



RLS 68÷200/E-/EVi MX Series

Low NOx Modulating Dual Fuel Burners

RLS 68/E-/EVi MX	195/350 ÷	871	kW
RLS 120/E-/EVi MX	290/595 ÷	1224	kW
RLS 160/E-/EVi MX	421/947 ÷	1845	kW
RLS 200/E-/EVi MX	401/1400 ÷	2322	kW



The RLS/E-/EVi MX series of burners covers a firing range from 195 to 2322 kW, and they have been designed for use in hot or superheated water boilers, hot air or steam generators, diathermic oil boilers.

Operation is "modulating" at the gas and oil side with the installation of a PID logic regulator and respective probes.

RLS/E-/EVi MX series burners guarantees high efficiency levels in all the various applications, thus reducing fuel consumption and running costs.

Optimisation of sound emissions is guaranteed by the special design of air suction circuit and the use of sound proofing material.

The exclusive design ensures reduced dimensions, simple use and maintenance. A wide range of accessories guarantees elevated working flexibility.

Technical Data

MODEL			RLS 68/E-/EVI MX	RLS 120/E-/EVI MX	RLS 160/E-/EVI MX	RLS 200/E-/EVI MX
Burner operation mode			Two stages progressive or modulating			
Modulation ratio at max. output			1÷3 (light oil) / 1÷4 (gas)			
Servomotor		type	SQN 33.4 (fuel) – SQN 33.5 (air)			
	run time	s	5...120			
Heat output		kW	195/350÷871	290/595÷1224	421/947÷1845	401/1400÷2322
		Mcal/h	168/301÷749	249/512÷1053	362/814÷1587	345/1204÷1997
Working temperature		°C min./Max.	0/40			
Oil	net calorific value	kWh/kg	11,86			
	viscosity	mm²/s (cSt)	4 ÷ 6			
	delivery	kg/h	16/29÷73	24/50÷95	35/80÷155	34/118÷196
Pump		type	J7 C		TA2	
	delivery	kg/h	195 (at 20 bar)		350 (at 20 bar)	
Atomised pressure		bar	20		20	
Fuel temperature		max. °C	60			
Fuel pre-heater			NO			
G20	net calorific value	kWh/Nm³	10			
	density	kg/Nm³	0,71			
	gas delivery	Nm³/h	19/35÷87	29/59÷122	42/95÷184	40/140÷232
G25	net calorific value	kWh/Nm³	8,6			
	density	kg/Nm³	0,78			
	gas delivery	Nm³/h	23/41÷101	33/70÷142	49/110÷214	47/163÷270
LPG	net calorific value	kWh/Nm³	25,8			
	density	kg/Nm³	2,02			
	gas delivery	Nm³/h	--			
Fan		type	reverse blade fan		straight blade fan	
Air temperature		max °C	60			
Electrical supply		Ph/Hz/V	3/400/50 ~ (±10%)			
Auxiliary electrical supply		Ph/Hz/V	1N/230/50			
Control box		type	LMV 26...			
Total electrical power		kW	3,2	3,8	7,1	8,2
Auxiliary electrical power		kW	1,2	1,2	0,5	0,5
Heaters electrical power		kW	--			
Protection level		IP	44			
Pump motor electrical power		kW	0,55 (1Ph)	0,55 (1Ph)	1,1 (3Ph)	1,1 (3Ph)
Rated pump motor current		A	3,6	3,6	2,6	2,6
Pump motor protection level		IP	44			
Fan motor electrical power		kW	1,5	2,2	4,5	5,5
Rated fan motor current		A	5,9-3,4	4,4-7,6	15-8,7	18,2-10,5
Fan motor start up current		A	35,4-20	30,8-53,2	105-61	127,4-73,5
Fan motor protection level		IP	54			
Ignition transformer		type	--			
		V1 – V2	230V – 2x5 kV			
		I1 – I2	1,9A – 35mA			
Operation			FS1 intermittent (1 stop each 24 h)			
Sound pressure		dB (A)	76	79	80,5	85
Sound power		W	87	90	91,5	96
Oil	CO emission	mg/kWh	< 10			
	grade of smoke indicator	Nº Bacharach	< 1			
	CxHy emission	mg/kWh	< 10			
	NOx emission	mg/kWh	< 185			
G20	CO emission	mg/kWh	< 10			
	NOx emission	mg/kWh	< 80			

Reference conditions:

Temperature: 20°C – Pressure: 1013,5 mbar – Altitude: 0 m a.s.l. – Noise measured at a distance of 1 meter.

Since the Company is constantly engaged in the production improvement, the aesthetic and dimensional features, the technical data, the equipment and the accessories can be changed.
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Technical Data

MODEL	RLS 68/E-/EVi MX	RLS 120/E-/EVi MX	RLS 160/E-/EVi MX	RLS 200/E-/EVi MX
Directive	2006/42/EC - 2009/142/EC - 2014/30/EU - 2014/35/EU			
Conforming to	EN 267 - EN 676			
Certification	In progress			

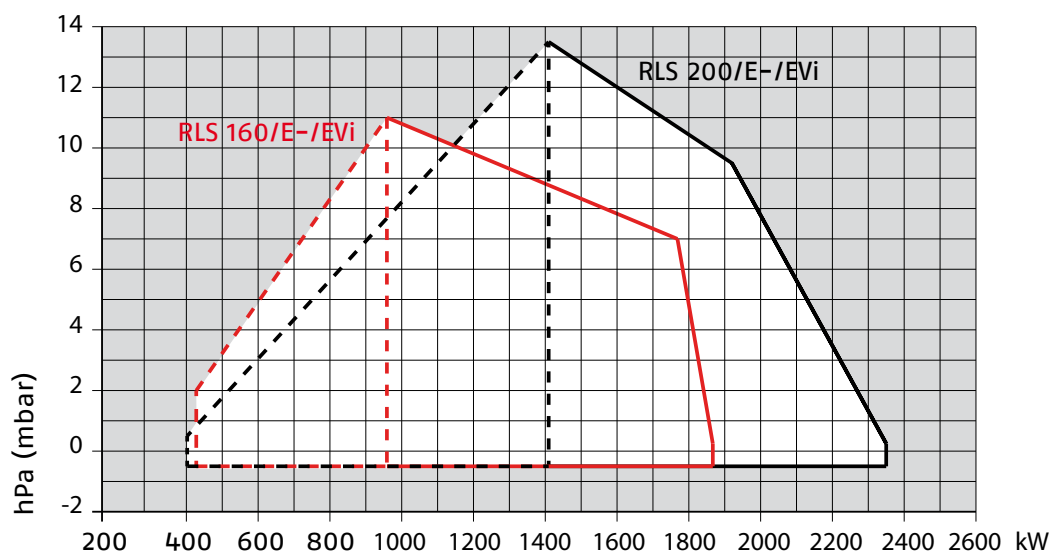
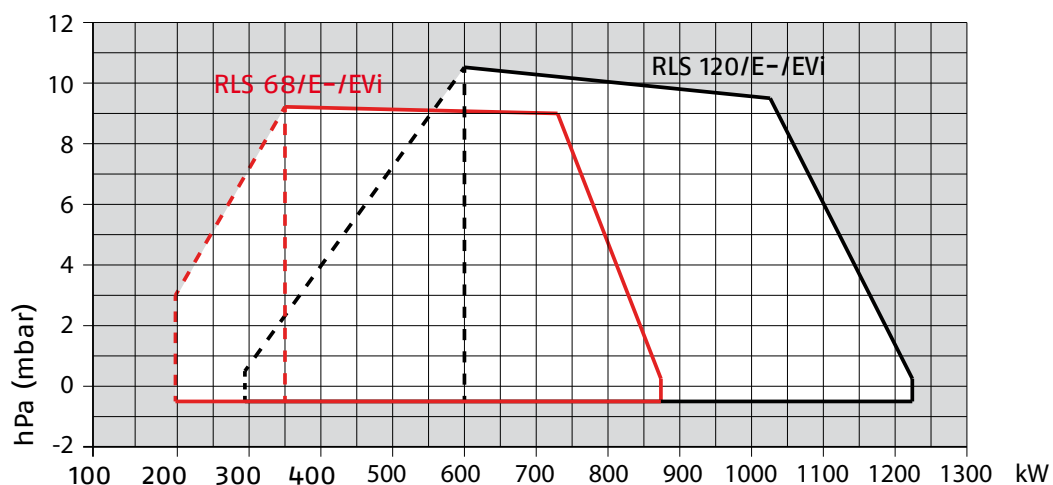
Reference conditions:

Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.

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Firing Rates



Fuel Supply

GAS TRAIN DESIGNATION

Series:		MB									
		MBC									
		DMV									
		DMV12									
		VGD									
		CB									
		CBH									
		MV									
		CG									

Size:	405	407	410	412	415	420						
		65	120	300	700	1200	-	1900	3100	5000		
	505	507	510	512	-	520	525	5065	5080	50100	50125	50150
10	15	20	32	40	-	50	-	65	80	100	125	150
		120	220									

Operation:	/S	only ON-OFF function
	/1	stage mode opening
	/2	2nd stage mode opening
	/P	1st stage mode opening with air/gas proportional regulator

Leak detection control:	-	0
	CT	leak detection control device installed on the gas train
	CQ	equipped with pressure switch for leak detection control

Joint type:	R	threaded joint
	F	standard flange ISO
	F1	square flange BS1
	F2	square flange BS2
	F3	square flange BS3 - BS4

Electrical connection:	T	Terminals - Terminal strip
	SD	Domestic plug
	SM	Medium voltage plug

Standard output pressure range:	-	without pressure governor
	0	with governor and air/gas proportional pressure
	2	with governor and output pressure up to 20 mbar
	3	with governor and output pressure up to 30 mbar
	4	with governor and output pressure up to 40 mbar
	5	with governor and output pressure up to 50 mbar
	6	with governor and output pressure up to 60 mbar
	8	with governor and output pressure up to 80 mbar
	15	with governor and output pressure up to 150 mbar

Valve control:	0	shared
	2	separate

CB	5065	/1	CT	F	SM	3	0
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BASIC DESIGNATION

EXTENDED DESIGNATION

GAS TRAINS

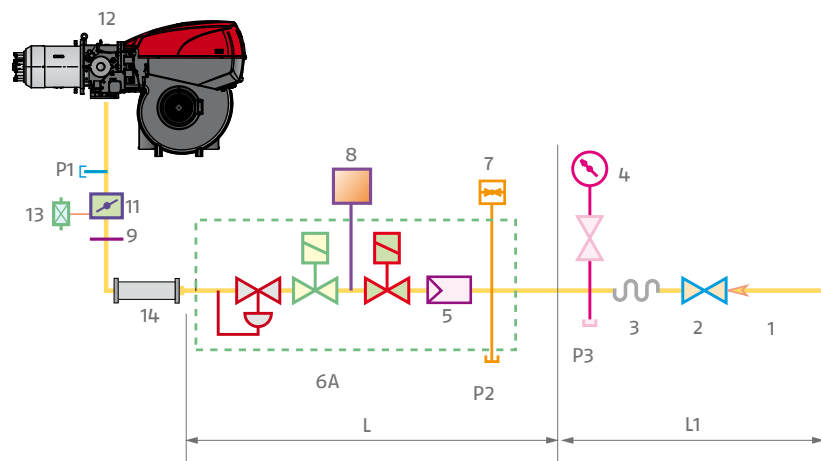
The burners are fitted with a butterfly valve to regulate the fuel, controlled by a stepper motor with accuracy position and absence of joint clearance and mechanical hysteresis.

Fuel can be supplied either from the right or left hand sides. A maximum gas pressure switch stops the burner in case of excess pressure in the fuel line.

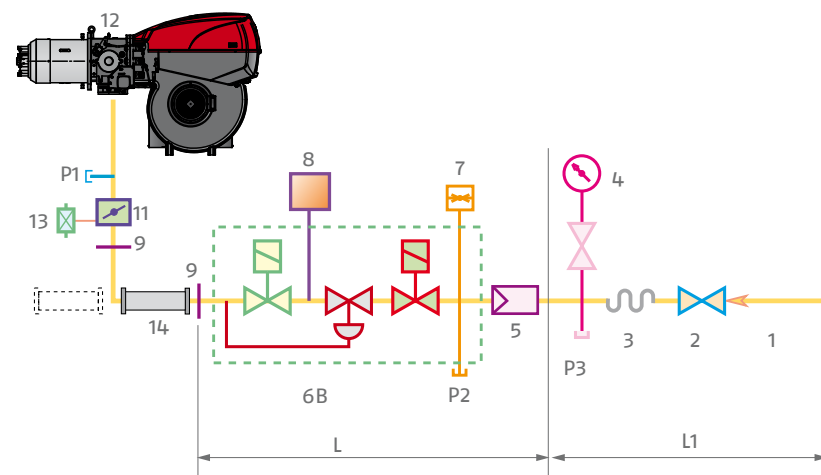
The gas train can be selected to best fit system requirements depending on the fuel output and pressure in the supply line.

The gas train can be "Multibloc" type (containing the main components in a single unit) or "Composed" type (assembly of the single components).

MB "THREADED"

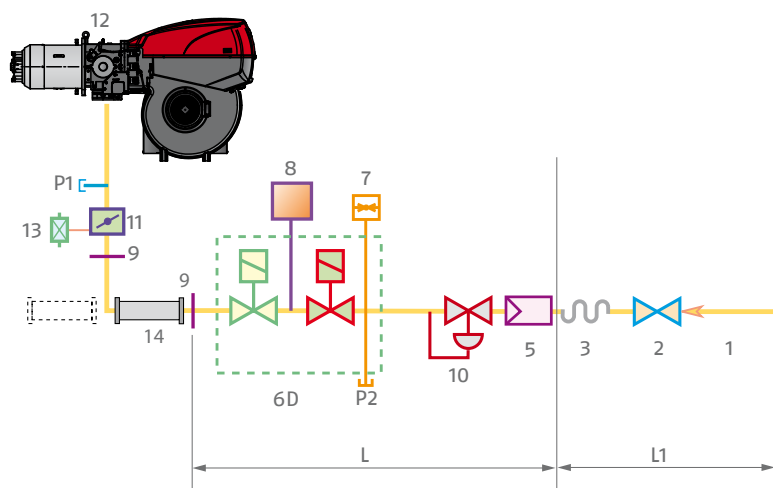


MBC "FLANGED"

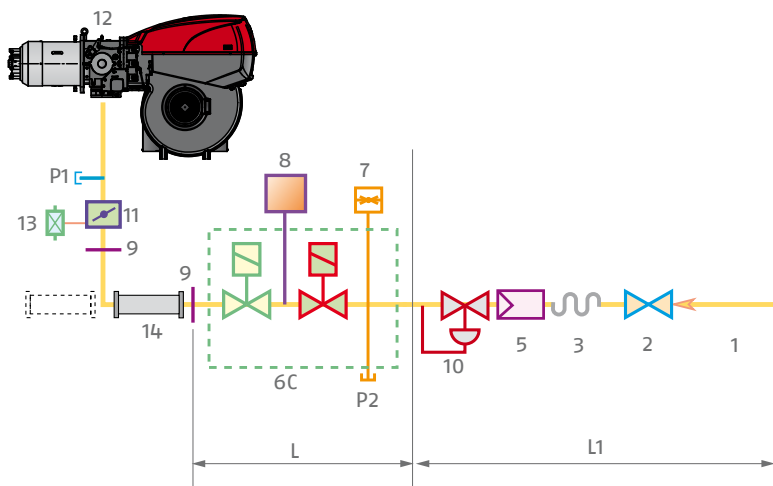


1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock
5	Filter
6A	Includes:
	- filter
	- operation valve
	- safety valve
	- pressure adjuster
6B	Includes:
	- operation valve
	- safety valve
	- pressure adjuster
7	Minimum gas pressure switch
8	Leak detection device, supplied as an accessory or incorporated, based on the gas train code.
9	Gasket, for "flanged" versions only
10	Pressure adjuster
11	Gas adjuster butterfly valve
12	Burner
13	Maximum gas pressure switch
14	Gas train-burner adaptor, supplied separately
P1	Combustion head pressure
P2	Upstream pressure from the regulator
P3	Pressure upstream from the filter
L	Gas train supplied separately, with the code given in the table
L1	Installer' responsibility

CB "FLANGED OR THREADED"



DMV "FLANGED OR THREADED"



1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock
5	Filter
6C	Includes:
	- safety valve
	- operation valve
6D	Includes:
	- safety valve
	- operation valve
7	Minimum gas pressure switch
8	Leak detection device, supplied as an accessory or incorporated, based on the gas train code.
9	Gasket, for "flanged" versions only
10	Pressure adjuster
11	Gas adjustment butterfly valve
12	Burner
13	Maximum gas pressure switch
14	Gas train-burner adaptor, supplied separately
P1	Combustion head pressure
P2	Upstream pressure from the regulator
P3	Pressure upstream from the filter
L	Gas train supplied separately, with the code given in the table
L1	Installer' responsibility

Gas trains are approved by standard EN 676 together with the burner.

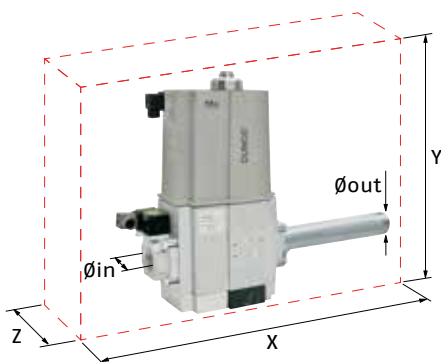
The overall dimensions of the gas train depends on how they are constructed. The following table shows the maximum dimensions of the gas trains that can be fitted to RLS/E-/EVi burners, intake and outlet diameters and seal control if fitted.

The maximum gas pressure of gas train "MULTIBLOC" type is 360 mbar, and that one of gas train "COMPOSED" type is 500 mbar.

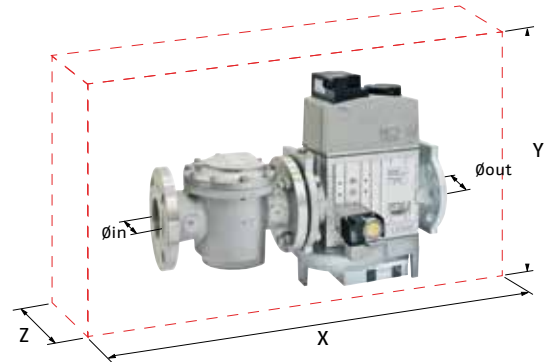
"MULTIBLOC" guarantees a range of pressure towards the burner from 4 to 60 mbar. For version DN 65 and DN 80 is from 20 to 40 mbar. For version DN 100 is from 40 to 80 mbar. The range of pressure in the "MULTIBLOC" with flange can be modified choosing the stabiliser spring (see gas train accessory).

The maximum gas pressure of gas train "CB" series is 500 mbar. "CB" gas train guarantees a range of pressure towards the burner from 10 to 30 mbar. The range of pressure can be modified choosing the stabilizer spring (see accessories).

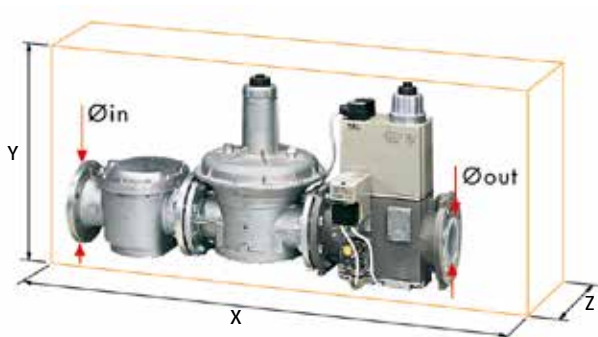
The maximum gas pressure of gas train "DMV" series is 500 mbar. "DMV" gas train is supplied without pressure governor.



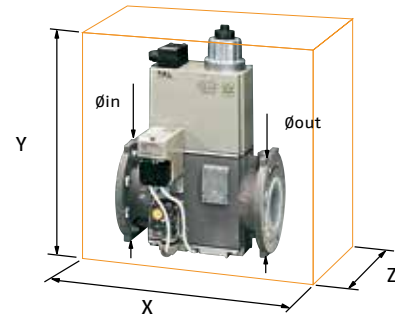
Example of gas train "MULTIBLOC" type without seal control (i.e. MBC 1200)



Example of gas train "COMPOSED" type without seal control (i.e. MBC 1900-3100-5000)



Example of gas train "CB" series with seal control



Example of gas train "DMV" series with seal control

GAS TRAIN						
MODEL	CODE	Ø in	Ø out	X mm	Y mm	Z mm
MB 415/1 - RT 30	3970180	Rp 1-1/2"	Rp 1-1/2"	523	250	100
MB 415/1 - RT 52	3970250	Rp 1-1/2"	Rp 1-1/2"	523	250	100
MB 415/1 RSM 30	3970232	Rp 1-1/2"	Rp 1-1/2"	523	250	100
MB 420/1 RT 30	3970181	Rp 2"	Rp 2"	523	289	100
MB 420/1 RT 52	3970257	Rp 2"	Rp 2"	523	289	100
MB 420/1 RSM 30	3970233	Rp 2"	Rp 2"	523	289	100

GAS TRAIN						
MODEL	CODE	Ø in	Ø out	X mm	Y mm	Z mm
MBC 1200/1 - RSM 60	3970221	Rp 2"	Rp 2"	528	424	161
MBC 1900/1 - FSM 40	3970222	DN 65	DN 65	613	430	237
MBC 3100/1 - FSM 40	3970223	DN 80	DN 80	633	500	240
MBC 5000/1 - FSM 80	3970224	DN 100	DN 100	733	576	280

GAS TRAIN						
MODEL	CODE	Ø in	Ø out	X mm	Y mm	Z mm
CB 512/1 - RSM 30	3970145	Rp 1-1/2"	Rp 1-1/2"	891	261	245
CB 520/1 - RSM 30	3970146	Rp 2"	Rp 2"	986	328	255
CB 525/1 - RSM 30	20044659	Rp 2"	Rp 2"	1025	356	285
CB 5065/1 - FSM 30	3970147	DN 65	DN 65	906	356	285
CB 5080/1 - FSM 30	3970148	DN 80	DN 80	934	416	285
CB 50100/1 - FSM 30	3970149	DN 100	DN 100	1054	501	350
CB 50125/1 - FSM 30	20015871	DN 125	DN 125	1164	780	400

GAS TRAIN						
MODEL	CODE	Ø in	Ø out	X mm	Y mm	Z mm
DMV 512/1 - RSM - 0	20043035	Rp 1-1/2"	Rp 1-1/2"	490	292	245
DMV 520/1 - RSM - 0	20043038	Rp 2"	Rp 2"	490	292	255
DMV 525/1 - RSM - 0	20043053	Rp 2"	Rp 2"	530	338	270
DMV 5065/1 - FSM - 0	20043041	DN 65	DN 65	290	338	270
DMV 5080/1 - FSM - 0	20043044	DN 80	DN 80	310	397	290
DMV 50100/1 - FSM - 0	20043047	DN 100	DN 100	350	449	307
DMV 50125/1 - FSM - 0	20043050	DN 125	DN 125	400	554	333

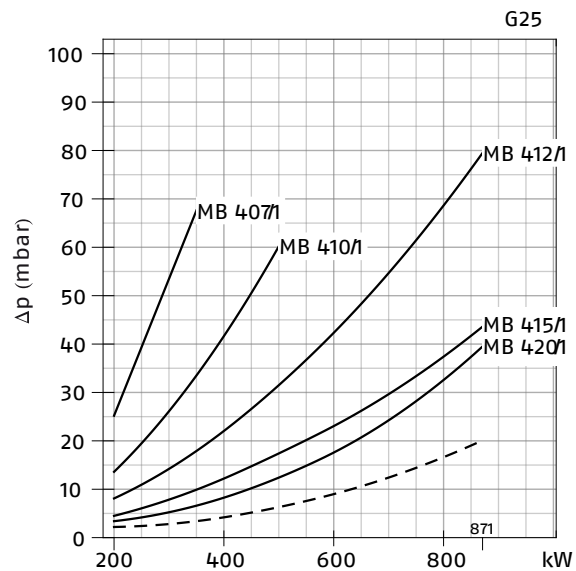
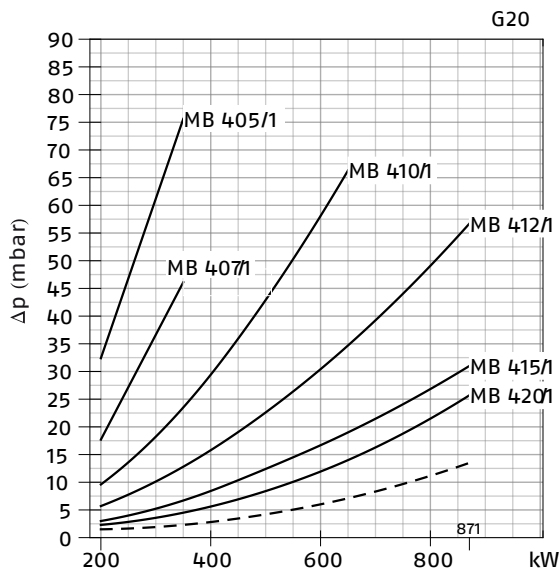
Pressure Drop Diagram

The diagrams indicate the minimum pressure drop of the burners with the various gas trains that can be matched with them; at the value of these pressure drop add the combustion chamber pressure.

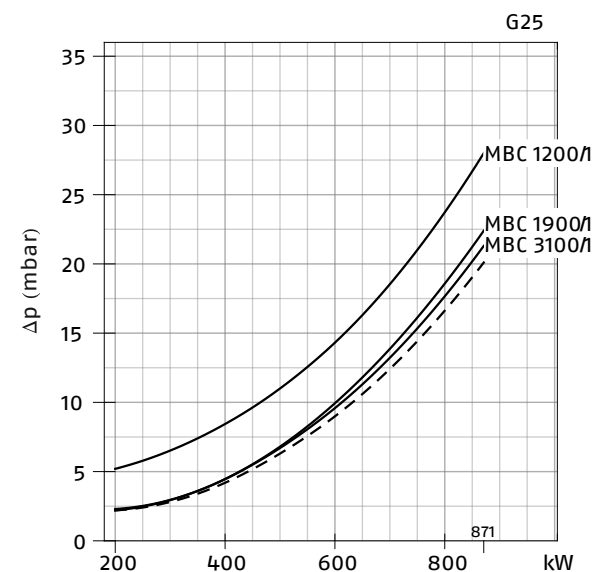
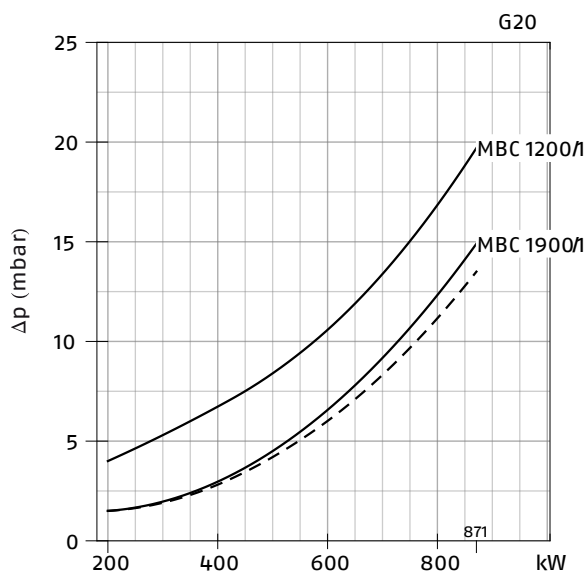
The value thus calculated represents the minimum required input pressure to the gas train. The minimum input gas pressure required is 15 mbar while burner operating.

In particular, the pressure difference between gas train upstream and downstream has to remain always over pressure drop values indicated below.

RLS 68/E-/EVi (NATURAL GAS)

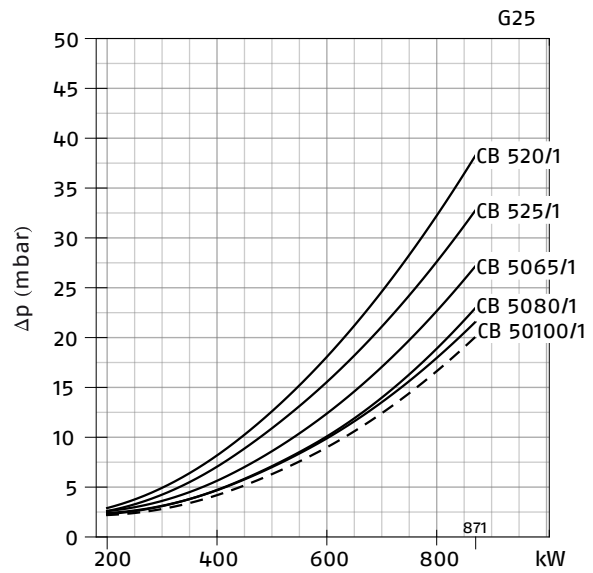
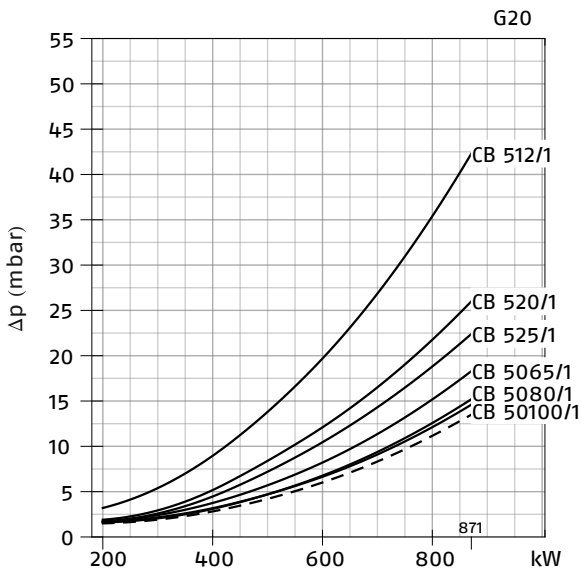


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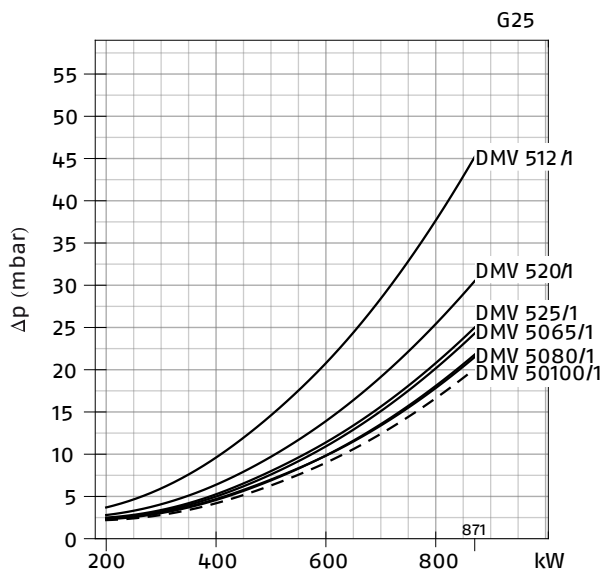
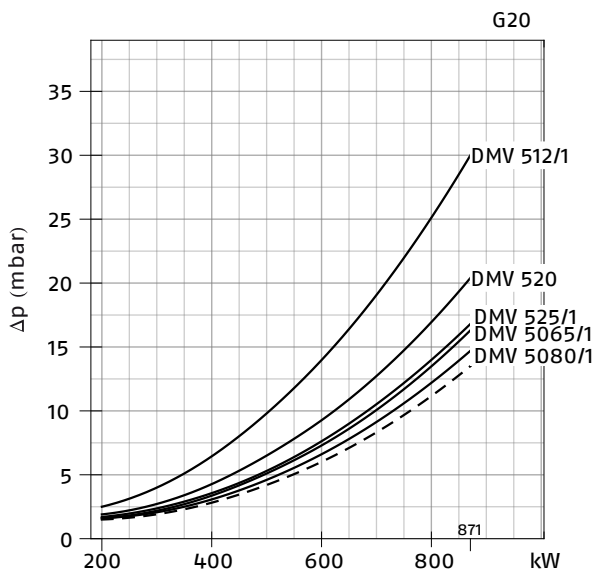


— Combustion head + gas butterfly valve + gas train
- - - Combustion head + gas butterfly valve

RLS 68/E-/EVi (NATURAL GAS)

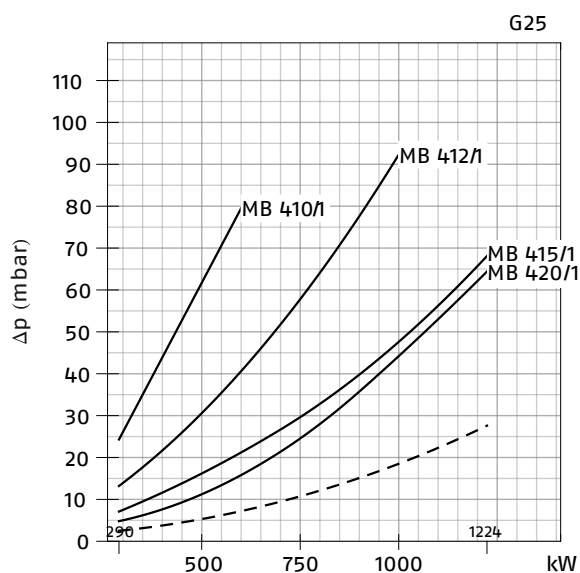
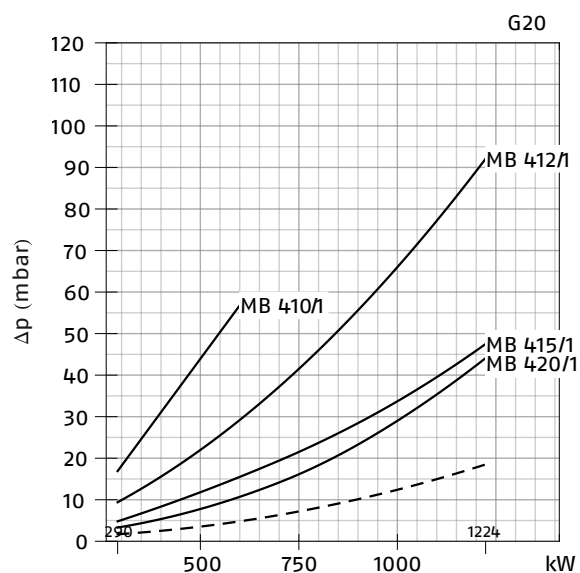


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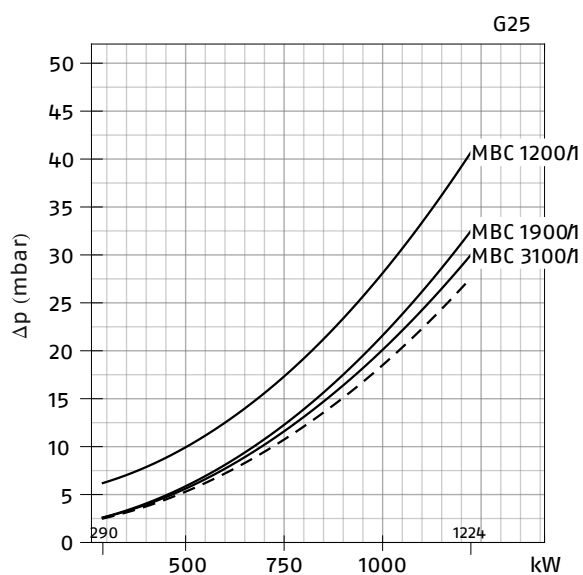
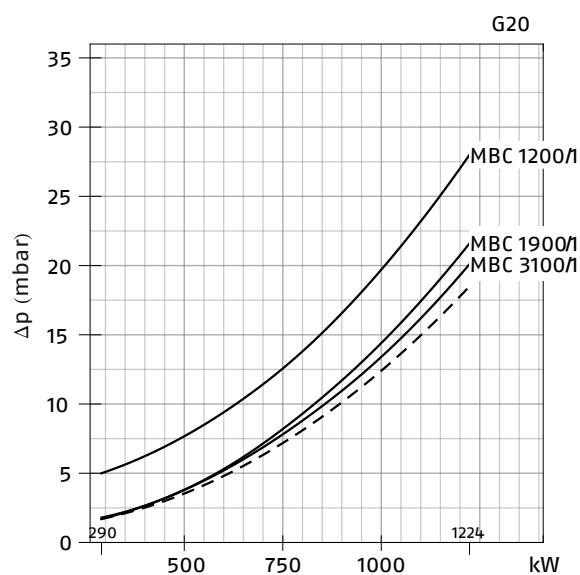


— Combustion head + gas butterfly valve + gas train
 - - - Combustion head + gas butterfly valve

RLS 120/E-/EVi (NATURAL GAS)

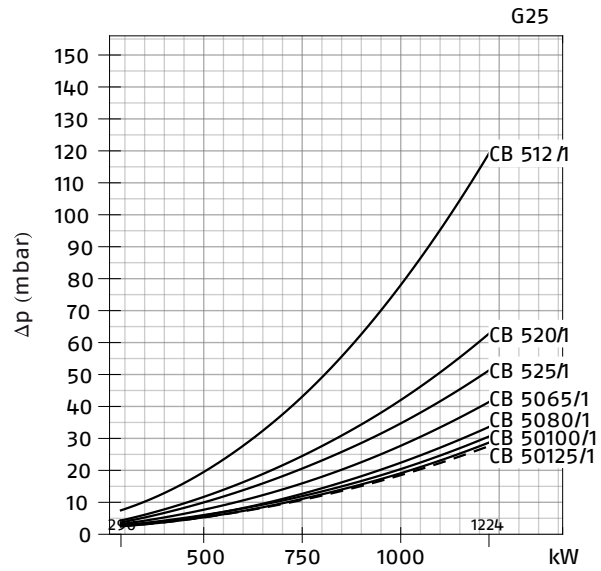
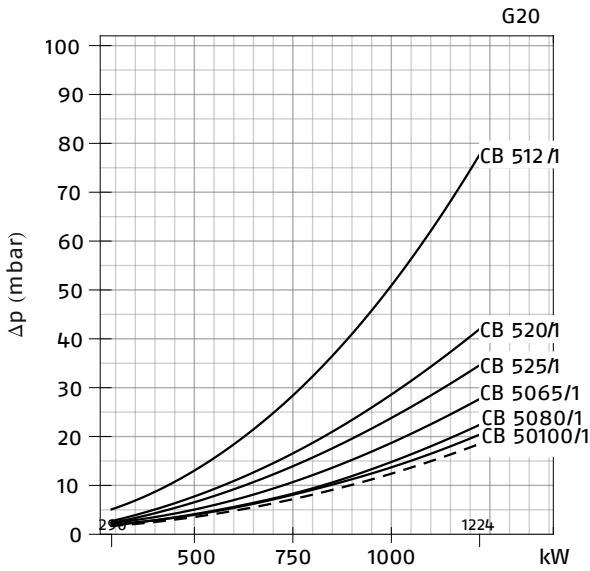


RLS 120/E-/EVi (NATURAL GAS)

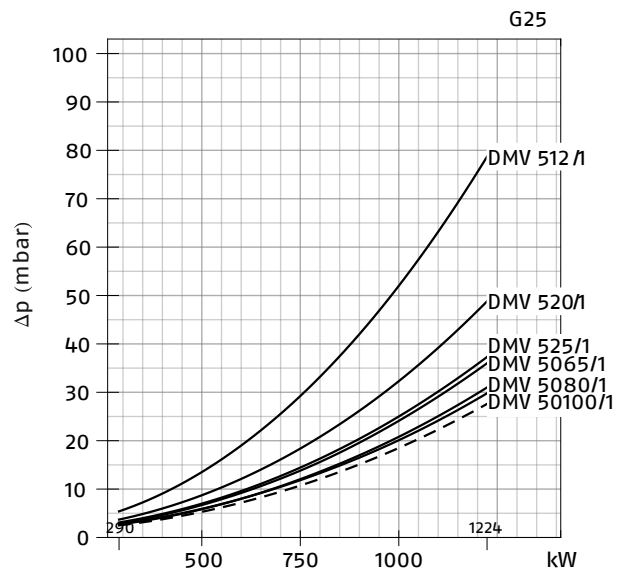
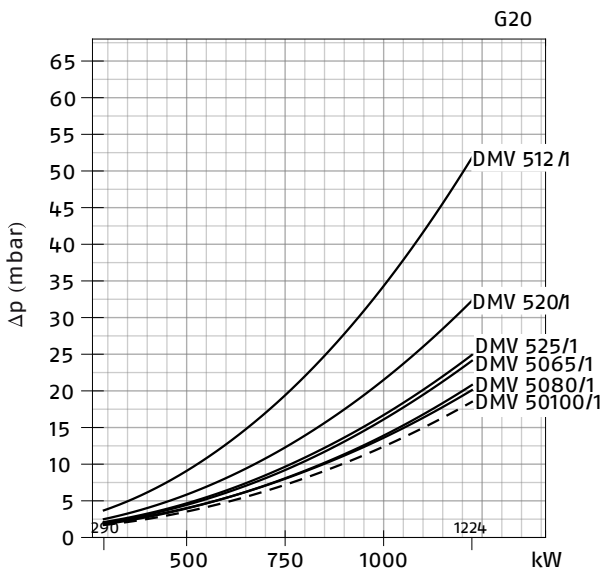


— Combustion head + gas butterfly valve + gas train
 - - - Combustion head + gas butterfly valve

RLS 120/E-/EVi (NATURAL GAS)

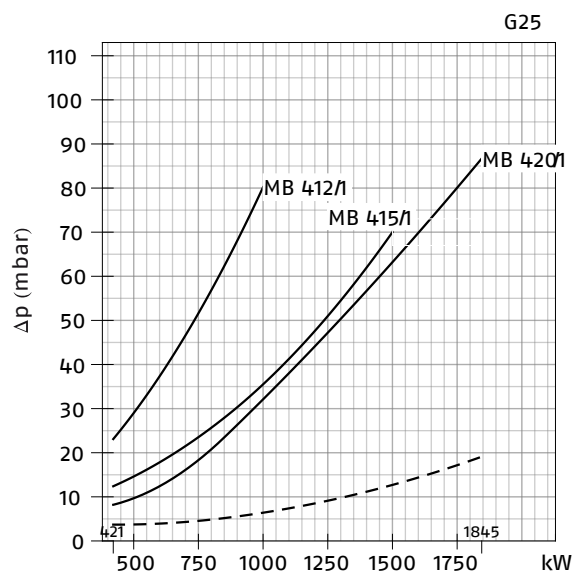
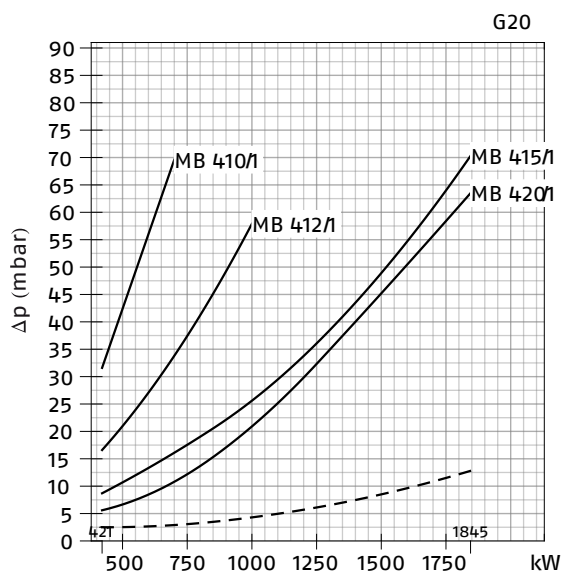


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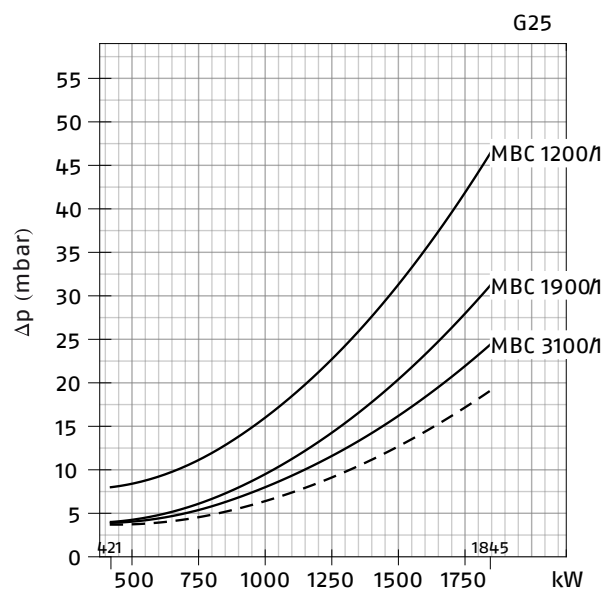
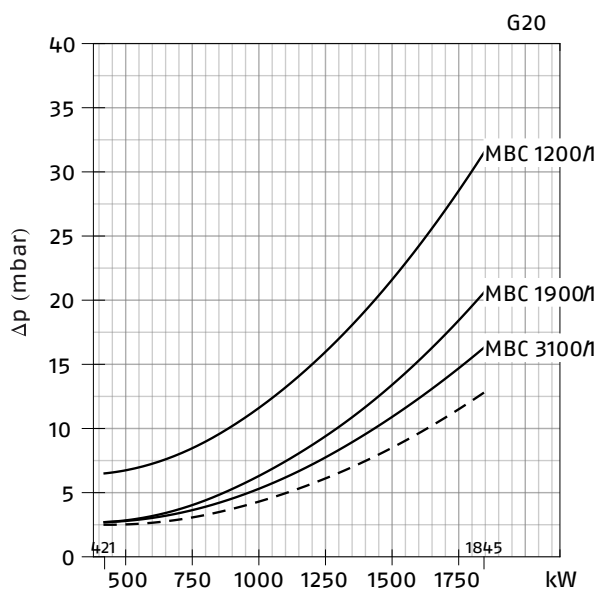


— Combustion head + gas butterfly valve + gas train
- - - Combustion head + gas butterfly valve

RLS 160/E-/EVi (NATURAL GAS)

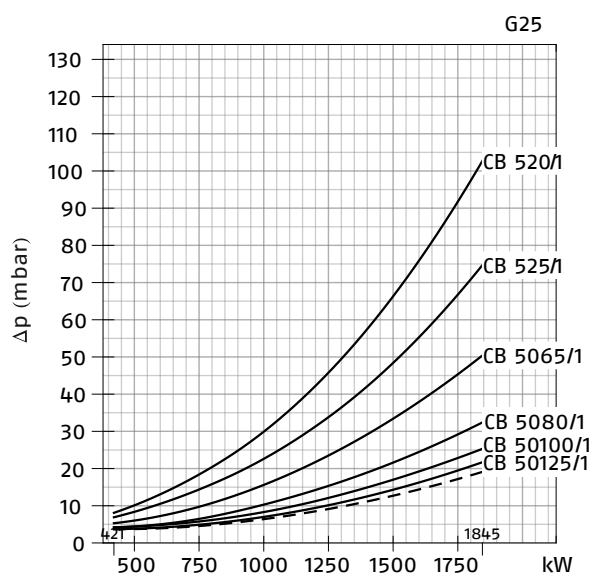
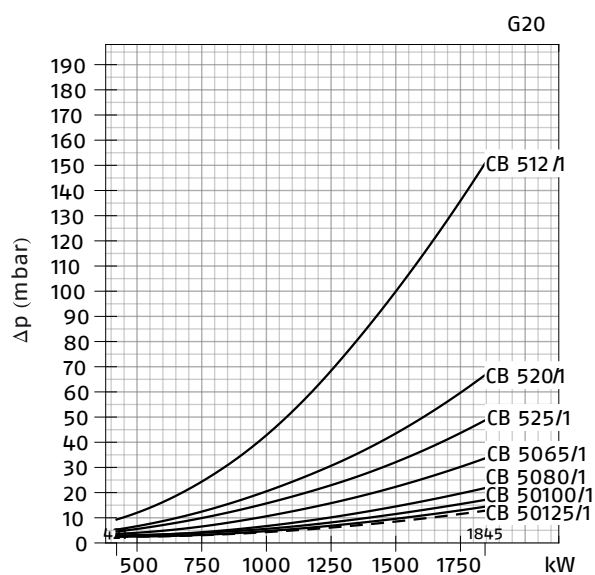


RLS 160/E-/EVi (NATURAL GAS)

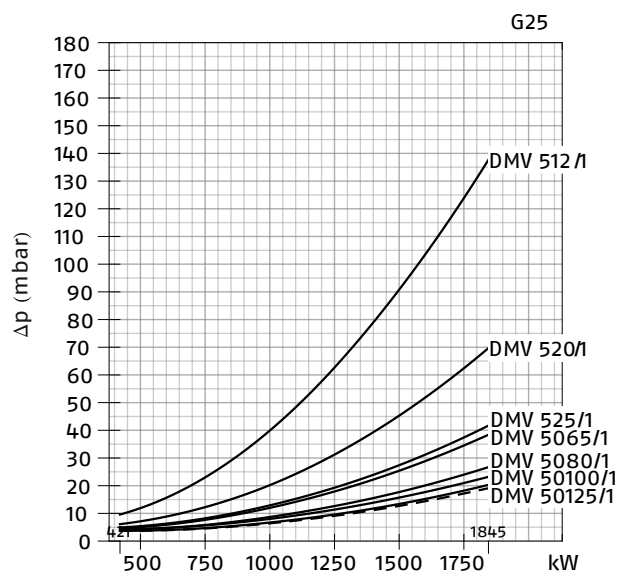
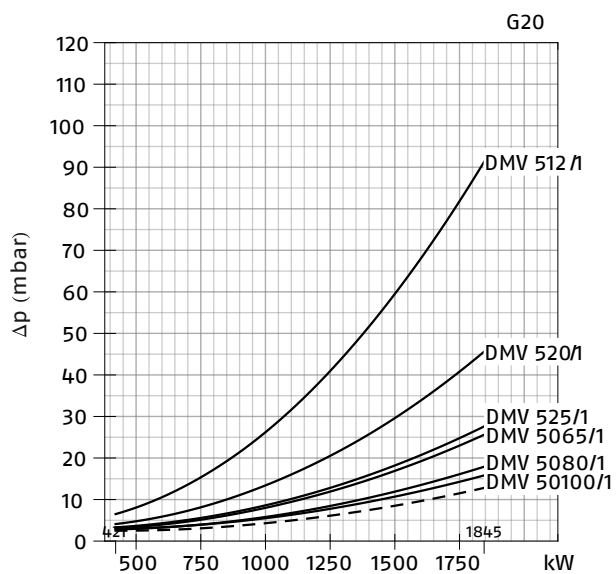


— Combustion head + gas butterfly valve + gas train
 - - - Combustion head + gas butterfly valve

RLS 160/E-/EVi (NATURAL GAS)

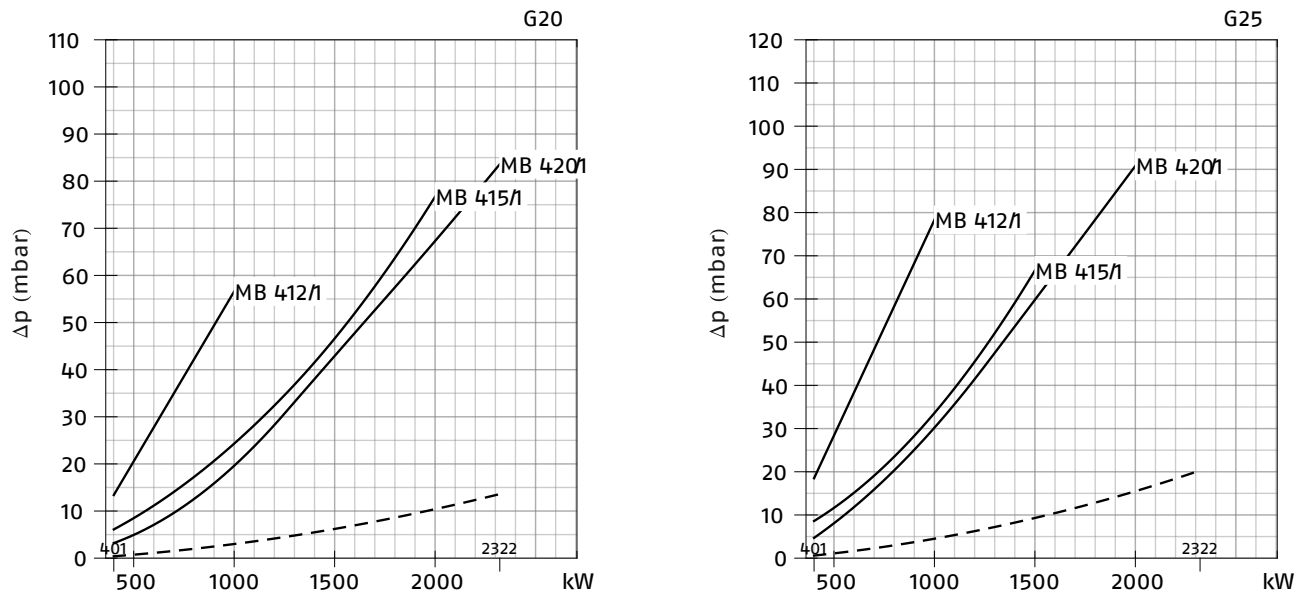


RLS 160/E-/EVi (NATURAL GAS)

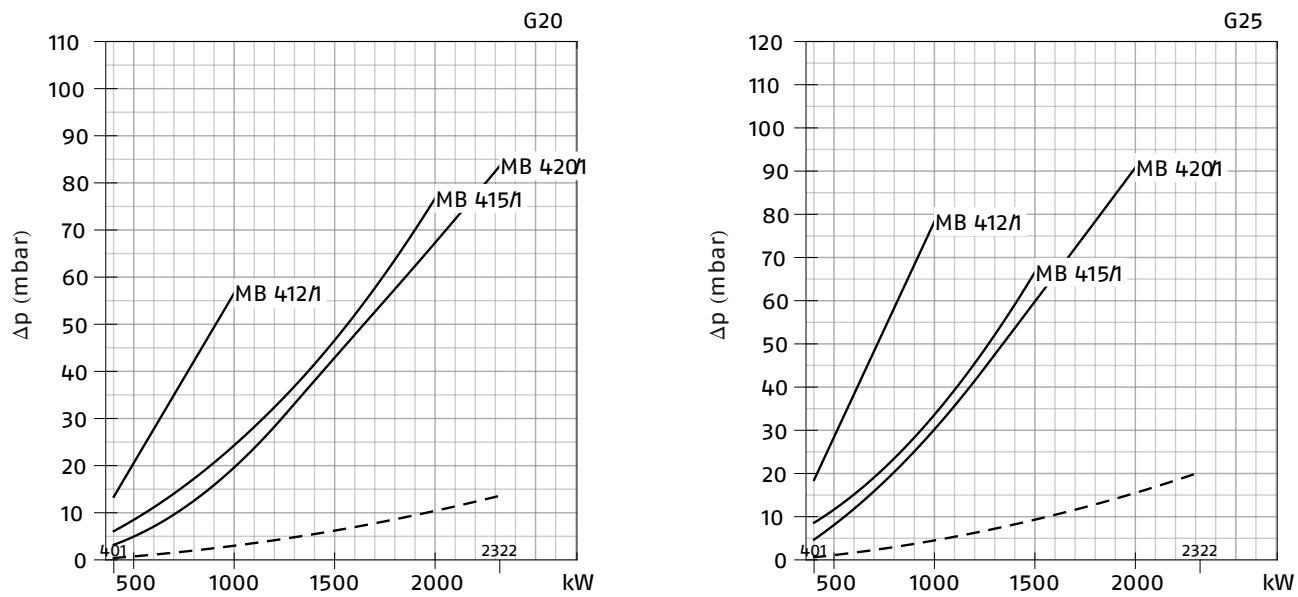


— Combustion head + gas butterfly valve + gas train
- - - Combustion head + gas butterfly valve

RLS 200/E-/EVi (NATURAL GAS)

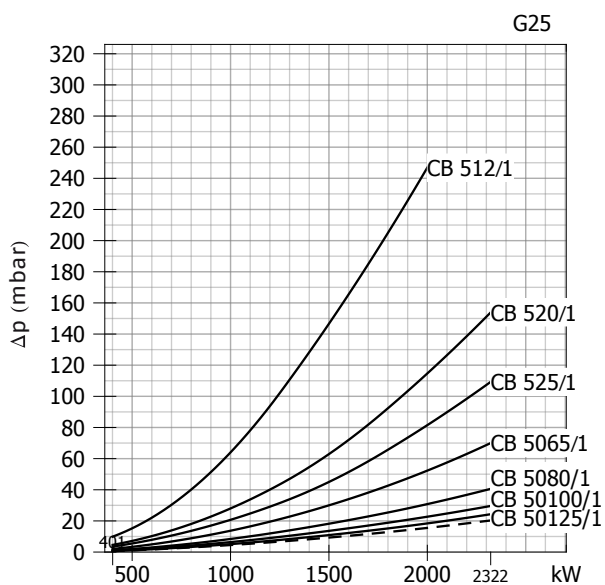
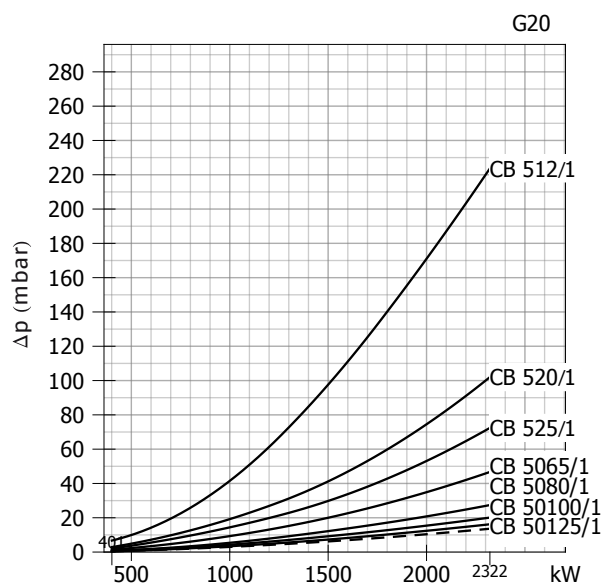


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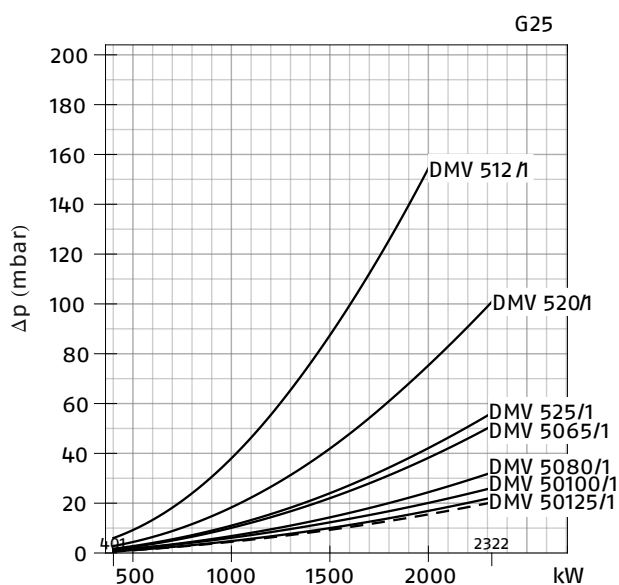
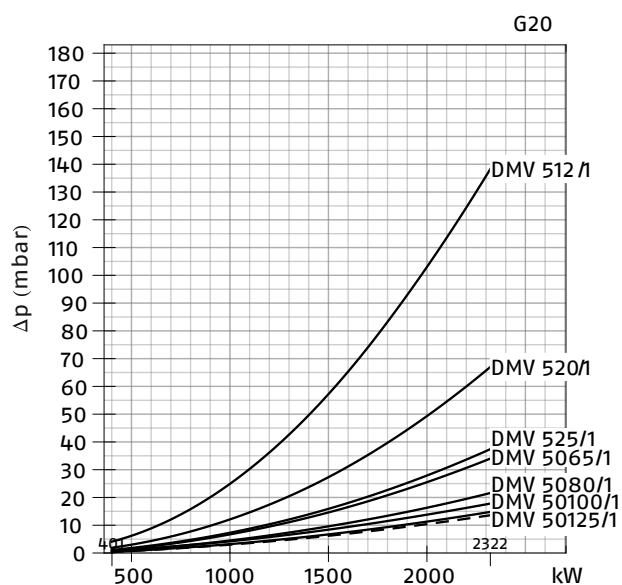


— Combustion head + gas butterfly valve + gas train
- - - Combustion head + gas butterfly valve

RLS 200/E-/EVi (NATURAL GAS)



RLS 200/E-/EVi (NATURAL GAS)



— Combustion head + gas butterfly valve + gas train
- - - Combustion head + gas butterfly valve

GAS TRAIN		ADAPTER CODE			
CODE	MODEL	RLS 68	RLS 120	RLS 160	RLS 200
3970599	MB 407/1 - RT 52	3000824 + 3000843	●	●	●
3970553	MB 407/1 - RT 20		●	●	●
3970229	MB 407/1 - RSM 20		●	●	●
3970258	MB 410/1 - RT 52	3010126		●	●
3970554	MB 410/1 - RT 20	3000824 + 3000843		●	●
3970600	MB 410/1 - RT 52			●	●
3970230	MB 410/1 - RSM 20			●	●
3970256	MB 412/1 - RT 52	3000843			●
3970144	MB 412/1 - RT 20				●
3970231	MB 412/1 - RSM 20				●
3970180	MB 415/1 - RT 30	3000843			
3970250	MB 415/1 - RT 52				
3970232	MB 415/1 - RSM 30				
3970181	MB 420/1 - RT 30	-	-	-	-
3970257	MB 420/1 - RT 52	-	-	-	-
3970233	MB 420/1 - RSM 30	-	-	-	-
3970221	MBC 1200/1 - RSM 60	-	-	-	-
3970222	MBC 1900/1 - FSM 40	3000825			
3970223	MBC 3100/1 - FSM 40	3000826			
3970145	CB 512/1 - RSM 30	3000843			
3970146	CB 520/1 - RSM 30	-	-	-	-
20044659	CB 525/1 - RSM 30	-	-	-	-
3970147	CB 5065/1 - FSM 30	3000825			
3970148	CB 5080/1 - FSM 30	3000826			
3970148	CB 50100/1 - FSM 30	3010370 + 3000826			
3970148	CB 50125/1 - FSM 30	●	3010224 + 3000826		
20043035	DMV 512/1 - RSM -0	3000843			
20043038	DMV 520/1 - RSM -0	-	-	-	-
20043053	DMV 525/1 - RSM -0	-	-	-	-
20043041	DMV 5065/1 - FSM -0	3000825			
20043044	DMV 5080/1 - FSM -0	3000826			
20043047	DMV 50100/1 - FSM -0	3010370 + 3000826			
20043050	DMV 50125/1 - FSM -0	●	●	3010224 + 3000826	

● Gas train not available or not suitable for the matching to the burner.

Hydraulic Circuit

Various hydraulic circuits are available, depending on fuel output asset according to local norms of steam generators.

The burners are fitted with two valves for oil output from the pump: a pressure regulator on the return circuit from the nozzle allows varying the quantity of burnt fuel.

A safety valve on the return circuit impedes oil leakage from the nozzle when the burner is in stand by and pre-purge phases.

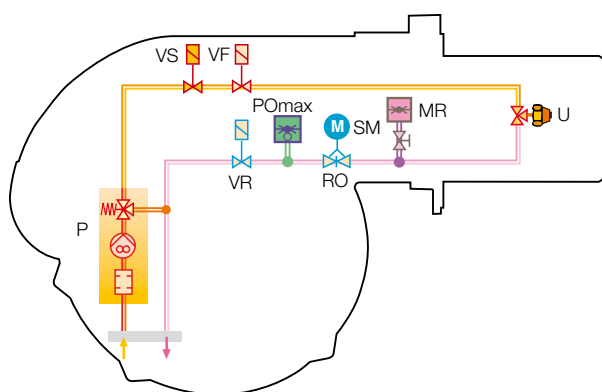
Beginning with the RLS 120/E-/EVi model, the burners have a double safety valve on the return circuit.

The models fitted with a minimum pressure switch on the oil delivery circuit can be installed on steam generators according to TRD-72 standard (Germany) and NBN standard (Belgium).

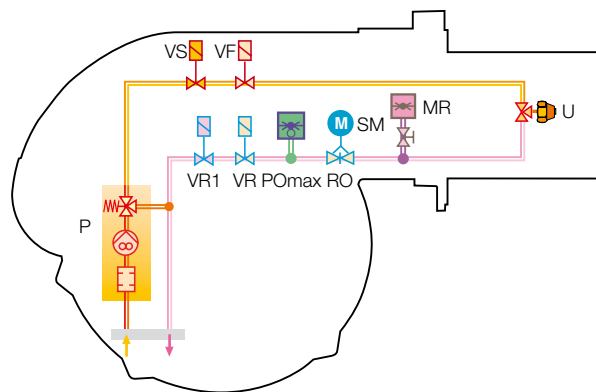


Example of light oil pump of RLS 160/EVi MX burner

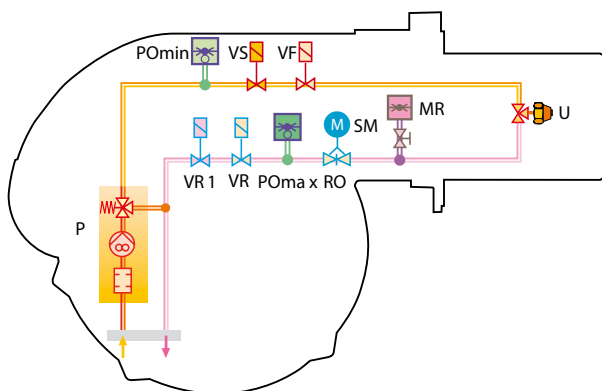
EN 267 < 100 Kg/h



EN 267 > 100 Kg/h



Versions for TRD-72, NBN steam generators



p	Pump with filter and pressure regulator on the output circuit
VS	Safety valve on the output circuit
VF	Working valve on the output circuit
PO min	Min. Oil pressure switch on the output circuit
U	Nozzle
MR	Pressure gauge on the return circuit
SM	Servomotor
RO	Pressure regulator on the return circuit
PO max	Max. Oil pressure switch on the return circuit
VR	1st safety valve on the return circuit
VR1	2nd safety valve on the return circuit

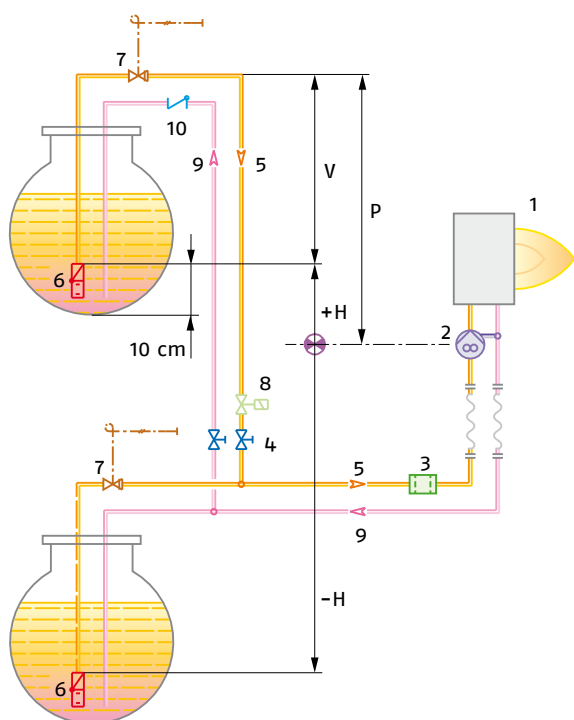
Selecting the Fuel Supply lines

The fuel feed must be completed with the safety devices required by the local norms.

The table shows the choice of piping diameter, depending on the difference in height between the burner and the tank and their distance.

Maximum equivalent length for the piping L [m]

Model	RLS 68-120/E-/EVi MX			RLS 160-200/E-/EVi MX	
Diameter piping	Ø12mm	Ø14mm	Ø16mm	Ø16mm	Ø18mm
+H, -H (m)	Lmax (m)	Lmax (m)	Lmax (m)	Lmax (m)	Lmax (m)
+4,0	71	138	150	60	80
+3,0	62	122	150	50	70
+2,0	53	106	150	40	60
+1,0	44	90	150	30	50
+0,5	40	82	150	25	45
0	36	74	137	20	40
-0,5	32	66	123	18	35
-1,0	28	58	109	15	30
-2,0	19	42	81	10	20
-3,0	10	26	53	5	10
-4,0	-	10	25	-	6



H	Difference in height pump-foot valve
Ø	Internal pipe diameter
P	Max. height 10 m
V	Height 4 m
1	Burner
2	Burner pump
3	Filter
4	Manual shut off valve
5	Suction pipework
6	Bottom valve
7	Remote controlled rapid manual shut off valve (compulsory in Italy)
8	Type approved shut off solenoid valve (compulsory in Italy)
9	Return pipework
10	Check valve

Note: With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.

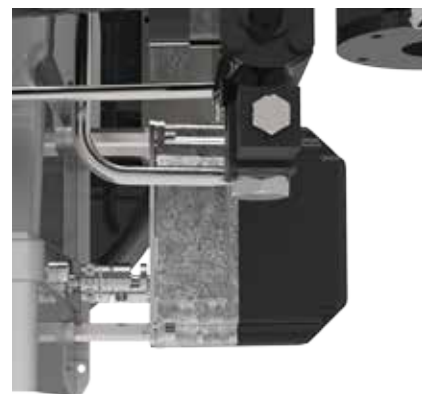
Ventilation

The ventilation circuit produces low noise levels with high performances pressure and air output, in despite of the compact dimensions.

The special design of the air suction circuit and the use of sound-proofing material keeps noise level very low.

A stepper motor with high accuracy position and absence of joint clearance and mechanical hysteresis controls the air regulations, ensuring high fuel efficiency at all firing ranges.

A minimum air pressure switch stops the burner when there is an insufficient quantity of air at the combustion head.



Example of the stepper motor for air flow setting

Combustion Head

Different lengths of the combustion head can be chosen for the RLS/E-/EVi MX series of burners.

The choice depends on the thickness of the front panel and the type of boiler.

Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

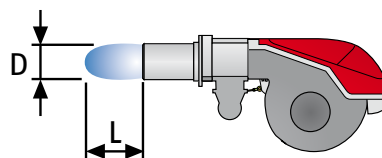
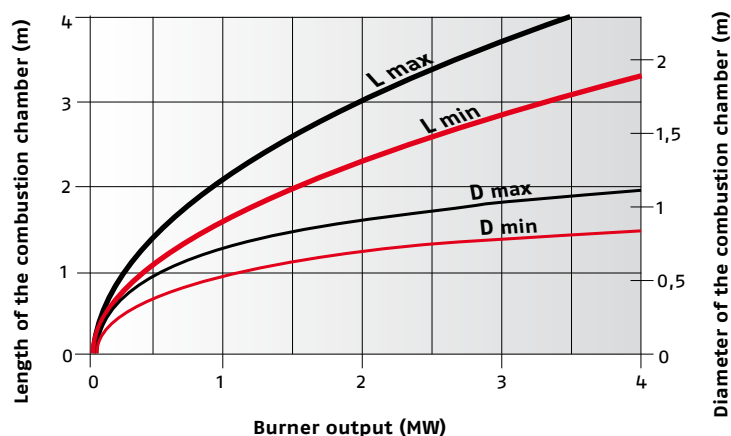
The internal positioning of the combustion head can easily be adjusted to the maximum defined output by adjusting a screw fixed to the flange.

Note: The burners of RLS/EVi MX series are not suitable to be installed on boiler with "reverse flame chamber".



Example of RLS 160/E-/EVi MX burner combustion head.

SUGGESTED COMBUSTION CHAMBER DIMENSIONS



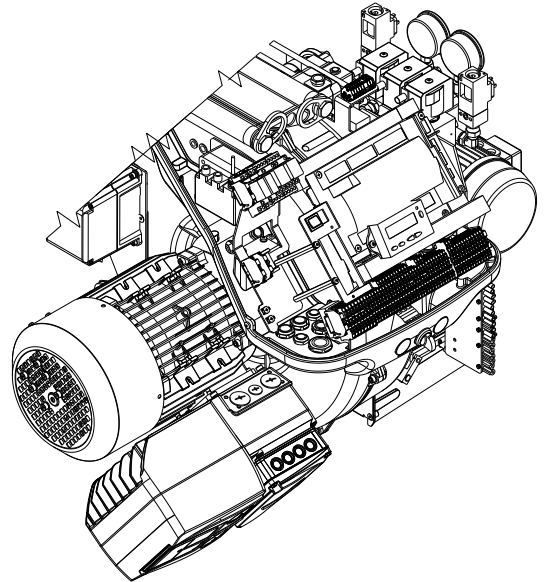
Example:
 Burner thermal output = 2000 kW;
 L flame (m) = 2,7 m (medium value);
 D flame (m) = 0,8 m (medium value)

Operation

BURNER OPERATION MODE

The models of RLS/E-/EVi MX series of burners are based on a Digital Burner Management System, LMV 26, which is able to manage the air-fuel ratio by independent servomotors and VSD in order to obtain a perfect output control and to assure a correct combustion and safe operation on all modulation range.

The Combustion Management System includes the standard function of a Flame Control Panel and offers many advantages such as, for example, a simple and fast commissioning, the burner status and fault causes diagnostic to facilitate the maintenance, the Integrated Gas Valves Proving function.



Example of Riello LMV 26, Digital Burner Management System, installed on a RLS/EVi burner models.

The LMV 26 Digital Burner Management System, also called Electronic Cam, is a microprocessor-based device that controls the complete burner operating cycle, included the valves proofing test before the start-up, and the correct air-fuel mixing in every point of modulation range.

It is based on the Digital Burner Management System, LMV 26, 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" with the installation of a PID logic regulator and respective probes.

RLS/E-/EVi MX burners series guarantees high efficiency levels, thus reducing fuel consumption and running costs; specific versions are available to operate with Variable Speed Drive technology base on the control of a Frequency Inverter that modifies the air flow through the motor speed variation.

The RLS/EVi MX burners provide a Variable Speed Drive System integrated with the fan motor for a compact solution and an easy commissioning.

FAN SPEED CONTROL

The RLS/EVi MX models, are available to operate with Variable Speed Drive technology base on the control of a Frequency Inverter that modifies the air flow through the motor speed variation.

The inverter device fitted to the RLS/EVi series burner acts on the electrical supply frequency of the fan motor to adjust the air flow through the motor speed variation.

The main advantages of speed control:

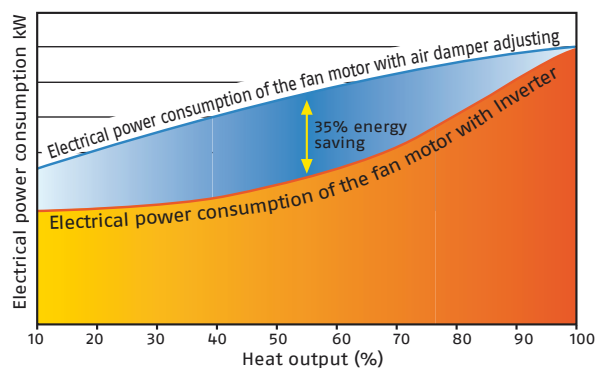
- lower sound emissions
- electric power saving.

The fan motor supplies just the necessary air flow, thus reducing sound emissions and avoiding energy loss due to the air damper regulation mechanism.

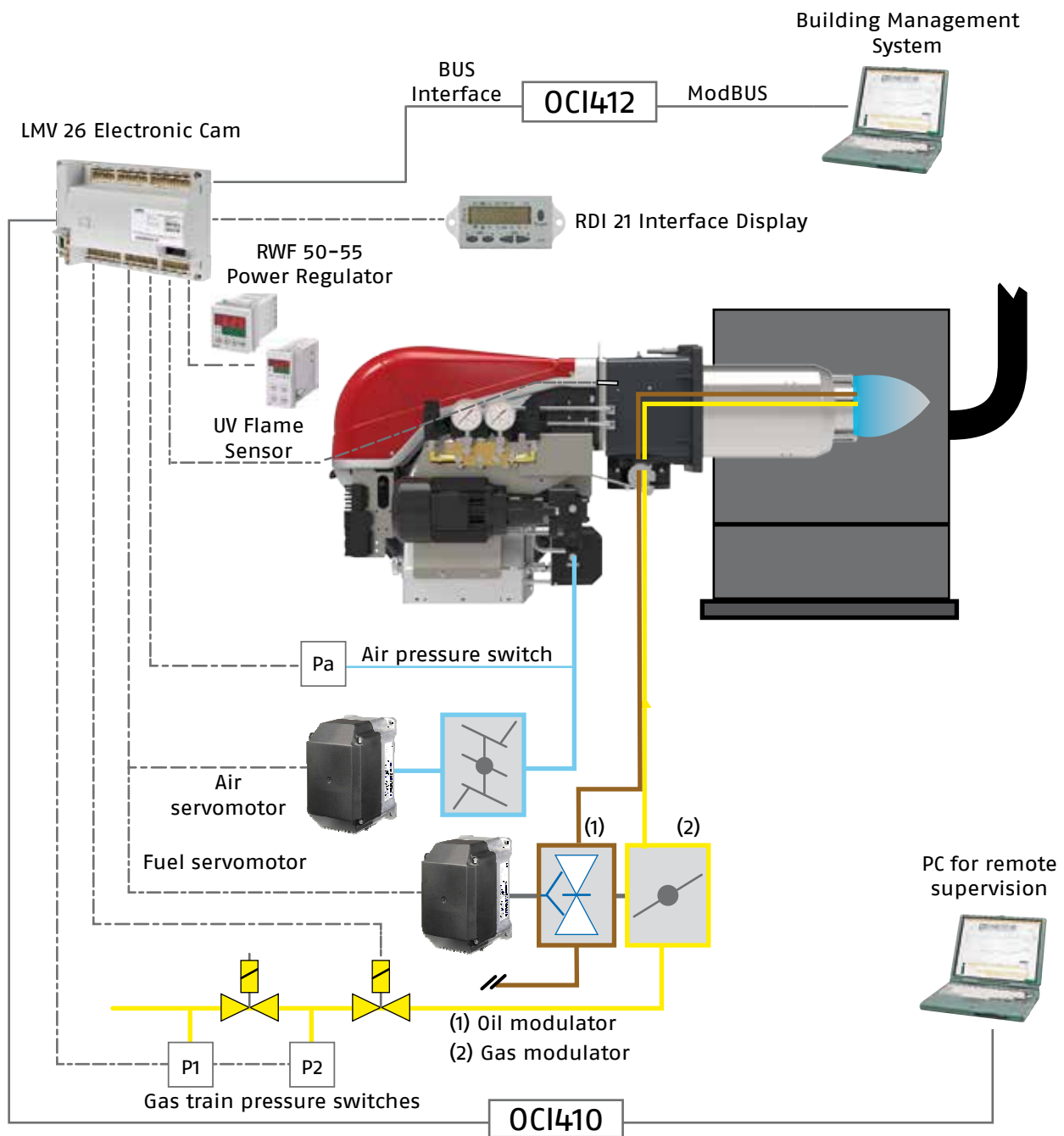
The inverter technology can save up to 35% of the energy costs.

A safety device to verify the correct speed of the motor is mounted on the air suction circuit of the burner.

The RLS/EVi MX burners leave the factory with the inverter installed on the fan motor already settled for the start-up and ready to operate correctly without ant additional information on the status of the inverter can be obtained through the "Led Status Display" on the basis of the color (green or red) and the type (fixed or flashing).



LMV 26 DIGITAL BURNER MANAGEMENT SYSTEM LAYOUT



DISPLAY INTERFACE

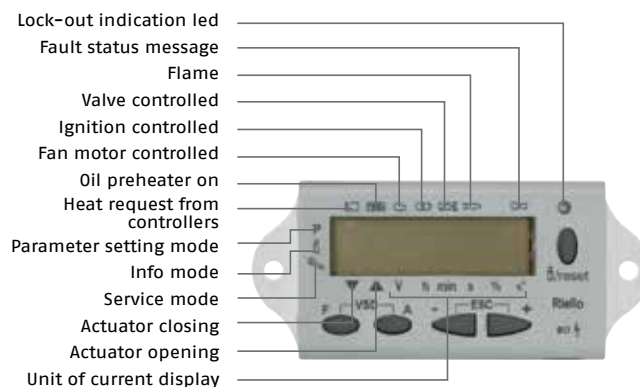
The AZL 21 display allows an easy interface with the LMV 26 electronic cam.

It is a "Non-language" display; there are only symbols and parameter numbers with certain values displayed. Only English international abbreviations are used instead of numbers.

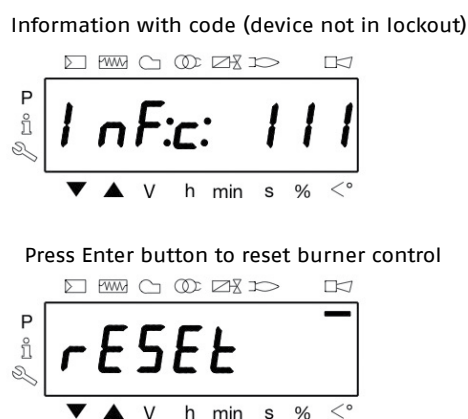
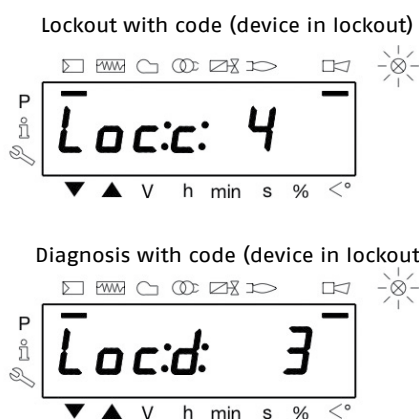
This solution significantly improves the understanding of the information; here below some examples are listed:

- OFF
- RUN
- OP (Operation)
- SER (Service)
- INF (Information)
- ERR (Error)
- LOC (Lockout)
- CODE (Password input)

In case of burner fault, a led highlights the lock-out status.



Example of AZL 21 display and related symbols.



Example of AZL 21 display Status and Fault information.

REMOTE CONNECTIONS

It is possible to connect the LMV 26 electronic cam to a data network based on a Modbus system by using of its Modbus functionality.

This facilitates implementation of the following applications:

- Visualisation of plant states
- Plant control
- Logging

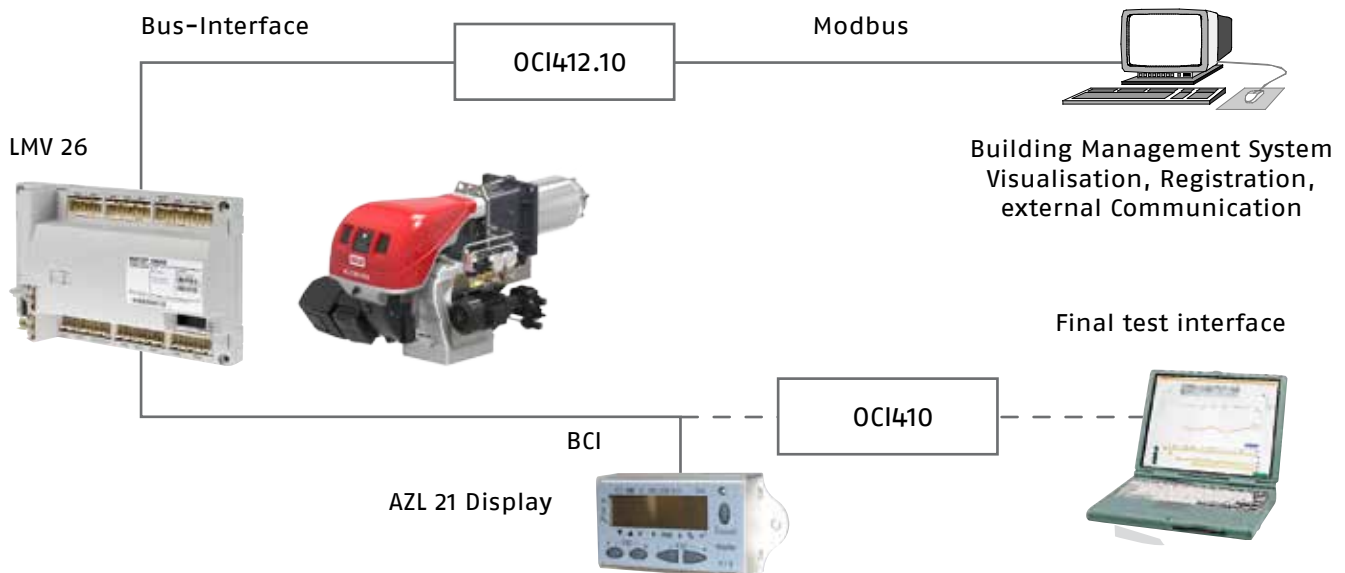
The physical connection to the Modbus system is made via an external OCI module.

The transmission mode used is RTU (Remote Terminal Unit).

The data are transmitted in binary format (hexadecimal) with 8 Bits.

The LSB (least significant bit) is transmitted first.

ASCII mode is not supported.

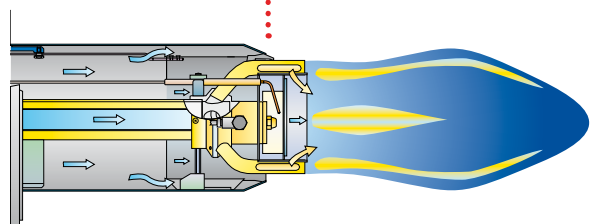


LMV 26 Remote Connections layout.

Safe and Green

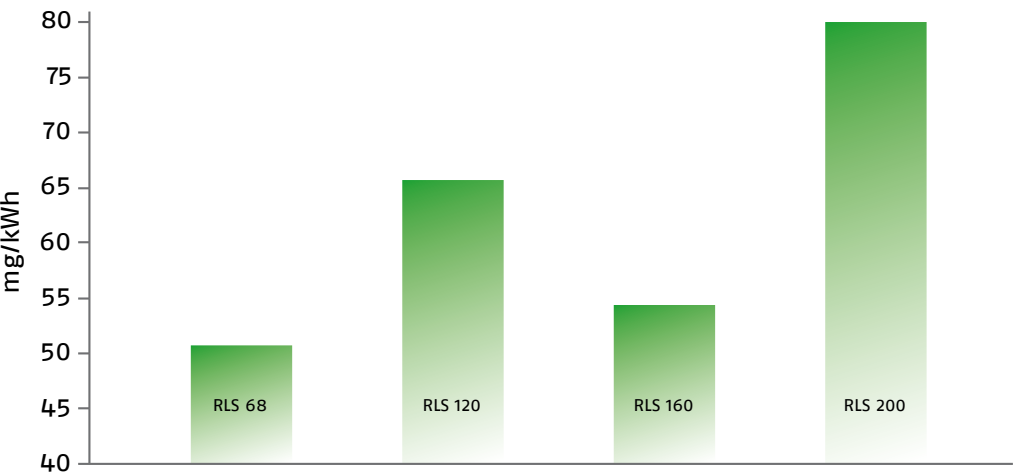
In the RLS/E-/EVi MX burners part of the gas is distributed through outlets which are perpendicular to the air flow, while the remaining gas is injected directly into the centre of the flame.

This prevents no homogeneous concentrations in the flame with areas of high oxidation, producing very stable flame with gradual and progressive combustion as the flame develops, thus giving polluting emission values below even the most restrictive norm values.

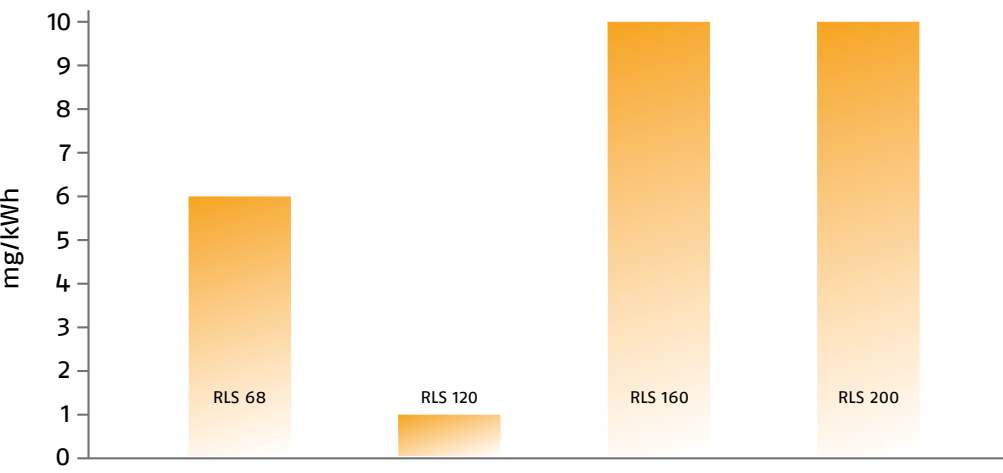


Emission

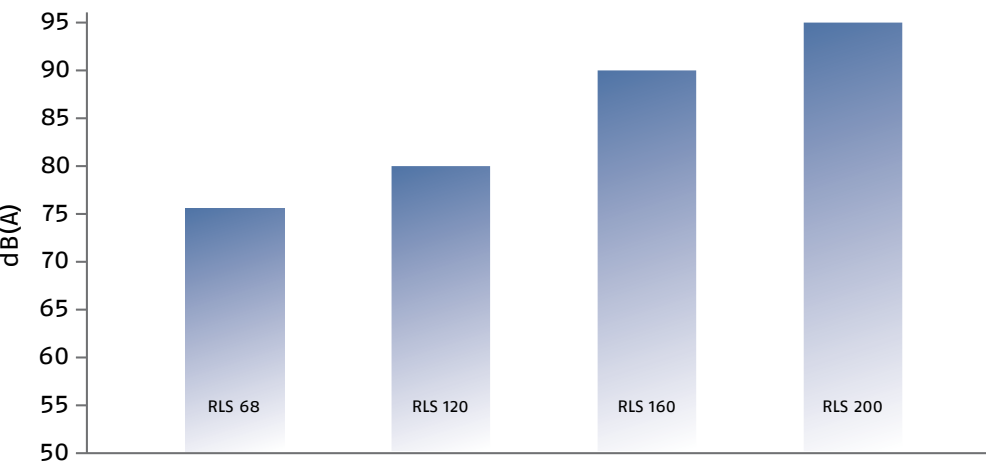
N02 EMISSIONS (gas G20)



CO EMISSIONS (gas G20)



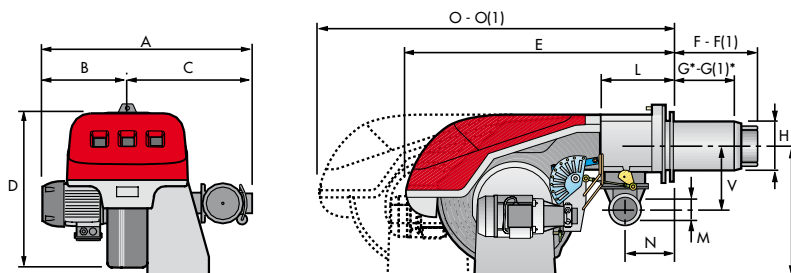
NOISE EMISSIONS



The noise emissions have been measured at the maximum output.

Overall Dimensions (mm)

BURNERS

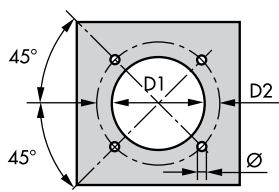


Model	A	B	C	D	E	F - F(1)	G* - G(1)*	H	I	L	M	N	O - O (1)	V
RLS 68/E-/EVi MX	745	350	395	585	860	260 - 395	200 - 335	189	430	214	2"	134	1161 - 1300	221
RLS 120/E-/EVi MX	765	370	395	585	860	260 - 395	200 - 335	189	430	214	2"	134	1161 - 1300	221
RLS 160/E-/EVi MX	895	415	480	615	880	373 - 503	272 - 402	221	445	221	2"	141	1440 - 1575	262
RLS 200/E-/EVi MX	935	455	480	615	880	373 - 503	272 - 402	221	445	221	2"	141	1440 - 1575	262

(1) Length with extended combustion head.

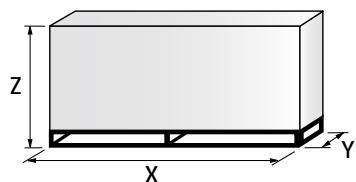
* Maximum depth of the boiler door including the depth of the burner flange insulating gasket.

BURNER - BOILER MOUNTING FLANGE



Model	D1	D2	Ø
RLS 68-120/E-/EVi MX	195	275 - 325	M12
RLS 160-200/E-/EVi MX	230	325 - 368	M16

PACKAGING



MODEL	X (1)	Y	Z	kg
RLS 68/E-/EVi MX	1400	975	645	115
RLS 120/E-/EVi MX	1400	975	645	120
RLS 160/E-/EVi MX	1400-1500 (2)	975	645	135
RLS 200/E-/EVi MX	1400-1500 (2)	975	645	135

(1) Length with standard and extended combustion head.

(2) Length with extended combustion head.

Burner Accessories

Return Nozzles type A3, A4 45°



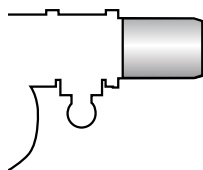
The following list shows the features and codes on the basis of the maximum required fuel output.

NOTE: each burner needs N° 1 nozzle.

Burner	Rated Output kg/h	A3 Nozzle code	A4 Nozzle code
RLS/E-/EVi MX	40	3009853	20067277
RLS/E-/EVi MX	50	3009854	20067279
RLS/E-/EVi MX	60	3009855	20067281
RLS/E-/EVi MX	70	3009856	20067283
RLS/E-/EVi MX	80	3009857	20067284
RLS/E-/EVi MX	90	3009858	20067285
RLS/E-/EVi MX	100	3009859	20067286
RLS/E-/EVi MX	110	3009860	20067287
RLS/E-/EVi MX	120	3009861	20067288
RLS/E-/EVi MX	130	3009862	20067289
RLS/E-/EVi MX	140	3009863	20067290
RLS/E-/EVi MX	150	20059496*	20067290
RLS/E-/EVi MX	160	3009864	20067293
RLS/E-/EVi MX	180	3009865	20067295
RLS/E-/EVi MX	200	3009866	20067297

* 60° angle

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
RLS 68-120/E-/EVi MX	260	395	in progress
RLS 160/E-/EVi MX	373	503	in progress
RLS 200/E-/EVi MX	373	503	in progress

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/E-/EVi MX	102	3000722

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/E-/EVi MX	3010094

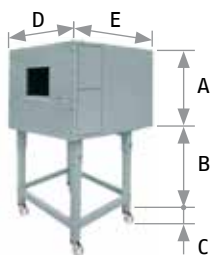
Ground fault interrupter kit



A "Ground fault interrupter kit" is available as a safety device for electrical system fault.

Burner	Kit code
RLS/E-/EVi MX	20098337

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 68-120/E-/EVi MX RLS 160-200/E-/EVi MX	C4/5	850	160 - 980	110	980	930	10	3010404

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

Head kit for "reverse flame chamber"



In certain cases, the use of the burner on reverse flame boilers can be improved by using an additional Pipes Kit.

Burner	Kit code
RLS 68/E-/EVi MX	20006401
RLS 120/E-/EVi MX	20006402
RLS 160/E-/EVi MX	3010249
RLS 200/E-/EVi MX	20035848

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
RLS/E-/EVi MX	3010436

OCI412 interface kit



Interface kit between the LMV 26 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/E-/EVi MX	3010437

EMI filter kit and ferrite

The KIT is required in case of Residential installations with direct connection in a public network (according to EN55014-1).
NOT required in case of Industrial installations with connection in a dedicated network (according to EN61000-6-4).

Burner	Kit code
RLS 68-120/E-/EVi MX	20122917
RLS 160-200/E-/EVi MX	20122922

Accessories for modulating operation

POWER CONTROLLER



To obtain modulating operation, the RLS/E-/EVi MX series of burners requires a regulator with three point outlet controls. The following table lists the accessories for modulating operation with their application range.

Burner	Regulator type	Regulator code
RLS/E-/EVi MX	RWF 50.2	20099869
RLS/E-/EVi MX	RWF 55.5	20099905

PROBE






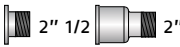



The relative temperature or pressure probes fitted to the regulator must be chosen on the basis of the application.

Burner	Probe type	Range (°C) (bar)	Probe code
RLS/E-/EVi MX	Temperature PT 100	-100 ÷ 500°C	3010110
RLS/E-/EVi MX	Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
RLS/E-/EVi MX	Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214
RLS/E-/EVi MX	Pressure 4 ÷ 20 mA	0 ÷ 25 bar	3090873

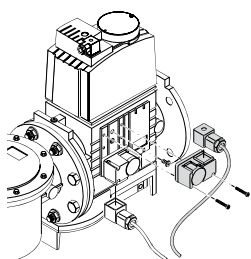
Gas Train Accessories

Adapters

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

Adapter	Length mm	Adapter code
 3/4" 1" 1/2	31	3000824
 2" 1/2 2"	300	3000825
DN 65  2" 1/2 1" 1/2		
DN 80  2" 1/2 2"	300	3000826
 1" 1/2 2"	35	3000843
 1" 1/4 2"	35	3010126
	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. The PVP is included as standard equipment on RLS 120/E-EVi-160/E-EVi-200/E-EVi MX models.

Gas train	Kit code
MB - CB type	3010344

* not necessary for the RLS 120/E-EVi - 160/E-EVi - 200/E-EVi MX models where is included as a standard.

Seal control kit



To test the valve seals on the gas train, a special "seal control kit" is available. The valve seal control device is compulsory (EN 676) on gas trains to burners with a maximum output over 1200 kW. The seal control is type VPS 504.

Burner	GAS TRAIN	Kit code
RLS/E-/EVi MX	MB	3010123
RLS/E-/EVi MX	MBC - CB - DMV	3010367

Stabiliser spring



Accessory springs are available to vary the pressure range of the gas train stabilisers.

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

Specification

DESIGNATION OF SERIES

A specific index guides your choice of burner from the various models available in the RLS/EVi Series. Below is a clear and detailed specification description of the product.

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	160	/EVi	MX	TC	FS1	3/400/50	230/50
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BASIC DESIGNATION

EXTENDED DESIGNATION

AVAILABLE BURNER MODELS

BURNER MODELS	HEAD LENGHT	FLAME CONTROL SYSTEM	ELECTRICAL SUPPLY	AUXILIARY VOLTAGE	NOTE
RLS 68/E-/EVi MX	TC	FS1	3/400/50	230/50-60	(1) (2)
RLS 68/E-/EVi MX	TL	FS1	3/400/50	230/50-60	(1) (2)
RLS 120/E-/EVi MX	TC	FS1	3/400/50	230/50-60	(1) (2)
RLS 120/E-/EVi MX	TL	FS1	3/400/50	230/50-60	(1) (2)
RLS 160/E MX	TC	FS1	3/230/50	230/50-60	(1) (2)
RLS 160/E MX	TL	FS1	3/230/50	230/50-60	(1) (2)
RLS 160/E-/EVi MX	TC	FS1	3/400/50	230/50-60	(1) (2)
RLS 160/E-/EVi MX	TL	FS1	3/400/50	230/50-60	(1) (2)
RLS 200/E MX	TC	FS1	3/230/50	230/50-60	(1) (2)
RLS 200/E MX	TL	FS1	3/230/50	230/50-60	(1) (2)
RLS 200/EVi MX	TC	FS1	3/400/50	230/50-60	(1) (2)
RLS 200/EVi MX	TL	FS1	3/400/50	230/50-60	(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-/EVi MX series are in according to 2006/42/EC - 2009/142/EC - 2014/30/UE - 2014/35/UE Directives.

(1) with plug and socket

(2) with terminal board

PRODUCT SPECIFICATION

Monoblock forced draught Low NOx dual fuel burner with two stage progressive or modulating operation at the gas and oil side, with a specific kit, fully automatic, made up of:

- air suction circuit lined with sound-proofing material
- centrifugal fan with high performance and low sound emissions
- air damper for air flow setting controlled by a high precision servomotor
- starting motor at 2800 rpm, three-phase 400V with neutral, 50Hz
- 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
 - gas distributor
 - flame stability disk
- maximum gas pressure switch to stop the burner in the case of excess pressure on the fuel supply line
- minimum air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- gears pump for high pressure fuel supply
- pump starting motor
- oil safety valves
- flame control panel
- UV photocell for flame detection
- burner on/off selection switch
- oil/gas selector
- flame inspection window
- slide bars for easier installation and maintenance
- protection filter against radio interference
- IP 44 electric protection level.
- digital Burner management system for air/fuel setting; with output PID modulation control as accessory
- AZL Display Interface, for combustion system commissioning and monitoring
- electronic cam for controlling the system safety
- valve unit with double oil safety valve on the output circuit and a safety valve on the return circuit (RLS 68/E-/EVi MX); double oil safety valve on the return circuit (RLS 120-160-200/E-/EVi MX)

Gas train:

Fuel supply line, 3/4" - 1 1/2" - 2" configuration:

- MULTIBLOC with integrated filter
- minimum gas pressure switch.

Fuel supply line DN 65 - DN80, DN100 and DN125 configuration:

- filter
- MULTIBLOC
- minimum gas pressure switch

Conforming to:

- 2014/30/EU directive (electromagnetic compatibility)
- 2014/35/EU directive (low voltage)
- 2009/142/EC directive (gas)
- 2006/42/EC directive (machinery)
- EN 676 (gas burners)
- EN 267 (oil burners)

Standard equipment:

- 1 gas train flange
- 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
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue

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

02/2017

T50095UK01



[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 Nox 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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