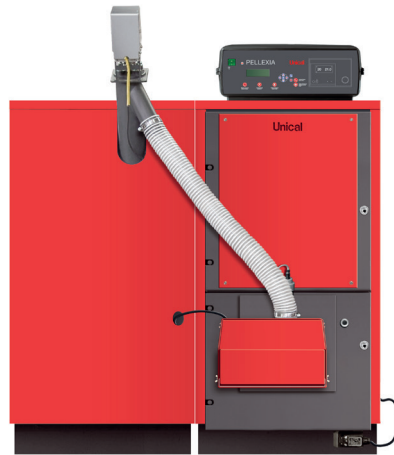


Unical®



PELLEXIA

INSTRUCTIONS ON INSTALLATION, USE AND MAINTENANCE

Attention: this manual contains instructions for the exclusive use of the professionally qualified installer and/or maintenance technician in compliance with current legislation.

The system manager is NOT authorised to service the boiler.

The manufacturer will not be held liable in case of damage to persons, animals or objects resulting from failure to comply with the instructions contained in the manuals supplied with the boiler.

1 GENERAL INFORMATION	5
1.1 General warnings	5
1.2 Symbols used in the manual	6
1.3 Appropriate use of appliance	6
1.4 Information for system manager	6
1.5 Safety warnings	7
1.6 Technical data plate	8

2 TECHNICAL FEATURES AND DIMENSIONS	9
2.1 Technical features	9
2.2 Hydraulic dimensions and connections	10
2.3 Technical data	11
2.4 Supplies	12
2.5 Main components	12
2.6 General	12

3 INSTALLATION INSTRUCTIONS	15
3.1 General warnings	15
3.2 Installation standards	15
3.3 Installation on old or retrofittable systems	15
3.4 Packaging	16
3.5 Installation	17
3.6 Hydraulic connections	18
3.7 Assembly instructions	20
3.8 Connection to the flue	23
3.9 Electrical connections	26
3.10 Filling the system	27
3.11 Hydraulic base diagrams	28
3.12 Panel board	38
3.13 Panel board connections	43
3.14 Boiler start-up	44
3.15 Troubleshooting	46
3.16 Alarms of the electronic control board	47
3.17 Audible alarms	48

4 INSPECTION AND MAINTENANCE	49
Inspection and maintenance instructions	49
Maintenance of the body	50
Cleaning and routine maintenance	50
Non-routine maintenance	50
Maintenance operations	51

(This page has been intentionally left blank)

1

GENERAL INFORMATION

1.1 - GENERAL WARNINGS

The instruction booklet is an integral and essential part of the product and must be kept by the system manager.

Read the warnings contained in this instruction booklet carefully as they provide important guidelines regarding installation, use and maintenance safety.

Keep the booklet with care for further consultation.

Your appliance must be installed and serviced in compliance with the standards in force according to the manufacturer instructions, up to standard and by legally qualified and certified personnel.

Systems for the production of domestic hot water MUST be constructed entirely with materials that comply with M.D. 174/2004 (taps, pipes, fittings, etc.).

By professionally qualified personnel we mean: personnel with specific technical skill in the field of heating system components for civil use, domestic hot water production and maintenance. Personnel must have the qualifications provided for by current legislation.

Incorrect installation or improper maintenance can cause damage to persons, animals or objects for which the manufacturer is not responsible.

Before performing any cleaning or maintenance, disconnect the appliance from the energy mains by acting on the switch of the system and/or through the specific cut-off devices.

Do not obstruct the terminals of the ventilation ducts.

In case of failure and/or malfunctioning of the appliance, switch it off and do not try to repair it or intervene on it directly. Contact only personnel qualified in compliance with law.

Any product repairs must be performed solely by personnel authorised by Unical, using original spare parts only. Failure to comply with the above can compromise the safety of the appliance and void the warranty.

To guarantee appliance efficiency and its correct operation, yearly maintenance must be performed by qualified personnel.

Should you decide not to use the appliance, parts entailing potential sources of hazard must be made safe.

Should the appliance be sold or transferred to a new owner or if you move and leave the appliance, always make sure that the instruction booklet accompanies it in order to be consulted by the new owner and/or installer.

Only original accessories must be used for all appliances with optionals or kits (including electric).

This appliance is intended solely for the use for which it was expressly designed.

Any other use is to be considered improper and therefore dangerous.

1.2 - SYMBOLS USED IN THE MANUAL

Pay special attention when reading this manual to the parts marked by the symbols:



DANGER!
Serious danger for
personal safety and life



ATTENTION!
Possible dangerous
situation for the product
and the environment



NOTE!
Tips
for the user

1.3 - APPROPRIATE USE OF THE APPLIANCE



The PELLEXIA appliance has been built according to the current level of engineering and acknowledged technical safety rules.

Nonetheless, if improperly used, dangers could arise for the safety and life of the user and other persons or damage to the equipment or other objects.

The appliance is intended to operate in hot water recirculation heating systems.

Any other use must be considered improper.

UNICAL will not be held liable for any damage resulting from improper use.

Use according to the intended purposes also includes strict compliance with the instructions in this manual.

1.4 - INFORMATION FOR SYSTEM MANAGER



The user must be instructed concerning the use and operation of his heating system, in particular:

- Deliver these instructions to the user, as well as other documents concerning the appliance inserted in the envelope inside the packaging. **The user must keep this documentation safe for future consultation.**
- Inform the user about the importance of the air vents and the flue gas exhaust system, highlighting their essential features and the absolute prohibition of modifying them.
- Inform the user concerning controlling the system's water pressure as well as operations to restore it.
- Inform the user concerning correct temperature control, control units/thermostats and radiators for saving energy.
- Remember that the system must receive regular maintenance at least once a year and combustion analysis must be performed every two years (as per national law).
- Should the appliance be sold or transferred to a new owner or if you move and leave the appliance, always make sure that the instruction booklet accompanies it in order to be consulted by the new owner and/or installer.

The manufacturer will not be held liable in the event of damage to persons, animals or objects resulting from failure to comply with the instructions contained in this manual.

1.5 - SAFETY WARNINGS



ATTENTION!

The appliance must not be used by people with reduced physical, sensory and mental abilities, without experience and knowledge. These people must be previously trained and supervised during manoeuvre operations. Children must be supervised so that they do not play with the appliance.



ATTENTION!

The appliance must be installed, adjusted and maintained by professionally qualified personnel, in compliance with the standards and provisions in force. Incorrect installation can cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



DANGER!

The boiler must be serviced or repaired by professionally qualified personnel, authorised by Unical. We recommend stipulating a maintenance contract. Insufficient or irregular maintenance can jeopardise the operating safety of the appliance and cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



Modifying parts connected to appliance

Do not modify the following parts:

- the boiler
- the air, water and electricity supply lines
- the flue gas pipe, the safety valve and the exhaust pipe
- the construction parts which affect the operating safety of the appliance.



Attention!

To tighten or loosen the screwed fittings, use only appropriate fixed spanners. Incompliant use and/or inappropriate tools can cause damage (e.g. water or gas leakage).



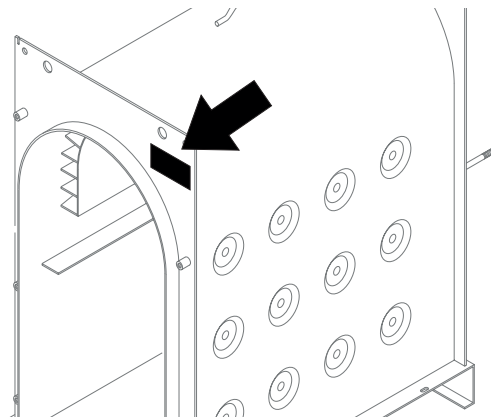
Explosive and easily flammable substances

Do not use or store explosive or easily flammable materials (e.g. petrol, paints, paper) in the room where the appliance is installed.

1.6 - TECHNICAL DATA PLATE

The technical data plate is adhesive and is included in the document case; it must be applied by the installer on the outside of the casing.

The serial number of the boiler is on the riveted plaque on the front plate of the body (front right top side).



Unical®		46033 CASTELDARIO (MN) - Via Roma 123 Tel. +36 0376 57001 - Fax +39 0376 660556 www.unical.eu info@unical-ag.com	
Model	<input type="text"/>		
S.N°	<input type="text"/>	Year	<input type="text"/>
		WOOD	PELLET
Fuel type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	
Pn	<input type="text"/>	<input type="text"/>	<input type="text"/>
	kW	kW	kW
Qmax	<input type="text"/>	<input type="text"/>	<input type="text"/>
	kW	kW	kW
Adjusted Qn	<input type="text"/>	<input type="text"/>	<input type="text"/>
	kW	kW	kW
PIN	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fuel Class:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Boiler Efficiency:	Class	<input type="text"/>	<input type="text"/>
Emission Limits	Class	<input type="text"/>	<input type="text"/>
	Stock <input type="text"/> l	PMS <input type="text"/> bar	T max <input type="text"/> °C
	Stock <input type="text"/> l	PMW <input type="text"/> bar	T max <input type="text"/> °C
	230 V - 50 Hz	A	W

Legenda		Paese di destino
Symbol		IT
(Model)	Boiler Model	Modello Caldaia
(S.N.) (*)	Serial Number: See on boiler body	Matricola: vedi il numero di fabbricazione sul corpo caldaia
Year	Year of manufacturing	Anno di costruzione
(Fuel) type:	Fuel 1 - WOOD 2 - PELLET	Combustibile 1 - LEGNA 2 - PELLET
(Pn)	Nominal Output	Potenza Utile Nominale
(Qmax)	Nominal Input	Potenza Termica
(Adjust Qn)	Input adjusted at ...	Portata termica Regolata a ...
(CE)	Surveillance notify body	Ente di sorveglianza CE
(PIN)	P.I.N. code	Numero Identificazione Prodotto
	BOILER data:	Specifiche CALDAIA
(Stock)	Water content [l]	Contenuto acqua calda [l]
(PMS)	Max Working Pressure	Pressione Massima Esercizio
(T. max)	Max Working Temperature	Temperatura Massima Esercizio
	D.H.W. TANK data:	D.H.W. TANK data:
(Stock)	Water content [l]	Contenuto acqua calda [l]
(PMW)	Max Working Pressure	Pressione Massima Esercizio
(T. max)	Max Working Temperature	Temperatura Massima Esercizio
	Electrical supply	Alimentazione Elettrica
EN 303-5 Classification	Fuel Class Boiler Efficiency Emission Limits	Classe Combustibile Classe di Efficienza Classe di Emissioni

TECHNICAL FEATURES AND DIMENSIONS

2.1 - TECHNICAL FEATURES

The heat generator mod. PELLEXIA is a steel boiler operating with wood pellets, equipped with a burner fed automatically by a screw which withdraws the pellets from a tank alongside it, **with combustion chamber under negative pressure**, suitable for household heating.

You should ensure, therefore, a minimum draught in the flue of 15 Pa for model 34 and of 18 Pa for model 45.

The PELLEXIA boiler is complete with all the safety and control devices required by relevant standards.

DESCRIPTION OF COMPONENTS:

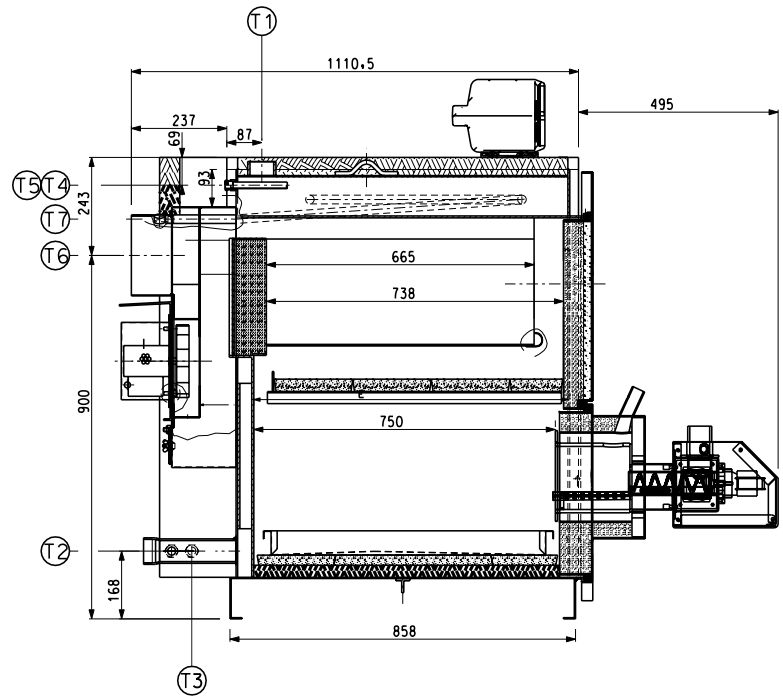
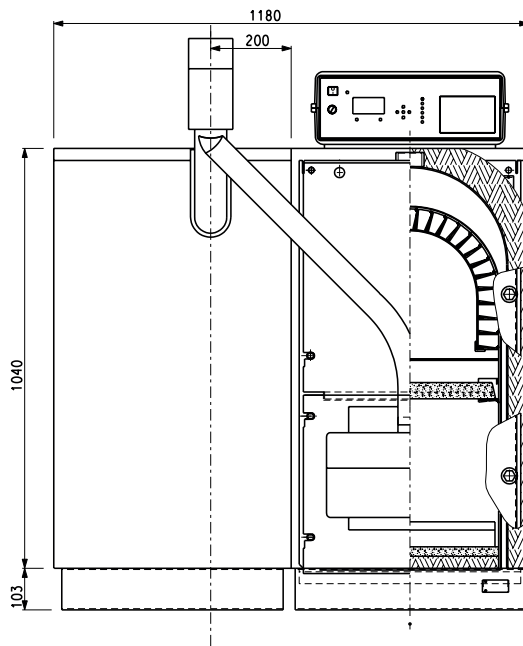
- Steel boiler body with combustion chamber partially covered with refractory material
- Air-blown pellet burner with automatic feeding
- Three smoke circuits, with the third equipped with turbolators
- Front doors with refractory coating and flame warning light on the burner
- Rear smoke chamber with inspection door and ash removal door
- Smoke extraction fan
- Safety heat exchanger
- Boiler body insulated with 60 mm thick mineral wool panel
- Powder painted sheet steel casing
- Large capacity pellet tank (230 kg/360 litres)
- Recirculation pump kit (optional).

PANEL BOARD COMPONENTS:

- Main switch with light indicating presence of power
- Safety thermostat for boiler overheating
- Main fuse
- Display.

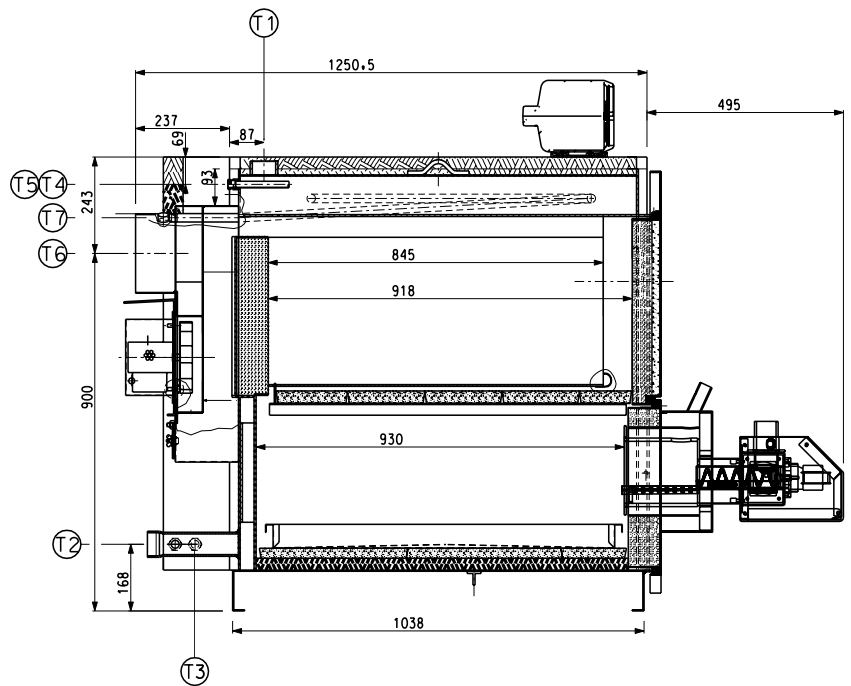
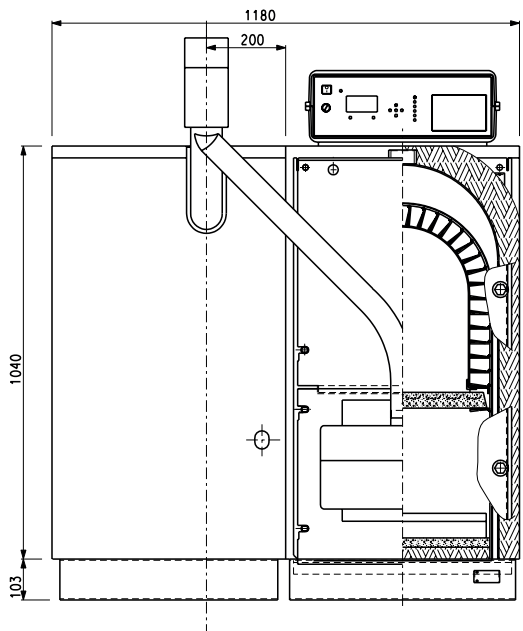
2.2 - HYDRAULIC DIMENSIONS AND CONNECTIONS

PELLEXIA 34



POS.	DESCRIPTION		PELLEXIA 34
T1	BOILER DELIVERY	Rp	2
T2	BOILER RETURN	Rp	2
T3	RETURN PROBE FITTINGS	Rp	1/2
T4	FITTING WITH SHEATH	Rp	1/2
T5	FITTING FOR SHEATH	Rp	1/2
T6	BOILER FLUE GAS OUTPUT Øe		130
T7	EXCHANGER FITTING	R	1/2

PELLEXIA 45



POS.	DESCRIPTION		PELLEXIA 45
T1	BOILER DELIVERY	Rp	2
T2	BOILER RETURN	Rp	2
T3	RETURN PROBE FITTINGS	Rp	1/2
T4	FITTING WITH SHEATH	Rp	1/2
T5	FITTING FOR SHEATH	Rp	1/2
T6	BOILER FLUE GAS OUTPUT Øe		130
T7	EXCHANGER FITTING	R	1/2

2.3 - TECHNICAL DATA

MODELS		PELLEXIA 34	PELLEXIA 45
NOMINAL MIN/MAX OUTPUT	(kW)	9.4/31.4	12.2/39.8
FURNACE MIN/MAX OUTPUT	(kW)	10.8/34.91	13.8/44.19
MAI/MAX EFFICIENCY	(%)	87/90	88.3/90.1
O ₂	(%)	5.69/12.4	5.8/10.9
CO ₂	(%)	13.37/6.89	13.9/8.6
CO 10%	(mg/Nm ³)	116/459	182/476
CO 13%	(mg/Nm ³)	84/334	132/346
NO _x 10%	(mg/Nm ³)	171/176	223/243
NO _x 13%	(mg/Nm ³)	124/128	162/177
Hc 10%	(mg/Nm ³)	4/15	4/11
Hc 13%	(mg/Nm ³)	3/11	3/8
Dust 10% (nominal output)	(mg/Nm ³)	18	19
Dust 13% (nominal output)	(mg/Nm ³)	13	14
MAX OPERATING PRESSURE	(bar)	3	3
MINIMUM DRAUGHT REQUIRED BY CHIMNEY	(Pa)	15	18
MIN. FLOW TEMPERATURE	(°C)	75	75
MAX. FLOW TEMPERATURE	(°C)	88	88
MIN. RETURN TEMPERATURE	(°C)	55	55
WATER SIDE PRESSURE DROPS (10K)*	[mbar]	10	10
WATER SIDE PRESSURE DROPS (20K)*	[mbar]	3	3
COMBUSTION AUTONOMY	(h)	21.4	16
PELLET STORAGE VOLUME	(l)	360	360
PELLET STORAGE CAPACITY	(kg)	230	230
DIMENSIONS OF THE LOADING DOOR	(mm)	505x274	505x274
Pellet CONSUMPTION Q _n /Q _{min}	(kg/h)	7.1/2.14	9/2.8
MAX HEATABLE VOLUME **	(m ³)	900	1146
FLUE GAS TEMPERATURE Q _n /Q _{min}	(°C)	158/97	166/102
NOMINAL LOADING FLUE GAS MASS FLOW RATE	(kg/s)	0.0176	0.0214
BOILER WATER CONTENT	(l)	67	82
EMPTY BOILER WEIGHT	(kg)	477	600
MAXIMUM OUTPUT Q _n /Q _{min}	(W)	227/207	227/207
OUTPUT IN STAND-BY	(W)	30	30
NOISE LEVEL	(dB)	<-	<-
BOILER CLASS ACCORDING TO EN 303-5		5	5
FUEL CHARACTERISTICS		See par. 2.6	
THERMAL STORAGE VOLUME (Recommended)	(l)	> 680	> 900
MAX. SUPPLY WATER TEMPERATURE SAFETY HEAT EXCHANGER	(°C)	15	15
SUPPLY WATER PRESSURE SAFETY HEAT EXCHANGER	(bar)	2	2
BOILER OPERATION		WITH FAN	WITH FAN
COMBUSTION CHAMBER OPERATION		UNDER NEGATIVE PRESSURE	UNDER NEGATIVE PRESSURE
OPERATION IN CONDENSATION		NO	NO

* Pressure drops for flow rate corresponding to a thermal variation of 15K.

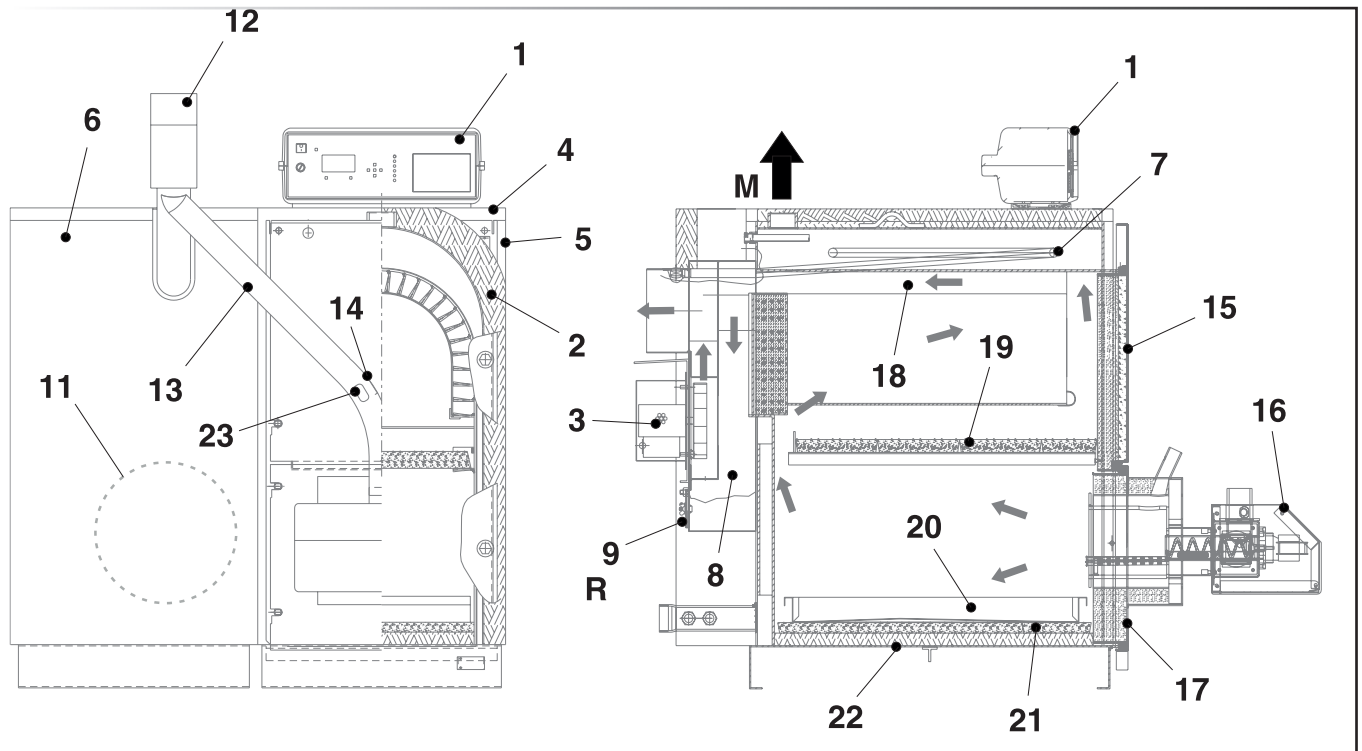
** Values calculated based on the Law 10/91 for residential homes with a heat requirement of 30 kcal/hm³. The data shown is indicative.

The results in the table have been obtained using certified pellets based on the standards EN 14961-2.

2.4 - SUPPLY

System expansion vessel (18 litres)	standard
Automatic release valve	standard
System safety valve (3 bar)	standard

2.5 - MAIN COMPONENTS



- | | | |
|---|----------------------------------|--|
| 1. Panel board | 9. Smoke chamber inspection door | 18. Heat exchange fin with turbulators |
| 2. Boiler body insulation in mineral wool | 11. Expansion vessel | 19. Intermediate refractory stones |
| 3. Fan | 12. Pellet feeding screw | 20. Ash collection pan |
| 4. Top cover | 13. Burner feeding hose | 21. Base refractory stones |
| 5. Boiler casing side | 14. Pellet clogging sensor | 22. Furnace base insulation |
| 6. Pellet tank | 15. Boiler top door | 23. Pellet fire prevention Klixon thermostat |
| 7. Safety heat exchanger | 16. Burner | M Heating system flow |
| 8. Smoke chamber | 17. Boiler bottom door | R Heating system return |

2.6 - GENERAL

The main feature of the PELLEXIA heat stove is that of burning natural fuel (pellets) obtained in an environmentally-friendly way from wood industry waste (sawdust, powders). The sawdust and powders coming from wood processing, after having been appropriately cleaned and dried, are compacted at high pressure to create pure wood cylinders: pellets.

The main features of the pellet are its low moisture content (lower than 10%), its high density (> 600 kg/m³) as well as its regularity and compactness providing to this type of fuel a high Net Calorific Value.

In order to provide PELLEXIA with a long lifespan, Unical advises using certified pellets.

The pellets used to feed the boiler must have high quality features such as, for example, those determined by the standard EN 14961-2. The following are some of their fundamental data.

Parameter	M.U.	EN plus-A1	EN plus-A2
Diameter (D)	mm	6 (± 1)	
Length (L)	mm	31.5 ≤ L ≤ 40 ¹	
Water content (M)	%us ²	≤ 10	≤ 10
Ashes (A)	%dm ²	≤ 0.7	≤ 1.5
Mechanical durability (DU)	%us	≥ 97.5	≥ 97.5
Fine particles (< 3.15 mm)	%us	< 1	< 1
Additives	%dm	≤ 2	≤ 2
Lower Calorific Value (Q)	MJ/kg us	16.5 ≤ Q ≤ 19	16.3 ≤ Q ≤ 19
Bulk density (BD)	kg/m ³	≥ 600	≥ 600
Nitrogen (N)	%dm	≤ 0.3	≤ 0.5
Sulphur (S)	%dm	≤ 0.03	≤ 0.03
Chlorine (Cl)	%dm	≤ 0.02	≤ 0.02
Arsenic (As)	%dm	< 1	< 1
Cadmium (Cd)	%dm	≤ 0.5	≤ 0.5
Chromium (Cr)	%dm	≤ 10	≤ 10
Copper (Cu)	mg/kg	≤ 10	≤ 10
Lead (Pb)	mg/kg	≤ 10	≤ 10
Mercury (Hg)	mg/kg	≤ 10	≤ 10
Nickel (Ni)	mg/kg	≤ 10	≤ 10
Zinc (Zn)	mg/kg	≤ 100	≤ 100
Melting point of the ashes (DT) ⁴	°C	≥ 1200	≥ 1100

1) Maximum 1% of pellets with length greater than 40 mm. Maximum length 45 mm.

2) us = unaltered state, dm = dry matter

3) Determination at 550°C

4) In this case, the ashes must be produced at 815°C



The pellets, as foreseen by current Italian legislation governing commodity features of fuels (DPCM 2.10.1995), must be produced exclusively with untreated wood sawdust without other materials added.



It is absolutely forbidden to use any solid or liquid fuel other than pellets to feed PELLEXIA.



It is advisable to use certified pellets to ensure optimal use of PELLEXIA. The use of poor quality pellets can cause PELLEXIA malfunctioning and shall terminate the warranty.

Compliance with these two simple rules provides better combustion efficiency and conserves the moving mechanical parts of the appliance.



If you plan on not using the PELLEXIA boiler for a long period of time (seven days or more), you should remove any residual fuel in the tank which, if left inside, could gather moisture and cause the product to malfunction.



A high moisture content in the pellet can cause it to break up into powder generating a greater accumulation of residue in the brazier and a blocking of the fuel feed system (screw).

Storage and handling of pellets are important operations to be performed with care:

- The fuel must be stored in a dry place which is not cold;
- Pellets must be moved in such a way to avoid excessive crushing into fine powders.

(This page has been intentionally left blank)

3

INSTRUCTIONS FOR INSTALLATION

3.1 - GENERAL WARNINGS



ATTENTION!

This boiler is intended solely for the use for which it was expressly designed. Any other use is to be considered improper and therefore dangerous.

This boiler heats water at a temperature lower than the atmospheric pressure boiling temperature.



ATTENTION!

The appliances are designed to be installed inside suitable rooms or technical spaces only. The appliances cannot be installed or operate outdoors. Outdoor installation can cause malfunctioning and be dangerous. Choose specifically designed appliances for outdoor installation.



Before connecting the boiler, have professionally qualified personnel:

- a) Thoroughly wash all the piping of the system to remove any residue or impurities which could jeopardise proper operation of the boiler;

- b) Check that the chimney/flue has an appropriate draught, without any bottlenecks, and that no exhausts from other appliances are inserted, unless the flue has been implemented to accommodate several utilities according to specific standards and prescriptions in force. Only after this check can the fitting between the boiler and chimney/flue be mounted;



ATTENTION!

The appliance must be installed by a qualified technician with the technical-professional requirements according to law 37/08 which, under his own responsibility, guarantees compliance with the standards according to good practice rules.



The boiler must be connected to a central heating system and/or domestic hot water production network compatible with its efficiency and output.

3.2 - INSTALLATION STANDARDS

It must be installed by a professionally qualified technician, **who shall take the responsibility of observing all local and/or national laws published in the official journal, as well as applicable technical standards.**

3.3 - INSTALLATION ON OLD OR RETROFITTABLE SYSTEMS

Before installing this appliance on old systems, check that:

- The flue is able to withstand the temperature generated by the combustion products, has been measured and designed according to the regulations in force, is airtight and insulated, and does not feature obstructions or constrictions.
- The flue has a device for releasing condensation.
- The electrical system has been set up by a qualified technician in compliance with the rules in force.
- The rate, head and direction of the flow of the recirculation pumps are appropriate.
- The expansion vessel(s) can fully absorb dilation of the fluid in the system.
- The expansion vessels can fully absorb dilation of the fluid in the system.
- The system has been cleaned and cleared of all sludge and scale, has been vented, and all its seals have been checked.
- There is a water supply treatment/recirculation system.

3.4 - PACKAGING

The **PELLEXIA** boiler is delivered already encased on a pallet together with other boxes containing the pellet tank, the panel board, and the pellet feeding screw, all protected with heat shrink plastic film. The boxes containing the panel board are placed inside the furnace, as are the accessories for assembly and for cleaning.



After having removed all packaging, make sure that the supply is complete and undamaged. If in doubt, do not use the appliance and contact the supplier.



To handle the boiler and to remove the pallet below, fasten the upper hook intended for this purpose using appropriate lifting systems (below the casing cover).



The packaging elements (cardboard boxes, straps, plastic bags, etc.) **must be kept out of the reach of children as they are potential sources of danger.**

Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the instruction above.

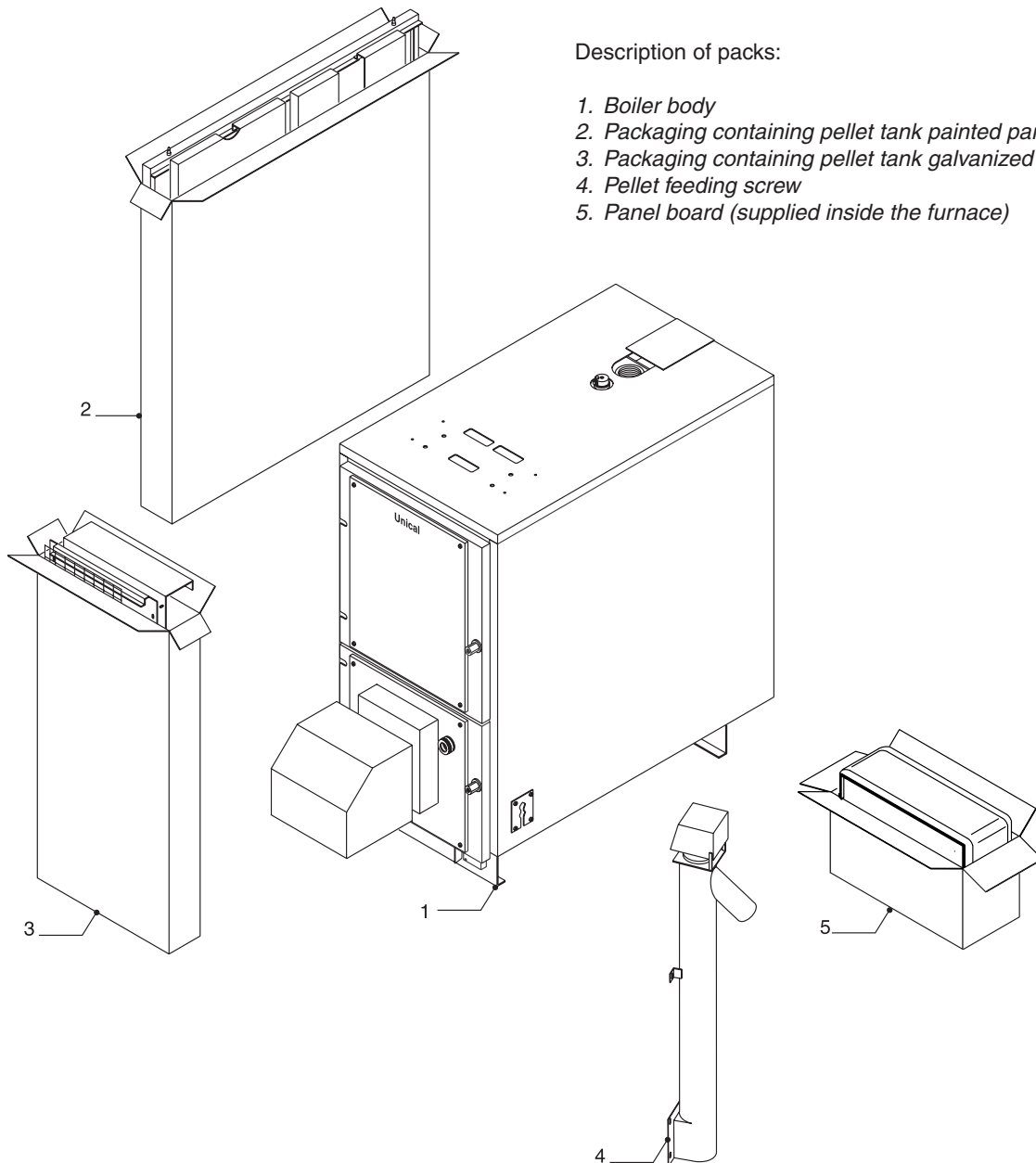
The document envelope, inserted in the furnace, contains:

- Hydraulic test certificate (PELLEXIA 45)
- Heating system booklet (PELLEXIA 34)
- Heating system booklet (PELLEXIA 45)
- Installation, maintenance and operating instruction booklets
- Warranty
- Local ventilation requirements adhesive label

If the boiler is stored for long periods, it should be adequately protected.

Description of packs:

1. Boiler body
2. Packaging containing pellet tank painted parts
3. Packaging containing pellet tank galvanized parts
4. Pellet feeding screw
5. Panel board (supplied inside the furnace)



3.6 - INSTALLATION

PELLEXIA is a heat generator which withdraws the combustion air required for the combustion process directly from the environment in which it is installed.

For this reason, and above all for the safety of the persons using PELLEXIA, it must be installed in a ventilated area so that a continuous flow of combustion air is always guaranteed.

It is therefore essential to make air vents linked with the outside which, in compliance with that indicated by Standard UNI 10683, have the following features:

1. A width of 100 cm or more², ensuring at least that pressure in the installation area does not exceed 4 Pa;
2. Be made close to the floor;
3. Be appropriately protected by metallic mesh or grille so that the minimum air passage cross-section is not reduced;
4. Be positioned in such a way that it cannot be obstructed.



The correct air influx can also be guaranteed by using openings towards an adjacent room as long as that room is provided with direct ventilation and that it is not a room with a fire risk such as depots, garages or storerooms as regulated by standard UNI 10683.

PELLEXIA should be installed in rooms without natural draught equipment or appliances which can create a vacuum in the room in relation to the outside environment and therefore hinder the draught of the flue gas exhaust system (UNI 10683).

To make it easier to clean, there must be a clearance space in front of the heat stove no less than the length of the stove itself. You must at least make sure that the door can open 90° unobstructed.

PELLEXIA can be placed directly on the floor as it is equipped with a self-supporting frame.

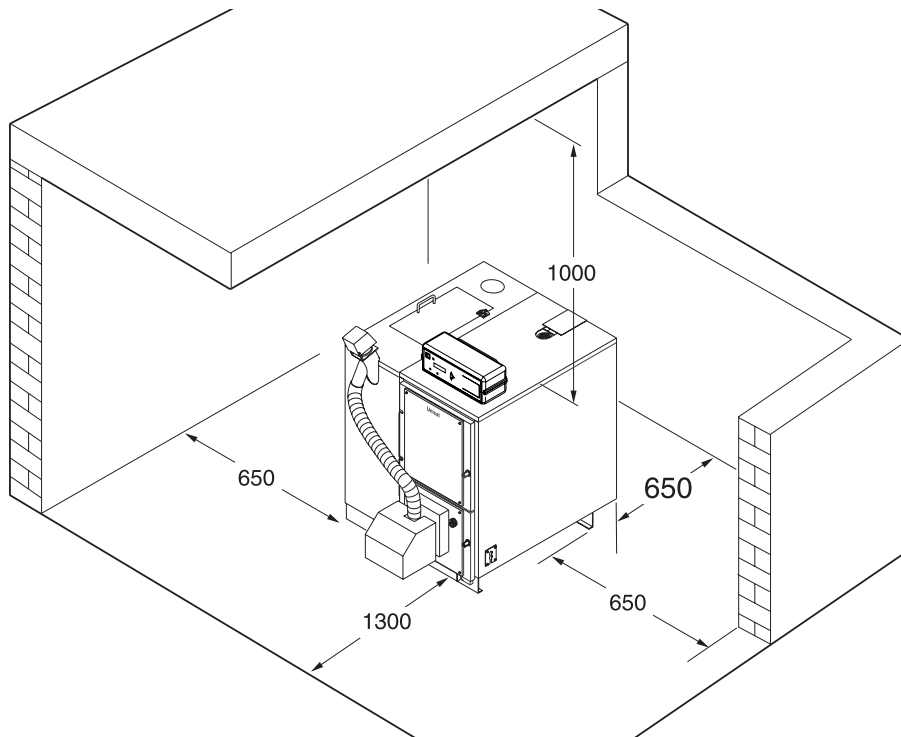


When inspecting compatibility of the heating system, you should make sure that the support surface (floor) has a support capacity (kg) suitable to bear the weight of the product. If it is not adequate, suitable safety measures should be taken (e.g. load distribution plate).

Furthermore, should the floor be made of combustible material (such as parquet) it should be protected by placing a sheet of fireproof material underneath PELLEXIA which is sufficiently wider than the base.

When installation has been performed, the boiler must be horizontal and stable, in order to reduce vibrations and noise. However clearance space must be left behind the boiler and on both sides to allow the casing to be opened for maintenance. There must also be sufficient clearance for loading the pellet tank.

Do not approach or touch the outer surfaces of the combustion chamber with flammable material as it can reach high temperatures following continuous use.



3.7 - HYDRAULIC CONNECTIONS



ATTENTION!
Before connecting the boiler to the heating system, thoroughly clean the piping with an appropriate product compliant with UNI-CTI 8065, in order to eliminate metallic residue from processing and welding, oil and grease which could be present and which, reaching the boiler, could alter its functioning.



Attention!
The fittings of the boiler must not take the weight of the connecting pipes of the system; suitable supporting devices should be installed to do this.

The dimensions of the supply and return pipes for each boiler model are given in the DIMENSIONS table.

Check that the system is fitted with a sufficient number of vent valves.

3.6.1 - CONNECTION TO THE SAFETY HEAT EXCHANGER



Solid fuel fired boilers must be installed with the safety devices foreseen by the relevant laws in force.
For this purpose PELLEIXIA boilers are equipped with a safety exchanger.

A thermal discharge valve **must** be installed on the safety heat exchanger by **the installation technician**, with a control bulb set up inside the sheath located on the rear side of the PELLEIXIA boiler.

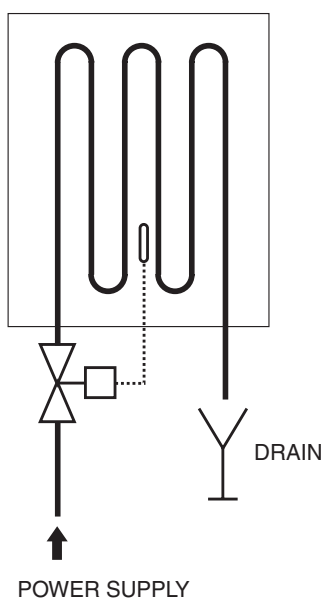
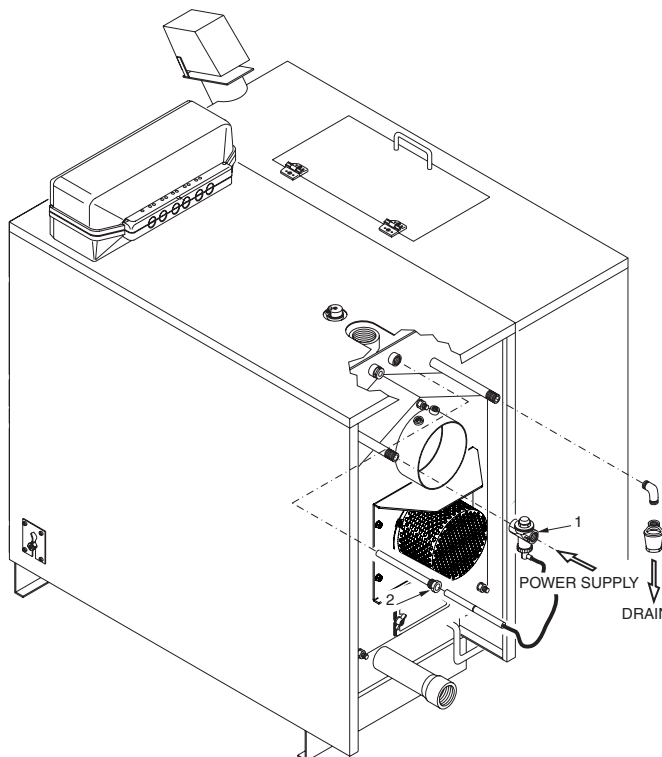


Attention!
The input or output can be inverted as long as the valve is installed on the cold water intake.

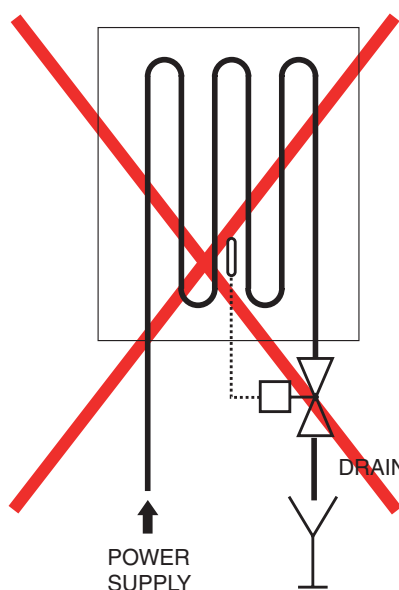
Provide a drain pipe with a funnel and a siphon leading to an appropriate drainage at the heat exchanger outlet. This drainage must be controlled on sight.



Attention!
If this precaution is not taken, triggering of the thermal discharge valve can cause damage to persons, animals and objects for which the manufacturer cannot be held responsible.



**CORRECT
INSTALLATION**



**INCORRECT
INSTALLATION**

3.6.2 - RECIRCULATION PUMP

For correct generator operation, a recirculation pump must be installed in the boiler.

The recirculation pump, supplied in an optional kit, must be connected as indicated in the figure.

If it is not installed, besides limiting the boiler's lifespan, it will invalidate the warranty.

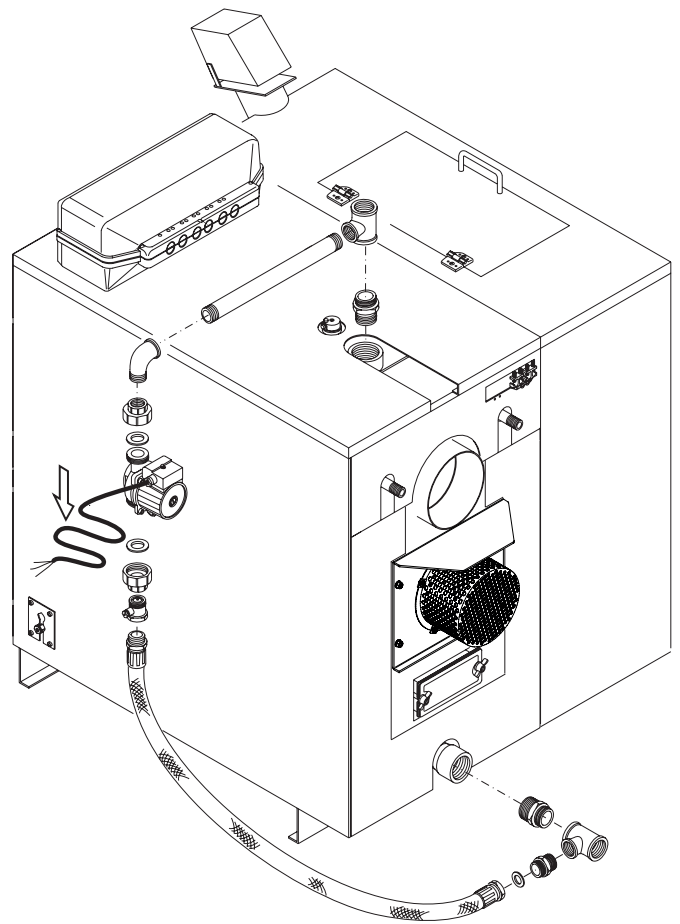
ATTENTION!

The hardness of the mains water supply conditions the boiler's lifespan.

Depending on the hardness of the mains water supply, the possibility of installing appropriate domestic water softeners has to be taken into consideration in compliance with DM n° 443 of 21/12/90.



It is always recommended to treat water with a hardness greater than 15°f.



3.7 - ASSEMBLY INSTRUCTIONS



IMPORTANT!

Before beginning the casing work, perform the hydraulic testing of the boiler and of the plant connected to it. When installing the boiler, consider the size of the pellet tank on the left side (refer to the dimensions on page 10) and leave sufficient space for loading pellets in this tank.

As an indication, there should be a clearance of no less than 1000 mm between the boiler and any wall on the left side for standing next to the tank and to fill it easily.

Pellet tank assembly

Preliminary operation:

Fasten the adhesive sealing supplied in the accessory box as indicated in details "A" (N.B. on both sides).

- Fit the base pos. 1 below the side casing of the boiler; if needed, the side casing can be lifted slightly.

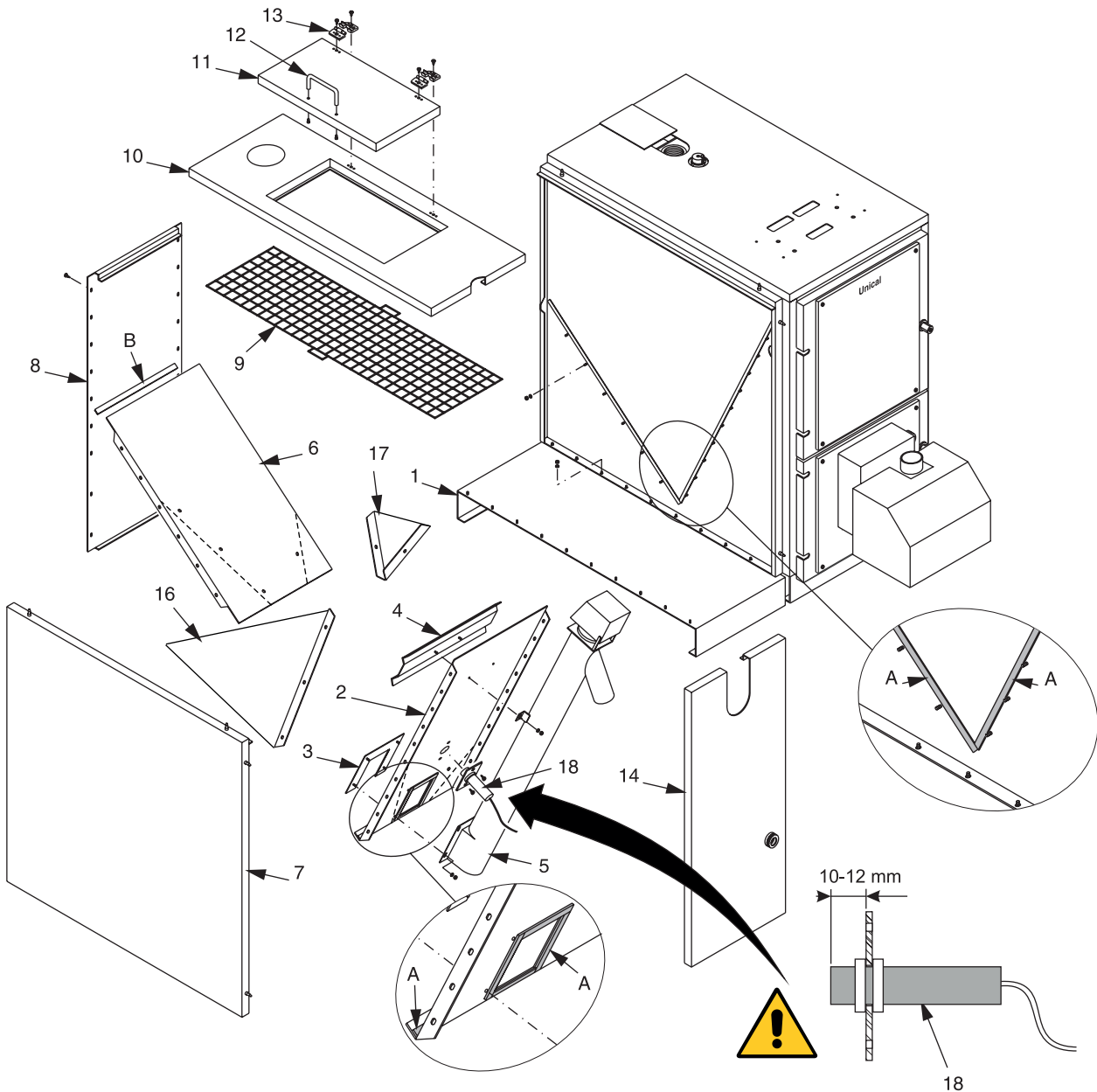
Fasten the base to the side casing using the washers and nuts supplied in the accessory box.

- Assemble "on the ground" the parts pos. 2, 3, and 4 with the screw unit.

While assembling, verify the correct positioning of the sealing gasket (detail A).

- Fasten the panel (pos. 2) to the side boiler casing.
- Fasten the panel (pos. 6) to the side boiler casing.

- Fit on the base the side panel (pos. 7) and secure it to the panels (pos. 2 and 6) as well as to the base itself.
- Assemble the rear panel (pos. 8) making sure that the profile (pos. B) overlaps the panel (pos. 6).
- Attach the two triangular sheets (pos. 16 and 17) to panels 2 and 6.
- Place the grate pos. 9 above the tank.
- Hook the upper panel pos. 10 to the 2 sides of the tank.
- Mount the central cover pos. 11 with the two hinges provided and secure the opening handle.
- The front panel pos. 14 must be mounted after the electric connections of the screw motor, level and pellet clogging sensors have been done.



Electric and probe connections

Unlatch the upper cover of the boiler, lifting it upwards.

Open the panel board by undoing the five screws with a screwdriver, and lift the top part.

Pass through the two rectangular slots on the base of the panel board: the cables with plugs for connecting the burner; the door opening micro-switch cable, and connect this to the electronic board; the connecting cable to the power line, and connect this; the fan cable, and connect this to the inverter; the cables of the relative pumps (storage tank, system, recirculation); and the gas, return and flow probes.

Pass the two wires to the plug through the hole on the right side of the boiler (on the side of the pellet container), then pass the plug through the front hole in the front of the shell of the pellet container, and connect the plug to the burner keeping the cables away from the door of the boiler.

Attach the micro-switch (pos. 2) to the boiler body, making sure it fits correctly with the control plate below the bottom door.

Insert the system flow probe and the water safety thermostat in the rear pit on the boiler body above the smoke chamber.

Insert the arc contact spring and fasten the capillaries with the fixing clip.

Put the return probe in the relative pit at the bottom of the boiler.

Insert the flue gas temperature thermocouple in the relative sheath of the flue gas outlet section.

Connect the power supply of the screw and the pellet level sensor, passing the cables from the connection point on the burner through the hole at the front of the pellet container, making sure the cables do not touch the front door of the boiler.

Position the top shell of the boiler, moving any power cables to the back of the boiler and attaching these with cable ties.

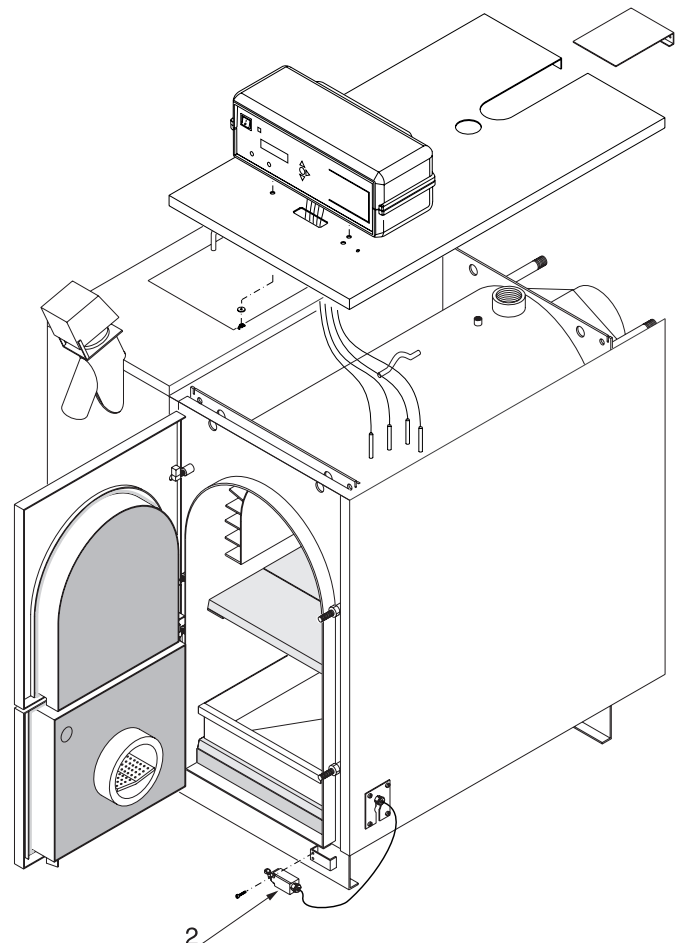
The screw motor must be connected with the cable which is supplied already wired to the panel board.
To perform this connection, remove the upper protective casing of the screw motor.

Close the doors of the boiler and connect the pellet feeding hose between the screw and the burner, securing it with the two provided clamps.

Keep the electric cables from coming into contact with the smoke chamber and/or parts of it or from being cut by friction.

A silicon gasket has been fitted on the top part of the rear plate of the boiler for this purpose.

- Apply the boiler TECHNICAL DATA plate and the LOCAL VENTILATION REQUIREMENTS label on the right side of the casing after having cleaned the concerned area and removed any grease with a suitable solvent.
Remove the protective film from the plates and apply them making sure they stick perfectly.
Do not remove the plates as they would then no longer stick.



3.9 - CONNECTION TO THE FLUE

To connect the flue gas exhaust pipe, local and national standards must be observed.

The chimney is essential to good boiler operation: accordingly, the chimney needs to be water-proof and well-insulated.

Old or new chimneys, built without respecting the specific requirements, can be recovered by "piping" the chimney itself. It will be necessary to introduce a metallic pipe inside the existing chimney and insulate the space between the metallic pipe and the chimney.

Chimneys made of prefabricated blocks must have perfectly sealed joints to avoid that flue condensate smudging the walls due to permeation.

The entrance to the chimney should be at a 45° angle.

At the base of the chimney a flue inspection opening has to be made.

It is recommended to insulate the pipe connecting to the chimney to reduce heat loss and noise.

The dimensions of the chimney must guarantee the draught required to properly operate the boiler.

An insufficient draught, besides causing smoke leakage from the generator, it considerably reduces the heat output. On the contrary, an excessive draught causes an abnormal heat output increase, a higher flue gas temperature in the chimney and too much fuel consumption.



Use only exhaust pipes suitable for the type of fuel used.

The supplier will have no contractual or extra-contractual liability for damage caused due to incorrect installation and use and anyway failure to comply with the instructions provided by the manufacturer.



It is prohibited to exhaust PELLEXIA combustion products in shared smoke pipes.



The flue must comply with the standards in force.

The flue gas chimney must be made properly to favour the normal flow of flue gas from the combustion chamber towards the outside in the case of a power outage.

Remember that the elimination of excess heat is managed optimally by the electronic control unit.

The following are the main features of the flue gas exhaust pipe according to that established by standards UNI 7129 and UNI 10683:

- The flue gas exhaust pipe must have airtight inspection ports;
- The minimum height of the pipe connected directly to the flue gas exhaust is between 2-3 m;
- If a horizontal section is inevitable, it is recommended that it be no longer than 1.5 m at most and at a gradient of 3-5% to favour the escape of the flue gas;
- **A weatherproof terminal must be used** to avoid altering the slight state of overpressure found in the flue (do not fit a horizontal section at the end of the pipe);
- The exhaust ducts must be made with material resistant to combustion products and condensation (the inspection valve can drain any condensation which may be formed);

- Pipes must be built in such a way to guarantee maximum smoke tightness (UNI 10683);
- It is recommended to insulate the piping, especially the outside part exposed to foul weather.

Do not make sections fully horizontal.

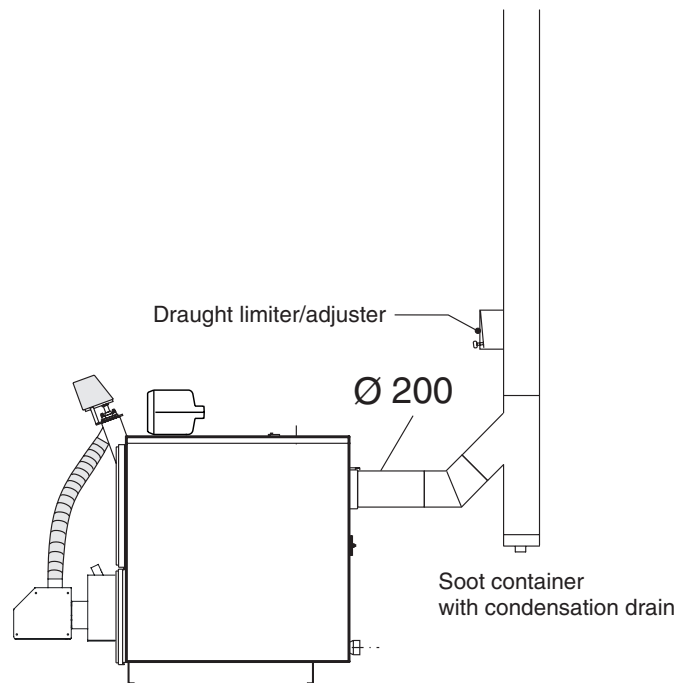
There must be no flue gas exhaust hoods installed or already existing in the room where the heat generator is installed to avoid creating a vacuum in the environment.

It is prohibited to close the air vents.

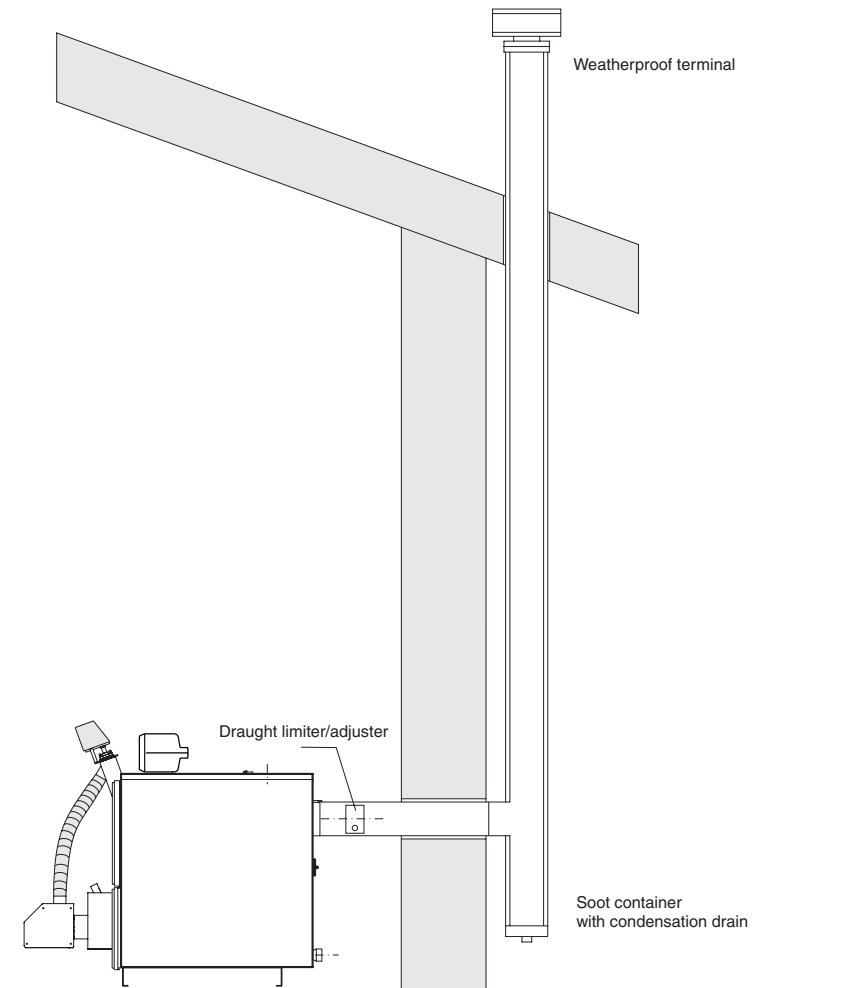
Have the flue cleaned at least once a year; we therefore recommend having both the chimney and the flue gas fitting thoroughly cleaned.



Should the flue or piping catch fire, immediately switch the boiler off and disconnect it from the household electrical mains.



3.8.1 - EXHAUST THROUGH EXTERNAL WALL

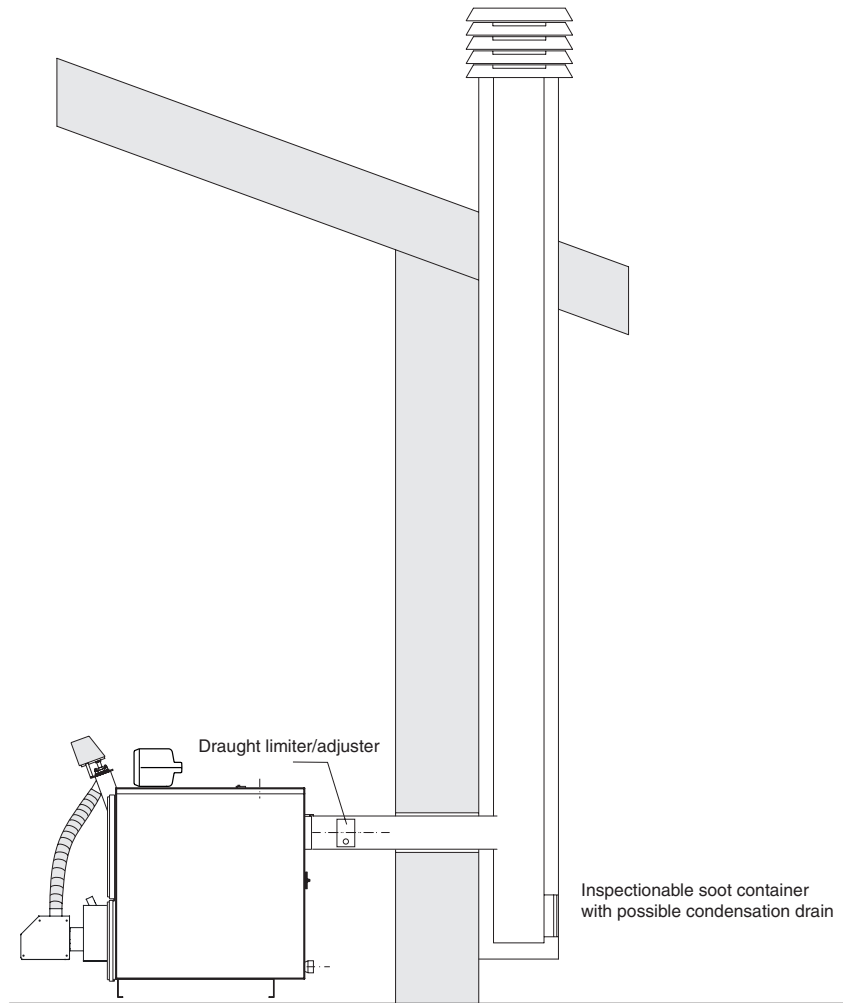


One of the installation solutions which can be adopted is that of positioning the PELLEXIA near a perimeter wall of the home so that flue gas is discharged directly outside. Here are some guidelines from the standard UNI 7129 for this particular type of configuration:

- Always provide an inspection valve which allows you to perform efficient and periodical cleaning as well as draining any condensation formed;
- The chimney must be strictly wind and rain proof;
- Appropriately insulate the flue gas exhaust pipe in the section passing through the wall.

The flue gas exhaust pipe, if completely outside, should be made in double wall stainless steel to guarantee both greater resistance to atmospheric agents and a sufficient flue gas temperature.

3.8.2 - EXHAUST THROUGH ROOF BY MEANS OF TRADITIONAL FLUE



The pellet combustion flue gas can also be discharged using a traditional pre-existing flue as long it is made to standard (see UNI 10683).

We will briefly list some of the main features highlighted by the standard which characterise a good chimney:

- Adequate insulation especially in the outside section exposed to the atmosphere;
- Constant internal cross-section (there must be no cross-section constrictions);
- Made with material resistant to high temperatures, to the action of combustion products and to the corrosive action of condensation which could be formed;
- Predominantly vertical with deviations no greater than 45°.

It is recommended to provide a solid material and/or condensation collection chamber which can be inspected through an airtight door.

It is recommended to abide by that established by standards UNI 9615 and 9731 for the dimensioning of the chimney cross-sections and anyhow not to make pipes with a cross-section less than 100 mm.

If there are larger cross-sections, a steel pipe must be inserted inside the masonry duct.



The steel pipe must be sufficiently insulated with high temperature resistant material and sealed from the outer chimney.

3.9 - ELECTRICAL CONNECTIONS

General warnings

The electrical safety of the appliance is guaranteed only when it has been properly connected to an efficient earthing system, carried out as intended by safety standards in force: pipes of the gas, water and heating systems are absolutely unsuitable as earthing electrodes.

It is necessary to verify this fundamental safety requirement. If in doubt, have the electric system carefully checked by professionally qualified personnel as the manufacturer is not liable for damage caused by failure to provide an earthing system.

Have professionally qualified personnel check that the electric system is adequate for the maximum power absorbed by the appliance, indicated on the data plate. Make sure in particular that the cross-section of the cables is suitable for the power absorbed by the appliance.

Adapters, multiple sockets and/or extension cords cannot be used to power the appliance.

Use of any type of component using electric energy requires the observance of some fundamental rules, such as:

- do not touch the appliance with wet and/or moist parts of the body and/or in bare feet;
- do not pull the electric cables;
- do not leave the appliance exposed to atmospheric agents (rain, sun, etc.) unless expressly designed;
- do not allow children or unskilled persons to use the appliance.

230V electric power supply connection

The electrical connections are described in sections 3.16.

Boiler installation requires connection to a 230 V - 50 Hz electric mains:

This connection must be set up according to standard, as intended by current IEC regulations.

Danger!



Only a qualified technician may perform the electrical installation. Before performing connections or any type of operation on electrical parts, always disconnect electrical power and make sure that it cannot be reconnected accidentally.

Remember that a bipolar switch must be installed on the boiler power line with over 3 mm between contacts, easy to access, making maintenance quick and safe.

The power cable must be replaced by authorised technical personnel. Failure to comply with the above can jeopardise the safety of the appliance.

Attention!



- **Before opening the panel board, isolate the boiler from mains via a device having, at least, a 3 mm in the switch contacts (e.g.: safety devices or power switches) and make sure it cannot be switched ON accidentally and move the main switch (1) to pos. "0"!**
- **Do not connect loads to the panel board which absorb more than 6A overall!**



Approvals

The UNICAL panel board for PELLEXIA boilers received the EC approval according to the standard EN 60335-1.



Technical data plate and serial number of the panel board.

The identification plate of the panel board is glued on the base.

Use

This panel board must be used to operate a boiler intended to heat water at a temperature which does not exceed the boiling point when installed.

3.10 - FILLING THE SYSTEM



NOTE

Before filling the system, check the preload of the expansion vessel which must be 1.5 bar, and adjust it if the pressure is any less.

In systems equipped with a closed expansion vessel, the water pressure in the heating system - with the system cold - must not drop below 1 bar; open the filling tap when the pressure is too low. This operation must be performed with a cooled system.

The pressure gauge fitted on the system allows you to read the circuit pressure.



Attention!

Do not mix the heating water with incorrect concentrations of antifreeze or anti-corrosion substances! This could damage the gaskets and cause noise during operation.

Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the instruction above.



After making all the hydraulic connections, fill the boiler and check the soundness of all the connections.

This operation must be performed carefully, respecting the following phases:

- open the bleeder valves of the radiators, radiant batteries and/or distribution manifolds;
- open the system filling tap gradually, making sure that the automatic air release valves installed on the system work properly;
- close the bleeder valves of the radiators, radiant batteries and/or distribution manifolds as soon as water comes out;
- check the pressure gauge until the pressure reaches approximately 1 bar.
- close the system filling tap and bleed air once again through the bleeder valves of the radiators, radiant batteries and/or distribution manifolds;
- make sure that all the connections are water-tight;
- after commissioning the boiler and bringing the system to the operating temperature, stop the pumps and repeat the air bleed operations;
- let the system cool off and, if necessary, return the water pressure to 1 bar.

3.11 - HYDRAULIC BASE DIAGRAMS

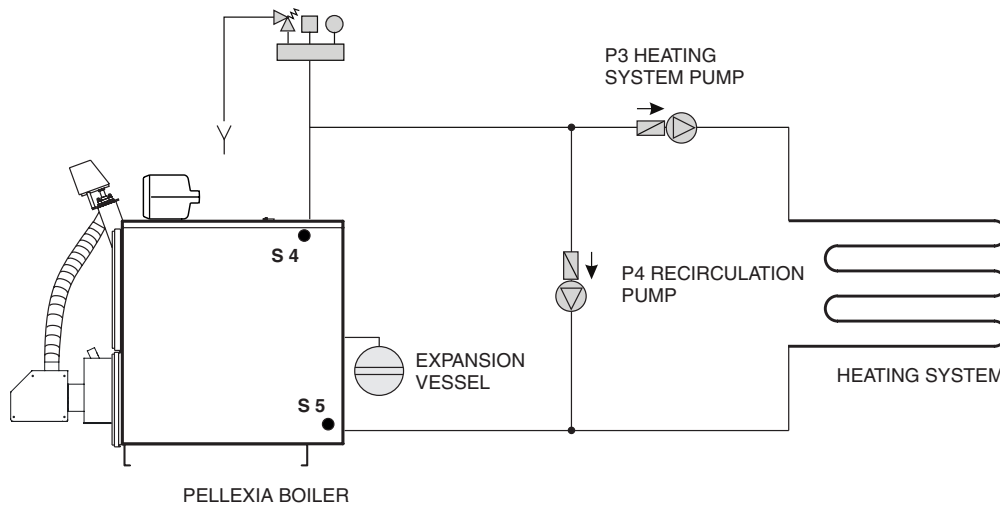
The following diagrams are for reference only and therefore are not binding. Unical declines any responsibility for errors or omissions.

3.11.1 - SYSTEM WITH PELLEXIA BOILER FOR HEATING

In this diagram, the boiler is connected only to the heating circuit and requires the "P3 heating system pump" and the "P4 recirculation pump".

NB: The P4 recirculation and balancing pump is essential; it serves the purpose of balancing the flow and return temperature of the boiler and adds cold water when necessary to prevent the risk of condensation.

The **P3** heating system pump is enabled in Winter mode. It is triggered by the ambient chronothermostat (input 15-16 on the control unit) and when the boiler temperature exceeds the minimum value (which is normally 60°C).



Sensor legend:

S4: flow temperature sensor of the boiler

S5: return temperature sensor of the boiler



ATTENTION:

In the case of a system with closed expansion vessel, the installer must assemble a minimum/maximum water pressure switch and the safety heat exchanger.

Parameter	LIST OF PARAMETERS	PELLEXIA 34	PELLEXIA 45
		DEFAULT SETTINGS	DEFAULT SETTINGS
0	Boiler operating temperature (°C)	75	75
1	Minimum boiler temperature (°C)	60	60
2	Maximum boiler temperature for alarm (°C)	90	90
3	Start temperature for filling storage tank (°C).	55	55
4	End temperature for filling storage tank (°C).	65	65
5	Maximum temperature for storage tank (solar protection) (°C).	90	90
6	Thermostat control temperature tolerance band for heating (°C)	5	5
7	Temperature tolerance band for filling storage tank (°C)	6	6
8	Maximum temperature tolerance band for boiler body (°C)	4	4
9	Temperature tolerance band for operating solar panels (°C)	10	10
10	Maximum operating time of burner (hours)	5	5
11	Number of burner start-up attempts	2	2
12	Duration of burner flame ignition cycle (minutes)	15	15
13	Time for detecting stability of burner flame (seconds)	30	30
14	Modulation of fuel and air to adjust boiler temperature	8	10
15	Time for cleaning burner (seconds)	40	40
16	Time for pre-igniting the burner (seconds)	60	60
17	Time for preloading fuel (seconds)	100	100
18	Pre-combustion/combustion time (minutes)	5	5
19	Time for running the screw motor ON (seconds)	13	22
20	Time for pausing the screw motor OFF (seconds)	13	13
21	Time for post-rotation of screw 2 (seconds)	5	5
22	Time for final cleaning of burners (seconds)	5	5
23	Fan speed with burner running	180	180
24	Fan speed during burner combustion	165	185
25	Maximum operating temperature of the solar panels (°C)	160	160
26	Minimum flue gas temperature for detecting start-up of burner (°C)	60	60
27	Maximum flue gas temperature of burner with modulation of -15°C	220	220
28	PROBE CONFIGURATION PARAMETER		
	Probe 0 at 0 if absent or at -1 if present	0	0
	Probe 2 at 0 if absent or at -2 if present	0	0
	Probe 3 at 0 if absent or at -4 if present	0	0
	Probe 4 at 0 if absent or at -8 if present	8	8
	Probe 5 at 0 if absent or at -16 if present	16	16
	Parameter to be used for configuring probes	24	24
29	FUNCTIONAL CONFIGURATION PARAMETER		
	Def. 1 = at 0 if storage tank absent or at -1 if storage tank present	0	0
	Def. 2 = at 0 if coil-type storage tank or at -2 if Combi or Puffer storage tank	0	0
	Def. 3 = at 0 if solar panel absent or at -4 if solar panel present	0	0
	Def. 4 = at 0 for optical ignition detection or at -8 for flue gas ignition detection	0	0
	Parameter to be entered for functional settings	0	0
30	Language selection: 0 = Italian - 2 = English - 4 = French - 6 = Spanish	0	0

3.11.2 - PELLEXIA BOILER SYSTEM FOR HEATING AND FOR THE PRODUCTION OF DOMESTIC HOT WATER, WITH SINGLE-COIL TYPE STORAGE TANK

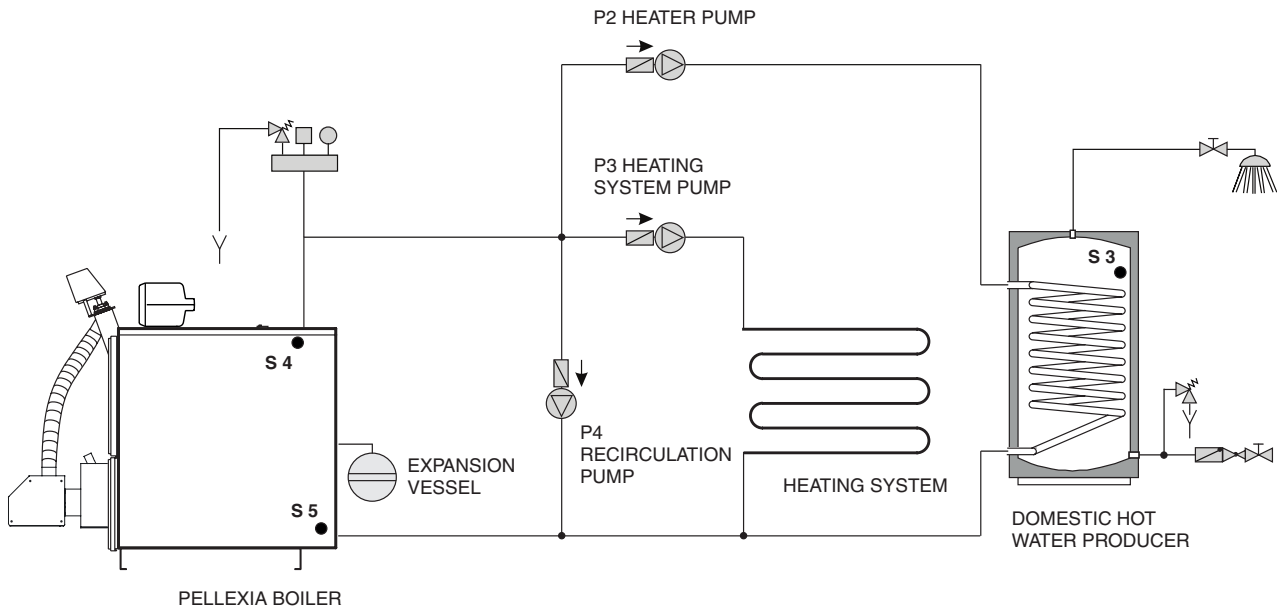
In this diagram, the boiler is connected to both the heating system and to a domestic hot water storage tank; there are the **P3** heating system pump, the **P2** storage tank pump, and the recirculation pump.

NB: The P4 recirculation and balancing pump is essential; it serves the purpose of balancing the flow and return temperature of the boiler and adds cold water when necessary to prevent the risk of condensation.

The **S3** probe is required to install and run the storage tank because it controls the temperature and the priority of either heating or hot water.

When the temperature of the storage tank falls below the minimum threshold, the control unit prioritises domestic hot water.

The storage tank pump is enabled when the boiler temperature (the **S4** probe) is above the minimum boiler temperature (normally 60°C); the storage tank pump is also enabled when the **S4** boiler flow probe detects a temperature above that of the **S3** probe plus a heat differential (normally 6°C).



Sensor legend:

S3: temperature sensor at the top of the storage tank

S4: flow temperature sensor of the boiler

S5: return temperature sensor of the boiler



ATTENTION:

In the case of a system with closed expansion vessel, the installer must assemble a minimum/maximum water pressure switch and the safety heat exchanger.

Parameter	LIST OF PARAMETERS	PELLEXIA 34	PELLEXIA 45
		FACTORY SETTINGS	FACTORY SETTINGS
0	Boiler operating temperature (°C)	75	75
1	Minimum boiler temperature (°C)	60	60
2	Maximum boiler temperature for alarm (°C)	90	90
3	Start temperature for filling storage tank (°C).	55	55
4	End temperature for filling storage tank (°C).	65	65
5	Maximum temperature for storage tank (solar protection) (°C).	90	90
6	Thermostat control temperature tolerance band for heating (°C)	5	5
7	Temperature tolerance band for filling storage tank (°C)	6	6
8	Maximum temperature tolerance band for boiler body (°C)	4	4
9	Temperature tolerance band for operating solar panels (°C)	10	10
10	Maximum operating time of burner (hours)	5	5
11	Number of burner start-up attempts	2	2
12	Duration of burner flame ignition cycle (minutes)	15	15
13	Time for detecting stability of burner flame (seconds)	30	30
14	Modulation of fuel and air to adjust boiler temperature	8	10
15	Time for cleaning burner (seconds)	40	40
16	Time for pre-igniting the burner (seconds)	60	60
17	Time for preloading fuel (seconds)	100	100
18	Pre-combustion/combustion time (minutes)	5	5
19	Time for running the screw motor (seconds)	13	22
20	Time for pausing the screw motor (seconds)	13	13
21	Time for post-rotation of screw 2 (seconds)	5	5
22	Time for final cleaning of burners (seconds)	5	5
23	Fan speed with burner running	180	180
24	Fan speed during burner combustion	165	185
25	Maximum operating temperature of the solar panels (°C)	160	160
26	Minimum flue gas temperature for detecting start-up of burner (°C)	60	60
27	Maximum gas flue temperature of burner with modulation of -15°C	220	220
28	PROBE CONFIGURATION PARAMETER		
	Probe 0 at 0 if absent or at -1 if present	0	0
	Probe 2 at 0 if absent or at -2 if present	0	0
	Probe 3 at 0 if absent or at -4 if present	4	4
	Probe 4 at 0 if absent or at -8 if present	8	8
	Probe 5 at 0 if absent or at -16 if present	16	16
	Parameter to be used for configuring probes	28	28
29	FUNCTIONAL CONFIGURATION PARAMETER		
	Def. 1 = at 0 if storage tank absent or at -1 if storage tank present	1	1
	Def. 2 = at 0 if coil-type storage tank or at -2 if Combi or Puffer storage tank	0	0
	Def. 3 = at 0 if solar panel absent or at -4 if solar panel present	0	0
	Def. 4 = at 0 for optical ignition detection or at -8 for flue gas ignition detection	0	0
	Parameter to be entered for functional settings	1	1
30	Language selection: 0 = Italian - 2 = English - 4 = French - 6 = Spanish	0	0

3.11.3 - PELLEXIA BOILER SYSTEM FOR HEATING AND FOR THE PRODUCTION OF DOMESTIC HOT WATER, WITH DOUBLE-COIL TYPE STORAGE TANK + SOLAR SYSTEM

In this diagram, the boiler is connected to both the heating system and to a domestic hot water storage tank; there are the **P3** heating system pump, the **P2** storage tank pump, and the **P4** recirculation pump. The solar circuit pump is controlled by the **P1** solar panel pump.

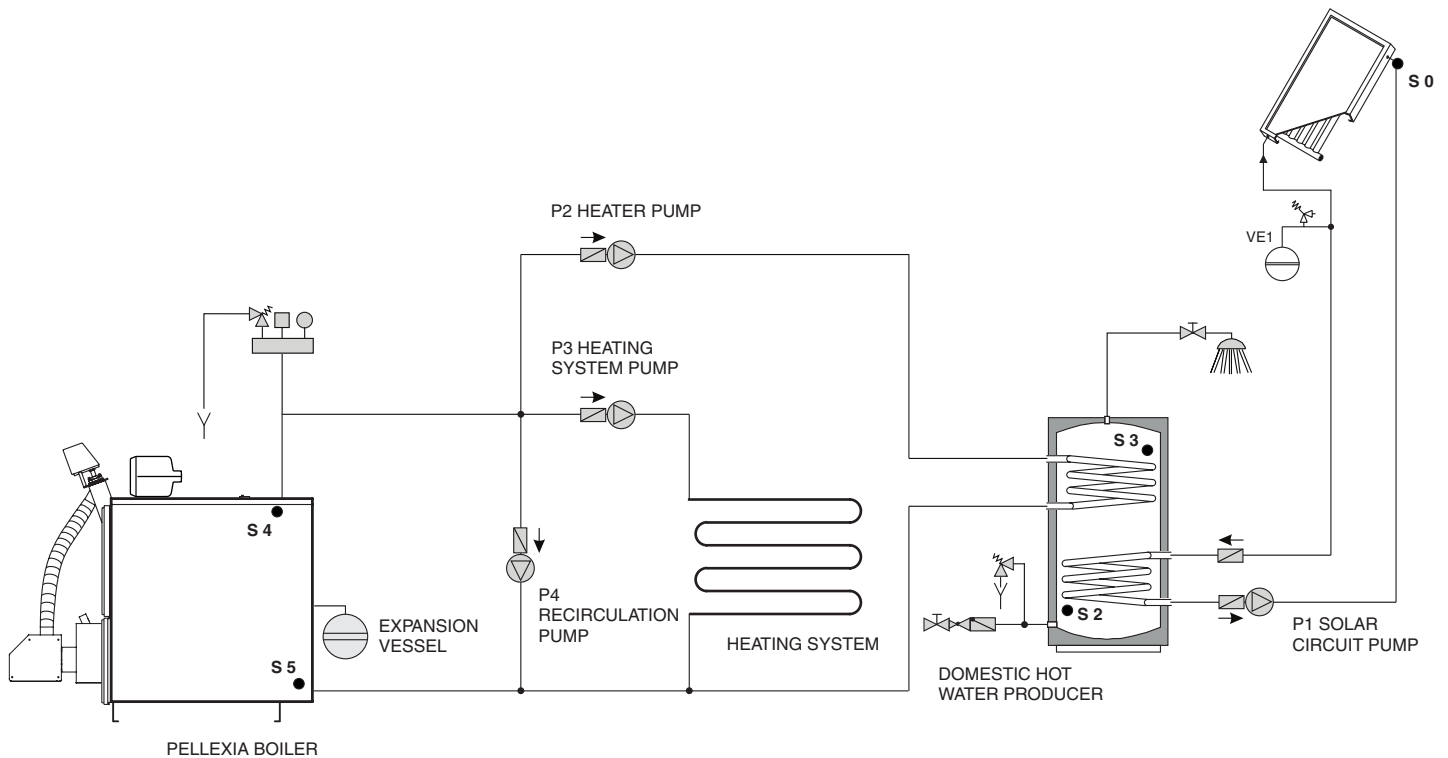
NB: The P4 recirculation and balancing pump is essential; it serves the purpose of balancing the flow and return temperature of the boiler and adds cold water when necessary to prevent the risk of condensation.

The **S3** probe is required to install and run the storage tank because it controls the temperature and the priority of either heating or hot water.

When the temperature of the storage tank falls below the minimum threshold, the control unit prioritises domestic hot water.

The **P2** storage tank pump is enabled when the boiler temperature (the **S4** probe) is above the minimum boiler temperature (normally 60°C); the storage tank pump is also enabled when the **S4** boiler flow probe detects a temperature above that of the **S3** probe plus a heat differential (normally 6°C).

The **S2** probe for the base of the storage tank (solar exchanger) and the **S0** solar panel probe need to be enabled for the use of solar panels.



Sensor legend:

- S0:** panel temperature sensor
- S2:** temperature sensor of the exchanger at the base of the storage tank
- S3:** temperature sensor at the top of the storage tank
- S4:** flow temperature sensor of the boiler
- S5:** return temperature sensor of the boiler



ATTENTION:

In the case of a system with closed expansion vessel, the installer must assemble a minimum/maximum water pressure switch and the safety heat exchanger.

Parameter	LIST OF PARAMETERS	PELLEXIA 34	PELLEXIA 45
		FACTORY SETTINGS	FACTORY SETTINGS
0	Boiler operating temperature (°C)	75	75
1	Minimum boiler temperature (°C)	60	60
2	Maximum boiler temperature for alarm (°C)	90	90
3	Start temperature for filling storage tank (°C).	55	55
4	End temperature for filling storage tank (°C).	65	65
5	Maximum temperature for storage tank (solar protection) (°C).	90	90
6	Thermostat control temperature tolerance band for heating (°C)	5	5
7	Temperature tolerance band for filling storage tank (°C)	6	6
8	Maximum temperature tolerance band for boiler body (°C)	4	4
9	Temperature tolerance band for operating solar panels (°C)	10	10
10	Maximum operating time of burner (hours)	5	5
11	Number of burner start-up attempts	2	2
12	Duration of burner flame ignition cycle (minutes)	15	15
13	Time for detecting stability of burner flame (seconds)	30	30
14	Modulation of fuel and air to adjust boiler temperature	8	10
15	Time for cleaning burner (seconds)	40	40
16	Time for pre-igniting the burner (seconds)	60	60
17	Time for preloading fuel (seconds)	100	100
18	Pre-combustion/combustion time (minutes)	5	5
19	Time for running the screw motor (seconds)	13	22
20	Time for pausing the screw motor (seconds)	13	13
21	Time for post-rotation of screw 2 (seconds)	5	5
22	Time for final cleaning of burners (seconds)	5	5
23	Fan speed with burner running	180	180
24	Fan speed during burner combustion	165	185
25	Maximum operating temperature of the solar panels (°C)	160	160
26	Minimum flue gas temperature for detecting start-up of burner (°C)	60	60
27	Maximum gas flue temperature of burner with modulation of -15°C	220	220
28	PROBE CONFIGURATION PARAMETER		
	Probe 0 at 0 if absent or at -1 if present	1	1
	Probe 2 at 0 if absent or at -2 if present	2	2
	Probe 3 at 0 if absent or at -4 if present	4	4
	Probe 4 at 0 if absent or at -8 if present	8	8
	Probe 5 at 0 if absent or at -16 if present	16	16
	Parameter to be used for configuring probes	31	31
29	FUNCTIONAL CONFIGURATION PARAMETER		
	Def. 1 = at 0 if storage tank absent or at -1 if storage tank present	1	1
	Def. 2 = at 0 if coil-type storage tank or at -2 if Combi or Puffer storage tank	0	0
	Def. 3 = at 0 if solar panel absent or at -4 if solar panel present	4	4
	Def. 4 = at 0 for optical ignition detection or at -8 for flue gas ignition detection	0	0
	Parameter to be entered for functional settings	5	5
30	Language selection: 0 = Italian - 2 = English - 4 = French - 6 = Spanish	0	0

3.11.4 - PELLEXIA BOILER SYSTEM FOR HEATING AND FOR THE PRODUCTION OF DOMESTIC HOT WATER, WITH PUFFER

This diagram shows a stratification heat storage tank for the production of domestic hot water. The diagram shows the **P4** recirculation pump, the **P3** heating system pump, and the **P2** storage tank pump.

NB: The P4 circulation and balancing pump is essential; it serves the purpose of balancing the flow and return temperature of the boiler and adds cold water when necessary to prevent the risk of condensation. A mixing valve is essential in several areas of the system.

The **S3** and **S2** probes are required in this configuration.

The **P2** storage tank pump is enabled when the boiler temperature (the **S4** probe) is above the minimum boiler temperature (normally 60°C).

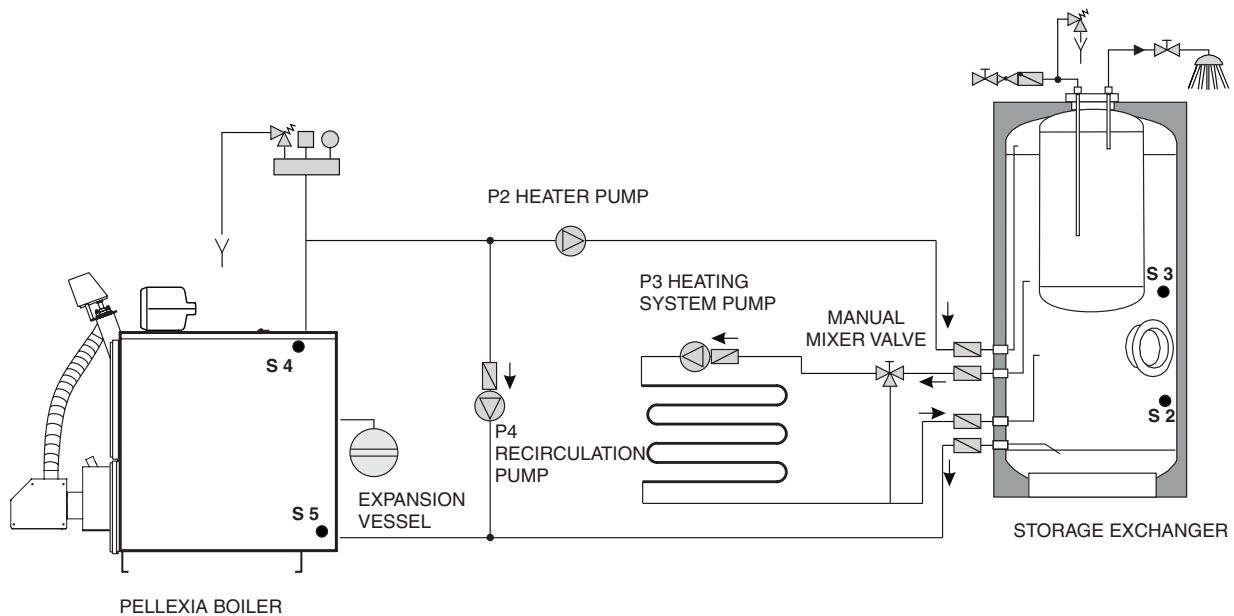
The storage tank pump is enabled when the **S4** boiler flow probe detects a temperature above that of the **S2** probe plus a heat differential (normally 6°C).

Running the heating system:

In this configuration, the **P3** heating system pump is connected directly to the storage tank and depends, therefore, not on the boiler temperature but on the temperature of the storage tank.

The **S3** probe controls the heating circuit.

If the temperature of the storage tank is, therefore, equal to or greater than the minimum temperature, the input chronothermostat enables the heating system pump even when the boiler is cold.



Sensor legend:

- S2:** temperature sensor at base of storage tank
- S3:** temperature sensor at top of storage tank
- S4:** flow temperature sensor of the boiler
- S5:** return temperature sensor of the boiler



ATTENTION:

In the case of a system with closed expansion vessel, the installer must assemble a minimum/maximum water pressure switch and the safety heat exchanger.

Parameter	LIST OF PARAMETERS	PELLEXIA 34	PELLEXIA 45
		FACTORY SETTINGS	FACTORY SETTINGS
0	Boiler operating temperature (°C)	75	75
1	Minimum boiler temperature (°C)	60	60
2	Maximum boiler temperature for alarm (°C)	90	90
3	Start temperature for filling storage tank (°C).	55	55
4	End temperature for filling storage tank (°C).	65	65
5	Maximum temperature for storage tank (solar protection) (°C).	90	90
6	Thermostat control temperature tolerance band for heating (°C)	5	5
7	Temperature tolerance band for filling storage tank (°C)	6	6
8	Maximum temperature tolerance band for boiler body (°C)	4	4
9	Temperature tolerance band for operating solar panels (°C)	10	10
10	Maximum operating time of burner (hours)	5	5
11	Number of burner start-up attempts	2	2
12	Duration of burner flame ignition cycle (minutes)	15	15
13	Time for detecting stability of burner flame (seconds)	30	30
14	Modulation of fuel and air to adjust boiler temperature	8	10
15	Time for cleaning burner (seconds)	40	40
16	Time for pre-igniting the burner (seconds)	60	60
17	Time for preloading fuel (seconds)	100	100
18	Pre-combustion/combustion time (minutes)	5	5
19	Time for running the screw motor (seconds)	13	22
20	Time for pausing the screw motor (seconds)	13	13
21	Time for post-rotation of screw 2 (seconds)	5	5
22	Time for final cleaning of burners (seconds)	5	5
23	Fan speed with burner running	180	180
24	Fan speed during burner combustion	165	185
25	Maximum operating temperature of the solar panels (°C)	160	160
26	Minimum flue gas temperature for detecting start-up of burner (°C)	60	60
27	Maximum gas flue temperature of burner with modulation of -15°C	220	220
28	PROBE CONFIGURATION PARAMETER		
	Probe 0 at 0 if absent or at -1 if present	0	0
	Probe 2 at 0 if absent or at -2 if present	2	2
	Probe 3 at 0 if absent or at -4 if present	4	4
	Probe 4 at 0 if absent or at -8 if present	8	8
	Probe 5 at 0 if absent or at -16 if present	16	16
	Parameter to be used for configuring probes	30	30
29	FUNCTIONAL CONFIGURATION PARAMETER		
	Def. 1 = at 0 if storage tank absent or at -1 if storage tank present	1	1
	Def. 2 = at 0 if coil-type storage tank or at -2 if Combi or Puffer storage tank	2	2
	Def. 3 = at 0 if solar panel absent or at -4 if solar panel present	0	0
	Def. 4 = at 0 for optical ignition detection or at -8 for flue gas ignition detection	0	0
	Parameter to be entered for functional settings	3	3
30	Language selection: 0 = Italian - 2 = English - 4 = French - 6 = Spanish	0	0

3.11.5 - PELLEXIA BOILER SYSTEM FOR HEATING AND FOR THE PRODUCTION OF DOMESTIC HOT WATER, WITH PUFFER + SOLAR SYSTEM

This diagram shows a stratification heat storage tank for the production of domestic hot water.

The diagram shows the **P4** recirculation pump, the **P3** heating system pump, the **P2** storage tank pump, and the **P1** solar panel pump.

NB: The P4 recirculation and balancing pump is essential; it serves the purpose of balancing the flow and return temperature of the boiler and adds cold water when necessary to prevent the risk of condensation. A mixing valve is essential in several areas of the system.

This configuration requires the **S3**, **S2** and **S0** probes for the use of solar panels.

The **P2** storage tank pump is enabled when the boiler temperature (the **S4** probe) is above the minimum boiler temperature (normally 60°C).

The **P2** storage tank pump is enabled when the **S4** boiler flow probe detects a temperature above that of the **S2** probe plus a heat differential (normally 6°C).

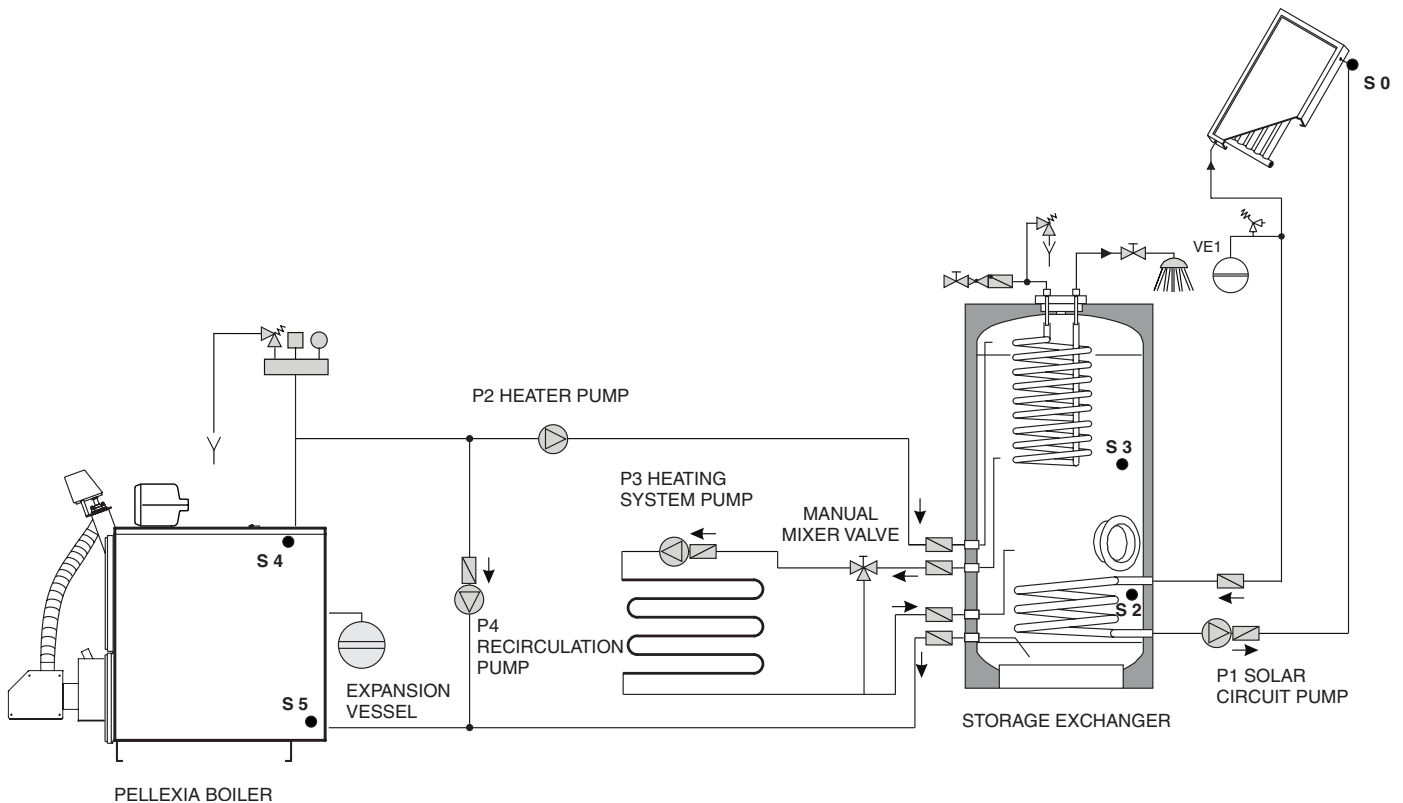
Running the heating system:

In this configuration, the **P3** heating system pump is connected directly to the storage tank and depends, therefore, not on the boiler temperature but on the temperature of the storage tank.

The **S3** probe controls the heating circuit.

If the temperature of the storage tank is, therefore, equal to or greater than the minimum temperature, the input chronothermostat enables the heating system pump even when the boiler is cold.

The **S0** probe needs to be enabled to run the solar circuit.



Sensor legend:

S0: panel temperature sensor

S2: temperature sensor at base of storage tank

S3: temperature sensor at top of storage tank

S4: flow temperature sensor of the boiler

S5: return temperature sensor of the boiler



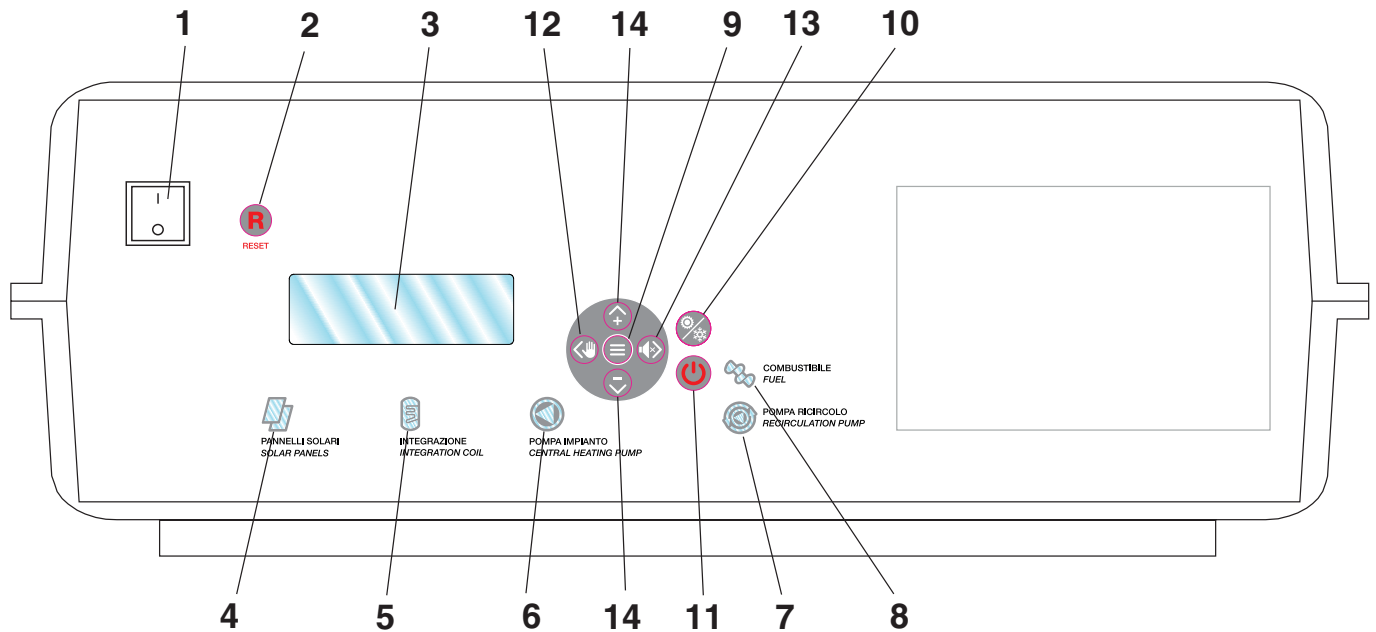
ATTENTION:

In the case of a system with closed expansion vessel, the installer must assemble a minimum/maximum water pressure switch and the safety heat exchanger.

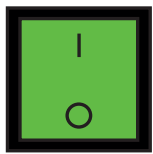
Parameter	LIST OF PARAMETERS	PELLEXIA 34	PELLEXIA 45
		FACTORY SETTINGS	FACTORY SETTINGS
0	Boiler operating temperature (°C)	75	75
1	Minimum boiler temperature (°C)	60	60
2	Maximum boiler temperature for alarm (°C)	90	90
3	Start temperature for filling storage tank (°C).	55	55
4	End temperature for filling storage tank (°C).	65	65
5	Maximum temperature for storage tank (solar protection) (°C).	90	90
6	Thermostat control temperature tolerance band for heating (°C)	5	5
7	Temperature tolerance band for filling storage tank (°C)	6	6
8	Maximum temperature tolerance band for boiler body (°C)	4	4
9	Temperature tolerance band for operating solar panels (°C)	10	10
10	Maximum operating time of burner (hours)	5	5
11	Number of burner start-up attempts	2	2
12	Duration of burner flame ignition cycle (minutes)	15	15
13	Time for detecting stability of burner flame (seconds)	30	30
14	Modulation of fuel and air to adjust boiler temperature	8	10
15	Time for cleaning burner (seconds)	40	40
16	Time for pre-igniting the burner (seconds)	60	60
17	Time for preloading fuel (seconds)	100	100
18	Pre-combustion/combustion time (minutes)	5	5
19	Time for running the screw motor (seconds)	13	22
20	Time for pausing the screw motor (seconds)	13	13
21	Time for post-rotation of screw 2 (seconds)	5	5
22	Time for final cleaning of burners (seconds)	5	5
23	Fan speed with burner running	180	180
24	Fan speed during burner combustion	165	185
25	Maximum operating temperature of the solar panels (°C)	160	160
26	Minimum flue gas temperature for detecting start-up of burner (°C)	60	60
27	Maximum gas flue temperature of burner with modulation of -15°C	220	220
28	PROBE CONFIGURATION PARAMETER		
	Probe 0 at 0 if absent or at -1 if present	1	1
	Probe 2 at 0 if absent or at -2 if present	2	2
	Probe 3 at 0 if absent or at -4 if present	4	4
	Probe 4 at 0 if absent or at -8 if present	8	8
	Probe 5 at 0 if absent or at -16 if present	16	16
	Parameter to be used for configuring probes	31	31
29	FUNCTIONAL CONFIGURATION PARAMETER		
	Def. 1 = at 0 if storage tank absent or at -1 if storage tank present	1	1
	Def. 2 = at 0 if coil-type storage tank or at -2 if Combi or Puffer storage tank	2	2
	Def. 3 = at 0 if solar panel absent or at -4 if solar panel present	4	4
	Def. 4 = at 0 for optical ignition detection or at -8 for flue gas ignition detection	0	0
	Parameter to be entered for functional settings	7	7
30	Language selection: 0 = Italian - 2 = English - 4 = French - 6 = Spanish	0	0

3.12 - PANEL BOARD

3.12.1 - FRONT OF PANEL BOARD



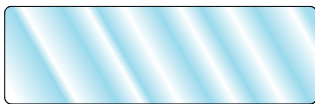
KEY



1. - Main switch



2. - Control unit general reset button



3. - Control unit screen with four lines of 20 digits



4. - Warning light: Solar panels



5. - Warning light: Storage tank P2 pump



6. - Warning light: P3 heating pump



7. - Warning light: P4 boiler recirculation



8. - Warning light: Fuel screw



9. - Key to access the settings and parameters configuration menu (**restricted to the authorised technician**)



10. - Key for selecting the season: Summer/Winter



11. - Set-up key: Off/Automatic Burner/Reset manually resettable alarms



12. - Priority selection key: Production of domestic hot water/Heating



13. - Silence alarm key



14. - Keys for scrolling through the pages on the screen



15. - Manually resettable safety thermostat

3.12.2 - MAIN TECHNICAL EQUIPMENT

The main features of the control unit are as follows:

- A microprocessor with EEPROM memory (all the settings and work modes are saved in the event of a power cut).
- Non-volatile memory (the data are saved in the memory for 10 years without power).
- Liquid crystal display with four lines of 20 digits.
- Self-diagnosis program that detects disconnection or malfunctioning of the temperature probes.
- Diagnostics and displaying of up to 8 alarms on the screen.

- Probes:
 - 4 x PTC probes with silicone insulated cable and 6 mm stainless steel tip;
 - 1 x PT1000 probe with silicone insulated cable and 6 mm stainless steel tip, for solar circuit.
 - 1 x PT1000 probe with fibreglass and metal mesh cable insulation and 6 mm stainless steel tip, for flue gas.
- Fan with incorporated speed control inverter.
- Terminal block on the side of the boiler, for the electrical connections of the pumps.
- Manually resettable mechanical safety thermostat, in the control board.

3.12.3 - USE OF THE CONTROL UNIT

The user interface is described below with reference to the picture on the previous page.

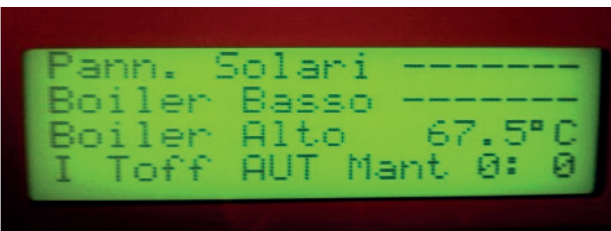
All information, like the temperature readings of the probes, the set-up and use of the boiler, and any alarms, is displayed on the screen in real time.

There are four lines of twenty digits on the screen, and the software displays all the information on three pages.

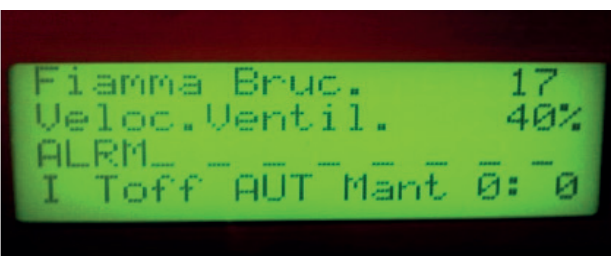
The first page displays the readings of the flow, boiler return and flue gas temperature probes.



The second page displays the readings of the solar panel probe and of the probes at the top and bottom of the storage tank.



The third page displays burner flame intensity, fan speed, and alarm status, on a scale of 0 to 255.





If the burner flame is > 20, the boiler is considered to be running. The fourth line displays information on the boiler settings and work mode.


From left to right, the first digit indicates summer (S) or winter (W) mode.


To the right is indicated the use of central heating (CH) or the priority of domestic hot water (DHW), or the use of neither (Toff).

The next two words indicate the boiler work mode and work phase, respectively.


The keypad, which has 7 keys, allows you to scroll through the pages and to select the boiler mode.


Use key nr. 14   and the arrow keys on the panel to scroll through the three pages.

Key nr. 10  allows you to switch between Summer and Winter mode.

Key nr. 11  allows you to switch between Automatic and Off mode.

You can use press this key to reset the manually resettable alarms.


Key nr. 13  allows you to manually silence the maximum temperature alarm.

Key nr. 12  allows you to manually set the priority of heating and domestic hot water when the boiler controls the heating of a storage tank.

3.12.4 - SELECTING THE WORK MODE (With key nr. 11)

There is a two-way electronic selector switch for setting either of two boiler work modes:

- 1. Automatic (AUT)
- 2. Boiler disabled (---)

To change the work mode, press key nr. 11  for a few seconds; three short "beeps" and a long one confirms your selection.

Each change of the work mode is saved on the non-volatile memory.

AUTOMATIC OPERATION OF THE BURNER

Automatic mode enables combustion in the burner.

When domestic hot water or heating is required, the electronic control unit enables combustion in the burner, running the work cycles described in the next section.

BURNER OPERATION SEQUENCE

Various phases make up the burner operation sequence. The combustion process is triggered automatically when heating or domestic hot water is required, and involves these eight distinct phases:

0. Burner in standby
1. Cleaning
2. Pre-ignition
3. Ignition
4. Pre-combustion
5. Combustion
6. Burning
7. Shutdown

Phase 0, identified as "StBy" on the screen, indicates the burner is in standby.

Phase 1, identified as "Clean" on the screen, is for cleaning the combustor; the fan runs at maximum speed and the grate of the burner is opened for initial cleaning.

Phase 2, identified as "PreIg" on the screen, is when fan speed is adjusted according to ignition speed and the igniter is enabled.

Phase 3, identified as "Ign" on the screen, involves an attempt to ignite using the pre-loaded fuel.

Phase 4, referred to as "PreC" on the screen, is the phase immediately after ignition and involves the preparation of a good bed of embers; the speed of the fan varies according to the speed of combustion, without the addition of new fuel.

Phase 5, indicated on the screen as "COMB", is when the fuel is added, and involves start and stop cycles. The system automatically varies the power according to the temperature in the boiler, the temperature of the flue gas, and the state of the embers, adjusting the fan and the supply of fuel. For example, if the fire dies down when fuel is added, the flow of combustion air is carefully adjusted in proportion to the amount of fuel, ensuring the correct stoichiometric fuel/air ratio.

Phase 6, referred to as "Burning" on the screen, is when the boiler is brought up to the working temperature, at which point fuel ceases to be supplied and combustion eventually ends. The next phase occurs after a long period of inactivity.

Phase 7, referred to as "Off" on the screen, is the shutdown phase. If there is no need for heating or domestic water, or the boiler reaches the working temperature, the flame is put out under controlled conditions and the burner is given a final clean with a jet of air at maximum speed.

During the final 30 seconds of this phase, the base of the burner is opened mechanically for cleaning the combustion grate.

DISABLING THE BOILER

In this case, combustion in the boiler is disabled while solar mode and the heating circuits remain enabled.

3.12.5 - COMBUSTION POWER MODULATION

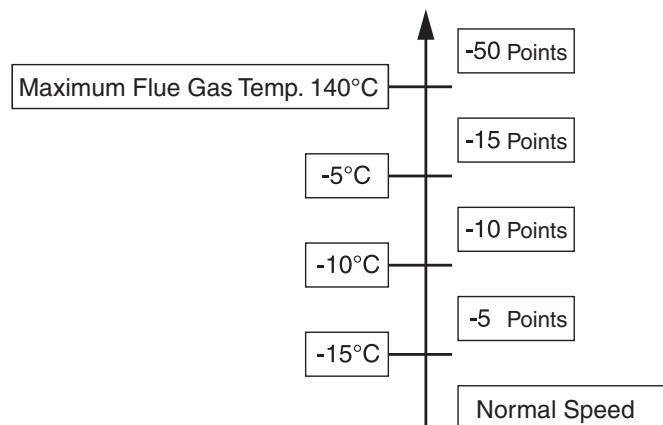
The circuit board simultaneously performs three combustion output modulations:

1. Modulation of flue gas temperature
2. Modulation of boiler temperature
3. Modulation of burner combustion (using a photosensor).

The modulation of the flue gas temperature limits the temperature of the flue gas leaving the flue. A threshold is set with the **Maximum Flue Gas Temperature** parameter, which is the nominal flue gas temperature (refer to the technical data table) + 15°C, and represents the maximum permitted amount of discharged flue gas. The system decreases the speed of the fan 15°C before the maximum temperature, in three steps of 5°C.

For example, if the maximum allowed temperature is 140°C, when the flue gas temperature rises, the fan is slowed down at a set rate of 5 points for each step. If the flue gas temperature reaches the maximum, the fan is stopped by 50 points.

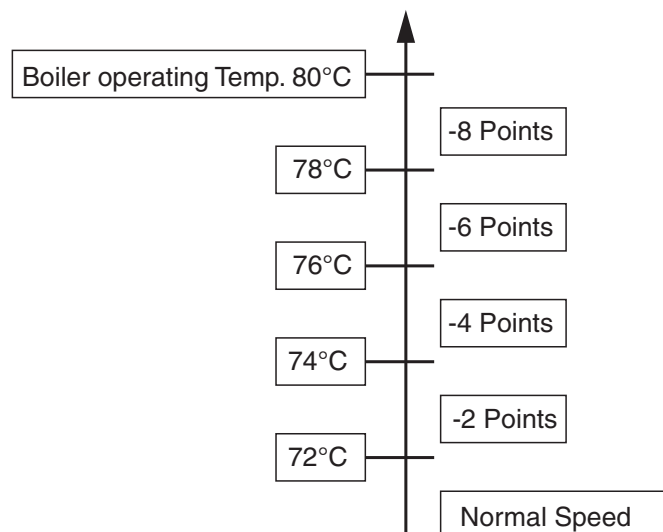
Data available to the Technician



Modulation of the boiler temperature is performed on an 8°C scale in four 2°C steps, starting from the boiler working temperature defined by parameter n° 0.

Furthermore, it is possible to set higher or lower modulation according to parameter n° 14 (Modulation Step) to adjust the fan stopping points as the temperature rises. For example, if the parameter n° 0 (Boiler working temperature) is set at 80°C and the parameter n° 14 (Modulation Step) is set at 2 points, the fan speed will be decreased by a total of 8 points.

Data available to the User






Modulation according to the state of combustion, also known as third modulation, uses a photosensor that detects the combustion flame.





The flow of air is increased as the emissions decrease, to ensure the correct amount of oxygen for optimal combustion.

The three types of modulation can be performed at the same time, calculating the decrease or increase in fan speed in a dynamic and continuous manner, for smooth adjustment.


3.12.6 - TECHNICAL PROGRAMMING MODE (ONLY QUALIFIED PERSONNEL):

Programming procedure:

- PHASE 1** In order to configure the functional parameters, press and hold the button  for about 6 seconds, until "PROGRAMMING MODE" appears on the screen.
- PHASE 2** The next page displays the first parameter (Parameter 0) with the data saved in the memory.
- PHASE 3** You can scroll through the parameters using the arrow keys  and  on the panel.

PHASE 4 Select a parameter and press the arrow key . The parameter will start flashing and you can edit it. Press the keys  and  to edit the parameter. After setting the required value, press the arrow key  to save it in the non-volatile memory.

PHASE 5 Repeat steps 3 and 4 to edit any of the other parameters.

PHASE 6 When you have done, press the key  for about 6 seconds to exit programming mode and return to the user display.

3.12.7 - CONFIGURATION OF THE PROBES (Parameter 28)

To enable or disable the probes, enter a numerical value which is the result of the sum of the weights attributed to each individual probe in "PARAMETER 30 Probes".

- S0 (solar panel flow temperature) >>> set "1"
- S2 (temperature of exchanger at base of storage tank) >>> set "2"
- S3 (temperature at top of storage tank) >>> set "4"
- S4 (flow temperature of boiler) >>> set "8"
- S5 (return temperature of boiler) >>> set "16"

The number is calculated by adding up the weight of the probes required for the work environment selected in the following "Functional settings parameter".

Example of how to set the Probes Parameter

If the boiler is used and connected for heating only, as shown in the diagrams in section 3.11.1, the two probes S4 and S5 are required. You therefore need to add $8 + 16 = 24$. The number to be entered is 24.

Please note:

If you have any trouble installing (and therefore enabling or disabling) a probe, you need to access programming mode to correctly configure the electronic control unit. Press and hold the relative key to access programming mode. Alternatively, you can use a wire to bridge the two terminals of the connector of the terminal block on the board, to disable the missing or defective probe alarm.

3.12.8 - FUNCTIONAL SETTINGS OF THE BOILER AND ACCESSORIES (Parameter 29)

This parameter allows you to configure the printed circuit-board in either of two ways:

- Heating only
- Heating and domestic hot water with coil-type storage tank
- Heating and domestic hot water with coil-type storage tank + solar panel
- Heating and use of a Puffer storage tank
- Heating and use of a Puffer storage tank + solar panel

The functional settings use the same logic as the "Function 1 parameter".

To calculate the value to be entered, add the loads assigned to the various functions of the functional parameters as follows:

Functional settings (Ref. Fig. pages 28, 30, 32, 34 and 36).

System without BOILER >>> set "0"

System with STORAGE TANK >>> set "1"

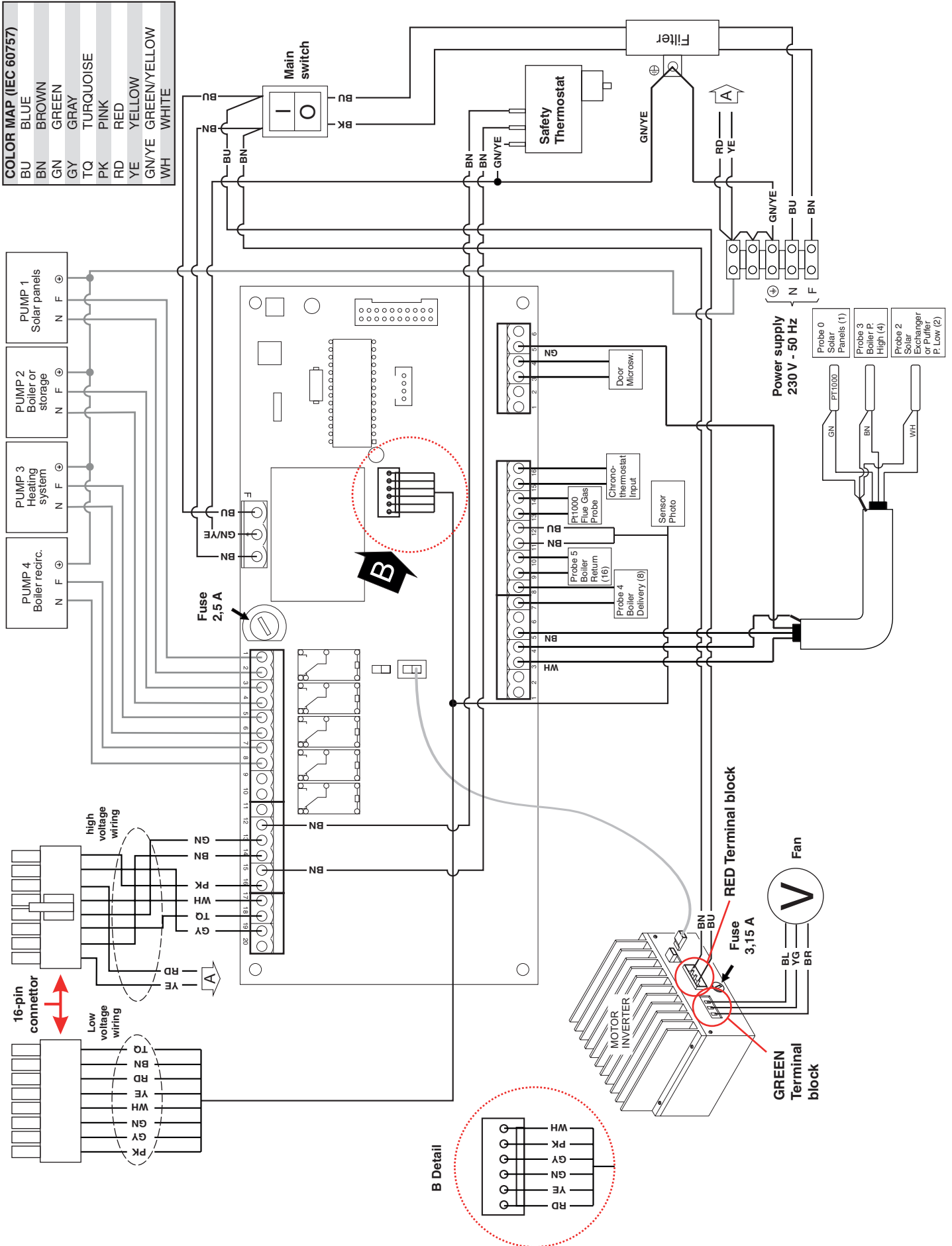
COIL-TYPE STORAGE TANK >>> set "0"

Puffer >>> set "2"

Without SOLAR PANELS >>> set "0"

With SOLAR PANELS >>> set "4"

3.13 - PANEL BOARD CONNECTIONS



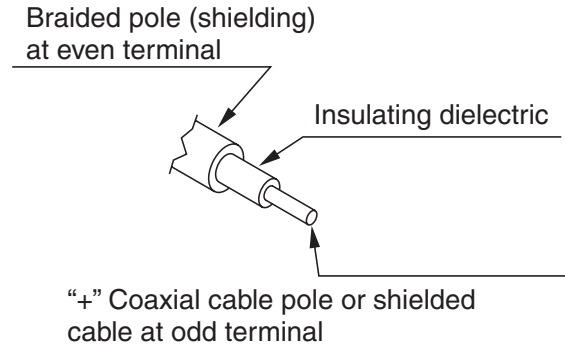
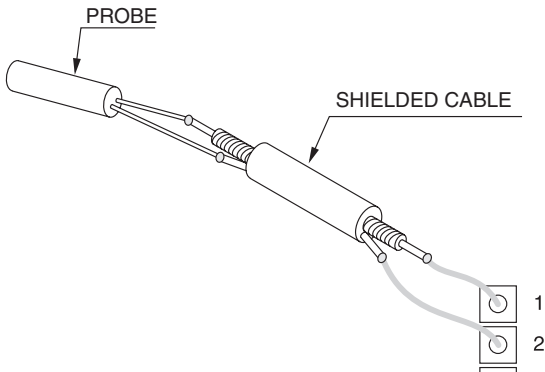
Installation instructions

Correct connection of the probes:

Extension of the probe cable or connection of the probe cable together with or in the vicinity of other live cables can cause induced electrical noise, which can affect the efficiency of the probes and result in incorrect temperature readings. To avoid instability, the probes must, therefore, be connected using shielded cables even with double central conductor.

The following drawing specifies that the central pole of the shielded cable must be connected to the odd number terminal while the braid shield of the cable must be connected to the even number terminal.

This is how the probe line is shielded.



3.14 - BOILER START-UP

3.14.1 - PRELIMINARY CHECKS



Commissioning must be done by professionally qualified personnel. Unical will not be held liable for damage to persons, animals or objects due to failure to comply with the above instruction.

The preliminary checks must be carried out by the company who installs the system.

After connecting the hydraulic and electrical system and the fuel line to the boiler, and before starting up the boiler, it is advisable to check the following:

	YES	NO
Have all the hydraulic and electrical systems and the safety devices been connected in compliance with the domestic and local laws in force?	<input type="checkbox"/>	<input type="checkbox"/>
Are the expansion vessel and the safety valve (when applicable) connected correctly and cannot be shut off?	<input type="checkbox"/>	<input type="checkbox"/>
Are the bulbs of the operating, safety, minimum thermostats and that of the thermometer inserted in their conduits?	<input type="checkbox"/>	<input type="checkbox"/>
Are the control and safety devices working and configured correctly?	<input type="checkbox"/>	<input type="checkbox"/>
Are the refractory coverings intact?	<input type="checkbox"/>	<input type="checkbox"/>
Is the grate of the burner installed correctly?	<input type="checkbox"/>	<input type="checkbox"/>
Are the combustion air intake line and the flue gas evacuation line compliant with the applicable standards in force?	<input type="checkbox"/>	<input type="checkbox"/>
Are the mains voltage and frequency compatible with the burner and the electrical equipment of the boiler?	<input type="checkbox"/>	<input type="checkbox"/>
Is the system full of water and does not contain any air?	<input type="checkbox"/>	<input type="checkbox"/>
Are the drain valves closed and the system cut-off devices fully open?	<input type="checkbox"/>	<input type="checkbox"/>
Is the outside main switch ON?	<input type="checkbox"/>	<input type="checkbox"/>
Is the pump/are the pumps working correctly?	<input type="checkbox"/>	<input type="checkbox"/>
Has the system been checked for water leaks?	<input type="checkbox"/>	<input type="checkbox"/>
Are the ventilation conditions and minimum distances to perform any maintenance guaranteed?	<input type="checkbox"/>	<input type="checkbox"/>
Has the operator been trained and has the documentation been supplied?	<input type="checkbox"/>	<input type="checkbox"/>

Please tick the operations performed

3.14.2 - START-UP

IGNITION

The boiler starts up automatically without the need for manual intervention.

It starts up whenever the storage tank requires domestic hot water or the input contact of the room thermostat requires heating.

The ignition and operation cycle are both fully automatic.

The only manual action required is to fill the tank with fuel according to daily consumption needs.

Also, during the combustion process, the boiler automatically decreases the amount of power generated as the work temperature increases, and up to the temperature threshold; refer to the section "COMBUSTION POWER MODULATION".

The boiler works in normal operating conditions with the combustion chamber under NEGATIVE PRESSURE. A minimum draught to the chimney of 15 Pa must therefore be guaranteed for model 34 and of 18 Pa for model 45.

IMPORTANT INFORMATION FOR PROPER OPERATION

- Do not open the boiler door while it is running.
 - Disconnect power before removing the burner guard.
 - Make sure that the pellets are good quality, with a low amount of dust and do not cause the grate to clog.
 - Check the proper operation of the burner and adjust flame modulation.
 - If the burner is not lit after the ignition phase time has elapsed and you detect the presence of dense smoke inside the combustion chamber, immediately SWITCH OFF the boiler and replace the pellets as they are too moist; if you insist, the combustion chamber risks an explosion.
 - If during routine cleaning you find spongy but very hard residue inside the burner which tends to stick to the grate, replace the pellets as they come from poor quality sawdust.
- Running the burner with the combustion grate clogged causes frequent triggering of alarms such as "PELLET CLOGGING ALARM".
- After the first hour of boiler operation, switch the burner off and wait for it to cool down.

Open the bottom door and check the amount of ash on the grate: there should be very little in the way of unburnt pellets; if this is not the case, you need to edit the combustion parameters to change the fan speed.

Clean the burner on a regular basis.

When the burner is cold, open the bottom door of the boiler, remove the grate and clean it with a steel brush.

Vacuum residual ashes which could be deposited below the grate, make sure that the side air intake holes are free and then put the grate back in place making sure it fits in its seat. Correct and constant maintenance of the boiler guarantees its high standard of safety and efficiency.

If sawdust deposits inside the pellet feed pipe, touch it to check that it is at an acceptable temperature (30°C - 40°C).

At the end of the ignition phase, make sure the flame is well-defined and clear.

3.15 - TROUBLESHOOTING

Problem:

- *The panel board does not switch on.*

Remedy:

- Make sure the panel board is powered.
- Check the PCB fuse.

Problem:

- *The fan does not start.*

Remedy:

- Make sure no alarm appears on the display.
- Check the power connection of the fan.
- Check whether the system is on or off.
- Check the inverter.
- Replace the fan.

Problem:

- *The burner starts up but triggers an alarm shortly afterwards.*

Remedy:

- Check that the screw is feeding the pellets correctly.
- Check that the value of the burner flame signal is above 50.
- Check the condition of the pellets and replace them if necessary.

Problem:

- *The start-up process goes smoothly until pre-loading of the pellets, after which an alarm is triggered.*

Remedy:

- Check the nature of the triggered alarm.
- Check the condition of the igniters.
- Replace the igniters.

Other alarms that can occur during use of the boiler, and the measures to be taken.

Triggering of the pellet clogging sensor.

- Check for clogging of pellets, or check whether the sensor is dirty.

Triggering of the water safety thermostat

- Check the working order of the pumps.
- Reset the thermostat manually.

Triggering of the pellet fire thermostat

- Check the draught in the flue.
- Check that the smoke ducts containing the turbolators are not clogged with ash.
- Clean them if necessary.
- Resetting occurs automatically when the temperature detected by the thermostat falls by 10°C.

Check that the level of pellets in the tank does not fall below the reserve line, because this triggers emergency shutdown of the boiler.

3.16 - ALARMS OF THE ELECTRONIC CONTROL BOARD

Refer to the third page on the screen and check the status of alarms in the third line.

Problem encountered	Solution
The boiler triggers alarm 1 "bottom door of burner open"	Check that the bottom door is shut and check the relative contact of the micro-switch.
The boiler stops and triggers alarm 2 "no fuel in container"	Check that there is fuel in the container and top this up if necessary.
The burner does not start and the control unit triggers alarm 3 "clogging of fuel in burner"	Check for and remove any residue or fuel in the inlet of the burner. If the fuel does not flow smoothly during the loading process, it is likely that the fuel has caused an obstruction or there is a fault with the motor of the screw in the burner, in which case you need to call the assistance centre.
alarm 5 "storage tank and/or solar panels above maximum temperature threshold"	This occurs when the storage tank and/or the solar panels are at maximum temperature. The alarm resets itself automatically when the temperature of the storage tank and/or solar panels falls below the maximum temperature again.
alarm 6 "Triggering of the fire safety thermostat"	Fault due to triggering of the (automatically resettable) fire safety thermostat on the manifold of the burner. To reset this alarm, press key 11 on the panel board (refer to section 3.12).
The boiler does not start up and alarm 7 is triggered "Burner not ignited"	Before resetting this alarm, you must check that there is no fuel or non-combusted material in the brazier of the burner, and only then press button 11 to reset the alarm manually (refer to section 3.12). If there is any non-combusted material, it is likely that the igniter has burnt out. In which case, manually remove the fuel, reset the alarm and wait for the new ignition cycle to start. If this problem reoccurs, call the assistance centre and ask to have the igniter replaced.
The boiler does not start and alarm 8 is triggered "instability of boiler flow Probe 4"	This problem can be due to overheating of the boiler or instability of the S4 boiler flow probe. The only way to resolve this problem is to reset the system manually by pressing button 11 on the electronic control unit (refer to section 3.12). If the error occurs and you are certain that the boiler has not overheated, call the assistance centre and ask to have the probe replaced.
One or more of the probes are unstable	The probes must be connected with a shielded cable to avoid interference and ensure correct temperature readings. Refer to section 14.
This message is displayed on the screen: "Alarm: probe disconnected or malfunctioning."	The probe may be disconnected or defective (in this case, check the cable and replace it if necessary). It is also possible that "parameter 28 probe configuration" has been set incorrectly. In which case, call the assistance centre to have this checked.

3.17 - AUDIBLE ALARMS

MAXIMUM TEMPERATURE AUDIBLE ALARM

The boiler triggers an audible alarm when it is overheated.

The temperature threshold is set in parameter 3, which is pre-configured at 88°C by the printed circuit board.

It can happen that, in certain cases, the working temperature of the boiler has to be set much higher (e.g. unit heaters or fan coils situated far from the boiler) than parameter 1 (working temperature 80°C).

In this case, the overheating audible alarm could be triggered frequently.

It is advisable to set parameter 3 (max temperature for thermal inertia in boiler) at a higher value of up to 90°C.

If instead the alarm is triggered without the boiler overheating, the cause may be an operating fault of the system like excess draught in the flue, obstruction of the system or storage tank pump, obstruction of the recirculation pump, or a defect with the printed circuit board.

Advice for the user: if it is necessary to set a working temperature of more than 80°C, it is advisable to proportionally increase parameter 2 (max temperature for thermal inertia in the boiler).

PROBE AUDIBLE ALARM

The boiler has an intermittent alarm system that signals one or more faults with the probes due to these being disconnected or out of range; in any case, a message is displayed on the screen referring to the probe or probes (in order) that are defective or disconnected or out of range (e.g. "Probe S4 disconnected"). If the temperature to which the probes are subjected is out of range, you need to wait for the temperature to return to a normal level. Replace the probe if you are certain the temperature is not out of range.

If the problem relates to the connection of a probe, and the message on the display indicates that a probe is disconnected, check the connection concerned: if the probe is disconnected, simply reconnect it; but if it is connected, despite the alarm message, contact the assistance centre because the probe is clearly defective.

4

INSPECTIONS AND MAINTENANCE



Routine maintenance is essential in the interest of the safety, efficiency and durability of the appliance.

All maintenance must be carried out by qualified personnel.

Yearly maintenance of the appliance is mandatory in compliance with Laws in force.



Failure to perform Inspections and Maintenance can entail material and personal damage.



Always turn off the power supply and stop the supply of fuel before cleaning and maintenance.

In order to make the most of the boiler, you should properly clean the combustion chamber, smoke pipes and smoke chamber.

We therefore recommend stipulating an inspection or maintenance contract.

Inspections help to determine the actual status of the appliance and to compare it with the nominal status. This is done through measuring, controls and observation.

Maintenance is required to eliminate any differences between the actual status and the nominal status. This is normally done by cleaning, setting and replacing individual components subject to wear.

Maintenance intervals and their extent are determined by a specialist based on the status of the appliance ascertained through inspection.

Inspection and maintenance jobs must be performed in the order shown on page 51.

Inspection and maintenance instructions

To assure long-term functioning of your appliance and to avoid altering its approved status, only original Unical spare parts must be used.

Before proceeding with maintenance, always perform the following operations:

- Disconnect the electric mains switch.
- Isolate the appliance from the electric mains by means of an isolated device with a contact opening of at least 3 mm (e.g. safety devices or power switches) and make sure that it cannot be re-connected accidentally.
- Close the shut-off valves on the heating flow and return pipes, as well as the cold water inlet valve.

After having completed all maintenance work, always perform the following operations:

- Open the heating flow and return pipes, as well as the cold water inlet valve.
- If necessary, restore the heating system pressure.
- Reconnect the appliance to the electric mains and turn on the switch.
- Make sure that the appliance is watertight.
- Vent the heating system and restore pressure if necessary.

EXCHANGER BODY MAINTENANCE



Danger!
Before performing any maintenance, make sure the boiler and its components have cooled down.

Warnings

Never drain water from the system, even partially, unless absolutely necessary.

Periodically check the proper operation and integrity of the flue gas exhaust pipe and/or device.

Do not clean the boiler and/or its parts with easily flammable substances (e.g. petrol, alcohol, etc.).

Do not leave flammable substances in the room where the boiler is installed.

At the end of each heating period, inspect the boiler to keep the system in perfect efficiency.

Proper maintenance is essential in the interest of economy and safety.



IMPORTANT

Regularly check the parts of the burner that can be dirtied as a result of the quality of the pellets or of poor control of combustion.

Clean with brushes and a vacuum cleaner; if you use any rags, make sure you collect all these. Keeps the screws and nuts lubricated.

CLEANING AND ROUTINE MAINTENANCE

Every day

- Fill the pellet tank

Every 3 days

- Remove ashes in the pan.

To perform this operation, act as follows:

- turn off the power at the main switch upstream of the boiler;
- unplug the burner and pressure switch;
- open the doors of the boiler by undoing the nuts with the spanner provided;
- use a suitable vacuum cleaner to carefully remove all combustion residue in the boiler;
- put the pan back in place and check the condition of the refractory material;
- remove ashes from the smoke chamber through the rear door;
- check the condition and correct fixing of the pellet feeding hose.

Every month

In addition to the weekly maintenance, clean the upper passages of the combustion chamber with the brush supplied after having removed and cleaned all the smoke diverters.

Replace the diverters in their seats alternating them.

Also check the condition of the sealing gaskets on the doors and on the smoke chamber.

ANNUAL MAINTENANCE

Refer to the table on the next page.

MAINTENANCE OPERATIONS	Every year
Screw reducer	X
Check preloading of the expansion vessel	X
Condition of pellet feeding hose	X
Fan: general overhaul and inspection of the state of the impeller, cleaning and lubricating the bearings, checking the direction of rotation and that the impeller spins freely	X
Check the hermetic seal of the doors	X
Make sure that the sealing gaskets are intact	X
Check the operation of the safety devices	X
Clean the smoke ducts	X
Make sure that the refractory stones are intact	X
Check wear, cleanliness and repositioning of the burner grate	X
Lubricate/grease the hinges and door opening levers	X
Properly clean the furnace and smoke ducts, removing any build-up and soot	X
Calibrate the draught adjuster	X

Unical[®]



www.unical.eu

Unical AG S.p.A. 46033 casteldario - mantova - Italy - tel. +39 0376 57001 - telefax +39 0376 660556
info@unical-ag.com - export@unical-ag.com - www.unical.eu

Unical will not be held responsible for possible inaccuracies if due to transcription or printing errors.
It reserves the right to modify its products as deemed necessary or useful, without jeopardising their essential features.