

RTT 163-355

EN INSTRUCTIONS FOR THE INSTALLER AND FOR THE TECHNICAL ASSISTANCE CENTRE

RIELLO

RANGE

MODEL	CODE
RTT 163	20091302
RTT 195	20091303
RTT 227	20091304
RTT 259	20091305
RTT 291	20091306
RTT 323	20091308
RTT 355	20091309

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 163-355 boiler.

Thank you once again
Riello S.p.A.

ACCESSORIES

For the RTT 163-355 r boilers the following accessories are available:

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

CONFORMITY

The RTT 163-355 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

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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-0079321 – Rev. 0 (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 boilers RTT 163-355 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 163-355 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. To attain an appropriate performance, pay special attention to the size of the domestic hot water circuit.

 The RTT 163-355 boilers are delivered without the burner. To choose the most suitable burner and to keep the performance at a high level, 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, the performance will worsen and there will be an increase in fuel consumption. The periodic and annual controls of the boiler should be carried out precisely and at the scheduled time. Natural gas is a clean fuel and does not dirty the appliance so much. Liquid fuel burners, on the other hand, get the appliance very dirty and the boiler controls and maintenance operations are necessary to ensure a high performance and a long life.

 Repairs and periodic controls of the boilers RTT 163-355 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 per-

sonnel 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 163–355 boilers operate with forced draught burner, they are made of cast iron elements, provide outputs of 163 to 355 kW when connected to the burner correctly, and are available in 7 different models (from 5 to 11 elements) running on gas or liquid fuel.

The RTT 163–355 boilers operate at a maximum pressure of 6 bar and at a maximum temperature of 90 °C.

In the RTT 163–355 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 163–355 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 163–355 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 163–355 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 163–355 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.

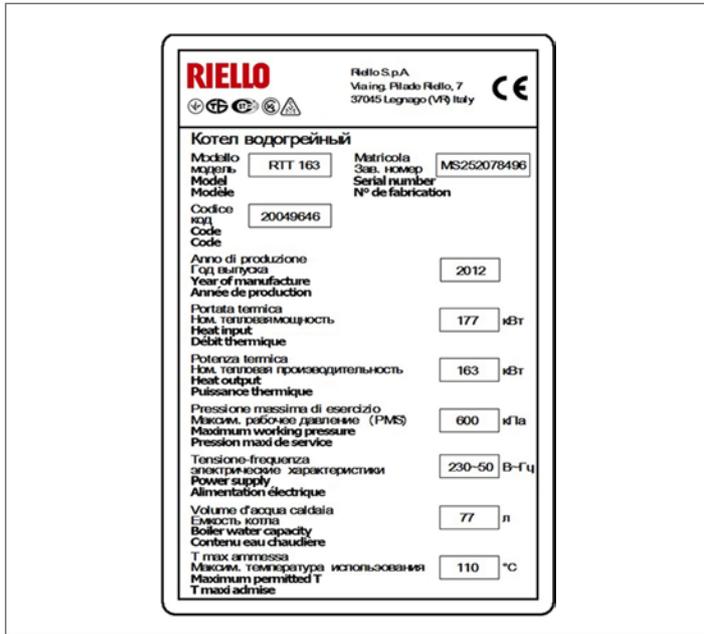


1.3 Technical data

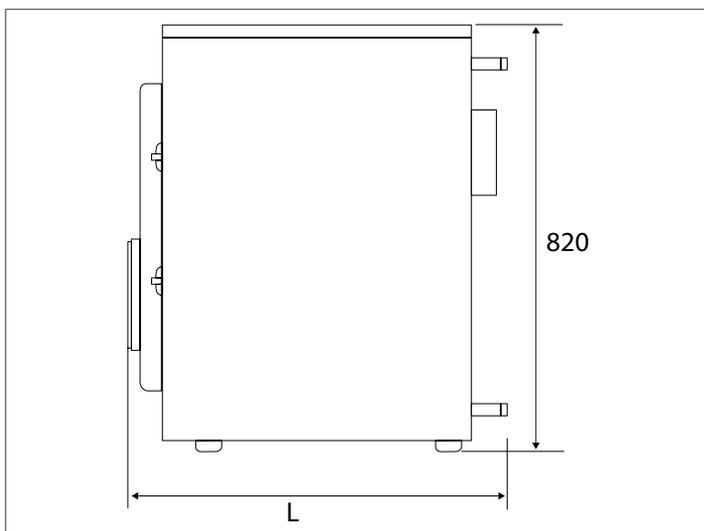
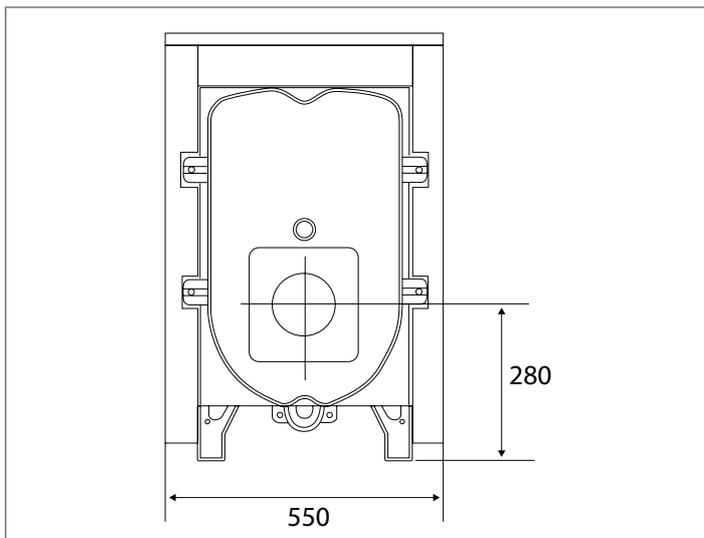
RTT BOILER MADE OF CAST IRON		RTT 163	RTT 195	RTT 227	RTT 259	RTT 291	RTT 323	RTT 355	UM	
Number of sections		5	6	7	8	9	10	11	pieces	
Heat output		169	195	227	259	291	323	355	kW	
		140,000	167,500	195,000	222,500	250,000	277,500	305,000	kCal/h	
Heat input		177	211	246	281	316	351	385	kW	
Maximum operating temperature		90							°C	
Temperature adjustment range		30-90							°C	
Gas side resistor		1.25-1.60	1.35-1.70	1.55-1.90	1.78-2.20	2.08-2.50	2.37-2.80	2.65-3.10	mbar	
Maximum operating pressure		6							bar	
Boiler water capacity		77	93	109	125	141	157	173	litres	
		0.077	0.093	0.109	0.125	0.141	0.157	0.173	m ²	
Diameter flue pipe fitting		see table pag. 12							mm	
Combustion chamber dimensions		width X length							mm	
		L							mm	
Water input-output coupling		G 3							DN (*)	
Boiler gas volume		142.17	170.43	198.69	226.95	255.21	283.47	311.73	dm ³ (lt.)	
		0.142	0.170	0.199	0.277	0.255	0.283	0.312	m ²	
Combustion chamber volume (gas side)		101.89	122.15	142.4	162.65	182.91	203.16	223.41	dm ³ (lt.)	
		0.102	0.122	0.142	0.163	0.183	0.203	0.223	m ²	
Safety limit thermostat		110							°C	
Type of fuel		Natural gas (I ₂ H)							gas	
		Extra Light Fuel Oil							comb. liquid	
Flue gases output temperature		full load	182-187	178-185	175-180	173-178	173-175	170-173	172-170	°C
		partial load	165-172	164-170	162-168	161-165	160-165	158-163	156-161	°C
Mass flow of the flue gases		full load	273	326	380	433	487	540	594	kg/h
		partial load	164	196	228	260	292	324	356	kg/h
Type of burner		With short head								
Dimensions of burner flange coupling		185							mm	
Heat loss in stand-by		0.25	0.24	0.22	0.20	0.19	0.18	0.16	%	
		3,780	4,342	4,633	4,806	5,130	5,395	5,270	kCal/h	
Boiler length (L)		1,070	1,215	1,360	1,505	1,650	1,795	1,940		
Boiler net weight		485	565	650	735	810	895	975	Kg	

1.4 Boiler data plate

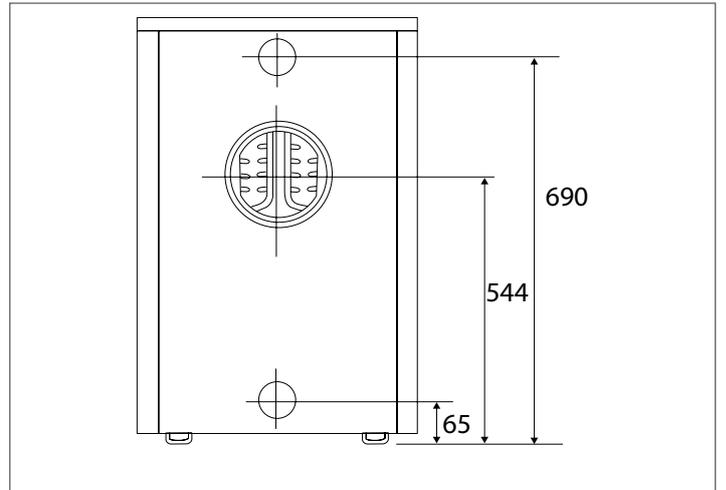
The data plate is applied to the rear of the boiler shell.



1.5 Overall dimensions



	RTT 163	RTT 195	RTT 227	RTT 259	RTT 291	RTT 323	RTT 355
L(mm)	1,070	1,215	1,360	1,505	1,650	1,795	1,940



1.6 Delivery

The boiler sections are delivered either already assembled or not, depending on the dimensions and the specifications of the boiler room.

For the delivery of the unassembled appliances, the various sections and the various components are delivered inside a pallet, while the casing, the insulating layer and other elements are delivered in a box. The assembly of the boiler is carried out by specialist technicians.

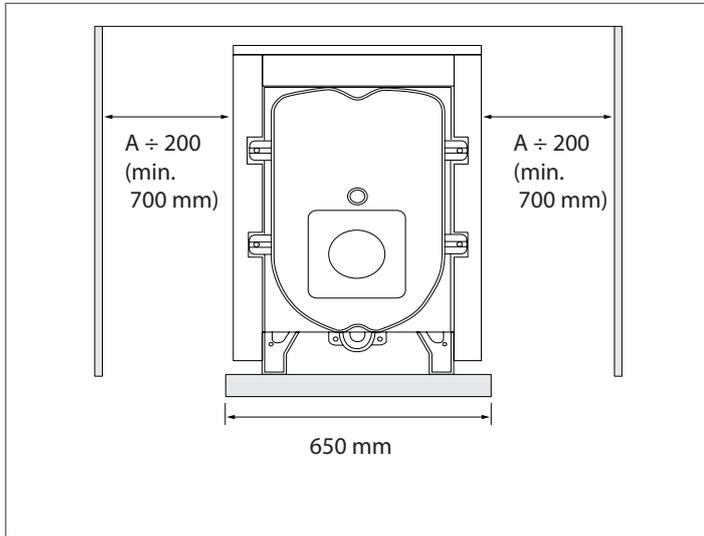
	Burner box (pallet and cardboard box)
	Casing walls and insulating covering (wood box)
	Cast iron boiler elements (pallet 80x120)
	Box of assembly pieces (cardboard box)
	Control panel box (cardboard box)

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



1.7 Installation of the boiler

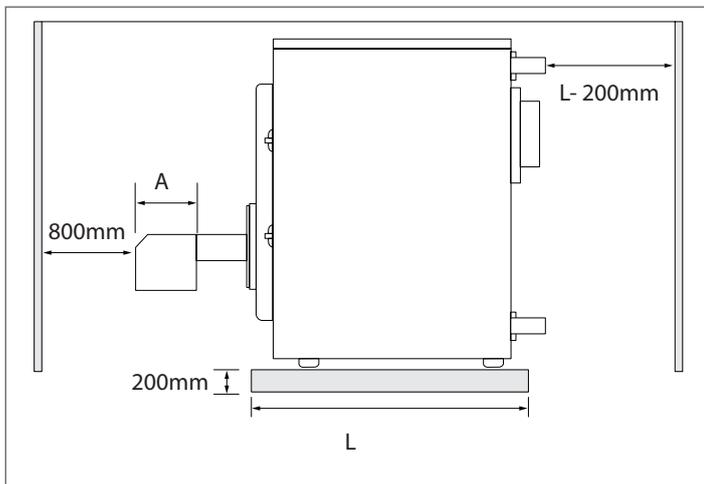
The boiler must be installed respecting the minimum indicated distances to allow the necessary maintenance work to be carried out. The position "A" depends on the burner model used.



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.

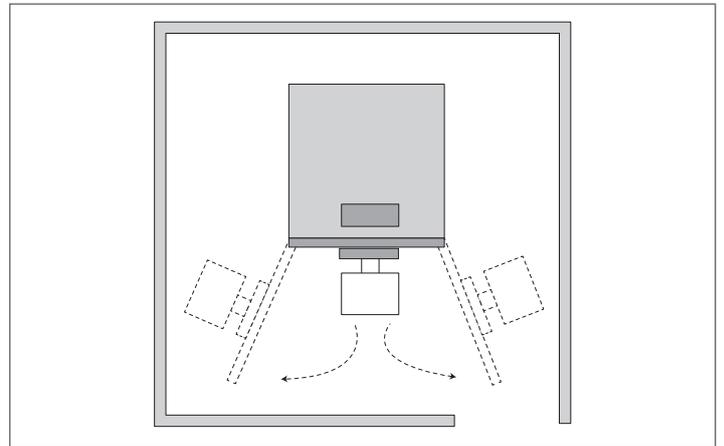
	RTT 163	RTT 195	RTT 227	RTT 259	RTT 291	RTT 323	RTT 355
L(mm)	1,170	1,315	1,460	1,605	1,750	1,890	2,035



Characteristics of the base:

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

In the RTT 163–355 boilers, the door of the burner can open on 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 close the gas valve.
-  The boiler room should not contain any 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, except for 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 branching 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 systems or other devices in the boiler room that, as a secondary effect, could cause the so-called "vacuum effect" and reduce the draught force of the boiler, with the 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 norms and by gas supplying companies. The company is not responsible for any faults or problems caused by the inadequate conditions of 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

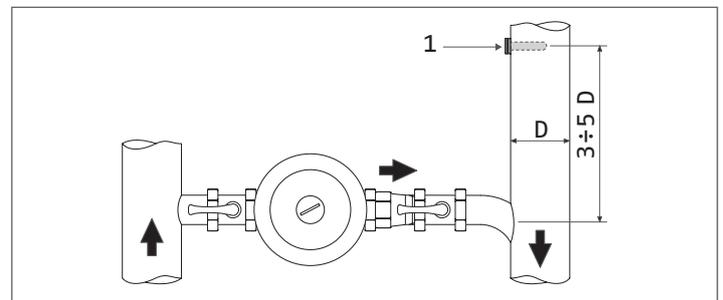
Limescale and other chemical substances in the water can solidify producing incrustations. To prevent this happening, equip the system with a closed expansion tank. The water that goes into the closed expansion tank does not evaporate and is not dispersed. In this way the level of water in the system 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 circulating in the system is not to be used for washing or drinking.
- Do not take water from the system. If the water level is low, top it up.
- To prevent damage due to limescale or chemical residues, put water in the system with the following recommended values: pH > 7.2 TH < 25 °Fr. Check the water quality, and if the quality of the water used does not meet the required standards, subject the water to suitable corrective processes to obtain the desired quality.
- To prevent the formation of limescale or sediments inside the boiler or their passage from the boiler to the hydraulic system, equip the system with suitable protections both inside and on the outside.
- Connect the circulation pump to the boiler water outlet. The power of the pump should be suitable for the boiler.
- Provide a 4-way mixing valve or a pump on the by-pass section activated by a thermostatic control to raise the temperature of the water in the return line.
- Provide a 3-way motorised valve connecting the supply line and the return line of the heating system, to adjust the flow rate of the water in the system according to the desired performances.
- The amount of water in the system should be such that there is always water in the boiler. Otherwise the boiler could be subject to corrosion. If the boiler is not used in winter, in order to prevent damage from freezing, use an anti-freeze product, periodically measure the amount of

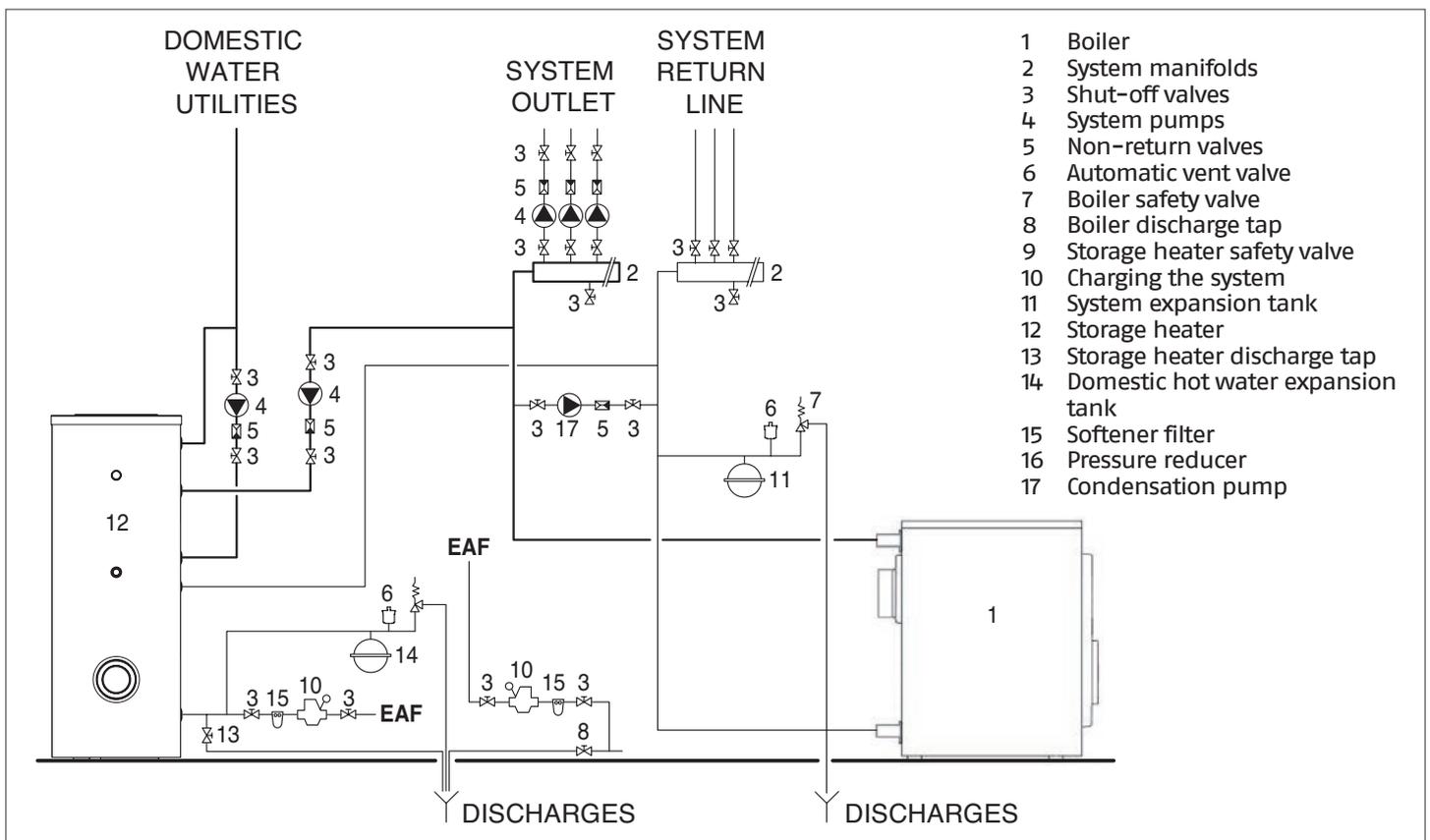
water in the boiler with a pressure gauge if it has a closed expansion tank or with a water gauge if it has an open expansion tank.

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.



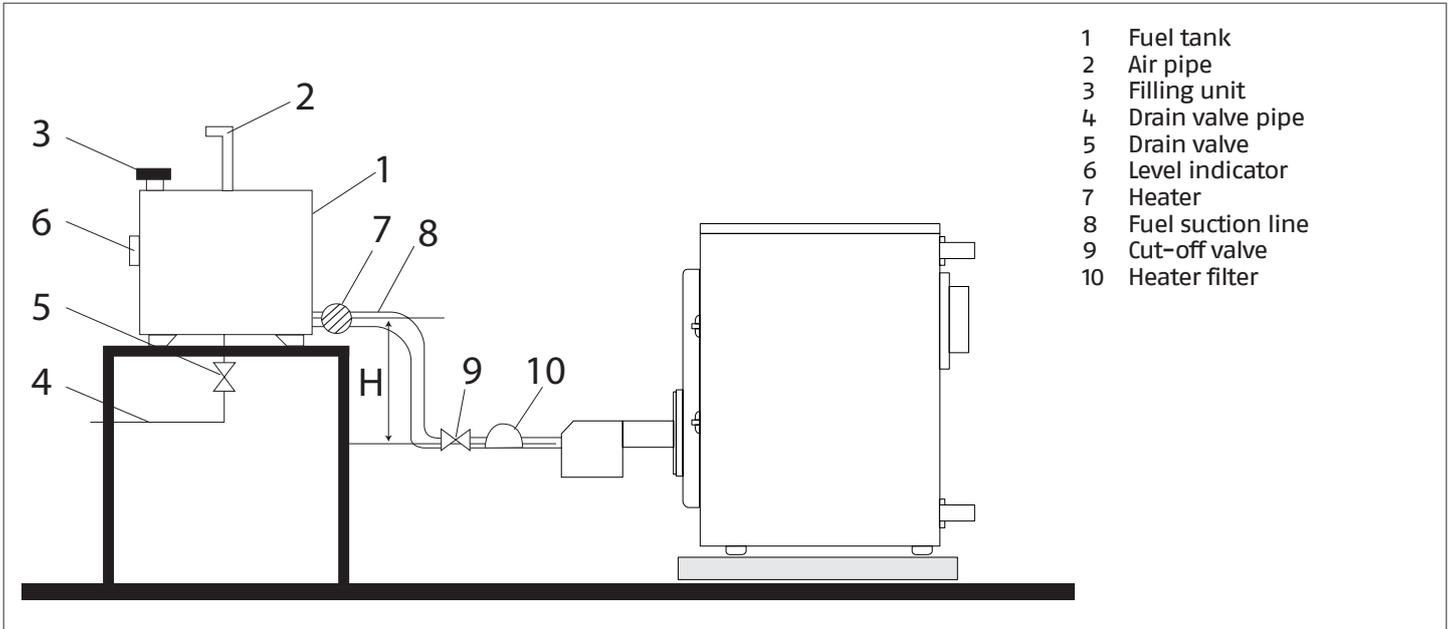
1.10 Schematic diagram - system for heating and domestic hot water production



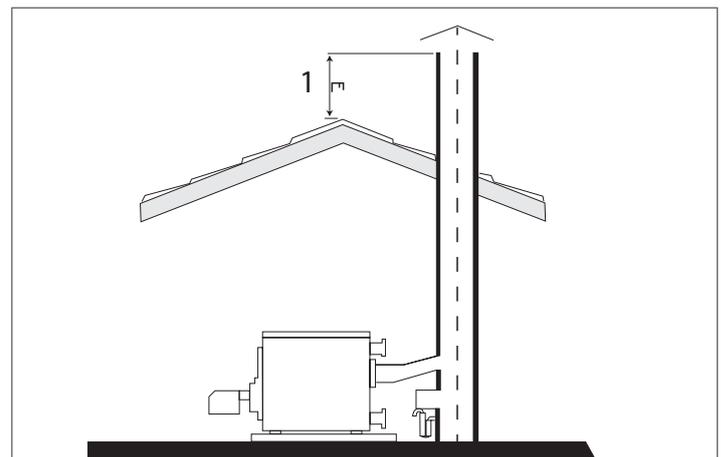
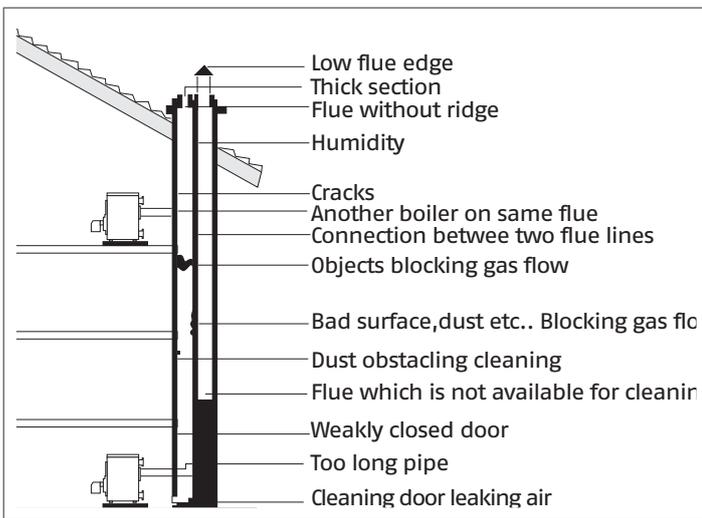
1.11 Important instructions for the connection of the fuel tank

The dimensions of the fuel tank support platform should be adequate for the dimensions of the tank and the weight of the tank when full. If the fuel tank is located on the outside, this and the coupling pipe should be thermally insulated.

The tank should be placed higher than the burner, with a difference of level H between the output of the fuel tank (9) and the burner input (10) greater than 4 m. When the boiler is not being used, empty the fuel tank to prevent 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.

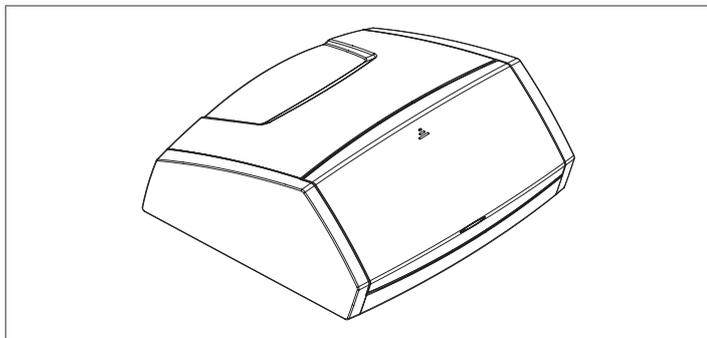
Horizontal flue channels must be connected with at least 5% slope and length of them will not pass 1/4 of the length of the flue.

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

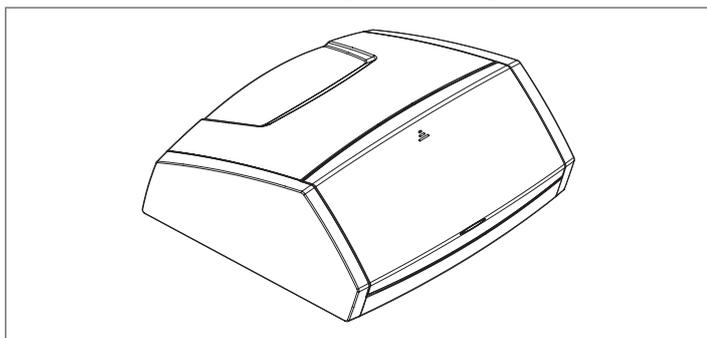
1.13 Control panels that can be combined

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 installation 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 for heating (1 direct zone) and production of domestic hot water with one-stage or two stage burner.

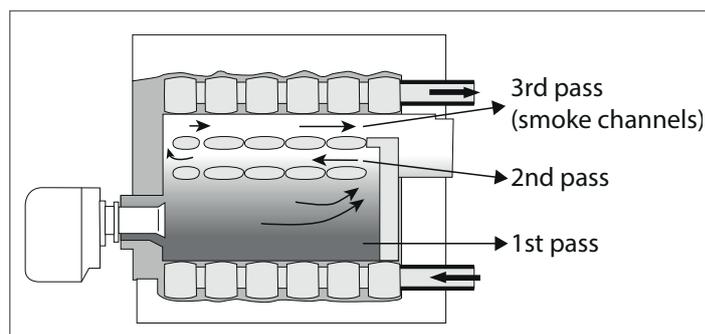


⚠ When the TECH PRIME control panel is installed, on the boiler return line (cold water), there needs to be a well for housing the probe. For the accessories codes, see the price list.

⚠ Boilers in the RTT 163–355 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-passageway 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 passageways.

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 always 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 163	180	30.27 43.59
RTT 195	180	43.33 62.39
RTT 227	250	15.78 22.72
RTT 259	250	20.55 29.59
RTT 291	250	25.94 37.35
RTT 323	250	31.96 46.02
RTT 355	250	38.61 55.59

If the fuel is methane gas:

Type of boiler	(*) Cross-section of the opening for natural ventilation (cm ²)		(**) Volume of air required for forced ventilation	
	(***) Lower part	Upper part	Lower part	Upper part
RTT 163	1,003	501	527	352
RTT 195	1146	573	631	421
RTT 227	1290	645	735	490
RTT 259	1,434	717	838	559
RTT 291	1,578	789	942	628
RTT 323	1722	861	1,045	697
RTT 355	1,866	933	1,149	766

(*) 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.

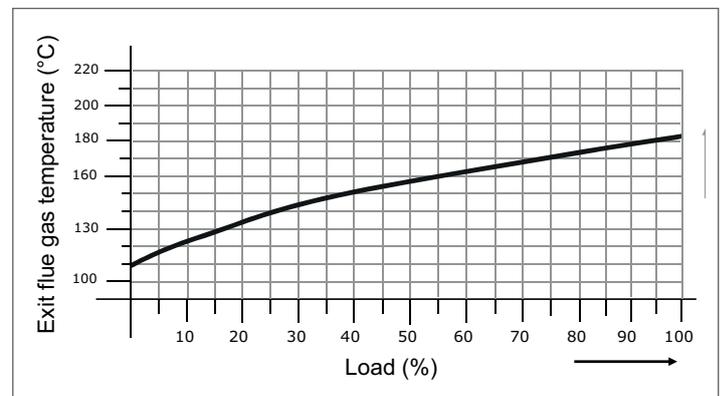
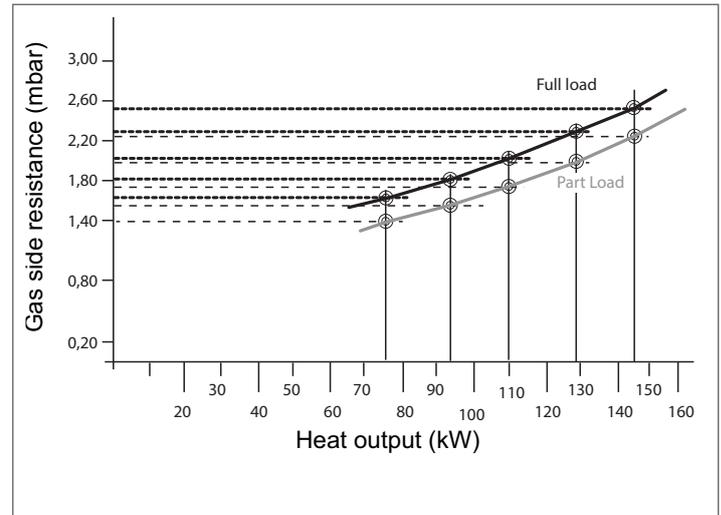
To ensure the boiler is operating at optimal conditions, the temperature difference between the supply water and the return water should be no greater than 20 °C. The boiler should not be started or run with water volumes lower than those indicated in the following table.

Type of boiler	Output		Δ t = 15 K (*)		Δ t = 20 K (*)	
	kCal/h	kW	Water flow rate	Water resistance	Water flow rate	Water resistance
			m ³ /h	mbar	m ³ /h	mbar
RTT 163	140,000	162.8	9.3	37.0	7.0	15.0
RTT 195	167,500	194.8	11.2	27.0	8.4	17.5
RTT 227	195,000	226.7	13.0	29.0	9.8	23.0
RTT 259	222,500	258.7	14.8	38.0	11.1	25.0
RTT 291	250,000	290.7	16.7	45.0	12.5	26.0
RTT 323	277,500	322.7	18.5	71.0	13.9	31.0
RTT 355	305,000	354.7	20.3	82.0	15.3	41.0

(*) Δt = 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

In the heating system, the difference between the direct supply temperature and the water return temperature should not exceed 20°C. The temperature of the return water should be higher than 50°C. Use the boiler's protection pump to increase the temperature of the return line water. Regularly measure the system's water level and add water if it is too low. Before adding water to the system, stop the pump and wait for the water temperature to reach 40°. Check for and resolve any problems caused by leaks in the boiler or in the system.

The hydraulic system should be carried out by qualified personnel to meet European standards.

For the system use material complying with European standards.

Connections to the electrical system and fuel delivery system

All the electrical connections should only be carried out by qualified professional using only materials and assembly procedures that comply with regulations in force in the country where it is used. For the burner, the control panel, Ecopanel etc., read the directions and warnings carefully in the instruction manuals supplied by the manufacturer or distributors. Do not switch on the burner until the circulation has started inside the boiler. If the circulation pump or the protection pump are faulty, switch off the burner. The system should work in a coordinated manner.

The circulation pump should always be operating when the burner is running. Choose a protection pump that is adequate for the boiler output. Connect the pump to the collectors, to the valve and to the thermostat correctly. In this way the system can switch off once the pre-set temperature has been reached.

When faced with any fault (contactor, temperature swings, interruption of current, other faults), or when the pumps are stopped (protection pumps, etc.), the burner should switch off. The system should do this automatically.

Carry out the electrical wiring taking into account all the above-mentioned information.

1.18 Supply and discharge of the boiler water

Discharge of the boiler water

⚠ Switch off the boiler before emptying the boiler and let it cool.

To empty the boiler, open all the valves of the circuit and the radiators. All the system water should be discharged by draining the boiler, when the latter is in the lower part of the system itself. If a part of the heating system is below the boiler room, the process for draining the water can be carried out at a point situated in the lower part of the system.

Supplying water to the boiler

To fill the boiler with water use the tap upstream of the boiler, during the charging operations all the valves of the hydraulic piping and radiators should be open. To prevent air infiltration, carry out this operation slowly, opening the plug at the top. When water comes out of this plug it means the process has finished. Bleed the air from all the radiators.

⚠ Do not fill the boiler with water when it is hot. This could damage the elements

⚠ The quality of the water should correspond to that indicated in "1.9 Hydraulic system" a pagina 10

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 stated 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 harmless 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 au

NOTA: *thorised dealers*

1.20 Fire prevention regulations for the boiler room

The RTT 163-355 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. Adequately air the room.
- Check the level of water in the boiler. If the level is below the minimum, add the necessary amount.
- If the hydraulic system is leaking water, contact the technical assistance service which will carry out repairs, and in any event repairs should be carried out before the boiler is started.
- Check the connection between the fuel tank and the burner. In the event of leaks or faults restore the connection before starting the boiler. Clean the filters.
- If the boiler runs on gas, make sure that the tank is charged and check that the gas valves are open.
- If the boiler runs on liquid fuel, check the level in the fuel tank and make sure the fuel valve is open.
- Check the pumps are running and check their rotation direction.
- Check the control panel electrical system.
- 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, and as a result the operating lamp will come on.
- Start the circulation pump
- Warning, it is mistaken to wait until the water tempera-

- ture goes above 40°C before starting the pumps, the circulation pump and the burner should operate contemporaneously.
- Start the burner (carrying out the commands described in the burner's instruction manual).
 - Set the temperature of the boiler between 30 and 90° C. If the burner is a two-stage burner, adjust the temperature of the second stage to 5-10°C less than that of the first stage. This will make the second stage light come on.
 - 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 centre.

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 carrying out these checks, contact the technical assistance service.

- 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 stops it could cause overheating. Contact the pump's manufacturer or distributor. 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 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 sufficiently, the burner should restart.
- If the burner 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), periodic 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 routine 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 the checking the seal of the flue gases pipe fitting.
- Checking the valves.
- Checking the pumps.
- Checking and cleaning, if necessary, the fuel filter.
- Checking the combustion (visual). Adjustments to 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 pipes 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.

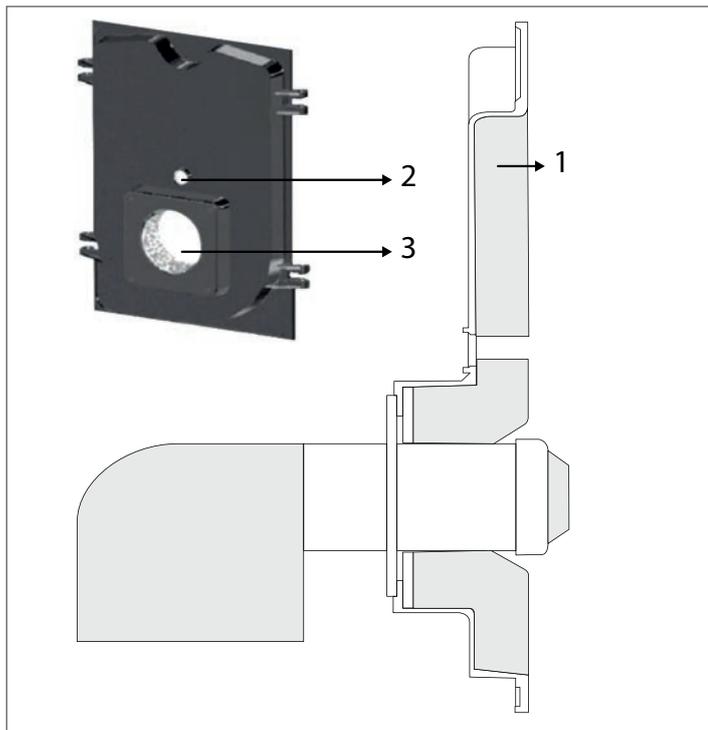
To make it easier to fix the burner to the door a metal flange is used. The flange measures 198x198 mm and has a thickness of 10 mm; the burner hole measures 110 mm (3).

The burner door insulation (1) 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 range of 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 (2).



1.25 Table of burner combinations

OIL BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 163	RG 5D	3739800
RTT 195	RG 5D	3739800
RTT 227	RL 34 MZ TC	3470200
RTT 259	RL 34 MZ TC	3470200
RTT 291	RL 34 MZ TC	3470200
RTT 323	RL 44 MZ TC*	3470300
RTT 323	RL 44 MZ TC**	3470330
RTT 355	RL 44 MZ TC*	3470300
RTT 355	RL 44 MZ TC**	3470330

DOUBLE FUEL BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 163	RLS 28	3483200
RTT 195	RLS 28	3483200
RTT 227	RLS 28	3483200
RTT 259	RLS 28	3483200
RTT 291	RLS 38	3484100
RTT 323	RLS 38	3484100
RTT 323	RLS 38	3484100
RTT 355	RLS 38	3484100
RTT 355	RLS 38	3484100

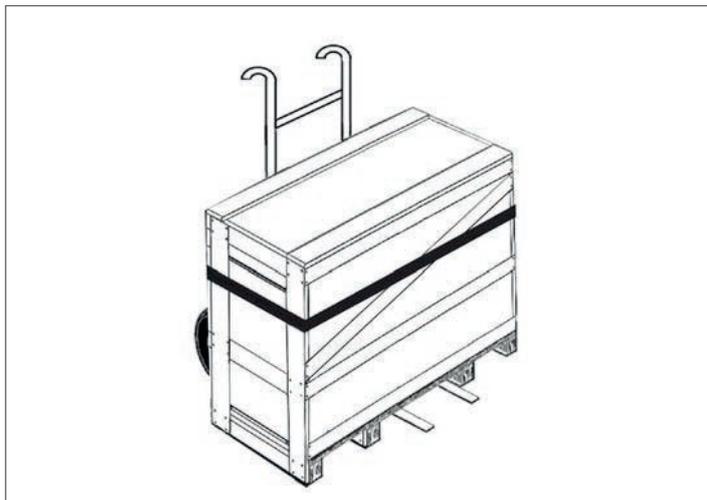
GAS BURNER		
BOILER	BURNER	
	MODEL	CODE
RTT 163	BS 4D	3761816
RTT 195	BS 4D	3731816
RTT 227	RS 34 MZ TC	3789000
RTT 259	RS 34 MZ TC	3789000
RTT 291	RS 34 MZ TC	3789000
RTT 323	RS 44 MZ TC*	3789100
RTT 323	RS 44 MZ TC**	3789130
RTT 355	RS 44 MZ TC*	3789100
RTT 355	RS 44 MZ TC**	3789130

(*) Single-phase model

(**) Three-phase model

1.26 Transport and storage

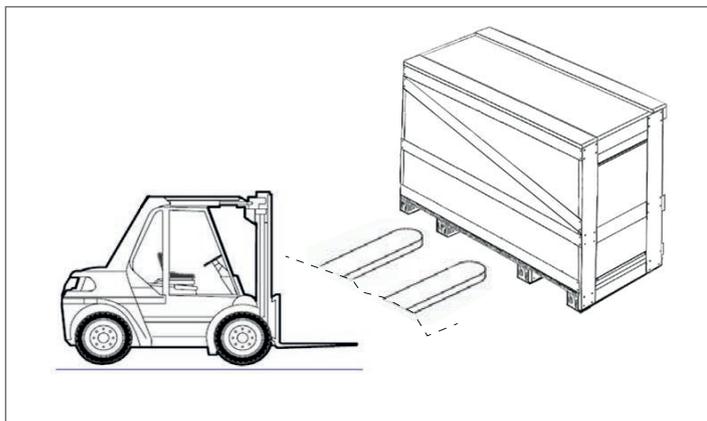
The manufacturer transports the boiler on a pallet fixing it (using screws) to prevent any sliding. Transport the boiler only on its base and in no other way.



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.



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