RIELLO BURNERS

CE

TWO STAGE DUAL FUEL BURNERS

RLS SERIES

RLS 28	100/163 ÷	325 kW
RLS 38	116/232 ÷	442 kW
RLS 50	145/290 ÷	581 kW
RLS 70	232/465 ÷	814 kW
RLS 100	349/698 ÷	1163 kW
RLS 130	465/930 ÷	1395 kW

The RLS series of burners covers a firing range from 100 to 1395 kW, and they have been designed for use in hot or superheater water boilers, hot air or steam generators, diathermic oil boilers.
Operation is "two stage"; the burners are fitted with an electronic device STATUS PANEL, which supplies complete diagnostic: hour meter, ignition meter, identification of trouble shooting.
Optimisation of sound emissions is guaranteed by the use of fans with forward inclined blades and sound deadening material incorporated in the air suction circuit. The elevated performance of the fans and combustion head guarantee flexibility of use and excellent working at all firing rates.
The exclusive design ensures reduced dimensions, simple use and maintenance. A wide range of accessories guarantees elevated working flexibility.

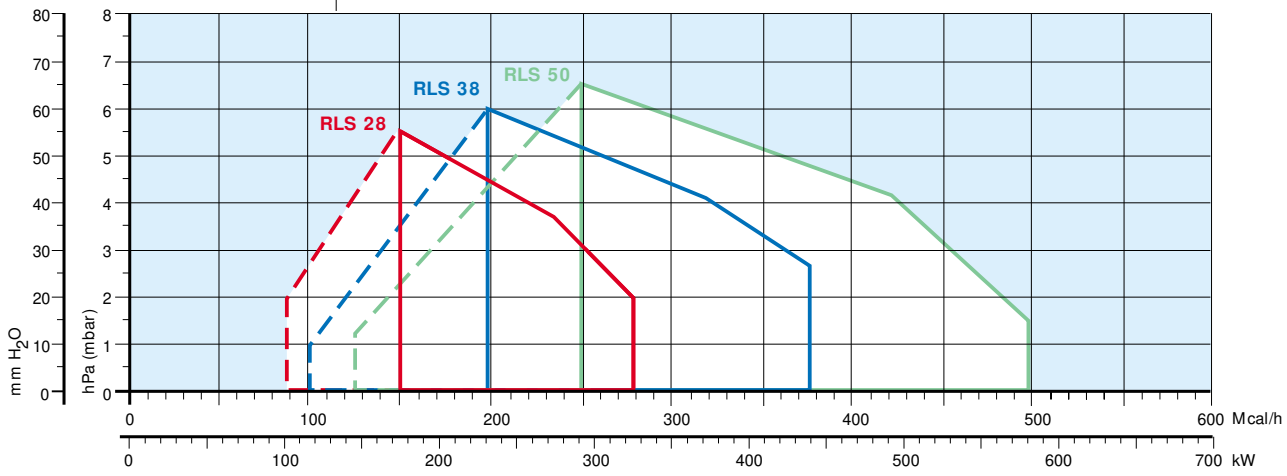
TECHNICAL DATA

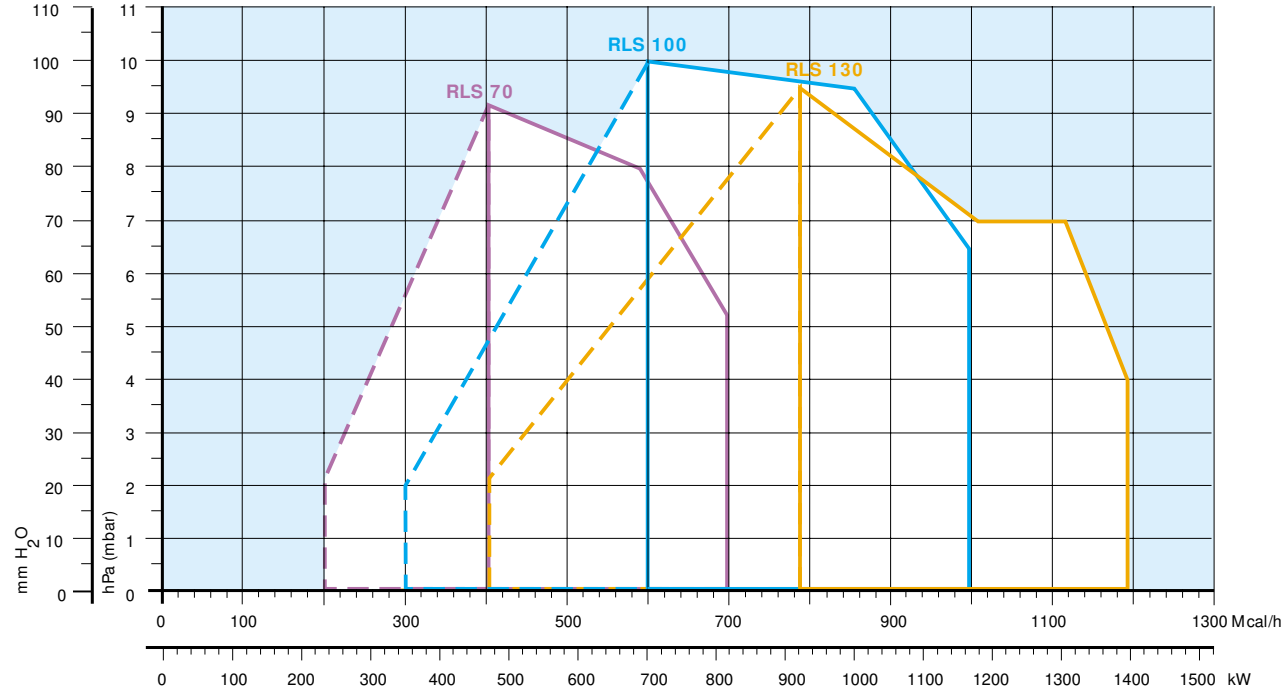
	Model			RLS 28	RLS 38	RLS 50	RLS 70	RLS 100	RLS 130
	Operation			Two stage					
	Modulating ratio at max. ouput			2:1					
	Servomotor	type		LKS 210 - 08			LKS 210 -10		
		run time	s	5					
	Heat output		kW	100/163-325	116/232-442	145/290-581	232/465-814	349/698-1163	465/930-1395
			Mcal/h	86/140-303	100/200-380	125/249-500	200/400-700	300/600-1000	400/800-1200
	Working temperature		°C min/max	0/40					
Fuel / air data	Light oil	Net calorific value	kWh/kg	11,8					
		Viscosity at 20°C	mm^2/s (cSt)	4-6					
		Delivery	kg/h	8/14-28	10/20-37	12/25-49	20/39-69	30/59-99	39/79-118
		Max temperature	°C	60					
	Pump	type		AL 65B			AJ 6CC		
		delivery	kg/h	63 (at 15 bar)			134 (at 20 bar)		
	Atomised pressure		bar	12					
	G20	Net calorific value	kWh/Nm^3	10					
		Density	kg/Nm^3	0,71					
		Delivery	Nm^3/h	10/16-32,5	12/23-44	14,5/29-58	23/46,5-81	35/70-116	46,5/93-139,5
	G25	Net calorific value	kWh/Nm^3	8,6					
		Density	kg/Nm^3	0,78					
		Delivery	Nm^3/h	12/19-38	13/27-51	17/33-68	27/54-95	41/81-135	54/108-162
	LPG	Net calorific value	kWh/Nm^3	25,8					
		Density	kg/Nm^3	2,02					
		Delivery	Nm^3/h	4/6-13	4/9-17	6/11-23	9/18-32	14/27-45	18/36-54
	Fan		type	Centrifugal - with reverse curve blades					
	Air temperature		max °C	60					
Electrical data	Electrical supply		Ph / Hz / V	1/50/230 (±10%)		3N/50/230-400 (±10%)			
	Auxiliary electrical supply		Ph / Hz / V	1/50/230 (±10%)					
	Control box		type	LFL 1.333					
	Total electrical power		kW	0,53	0,76	0,91	1,8	2,2	3
	Auxiliary electrical power		kW	0,19	0,25	0,17	0,33	0,33	0,43
	Protection level		IP	44					
	Fan electrical motor power		kW	0,25	0,42	0,65	1,1	1,5	2,2
	Rated fan motor current		A	2,1	2,9	3 -1,7	4,8 - 2,8	5,9 - 3,4	8,8 - 5,1
	Fan motor start current		A	4,8	11	13,8-8	22,6 -13,2	29,5 -17	52,8 - 30,6
	Fan motor protection level		IP	44			55	54	
	Pump electric motor power		kW	0,09			0,37		
	Rated pump motor current		A	0,8			2,4		
	Pump motor start current		A	-	-	-	-	-	-
	Pump motor protection level		IP	44					
	Ignition transformer		V1- V2	230 V - 2 x 5 kV					
			I1 - I2	1,9 A - 30 mA					
	Working			Intermittent (at least one stop every 24h)					
Emissions	Sound pressure		dBA	68	70	72	74	77,5	80
	Sound power		W	-	-	-	-	-	-
	Light oil	CO emissions	mg/kWh	< 20					
		Grade of smoke indicator	N° Bacharach	< 1					
		CxHy emissions	mg/kWh	< 10					
		NOx emissions	mg/kWh	< 190					
	G20	CO emissions	mg/kWh	< 15					
		NOx emissions	mg/kWh	< 80					
Approval	Directive			90/396 - 89/336 - 73/23 - 92/42 EEC					
	Conforming to			EN 267 - EN 676					
	Certifications			CE 0063 AR 4637			CE 0063 AS 4863 - DIN 5G 835/97 M		

Reference conditions:
Ambient temperature: 20°C
Pressure: 1000 mbar
Altitude: 100 m a.s.l.
Sound pressure level measured in manufacturers combustion laboratory, with burner operating on test boiler and at maximum rated output

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.

FIRING RATES





Useful working field for choosing the burner

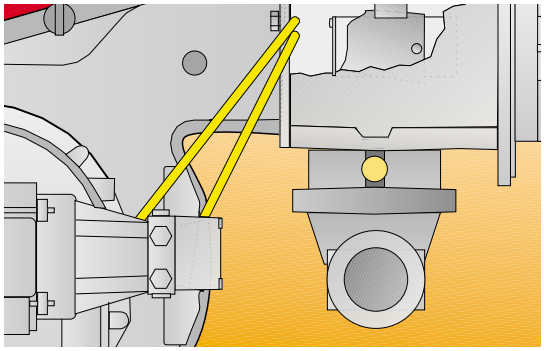
Modulating range

Test conditions conforming to EN 267 - EN 676:
Temperature: 20°C
Pressure: 1013.5 mbar
Altitude: 100 m a.s.l.

FUEL SUPPLY

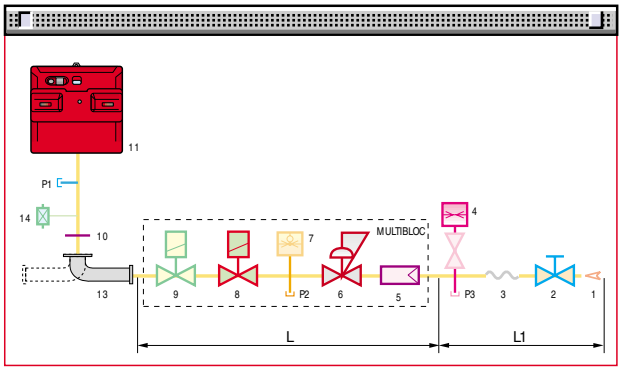
GAS TRAIN

The gas trains are fitted with a regulating valve to adjusts fuel delivery in relation to heat required. This valve is controlled by the two-stages device fitted on the burner.
Fuel can be supplied either from the right or left sides, on the basis of the application requirments.
A maximum gas pressure switch stops the burner in case of excess pressure in the supply line.
The gas train can be selected to best fit system requirments depending on the fuel output and pressure in the supply line.
The gas trains can be "Multibloc" type (containing the main components in a single unit) or "Composed" type (assembly of the single components).

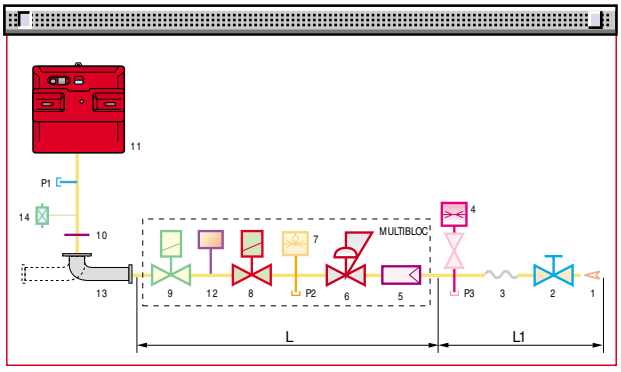


Example of gas inlet pipe burners for RLS 70-100-130

MULTIBLOC gas train without seal control

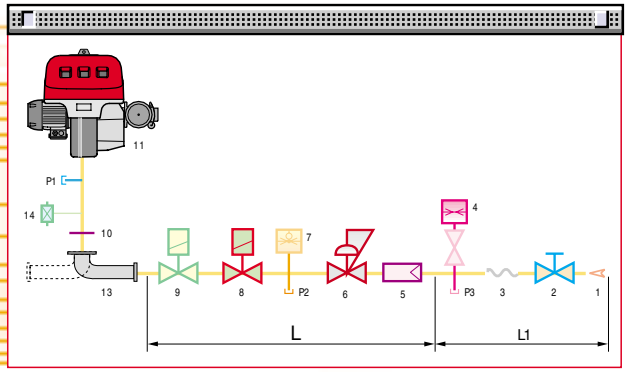


MULTIBLOC gas train with seal control

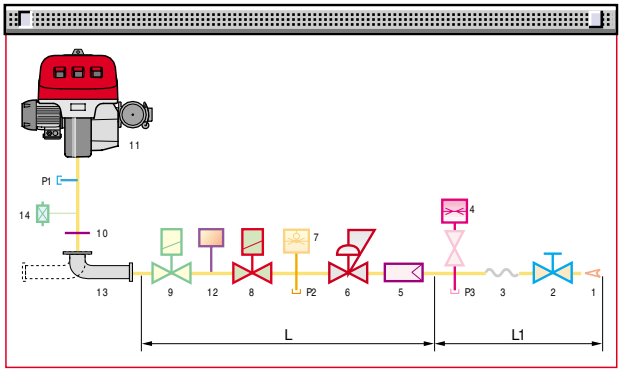


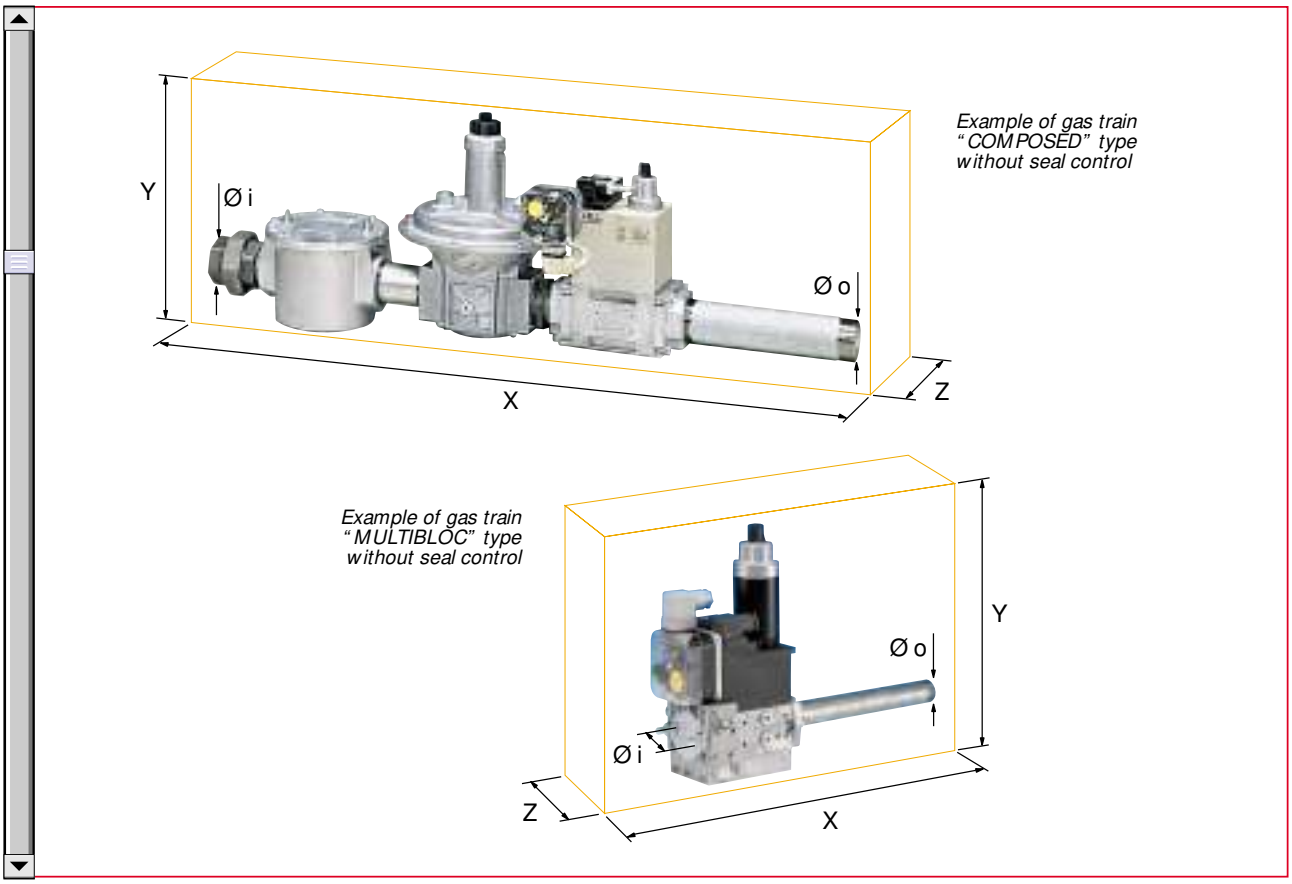
1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock
5	Filter
6	Pressure regulator (vertical)
7	Minimum gas pressure switch
8	VS safety solenoid (vertical)
9	VR regulation solenoid (vertical). Three adjustments: - ignition delivery (rapid opening) - 1st stage delivery (slow opening) - 2nd stage delivery ((slow opening)
10	Gasket and flange supplied with the burner
11	Burner
12	Seal control mechanism for valves 8-9. According to standard EN 676, the seal control is compulsory for burners with maximum output above 1200 kW
13	Gas train-burner adapter.
14	Maximum gas pressure switch
P1	Combustion head pressure
P2	Pressure downstream from the regulator
P3	Pressure upstream from the filter
L	Gas train supplied separately, with the code given in the table
L1	Installer's responsibility

COMPOSED gas train without seal control



COMPOSED gas train with seal control





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 burners, intake and outlet diameters and seal control if fitted.
Please note that the seal control can be installed as an accessory, if not already installed on the gas train.
The maximum gas pressure of gas train "Multibloc" type is 300 mbar, and that one of gas train "Composed" type is 500 mbar.

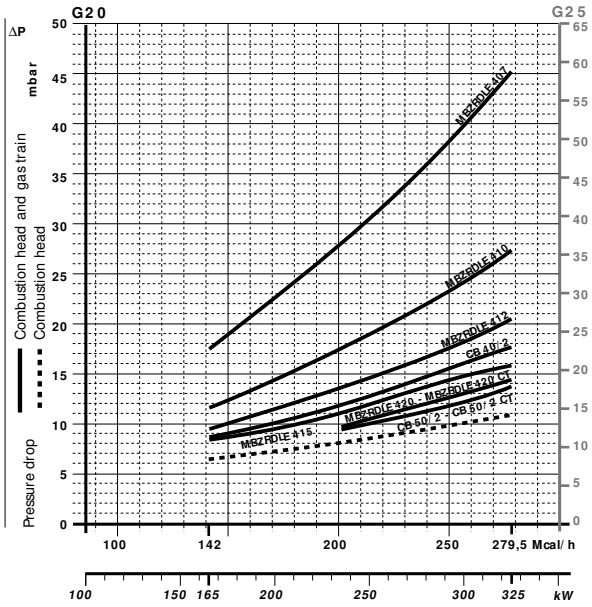
	Name	Code	Ø i	Ø o	X mm	Y mm	Z mm	Seal Control
MULTIBLOC GAS TRAINS	**MBZRDLE 407**	3970046	3/4"	3/4"	195	235	120	-
	MBZRDLE 410	3970079	1"	3/4"	195	235	145	-
	MBZRDLE 412	3970152	1" 1/4	1" 1/2	433	290	145	-
	MBZRDLE 415	3970183	1" 1/2	121/2	523	346	100	-
	MBZRDLE 420	3970184	2"	2"	523	400	100	-
	MBZRDLE 420 CT	3970185	2"	2"	523	400	227	Incorporated
COMPOSED GAS TRAINS	**CB 40/2**	3970153	1" 1/2	1" 1/2	1013	346	195	-
	CB 50/2	3970154	2"	2"	1150	354	250	-
	CB 50/2 CT	3970166	2"	2"	1150	354	320	Incorporated
	CBF 65/2	3970155	DN 65	DN 65	1166	475	285	-
	CBF 65/2 CT	3970167	DN 65	DN 65	1166	475	285	Incorporated
	CBF 80/2	3970156	DN 80	DN 80	1246	425	285	-
	CBF 80/2 CT	3970168	DN 80	DN 80	1246	425	285	incorporated

PRESSURE DROP DIAGRAMS

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.

NATURAL GAS

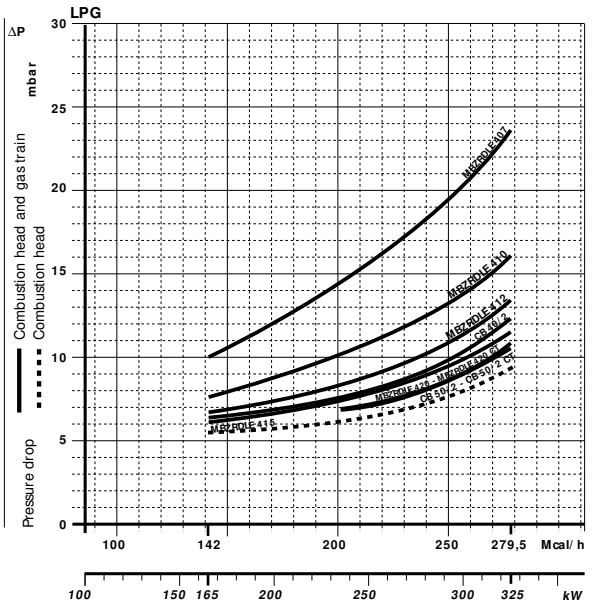
RLS 28



Gas train	Code	Adapter	Seal Control
MBZRDLE 407	3970046	3000824	Accessory
MBZRDLE 410	3970079	3000824	Accessory
MBZRDLE 412	3970152	-	Accessory
MBZRDLE 415	3970183	-	Accessory
CB 40/2	3970153	-	Accessory

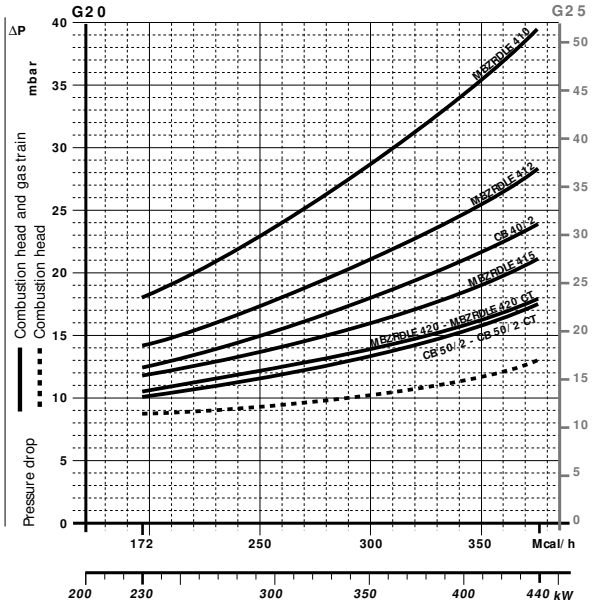
LPG

RLS 28



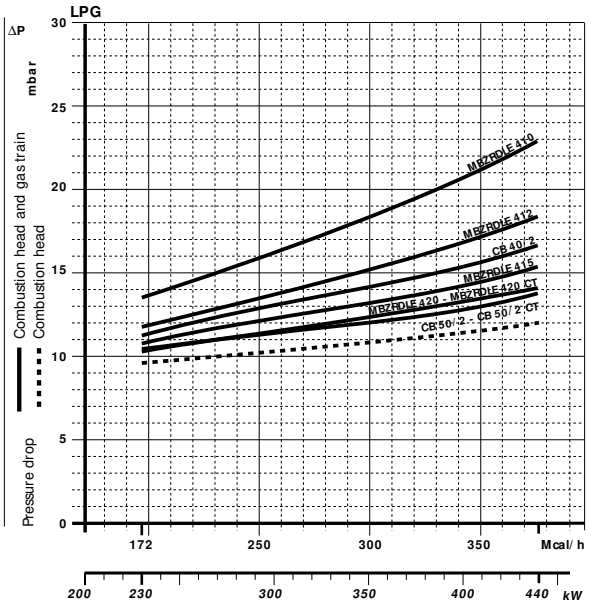
Gas train	Code	Adapter	Seal Control
MBZRDLE 420	3970184	3000822	Accessory
MBZRDLE 420 CT	3970185	3000822	Incorporated
CB 50/2	3970154	3000822	Accessory
CB 50/2 CT	3970166	3000822	Incorporated

RLS 38



Gas train	Code	Adapter	Seal Control
MBZRDLE 410	3970079	3000824	Accessory
MBZRDLE 412	3970152	-	Accessory
MBZRDLE 415	3970183	-	Accessory
CB 40/2	3970153	-	Accessory

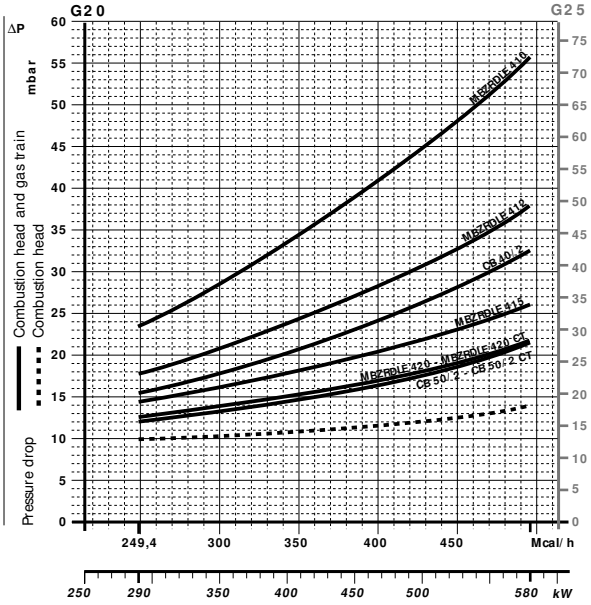
RLS 38



Gas train	Code	Adapter	Seal Control
MBZRDLE 420	3970184	3000822	Accessory
MBZRDLE 420 CT	3970185	3000822	Incorporated
CB 50/2	3970154	3000822	Accessory
CB 50/2 CT	3970166	3000822	Incorporated

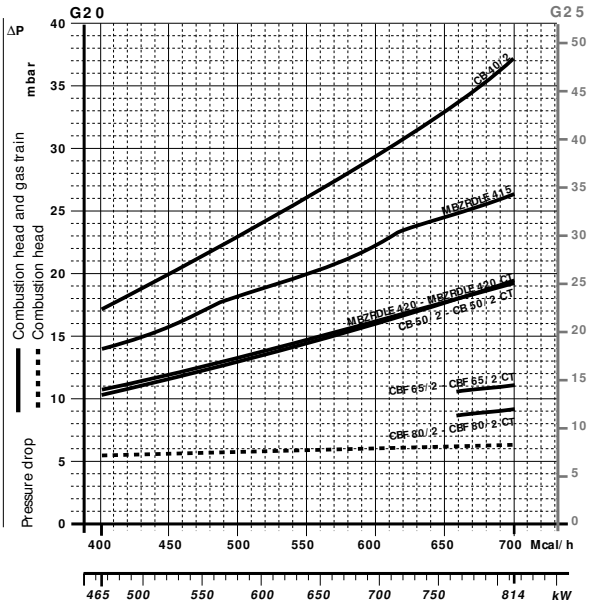
NATURAL GAS

RLS 50



Gas train	Code	Adapter	Seal Control
MBZRDLE 410	3970079	3000824	Accessory
MBZRDLE 412	3970152	-	Accessory
MBZRDLE 415	3970183	-	Accessory
CB 40/2	3970153	-	Accessory

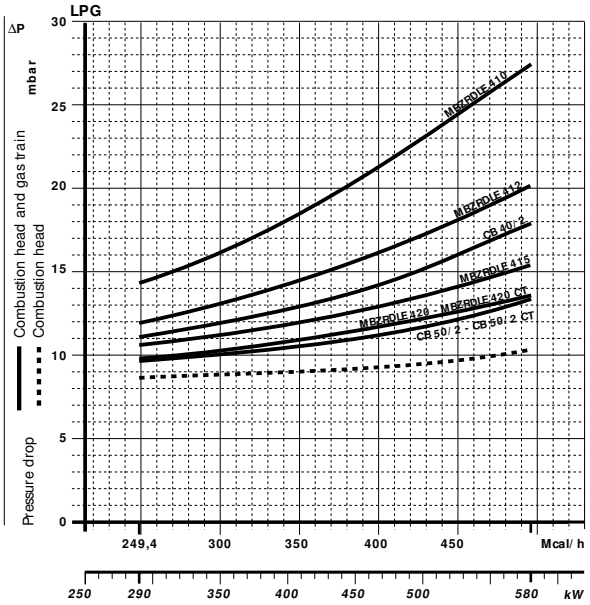
RLS 70



Gas train	Code	Adapter	Seal Control
MBZRDLE 415	3970183	3000843	Accessory
CB 40/2	3970153	3000843	Accessory
MBZRDLE 420	3970184	-	Accessory
MBZRDLE 420 CT	3970185	-	Incorporated
CB 50/2	3970154	-	Accessory

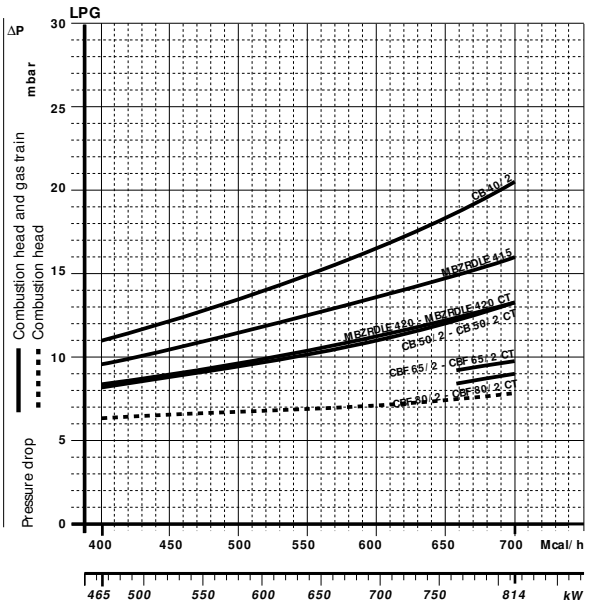
LPG

RLS 50



Gas train	Code	Adapter	Seal Control
MBZRDLE 420	3970184	3000822	Accessory
MBZRDLE 420 CT	3970185	3000822	Incorporated
CB 50/2	3970154	3000822	Accessory
CB 50/2 CT	3970166	3000822	Incorporated

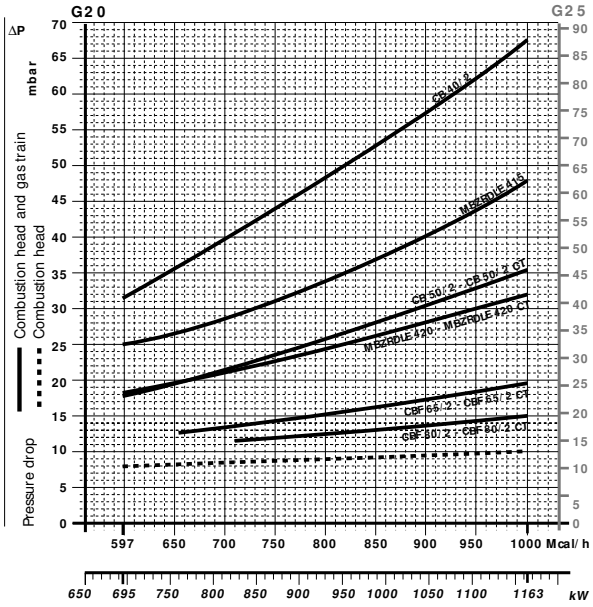
RLS 70



Gas train	Code	Adapter	Seal Control
CB 50/2 CT	3970166	-	Incorporated
CBF 65/2	3970155	3000825	Accessory
CBF 65/2 CT	3970167	3000825	Incorporated
CBF 80/2	3970156	3000826	Accessory
CBF 80/2 CT	3970168	3000826	Incorporated

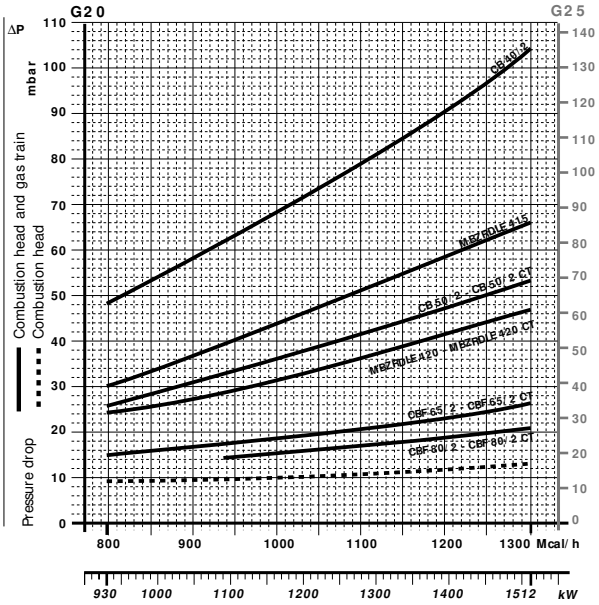
NATURAL GAS

RLS 100



Gas train	Code	Adapter	Seal Control
MBZRDLE 415	3970183	3000843	Accessory
CB 40/2	3970153	3000843	Accessory
MBZRDLE 420	3970184	-	Accessory
MBZRDLE 420 CT	3970185	-	Incorporated
CB 50/2	3970154	-	Accessory

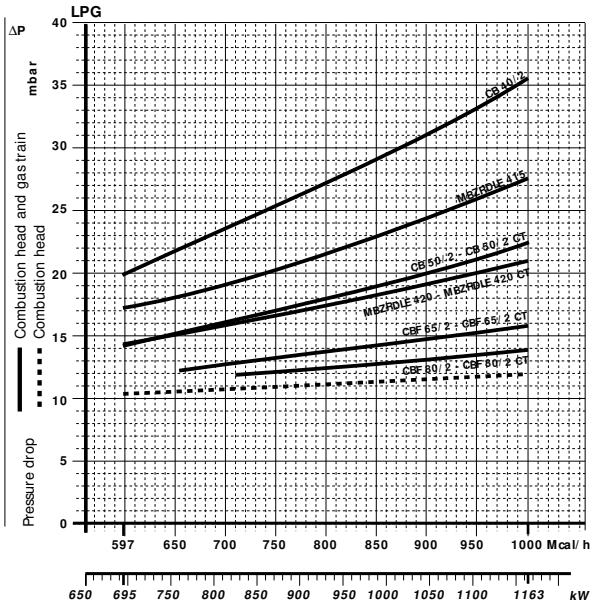
RLS 130



Gas train	Code	Adapter	Seal Control
MBZRDLE 415	3970183	3000843	Accessory
CB 40/2	3970153	3000843	Accessory
MBZRDLE 420	3970184	-	Accessory
MBZRDLE 420 CT	3970185	-	Incorporated
CB 50/2	3970154	-	Accessory

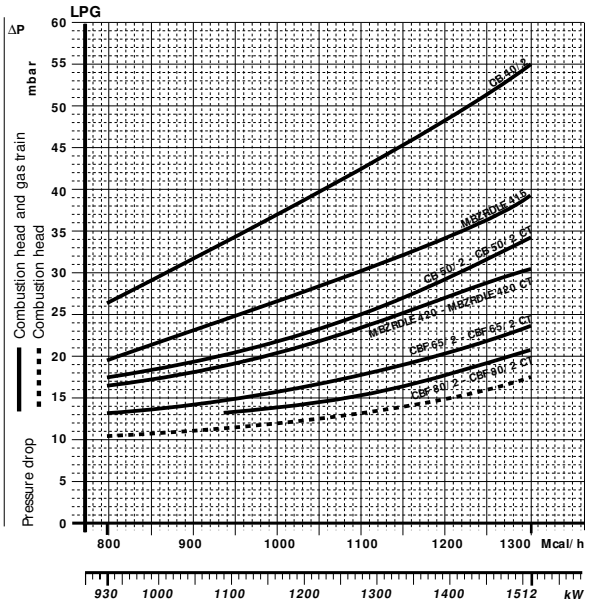
LPG

RLS 100



Gas train	Code	Adapter	Seal Control
CB 50/2 CT	3970166	-	Incorporated
CBF 65/2	3970155	3000825	Accessory
CBF 65/2 CT	3970167	3000825	Incorporated
CBF 80/2	3970156	3000826	Accessory
CBF 80/2 CT	3970168	3000826	Incorporated

RLS 130

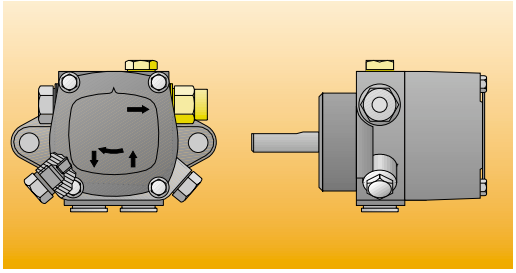


Gas train	Code	Adapter	Seal Control
CB 50/2 CT	3970166	-	Incorporated
CBF 65/2	3970155	3000825	Accessory
CBF 65/2 CT	3970167	3000825	Incorporated
CBF 80/2	3970156	3000826	Accessory
CBF 80/2 CT	3970168	3000826	Incorporated

note *Please contact the Riello Burner Technical Office for different pressure levels from those above indicated.*

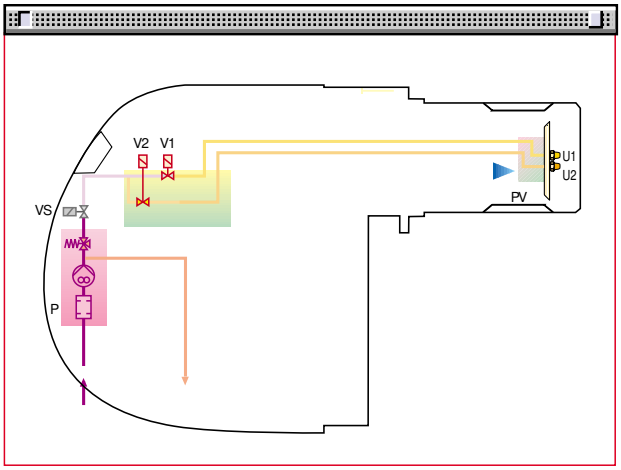
HYDRAULIC CIRCUIT

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 manaully adjusts atomised pressure, which in factory is preset at 12 bar.

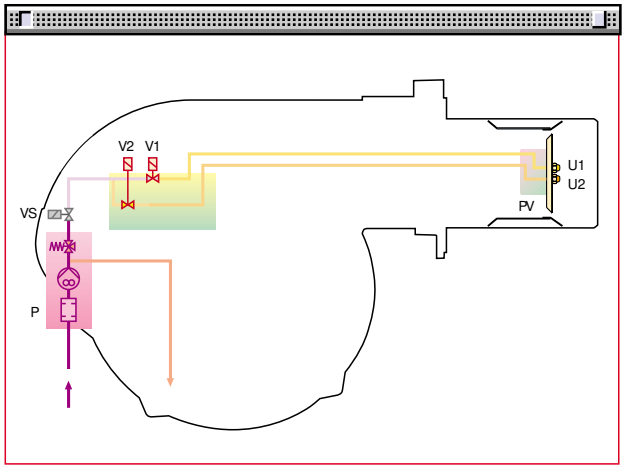


Example of light oil pump of RLS 70-100-130 burners

RLS 28-38-50



RLS 70-100-130



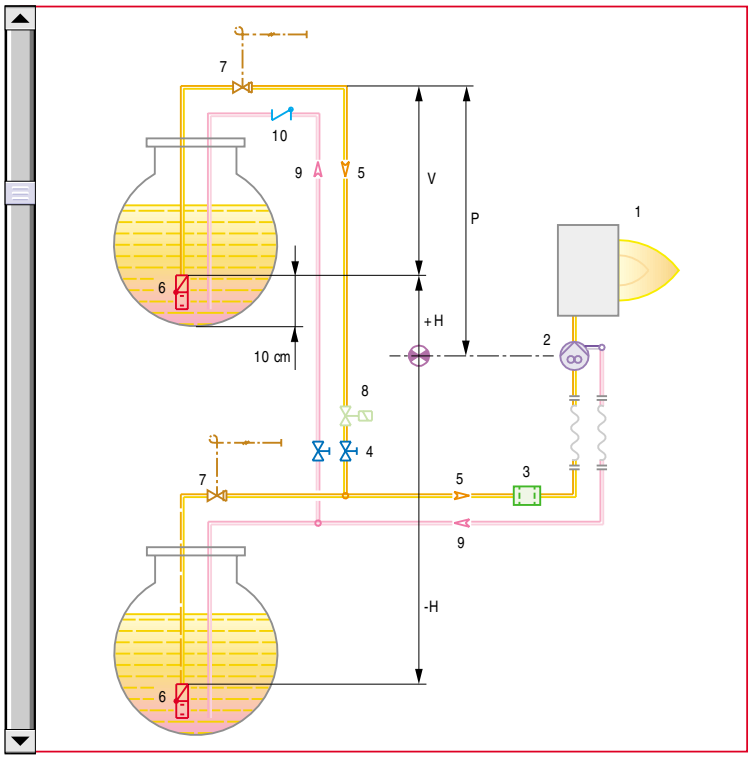
P	Pump with filter and pressure regulator on the output circuit
VS	Safety valve on the output circuit
V1	1st stage valve
V2	2nd stage valve
PV	Nozzle holder
U1	1st stage nozzle
U2	2nd stage nozzle

DIMENSIONING OF 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 for the various burners, 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 28 – 38 -50			▼ RLS 70 –100 –130		
Piping diameter	8mm	10mm	12mm	12mm	14mm	16mm
+H, -H (m)	Lmax (m)	Lmax (m)	Lmax (m)	Lmax (m)	Lmax (m)	Lmax (m)
+4,0	35	90	152	71	138	150
+3,0	30	80	152	62	122	150
+2,0	26	69	152	53	106	150
+1,5	22	54	141	49	98	150
+1,0	21	59	130	44	90	150
+0,5	19	53	119	40	82	150
0	17	48	108	36	74	137
-0,5	15	43	97	32	66	123
-1,0	13	37	83	28	56	109
-1,5	11	32	74	24	49	95
-2,0	9	27	64	19	42	81
-3,0	4	16	42	10	26	53
-4,0	-	6	20	-	10	25

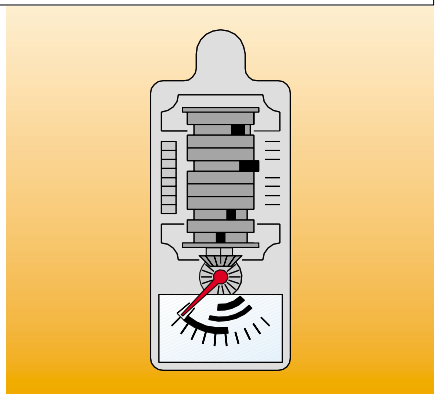


H	Difference in height pump-foot valve
Ø	Internal pipe diameter
P	Height ≤ 10 m
V	Height ≤ 4 m
1	Burner
2	Burner pump
3	Filter
4	Manual shut off valve
5	Suction pipework
6	Bottom valve
7	Remote controlled rapid manual shutoff valve (compulsory in Italy)
8	Type approved shut off solenoid (compulsory in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

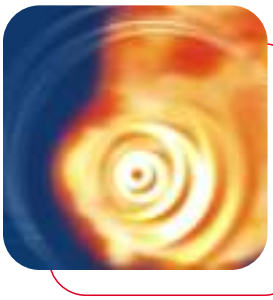
note *With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.*

VENTILATION

The ventilation circuit produces low noise levels with high performances in pressure and air delivery, in spite of compact dimensions. The use of reverse curve blades and sound proofing material keeps noise level very low.
The result is a powerful yet quiet burner with increased combustion performance.
A servomotor allows to have a right air flow in any operational state and the closure of the air damper when burner is in stand-by.



Example of the servomotor for air regulation on RLS 70-100-130 burners.

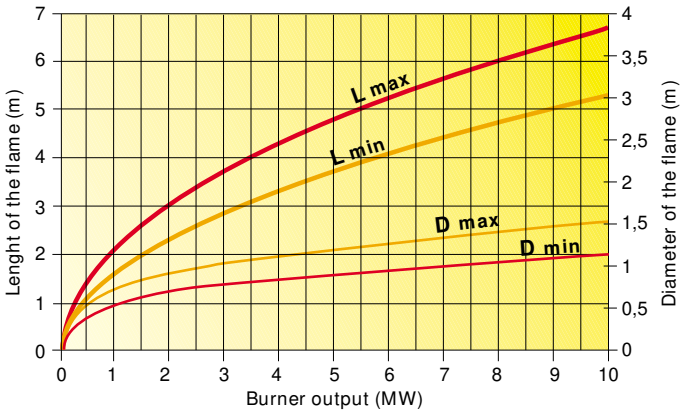


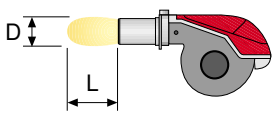
COMBUSTION HEAD

Different lenghts of the combustion head can be supplied (with application of a specific “extended head kit”) for the RLS series of burners.
The selection depends on the thickness of the front panel and on 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 position of the combustion head can easily be adjusted to the maximum defined output by regulating a screw fixed to the flange.

Example of RLS 130 burners combustion head.

Dimensions of the flame





Example:
Burner thermal output = 3500 kW;
L flame (m) = 3,5 m (medium value);
D flame (m) = 1 m (medium value)

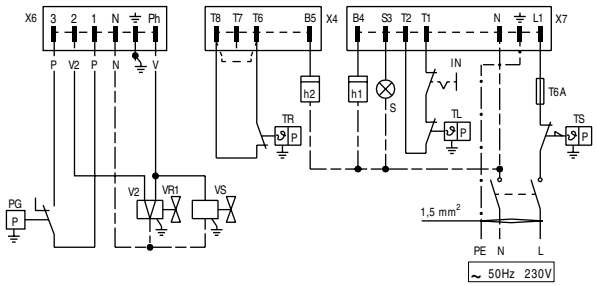
ELECTRICAL CONNECTIONS
To be made by the installer

Electrical connections must be made by qualified and skilled personnel, according to the local norms.

Example of the terminal board for electrical connections for RLS 28-38 burner models

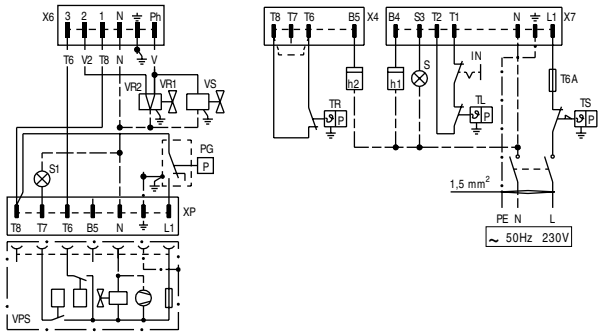
TWO STAGE OPERATION

RLS 28-38
Without seal control



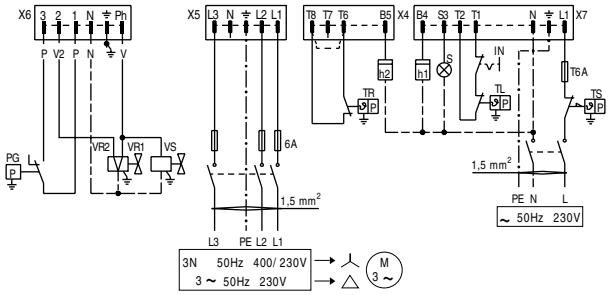
h1 - 1st stage hourcounter
h2 - 2nd stage hourcounter
IN - Burner manual stop switch
XP - Plug for seal control device
X4 - 4 pole plug
X6 - 6 pole plug
X7 - 7 pole plug
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

RLS 28-38
With seal control



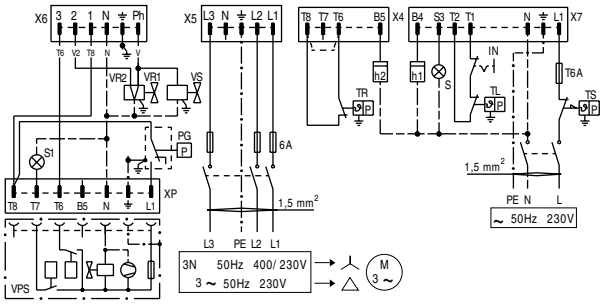
h1 - 1st stage hourcounter
h2 - 2nd stage hourcounter
IN - Burner manual stop switch
XP - Plug for seal control device
X4 - 4 pole plug
X6 - 6 pole plug
X7 - 7 pole plug
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

RLS 50
Without seal control



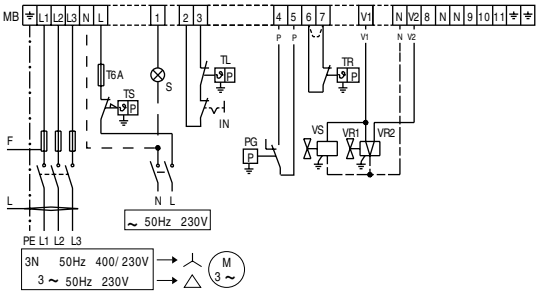
h1 - 1st stage hourcounter
h2 - 2nd stage hourcounter
IN - Burner manual stop switch
XP - Plug for seal control device
X4 - 4 pole plug
X5 - 5 pole plug
X6 - 6 pole plug
X7 - 7 pole plug
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

RLS 50
With seal control



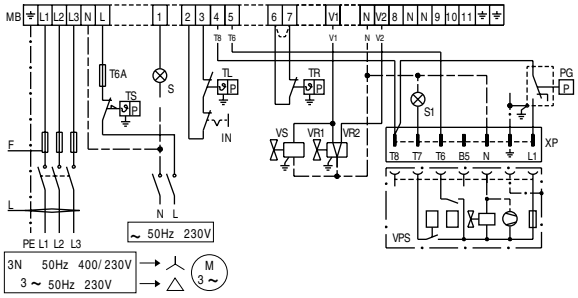
h1 - 1st stage hourcounter
h2 - 2nd stage hourcounter
IN - Burner manual stop switch
XP - Plug for seal control device
X4 - 4 pole plug
X5 - 5 pole plug
X6 - 6 pole plug
X7 - 7 pole plug
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

RLS 70-100-130
Without seal control



IN - Burner manual stop switch
XP - Plug for seal control device
MB - Burner terminal board
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

RLS 70-100-130
With seal control



IN - Burner manual stop switch
XP - Plug for seal control device
MB - Burner terminal board
PG - Min gas pressure switch
S - Remote lock-out signal
S1 - Remote lock-out signal of seal control device
TR - High-low mode load remote control system
TL - Load limit remote control system
TS - Safety load control system
VR1 - Regulating valve 1st stage
VR2 - Regulating valve 2nd stage
VS - Safety valve

The following table shows the supply lead sections and the type of fuse to be used.

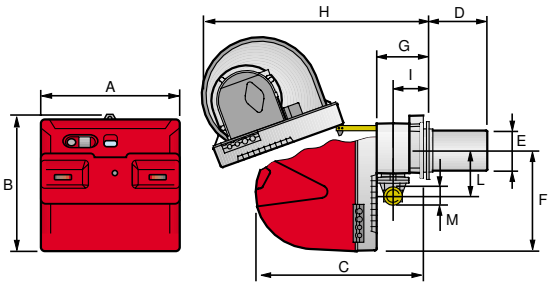
Model		▼ RLS 28	▼ RLS 38	▼ RLS 50		▼ RLS 70		▼ RLS 100		▼ RLS 130	
		230V	230V	230V	400V	230V	400V	230V	400V	230V	400V
F	A	T6	T6	T10	T6	T10	T6	T10	T6	T10	T6
L	mm²	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5

Table A

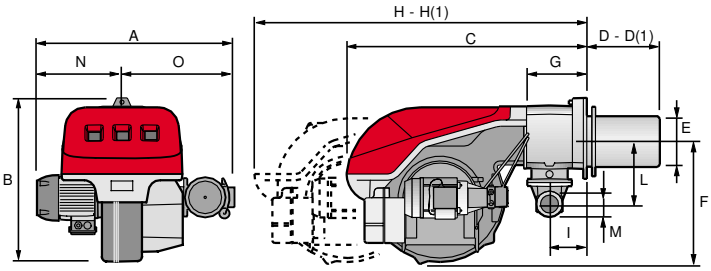
OVERALL DIMENSIONS (mm)

BURNERS

RLS 28 - 38 - 50



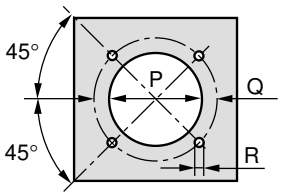
RLS 70 - 100 - 130



Model	A	B	C	D	D(1)	E	F	G	H	H(1)	I	L	M	N	O
RLS 28	476	474	580	191	326	140	352	164	810	810	108	168	1" 1/2	-	-
RLS 38	476	474	580	201	336	152	352	164	810	810	108	168	1" 1/2	-	-
RLS 50	476	474	580	216	351	152	352	164	810	810	108	168	1" 1/2	-	-
RLS 70	691	555	840	250	385	179	430	214	1161	1361	134	221	2"	296	395
RLS 100	707	555	840	250	385	179	430	214	1161	1361	134	221	2"	312	395
RLS 130	733	555	840	250	385	189	430	214	1161	1361	134	221	2"	338	395

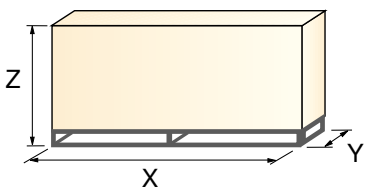
(1) Dimension with " extended head" .

BURNER - BOILER MOUNTING FLANGE



Model	P	Q	R
RLS 28	160	224	M8
RLS 38	160	224	M8
RLS 50	160	224	M8
RLS 70	185	275-325	M12
RLS 100	195	275-325	M12
RLS 130	195	275-325	M12

PACKAGING



Model	X	Y	Z	kg
RLS 28	872	540	550	43
RLS 38	872	540	550	45
RLS 50	872	540	550	46
RLS 70	1190	692	740	70
RLS 100	1190	692	740	73
RLS 130	1190	692	740	76