

STEEL BOILERS

RTQ 3S

**INSTALLATION, OPERATION, MAINTENANCE
AND SYSTEM MANAGEMENT MANUAL**



RIELLO

CONFORMITY

RTQ 3S RIELLO boilers conform to the Efficiency Directive 92/42/CEE.

When used in conjunction with a CE marked jet burner, they also satisfy the requirements of the Gas Appliances Directive 2009/142/EC (until 20 April 2018) and Regulation (EU) 2016/426 (from 21 April 2018) and applicable sections of the Electromagnetic Compatibility Directive 2014/30/UE and Low Voltage Directive 2014/35/UE.

When **RTQ 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



RANGE

MODEL	CODE
RTQ 91 3S	20024200
RTQ 115 3S	4032606.0
RTQ 166 3S	4032607.0
RTQ 217 3S	4032608.0
RTQ 255 3S	4032609.0
RTQ 318 3S	4032610.0
RTQ 349 3S	4032611.0
RTQ 448 3S	4032613.0
RTQ 511 3S	4032614.0
RTQ 575 3S	4032615.0
RTQ 639 3S	4032616.0
RTQ 766 3S	4032617.0
RTQ 896 3S	20008436
RTQ 1100 3S	20012427
RTQ 1300 3S	20008435
RTQ 1600 3S	20016656
RTQ 2100 3S	20016657
RTQ 2400 3S	20018817

MODEL	CODE
RTQ 166 3S COMPONIBILE	20040755
RTQ 217 3S COMPONIBILE	4032620.0
RTQ 255 3S COMPONIBILE	4032621.0
RTQ 318 3S COMPONIBILE	4032622.0
RTQ 349 3S COMPONIBILE	4032623.0
RTQ 448 3S COMPONIBILE	4032625.0
RTQ 511 3S COMPONIBILE	4032626.0
RTQ 575 3S COMPONIBILE	4032627.0
RTQ 639 3S COMPONIBILE	4032628.0
RTQ 766 3S COMPONIBILE	20042810
RTQ 896 3S COMPONIBILE	20042814

Dear Customer,

*Thank you for choosing a **RTQ 3S RIELLO**, 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 **RTQ 3S RIELLO** boiler.*

Please accept our renewed thanks for your purchase.

Riello S.p.A.

GENERAL	5
General safety information	5
Precautions	5
Product description	6
Control panels	8
Recommended fuel oil burners	9
Recommended gas burners	10
Product identification	12
Technical data for boilers with fuel oil burners <400 kw	13
Technical data for boilers with gas burners <400 kw	14
Technical data for boilers > 400 kw	15
SYSTEM MANAGER	16
Start up	16
Temporary shutdown	17
Preparing for extended periods of disuse	18
Cleaning	18
Maintenance	19
Useful information	19
HEATING ENGINEER	20
Unpacking the product	20
Overall dimensions and weights	21
Handling	22
Place of installation	23
Installation in older systems and systems requiring modernisation	24
Water connections	24
Anti-condensate pump	28
Combustion gas exhaust	28
Door hinges	29
Changing the direction of door opening	29
Earth connection	31
Fitting the casing panels	32
TECHNICAL ASSISTANCE SERVICE	36
Preparing for initial start-up	36
Initial start-up	37
Checks during and after initial start-up	38
Maintenance	39
- Opening the door	39
- adjusting the door	39
Cleaning the boiler	40
Troubleshooting	41

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 20020615 Rev. 30 (04/18) is made up of 44 pages.

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.
-  The **RTQ 3S RIELLO** boiler must be installed by a legally qualified heating engineer. 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 **RTQ 3S RIELLO** 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.

PRODUCT DESCRIPTION

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

RTQ 3S RIELLO steel boilers are high efficiency boilers with horizontal, flame reversal combustion chambers and concentrically arranged flue gas pipes. They are designed for central heating and, when used in conjunction with a suitable storage cylinder, for domestic hot water production too.

Because they operate at low pressure, they provide a gradual heating action without thermal shock.

The most important technical features of these boilers are:

- The combustion chamber and heat exchange system are specially designed and shaped to achieve the best possible volume ratio.
- Only top quality materials are used to ensure a long working life.

Stainless steel turbulators inside the flue gas pipes establish an ideal pressure inside the combustion chamber and an ideal flue gas temperature. Evenly distributed thermal load optimises the efficiency of the boiler-burner system.

The boiler body is thoroughly insulated with a layer of high density glass wool.

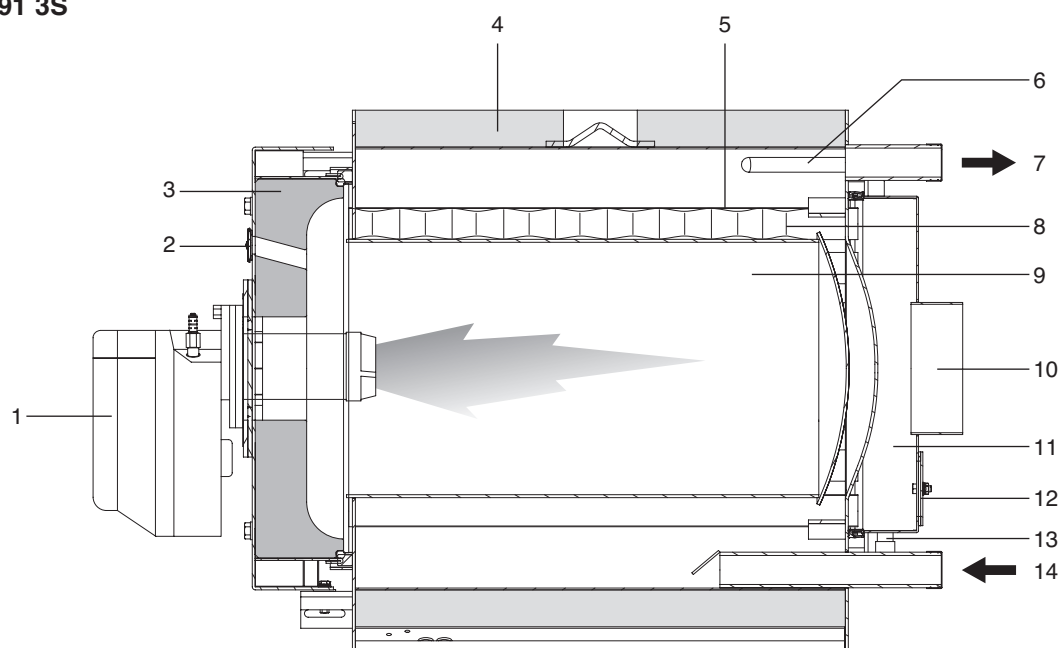
The boiler's front door and the flue gas box can be opened completely to facilitate the inspection, maintenance and cleaning of internal parts and to speed up servicing in general.

The front door can open in either direction, even without removing the burner.

Max. permissible return temperature with a gas burner: 50-55°C.

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

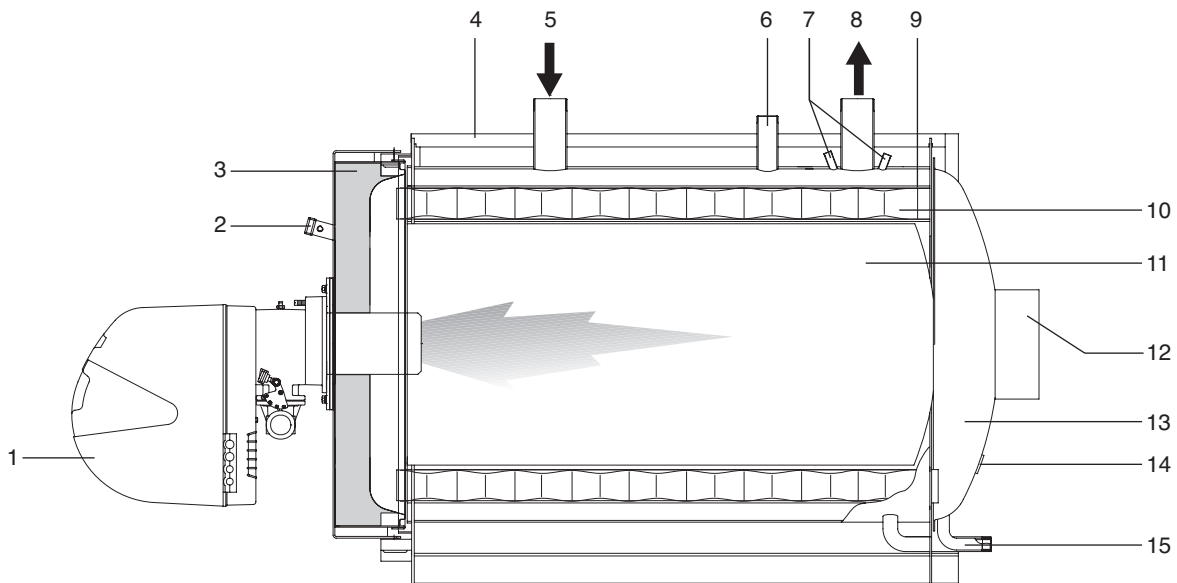
RTQ 91 3S



- 1 - Burner
- 2 - Flame inspection window
- 3 - Door
- 4 - Casing
- 5 - Flue gas pipes
- 6 - Instrument bulb/sensor sockets
- 7 - Central heating flow

- 8 - Turbulators
- 9 - Combustion chamber
- 10 - Flue gas exhaust
- 11 - Flue gas box
- 12 - Inspection window
- 13 - Condensate drain
- 14 - Central heating return

RTQ 115 - 2400 3S



- 1 - Burner
- 2 - Flame inspection window with pressure measurement / cooling valve
- 3 - Door
- 4 - Casing
- 5 - Central heating return
- 6 - Safety device fitting
- 7 - Instrument bulb/sensor sockets

- 8 - Central heating flow
- 9 - Flue gas pipes
- 10 - Turbulators
- 11 - Combustion chamber
- 12 - Flue gas exhaust
- 13 - Flue gas box
- 14 - Inspection window
- 15 - Condensate drain

CONTROL PANELS

The **RIELLO** control panels that can be used with **RIELLO RTQ 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		MINIMUM CH FLOW TEMPERATURE								
MODEL	TYPE	T° > 50°C			T° > 40°C					
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 ①	Two stage ②	Modulating M	Cascaded A/C	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								

RECOMMENDED FUEL OIL BURNERS

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

BURNER				RTQ 3S																		ACCESSORIES KIT	
MODEL			CODE	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400	BURNER PLATE	LONG HEAD
OIL	SINGLE STAGE	RG 3	3739300	•																			3000965
		RG 4 S	3739650			•																	3000966
		RG 5 S	3739950				•	•														4031391	3001068
		RL 34/1 MZ t.l.	3470111					•	•														
	TWO STAGE	RG 3D	3739450	• (R)	• (R)																		
		RG 4D	3739750			• (R)																	3000969
		RG 5D	3739850				• (R)															4031391	3000981
		RL 34 MZ t.l.	3470211					• (R)	• (R)														3010426
		RL 44 MZ t.l.	3470311							•													
		RL 44 MZ t.l.	3470341							• (R)													
		RL 50 t.l.	3474633								•	•											
		RL 50 t.l.	3474633										•									4031395	
		RL 70 t.l.	3475033										•	•									
		RL 100 t.l.	3475233											•	•	•							
		RL 130 t.l.	3475433															•	•				
		RL 190 t.c.	3475613																	•			3010444
		RL 250 t.c.	3470010																		•		3010422
		RL 300/B MZ	3478410																			•	
	MECHANICAL CAM MODULATION	RL 28/M t.l.	3471003			•																	4031198
		RL 28/M t.l.	3471003				•	•															
		RL 38/M t.l.	3471403						•	•													

(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).

RECOMMENDED GAS BURNERS

BURNER			RTQ 35											ACCESSORIES KIT	
MODEL		CODE	448	511	575	639	766	896	1100	1300	1600	2100	2400	BURNER PLATE	LONG HEAD
GAS	TWO STAGE	RS 50 t.l.	3784703	•	•										
		RS 70 t.l.	3785103			•	•								
		RS 100 t.l.	3785303				•	•	•						
		RS 130 t.l.	3785503						•	•					
	MODULATING	RS 50/M MZ t.l.	3781622	•	•										
		RS 70/M t.l.	3789611			•	•								
		RS 100/M t.l.	3789711			•	•	•	•						
		RS 130/M t.l.	3789811						•	•					
		RS 190/M t.c.	3787623								•				3010443
		RS 250/M MZ t.c.	3788411									•			
		GAS 9 P/M t.l.	3754038										•		



See the instruction manual provided with the burner for further information on:

- Burner installation
- Electrical connections
- Burner adjustments.



- 1 - Long heads and burner plates are required for the correct installation and coupling of the burners.
- 2 - If a two stage burner is installed, 1st stage heat input must not be less than 70% of total heat input. With liquid fuel burners equipped with 2 nozzles, it is therefore important to choose the correct first stage nozzle.



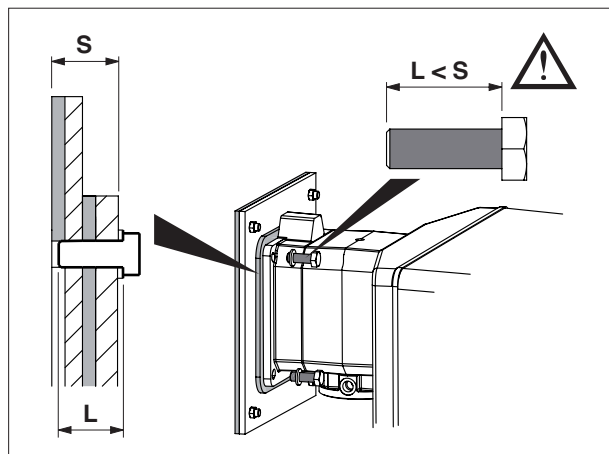
To assemble/disassemble the burners equipped with recirculation tube, it might be necessary to remove the latter before carrying out such operations (strictly comply with the use and maintenance manual of the burner).

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.

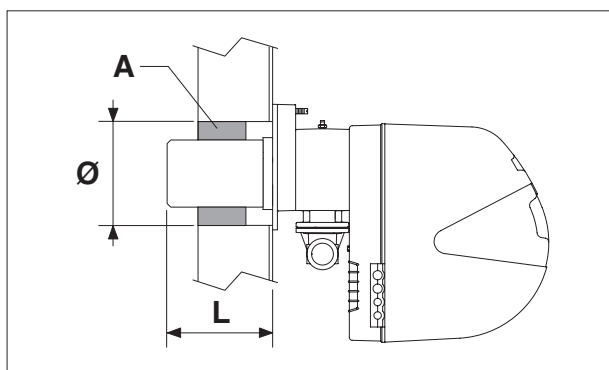
To ensure correct burner installation, also refer to the burner's own manual.



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.



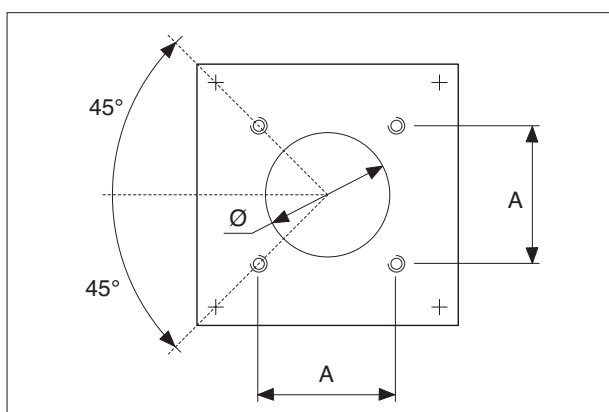
DIMENSIONS (mm)	RTQ 3S																	
	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400
L min.	170	170	170	215	215	240	240	260	260	275	275	280	325	340	365	375	375	375
Ø hole in door	140	140	160	180	180	180	180	185	185	205	205	205	260	280	300	350	350	350

! Blast tubes must not exceed the specified lengths by more than 20%.

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

BURNER PLATE

RTQ 3S RIELLO boilers have burner plates with holes arranged to accept the recommended burners. The following table shows the dimensions of the holes.



DIMENSIONS (mm)	RTQ 3S																	
	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400
Ø	140	130	140	165	165	165	165	165	165	185	185	185	185	205	205	265	230	300
A	120	120	131	158,5	158,5	158,5	158,5	158,5	158,5	195	195	195	195	195	195	260	255	260
Threads	M8	M8	M8	M8	M8	M8	M8	M8	M8	M12	M12	M12	M12	M12	M12	M16	M16	M18

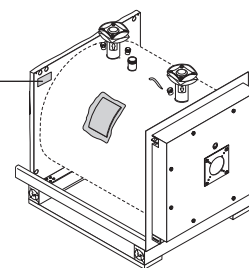
PRODUCT IDENTIFICATION

The boilers are identified by two plates:

- Serial number plate

This is located on the boiler body and specifies the serial number, model, and furnace power.

RIELLO		RIELLO S.p.A. Via Ing. Paolo Rello 7 37045 Legnago (VR) - ITALY		CE
Modello		Press. Max esercizio	PMS	bar
Fabbricazione		Portata term.	Qmax (H)	kW
Modello		Portata term.	Qmax (H)	kW
COMBUSTIBILE UTILIZZATO / COMBUSTIBLE UTILISE: GAS, GASOILIO / GAZ, POUL.				



- Data plate

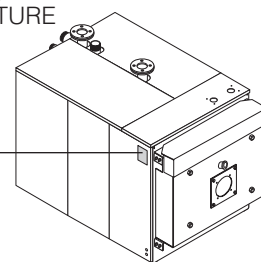
This lists the technical specifications and performance of the product. It comes inside the documentation envelope. On completion of the installation you MUST apply it in a clearly visible position at the top of one of the side panels.

If you damage or lose this label, order a replacement immediately from **RIELLO's** Technical Assistance Service.

RIELLO		RIELLO S.p.A. Via Ing. Paolo Rello 7 37045 Legnago (VR) - ITALY		CE
CALDAIA IN ACCIAIO / CHAUDIERE EN ACIER				
Modello		Matricola		
Fabbricazione		Fabbricazione		
Modello		Code		
Code		Code		
Anno fabbricazione		Tipi		
Anno fabbricazione		Tipi		
Portata term.	Q max (H)	kW	Port. utile p	Puls. utile max 60°/90°
Portata term.	Q min (H)	kW	Port. utile p	Puls. utile min 60°/90°
Pressione bar	bar	Contenuto acqua		
Pressione bar	bar	Capacità in max		
Press. Max esercizio	PMS	Superficie di scambio		
Press. Max da serb.		Surface d'échange		
T _{Max} ammessa T _{max}	°C			
T _{Max} ammessa T _{max}	°C			
Aliment. elettrica				
VEDI QUINDI ELETTRICO - VOR TILBAU ELEKTRIKER				
Collegamento di terra obbligatorio - Raccordement à la terre obligatoire				
Combustibile utilizzato: TUTTI I GAS / GASOILIO				
Combustible utilisé: TOUS GAZ / POUL.				
PER CATEGORIA COMBUSTIBILE E PAESI DI DESTINAZIONE VEDI ETICHETTA BRUCIATORE				
POUR CATEGORIE COMBUSTIBLE ET PAYS DE DESTINATION VOR ETIQUETTE BRULEUR				

23270000581

WEEK OF
MANUFACTURE



FUEL

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

DESCRIPTION	RTQ 3S							
	91	115	166	217	255	318	349	
Device type	Central Heating							
	B23							
Fuel	OIL							
Device category	See burner							
Maximum rated heat input HCV (LCV)	95,4 (90)	122 (115)	176,0 (166)	230,1 (217)	270,4 (255)	337,2 (318)	369,0 (348)	kW
Minimum rated heat input HCV (LCV)	74,2 (70)	95,4 (90)	122 (115)	176,0 (166)	230,1 (217)	270,4 (255)	337,2 (318)	kW
Maximum useful output (80°/60° C) P4	84,8	110,2	158,7	206,8	243,0	303,4	332,0	kW
Minimum useful output (80°/60° C) (Pn min)	66,9	86,6	110,4	159,2	208,8	244,3	304,0	kW
30% heat output with return at 37°C (P1)	25,7	33,1	47,6	62,0	72,9	91,0	99,9	kW
Seasonal energy efficiency η_s	89,0	89,0	89,0	89,0	90,0	90,0	90,0	%
Efficiency at rated heat input in high temperature mode η_4 (80-60°C) HCV (LCV)	88,8 (94,2)	90,3 (95,8)	90,2 (95,6)	89,9 (95,3)	89,9 (95,3)	90,0 (95,4)	90,0 (95,4)	%
Useful efficiency at min Pn (80-60°C) HCV (LCV)	90,1 (95,6)	90,7 (96,2)	90,5 (96,0)	90,4 (95,9)	90,7 (96,2)	90,3 (95,8)	90,1 (95,6)	%
Efficiency at rated heat input in low temperature mode η_1 with return at 37°C HCV (LCV)	94,0 (99,7)	94,0 (99,7)	94,0 (99,7)	94,0 (99,7)	94,0 (99,7)	94,1 (99,8)	94,1 (99,8)	%
Constant pressure drop	260	330	400	480	550	620	680	W
Flue gas temperature (ΔT)	93	95 ÷ 108						°C
Flue gas mass flow rate	0,040	0,050	0,072	0,094	0,111	0,139	0,151	kg/sec
Furnace pressure	2,0	1,5	1,3	2,2	2,8	3,2	3,9	mbar
Furnace volume	97,4	91,0	138,4	199,1	199,1	298,9	298,9	dm³
Total volume of flue gas side	139,7	163,2	234,3	317,2	325,6	457,9	457,9	dm³
Total surface area for heat exchange	3,62	4,35	6,68	8,59	9,47	12,34	12,34	m²
Volumetric heat load	928	1264	1199	1090	1281	1064	1164	kW/m³
Specific heat load	24,1	25,2	23,8	24,1	25,7	24,6	26,9	kW/m²
Maximum operating pressure	6							bar
Maximum admissible temperature	110							°C
Maximum operating temperature	95							°C
Min. admissible water return temp.	37							°C
Pressure drop ΔT 10°C	42,0	15,1	42,0	76,5	144,0	148,0	162,0	mbar
Pressure drop ΔT 20°C	14,0	3,0	11,2	17,2	45,0	27,2	29,7	mbar
Water capacity	126	161	191	268	258	308	308	litri
Turbulators	22	22	30	34	39	44	44	n°
Consumption at full load (Elmax)	460	460	460	530	660	660	760	W
Consumption at part load (Elmin)	138	138	138	159	198	198	228	W
Electrical consumption in standby mode (Psb)	20	20	20	20	20	20	20	W

⚠ 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 CO₂ = 12,5%.

⚠ When used in conjunction with fuel oil burners, RTQ 3S boilers <400kW conform to:

- Energy-Related Products Directive 2009/125/EC
- EU Delegated Regulation 813/2013

TECHNICAL DATA FOR BOILERS WITH GAS BURNERS <400 KW

DESCRIPTION	RTQ 3S								
	91(*)	115(*)	166(*)	217(*)	255(*)	318(*)	349(*)		
Fuel	GAS								
Rated heat input	min	70	90	115	166	217	255	318	kW
	max	90	115	166	217	255	318	348	kW
Rated useful heat output Pn	min	66,9	86,6	110,4	159,2	208,8	244,3	304,0	kW
	max	84,8	110,2	158,7	206,8	243,0	303,4	332,0	kW
Useful efficiency at minimum Pn		95,6	96,2	96,0	95,9	96,2	95,8	95,6	%
Useful efficiency at maximum Pn		94,2	95,8	95,6	95,3	95,3	95,4	95,4	%
Useful efficiency at 30% max. Pn		95,9	95,1	95,6	96,3	96,5	96,5	96,7	%
Constant pressure drop		< 1,5	< 1,4				< 1,2		
Flue gas temperature (ΔT)		93	95 ÷ 108						°C
Flue gas mass flow rate		0,040	0,050	0,072	0,094	0,111	0,139	0,151	kg/sec
Furnace pressure		2,0	1,5	1,3	2,2	2,8	3,2	3,9	mbar
Furnace volume		97,4	91,0	138,4	199,1	199,1	298,9	298,9	dm3
Total volume of flue gas side		139,7	163,2	234,3	317,2	325,6	457,9	457,9	dm3
Total surface area for heat exchange		3,62	4,35	6,68	8,59	9,47	12,34	12,34	m2
Volumetric heat load		928	1264	1199	1090	1281	1064	1164	kW/m3
Specific heat load		24,1	25,2	23,8	24,1	25,7	24,6	26,9	kW/m2
Maximum operating pressure		6							bar
Maximum admissible temperature		110							°C
Maximum operating temperature		95							°C
Min. admissible water return temp.		50	55						°C
Pressure drop ΔT 10°C		42,0	15,1	42	76,5	144	148	162	mbar
Pressure drop ΔT 20°C		14,0	3	11,2	17,2	45	27,2	29,7	mbar
Water capacity		126	161	191	268	258	308	308	litri
Turbulators		22	22	30	34	39	44	44	n°


(*) 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 CO₂ = 9,7% and λ = 1,2.

TECHNICAL DATA FOR BOILERS > 400 KW

DESCRIPTION		RTQ 3S											
		448	511	575	639	766	896	1100	1300	1600	2100	2400	
Fuel		GAS / OIL											
Rated heat input	min	384	448	511	575	639	766	896	1020	1300	1600	2100	kW
	max	448	511	575	639	766	896	1100	1300	1600	2100	2400	kW
Rated useful heat output Pn	min	369,4	431,0	491,6	553,2	614,7	736,9	862,0	981,2	1250,6	1539,2	2020,2	kW
	max	427,4	487,5	548,6	609,6	730,8	854,8	1049,4	1240,2	1526,4	2003,4	2289,6	kW
Useful efficiency at minimum Pn		96,2	96,2	96,2	96,2	96,2	96,2	96,2	96,2	96,2	96,2	96,2	%
Useful efficiency at maximum Pn		95,4	95,4	95,4	95,4	95,4	95,4	95,4	95,4	95,4	95,4	95,4	%
Useful efficiency at 30% max. Pn		96,7	96,7	96,7	96,7	96,7	96,7	96,7	96,7	96,7	96,7	96,7	%
Constant pressure drop		< 1,2			< 1								%
Flue gas temperature (ΔT)		95 ÷ 108											°C
Flue gas mass flow rate		0,206	0,222	0,250	0,277	0,332	0,392	0,477	0,553	0,704	0,911	1,050	kg/sec
Furnace pressure		3,5	4,2	3,4	4,5	5,3	6,0	3,3	5,3	4,7	5,1	7,6	mbar
Furnace volume		410,5	410,5	548,0	548,0	695,0	912,1	1097,8	1479,7	1569,7	2066,2	2066,2	dm³
Total volume of flue gas side		676,8	676,8	888,3	888,3	1101,4	1388,9	1727,9	2162,7	2531,6	3243,5	3243,5	dm³
Total surface area for heat exchange		19,04	19,04	23,52	23,52	28,06	32,87	37,28	42,24	51,37	67,94	67,94	m²
Volumetric heat load		1091	1245	1049	1166	1102	982	1002	879	1020	1016	1162	kW/m³
Specific heat load		22,5	25,6	23,3	25,9	26,0	26,0	28,1	29,4	29,7	29,5	33,7	kW/m²
Maximum operating pressure		6											bar
Maximum admissible temperature		110											°C
Maximum operating temperature		95											°C
Min. admissible water return temp.		55											°C
Pressure drop ΔT 10°C		258,6	295,0	48,6	54,0	48,0	76,5	132,0	230,0	130,0	111,0	142,0	mbar
Pressure drop ΔT 20°C		64,7	73,8	8,1	9,0	11,7	15,3	30,5	60,0	30,5	30,0	35,0	mbar
Water capacity		593	593	758	758	839	1080	1350	1480	1716	2000	2000	litri
Turbulators		60	60	66	66	74	76	70	75	93	114	114	n°

 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 CO₂ = 9,7%, λ = 1,2 and with **RIELLO** fuel oil burners calibrated with CO₂ = 12,5%.

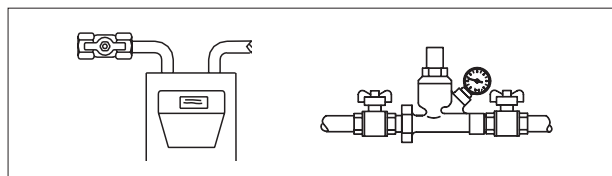
START UP

Have **RIELLO**'s Technical Assistance Service start up your **RTQ 3S** boiler for the first time. Once this has been done, the boiler can be left to function automatically.

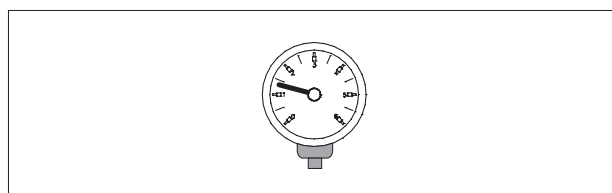
Under certain circumstances, such as after long periods of disuse, the service engineer responsible for the boiler may need to re-start it without involving the Technical Assistance Service.

To do so, perform the following checks and operations:

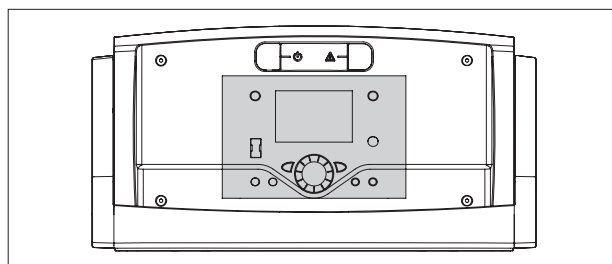
- Check that the gas cock and heating water cock are open



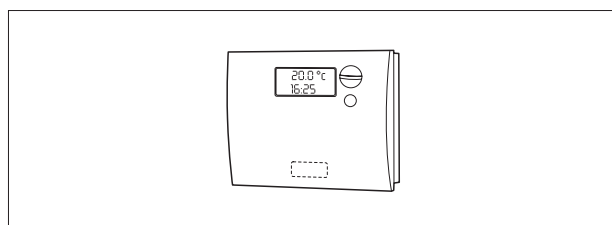
- While the system is still cold, check that working pressure in the water circuit is **over 1 bar** but below the maximum limit specified for the boiler



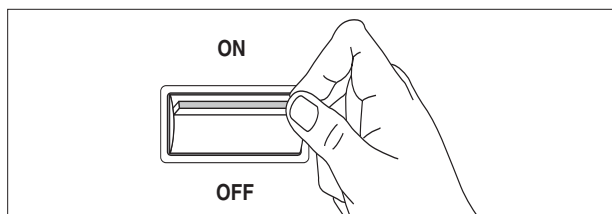
- If the system is equipped with a temperature controller or timer thermostat, make sure that it is switched on



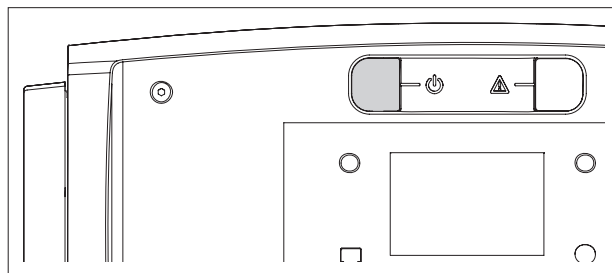
- Adjust the timer thermostat/s or temperature controller to the desired temperature (~20°C)



- 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.
The burner will then switch off and on automatically to maintain the set temperature without further operator action.

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.

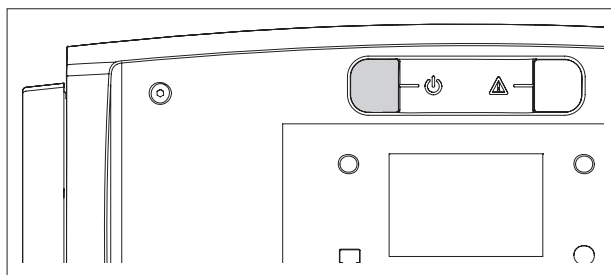
To reset the burner, press the red button light on the burner and wait until the flame ignites.

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


TEMPORARY SHUTDOWN

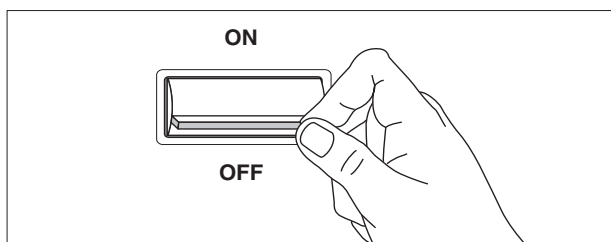
If you need to shut down the system for a short period, proceed as follows.

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



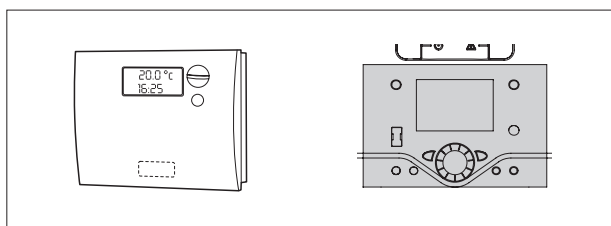
- Turn the mains power switch OFF

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



THEN PROCEED AS FOLLOWS:

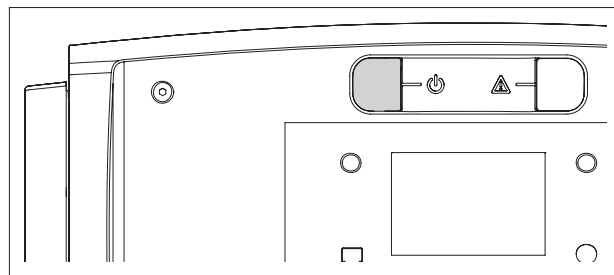
- Make the settings as instructed in the instruction manual for your control panel.
- Make sure that the temperature controller or timer / room thermostat is set to "frost protection" mode.



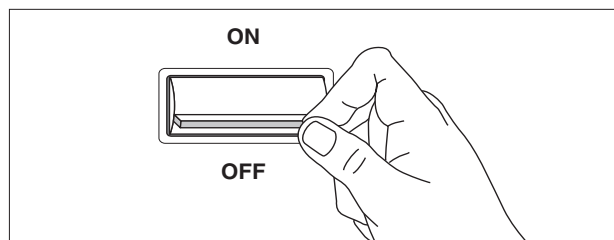
PREPARING FOR EXTENDED PERIODS OF DISUSE

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

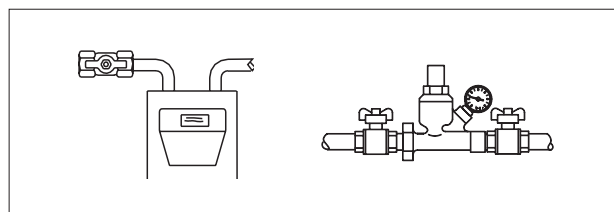
- Turn the control panel power switch OFF and make sure that the green power indicator goes out



- 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 dampened in soapy water to clean the boiler's external casing.

To remove stubborn marks, use a cloth dampened 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 the Technical Assistance Service or by a qualified heating engineer (see page 40).

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.

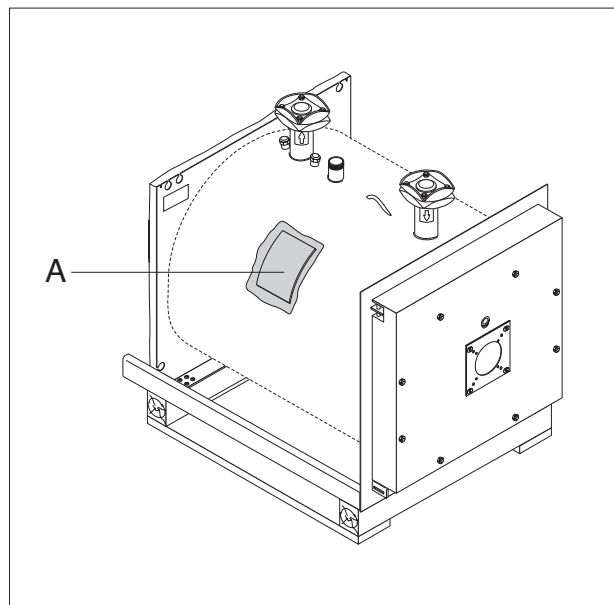
Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied	Date	Quantity supplied

UNPACKING THE PRODUCT

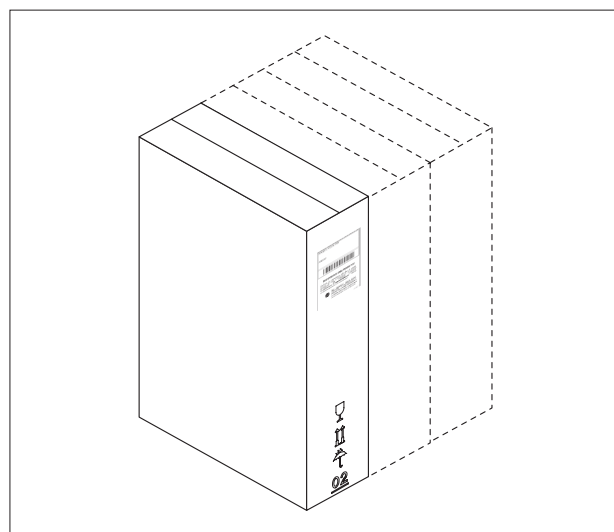
RTQ 3S **RIELLO** steel boilers come in **3 separate crates**:

- 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
 - Spare parts catalogue

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



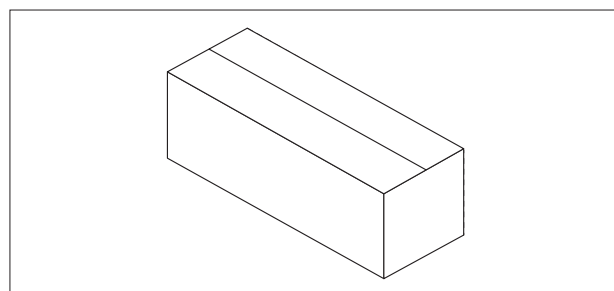
- 2) **THE CASING PANELS** complete with assembly accessories (2 packs for models RTQ 448÷1600 3S and 3 packs for models RTQ 2100÷2400 3S).



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

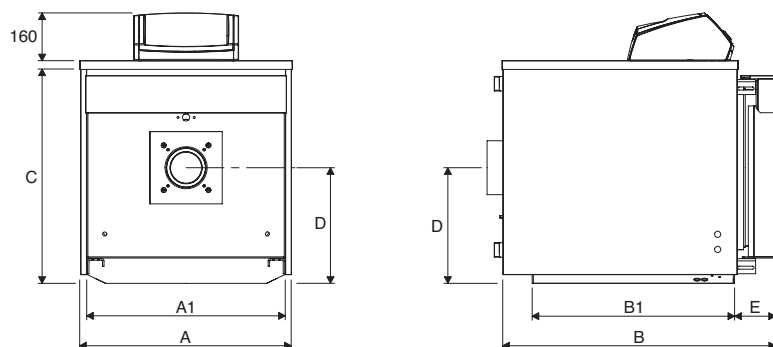
IMPORTANT

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

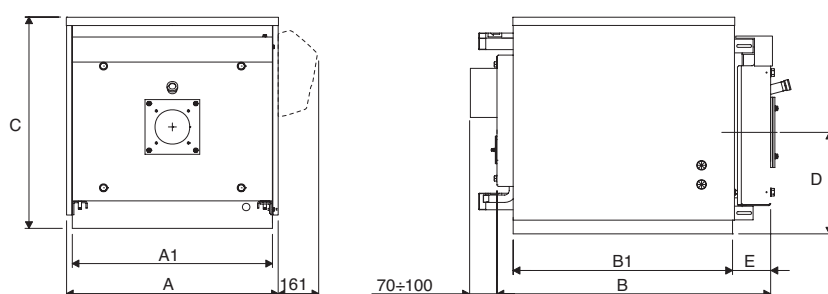


OVERALL DIMENSIONS AND WEIGHTS

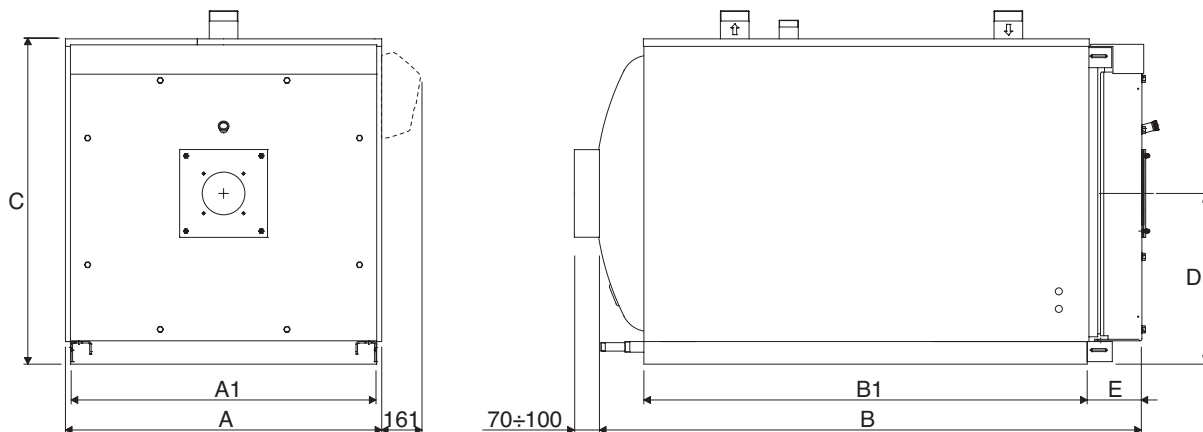
RTQ 91 3S



RTQ 115÷166 3S

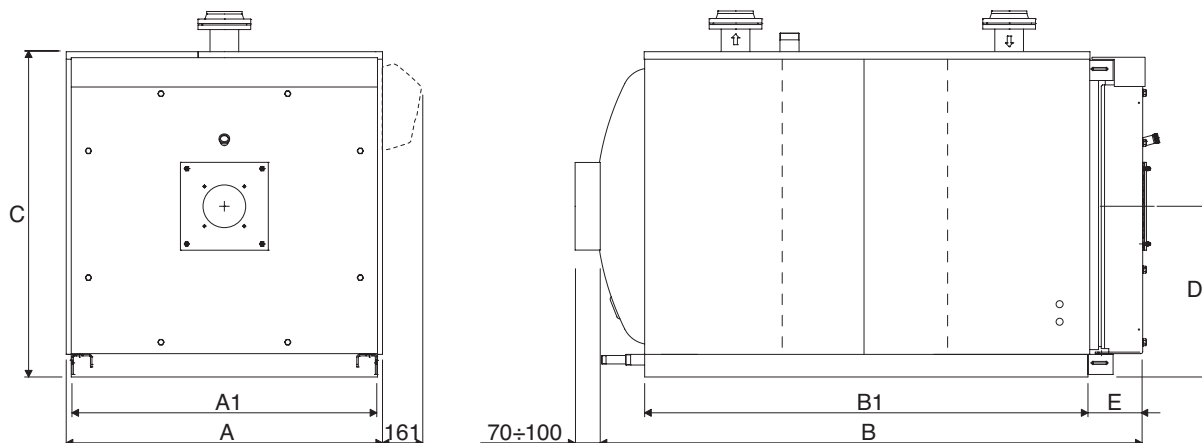


RTQ 217÷349 3S



DESCRIPTION	RTQ 3S							
	91	115	166	217	255	318	349	
A - Width	705	805	853	925	925	975	975	mm
A1 - Base width	660	753	803	875	875	925	925	mm
B - Depth	1060	1130	1305	1480	1480	1710	1710	mm
B1 - Base depth	882	945	1110	1255	1255	1450	1450	mm
C - Height	740	790	840	980	980	1030	1030	mm
D - Burner and flue height	384	410	435	525	525	550	550	mm
E - Door depth	135	135	145	150	150	180	180	mm
Weight of boiler	201	258	325	420	438	568	568	kg
Weight of casing	24	25	30	35	35	42	42	kg

RTQ 448÷2400 3S



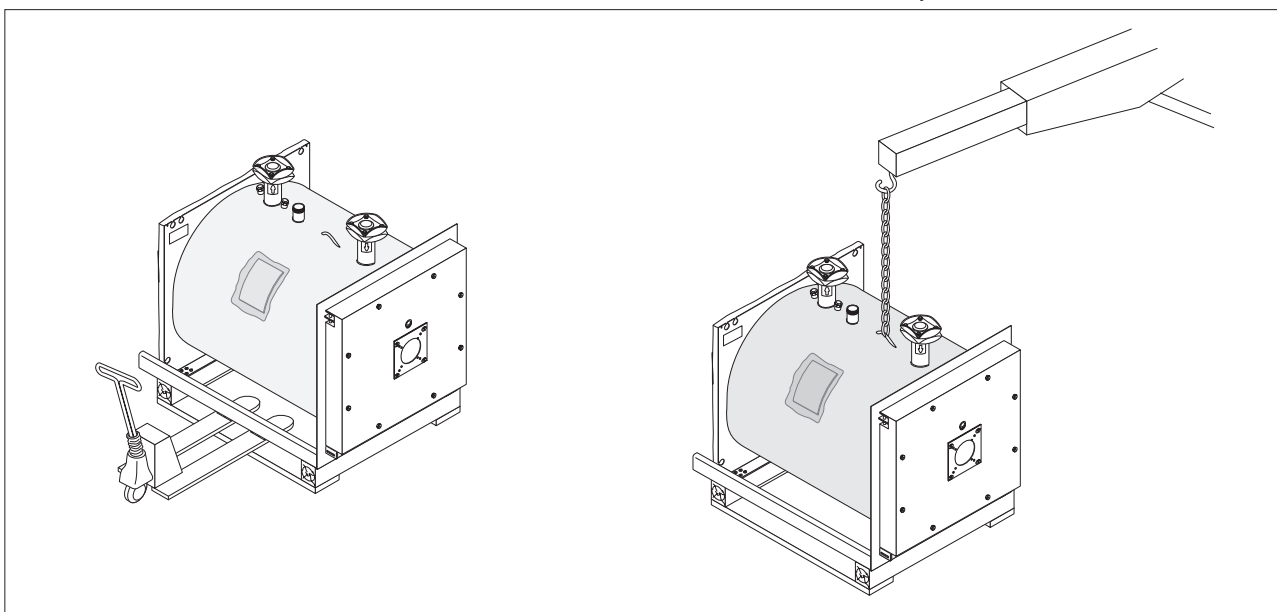
DESCRIPTION	RTQ 3S											
	448	511	575	639	766	896	1100	1300	1600	2100	2400	
A - Width	1150	1150	1220	1220	1285	1360	1450	1535	1610	1715	1715	mm
A1- Base width	1100	1100	1170	1170	1235	1310	1400	1485	1555	1660	1660	mm
B - Depth	2040	2040	2310	2310	2450	2765	3030	3055	3135	3415	3415	mm
B1- Base depth	1710	1710	1930	1930	2110	2375	2470	2580	2630	2890	2890	mm
C - Height	1210	1210	1280	1280	1335	1430	1530	1610	1680	1850	1850	mm
D - Burner and flue height	655	655	690	690	715	755	820	865	900	1000	1000	mm
E - Door depth	195	195	205	205	215	245	270	290	300	300	300	mm
Weight of boiler	920	920	1134	1134	1336	1730	2185	2670	3045	4170	4180	kg
Weight of casing	50	50	55	55	70	87	95	110	115	122	122	kg

HANDLING

RTQ 3S RIELLO steel boilers are fitted with lifting attachments. Take great care when moving them and only use lifting equipment of adequate capacity.

Remove the fixing screws and remove the wooden pallet before positioning the boiler.

⚠ Wear suitable personal protective equipment and use suitable safety devices.



RTQ 3S RIELLO 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.

! 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.

RTQ 91 3S MODELS ONLY

RIELLO RTQ 3S boilers can be positioned:

On the floor or pedestal

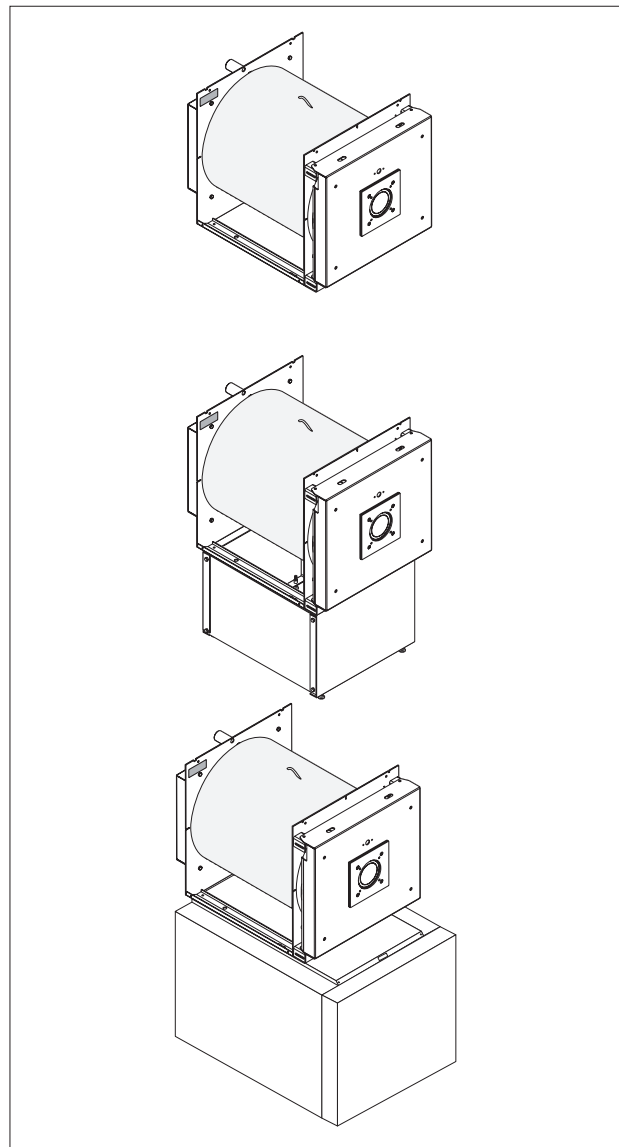
The ideal solution for just heating installation.

! If you are installing the boiler without a pedestal, the limited gap between the burner and the floor makes it particularly important to keep the boiler room clean.

On the heater

This is more practical with a combined installation (heating and hot water).

In this case, **RIELLO 7300** boiler heater combinations are used, as this heater has been specifically designed and manufactured to support the weight of the boiler..



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.

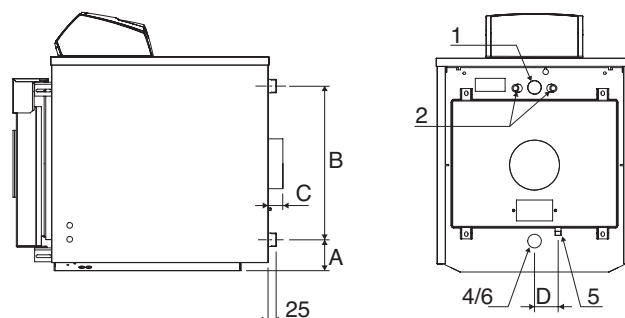
- Make sure that the oil feed line and any oil storage tank are made and installed in compliance with applicable standards.
- Make sure that the expansion vessels are big enough to contain the volume generated by thermal expansion.
- Make sure that flow rate, head and direction of flow of the pumps are 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. (See page.27).

WATER CONNECTIONS

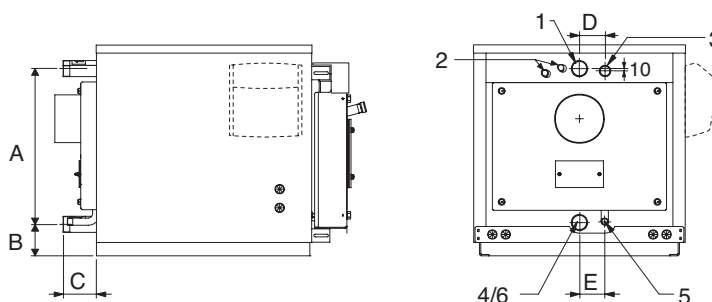
RTQ 3S RIELLO boilers are designed and made for use in central heating installations, but can also be used for domestic hot water production if connected to a suitable storage cylinder. Water fittings are as specified in the following table.

 Allow for the dimensions of the control panel that needs to be installed on top of the boiler.

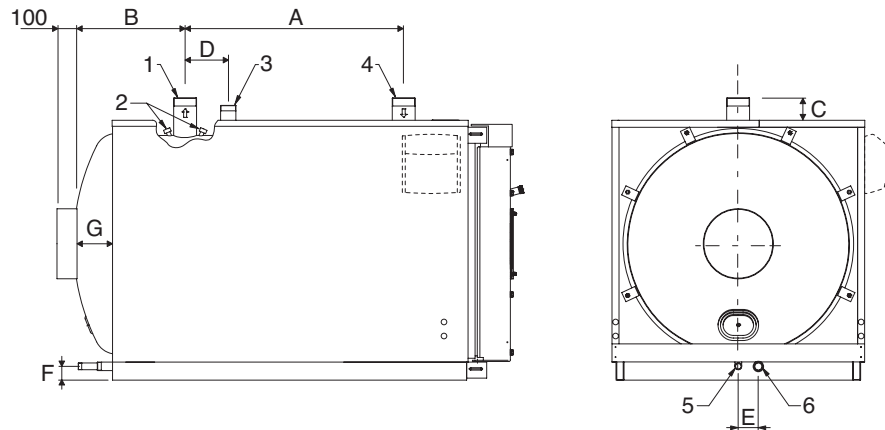
RTQ 91 3S



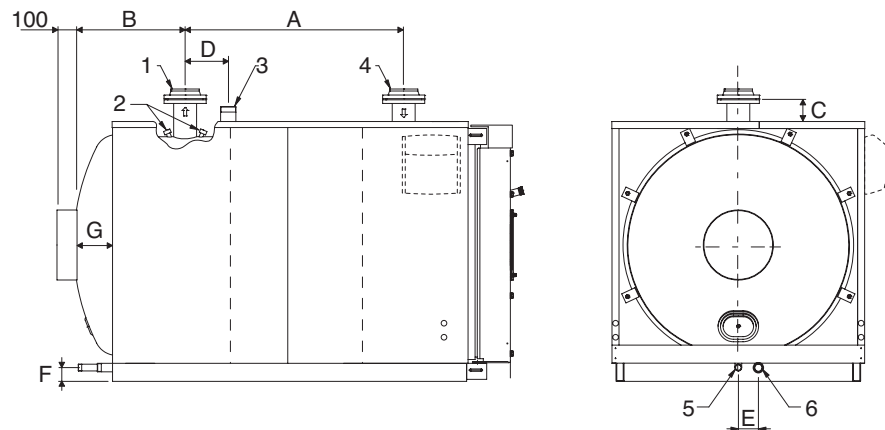
RTQ 115÷166 3S



RTQ 217÷349 3S



RTQ 448÷2400 3S



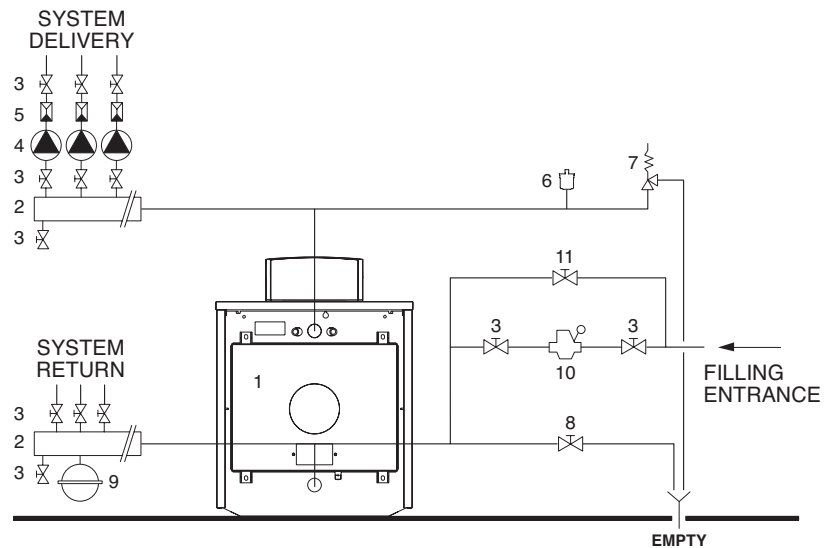
DESCRIPTION	RTQ 3S																		
	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400	
1 - Central heating flow (*)	G1"1/4	G2"	G2"	G2"1/2	G2"1/2	G2"1/2	G2"1/2	DN80	DN80	DN100	DN100	DN100	DN125	DN125	DN125	DN150	DN175	DN175	Ø
2 - Instrument bulb / sensor socket	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	G1/2"	Ø
3 - Safety device fitting	-	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/2	G1"1/2	G1"1/2	G1"1/2	G2"1/2	G2"1/2	G2"1/2	DN 80	DN100	DN100	DN100	Ø
4 - Central heating return (*)	G1"1/4	G2"	G2"	G2"1/2	G2"1/2	G2"1/2	G2"1/2	DN80	DN80	DN100	DN100	DN100	DN125	DN125	DN125	DN150	DN175	DN175	Ø
5 - Condensate drain	G1/2"	G3/4"	G3/4"	G3/4"	G3/4"	G3/4"	G3/4"	G1"	G1"	G1"	G1"	G1"	G1"	G1"	G1"	G1"	G1"	G1"	Ø
6 - Boiler drain	G1"1/4	G2"	G2"	G1"	G1"	G1"	G1"	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/4	G1"1/2	G1"1/2	G1"1/2	G1"1/2	Ø
A	110	577	628	750	750	850	850	1000	1000	1250	1250	1300	1540	1600	1650	1650	1910	1910	mm
B	552	124	124	305	305	315	315	480	480	445	445	540	610	655	700	735	745	745	mm
C	60	115	115	80	80	80	80	75	75	105	105	105	100	100	115	142	122	122	mm
D	85	95	110	205	205	205	205	215	215	300	300	250	550	650	380	280	510	510	mm
E	-	95	120	110	110	110	110	110	110	110	110	110	110	110	115	115	120	120	mm
F	-	-	-	95	95	95	95	95	95	95	95	95	110	115	120	117	155	155	mm
G	-	-	-	85	85	85	85	145	145	180	180	125	145	170	180	215	335	335	mm

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

Below are given the two main hydraulic diagrams:

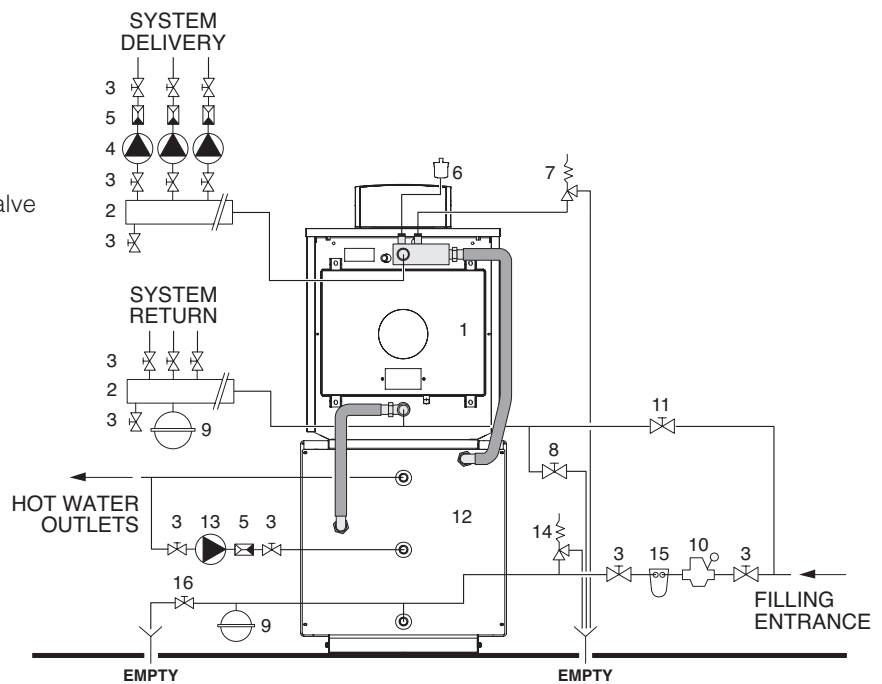
Just heating installation RTQ 91 3S

- 1 - Boiler
- 2 - System headers
- 3 - Sectioning valves
- 4 - System circulators
- 5 - Check valves
- 6 - Automatic pressure relief valve
- 7 - Boiler safety valve
- 8 - Boiler discharge valve
- 9 - Expansion tank
- 10 - Pressure reducer
- 11 - Manual fast filling valve



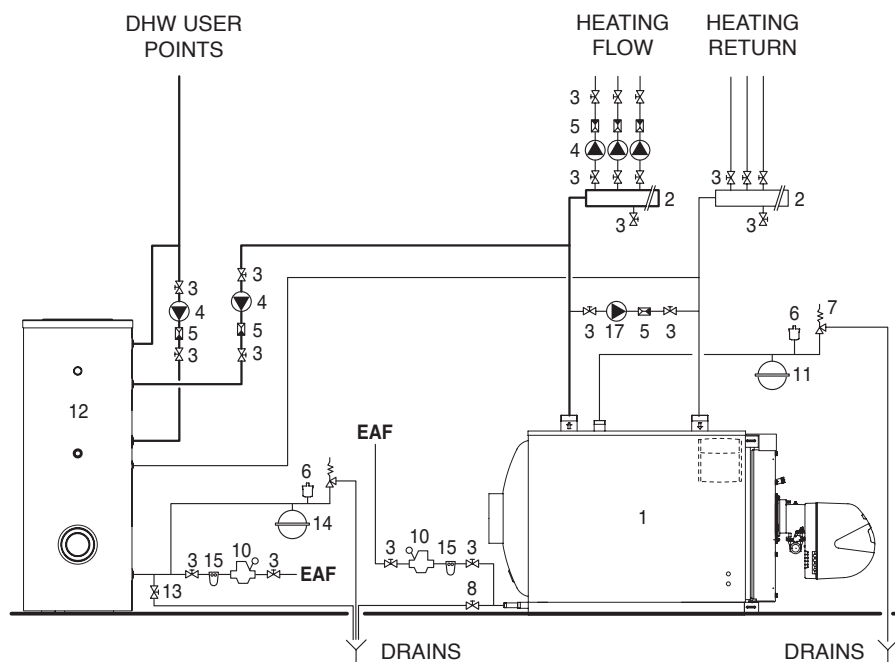
Heating and hot water installation RTQ 91 3S

- 1 - Boiler
- 2 - System headers
- 3 - Sectioning valves
- 4 - System circulators
- 5 - Check valves
- 6 - Automatic pressure relief valve
- 7 - Boiler safety valve
- 8 - Boiler discharge valve
- 9 - Expansion tank
- 10 - Pressure reducer
- 11 - Manual fast filling valve
- 12 - RIELLO 7300 heater
- 13 - Hot water recycle pump
- 14 - Heater safety valve
- 15 - Water softener filter
- 16 - Heater discharge valve



Schematic diagram - central heating and domestic hot water production RTQ 115÷2400 3S

- 1 - Boiler
- 2 - Central heating manifolds
- 3 - Disconnect valves
- 4 - System 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 - **RIELLO** 7200 storage cylinder
- 13 - Storage cylinder drain cock
- 14 - DHW expansion vessel
- 15 - Softener filter
- 16 - Pressure reducer
- 17 - 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.

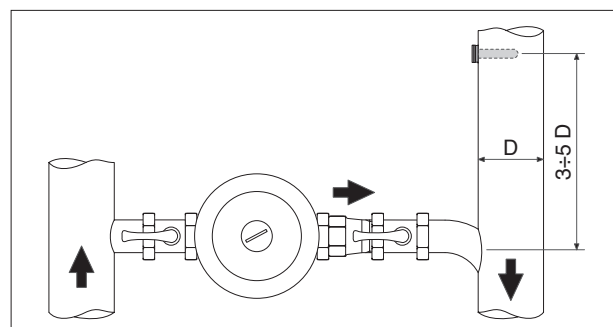
! If needed, water supplies and recovery circuits must be conditioned by suitable treatment systems. See the table alongside for reference values.

REFERENCE VALUES

PH	6-8
Electrical conductivity	below 200 $\mu\text{S}/\text{cm}$ (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

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.).

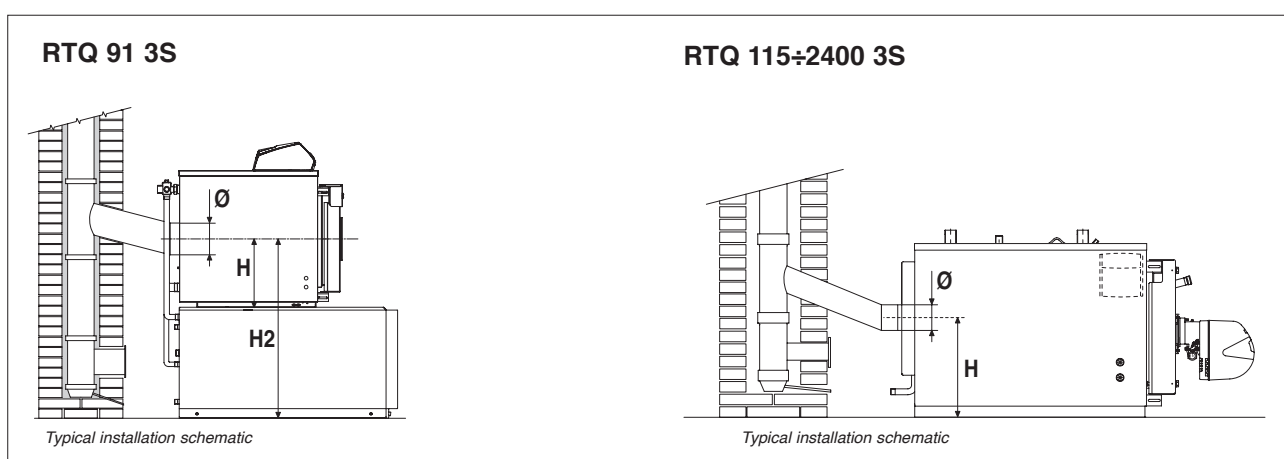


⚠ A sensor socket must be positioned at a distance of 3 to 5 times the diameter of the water return pipe, upstream from the water fitting, to measure effective water return temperature and control the anti-condensate pump or the temperature controller stabilisation function.

⚠ 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.



DIMENSION (mm)	RTQ 3S																	
	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400
Ø	179	180	180	200	200	250	250	300	300	300	300	350	400	400	450	500	500	500
H	384	500	525	525	525	550	550	655	655	690	690	715	755	820	865	900	1000	1000
H2	1010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

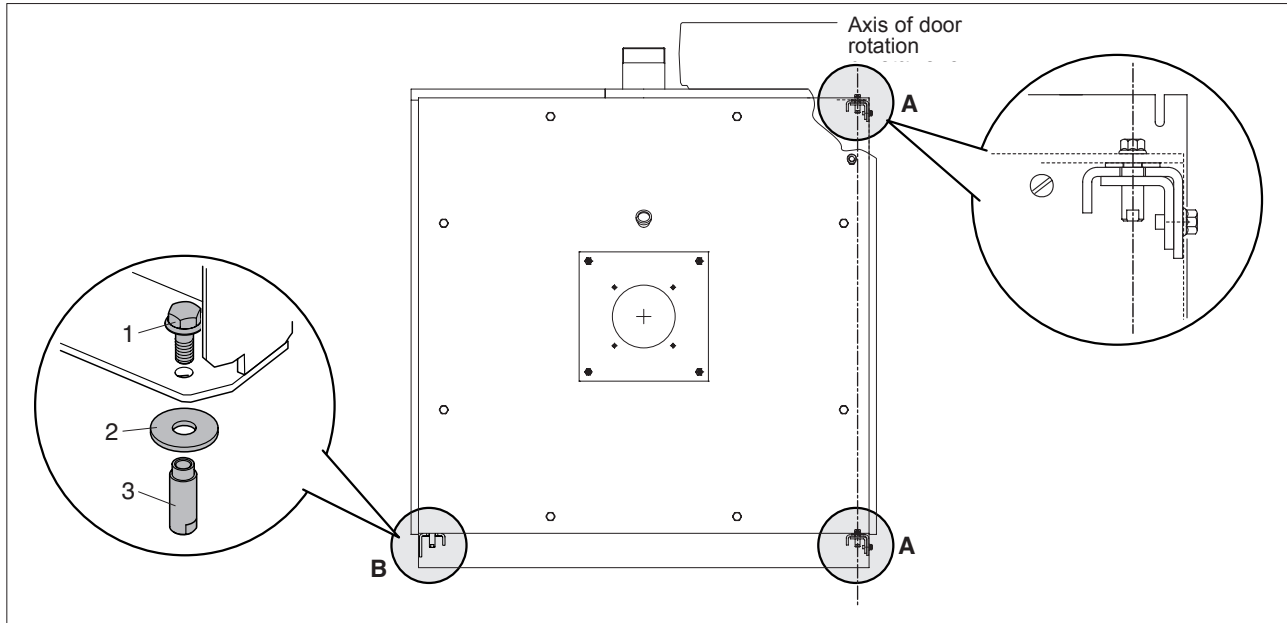
⚠ The stack must guarantee the minimum draught specified by applicable technical standards, assuming zero pressure at the connection to the flue gas exhaust.

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

⚠ Uninsulated flues are potentially dangerous and can cause burns.

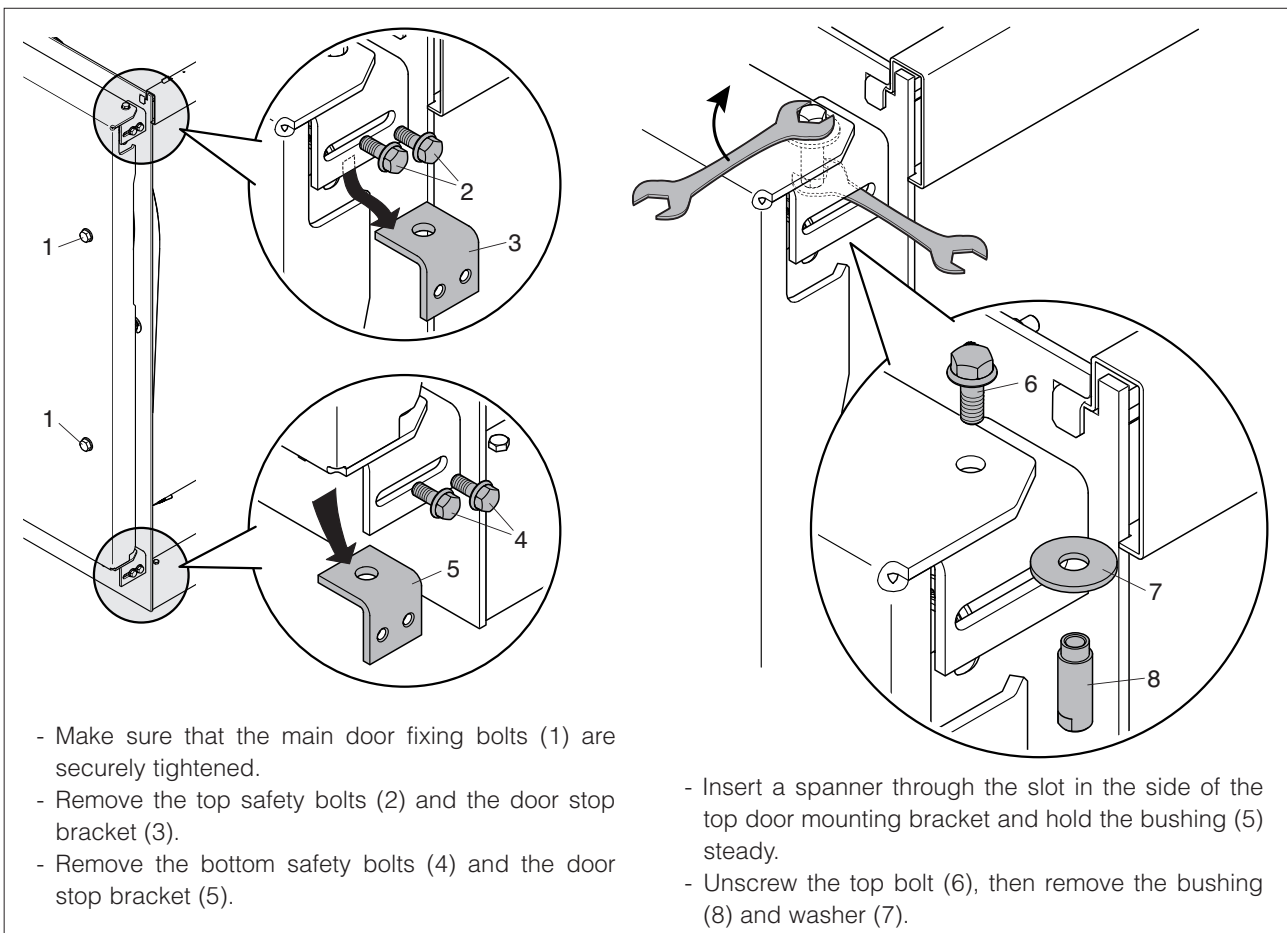
⚠ Joints must be sealed using materials capable of withstanding temperatures of at least 200°C (e.g. filler, mastic or silicone based sealant).

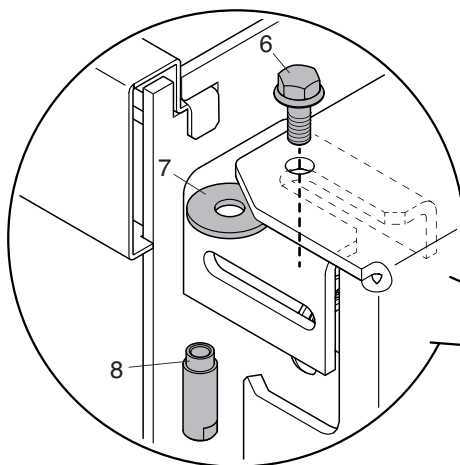
The boilers come fitted with 2 hinges that allow the door to open from left to right.



CHANGING THE DIRECTION OF DOOR OPENING

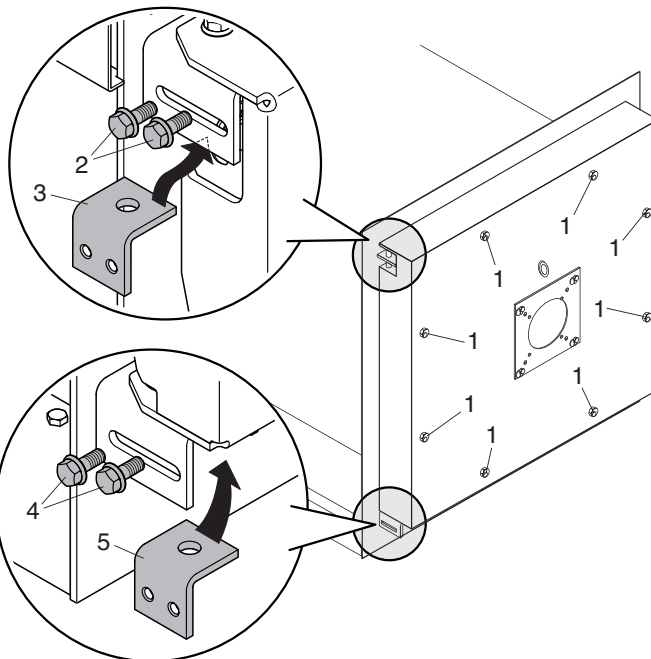
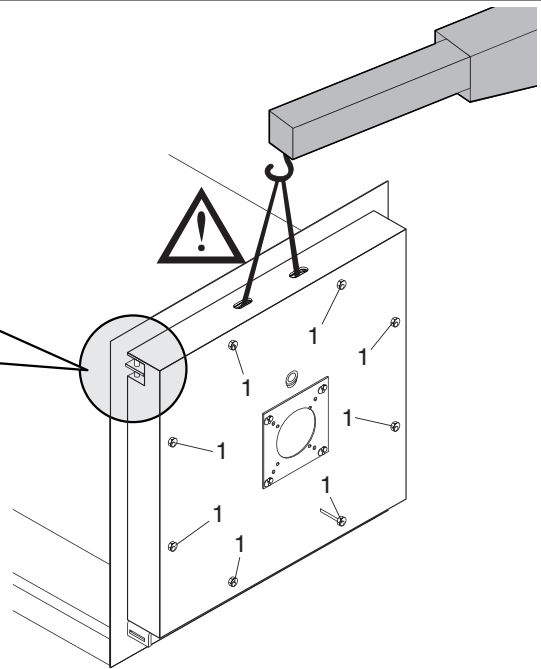
The boiler door hinges are factory fitted on the right of the door. If you need to reverse the direction of opening, remove the boiler's side panel and proceed as follows.





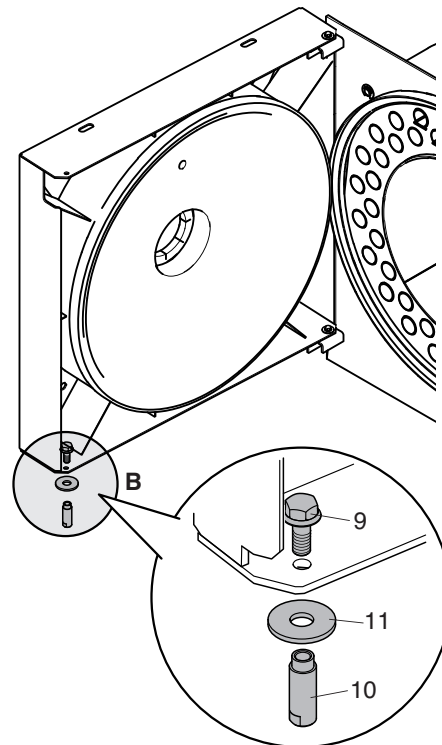
- Fit the bushing (8), bolt (6) and washer (7) to the opposite side of the door.

! 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.

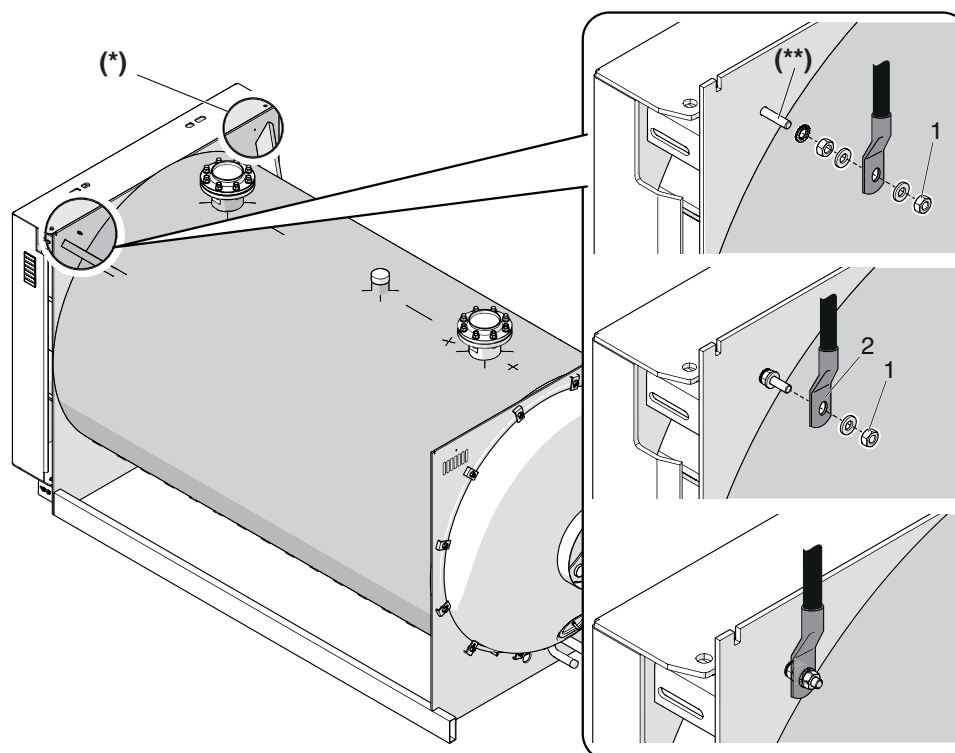
A terminal is provided on the front boiler head to connect the boiler body to an efficient earth system.

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.

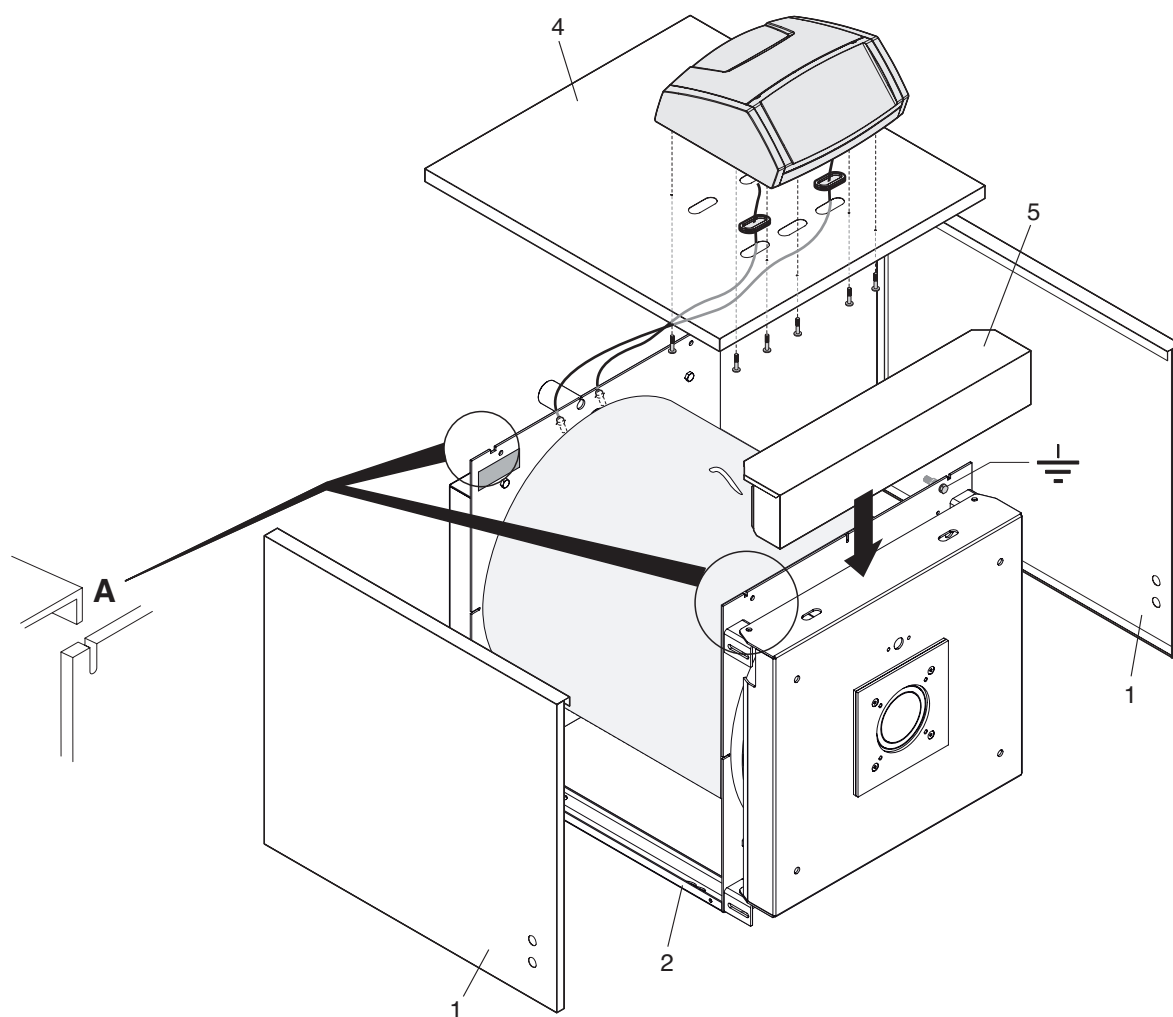


(**) M6x30 brass

FITTING THE CASING PANELS

- Engage the bottom of the side panels (1) in the bottom rails (2) and engage the top lip of the side panels in the slots (A) in the front and rear heads
- Fit your chosen control panel on the top panel (4) as instructed in the control panel's own instruction manual
- Route the electrical cables and insert the bulbs/sensors in their sockets
- Fit the cable grommets provided into their seats in the panels
- Fit the top panel (4) to close the top of the boiler
- Once all the panels are in place, fit the front cover (5) over the top of the door.

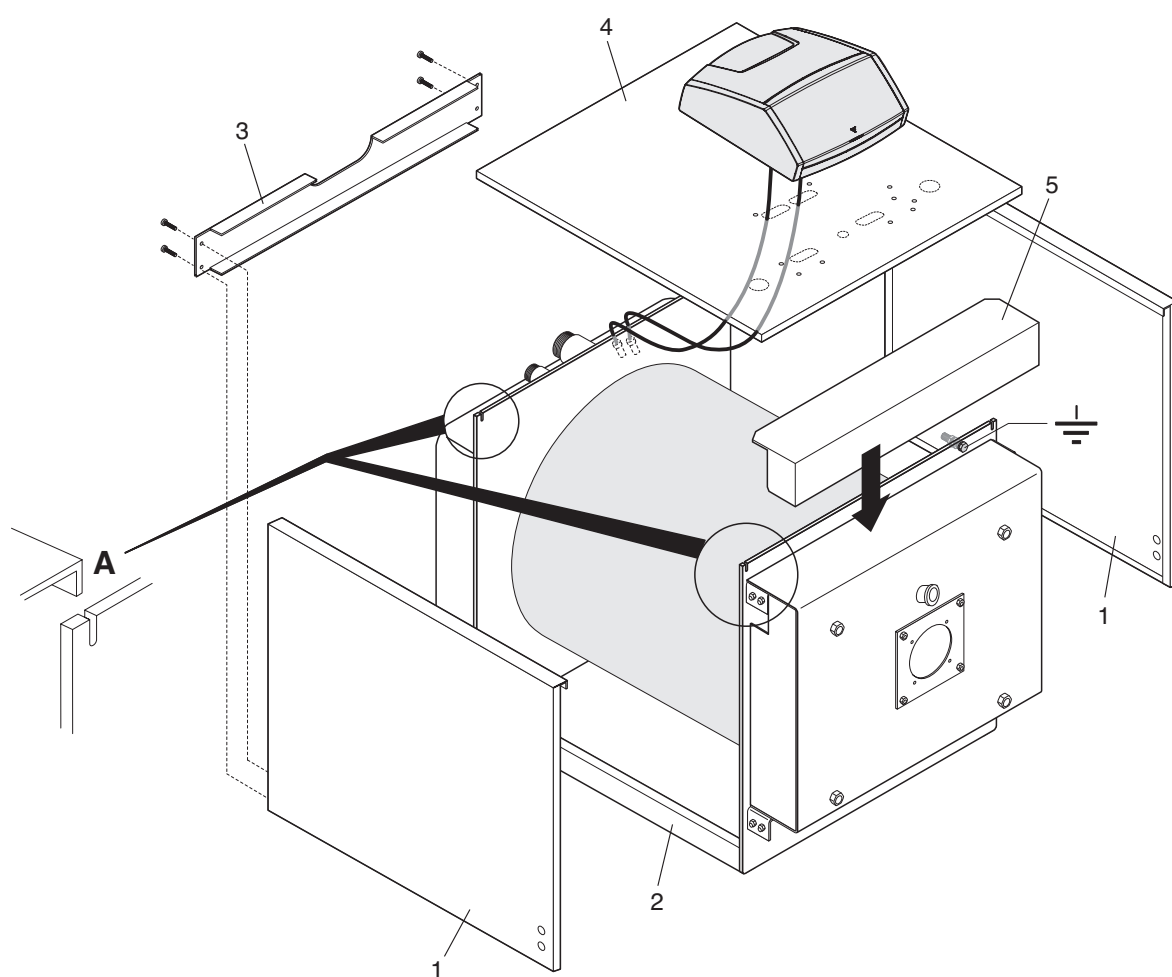
RTQ 91 3S



 - Refer to the instruction manuals for the **RIELLO TECH** control panel and for your chosen burner.

- Engage the bottom of the side panels (1) in the bottom rails (2) and engage the top lip of the side panels in the slots (A) in the front and rear heads
- Secure the side panels in place with the top cross beam (3) and the screws provided
- Fit your chosen control panel on the top panel (4) as instructed in the control panel's own instruction manual
- Route the electrical cables and insert the bulbs/sensors in their sockets
- Fit the cable grommets provided into their seats in the panels
- Fit the top panel (4) to close the top of the boiler
- Once all the panels are in place, fit the front cover (5) over the top of the door.

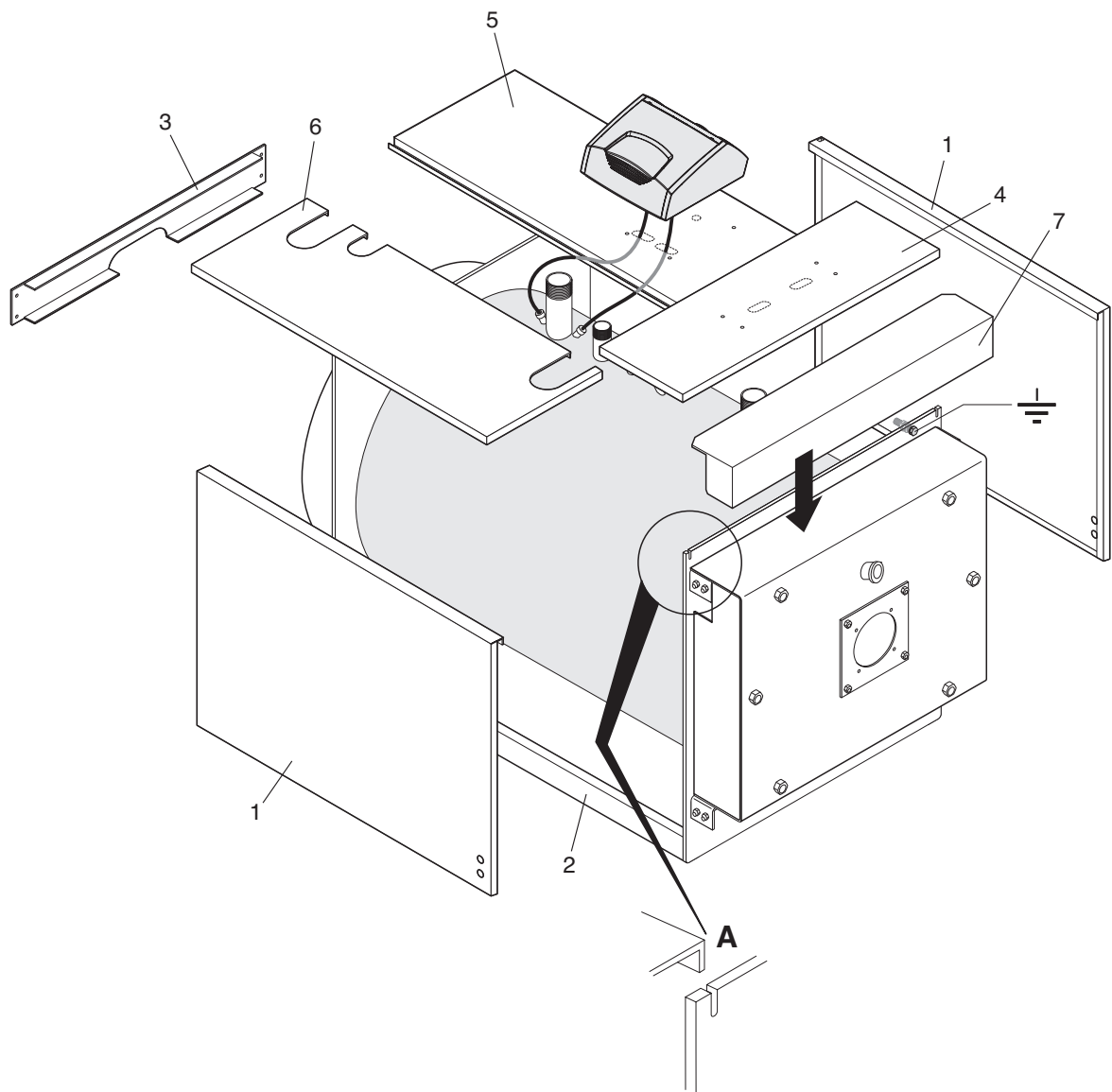
RTQ 115÷166 3S



 - Refer to the instruction manuals for the **RIELLO TECH** control panel and for your chosen burner.

- Engage the bottom of the side panels (1) in the bottom rails (2) and engage the top lip of the side panels in the slots (A) in the front and rear heads
- Secure the side panels in place with the top cross beam (3) and the screws provided
- Fit the top panel (4)
- Fit your chosen control panel on the top panel (5) as instructed in the control panel's own instruction manual
- Route the electrical cables and insert the bulbs/sensors in their sockets
- Fit the cable grommets provided into their seats in the panels
- Fit the top panels (5) and (6) to close the top of the boiler
- Once all the panels are in place, fit the front cover (7) over the top of the door.

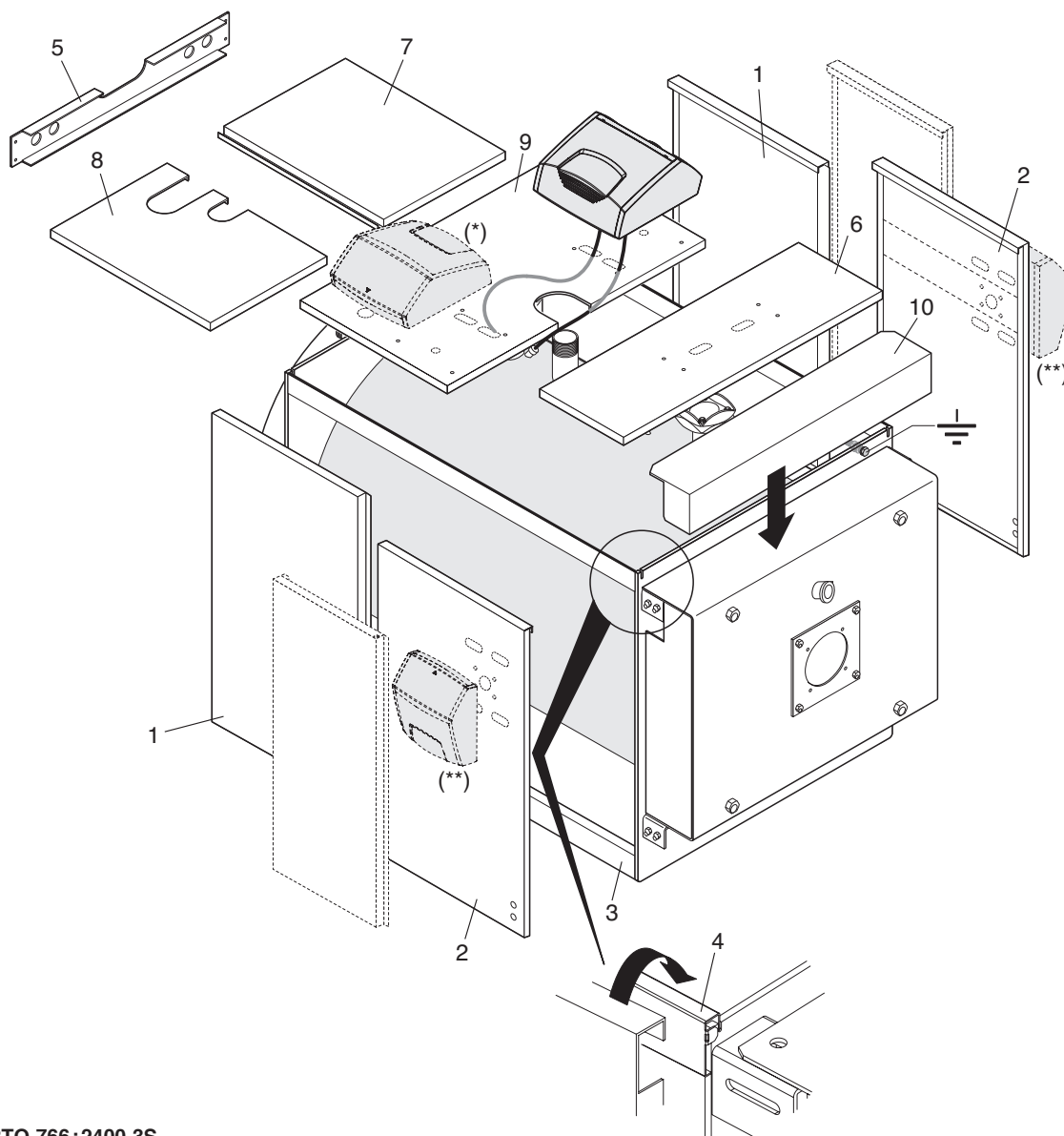
RTQ 217÷349 3S



 - Refer to the instruction manuals for the **RIELLO TECH** control panel and for your chosen burner.

- Engage the bottoms of the rear side (1) and front side panels (2) in the bottom rails (3), then hook their top lips over the top rails (4) running between the front and rear heads.
- Secure the side panels in place with the top cross beam (5) and the screws provided.
- Fit your chosen control panel to the central top panel (9) (for models up to RTQ 1600 3S), or on one of the side panels (2) (for models RTQ 1300-1600-2100-2400 3S), as instructed in the control panel's own instruction manual.
- Route the electrical cables and insert the sensors in their sockets.
- Fit the cable grommets provided into their seats in the panels.
- Fit, in this order, the rear top panels (7) and (8), then the central top panel (9) to close the top of the boiler.
- Once all the panels are in place, fit the front cover (10) over the top of the door.

RTQ 448÷2400 3S



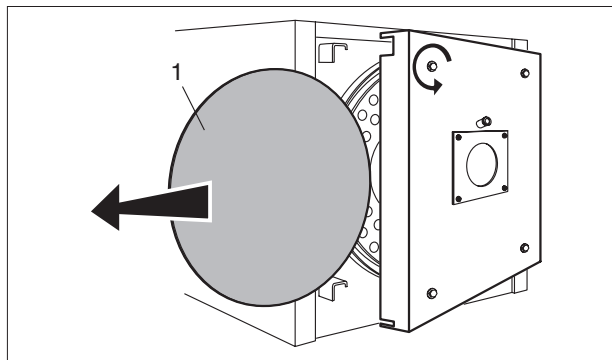
(*) RTQ 766÷2400 3S
 (**) RTQ 1100÷2400 3S

 - Refer to the instruction manuals for the **RIELLO TECH** control panel and for your chosen burner.

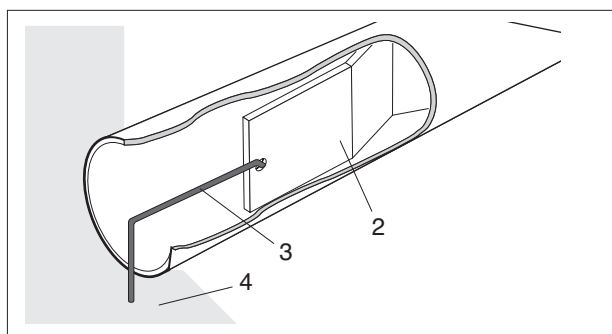
PREPARING FOR INITIAL START-UP

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

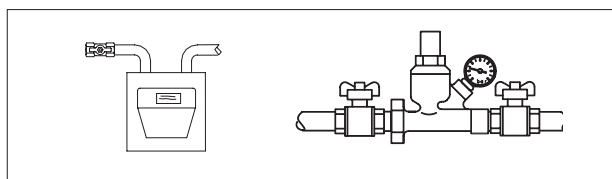
- The protective cardboard sheet (1) has been removed from the ceramic fibre



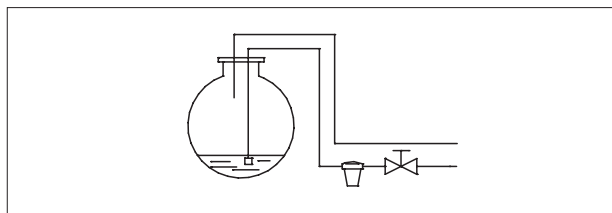
- The turbulators (2) are correctly positioned (vertical position) inside the heat exchange tubes and the clips (3) are resting against the wall (4) of the heat exchanger



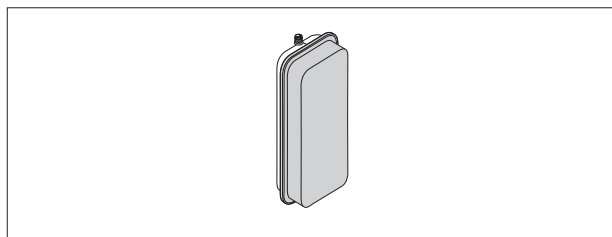
- The water and gas cocks are open



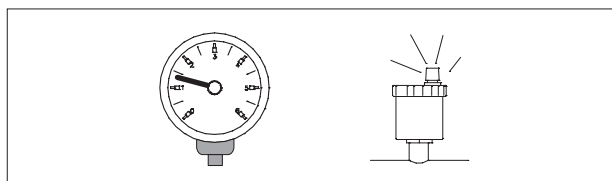
- There is an adequate fuel supply



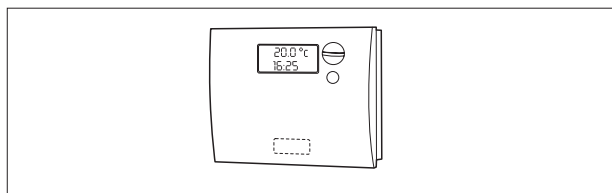
- The expansion vessel is properly charged



- 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



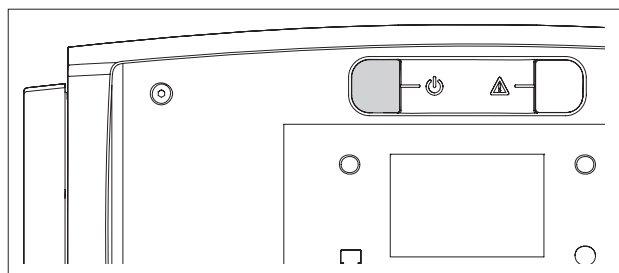
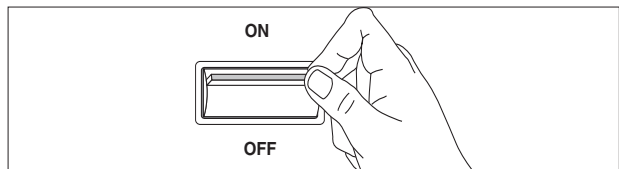
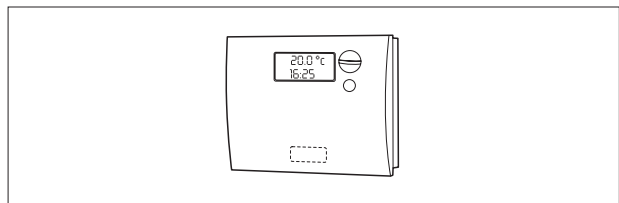
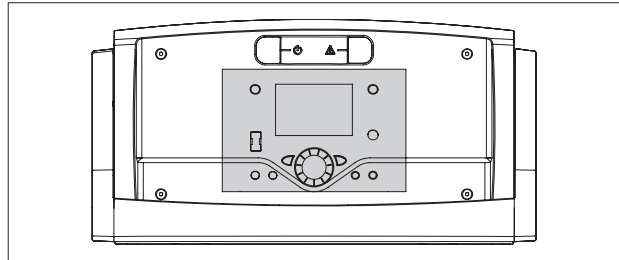
- The mains power connections to the boiler and its accessories (burner, pump, control panel, thermostats, etc.) have been properly made.



- ⚠ 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 settings as instructed in the instruction manual for your 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.

CHECKS DURING AND AFTER INITIAL START-UP

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

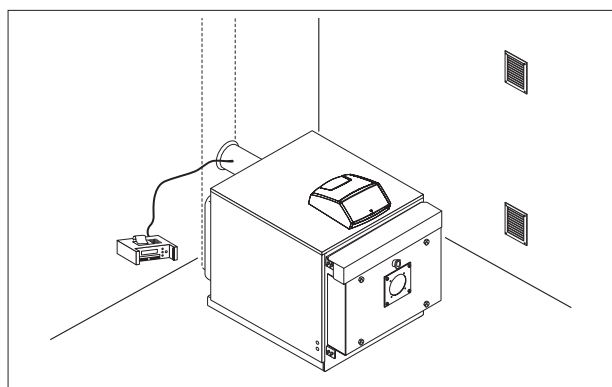
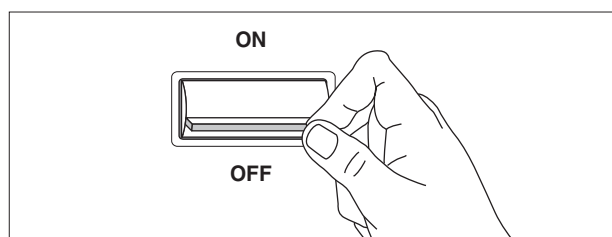
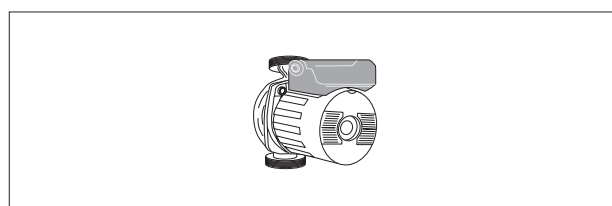
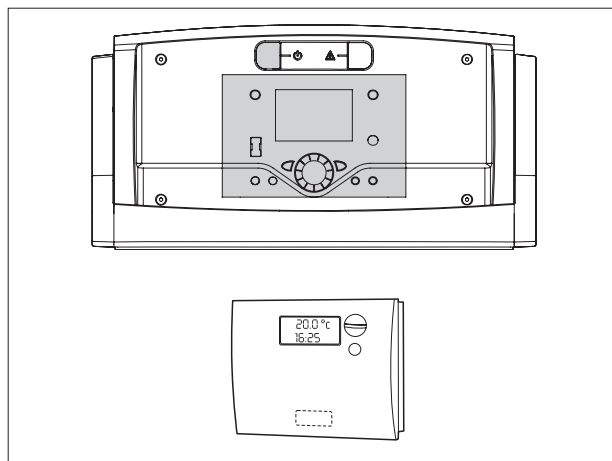
- The boiler thermostat setting is changed
- Power to the control panel is switched off and on again
- The room thermostat or timer thermostat is adjusted.

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 39.

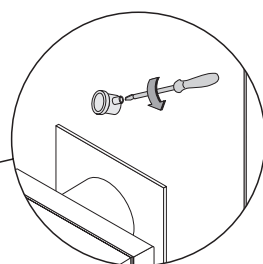
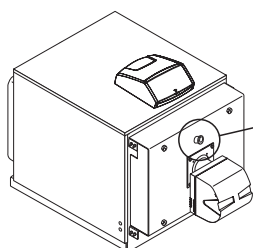
Make sure that all the pumps in the system are free and rotate in the right direction.

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

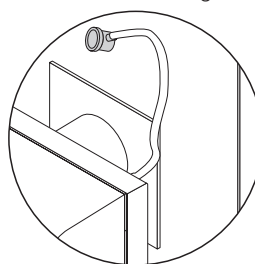
Provided all the above conditions are satisfied, start the boiler up again, then analyse the combustion fumes, measure fuel flow and re-check the door seal.



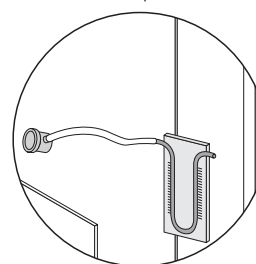
RTQ 115÷2400 3S



Flame inspection window cooling



Pressure measurement point



⚠ A rubber socket is attached to the flame inspection window. If this is used as a pressure measurement point, leave the screw in place in order to close off the

pressure measurement line during normal boiler functioning. If the rubber socket is used to cool the flame inspection window, remove the screw to ensure an adequate air flow.

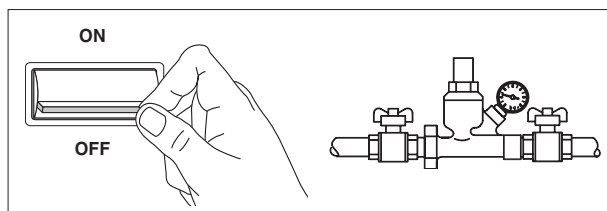
Regular maintenance is a legal requirement. It is also essential for the safety, efficiency and durability of the boiler. Proper maintenance keeps consumption and emissions down, and ensures that the boiler continues to operate reliably over time.

- 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.

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

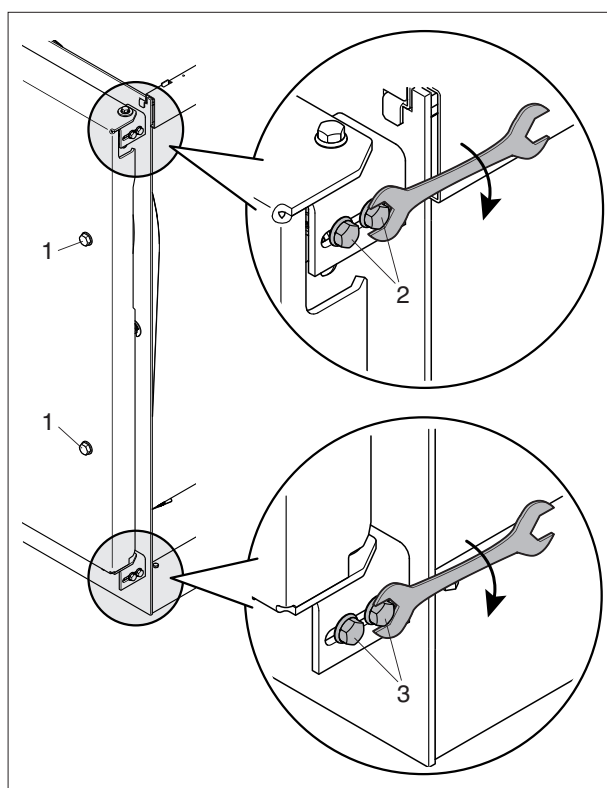
Analyse the combustion fumes before commencing any maintenance. The results of fume analysis can give a clear idea of what servicing or repairs are needed.



OPENING THE DOOR

- 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.)

⚠ 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.

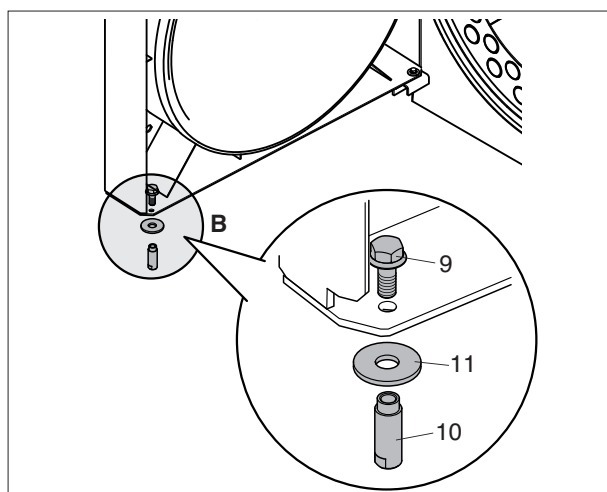


ADJUSTING THE DOOR

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:

- 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).

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



CLEANING THE BOILER

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)

⚠ If you need to replace any turbulators, make sure that the replacements have the characteristics listed in the table below.

- Use a flue brush (3) or other suitable tool to clean inside the combustion chamber and the flue gas pipes.
- Open the inspection window (4) and clean out any deposits from inside the flue gas box.

If more thorough cleaning is required, remove the flue gas box cover (5). Fit a new glass fibre seal when fitting

the cover again.

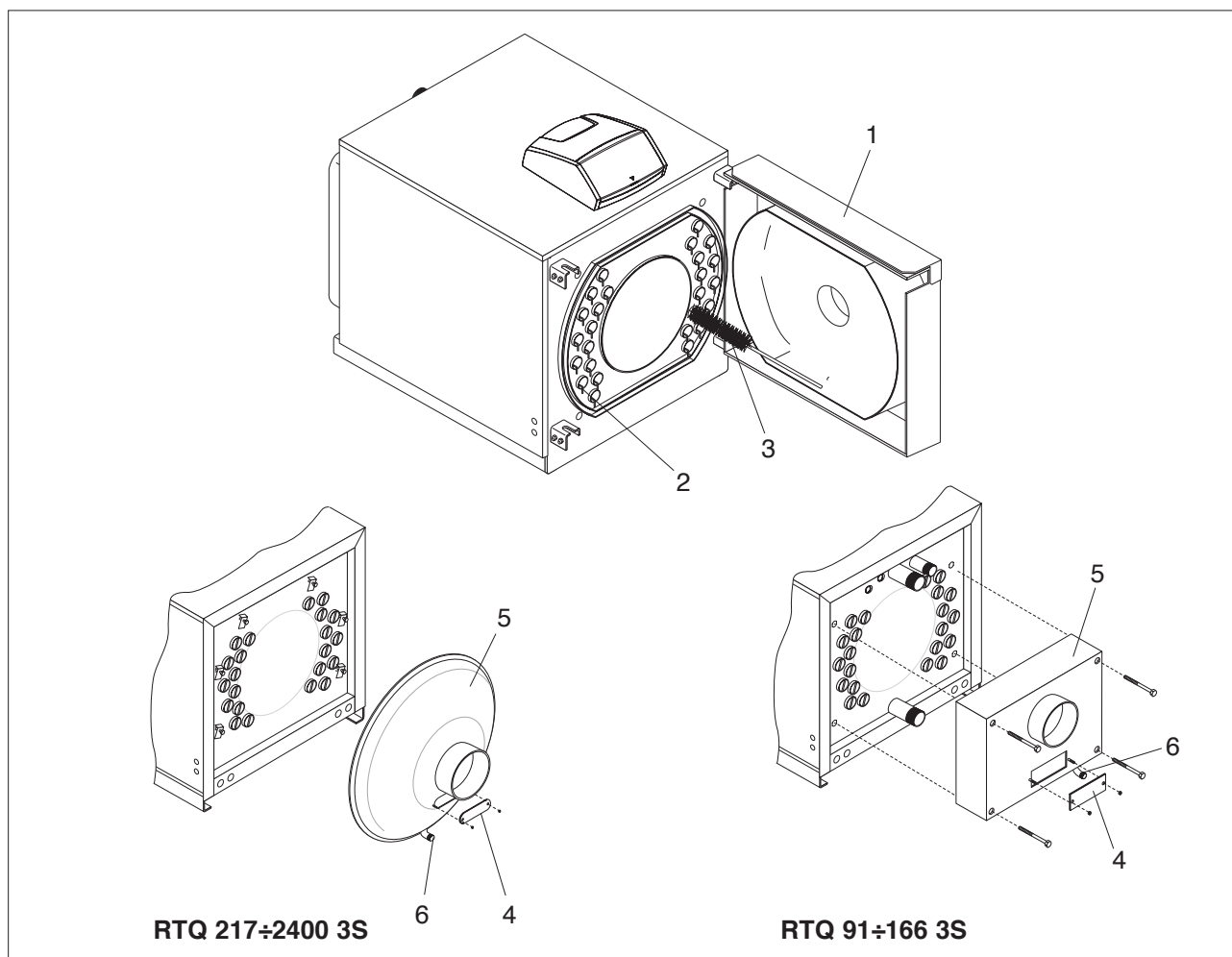
Check at regular intervals that the condensate drain (6) is not blocked.

Clean all removed components, then follow the above steps in the reverse order to refit them.

⚠ 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.

DIMENSIONS (mm)	RTQ 3S																	
	91	115	166	217	255	318	349	448	511	575	639	766	896	1100	1300	1600	2100	2400
Depth	560	855	973	1150	1150	1386	1386	1327	1327	1741	1741	1741	1741	2150	2400	2400	2400	2700
N° waves	9	14	16	19	19	23	23	22	22	29	29	29	29	36	40	40	40	45
N° turbulators	22	22	30	34	39	44	44	60	60	66	66	74	76	70	75	93	114	114
Depth clip	89	48	89	89	89	48	48	335	335	89	89	250	400	89	89	89	89	89



FAULT	CAUSE	CORRECTIVE ACTION
The boiler becomes dirty very quickly	Burner badly adjusted	Check the adj. 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 functioning of 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 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 temp. 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 the door seal

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

RIELLO

RIELLO S.p.A.
Via Ing. Pilade Riello, 7
37045 - Legnago (VR)
www.riello.com

The manufacturer strives to continuously improve all products. Appearance, dimensions, technical specifications, standard equipment and accessories are therefore liable to modification without notice.