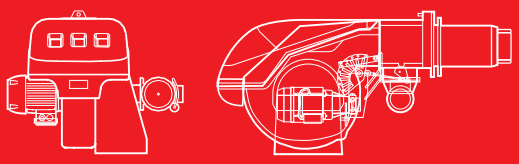
TECHNICAL DATA LEAFLET

Low NOx DUAL FUEL

RLS 68÷160/M MX Series

Low NOx Modulating Dual Fuel Burners

RLS 68/M MX	200/350	÷	860	kW
RLS 120/M MX	300/600	÷	1200	kW
RLS 160/M MX	300/930	÷	1840	kW



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Energy For Life

The RLS/M MX series of burners covers a firing range from 200 to 1840 kW, and they have been designed for use in hot or superheated water boilers, hot air or steam generators, diathermic oil boilers.
0peration is "two stage" at the oil side and "modulating" at the gas side with the installation of a PID logic regulator and respective probes.
RLS/M MX series burners guarantees high efficiency levels in all the various applications, thus reducing fuel consumption and running costs.
0ptimisation 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/M MX	RLS 120/M MX	RLS 160/M MX
Burner operation mode			Two stages light oil - Two stages progressive/modulating gas		
Modulation ratio at max. output			1 ÷ 2 (light oil) / 1 ÷ 4 (gas)		
Servomotor		type	SQN 31		
	run time	s	33		
Heat output		kW	200/350÷860	300/600÷1200	300/930÷1840
		Mcal/h	172/300÷740	258/516÷1032	258/800÷1582
Working temperature		°C min./ max.	0/40		
Oil	net calorific value	kWh/kg	11,86		
	viscosity	mm²/s (cSt)	4 ÷ 6		
	delivery	kg/h	17/30÷73	25/50÷101	25/78÷155
Pump		type	J6 C		J7 C
	delivery	kg/h	230 (at 12 bar)		
Atomised pressure		bar	12		
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	23/35÷86	30/60÷120	30/93÷184
G25	net calorific value	kWh/Nm³	8,6		
	density	kg/Nm³	0,78		
	gas delivery	Nm³/h	27/40÷100	35/70÷140	35/108÷214
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	3N/50/230-400~(±10%)		
Auxiliary electrical supply		Ph/Hz/V	1/50/230~(±10%)		
Control box		type	LFL 1.333 (FS1) - LGK 16 (FS2)		
Total electrical power		kW	3	3,7	6,0
Auxiliary electrical power		kW	1,5		
Heaters electrical power		kW	--		
Protection level		IP	44		
Pump motor electrical power		kW	0,55		
Rated pump motor current		A	3,6		
Pump motor start up current		A	9,5		
Pump motor protection level		IP	44		
Fan motor electrical power		kW	1,5	2,2	4,5
Rated fan motor current		A	5,9 - 3,4	8,8 - 5,1	15,8 - 9,1
Fan motor start up current		A	35,4 - 20	52,8 - 30,6	126 72,8
Fan motor protection level		IP	54		
Ignition transformer		type	--		
		V1 - V2	230V - 2x5 kV		
		I1 - I2	1,9A - 30mA		
Operation			FS1 intermittent (1 stop each 24 h) - FS2 continuous (1 stop each 72 h)		
Sound pressure		dB (A)	76	79	80,5
Sound power		dB (A)	87	90	91,5

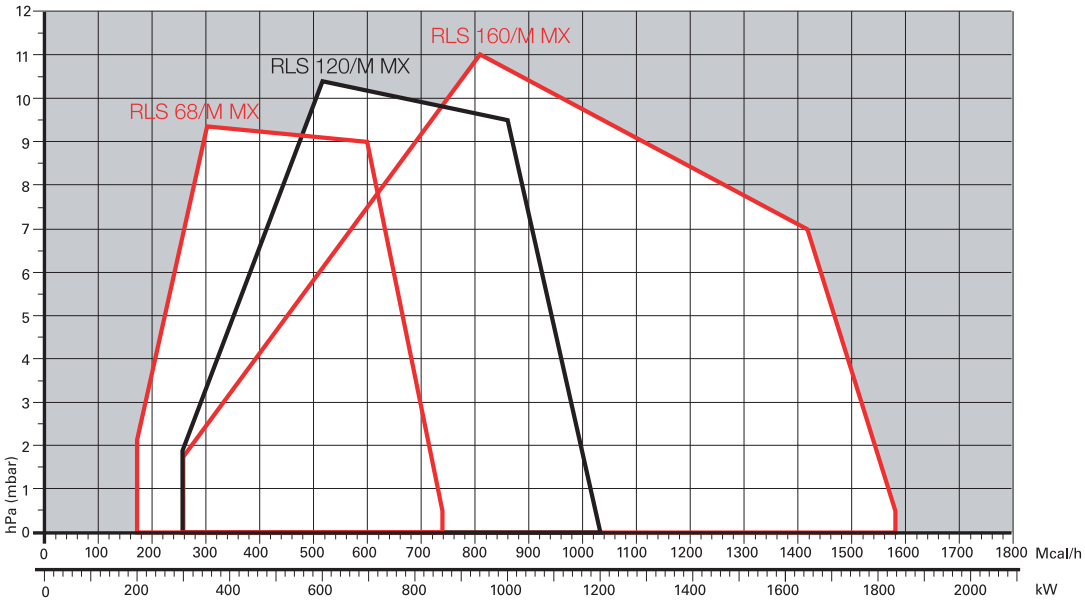
Technical Data

MODEL			RLS 68/M MX	RLS 120/M MX	RLS 160/M MX
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		
Directive			2006/42/EC - 2009/142/EC - 2014/30/UE - 2014/35/UE		
Conforming to			EN 267 - EN 676		
Certification			CE 0085BP0175		CE 0085BN0625

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

Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.

Firing Rates



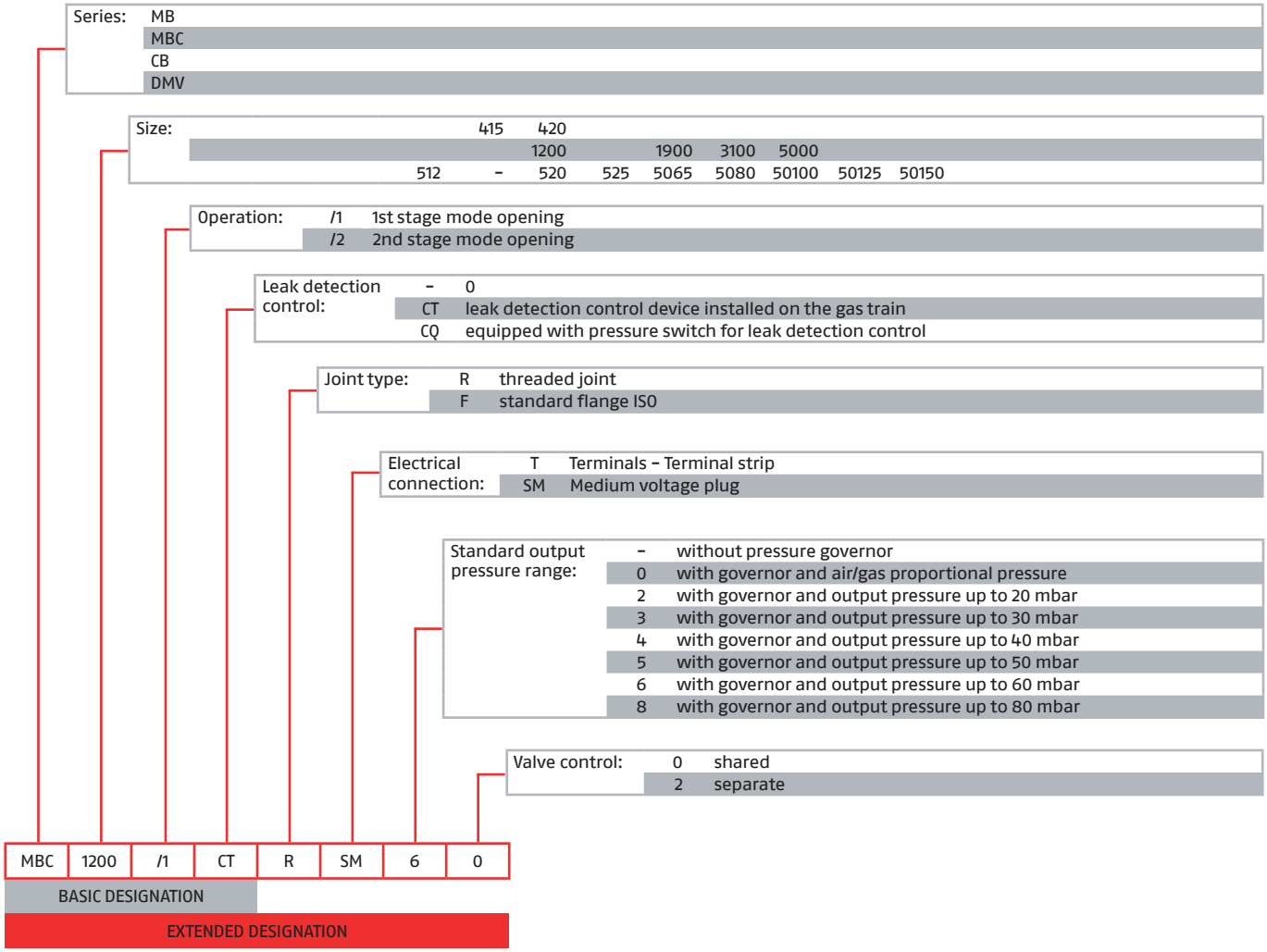
Useful working field for choosing the burner

Modulation range

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

Fuel Supply

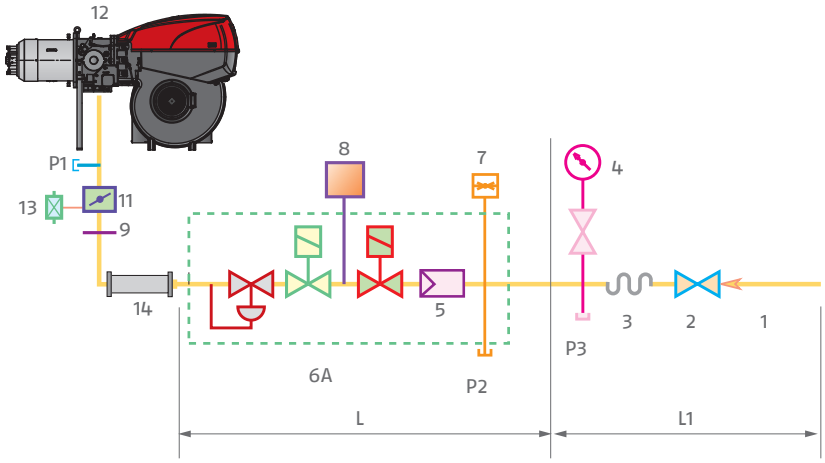
GAS TRAIN DESIGNATION



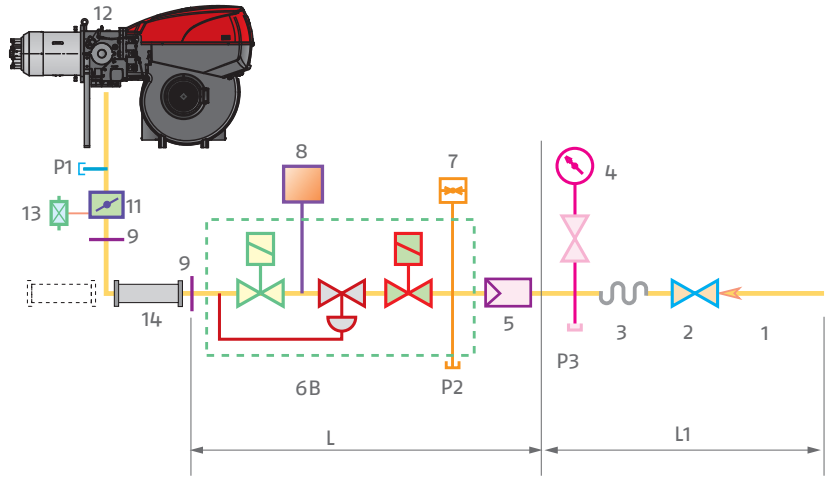
GAS TRAINS

The burners are fitted with a butterfly valve to regulate the fuel, controlled by a variable profile cam servomotor. 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"

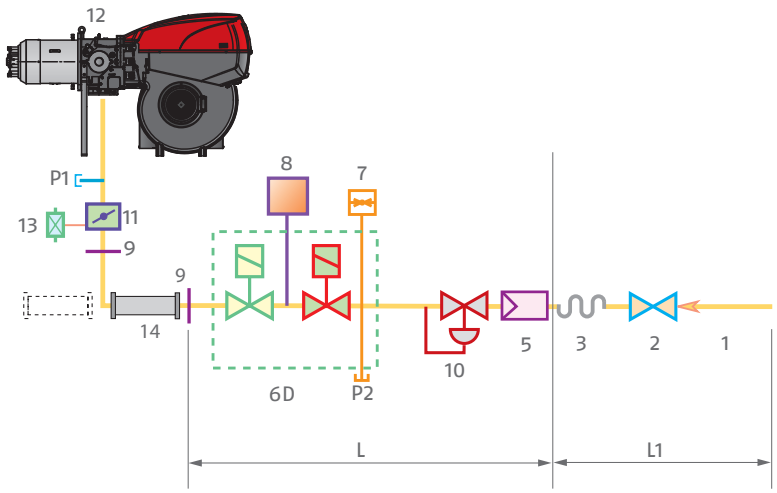


MBC "FLANGED"

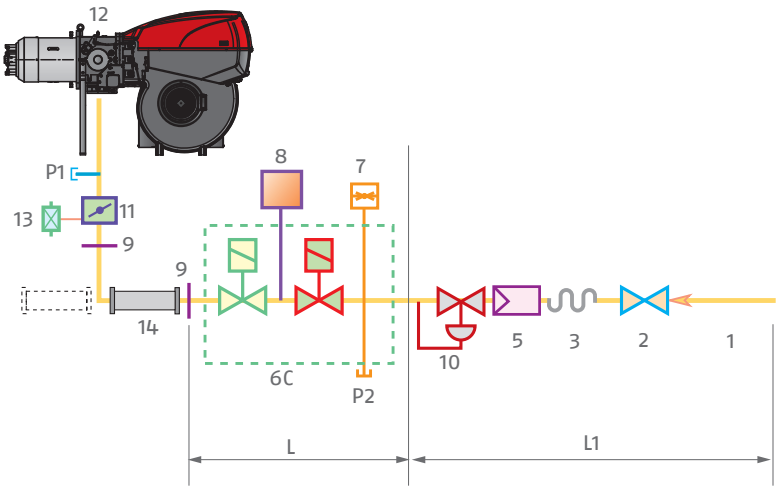


1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock
5	Filter
6A	Includes: – filter – operation valve – safety valve – pressure adjuster
6B	Includes: – operation valve – safety valve – pressure adjuster
7	Minimum gas pressure switch
8	Leak detection device, 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' responsability

CB "FLANGED OR THREADED"

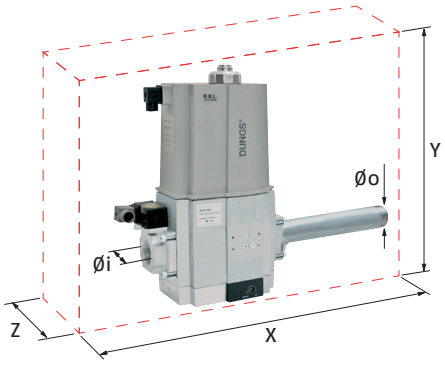


DMV "FLANGED OR THREADED"

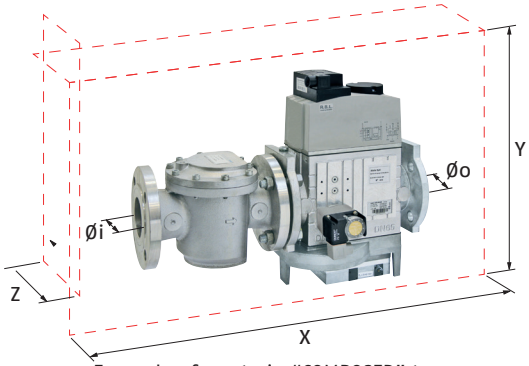


1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock
5	Filter
6C	Includes:
	– safety valve
	– operation valve
6D	Includes:
	– safety valve
	– operation valve
7	Minimum gas pressure switch
8	Leak detection device, supplied as an accessory or incorporated, based 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' responsability

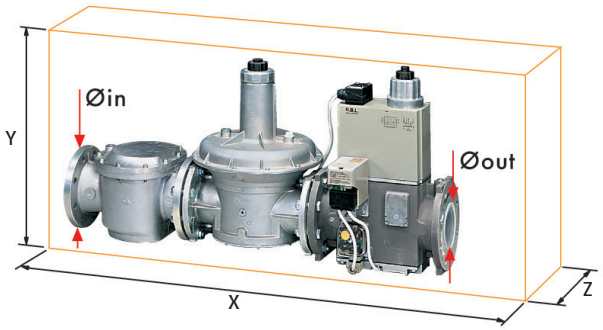
Gas trains are approved by standard EN 676 together with the burner.
The overall dimensions of the gas train depends on how they are constructed. The following table shows the maximum dimensions of the gas trains that can be fitted to RLS/M MX burners, intake and outlet diameters and seal control if 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.



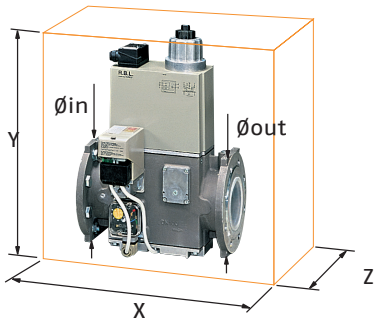
Example of gas train "MULTIBLOC" type
without seal control



Example of gas train "COMPOSED" type
without seal control



Example of gas train "CB" series
with seal control



Example of gas train "DMV" series
with seal control

	GAS TRAIN Model	Code	Ø i	Ø 0	X mm	Y mm	Z mm
MULTIBLOC GAS TRAIN	MBC 1200/1 - RSM 60	3970221	Rp 2"	Rp 2"	528	424	161
	MBC 1200/1 CT RSM 60	3970225	Rp 2"	Rp 2"	528	424	290
COMPOSED GAS TRAIN	MBC 1900/1 - FSM 40	3970222	DN 65	DN 65	613	430	237
	MBC 1900/1 CT FSM 40	3970226	DN 65	DN 65	613	430	298
	MBC 3100/1 - FSM 40	3970223	DN 80	DN 80	633	500	240
	MBC 3100/1 CT FSM 40	3970227	DN 80	DN 80	633	500	319
	MBC 5000/1 - FSM 80	3970224	DN 100	DN 100	733	576	348
	MBC 5000/1 CT FSM 80	3970228	DN 100	DN 100	733	576	350

GAS TRAIN Model	Code	Ø i	Ø 0	X mm	Y mm	Z mm
CB 5065/1 - FSM 30	3970147	DN 65	DN 65	906	356	285
CB 5065/1 CT FSM 30	3970161	DN 65	DN 65	906	356	285
CB 5080/1 - FSM 30	3970148	DN 80	DN 80	934	416	285
CB 5080/1 CT FSM 30	3970162	DN 80	DN 80	934	416	285
CB 50100/1 - FSM 30	3970149	DN 100	DN 100	1054	501	350
CB 50100/1 CT FSM 30	3970163	DN 100	DN 100	1054	501	350
CB 50125/1 - FSM 30	20015871	DN 125	DN 125	1166	780	350
CB 50125/1 CT FSM 30	3970196	DN 125	DN 125	1166	780	350
CB 525/1 - RSM 30	20044659	Rp 2"	Rp 2"	1025	356	285
CB 525/1 - CT RSM 30	20044690	Rp 2"	Rp 2"	1025	356	285

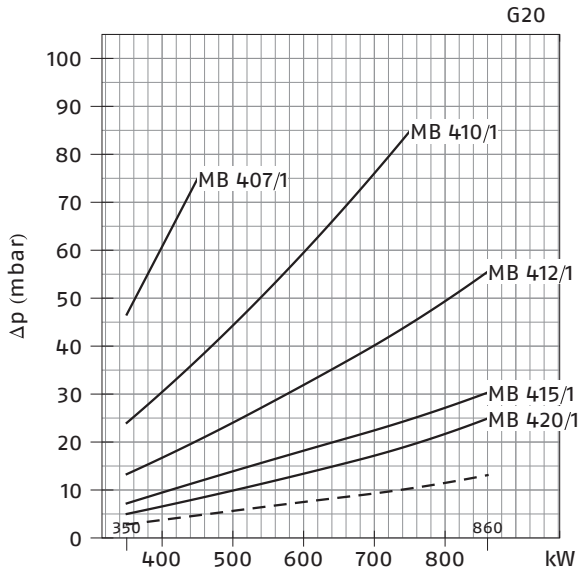
GAS TRAIN Model	Code	Ø i	Ø 0	X mm	Y mm	Z mm
DMV 525/1 - RSM -0	20043053	Rp 2"	Rp 2"	530	363	125
DMV 525/1 CT RSM -0	20043054	Rp 2"	Rp 2"	530	303	242
DMV 525/1 CT RSM -2	20043055	Rp 2"	Rp 2"	530	303	242
DMV 5065/1 - FSM -0	20043041	DN 65	DN 65	290	362	186
DMV 5065/1 CT FSM -0	20043042	DN 65	DN 65	290	362	271
DMV 5065/1 CT FSM -2	20043043	DN 65	DN 65	290	362	271
DMV 5080/1 - FSM -0	20043044	DN 80	DN 80	310	397	290
DMV 5080/1 CT FSM -0	20043045	DN 80	DN 80	310	397	290
DMV 5080/1 CQ FSM -2	20043046	DN 80	DN 80	310	397	290
DMV 50100/1 - FSM -0	20043047	DN 100	DN 100	350	449	307
DMV 50100/1 CT FSM -0	20043048	DN 100	DN 100	350	449	307
DMV 50100/1 CQ FSM -2	20043049	DN 100	DN 100	350	449	307
DMV 50125/1 - FSM -0	20043050	DN 125	DN 125	400	554	333
DMV 50125/1 CT FSM -0	20043051	DN 125	DN 125	400	554	333
DMV 50125/1 CQ FSM -2	20043052	DN 125	DN 125	400	554	333

Pressure Drop Diagram

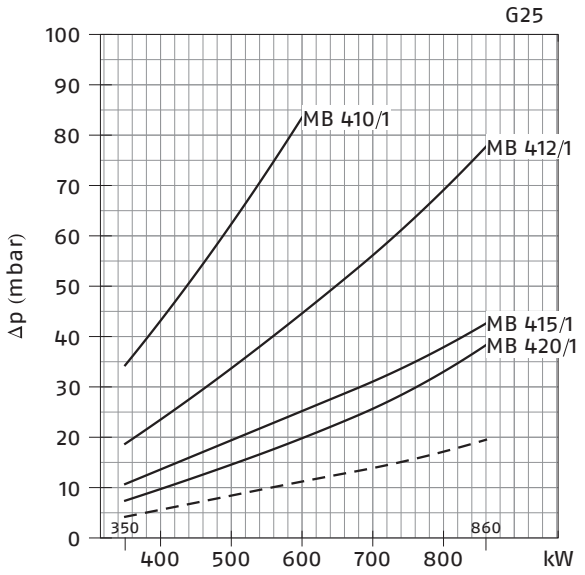
The diagrams indicate the minimum pressure drop of the burners with the various gas trains that can be matched with them; at the value of these pressure drop add the combustion chamber pressure.
The value thus calculated represents the minimum required input pressure to the gas train.

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/M (NATURAL GAS) G20



RLS 68/M (NATURAL GAS) G25



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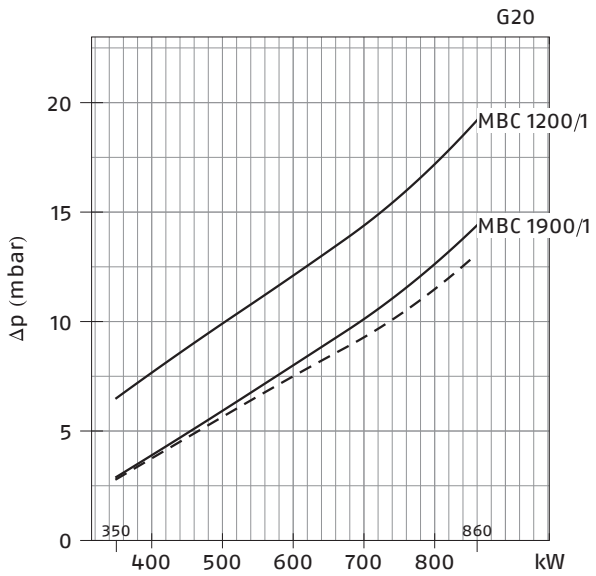

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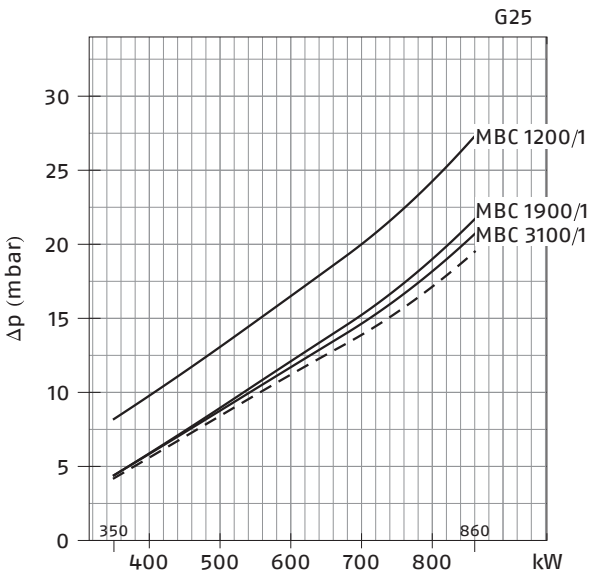
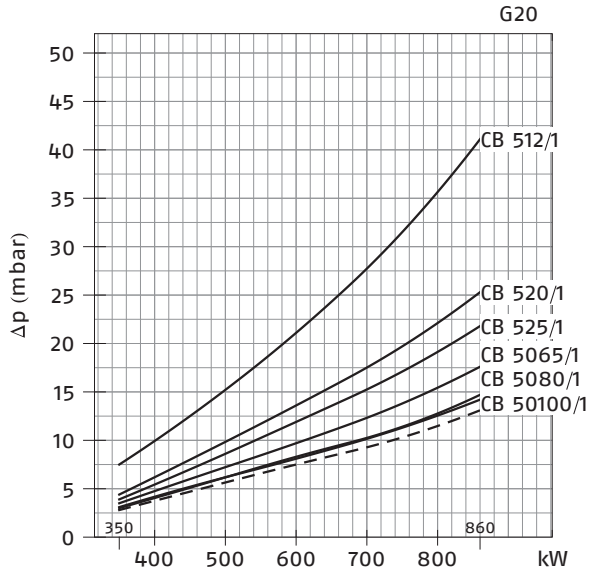


Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

RLS 68/M (NATURAL GAS) G20



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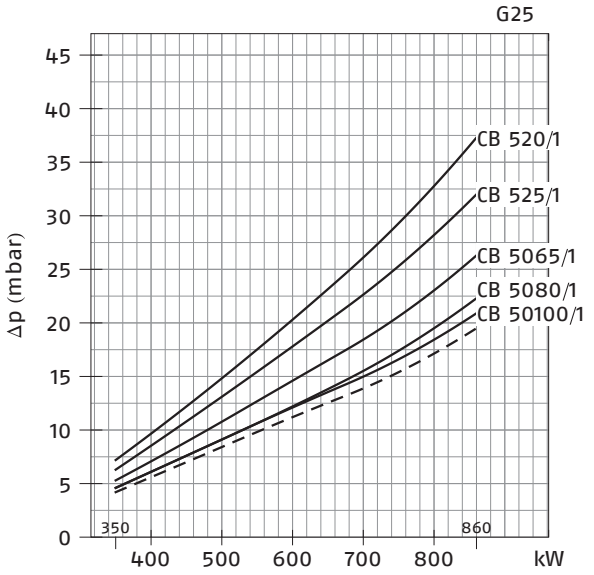

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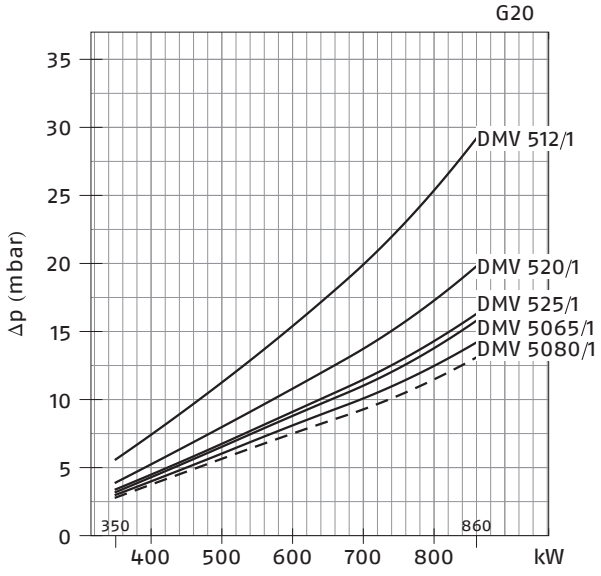
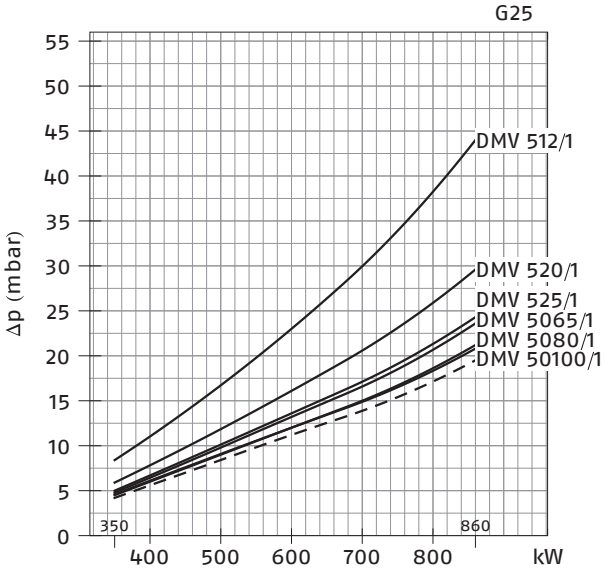
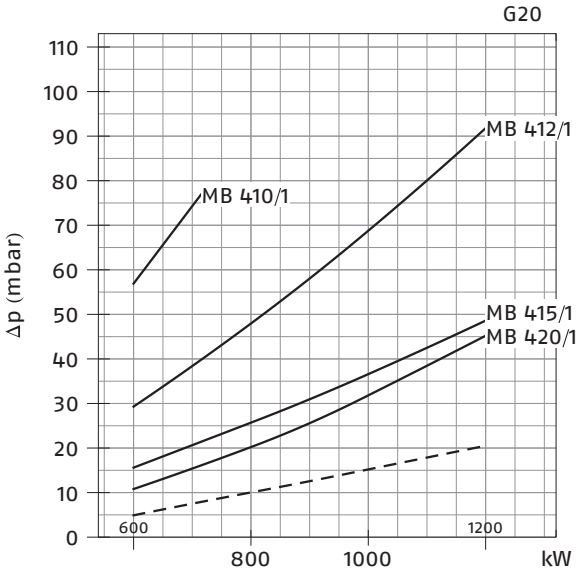


RLS 68/M (NATURAL GAS) G25

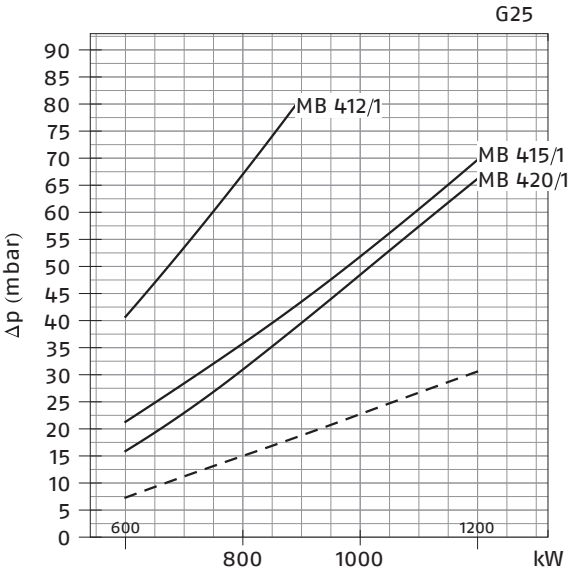


Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

RS 120/M (NATURAL GAS) G20



RLS 120/M (NATURAL GAS) G25



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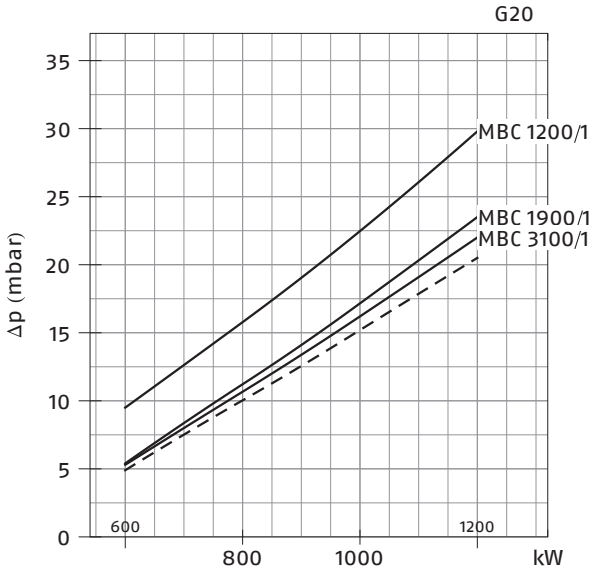
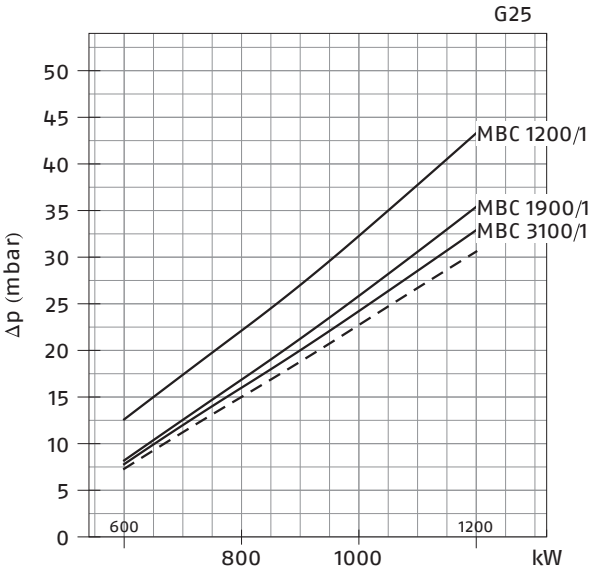
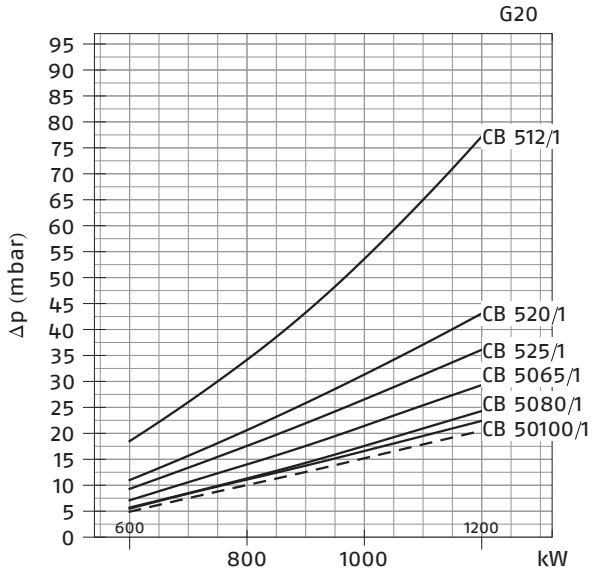


RLS 120/M (NATURAL GAS) G25



Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

RLS 120/M (NATURAL GAS) G20



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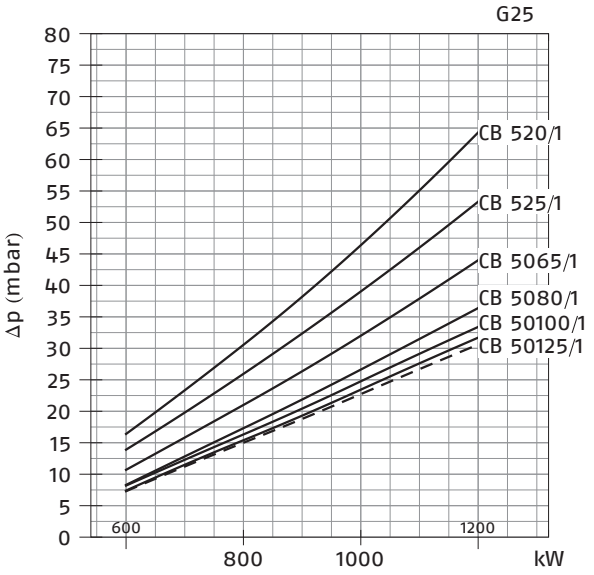
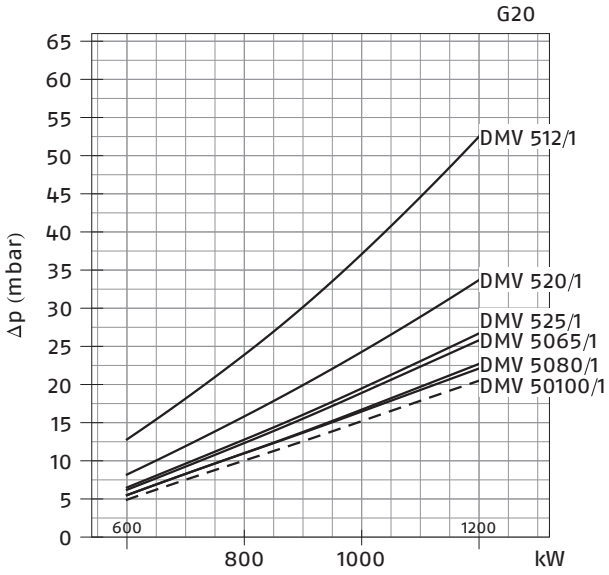
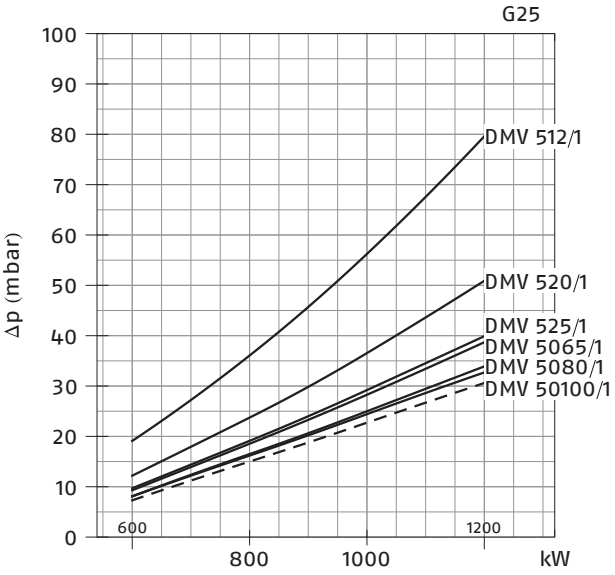


RLS 120/M (NATURAL GAS) G20

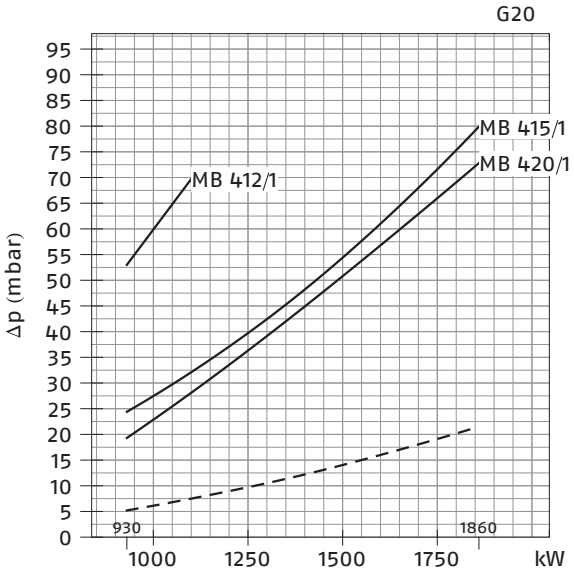


RLS 120/M (NATURAL GAS) G25



Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

RLS 160/M (NATURAL GAS) G20



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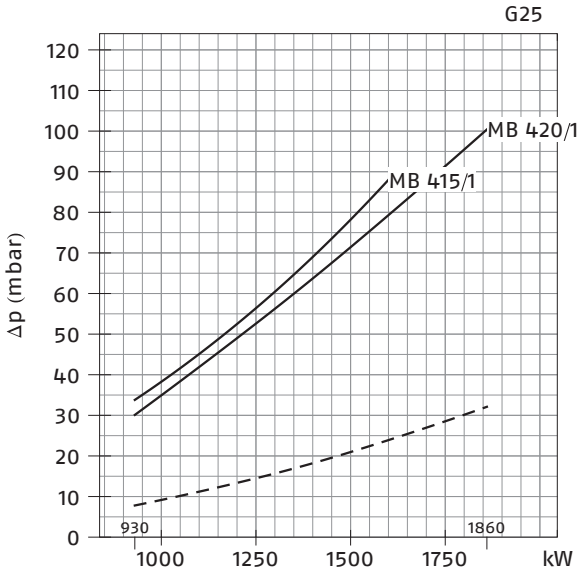
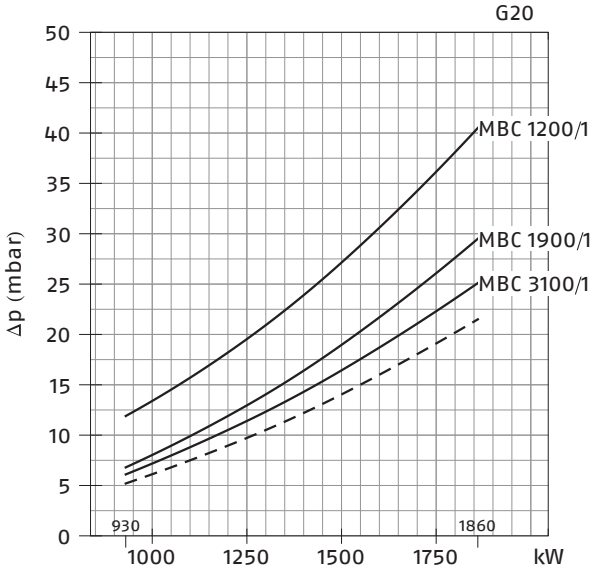
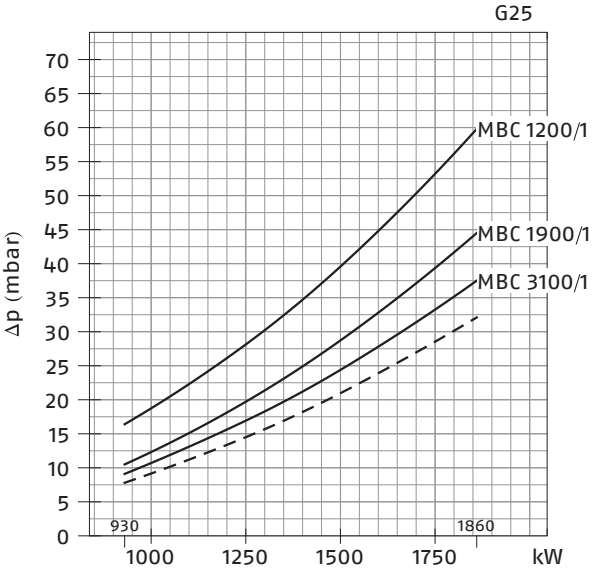


RLS 160/M (NATURAL GAS) G20

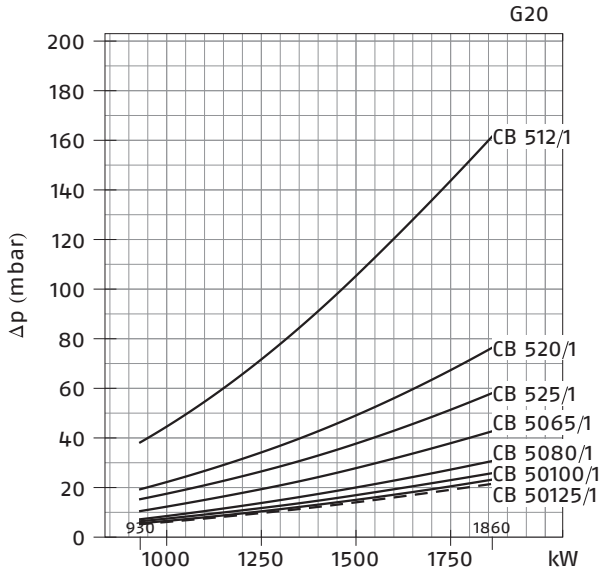


RLS 160/M (NATURAL GAS) G25

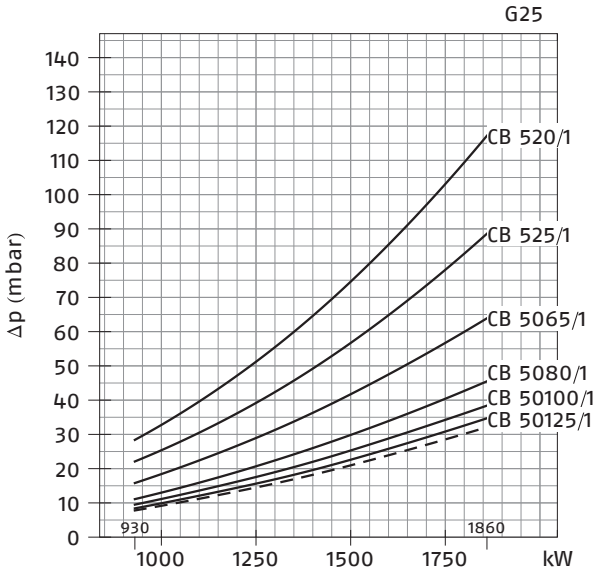


Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

RLS 160/M (NATURAL GAS) G20



RLS 160/M (NATURAL GAS) G25



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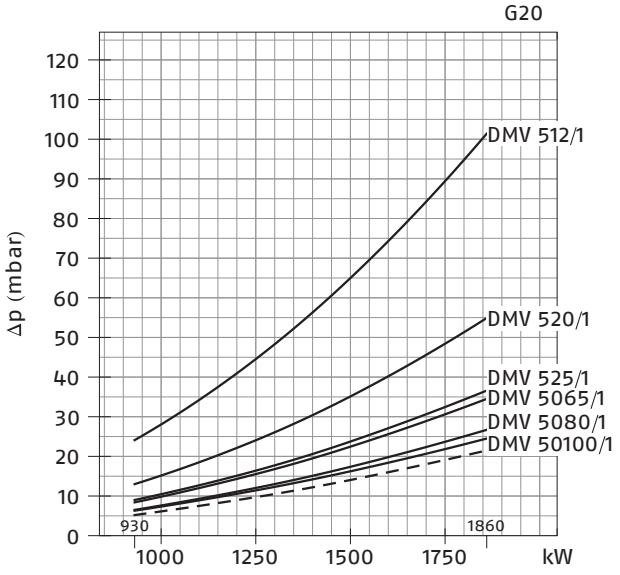
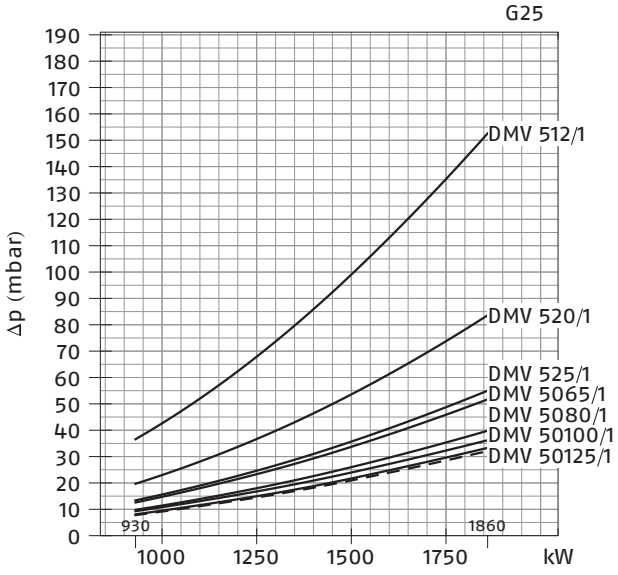


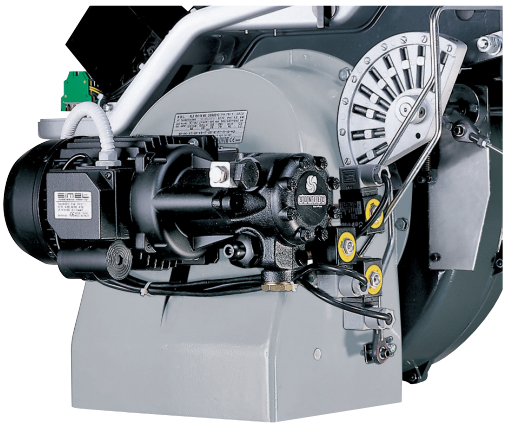
RLS 160/M (NATURAL GAS) G25



Combustion head + gas butterfly valve + gas train
Combustion head + gas butterfly valve

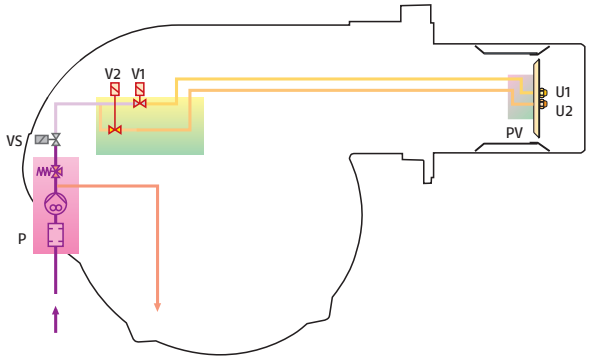
Hydraulic Circuit

The burners are fitted with three valves (a safety valve and two oil delivery valves) along the oil line from the pump to the nozzle.
A thermostatic control device, on the basis of required output, regulates oil delivery valves opening, allowing light oil passage trough the valves and to the nozzle.
Delivery valves open contemporary to the air damper opening, controlled by a servomotor.
The pumping group is fitted whit a pump, an oil filter and a regulating valve: through this it is possible to manually adjusts atomised pressure, which in factory is preset at 12 bar.



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

RLS/M MX



P	Pump with filter and pressure regulator on the output circuit
VS	Safety valve on the output circuit
V1	1st stage valve
V2	2nd stage valve
PV	Nozzle holder
U1	1st stage nozzle
U2	2nd stage nozzle

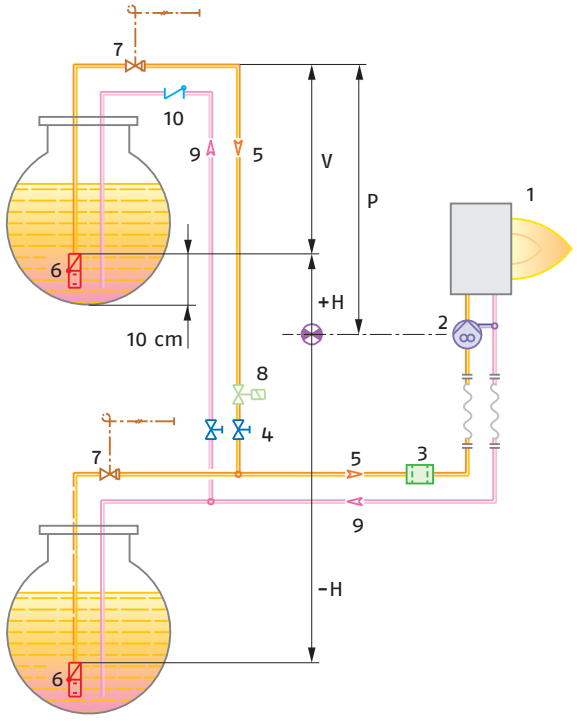
Selecting the Fuel Supply lines

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 160/M MX		
Diameter piping	Ø12mm	Ø14mm	Ø16mm
+H, -H (m)	Lmax (m)	Lmax (m)	Lmax (m)
+4,0	71	138	150
+3,0	62	122	150
+2,0	53	106	150
+1,0	44	90	150
+0,5	40	82	150
0	36	74	137
-0,5	32	66	123
-1,0	28	58	109
-2,0	19	42	81
-3,0	10	26	53
-4,0	-	10	25



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

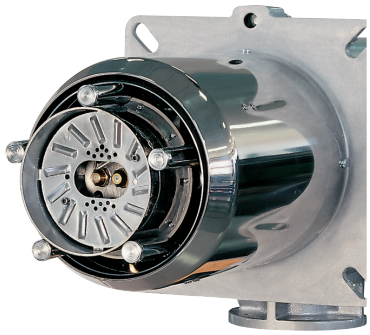
The ventilation circuit produces low noise levels with high performances pressure and air output, in despite of the compact dimensions.
The special design of the air suction circuit and the use of sound-proofing material keeps noise level very low.
A variable profile cam connects the fuel and air regulations, 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 servomotor for air/gas setting

Combustion Head

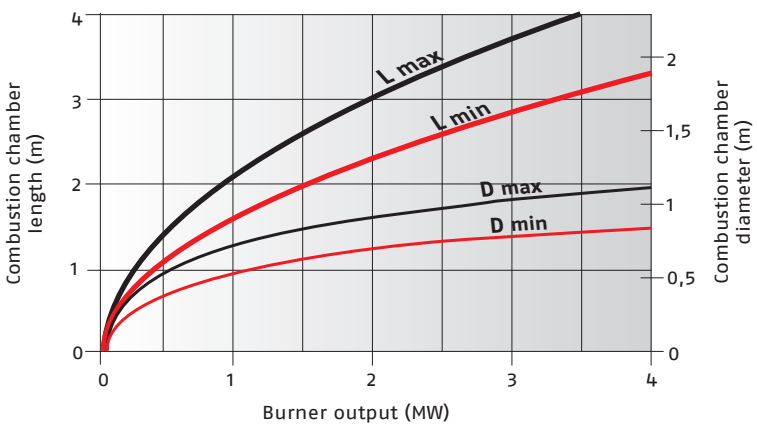
Different lengths of the combustion head can be chosen for the RLS/M MX series of burners.
The choice depends on the thickness of the front panel and the type of boiler.
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.
The internal positioning of the combustion head can easily be adjusted to the maximum defined output by adjusting a screw fixed to the flange.

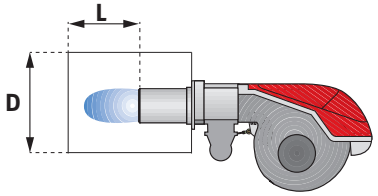
Note: The burners of RLS/M MX series are not suitable to be installed on boiler with "reverse flame chamber".



Example of RLS 160/M MX burner combustion head.

SUGGESTED COMBUSTION CHAMBER DIMENSIONS



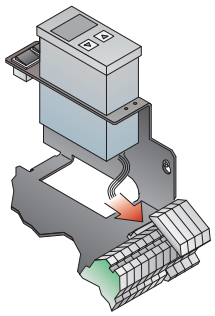


Example:
Burner thermal output = 2000 kW;
L Combustion Chamber (m) = 2,7 m (medium value);
D Combustion Chamber (m) = 0,8 m (medium value)

Operation

BURNER OPERATION MODE

The RLS/M MX series of burners can have “two stage” operation at the oil side and “modulating” operation at the gas side with the installation of a PID logic regulator and respective probes. When burner is supplied with light oil a modulation ratio of 2:1 is reached thanks to the “two nozzles” solution; when burner is supplied with gas modulation ratio is 6:1.
The air is adapted to the servomotor rotations.

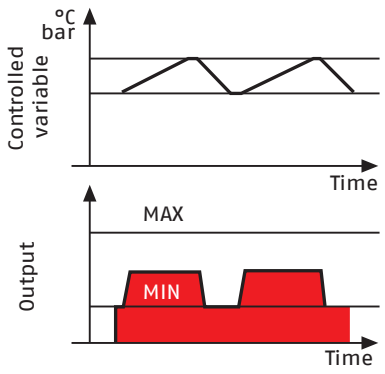


Example of a regulator

On “two stage” operation, the burner gradually adjusts output to the requested level, by varying between the two pre-set levels (see picture A).

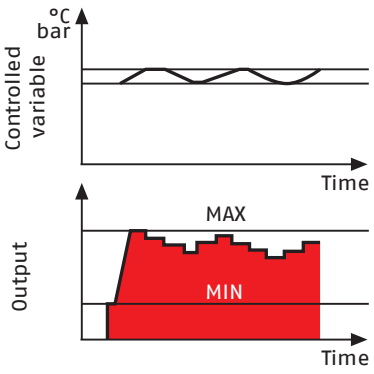
In “modulating” operation, normally required in steam generators, in superheated boilers or diathermic oil burners, a specific regulator and probes are required. These are supplied as accessories that must be ordered separately. The burner can work for long periods at intermediate output levels (see picture B).

“TWO-STAGE PROGRESSIVE” OPERATION



Picture A

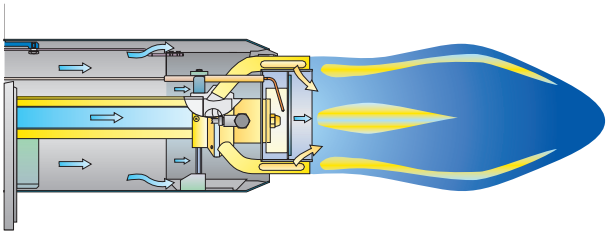
“MODULATING” OPERATION



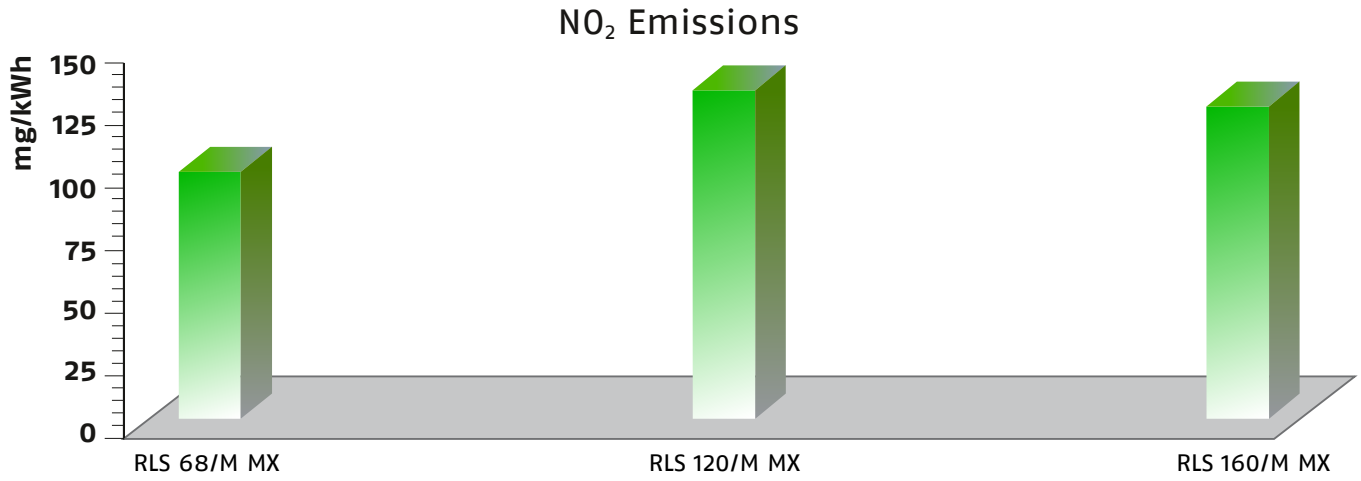
Picture B

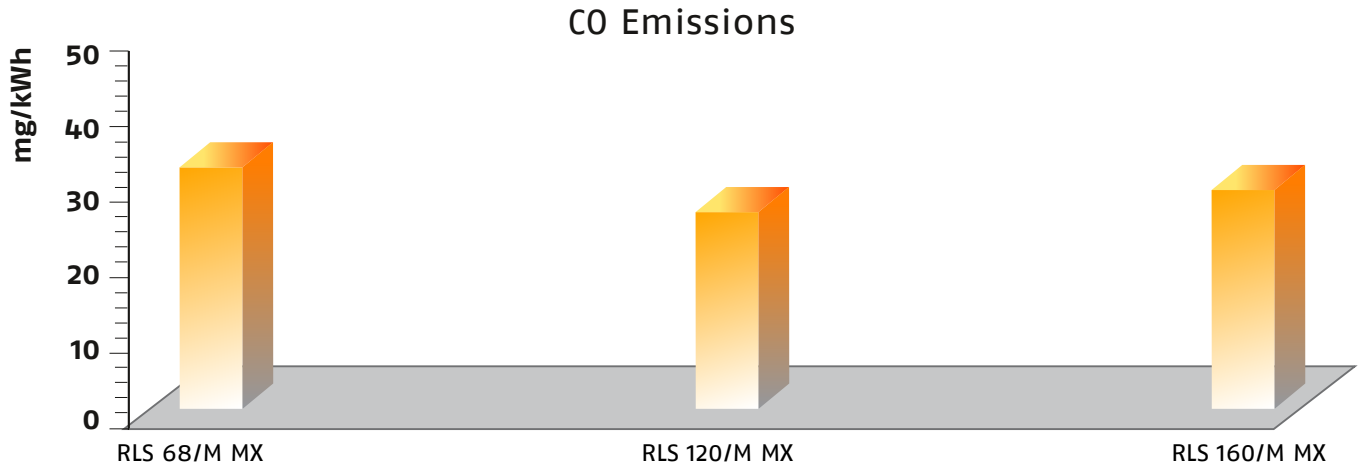
Safe and Green

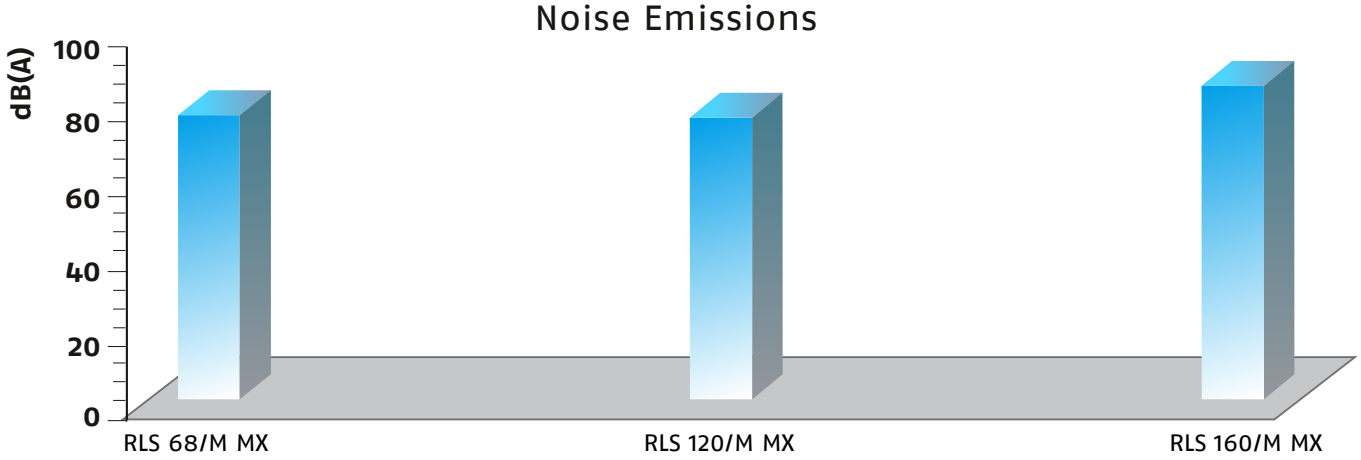
In the RLS/M MX burners part of the gas is distributed through outlets which are perpendicular to the air flow, while the remaining gas is injected directly into the centre of the flame.
This prevents no homogeneous concentrations in the flame with areas of high oxidation,
producing very stable flame with gradual and progressive combustion as the flame develops, thus giving polluting emission values below even the most restrictive norm values.



Emission



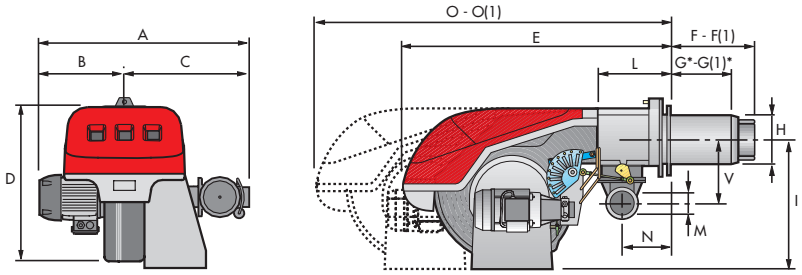




The noise emissions have been measured at the maximum output.

Overall Dimensions (mm)

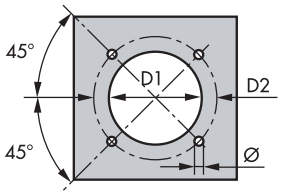
BURNERS



Model	A	B	C	D	E	F – F(1)	G* – G(1)*	H	I	L	M	N	O – O (1)	V
RLS 68/M MX	691	296	395	555	840	260 – 395	200 – 335	189	430	214	2"	134	1161 – 1300	221
RLS 120/M MX	733	338	395	555	840	260 – 395	200 – 335	189	430	214	2"	134	1161 – 1300	221
RLS 160/M MX	843	366	477	555	863	373 – 503	272 – 402	221	430	237	2"	141	1442 – 1589	186

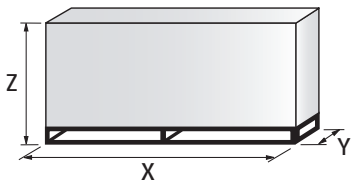
(1) Length with extended combustion head.
* Maximum depth of the boiler door including the depth of the burner flange insulating gasket.

BURNER – BOILER MOUNTING FLANGE



Model	D1	D2	Ø
RLS 68-120/M MX	195	275 – 325	M12
RLS 160/M MX	230	325 – 368	M16

PACKAGING



MODEL	X (1)	Y	Z	kg
RLS 68/M MX	1400	975	645	115
RLS 120/M MX	1400	975	645	120
RLS 160/M MX	1400	975	645	135

(1) Length with standard and extended combustion head.

Installation Description

Installation, start up and maintenance must be carried out by qualified and skilled personnel.
All operations must be performed in accordance with the technical handbook supplied with the burner.

BURNER SETTING

All the burners have slide bars, for easier installation and maintenance.

After drilling the boilerplate, using the supplied gasket as a template, dismantle the blast tube from the burner and fix it to the boiler.

Adjust the combustion head.

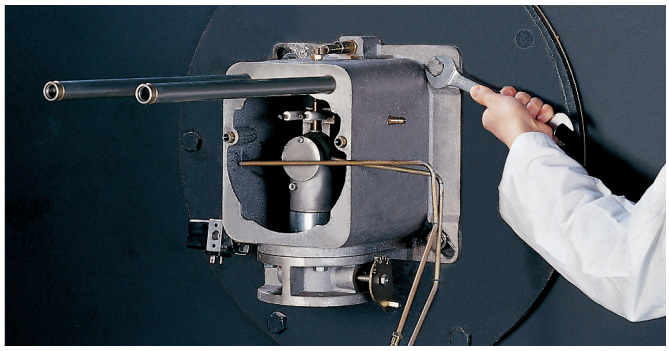
Fit the gas train choosing this on the basis of the maximum boiler output and following the diagrams included in the burner instruction handbook.

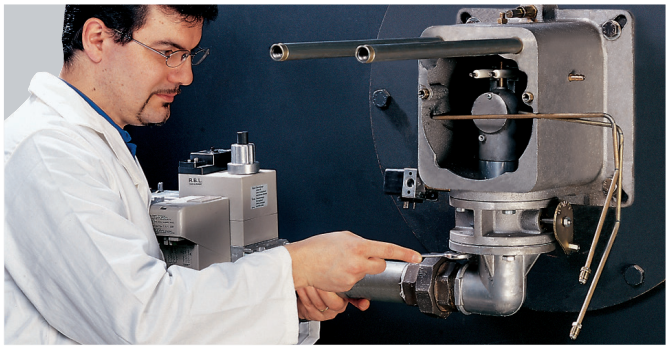
Refit the burner casing to the slide bars.

Install the nozzle choosing this on the basis of the maximum boiler output and following the diagrams included in the burner instruction handbook.

Check the position of the electrodes.

Close the burner, sliding it up to the flange, keeping it slightly raised to avoid the flame stability disk rubbing against the blast tube.





ELECTRICAL AND HYDRAULIC CONNECTIONS AND START UP

The burners are supplied for connection to two pipes fuel supply system.

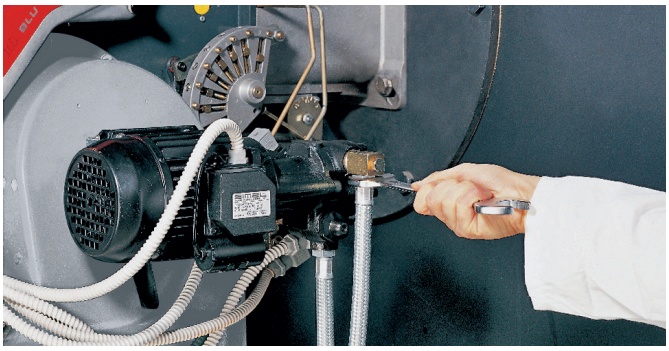
Connect the ends of the flexible pipes to the suction and return pipework using the supplied nipples.

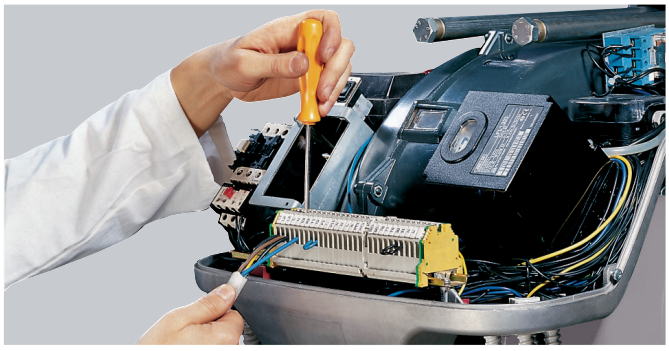
Make the electrical connections to the burner following the wiring diagrams included in the instruction handbook.

Prime the pump by turning the motor (after checking rotation direction if it is a three phase motor).

Adjust the gas train for first start.

On start up, check:
- Pressure pump and valve unit regulator (to max. and min).
- Gas pressure at the combustion head (to max. and min. output).
- Combustion quality, in terms of unburned substances and excess air.





Burner Accessories

NOZZLES TYPE 60° B

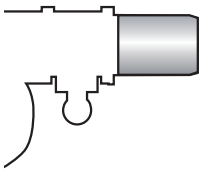
The nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required fuel output.

NOTE: each burner needs N° 2 nozzles.

Burner	Rated delivery kg/h (*)	GPH	Nozzle
RLS 68-120/M MX	21,2	5,00	3042582
	23,3	5,50	3042202
	25,5	6,00	3042583
	27,6	6,50	3042222
	29,7	7,00	3042584
	31,8	7,50	3042242
	33,9	8,00	3042585
	36,1	8,50	3042262
	38,2	9,00	3042586
	40,3	9,50	3042282
RLS/M MX	42,4	10,00	3042292
	46,7	11,00	3042312
	50,9	12,00	3042322
	55,1	13,00	3042332
	59,4	14,00	3042352
	63,6	15,00	3042362
	67,9	16,00	3042382
	72,1	17,00	3042392
	76,4	18,00	3042412
	80,6	19,00	3042422
	84,8	20,00	3042442
	93,3	22,00	3042462
	101,8	24,00	3042472
RLS 160/M MX	110,3	26,00	3042482
	118,8	28,00	20018051

(*) Nozzle rated delivery is reffered to atomized pressure

EXTENDED HEAD KIT

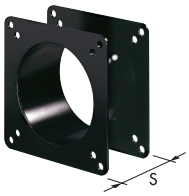


"Standard head" burners can be transformed into "extended head" versions, by using the special kit. The kits available for the various burners, giving the original and the extended lengths, are listed below.

Burner	Standard head length (mm)	Extended head length (mm)	Kit code
RLS 68-120/M MX	260	395	3010360
RLS 160/M MX	373	503	3010441 *

* Kit to be used on burners recognizable by a serial number that is over or equal to 02426XXXXXX, for burners with a serial number that is under or equal to 02416XXXXXX please use the Kit coded 3010340

SPACER KIT



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

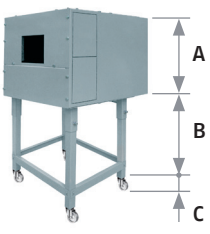
Burner	Spacer thickness S (mm)	Kit code
RLS 68-120-160/M MX	102	3000722

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 68-120-160/M MX	3010094

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.

Burner	Box type	A (mm)	B (mm) min-max	C (mm)	[dB(A)] (*)	Box code
RLS 68-120-160/M MX	C4/5	850	160 - 980	110	10	3010404

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

ACCESSORIES FOR MODULATING OPERATION

To obtain modulating operation, the RLS/M 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.

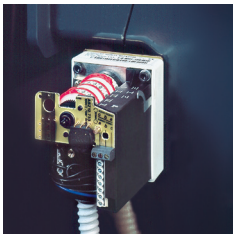
Burner	Regulator type	Regulator code
RLS 68/M - 120/M MX	RWF 50.2	20082208
	RWF 55.5	20099657
RLS 160/M MX	RWF 50.2	20099869
	RWF 55.5	20099905

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/M MX	Temperature PT 100	-100 ÷ 500°C	3010110
RLS/M MX	Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
RLS/M MX	Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214
RLS/M MX	Pressure 4 ÷ 20 mA	0 ÷ 25 bar	3090873

Modulating operation can also be obtained with an analog control signal converter and a feedback three-pole potentiometer.
Alternatively, the potentiometer can be used to check the servomotor position.

Burner	Type (input signal)	code
RLS 68/M - 120/M MX	0/2 - 10 V (impedance 200 KΩ) 0/4 - 20 mA (impedance 250 Ω)	on demand
RS 160/M MX	0/2 - 10 V (impedance 200 KΩ) 0/4 - 20 mA (impedance 250 Ω)	3010415



Depending on the servomotor fitted to the burner, a three-pole potentiometer (1000 W) can be installed to check the position of the servomotor. The KITS available for the various burners are listed below.

Burner	Potentiometer KIT code
RLS 68/M - 120/M - 160/M MX	3010416

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/M MX	20006401
RLS 120/M MX	20006402
RLS 160/M MX	3010249

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" DN 65 2" 1/2 1" 1/2	300	3000825
DN 80 2" 1/2 2"	300	3000826
1" 1/2 2"	35	3000843
1" 1/4 2"	35	3010126
	320	3010224

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

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.

GAS TRAIN	Kit code for 50 Hz operation	Kit code for 60 Hz operation
MBC/1 type	3010367	20029057
CB/1 type	3010367	20029057

Specification

DESIGNATION OF SERIES

Series : R

Fuel : S Natural gas
L Light oil
LS Light oil / Natural gas
N Heavy oil

Size

Operation : /1 One stage
... Two stage
/M Modulating
/E Electronic cam
/P Proportioning air/gas valve
/EV Electronic cam predisposed for variable speed (with inverter)

Emission : ... Class 1 EN267 - EN676
MZ Class 2 EN267 - EN676
BLU Class 3 EN267 - EN676
MX Class 2 EN267 Class 3 EN676

Head : 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 3/220V/60Hz - 3N/380V/60Hz

Auxiliary voltage :
230/50-60 230V/50-60Hz
110/50-60 110V/50-60Hz

ID : Differential switch

R	LS	160	/M	MX	TC	FS1	3/230-400/50	230/50	

BASIC DESIGNATION

EXTENDED DESIGNATION

AVAILABLE BURNER MODELS

RLS 68/M MX	TC	FS1	3/230-400/50	230/50-60
RLS 68/M MX	TL	FS1	3/230-400/50	230/50-60
RLS 68/M MX	TC	FS2	3/230-400/50	230/50-60
RLS 68/M MX	TL	FS2	3/230-400/50	230/50-60
RLS 120/M MX	TC	FS1	3/230-400/50	230/50-60
RLS 120/M MX	TL	FS1	3/230-400/50	230/50-60
RLS 120/M MX	TC	FS2	3/230-400/50	230/50-60
RLS 120/M MX	TL	FS2	3/230-400/50	230/50-60
RLS 160/M MX	TC	FS1	3/400/50	230/50-60
RLS 160/M MX	TC	FS1	3/230/50	230/50-60
RLS 160/M MX	TL	FS1	3/400/50	230/50-60
RLS 160/M MX	TL	FS1	3/230/50	230/50-60
RLS 160/M MX	TC	FS2	3/400/50	230/50-60
RLS 160/M MX	TC	FS2	3/230/50	230/50-60
RLS 160/M MX	TL	FS2	3/400/50	230/50-60
RLS 160/M MX	TL	FS2	3/230/50	230/50-60

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/M MX series are in according to 2009/142/EC - 2014/30/UE - 2014/35/UE - 2006/42/EC Directives - EN 676 - EN 267 Norm.

PRODUCT SPECIFICATION

Monoblock forced draught Low N0x dual fuel burner with two stage operation at the oil side and two stage progressive or modulating operation at the gas 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 and butterfly valve for regulating gas output controlled by a servomotor with variable cam
- 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
- two oil valves (1st and 2nd stage)
- burner safety control box
- UV photocell for flame detection
- burner on/off selection switch
- manual or automatic output increase/decrease 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.

Conforming to:
- 2014/30/UE directive (electromagnetic compatibility)
- 2014/35/UE directive (low voltage)
- 2009/142/EC directive (gas)
- 2006/42/EC directive (machine)
- EN 676 (gas burners)
- EN 267 (light 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.

NOTES

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

05/2016
TS0064UK03

[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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