STEEL
BOILERS

RTS 3S

INSTALLATION, OPERATION, MAINTENANCE AND SYSTEM MANAGEMENT MANUAL

RIELLO

CONFORMITY

RIELLO RTS 3S *boilers conform to the Efficiency Directive 92/42/EEC and the applicable sections of the Low Voltage Directive 2014/35/EU. When used in conjunction with a CE-marked forced draught gas burner, they also satisfy the requirements of Regulation (EU) 2016/426.*
When **RTS 3S** *boilers up to 400 kW are used in conjunction with a fuel oil burner, they conform to the Energy-Related Products Directive 2009/125/EC and to the EU Delegated Regulation 813/2013.*

CE

RANGE

MODEL	CODE
RTS 90 3S	20042418
RTS 115 3S	20031973
RTS 166 3S	20031974
RTS 217 3S	20031976
RTS 255 3S	20031977
RTS 349 3S	20031978
RTS 448 3S	20031979
RTS 511 3S	20031980
RTS 639 3S	20042417
RTS 850 3S	20044152
RTS 1160 3S	20047381
RTS 1450 3S	20047391

CHARACTERISTICS

- High efficiency
- Low emissions (when fitted with a low NOx burner)

Dear Customer,

Thank you for choosing a **RIELLO** **RTS 3S**, *boiler. You have purchased a modern, high efficiency, quality product that is designed to give dependable and safe service and to provide comfort in the home for many years to come. Arrange for your boiler to be serviced regularly by an authorised* **RIELLO** *Technical Assistance Centre. Their personnel are specially trained to keep your boiler efficient and cheap to run. Technical Assistance Centres also stock any original spare parts that might be required.*

This instruction manual contains important instructions and precautions that must be observed to ensure the trouble-free installation and efficient functioning of your **RIELLO** **RTS 3S** *boiler.*

Please accept our renewed thanks for your purchase.

Riello S.p.A.

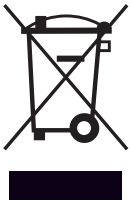
CONTENTS

The following symbols are used in this manual:

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

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

This manual, Code 20030350 Rev. 26 (12/19) is made up of 40 pages.



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

GENERAL SAFETY INFORMATION

⚠ The boiler is delivered in separate crates. Check that it is complete, undamaged and as ordered as soon as you receive it. Report any discrepancies or damage to the dealer who sold it.

⚠ On completion of the installation, the installer must issue the owner with a declaration of conformity confirming that the installation has been completed to the highest standards in compliance with the instructions provided by **RIELLO** in this instruction manual, and that it conforms to all applicable laws and standards.

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

⚠ If you notice any water leaking from the boiler, disconnect it immediately from the mains electricity supply, shut off the water supply, and notify your local **RIELLO** Technical Assistance Centre or a qualified heating engineer immediately.

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

⚠ If the boiler is not going to be used for an extended period of time, contact **RIELLO**'s Technical Assistance Service or a qualified heating engineer to have it prepared for shut-down as follows:
- Switch the boiler OFF at the control panel and at the mains power switch.
- Close the fuel cock and heating circuit water cock.
- Drain the central heating circuit if there is any risk of freezing.

⚠ Drain the central heating circuit if there is any risk of freezing

⚠ This instruction manual is an integral part of the boiler. It must be kept safe and must ALWAYS accompany the boiler, even if it is sold to another owner or transferred to another user or to another installation. If you damage or lose this manual, order a replacement immediately from your local **RIELLO** Technical Assistance Centre.

PRECAUTIONS

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

⛔ Do not allow children or infirm persons to operate this **RIELLO RTS 3S** boiler unsupervised.

⛔ Do not operate any electrical devices or equipment, including switches or domestic appliances, etc., if you can smell fuel or fumes. If you detect any suspicious smells:
- Ventilate the room by opening all doors and windows.
- Close the fuel shut-off cock.
- Report the fault immediately to the **RIELLO** Technical Assistance Service or a professionally qualified heating engineer.

⛔ Do not touch the boiler while barefoot or wet.

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

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

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

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

⛔ Do not expose the boiler to the elements. Do not install the boiler outdoors. It is not designed to work outdoors and is not fitted with the necessary automatic anti-frost systems to do so.

⛔ Do not switch the boiler off if outdoor temperature drops below ZERO (risk of freezing).

⛔ Do not store containers of flammable substances in the room where the boiler is installed.

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

MODELS UP TO 400 KW USED WITH FUEL OIL BURNERS CONFORM TO THE ENERGY-RELATED PRODUCTS DIRECTIVE 2009/125/EC AND TO THE EU DELEGATED REGULATION 813/2013

RIELLO RTS 3S steel boilers are high efficiency triple flue pass boilers for central heating systems. When combined with a storage cylinder, they can also be used to produce domestic hot water.

RIELLO RTS 3S boilers are monobloc boilers with pressurised combustion. The flame from the burner first enters the furnace (1st flue pass). Via an opening at the other end of the furnace, the combustion gases then enter a duct that takes them back towards the front of the boiler (2nd flue pass).

This separation between the combustion gas return duct and the furnace makes a major contribution to reducing Nox emissions. Combustion gases remaining in the high temperatures of the furnace is one of the main reasons for the formation of NOx emissions.

At the front of the boiler, the combustion gases pass through a recess in the door insulation and exit through the tube bundle (3rd flue pass).

In the tube bundle, turbulators force the combustion gases into a vortex-like path that improves the efficiency of convection heat exchange.

This system achieves maximum heat absorption without risking damage through thermal stress.

Once out of the tube bundle, the flue gases pas through a chamber at the rear of the boiler, and into the vent flue.

Their special design (with tube bundle over the combustion chamber) makes these boilers far narrower than conventional pressurised boilers and therefore easier to install in boiler rooms with narrow doors or where space is limited.

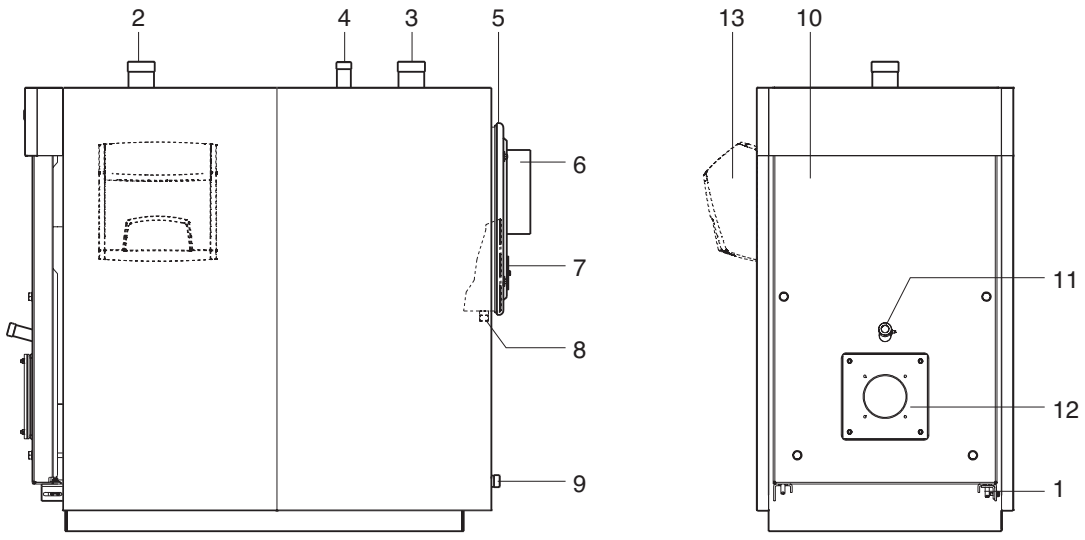
The burner is installed in a hinged door to permit the adjustment and servicing of both boiler and burner without having to remove the burner.

The boiler body is thermally insulated by high efficiency mineral wool insulation that reduces heat loss to an extremely low level.

The boiler casing is made from pre-painted panels lined with mineral wool insulation.

Max. permissible return temperature with a gas burner: 50°C.

Max. permissible return temperature with a fuel oil burner: 37°C.



1 - Door hinge
2 - Central heating return
3 - Central heating flow
4 - Safety device fitting
5 - Flue gas box
6 - Flue gas exhaust
7 - Access door for cleaning the flue gas box
8 - Condensate drain
9 - Boiler drain
10 - Door
11 - Flame inspection window
12 - Burner plate
13 - Control panel

The **RIELLO** control panels that can be used with **RIELLO RTS 3S** steel boilers are listed below. These control panels cater for all the needs of the heating system and of all the devices installed in it.
Respect the indications of the table rigorously to ensure trouble-free operation and maximum reliability of your boiler over time.

CONTROL PANELS	
MODEL	**TYPE**
TECH CLIMA TOP	Climate control
TECH CLIMA COMFORT	Climate control
TECH CLIMA MIX	Climate control
TECH PRIME	Electro-mechanical
TECH PRIME ACS	Electro-mechanical

		Single stage	Two stage	Modulating	Cascaded	Wood fuelled	Solar	DHW	Direct CH circuit	Mixed CH zone 1	Mixed CH zone 2
CLIMA TOP	**STANDARD**	●	●	●					●		
	Control by control panel with assistance of accessories listed below				○	○	○	○		○	○
	ACCESSORIES										
	Immersion temperature sensor				**1**	**1**	**1**	**1**			
	Solar collector temperature sensor						**1**				
	Pipe temperature sensor									**1**	**1**
CLIMA COMFORT	**STANDARD**	●							●		
	Control by control panel with assistance of accessories listed below		○		○		○	○		○	○
	ACCESSORIES										
	Immersion temperature sensor				**1**		**1**	**1**			
	Solar collector temperature sensor						**1**				
	Pipe temperature sensor									**1**	**1**
	Two-stage burner control kit		**1**								
	1 mixed zone kit										**1**
CLIMA MIX	**STANDARD**									●	
	Control by control panel with assistance of accessories listed below										○
	ACCESSORIES										
	Pipe temperature sensor									**1**	**1**
	1 mixed zone kit										**1**
PRIME	**STANDARD**	●							●		
	Control by control panel with assistance of accessories listed below		○								
	ACCESSORIES										
	Two stage burner kit		**1**								
PRIME ACS	**STANDARD**	●						●	●		
	Control by control panel with assistance of accessories listed below		○								
	ACCESSORIES										
	Two stage burner kit		**1**								
	Total shutdown kit	**1**	**1**								

⚠ When a TECH CLIMA TOP or CLIMA COMFORT control panel is installed, the boiler return (cold) line must be equipped with a temperature sensor socket.
See the catalogue for the necessary accessory part numbers.

RECOMMENDED FUEL OIL BURNERS

The burners recommended to obtain the best possible performance from **RIELLO RTS 3S** boilers are:

		BURNER		RTS 3S												Burner plate
		Model	Code	90	115	166	217	255	349	448	511	639	850	1160	1450	Code
OIL	TWO STAGE	BG6.1D	20015693	• (R)												
		BG7.1D	20015696		• (R)											
		RL25 BLU	20116089			• (R)	• (R)									4031198
		RL35 BLU	20116062					• (R)								
		RL 42 BLU (Low NOx)	20027567						• (R)	•						4031188
		RL 50	3474632							•	•					
		RL 70	3475032									•				
		RL 100	3475232										•			
		RL 130	3475432											•	•	20043900
	MODULATING	RL 50/M	3471602							•	•					
		RL 70/M	3477012									•				
		RL 100/M	3477212										•	•		
		RL 130/M	3477412											•	•	20043900
		RL 55/M BLU (Low NOx)	3899210							•	•	•				4031196
		RL 85/M BLU (Low NOx)	3896011									• (1)	•			4031196 (1)

(R) Reference burner used during performance qualification tests to derive the technical data declared.

⚠ To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).

		BURNER		RTS 3S						Burner plate
		Model	Code	448	511	639	850	1160	1450	Code
GAS	TWO STAGE	RS 50	3784702	•	•					
		RS 70	3785102			•				
		RS 100	3785302				•			
		RS 130	3785502					•	• (*)	20043900
		RS 150	20044636						•	
	MECHANICAL CAM MODULATION	RS 55/M BLU (Low NOx)	20038484	•	•					4031196
		RS 68/M BLU (Low NOx)	3897406	•	•	•				4031196
		RS 120/M BLU (Low NOx)	3897606				•	•		
		RS 160/M BLU (Low NOx)	3788006					•	•	20047680
		RS 50/M MZ	3781622	•	•					
		RS 70/M	3789610			•				
		RS 100/M	3789710				•	•		
		RS 130/M	3789810					•	•(*)	20043900
		RS 150/M	20044638						•	
	ELECTRONIC CAM MODULATION	RS 55/E BLU t.c. (Low NOx)	20038491	•	•					4031196
		RS 68/E BLU t.c. (Low NOx)	3897432	•	•					4031196
		RS 68/E BLU t.c. (Low NOx)	3897432			•				4031197
		RS 120/E BLU t.c. (Low NOx)	3897632				•	•		
		RS 160/E BLU t.c. (Low NOx)	3788032						•	

(*) = To be used together only for heat outputs up to max. 1300 kW.

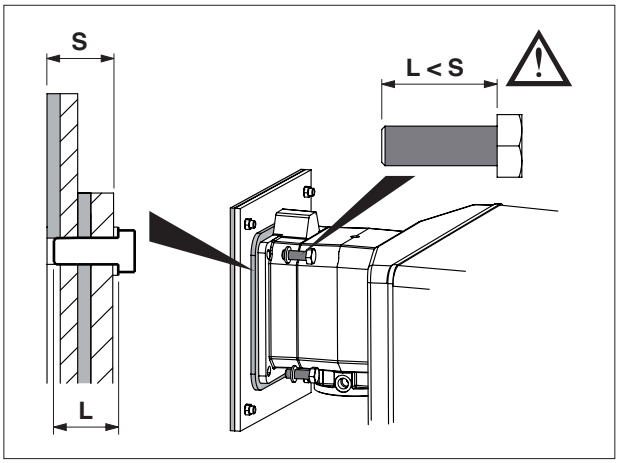
⚠ To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).

IMPORTANT NOTES FOR BURNER INSTALLATION

Before fixing the burner to the boiler, make sure that:

- The door opens the right way (see the relevant sections for details on how to reverse the door).
- The length (L) of the burner fixing bolts is less than (S), i.e. the total depth of the seal, plates and washer. **Longer bolts can cause the door to warp, compromising its ability to seal the boiler hermetically and permitting the release of combustion fumes.**

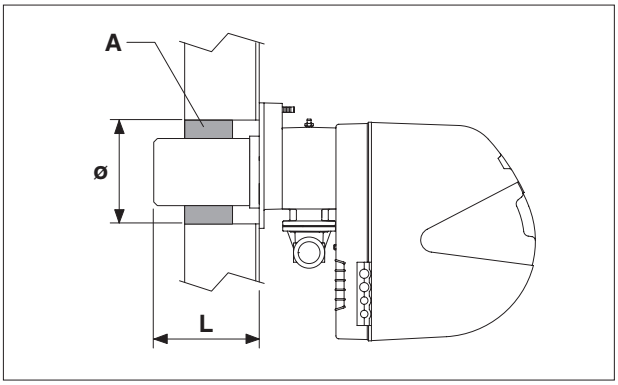
To ensure correct burner installation, also refer to the burner's own manual.



⚠ See the instruction manual provided with the burner for further information on burner installation, electrical connections, burner adjustments.
If a two stage burner is installed, 1st stage heat input must not be less than 70% of total heat input.

IMPORTANT
If you are installing a new boiler but re-using an old burner, always perform the following checks.
- Make sure that the performance of the old burner is adequate for the requirements of the boiler.
- Make sure that the length and diameter of the burner's blast tube are as specified in the following table.

⚠ When you finish installing the burner in the boiler, fill the gap between the burner's blast tube and the refractory material in the door with the ceramic insulation (A) supplied with the boiler.

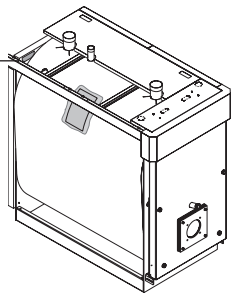


RTS 3S	90	115	166	217	255	349	448	511	639	850	1160	1450	
L min	128	128	128	128	155	155	195	195	200	200	205	205	mm
Diameter of door hole	140	140	162	162	180	180	205	205	205	230	230	270	Ø mm
Thickness of door	93	93	93	93	103	103	118	118	119	119	119	119	mm

⛔ Do not re-use old burners if their blast tube lengths are below those specified in the table.

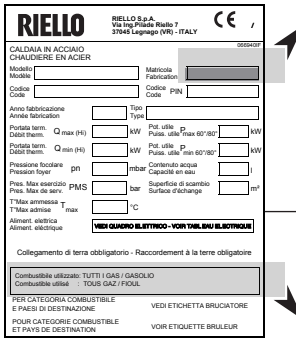
The boilers are identified by two plates:

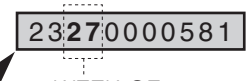
- **Serial number plate**
  This is located on the boiler body and specifies the serial number, model, furnace power and maximum operating pressure.



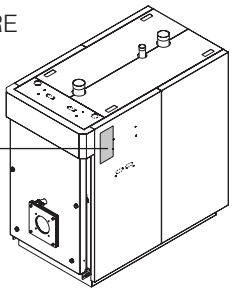
- **Data plate**
  This lists the technical specifications and performance of the product.
  It comes inside the documentation envelope. On completion of the installation you MUST apply it in a clearly visible position at the top of one of the side panels.
  If you damage or lose this label, order a replacement immediately from **RIELLO**'s Technical Assistance Service.

⚠ One or more data labels may be supplied in the document envelope. Identify the correct label for the type of fuel.





WEEK OF MANUFACTURE



FUEL

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

TECHNICAL DATA FOR BOILERS WITH FUEL OIL BURNERS <400 KW

RTS 3S	90	115	166	217	255	349	
Device type	Central Heating						
	B23						
Fuel	Oil						
Device category	See burner						
Maximum rated heat input HCV (LCV)	95,4 (90)	122 (115)	176 (166)	230,1 (217)	270,4 (255)	370,1 (349)	kW
Minimum rated heat input (Q min) HCV (LCV)	74,2 (70)	95,4 (90)	122 (115)	176 (166)	230,1 (217)	270,4 (255)	kW
Rated useful heat output max. (80/60°C) P4	85,1	108,3	157,4	207,5	244,0	334,7	kW
Rated useful heat output min. (80/60°C) (Pn min)	66,6	85.5	109,6	158,7	206,2	243,0	kW
30% heat output with return at 37°C (P1)	25,5	32,5	47,2	62,9	73,2	100,4	kW
Seasonal energy efficiency ηs	89,0	89,0	89,0	90,0	90,0	90,0	%
Efficiency at rated heat input in high temperature mode $\eta 4$ (80-60°C) HCV (LCV)	89,1 (94,5)	88,8 (94,2)	89,4 (94,8)	90,2 (95,6)	90,3 (95,7)	90,4 (95,9)	%
Useful efficiency at min Pn (80-60°C) HCV (LCV)	89.8 (95.2)	89,6 (95,0)	89,9 (95,3)	90,2 (95,6)	89,6 (95,0)	89,9 (95,3)	%
Efficiency at rated heat input in Low temperature mode $\eta 1$ with return at 37°C HCV (LCV)	94,0 (99,7)	94,1 (99,8)	94,2 (99,9)	94,2 (99,9)	94,1 (99,8)	94,1 (99,8)	%
Heat loss in standby mode	240	300	360	430	500	600	W
Flue gas temperature (ΔT°)	106	103	103	106	100	106	°C
Emissions at max. heat input Nox (0% O2)	<120 (*)						mg/kWh
Flue gas mass flow rate (Pn Max)	0,040	0,050	0,072	0,094	0,110	0,151	Kg/s
Furnace pressure	1,0	1,4	1,8	2,7	2,9	3,6	mbar
Furnace volume	75	121	176	176	240	296	dm^3
Total volume of flue gas side	112	176	253,5	261,5	357,5	443	dm^3
Surface area for heat exchange	3,77	5,32	7,34	8,16	10,06	12,88	m^2
Volumetric heat load (Pn Max)	1203	947	941	1229	1066	1180	kW/m^3
Specific heat load (Pn Max)	22,6	20,4	21,4	25,4	24,3	26,0	kW/m^2
Maximum operating pressure	6						bar
Maximum admissible temperature	110						°C
Maximum operating temperature	95						°C
Min. admissible water return temper.	37						°C
Pressure drop ΔT 10° C	22	25	27	45	43	75	mbar
Pressure drop ΔT 20° C	7	5	5	10	13	20	mbar
Water capacity	176	255	319	309	408	495	l
Consumption at full load (Elmax)	430	450	460	660	660	760	W
Consumption at part load (Elmin)	151	158	161	231	231	266	W
Electrical consumption in standby mode (Psb)	20	20	20	20	20	20	W

(*) Value according to EN267 (nitrogen content in light oil =140mg/kg).

⚠ The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue gas exhaust.

⚠ Values obtained in combination with the reference burners (R) indicated in the combination table with CO_2 = 12,5%.

⚠ When used in conjunction with fuel oil burners, RTS boilers <400kW conform to:
- Energy-Related Products Directive 2009/125/EC
- EU Delegated Regulation 813/2013

⚠ WARNING: If coupled with low NOx emission diesel burners compliant with the 2018 ErP Directive, the generators are able to operate with nitrogen oxide emissions below the limits required by said Directive.

RTS 3S		90(*)	115(*)	166(*)	217(*)	255(*)	349(*)	
Fuel		Gas						
Rated heat input	minimum	70,0	90,0	115,0	166,0	217,0	255,0	kW
	maximum	90,0	115,0	166,0	217,0	255,0	349,0	kW
Rated useful heat output Pn	minimum	66,6	85,5	109,6	158,7	206,2	243,0	kW
	maximum	85,1	108,3	157,4	207,5	244,0	334,7	kW
Useful efficiency	at min. Pn	95,2	95,0	95,3	95,6	95,0	95,3	%
	at max. Pn	94,5	94,2	94,8	95,6	95,7	95,9	%
Useful efficiency at 30% (Pn Max)		98,5	98,5	98,5	98,5	98,5	98,5	%
Constant pressure drop (Pn Max)		< 1,4					< 1,2	%
Flue gas temperature (ΔT°)		106	103	103	106	100	106	°C
Flue gas mass flow rate (Pn Max)		0,040	0,050	0,072	0,094	0,110	0,151	Kg/s
Furnace pressure		1,0	1,4	1,8	2,7	2,9	3,6	mbar
Furnace volume		75,0	121,0	176,0	176,0	240,0	296,0	dm^3
Total volume of flue gas side		112	176	2.535	2.615	3.575	443	dm^3
Surface area for heat exchange		3,8	5,3	7,3	8,2	10,1	12,9	m^2
Volumetric heat load (Pn Max)		1.203	947	941	1.229	1.066	1.180	kW/m^3
Specific heat load (Pn Max)		22,6	20,4	21,4	25,4	24,3	26,0	kW/m^2
Maximum operating pressure		6						bar
Maximum admissible temperature		110						°C
Maximum operating temperature		95						°C
Min. admissible water return temper.		50						°C
Pressure drop ΔT 10° C		22	25	27	45	43	75	mbar
Pressure drop ΔT 20° C		7	5	5	10	13	20	mbar
Water capacity		176	255	319	309	408	495	l

(*) Heating appliance marketed intended exclusively for replacement under the terms of EU Regulation 813/2013, article 1,section 2, letter (g).

⚠ Values obtained with **RIELLO** gas burners, calibrated with CO_2 = 9,7% and λ = 1,2.

TECHNICAL DATA FOR BOILERS WITH > 400 KW

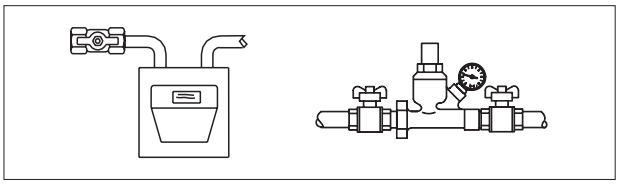
RTS 3S		448	511	639	850	1160	1450	
Fuel		Gas / Oil						
Rated heat input	minimum	349	448	511	639	850	1160	kW
	maximum	448	511	639	850	1160	1450	kW
Rated useful heat output Pn	minimum	332,2	426,5	486,5	608,3	809,2	1104,3	kW
	maximum	427,8	488,0	610,2	811,8	1107,8	1384,8	kW
Useful efficiency	at min. Pn	95,2	95,2	95,2	95,2	95,2	95,2	%
	at max. Pn	95,5	95,5	95,5	95,5	95,5	95,5	%
Useful efficiency at 30% (Pn Max)		98,5	98,5	98,5	98,5	98,5	98,5	%
Constant pressure drop (Pn Max)		< 1,2				< 1,0		%
Flue gas temperature (ΔT°)		104	105	102	108	112	107	°C
Flue gas mass flow rate (Pn Max)		0,195	0,221	0,278	0,367	0,507	0,626	Kg/s
Furnace pressure		2,9	5,4	5,2	6,7	3,9	4,6	mbar
Furnace volume		453	453	613	812	1065	1297	dm^3
Total volume of flue gas side		682	682	899	1209	1656	2088	dm^3
Surface area for heat exchange		18,58	18,58	23,45	30,60	40,40	51,82	m^2
Volumetric heat load (Pn Max)		988	1127	1043	1046	1089	1118	kW/m^3
Specific heat load (Pn Max)		23,0	26,3	26,0	26,5	27,4	26,7	kW/m^2
Maximum operating pressure		6						bar
Maximum admissible temperature		110						°C
Maximum operating temperature		95						°C
Min. admissible water return temper.		50						°C
Pressure drop ΔT 10° C		70	90	52	42	75	75	mbar
Pressure drop ΔT 20° C		20	20	16	14	20	22	mbar
Water capacity		655	655	899	1193	1537	2211	l

⚠ The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue gas exhaust.

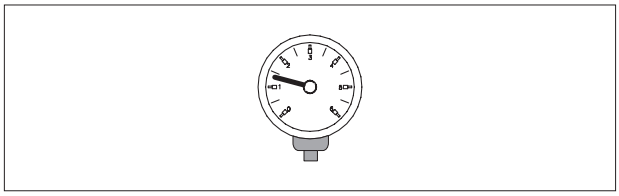
⚠ Values obtained with **RIELLO** gas burners, calibrated with CO_2 = 9,7%, λ = 1,2 and with **RIELLO** fuel oil burners calibrated with CO_2 = 12,5%.

Have **RIELLO**'s Technical Assistance Service start up your **RIELLO RTS 3S** boiler for the first time. Once this has been done, the boiler can be left to function automatically.
Under certain circumstances, such as after long periods of disuse, the service engineer responsible for the boiler may need to re-start it without involving the Technical Assistance Service.
To do so, perform the following checks and operations:

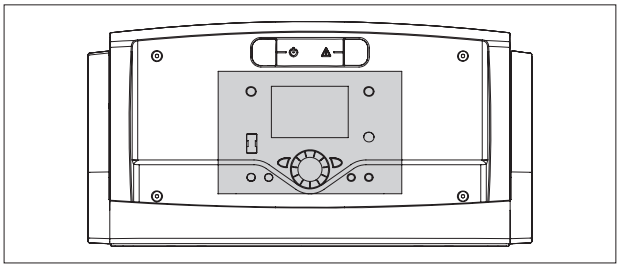
- Check that the gas cock and heating water cock are open



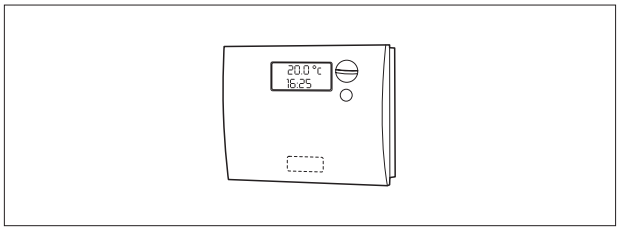
- While the system is still cold, check that working pressure in the water circuit is **over 1 bar** but below the maximum limit specified for the boiler



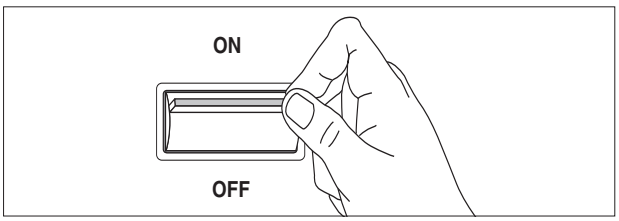
- If the system is equipped with a temperature controller or timer thermostat, make sure that it is switched on



- Adjust the timer thermostat/s or temperature controller to the desired temperature (~20° C)

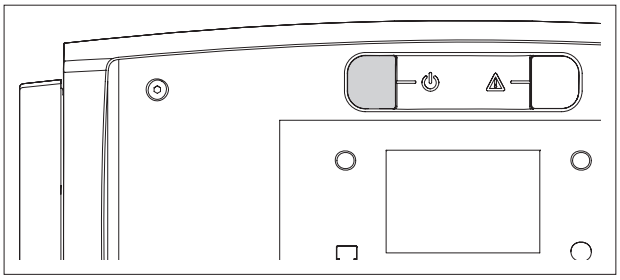


- Turn the system's main power switch ON



- Turn the control panel power switch ON and make sure that the green power indicator lights

- Make the settings as instructed in the instruction manual for your control panel.



The burner should now ignite and remain in operation until the set temperature is reached.

If any ignition faults or malfunctions occur, the burner performs a “LOCKOUT SHUTDOWN”. This is shown by the red button light on the burner and by the warning light on the control panel.

⚠ If a “LOCKOUT SHUTDOWN” occurs, wait about 30 seconds before resetting the burner.

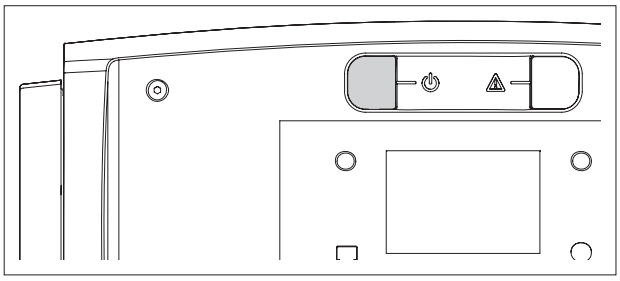
To reset the burner, press the red button light on the burner and wait until the flame ignites.

Repeat this operation 2 -3 times at the most. If the problem persists after that, call **RIELLO**’s Technical Assistance Service.

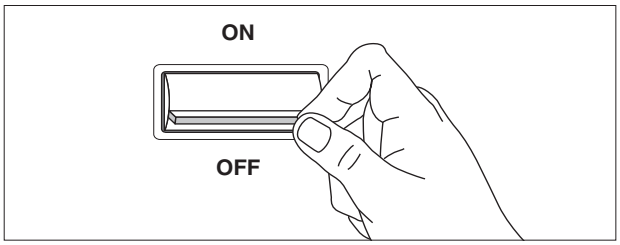
TEMPORARY SHUTDOWN

If you need to shut down the system for a short period, proceed as follows.

- Turn the control panel power switch OFF and make sure that the green power indicator goes out



- Turn the mains power switch OFF.

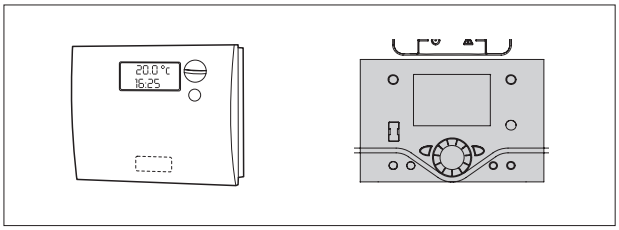


⚠ Do NOT perform this procedure if outdoor temperature falls below ZERO (risk of freezing).

Then proceed as follows:

- Make the settings as instructed in the instruction manual for your control panel.

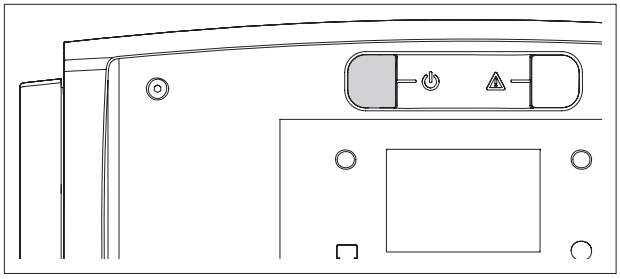
- Make sure that the temperature controller or timer / room thermostat is set to “frost protection” mode.



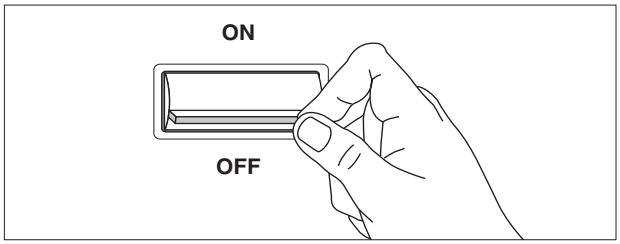
PREPARING FOR EXTENDED PERIODS OF DISUSE

If the boiler is not going to be used for an extended period of time, perform the following operations:

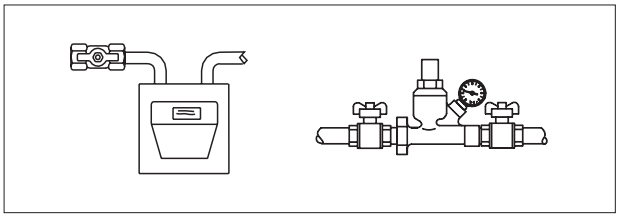
- Turn the control panel power switch OFF and make sure that the green power indicator goes out



- Turn the mains power switch OFF



- Close the fuel cock and heating circuit water cock



- Drain the central heating circuit if there is any risk of freezing.

⚠ Contact **RIELLO** Technical Assistance Service if you encounter any problems in completing the above procedure.

CLEANING

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

⛔ Do not use abrasive cleaning pads or powder detergents.

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

⚠ The combustion chamber and flue pipes must be cleaned periodically by **RIELLO**'s Technical Assistance Service or by a qualified heating engineer (see page 37).

MAINTENANCE

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

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

- greater safety
- compliance with applicable legislation
- freedom from the risk of fines in the event of spot checks.

USEFUL INFORMATION

Seller: .....
Mr. .....
Address .....
tel. .....

Installer: .....
Mr. .....
Address .....
tel. .....

Technical Assistance Service: .....
Mr. .....
Address .....
tel. .....

Date	Work done

Fuel oil supplier: .....
Mr. .....
Address .....
tel. .....

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

RIELLO RTS 3S steel boilers come in:

1) **BOILER BODY CRATE** to which is attached the documentation envelope (A) containing:
   - Instruction manual
   - Data label (to be applied to the casing on completion of the installation)
   - Water test certificate
   - Bar code labels
   - Ceramic insulation.

⚠ The instruction manual is an integral part of the boiler. Once located, read it thoroughly and keep it safe.

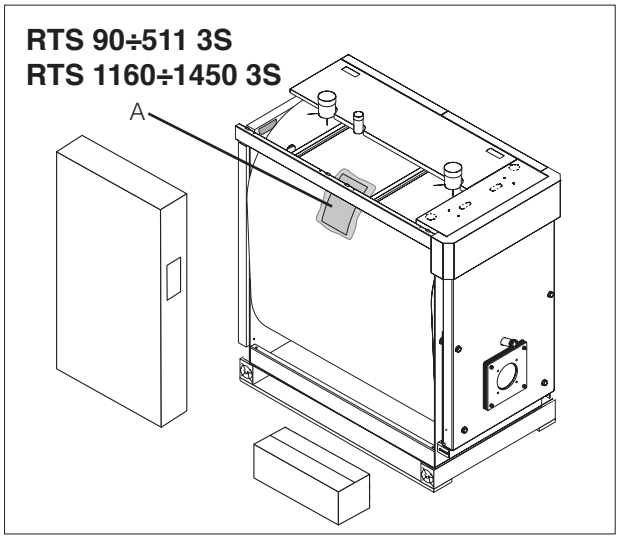
2) **THE CASING PANELS** complete with assembly accessories.

3) **THE FRONT COVER** to fit on top of the front door.

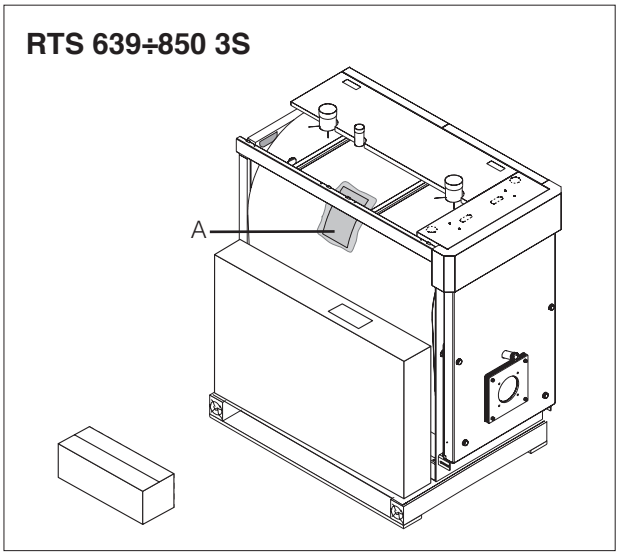
IMPORTANT

For the boiler to function correctly, it must be connected to a **RIELLO TECH** control panel and dedicated control accessories.

RTS 90÷511 3S
RTS 1160÷1450 3S

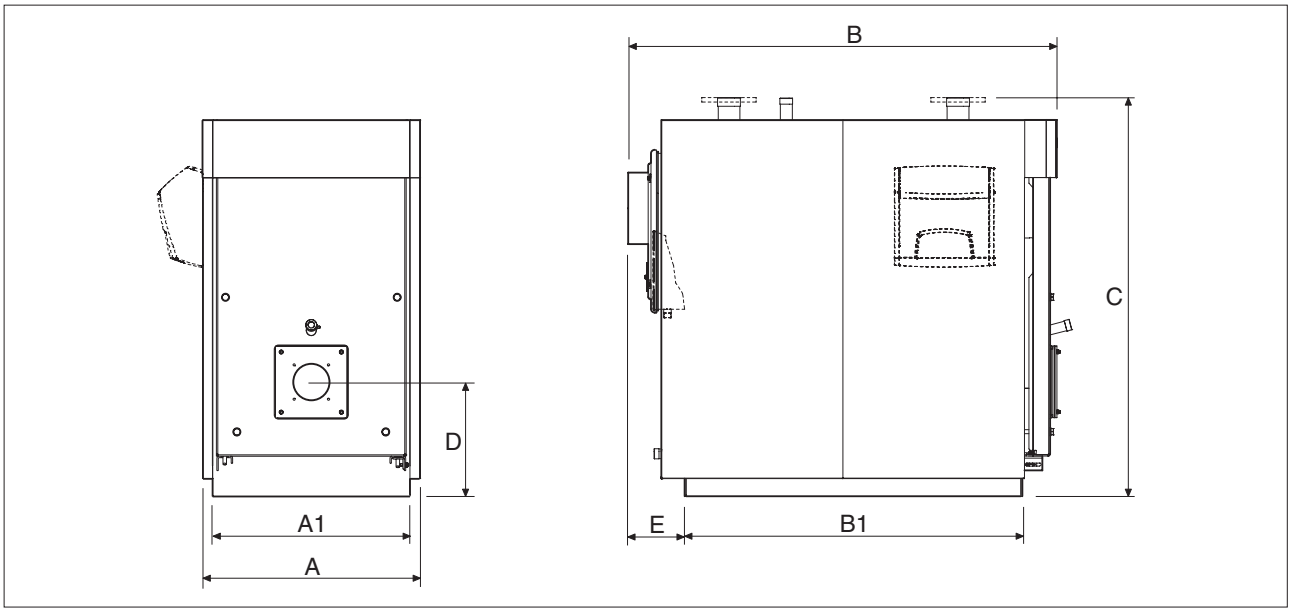


RTS 639÷850 3S



(*) Casing panels supplied on the same pallet as the boiler.

OVERALL DIMENSIONS AND WEIGHTS

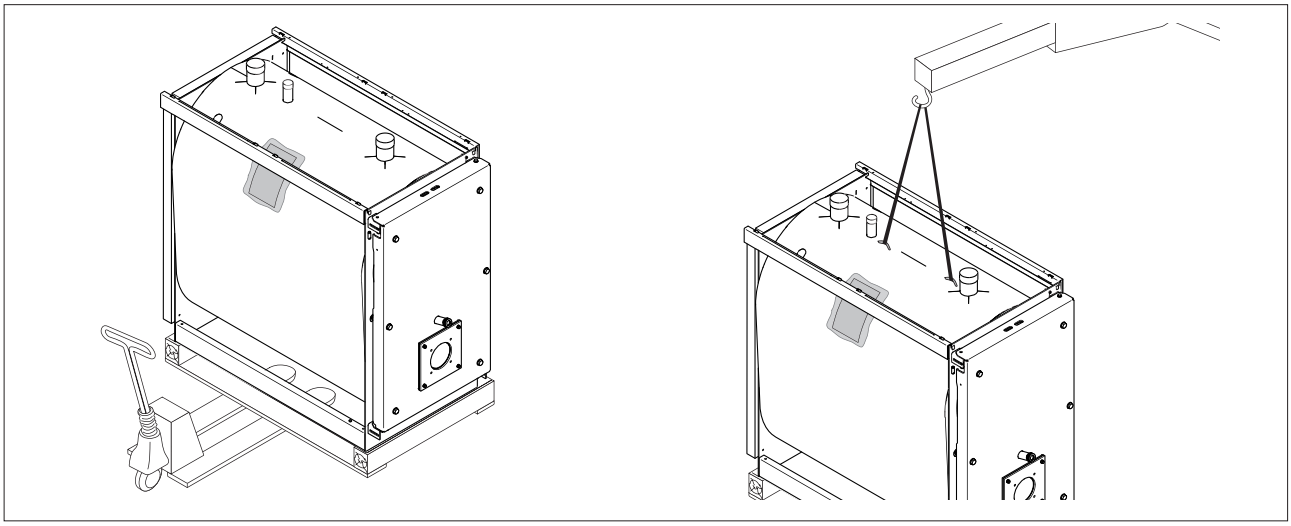


RTS 3S	90	115	166	217	255	349	448	511	639	850	1160	1450	
A - Width	660	710	760	760	820	820	890	890	1000	1047	1147	1237	mm
A1 - Base width	580	640	690	690	750	750	790	790	900	980	1070	1160	mm
B - Depth	1155	1330	1500	1500	1660	1960	2085	2085	2375	2657	2954	3173	mm
B1 - Base depth	860	1010	1180	1180	1296	1596	1692	1692	1965	2236	2533	2754	mm
C - Height	1205	1285	1390	1390	1524	1490	1685	1685	1830	1920	2080	2222	mm
D - Burner height	380	380	400	400	468	468	510	510	560	570	625	650	mm
E - Flue to base	180	190	200	200	225	225	250	250	270	270	270	270	mm
Weight (inclusive of casing)	335	420	515	535	715	840	1160	1160	1500	2040	2627	3440	kg

HANDLING

Only use lifting equipment of adequate capacity to move and handle the boiler.
Remove the fixing screws and remove the wooden pallet before positioning the boiler.

⚠ Wear suitable personal protective equipment and use suitable safety devices



⚠ When moving the boiler, take particular care not to damage the front panel.

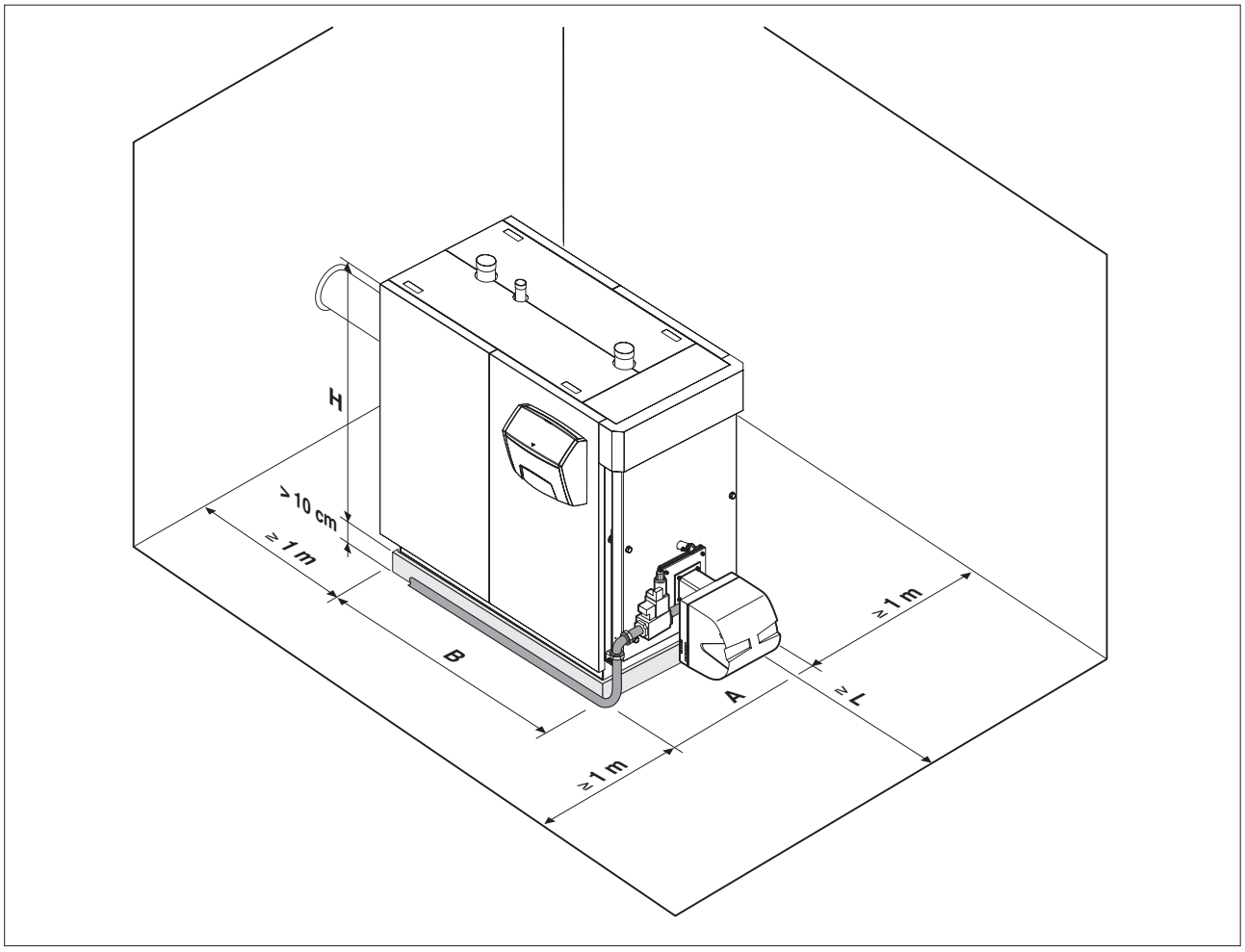
RIELLO RTS 3S steel boilers must be installed in a dedicated boiler room, with adequately sized vents, in compliance with applicable laws and standards.
If at all possible, the boiler should be installed on a raised base to prevent the burner fan sucking up dust.

The gas supply pipe must be installed in such a way that the boiler's panelling can be removed and the front door opened without having to remove the burner.

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

⚠ If the specific weight of the gas supply to the burner is greater than the specific weight of air, install all electrical parts at least 500 mm above floor level.

⛔ Do not install the boiler outdoors. It is not designed to work outdoors and is not fitted with the necessary automatic anti-frost systems to do so.



RTS 3S	90	115	166	217	255	349	448	511	639	850	1160	1450	
A - Length	660	710	760	760	820	820	890	890	1000	1047	1147	1237	mm
B - Depth	1155	1330	1500	1500	1660	1960	2085	2085	2375	2657	2954	3173	mm
H - Heigjt	1175	1285	1390	1390	1524	1490	1685	1685	1820	1900	2080	2222	mm

INSTALLATION IN OLDER SYSTEMS AND SYSTEMS REQUIRING MODERNISATION

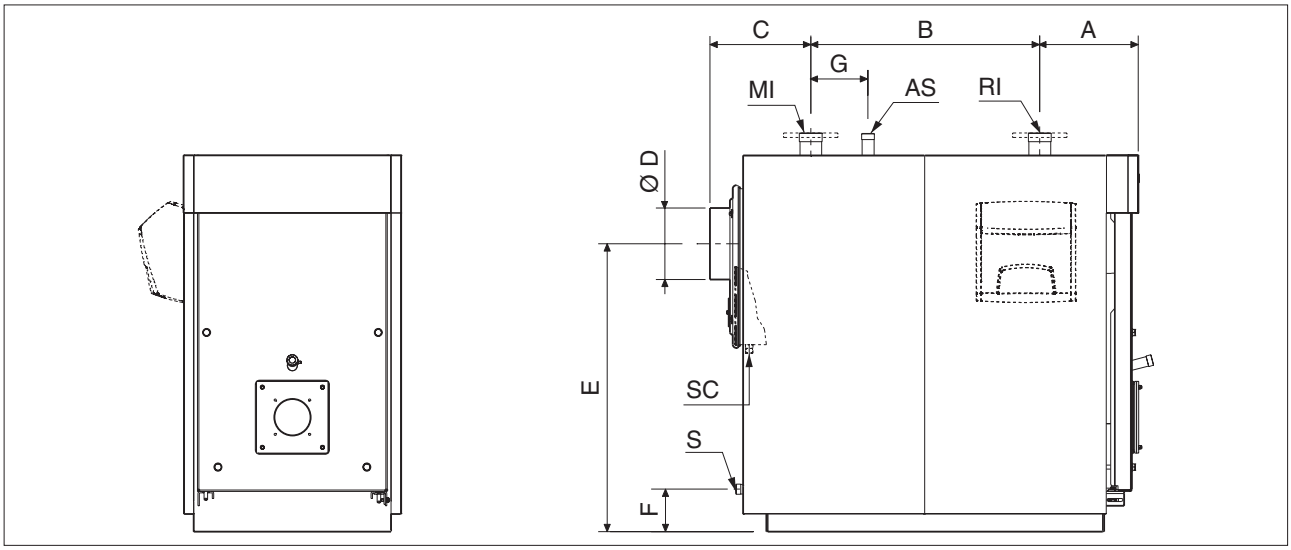
When installing these boilers in old systems or systems requiring modernisation, always perform the following checks:

- Make sure that the stack is able to withstand the temperature of the combustion gases and that it has been designed and made in compliance with applicable standards. The stack must also be as straight as possible, sealed, insulated and not blocked or choked
- Make sure that the electrical system has been installed by a qualified electrician in compliance with applicable standards
- Make sure that the oil feed line and any oil storage tank are made and installed in compliance with applicable standards
- Make sure that the expansion vessels are big enough to contain the volume generated by thermal expansion
- Make sure that flow rate, head and direction of flow of the pumps are suitable and correct
- Make sure that the circuit has been flushed out to remove all sludge and lime scale, and has been vented and seal tested
- Make sure that a suitable water treatment system is installed if the quality of the supply/recirculation water so demands (Refer to the reference values listed in the table alongside).

REFERENCE VALUES	
PH	6-8
Electrical conductivity	below 200 µS/cm (25°C)
Chlorine ions	below 50 ppm
Sulphuric acid ions	below 50 ppm
Total iron	below 0,3 ppm
Alkalinity M	below 50 ppm
Total hardness	35° F
Sulphur ions	none
Ammonia ions	none
Silicon ions	below 30 ppm

WATER CONNECTIONS

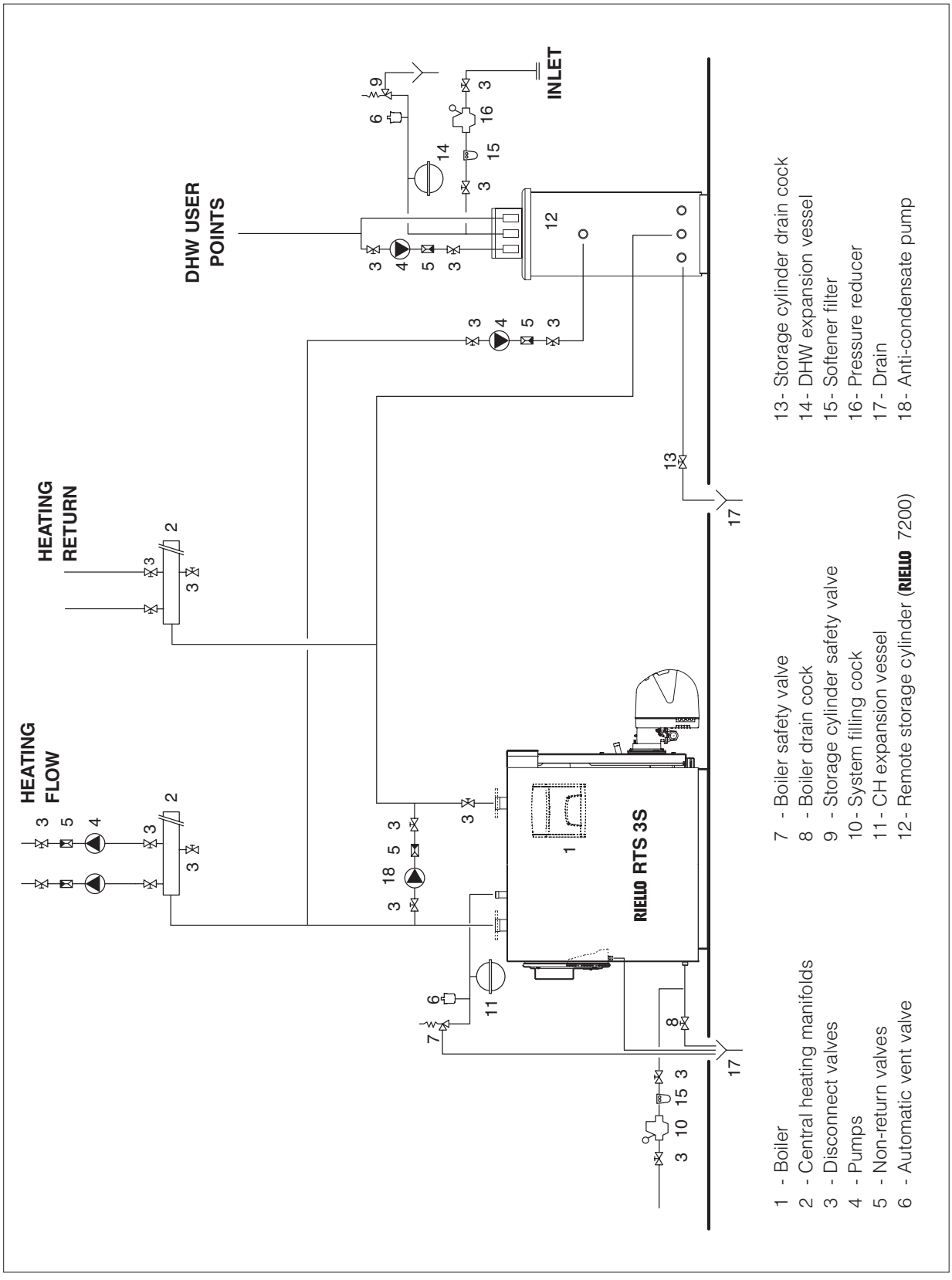
RIELLO RTS 3S boilers are designed and made for use in central heating installations, but can also be used for domestic hot water production if connected to a suitable storage cylinder. Water fittings are as specified in the following table:



RTS 3S	**90**	**115**	**166**	**217**	**255**	**349**	**448**	**511**	**639**	**850**	**1160**	**1450**	
A	320	335	348	348	360	390	395	395	450	512	514	563	mm
B	530	650	800	800	890	1085	1200	1200	1400	1570	1865	2030	mm
C	305	345	352	352	410	485	490	490	525	575	575	580	mm
Ø D	180	200	250	250	250	250	300	300	350	350	400	450	mm
E	870	946	1005	1005	1130	1130	1290	1290	1405	1445	1580	1695	mm
F	175	150	148	148	187	187	185	185	205	190	218	190	mm
G	130	200	200	200	200	300	250	250	300	350	350	700	mm
Mi - Central heating flow (*)	2”	2”	2”1/2	2”1/2	2”1/2	DN80	DN80	DN80	DN100	DN125	DN125	DN150	G” /DN
Ri - Central heating return (*)	2”	2”	2”1/2	2”1/2	2”1/2	DN80	DN80	DN80	DN100	DN125	DN125	DN150	G” /DN
As - Safety device fitting	1”1/4	1”1/4	1”1/4	1”1/4	1”1/4	1”1/4	1”1/2	1”1/2	1”1/2	2”1/2	2”1/2	DN80	G” /DN
Sc - Condensate drain	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”	3/4”	1”	1”	1”	G” /DN
S - Boiler drain	3/4”	1”	1”	1”	1”	1”	1”1/4	1”1/4	1”1/4	1”1/4	1”1/4	1”1/4	G” /DN

(*) All flanged connections are PN6 according to EN 1092-1.

SCHEMATIC DIAGRAM - 1 - CENTRAL HEATING AND DOMESTIC HOT WATER PRODUCTION



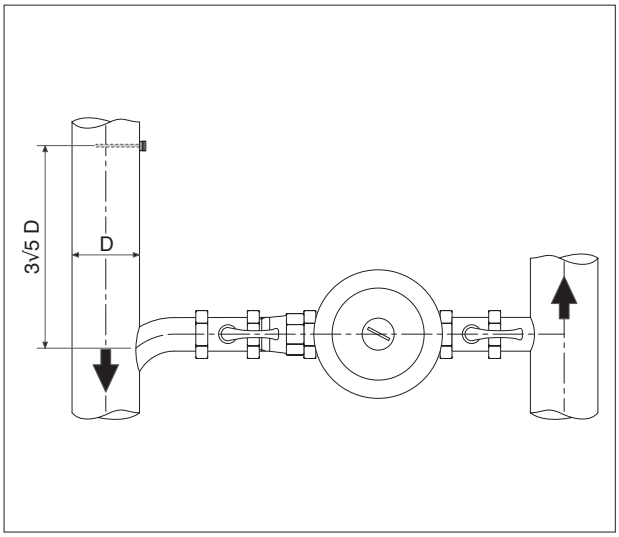
1 - Boiler
2 - Central heating manifolds
3 - Disconnect valves
4 - Pumps
5 - Non-return valves
6 - Automatic vent valve
7 - Boiler safety valve
8 - Boiler drain cock
9 - Storage cylinder safety valve
10 - System filling cock
11 - CH expansion vessel
12 - Remote storage cylinder (RIELLO 7200)
13 - Storage cylinder drain cock
14 - DHW expansion vessel
15 - Softener filter
16 - Pressure reducer
17 - Drain
18 - Anti-condensate pump

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

⚠ Circuits filled with anti-freeze must be fitted with water disconnectors.

ANTI-CONDENSATE PUMP

An anti-condensate pump operates during periods of no heat request to avoid damage until the boiler returns to a stable operating temperature. While the system is operating, this pump must guarantee a flow rate between 20 and 30% of maximum flow, must ensure a water return temperature no lower than the minimum permissible (see technical data) and must also delay shutting down for at least 3 minutes at the beginning of extended periods of boiler shutdown (overnight or weekend shutdown etc.).

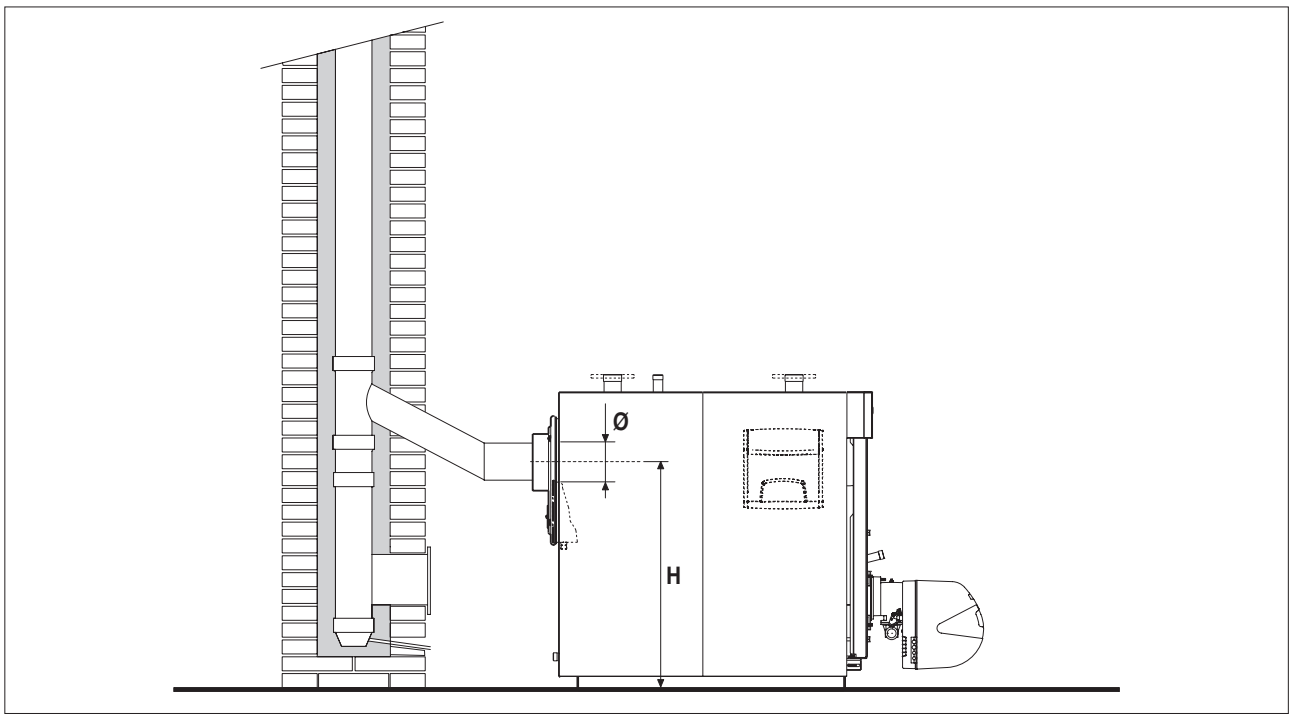


⚠ A sensor socket must be positioned at a distance of 3 to 5 times the diameter of the water return pipe, upstream from the water fitting, to measure effective water return temperature and control the anti-condensate pump or the temperature controller stabilisation function.

⚠ Any temperature controllers installed remotely from the control panel must be compatible with the system's electrical connections and functioning logic.

COMBUSTION GAS EXHAUST

The flue gas exhaust and its connection to the stack must be made in compliance with applicable laws and standards, using heat resistant, condensate resistant and stress resistant rigid pipe and sealed joints.



RTS 3S	90	115	166	217	255	349	448	511	639	850	1160	1450	
Ø - Diameter	180	200	250	250	250	250	300	300	350	350	400	450	mm
H	870	946	1005	1005	1130	1130	1290	1290	1405	1445	1580	1695	mm

⚠ The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue gas exhaust.

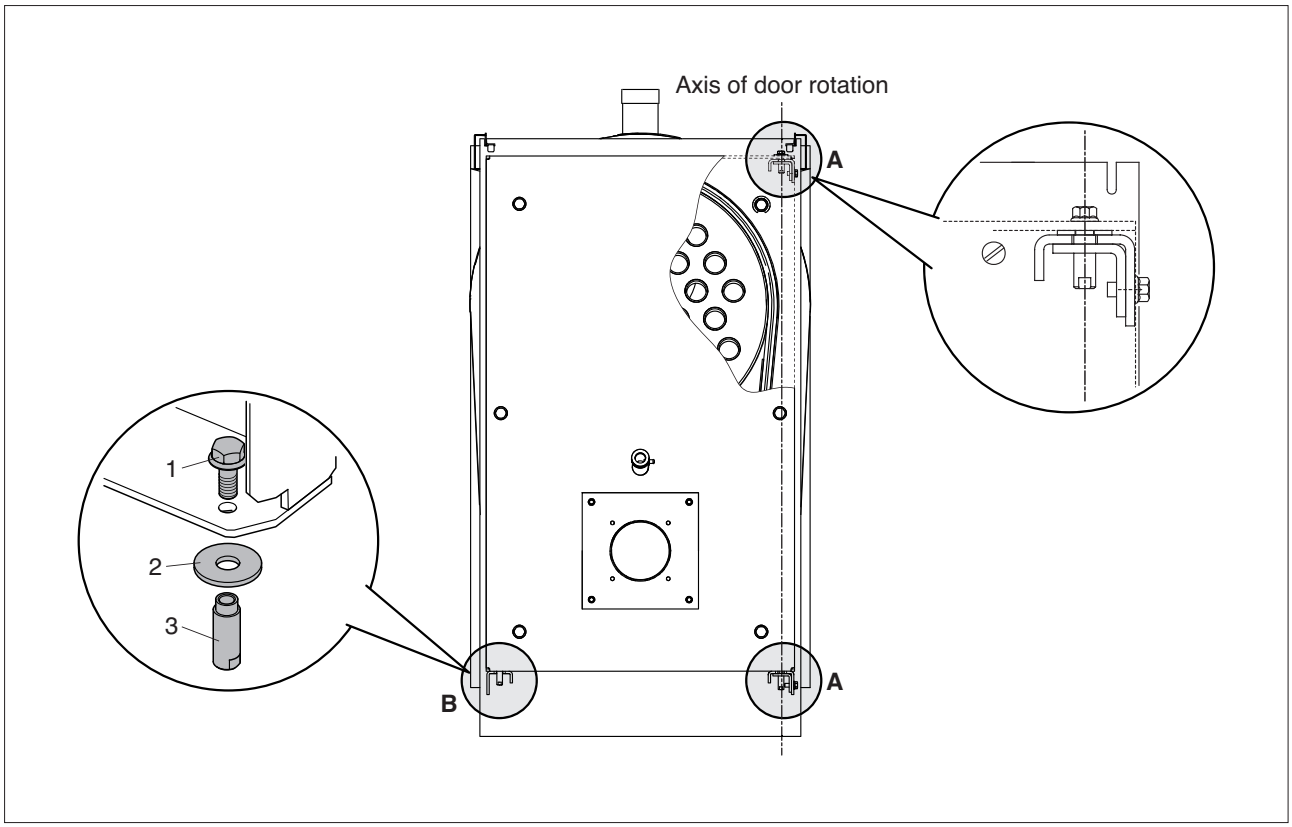
⚠ Inadequate or badly dimensioned stacks and exhausts can increase combustion noise, cause condensation problems and affect combustion parameters.

⚠ Joints must be sealed using appropriate materials (e.g. filler, mastic or silicone based sealant).

⚠ Uninsulated flues are potentially dangerous and can cause burns.

BOILER DOOR HINGES

The boilers has 3 hinge points so that the direction of opening of the door can be rapidly reversed.

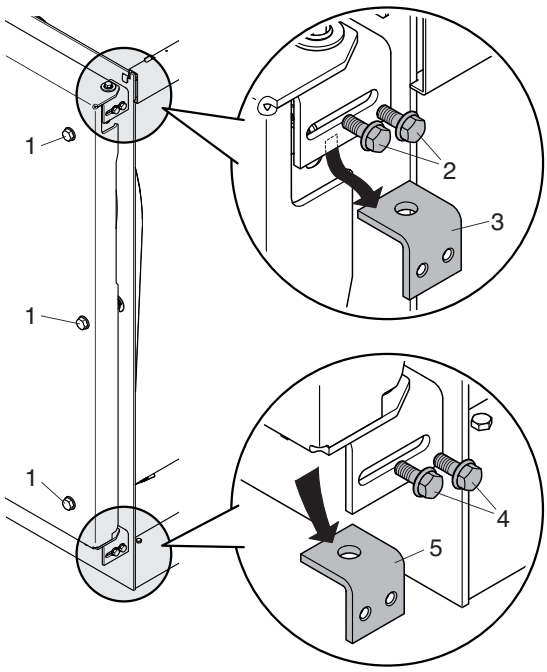


Once you have checked that the default direction of opening is as required, or have reversed the direction of opening as instructed in the 'Changing the direction of door opening' section, remove the spare hinge assembly 'B' (bolt (1), bushing (3) and washer (2)) opposite the hinged side of the door.

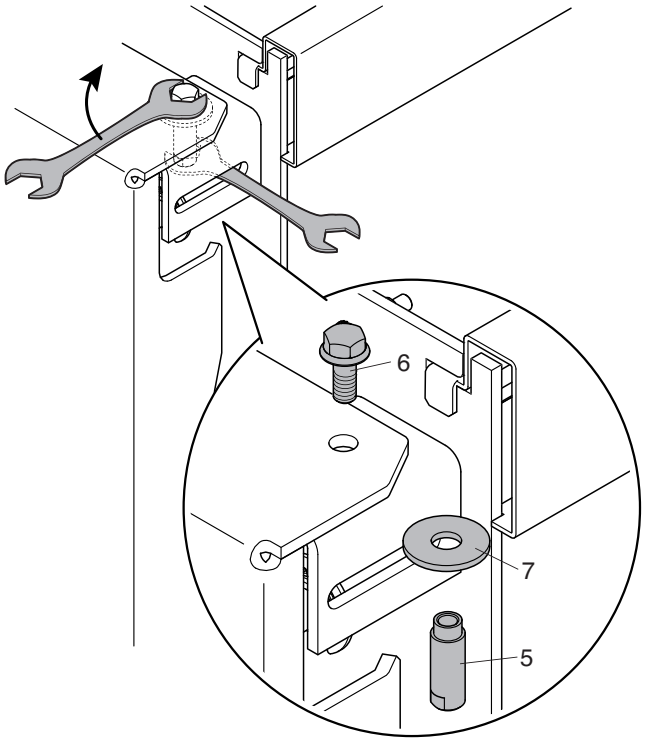
CHANGING THE DIRECTION OF DOOR OPENING

The boiler door hinges are factory fitted on the right of the door. If you need to reverse the direction of opening, remove the boiler's side panel and proceed as follows.

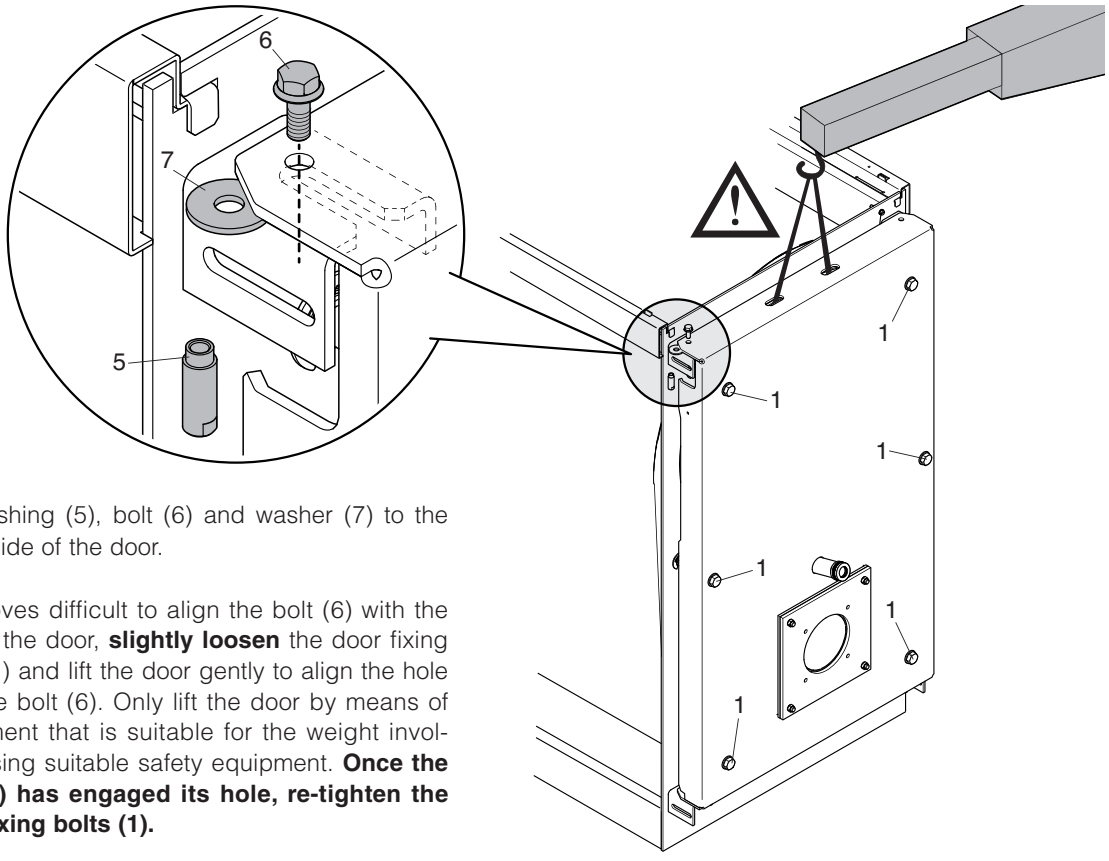
System A - RTS 90÷349 3S



- Make sure that the main door fixing bolts (1) are securely tightened.
- Remove the top safety bolts (2) and the door stop bracket (3).
- Remove the bottom safety bolts (4) and the door stop bracket (5).

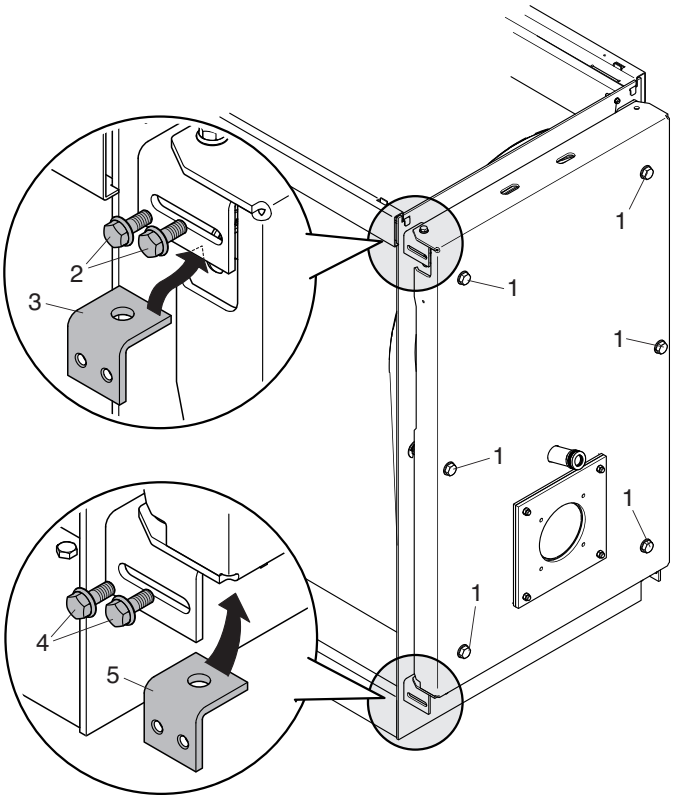


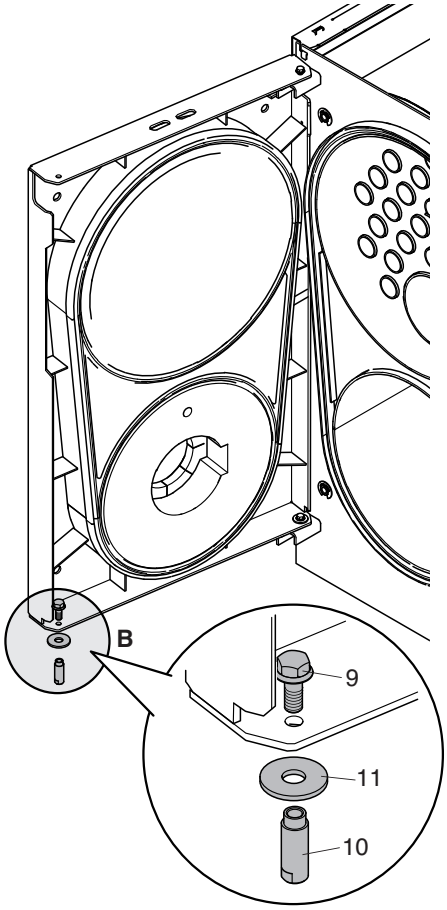
- Insert a spanner through the slot in the side of the top door mounting bracket and hold the bushing (5) steady.
- Unscrew the top bolt (6), then remove the bushing (5) and washer (7).



- Fit the bushing (5), bolt (6) and washer (7) to the opposite side of the door.

⚠ If it proves difficult to align the bolt (6) with the hole in the door, **slightly loosen** the door fixing bolts (1) and lift the door gently to align the hole with the bolt (6). Only lift the door by means of equipment that is suitable for the weight involved, using suitable safety equipment. **Once the bolt (6) has engaged its hole, re-tighten the door fixing bolts (1).**



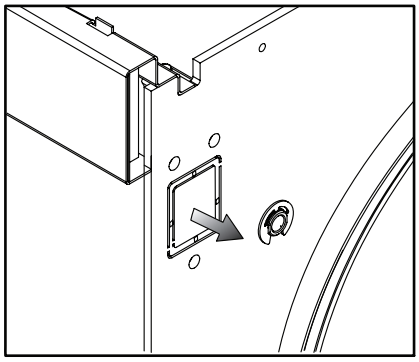


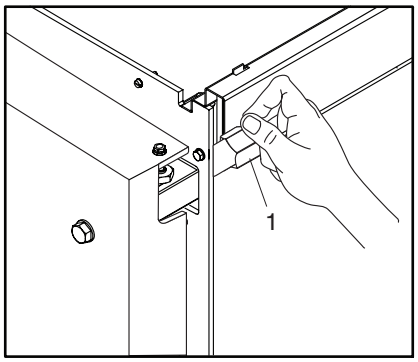
- Fit the top door stop bracket (3) to the opposite side of the door and fix it in place with the safety bolts (2).
- Fit the bottom door stop bracket (5) to the opposite side of the door and fix it in place with the safety bolts (4).

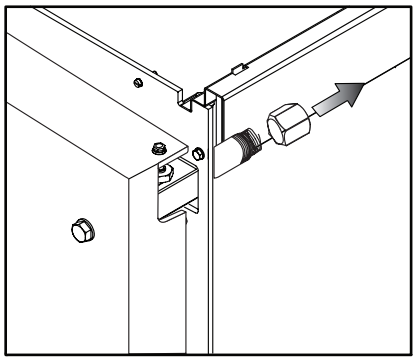
⚠ **Make sure that the safety bolts (2 and 4) are securely tightened before attempting to open the door.**

- Completely unscrew the main fixing bolts (1) and open the door. (These bolts are captive in the door and cannot be removed.)
- Remove the spare hinge assembly 'B' (bolt (9), bushing (10), and washer (11)) opposite the hinged side of the door.

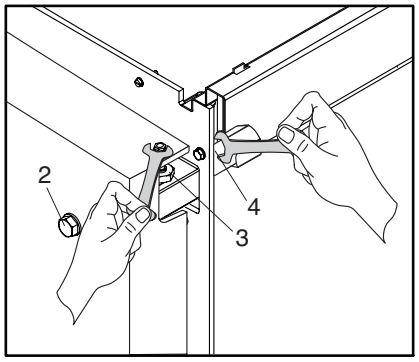
System B - RTS 448÷1450 3S

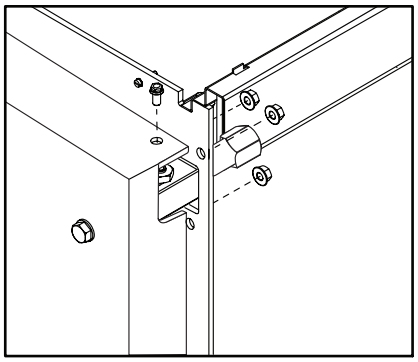


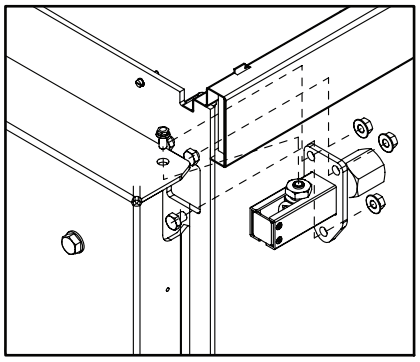


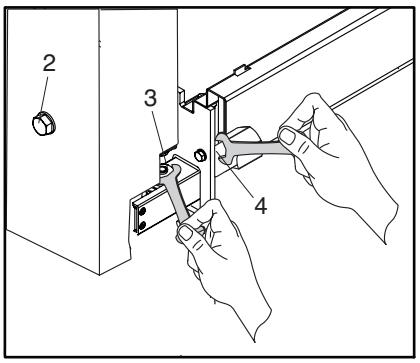


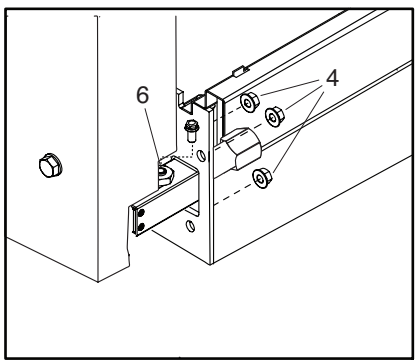
Open the door and use a hacksaw or file to remove the cutout from the front head on the opposite side to the door hinges. Reclose the door and secure it with the bolts (2). Remove the plug (1), taking care not to lose the spring from inside the threaded tube.
Remove the bolt (3) and the nuts (4), and pull the hinges out from their seats.

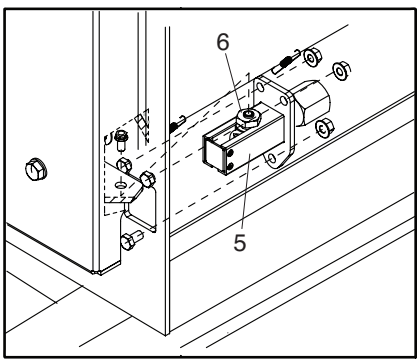










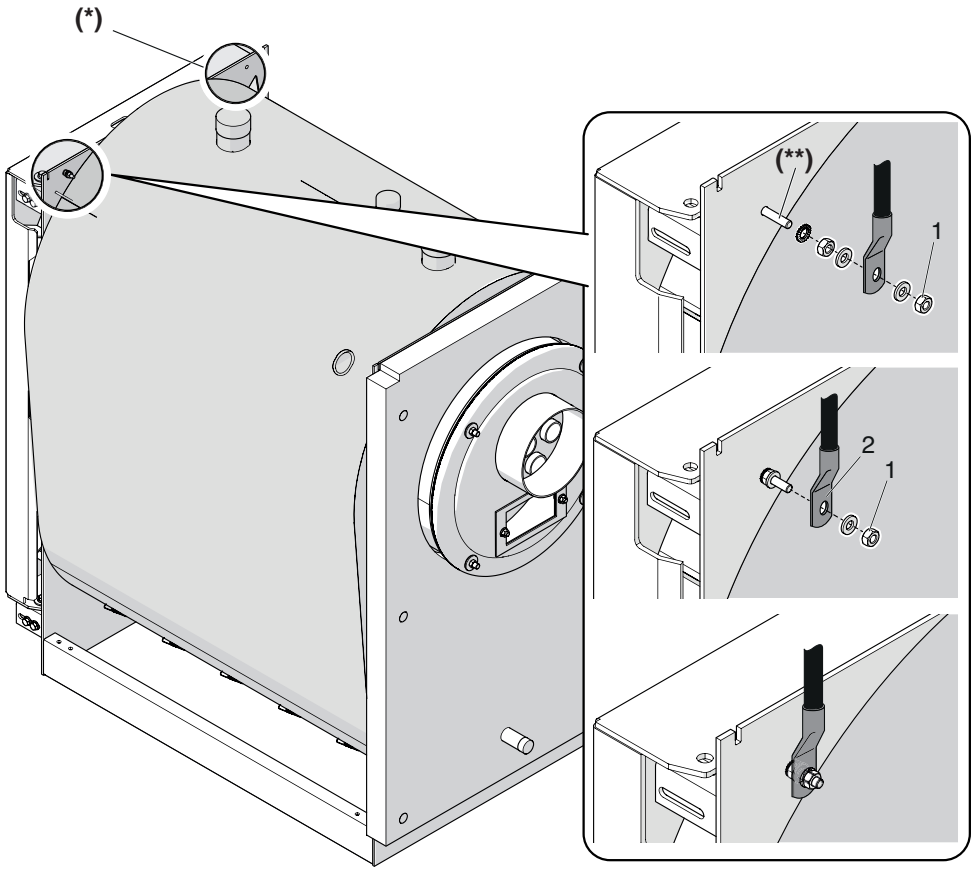


Fit the hinges on the opposite side, making sure that the pivots above the nuts (6) engage the door correctly. If necessary, screw down the nut (6) to raise the pivot. Finally, tighten the bolt (3) to secure the hinge.

A terminal is provided on the front boiler head to connect the boiler body to an efficient earth system.

Proceed as follows.
- Unscrew the nut and washer (1) from the earth terminal.
- Attach the earth cable's eye connector (2) to the terminal. (Make sure that the cable is of adequate size and complies with legislation in the country of installation.)
- Fit the nut and washer (1) to the earth terminal and tighten the nut.
- Connect the other end of the cable to the system's earth bar.

⚠ Another hole (*) in the left side of the boiler head can also be used to earth the appliance. If you wish to use this hole for the earth connection, remove the terminal fittings from the right of the head and move them to the left earthing point.



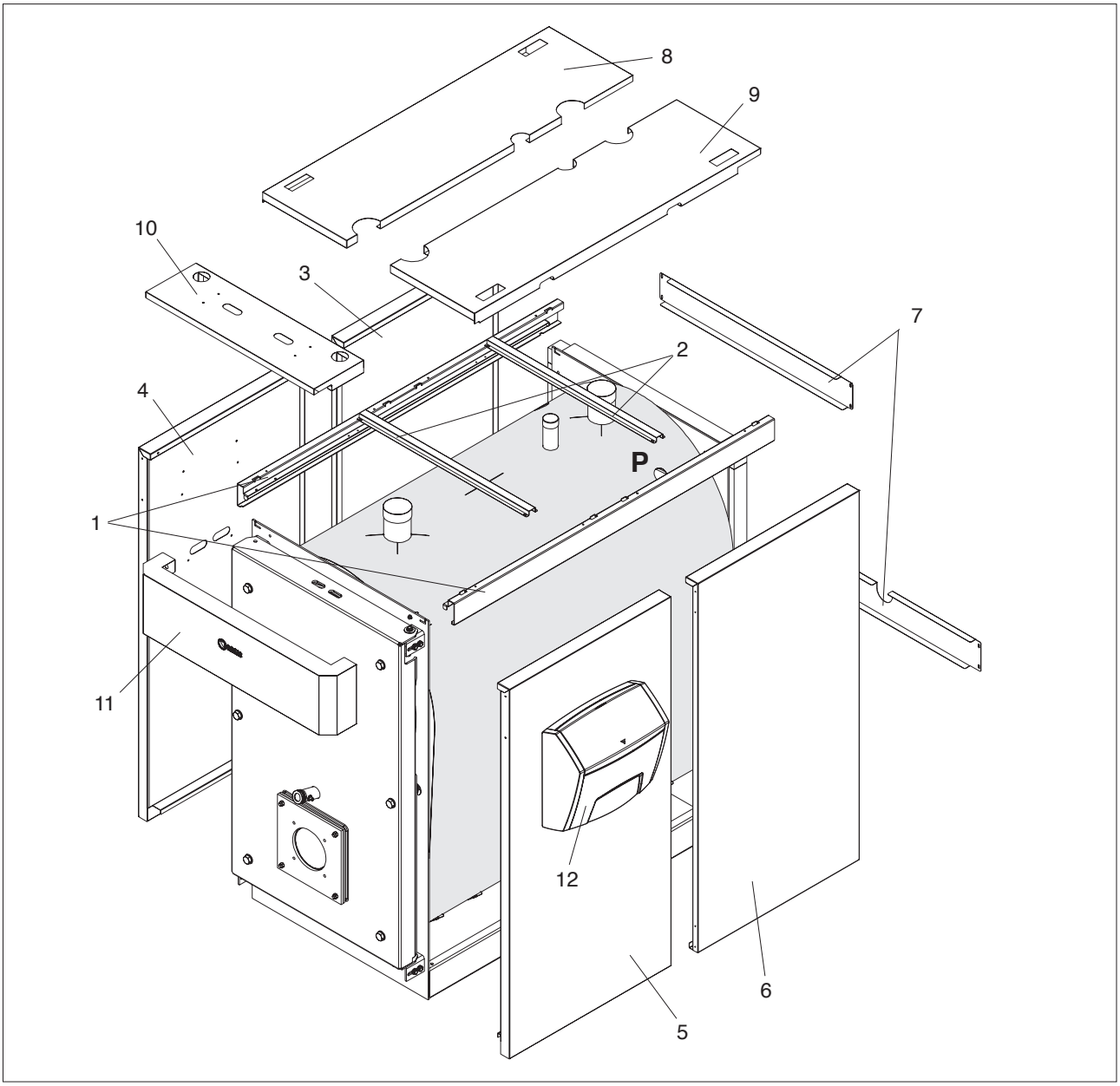
(**) M6x30 brass

Models RTS 90÷639 3S

- Push out the pre-formed cutouts in the boiler's side panel ((4) or (5) depending on what side you want to install the control panel) corresponding to the oval cable grommets in the control panel.
- Perforate the membranes of the control panel cable grommets. Route the electrical cables through them and insert the sensors in their sockets.
- Fix the control panel (12) to the boiler casing using the screws provided.
- Fit the side rails (1) and cross members (2).
- Engage the bottoms of the rear side panels (6)-(3) and front side panels (4)-(5) in the bottom rails, then hook their top lips over the top rails (1) running between the front and rear heads.
- Secure the side panels in place with the top cross beams (7) and the screws provided.
- Fit your chosen control panel on the left panel (4) or right panel (5) as instructed in the control panel's own instruction manual.
- Route the electrical cables and insert the sensors in their sockets.

⚠ **Use the copper socket (P) to insert the sensors of the safety devices (see the "Location of sensors" section).**

- Fit the cable grommets provided into their seats in the panels.
- Fit the rear top panels (8) and (9) and the front top panel (10) to close the top of the boiler.
- Once all the panels are in place, fit the front cover (11) over the top of the door.

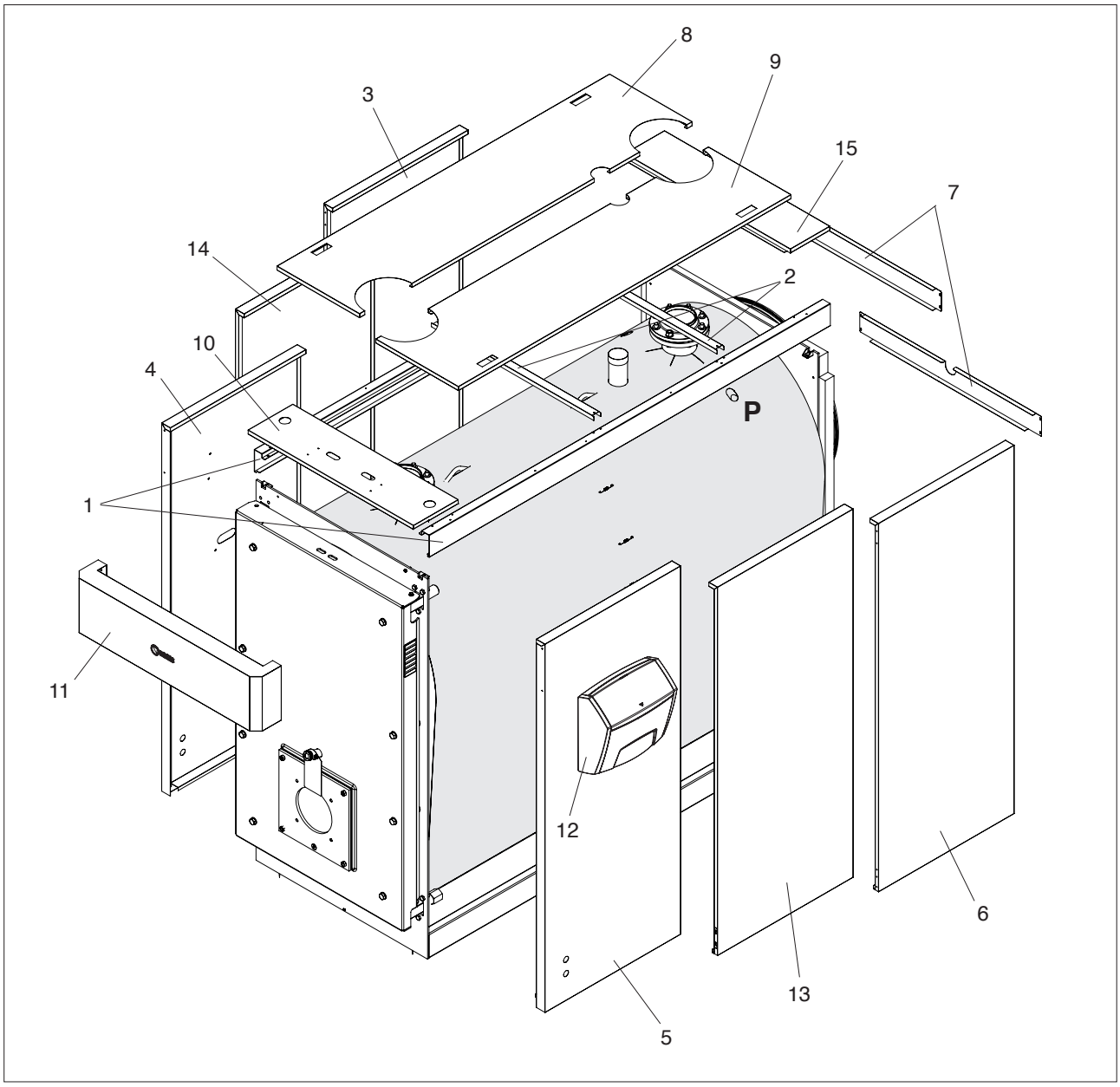


Models RTS 850÷1450 3S

- Push out the pre-formed cutouts in the boiler's side panel ((4) or (5) depending on what side you want to install the control panel) corresponding to the oval cable grommets in the control panel.
- Perforate the membranes of the control panel cable grommets. Route the electrical cables through them and insert the sensors in their sockets.
- Fix the control panel (12) to the boiler casing using the screws provided.
- Fit the side rails (1) and cross members (2).
- Engage the bottoms of the rear side panels (6 and 3), central side panels (13 and 14), and front side panels (4 and 5) in the bottom rails of the base, then hook their top lips over the top rails (1) running between the front and rear heads.
- Secure the side panels in place with the top cross beams (7) and the screws provided.
- Fit your chosen control panel on the left panel (4) or right panel (5) as instructed in the control panel's own instruction manual.
- Route the electrical cables and insert the sensors in their sockets.

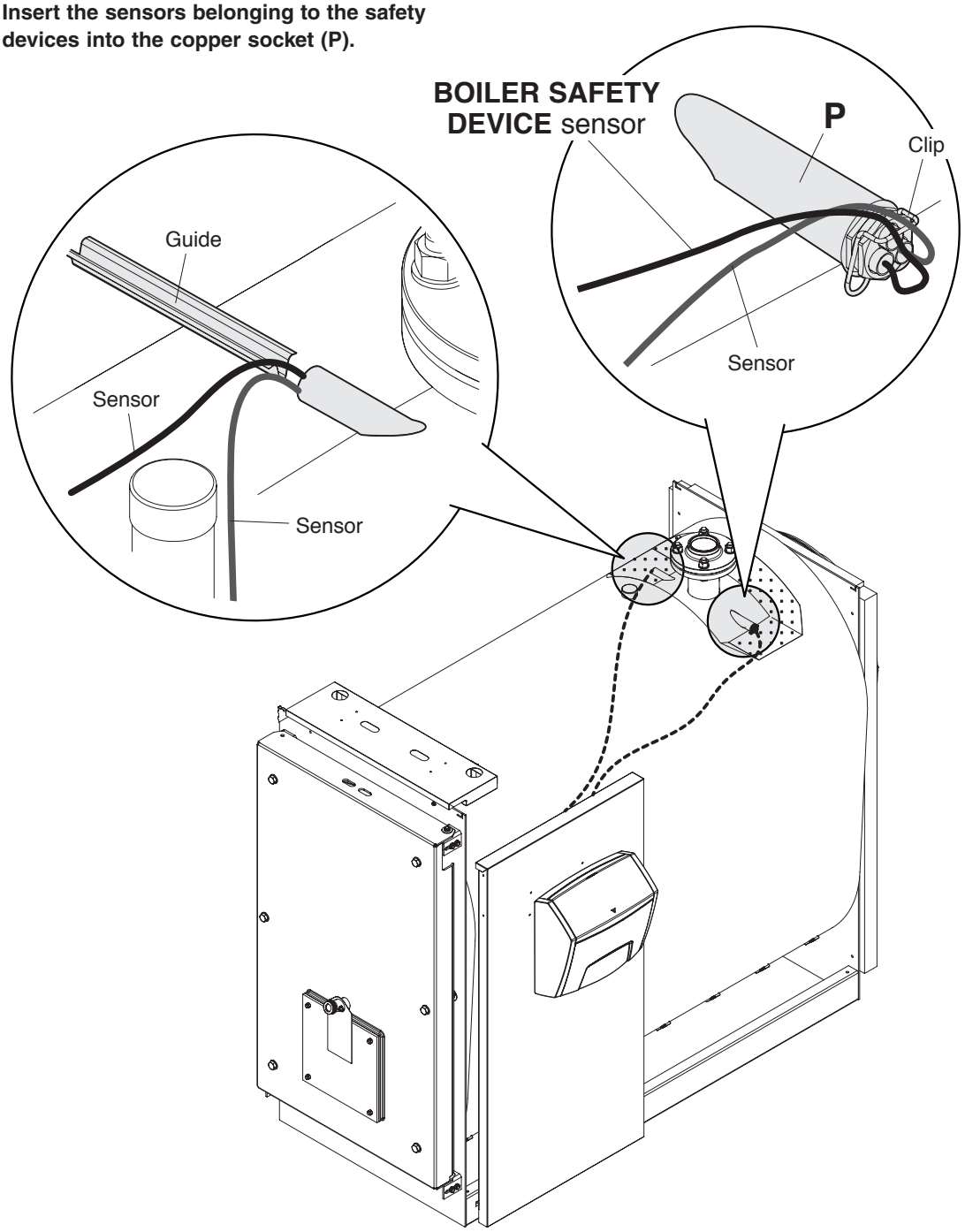
⚠ **Use the copper socket (P) to insert the sensors of the safety devices (see the "Location of sensors" section).**

- Fit the cable grommets provided into their seats in the panels.
- Fit the rear top panel (15), the central top panels (8 and 9) and the front top panel (10) to close the top of the boiler.
- Once all the panels are in place, fit the front cover (11) over the top of the door.



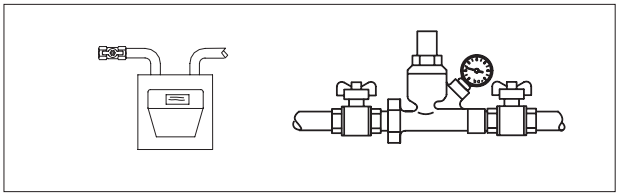
LOCATION OF SENSORS

⚠ **Insert the sensors belonging to the safety devices into the copper socket (P).**

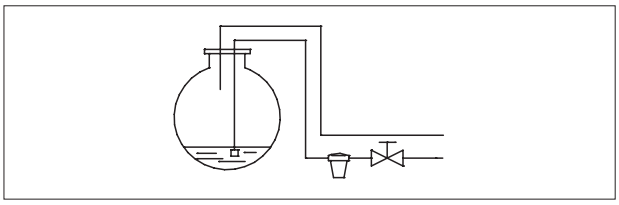


It is essential to perform the following checks before starting up or testing the functioning of your **RIELLO RTS 3S** boiler. In particular, check that:

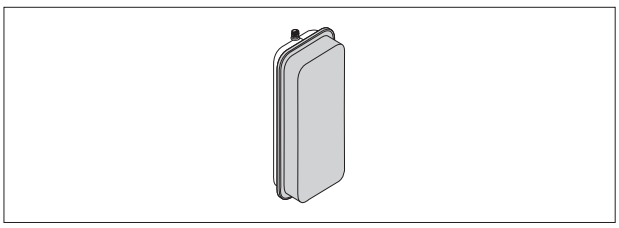
- The water and gas cocks are open



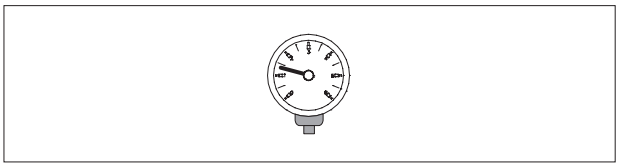
- There is an adequate fuel supply



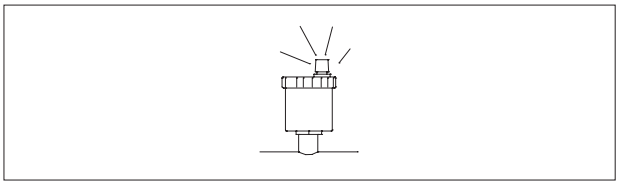
- The expansion vessel is properly charged



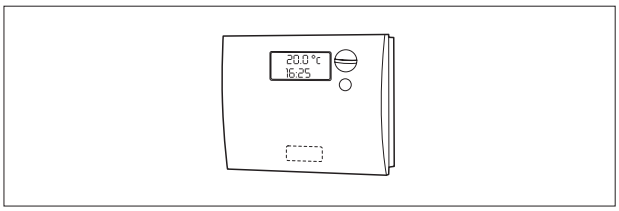
- The working pressure in the water circuit is **over 1 bar** but below the maximum limit specified for the boiler



- The water circuits have been properly bled



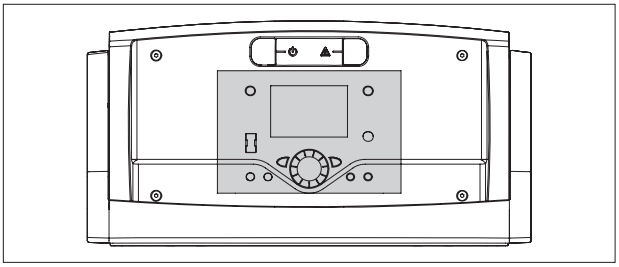
- The mains power connections to the boiler and its accessories (burner, pump, control panel, thermostats, etc.) have been properly made.



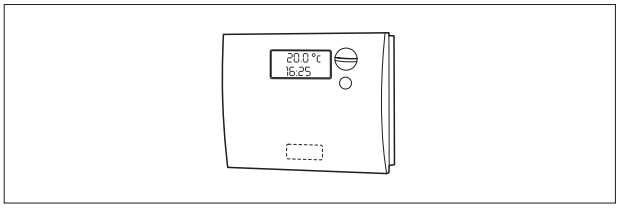
⚠ The phase-neutral polarity has been respected.
A ground (earth) connection is obligatory.

Once you have completed all the preparatory steps, proceed as follows to start up the boiler for the first time:

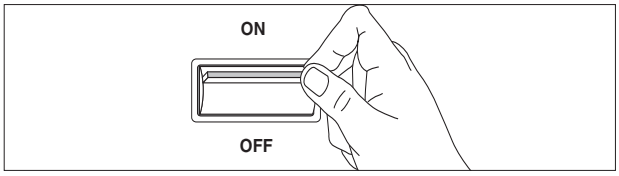
- If the system is equipped with a temperature controller or timer thermostat, make sure that it is switched on



- Adjust the timer thermostat/s or temperature controller to the desired temperature (~20° C)

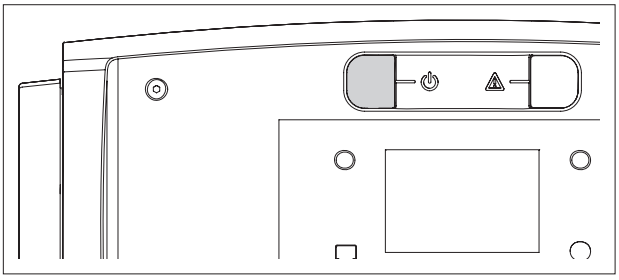


- Turn the system's main power switch ON



- Make the required adjustments as described in the instruction manual specific to the control panel

Turn the control panel power switch ON and make sure that the green power indicator lights.



The burner should now ignite and remain in operation until the set temperature is reached.

If any ignition faults or malfunctions occur, the burner performs a "LOCKOUT SHUTDOWN". This is shown by the red button light on the burner and by the warning light on the control panel.

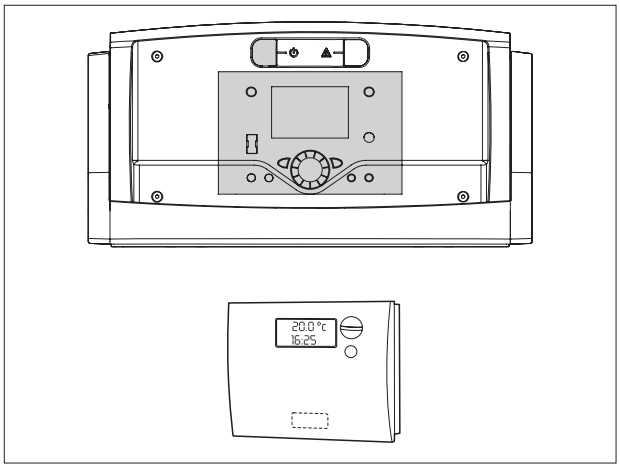
⚠ If a "LOCKOUT SHUTDOWN" occurs, wait about 30 seconds before resetting the burner.

To reset the burner, press the red button light on the burner and wait until the flame ignites.

Repeat this operation 2 -3 times at the most. If the problem persists, perform the following checks:
- All checks listed in the burner's own instruction manual;
- All steps listed in the 'Preparing for Initial Start-up' section;
- All the electrical connections shown on the control panel wiring diagrams.

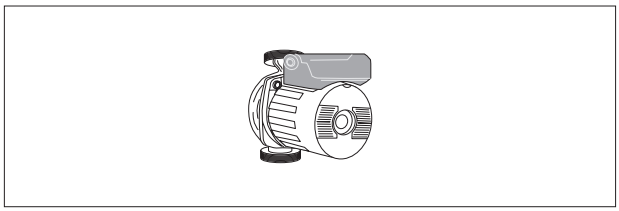
Once the boiler has started up, make sure that it shuts down and re-starts properly when the following actions are taken:

- The boiler thermostat setting is changed
- Power to the control panel is switched off and on again
- The room thermostat or timer thermostat is adjusted.

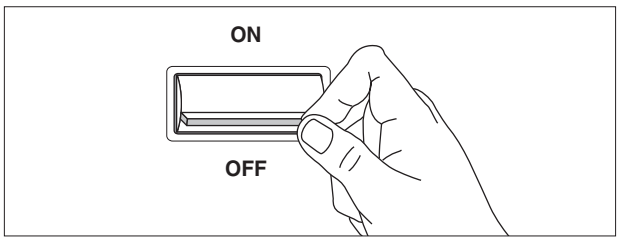


Check that there are no leaks from around the door seal. If there is any leakage of combustion gases, adjust the door as instructed on page 36.

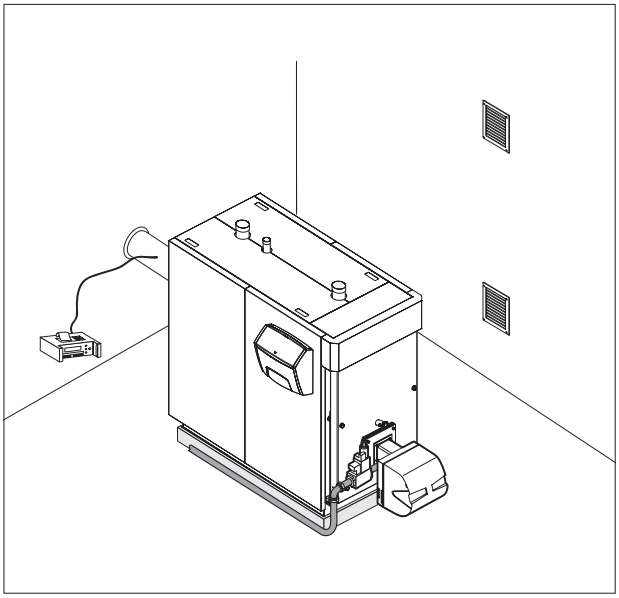
- Make sure that all the pumps in the system are free and rotate in the right direction



- Turn off the main power switch to the boiler and make sure that the boiler shuts down properly.



Provided all the above conditions are satisfied, start the boiler up again, then analyse the combustion fumes, measure fuel flow and re-check the door seal.



Regular maintenance is a legal requirement. It is also essential for the safety, efficiency and durability of the boiler. Proper maintenance keeps consumption and emissions down, and ensures that the boiler continues to operate reliably over time.

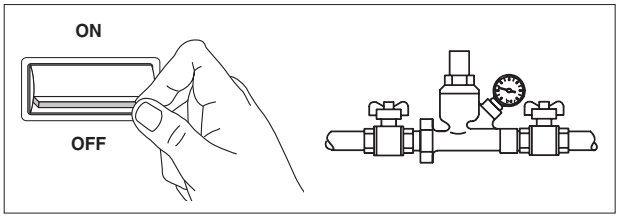
Have your boiler serviced either by **RIELLO**'s Technical Assistance Service or by a qualified heating engineer.

Analyse the combustion fumes before commencing any maintenance. The results of fume analysis can give a clear idea of what servicing or repairs are needed.

- Turn the system's main power switch OFF

- Close the fuel shut-off cocks.

⚠ Make sure that the door is properly adjusted after every maintenance operation.

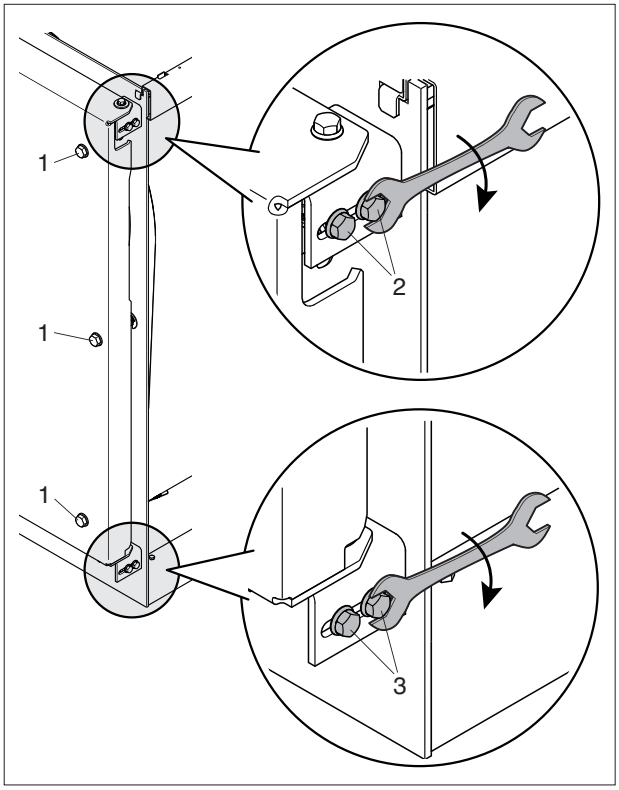


OPENING THE DOOR

System A - RTS 90÷349 3S:
- Make sure that the top safety bolts (2) and bottom safety bolts (3) on the hinged side of the boiler are tight.
- Completely unscrew the main fixing bolts (1) and open the door. (These bolts are captive in the door and cannot be removed.)

System B - RTS 448÷1450 3S:
- Completely unscrew the main fixing bolts (1) and open the door. (These bolts are captive in the door and cannot be removed.)

⚠ **The first time you open the door, remove the spare hinge assembly 'B' (bushing (10), bolt (9), and washer (11)) opposite the hinged side of the door.**



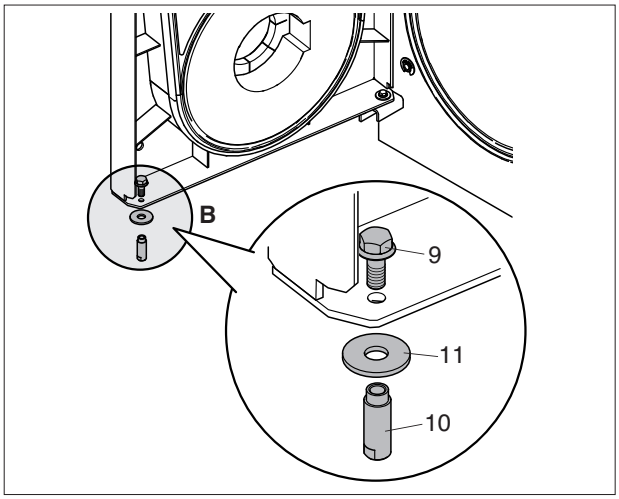
ADJUSTING THE DOOR

Make quite sure that the door presses uniformly all around the double seal to prevent dangerous fumes escaping into the air from the pressurised furnace. Proceed as follows to adjust the door seals:

System A - RTS 90÷349 3S:
- Push the door shut and tighten the main fixing bolts (1) until the seals start to compress.
- Loosen the safety bolts (2 and 3) then fully tighten the main door fixing bolts (1).
- Re-tighten the safety bolts (2 and 3).

System B - RTS 448÷1450 3S:
- Push the door shut and tighten the main fixing bolts (1) until the seals start to compress.

⚠ **Make sure that the door is properly adjusted after every maintenance operation.**

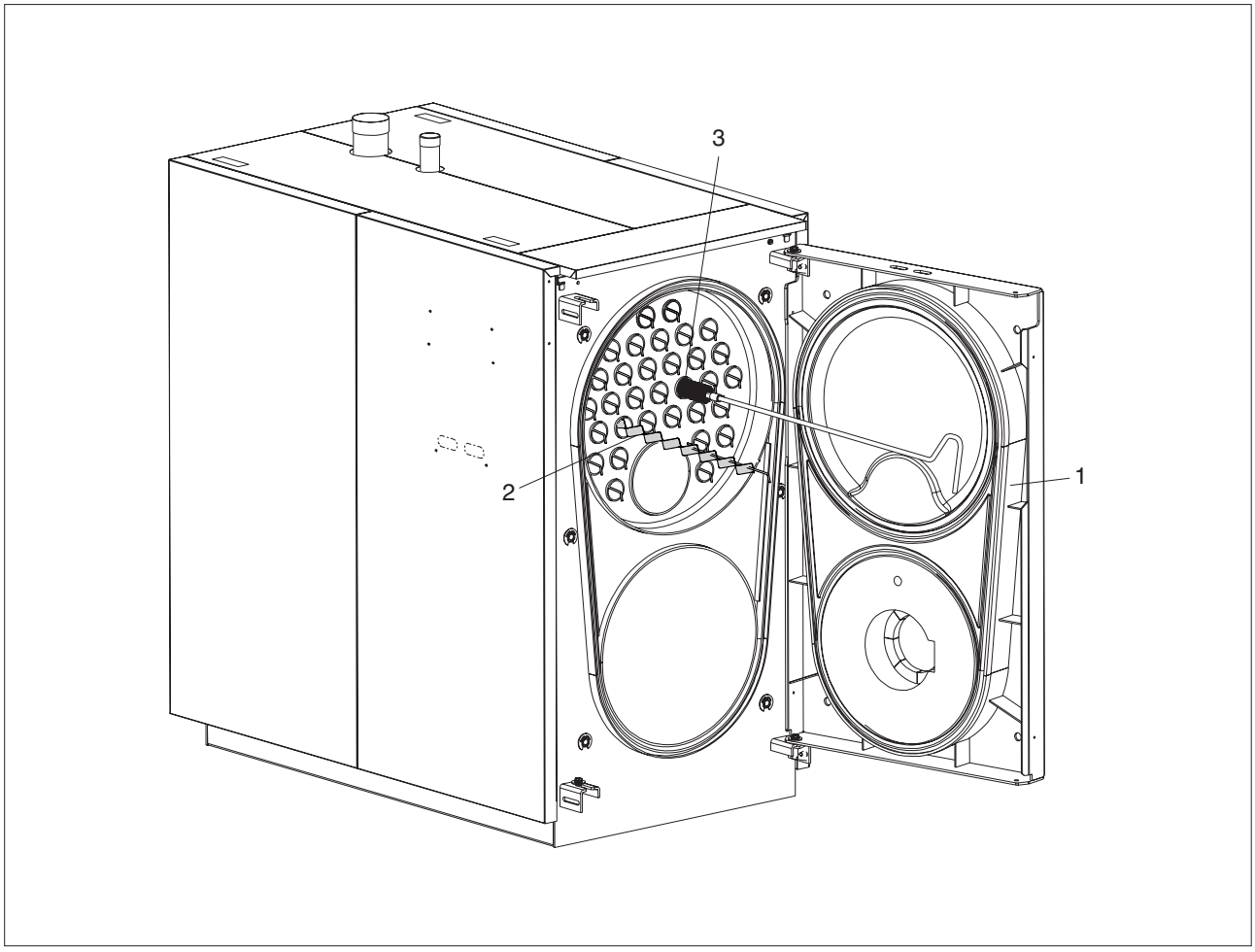


Clean the boiler and remove any carbon deposits from the surfaces of the heat exchanger **at least once a year**. This not only extends the boiler's working life, but also keeps it efficient in terms of heat output and consumption.

Proceed as follows to clean the boiler. Open the front door (1) and pull out the turbulators (2). Use cleaning rods (3) or other tools of suitable size and shape to clean inside the tubes. Remove any built-up deposits from the flue gas box through the access door opening.

⚠ If you are using fuel oil burners with a smoke scale reading higher than 3, perform the following actions **every 300 hours** of operation.
- Clean the boiler's heat exchange surfaces.
- Check and clean the turbulators. Replace if worn or damaged.

RTS 3S	**90**	**115**	**166**	**217**	**255**	**349**	**448**	**511**	**639**	**850**	**1160**	**1450**	
N. waves	22	22	27	32	38	40	55	55	61	71	71	90	n°



FAULT	CAUSE	CORRECTIVE ACTION
The boiler becomes dirty very quickly	Burner badly adjusted	Check the adjustment of the burner (perform flue gas analysis)
	Blockage in stack	Clean the flue gas pipes and stack
	Burner air intake dirty	Clean the burner air intake
The boiler does not reach its temperature setpoint	Boiler dirty	Clean the flue gas pipes
	Boiler and burner mismatched	Check specifications and settings
	Insufficient air/fuel flow to burner	Check and adjust the burner
	Control thermostat problem	Check the functioning of the thermostat Check the temperature setting.
The boiler keeps shutting down, and the control panel warning light comes on	Control thermostat problem	Check the functioning of the thermostat Check the temperature setting Check the electrical wiring Check the sensors
	No water supply Air in the circuit	Check the circuit pressure Check the vent valve

FAULT	CAUSE	CORRECTIVE ACTION
The boiler does not start up, but there is no error signal.	Transfer pump auxiliary control safety thermostat has tripped	Make sure that the multi-compartment zone water circuit has been correctly bled. Check that the transfer pumps are functioning correctly. Check that the transfer pump control thermostat or bithermostat is functioning correctly. Check the functioning of the auxiliary control safety thermostat
The boiler has reached the set temperature but the radiators are still cold	Air in the circuit	Bleed the circuit
	Pump malfunctioning	Check/unseize the pump
	Problem with minimum temperature thermostat (if present)	Check the temperature setting
There is a smell of fumes	Fumes escaping into the air	Clean the boiler body Clean the flue gas pipes Check that the boiler, flue gas pipes and stack are all properly sealed Check that the boiler, flue gas pipes and stack are all properly sealed
The safety valve keeps opening	Circuit pressure too high	Check the circuit pressure Check pressure reducer functioning Check pressure reducer setting
	Problem with heating system expansion vessel	Check the efficiency of the expansion vessel

Cod. 20030350

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