

# RS ULX SERIES

## PRODUCT OVERVIEW

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Monoblock Ultra Low NOx Gas Burners

# ULTRA LOW NOx GAS MONOBLOCK BURNERS RS ULX SERIES



**NOx EMISSIONS < 40 mg/Nm<sup>3</sup> @ 3% O<sub>2</sub>,  
WITHOUT FGR, WITH PROPER COMBUSTION CHAMBER DIMENSIONS**



RS 68/E-EV ULX

RS 120/E-EV ULX

RS 160/E-EV ULX

RS 200/E-EV ULX

RS 310/E-EV ULX

RS 510/E-EV ULX

RS 610/E-EV ULX

RS 810/E-EV ULX

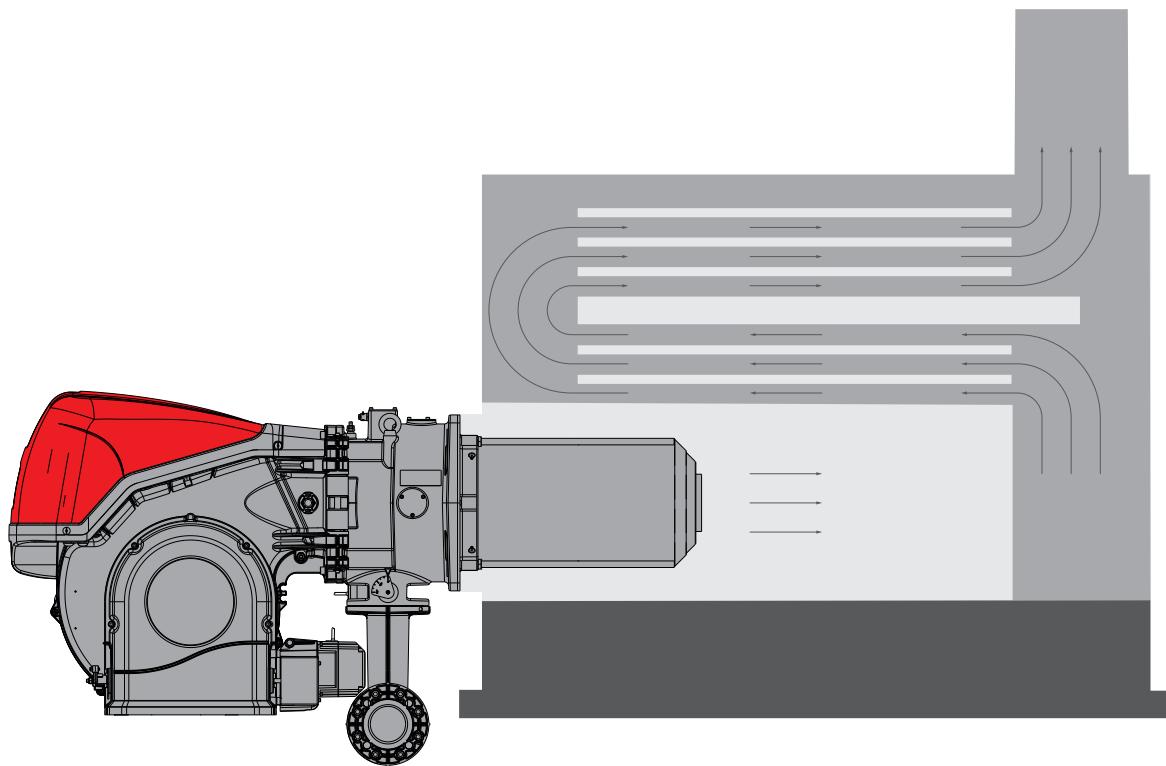
## ULX TECHNOLOGY, A NEW MILESTONE FOR ENVIRONMENTAL SUSTAINABILITY

**DUE TO THE SIGNIFICANT INCREASE OF POLLUTANTS, ATTENTION TO PERFORMANCE, ENERGY EFFICIENCY AND EMISSION REDUCTION IS BECOMING MORE AND MORE IMPORTANT ALL AROUND THE WORLD, IN PARTICULAR IN ALL THE HIGHLY INDUSTRIALIZED COUNTRIES.**

In order to comply with the increasing demand for very low NOx emissions, RIELLO has developed a **new range of Monoblock Burners** based on the innovative **ULX combustion technology patented by RIELLO**.

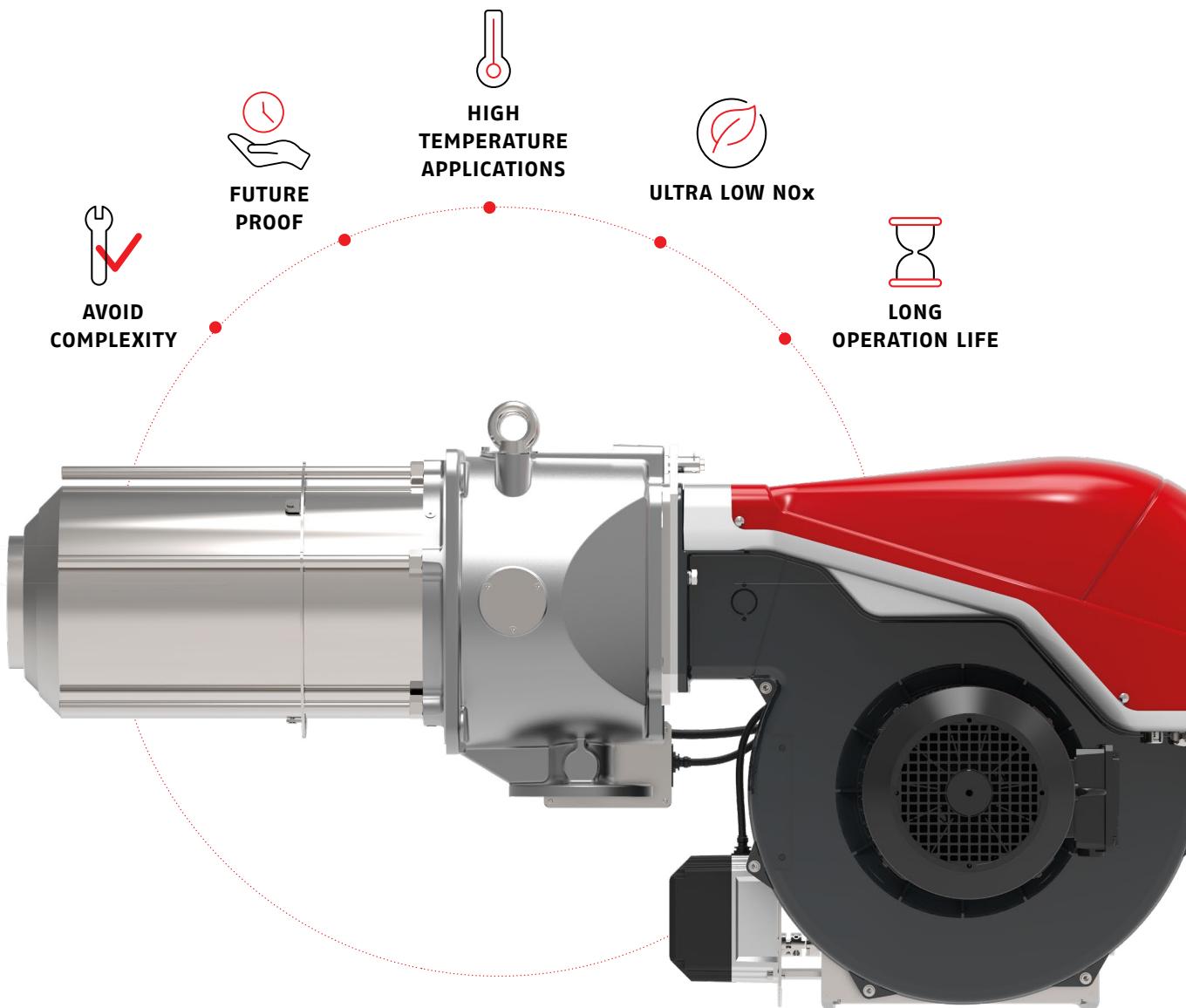
ULX operates on the control of the fuel supply and flues that are generated by the combustion process, thus making them suitable for reaching very low emission limits also in applications with high temperature in the combustion chamber (e.g. steam and superheated water boilers).

**ULX technology allows to obtain NOx emissions lower than 40 mg/Nm<sup>3</sup>@3% O<sub>2</sub>, without any need of FGR system, with proper combustion chamber dimensions;**



The new ULX combustion head is based on the gas staging and the internal recirculation of exhaust gas, therefore achieving NOx reduction. This new combustion head is characterized by recognized RIELLO robustness and reliability.

An integrated **Digital Burner Management System**, through the action of independent servomotors, allows the control of air and fuel proportion in every working point, in order to reach very low NOx emissions, high reliability, great stability of the flame and safety of operation.



## ADVANTAGES

- > The ULX burners, approved with the lowest European emission class (Class 4 EN 676), can reach very low NOx levels, helping to comply also with strict regulations.
- > The Ultra Low NOx performance obtained with ULX technology helps to reach outstanding emission reduction also in high temperature combustion chambers (e.g. steam boilers or superheated water boiler), without any need of external flue recirculation (FGR) system.
- > ULX technology simplifies the management of Ultra Low NOx burners as it does not introduce complexity but helps to ensure simple installation, operation and maintenance as in traditional diffusive flame burners.

## ULTRA LOW NOx INNOVATION IN BURNER TECHNOLOGY: REDUCED EMISSION IN ALL APPLICATIONS

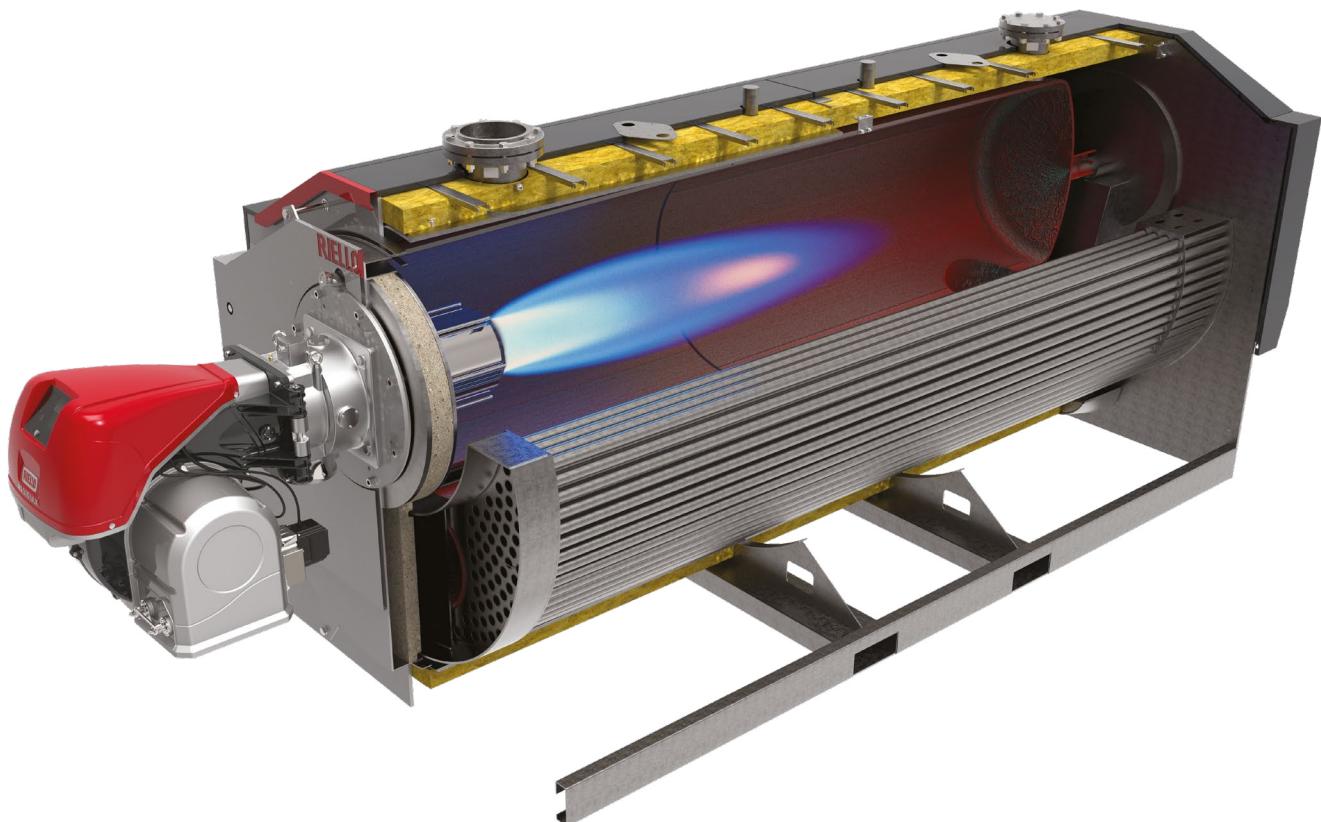
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**ULX MONOBLOC GAS BURNERS ALLOW TO SATISFY VERY LOW NOx EMISSIONS EVEN IN APPLICATIONS WITH HIGH TEMPERATURE COMBUSTION CHAMBER**

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The advanced combustion technology ULX patented by RIELLO delivers consistent heat and Ultra Low NOx emission level even in harsh conditions. This helps ULX burners to meet the Medium Combustion Plant Directive (MCPD) requirements and local requirements when coupled with hot water boilers but also in high temperature conditions like steam or diathermic oil boilers.

The new burner family RS 68÷810 ULX has been rigorously tested and certified to meet industry standards, helping to ensure safe and reliable operation. The traditional design of the burner makes it easy to install, and the tested durability make it a excellent solution for all commercial and industrial applications.



# ULTRA LOW NOx GAS MONOBLOCK BURNERS

## RS 68÷810/E-EV ULX SERIES

Thanks to many years of experience in the design and manufacture of burners, RIELLO has developed a new range of high power burners, the New RS ULX Series, based on ULX (Internal Gas Recirculation) low emission technology, suitable to achieve very Low NOx emission performance. With proper combustion chamber dimension and the support of a RIELLO technician this burner series is capable to reach an emission limit of 30 mg/Nm<sup>3</sup> @3,5%O<sub>2</sub>, without any need of FGR system.

The RS/E ULX burners series operation uses a new combustion technology patented by RIELLO that provides excellent performance of Low NOx emission, capable to meet also strict regulations. **An integrated Digital Burner Management System, manages the air-fuel ratio by independent servomotors in order to obtain a an excellent output control and to provide a correct low polluting combustion and a reliable operation on all modulation ranges.**

The new RS/E ULX range combines exceptional Ultra Low NOx combustion performance to the consolidated features of robustness and reliability of the RS series.

**The monoblock configuration helps having all the components integrated in a compact size**, in order to facilitate and make the installation and maintenance extremely easy.

### FEATURES AND ADVANTAGES

- **Ultra Low NOx emission performance**, lower than 40 mg/Nm<sup>3</sup> @ 3% O<sub>2</sub>, without any need of FGR system, with proper combustion chamber dimensions
- Extremely Low NOx level also in **high temperature combustion chamber**
- Patented **new low NOx combustion head**
- **High reliability** of operation and ignition
- Installation, operation and maintenance in line with **standard diffusive flame burners**
- Suitable for **retrofit and first equipment**
- **Long operating life**

### RANGE RS/E-EV ULX

BURNER MODEL	OUTPUT
RS 68/E-EV ULX	150/350-1050 kW
RS 120/E-EV ULX	200/610-1400 kW
RS 160/E-EV ULX	290/950-1950 kW
RS 200/E-EV ULX	375/1360-2400 kW
RS 310/E-EV ULX	370/1250-3700 kW
RS 510/E-EV ULX	570/1900-4600 kW
RS 610/E-EV ULX	750/2080-6000 kW
RS 810/E-EV ULX	970/3350-8100 kW

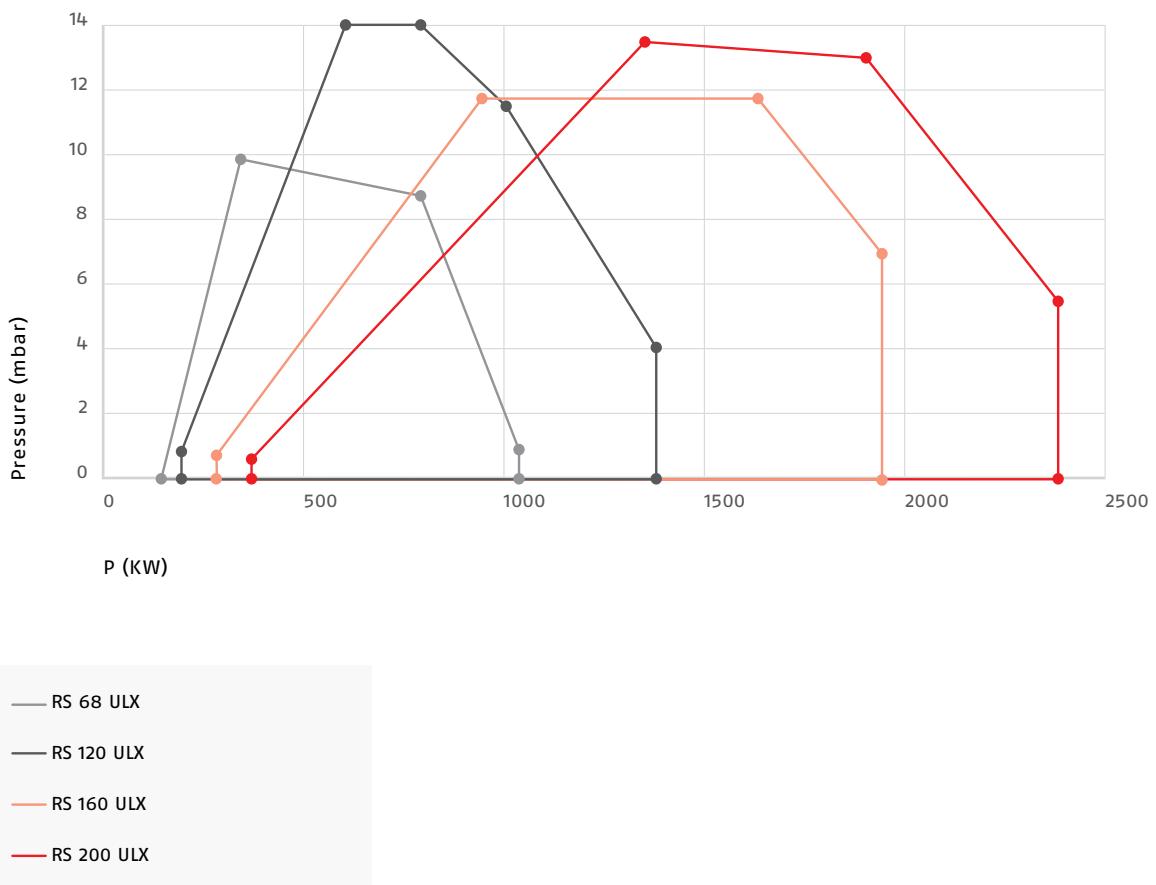
Remark: the above output ranges are laboratory test data and the actual output may vary due to NOx emissions required.



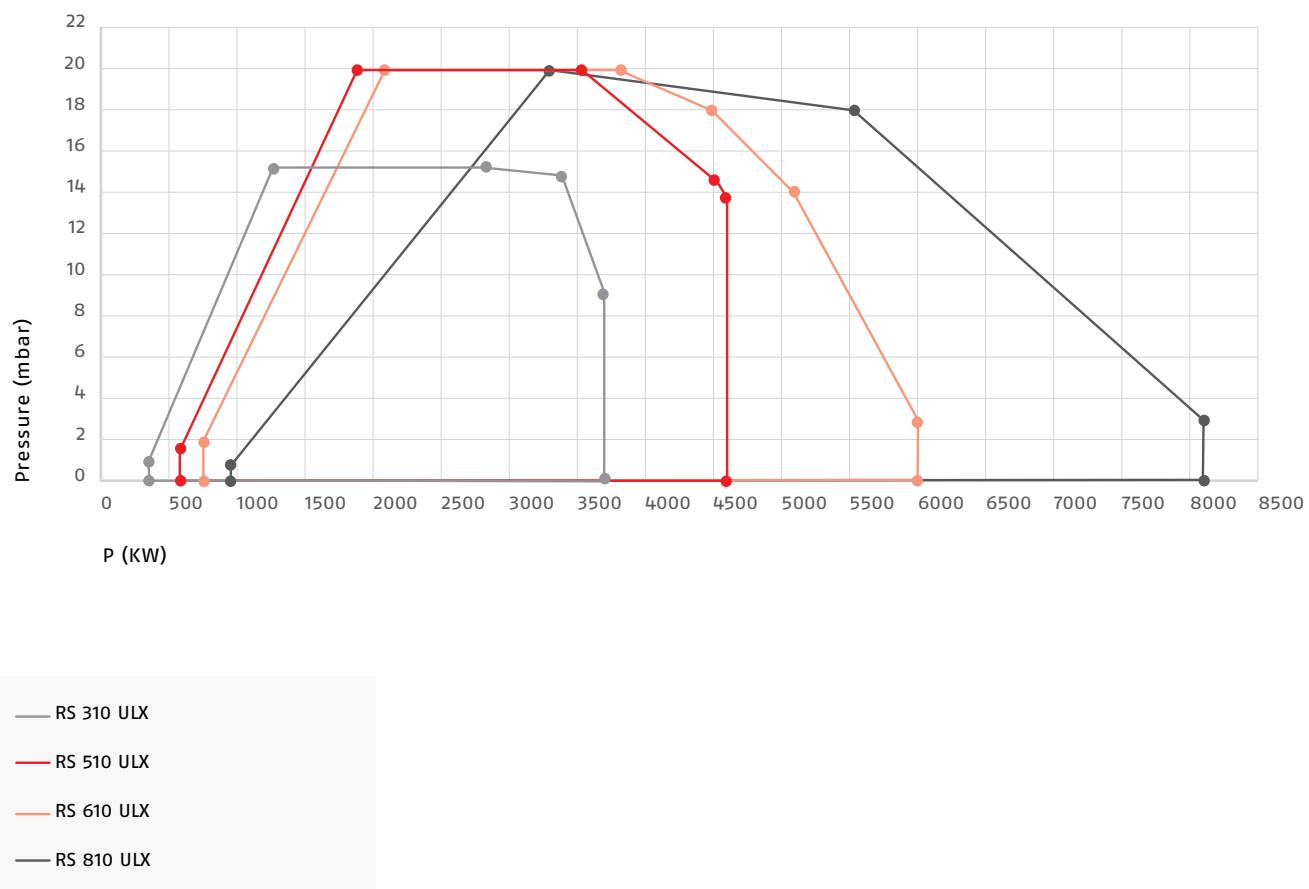
## FIRING RATES

The shown firing rates are referred to a Ultra Low NOx performance of 60 mg/kWh NOx @3% O<sub>2</sub> (class 4 EN 676), obtained without external Flue Gas Recirculation, in special test boilers with diameter of combustion chamber conforming to the EN 676 homologation standard.

In specific applications and with support of a RIELLO technician it is possible to reach NOx emission lower than class 4 EN 676.



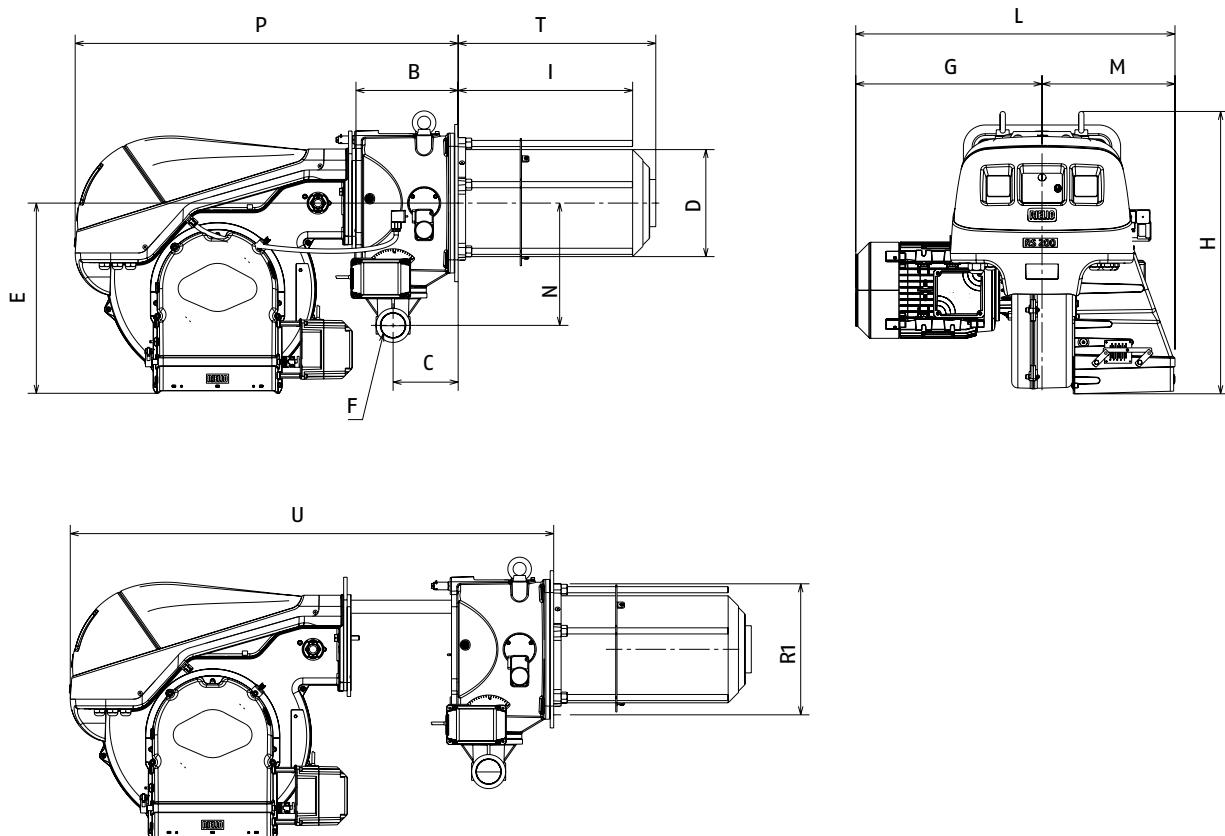
Test conditions conforming to EN 676 Standard. Temperature: 20°C | Pressure: 1013,5 mbar | Altitude: 0 m a.s.l.



Test conditions conforming to EN 676 Standard. Temperature: 20°C | Pressure: 1013,5 mbar | Altitude: 0 m a.s.l.

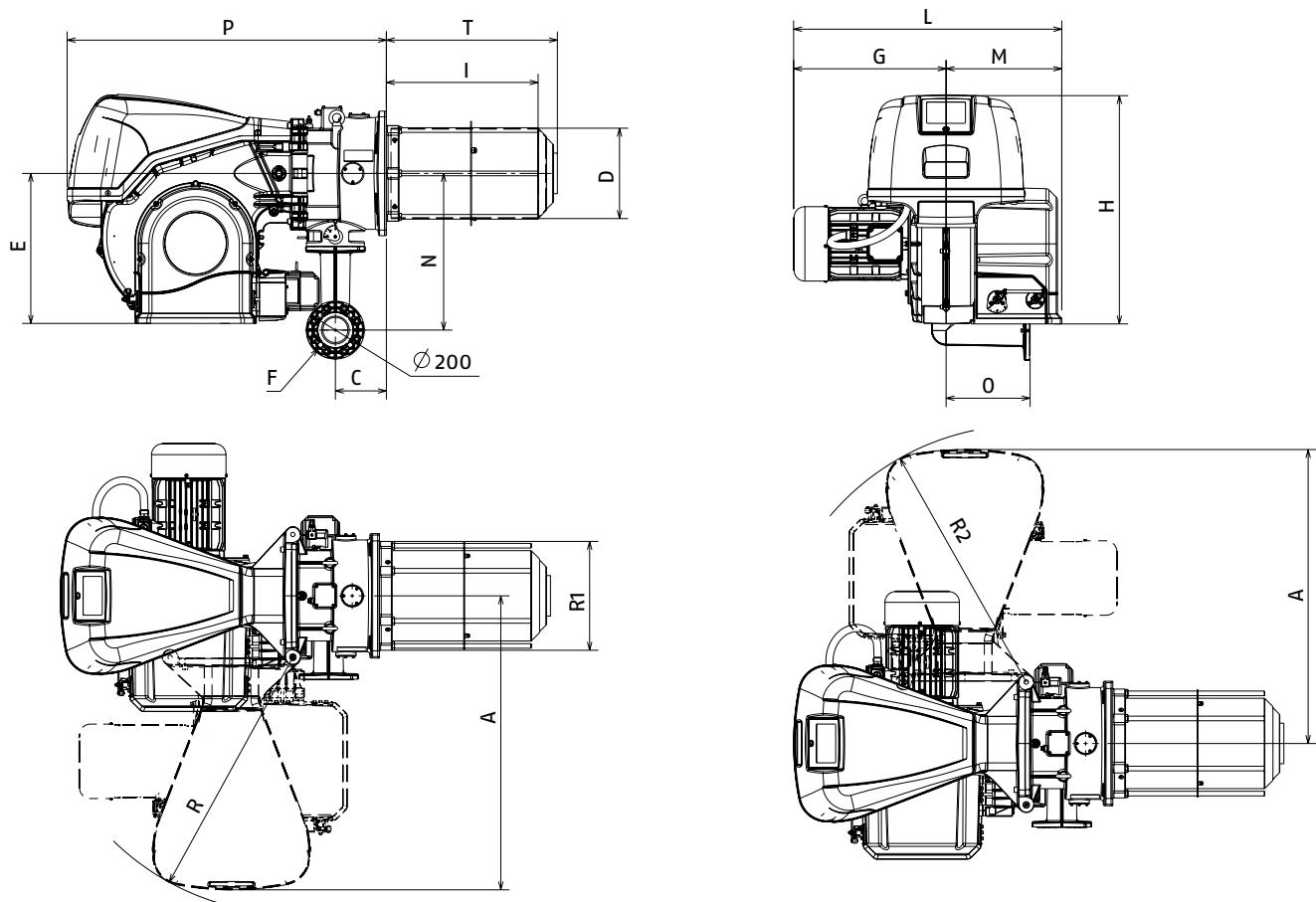
## OVERALL DIMENSIONS (mm)

### BURNER



BURNER MODEL	B	C	D	E	F	G	H	I	L	M	N	P	R1	T	U
RS 68/E ULX	234	149	189	425	2"	303	607	330	539	236	260	861	240	374	1245
RS 120/E ULX	234	149	189	425	2"	329	607	330	565	236	260	861	240	374	1245
RS 160/E ULX	234	149	245	436	2"	427	646	400	732	305	280	877	300	453	1446
RS 200/E ULX	234	149	245	436	2"	427	646	400	732	305	280	877	300	453	1446

BURNER MODEL	B	C	D	E	F	G	H	I	L	M	N	P	R1	T	U
RS 68/EV ULX	234	149	189	425	2"	303	607	330	539	236	260	861	240	374	1245
RS 120/EV ULX	234	149	189	425	2"	329	607	330	565	236	260	861	240	374	1245
RS 160/EV ULX	234	149	245	436	2"	427	646	400	732	305	280	877	300	453	1446
RS 200/EV ULX	234	149	245	436	2"	427	646	400	732	305	280	877	300	453	1446

**BURNER**

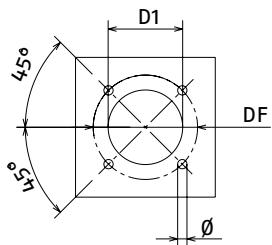
BURNER MODEL	A	C	D	E	F*	G	H	I	L	M	N	O	P	R	R1	R2	T
RS 310/E ULX	1015	176	312	518	DN65	480	790	525	880	400	541	290	1104	886	376	886	590
RS 510/E ULX	1015	176	312	518	DN65	527	790	525	927	400	541	290	1104	886	376	886	590
RS 610/E ULX	1015	181	344	518	DN65	580	790	533	980	400	597	290	1160	886	460	886	620
RS 810/E ULX	1200	181	379	537	DN65	575	890	530	990	415	597	290	1345	1055	460	1055	620

BURNER MODEL	A	C	D	E	F*	G	H	I	L	M	N	O	P	R	R1	R2	T
RS 310/EV 02 ULX	1015	176	312	518	DN65	511	790	525	911	400	541	290	1186	966	376	966	590
RS 510/EV 02 ULX	1015	176	312	518	DN65	559	790	525	959	400	541	290	1186	966	376	966	590
RS 610/EV 02 ULX	1015	181	344	518	DN65	610	790	533	1010	400	597	290	1250	966	460	966	620
RS 810/EV 02 ULX	1200	181	379	537	DN65	605	890	530	1020	415	597	290	1435	1135	460	1135	620

\* The gas adapter is also suitable for DN 80 drilling.

## OVERALL DIMENSIONS (mm)

### BOILER MOUNTING FLANGE

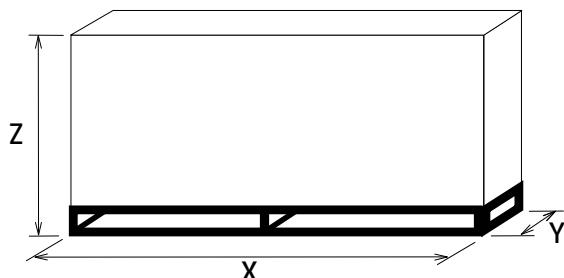


COD 20149117

BURNER MODEL	D1	DF	Ø
RS 68/E-EV ULX	260	325	M16
RS 120/E-EV ULX	260	325	M16
RS 160/E-EV ULX	320	368	M16
RS 200/E-EV ULX	320	368	M16

BURNER MODEL	D1	DF	Ø
RS 310/E-EV ULX	390	452	M18
RS 510/E-EV ULX	390	452	M18
RS 610/E-EV ULX	480	608	M18
RS 810/E-EV ULX	480	608	M18

### PACKAGING



COD 20158479

BURNER MODEL	X	Y	Z	Kg
RS 68/E-EV ULX	1400	700	810	90
RS 120/E-EV ULX	1400	700	810	100
RS 160/E-EV ULX	1500	1000	810	130
RS 200/E-EV ULX	1500	1000	810	130

BURNER MODEL	X	Y	Z	Kg
RS 310/E-EV ULX	2040	1180	1150	250
RS 510/E-EV ULX	2040	1180	1150	250
RS 610/E-EV ULX	2040	1180	1150	280
RS 810/E-EV ULX	2040	1180	1150	360

# SPECIFICATION

## STATE OF SUPPLY

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Monoblock forced draught, Ultra Low NOx gas burner, with modulating operation, fully automatic, made up of:

- High performance fan with low noise emissions
- Air damper for air setting controlled by a high precision servomotor
- Air pressure switch
- Three-phase Fan starting motor
- Ultra Low emission combustion head, that can be set on the basis of required output, fitted with:
  - stainless steel end cone, resistant to corrosion and high temperatures
  - flame stability disk
- Automatic regulator for gas delivery, controlled by a high precision servomotor
- Maximum gas pressure switch, with pressure test point, to stop the burner in case of excess pressure on
- Fuel supply line
- Electronic Cam control
  - for air/fuel setting
  - with indication of operating status and parameters, error messages and diagnosis of fault causes
- Operator panel with LCD Display Interface, for combustion system commissioning and monitoring
- Burner safety control included on Electronic Cam device
- Ionization probe for flame detection
- Main electrical supply terminal board
- Burner on/off switch
- Manual or automatic output increase/decrease by operator panel
- Contacts motor and protection thermal relay with release button
- Clean contacts relay
- Burner failure led signal and lighted release button
- Runners for opening the burner and inspecting the combustion head (RS 68 ÷ 200/E-EV ULX)
- Hinge for opening the burner and inspecting the combustion head (RS 310 ÷ 810/E-EV ULX)
- Lifting rings

## > STANDARD EQUIPMENT:

- Thermal insulation screen
- Screws to fix the burner flange to the boiler
- Screws to fix the gas train flange
- Gas train flange
- Gasket for gas train flange
- Spare parts catalogue
- Instruction handbook for installation, use and maintenance

## AVAILABLE MODELS BURNERS

MODEL	HEAT OUTPUT NATURAL GAS		TOTAL ELECTRICAL POWER	MOTOR ELECTRICAL POWER	NOTE
	kW	Nm <sup>3</sup> /h			
RS 68/E ULX	150/350-1050	15/35-105	2,1	1,5	(1)(2)
RS 120/E ULX	200/610-1400	20/61-140	2,9	2,2	(1)(2)
RS 160/E ULX	290/950-1950	29/95-195	5,5	4,5	(1)(2)
RS 200/E ULX	375/1360-2400	38/136-240	6,5	5,5	(1)(2)
RS 310/E ULX	370/1250-3700	37/125-370	9,1	7,5	(1)(2)
RS 510/E ULX	570/1900-4600	57/190-460	14	12	(1)(3)
RS 610/E ULX	750/2080-6000	75/208-600	17	15	(1)(3)
RS 810/E ULX	570/1900-4600	57/190-460	22	12	(1)(3)
RS 68/E 02 ULX	150/350-1050	15/35-105	2,1	1,5	(1)(2)
RS 120/E 02 ULX	200/610-1400	20/61-140	2,9	2,2	(1)(2)
RS 160/E 02 ULX	290/950-1950	29/95-195	5,5	4,5	(1)(2)
RS 200/E 02 ULX	375/1360-2400	38/136-240	6,5	5,5	(1)(2)
RS 310/E 02 ULX	370/1250-3700	37/125-370	9,1	7,5	(1)(2)
RS 510/E 02 ULX	570/1900-4600	57/190-460	14	12	(1)(3)
RS 610/E 02 ULX	750/2080-6000	75/208-600	17	15	(1)(3)
RS 810/E 02 ULX	570/1900-4600	57/190-460	22	12	(1)(3)
RS 68/EV ULX	150/350-1050	15/35-105	2,1	1,5	(1)(2)
RS 120/EV ULX	200/610-1400	20/61-140	2,9	2,2	(1)(2)
RS 160/EV ULX	290/950-1950	29/95-195	5,5	4,5	(1)(2)
RS 200/EV ULX	375/1360-2400	38/136-240	6,5	5,5	(1)(2)
RS 310/EV ULX	370/1250-3700	37/125-370	9,1	7,5	(1)(2)
RS 510/EV ULX	570/1900-4600	57/190-460	14	12	(1)(3)
RS 610/EV ULX	750/2080-6000	75/208-600	17	15	(1)(3)
RS 810/EV ULX	570/1900-4600	57/190-460	22	12	(1)(3)
RS 68/EV 02 ULX	150/350-1050	15/35-105	2,1	1,5	(1)(2)
RS 120/EV 02 ULX	200/610-1400	20/61-140	2,9	2,2	(1)(2)
RS 160/EV 02 ULX	290/950-1950	29/95-195	5,5	4,5	(1)(2)
RS 200/EV 02 ULX	375/1360-2400	38/136-240	6,5	5,5	(1)(2)
RS 310/EV 02 ULX	370/1250-3700	37/125-370	9,1	7,5	(1)(2)
RS 510/EV 02 ULX	570/1900-4600	57/190-460	14	12	(1)(3)
RS 610/EV 02 ULX	750/2080-6000	75/208-600	17	15	(1)(3)
RS 810/EV 02 ULX	570/1900-4600	57/190-460	22	12	(1)(3)

(1) Power range referred to a Low NOx performance conforming to class 4 EN 676

(2) Direct starter fan motor

(3) Star delta fan motor starter

REMARK: THE ABOVE OUTPUT RANGES ARE LABORATORY TEST DATA AND THE ACTUAL OUTPUT MAY VARY DUE TO NOx EMISSIONS OR TYPE OF APPLICATION.

For more information, please contact RIELLO Burners Commercial and Technical Department, our Application Engineers will be pleased to help you.

## ACCESSORIES BURNERS

### CONTINUOUS VENTILATION KIT



If the burner requires continuous ventilation in the stages without flame, a special kit is available as given in the following table.

BURNER	KIT CODE
RS 68-200/E-EV ULX	3010094
RS 310-810/E-EV ULX	20074542

Note: the Post-ventilation function is obtainable by modification of the Digital Burner Management System parameters (see burner instruction manual).

### ACCESSORIES FOR MODULATING OPERATION



To obtain modulating operation, RS/E ULX burners equipped with REC27 and RS/EV ULX burners equipped with REC37 control box require a regulator with three point outlet controls. The following table lists the accessories for modulating operation with their application range.

For remote setpoint use RWF 55.

BURNER	REGULATOR TYPE	REGULATOR CODE
RS 68-120-200/E ULX	RWF 50.2 Basic version with 3 position output	20099869
	RWF 55.5 Complete with RS-485 interface	20099905
RS 310-810/E ULX	RWF 50.2 Basic version with 3 position output	20085417
	RWF 55.5 Complete with RS-485 interface	20074441
	RWF 55.6 Complete with RS-485/ PROFIBUS interface	20074442

The relative temperature or pressure probes fitted to the regulator, must be chosen on the basis of the application.



BURNER	PROBE TYPE	RANGE	PROBE CODE
All models	Temperature PT 100	-100 ÷ 500°C	3010110
	Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
	Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214
	Pressure 4 ÷ 20 mA	0 ÷ 25 bar	3090873

### PC INTERFACE KIT

To connect the control box to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software are available.



BURNER	KIT CODE
All models equipped with REC 27 control box	3010436

### VARIABLE SPEED DRIVE (VSD) FOR RS/EV SERIES ONLY



The motor speed variation for the RS/EV ULX burners series is obtained thanks to a frequency converter: variable speed drive (VSD), provided with a programming panel with start-up assistant. It always must be ordered with RS/EV series.

BURNER	MAX POWER (kW)	KIT CODE
RS 68/EV ULX	1,5	20163060
RS 120/EV ULX	3,0	20163064
RS 160/EV – 200/EV ULX	5,5	20163071
RS 310/EV ULX	7,5	20163074
RS 510/EV ULX – RS 610/EV ULX	15	20163096
RS 810/EV ULX	22	20163099

### SOUND PROOFING BOX



If noise emission needs reducing even further, sound-proofing boxes are available. The sound-proofing boxes are not suitable for outdoor use.

BURNER	TYPE	dB(A)	CODE
RS 68-200/E-EV ULX	C4/5	10	3010404
RS 310-610/E-EV ULX	C7	10	3010376
RS 810/E-EV ULX	C7	10	20177776

### OXYGEN CONTROL KIT [QG02] FOR RS/E-EV ULX BURNERS WITH LMV52 CONTROL BOX



The QG02 is an oxygen analizer with relevant probe which controls and supervises the residual oxygen content in exhaust gases.

BURNER	KIT CODE
All models equipped with LMV 52 control box	20045187*

An additional transformer kit is needed to provide the power supply to the PLL device in case of installation where the distance between the last servomotor and the PLL kit is greater than 20 meters. Please contact RIELLO Burners Commercial and Technical Department, our Application Engineers will be pleased to help you.

\* Installations outside the burner cover

**EFFICIENCY KIT WITH OXYGEN CONTROL**

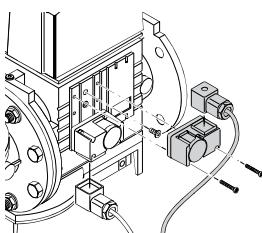
The kit includes two temperature sensors: one for air and one for exhaust gas detection. They must be wired to oxygen control kit interface to allow the LMV 52 efficiency calculation. The value is showed on AZL display.

BURNER	KIT CODE
All models equipped with LMV 52 control box	3010377

**MODBUS INTERFACE KIT**

Interface kit between the REC27-37 and a Modbus system, such as a building automation and control system (BACS).  
The Modbus interface is based on the RS-485 standard.

BURNER	KIT CODE
All models equipped with REC 27/37 control box	3010437

**PVP (PRESSURE VALVE PROVING KIT)**

The seal control function is included on Burner Digital Management System, it is only necessary to add the PVP kit on the gas train.

BURNER	GAS TRAIN	KIT CODE
ALL MODELS	VGD	3010344

## RIELLO ENERGY FOR A HEALTHY LIFE

### LOW EMISSIONS AND ENERGY-SAVINGS

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The attention to air quality is becoming more and more important all over the world due to the significant increase of air pollution occurred in recent years; RIELLO's particular attention to this important issue is found in the constant commitment to design and produce products that offer excellent performance, high energy efficiency and significant reductions in emissions of nitrogen oxides and, in general, of pollutants generated by combustion.

RIELLO daily focuses its energies to meet increasingly stringent requirements in terms of NOx emissions, harmful both for the environment and for human health.



**MORE THAN 100 YEARS EXPERIENCE**

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Each RIELLO burner is the result of a long experience in design and manufacture, coupled with leading technology and flexible burner design. RIELLO has always believed and invested in the search for new materials and in the development of more advanced combustion technology. The RS 68÷810/E-EV ULX SERIES, the new ULTRA LOW NOx GAS MONOBLOCK BURNER range, is part of the new generation of products combining high efficiency with very low NOx emissions.

**OUR PRESENCE**

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RIELLO, World Leader in the production of gas, oil, dual fuel and Low NOx burners (with capacity from 5 kW to 80 MW) deliver outstanding performance across the full range of residential and commercial heating applications, as well as in industrial processes.

The RIELLO Combustion Research Centre represents one of the most modern facilities in Europe and one of the most advanced in the world for the development of the combustion technology.

Today, the company's presence on worldwide markets is distinguished by a well-structured and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs.



With headquarters in Legnago (Northern Italy), RIELLO has been manufacturing premium quality burners for more than 100 years. The manufacturing plant is equipped with the most innovative systems of assembling lines and modern manufacturing cells for a quick and flexible response to the market.