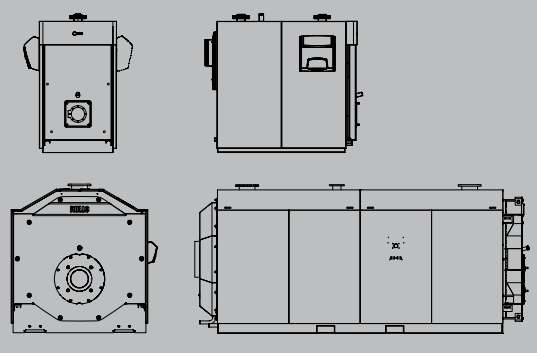
27005120 - rev. 07 - EN - 06/2024

RTS 3S

Blown air steel boilers with three-pass flue

Diesel-fired heating appliances are ErP compliant
(EU Regulation No. 813/2013).
Gas-fired heating appliances up to 400 kW are intended,
until January 1, 2018, only for replacement within the timeframe
stipulated in Article 1(2)(G) of EU Regulation No. 813/2013.
ErP compliant diesel applications
Monobloc steel boilers with three effective flue pass that can be
combined with forced air burners
The special geometry of heat exchange makes it possible to reduce
the residence time of flue gas in high temperature zones, thus
reducing the formation of pollutant emissions (NOx)



RIELLO
Energy For Life

A Carrier Company

RTS 3S

PRODUCT DESCRIPTION

The reduced width (narrow series) facilitates positioning in the boiler room.
The flue gas pipe are complete with extractable stainless steel turbulators which allow optimizing the efficiency of the heat exchange without increasing pressure losses.
The door has an ambidextrous opening and is equipped with a peephole with pressure outlet.
The panels are made of fire-painted sheet metal. The body and the flue compartment are totally accessible to facilitate maintenance operations. The control panel must be ordered separately.

- High point and average seasonal efficiency (compliance with Annex I of Legislative Decree No. 311 of December 29, 2006).
- Possible operation with sliding temperature (minimum return temperature allowed 50°C).
- Multiple system solutions by combining with RIELLOtech control panels.
- Maximum operating pressure: 6 bar.

TECHNICAL DATA - RTS 90 ÷ 511 3S

MODELS		U.o.M.	RTS							
			90 3S	115 3S	166 3S	217 3S	255 3S	349 3S	RTS 448 3S	RTS 511 3S
Material			STEEL							
Efficiency class			≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn
Fuel supply			Natural gas/LPG/Diesel							
Test room temperature		°C	20	20	20	20	20	20	20	20
Max furnace output	Output band approval	kW	90,0	115,0	166,0	217,0	255,0	349,0	448,0	511,0
Min. (max)* furnace output	Output band approval	kW	70,0	90,0	115,0	166,0	217,0	255,0	349,0	448,0
Min. furnace output (burner minimum)		kW	Check with burner							
Max nominal output 80-60°C		kW	85,1	108,3	157,4	207,5	244,0	334,7	427,8	488,0
Min. nominal output 80-60°C (max) *		kW	66,6	85,5	109,6	158,7	206,2	243,0	332,2	426,5
Min. nominal output 80-60°C (burner minimum)		kW	Check with burner							
Nominal output at 30%		kW	23,6	30,3	41,5	56,6	69,7	89,2	117,8	141,7
Efficiency at max output 80-60°C		%	94,5	94,2	94,8	95,6	95,7	95,9	95,5	95,5
Efficiency at min output 80-60°C (max)*		%	95,2	95,0	95,3	95,6	95,0	95,3	95,2	95,2
Efficiency at min output 80-60°C (burner minimum)*		%	Check with burner							
Useful efficiency at 30%		%	98,5	98,5	98,5	98,5	98,5	98,5	98,5	98,5
Chimney losses at burner off		%	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Chimney losses at burner on Max output		%	4,1	4,4	3,8	3,0	2,9	2,9	3,3	3,3
Chimney losses at burner on Min. output		%	3,4	3,6	3,3	3,0	3,6	3,5	3,6	3,6
Losses at the cover with average T of 70°C		%	1,4	1,4	1,4	1,4	1,4	1,2	1,2	1,2
Flue gas temperature at max Output and min output 80-60°C		°C	106-106	103-103	103-103	106-106	100-100	106-106	104-104	105-105
Air excess at max output			1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Air excess at min. output			1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Max-min flue gas mass flow rate		kg/s	0,040/0,020	0,050/0,025	0,072/0,036	0,094/0,047	0,110/0,055	0,151/0,075	0,195/0,098	0,221/0,111
Residual flue gas head		Pa	Check with burner (~ 50 Pa Pmax - ~ 50 Pa Pmin)							
Flue gas-side pressure losses		mbar	1,0	1,4	1,8	2,7	2,9	3,6	2,9	5,4
Furnace volume		dm^3	75,0	121,0	176,0	176,0	240,0	296,0	453,0	453,0
Total volume on the flue gas side		dm^3	112,0	176,0	253,5	261,5	357,5	443,0	682,0	682,0
Exchange surface		m^2	3,8	5,3	7,3	8,2	10,1	12,9	18,6	18,6
Volumetric heat load (Qmax)		kW/m^3	1203,0	947,0	941,0	1229,0	1066,0	1180,0	988,0	1127,0
Specific thermal load		kW/m^2	22,6	20,4	21,4	25,4	24,3	26,0	23,0	26,3
NOx		mg/kWh	Check with burner**							
Water-side pressure losses with ΔT20°C		mbar	7,0	5,0	5,0	10,0	13,0	20,0	20,0	20,0
Water-side pressure losses with ΔT10°C		mbar	22,0	25,0	27,0	45,0	43,0	75,0	70,0	90,0
Water content		l	176,0	255,0	319,0	309,0	408,0	495,0	655,0	655,0
Maximum operating pressure		bar	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0

MODELS	U.o.M.	RTS							
		90 3S	115 3S	166 3S	217 3S	255 3S	349 3S	RTS 448 3S	RTS 511 3S
Maximum temperature allowed	°C	110,0							
Maximum operating temperature	°C	95,0							
Boiler electrical power input to max output	W	Check with burner							
Boiler electrical power input a min output	W	Check with burner							
Flue gas discharge diameter	mm	180	200	250	250	250	250	300	300
Empty weight (including paneling)	kg	335	420	515	535	715	840	1160	1160
Installation type flue gas exhausts		B23	B23	B23	B23	B23	B23	B23	B23
Noise (Sound Power)	dB(A)	Check with burner							

* Minimum outputs indicate in minimum calibration level of maximum outout (power band approval); minimum operating power depends on the burner installed. If necessary, request the boiler nameplate with the desired power rating (as long as it is within the approval band) when ordering.

** <120 mg/kWh for combination with low NOx diesel burners up to 400 kW. Value in accordance with EN267 (nitrogen content in diesel =140 mg/kg).

Values obtained with gas burners calibrated with CO_2 = 9,7%, λ = 1,2 and with diesel burners calibrated with CO_2 = 12,5%.

TECHNICAL DATA – RTS 639 ÷ 3000 3S

MODELS		U.o.M.	RTS							
			RTS 639 3S	RTS 850 3S	RTS 1160 3S	RTS 1450 3S	RTS 1750 3S	RTS 2100 3S	RTS 2600 3S	RTS 3000 3S
Material			STEEL							
Efficiency class			≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn	≥ 90 + 2 log Pn
Fuel supply			Natural gas/LPG/Diesel							
Test room temperature		°C	20	20	20	20	20	20	20	20
Max furnace output	Output band approval	kW	639,0	850,0	1160,0	1450,0	1750,0	2100,0	2600,0	3000,0
Min. (max)* furnace output	Output band approval	kW	511,0	639,0	850,0	1160,0	1450,0	1751,0	2101,0	2601,0
Min. furnace output (burner minimum)		kW	Check with burner							
Max nominal output 80-60°C		kW	610,2	811,8	1107,8	1384,8	1671,0	2005,0	2483,0	2865,0
Min. nominal output 80-60°C (max) *		kW	486,5	608,3	809,2	1104,3	1380,0	1667,0	2000,0	2476,0
Min. nominal output 80-60°C (burner minimum)		kW	Check with burner							
Nominal output at 30%		kW	169,9	220,0	297,0	385,6	472,8	569,0	694,6	827,5
Efficiency at max output 80-60°C		%	95,5	95,5	95,5	95,5	95,5	95,5	95,5	95,5
Efficiency at min output 80-60°C (max)*		%	95,2	95,2	95,2	95,2	95,2	95,2	95,2	95,2
Efficiency at min output 80-60°C (burner minimum)*		%	Check with burner							
Useful efficiency at 30%		%	98,5	98,5	98,5	98,5	98,5	98,5	98,5	98,5
Chimney losses at burner off		%	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Chimney losses at burner on Max output		%	3,3	3,3	3,5	3,5	3,5	3,7	3,7	3,7
Chimney losses at burner on Min. output		%	3,6	3,6	3,8	3,8	3,8	4,0	4,0	4,0
Losses at the cover with everage T of 70°C		%	1,2	1,2	1,0	1,0	1,0	0,8	0,8	0,8
Flue gas temperature at max Output and min output 80-60°C		°C	102-102	108-108	112-112	107-107	115-115	107-107	107-107	107-107
Air excess at max output			1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Air excess at min. output			1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Max-min flue gas mass flow rate		kg/s	0,278/0,139	0,367/0,183	0,507/0,253	0,626/0,313	0,756/0,378	0,750/0,375	0,928/0,464	1,070/0,535
Residual flue gas head		Pa	Check with burner (~ 50 Pa Pmax - ~ 50 Pa Pmin)							
Flue gas-side pressure losses		mbar	5,2	6,7	3,9	4,6	5,9	9,5	10,8	12,5
Furnace volume		dm^3	613,0	812,0	1065,0	1297,0	1593,0	1988,0	2485,0	2657,0
Total volume on the flue gas side		dm^3	899,0	1209,0	1656,0	2088,0	2410,0	3125,0	3925,0	4384,0
Exchange surface		m^2	23,5	30,6	40,4	51,8	63,0	74,0	89,0	99,9
Volumetric heat load (Qmax)		kW/m^3	1043,0	1046,0	1089,0	1118,0	1099,0	1056,0	1046,0	1129,0
Specific thermal load		kW/m^2	26,0	26,5	27,4	26,7	26,5	27,1	27,9	28,7
NOx		mg/kWh	Check with burner**							

Forced Blown air boilers

Blown air steel boilers with three-pass flue

MODELS	U.o.M.	RTS							
		RTS 639 3S	RTS 850 3S	RTS 1160 3S	RTS 1450 3S	RTS 1750 3S	RTS 2100 3S	RTS 2600 3S	RTS 3000 3S
Water-side pressure losses with ΔT20°C	mbar	16,0	14,0	20,0	22,0	30,0	21,0	25,0	22,0
Water-side pressure losses with ΔT10°C	mbar	52,0	42,0	75,0	75,0	132,0	86,0	90,0	87,0
Water content	l	899,0	1193,0	1537,0	2211,0	2405,0	2753,0	3436,0	3634,0
Maximum operating pressure	bar	6,0	6,0	6,0	6,0	6,0	6,0	6,0	6,0
Maximum temperature allowed	°C	110,0							
Maximum operating temperature	°C	95,0							
Boiler electrical power input to max output	W	Check with burner							
Boiler electrical power input a min output	W	Check with burner							
Flue gas discharge diameter	mm	350	350	400	450	450	500	500	500
Empty weight (including paneling)	kg	1500	2040	2627	3440	4530	5305	5787	6262
Installation type flue gas exhausts		B23	B23	B23	B23	B23	B23 - B23P***	B23 - B23P***	B23 - B23P***
Noise (Sound Power)	dB(A)	Check with burner							

* Minimum outputs indicate in minimum calibration level of maximum outout (power band approval); minimum operating power depends on the burner installed. If necessary, request the boiler nameplate with the desired power rating (as long as it is within the approval band) when ordering.

** <120 mg/kWh for combination with low NOx diesel burners up to 400 kW. Value in accordance with EN267 (nitrogen content in diesel =140 mg/kg).

Values obtained with gas burners calibrated with CO_2 = 9,7%, λ = 1.2 and with diesel burners calibrated with CO_2 = 12,5%.

***The B23P configuration is only available with premixed gas burners.

ERP DIESEL TECHNICAL DATA

PARAMETER	SYMBOL	UOM	90 3S	115 3S	166 3S	217 3S	255 3S	349 3S
Seasonal space heating energy efficiency class			–	–	–	–	–	–
Water heating energy efficiency class			–	–	–	–	–	–
Nominal output	Pnominal	kW	85	108	157	208	244	335
Seasonal space heating energy efficiency class	ηs	%	89,0	89,0	89,0	90,0	90,0	90,0
USEFUL HEAT OUTPUT								
At the nominal thermal output and at a high temperature regime	P4	kW	85,1	108,3	157,4	207,5	244,0	334,7
At 30% of the nominal heat output and at a low temperature regime	P1	kW	26,9	34,4	47,8	65,0	76,3	104,5
EFFICIENCY								
At the nominal thermal output and at a high temperature regime	η4	%	89,1	88,8	89,4	90,2	90,3	90,4
At 30% of the nominal heat output and at a low temperature regime	η1	%	94,0	94,1	94,2	94,2	94,1	94,1
AUXILIARY ELECTRICITY CONSUMPTION								
At full load	elmax	W	430	450	460	660	660	760
Partial load	elmin	W	151	158	161	231	231	266
In Standby mode	PSB	W	20	20	20	20	20	20
OTHER PARAMETERS								
Thermal losses in standby mode	Pstby	W	240	300	360	430	500	600
Energy consumption of pilot flame	Pign	W	–	–	–	–	–	–
Annual energy consumption	QHE	GJ	–	–	–	–	–	–
Indoor sound power level	LWA	dB	–	–	–	–	–	–
Nitrogen oxide emissions	NOx	mg/kWh	<120 mg/kWh for combination with low NOx diesel burners. Value in accordance with EN267 (nitrogen content in diesel =140 mg/kg)					

Values obtained with diesel burners calibrated with CO_2 = 12,5%.
In combination with a diesel burner, RTS <400kW boilers comply with:
- Ecodesign Directive for energy-related products 2009/125/EC
- Delegated Regulation (EU) n. 813/2013

OVERALL DIMENSIONS

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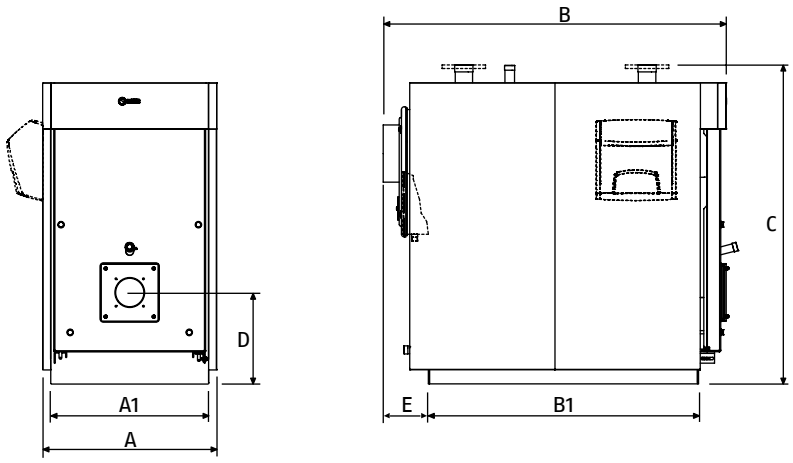

RTS 3S BOILER	U.o.M.	90	115	166	217	255	349	448	511	639	850	1160	1450	1750
A – Boiler width	mm	660	710	760	760	820	820	890	890	1000	1047	1147	1237	1340
A1 – Body width	mm	580	640	690	690	750	750	790	790	900	980	1070	1160	1260
B – Boiler length	mm	1155	1330	1500	1500	1660	1960	2085	2085	2375	2657	2954	3173	3460
B1 – Base length	mm	860	1010	1180	1180	1296	1596	1692	1692	1965	2236	2533	2754	3020
C – Hydraulic connection height	mm	1205	1285	1390	1390	1524	1490	1685	1685	1830	1920	2080	2222	2322
C1 – Boiler height	mm	1225	1305	1390	1390	1525	1525	1730	1730	1875	1960	2120	2222	2322
D – Burner Axis	mm	380	380	400	400	468	468	510	510	560	570	625	650	670
E – Chimney-Base	mm	180	190	200	200	225	225	250	250	270	270	270	270	265
Weight (including paneling)	kg	335	420	515	535	715	840	1160	1160	1500	2040	2627	3440	4530

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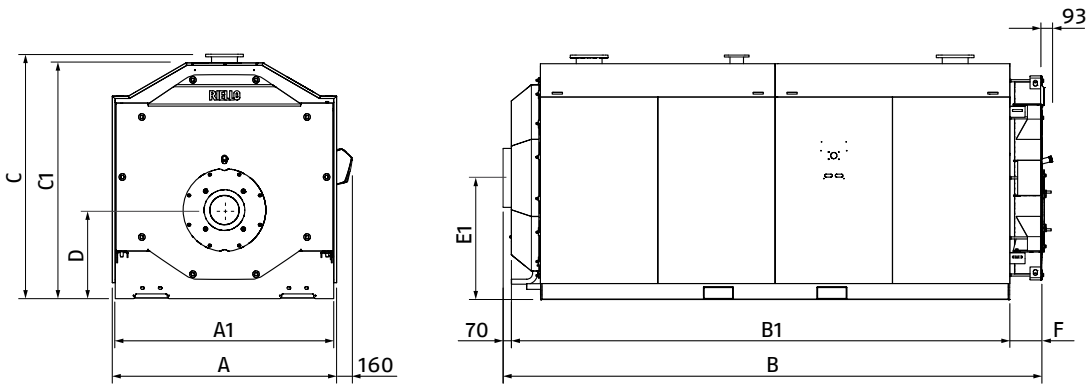

RTS 3S BOILER	U.o.M.	2100	2600	300
A – Total Length	mm	1800	1900	1900
A1 – Base Width	mm	1750	1850	1850
B – Total Length	mm	3981	4171	4491
B1 – Base Width	mm	3394	3831	3962
C – Total Height	mm	1980	2070	2070
C1 – Walkable Height	mm	1872	1997	1997
D – Burner Axis	mm	750	750	750
E – Chimney Axis	mm	1000	1030	1030
F – Door projection	mm	270	270	270
Boiler weight	kg	5125	5575	6015
Weight Paneling	kg	180	212	247

HYDRAULIC CONNECTIONS

The **RIELLO RTS 3S** boilers are designed and built to be installed on heating systems and also for the production of domestic hot water if connected to adequate systems. The characteristics of the hydraulic connections are as follows:

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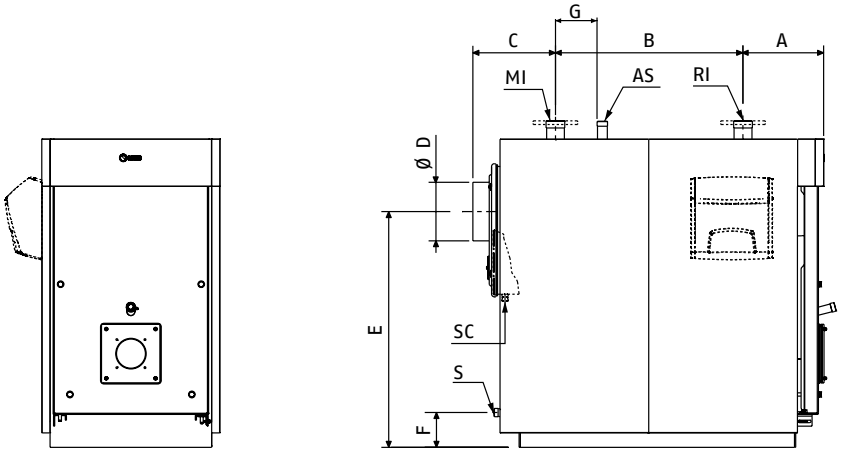
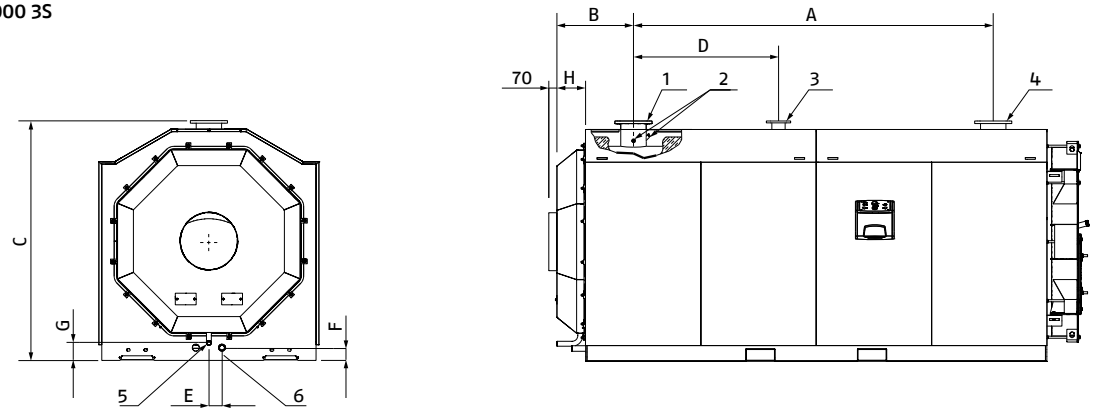


RTS 3S BOILER	U.o.M.	90	115	166	217	255	349	448	511	639	850	1160	1450	1750
A	mm	320	335	348	348	360	390	395	395	450	512	514	563	590
B	mm	530	650	800	800	890	1085	1200	1200	1400	1570	1865	2030	2300
C	mm	305	345	352	352	410	485	490	490	525	575	505	580	570
Ø D	mm	180	200	250	250	250	250	300	300	350	350	400	450	450
E	mm	870	946	1005	1005	1130	1130	1290	1290	1405	1445	1580	1695	1760
F	mm	175	150	148	148	187	187	185	185	205	190	218	190	210
G	mm	130	200	200	200	200	300	250	250	300	350	350	700	1000
Mi - Heating flow*	G"/DN	2"	2"	2" 1/2	2" 1/2	2" 1/2	DN80	DN80	DN80	DN100	DN125	DN125	DN150	DN150
Ri - Heating return*	G"/DN	2"	2"	2" 1/2	2" 1/2	2" 1/2	DN80	DN80	DN80	DN100	DN125	DN125	DN150	DN150
As - Safety connection	G"/DN	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	DN80
Sc - Condensate drain	G"/DN	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1"	1"
S - Boiler drain	G"/DN	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	1"1/2

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

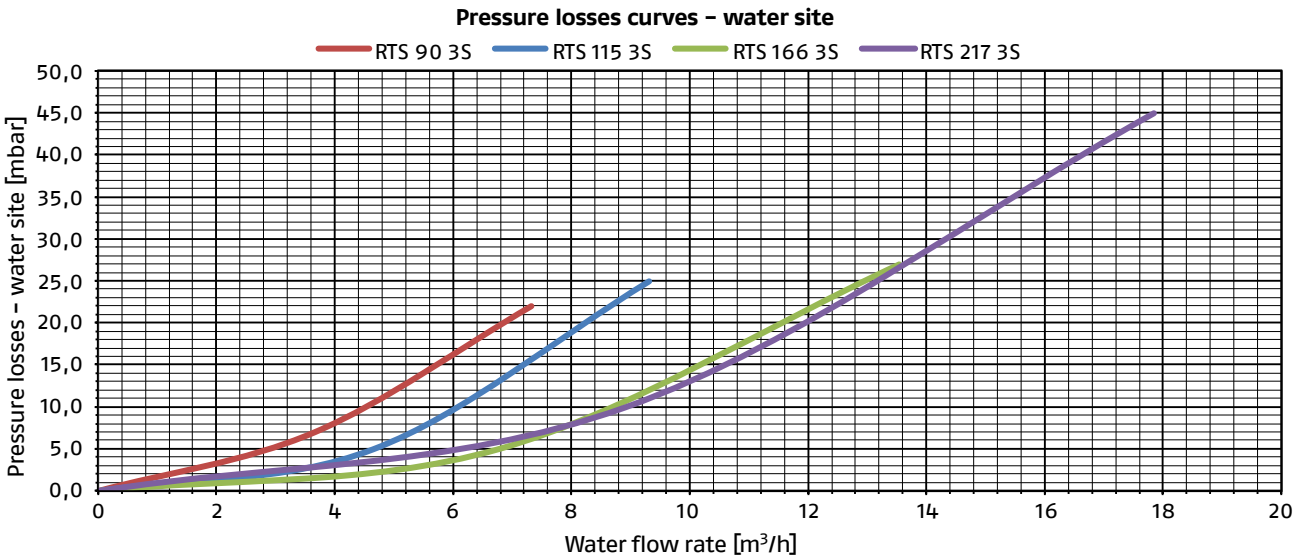
RTS 2100÷3000 3S

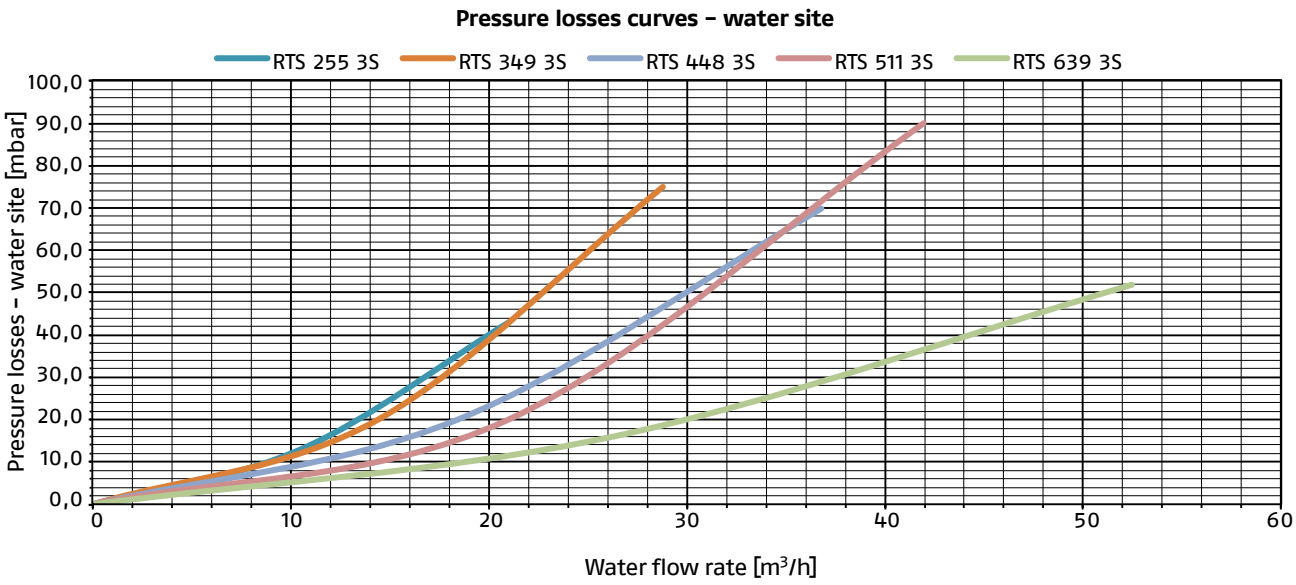


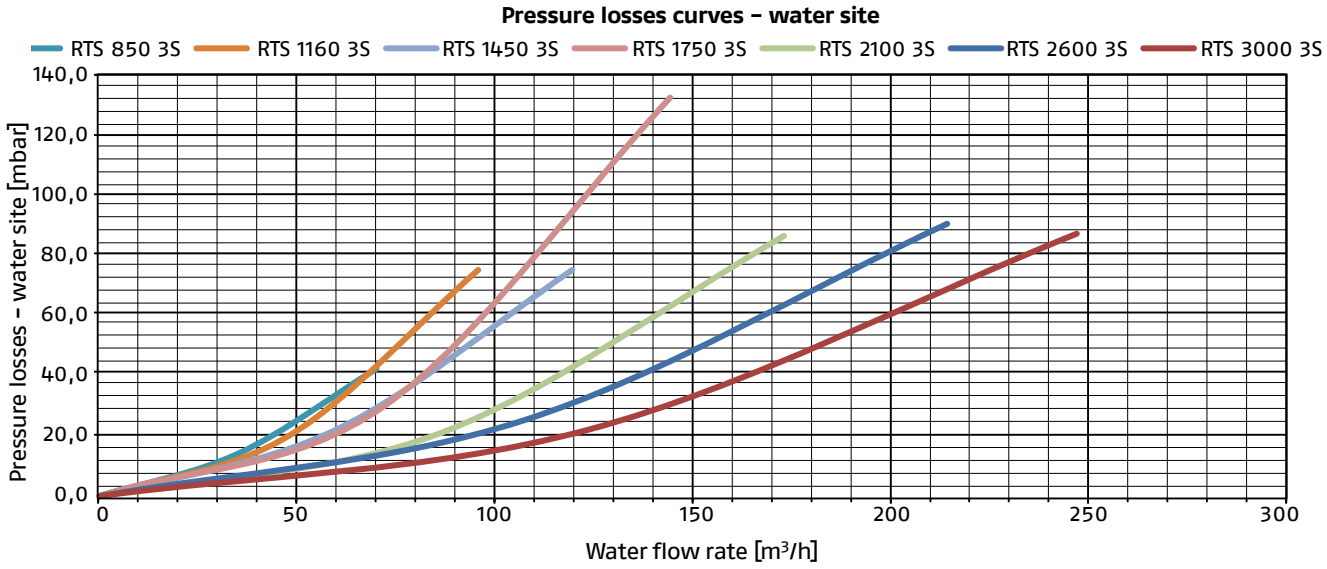
RTS 3S BOILER	U.o.M.	2100	2600	3000
1 - Heating flow (*)	Ø	DN200	DN200	DN200
2 - Bulb wells / Instrument probes	Ø	G 1/2"	G 1/2"	G 1/2"
3 - Safety connection	Ø	DN100	DN100	DN100
4 - Boiler return (*)	Ø	DN200	DN200	DN200
5 - Condensate drain	Ø	G 1"	G 1"1/4	G 1"1/4
6 - Boiler drain	Ø	G 1"1/2	G 1"1/2	G 1"1/2
A	mm	2470	2710	3100
B	mm	709	659	659
C	mm	1980	2070	2070
D	mm	920	1250	1250
E	mm	103	113	113
F	mm	135	110	110
G	mm	189	151	151
H	mm	247	247	247

(*) All flanged connections are PN6 according to UNI EN 1092-1.
(**) The vertical dimensions do not include the thickness of the plinth.

HYDRAULIC CIRCUIT







DISCHARGE OF COMBUSTION PRODUCTS

The flue gas pipe and the connection to the chimney must be made in accordance with current Standards and Legislation, with rigid pipes, resistant to condensation, adequate to the temperature of combustion products, mechanical stresses and tight.
The chimney must be equipped with a condensate collection and drainage module and the flue must have a slope, toward the boiler, of at least 3°.

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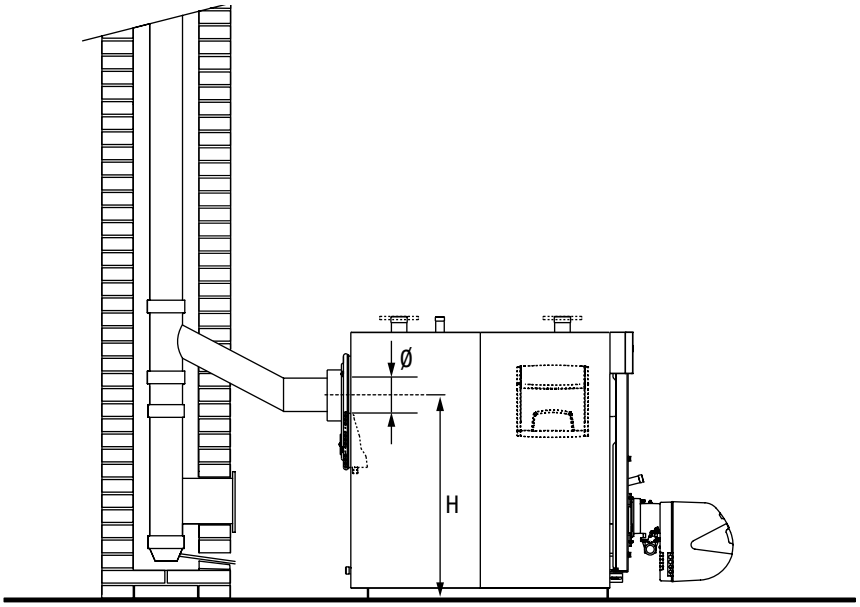
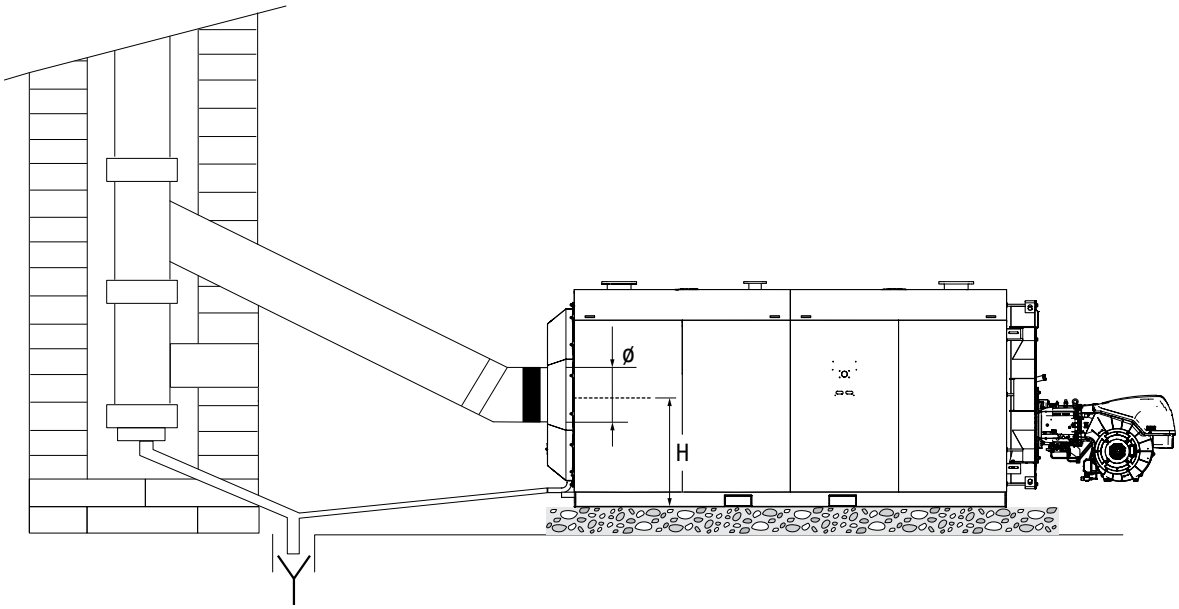


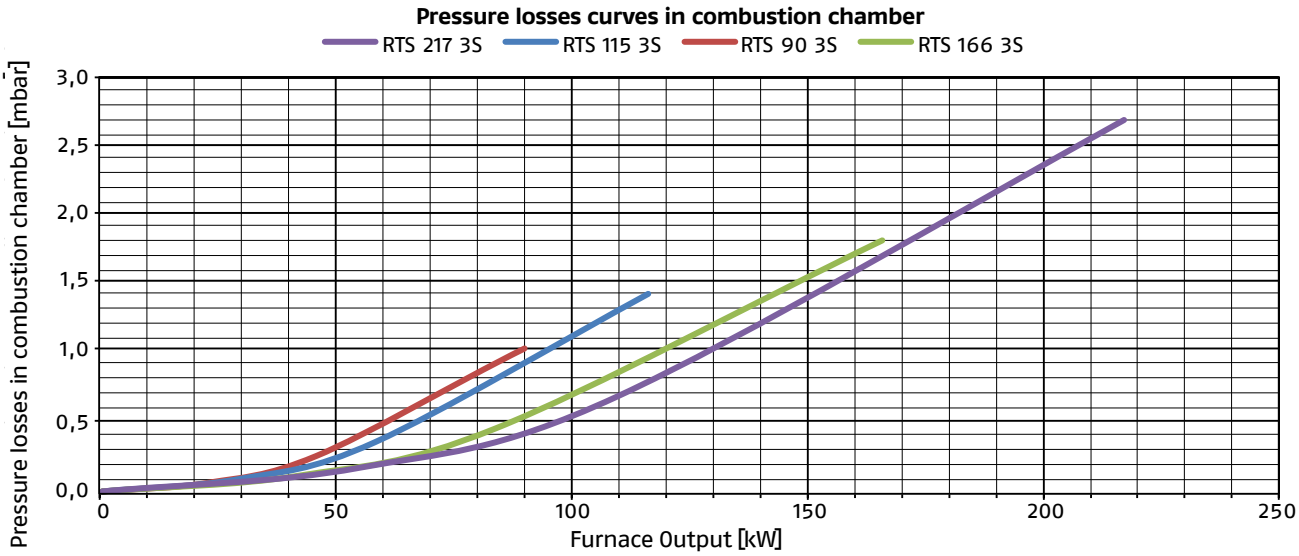
RTS 3S BOILER	U.o.M.	90	115	166	217	255	349	448	511	639	850	1160	1450
Ø - Diameter	mm	180	200	250	250	250	250	350	350	350	350	400	450
H	mm	870	946	1005	1005	1130	1130	1290	1290	1405	1445	1580	1695

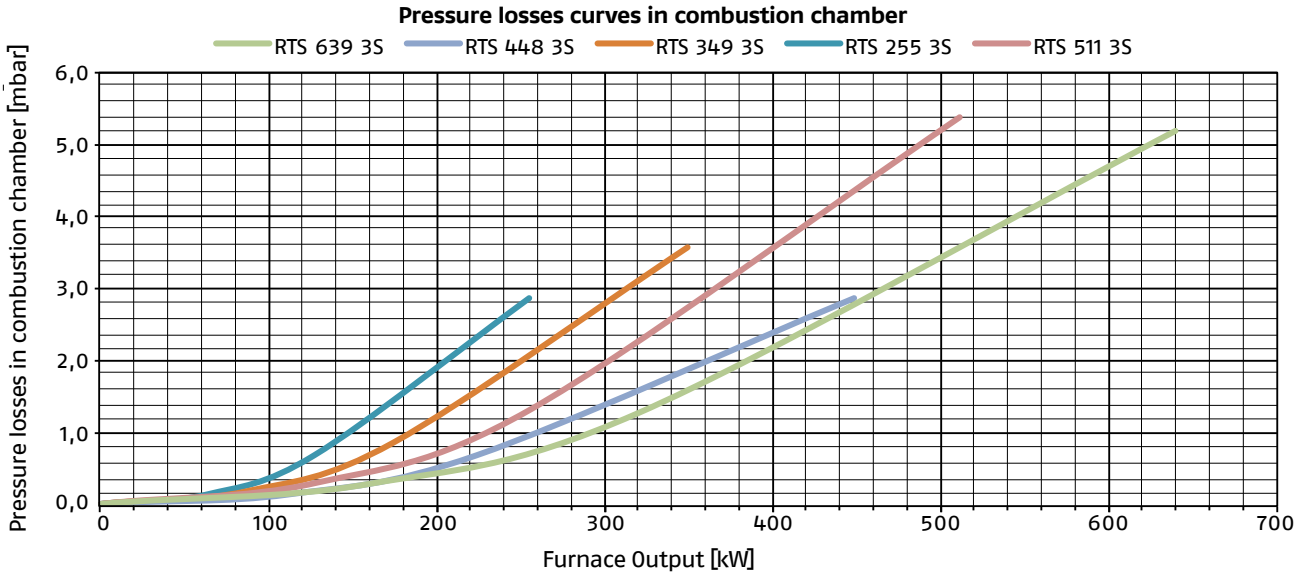
RTS 2100÷3000 3S

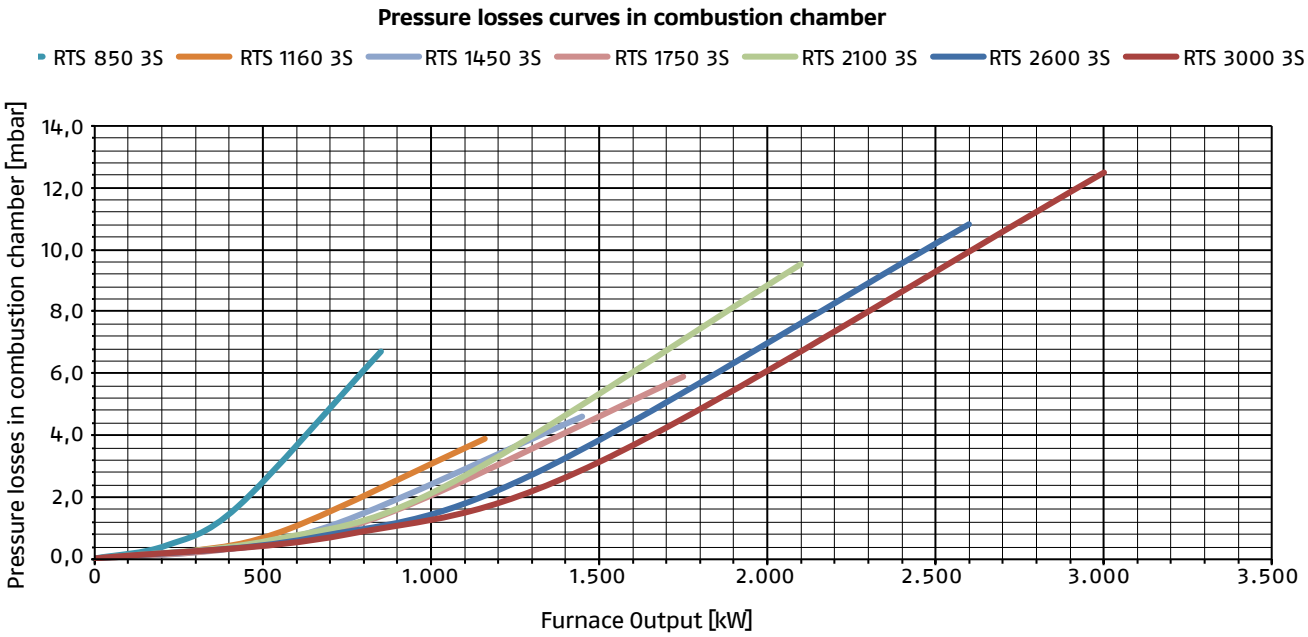


RTS 3S BOILER	U.o.M.	2100	2600	3000
Ø - Diameter	mm	500	500	500
H	mm	100	1030	1030

PRESSURE LOSSES IN THE COMBUSTION CHAMBER

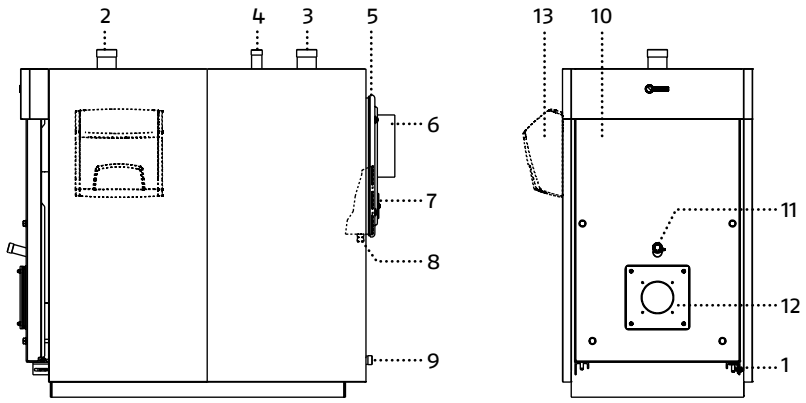






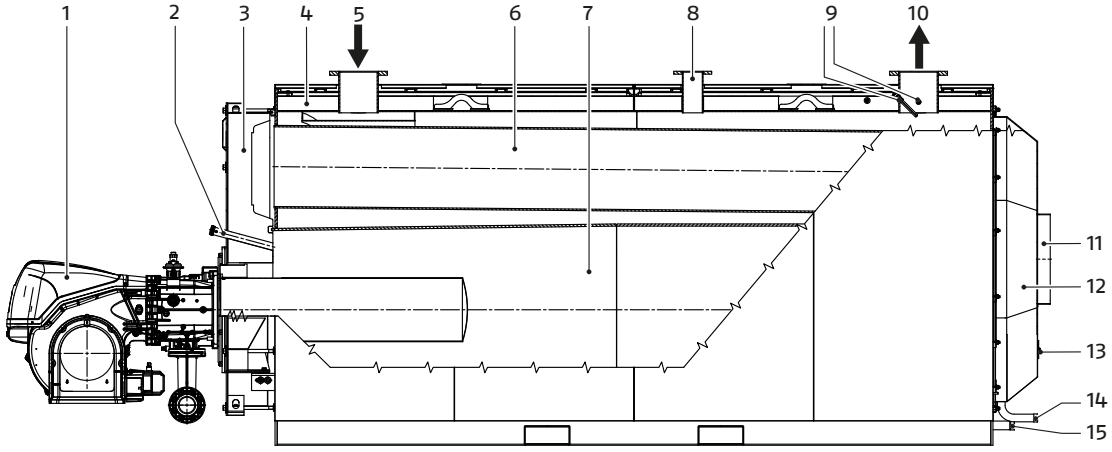
STRUCTURE

RTS 90÷1750 3S



1 Door hinge
2 Heating return
3 Heating flow
4 Safety connection
5 flue gas chamber
6 flue duct connection
7 Flue chamber cleaning door
8 Condensate drain
9 Boiler drain
10 Front door
11 Flame viewer
12 Burner holder plate
13 Electrical cabinet

RTS 2100÷3000 3S



1 Burner
2 Flame viewer with pressure/cooling socket
3 Door
4 Paneling
5 Heating return
6 Flue gas pipes
7 Combustion chamber
8 Safety connection
9 Bulb wells/instrumentation probes
10 Heating flow
11 flue duct connection
12 flue gas chamber
13 Inspection door
14 Condensate drain
15 Boiler drain

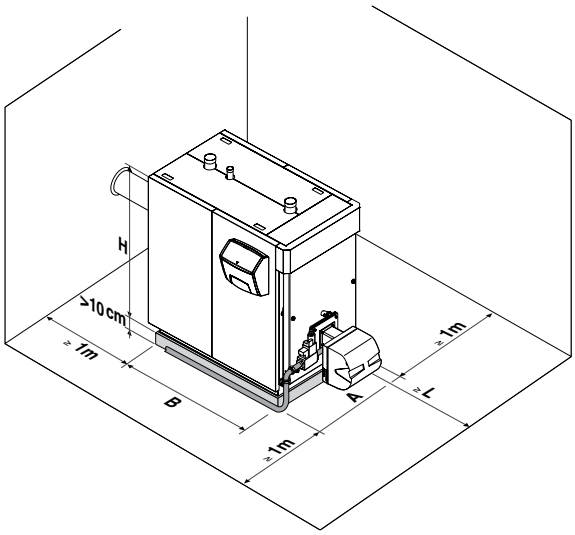
BOILER INSTALLATION ROOM

RIELLO RTS 3S steel boilers should be installed in rooms for exclusive use that comply with Technical Standards and current Legislation and have adequately sized ventilation openings. The boiler should be positioned, if possible, raised off the floor to minimize the intake of dust by the burner fan. The gas supply line must be constructed in such a way as to permit both the removal of the panelling and the opening of the hatch with the burner mounted.
The appliance cannot be installed outdoors because it is not designed to operate outdoors and does not have automatic anti-freeze systems.

- If the burner is powered by fuel gas with a specific weight higher than that of air, the electrical parts must be placed at a height higher than 500 mm from the ground.

RTS 90÷1750 3S

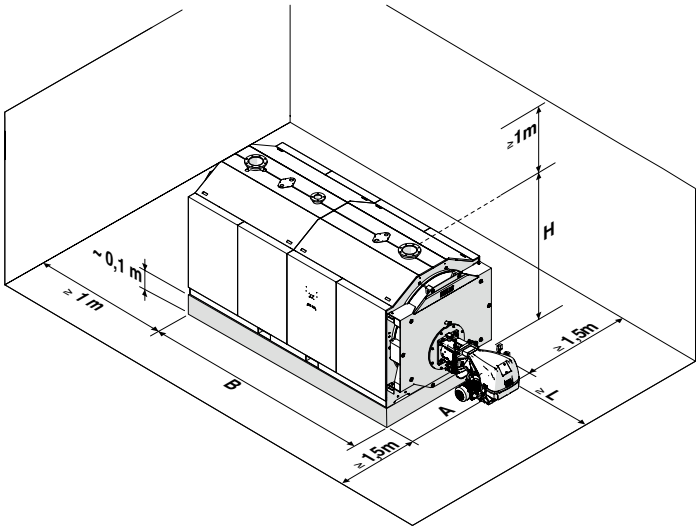
Recommended distances



RTS 3S BOILER	U.o.M.	90	115	166	217	255	349	448	511	639	850	1160	1450
A – Boiler Width	mm	660	710	760	760	850	850	890	890	970	1047	1070	1160
B – Boiler Length	mm	1155	1330	1500	1500	1660	1960	2110	2110	2375	2657	2533	2754
H – Boiler Height	mm	1175	1285	1390	1390	1524	1490	1685	1685	1820	1900	2080	2222

RTS 2100÷3000 3S

Recommended distances



RTS 3S BOILER	U.o.M.	2100	2600	3000
A – Boiler Width	mm	1750	1900	1900
B – Boiler Length	mm	3394	3831	3962
H – Boiler Height	mm	2080	2170	2170

INSTALLATION ON OLD OR MODERNIZED SYSTEMS

When the boiler is installed on old or modernized systems, check that:

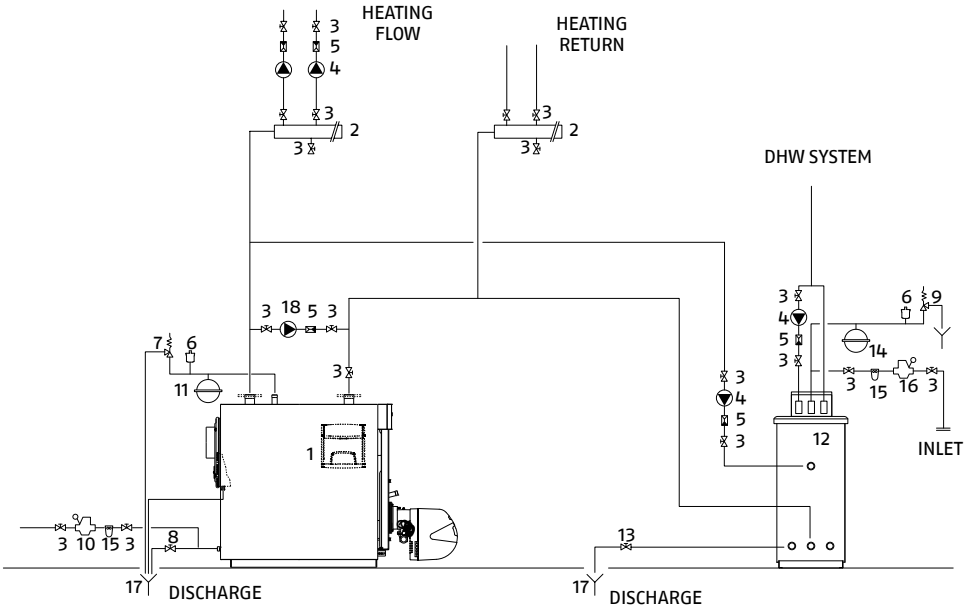
- The flue is suitable for the temperatures of the combustion products, calculated and built according to the Standard, is as straight as possible, sealed, insulated and has no occlusions or restrictions
- The electrical system is created in compliance with specific standards and by qualified personnel
- The fuel supply line and any tank are made according to specific standards
- The expansion vessels ensure total absorption of the expansion of the fluid contained in the system
- The flow rate, head and flow direction of the circulation pumps are appropriate
- The system is washed, cleaned of sludge and encrustations, deaerated and the seals have been checked
- A treatment system is provided when the supply/replenishment water is particular (those shown in the table can be considered as reference values) according to Presidential Decree 59/09 and subsequent amendments.

Particular supply/replenishment waters must be conditioned with appropriate treatment systems. Those shown in the table can be considered as reference values.

REFERENCE VALUES	
PH	6-8
Electrical conductivity	less than 200 mV/cm (25°C)
Chlorine ions	less than 50 ppm
Sulfuric acid ions	less than 50 ppm
Total iron	less than 0,3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 35°f
Sulfur ions	none
Ammonia ions	none
Silicon ions	less than 30 ppm

EXAMPLE SCHEME – SYSTEM FOR HEATING AND DOMESTIC WATER PRODUCTION

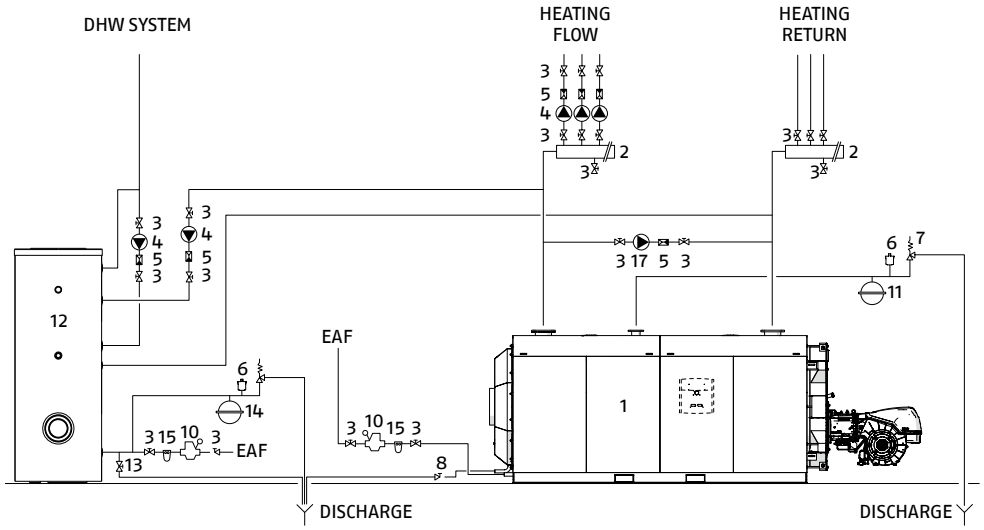
RTS 90÷1750 3S



1 Riello RTS 3S boiler
2 System pipes
3 Section valves
4 Circulators
5 Non-return valves
6 Automatic air-vent valve
7 Boiler safety valve
8 Boiler drain cock
9 tank safety valve
10 System loading
11 System expansion vessel
12 Remote tank (Riello 7200)
13 Tank drain tap
14 DHW expansion vessel
15 Softener filter
16 Pressure reducer
17 Discharge
18 Anti-condensate pump

The choice and installation of the system components are delegated to the installer, who must operate according to the rules of good technique and current legislation.

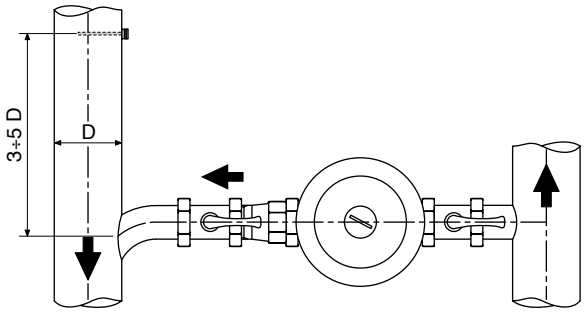
RTS 2100÷3000 3S



1	Generator
2	System pipes
3	Section valves
4	Circulators
5	Non-return valves
6	Automatic air-vent valve
7	Boiler safety valve
8	Boiler drain cock
9	tank safety valve
10	System loading
11	System expansion vessel
12	Remote tank
13	Tank drain tap
14	DHW expansion vessel
15	Softener filter
16	Pressure reducer
17	Anti-condensate pump
EAF	Cold water inlet

ANTI-CONDENSATE PUMP

To prevent damage to the boiler during transients and prior to system start-up, an anti-condensate pump is required.
The pump must ensure, during periods of system operation, a flow rate of between 20 and 30 percent of the total flow rate, must ensure a return water temperature of not less than 50°C, and must delay its own shutdown by at least 3 minutes, at the beginning of prolonged periods of boiler shutdown (nighttime total shutdown, weekends, etc.).
To detect the actual system return temperature with the aim of controlling the anti-condensate pump or to manage the commissioning functions in thermoregulation systems, it is necessary to prepare a probe holder to be positioned 3÷5 diameters of the return pipe before (at upstream) of the hydraulic coupling point.
Any temperature control devices, external to the boiler control panel, must be compatible in terms of both electrical connections and functional logic.



BURNERS RECOMMENDED FOR MATCHING

RECOMMENDED COMBINATIONS WITH Low NOx "BLUE FLAME" BURNERS

Name commercial	Back pressure in Combustion chamber mbar	GAS							diesel							Burner holder plate				Control panels		Control panel accessories	
		Modulating							Two-stage					Modulating									
		Mechanical cam			Electronic cam				-					Mechanical cam									
		RS 55/M BLU TC	RS 68/M BLU TC	RS 120/M BLU TC	RS 45/E BLU	RS 55/E BLU	RS 68/E BLU	RS 120/E BLU	BG6.1D	BG7.1D	RL 22 BLU	RL 32 BLU	RL 42 BLU	RL 55/M BLU	RL 85/M BLU	Burner flange	Burner flange	Burner flange	Burner flange	RIELLOtech Prime	RIELLOtech Clima Comfort	Two-stage burner management kit	3-point modulation kit
RTS 90 3S	1,0								●											●		●	
RTS 115 3S	1,4									●										●		●	
RTS 166 3S	1,8										●							●		●		●	
RTS 217 3S	2,7										●							●		●		●	
RTS 255 3S	2,9											●								●		●	
RTS 349 3S	3,6												●			●				●		●	
RTS 448 3S	2,9	●															●				●		●
	2,9				●																●		●
	2,9												●			●				●		●	
	2,9													●			●				●		●
RTS 511 3S	5,4	●															●				●		●
	5,4					●											●				●		●
	5,4													●			●				●		●
RTS 639 3S	5,2		●														●				●		●
	5,2						●												●		●		●
	5,2													●			●				●		●
RTS 850 3S	6,7			●																	●		●
	6,7							●													●		●
	6,7														●		●				●		●
RTS 1160 3S	3,9			●																	●		●
	3,9							●													●		●

NOTE: the gas burners must be completed with the gas train.

RECOMMENDED COMBINATIONS WITH "BLU FLAME" LOW NOx burners with oxygen control

Commercial name	Back pressure in combustion chamber mbar	GAS												Control panels	Control panel accessories
		Modulating													
		Electronic cam													
		With oxygen control						Variable speed with oxygen control							
		RS 120/E O2 BLU TC	RS 160/E O2 BLU TC	RS 200/E O2 BLU TC	RS 310/E O2 BLU TC	RS 410/E O2 BLU TC	RS 510/E O2 BLU TC	RS 120/EV O2 BLU TC	RS 160/EV O2 BLU TC	RS 200/EV O2 BLU TC	RS 310/EV O2 BLU TC	RS 410/EV O2 BLU TC	RS 510/EV O2 BLU TC	RIELLOtech Clima Comfort	3-point modulation kit
RTS 850 3S	6,7	●						●						●	●
RTS 1160 3S	3,9	●						●						●	●
RTS 1450 3S	4,6		●						●					●	●
RTS 1750 3S	5,9			●						●				●	●
RTS 2100 3S	9,5				●						●			●	●
RTS 2600 3S	10,8					●						●		●	●
RTS 3000 3S	12,5						●						●	●	●

Note:
Couplings in accordance with Legislative Decree No. 183, Nov. 15, 2017 (amending Legislative Decree 152/2006), which require combustion control (oxygen probe) for appliances with heat output at the firebox >1160 kW and for systems with rated heat output >1500 kW with generators with heat output at the firebox >750 kW.
The burners must be completed with a gas train and appropriate accessories that allow combustion control.
Oxygen probe and inverter kit to be ordered separately.
For complete system configuration, contact the presales office and/or the Professional Sales Manager.

RECOMMENDED COMBINATIONS WITH STANDARD "YELLOW FLAME" BURNERS

Name commercial	Back pressure in Combustion chamber mbar	GAS										diesel								MIXED			Control panels		Control panel accessories	
		Two-stage					Modulating					Two-stage				Modulating				Two-stage						
		-					Mechanical cam					-				Mechanical cam				-						
		RS 50 TC	RS 70 TC	RS 100 TC	RS 130 TC	RS 150 TC	RS 50/M MZ TC	RS 70/M TC	RS 100/M TC	RS 130/M TC	RS 150/M TC	RL 50 TC	RL 70 TC	RL 100 TC	RL 130 TC	RL 50/M TC	RL 70/M TC	RL 100/M TC	RL 130/M TC	RLS 50	RLS 70	RLS 100	RIELLOtech Prime	RIELLOtech Clima Comfort	Two-stage burner management kit	3-point modulation kit
RTS 448 3S	2,9	●																					●		●	
	2,9						●																	●		●
	2,9											●											●		●	
	2,9															●								●		●
	2,9																			●			●		●	
RTS 511 3S	5,4	●																					●		●	
	5,4						●																	●		●
	5,4											●											●		●	
	5,4															●								●		●
	5,4																				●		●		●	
RTS 639 3S	5,2		●																				●		●	
	5,2							●																●		●
	5,2												●										●		●	
	5,2																●							●		●
	5,2																				●		●		●	
RTS 850 3S	6,7			●																			●		●	
	6,7								●															●		●
	6,7													●									●		●	
	6,7																	●						●		●
	6,7																					●	●		●	

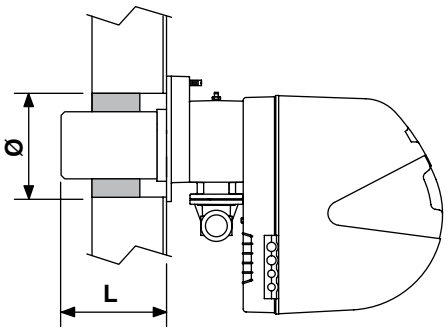
NOTE: the gas burners must be completed with the gas train.

Forced Blown air boilers

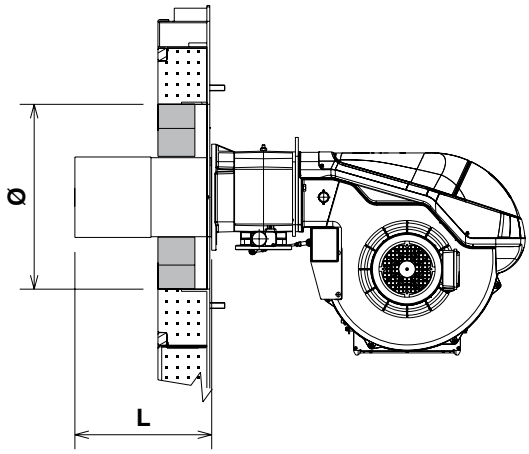
Blown air steel boilers with three-pass flue

Once the burner has been installed on the boiler, the space between the burner mouthpiece and the refractory material of the door must be filled with the ceramic mat supplied with the boiler.

RTS 90÷1750 3S



RTS 2100÷3000 3S



RTS 3S BOILER	U.o.M.	90	115	166	217	255	349	448	511	639	850	1160	1450	1750	2100	2600	3000
L min	mm	128	128	128	128	155	155	195	195	200	200	205	205	300	350	350	500
Door Hole Diameter	Ø mm	140	140	162	162	180	180	205	205	205	230	370	370	520	520	520	520
Door thickness	mm	93	93	93	93	103	103	118	118	119	119	119	119	140	–	–	–

NOTE: It is forbidden to use the existing burner in the case of shorter lengths than those given above.

THERMOREGULATIONS – RIELLOTECH

RIELLOtech is the range of RIELLO controls created for the management of any type of system. Ideal for complex systems as well as for managing simpler installations. The range includes:
RIELLOtech Clima Top: is the climate regulation of complex systems in multi-family installations. It manages modulating burners, boiler cascades, complex solar systems and the integration of multiple types of heat producers. On the system side it manages 2 mixed zones, one direct and the production of domestic hot water.
RIELLOtech Clima Comfort: it is the climatic regulation of even complex systems in single-family installations. It manages single and two-stage burners (with a specific kit), boiler cascades, solar systems, and the integration of multiple types of heat generators. On the system side it manages a mixed area (expandable to 2 with a specific kit), a direct one and the production of domestic hot water.
RIELLOtech Clima Mix: it is the system control capable of managing 1 mixed zone, expandable to 2 with a specific kit.
RIELLOtech Prime ACS: is the thermostatic line capable of managing single and two-stage burners
(using a specific kit), the production of domestic hot water and a direct zone.
RIELLOtech Prime: is the thermostatic line capable of managing single and two-stage burners
(via a specific kit) and a direct area.
The **RIELLOtech Clima Top** and **Comfort** versions include a boiler probe and an external probe.
All RIELLOtech Clima adjustments can be integrated via BUS.
The Clima series is also available in the control panel version.
IPX4D electrical protection degree.

APPLICATION PROCEDURE

	BURNER	BOILERS CASCADE	ALTERNATIVE GENERATOR	SOLAR SYSTEM	DOMESTIC HOT WATER TANK	DIRECT ZONE	1st ZONE MIXED	2nd ZONE MIXED
MANDATORY ACCESSORIES		Immersion probe or cuff probe		2 tank probes and 1 solar collector probe	tank probe (for climate box)		Immersion probe or cuff probe	Immersion probe or cuff probe
OPTIONAL ACCESSORIES			Immersion probe (only for biomass boiler)				Room probe or Remote Control RC3	Room probe or Remote Control RC3
RIELLOtech CLIMA COMFORT	 modulating							with kit additional dedicated mix area management
RIELLOtech CLIMA MIX								with kit additional mix area management
RIELLOtech Prime	 Two-stage with special kit							
RIELLOtech Prime ACS	 Two-stage with special kit							

ERP thermoregulation class

DESCRIPTION ACCESSORIES	EXTERNAL PROBE	BURNERS	CLASS	RELAY KIT 3 POINT MODULATION	ONE ROOM PROBE	TWO ROOM PROBES	THREE ROOM PROBES	MIX ZONE MANAGEMENT ADD + RELATED ROOM PROBE
RIELLOtech CLIMA COMFORT	Yes	Modulation On/off	II III	II III	VI VII	VI VII	VIII VII	VIII VII
REMOTE CONTROL RC3			V					
ROOM PROBE			V					

DESCRIPTION PER SPECIFICATIONS

RIELLO RTS 3S

The **RIELLO RTS 3S** steel boilers are high-efficiency heat generators with three-flue passes, for heating systems and, when combined with a boiler, for the production of domestic hot water.
They are pressurized combustion monoblock boilers the flame produced by the burner develops in the furnace (1st pass); at the end of the furnace, an opening connects to a duct that the flue gases enter to return to the front (2nd pass). The net separation of the flue gas inversion from the furnace is important for NOx reduction. In fact, the residence time of flue gases in the high temperature zone is a cause of the formation of such pollutant emissions. At the front, through the recess made in the insulation of the door, the flue gases enter the tube bundle (3rd pass).
Here the flue gases are forced by the turbulators to run a swirling path that increases heat transfer by convection. This provides maximum heat absorption without harmful thermal stress. Exiting the tube bundle, the flue gases are collected in the rear chamber and conveyed to the chimney.

The **RTS 3S** steel boiler has the following characteristics:
- Min/max heat input (furnace) up to 70-3000 kW (power band approval);
- Maximum nominal output of 85,1-2865 kW at temperature 80-60°C
- Useful efficiency at max nominal output with temperature 80-60°C from 94,5 to 95,9%;
- Useful efficielncy at 30% at nominal output of 98,5%.
- Minimum return water temperature 50°C
- Max operating water temperature 95°C
- Maximum operating pressure 6 bar
- Modulation ratio dependent on the combined burner (two-stage / modulating / with inverter fan / with 0_2 probe)
- External casing made of stove-painted steel sheet panels, assembled with snap-on and removable couplings for total accessibility to the boiler with complete opening of both the front door and the combustion chamber;
- Front door with ambidextrous opening without the need to remove the burner;
- Thermal insulation with a glass wool mat covered with black fabric, with a density of 15 kg/m^3 and a thickness of 80 mm;
- Heat exchange surfaces in contact with combustion products composed of:
  - combustion chamber and inversion pipe in black S235JR sheet metal, 10mm thick. UNI EN-10025;
  - tube bundle in Fe33 ERW UNI 7288;

These characteristics make the boiler suitable for the combustion of:
  - **Natural gas**
  - **LPG**
  - **Diesel**
- Disposal of overtemperatures carried out automatically by the internal circulation system;
- Exchanger with three effective flue passes to promote low NOX emissions and with no limit on the minimum burned output;
- Structure with a "narrow" shape up to the 1750 model: characterized by an "8" shape which divides the exchange body into two sections in order to maintain a small footprint of the generator and allow passage through small doors ;
- Structure with a "square" shape up to model 3000 that maximizes the compactness of the exchanger and reduces its overall height;
- AISI 310S stainless steel turbulators to promote heat exchange;
- Connection to safety tube;
- Probe wells and regulation according to law;
- System drain;
- Cleaning and control of the combustion chamber executable totally from the front;

NOTE

RIELLO

Riello RTS 3S

RIELLO S.p.A. -
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www.riello.com

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