

RLS 310÷610/E-EV MX SERIES

The RLS/E-EV MX series of 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 1200 to 6155 kW, these burners have been designed for use in hot water boilers, overheated water boilers as well as steam boilers.

They are equipped with an Electronic Cam, 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 combustion and safe operation on all modulation range. Operation can be "two stage progressive" or alternatively "modulating" for both fuels, light oil and gas. 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 combustion head guarantees reduced polluting emissions. An exclusive design guarantees low sound emissions, low electrical consumption, easy use and maintenance.

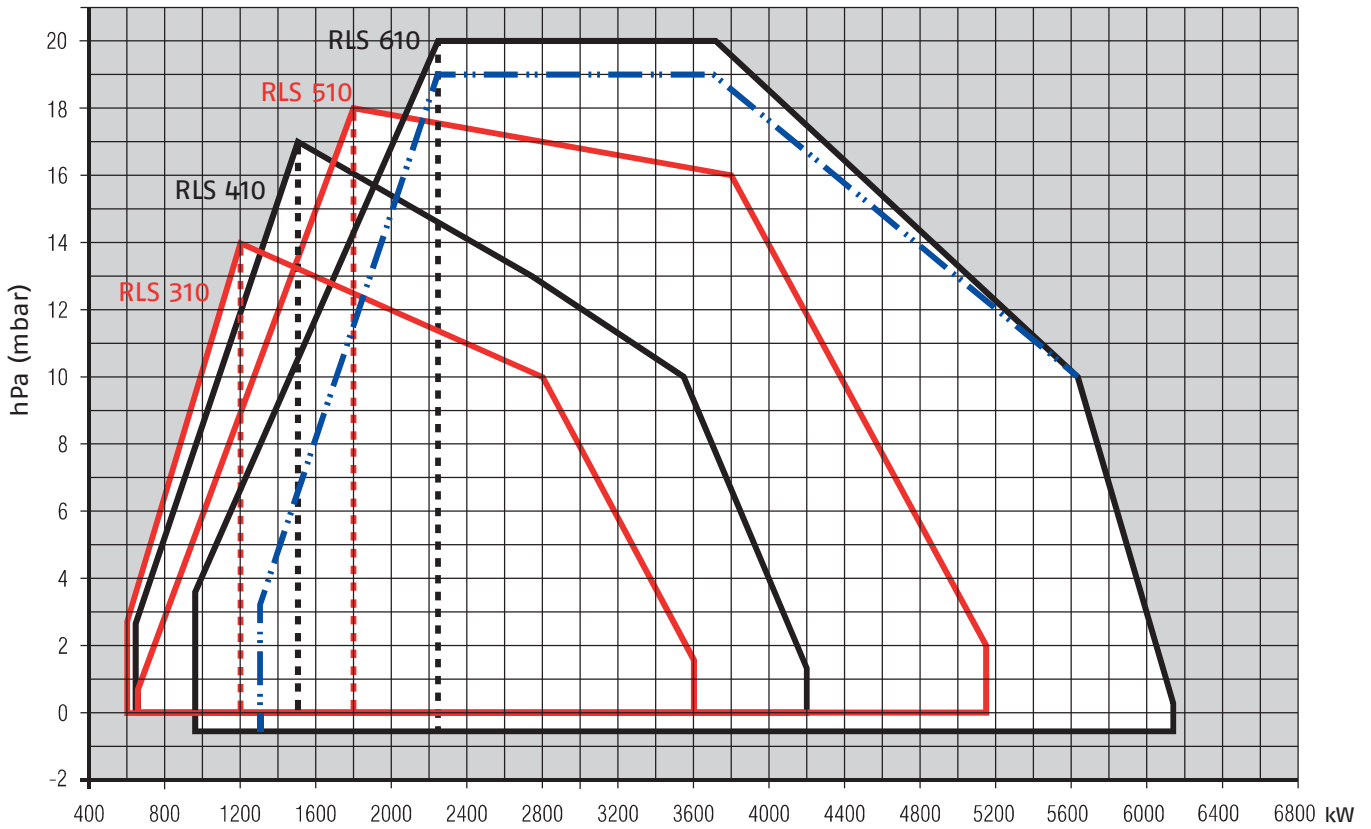


RLS 310/E-EV MX	600/1200 ÷ 3600 kW
RLS 410/E-EV MX	640/1500 ÷ 4200 kW
RLS 510/E-EV MX	660/1800 ÷ 5170 kW
RLS 610/E-EV MX	1000/2200 ÷ 6155 kW

Low NOx Modulating Dual Fuel Burners

RLS 310÷610/E-EV MX SERIES

FIRING RATES



Useful working field
for choosing the
burner



Modulation range

Test conditions
conforming to EN267-
EN676

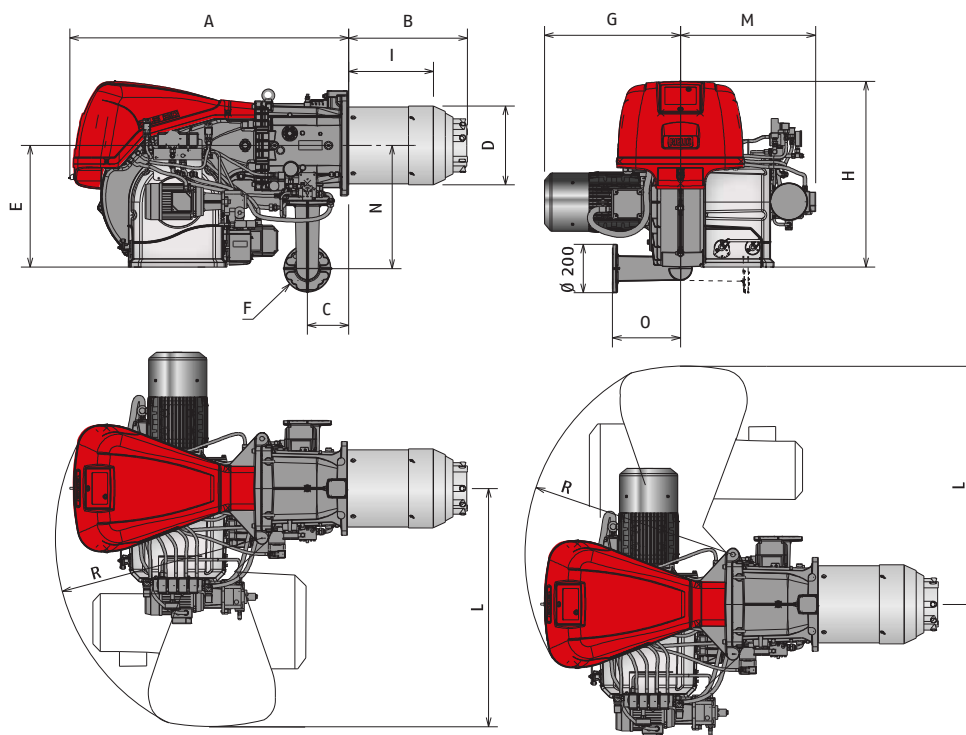
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.



Light-oil
firing rate
for RLS 610 model
(min. output 1.300 kW)

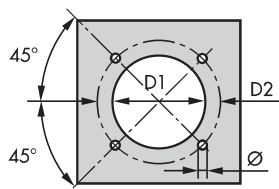
Overall dimensions (mm)

BURNER



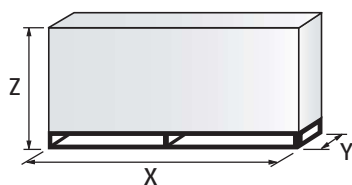
MODEL	A	B	C	D	E	F	G	H	I	L	M	N	O	R
▶ RLS 310/E-EV MX	1190	507	178	313	520	DN65	571	790	365	1015	595	528	290	890
▶ RLS 410/E-EV MX	1190	507	178	313	520	DN65	530	790	365	1015	595	528	290	890
▶ RLS 510/E-EV MX	1190	507	178	313	520	DN65	530	790	365	1015	595	528	290	890
▶ RLS 610/E-EV MX	1190	510	178	336	520	DN65	580	790	351	1015	595	528	290	890

BURNER - BOILER MOUNTING FLANGE



MODEL	D1	D2	Ø
▶ RLS 310/E-EV MX	335	452	M18
▶ RLS 410/E-EV MX	335	452	M18
▶ RLS 510/E-EV MX	335	452	M18
▶ RLS 610/E-EV MX	350	452	M18

PACKAGING



MODEL	X	Y	Z	kg
▶ RLS 310/E-EV MX	2040	1180	1125	300
▶ RLS 410/E-EV MX	2040	1180	1125	300
▶ RLS 510/E-EV MX	2040	1180	1125	300
▶ RLS 610/E-EV MX	2400	1400	1595	320

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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

Emission: ... or C11 Class 1 EN267 – EN676
 MZ or C22 Class 2 EN267 – EN676
 BLU or C33 Class 3 EN267 – EN676
 MX or C23 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/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	3/400V/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	230V/50Hz
110/50-60	110V/50-60Hz

R	LS	310	/E	MX	TC	FS1	3/400/50	230/50
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BASIC DESIGNATION

EXTENDED DESIGNATION

RLS 310÷610/E-EV MX SERIES

Specification

STATE OF SUPPLY

Monoblock forced draught dual fuel burners with modulating operation, fully automatic, made up of:

- High performance fan with low sound emissions, forward curve blades
- 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
 - 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
- LMV26 Digital Burner management system for air/fuel setting; with output PID modulation control as accessory (RLS 310-410-510-610/E MX)
- LMV52 Digital Burner management system for air/fuel setting and O₂ Control Ready; with output PID modulation control included (RLS 310-410-510-610/E MX)
- LMV52 Digital Burner management system for air/fuel setting, O₂ Control Ready and Operation with Variable Speed Drive (VSD); with output PID modulation control included (RLS 310-410-510-610/EV MX)
- AZL Display Interface, for combustion system commissioning and monitoring
- UV flame sensor
- Star/delta starter or direct starter
- 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

Standard equipment:

- 1 flange gasket for gas train adaptor
- 1 adaptor for gas train
- 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
- 8 gas nozzles (only for RLS 310/E)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

Low NOx Modulating Dual Fuel Burners

RLS 310÷610/E-EV MX SERIES

Available models

Burners

Models with electronic cam (LMV 26)

CODE	MODEL	HEAT OUTPUT			TOTAL ELECTRICAL POWER (kW)	CERTIFICATION	NOTE
		(kW)	LIGHT OIL (kg/h)	NATURAL GAS (Nm ³ /h)			
20082946	RLS 310/E MX TC FS1 3/400/50	600/1200-3600	50/100-305	60/120-360	10,9 (oil) 9,1 (gas)	CE 0085CQ0196	
20087644	RLS 310/E MX TC FS1 3/400/50	600/1200-3600	50/100-305	60/120-360	10,9 (oil) 9,1 (gas)	CE 0085CQ0196	
20087646	RLS 410/E MX TC FS1 3/400/50	640/1500-4200	55/126-352	64/150-420	12,6 (oil) 10,8 (gas)	CE 0085CQ0196	
20084376	RLS 410/E MX TC FS1 3/400/50	640/1500-4200	55/126-352	64/150-420	12,6 (oil) 10,8 (gas)	CE 0085CQ0196	
20083562	RLS 510/E MX TC FS1 3/400/50	660/1800-5170	55/195-435	66/180-517	15,8 (oil) 14 (gas)	CE 0085CQ0196	
20080180	RLS 610/E MX TC FS1 3/400/50	1000/2200-6155	86/185-516	100/220-615,5	18,8 (oil) 17 (gas)	CE 0085CQ0196	

Models with electronic cam (LMV 52) - O₂ Control Ready

20182632	RLS 310/E O ₂ MX TC FS1 3/400/50	600/1200-3600	50/100-305	60/120-360	10,9 (oil) 9,1 (gas)	CE 0085CQ0196	(1)
20182634	RLS 410/E O ₂ MX TC FS1 3/400/50	640/1500-4200	55/126-352	64/150-420	12,6 (oil) 10,8 (gas)	CE 0085CQ0196	(1)
20182635	RLS 510/E O ₂ MX TC FS1 3/400/50	660/1800-5170	55/195-435	66/180-517	15,8 (oil) 14 (gas)	CE 0085CQ0196	(1)
20182636	RLS 610/E O ₂ MX TC FS1 3/400/50	1000/2200-6155	86/185-516	100/220-615,5	18,8 (oil) 17 (gas)	CE 0085CQ0196	(1)

Models with electronic cam (LMV 52) - O₂ Control Ready - Operation with Variable Speed Drive (VSD)

20182022	RLS 310/EV O ₂ MX TC FS1 3/400/50	600/1200-3600	50/100-305	60/120-360	10,9 (oil) 9,1 (gas)	In progress	(1)(2)
20182023	RLS 410/EV O ₂ MX TC FS1 3/400/50	640/1500-4200	55/126-352	64/150-420	12,6 (oil) 10,8 (gas)	In progress	(1)(2)
20182024	RLS 510/EV O ₂ MX TC FS1 3/400/50	660/1800-5170	55/195-435	66/180-517	15,8 (oil) 14 (gas)	In progress	(1)(2)
20182026	RLS 610/EV O ₂ MX TC FS1 3/400/50	1000/2200-6155	86/185-516	100/220-615,5	18,8 (oil) 17 (gas)	In progress	(1)(2)

Net calorific value light oil: 11,8 kWh/kg; 10.200 kcal/kg - Viscosity at 20°C: 4-6 mm²/s (cSt).

Net calorific value G20 gas: 10 kWh/Nm³; 8.600 kcal/Nm³ - Density: 0,71 kg/Nm³.

The burners of RLS/E MX series are in according to 2016/426/EU - 2014/30/EU - 2014/35/EU - 2014/68/EU - 2006/42 CE Directive and EN 267 - 676 Norm.

RLS/EV-EVi models with Variable Speed Drive System are available on demand.

For more information, please contact Riello Burners Commercial and Technical Department.

(1) The frequency converter for variable speed drive (VSD) operation must be ordered as Accessory (see Accessories paragraph).

(2) The QGO₂ oxygen analyzer with relevant probe must be ordered as Accessory (see Accessories paragraph).

RLS 310÷610/E-EV MX SERIES

Available models

Gas Trains

CODE	GAS TRAIN MODEL	Ø	ADAPTER CODE			
			RLS 310	RLS 410	RLS 510	RLS 610
3970250*	MB 415/1 - RT 52	Rp 1" 1/2	3000826 + 20064220	●	●	●
3970257*	MB 420/1 - RT 52	Rp 2"	3000826 + 20042324	●	●	●
20137718*	VGD 50/1 - RT 122 (1)	Rp 2"	(3000826 + 20042324) / 20068062 (3)			●
20140762*	VGD 65/1 - FT 122	DN 65 (2)	□			
20140763*	VGD 80/1 - FT 122	DN 80	□			
20169193*	VGD 100/1 - FT 122	DN 100	3010370			
20169195*	VGD 125/1 - FT 122	DN 125	●	3010224		

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

* 230V/50Hz - 220V/60Hz electrical supply.

** 230V/50Hz electrical supply.

The valves 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 REC control box, by installation on gas train of a pressure switch (please see Gas train accessories paragraph).

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

(1) Additional flange kit code 20185515 needed for seal control function.

(2) øin = DN 65, øout = DN 80

(3) To be used with gas train and burner opening on the left (fan motor side).

● Not available.

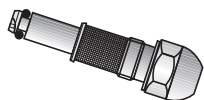
□ Additional adapter not necessary, the gas train may be connected directly to the burner.

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Burner accessories

Nozzles



Return nozzles without needle are used on RLS/E MX burners. The nozzle must be ordered as accessory. The following table shows the features and codes on the basis of the maximum required fuel output.

BURNER	RATED DELIVERY (kg/h)	NOZZLE CODE ⁽¹⁾	NOZZLE CODE ⁽²⁾
▶ RLS 310-410/E-EV MX	150	3009314	3045479
▶ RLS 310-410/E-EV MX	175	3009316	3045481
▶ RLS 310-410/E-EV MX	200	3009318	3045483
▶ RLS 310-410/E-EV MX	225	3009320	3045485
▶ RLS 310-410-510/E-EV MX	250	3009322	3045487
▶ RLS 310-410-510/E-EV MX	275	3009324	3045489
▶ RLS 310-410-510-610/E-EV MX	300	3009326	3045491
▶ RLS 310-410-510-610/E-EV MX	325	3009328	3045493
▶ RLS 310-410-510-610/E-EV MX	350	3009330	3045495
▶ RLS 310-410-510-610/E-EV MX	375	3009332	3045497
▶ RLS 310-410-510-610/E-EV MX	400	3009334	3045499
▶ RLS 310-410-510-610/E-EV MX	425	3009336	3045500
▶ RLS 510-610/E-EV MX	450	3009338	3045501
▶ RLS 610/E-EV MX	475	3009340	-
▶ RLS 610/E-EV MX	500	3009342	3045503
▶ RLS 610/E-EV MX	525	3009344	-
▶ RLS 610/E-EV MX	550	3009346	3045505
▶ RLS 610/E-EV MX	575	3009348	-
▶ RLS 610/E-EV MX	600	3009350	3045507

⁽¹⁾ Nozzle Bergonzo type B5 45° SA

⁽²⁾ Nozzle Fluidics type N2 45°

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

Burner accessories

Accessories for modulating operation

POWER CONTROLLER



To obtain modulating operation, the RLS/E-EV MX series of burners, equipped with LMV26 control, requires a regulator. For remote setpoint use RWF 55.

BURNER	REGULATOR TYPE	REGULATOR CODE
► All models	RWF 50.2 - Basic version with - 3 position output	20085417
► All models	RWF 55.5 - Complete with RS-485 interface	20074441
► All models	RWF 55.6 - Complete with RS-485/ PROFIBUS interface	20074442

PROBE



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
► All models	Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
► All models	Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214

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
► RLS 310-410-510-610/E-EV MX	20074542

Pc interface kit



To connect the control panel 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 REC27-37 control box	3010436
► All models equipped with LMV52 control box	3010388

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Burner accessories

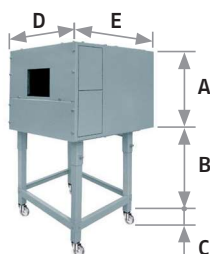
OCI412 interface kit



Interface kit between the REC 27.1 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
▶ RLS 310-410-510-610/E-EV (equipped with LMV26 control)	3010437

Sound proofing box



If noise emission needs reducing even further, sound-proofing boxes are available. When a lower "B" dimension is required, it is available the Box Support Kit code 20065135 which allows to reduce it at the fixed dimension of 55 mm. The sound-proofing boxes are 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 310-410/E-EV	C7	1255	160 - 980	110	1140	1345	10	3010376
▶ RLS 510-610/E-EV	C7 Plus	1255	160 - 980	110	1240	1345	10	20085111

(*) 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
▶ All models	180	20008903

Clean contacts kit

BURNER	KIT CODE
▶ All models	20096377

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Burner accessories

Oxygen Control kit (QGO₂) for RLS 310÷610/E-EV MX burners with LMV52 control box only



The QGO₂ is an oxygen analyzer with relevant probe which controls and supervises the residual oxygen content in exhaust gases.

BURNER	KIT CODE
► All models equipped with LMV52 control box	20045187*

An additional transformer kit is needed to guarantee 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.

* Installation outside the burner cover

Kit efficiency with oxygen control kit (RLS 310÷610/E-EV MX burners with LMV52 control box 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
► All models equipped with LMV52 control box	3010377

Variable Speed Drive (VSD) for RLS 310÷610/EV MX series only



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

BURNER	ELECTRICAL SUPPLY	MOTOR POWER (kW)	MAX POWER (kW)	KIT CODE
► RLS 310/E-EV MX	400	7,5	7,5	20163074
► RLS 410/E-EV MX	400	9,2	11	20163093
► RLS 510/E-EV MX	400	12	15	20163096
► RLS 610/E-EV MX	400	15	15	20163096

The use of inverters other than those indicated by the manufacturer may lead to burner failure and, in extreme cases, a potential risk of harm to people and damage to property.

The manufacturing company shall not be liable for any such damage arising from non-observance of the requirements contained in the burner manual.







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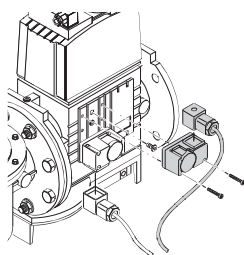
Gas train accessories

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	DIMENSIONS			ADAPTER CODE
	Ø1 DN	Ø2 DN	A mm	
 1" 1/2 2"	-	-	65	20064220
 2" 2"	-	-	65	20042324
 DN 80 2" 1/2 2"	-	-	300	3000826
	100	80	50	3010370
 DN 80/65 2"	2"	65/80	780	20068062
 Ø1 Ø2 A	125	80	320	3010224

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.

GAS TRAIN	KIT CODE
► All MB models, VGD 65/1 – 80/1 – 100/1 – 125/1	3010344
► VGD 50/1	3010344 + 20185515

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
► VGD/1 series	Neutral	0 – 22	20181839
	Yellow	15 – 120	20141900
	Red	100 – 250	20141901