



# RTT 378-930

EN INSTRUCTIONS FOR THE INSTALLER AND FOR THE TECHNICAL ASSISTANCE CENTRE

**RIELLO**

## RANGE

---

MODEL	CODE
RTT 378	20093090
RTT 448	20091316
RTT 506	20091318
RTT 564	20091321
RTT 610	20091325
RTT 663	20091326
RTT 715	20091329
RTT 773	20091334
RTT 831	20091335
RTT 878	20091337
RTT 930	20091339

## ACCESSORIES

---

For the RTT 378-930 r boilers the following accessories are available:

- a. Two stage kit – 4031067
- b. Storage heater probe – 20010103

Dear client,

Thank you for choosing a **RIELLO** boiler, a modern and high quality product, providing you with the utmost well-being and with a high level of reliability and safety; and this is particularly the case if entrusted to a **RIELLO** Technical Assistance Centre which is specifically capable of carrying out routine maintenance, keep it running at maximum efficiency, with low running costs and which has original spare parts if required.

This instruction booklet contains important information and suggestions that should be observed for easy installation and better use of the RTT 378-930 boiler.

Thank you once again  
Riello S.p.A.

## CONFORMITY

---

The RTT 378-930 r boilers comply with:

- 2009/142/EC (ex 90/396/EEC-Gas Directive)
- 92/42/EEC (Efficiency Directive)
- 2006/95/EC (ex 73/23/EEC-Low voltage Directive)
- 2004/108/EC (ex 89/336/EEC-Electromagnetic Compatibility Directive)
- EN 303/1-2-3
- EN 60335-1/2
- EN55014-1/2
- EN 61000

## CONTENTS

---

1.1	General warnings . . . . .	4
1.2	General characteristics of the RTT boilers. . . . .	5
1.3	Technical data. . . . .	6
1.4	Boiler data plate . . . . .	7
1.5	Dimensions. . . . .	7
1.6	Delivery. . . . .	7
1.7	Installation of the boiler . . . . .	8
1.8	Important information about the boiler room . . . . .	9
1.9	Hydraulic system. . . . .	10
1.10	Schematic diagram – system for heating and domestic hot water production . . . . .	10
1.11	Important instructions for connecting the fuel tank . . . . .	11
1.12	Important information about the flue pipe . . . . .	11
1.13	Control panels that can be combined . . . . .	12
1.14	High performance cast iron elements . . . . .	12
1.15	Ventilation of the boiler room . . . . .	12
1.16	Gas side resistor and output temperature of combustion gases . . . . .	13
1.17	Instructions for use . . . . .	13
1.18	Conveyance and discharge of the boiler water . . . . .	14
1.19	Instructions for disposing of the product . . . . .	14
1.20	Fire prevention regulations for the boiler room. . . . .	14
1.21	Controls and starting the boiler. . . . .	14
1.22	Maintenance instructions . . . . .	15
1.23	Cleaning the boiler . . . . .	15
1.24	Burner door and burner connection. . . . .	16
1.25	Table of burner combinations. . . . .	17
1.26	Transport and storage . . . . .	18
1.27	Useful information . . . . .	19

In some parts of the booklet, some symbols are used:



= for actions requiring special care and adequate preparation



= for actions THAT MUST NOT be performed

This booklet, Cod. Doc-0079323 – Rev. 1 (03/2016) is composed of 20 pages.

## 1.1 General warnings

The boiler models that are the subject of this manual are supplied disassembled of the boiler body.

-  The cast iron RTT 378-930 boilers are designed for heating using water and/or supplying hot water systems and have been designed with technologies and materials suitable for this purpose. Use the product only for this intended use.
-  The installation of the appliance should be carried out on a base that is suited to the weight and the dimensions.
-  The base of the boiler should be positioned and oriented in such a way as to leave sufficient space on the sides of the appliance to meet safety requirements and permit access to the boiler for maintenance and repairs.
-  The commissioning and initial ignition of the boiler should only be carried out by specialised installers.
-  It is forbidden to put or pump water into the boiler or the hydraulic system when the appliance is running and is hot.
-  Before putting water in the boiler or the system, it is necessary to wait for the water temperature to reach 40° C. When putting water into the system, always run the circulation pump to prevent breaking the elements.
-  When the boiler is off for a long period or when carrying out repairs, maintenance or cleaning, the electrical supply must be disconnected using the master switch.
-  Especially in summer, when the boiler is off for a long period, to avoid problems of incrustation in the circulation pumps, the boiler must be switched on 1-2 times a month and the circulation pumps operated for at least 5 minutes. Limescale in the water can cause problems if the pump is unused for a long period.
-  Choose a boiler with the right dimensions for the project in full compliance with applicable regulations. If the wrong size is chosen, the performance will suffer.
-  The RTT 378-930 boilers are only to be used for heating. For the production of domestic hot water, it is necessary to use a storage heater or another heat exchanger. For it to work efficiently, pay special attention to the size of the domestic hot water circuit.
-  The RTT 378-930 boilers are delivered without the burner. To choose the most suitable burner and keep the performance high, contact technical personnel.
-  If the boiler goes into lockout automatically because of overheating, do not put cold water inside to get it going again. Wait until the boiler cools down, and try to restart it. If this does not happen, contact the Technical Assistance Service.
-  Periodically check the boiler and the burner. If these periodic controls are not carried out, performance will suffer and there will be an increase in fuel consumption. The periodic and annual controls of the boiler should be carried out carefully and at the pre-established time. Natural gas is a clean fuel and does not dirty the appliance so much. Liquid fuel burners, on the other hand, dirty the appliance a great deal, and the boiler controls and maintenance operations are necessary to ensure a high level of performance and a long life.
-  Repairs and periodic inspections of the RTT 378-930 boilers should be carried out by specialised technicians. This manual contains an explanation of the user's responsibilities and the information required for using the boiler. Beyond these operations, the boiler should only be commissioned by the user or by one of our technicians. Do not try to adjust the boiler or tamper with any components.
-  The mains electrical connections to the boiler room, to the burner and to the boiler itself, the earthing of the control

panel and the boiler should be carried out by qualified personnel in compliance with the reference regulations and standards.

-  The burner should be purchased separately, this manual contains only information regarding the boilers and the boiler warranty does not extend to the burner. It is necessary to consult the burner's instruction manual and have the Warranty Certificate issued for the burner by the dealer where it was purchased.
-  Before starting the burner, make sure that the front door of the boiler is closed tight and that the burner connections have been carried out correctly.
-  Do not touch the hot water pipes and the flues gases discharge pipe when the boiler is running.

## 1.2 General characteristics of the RTT boilers

The RTT 378–930 boilers operate with forced draught burner, they are made of cast iron elements, provide outputs of 378 to 930 kW when connected to the burner correctly and are available in 11 different models (from 7 to 16 elements) running on gas or liquid fuel.

The RTT 378–930 boilers operate at a maximum pressure of 6 bar and at a maximum temperature of 90 °C.

In the RTT 378–930 boilers, the surfaces that transfer the heat are expanded by special fins in the burner chamber and in the flue gas pipes. This system maximises the calorific value of the cast iron boiler.

The RTT 378–930 boilers are boilers with cast iron elements. This structure provides for easy assembly and allows you to increase the capacity of the boiler by simply adding elements. Transport and installation are simplified by the fact that the boiler is assembled on site. Handling or changing its position are easy and do not require the breaking of walls, etc.

The RTT 378–930 boilers have been produced with a special iron alloy EN GJL 200, which provides a high degree of resistance to corrosion and thermal expansion. This special material guarantees the boilers have a long working life.

Thanks to the special horizontal gas elements with three passages, the combustion gases pass three times in the boiler effectively transferring the thermal energy to the water inside the elements.

The RTT 378–930 boilers are high performance boilers (max. calorific value 91–93% depending on the fuel used). The high level of efficiency and the perfect insulation translate into greater energy production with less fuel consumption. The RTT boilers also provide minimal heat dispersion.

An efficient combustion chamber, a good heat transfer surface, the turbulators, the manifold and the insulation provide a high degree of thermal capacity and reduced discharge gas emissions.

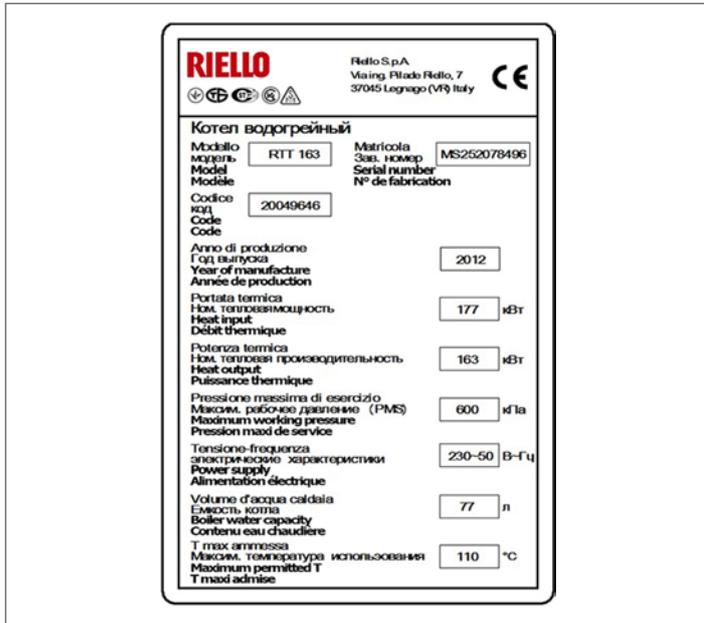


### 1.3 Technical data

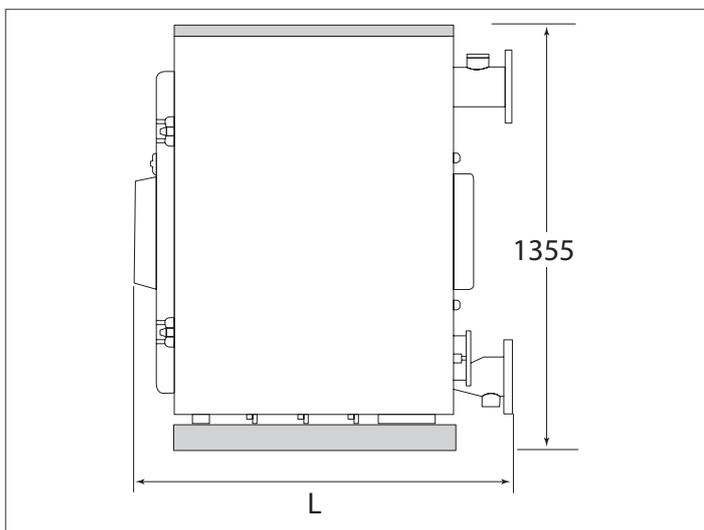
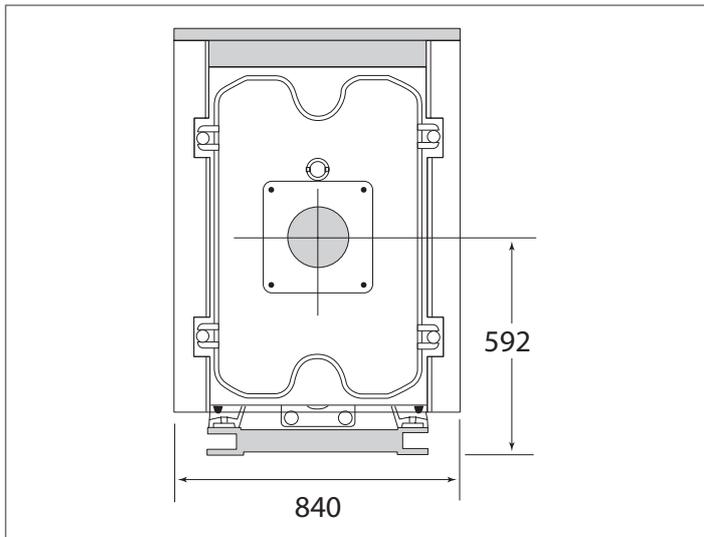
RTT CAST IRON BOILER		RTT 378	RTT 448	RTT 506	RTT 564	RTT 610	RTT 663	RTT 715	RTT 773	RTT 831	RTT 878	RTT 930	UM
Number of sections		6	7	8	9	10	11	12	13	14	15	16	pieces
Nominal heat output		378	448	506	564	610	663	715	773	831	878	930	kW
		325000	385000	435000	485000	525000	570000	615000	665000	715000	755000	800000	kCal/h
Nominal heat input		410	487	551	615	665	720	777	839	900	956	1013	kW
Maximum operating temperature		90											°C
Temperature adjustment range		30-90											°C
Gas side resistor		1.75	1.90	2.25	2.55	2.80	3.15	3.45	3.80	4.10	4.45	4.85	mbar
		2.20	2.40	2.75	3.10	3.35	3.70	4.05	4.35	4.75	4.95	5.50	
Maximum operating pressure		6											bar
Boiler water capacity		149.5	174	198.5	223	247.5	272	296.5	321	345.5	370	394.5	litres
		0.150	0.174	0.199	0.223	0.248	0.272	0.297	0.321	0.346	0.370	0.395	m <sup>3</sup>
Diameter flue pipe fitting		350											mm
Combustion chamber dimensions	width X length	501											mm
	L	910	1,070	1,230	1,390	1,550	1,710	1,870	2,030	2,190	2,350	2,510	mm
Water input-output coupling		G4											DN (*)
Boiler gas volume		341.74	400.71	459.68	518.65	577.62	636.59	695.56	754.53	813.5	872.47	931.44	dm <sup>3</sup> (lt.)
		0.342	0.401	0.460	0.519	0.578	0.637	0.696	0.755	0.814	0.872	0.931	m <sup>3</sup>
Combustion chamber gas volume (gas side)		179.39	210.93	242.48	274.02	305.56	337.1	368.64	400.18	431.73	463.27	494.81	dm <sup>3</sup> (lt.)
		0.179	0.211	0.242	0.274	0.306	0.337	0.369	0.400	0.432	0.463	0.496	m <sup>3</sup>
Safety limit thermostat		110											°C
Type of fuel		l <sub>2</sub> H											gas
		Extra light fuel oil											comb. liquid
Flue gases output temperature	full load	182-187	178-185	175-180	173-178	173-176	170-175	170-174	168-172	165-168	162-165	160-163	°C
	partial load	165-172	164-170	162-168	161-165	160-165	158-163	156-161	155-160	155-160	153-150	150-148	°C
Mass flow of the flue gases	full load	633	750	848	945	1,023	1,110	1,198	1,295	1,393	1,470	1,588	kg/h
	partial load	380	450	508	567	614	666	719	777	836	882	935	kg/h
Boiler dimensions	width X length	840 X 1355											mm
	L	1,300	1,460	1,620	1,780	1,940	2,100	2,260	2,420	2,580	2,740	2,900	mm
Heat loss in stand-by		0.33	0.31	0.28	0.27	0.24	0.22	0.20	0.18	0.17	0.16	0.14	%
		11583	12890	13154	14143	13608	13543	13284	12928	13127	13046	12096	kCal/h
Diameter burner hole		225											mm
Type of burner		With short head											
Flue effect		5											Pa
Boiler net weight		1,020	1,235	1,415	1,555	1,725	1,875	1,975	2,170	2,375	2,465	2,540	kg

## 1.4 Boiler data plate

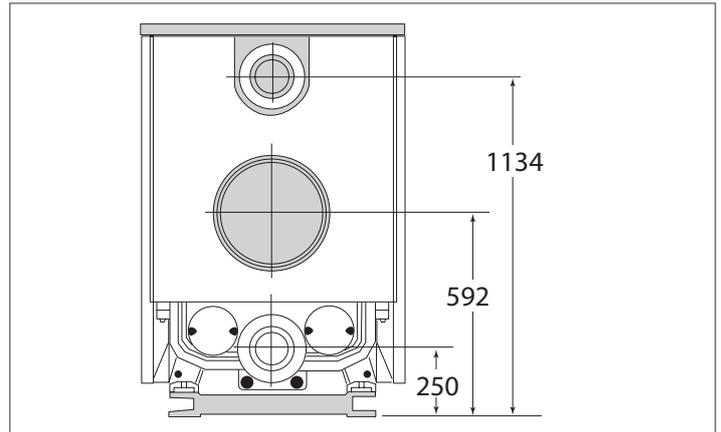
The data plate is applied to the rear of the boiler shell.



## 1.5 Overall dimensions



MODEL	LENGTH L (mm)
RTT 378	1,300
RTT 448	1,460
RTT 506	1,620
RTT 564	1,780
RTT 610	1,940
RTT 663	2,100
RTT 715	2,260
RTT 773	2,420
RTT 831	2,580
RTT 878	2,740
RTT 930	2,900



## 1.6 Delivery

The boiler elements are not supplied assembled, according to the characteristics specified and the dimensions of the installation room. The supply of the disassembled boiler provides for the shipping of the elements and the assembly equipment on pallets. The outer casing, the insulation and other components are supplied inside a box. The assembly of the boiler is carried out by technicians.

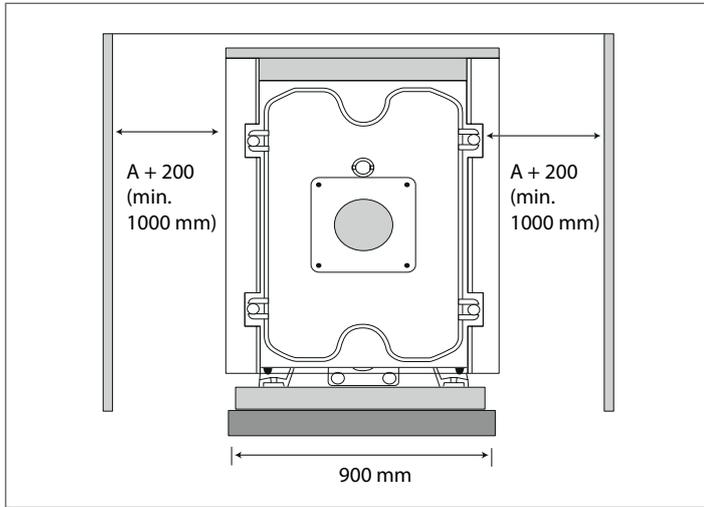
	Burner box (pallet and cardboard box)
	Casing walls and insulating covering (wood box)
	Cast iron boiler elements (pallet 80x120)
	Box for assembly pieces (cardboard box)
	Control panel box (cardboard box)

**!** Comply with the meaning of the symbols on the packaging for reasons of safety.



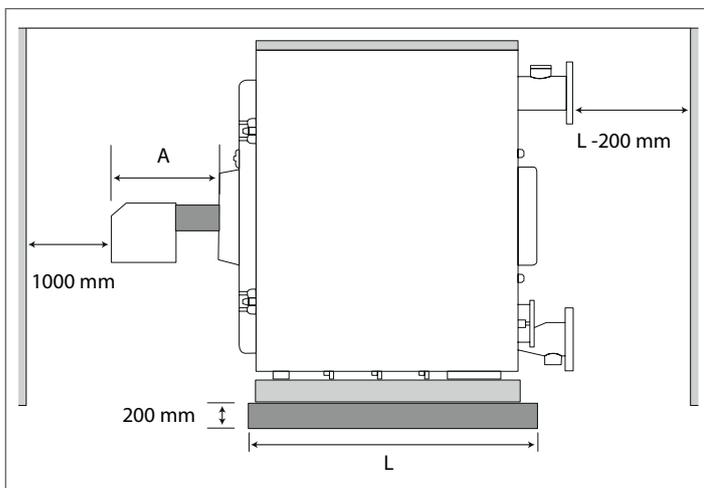
## 1.7 Installation of the boiler

The dimensions of the boiler room and the free spaces should make it easy to carry out any assembly work, repairs, re-assembly and connection of the burner.



The recommended height for the boiler room is at least 2,200 mm, leave the minimum space free on the sides and in front of the boiler as shown in the drawing. Provide a base with a minimum height of 200 mm above the floor for the installation of the burner of the boiler.

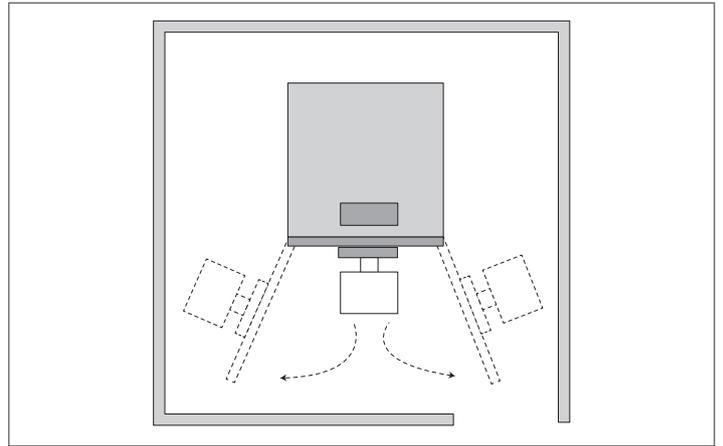
MODEL	LENGTH L (mm)
RTT 378	1,300
RTT 448	1,460
RTT 506	1,620
RTT 564	1,780
RTT 610	1,940
RTT 663	2,100
RTT 715	2,260
RTT 773	2,420
RTT 831	2,580
RTT 878	2,740
RTT 930	2,900



### Characteristics of the base:

- The concrete base should have the indicated dimensions.
- The concrete base should not be covered with a slippery material like ceramic etc.
- Any acoustic insulation should be made before the base.
- The base should be made of BS 25 fiber concrete.

**⚠** Do not place flammable materials on the boiler or at a distance less than the specified safety distance. In the RTT boilers the door of the burner can open from both sides. For this reason, equal free distances are specified on both sides (min. 700 mm). This characteristic is advantageous for operations to be carried out on the boiler. If the space available in the boiler room is not sufficient for the distances indicated, you can choose the opening side and leave more space free on that part. On the other part, half the indicated free distance is sufficient.



Provide enough space for the tools to be used in the boiler room.

## 1.8 Important information about the boiler room

-  The boiler room should be well lit and the light switches should be located outside the room itself.
-  Place any gas detection devices at a height conforming to regulations in force.
-  Do not place devices like the water pump, the contactor, etc., in the boiler room.
-  Repair or replace as soon as possible any electric locks, cables, etc., that could cause short-circuits.
-  Before carrying out any welding in the boiler room, switch off the boiler and stop the flow of flue gases by closing the gas valve.
-  Inside the boiler room there should be no explosive, combustible or inflammable material.
-  The boiler room air should not contain any explosive, combustible or inflammable gas.
-  Children or non-technical persons should not be allowed in the boiler room, just the person who is responsible for it. Keep a copy of the key for the boiler room in a safe place for emergencies.
-  It is possible to insulate the boiler room against noise and heat, also the position and the orientation of the boiler are important for its acoustic insulation.
-  Place the fuel tanks in another room surrounded by walls and with adequate natural ventilation.
-  Arrange for the creation of a diversion of the water supply line near the boiler and a drainage system for draining the boiler water.
-  It is strongly recommended not to install extraction systems, air conditioning system or other devices that in the boiler room, as a secondary effect, could cause the so-called "vacuum effect" and reduce the draught force of the boiler, with main consequence of damaging the burner.
-  Make sure that the boiler room receives sufficient air either naturally or forced (using an aspirator).
-  To ensure the burner and the boiler work efficiently keep the boiler room clean and prevent the formation of humidity.
-  The boiler room should have the minimum dimensions specified.
-  Do not store inflammable material inside the room.
-  Do not touch the supply pipe fitting or other hot parts of the boiler when it is running.
-  Do not install the boiler on a rubber mat.
-  When using LPG or another liquid fuel, the boiler room, the fuel, the system components and the hydraulic pipes need to be in conformity with the parameters established by European standards and by gas supplying companies. The company is not responsible for any faults or problems caused by inadequate or insufficiently adequate conditions for the boiler room, the hydraulic pipes and the other components of the system.
-  Follow the instructions of your local gas suppliers.

## 1.9 Hydraulic system

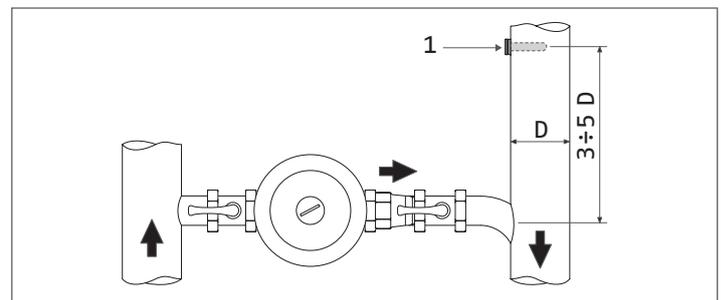
Limescale and other chemical substances in the water can solidify producing incrustations. To prevent this happening, equip the system with a closed expansion tank. The water that enters the closed expansion tank does not evaporate and is not dispersed. In this way the level of water in the system is kept constant and it will not be necessary to add fresh water. In addition, limescale and dust do not form and the system will have a longer life.

- The water contained in the radiator and in the heating system cannot be drunk and is not suitable for domestic use. Do not take water from the system. Add water if the level is low.
- The hardness level of the water should be low to prevent the formation of limescale and other chemical powders. Quality of the water circuit water:  $Ph \geq 7.2$   $Th \leq 25$  °Fr
- If the water from the mains is not of the required quality, after appropriate analyses it is possible to add spring water or water from other sources. If necessary, the water can be treated to get the desired quality.
- To prevent limescale or other powders penetrating the boiler, or from the boiler going into the water circuit, dust filters need to be installed at the system's input and output.
- Connect the recirculation pump to the boiler output. The power of the pump should be suitable for the boiler. Otherwise, the water flow and the boiler performance may suffer.
- To raise the temperature of the return water and to ensure the system runs properly, use a 4-way mixing valve or a by-pass pump with thermostatic control.
- Connecting a 3-way motor valve between the supply line and the return line of the heating system you can obtain a calibrated control of the water flow towards the system.
- There must always be water in the boiler. Otherwise the pipes and the boiler could corrode. If the boiler is not used in winter, add an anti-freeze solution to prevent

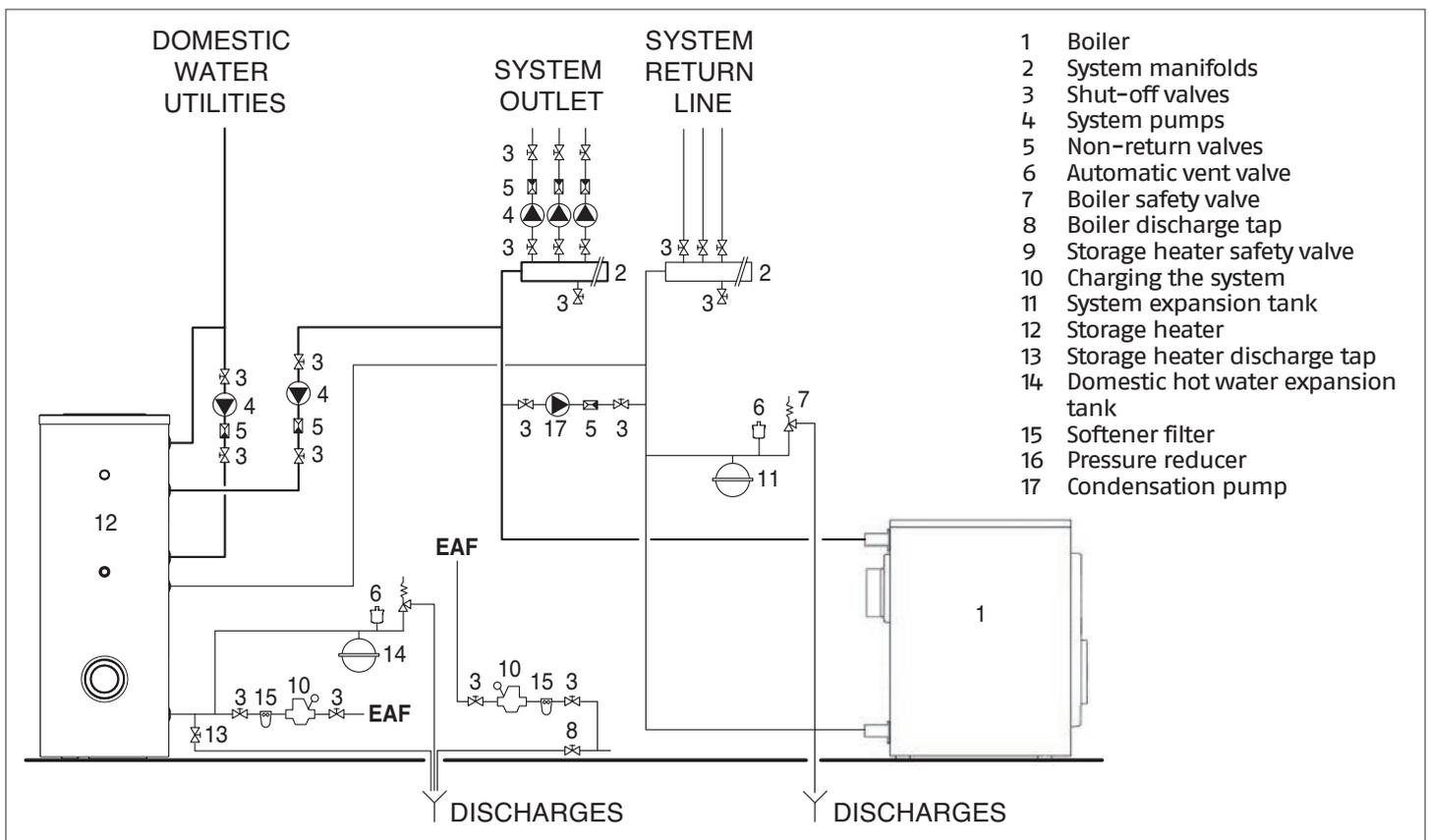
water freezing inside the system.

REFERENCE VALUES	
pH	less than 7.2
Electrical conductivity	less than 200 $\mu\text{s}/\text{cm}$ (25°C)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
M alkalinity	less than 50 ppm
Total hardness	less than 25° F
Sulphur ions	none
Ammonia ions	none
Silicon ions	less than 30 ppm

The Thermostat (1) should be installed at a distance of 3-5 diameters from the connection point to the return line.



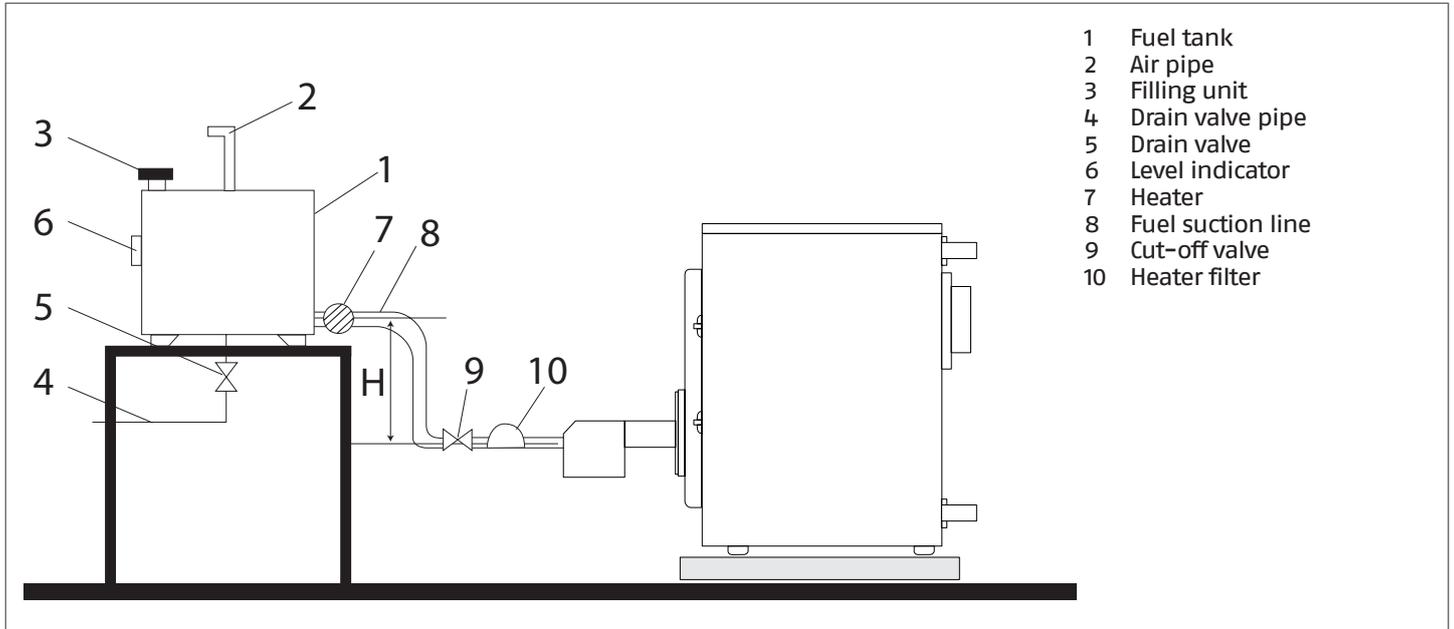
## 1.10 Schematic diagram - system for heating and domestic hot water production



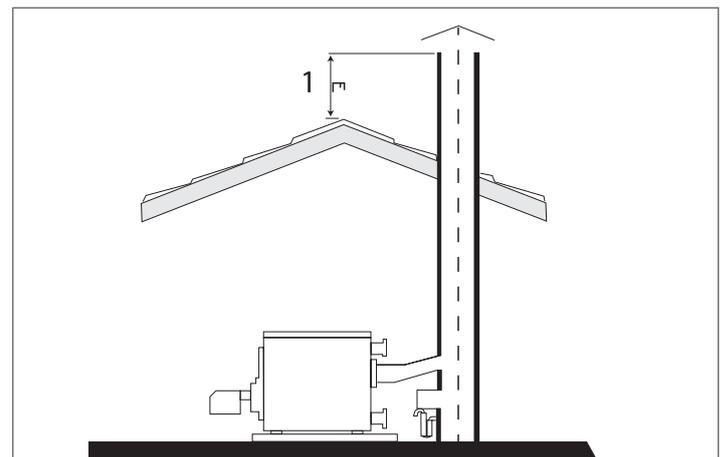
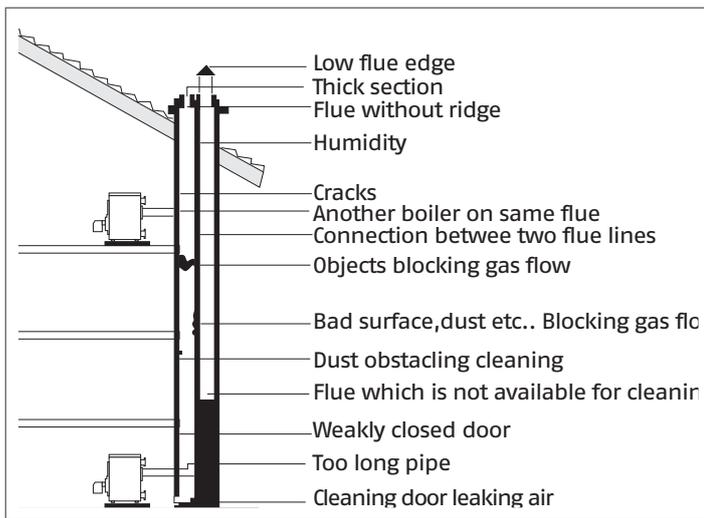
## 1.11 Important instructions for the connection of the fuel tank

The base of the fuel tank should be strong enough to bear the weight of the tank. If the tank is on the outside, the connection pipes must be insulated. The fuel tank should be positioned higher than the burner.

The difference in height between the burner and the fuel tank (H) should be greater than 4 m. In the seasons when the boiler is not used the tank should be emptied to avoid corrosion.



## 1.12 Important information about the flue gases pipe



Flue must be isolated. Isolation ratio is:  $\Delta t < 1^\circ\text{C}/\text{m}$   
Minimum flue height must be 6 m.

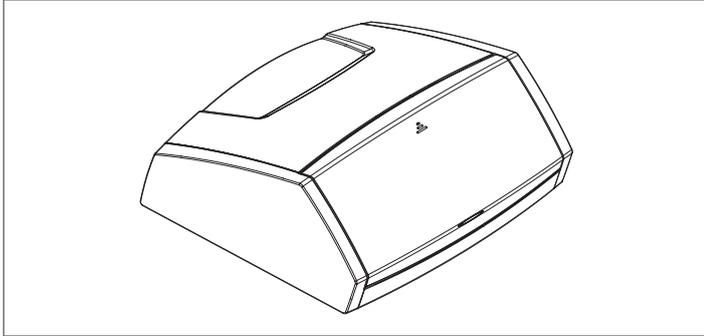
Horizontal flue channels must be connected with at least 5% slope and length of them will not pass 1/4 of the length of the flue.

The gas flow speed must not come under 0,5 m/sec. limit. (2 m/sec. in the advised speed)

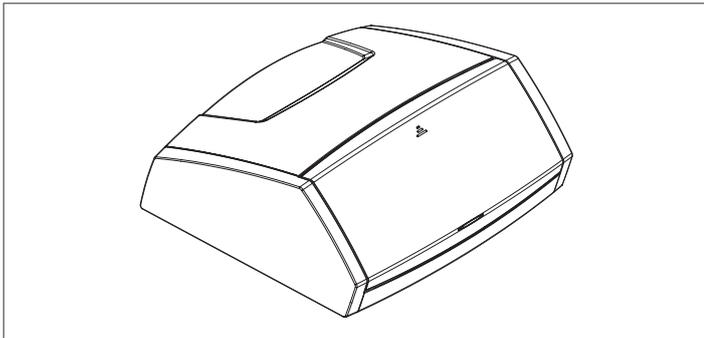
### 1.13 Control panels that can be combined

The control panels that can be combined with the RTT boilers are those shown below, which take into account the various operating functions, the requirements of the heating system and the various devices used on it.

**TECH PRIME** only for heating (1 direct zone) with one-stage or two stage burner.



**TECH PRIME ACS** only for heating (1 direct zone) and domestic hot water production with one-stage or two stage burner.

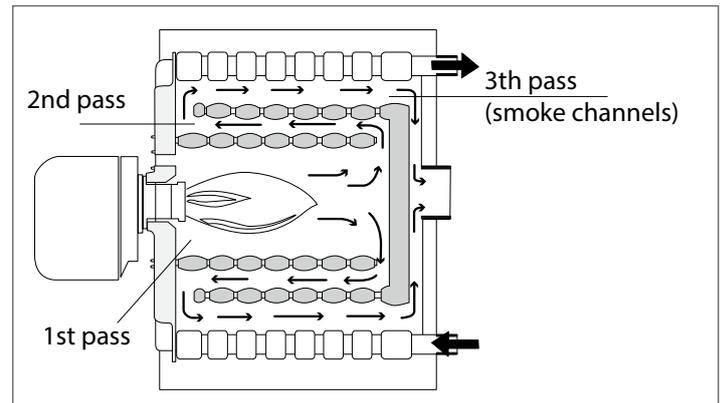


**⚠** When the TECH PRIME control panel is installed, on the boiler return line (cold water), there needs to be a well for housing the probe. For the accessories codes, see the price list.

**⚠** The boilers in the RTT range have a maximum operating temperature of 110°C.

**⚠** Before placing the electrical panel on the top panel it is necessary to fit the relative shim supplied with the boiler. For more details, see the assembly manual.

### 1.14 High performance cast iron elements



The 3-pass system brings about the forced circulation of the combustion gas inside the boiler three times before it comes out of the discharge pipe. In this way, all the useful thermal energy is transferred to the water inside the elements. The optimised combustion chamber and the excellent thermal insulation provide maximum energy efficiency.

The combustion chamber of the boiler has a positive pressure. The boiler operates according to the principle of 3 horizontal passages.

### 1.15 Ventilation of the boiler room

The constant ventilation of the boiler room is important for three reasons:

- 1 Air is required for the boiler's combustion process.
- 2 Air is required to prevent the formation of dirt and dust and for the emission of the gases and the depletion of the fuel.
- 3 Air is required to prevent the boiler room overheating.

Ventilation for the first two reasons is constantly required. In the third case, ventilation is needed above all for boilers that also operate in summer.

The maximum temperature of the boiler room should be 32 °C and the room should be protected from frost.

Type of boiler	Combustion gas pipe dimensions (mm)	Flue gases pipe (methane gas) (m)
RTT 378	350	11.41 16.43
RTT 448	350	16.01 23.06
RTT 506	350	20.44 29.44
RTT 564	350	25.41 36.59
RTT 610	350	29.78 42.88
RTT 663	350	35.1 50.54
RTT 715	350	40.86 58.84
RTT 773	350	47.77 68.79
RTT 831	350	55.23 79.53
RTT 878	350	61.58 88.68

Type of boiler	Combustion gas pipe dimensions (mm)	Flue gases pipe (methane gas) (m)
RTT 930	350	69.14 99.56

If the fuel is methane gas:

Type of boiler	(*) Cross-section of the opening for natural ventilation (cm <sup>2</sup> )		(**) Volume of air required for forced ventilation	
	Lower part	Upper part	Lower part	Upper part
RTT 378	1,971	985	1,224	816
RTT 448	2,285	1,142	1,450	967
RTT 506	2,546	1,273	1,639	1,093
RTT 564	2,808	1,404	1,827	1,218
RTT 610	3,017	1,509	1,978	1,319
RTT 663	3,253	1,626	2,147	1,432
RTT 715	3,488	1,744	2,317	1,545
RTT 773	3,750	1,875	2,505	1,670
RTT 831	4,011	2,006	2,694	1,796
RTT 878	4,221	2,110	2,844	1,896
RTT 930	4,456	2,228	3,014	2,009

(\*) If natural ventilation is used.

(\*\*) If forced ventilation is used.

(\*\*\*) The value in the "Lower" column refers to the clean air input, the one in the "Upper" column to the air output.

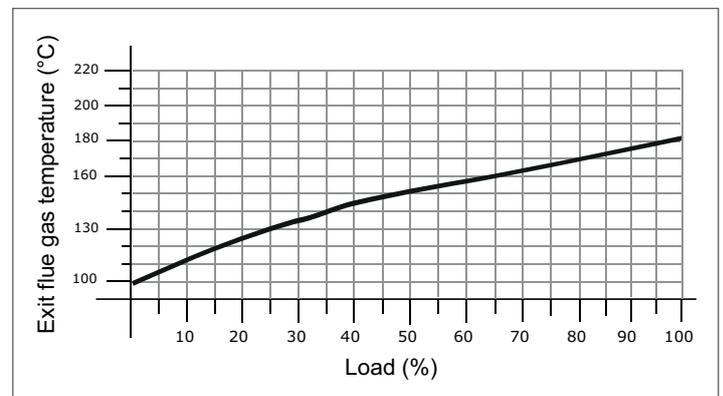
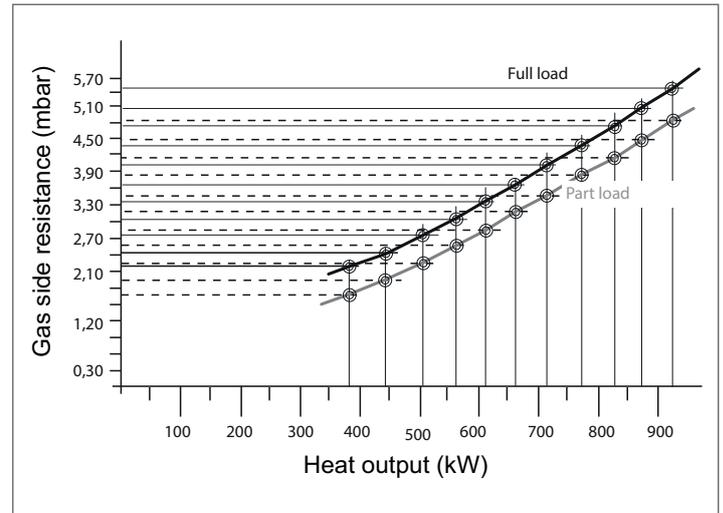
To ensure the boiler is operating at optimal conditions, the temperature difference between the supply water and the return water should be no greater than 20 °C. The boiler should not be started or run with water volumes lower than those indicated in the following table.

Type of boiler	Output		$\Delta t = 15 \text{ K (*)}$		$\Delta t = 20 \text{ K (*)}$	
	kCal/h	kW	Water flow rate	Water resistance	Water flow rate	Water resistance
			m <sup>3</sup> /h	mbar	m <sup>3</sup> /h	mbar
RTT 378	325,000	377.9	21.67	102	16.25	54
RTT 448	385,000	447.7	25.67	147	19.25	80
RTT 506	435,000	505.8	29.00	180	21.75	105
RTT 564	485,000	564.0	32.33	160	24.25	78
RTT 610	525,000	610.5	35.00	175	26.25	88
RTT 663	570,000	662.8	38.00	200	28.50	115
RTT 715	615,000	715.1	41.00	220	30.75	130
RTT 773	665,000	773.3	44.33	160	33.25	85
RTT 831	715,000	831.4	47.67	180	35.75	90
RTT 878	755,000	877.9	50.33	205	37.75	125
RTT 930	800,000	930.2	53.33	220	40.00	140

(\*)  $\Delta t$  = temperature difference

NOTA: The RTT boiler has been designed only for heating systems with forced circulation of hot water.

## 1.16 Gas side resistor and output temperature of combustion gases



## 1.17 User instructions

### Heating system

The difference in temperature between the supply temperature and the water return temperature should not exceed 20°C. The temperature of the return water should be higher than 50–55 °C. Use the boiler's protection pump to raise the temperature of the return line water. The water level in the system should be measured every day (if the circuit is open with a water gauge, if closed with a pressure gauge) topping up with water if the level is too low. Do not add water when the system is hot. If there are problems that are causing leaks, these should be dealt with as soon as possible. The water circuit should be made by certified professionals, in conformity with the requirements and using the materials specified in current regulations.

### Connections to the electrical system and fuel delivery system

These connections should be made by certified professionals, in conformity with the requirements and using the materials specified in current regulations. Burner, control panel, Ecopanel etc.: read the warnings and the instruction manuals provided by the manufacturer or by the distributor. The burner should not start before the boiler's recirculation pump is running. If there is a fault with the recirculation or protection pump, switch off the burner. The operation of the systems should be coordinated. Do not switch on the pumps when the water temperature is at 40 °C or higher. The recirculation pump and the burner should operate contemporaneously.

The protection pump should be chosen taking into account the boiler capacity. The connection of the pumps to the manifolds should be carried out correctly with valve and thermostat. In this way the system will stop at the temperature that has been set. If

there is any anomaly or fault (contactor, thermal fault, electrical supply interruption etc.), if the pumps are not running (heating, protection pumps etc.), the burner should not start. The lock-out should occur automatically. The electrical system should be made taking into account the above information.

## 1.18 Conveyance and discharge of the boiler water

### Discharge of the boiler water

To empty the boiler, open all the valves of the circuit and the radiators. The water of the entire system can be drained by emptying the boiler as the end element of the system. If some parts of the heating system are under the boiler room, draining the water can be carried out at the lowest point of the system.

### Supplying the boiler with water

The boiler receives water from the tap through the water circuit. During the conveyance process, all the water circuit and radiator valves need to be open. To prevent air entering the system, this operation should be carried out slowly and by opening the top tap. When water comes out of this tap, the operation is finished. Let the air come out of each radiator. The water should be of the quality indicated in the chapter "Hydraulic system" a pagina 10. The boiler should not be filled with water when it is hot, since this could cause cracks in the elements.

## 1.19 Instructions for disposing of the product

Cast iron boilers have a long life due to the particular characteristics of the construction materials used. The service life of these appliances, which is declared in the accompanying legal documents, is 15 years. Therefore, the replacement of these appliances generally takes place for reasons of plant modernisation.

Cast iron boilers, produced with innocuous materials, can be disposed of as follows:

Cast iron body (Grey cast Iron)	Using disposal companies specialised in iron and cast iron foundries
Casing piping and panels	Using disposal companies specialised in iron
Other Metal Parts	Using disposal companies specialised in iron
Thermal ceramic and other insulating materials	Using normal refuse disposal services

NOTA: For more information please contact an authorised dealer

## 1.20 Fire prevention regulations for the boiler room

The boilers should be positioned and installed particularly carefully and in conformity with fire safety regulations.

When installing and using the boiler, a safety distance of 200 mm must be observed from class B, C1 and C2 flammable materials.

For class C3 materials that easily catch fire, namely materials that burn quickly and that keep combusting even after removal from the source of the ignition, the safety distance is 400 mm.

The safety distance should be doubled also when the flammability class of the material has not been ascertained.

Flammability classes of the materials and the construction products	Materials and construction products
A - Non-combustible	Granite, sandstone, bricks, ceramic tiles, mortar, fire-proof plasters etc.
B - Almost non-combustible	acumin, izumin, heraklit, lignos, basalt panels and fibre, fiberglass panels etc.
C1- Difficult to ignite	Beech or oak, hobrex panels, plywood, werzalit etc.
C2 - Normal combustibility	Pine, larch, white wood, panels of wood shavings and cork, rubber floors etc.
C3 - Easily ignited	Tar-coated sheets, polyurethane, polystyrene, polyethylene, PVC etc.

NOTA: For more information, contact an authorised service company.

## 1.21 Boiler checks and start-up

### Preliminary checks

- The following checks need to be carried out before starting the boiler. In the event of problems or faults, the boiler should not be started.
- Check the level of the boiler water. Add water if the level is low.
- Call for technicians if you see water leaks. Leaks should be dealt with before starting the boiler. If there are leaks in the water circuit, the boiler should be started after carrying out the necessary repairs.
- Check the connections of the flue gas pipe. If there are problems, the boiler should be started after carrying out the necessary repairs.
- The room should have an adequate ventilation system.
- If the boiler runs on gas, check the gas valves have been installed correctly.
- If the boiler runs on liquid fuel, check the level of fuel in the tank and open the fuel valve. Check the connection between the fuel supply and the burner. If there are problems, clean the filters.
- Check the pumps are running and check their rotation direction.
- Check the electrical connections of the control panel.
- All the boiler's gas and water valves should be open.



Check all the other connections according to the system's options.

### Boiler start-up

- Switch on the electrical supply using the master switch in the boiler room. The operating lamp comes on.
- Start the recirculation pump.
- Set the burner's ignition switch to "ON" (see burner's instruction manual). The lamp comes on.
- Adjust the temperature of the boiler with the thermostat. If it is a two-stage burner, adjust the boiler temperature as for the single-stage burner. The two-stage thermostat (TRZ) adjusts the temperature (8 °C).
- If the burner does not start, follow the instructions in the burner's manual. If it is not possible to start the burner after following the manual's instructions, contact the burner's technical assistance service.

### Switching off the boiler

- Switch off the burner (carrying out the commands described in the burner's instruction manual).
- Set the "ON/OFF" switch on the control panel to "OFF".
- Switch off the circulation pump
- Close all the fuel valves.
- Switch off the electrical supply using the master switch in

the boiler room.

### First checks in the event of a fault

When the burner or a boiler has a fault, check the following before calling for assistance. Do not carry out any other intervention except for the controls indicated. After these checks, contact the technical assistance service.

If the boiler stops and does not restart, the stop could have been caused by the safety thermostat due to the overheating of the water in the boiler. In this case, wait for the boiler to cool down and carry out the following checks.

- Check that the fuel is being correctly supplied to the burner. If necessary, restore the fuel supply to the burner.
- Check that the pump is working. If the pump has stopped it could be the cause of the overheating. Contact the pump's manufacturer or distributor.
- Check the position of the valves. If the valves are closed, open them. Press the switch of the safety thermostat when the boiler has cooled down enough.
- The burner should start.
- If the boiler does not start, or if the safety thermostat stops the boiler again, contact the technical assistance service.
- If the warning light of the burner is on, consult the burner's instruction manual or contact the appliance's manufacturer or dealer.

## 1.22 Maintenance instructions

The boiler and burner checks are carried out: daily (daily use), periodically and annually.

### Daily checks

The user should carry out these checks daily in the season when the boiler is used every day. Read and follow the instructions for the daily checks in the chapter "Preliminary checks" in the manual.

### Periodic checks

To perform efficiently, to prevent faults and to prolong the boiler's life, it is important to carry out periodic checks. We recommend these checks be carried out once every three months. Periodic checks are carried out by the technicians as follows:

- Checking and cleaning, if necessary, of the combustion chamber and the passageways of the boiler smoke.
- Checking for water leaks going into and coming out of the boiler and checking the flue gases pipe fitting seal.
- Checking the valves.
- Checking the pumps.
- Checking and cleaning, if necessary, the fuel filter.
- Checking the combustion (visual). Adjusting the burner and flame, if necessary.
- Checking and cleaning, if necessary, the liquid fuel sensor.
- Checking the operation and safety of the burner and the boiler.

### Annual checks

The annual checks should be carried out by technicians before the start of the season. The flue gases pipe and the relative fittings need to be cleaned before requesting the intervention of technicians for the annual checks. In the annual checks, the technicians assess the following:

- Conditions and sealing of the elements and the insulating cords.
- Operating pressure for adjusting the combustion with the combustion gas measurement system, if necessary.
- Sensors and connection of the sensors.
- Boiler combustion chamber and any formations of soot in the flue gas passages; cleaning after checking.
- Fastening and seal of the boiler door.
- Seals of the boiler fittings.

- Correct opening and closing of the valves.
- Fuel filter and eventual cleaning.
- Burner liquid sensor with cleaning or replacement.
- Operation and safety of the burner and the boiler.

## 1.23 Cleaning the boiler

Before carrying out this work on the boiler, switch off the electrical supply with the master switch, close the fuel valves and protect the control panel and the burner so as not to damage them.

### Cleaning the flue gas passages

The formation of soot on the heating surfaces can lead to an increase in the temperature of the fumes by up to 100° above normal, leading to a yield reduction of 5%.

- Remove the M16 screws and the nuts from the four hinges that connect the burner door to the front and then open the door.
- Clean the combustion chamber, extract the turbulators and the horizontal flue gas passages (second and third passage).
- Clean the turbulators and put them back in the channels.
- Close the door of the burner securely.
- During this cleaning operation, a layer of soot could form in the flue gas outlet zone. The soot can be removed by separating the horizontal passages from the flue pipe.
- After this operation, put back the screws and check the door seal.

The frequency of the cleaning changes depending on the type of fuel used by the boiler and the period it is used. When cleaning the boiler, check the ceramic fibre cords that insulate the door from the front element and the flue gases pipe from the rear element and replace them if necessary.

## 1.24 Burner door and burner connection

When assembling the burner, be careful not to leave any empty space between the front door and the body of the burner. All the points of contact should be covered with insulating material to prevent air leaks.

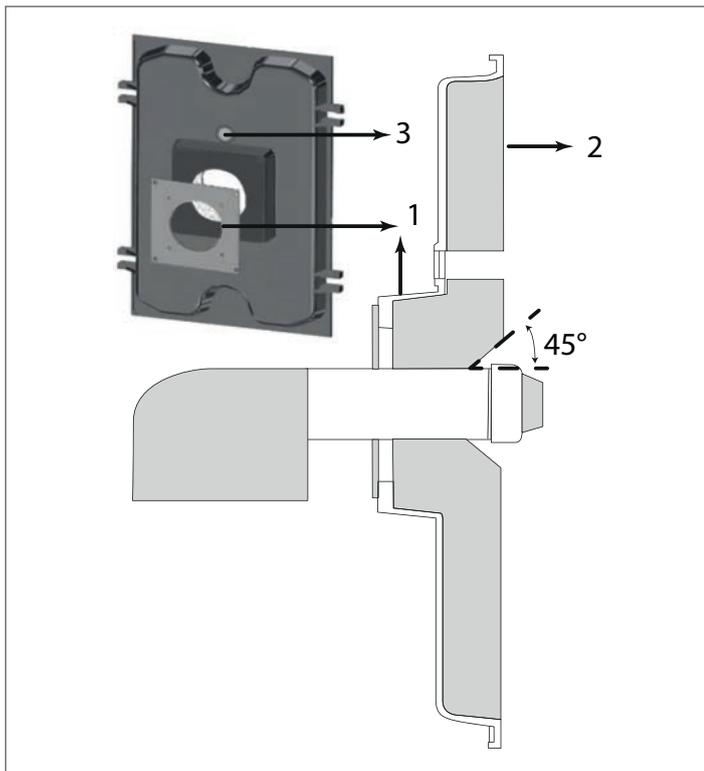
To make it easier to fix the burner to the door a metal flange is used. The cover measures 320x320 mm and has a thickness of 10 mm; the burner hole measures 225 mm (1).

The burner door insulation (2) is composed of a special thermal ceramic that can withstand up to 1250 °C and is safe for people to use. Be very careful when transporting the insulating plate.

A ceramic fibre insulating cord is inserted in the door groove. The cord has the function of preventing leaks between the door and the front element of the boiler. After cleaning or repair work, put back the door fixing it solidly to the front element.

In the RTT 378-930 boilers it is possible to choose the opening side of the door. This feature is an advantage for assembly, repair operations etc.

The burner door has an inspection window made of tempered ceramic glass (3).



## 1.25 Table of burner combinations

OIL BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 378	RL 44 MZ TC	3470310 (*)
		3470340 (**)
RTT 448	RL 50 t.c.	3474632 (**)
RTT 506	RL 50 t.c.	3474632 (**)
RTT 564	RL 70 t.c.	3475032 (**)
RTT 610	RL 70 t.c.	3475032 (**)
RTT 663	RL 70 t.c.	3475032 (**)
RTT 715	RL 70 t.c.	3475032 (**)
RTT 773	RL 100 t.c.	3475232 (**)
RTT 831	RL 100 t.c.	3475232 (**)
RTT 878	RL 100 t.c.	3475232 (**)
RTT 930	RL 100 t.c.	3475232 (**)

DOUBLE FUEL BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 378	RLS 38	3484101 (*)
RTT 448	RLS 50	3484601 (**)
RTT 506	RLS 70	3485001 (**)
RTT 564	RLS 70	3485001 (**)
RTT 610	RLS 70	3485001 (**)
RTT 663	RLS 70	3485001 (**)
RTT 715	RLS 70	3485001 (**)
RTT 773	RLS 100	3485201 (**)
RTT 831	RLS 100	3485201 (**)
RTT 878	RLS 100	3485201 (**)
RTT 930	RLS 100	3485201 (**)

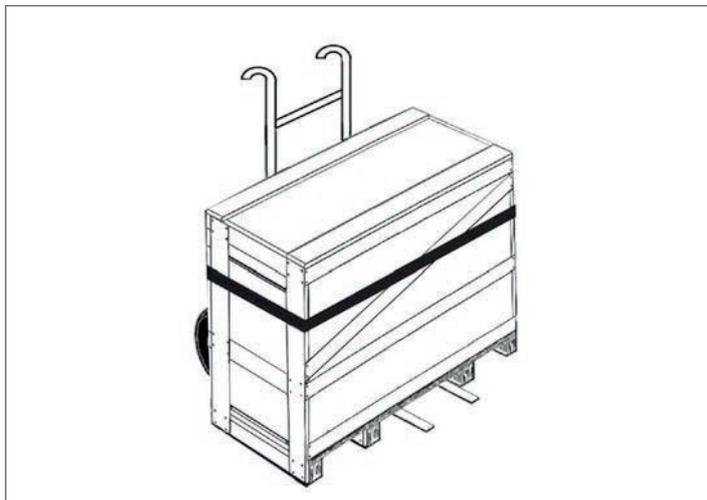
GAS BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 378	RL 44 MZ TC	3789110 (*)
		3789140 (**)
RTT 448	RS 50 t.c.	3784702 (**)
RTT 506	RS 50 t.c.	3784702 (**)
RTT 564	RS 64 MZ TC	3789310 (**)
RTT 610	RS 64 MZ t.c.	3789310 (**)
RTT 663	RS 70 t.c.	3785102 (**)
RTT 715	RS 70 t.c.	3785102 (**)
RTT 773	RS 100 t.c.	3785302 (**)
RTT 831	RS 100 t.c.	3785302 (**)
RTT 878	RS 100 t.c.	3785302 (**)
RTT 930	RS 100 t.c.	3785302 (**)

(\*) Single-phase burner

(\*\*) Three-phase burner

## 1.26 Transport and storage

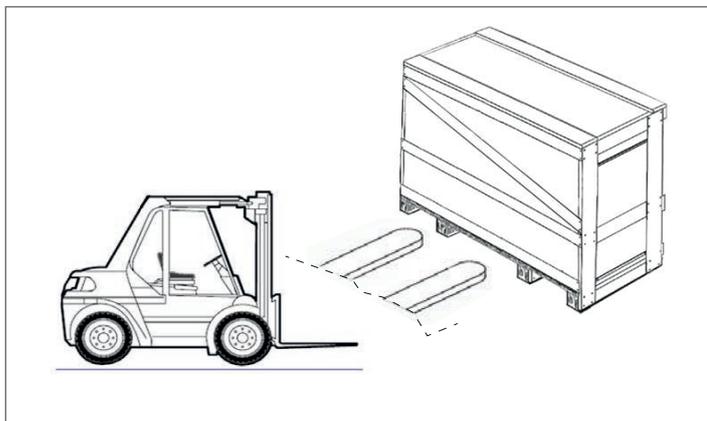
The manufacturer transports the boiler on a pallet fixing it (using screws) to prevent any sliding. Transport the boiler only on its base and in no other way.



When the boiler is being stored or transported ensure at least the normal storage conditions (non-aggressive environment, air humidity less than 75%, temperature between 5° and 55° C, low dust levels and the prevention of damage due to biological factors).

Do not force the cover elements and the boiler panels in the storage phase or when being transported.

For the transportation of the boiler always use lift trucks, trans-pallets or other means of transport with wheels.





# RIELLO

RIELLO S.p.A.

37045 Legnago (VR)

Tel. 0442630111 - Fax 044222378 - [www.riello.it](http://www.riello.it)

As part of the company's ongoing commitment to perfecting its range of products, the appearance, dimensions, technical data, equipment and accessories may be subject to variation.