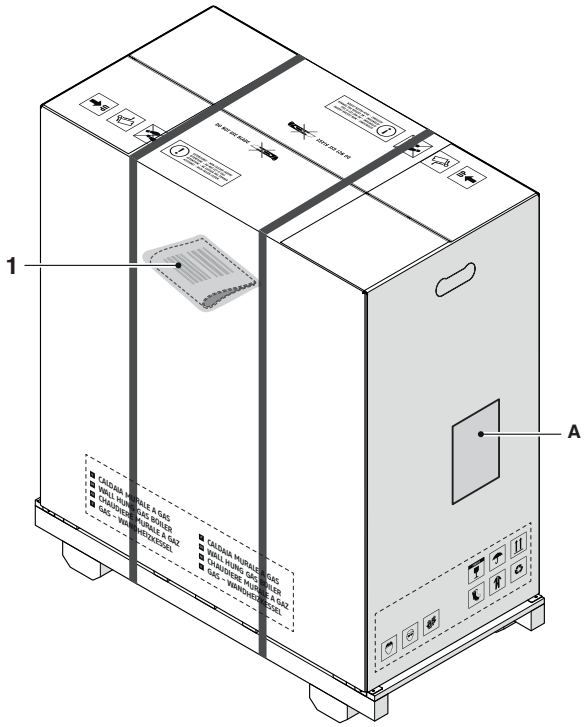
2 INSTALLATION

2.1 Unpacking the product

The thermal module **POWER MAX** is shipped palletised, packaged and with cardboard protections.
The following material is supplied in a plastic envelope inside the package (1):

- Instruction manual
- Warranty information leaflet **Beretta**
- LPG conversion kit
- Wall-mounting bracket with plugs (no.4 plugs s=10 mm suitable for concrete, brick, compact stone and concrete hollow brick walls)
- Hydraulic test certificate
- Energy Efficiency Label (for models <68kW)

2.1.1 Positioning of labels

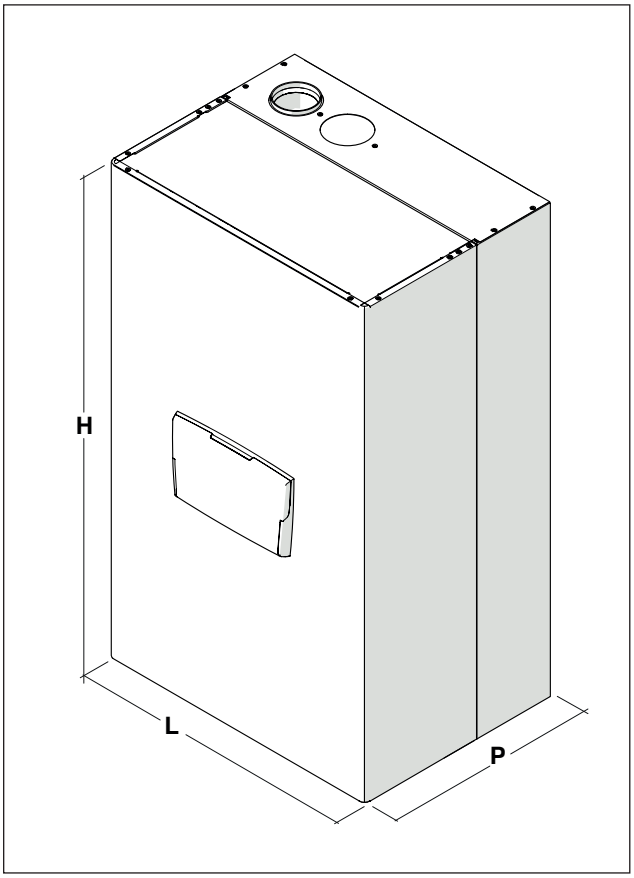


A Packing label

⚠ The instruction manual is an integral part of the appliance; therefore, it should be read and stored carefully.

⚠ Keep the documentation envelope in a safe place. Any replacement documents must be ordered from Beretta who reserve the right to charge for the cost of the replacement.

2.2 Overall dimensions and weights



Description	POWER MAX				
	50 P DEP	50 P	65 P	80 P	
L	600	600	600	600	mm
P	435	435	435	435	mm
H	1000	1000	1000	1000	mm
Net weight	66	66	78	78	kg

Description	POWER MAX				
	100	110	130	150	
L	600	600	600	600	mm
P	435	435	435	435	mm
H	1000	1000	1165	1165	mm
Net weight	81	81	93	97	kg

2.3 Installation premises

The thermal module **POWER MAX** can be installed in rooms that are permanently ventilated and equipped with suitably sized ventilation openings in line with Technical Standards and Regulations applicable to the installation site.

⚠ When installing the boiler, allow sufficient space around it to access all safety and control devices and to permit easy maintenance.

⚠ Check that the electric protection level of the appliance is suitable for features of the room where it is installed.

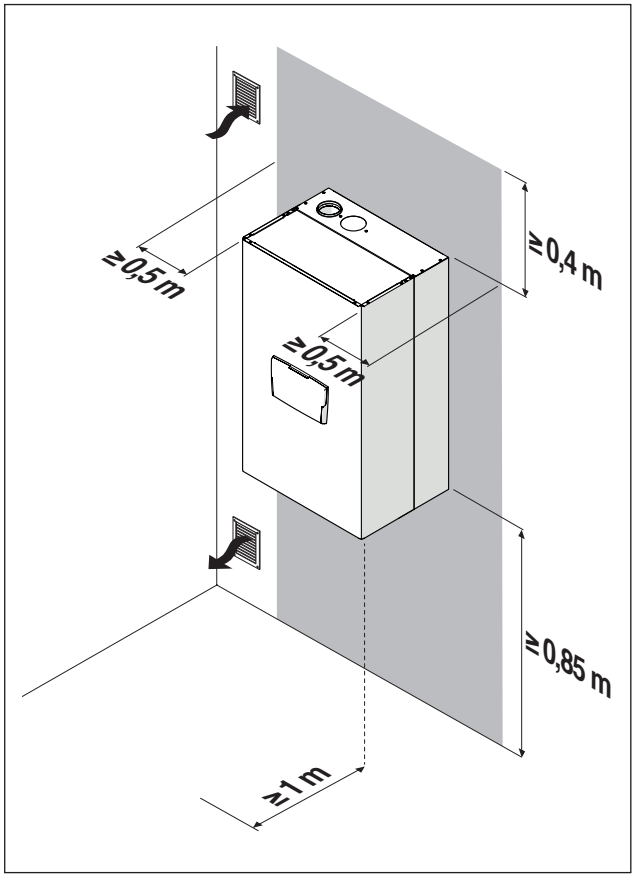
⚠ Make sure that comburent air is not contaminated by substances containing chlorine or fluorine (elements found in sprays, paints, detergents etc.).

⛔ Do not obstruct or restrict the air vents in the room where the boiler is installed. A free air supply is essential for correct combustion.

⛔ It is forbidden to leave flammable containers and substances in the room where the thermal module is installed.

2.3.1 Recommended minimum distances

Clearances for the assembly and the maintenance of the appliance are shown in the figure.



The minimum surface of ventilation openings is 3,000 cm^2 for gas fuel heating systems.

2.4 Installation in older systems and systems requiring modernisation

When installing these boilers in older systems or systems requiring modernisation, always perform the following checks:

- Make sure that the flue is able to withstand the temperature of the combustion gases and that it has been designed and made in compliance with applicable standards. The flue must also be as straight as possible, sealed, insulated and not blocked or choked. See Paragraph "Discharge of combustion products" for any additional information.
- Make sure that the electrical supply system has been installed by a qualified electrician in compliance with applicable standards
- Make sure that the fuel feed line and any storage tank are made and installed in compliance with applicable standards
- Make sure that expansion vessels are big enough to contain the additional volume generated by thermal expansion
- Make sure that the flow rate, head and direction of flow of the pumps are suitable and correct
- The system has been washed, cleaned of mud and grime and water seals have been checked
- A treatment system is fitted when the supply/refill water has values other than those indicated in Paragraph "Water quality requirements"

⚠ The manufacturer declines all responsibility for damage caused by incorrectly constructed flue systems.

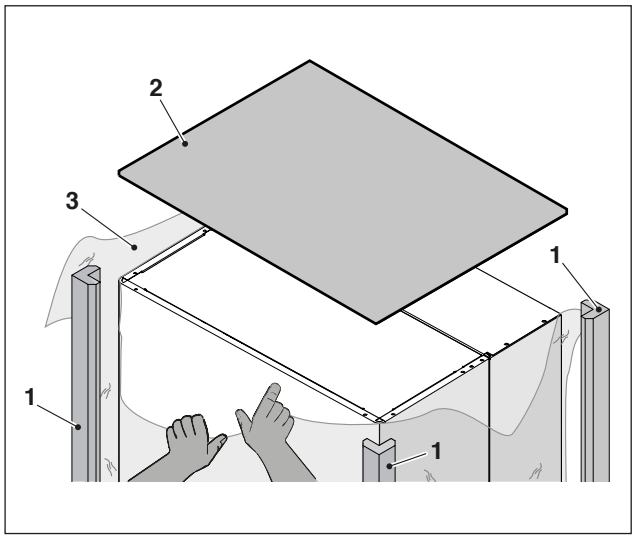
2.5 Moving and removing the packing

⚠ Do not remove the cardboard packaging until your reach the installation location.

⚠ Before handling the appliance and removing the packaging, wear PPE and use tools suitable for the appliance's size and weight.

⚠ This step must be carried out by several individuals equipped with suitable means with respect to the appliance's size. Make sure that the load is not unbalanced during handling.

Proceed as follows to remove the packing:
- Remove the strapping that secures the cardboard packaging to the pallet
- Remove the cardboard
- Remove edge protectors (1)
- Remove the Styrofoam protection (2)
- Remove the protective bag (3)

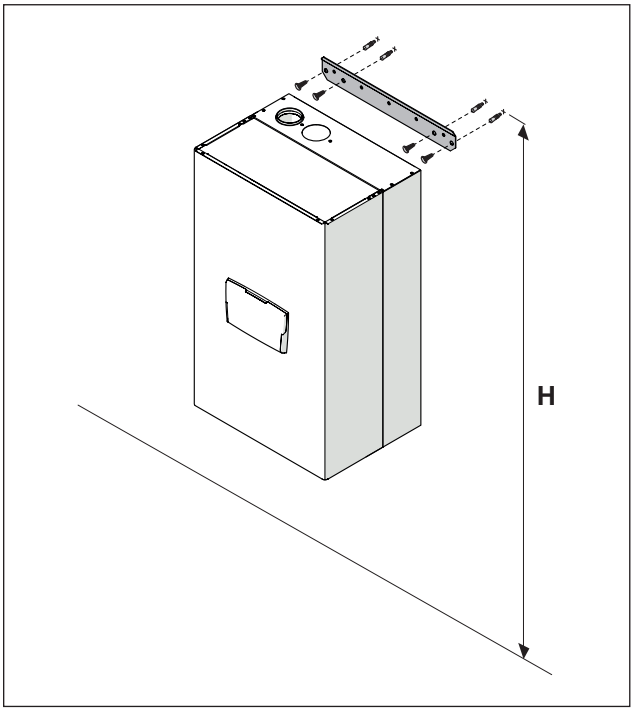


2.6 Thermal module assembly

Thermal modules **POWER MAX** are supplied complete with a wall-mounting bracket.

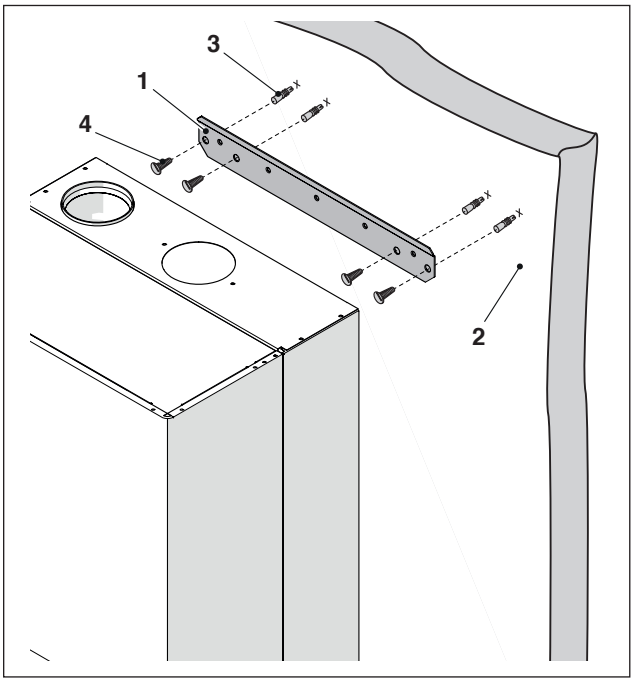
⚠ Check that the wall on which the appliance is to be fitted is sufficiently solid and supports safe screw fixing points.

⚠ The appliance's height must be selected so as to facilitate dismantling it and maintaining it.



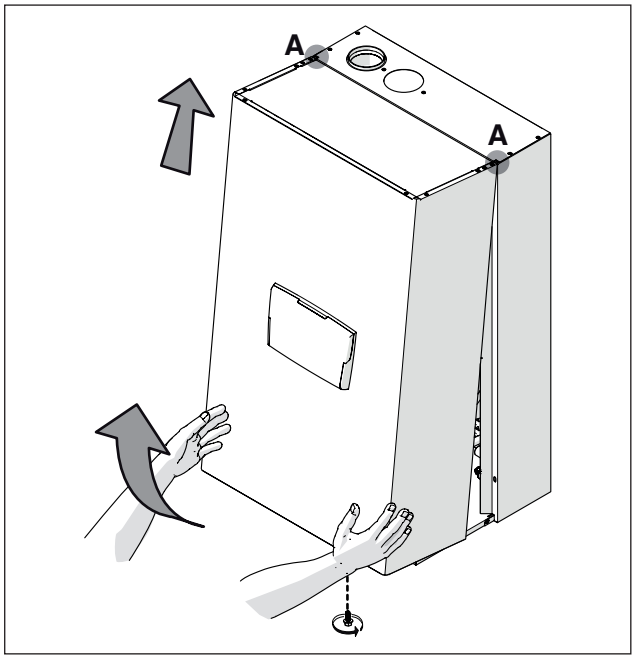
Model	Height (H) mm
POWER MAX 50 P DEP	1850<H<2000
POWER MAX 50 P	1850<H<2000
POWER MAX 65 P	1850<H<2000
POWER MAX 80 P	1850<H<2000
POWER MAX 100	1850<H<2000
POWER MAX 110	1850<H<2000
POWER MAX 130	2000<H<2150
POWER MAX 150	2000<H<2150

For installation:
- Position the bracket (1) onto the wall (2), at the point where you wish to install the appliance
- Ensure that the bracket is horizontal and mark the points where the holes for fixing plugs must be drilled
- Drill the holes and insert expansion plugs (3)
- Fix the bracket to the wall using the screws (4)
- Secure the appliance onto the bracket

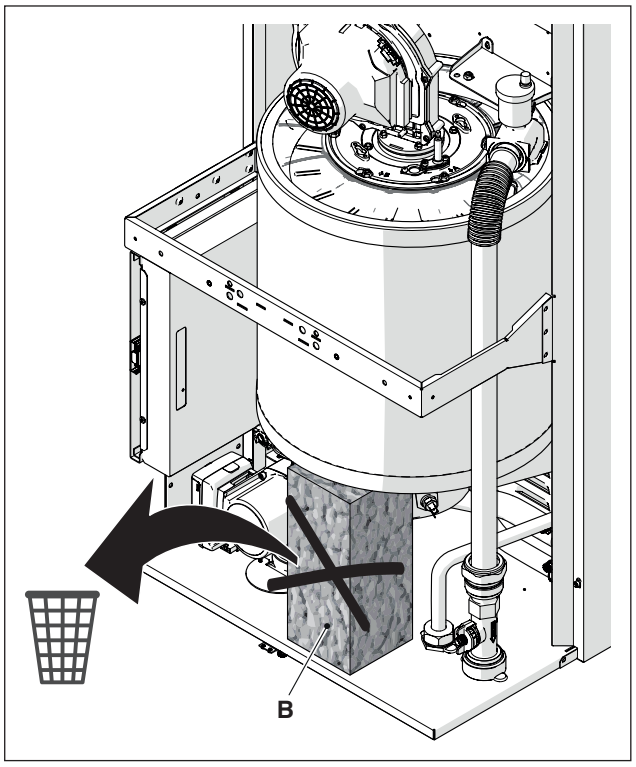


After installing the thermal module:

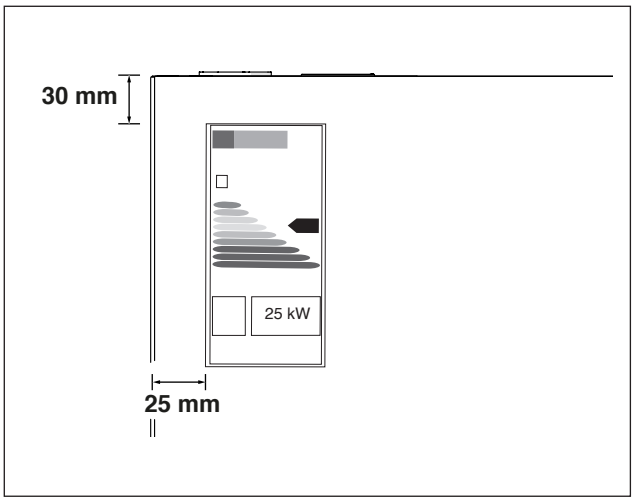
- remove the locking screw.
- pull the front panel outwards and then to the top to decouple it from points A.



- remove the polystyrene block (B) under heat exchanger (only for models POWER MAX 100 - POWER MAX 110 - null - POWER MAX 150).



Locate the envelope containing the product documentation and stick the Energy Efficiency Label (if any) contained in the envelope onto the panel.

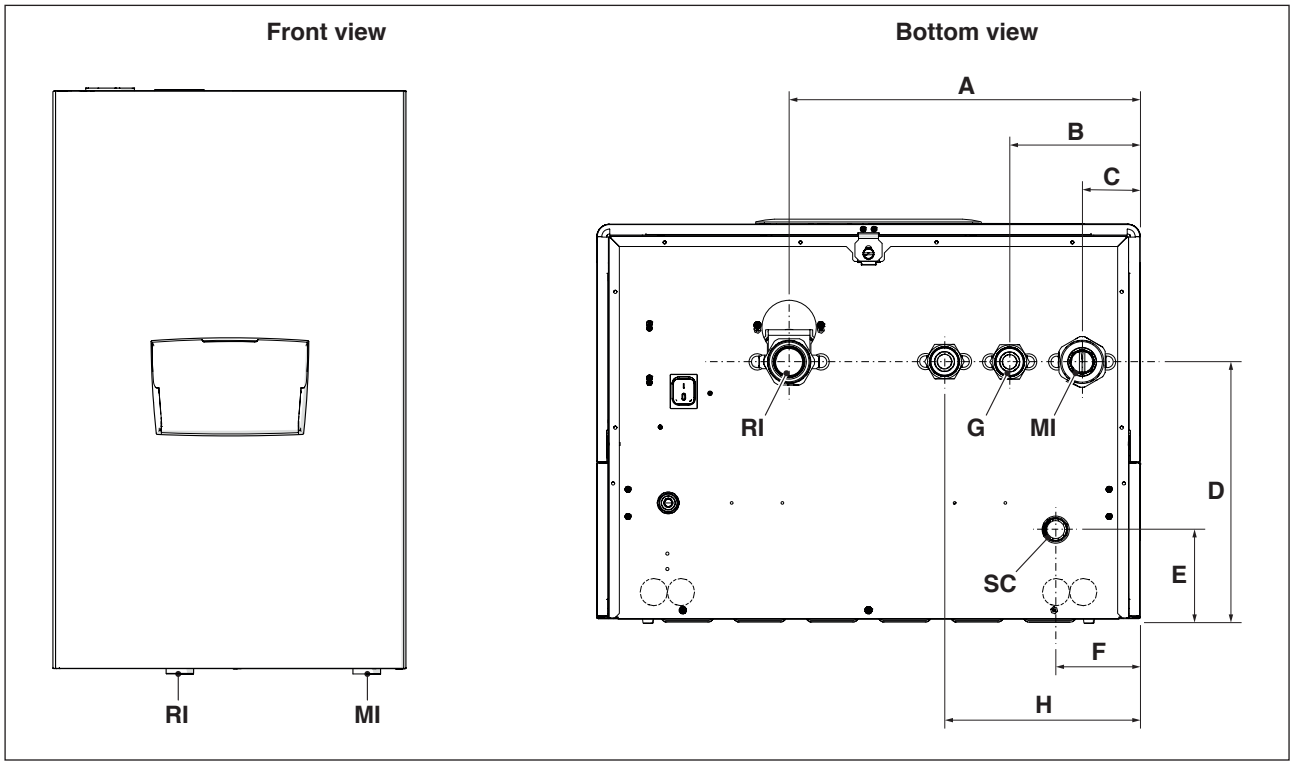


Close the panelling in reverse order to the one described above.

⚠ Before proceeding with the hydraulic connections the protection plugs must be removed from the delivery, return and condensate drain piping.

2.7 Water connections

The dimensions and position of thermal module's hydraulic connections are shown in the table below.



DESCRIPTION		POWER MAX								
		50 P DEP	50 P	65 P	80 P	100	110	130	150	
A		387	387	387	387	387	387	387	387	mm
B		143,5	143,5	143,5	143,5	143,5	143,5	143,5	143,5	mm
C		63,5	63,5	63,5	63,5	63,5	63,5	63,5	63,5	mm
D		283,5	283,5	283,5	283,5	283,5	283,5	283,5	283,5	mm
E		98,5	98,5	98,5	98,5	98,5	98,5	98,5	98,5	mm
F		92,5	92,5	92,5	92,5	92,5	92,5	92,5	92,5	mm
H	(optional 3-way valve attachment)	202,5	202,5	-	-	-	-	-	-	mm
MI	(system flow)	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	Ø
RI	(system return)	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	G 1" 1/2 M	Ø
SC	(condensate drain)	25	25	25	25	25	25	25	25	Ø mm
G	(gas inlet)	G 1" M	G 1" M	G 1" M	G 1" M	G 1" M	G 1" M	G 1" M	G 1" M	Ø

⚠ Before connecting the thermal module the protection plugs must be removed from the delivery, return and condensate drain pipes.

⚠ Before connecting the thermal module, it is necessary to clean the system. This step is absolutely required when the appliance replaces another one on pre-existing systems.

In order to carry out this cleaning activity, if the old generator is still installed on the system, it is advisable to:

- add a de-scaling additive.
- Operate the system with the generator on for around 7 days.
- Discharge dirty system water and flush the system one or more times with clean water.

If the system is very dirty, repeat the last procedure one more time.

If the old generator is not present or available, use a pump to circulate the water + additive through the system for about 10 days and perform a final washing as described in the previous paragraph.

Once the cleaning has been completed, it is recommended to add a suitable protective fluid to the system's water before installing the thermal module.

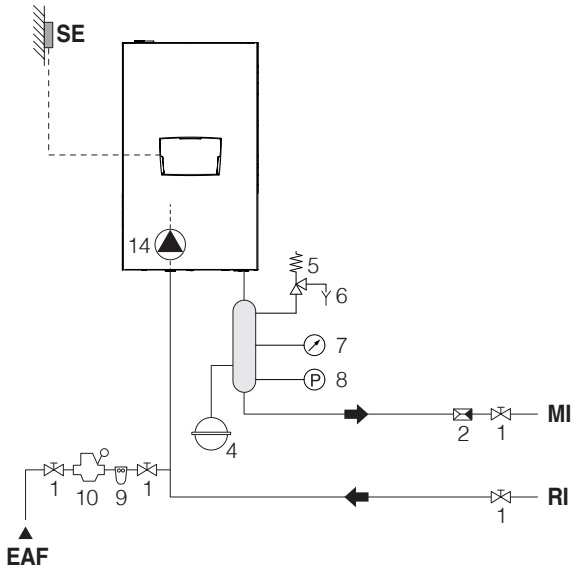
In order to clean the heat exchanger's built-in water system, please contact Technical Assistance Centre **Beretta**.

⛔ Do not use incompatible liquid detergents, including acids (for instance, chloridric acid and similar) in any concentration.

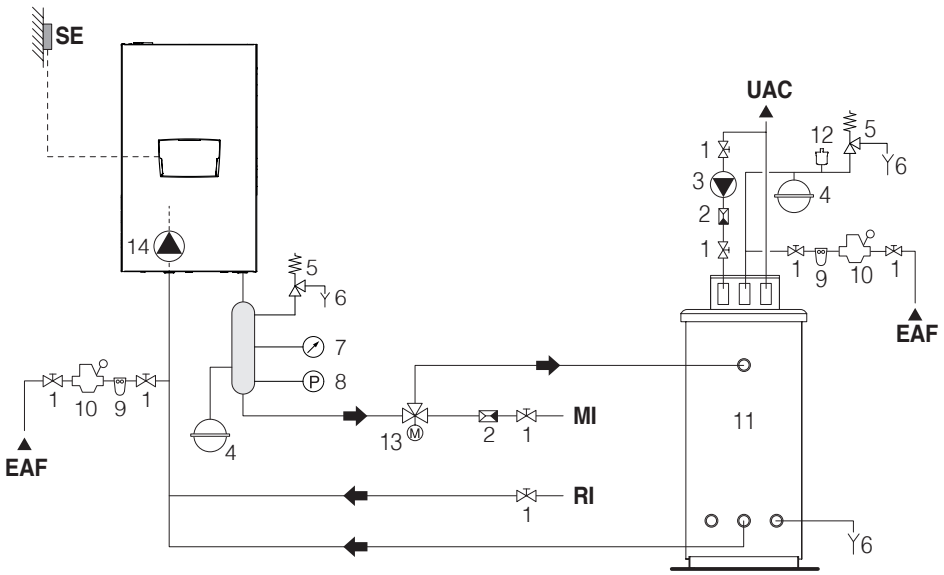
⛔ Do not subject the heat exchanger to cyclical pressure changes because fatigue stress is very dangerous for the integrity of system components.

2.8 Typical water system schematics

Layout 1: circuit with thermal module directly linked to heating system (check that the pump's discharge head is sufficient to ensure adequate circulation)



Layout 2: circuit with thermal module directly linked to heating system and DHW tank. (check that the pump's discharge head is sufficient to ensure adequate circulation)



1 Isolating valve
2 Non-return valve
3 DHW circulation pump
4 Expansion tank
5 Safety valve
6 Drain
7 Pressure gauge
8 Pressure switch
9 Water softener filter
10 Pressure reducer
11 Storage cylinder
12 Automatic bleed valve
13 Diverter valve
14 Pump (fitted as standard for models POWER MAX 50 P DEP and POWER MAX 80 P)
15 High-temperature system circulator
16 Storage cylinder circulator

SE Outdoor sensor
MI High temperature system flow
RI High temperature system return
EAF Domestic cold water inlet
UAC Domestic hot water outlet

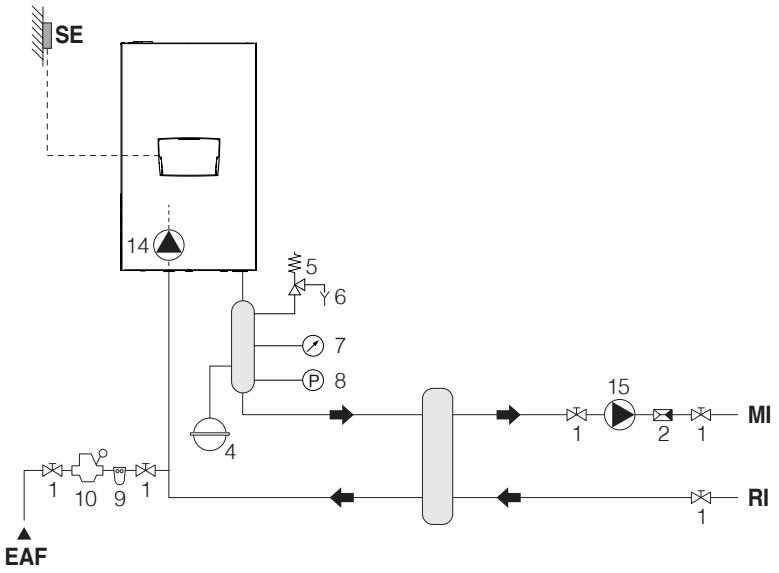
⚠ Domestic hot water and central heating circuits must be completed with expansion vessels of adequate capacity and suitable, correctly-sized safety valves. The discharge of safety valves and appliances must be connected to a suitable collection and disposal system (see Catalogue for compatible accessories).

⚠ The choice of system components and the method of their installation are left up to the heating engineer installing the system. Installers must use their expertise to ensure proper installation and functioning in conformity to all applicable legislation.

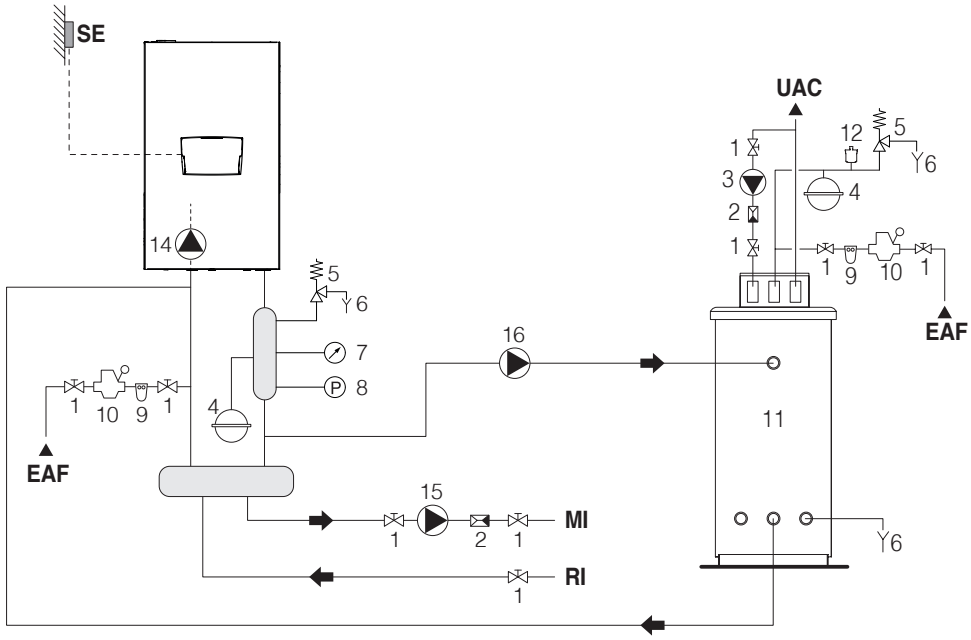
⚠ Special supply/refill water must be conditioned using suitable treatment systems.

⛔ It is prohibited to operate the thermal module without water.

Layout 3: circuit with thermal module connected to a heating system via a separator



Layout 4: circuit with thermal module linked to DHW tank and heating system via a separator



1 Isolating valve
2 Non-return valve
3 DHW circulation pump
4 Expansion tank
5 Safety valve
6 Drain
7 Pressure gauge
8 Pressure switch
9 Water softener filter
10 Pressure reducer
11 Storage cylinder
12 Automatic bleed valve
13 Diverter valve
14 Pump (fitted as standard for models POWER MAX 50 P DEP and POWER MAX 80 P)
15 High-temperature system circulator
16 Storage cylinder circulator

SE Outdoor sensor
MI High temperature system flow
RI High temperature system return
EAF Domestic cold water inlet
UAC Domestic hot water outlet

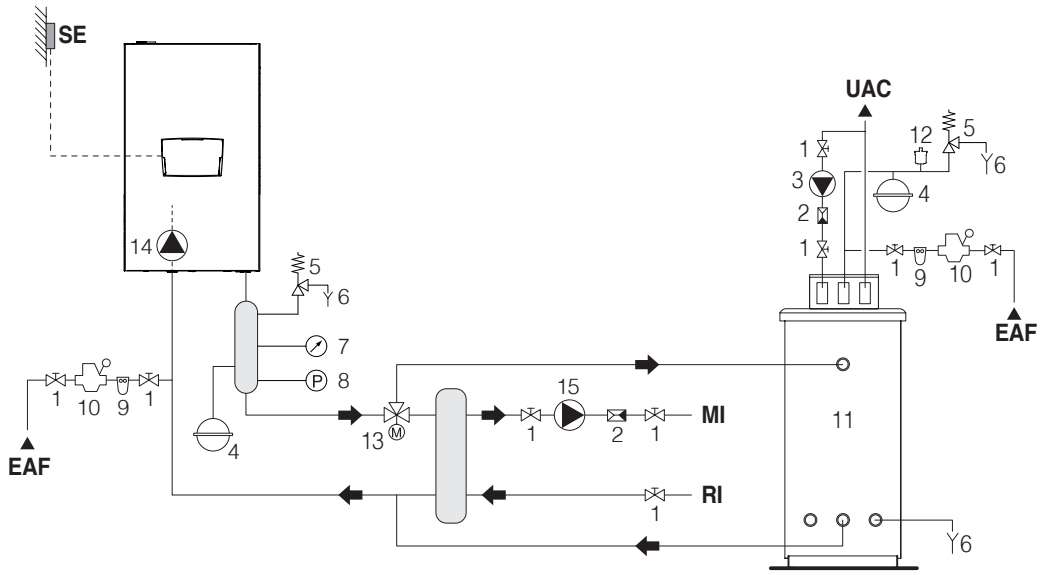
⚠ Domestic hot water and central heating circuits must be completed with expansion vessels of adequate capacity and suitable, correctly-sized safety valves. The discharge of safety valves and appliances must be connected to a suitable collection and disposal system (see Catalogue for compatible accessories).

⚠ The choice of system components and the method of their installation are left up to the heating engineer installing the system. Installers must use their expertise to ensure proper installation and functioning in conformity to all applicable legislation.

⚠ Special supply/refill water must be conditioned using suitable treatment systems.

⛔ It is prohibited to operate the thermal module without water.

Layout 5: circuit with thermal module linked to heating system and DHW. tank via a separator



1 Isolating valve
2 Non-return valve
3 DHW circulation pump
4 Expansion tank
5 Safety valve
6 Drain
7 Pressure gauge
8 Pressure switch
9 Water softener filter
10 Pressure reducer
11 Storage cylinder
12 Automatic bleed valve
13 Diverter valve
14 Pump (fitted as standard for models POWER MAX 50 P DEP and POWER MAX 80 P)
15 High-temperature system circulator
16 Storage cylinder circulator

SE Outdoor sensor
MI High temperature system flow
RI High temperature system return
EAF Domestic cold water inlet
UAC Domestic hot water outlet

⚠ Domestic hot water and central heating circuits must be completed with expansion vessels of adequate capacity and suitable, correctly-sized safety valves. The discharge of safety valves and appliances must be connected to a suitable collection and disposal system (see Catalogue for compatible accessories).

⚠ The choice of system components and the method of their installation are left up to the heating engineer installing the system. Installers must use their expertise to ensure proper installation and functioning in conformity to all applicable legislation.

⚠ Special supply/refill water must be conditioned using suitable treatment systems.

⛔ It is prohibited to operate the thermal module without water.

2.9 Gas connections

The gas connection must be made respecting the installation regulations in force, and sized to ensure the correct gas delivery to the burner.
Before making the connection, check that:

⚠ The gas type is suitable for the appliance

⚠ If the appliance needs to be adapted for use with another gas fuel, contact your local Technical Assistance Centre to have the necessary modifications made. These operations may not be performed by the installer under any circumstances.

⚠ The piping is thoroughly clean

⚠ The gas meter's flow rate is capable of ensuring the simultaneous use of all the appliances connected to it. The appliance's connection to the gas supply line must be carried out in accordance with the current regulations.

⚠ Intake pressure with the appliance in the off position has the following reference values:
- powered by methane gas: optimal pressure 20 mbar
- powered by L.P.G.: optimal pressure 37 mbar

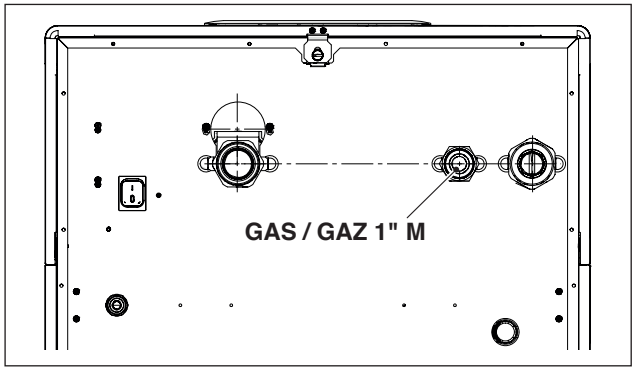
⛔ Do not use any fuels other than those provided under any circumstances.

While it is normal for the intake pressure to decrease while the appliance is in operation, it is advisable to verify that no excessive pressure fluctuations take place. In order to limit the extent of these types of variations, the diameter of the gas supply line to be used must be assessed based on the length and the pressure drops of the line itself, from the meter to the thermal module.

⚠ If fluctuations in the gas distribution pressure are encountered, it is recommended to install an appropriate pressure stabiliser upstream of the appliance's gas intake. For G30 and G31 gas supply, all the necessary precautions must be taken in order to prevent the gas from freezing in the case of extremely low outdoor temperatures.

If the gas distribution network contains solid particles, install a filter on the fuel supply line. When selecting it, consider that pressure drops due to the filter should be as low as possible.

⚠ On completion of the installation, check that all joints are sealed.



2.10 Discharge of combustion products

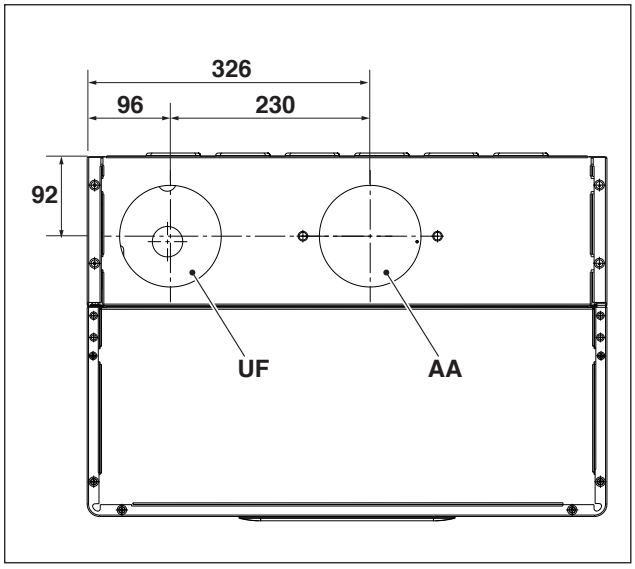
The appliance is supplied as standard in B-type configuration (B23-B23P-B53P), i.e. pre-fitted to suction air directly into the installation room and may be converted into a C-type appliance with the use of specific accessories. In this configuration, the appliance will suction the air directly from outdoors, with the possibility of coaxial or dual piping. For flue gas extraction and the intake of combustion air, it is essential to use only specific pipes for condensing boilers and ensure that they are correctly connected, as shown in the instructions supplied with the flue gas accessories.

⚠ Do not connect this appliance's flue gas extraction pipes with those of other appliances, unless this is specifically authorised by the manufacturer. Non-compliance with this precaution may cause a build-up of carbon monoxide in the room where the appliance is installed. This could jeopardise people's health and safety.

⚠ For further information on flue gas extraction pipes for thermal modules connected in a cascaded system, see Catalogue and the instructions provided for the relevant accessories.

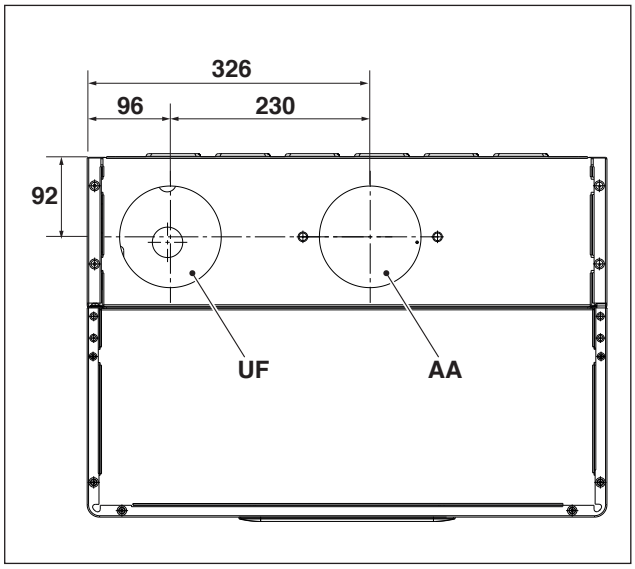
⚠ Ensure that combustion air (suction line air) is not contaminated by:
- waxes/chlorinated detergents
- chemical products based on swimming pool chlorine
- calcium chloride
- sodium chloride use to soften tap water
- refrigerant leaks
- paint or varnish removers
- chloridric acid/muriatic acid
- cements and glues
- anti-static softeners used in dryers
- chloride used for domestic or industrial applications as detergent, whitener or solvent
- adhesives used to glue construction and other similar products.

⚠ To prevent contamination of the thermal module, do not install suction line air intakes and gas flue extraction pipes near:
- dry-cleaners/laundry rooms and factories
- swimming pools
- metal processing plants
- beauty parlours
- fridge repair shops
- photo-processing facilities
- body-shops
- plastics manufacturing plants
- furniture workshops and manufacturing plants.



The AA outlet is supplied capped in B23 configuration.

DESCRIPTION	POWER MAX				
	50 P DEP	50 P	65 P	80 P	
FO (flue gas outlet)	DN80	DN80	DN80	DN80	Ø
AS (air suction)	DN80	DN80	DN80	DN80	Ø



The AA outlet is supplied capped in B23 configuration.

DESCRIPTION	POWER MAX				
	100	110	130	150	
FO (flue gas outlet)	DN110	DN110	DN110	DN110	Ø
AS (air suction)	DN110	DN110	DN110	DN110	Ø

⚠ For B-type installation, combustion air is taken from the environment and goes through the openings (shutters) on the rear panel of the device that must be located in a suitable and ventilated technical room.

⚠ Read the requirements, instructions and prohibitions detailed below carefully, since non-compliance with them may be result in a safety hazard or the appliance's malfunction.

⚠ Condensation appliances described in this handbook must be installed with flue gas pipes compliant with applicable legislation and expressly manufactured for this specific use.

⚠ Check that pipes and joints are not damaged.

⚠ Joint seals must be executed with materials that withstand the condensate's acidity and the temperatures of the appliance's flue gases.

⚠ When installing flue pipes, always bear in mind the direction of the flue gases and of possible condensate flows.

⚠ Inadequate or incorrectly sized flue gas pipes may increase combustion noise, create condensate extraction issues and negatively impact on combustion parameters.

⚠ Check that pipes are suitably far (min. 500 mm) from flammable or heat-sensitive construction elements.

⚠ Make sure that condensation is not built up along the duct. For this purpose, provide a sloping duct of at least 3 degrees towards the appliance in case there is an a horizontal section. If the horizontal or vertical section is longer than 4 meters, a condensate siphon drainage must be provided at the base of the pipe. The useful height of the siphon must be at least equal to the value "H" (see figure below). The siphon discharge must then be connected to the sewerage system (see paragraph "Preparation for the condensate drain" on page 26).

⛔ It is prohibited to block or section the flue gas extraction pipe or the combustion air suction pipe, if any.

⛔ It is prohibited to use pipes that not designed for this application, because the condensate's action would damage them quickly.

Maximum equivalent lengths are provided below.

B TYPE INSTALLATION
Exhaust Ø 80 mm

Model	Maximum length Ø 80 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 50 P DEP	30 m	1,5 m	3 m
POWER MAX 50 P	30 m	1,5 m	3 m
POWER MAX 65 P	30 m	1,5 m	3 m
POWER MAX 80 P	30 m	1,5 m	3 m

Exhaust Ø 110 mm

Model	Maximum length Ø 110 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 100	30 m	1,5 m	3 m
POWER MAX 110	30 m	1,5 m	3 m
POWER MAX 130	30 m	1,5 m	3 m
POWER MAX 150	30 m	2 m	4 m

C TYPE INSTALLATION

Double pipes Ø 80-125 mm

Model	Maximum length Ø 80-125 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 50 P DEP	15 m	2 m	6 m
POWER MAX 50 P	15 m	2 m	6 m
POWER MAX 65 P	15 m	2 m	6 m
POWER MAX 80 P	15 m	2 m	6 m

Double pipes Ø 110-160 mm

Model	Maximum length Ø 110-160 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 100	15 m	2 m	6 m
POWER MAX 110	15 m	2 m	6 m
POWER MAX 130	15 m	2 m	6 m
POWER MAX 150	15 m	4 m	8 m

Double pipes Ø 60-100 mm

Model	Maximum length Ø 60-100 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 50 P DEP	15 m	2 m	4 m
POWER MAX 50 P	10 m	2 m	4 m
POWER MAX 65 P	10 m	2 m	4 m
POWER MAX 80 P	10 m	3 m	6 m

Separate pipes Ø 80 mm + Ø 80 mm

Model	Maximum length Ø 80 + Ø 80 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 50 P DEP	15 m + 15 m	1,5 m	3 m
POWER MAX 50 P	15 m + 15 m	1,5 m	3 m
POWER MAX 65 P	15 m + 15 m	1,5 m	3 m
POWER MAX 80 P	15 m + 15 m	1,5 m	3 m

Separate pipes Ø 110 mm + Ø 110 mm

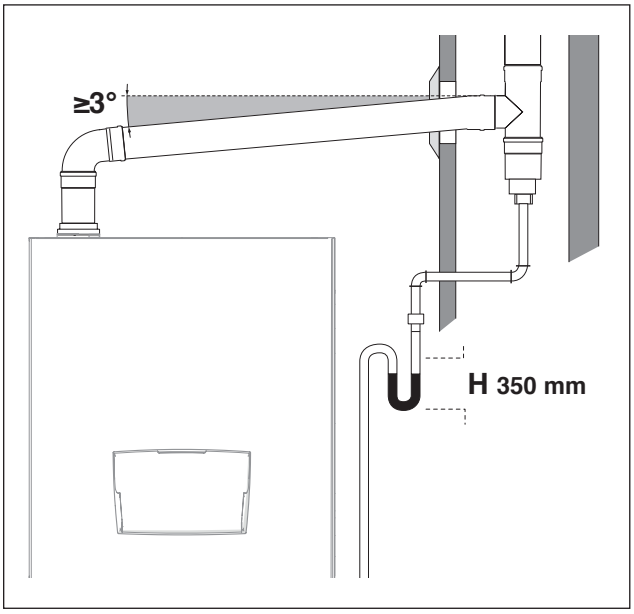
Model	Maximum length Ø110 + Ø110 mm	Pressure drop	
		45° bend	90° bend
POWER MAX 100	15 m + 15 m	1,5 m	3 m
POWER MAX 110	15 m + 15 m	1,5 m	3 m
POWER MAX 130	15 m + 15 m	1,5 m	3 m
POWER MAX 150	15 m + 15 m	2 m	4 m

The table with available residual discharge heads is shown below.

Description	Discharge head	
	Max	Min
POWER MAX 50 P DEP	300 (275*)	45 (30*)
POWER MAX 50 P	480 (455*)	45 (30*)
POWER MAX 65 P	510	35
POWER MAX 80 P	630	35
POWER MAX 100	560	32
POWER MAX 110	610	32
POWER MAX 130	500	30
POWER MAX 150	353	28

(*) with DN80 clapet accessory (Compulsory for cascade installations)

The residual discharge head values are shown in Pascal.



To change direction, use a T section with an inspection cap to permit easy access for cleaning inside the pipe. After cleaning, always make sure that inspection caps are replaced tightly and that their seals are undamaged and efficient.

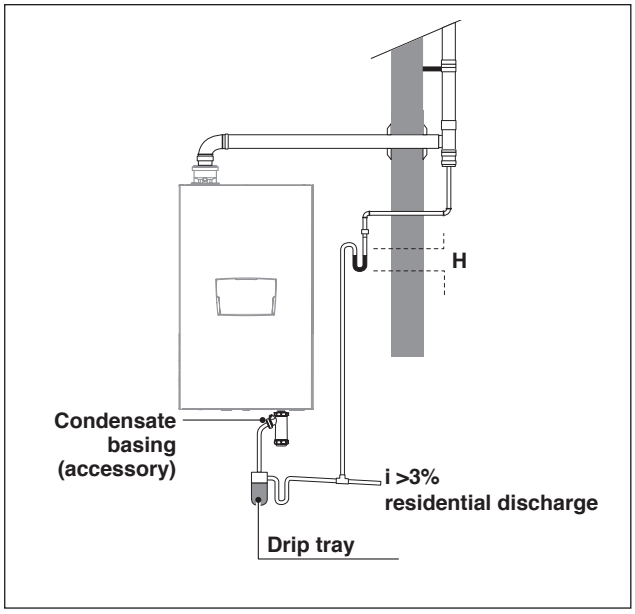
2.10.1 Preparation for the condensate drain

The evacuation of the condensate produced by the appliance **POWER MAX** during its normal operationmust be carried out through a siphoned condensate collector, placed under the thermal module itself. This collector is installed as standard in models POWER MAX 50 P DEP - POWER MAX 50 P, while it is available as an accessory for models POWER MAX 65 P ÷ POWER MAX 150.
The condensate coming out of the drainer must be collected for dripping into a taped vessel connected to the sewer system, if necessary by interposing a neutralizer (for more information see paragraph "Neutralising the condensate"), according to the following procedure:

- Fit a drip tray near the condensate discharge outlet, adding a condensate neutraliser if necessary
- Connect the drip collection receptacle to the local drain or sewer system using a siphon.

The drip tray can be created by fitting a cup or simply a polypropylene bend, suitable for collecting the condensate that comes out of the appliance and any liquid leaking from the safety valve.
The maximum distance between the condensate drainage of the appliance and the socket (or socket pipe) must not be less than 10 mm.
The connection to the local drain or sewer system must be executed using a siphon in order to prevent unpleasant odours from being released back into the room from the sewer.
We advise using plastic (PP) piping for building the condensate drainage.

Never use copper pipes under any circumstances, as the condensate itself will cause them to rapidly deteriorate.



Execute the condensate drain outlet so as to prevent combustion gases leaking into the environment or the drain or sewage system by sizing the siphon (height H) as described in Paragraph "Discharge of combustion products".

Always maintain a slope angle “s” of over 3° and ensure that the diameter of any condensate drain pipe is greater than that of the connection fitted at the drain outlet

Connect the condensate drain hose to a domestic water drain in accordance with national and local legislation and standards.

Fill the siphon with water before activating on the thermal module in order not to release any combustion products into the environment when the thermal module is first switched on.

The condensate drain must be suitably siphoned. Fill the siphon with drain in order to prevent the release of combustion products when the appliance is first switched on.

It is recommended that condensate from the thermal module and from the flue should be channelled to the same drain pipe.

The connection pipes used must be as short and as straight as possible. Any curves or sharp bends can lead to hoses becoming clogged and, therefore, can prevent proper condensate discharge

Size the condensate drain outlet so as to ensure the proper drainage of waste liquids without leaks

The condensate drain must be connected to the drain and sewage network in such a ways so that the condensate may not freeze under any circumstances

2.11 Neutralising the condensate

The UNI 11528 Standard provides for mandatory neutralisation of condensate for systems with total power of over 200 kW. For systems with total power from 35 to 200 kW, neutralisation may or may not be mandatory depending on the number of flats (for residential applications) or the number of occupants (for non-residential applications) served by the aforementioned system.

2.11.1 Water quality requirements

It is ABSOLUTELY NECESSARY to treat the water system in order for the heat generator to work properly and to guarantee its service life, as well as that of all its components. This not only applies to jobs carried out on existing installations but also on new installations.
Sludge, lime-scale and pollutants contained in the water can cause permanent damage to the heat generator, also within a short time and notwithstanding the quality standards of the materials used.
Contact the Technical Assistance Centre for any further information on type and use of additives.
The heat transfer fluid (water) for the central heating circuit must conform to the quality parameters given in the following table:

Parameters	Value	Unit
General characteristic	Colourless, without sediment	
PH value	Min. 6.5; Max. 8	PH
Dissolved oxygen	< 0,05	mg/l
Total iron (Fe)	< 0,3	mg/l
Total copper (Cu)	< 0,1	mg/l
Na2SO3	< 10	mg/l
N2H4	< 3	mg/l
PO4	< 15	mg/l
CaCO3	Min. 50 ; Max.150	ppm
Trisodium phosphate	None	ppm
Chlorine	< 100	ppm
Electrical conductivity	<200	micro-siemens/cm
Pressure	Min. 0.6; Max. 6	bar
Glycol	Max. 40% (only propylene glycol)	%

⚠ All data in the table refer to water contained in the system after 8 weeks' operation.

⚠ Do not use excessively softened water. Excessive water softening (total hardness < 5° f) results in corrosion due to contact with metal elements (pipes or thermal module components)

⚠ Immediately repair any leaks or drips that could result in air entering the system

⚠ Excessive pressure fluctuations can cause stress and fatigue to the heat exchanger. Keep the operating pressure constant.

⚠ Water used to fill a system for the first time and water used to top it up must always be filtered (using synthetic or metal mesh filters with a filtration rating of no less than 50 microns) to prevent sludge from forming and triggering deposit corrosion.

⚠ If oxygen enters a circuit continuously or even intermittently (e.g. in under-floor heating systems whose pipes are not protected by impermeable synthetic sheaths, in circuits with open expansion vessels, or in circuits that require frequent top-ups) always separate the boiler's water circuit from the central heating circuit.

⛔ It is prohibited to top up the heating system constantly or frequently, since this can damage the thermal module's heat exchanger. The use of automatic topping up systems should be avoided for this reason.

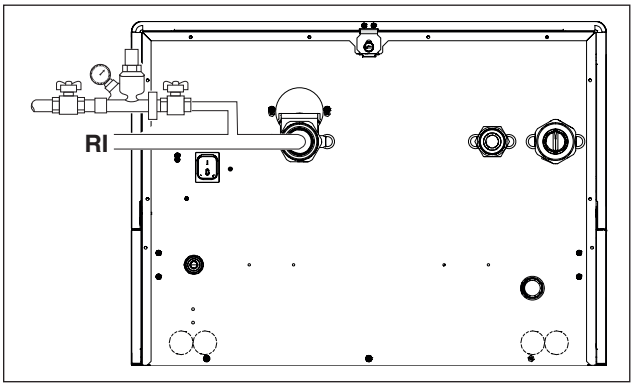
To sum up, in order to eliminate contact between air and water (and to prevent the latter from becoming oxidized), it is necessary:

- that the expansion system be a closed vessel, correctly sized and with the correct pre-loading pressure (to be regularly checked);
- that the system be always at a pressure higher than the atmospheric one at any point (including the pump suction side) and under any operating conditions (all seals and hydraulic couplings in a system are designed to withstand pressure towards the outside, but not underpressure);
- the installation be not made with gas-permeable materials (e.g. plastic pipes without oxygen barrier for underfloor heating systems)

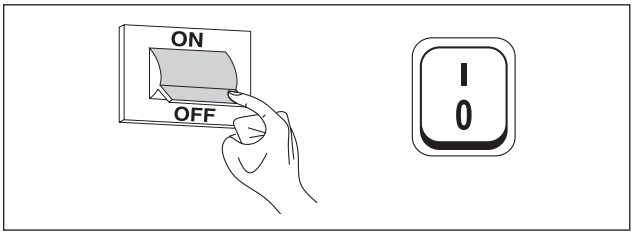
⚠ Damages suffered by the thermal module, caused by encrustations and corrosion, are not covered by warranty. In addition, the non compliance of the water requirements listed in this chapter will void the appliance warranty itself.

2.12 System filling and emptying

The thermal module **POWER MAX** must be provided with a charging system to be connected to the appliance's return line.



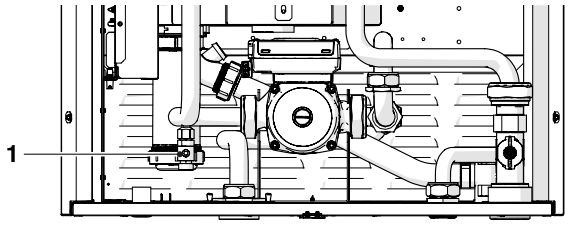
Before filling or emptying the system, switch the system's master switch to the OFF position and the thermal module's master switch to (**0**).



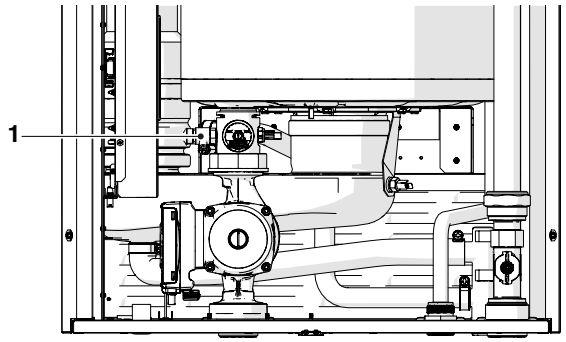
2.12.1 Filling

- Make sure that drain cocks (1) are closed before you start loading the system

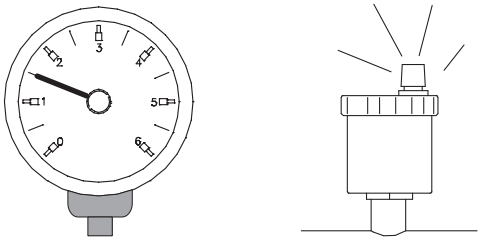
POWER MAX 50 P DEP - POWER MAX 50 P



POWER MAX 65 P ÷ POWER MAX 150



- Unscrew the vent valve's release cap
- Open the shut-off cocks in order to slowly fill the system
- Use the pressure gauge to check that the pressure is rising and the water is exiting through the vent valves
- Close the shut-off cocks after the pressure reaches 1.5 bar
- Start the system pumps and the thermal module's pump as shown in Paragraph "Commissioning and maintenance"
- During this stage, check that the air is correctly eliminated
- Restore the pressure if necessary
- Switch the pumps off and on again
- Repeat the last three steps until the pressure is stabilised



⚠ The system must be filled up slowly the first time; once it is filled and the air expelled it should never need to be topped up again.

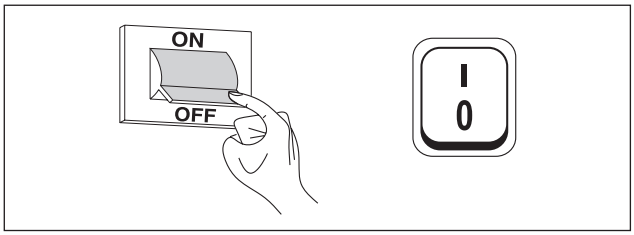
⚠ Systems should also be operated at maximum working temperature the first time they are started up, in order to facilitate de-aeration. (Gas is not released from the water at low temperatures).

⚠ An automatic spurge can be performed during the first ignition. The parameter that set the cycle is Par. 2139. See parameter table for more information.

2.12.2 Emptying

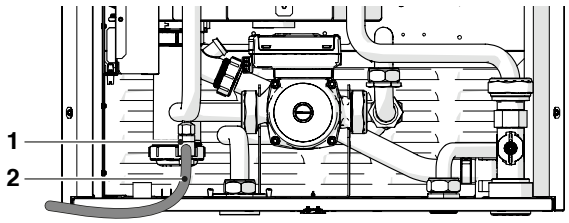
Before starting to empty the appliance and the storage cylinder:

- Switch the system's master switch to the OFF position and the thermal module's master switch to (**0**).

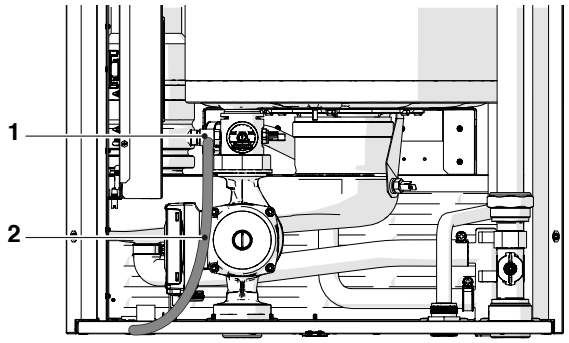


- Close the water supply shut-off cocks;
- In order to empty the appliance, fit a rubber hose (2) (inner diameter int. Ø = 12 mm) to the thermal module's discharge valve (1).

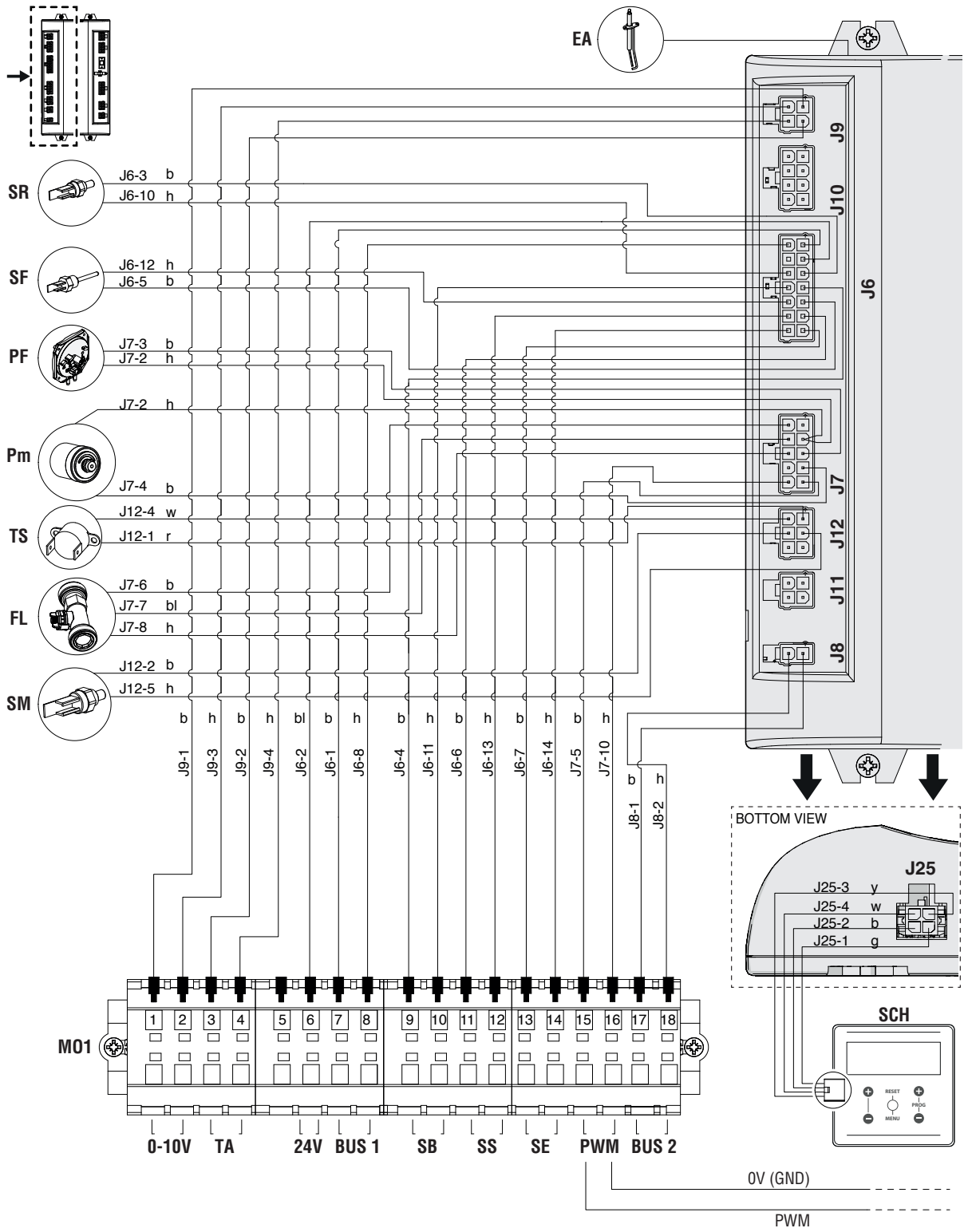
POWER MAX 50 P DEP - POWER MAX 50 P



POWER MAX 65 P ÷ POWER MAX 150

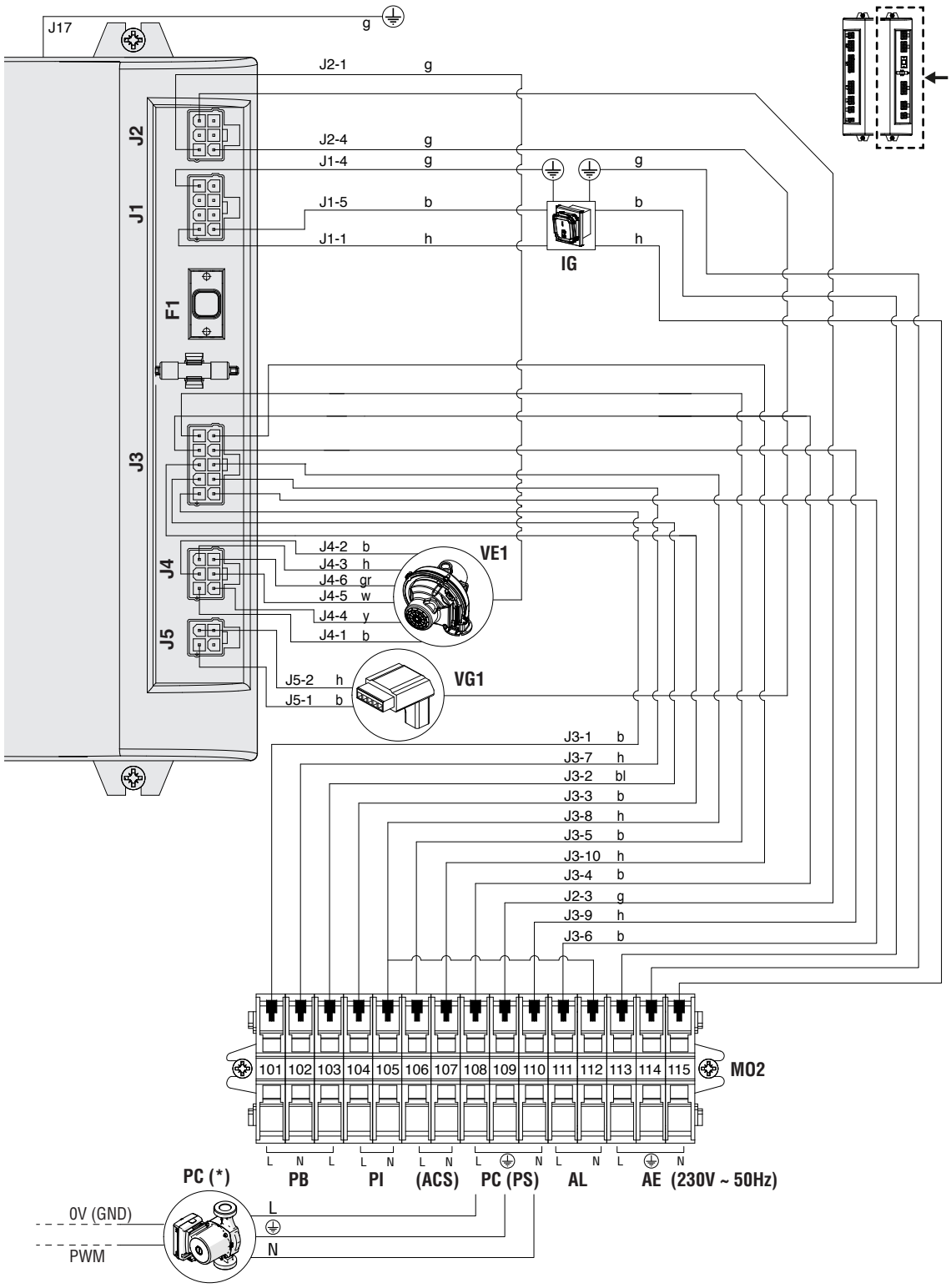


2.13 Wiring diagram



Key				Cable colour	
EA	Ignition/detection electrode	**SCH**	Display and control card	**b**	brown
SF	Exhaust flue probe	**MO1**	Low-voltage terminal board	**h**	blue
SM	Flow probe	**0-10V**	0-10V input	**r**	red
SR	Return probe	**TA**	Room/heat demand thermostat	**w**	white
TS	Safety thermostat	**24 V**	24V exit	**bl**	black
PF	Flue gases pressure switch (**)	**SB**	Boiler sensor (accessory)	**g**	yellow/green
Pm	Minimum pressure switch	**SS**	System probe (accessory)	**y**	yellow
FL	Flow-meter	**SE**	Outdoor sensor (accessory)	**gr**	green
		PWM	PWM connection (*)		

(*) Factory connections for models POWER MAX 50 P DEP ÷ POWER MAX 80 P
(**) Only for models POWER MAX 50 P DEP ÷ POWER MAX 50 P



Key		**PI**	Central heating system pump	**Cable colour**		**y**	yellow
IG	Main switch	**(ACS)**	DHW circulator (a**)	**b**	brown	**gr**	green
VG1	Gas valve	**PC**	Thermal module circulator (*)	**h**	blue		
VE1	Variable speed fan	**PS**	System circulator (**)	**r**	red		
MO2	High-voltage terminal board	**AL**	Alarm output (***)	**w**	white		
PB	Storage cylinder circulator/ 3-way valve/2-way valve (**)	**AE**	Power supply	**bl**	black		
				g	y e l l o w / green		

(*) For models POWER MAX 50 P DEP ÷ POWER MAX 80 P circulator fitted as standard; for other models, the circulator is provided as an accessory with connections to be executed by the installer.

(**) Valid configuration for thermal modules without heat pump c having their own two-way valve, connected in cascade and equipped with primary system circulator. For more information, see cascade installation manual.

(***) Connect a resistive load between 10VA and 50VA.

2.14 Electrical connections

The thermal module **POWER MAX** is manufactured fully wired and only needs to be connected to the mains, the room/heat demand thermostat and any other system components.

⚠ The following is mandatory:
- The use of an omnipolar magnetothermic switch, line disconnecting switch in compliance with CEI-EN standards (contact opening of at least 3 mm)
- Respect the connection L (line) - N (neutral). Keep the earth conductor 2 cm longer than the power supply conductors
- Use cables with a section greater than or equal to 1.5 mm^2, complete with cable terminal caps
- Refer to the wiring diagrams in this manual for all electric operations.

⚠ The use of adaptors, multiple sockets and extensions to power the appliance is not allowed

⚠ to connect external electric components, it is necessary to use auxiliary relays and/or contactors to be fitted in a dedicated external electrical panel

⚠ Any work on the electrical system must be carried out only by qualified personnel in compliance with all legal provision and safety regulations in particular

⚠ Secure the cables into the dedicated cable ties in order to always guarantee their correct positioning within the appliance.

⚠ Electrical supply cables and control cables (room/heat demand thermostat, external temperature probes, etc.) must be strictly separate the one from the other and fitting inside independent ribbed PVC sheaths up to the electrical panel.

⚠ The connection to the electrical power supply must be performed using type 1 sheathed cables (3 x 1,5) N1VVK or equivalent, while simple N07VK type or equivalent conductors can be used for the thermoregulation and low voltage circuits.

⚠ If the electrical power provided by the electrical company is of "**PHASE-PHASE**" connection type, preventively contact the nearest Technical Assistance Centre.

⚠ Never shut the appliance off during normal operation (with the burner on) by shutting off the electrical power supply using the On-Off key or an external switch. This could cause the primary heat exchanger to overheat.

⚠ To switch it off (during the heating stage) use a room/heat demand thermostat. The On-Off key can only be actioned whist the appliance is in stand-by or emergency mode.

⚠ Before connecting any external electrical components to the appliance (regulators, electric valves, climate control probes, etc.), check to make sure that their electrical characteristics are compatible with the available inputs and outputs (voltage, absorption, acceleration current).

⚠ Temperature probes must be NTC like. For resistance value, refer to table pag 13

⚠ Always check the proper operation of the "grounding conductor" for the electrical system to which the appliance will be connected.

⚠ **Beretta** shall bear no responsibility for any personal injuries or property damage caused by non-compliance with wiring diagrams or the electrical system's incorrect/lacking connection to the grounding system, or by non-compliance with applicable CEI Standards.

⛔ It is strictly forbidden to use pipes of any kind to ground the appliance.

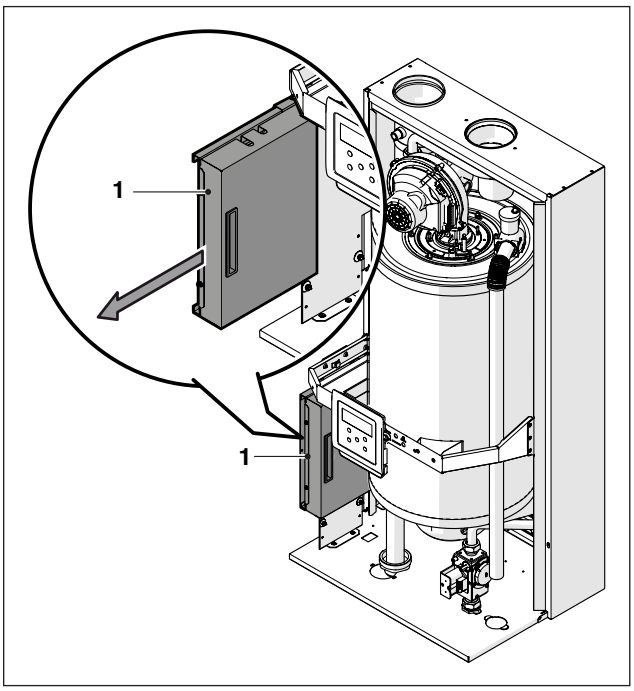
⛔ It is prohibited to lay power supply and room/heat demand thermostat cables near hot surfaces (delivery pipes). If they may come into contact with parts that have a temperature of over 50°C, use a suitable type of cable.

⛔ It is prohibited to touch electric appliances with damp/wet body parts or when your feet are wet.

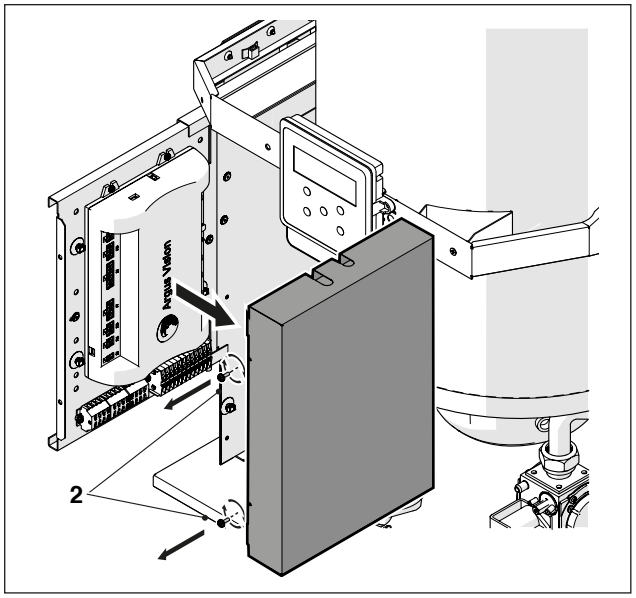
⛔ It is prohibited to leave the appliance exposed to weather elements (rain, sun, wind, etc.).

⛔ It is prohibited to pull, detach, or twist any electric cables coming from the thermal module even when the latter is disconnected from the mains power supply.

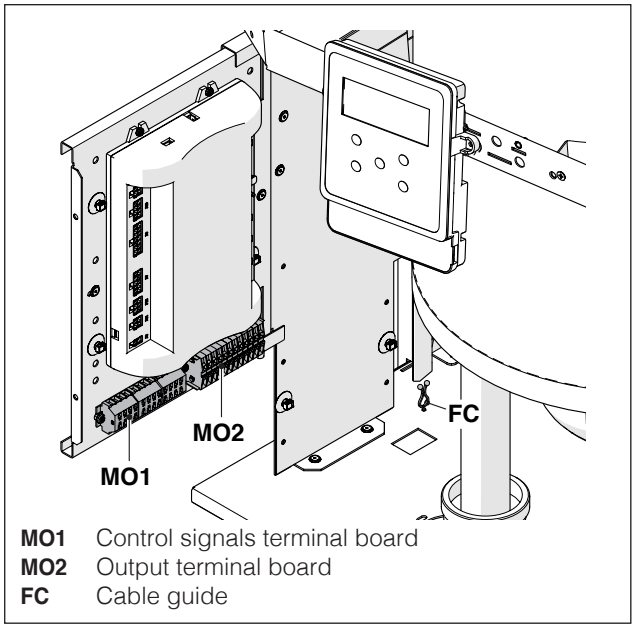
Proceed as follows to access the control panel terminals:
- Remove the locking screws and the panel's front side
- Pull and slide the electrical panel's box towards the outside (1)



Loosen the fixing screws (2) and remove the protection (3)



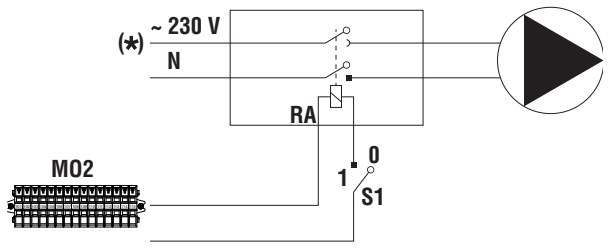
- Identify the low-tension terminal board (MO1) and the high-tension terminal board (MO2)



MO1 Control signals terminal board
MO2 Output terminal board
FC Cable guide

⚠ For the connection of the devices connected to the jig (pumps, circulators and diverting / mixing valves) use interposed relays unless the maximum absorption of all components connected to the board (including the module circulator) is less than or equal to 1.5 A. Relays sizing lays on the installer depending on the type of connected device.

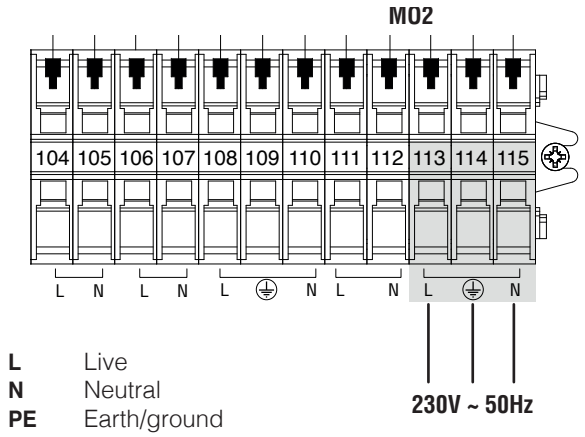
For connection, see the following figure:



S1 Circuit breaker
RA Relay / Switch (230V AC)
(*) Refer to the device type for the supply tension.

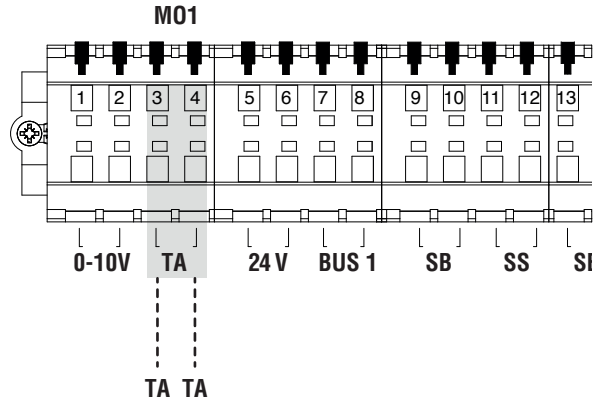
- Execute electrical wiring in compliance with the diagrams shown below

Power supply



L Live
N Neutral
PE Earth/ground

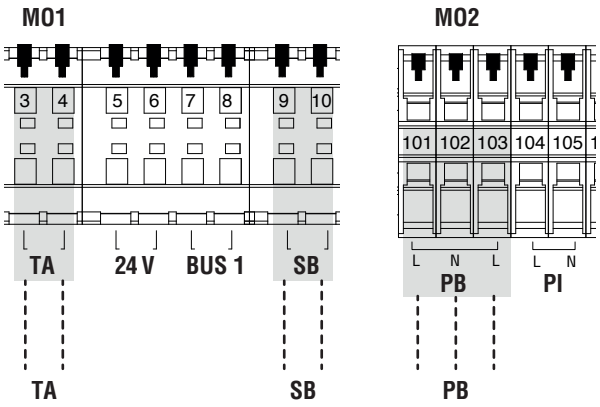
Electrical wiring referred to layout 1 at page "20".



TA Room/heat demand thermostat

NOTE The room thermostat connection must be dry (no voltage).

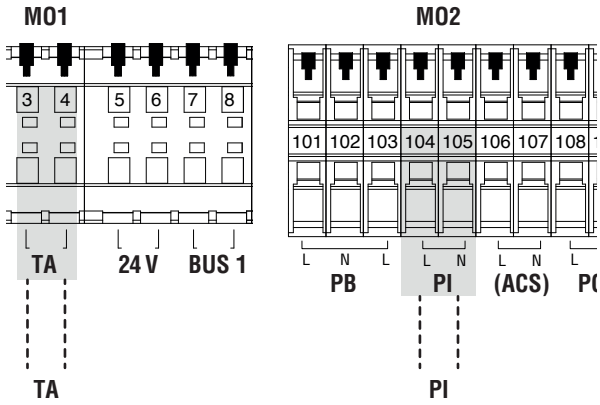
Electrical wiring referred to layout 2 at page "20".



TA Room/heat demand thermostat
SB Connect to the storage cylinder probe (Mod. San. 1) or to the storage cylinder thermostat (Mod. San. 2)
PB Connect to the deviating valve (13). Contacts 101-102 control the deviation on heating, contacts 102-103 control the deviation on domestic hot water

NOTE The room thermostat connection must be dry (no voltage).

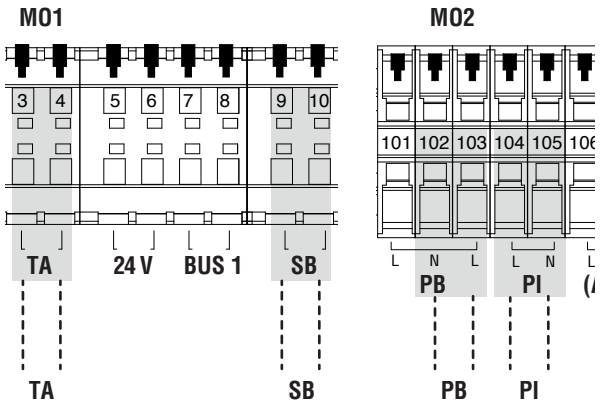
Electrical wiring referred to layout 3 at page "21".



TA Room/heat demand thermostat
PI Connect to the high temperature system pump

NOTE The room thermostat connection must be dry (no voltage).

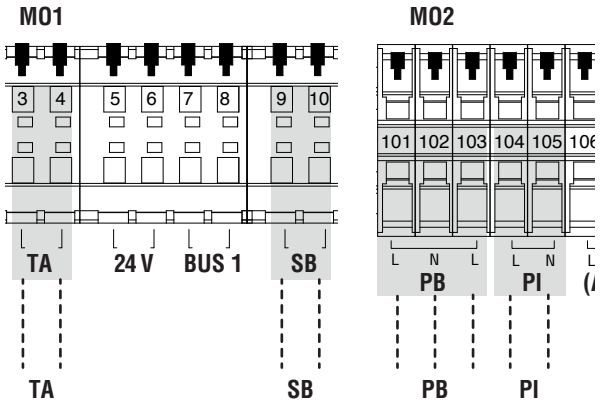
Electrical wiring referred to layout 4 at page "21".



TA Room/heat demand thermostat
SB Connect to the storage cylinder probe (Mod. San. 1) or to the storage cylinder thermostat (Mod. San. 2)
PB Connect to the water pump
PI Connect to the high temperature system pump

NOTE The room thermostat connection must be dry (no voltage).

Electrical wiring referred to layout 5 at page "22".



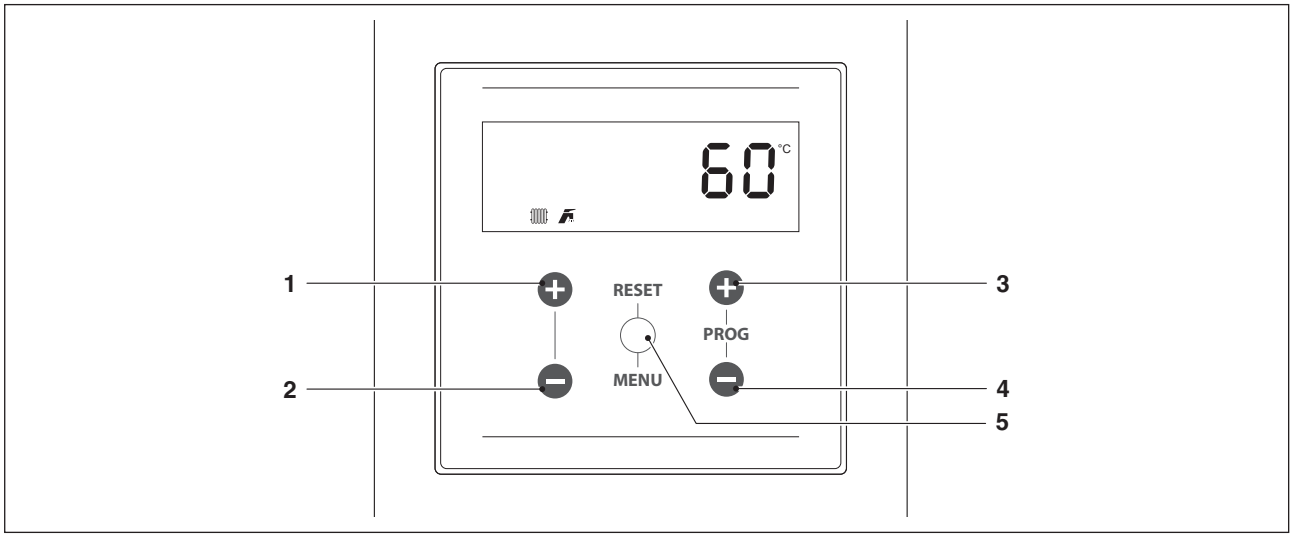
TA Room/heat demand thermostat
SB Connect to the storage cylinder probe (Mod. San. 1) or to the storage cylinder thermostat (Mod. San. 2)
PB Connect to the deviating valve (13). Contacts 101-102 control the deviation on heating, contacts 102-103 control the deviation on domestic hot water
PI Connect to the high temperature system pump

NOTE The room thermostat connection must be dry (no voltage).

⚠ Some electric connections of the power jig have a double function. With special reference to the principle schemes 2 and 5 where no tank pump is foreseen, the two-way valve of each module must be connected to the abovementioned connections 101-102-103.

2.14.1 USER navigation MENU

Whilst turning on or when any key is pushed for more than 4 minutes, the display is placed on the "basic display" and it provides some general information on the thermal module.

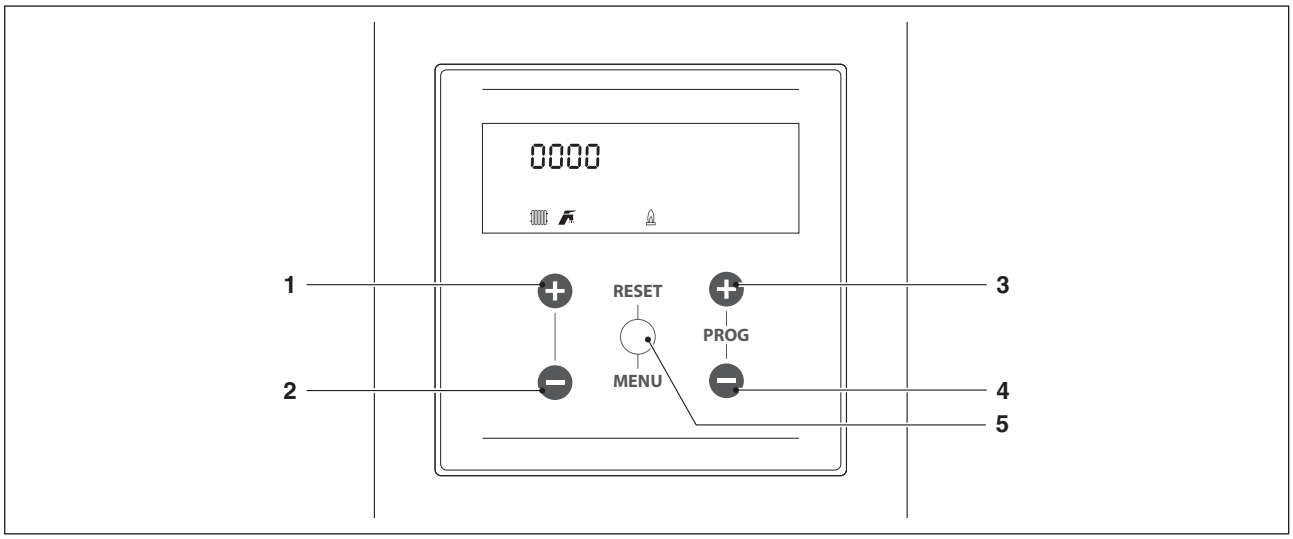


In this mode, keys have the following functions:

Nr.	Button	Function
1	"+"	Raise the heat set point (when available)
2	"-"	Decrease the heat set point (when available)
3	"PROG +"	Raise the DHW set point (when available)
4	"PROG -"	Decrease the DHW set point (when available)
5	"MENU/RESET"	Enters into "MENU" mode If pressed for more than 2 seconds, it resets a non volatile failure

MENU selection

Enters into "MENU" mode when "MENU/RESET" key is pushed. The figures of the small display indicate "0000" which is the first accessible menu.



In this mode, keys have the following functions:

Nr.	Button	Function
1	"+"	Exits from the menu and cancels a parameter change
2	"-"	Exits from the menu and cancels a parameter change
3	"PROG +"	Selects the following menu or increases a certain parameter value
4	"PROG -"	Selects the previous menu or decreases a certain parameter value
5	"MENU/RESET"	Enters into the selected menu/parameter or confirms the parameter change

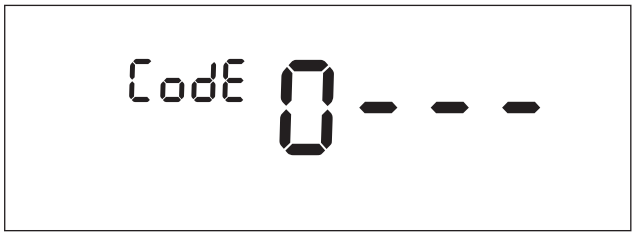
USER menu	Par. No.	Description	Range	Factory setting	UM
0000	0003	Sets the desired flow temperature with heating mode. Active for the heating mode Par. 2001 = 0 o 3	Par. 2023…Par. 2024	70	°C
	0048	Establishes the DHW storage tank set-point.	40…71	50	°C
	0200	Activates the test mode: off = test mode off fan = the fan is running at the max speed with the burner off lo = module is brought to min (when on) ign = module is brought to the ignition speed (when on) Hi = the module is brought to the max (when on) reg = the module is brought to the max power but it is set according to the temperature (when on)	off/fan/lo/ign/hi/reg	Off	
	0901	It defines the temperature units	C/F	C	
	0902	It defines the pressure units	bar/psi	bar	
1000	1001	CH flow temperature	Only display		°C
	1002	Domestic hot water temperature	Only display		°C
	1004	Outdoor temperature	Only display		°C
	1006	Flue gas temperature	Only display		°C
	1007	Flue gas temperature	Only display		°C
	1008	Ionisation current	Only display		µA
	1009	Status of the primary pump (on/off)	Only display		
	1010	Status of the heating system pump (on/off)	Only display		
	1011	Status of the DHW pump (on/off)	Only display		
	1012	Calculated heating set point (on climatic mode)	Only display		°C
	1013	Status of the room thermostat/heat demand (opened/closed)	Only display		
	1015	Secondary probe temperature (if on)	Only display		°C
	1031	Error code	Only display		
	1040	Actual fan speed	Only display		RPM
	1041	Ignition fan speed	Only display		RPM
	1042	Fan speed at the minimum	Only display		RPM
	1043	Fan speed at the maximum	Only display		RPM
	1051	Code of the last permanent error	Only display		
	1052	Code of the last temporary error	Only display		
	1054	Number of successful ignitions	Only display		
	1055	Number of failed ignitions	Only display		
	1056	Total heating hours	Only display		Hr x 10
	1057	Total Sanitary hours	Only display		Hr x 10
	1058	Total working days	Only display		Days
	1059	Time delay from the last Permanent error The measuring unit is defined by the number preceding the value. 1: = minutes 2: = hours 3: = days 4: = weeks	Only display		
	1060	Time delay from the last Temporary error The measuring unit is defined by the number preceding the value. 1: = minutes 2: = hours 3: = days 4: = weeks	Only display		
	1062	Water flow of the present module	Only display		from/min
	1063	Signal voltage 0-10 on inlet	Only display		Volt
	1098	Scheme type	Only display		
	1099	Software version identification code	Only display		
Code	--->	Enter menu password INSTALLER / MANUFACTURER			

2.15 Navigation Menu INSTALLER / MANUFACTURER

It is necessary to enter the password to access the INSTALLER / MANUFACTURER parameters

- Press "MENU/RESET" and select "Code" by using the "PROG +" and "PROG -".

- Press "MENU/RESET" to confirm
- "0---" is displayed on the big numeric display and the first digit is blinking

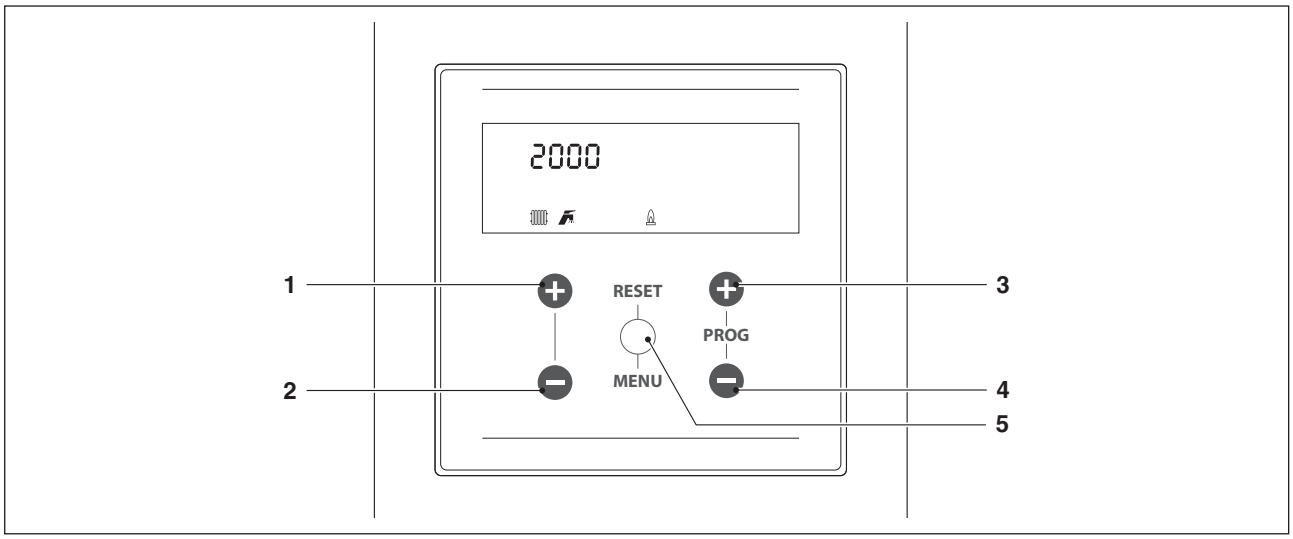


- Press "PROG +" and "PROG -" to increase or decrease the value of the first blinking digit
- When the desired value is reached on the single figure, press "MENU/RESET" to confirm the inserted value thus the second digit starts blinking
- Repeat the same procedure for all four figures and enter the password

After entering the INSTALLER or MANUFACTURER password, the related menu and parameters will be displayed.

The system provides for three types of access:
USER: password 0000
INSTALLER: password 0300
MANUFACTURER

⚠ After it is entered, the password is active during display and/or parametrisation. If the display is inactive for a few minutes, it needs to be re-entered.



In this mode, keys have the following functions:

Nr.	Button	Function
1	"+"	Exits from the menu and cancels a parameter change
2	"-"	Exits from the menu and cancels a parameter change
3	"PROG +"	Selects the following menu or increases a certain parameter value
4	"PROG -"	Selects the previous menu or decreases a certain parameter value
5	"MENU/RESET"	Enters into the selected menu/parameter or confirms the parameter change

MENU INSTALLER / MANUFACTURER	Par. No.	Description	Range	Default setting	UM
2000	2001	It defines the several functioning modes of the heat thermal module.	0…5	0	
	2005	Defines the time in seconds of post-circulation of the thermal module when working in stand-alone mode; when working in cascade mode, it defines the post-circulation of the module after switching off for thermoregulation.	0…900	60	Sec.
	2007	Sets the value in degrees beyond the set-point at which the burner switches off for thermoregulation.	0…20	5	°C
	2009	Sets the stand-by time before the appliance is switched on again after it switches off due to thermoregulation, independently from the delivery temperature dropping below the value indicated in Par. 2010. Parameter valid only in stand-alone mode.	10…900	120	Sec.
	2010	Sets the value in degrees below which the burner switches on again notwithstanding from the time spent at Par. 2009.	0…20	16	°C
	2014	Sets the heating's % max. power.	50…100	100	%
	2015	Sets the heating's % min. power.	1…30	1	%
	2019	Defines the max. set-point at the minimum outdoor temperature for climatic regulation.	30…90	80	°C
	2020	Defines the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation.	-25…25	0	°C
	2021	Defines the minimum set-point at the maximum outdoor temperature for climatic regulation.	30…90	40	°C
	2022	Defines the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation.	0…30	20	°C
	2023	Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).	4…82	30	°C
	2024	Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).	27…90	80	°C
	2025	Defines the temperature of exclusion of climatic regulation. Active for heating mode Par. 2001 = 1 or 2	0…35	22	°C
	2026	Establishes the set-point temperature increase delta T, if the heat demand in heating mode is not satisfied after the time interval specified in Par. 2027 (applies only to stand-alone mode).	0…30	0	°C
	2027	Defines the time interval after which the set-point is increased as defined in Par. 2026 (applies only to stand-alone mode).	1…120	20	Min.
	2028	Use the heating mode Par. 2001= 2 or 3. Defines how many degrees the flow set point is lowered.	0…30	10	°C
	2035	Establishes the domestic hot water circuit's operation mode. 0 = Disabled 1 = Tank + sensor 2 = Tank + thermostat	0,1,2	0	
	2036	Defines the hysteresis to initiate the domestic hot water demand.	0…20	5	°C
	2037	Defines the hysteresis to stop the domestic hot water demand.	0…20	5	°C
	2038	Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank.	0…30	15	°C
	2042	Defines the priority type: 0 = Time: time priority between the two circuits defined by Par. 2043; 1 = Off: priority for CH; 2 = On: priority for DHW; 3 = Parallel: parallel priority managed on the basis of the primary circuit's temperature compared to the heating circuit's set-point.	0…3	2 = On	
	2043	Establishes the time in minutes during which priority is alternatively allocated to the DHW and CH circuits when Par. 2043 is set to "time" mode.	1…255	30	Min.
	2044	Defines the time in seconds of post-circulation of the thermal module when working in stand-alone mode; when working in cascade mode, it defines the post-circulation of the module after switching off for thermoregulation.	0…900	60	Sec.
	2092	Defines the number of fan rpm at max. power (it depends on the model and is defined at Par. 9098).	0…12750	Defined by Par. 9098	RPM

MENU INSTALLER / MANUFACTURER	Par. No.	Description	Range	Default setting	UM
2000	2093	Defines the number of fan rpm at minimum power (it depends on the model and is defined at Par. 9098).	0…12750	Defined by Par. 9098	RPM
	2094	Defines the fan speeds on the module start up (depending on the model defined on Par. 9098).	0…12750	Defined by Par. 9098	RPM
	2109	Defines the offset of the calculated set point on climatic mode (Par. 2001= 1). Makes a climatic curve compensation.	Off, -10…10	0	
	2110	Sets the minimum delivery temperature value in heating mode (Par. 2001) = 4.	20…50	30	°C
	2111	Sets the maximum delivery temperature value in heating mode (Par. 2001) = 4.	50…90	80	°C
	2112	Sets the value in degrees below the set-point at which the burner switches on again for thermoregulation.	0…20	5	°C
	2113	Defines the domestic hot water circuit's % max. power.	50…100	100	%
	2114	Defines the domestic hot water circuit's % minimum power.	1…30	1	%
	2115	Defines the Accumulation sanitary Setpoint in mode 1	40…71	50	°C
	2116	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = Water pressure sensor 2 = CH flow switch 3 = Flue pressure switch	0,1,2,3	Defined by Par. 9097	
	2117	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = DHW flow sensor 2 = DHW flow switch 3 = CH flow sensor	0,1,2,3	Defined by Par. 9097	
	2118	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = Drain switch 2 = Gas pressure switch	0,1,3	Defined by Par. 9097	
	2120	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = T_Return sensor 2 = Extern switch	0,1,2	Defined by Par. 9097	
	2121	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = T_Flue sensor 2 = Flue switch 3 = APS switch	0,1,2,3	Defined by Par. 9097	
	2122	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = T_Flue_2 sensor 2 = T_Flue_2 + Bl. Flue 3 T_System sensor 4 = Blocked Flue switch 5 Cascade Sensor	0,1,2,3,4,5	Defined by Par. 9097	
	2123	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = T_DCW sensor 2 = Water pressure switch	0,1,2	Defined by Par. 9097	
	2124	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = Enabled	0,1	Defined by Par. 9097	
	2125	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 17 = Antilegionella pump	0,1,2,3,4,5,6,7, 8,9,10,14,15,17	Defined by Par. 9097	

MENU INSTALLER / MANUFACTURER	Par. No.	Description	Range	Default setting	UM
2000	2126	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = General Pump 2 = CH Pump 3 = DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank 9 = External Igniter 10 = Air Damper 14 = Alarm Burner CC 15 = Status Burner CC 17 = Antilegionella pump	0,1,2,3,4,5,6,7, 8,9,10,14,15,17	Defined by Par. 9097	
	2127	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = General Pump 10 = Air Damper 11 = External Igniter 12 = Modulating Pump	0,1,10,11,12	Defined by Par. 9097	
	2128	The value of this parameter is defined by Par. 9097. 0 = Disabled 1 = General Pump 2 = CH Pump 3 =DHW Pump 4 = System Pump 5 = Cascade Pump 6 = Alarm Relay 7 = Filling Valve 8 = LPG Tank	0,1,2,3,4,5,6,7,8	Defined by Par. 9097	
	2129	Defines the type of flow sensor used.	Bitron, Huba: DN8, DN10, DN15, DN15, DN20, DN25	Huba DN25	
	2133	Defines the delta T set for the operation of the modulating circulator.	5…40	15	°C
	2134	Defines the time in seconds from the moment the burner is switched on to start the modulation of the circulator and obtain the delta T specified in Par. 2133.	0…255	120	Sec.
	2135	Defines the PWM circulator model installed. 0 = Wilo 1 = Salmson 2 = Grundfos	0,1,2	2 = Grund-fos	
	2136	Defines if the module pump is on modulating mode or if it is made run at a fixed speed (on a percentage at the max speed).	On/Off Modulating Fixed 20… 100%	Modu-lating	
	2137	Defines the percentage of speed that sets the minimum speed that the circulator can reach during modulation.	0…100	30	%
	2138	Value can vary depending on appliance configuration based on Par. 9097 and 9098. This value is calculated by the board, which, based on an internal logic, defines as a single number the settings of Par. 9097 and 9098.	0…255	De-pends on boiler model	
	2139	Activates air purge in the system. To activate the air purge, switch on the thermal module and change the parameter from "No" to "Yes". Wait a minute. Turn off and on again. At this point at start-up, the thermal module will perform the automatic purge procedure (duration about 20 minutes). With the parameter set to "Yes", the procedure is performed each time the thermal module is switched off and back on via its own main switch. The value must be "No" if no purge procedure is required when the thermal module is started.	Yes, No	No	
	2140	Defines the flow level under which value the thermal module is turned off. The value may vary according to the model.	0.0…100	De-pends on boiler model	l/min
	2201	Enable Heating	Enable/Disable	Enable	-
	2202	Enable Heating	Enable/Disable	Enable	-
	2203	Sets the Service reminders	Off/On/Reset	Off	-
	2204	Days for Service	30/35/40…./1275	1000	days

MENU INSTALLER / MANUFACTURER	Par. No.	Description	Range	Default setting	UM
2000	2006	Sets the activation temperature when the maximum flue gas temperature is exceeded. When the flue gas temperature is higher than a set value, the module switches off and an error message is generated. When the flue gas temperature is in the interval between (Par. 2006) -5°C and Par. 2006, the module reduces its power in a linear way until it reaches minimum power when the temperature measured is equal to Par. 2006.	10…120	100	°C
	2012	Sets the value of the temperature difference (Delta T) between the module's delivery and return temperature. For a Delta T value ranging between Par. 2012 and (Par. 2012) +8°C, the module reduces its power in a linear fashion until it reaches the minimum power. The minimum power is maintained until reaching (Par. 2012) +8°C+5°C, after which the module switches off for a period of time equal to the value attributed to Par. 2013; at the end of this time interval, the module switches on again.	10…60	40	°C
	2013	Defines the restart time after reaching the Delta T limit between delivery and return.	10…250	30	Sec.
	2016	Defines the proportional parameter for modulation during heating operation.	0…1275	100	
	2017	Defines the modulation integral term during heating operation.	0…1275	250	
	2018	Defines the modulation derivative term during heating operation.	0…1275	0	
	2039	Defines the primary circuit's restart hysteresis in modes 1 and 2 of domestic hot water (valid both for cascade and stand-alone applications).	0…20	5	°C
	2040	Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of domestic hot water (valid both for cascade and stand-alone applications).	0…20	5	°C
	2041	Defines the value referred to the Delta T of the tank for maintenance purposes. E.g.: if it is set on 3, when the tank has a set point lowered of 3 degrees, the module turns on at the minimum to allow maintenance till the set point plus hysteresis. If this parameter is equal to 2036, this function is inactivated and the thermal module starts at the maximum sanitary power.	0…10	5	°C
	2045	Defines the proportional term for modulation during operation of the DHW storage tank.	0…1255	100	
	2046	Defines the integral term for modulation during operation of the DHW storage tank.	0…1255	500	
	2047	Defines the derivative term for modulation during operation of the DHW storage tank.	0…1255	0	
9000	9098	Allows to set the values of Par. 2092, 2093 and 2094 through some pre-set values of speeds which identify the module model.	1...12 19...22		
	9097	Allow to set the values of Par. from 2116 to 2128 through some pre-set values which define the configuration of the inlets and outlets of the module.	1...37		
Code	--->	Enter Password			

NOTE:
Please see sections "Display board replacement" and "Control board replacement" for detailed information on how to use and configure parameters 9097 and 9098.

3 COMMISSIONING AND MAINTENANCE

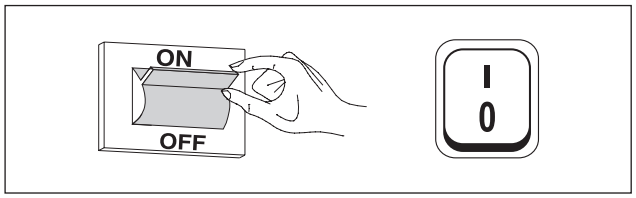
3.1 Preparing for initial startup

The thermal module **POWER MAX Beretta** must be commissioned by Technical Assistance Centre **Beretta**, after which step the appliance may operate automatically.

Perform the following checks before starting up the boiler:
- Check that the fuel shut-off cock and heating system shut-off cock are open
- Check that the central heating circuit pressure gauge shows a pressure over **1 bar** with the system cold. Check also that the circuit is properly de-aerated
- Check that the expansion vessel is correctly pre-charged
- the electric connections have been made correctly
- Check that the flue and air vents are made to applicable laws and standards

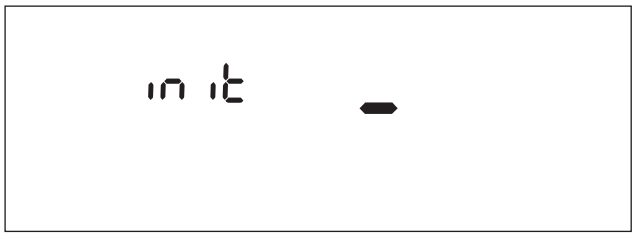
3.2 Initial startup

- Switch the system's master switch to the ON position and the thermal module's master switch to (**I**).



3.2.1 Switching the appliance on and off

Once the device is on, the initialization process starts for about one minute during which no operations are allowed.



Once the process is completed, parameters can be set for heating and DHW production.

To switch off the appliance, use the "ON/OFF" switch.

⚠ Never power off the appliance before switching the master switch to the "0" position.

⚠ Never switch off the appliance with the master switch if a request is active. Always make sure that the appliance is in stand-by before switching the main switch.

Example of display on stand-by (outdoor probe is not connected)

Example of display on stand-by (outdoor probe is connected).
Probe available as a accessory.

3.2.2 Password access

It is necessary to enter the password to access the INSTALLER / MANUFACTURER parameters
- For right procedure, refer to Par. "Navigation Menu INSTALLER / MANUFACTURER".

3.2.3 Setting the heating parameters

The parameter 2001establishes the thermal module's various heating operation modes.

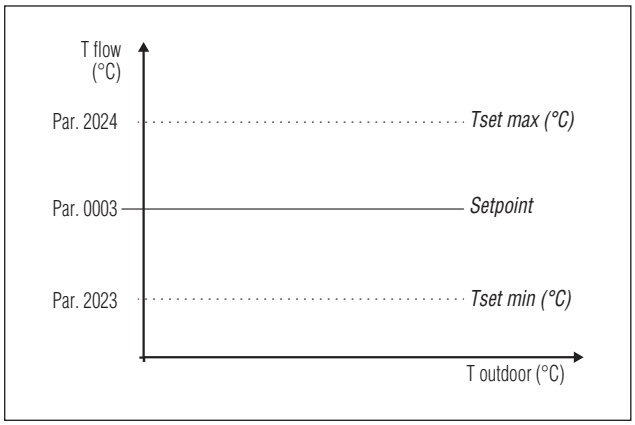
Mode 0
(Operation with room thermostat/heat demand and fixed heating setpoint)

In this mode, the thermal module operates with a fixed set-point (controlled by the parameter0003) based on whether the room/heat demand thermostat's contact is closed or not.
The set point value can be set directly without entering the parameter list as indicated on Par. "USER navigation MENU".

the set point can be set within a minimum and maximum value as indicated respectively on Par. 2023 and 2024 as shown in the figure.
The outdoor temperature sensor (accessory) is not required and if connected the outdoor temperature that is measured does not influence the setpoint that has been set.

The parameters regulating such temperature are:

Par. No.	Description
0003	Sets the desired flow temperature with heating mode. Active for the heating mode Par. 2001 = 0 o 3
2023	Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2024	Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).

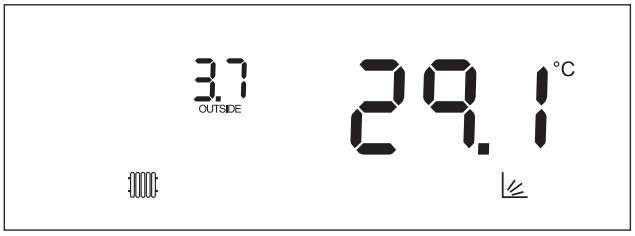


Mode 1
(Climatic functioning with room/heat demand thermostat, variable set point according to the outdoor temperature)

In this case the thermal module operates with a variable set-point depending on outdoor temperature based on a climatic curve defined by the following parameters:

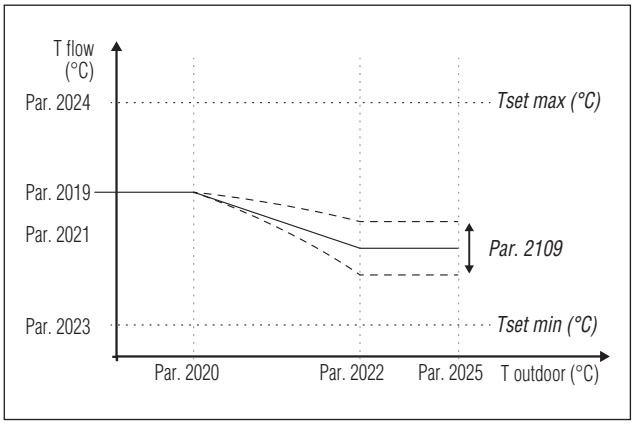
Par. No.	Description
2109	Defines the value of the set point calculated on climatic mode (Par. 2001 = 1).
2019	Establishes the max. set-point at the minimum outdoor temperature for climatic regulation
2020	Establishes the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation
2021	Establishes the minimum set-point at the maximum outdoor temperature for climatic regulation
2022	Establishes the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation
2023	Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2024	Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2025	Defines the temperature at which climatic regulation is switched off

Display on climatic mode



The demand is activated when the room/heat demand thermostat's contact is closed provided that outdoor temperature does not exceed the value set by the parameter 2025. if the outdoor temperature is higher than the one set on parameter 2025 , the burner is stopped even if there is a heat demand.

⚠ If the outdoor temperature sensor (accessory) is not detected (not installed or damaged) the system provides a warning: no. 202
The presence of the warning does not stop the thermal module allowing a heat request to be carried out at the maximum setpoint set on the climatic regulation.

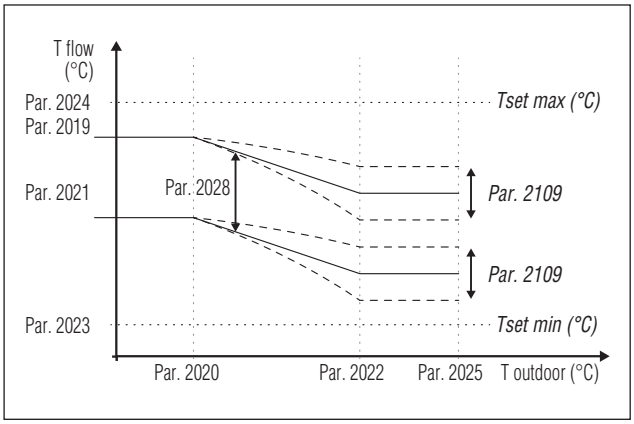


Mode 2
(Working on climatic mode with attenuation controlled by a room/heat demand thermostat, variable set point according to the outdoor temperature)

In this case the thermal module operates with a set-point defined by the climatic curve (which can be set in the same way as described in Mode 1) depending on outdoor temperature. Heat demand is actioned independently from whether the room/heat demand thermostat's contact is closed and stops only when the outdoor temperature is greater than the one defined by the parameter 2025.

In this mode the parameter 2028 defines by how many degrees the set-point is decreased (attenuation) when the room/ heat demand thermostat's contact is opened.

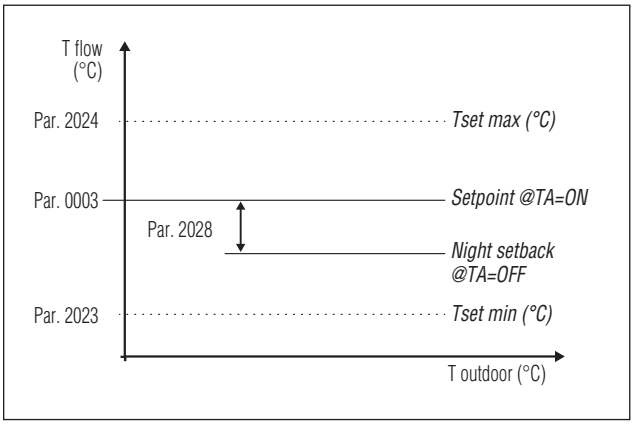
Par. No.	Description
2109	Defines the value of the set point calculated on climatic mode (Par. 2001 = 1).
2019	Establishes the max. set-point at the minimum outdoor temperature for climatic regulation
2020	Establishes the minimum outdoor temperature to which the maximum set-point can be associated for climatic regulation
2021	Establishes the minimum set-point at the maximum outdoor temperature for climatic regulation
2022	Establishes the maximum minimum outdoor temperature to which the minimum set-point can be associated for climatic regulation
2023	Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2024	Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2025	Defines the temperature at which climatic regulation is switched off
2028	Use the heating mode Par. 2001= 2 or 3. Defines how many degrees the flow set point is lowered.



Mode 3
(Continuous fixed set-point operation with attenuation controlled by room/heat demand thermostat)

In this mode the fixed set-point is adjusted in the same way as described for Mode 0. The difference consists in the fact that the demand is always active and the set-point is decreased (attenuation) by the value defined by the parameter 2028 when the room/heat demand thermostat's contact is opened.

Par. No.	Description
0003	Sets the desired flow temperature with heating mode. Active for the heating mode Par. 2001 = 0 o 3
2023	Limits the minimum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2024	Limits the maximum value that can be assigned to the set-point in heating mode (does not apply to heating mode 4).
2028	Use the heating mode Par. 2001= 2 or 3. Defines how many degrees the flow set point is lowered.

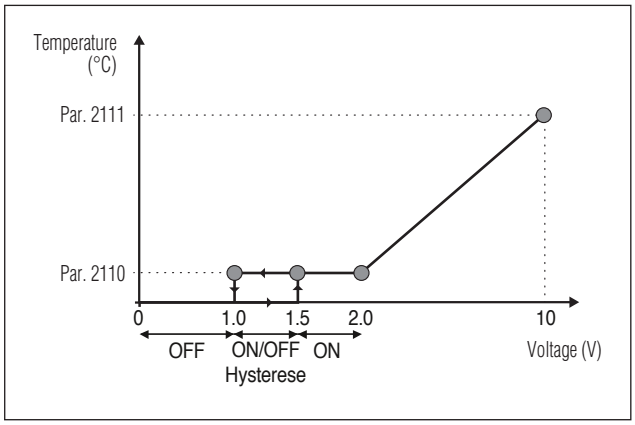


⚠ The outdoor temperature sensor (accessory) is not required and if connected the outdoor temperature that is measured does not influence the setpoint that has been set.

Mode 4
(Set-point adjustment based on a 0-10V analogical input)
The maximum and minimum set-point values are defined respectively by Par. 2111 and 2110.

Par. No.	Description
2110	Sets the minimum delivery temperature value in heating mode (Par. 2001) = 4.
2111	Sets the maximum delivery temperature value in heating mode (Par. 2001) = 4.

The operation set-point is adjusted on the basis of the following curve:



The maximum and minimum set-point values are defined respectively by Par. 2111 and 2110.
When the input voltage value exceeds 1.5V, the demand is triggered (at the minimum set-point).
For voltage values ranging from 2 to 10, the set-point varies in a linear fashion from the minimum through to the maximum value. If the voltage is decreased from 10 to 2, the set-point decreases in a linear fashion and maintains thee minimum value between 2 and 1V. For values lower than 1 V the demand stops.

3.2.4 Setting the domestic hot water parameters

The parameter 2035 defines the various operation modes of the thermal module for DHW production

Mode 0
(No production of domestic hot water)
In this mode the thermal module will work only for the heating circuit (see paragraph "Setting the heating parameters")

Mode 1
(DHW production with storage tank and storage cylinder probe)
In this mode, the thermal module is activated when the temperature recorded by the storage cylinder probe falls below the DHW setpoint by an amount equal to the hysteresis value and is deactivated when the temperature rises above the DHW setpoint by the value of the hysteresis.

The parameters that control DHW production are the following:

Par. No.	Description
2036	Defines the hysteresis to initiate the domestic hot water demand.
2037	Defines the hysteresis to stop the domestic hot water demand.
2038	Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank.
2039	Defines the primary circuit's restart hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications).
2040	Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications).
2041	Defines the value referred to the Delta T of the tank for maintenance purposes. E.g.: if it is set on 3, when the tank has a set point lowered of 3 degrees, the module turns on at the minimum to allow maintenance till the set point plus hysteresis. If this parameter is equal to 2036, this function is inactivated and the thermal module starts at the maximum sanitary power.
0048	Establishes the DHW storage tank set-point.

The set point value can be set directly without entering the parameter list as indicated on Par. "USER navigation MENU".

Mode 2
(DHW production with storage tank controlled by a thermostat)
In this case the thermal module is activated when the contact in boiler's thermostat is closed and is deactivated when the latter is opened.

The parameters that control DHW production are the following:

Par. No.	Description
2038*	Defines the primary circuit's set-point increase in degrees compared to the temperature set for the domestic hot water tank.
2039	Defines the primary circuit's restart hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications).
2040	Defines the primary circuit's shut-off hysteresis in modes 1 and 2 of DHW (valid both for cascade and stand-alone applications).
0048	Establishes the DHW storage tank set-point.

(*) Parameter 2038 is active on such mode even if the tank probe is not installed and it influences the flow temperature of the module.

It can be used to limit the difference between the flow and set temperature on the tank thermostat so that the system efficiency is maximized.

The set point value can be set directly without entering the parameter list as indicated on Par. "USER navigation MENU".

Priority setting
The parameter 2042 sets the priorities between the DHW and CH circuit.

Four modes are envisaged:

0 **Time**: timed priority between the two circuits. In the event of a simultaneous demand, initially the domestic hot water circuit is made to operate for a number of minutes equal to the value assigned to the parameter 2043. At the end of this time period, the CH circuit is operated (also for the same amount of time) and so on until demand for one or the other circuit stops

1 **Off**: priority given to the heating circuit

2 **On**: priority allocated to the DHW circuit

3 **Parallel**: simultaneous operation of both circuits provided that the delivery temperature requested by the DHW circuit is lower than or equal to the setpoint requested by the heating circuit. When the temperature requested by the DHW circuit exceeds the heating setpoint, the circulation pump of the heating is turned off and priority is switched to the DHW.

Anti-Legionella function
This function is only on when the circuit for DHW production is on mode 1.

The anti-legionella function is activated automatically on the module start up and it is repeated every 7 days (this parameter can be modified).

If the appliance is electrically discharged, the cycle described below will be repeated at the next start.
During the cycle of anti-legionella the thermal module generates a demand for the sanitary gathering set with a preset set point of 60 ° C (not modifiable). Once the temperature of 60 ° C is reached, the temperature is maintained for 30 minutes during which the system checks that the temperature of the probe does not drop below 57°C. At the end of this time, the anti-legionella function is terminated and the normal operation of the thermal module is reset.

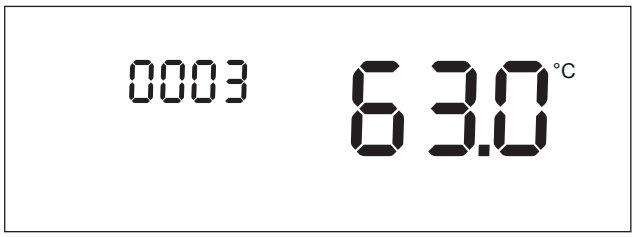
Anti-legionella mode has the priority over other requests regardless of the several parameters setting.

When the function is active, the message “ALE9” is displayed beside the heater temperature and the icon blinks.

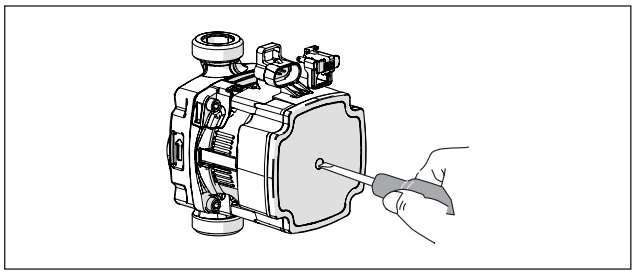
3.3 Checks during and after initial start-up

When the appliance it started, it must be checked by stopping and then restarting the thermal module in the following way:

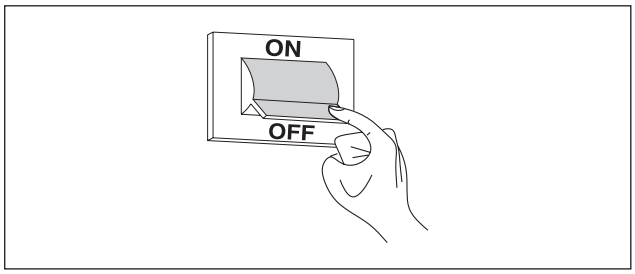
- Set the operating mode of the thermal module in heating to 0 (Par. 2001) e and close the RT input to generate a heat request
- If required, increase the set-point value (CH → Heating Set-point)



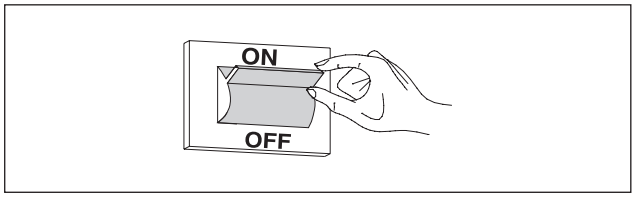
- Make sure that all the pumps in the system are free and rotate in the right direction



- Check the full stop of the thermal module and the heat demand by opening the “RT” contact (OFF).
- Check that the thermal module has come to a complete stop by setting the main switch of the equipment and the main switch of the system to “off”.

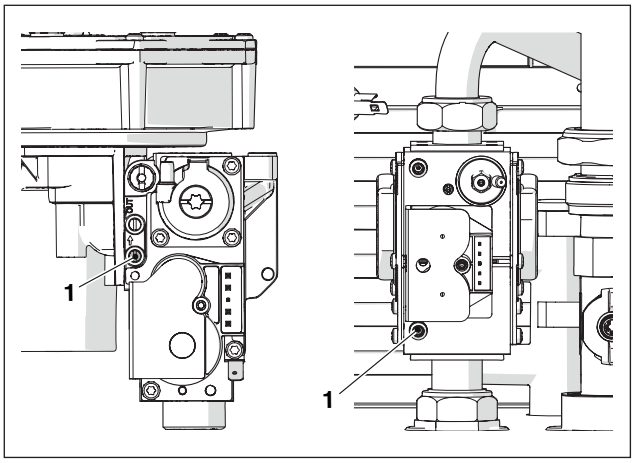


If all conditions are met, power the thermal module by setting the system's and the appliance's master switches to "On" and test combustion products (see Paragraph "Adjustments").



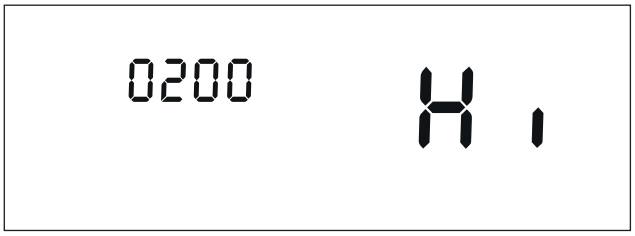
SUPPLY GAS PRESSURE CHECK

- Turn the main system switch "off"
- Remove the locking screws and the panel's front side
- Loosen by about two turns the pressure inlet screw (1) upstream of the gas valve and connect the pressure gauge



- Power the thermal module by setting the system's and the appliance's master switches to "On".

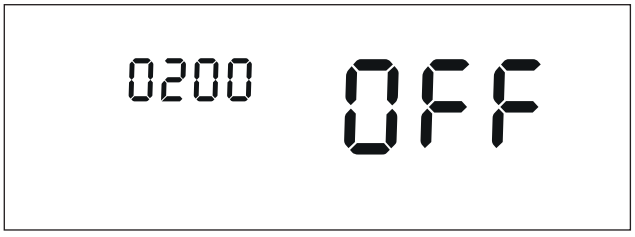
Set Par. 0200 on "Hi" by using "PROG +" and "PROG -" and press "MENU/RESET" to confirm.



DESCRIPTION	G20	G30	G31	
Wobbe index	45,7	80,6	70,7	MJ/m^3
Nominal supply pressure	20	28-30	37	mbar

After the checks:

- select "OFF" using "PROG +" and "PROG -" and press "MENU/RESET" to confirm.
- Disconnect the pressure gauge and tighten again the pressure test point screw (1) upstream from the gas valve.



- Fulfil the operations, place back the front panel and lock the locking screws.

3.4 Error List

When a display has a technical fault, a numeric error code appears that will enable the maintenance operator to identify the possible cause.

There are 3 categories of errors:
1 Permanent: errors that require a manual reset
2 Temporary: errors that are automatically reset once the cause that generated them is removed or stopped
3 Notices: simple warnings that do not block the appliance's operation

3.4.1 Permanent Errors

Nr.	Error	Description
0	E2PROM_READ_ERROR	Internal software error
1	IGNIT_ERROR	Three unsuccessful ignition attempts in a row
2	GV_RELAY_ERROR	Failure detected in the GV relay
3	SAFETY_RELAY_ERROR	Failure detected in safety relay
4	BLOCKING_TOO_LONG	Control had a blocking error for more than 20 hours
5	FAN_ERROR_NOT_RUNNING	Fan is not running for more than 60 seconds
6	FAN_ERROR_TOO_SLOW	Fan runs too slow for more than 60 seconds
7	FAN_ERROR_TOO_FAST	Fan runs too fast for more than 60 seconds
8	RAM_ERROR	Internal software error
9	WRONG_EEPROM_SIGNATURE	Contents of Eeprom is not up to date
10	E2PROM_ERROR	Wrong safety parameters in Eeprom
11	STATE_ERROR	Internal software error
12	ROM_ERROR	Internal software error
15	MAX_TEMP_ERROR	The external overheat protection is enabled or the T_Supply sensor measures a temperature of over 100°C (212°F)
16	FLUE_GAS_ERROR	Flue temperature exceeded the maximum flue temperature
17	STACK_ERROR	Internal software error
18	INSTRUCTION_ERROR	Internal software error
19	ION_CHECK_FAILED	Internal software error
20	FLAME_OUT_TOO_LATE	Flame still present 10 seconds after closing the gas valve
21	FLAME_BEFORE_IGNIT	Flame is detected before ignition
22	Loss of flame	Flame lost three times during a request
23	CORRUPTED_ERROR_NR	Error code RAM byte was corrupted to an unknown error code
29	PSM_ERROR	Internal software error
30	REGISTER_ERROR	Internal software error
37 (*)	Flue gases pressure switch error	Flue pressure switch open

(*) Only for models POWER MAX 50 P DEP and POWER MAX 50 P.

3.4.2 Temporary Errors

Nr.	Error	Description
100	WD_ERROR_RAM	Internal software error
101	WD_ERROR_ROM	Internal software error
102	WD_ERROR_STACK	Internal software error
103	WD_ERROR_REGISTER	Internal software error
106	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
107	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
108	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
109	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
110	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
111	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
112	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
113	REFHI_TOO_HIGH / REFHI_TOO_LOW	Internal software error
114	FALSE_FLAME	Flame is detected in a state in which no flame is allowed to be seen.
115	LOW_WATER_PRESSURE_ERROR	Low water pressure error
118	WD_COMM_ERROR	Watchdog communication error
119	RETURN_OPEN	Return sensor open
120	SUPPLY_OPEN	Supply sensor open
122	DHW_OPEN	DHW sensor open
123	FLUE_OPEN	Flue sensor open
126	RETURN_SHORTED	Return sensor shorted
127	SUPPLY_SHORTED	Supply sensor shorted
129	DHW_SHORTED	DHW sensor shorted
130	FLUE_SHORTED	Flue sensor shorted
133	Net Freq Error	Net. freq. error detected by the watchdog
134	RESET_BUTTON_ERROR	Too many resets in a short time period
155 (*)	Flue gases press. switch err.	Flue pressure switch open
163	T_SELECTION1_OPEN	Heat exchanger's flow rate too low
164	Boiler model not detected	Boiler model not set

(*) Only for models POWER MAX 50 P DEP and POWER MAX 50 P.

3.4.3 Warnings

Nr.	Error	Description
200	CC_LOSS_COMMUNICATION	Cascade system: the burner of the managing module has lost the signal of one of the depending thermal module burner
201	CC_LOSS_COMMUNICATION	Cascade system: the managing module has lost the signal of one of the depending thermal module
202	OUTDOOR_WRONG	Outdoor sensor is open of shorted
203	T_SYSTEM_WRONG	T_System sensor is open of shorted
204	T_CASCADE_WRONG	T_Cascade sensor is open of shorted
207	DHW sensor error	DHW sensor error
208	Zone sensor error	Zone sensor error
209	Boiler request disabled	Boiler request disabled

3.5 Transformation from one gas type to another

The thermal module **POWER MAX** is supplied for operation with G20 (natural gas). However, it can be converted to operation with G30-G31 (LPG) using the dedicated accessory supplied as standard.

⚠ Conversion can only be executed by Technical Assistance Centre or staff authorised by **Beretta**.

⚠ In order to execute the conversion, only follow the instructions in this manual and the provisions of safety standards.

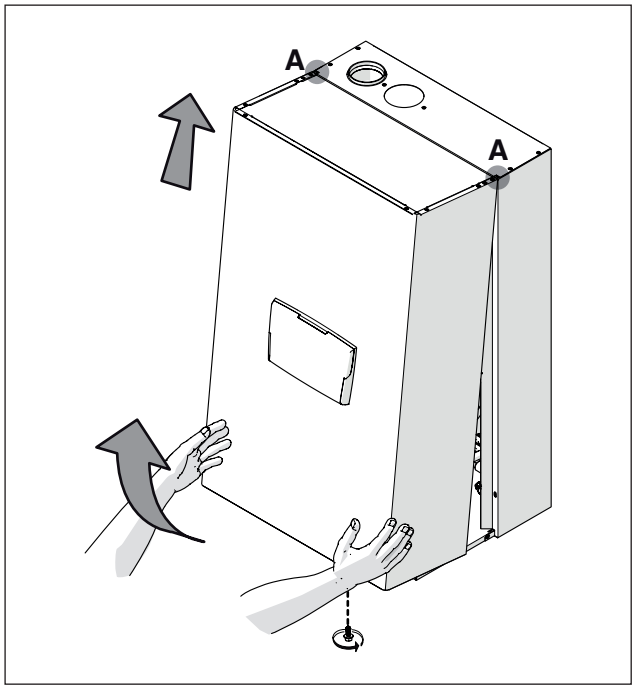
⚠ If the information contained in these instructions is not properly performed or performed by personnel not properly trained, there is a potential risk of fuel leakage and/or carbon monoxide production resulting in personal injury and/or injury.

⚠ Conversion is not complete until all the control steps described in these instructions have been carried out.

⚠ After conversion, calibrate the CO2 as shown in the “Adjustment” Paragraph.

Before making the transformation:
- Exclude the heat demand production or the DHW production by lowering the related set points and the set point of the room thermostat.
- make sure that the master switch and the thermal module's switch are in the "Off" position
- check that the fuel interception system valve is closed.

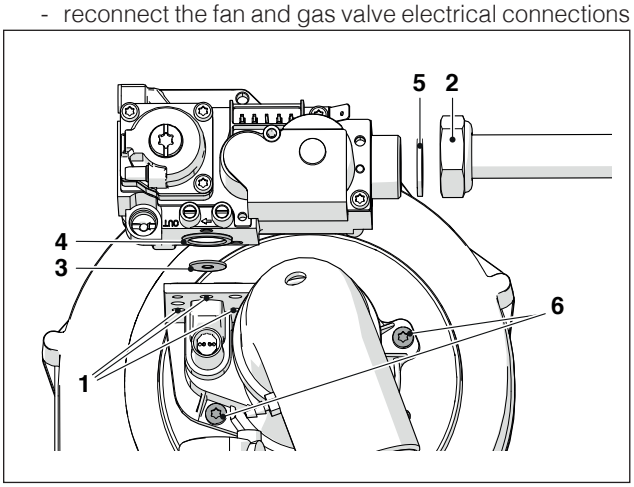
To install the accessory:
- remove the locking screw
- pull the front panel outwards and then to the top to decouple it from points A.



Versions POWER MAX 50 P DEP ÷ POWER MAX 50 P
- disconnect the fan and gas valve electrical connections
- unscrew the walker (2) of the gas pipe
- unscrew the mixer screws (6) to separate mixer-fan
- unscrew the three screws (1) to separate the valve from the fan
- insert the related diaphragm (3) onto the gasket (4) without removing the gasket itself

Model	int. Ø (mm)
POWER MAX 50 P DEP	6.5 (*)
POWER MAX 50 P	6.5 (*)

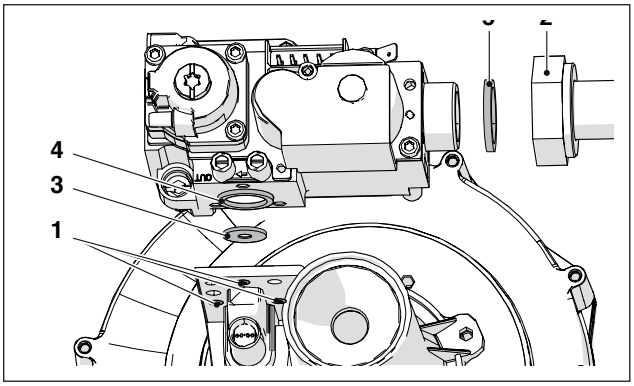
(*) If the CO_2 values indicated in the paragraph "Adjustments**" are not obtained, replace the diaphragm Ø 6.5 with the diaphragm Ø 5.5.**
- check the integrity of the gasket (5); replace it if necessary
- retighten the screws (6) of the mixer
- refit the three screws (1)
- refit the swivel nut (2)
- reconnect the fan and gas valve electrical connections



Versions POWER MAX 65 P ÷ POWER MAX 80 P
- disconnect the electrical connections of the fan and the gas valve
- unscrew the walker (2) of the gas pipe
- unscrew the fan screws to separate the fan from the heat-exchanger
- unscrew the three screws (1) to separate the valve from the fan
- insert the related diaphragm (3) onto the gasket (4) without removing the gasket itself

Model	int. Ø (mm)
POWER MAX 65 P	6.25
POWER MAX 80 P	6.25

- check the integrity of the gasket (5); if necessary replace it
- retighten the valve
- retighten the fan screws
- screw the walker (2) of the gas pipe
- reconnect the electrical connections of the fan and the gas valve



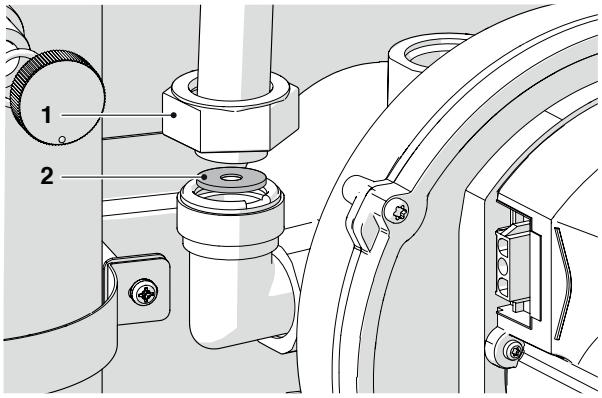
Versions POWER MAX 100 - POWER MAX 150

- disconnect the electrical connections of the fan and the gas valve
- unscrew the swivel nut (1) to remove the gas pipe from the fan
- loosen or unscrew the swivel on the gas valve to completely free the gas pipe
- insert the appropriate diaphragm (2) inside the brass curve

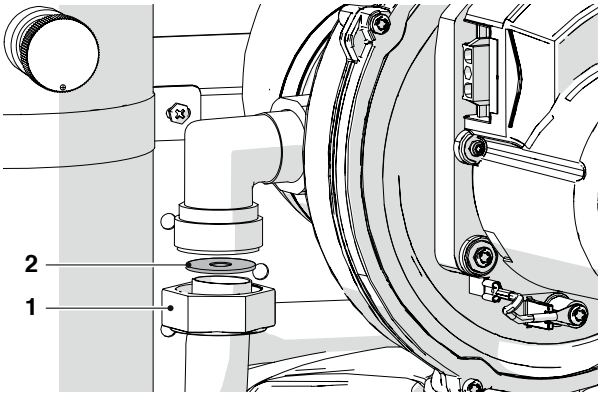
Model	int. Ø (mm)
POWER MAX 100	9
POWER MAX 110	9
POWER MAX 130	9,25
POWER MAX 150	8.75

- check the integrity of the gasket (5); replace it if necessary
- screw the swivel (1) to separate the gas pipe from the fan
- screw the swivel onto the gas valve to completely free the gas pipe
- reconnect the electrical connections of the fan and the gas valve

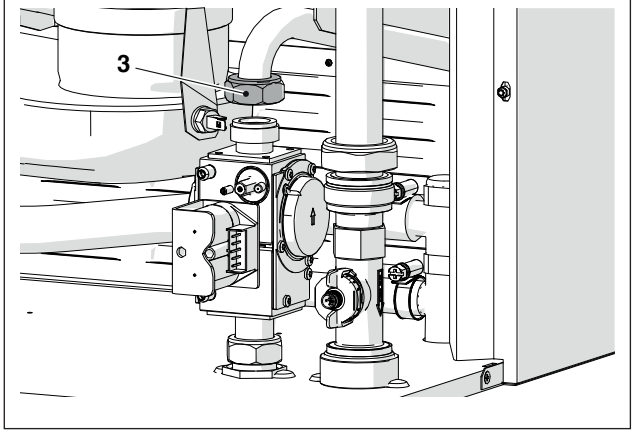
POWER MAX 100 - POWER MAX 110



POWER MAX 130 - POWER MAX 150



- if it is difficult to insert the diaphragm, unscrew the walker (3) to completely free the gas pipe.



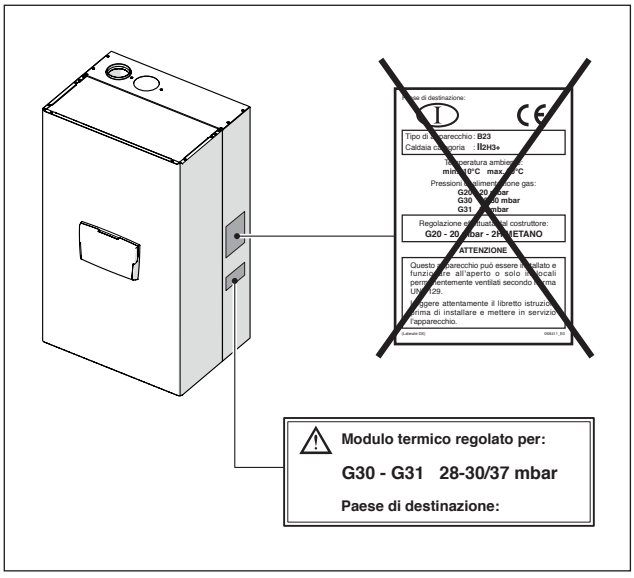
For all models

- Fulfil the operations, place back the front panel and lock the locking screws.
- Open the gas detection valve.
- Switch the electricity supply ON at the system's main switch and at the control panel.
- Make sure that there is no heat or DHW demand.

Enter the parameters and set the parameter 9098 as shown in the table below:

Model	Parameter 9098
POWER MAX 50 P DEP	22
POWER MAX 50 P	20
POWER MAX 65 P	12
POWER MAX 80 P	10
POWER MAX 100	8
POWER MAX 110	6
POWER MAX 130	4
POWER MAX 150	2

Apply the adhesive for the feeding to G30-G31.



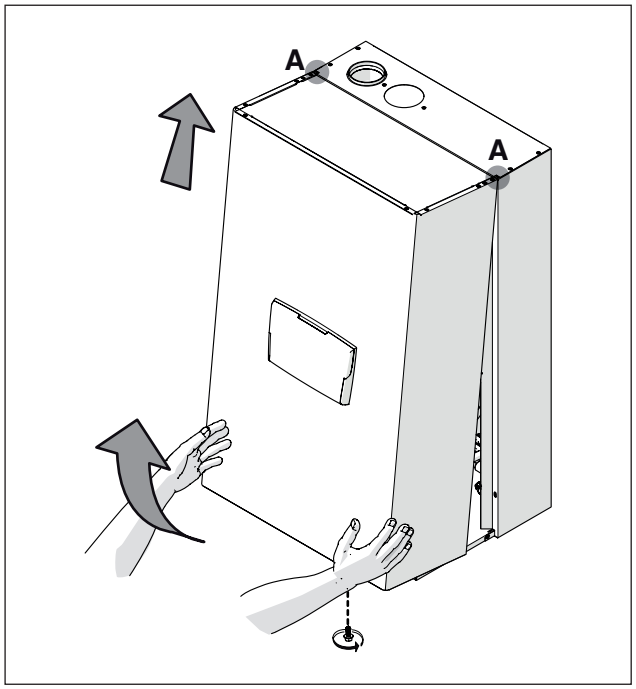
After installing the accessory, check all gaskets tightness.
Carry out all calibration activities described in Paragraph "Adjustments".
Restore the desired set points.

3.6 Adjustments

The thermal module **POWER MAX** is supplied for operation with G20 (methane gas), as indicated by the type plate, and has already been factory-calibrated by the manufacturer.
However, if it is necessary to repeat the adjustments, for example after non-scheduled maintenance, replacing the gas valve or after transformation from G20 gas to G30-G31 gas, or vice versa, proceed as described below.

⚠ Adjustments to maximum and minimum power must be performed in the indicated sequence and only by Technical Assistance Centre.

Before making the regulation:
- remove the locking screw
- pull the front panel outwards and then to the top to decouple it from points A.



CO2 ADJUSTMENT AT MAXIMUM POWER
- Enter the menu "0000", select Par. 0200 and press"MENU/RESET" to confirm.
- Select "Hi" by using "PROG +" and "PROG -" and press "MENU/RESET" to confirm.
- the appliance will operate at maximum power.
- unscrew the cap (1) and insert the combustion analyser sensor
- adjust the CO2 using a screwdriver on the adjustment screw (2) located on the gas valve, in order to obtain one of the values reported on the table.

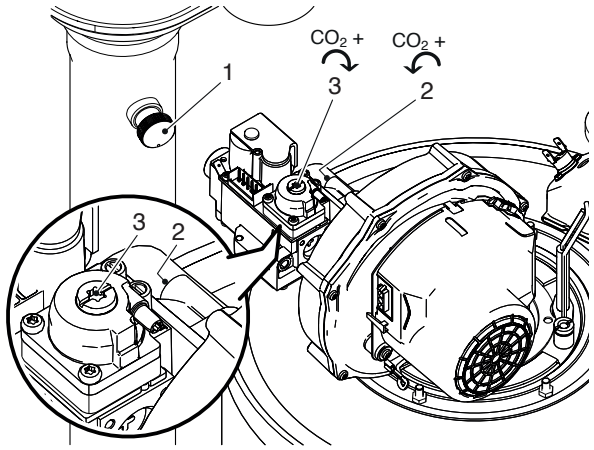
CO2% maximum power	Gas type			
	G20	G25	G30	G31
POWER MAX 50 P DEP	9	9	10,4	10,4
POWER MAX 50 P	9	9	10,4	10,4
POWER MAX 65 P	9	9	10,4	10,4
POWER MAX 80 P	9	9	10,4	10,4
POWER MAX 100	9	9	10,4	10,4
POWER MAX 110	9 (*)	9	10,4	10,4
POWER MAX 130	9	9	10,4	10,4
POWER MAX 150	9	9	10,4	10,4

⚠ (*) In Belgium and Switzerland the value must be adjusted to 8.6.

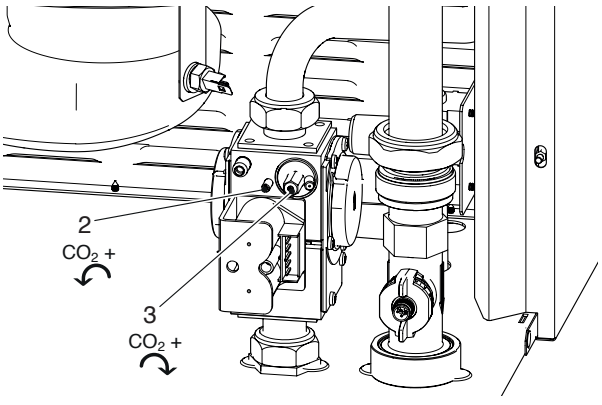
CO2 ADJUSTMENT AT MINIMUM POWER
- Select "Lo" using "PROG +" and "PROG -" and press "MENU/RESET" to confirm.
- the appliance will operate at minimum power.
- Adjust the CO2 using a screwdriver on the adjustment screw (3) on the fan unit, so as to obtain a value listed in the table.

Minimum power CO_2%	Gas type			
	G20	G25	G30	G31
POWER MAX 50 P DEP	9	9	9,9	9,9
POWER MAX 50 P	9	9	9,9	9,9
POWER MAX 65 P	9	9	10,4	10,4
POWER MAX 80 P	9	9	10,4	10,4
POWER MAX 100	9	9	10,4	10,4
POWER MAX 110	9	9	10,4	10,4
POWER MAX 130	9	9	10,4	10,4
POWER MAX 150	9	9	10,4	10,4

Versions POWER MAX 50 P DEP - POWER MAX 80 P



Versions POWER MAX 65 P ÷ POWER MAX 80 P



CHECKING THE CALIBRATION
Select "Hi", wait for the stable regime to be reached and make sure that CO values [2] are the same as the requested ones.
After the checks:
- select "OFF" using "PROG +" and "PROG -" and press "MENU/RESET" to confirm.
- remove the analyser sensor and carefully retighten the cap (1)
- place back the front panel and lock the locking screw.

3.7 Temporary or short-term shut-down

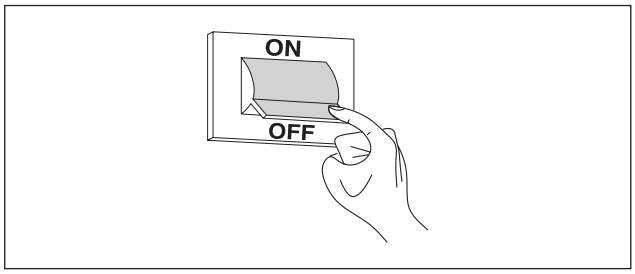
In the event of temporary or short-term shut-down (e.g. due to holidays), proceed as follows:

- Disconnect the power supply by positioning the thermal module switch and the system's main switch to "off".
- If there is a danger of frost, keep the system on. To reduce fuel consumption, set the heating set point to the minimum allowed value.

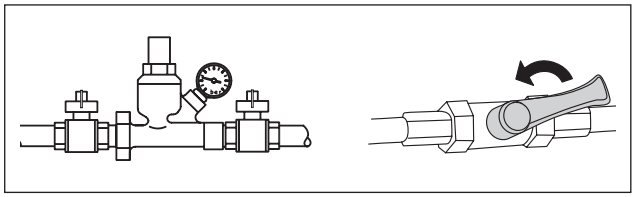
3.8 Preparing for extended periods of disuse

The following operations shall be necessary if the thermal module is not used for a long period of time:

- turn the main switch of the thermal modules and the main system switch to "off"



- Close the fuel and water valves for the heating and domestic hot water system.



⚠ Empty the thermal and sanitary system if there is a danger of frost.

3.9 Display board replacement

⚠ System configurations must be performed only by the Technical Assistance Centre or by personnel authorized by **Beretta**.

When replacing the front control panel, at subsequent restart, the system performs a consistency check between the configuration data saved on the Master board and those saved in the user interface; therefore, when replacing the control interface, check Par.9097, Par.9098 and Par.2116.

Change the parameter Par.9097, setting the value according to the following table:

Model	Par. 9097
POWER MAX 50 P DEP	46 (*)
POWER MAX 50 P	46 (*)
POWER MAX 65 P	1 (*)
POWER MAX 80 P	1 (*)
POWER MAX 100	1 (*)
POWER MAX 110	1 (*)
POWER MAX 130	1 (*)
POWER MAX 150	1 (*)

⚠ (*) Factory setting. It may be necessary to change the value depending on the type of installation and the accessories installed.

Change the parameter Par.9098, setting the value according to the following table:

Model	methane	Par. 9098
POWER MAX 50 P DEP	methane	21
	LPG	22
POWER MAX 50 P	methane	19
	LPG	20
POWER MAX 65 P	methane	11
	LPG	12
POWER MAX 80 P	methane	9
	LPG	10
POWER MAX 100	methane	7
	LPG	8
POWER MAX 110	methane	5
	LPG	6
POWER MAX 130	methane	3
	LPG	4
POWER MAX 150	methane	1
	LPG	2

Check the settings for parameter 2116:

Model	Par. 2116
POWER MAX 50 P DEP	3
POWER MAX 50 P	3
POWER MAX 65 P	0
POWER MAX 80 P	0
POWER MAX 100	0
POWER MAX 110	0
POWER MAX 130	0
POWER MAX 150	0

3.10 Control board replacement

⚠ System configurations must be performed only by the Technical Assistance Centre or by personnel authorized by **Beretta**.

When replacing the front control panel, at subsequent restart, the system performs a consistency check between the configuration data saved on the Master board and those saved in the user interface; therefore, when replacing the control interface, check Par.9097, Par.9098 and Par.2116.

Change the parameter Par.9097, setting the value according to the following table:

Model	Par. 9097
POWER MAX 50 P DEP	46 (*)
POWER MAX 50 P	46 (*)
POWER MAX 65 P	1 (*)
POWER MAX 80 P	1 (*)
POWER MAX 100	1 (*)
POWER MAX 110	1 (*)
POWER MAX 130	1 (*)
POWER MAX 150	1 (*)

⚠ (*) Factory setting. It may be necessary to change the value depending on the type of installation and the accessories installed.

Change the parameter Par.9098, setting the value according to the following table:

Model	methane	Par. 9098
POWER MAX 50 P DEP	methane	21
	LPG	22
POWER MAX 50 P	methane	19
	LPG	20
POWER MAX 65 P	methane	11
	LPG	12
POWER MAX 80 P	methane	9
	LPG	10
POWER MAX 100	methane	7
	LPG	8
POWER MAX 110	methane	5
	LPG	6
POWER MAX 130	methane	3
	LPG	4
POWER MAX 150	methane	1
	LPG	2

Check the settings for parameter 2116:

Model	Par. 2116
POWER MAX 50 P DEP	3
POWER MAX 50 P	3
POWER MAX 65 P	0
POWER MAX 80 P	0
POWER MAX 100	0
POWER MAX 110	0
POWER MAX 130	0
POWER MAX 150	0

3.11 Maintenance

It is mandatory to perform maintenance and cleaning of the device at least once a year.

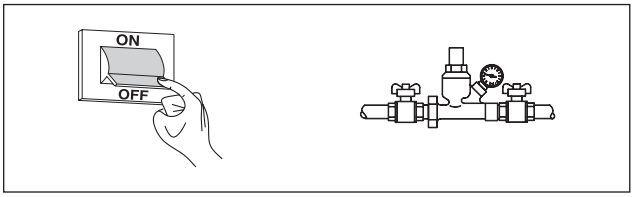
⚠ The non-performance of the annual maintenance will invalidate the warranty.

This operation, carried out by Technical Assistance Centre or by professionally qualified personnel, is necessary to monitor and ensure that the flue pipes inside and outside of the device, the fan, the safety valves, the condensate removal devices, the water drainage tubes and all the measurement and control devices are in perfect working order.

Table of the compulsory maintenance activities (to be performed every 2000 working hours or at least once a year)
Make the combustion test
Check the conditions of the inlet pipes (if present) and the flue pipes by making sure that no leakage is present
Check the ignition electrode
Clean the combustion chamber and check the conditions of the gaskets you have dismantled during such operation
Clean the condensate discharge pipe
Check the parameters settings
Check if there is any gas leakage
Check if there is any leakage on the hydraulic connections
Check the integrity of the cabling system and its related connections
Make sure the ignition takes place regularly
Make sure that there is the flame after ignition
Check the safety devices down the equipment
Check the system pressure

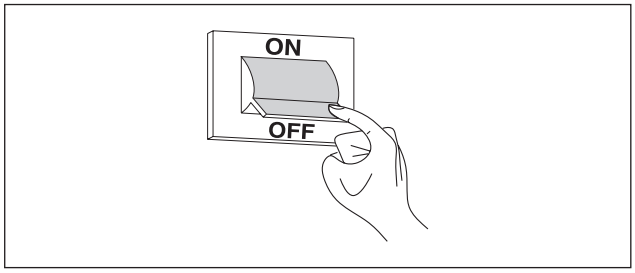
⚠ Before carrying out any maintenance or cleaning, disconnect the power from the device by turning off the bipolar main switch and closing the main gas valve. In addition, for all maintenance (to be carried out at least once a year, as noted above) always replace all the flue and gas seals, in particular the burner seals.

Before performing any operation:
- disconnect the electric power supply by turning the main system switch to "off"
- close the gas shut-off valve.



3.12 Cleaning and removing internal components

Before any cleaning operation, disconnect the electric power supply by switching the main system switch to "off".



OUTSIDE

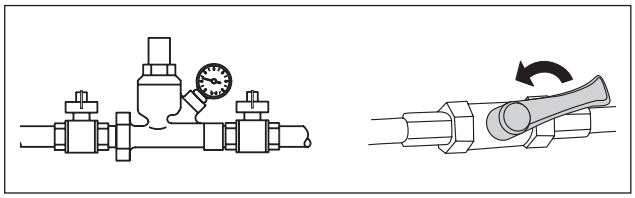
Clean the casing, the control panel, the painted parts and plastic parts with cloths moistened with soap and water. In the case of stubborn stains, moisten the cloth with a 50% water and alcohol mixture or specific products.

Do not use fuels, sponges impregnated with abrasive solutions or powder detergents.

INSIDE

Before starting internal cleaning operations:

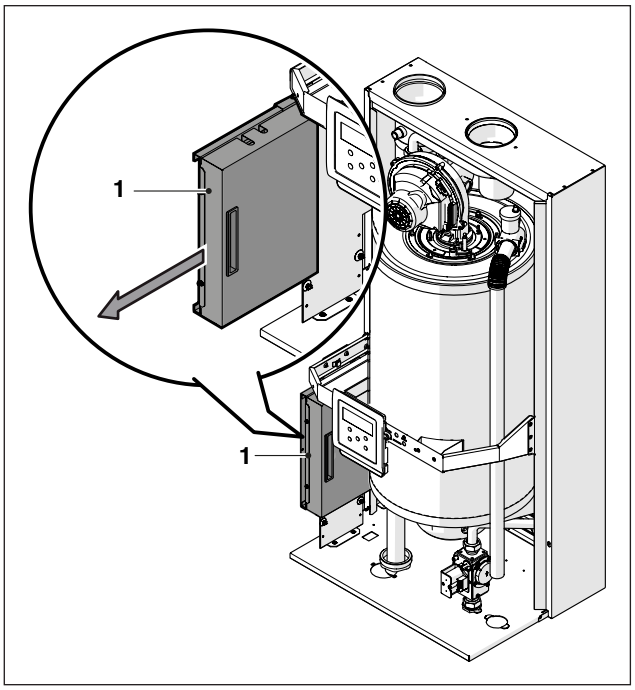
- close the gas shut-off valves
- close the system taps.



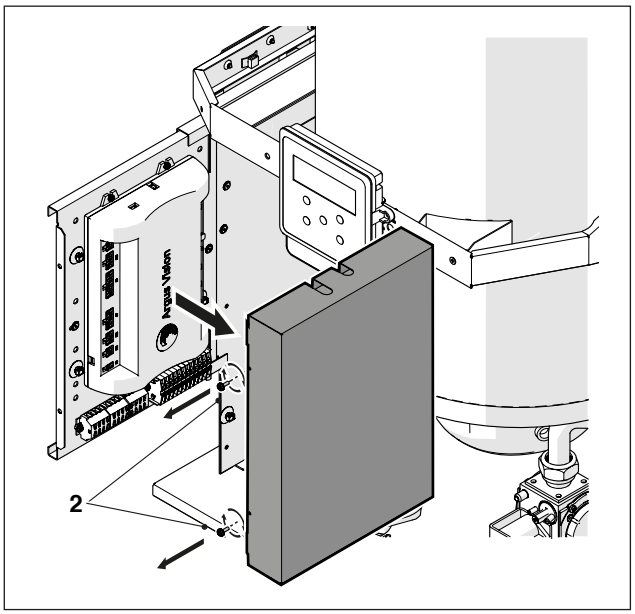
From time to time, check that the condensate drain is not blocked.

Access to the control panel and the internal parts of the thermal module

- Remove the locking screws and the panel's front side
- Pull and slide the electrical panel's box towards the outside (1)



Loosen the fixing screws (2) and remove the protection (3)

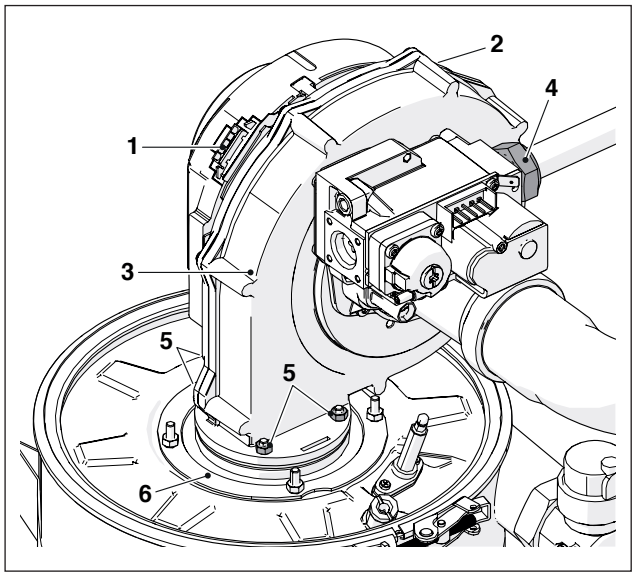


At this point, it will be possible to access terminal boards. Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

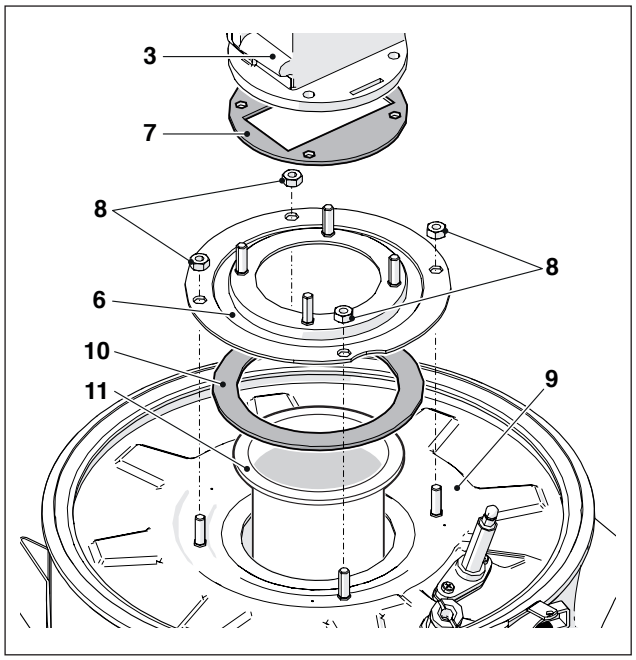
If the electronic control box is replaced, see the electrical wiring diagram in order to reset the connections.

Removing the fan and the burner models POWER MAX 50 P DEP - POWER MAX 50 P

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air tube from the fan if the thermal module is of type B - C
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Use a socket wrench to unscrew the four nuts (5) fixing the fan (3) to the flange (6)



- Take the fan (3) and the gasket (7) out
- Unscrew the four nuts (8) fixing the flange (6) to the top closing (9)
- Remove the gasket (10) and the burner (11).



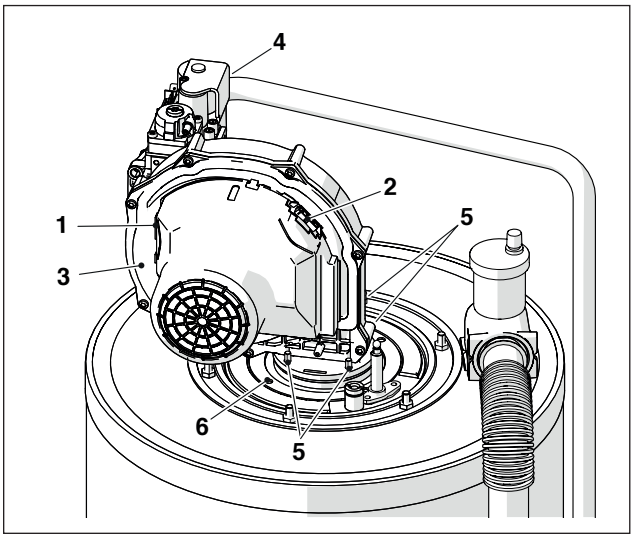
- Replace the gaskets (7-10) with the new ones.

Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

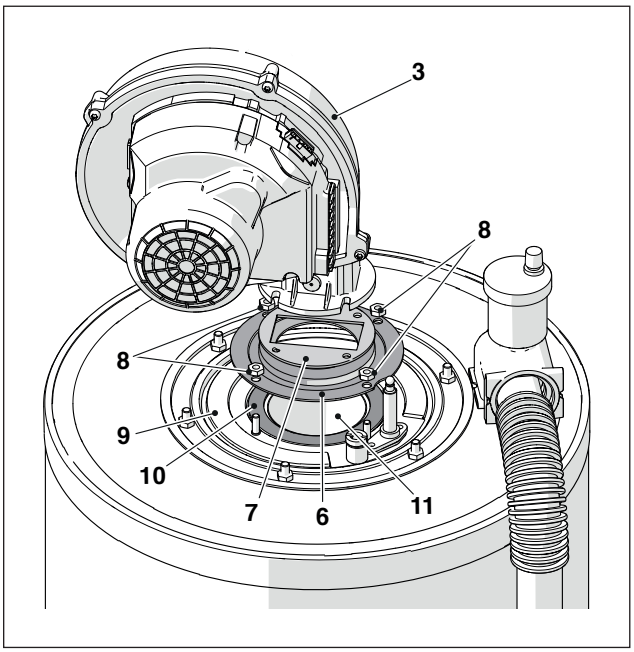
⚠ Check that the gas connection is leak proof.

Disassembling of the fan and burners models POWER MAX 65 P - POWER MAX 80 P

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air tube from the fan if the thermal module is of type B - C
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Unscrew the four screws with a pipe wrench (5) fixing the fan (3) to the flange (6)



- Take the fan (3) and the gasket (7) out
- Unscrew the 4 screws (8) that fix the flange (6) to the lower flange (9)
- Remove the gasket (10) and the burner (11).



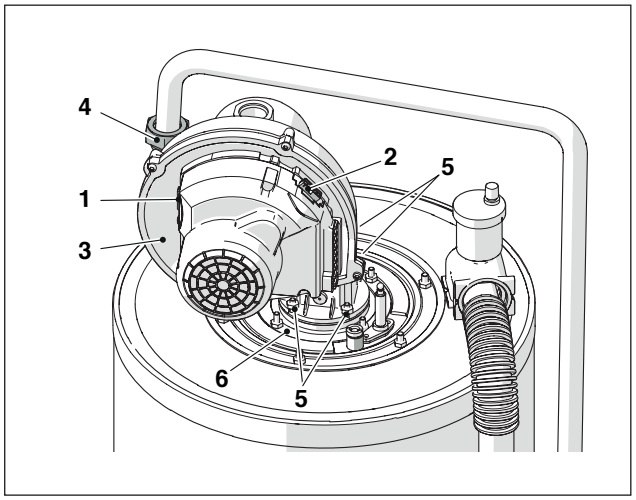
- Replace the gaskets (7-10) with the new ones.

Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

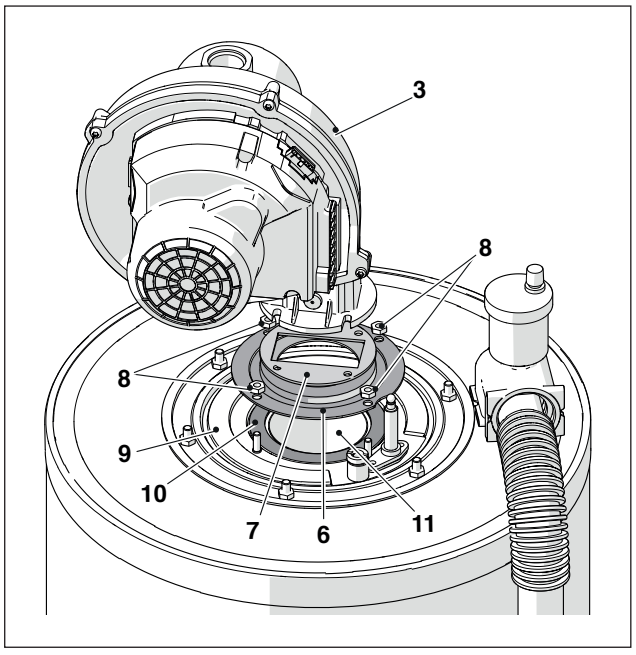
⚠ Check that the gas connection is leak proof.

Disassembling of the fan and burners models POWER MAX 100 - POWER MAX 110 - POWER MAX 130 - POWER MAX 150

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air pipe from the fan if the thermal module is type C (C type configuration non standard but obtained with specific accessory)
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Unscrew the four screws with a pipe wrench (5) fixing the fan (3) to the flange (6)



- Take the fan (3) and the gasket (7) out
- Unscrew the 4 screws (8) that fix the flange (6) to the lower flange (9)
- Remove the gasket (10) and the burner (11).



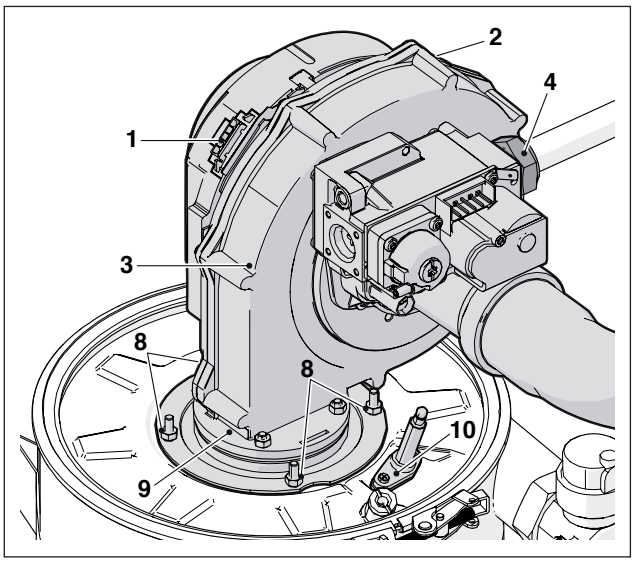
- Replace the gaskets (7-10) with the new ones.

Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

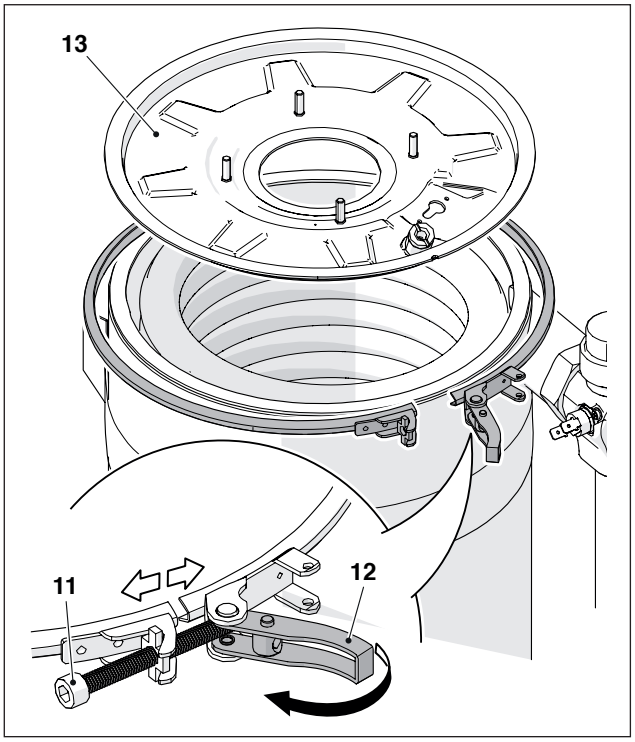
⚠ Check that the gas connection is leak proof.

Removing the top closing for cleaning the heat exchangers models POWER MAX 50 P DEP - POWER MAX 50 P

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air tube from the fan if the thermal module is of type B - C
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Use a socket wrench to unscrew the nuts (8) fixing the burner assembly (9) to the heat exchanger
- Remove the fan and the entire burner body (9)
- Remove the electrode plate (10), check the electrode's condition and replace it if necessary



- Unscrew screw (11)
- Open the lever catch (12)
- Lift and remove the top closure (13) with the relative insulating pad and gasket.

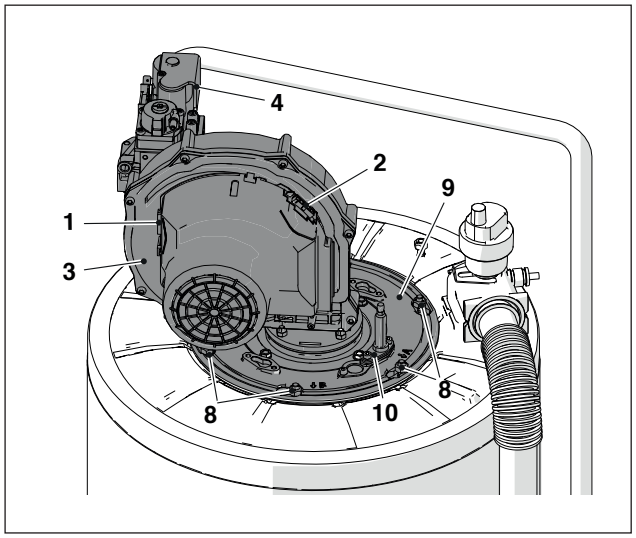


Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

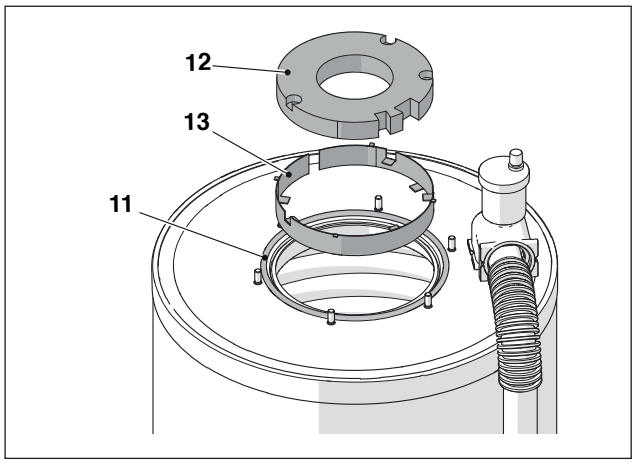
⚠ Check that the gas connection is leak proof.

disassembling of the flange for cleaning up the heatexchanger models POWER MAX 65 P - POWER MAX 80 P

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air tube from the fan if the thermal module is of type B - C
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Unscrew the six screws (8) that secure the burner unit (9) to the heat exchanger with a socket wrench
- Remove the fan and the entire burner body (9)
- Remove the electrode plate (10), check the electrode's condition and replace it if necessary



Remove the seal (11), the insulation mat (12) and the bracket (13).

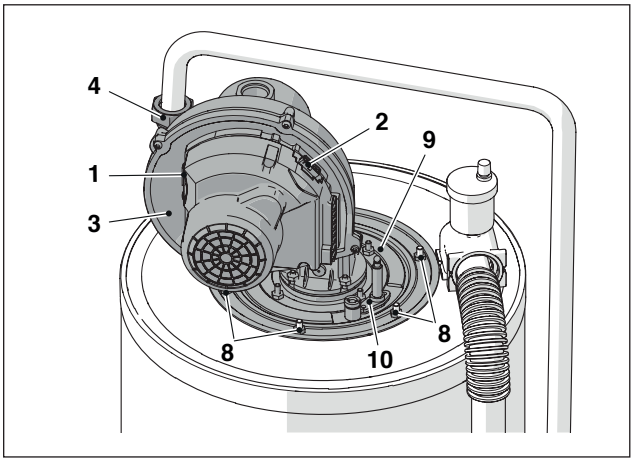


Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

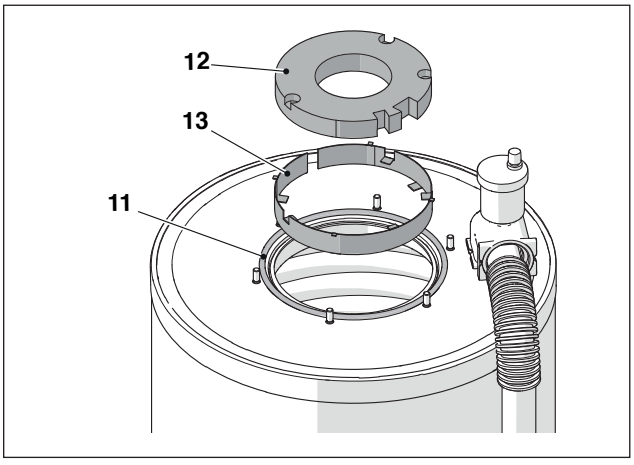
⚠ Check that the gas connection is leak proof.

Disassembling the flange for cleaning the exchanger models POWER MAX 100 - POWER MAX 110 - POWER MAX 130 - POWER MAX 150

- Remove the locking screws and the panel's front side
- Remove cables (1) and (2) for the fan (3)
- Remove the air hose from the fan if the thermal module is of type C (type C configuration not standard but obtained with a special accessory)
- Unscrew the swivel nut (4) and disconnect the gas pipe
- Unscrew the six screws (8) that secure the burner unit (9) to the heat exchanger with a socket wrench
- Remove the fan and the entire burner body (9)
- Remove the electrode plate (10), check the electrode's condition and replace it if necessary



Remove the seal (11), the insulation mat (12) and the bracket (13).



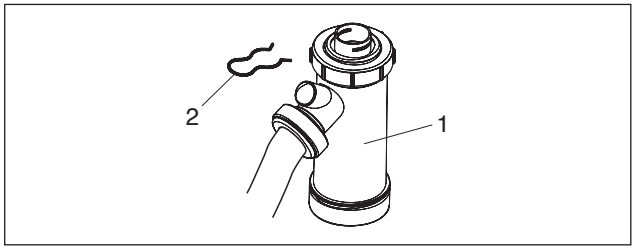
Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

⚠ Check that the gas connection is leak proof.

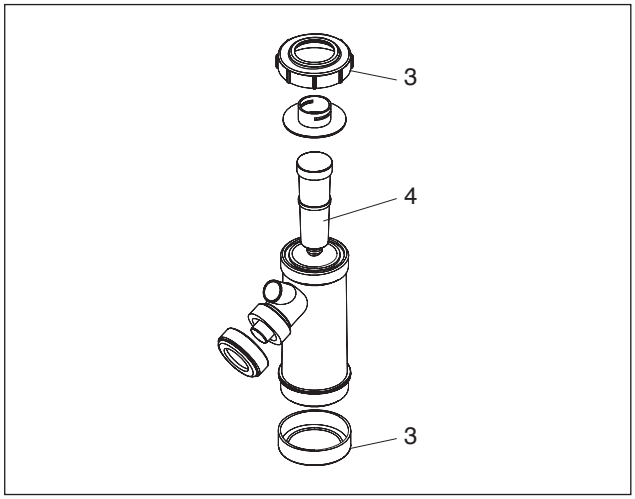
3.12.1 Condensate drain siphon cleaning

For models POWER MAX 50 P DEP and POWER MAX 50 P:

- Remove the front panel from the boiler and locate the condensate discharge syphon (1)



- Remove the split pin (2), detach the corrugated condensate drain hose, and remove the siphon. Unscrew the two caps (3) to disassemble the siphon
- Remove the float (4) and clean all internal components.

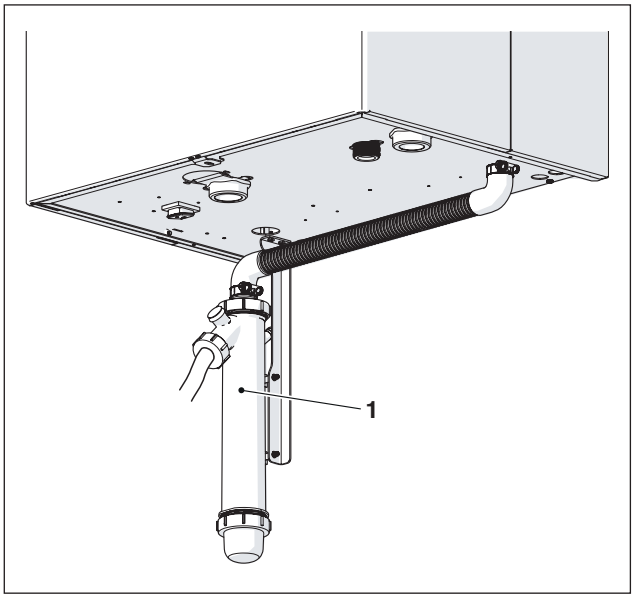


Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

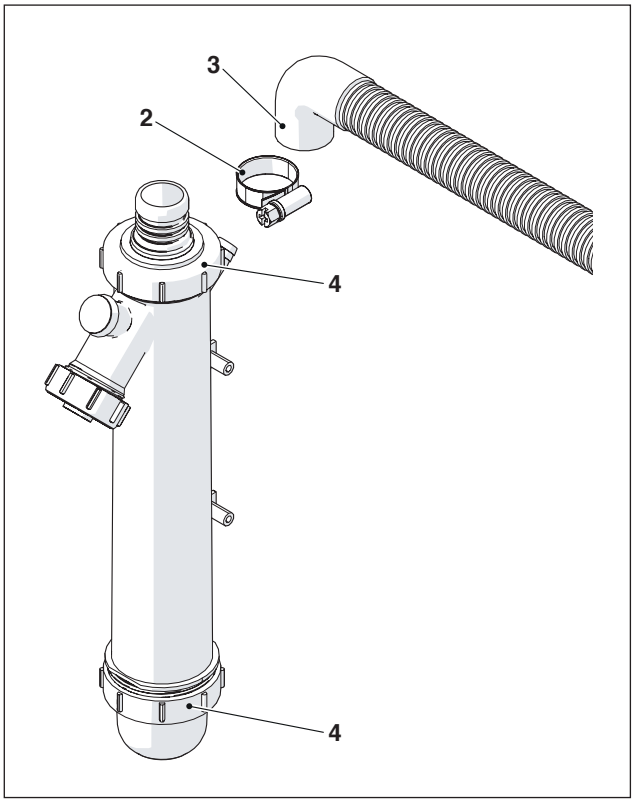
⚠ Fill the siphon with water before you start up the boiler to prevent combustion gases escaping into the room during the first few minutes of boiler functioning.

For models POWER MAX 65 P, POWER MAX 80 P, POWER MAX 100, POWER MAX 110, POWER MAX 130, POWER MAX 150 (accessory):

- Locate the condensate drain trap (1), mounted under the appliance.



- Loosen the clamp (2), detach the condensate drainage corrugated tube (3), remove the siphon and remove it using the two screw plugs (4)
- Remove the float and clean all internal components.



Once the maintenance operations are complete, refit the components working in the opposite direction of what was described.

⚠ Fill the siphon with water before you start up the boiler to prevent combustion gases escaping into the room during the first few minutes of boiler functioning.

3.13 Troubleshooting

FAULT	CAUSE	SOLUTION
There is a smell of gas	Gas supply circuit	- Check the seal of the gaskets and the closure of the pressure tapping points
Odour of unburnt gas	Flue gas circuit	- Check the gasket seals - Make sure there are no obstructions - Check the combustion quality
Irregular combustion	Burner gas pressure	- Check the setting
	Diaphragm installed	- Check the diameter
	Clean the burner and exchanger	- Check the conditions
	Exchanger passages obstructed	- Check passage cleaning
	Faulty fan	- Check operation
Ignition delays with pulsations to the burner	Burner gas pressure	- Check the setting
	Ignition electrode	- Check the positioning and conditions
The modular system becomes dirty very quickly	Combustion	- Check the combustion controls
The burner does not start upon consent of the modular system control	Gas valve	- Check for the presence of 230Vac voltage on the gas valve terminals, check wiring and connections
The modular system does not start	No electric power supply (no message on the display)	- Check the electric connections - Check the condition of the fuse
The modular system does not arrive at temperature	Boiler dirty	- Clean the combustion chamber
	Burner capacity insufficient	- Check and adjust the burner
	Modular system adjustment	- Check correct functioning - Check the temperature setting
The generator triggers a thermal safety block	No water	- Check correct functioning - Check the temperature setting - Check the electrical wiring - Check the position of the sensor bulbs
	Modular system adjustment	- Check the bleed valve - Check the heating circuit pressure
The generator is at temperature but the heating system is cold	Presence of air in the system	- Bleed the system
	Pump malfunctioning	- Check/unseize the pump - Replace the circulator - Check the electrical connection of the circulator
The circulator does not start	Pump malfunctioning	- Check/unseize the pump - Replace the circulator - Check the electrical connection of the circulator
Frequent tripping of the system safety valve	System safety valve	- Check calibration or efficiency
Frequent tripping of the system safety valve	Incorrect circuit pressure	- Check the circuit pressure - Check pressure reducer functioning
Frequent tripping of the system safety valve	CH expansion vessel	- Check the efficiency of the expansion vessel

4 SYSTEM MANAGER

4.1 Putting into service

⚠ The appliance must be maintained and adjusted at least once a year by Technical Assistance Centre or by professionally qualified staff in compliance with all applicable National and Local provisions.

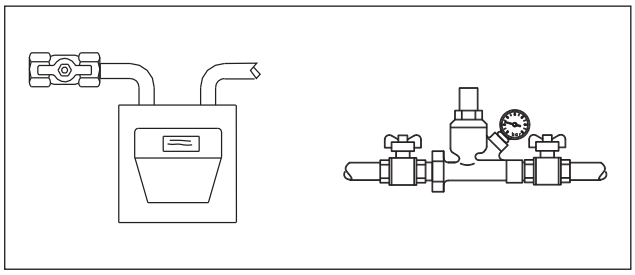
⚠ Incorrect maintenance or adjustment may damage the appliance and cause damage to people or create a hazard.

⚠ The system manager is forbidden from opening and removing the appliance's casing. These activities must be carried out only by Technical Assistance Centre or by professionally qualified personnel.

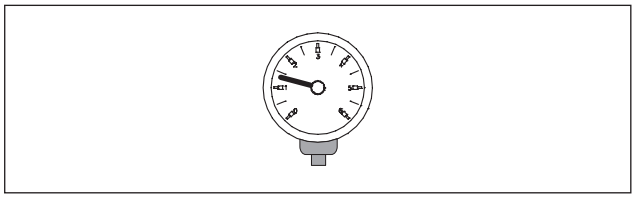
The thermal module **POWER MAX Beretta** must be commissioned by Technical Assistance Centre **Beretta**, after which step the appliance may operate automatically.

However, the system manager may be required to restart the appliance independently, without involving Technical Assistance Centre; for example after a long period of absence.
To do so, perform the following checks and operations:

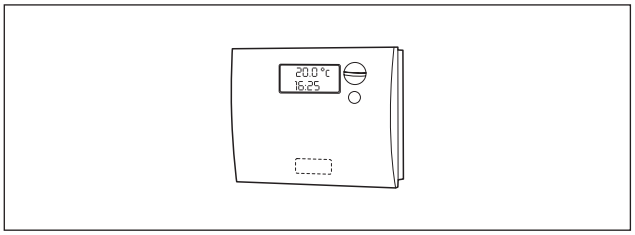
- Check that the gas cock and heating water cock are open



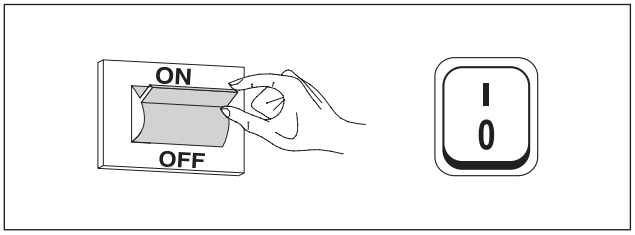
- While the system is still cold, check that working pressure in the central heating circuit is over 1 bar but below the maximum limit specified for the boiler



- Adjust the room thermostats for the high and low temperature zones to the required temperature (~20°C) or, if the systems are equipped with timer thermostats or a time programming unit, make sure it is on and adjusted (~20°C)



- Switch the system's master switch to the ON position and the thermal module's master switch to (**I**).



The appliance will go through the switch-on stage and, after starting, it will continue to operate until set temperatures are achieved.
The burner will then switch off and on automatically to maintain the set temperature without further operator action.

In the event of ignition or operation faults, the display will show a numeric error code that will enable the user to interpret the possible cause as detailed in Paragraph "Error List".

⚠ In the event of a permanent error, to reset starting conditions press the "RESET" key and wait for the thermal module to restart.

Repeat this operation 2-3 times at the most. If the problem persists after that, call **Beretta**'s Technical Assistance Centre.

4.2 Temporary or short-term shut-down

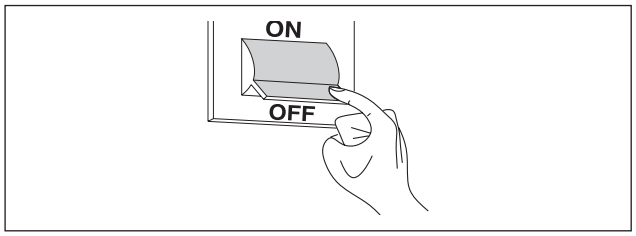
In the event of temporary or short-term shut-down (e.g. due to holidays), proceed as follows:

- Disconnect the power supply by positioning the thermal module switch and the system's main switch to "off".
- If there is a danger of frost, keep the system on. To reduce fuel consumption, set the heating set point to the minimum allowed value.

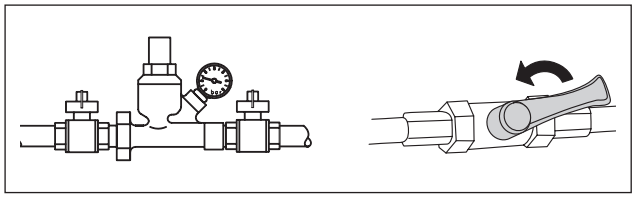
4.3 Preparing for extended periods of disuse

The following operations shall be necessary if the thermal module is not used for a long period of time:

- turn the main switch of the thermal modules and the main system switch to "off"



- Close the fuel and water valves for the heating and domestic hot water system.



⚠ Empty the thermal and sanitary system if there is a danger of frost.

4.4 Cleaning

Use a cloth damped in soapy water to clean the boiler's external casing.
To remove stubborn marks, use a cloth damped in a 50% mix of water and denatured alcohol or a suitable cleaning product.
Carefully dry after cleaning.

⛔ Do not use abrasive cleaning pads or powder detergents.

⛔ Never clean the boiler without first disconnecting it from the mains electricity supply by turning the mains power switch and the control panel switch OFF.

⚠ The combustion chamber and flue pipes must be cleaned periodically by the manufacturer's Technical Assistance Centre or by a qualified heating engineer.

4.5 Maintenance

Please remember that THE PERSON RESPONSIBLE FOR SYSTEM MANAGEMENT MUST ENSURE THAT PROFESSIONALLY QUALIFIED HEATING ENGINEERS UNDERTAKE PERIODIC MAINTENANCE AND COMBUSTION EFFICIENCY MEASUREMENTS.

Beretta's Technical Assistance Centre is qualified to satisfy these legal requirements and can also provide useful information on MAINTENANCE PROGRAMMES designed to guarantee:

- Greater safety
- Compliance with applicable legislation
- Freedom from the risk of fines in the event of spot checks.

Regular maintenance is essential for the safety, efficiency and durability of the boiler.
Servicing is a legal requirement and must be performed at least once a year by a professionally qualified heating engineer.

4.6 Useful information

Seller:..... **Installer:**.....

Mr.: ..... **Mr.:** .....

Address:..... **Address:**.....

Tel.: ..... **Tel.:** .....

Technical Assistance Centre:.....

Mr.: .....

Address:.....

Tel.: .....

Date	Work done

Fuel oil supplier:.....

Mr.: .....

Address:.....

Tel.: .....

Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied

5 RECYCLING AND DISPOSAL

The appliance is manufactured using various materials, such as metal, plastics, and electric and electronic components. At the end of the life cycle, safely remove the components and dispose of them in a responsible manner, in compliance with the installation country's applicable environmental legislation.

⚠ Adequate sorted waste collection, processing and environmentally-friendly disposal contribute to preventing possible negative impacts on the environment and health and promote the reuse and/or recycling of the materials of which the appliance consists.

⚠ Illegal disposal of the product by the owner shall be subject to administrative fines provided for by applicable laws.

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Via Risorgimento, 23 A
23900 - Lecco (LC)

www.berettaboilers.com

Beretta