

## RLS 300÷1200/E-EV SERIES

RLS/E-EV series burners are characterised by a modular monoblock structure that means all necessary components can be combined in a single unit thus making installation easier, faster and, above all, more flexible.

The series covers a firing range from 1250 to 11500 kW, and they have been designed for use in hot water boilers, overheated water boilers as well as steam boilers. Operation can be "two stage progressive" or alternatively "modulating" for both fuels, light oil and gas, with the installation of a PID logic regulator on the RLS 300÷800/E series burners while RLS/EV and RLS 1000-1200/E series is fully "modulating". The burner can, therefore, supply with precision the demanded power, guaranteeing an high efficiency system level and the stability setting, obtaining fuel consumption and operating costs reduction.

The innovative combustion head, adjustment system ensures perfect movement during modulation as well as reducing noise and pollutants.

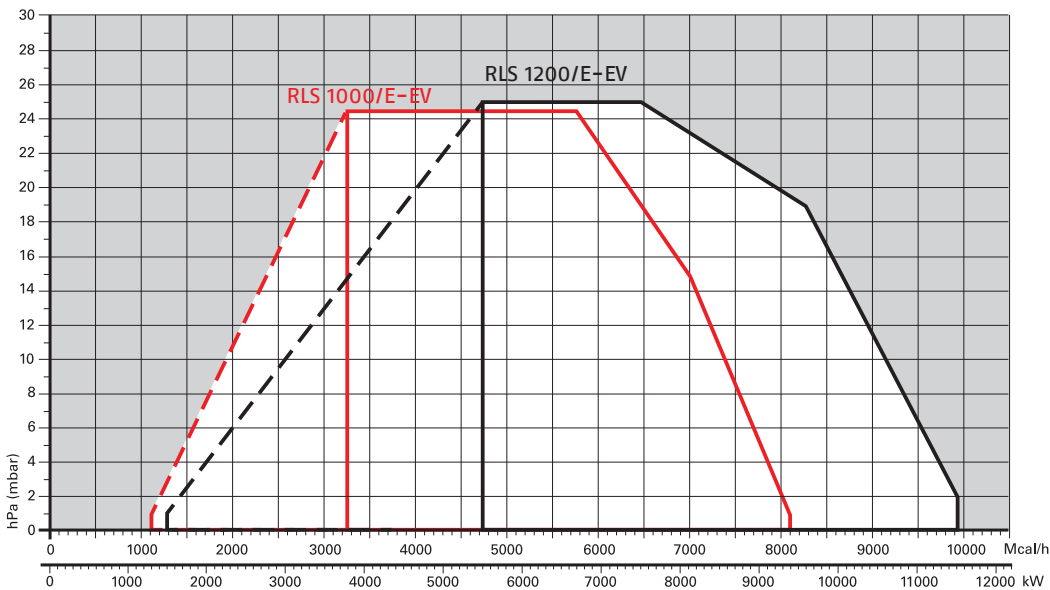
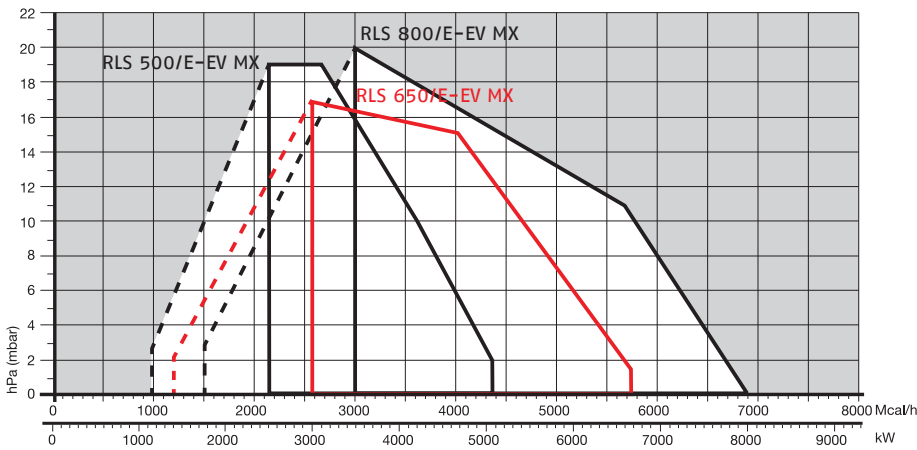
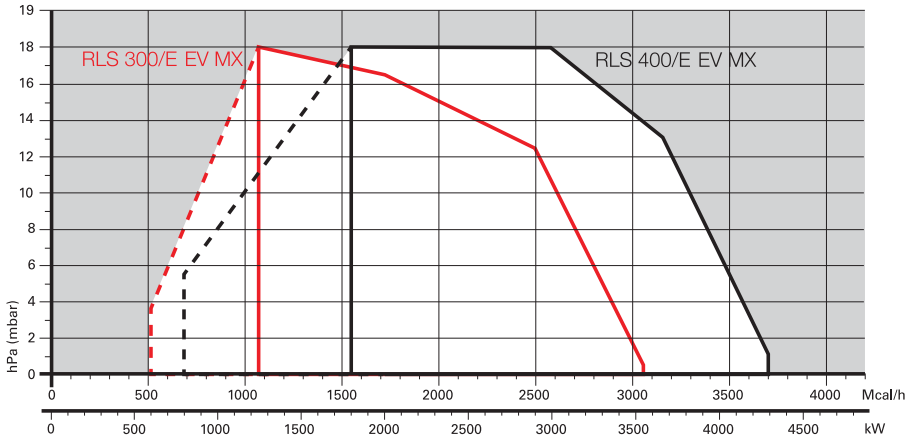


RLS 300/E MX	600/1250 ÷ 3550 kW
RLS 400/E MX	800/1800 ÷ 4300 kW
RLS 500/E MX	1120/2500 ÷ 5050 kW
RLS 650/E MX	1430/3000 ÷ 6550 kW
RLS 800/E MX	1750/3500 ÷ 8000 kW
RLS 300/EV MX	600/1250 ÷ 3550 kW
RLS 400/EV MX	800/1800 ÷ 4300 kW
RLS 500/EV MX	1120/2500 ÷ 5050 kW
RLS 650/EV MX	1430/3000 ÷ 6550 kW
RLS 800/EV MX	1750/3500 ÷ 8000 kW
RLS 1000/E C13	1200/3750 ÷ 10600 kW
RLS 1200/E C13	1500/5500 ÷ 11500 kW
RLS 1000/EV C13	1200/3750 ÷ 10600 kW
RLS 1200/EV C13	1500/5500 ÷ 11500 kW

# Low NOx Modulating Dual Fuel Burners

## RLS 300-1200/E-EV SERIES

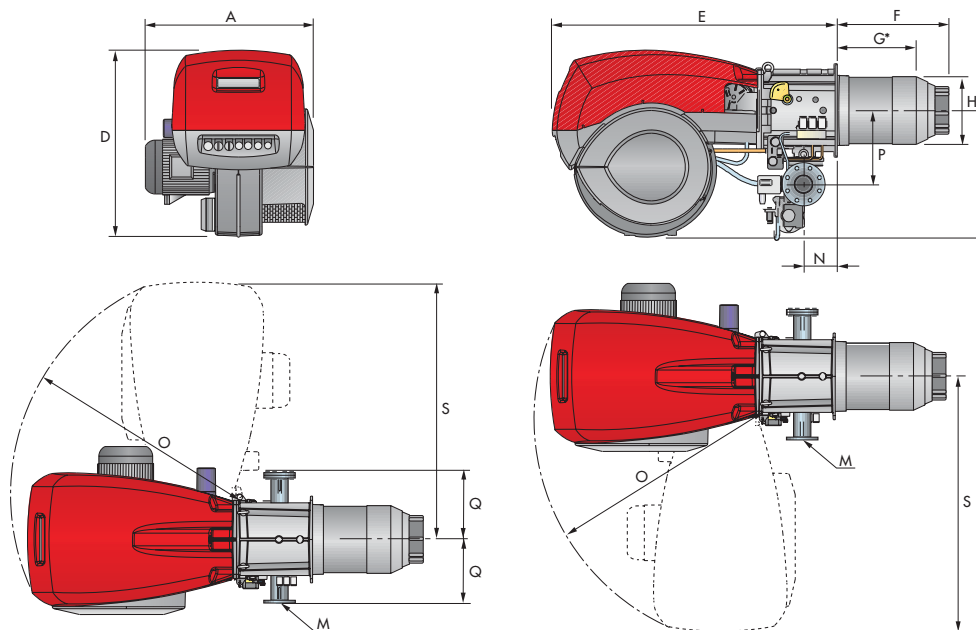
### FIRING RATES



**RLS 300-1200/E-EV SERIES**

**Overall dimensions (mm)**

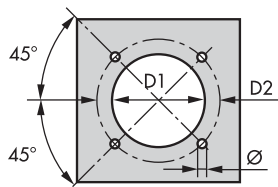
**BURNER**



MODEL	A	D	E	F	G*	H	I	M	N	O	P	Q	S
▶ RLS 300/E-EV MX	720	890	1325	508	365	313	605	DN80	164	1055	342	320	1175
▶ RLS 400/E-EV MX	775	890	1325	508	365	313	605	DN80	164	1055	342	320	1175
▶ RLS 500/E-EV MX	815	890	1325	544	390	370	605	DN80	164	1055	342	320	1175
▶ RLS 650/E-EV MX	880	950	1325	549	397	410	630	DN80	164	1055	427	320	1190
▶ RLS 800/E-EV MX	940	937	1325	558	382	428	630	DN80	164	1055	427	320	1190

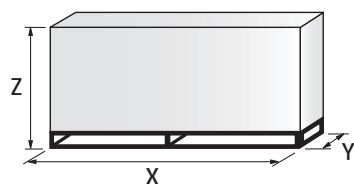
\* Maximum depth of the boiler door including the depth of the burner flange insulating gasket.

**BURNER - BOILER MOUNTING FLANGE**



MODEL	D1	D2	Ø
▶ RLS 300/E-EV MX	350	452	M18
▶ RLS 400/E-EV MX	350	452	M18
▶ RLS 500/E-EV MX	390	452	M18
▶ RLS 650/E-EV MX	440	495	M18
▶ RLS 800/E-EV MX	440	495	M18

**PACKAGING**



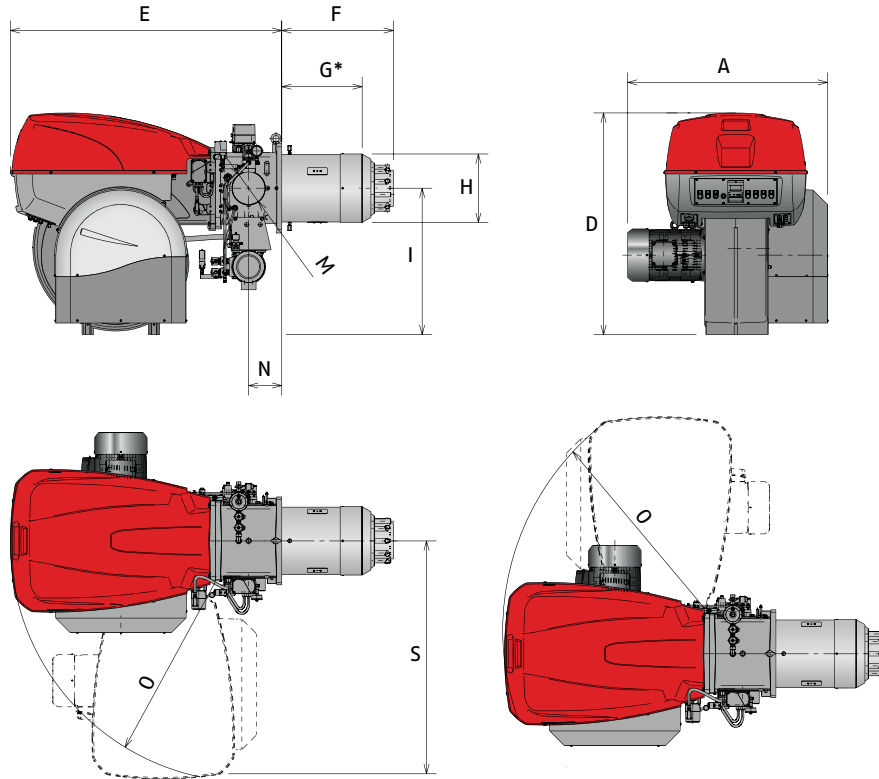
MODEL	X	Y	Z	kg
▶ RLS 300/E-EV MX	1960	970	1100	280
▶ RLS 400/E-EV MX	1960	970	1100	290
▶ RLS 500/E-EV MX	1960	970	1100	300
▶ RLS 650/E-EV MX	2190	1110	1450	320
▶ RLS 800/E-EV MX	2190	1110	1450	320

# Low NOx Modulating Dual Fuel Burners

## RLS 300-1200/E-EV SERIES

### Overall dimensions (mm)

#### BURNER

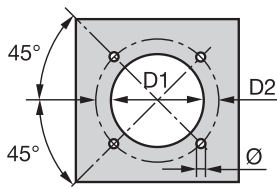


#### BURNER - BOILER MOUNTING FLANGE

MODEL	A	D	E	F	G*	H	I	M	N	O	S
▶ RLS 1000/E-EV C13	1206	1338	1637	674	484	413	885	DN80	200	1350	1425
▶ RLS 1200/E-EV C13	1250	1338	1637	658	465	456	885	DN80	200	1350	1425

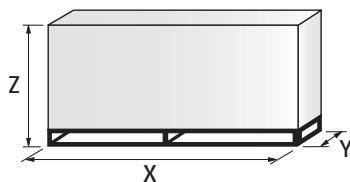
\* Maximum depth of the boiler door including the depth of the burner flange insulating gasket.

#### BURNER - BOILER MOUNTING FLANGE



MODEL	D1	D2	Ø
▶ RLS 1000/E-EV C13	460	608	M20
▶ RLS 1200/E-EV C13	500	608	M20

#### PACKAGING



MODEL	X	Y	Z	kg
▶ RLS 1000/E-EV C13	2400	1400	1595	550
▶ RLS 1200/E-EV C13	2400	1400	1595	600

## RLS 300-1200/E-EV SERIES

# 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 /P Proportioning air/gas valve /E Electronic cam /EV Electronic cam predisposed for variable speed (with inverter)
Emission:	C11 or ... Class 1 EN267 - EN676 C22 or MZ Class 2 EN267 - EN676 C33 or BLU Class 3 EN267 - EN676 C23 or MX Class 2 EN267 - Class 3 EN676 C13 Class 1 EN267 - Class 3 EN676
Head length:	TC standard head TL extended head
Flame control system:	FS1 Standard (1 stop every 24 h) FS2 Continuous working (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/50-60Hz
110/50-60	110V/50-60Hz

R	LS	1200	/E	C13	TC	FS1	3/400/50	230/50-60
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BASIC DESIGNATION

EXTENDED DESIGNATION

LOW NOx  
DUAL FUEL

### Specification

#### STATE OF SUPPLY

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

- High performance fan with low sound emissions, reverse curve blades for RLS 300-400-1000-1200/E-EV, forward curve blades for RLS 500-650-800/E-EV MX
- Air suction circuit lined with sound-proofing material
- Air damper for air setting controlled by a high precision servomotor
- Air pressure switch
- Fan starting motor at 2800 rpm, three-phase 230/400 - 400/690 V with neutral, 50Hz
- Separate light oil pump
- 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
  - ignition electrodes
  - ignition by gas pilot with gas train for RLS 650 and RLS 800-1000-1200 models
  - flame stability disk
- Maximum gas pressure switch, with pressure test point, for halting the burner in the case of over pressure on the fuel supply line
- Digital Burner management system for air/fuel setting; with output PID modulation control included on RLS/EV models, and RLS 1000-1200/E as accessory on RLS 300÷800/E MX models
- AZL Display Interface, for combustion system commissioning and monitoring, included in RLS/EV and RLS 1000-1200/E models (Available as accessory for RLS 300÷800/E BLU models)
- Electronic cam for controlling the system safety
- Infrared flame detector
- Star/delta starter for the fan motor (burners with motor electrical power  $\geq 7,5$  kW - RLS/E versions)
- Main electrical supply terminal board
- Burner on/off switch
- Auxiliary voltage led signal
- Burner working led signal
- Contacts motor and thermal relay with release button
- Motor internal thermal protection
- Motor failure led signal
- Burner failure led signal and lighted release button
- Emergency button
- Coded connection plugs-sockets
- Burner opening hinge
- Lifting rings
- IP 54 electric protection level
- Gears pump for high pressure fuel supply
- Pump starting motor
- Oil safety valves
- Valve unit with double oil safety valve on the output circuit and double safety valve on the return circuit
- Oil/Gas selector
- Flame inspection window
- The gas train can only enter from the right side of the burner
- The RLS 1000-1200/E-/EV dual fuel burners are equipped with as spray lance for light oil, activated by compressed air.

#### Standard equipment:

- 1 flange gasket
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- 2 flexible pipes for connection to the oil supply network
- 2 nipples for connection to the pump with gaskets
- Seal control pressure switch (for installation on gas train)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

## RLS 300-1200/E-EV SERIES

### Available models

#### Burners

CODE	MODEL	HEAT OUTPUT			TOTAL ELECTRICAL POWER (kW)	CERTIFICATION	NOTE
		(kW)	LIGHT OIL (kg/h)	NATURAL GAS (Nm <sup>3</sup> /h)			
3898530	RLS 300/E MX TC FS1 3/400/50 230/50-60	600/1250-3550	50/105-300	60/125-355	7,5	CE 0085BR0471	(1)(2)
3898632	RLS 400/E MX TC FS1 3/400/50 230/50-60	800/1800-4300	67/152-363	80/180-430	11,5	CE 0085BR0472	(1)(2)
3899632	RLS 500/E MX TC FS1 3/400/50 230/50-60	1120/2500-5050	95/211-426	112/250-505	15 (oil) 13 (gas)	CE 0085CL0207	(1)(2)
20026857	RLS 650/E MX TC FS1 3/400/50 230/50-60	1430/3000-6550	121/253-552	143/300-655	23,5 (oil) 19,5 (gas)	CE 0085CL0422	(2)(3)
3911132	RLS 800/E MX TC FS1 3/400/50 230/50-60	1750/3500-8000	148/295-675	175/350-800	26 (oil) 24 (gas)	CE 0085CL0422	(1)(2)
20057529	RLS 1000/E C13 TC FS1 3/400/50 230/50-60	1200/3750-10600	110/320-793	130/380-940	26 (oil) 23 (gas)	CE 0085CN0119	(1)
20057530	RLS 1200/E C13 TC FS1 3/400/50 230/50-60	1500/5500-11500	126/464-970	150/550-1150	31 (oil) 27 (gas)	CE 0085CN0120	(1)
20022571	RLS 300/EV MX TC FS1 3/400/50 230/50-60	600/1250-3550	50/105-300	60/125-355	7,5	CE 0085BR0471	(1)(2)
20022570	RLS 400/EV MX TC FS1 3/400/50 230/50-60	800/1800-4300	67/152-363	80/180-430	11,5	CE 0085BR0472	(1)(2)
20005681	RLS 500/EV MX TC FS1 3/400/50 230/50-60	1120/2500-5050	95/211-426	112/250-505	15 (oil) 13 (gas)	CE 0085CL0207	(1)(2)
20026959	RLS 650/EV MX TC FS1 3/400/50 230/50-60	1430/3000-6550	121/253-552	143/300-655	23,5 (oil) 19,5 (gas)	CE 0085CL0422	(2)(3)
20011318	RLS 800/EV MX TC FS1 3/400/50 230/50-60	1750/3500-8000	148/295-675	175/350-800	26 (oil) 24 (gas)	CE 0085CL0422	(1)(2)
20051416	RLS 1000/EV C13 TC FS1 3/400/50 230/50-60	1200/3750-10600	110/320-793	130/380-940	26 (oil) 23 (gas)	CE 0085CN0119	(1)
20047475	RLS 1200/EV C13 TC FS1 3/400/50 230/50-60	1500/5500-11500	126/464-970	150/550-1150	31 (oil) 27 (gas)	CE 0085CN0120	(1)

Net calorific value light oil: 11,8 kWh/kg; 10.200 kcal/kg - Viscosity at 20°C: 4-6 mm<sup>2</sup>/s (cSt).

Net calorific value G20 gas: 10 kWh/Nm<sup>3</sup>; 8.600 kcal/Nm<sup>3</sup> - Density: 0,71 kg/Nm<sup>3</sup>.

(1) according to 2009/142 - 2004/108 - 2006/95 - EC Directive and EN 267 - 676 Norm.

(2) the burners are factory set for FS1 operation (1 stop every 24 h) but they can be switched to FS2 operation (continuous - 1 stop every 72 h) by changing the parameters through the AZL unit menu.

(3) according to 2009/142 EC - 2006/95 - 2004/108 - EC Directive and EN 267 - 676 Norm.

# Low NOx Modulating Dual Fuel Burners

## RLS 300-1200/E-EV SERIES

### Available models

#### Gas Trains

CODE*	GAS TRAIN		ADAPTER CODE						
	MODEL	∅	RLS 300	RLS 400	RLS 500	RLS 650	RLS 800	RLS 1000	RLS 1200
3970250	MB 415/1 - RT 52	Rp 1" 1/2	3000843 + 3000826 + 20064220	●	●	●	●	●	●
3970257	MB 420/1 - RT 52	Rp 2"	3000826 + 20042324	●	●	●	●	●	●
3970221	MBC 1200/1 - RSM 60	Rp 2"	3000826 + 20042324						
3970222	MBC 1900/1 - FSM 40	DN 65	3010221 - 3010369						
3970223	MBC 3100/1 - FSM 40	DN 80	3010222 (1)						
3970224	MBC 5000/1 - FSM 80	DN 100	3010223 - 3010370						
3970145	CB 512/1 - RSM 30	Rp 1" 1/2	3000843 + 3000826 + 20064220	●	●	●	●	●	●
3970146	CB 520/1 - RSM 30	Rp 2"	3000826 + 20042324	●	●	●	●	●	●
20044659	CB 525/1 - RSM 30	Rp 2"	3000826 + 20042324						
3970147	CB 5065/1 - FSM 30	DN 65	3010221 - 3010369						
3970148	CB 5080/1 - FSM 30	DN 80	3010222 (1)						
3970149	CB 50100/1 - FSM 30	DN 100	3010223 - 3010370						
20015871	CB 50125/1 - FSM 30	DN 125	3010224						

Please see designation of Gas Train Series in the page before the Catalogue index.

\* gas train are 230V/50Hz - 220V/60Hz electrical supply.

The valve seal control device is compulsory (conforming to EN 676) on gas trains to burners with a maximum output over 1200 kW.

The seal control function is managed by LMV control box, by installation on gas train of pressure switch supplied, as standard equipment, with the burner.

To select the gas train please refer to the technical data leaflet and/or instruction manual.

● Not available.

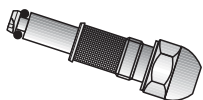
(1) To use if it is necessary to space out the gas train from the burner.



## RLS 300-1200/E-EV SERIES

### Burner accessories

#### Nozzles



The nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required fuel output.

BURNER	RATED DELIVERY (kg/h)	NOZZLE CODE
▶ RLS 300-400/E-EV MX	150	3009363
▶ RLS 300-400/E-EV MX	200	3009364
▶ RLS 300-400/E-EV MX	225	3009365
▶ RLS 300-400/E-EV MX	250	3009366
▶ RLS 300-400/E-EV MX	275	3009367
▶ RLS 300-400/E-EV MX	300	3009368
▶ RLS 400/E-EV MX	325	3009369
▶ RLS 400/E-EV MX	350	3009370
▶ RLS 400/E-EV MX	375	3009371
▶ RLS 400/E-EV MX	400	3009372
▶ RLS 400/E-EV MX	425	3009373
▶ RLS 500/E-EV MX	350	3045495
▶ RLS 500/E-EV MX	400	3045499
▶ RLS 500/E-EV MX	450	3045501
▶ RLS 500/E-EV MX	500	3045503
▶ RLS 650/E-EV MX	350	3045495
▶ RLS 650/E-EV MX	450	3045501
▶ RLS 650/E-EV MX	550	3045505
▶ RLS 650/E-EV MX	600	3045507
▶ RLS 800/E-EV MX	375	3009332
▶ RLS 800/E-EV MX	550	3009346
▶ RLS 800/E-EV MX	650	3009352
▶ RLS 800/E-EV MX	750	3009356
▶ RLS 1000/E-EV MX	350	20047954
▶ RLS 1000/E-EV MX	600	20047978
▶ RLS 1000/E-EV MX	750	20047985
▶ RLS 1000/E-EV MX	900	20047994
▶ RLS 1200/E-EV MX	700	20006479
▶ RLS 1200/E-EV MX	700	20006479
▶ RLS 1200/E-EV MX	900	20006482
▶ RLS 1200/E-EV MX	1100	20006484

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

# Low NOx Modulating Dual Fuel Burners

## RLS 300-1200/E-EV SERIES

### Burner accessories

#### Accessories for modulating operation



To obtain modulating operation, the RLS/E MX series of burners requires a regulator. In RLS/EV models PID regulator is integrated inside LMV 52 control box.

BURNER	REGULATOR TYPE	REGULATOR CODE
▶ RLS 300-400-500-650-800/E MX	RWF 40 Basic version with 3 position output	3010356
▶ RLS 300-400-500-650-800/E MX	RWF 40 High version with additional modulating output and RS 485 Interface	3010357



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

#### Variable Speed Drive (VSD) for RLS/EV series only



The motor speed variation for the RLS/EV 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 RLS/EV series.

BURNER	MAX POWER (kW)	KIT CODE
▶ RLS 300/EV	5.5	20062679
▶ RLS 400/EV	7.5	20028307
▶ RLS 500/EV	15	3090960
▶ RLS 650/EV	18.5	3091174
▶ RLS 800-1000/EV	22	3090913
▶ RLS 1200/EV	30	20030338

#### Oxygen Control kit (QG0<sub>2</sub>)



The QG0<sub>2</sub> is an oxygen analyzer with relevant probe which controls and supervises the residual oxygen content in exhaust gases.

BURNER	KIT CODE
▶ All models	3010378
▶ All models	20045187 *

\* Installation outside the burner cover

## RLS 300-1200/E-EV SERIES

### Burner accessories

#### PC Interface Software (ACS 450)



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

BURNER	KIT CODE
► All models	3010388

#### Kit efficiency with oxygen control kit (for RLS/EV only)



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
► RLS 300-400-500-650-800/E-EV	3010377 (*)
► RLS 1000-1200/E-EV	20041584

(\*) Probe type PT 1000 - range -80°C + 600°C

#### LPG kit



For burning LPG gas, a special kit is available to be fitted to the combustion head on the burner.

BURNER	KIT CODE
► RLS 300/E-EV MX	20039863 (*)
► RLS 400/E-EV MX	in progress
► RLS 500-650/E-EV MX	in progress
► RLS 800/E-EV MX	20007379
► RLS 1000-1200/E-EV C13	in progress

(\*) Certification in progress, CE approval on field is required.

#### Display and Operating Unit (AZL)



This tool is needed for combustion system commissioning and monitoring. The AZL, Display and Operating Unit, is included in RLS 1000-1200/E and RLS/EV models.

BURNER	KIT CODE
► RLS 300-400-500-650-800/E MX	3010355
► All models *	3010469

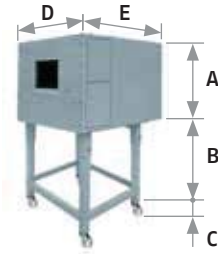
\* for Russian language only

# Low NOx Modulating Dual Fuel Burners

## RLS 300-1200/E-EV SERIES

### Burner accessories

#### Sound proofing box



If noise emission needs reducing even further, sound-proofing boxes are available. In case of generator heights, where a lower dimension "B" is required, ask for the Box Support Kit code 20065135. The useful dimensions are 40 mm less than the total dimensions indicated in the table (A, D, E). Not suitable for outdoor use.

BURNER	BOX TYPE	A (mm)	B (mm) min-max	C (mm)	D (mm)	E (mm)	[dB(A)] (*)	BOX CODE
▶ RLS 300-400-500/E-EV RLS 650-800/E-EV	C7	1255	160 - 980	110	1140	1345	10	3010376
▶ RLS 1000-1200/E-EV	C8	1425	285 - 1000	110	1500	1800	10	3010401

(\*) Average noise reduction according to EN 15036-1 standard

#### Spacer kit



If burner head penetration into the combustion chamber needs reducing, varying thickness spacers are available, as given in the following table:

BURNER	SPACER THICKNESS S (mm)	KIT CODE
▶ RLS 300-400-500-650-800/E-EV	180	20008903

### Gas train accessories

#### Adapters

In certain cases, an adapter must be fitted between the gas train and the burner, when the diameter of the gas train is different from the set diameter of the burner. Below are given the available adapters; please see on the Gas Train list the correct adapter codes to select.

ADAPTER	øi DN	øO DN	A mm	B mm	C mm	ADAPTER CODE
	65	80	400	-	-	3010221
	80	80	400	-	-	3010222
	100	80	400	-	-	3010223
	125	80	320	-	-	3010224
	65	80	10	-	-	3010369
	100	80	50	-	-	3010370
	1" 1/2	2"	35	-	-	3000843
	DN 80	2"	300	-	-	3000826
	1" 1/2	2"	65	-	-	20064220
	2"	2"	65	-	-	20042324

**RLS 300-1200/E-EV SERIES**

**Gas train accessories**

**Stabiliser spring**



To vary the pressure range of the gas train stabilisers, accessory springs are available. The following table shows these accessories with their application range. Please refer to the technical manual for the correct choice of spring.

GAS TRAIN	SPRING COLOUR	SPRING PRESSURE RANGE mbar	SPRING CODE
▶ MBC 1900/1 - 3100/1 MBC 5000/1	White	4 - 20	3010381
	Red	20 - 40	3010382
	Black	40 - 80	3010383
	Green	80 - 150	3010384
▶ CB 512/1	Red	25 - 55	3010131
	Black	60 - 110	3010157
	Pink	90 - 150	3090486
▶ CB 520/1 - 525/1	Red	25 - 55	3010132
	Black	60 - 110	3010158
	Pink	100 - 150	3090487
▶ CB 5065/1 - 5080/1	Red	25 - 55	3010133
	Black	60 - 110	3010135
	Pink	100 - 150	3090456
	Grey	140 - 200	3090992
▶ CB 50100/1	Red	25 - 55	3010134
	Black	60 - 110	3010136
	Pink	100 - 150	3090489
	Grey	140 - 200	3092174
▶ CB 50125/1	Red	25 - 55	3010315
	Yellow	30 - 70	3010316
	Black	60 - 110	3010317
	Pink	100 - 150	3010318