INSTRUCTIONS BOOKLET
FOR INSTALLATION, USE AND MAINTENANCE

HOT WATER BOILERS

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Dear Customer,

Thank you for choosing a hot water boiler by VERSOL GROUP.
In your interest and to maintain the highest level of performance and duration of your appliance, we recommend that you follow the instructions contained in this booklet and have regular maintenance performed by qualified personnel.
We would like to remind you that failure to follow the instructions contained in this booklet may invalidate the guarantee

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CONTENTS

GENERAL INSTRUCTION

GENERAL WARNINGS

This instruction booklet is an integral and essential part of the product.

Should the appliance be sold or transferred to another owner, or if you move and leave the appliance behind, always ensure that this booklet accompanies the appliance so that the new owner and/or installation technician can consult it.

This appliance must be used for the purpose for which it was specifically intended.
All contractual or non-contractual responsibility of the manufacturer is excluded in the event of damages to persons, animals or things caused by errors in installation, adjustment, maintenance and improper use.

The manufacturer's responsibility is excluded for all damage to persons and/or things resulting from a clear risk for the user which he could have avoided by taking suitable safety measures.

After having removed the packaging, check the contents for breakages. If you are in doubt do not use the appliance, contact your supplier.

Do not leave the packaging materials (wooden cage, nails, staples, plastic bags, polystyrene foam, etc.) within the reach of children, as they are potential sources of risk.

The installation must be performed in compliance with the regulations in force, following the manufacturer's instructions, by professionally qualified personnel.
The term “professionally qualified personnel” means persons with specific technical skills in the sector of heating systems and components for domestic use and domestic hot water production.

To guarantee the efficiency of the appliance and ensure correct operation, it is indispensable to have regular maintenance performed by professionally qualified personnel, following the manufacturer's instructions.
Any repairs to the appliance must be carried out using only original spare parts.

If you decide not to use the appliance for a long period, ensure you have professionally qualified personnel to carry out the necessary operations to preserve the generator:

- set the boiler main switch and the general switch on “off”;

- Close fuel and water on-off valve;

- empty the thermal system in case of freezing conditions.

BASIC SAFETY RULES

The use of any component utilising energy power, fuels and water requires that certain fundamental rules be respected, such as:

Do not allow children or unskilled people to use the appliance;

If you notice smell of gas, do not turn on electric switches, household appliances, telephone or any other objects that could cause sparks. If this is the case:

- Open doors and windows immediately to clear the air in the room;

- turn off the fuel taps;

- contact professional qualified personnel.

Do not touch the appliance with wet or damp parts of the body and/or with bare feet.

Do not perform any maintenance and cleaning operations without having disconnected the electric power and turned off the fuel supply tap(s).

Do not pull, disconnect, un-wind electric cables coming from the boiler, even if they are disconnected from the mains supply.

Do not block or reduce the ventilation openings in the room to prevent the formation or toxic and explosive mixtures caused by gas leakage; it is also uneconomic and polluting because it causes bad combustion.

Do not expose the appliance to atmospheric agents.
The generator has not been designed to work outdoors and is not provided with automatic anti-freezing systems. Keep the boiler turned on in freezing conditions.

Other important warnings to be respected:

- If the power cable of the appliance is damaged, have it replaced by professionally qualified personnel;

- do not fix (and do not allow other persons to fix) electric cables on the system pipes or near sources of heat;

- ensure that the earthling cables of the appliance are not connected to the water system;

- do not touch the hot parts of the system (in particular the door and the smoke box) as they normally remain hot even for some time after the appliance has been turned off.

In the event of a water leak, turn off the system and contact exclusively professionally qualified personnel.

BOILER DESCRIPTION

The steel boiler from the VERSOCALD SKD range is a high performance generator for heating systems up to 90°C. When combined with a hot water tank, this generator can be used also for the production of domestic hot water.

This is a en-bloc pressurized combustion flame-inversion boiler. The flame produced by the burner develops into the furnace and as it is closed on the bottom, the flue gas returns to the anterior part, and through the cavity obtained in the front door insulation it enters into the tube system.

Here the obliged to make a whirling run through high efficiency turbolators, which increase the convective heat transfer.

In this way it obtains the maximum absorption of heat without harmful thermal stresses and above all it has a useful output superior to 94%.

After the tube system, the flue gas is collected in the smoke chamber and conveyed to the chimney.

The boiler can be equipped with all the traditional liquid or gaseous burners.

The burner is installed on a hinge door; in this way the regulation and maintenance operation of the boiler and of the burner are facilitated, it is not necessary to disassemble the burner.

The thermal insulation of the boiler body is obtained by applying a pad of highly insulating mineral wall.

Elegant pre-painted steel panels complete the outside finish

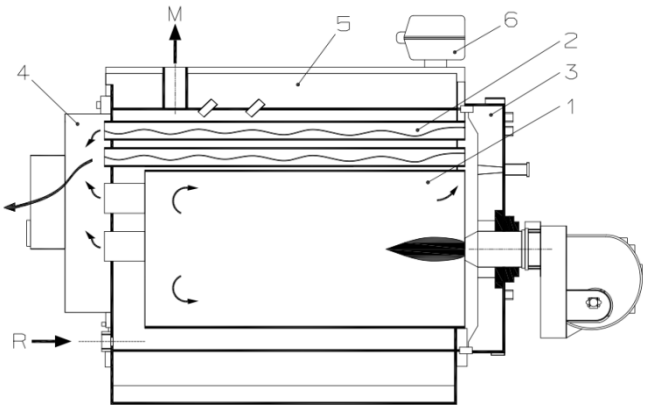
The pre-wired control panel for the boiler automatic operation is positioned on top of the boiler itself.

The electrical diagram is housed inside the control panel.

An electronic climate adjusting system can be installed on request and provides the boiler temperature adjustment as well as many other auxiliary functions.

TECHNICAL SPECIFICATIONS (SKD-64 TO SKD-291)

SKD-64 TO SKD-291



MAIN COMPONENTS

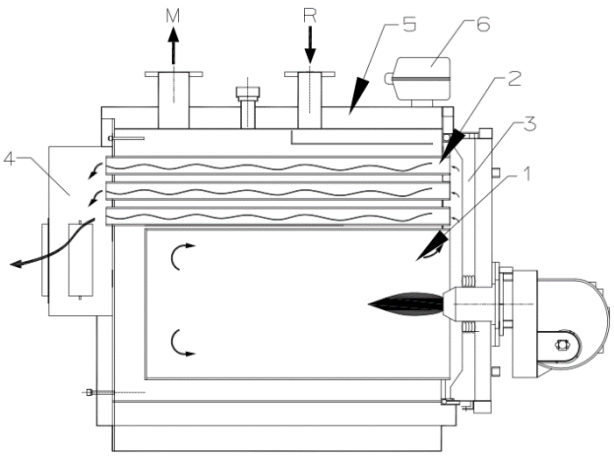
1. FURNACE
2. SMOKE PIPE WITH SMOKE DIVERTERS
3. DOORS WITH FLAME CONTROL WARNING LIGHT
4. SMOKE CHAMBER
5. BODY INSULATION
6. PANEL BOARDS

TECHNICAL DATA											
SKD		64	76	93	105	116	140	163	186	233	291
Nominal output	kW	64	76	93	105	116	140	163	186	233	291
Nominal input	kW	71	84	102	115	128	155	180	206	258	322
Water efficiency at nominal load	%	90.1	90.4	91.1	91.3	90.6	90.3	90.5	90.3	90.3	90.4
Boiler capacity	L	86	86	86	126	126	126	151	151	203	247
Water pressure drops	m.w.c	0.10	0.13	0.16	0.10	0.10	0.14	0.20	0.25	0.22	0.30
Flue gas pressure drop	Mm w.c	1.5	1.8	2.5	3	3	5	8	14	18	22
Maximum boiler working pressure	Bar	6	6	6	6	6	6	6	6	6	6
Weight	Kg	195	195	195	280	280	280	318	318	420	480
* Pressure drops corresponding to a thermal variation of 15K. ** On request Available up to 10Bar.											

PRODUCT PLUS VALUES	
Compact Dimension -simplifies the transport and the positioning in boiler house	Bottom of the Furnace -Reinforced with U profiles for greater mechanical resistance
Thermal Exchange Optimization -by driven water passage into the boiler	Internal Door Insulation -in light refractory concrete
Tube Bundle Positioning -decentralized upwards, above the furnace, with drastic reduction of the possible condensation	Front Door -with self-centering locking
Smoke Pipes of High Thickness -with anti-condensing effect	External Casing -inclusive of 60mm rock wool insulation
Tabulators -the thermal exchange optimization in the smoke pipes	Panel Board -Suitable for electronic control

TECHNICAL SPECIFICATIONS (SKD-340 TO SKD-7000)

SKD-340 TO SKD-7000



MAIN COMPONENT

1. FURNACE
2. SMOKE PIPE WITH SMOKE DIVERTERS
3. DOORS WITH FLAME CONTROL WARNING LIGHT
4. SMOKE CHAMBER
5. BODY INSULATION
6. PANEL BOARDS

TECHNICAL DETAILS								
Model	Heat output min/ max	Heat input min/ max	Boiler capacity	Water side pressure drop	Flue Gas Pressure Drop	Max. Boiler Operating Pressure	Combustion Chamber	Weight
	kW	kW	L	m.w.c	mm w.c	Bar	m^3	Kg
SKD-340	255÷340	277÷371	298	0.16÷0.28	17÷34	6	0.226	629
SKD-420	315÷420	342÷459	398	0.09÷0.17	16÷29	6	0.288	849
SKD-510	385÷510	418÷557	462	0.14÷0.25	24÷43	6	0.337	972
SKD-630	480÷630	520÷688	565	0.21÷0.38	32÷55	6	0.416	1102
SKD-760	580÷760	630÷830	671	0.15÷0.26	29÷51	6	0.513	1372
SKD-870	660÷870	715÷950	753	0.19÷0.33	33÷57	6	0.584	1482
SKD-970	750÷970	815÷1060	936	0.24÷0.41	29÷49	6	0.656	1588
SKD-1100	860÷1100	935÷1200	1040	0.18÷0.30	32÷52	6	0.748	1821
SKD-1320	1000÷1320	1087÷1442	1242	0.20÷0.35	38÷67	6	0.869	2030
SKD-1570	1200÷1570	1304÷1715	1418	0.19÷0.33	35÷60	6	1.087	2780
SKD-1850	1400÷1850	1520÷2020	1617	0.26÷0.45	42÷73	6	1.303	3280
SKD-2200	1700÷2200	1845÷2400	2086	0.21÷0.34	39÷65	6	1.650	4145
SKD-2650	2000÷2650	2170÷2890	2324	0.28÷0.48	43÷76	6	1.866	4465

SKD-3000	2300÷3000	2492÷3280	2667	0.36÷0.62	35÷60	6	2.313	5110
SKD-3500	2700÷3500	2930÷3825	4142	0.54÷0.84	47÷74	6	2.601	6700
SKD-4000	3200÷4000	3478÷4371	4455	0.54÷0.85	60÷80	6	3.126	7500
SKD-4500	3420÷4500	3638.3÷4838.7	6012	0.70÷0.85	51÷88	6	4.151	7750
SKD-5000	3800÷5000	4064.2÷5421.8	6012	0.80÷1.05	65÷110	6	4.151	7750
SKD-5500	4180÷5500	4446.8÷5914	7058	0.95÷1.15	60÷100	6	4.838	9300
SKD-6000	4870÷6000	4877÷6506.2	7058	1.00÷1.35	68÷120	6	4.838	9300
SKD-6500	4940÷6500	5255.3÷6989.2	7909	1.05÷1.50	61÷105	6	6.832	12600
SKD-7000	5320÷7000	5689.8÷7590.5	7909	1.10÷1.75	59÷120	6	6.832	12600

* Pressure drops corresponding to a thermal variation of 15K. ** On request Available up to 10Bar.	
PRODUCT PLUS VALUES	
Compact Dimension -simplifies the transport and the positioning in boiler house	Bottom of the Furnace -Reinforced with U profiles for greater mechanical resistance
Thermal Exchange Optimization -by driven water passage into the boiler	Internal Door Insulation -in light refractory concrete
Tube Bundle Positioning -decentralized upwards, above the furnace, with drastic reduction of the possible condensation	Front Door -with self-centering locking
Smoke Pipes of High Thickness -with anti-condensing effect	External Casing -inclusive of 60mm rock wool insulation
Turbulators -for the thermal exchange optimization into the smoke pipes	Panel Board -Suitable for electronic control

IDENTIFICATION ELEMENTS

The appliance can be identified through the TECHNICAL PLATE that contains the performing values and identification data.

The plate is applied in the front right upper part.

For any servicing and spare part the correct identification of the boiler model will facilitate all operations.

IMPORTANT: ensure that the technical plate has been applied onto the boiler: if not, asks your installation technician to apply it.

SPARE PART LIST

Spare parts recommended for two working years:

1 working thermostat
1 door gasket
1 pilot flame glass
1 burner plate gasket
1 safety thermostat
1 smoke box gasket
1 pilot flame gasket
1 complete set of turbolators

The following parts may also be supplied in the event of accidental damage or malfunctioning:

- Thermometer

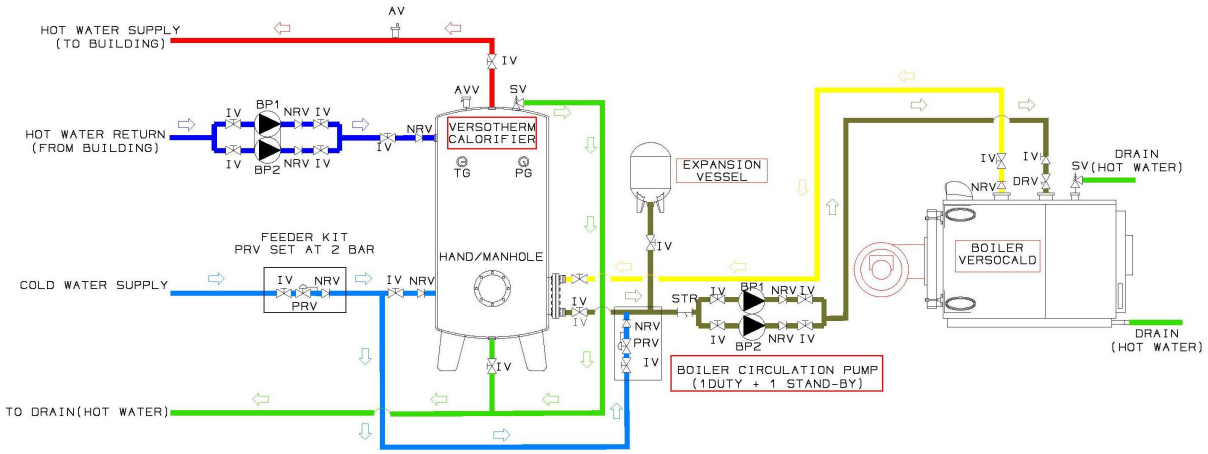
- Complete control panel

- Complete door

- Complete smoke chamber

- Complete or partial casing

GERERAL SCHEMATIC DRAWING AND BASIC DESCIPTION



Cold water supply will enter and fill the storage calorifier where the water is stored and getting heated up (by hot water boiler).

Feeder line will enter the boiler/primary circuit in the suction side of boiler circulation pumps and pumped from there to hot water boiler.

From hot water boiler heated up water will pass to the internal heat exchanger (inside storage calorifier) thus creating a continuous loop in the boiler/primary circuit up until hot water temperature in the secondary side / storage calorifier is reach as per required / set temperature.

Whenever the water temperature in the storage calorifier is less than 5°C of set temperature (example 60°C), hot water boiler and boiler circulation pump will turn on and heat up the water in the storage calorifier to the required / set temperature.

Boiler circulation pump will shift operation based on timer, which can be set at from 15 min to 8 hr.

BASIC BOILER OPERATION MODE		
If storage calorifier temperature is $\leq 55°C$	⇒	Boiler = ON (Duty) Boiler Circulation Pump-1 ON (Duty)
If storage calorifier temperature is = 60°C	⇒	Boiler = OFF Boiler Circulation Pump-1 = OFF

NOTE: Boiler hot water heating item quanitity, system desciption, control philosophy, sequence of operation and control logic may vary.

USER

START UP OPERATIONS

The boiler first start-up operation must be carried out by professionally qualified personnel. Later, it will start automatically.

The user, for instance, may need to re-start the boiler personally after a long period of inactivity.

Therefore, ensure:

-that the fuel and thermal plant water cocks are open;

-that the hydraulic system pressure when not working is over 1 bar and lower than the boiler max allowed limit;

-that the boiler regulation thermostat is set between 60 and 90°C;

-that the environment thermostat is “ON” and set on 20°C;

-That the plant pumps are not blocked.

Turn on the main general switch and later the main switch from the control panel.

The appliance will run an ignition cycle which will last until set temperatures have been reached.

After this operation has been completed, the system will run automatically.

In case of ignition failures or malfunctioning, turn off the appliance and contact professionally qualified personnel.

TURNING OFF

In the event of temporary periods of inactivity (week-ends, short trips, etc.) with no danger of frost, follow the procedure below:

-turn off the main switch on the control panel (OFF);

-Turn of the plant main switch.

CAUTION: if there is danger of frost, do not carry out the above operations but:

-Set the ambient thermostat on approx. 10°C.

In the event of a long period of inactivity, follow the procedure below:

-turn off the main switch on the control panel (OFF)

-Turn of the plant main switch.

-Close fuel and thermal plant water cocks.

CAUTION: if there is danger of frost, have the thermal plant emptied by professional qualified personnel.

CLEANING

Before cleaning operations make sure that:

-the main switch on the control panel has been turned off (OFF);

-The plant main switch has been turned off.

The only part of the boiler that needs to be cleaned by the user is the outer panelling; use a wet soapy cloth.

If the dirt is particularly difficult to remove, soak with water and denaturated alcohol.
Do not use abrasive sponges or products and do not clean with jets of water.

MAINTENANCE

Periodic maintenance and measurement of the combustion efficiency are required by law and the person in charge of the heating system must ensure that these checks are carried out by professionally qualified personnel.

INSTALLATION TECHNICIANS

PRODUCT RECEIPT

- boiler body without insulation (the box of the electric board, the documentation, the mineral wool insulation and the ceramic fiber mattress to seal the fissure of the burner nozzle, is placed into the boiler furnace)

- n°1 cardboard box containing the casing.

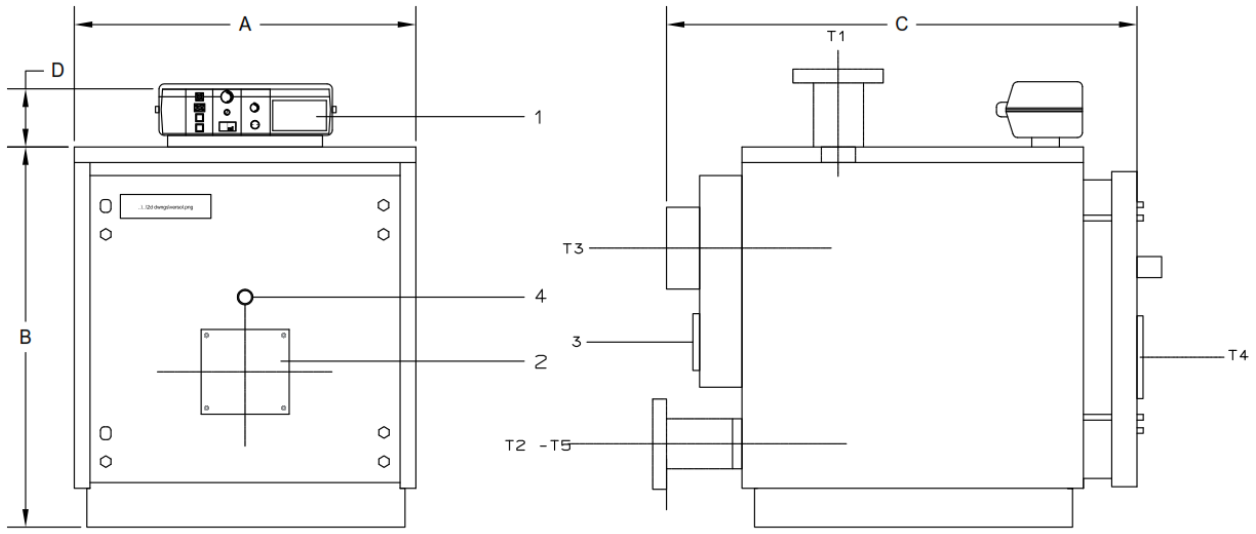
The VERSOCALD SKD hot water boilers are delivered already insulated and cased.

The box of the electric board, the documentation and the ceramic fiber mattress to seal the fissure of the burner nozzle, is placed into the boiler furnace.

Handle the boiler body using appropriate equipment using the lifting hooks of the boiler upper part.

Due to its heavy weight it should not be handled manually.

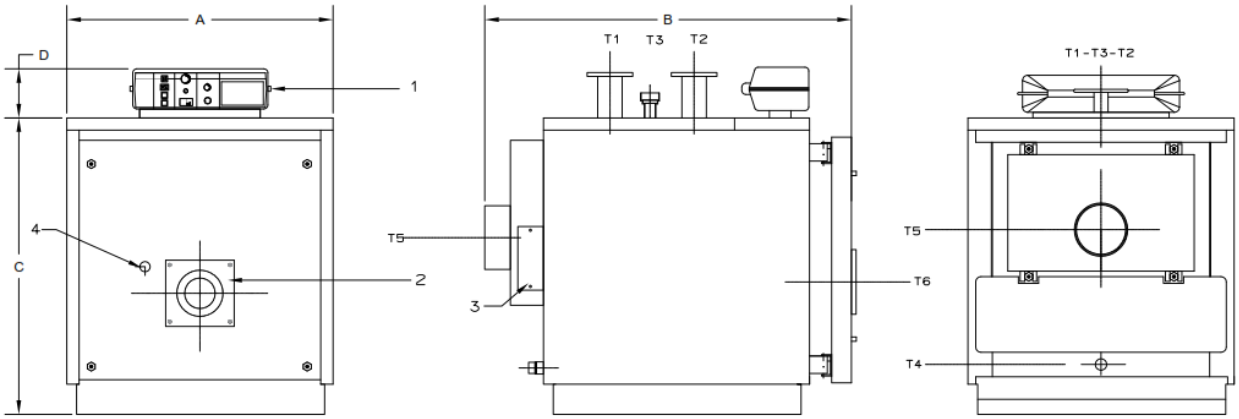
DIMENSIONS (SKD-64 TO SKD-291)



DIMENSION (SKD-64 TO SKD-291)										
SKD	A	B	C	D	T1	T2	T3	T4	T5	Legend:
	mm	mm	mm	mm	ISO 7/1 UNI2278 pn16	mm	mm	mm	mm	1) Board Panel 2) Burner Connecting Plate 3) Cleaning Door 4) Sight Glass T1) C.H Flow T2) C.H Return T3) Flue Connection
64	690	722	990	190	Rp 1-1/2”	200	200	130	Rp 3/4"	
76	690	722	990	190	Rp 1-1/2”	200	200	130	Rp 3/4"	
93	690	722	990	190	Rp 1-1/2”	200	200	130	Rp 3/4"	
105	760	812	1205	190	Rp 2”	200	200	180	Rp 3/4"	
116	760	812	1205	190	Rp 2”	200	200	180	Rp 3/4"	
140	760	812	1205	190	Rp 2”	200	200	180	Rp 3/4"	

163	760	812	1385	190	Rp 2”	200	200	180	Rp 3/4"	T4) Burner Axis T5) Boiler Drain
186	760	812	1385	190	Rp 2”	200	200	180	Rp 3/4"	
233	860	937	1437	190	DN65	250	250	180	Rp 3/4"	
291	860	937	1687	190	DN65	250	250	180	Rp 3/4"	

DIMENSIONS (SKD-340 TO SKD-970)

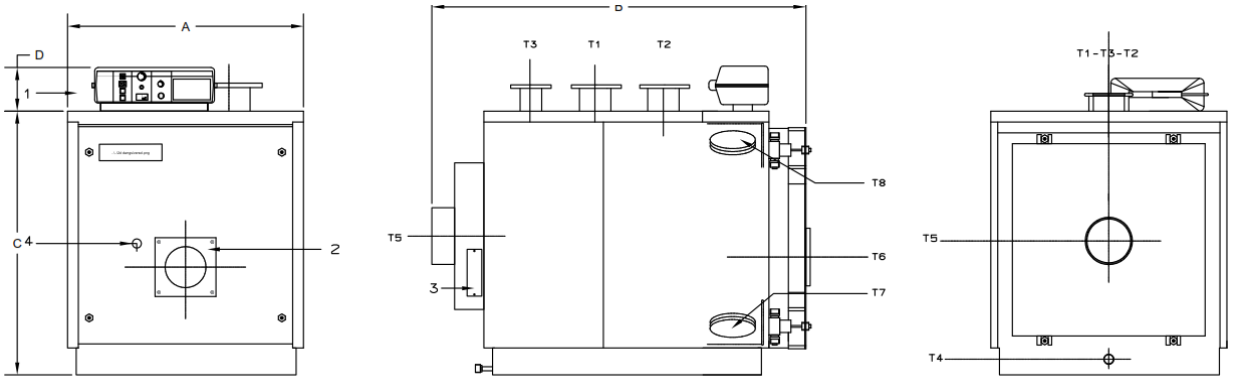


DIMENSION (SKD-340 TO SKD-970)										
SKD	A	B	C	D	T1	T2	T3	T4	T5	T6
	mm	mm	mm	mm	UNI2278 PN16	UNI2278 PN16	ISO7/1 UNI2278 PN16	ISO7/1	mm	mm
340	860	1541	1182	190	DN80	DN80	Rp2	Rp3/4	250	220
420	890	1606	1352	190	DN100	DN100	Rp2	Rp3/4	250	220
510	890	1801	1352	190	DN100	DN100	Rp2	Rp3/4	250	220
630	890	2113	1352	190	DN100	DN100	Rp2	Rp3/4	300	220
760	1122	1989	1432	190	DN125	DN125	DN65	Rp1-1/4	350	270
870	1122	2184	1432	190	DN125	DN125	DN65	Rp1-1/4	350	270
970	1122	2379	1432	190	DN125	DN125	DN65	Rp1-1/4	350	270

Legend:

1) Board Panel
2) Burner Connection Flange
3) Smoke Chamber Cleaning Door
4) Flame Control Warning Light
T1) Heating Flow
T2) Heating Return
T3) Expansion Vessel Connection
T4) Boiler Drain
T5) Chimney Connection
T6) Burner Connection

DIMENSIONS (SKD-1100 TO SKD-2650)

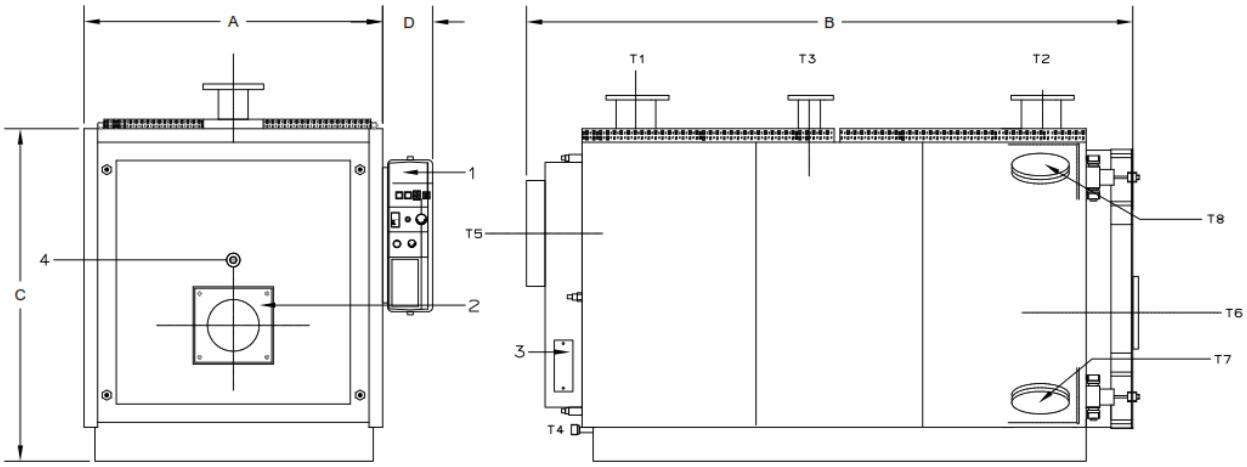


DIMENSION (SKD-1100 TO SKD-2650)										
SKD	A	B	C	D	T1	T2	T3	T4	T5	T6
	mm	mm	mm	mm	UNI2278 PN16	UNI2278 PN16	UNI2278 PN16	ISO7/1	mm	mm
1100	1352	2346	1432	190	DN150	DN150	DN80	Rp1-1/2	400	320
1320	1352	2686	1432	190	DN150	DN150	DN80	Rp1-1/2	400	320
1570	1462	2781	1542	190	DN175	DN175	DN100	Rp1-1/2	450	320
1850	1462	3151	1542	190	DN175	DN175	DN100	Rp1-1/2	450	320
2200	1622	3225	1702	190	DN200	DN200	DN125	Rp1-1/2	520	380
2650	1622	3545	1702	190	DN200	DN200	DN125	Rp1-1/2	520	380

Legend:

1) Board Panel
2) Burner Connection Flange
3) Smoke Chamber Cleaning Door
4) Flame Control Warning Light
T1) Heating Flow
T2) Heating Return
T3) Expansion Vessel Connection
T4) Boiler Drain
T5) Chimney Connection
T6) Burner Connection
T7) Boiler Air Bleed
T8) Inspection Door

DIMENSIONS (SKD-3000 TO SKD-4000)

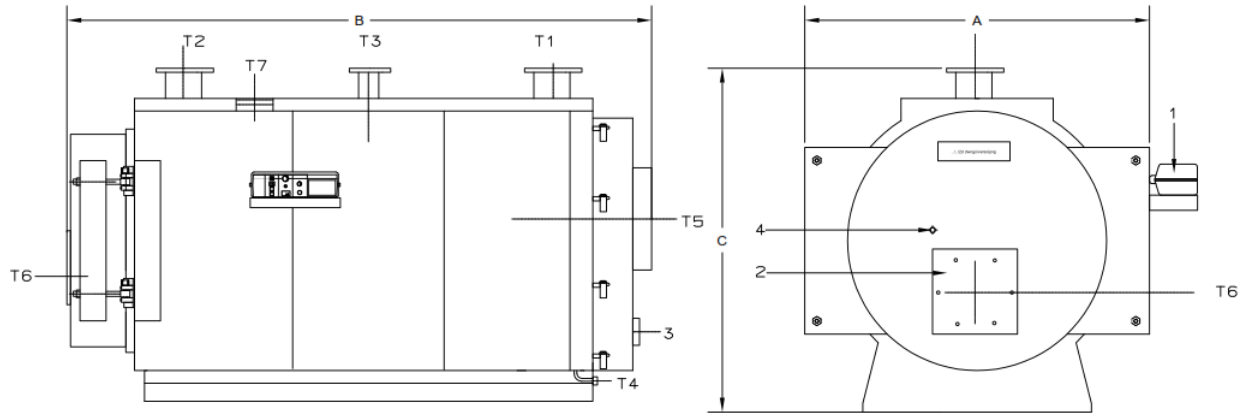


DIMENSION (SKD-3000 TO SKD-4000)										
SKD	A	B	C	D	T1	T2	T3	T4	T5	T6
	mm	mm	mm	mm	UNI2278 PN16	UNI2278 PN16	UNI2278 PN16	ISO7/1	mm	mm
3000	1720	3835	1830	190	DN200	DN200	DN125	Rp1-1/2	570	380
3500	1970	3879	2090	190	DN200	DN200	DN125	Rp1-1/2	620	400
4000	1970	4279	2090	190	DN200	DN200	DN125	Rp1-1/2	620	400

Legend:

1) Board Panel
2) Burner Fixing Plate
3) Smoke Chamber Cleaning Door
4) Sight Glass
T1) C.H Flow
T2) C.H. Return
T3) Expansion Vessel Connection
T4) Boiler Drain
T5) Flue Socket
T6) Burner Connection
T7) Sludge Drain
T8) Inspection Door

DIMENSIONS (SKD-4500 TO SKD-7000)



DIMENSION (SKD-4500 TO SKD-7000)											
SKD	A	B	C	D	T1	T2	T3	T4	T5	T6	T7
	mm	mm	mm	mm	UNI2278 PN16	UNI2278 PN16	UNI2278 PN16	ISO7/1	mm	mm	mm
4500	2088	4682	2533	417	DN250	DN250	DN125	Rp1-1/2	660	500	133
5000	2088	4682	2533	417	DN250	DN250	DN125	Rp1-1/2	660	500	133
5500	2214	4872	2653	437	DN250	DN250	DN125	Rp1-1/2	660	500	133
6000	2214	4872	2653	437	DN250	DN250	DN125	Rp1-1/2	660	500	133
6500	2380	5484	2860	509	DN250	DN250	DN125	Rp1-1/2	720	500	133
7000	2380	5484	2860	509	DN250	DN250	DN125	Rp1-1/2	720	500	133

Legend:

1) Board Panel
2) Burner Connection Flange
3) Smoke Chamber Cleaning Door
4) Flame Control Warning Light
T1) Heating Flow
T2) Heating Return
T3) Expansion Vessel Connection
T4) Boiler Drain
T5) Chimney Connection
T6) Burner Connection
T7) Inspection Door

INSTALLATION

INSTALLATION PREMISES

The boiler must be installed in a room that complies with the provisions and minimum distances provided for by the current regulations and is provided with suitably sized air vents.

The flat surface of the boiler must be positioned horizontally.
The flat surface should be raised from the floor.

CAUTION: if the burner is supplied with combustible gas with specific weight higher than the specific weight of air, the electric parts must be positioned above 0.5 meters from ground level.

The boiler must not be installed outside as it has not been designed for outdoor installation and is not provided with automatic anti-freezing systems.

DISCHARGE OF COMBUSTION PRODUCTS

Correct burner/boiler/flue coupling drastically reduces consumption, optimises combustion with low emission of contaminants and provides effective protection against condensation.

The FLUE must be resistant to heat and condensation, thermally insulated, hermetically sealed, without bottlenecks or obstructions, as vertical as possible and sized according to current regulations.

The CONNECTION BETWEEN THE BOILER AND THE FLUE must comply with the current regulations and legislation and consist of rigid hermetically sealed pipes resistant to high temperatures, condensation and mechanical stress.
For sealing the joints, use materials that can withstand at least 250°C.

Badly sized and shaped flues and couplings between boiler and flue can amplify the combustion noise, negatively affect the combustion parameters and cause condensation problems.

CAUTION: non-insulated outlet pipes are a potential source of danger.

HYDRAULIC CONNECTION

The choice and installation of the system components is the responsibility of the installer who must operate in accordance with correct working practice and the current legislation.
Here are some recommendations that should be taken in consideration:

-the boiler fittings and the safety valves must not be strained by the weight of the system connection pipes: this can be dangerous for the boiler and the latter must therefore be sustained and appropriately positioned

-Cut-off devices must not under any circumstances be fitted between the boiler and the expansion vessel and between the boiler and the safety valves.

-The expansion vessel must be correctly sized (there must be no leaks of water due to normal expansion) and, if the expansion vessel is closed, the safety valves must open only in exceptional cases in order to minimise any subsequent introduction of water and in any case to ensure that it is introduced and controlled by one single point in the system.

-Ensure that the safety valve outlets are connected to an outlet funnel. If not, when the valves cut in they will flood the room and the manufacturer will accept no liability for this.

-Ensure that the hydraulic pipes are not used as earth connections for the electrical or telephone system. They are not suitable for this use and can rapidly deteriorate leading to serious damage.

-Before connecting up the boiler, wash all the system pipes to remove any debris that could affect correct operation.

- If the water available for filling the system is hard (> 15 French degrees) or corrosive (pH < 7.2), a treatment plant should be provided otherwise permanent damage can occur.

-If the mains water supply contains impurities, a suitable filter must be fitted.

-Avoid any accidental contact between the heating system water and the sanitary water as the former is not drinkable.

-After connection to the hydraulic system, ensure that the latter is completely de-aerated.

You are advised to insulate the heating system pipes to avoid heat dispersion resulting in increased fuel consumption and environmental pollution.

ELECTRICAL SYSTEM

The electrical system must comply with the current regulations and be installed by professionally qualified personnel.

Electrical safety of the equipment is ensured only when it is correctly connected to an efficient earth system in compliance with the current safety regulations.
The manufacturer will not be liable for any damage caused by failure to earth the system.

Call professionally qualified personnel to check that the electrical system is suitable for the maximum power absorbed by the equipment, ensuring in particular that the system cable sections are suitable for the power absorbed by the equipment.

Adapters, multiple sockets and extension leads must not be used for general power supply of the equipment from the mains.

For connection to the mains, a twin-pole switch must be provided in compliance with the current regulations.

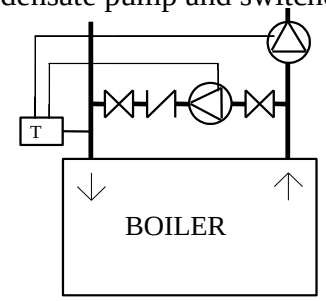
THE CONDENSATE PROBLEM

The condensation of the steam contained in the discharge smokes of the boiler (condensate), appears when the boiler temperature returning in the boiler is less than 50°C and it is important above all during the morning start up after than the boiler has been switched off all night long.

The condensate is acid and corrosive and, with the passing of time, corrodes the plates of the boiler.

To avoid the formation of condensate as much as possible, an anticondensate pump must be installed as describe below.

When the burner starts, a thermostat (calibrated to 55 °C) which is placed on the return water pipe makes contact, and starts the anticondensate pump to reach the stated temperature, and the temporally extinguishes the anticondensate pump and switches on the unit pump.



To eliminate totally the problem, it should make perfect the above mentioned design to maintaining the temperature of the boiler (55 °C) also by night and add a further temperature limit fuse thermostat that operate to the unit mixer valve not forward to the boiler, water not at 55 °C.
In this way it will guarantee a long life to the boiler.

The anticondensate pump capacity is normally the 25-30% of the plant pump capacity, while the required lift is modest because it was to overcome only the boiler and the check valve resistance.

On the smoke chamber of the VERSOCALD SKD boiler there is a connection for the discharge of eventual condensate that should form in the starting phase.

Do not connect directly the attach to the network of urban sewers, but to a gathering ground to control the extent of the phenomenon.

To survey exactly the phenomenon, check that the condensate formed in the chimney does not pour in the gathering ground.

The condensate is acid and corrosive, therefore polluting, if it is flown into the drainage system.

Therefore it is necessary, before to drain the tank into the drainage system, to restore the acidity level into levels between pH 6.5 and 9 using neutralizer products.

FUEL SUPPLY

The fuel supply line must comply with current regulations and be laid by professionally qualified personnel.

Before installation, you are advised to thoroughly clean the inside of all the fuel supply pipes in order to remove any debris that may affect correct operation of the boiler.

Check the internal and external seal of the fuel supply system.
If using gas, the connections must be perfectly sealed.

Check that the fuel supply system is provided with the safety and control devices prescribed by the current regulations.

Never use the plant fuel pipes to earth electric or telephone systems.

Ensure that the boiler can be fed with the type of fuel that will be used.

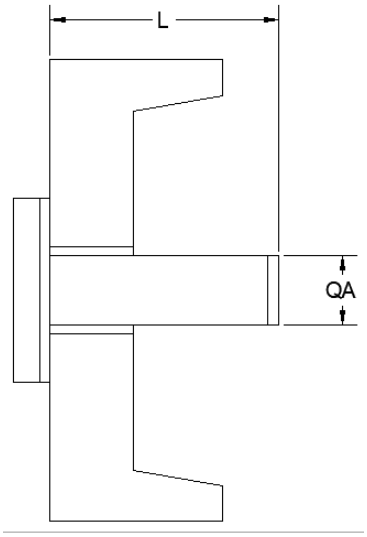
BURNER CONNECTION

For installation of the burner, the electrical connections and the necessary settings, consult the burner instruction manual.

Ascertain that the correct type of burner has been chosen for the boiler, checking the technical specifications of both.

The burner draught tube must be sized as shown below:

Boiler type	ØA(mm)	L(mm)
SKD 64÷93	130	150
SKD 105÷140	180	170
SKD 163÷186	180	170
SKD 233÷291	180	170
SKD 340÷630	220	250
SKD 760÷970	270	270
SKD 1100÷1320	320	300
SKD 1570÷1850	320	320
SKD 2200÷2650	380	350
SKD 3000	380	400
SKD 3500÷4000	400	400
SKD 4500÷6000	500	520
SKD 6500÷7000	500	630



Secure the burner to the door by means of the fixing plate so that the flame is parallel and centred in the furnace; if not, combustion problems can occur with the risk of seriously damaging the boiler.

IMPORTANT: after installing the burner, fill any crack between the draught tube and the hole of the door with the material provided, resistant to 1000°C (ceramic fibre mat).

This operation prevents overheating of the door which would otherwise be permanently deformed.

If the burner is provided with an air intake connect it through a rubber hose to the intake arranged over the flame pilot light: this way glass remains clear.
If burner has no air intake need to connect it through a rubber hose, remove the intake on the flame pilot light and close the hole with a tap ø 1/8" GAS.

The fuel connections to the burner must be positioned in order to permit complete opening of the boiler door with the burner fitted.

CONTROL PANEL INSTALLATION

The control panel is placed in a box inside the furnace or next to the boiler.
Voltage 220 V - 50 Hz.

Open the instrument panel by turning of the self-threading screws.

Extend the instrument gauge capillaries avoiding all damages and pass them through the hole at the bottom of the panel.

Later, take the cover of the boiler casing, pass the gauge capillaries through the hole and fix the instrument panel to the cover.

Lean the cover on the boiler and insert the gauges in the boiler bulbs avoiding any accidental breakage.

For model VERSOCALD SKD, fix the control panel in the most convenient position (upon or on the sides of the boiler) using the bracket in outfit.

CAUTION: all capillary gauges of the panel instruments must be inserted in the boiler body bulbs next to the flow fitting to the heating plant.

For the electrical connections, proceed according to the instructions in the attached electrical diagram.

Never fix the electrical cable to the sheet metal of the boiler body, door or smoke box

Finally, close the panel and re-fit the cover on the boiler casing.

ASSISTANCE AND MAINTENANCE

PRELIMINARY OPERATION PRIOR TO STARTING UP FOR THE FIRST TIME

Before starting up:

-check that the gauges of setting and control instruments have been correctly positioned in the bulbs;

-ensure that the turbolators do not protrude from the front of smoke tubes;

-Check that the plant has been filled with water, de-areated and that pressure is over 1 bar and lower than the instrument max. allowed pressure;

-check that all control and safety devices are working efficiently and calibrated appropriately;

-check that the furnace is free from foreign matters;

-ensure that door refractory casing is not broken;

-check that the burner tube has been plugged correctly (Refer “BURNER CONNECTION);

-check that the door has been closed correctly (Refer “OPENING AND ADJUSTMENT OF DOORS);

-check that the plant on-off valves are completely open and pumps turn correctly;

-ensure that fuel is available and fuel cocks are open.

FIRST START UP

After performing the preliminary checks, to power on the boiler it is necessary:

- that the boiler thermostat on the control panel is set between 60 and 90°C, according to the type of heating plant;

- That the environment thermostat is set on 20°C approx.;

- That the main switch is turned "ON";

- That the main switch is pressed from the control panel (the lighting button is lightened);

The appliance will run an ignition cycle which will last until set temperatures have been reached. After this operation has been completed, the system will run automatically.

FIRST START UP AND FURTHER CHECKS

After the start-up operations have been carried out, the appliance must be tested for standstill and further start up. Therefore:

- modify the boiler thermostat setting;
- actuate the main switch from the control panel;
- modify the environment thermostat setting.

Check the seal of all gaskets on the water and smoke sides.

This operation is of fundamental importance for the gaskets of the door, of the burner plate and of the smoke box to prevent leakage of toxic and therefore hazardous combustion fumes into the boiler room. To guarantee the perfect seal, warm tighten.

The weight of the overhanging burner tends to loosen the gasket of the door at the top.

It is very important to inspect the boiler/flue fitting seal because of the above reasons.

Check the pumps correct sense of direction.

Check the total standstill of the appliance by turning off the main switch.

After all conditions have been satisfied, the burner must be tested at the boiler max. Output by examining the combustion products to reach the correct combustion as well as the less polluting emissions as possible.

Smoke temperature under normal working conditions ranges from approx. 120÷140°C.

When the boiler is working, the pressure of the water contained in the system increases. Therefore, ensure that its highest value does not exceed the boiler max pressure.

MAINTENANCE

Periodical maintenance is essential for safety, output and the generator life span.
Furthermore, it is mandatory and it must be carried out by professional qualified personnel.

Before any servicing, it is recommended that a combustion analysis be performed to find out the operating conditions as well as indications on how to intervene.

After the combustion analysis has been performed and before any other operations:

- Power off the system by turning off the main general switch;

- Close the fuel on-off cocks.

OPENING AND ADJUSTMENT OF THE DOOR

The opening is normally from left to right.

To open the door, remove the fixing nuts from the left side.

To change the direction of opening of the front door with help of lifting equipment, work as follow:

- hood the front door to the lifting equipment through the foreseen 2 holes that are in the superior part;

- take away the 4 tightening nuts;

- unthread the front door;

- unscrew the 2 jam nuts left on the tie rods and screw them on the tie rods on the other side;

- remount the big door having care of threading the jam nuts seat in the front door bushes;

- Screw the 4 fixing nuts.

To adjust and tighten:

- release the regulation jam nuts without let them go out from the bush seat of the door;

- tighten the locking screw only as far as required to censure a uniform airtight closure.

- lock the regulation jam nuts against the door bush.

Normally, at all maintenance operations the door adjustment should be inspected.

CLEANING THE BOILER

The boiler should be cleaned at least once a year to remove carbon deposits from the heat transfer surfaces

Open the door, open the cleaning door and take the turbolators out.

Clean the smoke tubes using a steel brush and remove the soot from the furnace and the rear cleaning door.

CHECKS AFTER BOILER CLEANING OPERATIONS

After performing maintenance and cleaning operations, repeat the preliminary start up inspection (Refer “PRELIMINARY OPERATIONS PRIOR TO STARTING UP FOR THE FIRST TIME”), check the burner calibration and perform a smoke analysis to ensure that the correct degree has been reached.

Check the seal of the fuel supply system. This inspection is absolutely necessary when gaseous fuels are used.

Check the perfect seal of the smoke circuit and, if needed, replace worn seals.

Check the seal of the pipe system to avoid time-wasting water changes and refilling which could also increase the risk of scaling.

Should the boiler inside walls be scaled, a chemical washing is needed to remove scale. This operation must be performed by qualified companies.

The specification of the plant water should be examined and, if needed, a treatment system should be installed.

Never leave highly inflammable substance containers in the premises where the boiler has been installed.

TROUBLESHOOTING

Below is the description of the most common faults and their remedy:

FAULT: the burner does not turn on.
REMEDY:
-check electric connections;

-check the regular fuel supply;

-check the integrity and the cleanness of the fuel supply system and that no air is present;

-check that ignition sparks form regularly and the burner appliance works correctly;

-check the boiler safety thermostat intervention with manual reset;

-Check the calibration of the environment thermostat.

FAULT: the burner turns on well but turns off immediately after.
REMEDY:
-Check the pilot flame, the air calibration and that the burner appliance works correctly.

FAULT: the burner is difficult to be adjusted and/or no output.
REMEDY:
-check for the cleanness of burner, boiler, boiler/flue pipes and flue;

-check the hermetic seal of the smoke circuit (door, smoke box, boiler/flue connection);

-check that the fuel supply is flowing regularly and verify the effective power of the burner;

-check for the presence of scale and carry out a chemical washing

FAULT: the boiler gets easily covered with soot.
REMEDY:
-check the burner regulation (smoke analysis);

-check the fuel quality;

-Or clogging and the cleanness of the burner air intake (dust).

FAULT: the boiler does not reach set temperature.
REMEDY:
-check that the smoke side and water side of the boiler are clean;

-check the combination, regulation and performance of the burner;

-check the regulation of the pressure switches and that they work correctly;

-check the position of the thermostat gauges;

-Ensure that the boiler capacity is appropriate for the plant.

FAULT: the safety thermostat intervenes.
REMEDY:
-check electric wires;

- check that the gauges bulbs are positioned correctly and all thermostats are working correctly.

FAULT: smell of gas and/or unburnt products.
REMEDY:
-check the seal of the fuel supply system (if gas fuel);

-check the hermetic seal of the smoke circuit (door, smoke box, boiler/flue connection);

FAULT: the boiler reaches the appropriate temperature but the heating system is cold.
REMEDY:
-check that no air is in the system and that circulation pumps are working well;

-Check the ambience thermostat setting.

FAULT: the safety valve of the boiler intervenes often.
REMEDY:
-check the system loading pressure;

-check the efficiency of the expansion vessel;

-Check the calibration of the valve itself.

FAULT: water on the floor near the smoke box (condensate).
REMEDY:
-Check that the probes have been positioned correctly; the boiler thermostat has been regulated correctly (between 60 and 90°C) and works well.

-verify that the discharge in the fumes box is connected with a gathering ground;

-verify that the anticondensate pump and its regulation (if it is present) correctly work;

-Check that the temperature of the return water of the plant is not less than 50°C.

FAULT: membranes overheating due to lack of water in the boiler.
REMEDY:
Turn off the burner, do not pour water and do not open the door; wait until the ambience temperature is restored before performing any operation.

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