RS 68÷1200/E-/EV O_2 Series (O_2 Control Ready)

Monoblock Low NOx Gas Burners
Modulating with LMV52 Electronic Cam

Product Overview

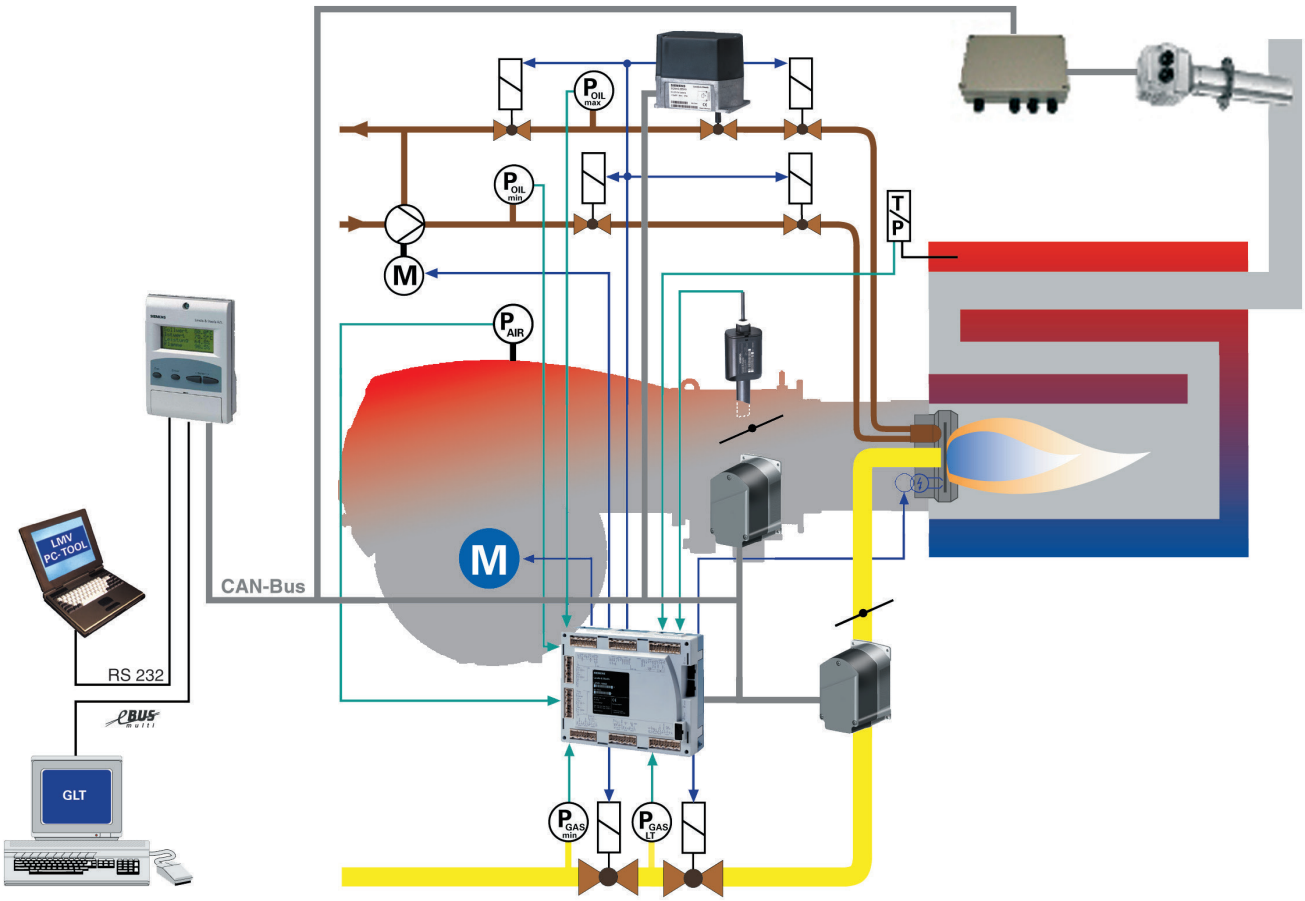
RIELLO
Energy For Life

O_2 Control Technology

The traditional combustion system aimed at the supply, dosage and correct mixing of the elements necessary for the combustion, obtained by means of mechanical devices, has deeply evolved thanks to the integration with electronic control elements. The state-of-the-art high-tech combustion systems allow the direct control of the combustion products and, through the detected oxygen content, actively act in order to maintain the combustion performances at optimal levels.

The burners equipped with combustion control systems have been initially supplied for the most complex and sophisticated plants, generally with high power applications, while they are now finding a greater and wider diffusion thanks to a growing sensitivity towards energy saving and the reduction of air polluting elements.

Thanks to the advanced combustion control systems equipped on RS/E-EV O_2 Riello burners, the combustion performances are monitored and maintained over time; energy savings and reduction of the air pollution are the primary targets. Moreover, these advanced systems are very flexible as they can be applied to various combustion systems, both within civil and industrial applications; futhermore, this burner series is suitable for the installation in existing installations, resulting in a considerable improvement and modernization of the system. Riello burners represent the ideal solution to fullfill any legislative obligations while simultaneously optimizing the efficiency of the combustion system.



Monoblock Low NOx Gas Burners
RS 68÷1200/E - /EV O_2 Series (O_2 Control Ready)

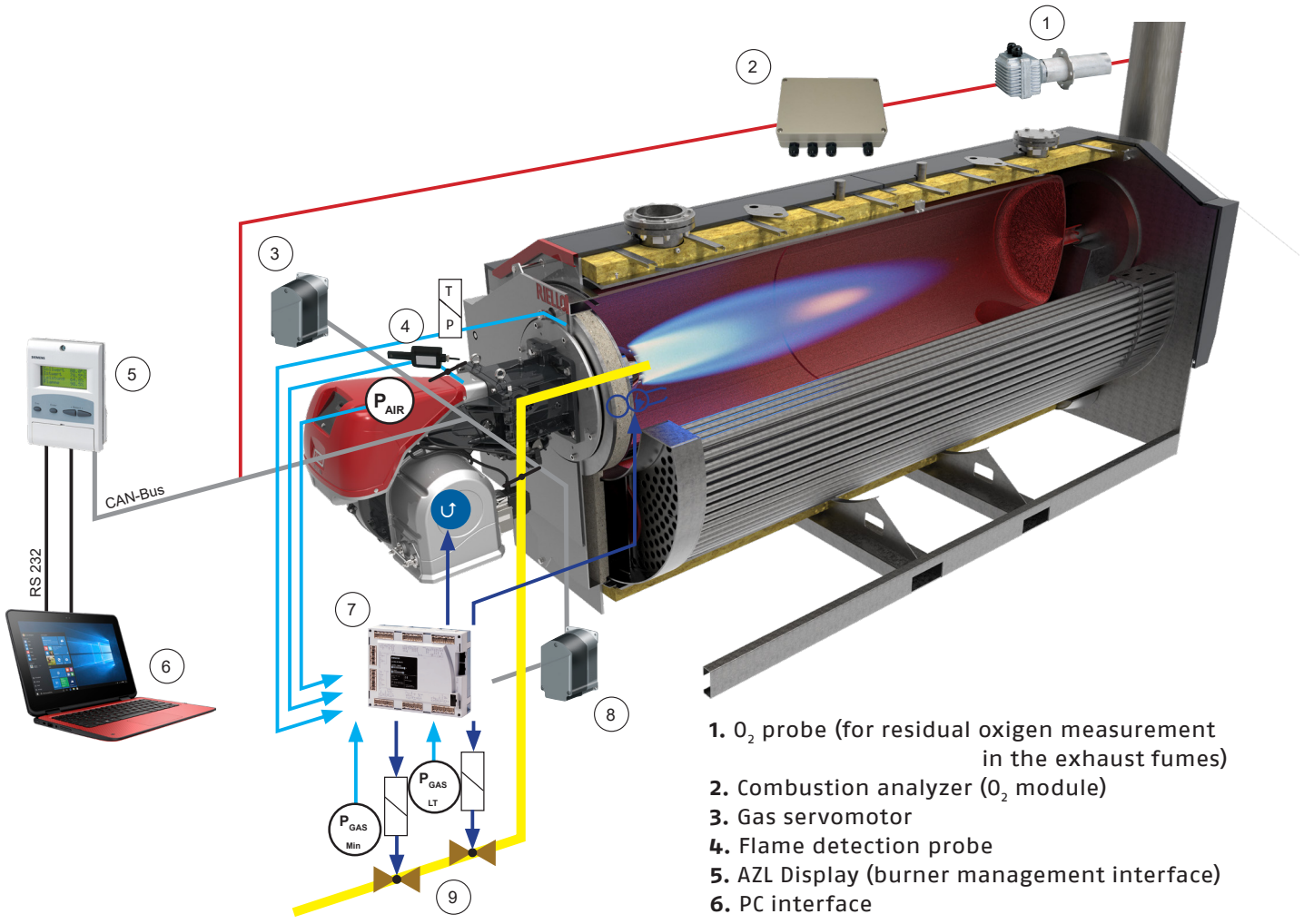
With many years of experience in the design and manufacture of burners, Riello has developed a new range of Commercial and Industrial products, the new RS 68÷1200/E-EV O_2 Series, capable to constantly optimize the combustion parameters based on the residual O_2 content in the exhaust fumes, while achieving Low NOx emission performances.

The RS 68÷1200/E-EV O_2 Series burner series operation is based on a Digital Burner Management System, which is able to manage the air-fuel ratio by independent servomotors in order to obtain a perfect output control and to assure a correct low polluting combustion and a safe operation on all modulation range. The philosophy of the combustion regulation based on the feedback of the O_2 probe is the continuous search for the optimal working point of the burner, which is maintained through constant surveillance.

High performance over time and reduced polluting emissions can thus be obtained by acting against the 'disturbing factors' which inevitably influence the composition of the comburent air / fuel mixture over time, such as, for example, changes in temperature and pressure of air and fuel, variation in the LCV of the fuel, variation of the pressure in the combustion chamber, mechanical hysteresis.

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

Burner with O_2 control: functional diagram

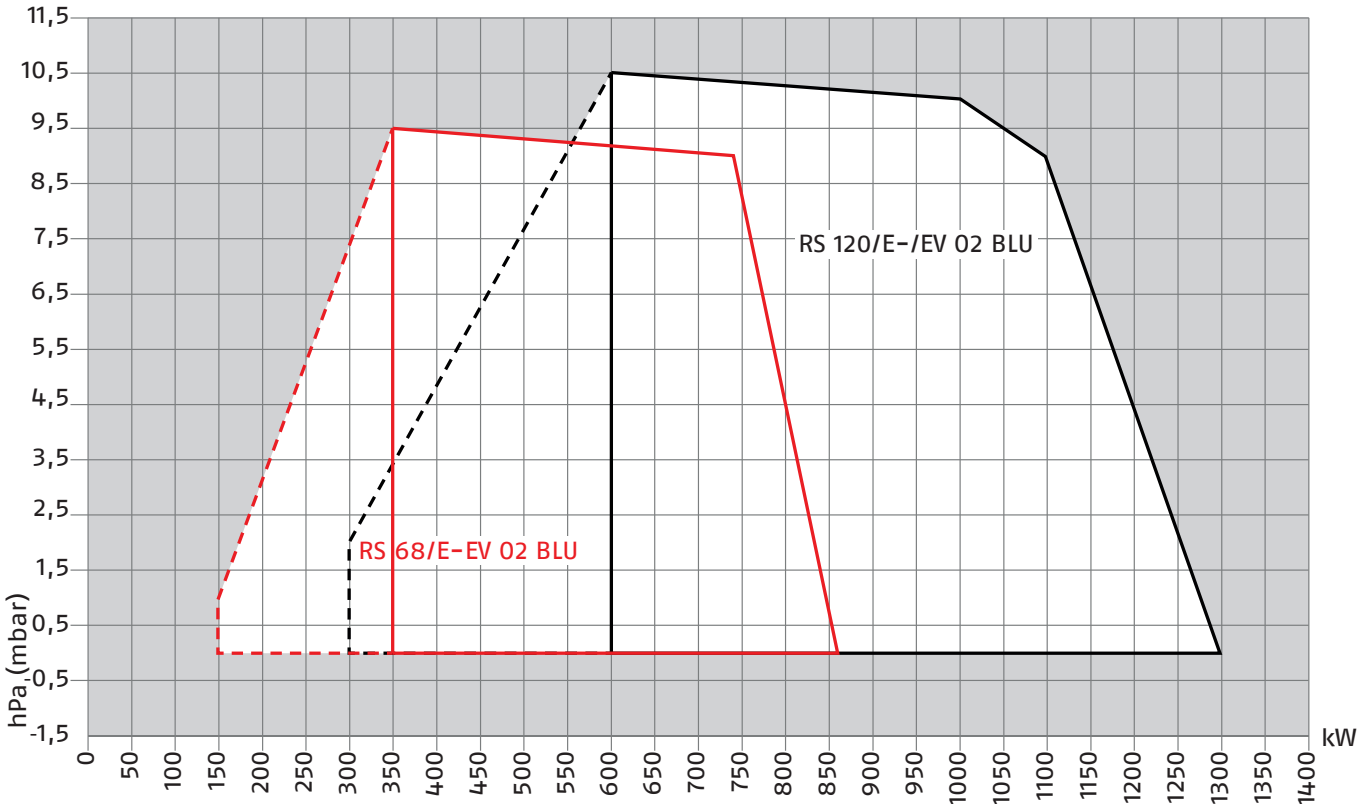


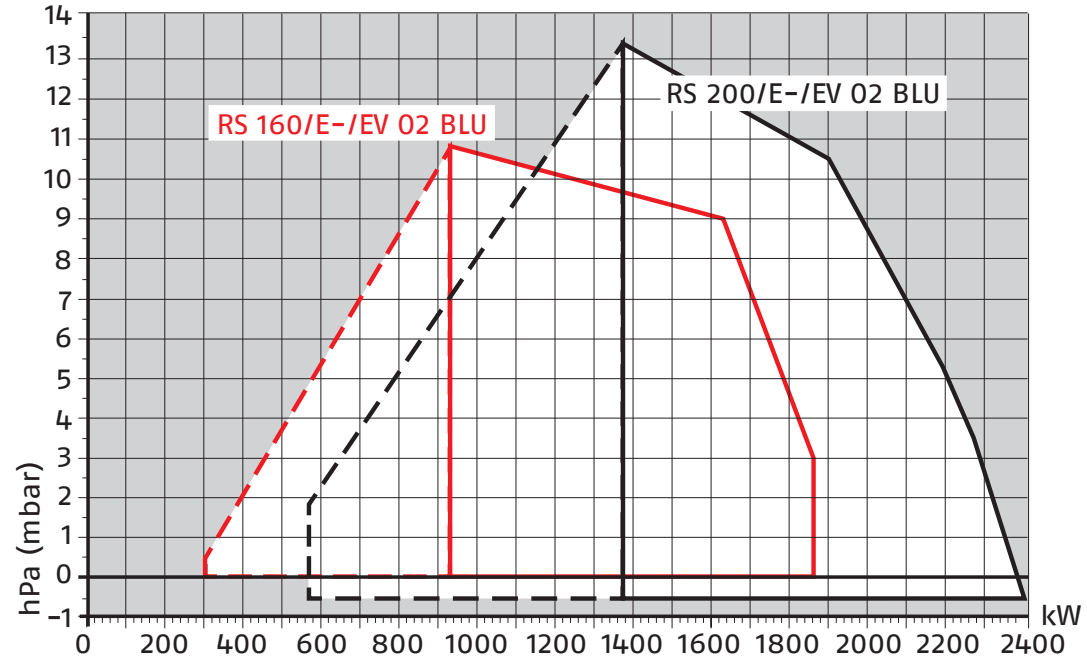
1. O_2 probe (for residual oxigen measurement in the exhaust fumes)
2. Combustion analyzer (O_2 module)
3. Gas servomotor
4. Flame detection probe
5. AZL Display (burner management interface)
6. PC interface
7. Electronic cam LMV 52
8. Air servomotor
9. Gas valves (included in gas train)

Burner Models

MODELS	OUTPUT RANGE [KW]		
RS 68/E-/EV O_2	150/350	÷	860
RS 120/E-/EV O_2	300/600	÷	1300
RS 160/E-/EV O_2	300/930	÷	1860
RS 200/E-/EV O_2	570/1375	÷	2400
RS 310/E-/EV O_2	400/1200	÷	3630
RS 410/E-/EV O_2	500/1500	÷	4450
RS 510/E-/EV O_2	680/1800	÷	5250
RS 610/E-/EV O_2	1000/2200	÷	6250
RS 810/E-/EV O_2	1200/3500	÷	8010
RS 1000/E-/EV O_2	1300/3800	÷	10100
RS 1200/E-/EV O_2	1500/5500	÷	11100

Firing Rates



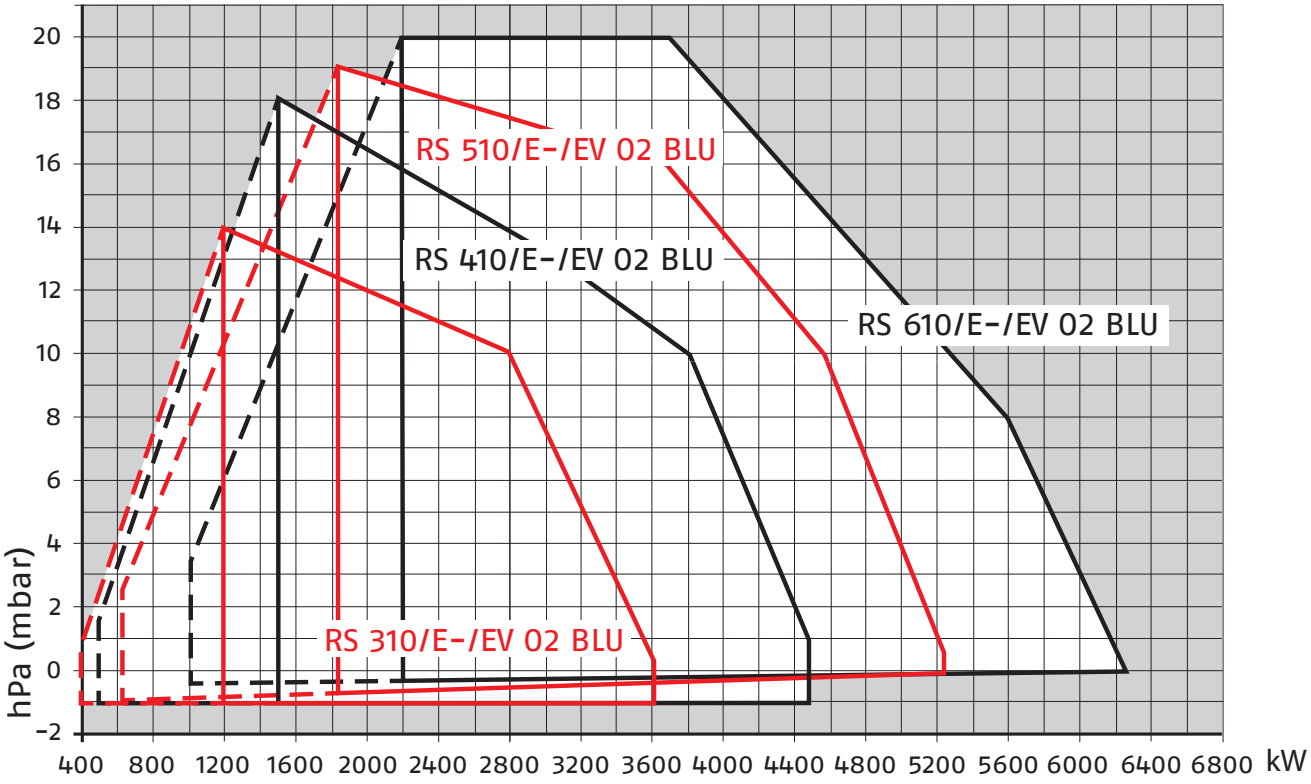


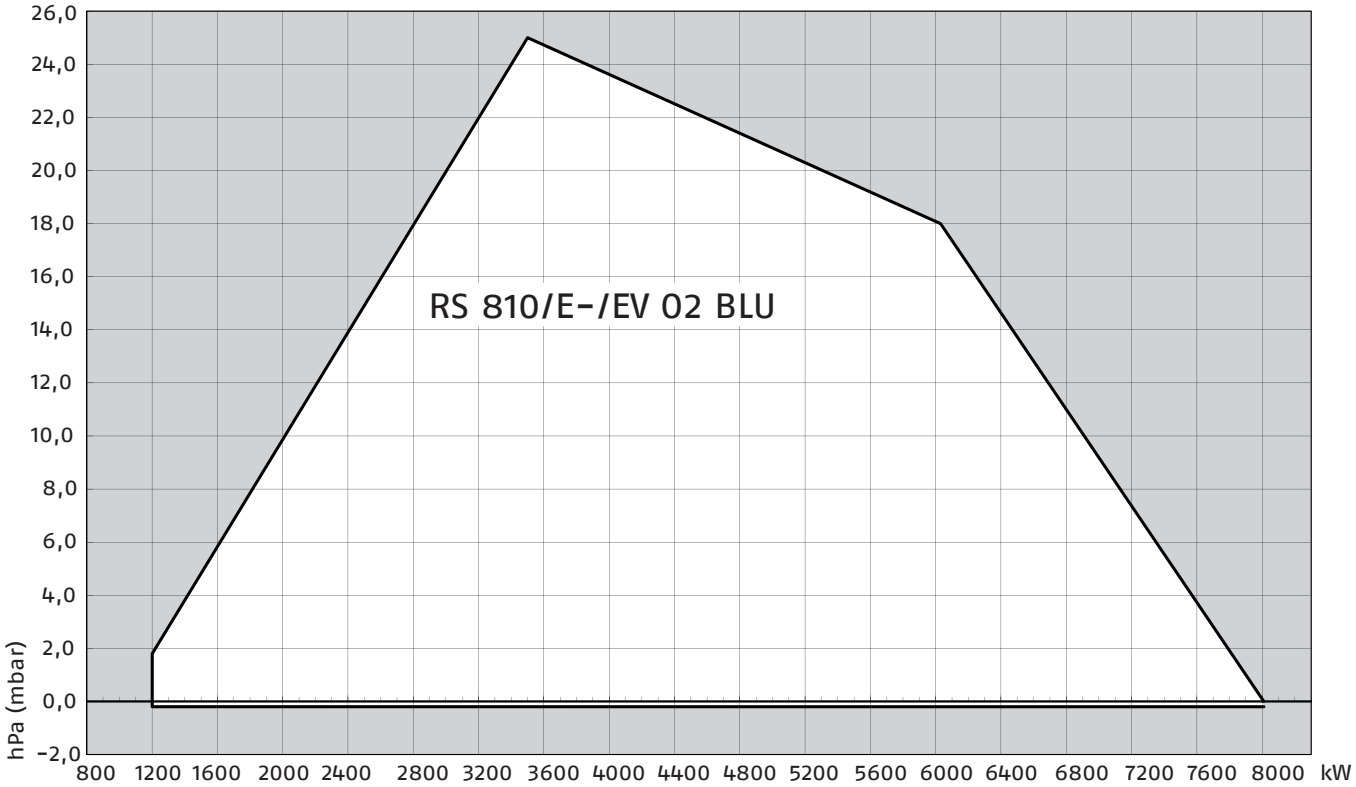
Useful working field for choosing the burner

Modulation range

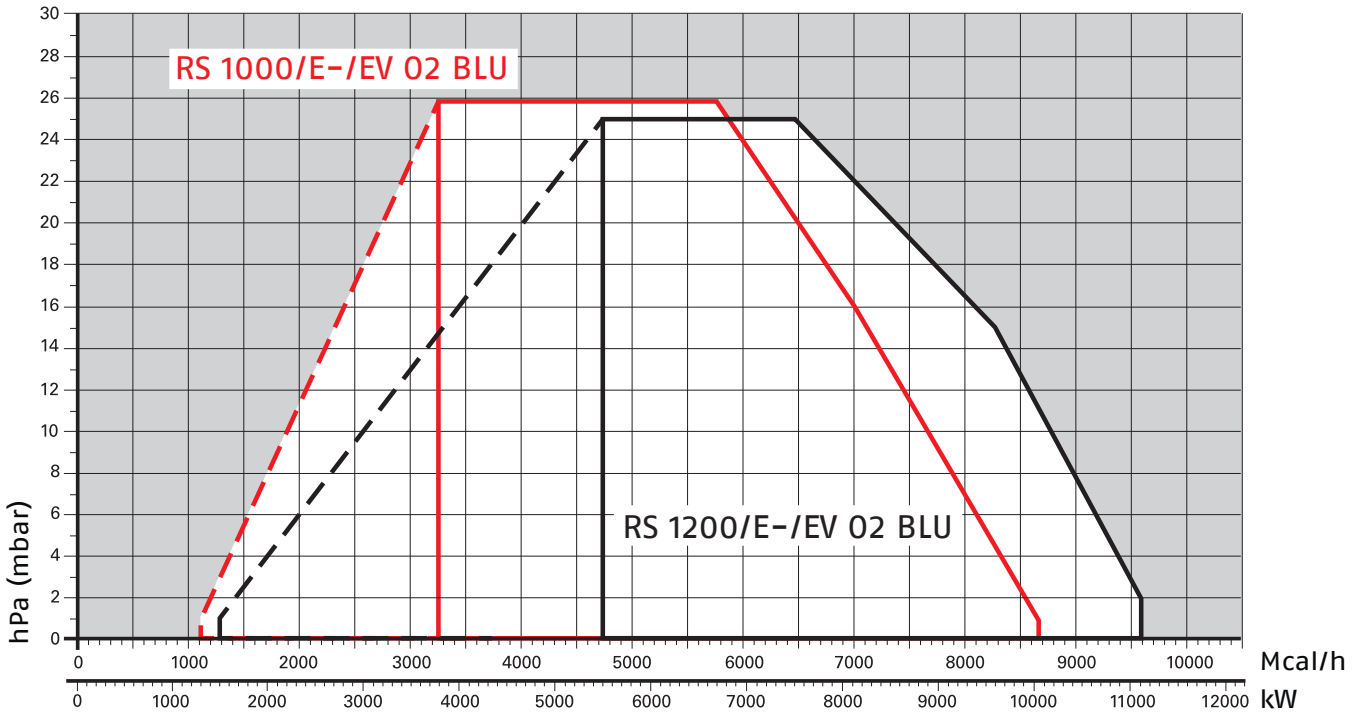
Test conditions conforming to EN676
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

Firing Rates





Firing Rates



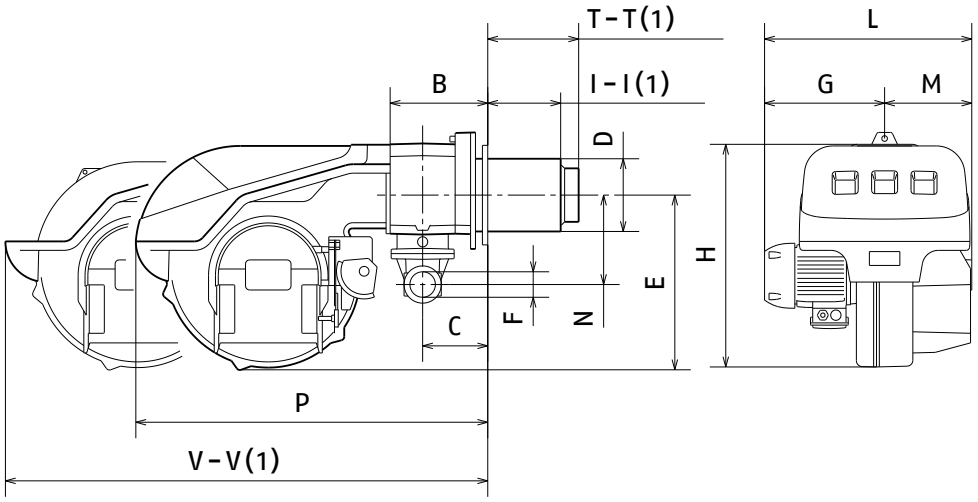
Useful working field for choosing the burner

Modulation range

Test conditions
conforming to EN676
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

Overall dimensions (mm)
Burner

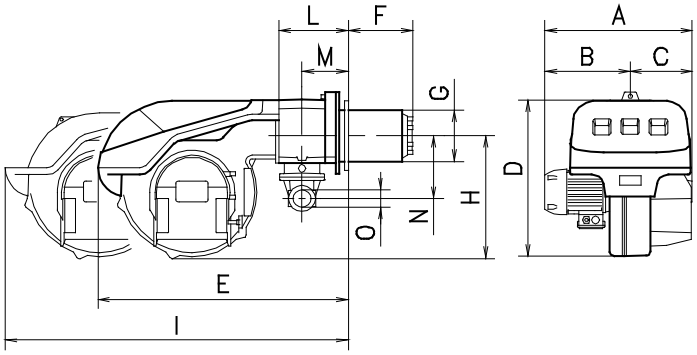
RS 68-120/E - /EV O_2 BLU



MODEL	B	C	D	E	F	G	H	I-I(1)	L	M	N	P	T-T(1)	V-V(1)
RS 68/E-EV	217	137	189	425	2"	305	640	200-335	575	270	221	1010	255-390	1350-1485
RS 120/E-EV	217	137	189	425	2"	330	640	200-335	600	270	221	1010	255-390	1350-1485

(1) Burner head length: short-long

RS 160-200/E - /EV O_2 BLU

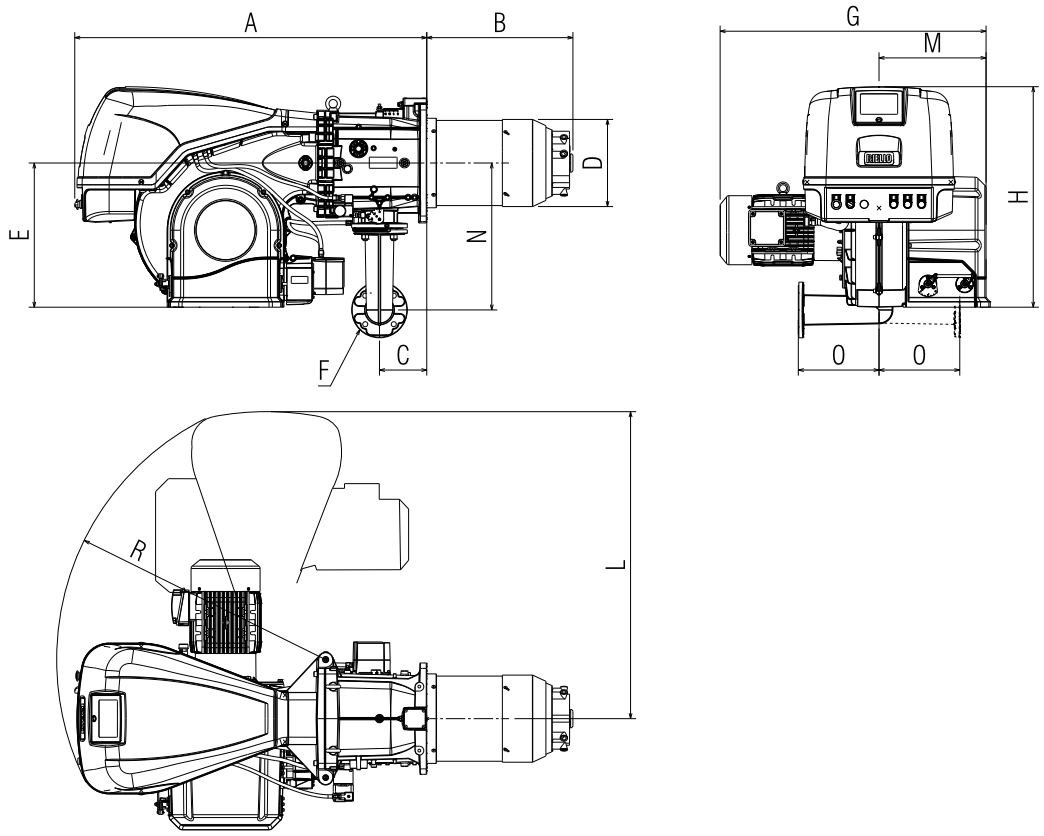


MODEL	A	B	C	D	E	F(1)	G	H	I	L	M	N	O
RS 160/E-EV	681	366	315	555	872	373-503	222	430	1442-1587	230	141	260	2"
RS 200/E-EV	732	427	315	555	872	373-503	222	430	1442-1587	230	141	260	2"

(1) Burner head length: short-long

Overall dimensions (mm)
Burner

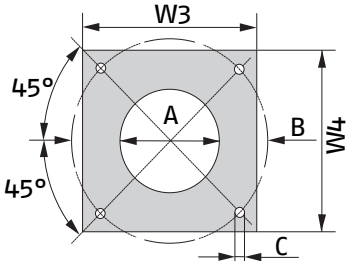
RS 310-410-510-610-810-610/E - /EV O_2 BLU



MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	R
RS 310/E-EV	1260	465	178	306	520	DN65	890	790	346	1090	400	528	290	966
RS 410/E-EV	1260	517	178	313	520	DN65	908	790	340	1090	400	528	290	966
RS 510/E-EV	1260	517	178	313	520	DN65	908	790	340	1090	400	528	290	966
RS 610/E-EV	1260	517	178	334	520	DN65	980	790	365	1090	400	528	290	966

Overall dimensions (mm)
Burner - Boiler Mounting Flange

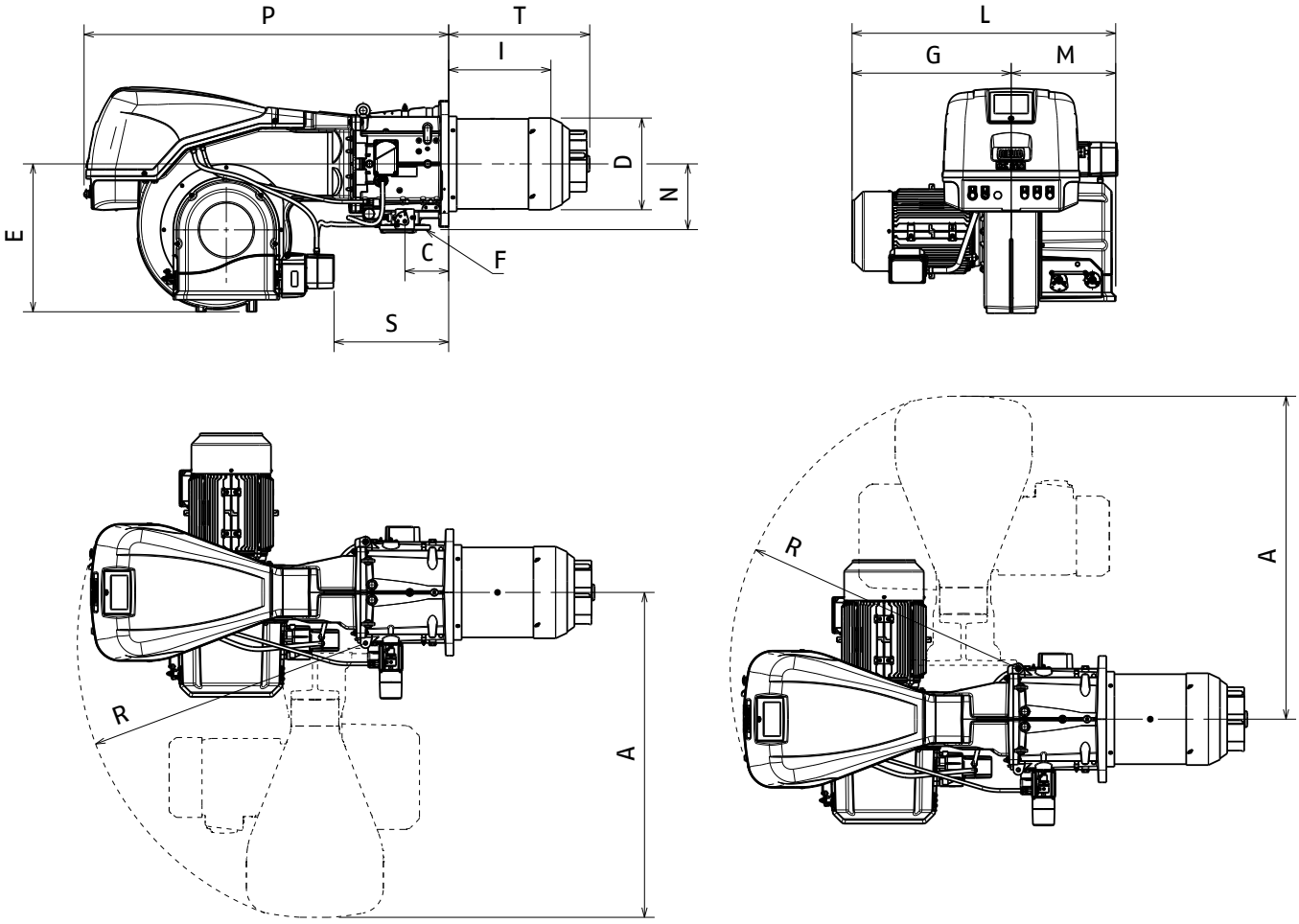
RS 68-120-160-200-310-410-510-610-810-610/E - /EV O_2 BLU



MODEL	A	B	C
RS 68/E-EV	195	275-325	M12
RS 120/E-EV	195	275-325	M12
RS 160/E-EV	230	325-368	M16
RS 200/E-EV	230	325-368	M16
RS 310/E-EV	335	452	M18
RS 410/E-EV	335	452	M18
RS 510/E-EV	335	452	M18
RS 610/E-EV	350	452	M18

Overall dimensions (mm)
Burner

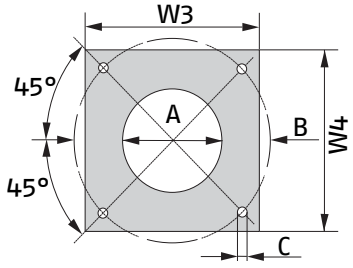
RS 810/E - /EV 0_2 BLU



MODEL	A	C	D	E	F	G	I	L	M	N	P	R	S	T
RS 810/E-EV	1285	173	363	585	DN80	577	405	990	413	260	1440	1140	452	558

Overall dimensions (mm)
Burner - Boiler Mounting Flange

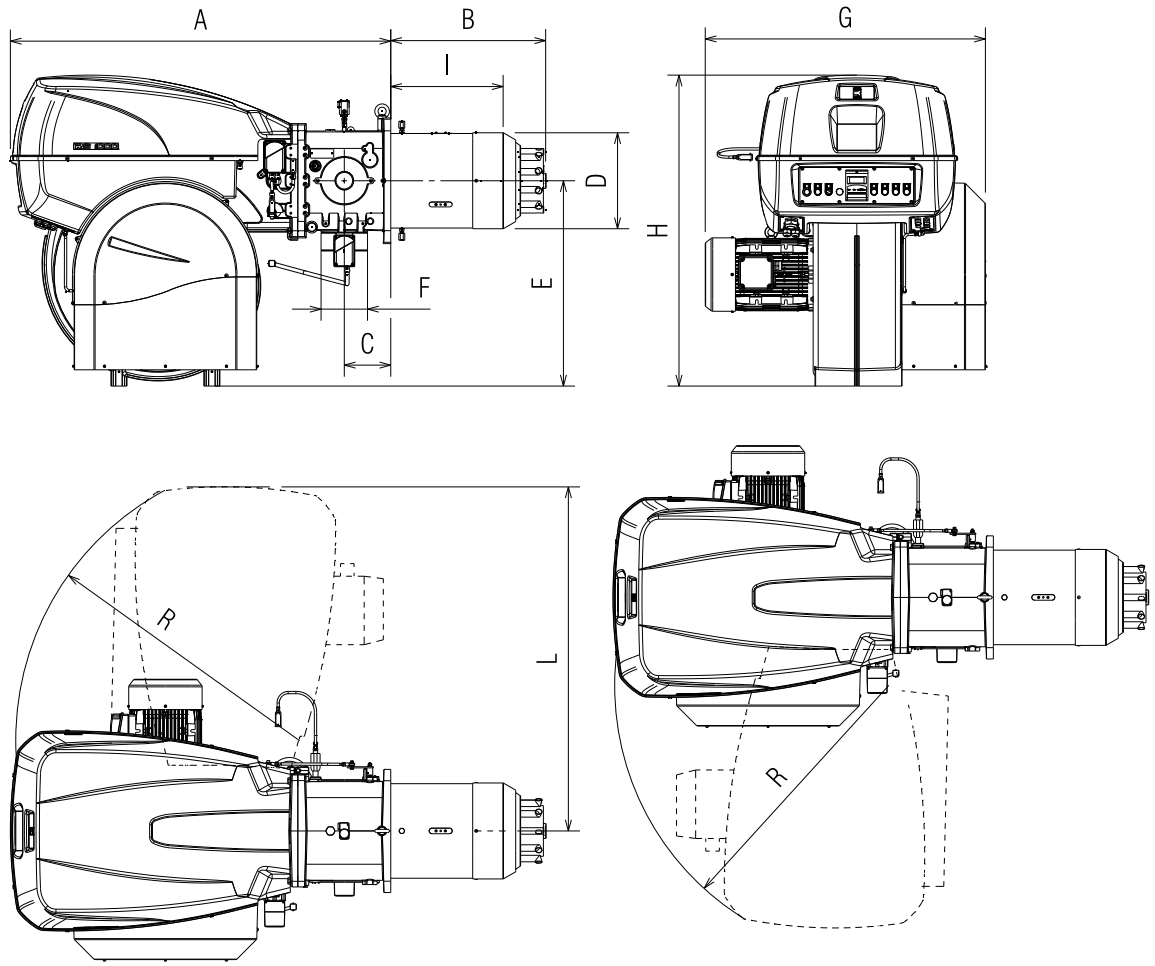
RS 810/E - /EV 0_2 BLU



MODEL	A	B	C
RS 810/E-EV	400	495	M18

Overall dimensions (mm)
Burner

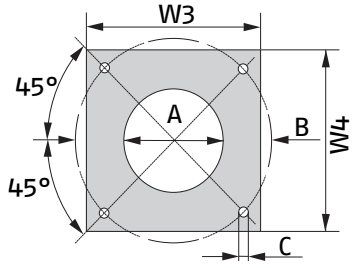
RS 1000-1200/E - /EV O_2 BLU



MODEL	A	B	C	D	E	F	G	H	I	L	R
RS 1000/E-EV	1637	669	200	413	885	DN80	1206	1338	485	1493	1350
RS 1200/E-EV	1637	670	200	456	885	DN80	1250	1338	485	1493	1350

Overall dimensions (mm)
Burner - Boiler Mounting Flange

RS 1000-1200/E - /EV O_2 BLU



MODEL	A	B	C
RS 1000/E-EV	460	608	M20
RS 1200/E-EV	500	608	M20

Specification

Designation of Series

Series:	R		
Fuel:	S	Natural Gas	
	L	Light oil	
	LS	Light oil/Natural Gas	
	N	Heavy oil	
Size:			
Setting:	/1	Single stage	
	/B	Two stage	
	/M	Modulating-Mechanical cam	
	/E	Electronic cam	
	/P	Proportioning air/gas valve	
	/EV	Electronic cam predisposed for variable speed (with inverter)	
	/EVi	Electronic cam with integrated inverter	
	E O_2	Electronic cam and suitable for 0xygen Control (O_2)	
	EV O_2	Electronic cam and variable speed (with Inverter) and suitable for 0xygen Control O_2	
Emission:	... or C01	Class 1 EN676	
	MZ	Class 2 EN676	
	BLU	Class 3 EN676	
	MX	Class 3 EN676	
	FGR	Ultra Low N0x	
Head length:	TC	standard head	
	TL	extended head	
Flame control system:	FS1	Standard/Intermittent (at least 1 stop every 24 h)	
	FS2	Continuous (1 stop every 72 h)	
Electrical supply to the system:			
	1/230/50	1/230V/50Hz	
	3/230/50	3/230V/50Hz	
	3/400/50	3N/400V/50Hz	
	3/230-400/50	3/230V/50Hz - 3N/400V/50Hz	
	3/220/60	3/220V/60Hz	
	3/380/60	3N/380V/60Hz	
	3/220-380/60	3/220/60Hz - 3N/380V/60Hz	
Auxiliary voltage:	230/50-60	230V/50-60H	
	110/50-60	110V/50-60Hz	

R	S	310	/E O_2	BLU	TC	FS1/FS2	3/400/50	230/50-60
BASIC DESIGNATION								
EXTENDED DESIGNATION								

Specification

State of supply

Monoblock forced draught, Low N0x gas burner, with modulating operation, fully automatic, made up of:
- High performance fan with low sound emissions
- Air suction circuit
- Air damper for air setting controlled by a high precision servomotor
- Air pressure switch
- Three-phase Fan starting motor
- 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 the case of excess pressure on the fuel supply line
- Electronic Cam control (LMV 52)
    - for air/fuel setting
    - for output modulation with incorporated PID control of temperature or pressure of the heat generator
    - with indication of operating status and parameters, error messages and diagnosis of fault causes
    - compatible with combustion control based on the residual 02 content in the exhaust fumes (0_2 probe and 0_2 analyzer available as a separate kit)
- Operator panel with LCD Display Interface, for combustion system commissioning and monitoring
- Burner safety control included on Electronic Cam device
- Ionization probe or IR flame detector, depending on the burner model
- Main electrical supply terminal board
- Burner on/off switch
- Manual or automatic output increase/decrease switch
- Contacts motor and thermal relay with release button
- Motor internal thermal protection
- Clean contacts relay
- Burner failure led signal and lighted release button
- Lifting rings

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

Available models

Burners

MODEL			HEAT OUTPUT [kW]	HEAT OUTPUT [Nm3/h]	TOTAL ELECTRICAL POWER [kW]	CERTIFICATION	NOTE
RS 68/E BLU	TC	FS1/FS2 3/400/50	150/350 ÷ 860	15/35 ÷ 86	2,1	CE-0085BS0267	(1)
RS 120/E BLU	TC	FS1/FS2 3/400/50	300/600 ÷ 1300	30/60 ÷ 130	2,8	CE-0085BS0268	(1)
RS 160/E BLU	TC	FS1/FS2 3/400/50	300/930 ÷ 1860	30/93 ÷ 186	5,5	CE-0085BS0266	(1)
RS 200/E BLU	TC	FS1/FS2 3/400/50	570/1375 ÷ 2400	57/137,5 ÷ 240	6,5	CE-0085BT0419	(1)
RS 310/E BLU	TC	FS1/FS2 3/400/50	400/1200 ÷ 3630	40/120 ÷ 363	9,1	CE-0085CP0166	(1)
RS 310/E BLU	TC	FS1/FS2 3/400/50	400/1200 ÷ 3630	40/120 ÷ 363	9,1	CE-0085CP0166	(1)(2)
RS 410/E BLU	TC	FS1/FS2 3/400/50	500/1500 ÷ 4450	50/150 ÷ 445	10,8	CE-0085CP0166	(1)
RS 410/E BLU	TC	FS1/FS2 3/400/50	500/1500 ÷ 4450	50/150 ÷ 445	10,8	CE-0085CP0166	(1)(2)
RS 510/E BLU	TC	FS1/FS2 3/400/50	680/1800 ÷ 5250	68/180 ÷ 525	14	CE-0085CP0166	(1)(2)
RS 610/E BLU	TC	FS1/FS2 3/400/50	1000/2200 ÷ 6250	100/220 ÷ 625	17	CE-0085CP0166	(1)(2)
RS 810/E BLU	TC	FS1/FS2 3/400/50	1200/3500 ÷ 8010	120/350 ÷ 801	24,5	CE-0123CU1067	(1)(2)
RS 1000/E BLU	TC	FS1/FS2 3/400/50	1300/3800 ÷ 10100	130/380 ÷ 1010	24	-	(1)(2)
RS 1200/E BLU	TC	FS1/FS2 3/400/50	1500/5500 ÷ 11100	150/550 ÷ 1110	27,2	-	(1)(2)
RS 68/EV BLU	TC	FS1/FS2 3/400/50	150/350 ÷ 860	15/35 ÷ 86	2,1	CE-0085BS0267	(1)(3)
RS 120/EV BLU	TC	FS1/FS2 3/400/50	300/600 ÷ 1300	30/60 ÷ 130	2,8	CE-0085BS0268	(1)(3)
RS 160/EV BLU	TC	FS1/FS2 3/400/50	300/930 ÷ 1860	30/93 ÷ 186	5,5	CE-0085BS0266	(1)(3)
RS 200/EV BLU	TC	FS1/FS2 3/400/50	570/1375 ÷ 2400	57/137,5 ÷ 240	6,5	CE-0085BT0419	(1)(3)
RS 310/EV BLU	TC	FS1/FS2 3/400/50	400/1200 ÷ 3630	40/120 ÷ 363	9,1	CE-0085CP0166	(1)(3)
RS 410/EV BLU	TC	FS1/FS2 3/400/50	500/1500 ÷ 4450	50/150 ÷ 445	10,8	CE-0085CP0166	(1)(3)
RS 510/EV BLU	TC	FS1/FS2 3/400/50	680/1800 ÷ 5250	68/180 ÷ 525	14	CE-0085CP0166	(1)(3)
RS 610/EV BLU	TC	FS1/FS2 3/400/50	1000/2200 ÷ 6250	100/220 ÷ 625	17	CE-0085CP0166	(1)(3)
RS 810/EV BLU	TC	FS1/FS2 3/400/50	1200/3500 ÷ 8010	120/350 ÷ 801	24,5	CE-0123CU1067	(1)(3)
RS 1000/EV BLU	TC	FS1/FS2 3/400/50	1300/3800 ÷ 10100	130/380 ÷ 1010	24	CE-0085CN0120	(1)(3)
RS 1200/EV BLU	TC	FS1/FS2 3/400/50	1500/5500 ÷ 11100	150/550 ÷ 1110	27,2	CE-0085CN0120	(1)(3)

(1) 02 probe and 02 analyzer not included in the supply (available as accessory)
(2) Star-delta starter
(3) Burner must be supplied with variable speed drive (not included, available as accessory)

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

Available models

Gas Trains

RS 68-120-160-200/E-/EV O_2 BLU

GAS TRAIN			ADAPTER			
CODE	MODEL	Ø	RS 68	RS 120	RS 160	RS 200
3970599*	MB 407/1 - RT 52	Rp ¾"	●	●	●	●
3970258*	MB 410/1 - RT 52	Rp 1" ¼	3010126		●	●
3970600*	MB 410/1 - RT 52	Rp ¾"	3000824 + 3000843		●	●
3970256*	MB 412/1 - RT 52	Rp 1" ½	3000843			●
3970250*	MB 415/1 - RT 52	Rp 1" ½	3000843			
3970257*	MB 420/1 - RT 52	Rp 2"	□			
20137718*	VGD 50/1 - RT 122	Rp 2"	□			
20140762*	VGD 65/1 - FT 122	DN 65 (1)	3000826			
20140763*	VGD 80/1 - FT 122	DN 80	3000826			
20169193*	VGD 100/1 - FT 122	DN 100	●	●	●	●
20169194**	VGD 100/1 CT FT 122	DN 100	●	●	●	●
20169195*	VGD 125/1 - FT 122	DN125	●	●	●	●
20169196**	VGD 125/1 CT FT 122	DN125	●	●	●	●

RS 310-410-510-610/E-/EV O_2 BLU

GAS TRAIN			ADAPTER			
CODE	MODEL	Ø	RS 310	RS 410	RS 510	RS 610
3970250*	MB 415/1 - RT 52	Rp 1" ½	3000826 + 20064220	●	●	●
3970257*	MB 420/1 - RT 52	Rp 2"	3000826 + 20042324	●	●	●
20137718*	VGD 50/1 - RT 122	Rp 2"	3000826 + 20042324			●
20140762*	VGD 65/1 - FT 122	DN 65 (1)	3010222			
20140763*	VGD 80/1 - FT 122	DN 80	3010222			
20169193*	VGD 100/1 - FT 122	DN 100	3010223 + 3010370			
20169195*	VGD 125/1 - FT 122	DN 125	●	3010224		

* Electrical supply

** Electrical supply

CT Leak detection control device

◆ Gas train with valve leak detection control device installed

● Unavailable

□ Additional adapter not necessary, the gas train may be connected directly to the burner

\- Gas train not equipped with leak detection control device.

(1) øin = DN 65, øout = DN 80

Available models

Gas Trains

RS 810/E-/EV 0_2 BLU

GAS TRAIN			ADAPTER
CODE	MODEL	Ø	RS 810
3970250*	MB 415/1 - RT 52	Rp 1" ½	●
3970257*	MB 420/1 - RT 52	Rp 2"	●
20137718*	VGD 50/1 - RT 122	Rp 2"	●
20140762*	VGD 65/1 - FT 122	DN 65 (1)	20059331 / (20065937+20059331) / (3010222+ 20059331)
20140763*	VGD 80/1 - FT 122	DN 80	20059331 / (20065937+20059331) / (3010222+ 20059331)
20169193*	VGD 100/1 - FT 122	DN 100	20059332 / (20065960 + 20059332) /(3010223 + 20059331)
20169195*	VGD 125/1 - FT 122	DN 125	20059333 / (20065968 + 20059333) / (3010224 + 20059331)

RS 1000-1200/E-/EV 0_2 BLU

GAS TRAIN			ADAPTER	
CODE	MODEL	Ø	RS 1000	RS 1200
20137718*	VGD 50/1 - RT 122	Rp 2"	●	●
20140762*	VGD 65/1 - FT 122	DN 65 (1)	●	●
20140763*	VGD 80/1 - FT 122	DN 80	20066268 / (20065937 + 20066268)[1]	
20169193*	VGD 100/1 - FT 122	DN 100	20066278 / (20065960 + 20066278)[1]	
20169195*	VGD 125/1 - FT 122	DN 125	20066284 / (20065968 + 20066284)[1]	

* Electrical supply

** Electrical supply

CT Leak detection control device

◆ Gas train with valve leak detection control device installed

● Unavailable

□ Additional adapter not necessary, the gas train may be connected directly to the burner

\- Gas train not equipped with leak detection control device.

(1) øin = DN 65, øout = DN 80

Burner accessories

Oxygen Control kit (QGO_2)

The QGO_2 is an oxygen analizer with relevant probe which controls and supervises the residual oxygen content in exhaust gases.

BURNER	KIT CODE
▶All models	20045187*

* Installation outside the burner cover

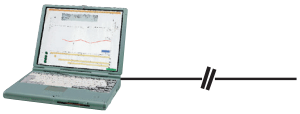
Variable Speed Drive (VSD) for RS/EV series only

The motor speed variation for the RS/EV BLU 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 O_2 BLU	1,5	20163060
▶RS 120/EV O_2 BLU	3,0	20163064
▶RS 160/EV O_2 BLU	5,5	20163071
▶RS 200/EV O_2 BLU	5,5	20163071
▶RS 310/EV O_2 BLU	7,5	20163074
▶RS 410/EV O_2 BLU	11	20163093
▶RS 510/EV O_2 BLU	15	20163096
▶RS 610/EV O_2 BLU	15	20163096
▶RS 810/EV O_2 BLU	22	20163099
▶RS 1000/EV O_2 BLU	22	20163099
▶RS 1200/EV O_2 BLU	30	20163100

The use of inverters other than those indicated by the manufacturer may lead to burner failure and, in extreme cases, a potential risk of ham to people and damage to property. The manufacturing company shall not be liable for any such demage arising from non-observance of the requirements contained in the burner manual.

PC Interface Software



PC tool for convenient programming and burner settings, process visualization, data recording, selection of AZL language, software update AZL.

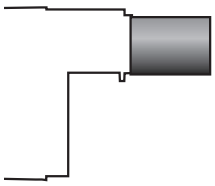
BURNER	KIT CODE
▶RS 68 - 120 - 160 - 200/E-/EV O_2 BLU	3010388
▶RS 310 - 410 - 510 - 610 - 810/E-/EV O_2 BLU	
▶RS 1000 - 1200/E-/EV O_2 BLU	

Accessories for modulating operation

The control box of RS /E-/EV 0_2 Burners includes the three point PID regulator to obtain the modulating operation.
The relative temperature or pressure probes fitted to the regulator must be chosen on the basis of the application.

BURNER	PROBE TYPE	RANGE (°C) (bar)	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

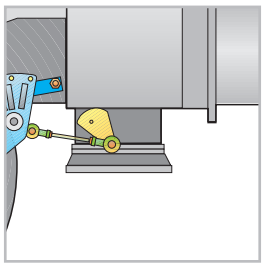
Extended head kit



"Standard head" burners can be transformed into "extended head" versions, by using the special kit. The KITS available for the various burners, giving the original and the extended lengths, are listed below.

BURNER	STANDARD HEAD LENGTH (mm)	EXTENDED HEAD LENGTH (mm)	KIT CODE
▶ RS 68/E-EV 0_2 BLU	390	390	3010177
▶ RS 120/E-EV 0_2 BLU	390	390	3010177
▶ RS 160/E-EV 0_2 BLU	373	503	3010442
▶ RS 200/E-EV 0_2 BLU	373	503	3010474

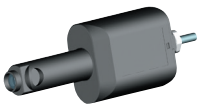
DN80 gas flange kit



To modify the standard 2" burner gas input connection in to DN80 connection, a specific gas flange is available.

BURNER	KIT CODE
▶ RS 68 - 120 - 160 - 200/E-/EV 0_2 BLU	3010439

Infrared Flame Detector (IFD)



Some models of RS/E-EV BLU series, equipped with LMV51 or LMV52 control, can be equipped with infrared flame detector.

BURNER	KIT CODE
▶ RS 310-410-510-610-810/E-EV BLU	20181871

Riello Burners a world of experience in every burner we sell.

[1]

[2]

[1] BURNERS PRODUCTION PLANT
S. PIETRO, LEGNAGO (VERONA) – ITALIA

[2] HEADQUARTER BURNERS DIVISION
S. PIETRO, LEGNAGO (VERONA) – ITALIA

Across the world, Riello sets the standard in reliable and high efficiency burner technology.
With burner capacity from 5 kW to 48 MW, Riello gas, oil, dual fuel and Low N0x burners deliver unbeatable performance across the full range of residential and commercial heating applications, as well as in industrial processes.
With headquarter in Legnago, Italy, Riello has been manufacturing premium quality burners for over 90 year.
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.
Besides, the Riello Combustion Research Centre, located in Angiari, Italy, represents one of the most modern facility 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-constructed and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs.
Riello has 13 operational branches abroad (in Europe, America and Asia), with customers in over 60 countries.

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