

CE



ONE STAGE GAS BURNERS

► RS/1 SERIES

► RS 28/1	163 ÷ 349 kW
► RS 34/1 MZ	70 ÷ 390 kW
► RS 38/1	232 ÷ 465 kW
► RS 44/1 MZ	100 ÷ 550 kW



The RS/1 series of burners covers a firing range from 70 to 550 kW, and they have been designed for use in low or medium temperature hot water boilers, hot air or steam boilers, diathermic oil boilers.

Operation is "one stage"; the burners are fitted with a microprocessor control panel which supplies indication of operation and diagnosis of fault cause. Optimisation of sound emissions is guaranteed by the special design of 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		▼ RS 28/1	▼ RS 34/1 MZ	▼ RS 38/1	▼ RS 44/1 MZ
Burner operation mode		One stage			
Modulation ratio at max. output		--			
Servomotor	type	--			
	run time	s			
Heat output	kW	163÷349	70÷390	232÷465	100÷550
	Mcal/h	140÷300	60÷335	200÷400	86÷473
Working temperature		°C min./max. 0/40			
Fuel / air data	Net calorific value G20 gas	kWh/Nm³ 10			
	G20 density gas	kg/Nm³ 0,71			
	G20 gas delivery	Nm³/h 16÷35	7÷39	23÷46,5	10÷55
	Net calorific value G25 gas	kWh/Nm³ 8,6			
	G25 density gas	kg/Nm³ 0,78			
	G25 delivery gas	Nm³/h 19÷41	8÷45	27÷54	12÷64
	Net calorific value LPG gas	kWh/Nm³ 25,8			
	LPG gas density	kg/Nm³ 2,02			
	LPG gas delivery	Nm³/h 6,5÷13,5	3÷15	9÷18	4÷21
	Fan	type (1)	(2)	(1)	(2)
Electrical data	Air temperature	Max. °C 60			
	Electrical supply	Ph/Hz/V (3)	(4)	(3)	(4)
	Auxiliary electrical supply	Ph/Hz/V (3)	(4)	(3)	(4)
	Control box	type	RMG		
	Total electrical power	kW 0,37	0,6	0,60	0,7
	Auxiliary electrical power	kW 0,12	0,3	0,12	0,28
	Protection level	IP 44	40	44	40
	Motor electrical power	kW 0,25	0,3	0,42	0,42
	Rated motor current	A 2,1	3,2	2,9	3,5
	Motor start current	A 10	15	11	17
Approval Emissions	Motor protection level	IP 40	54	54	54
	Ignition transformer	type			
		V1 - V2	230V - 1x8 kV	230V - 1x15 kV	230V - 1x8 kV
		I1 - I2	1A - 20 mA	1A - 25 mA	1A - 20 mA
					1A - 25 mA
	Operation	Intermittent (at least one stop every 24 h)			
	Sound pressure	dBA 68	70	70	72
	Sound power	W --	--	--	--
	CO Emission	mg/kWh	< 40		
	NOx Emission	mg/kWh < 130	< 120	< 130	< 120
Approval Emissions	Directive	90/396 - 89/336 - 73/23 - 92/42 EEC			
	Conforming to	EN 676			
	Certification	CE 63AP6680	CE 0085BR0380	CE 63AP6680	CE 0085BR0380

- (01) Centrifugal with reverse curve blades
 (02) Centrifugal with forward curve blades
 (03) 1/50/230~(±10%)
 (04) 1/50-60/220-230~(±10%)

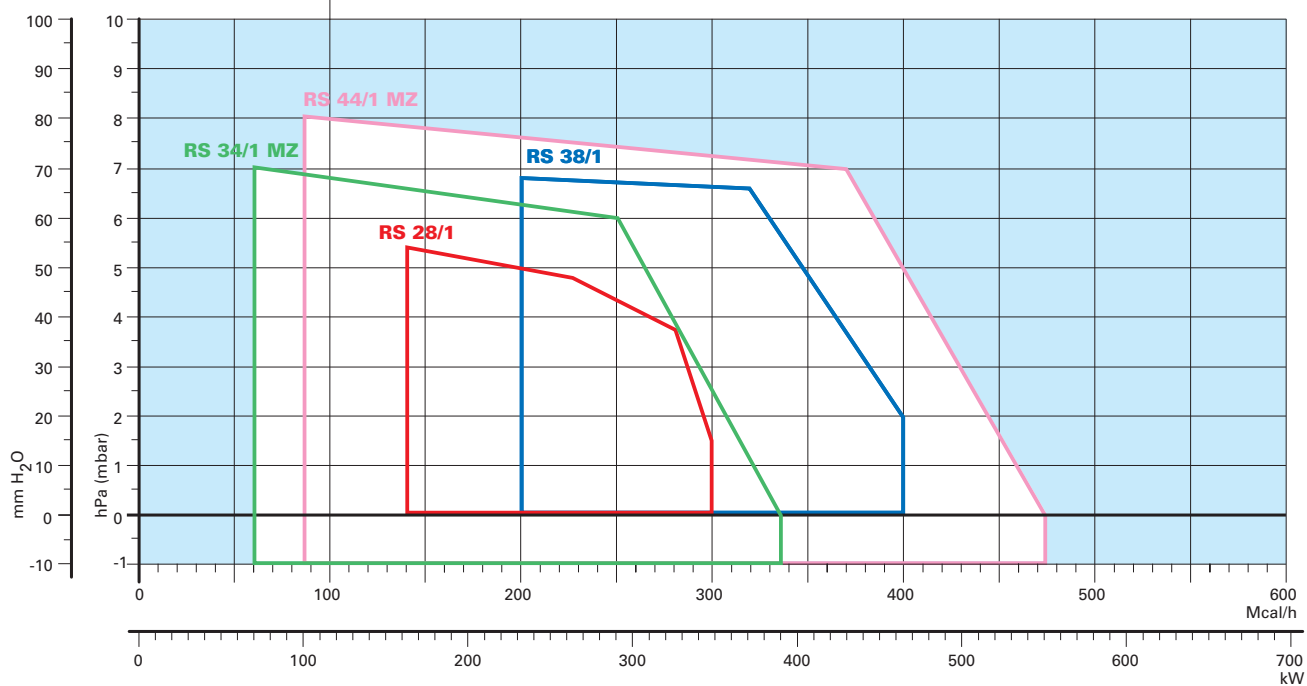
Reference conditions:

Temperature: 20°C
 Pressure: 1000 mbar
 Altitude: 100 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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FIRING RATES



☐ Useful working field for choosing the burner

Test conditions conforming to EN 676:

Temperature: 20°C
Pressure: 1000 mbar
Altitude: 100 m a.s.l.

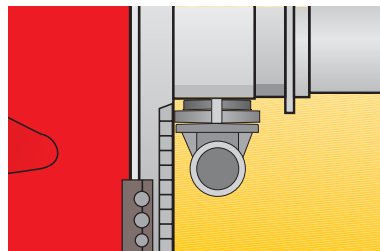


FUEL SUPPLY

► GASTRAIN

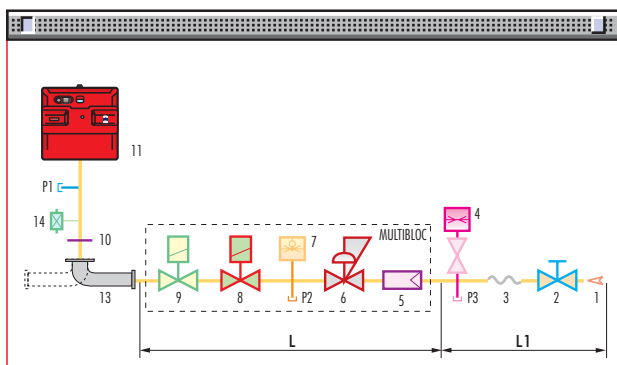
Fuel can be supplied either from the right or left hand sides.

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). The gas train can be, also, "One stage" or "Two stage" type. Conforming to EN676 Standard the one stage gas train can be used on RS 28/1 for all firing rates, and on RS 34/1 - 38/1 - 44/1 up to a capacity of 350 kW.

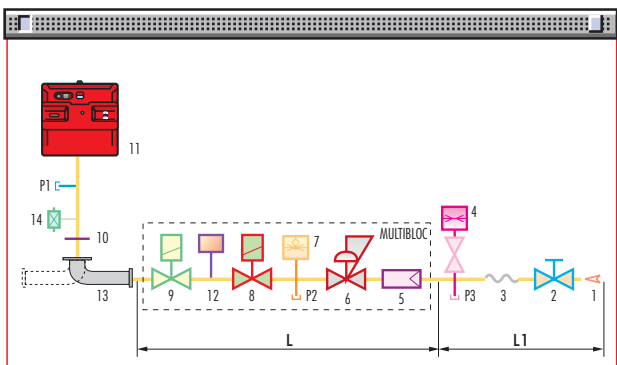


Example of the gas train connection flange of RS/1 burners.

MULTIBLOC gas train without seal control

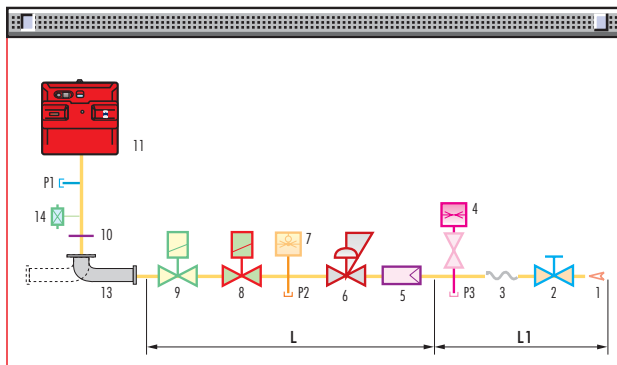


MULTIBLOC gas train with seal control

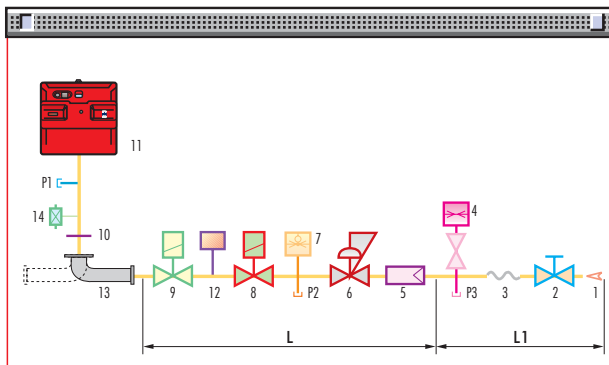


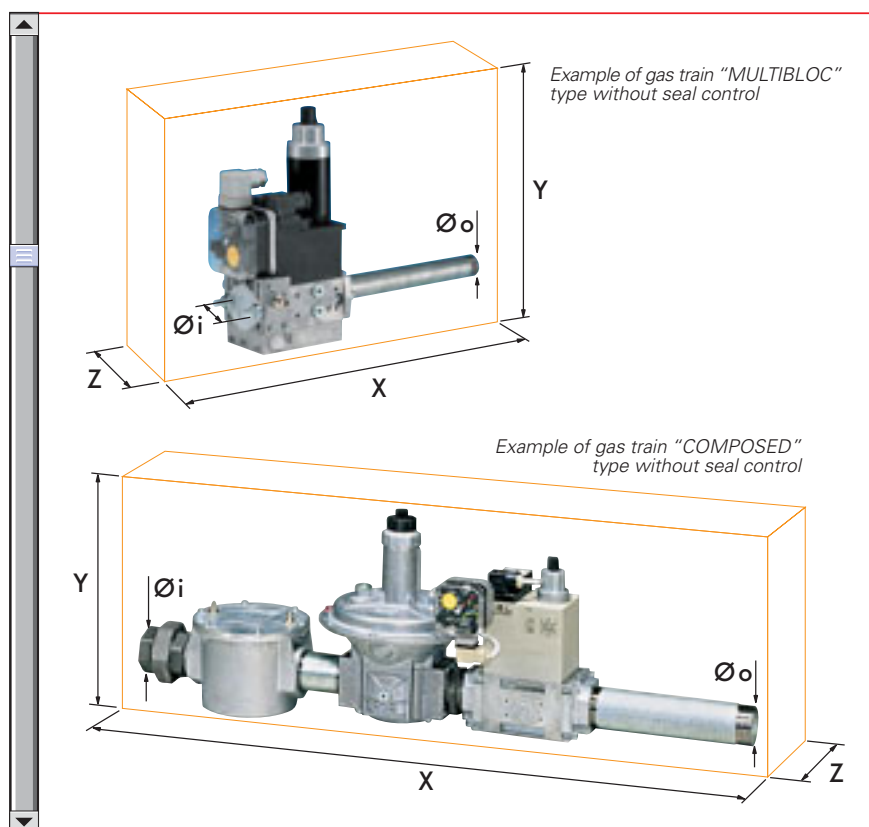
1	Gas input pipework
2	Manual valve
3	Anti-vibration joint
4	Pressure gauge with pushbutton cock.
5	Filter
6	Pressure regulator (vertical)
7	Minimum gas pressure switch
8	VS safety solenoid (vertical)
9	VR regulation solenoid (vertical) Two settings: - firing output (rapid opening) - maximum output (slow 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 RS/1 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 360 mbar, and that one of gas train "Composed" type is 500 mbar.

		Name	Code	Ø i	Ø o	X mm	Y mm	Z mm	Output pressure range (mbar)	Seal Control
ONE STAGE GAS TRAINS	MULTIBLOC GAS TRAINS	MBD 405	3970500 (1)	3/4"	3/4"	371	186	120	4 - 20	Accessory
		MBD 407	3970553 (1)	3/4"	3/4"	371	196	120	4 - 20	Accessory
			3970229 (2)							
		MBD 410	3970599 (1)(3)	1"	3/4"	405	217	145	4 - 20	Accessory
			3970554 (1)							
			3970230 (2)							
		MBD 412	3970600 (1)(3)	1"1/4	1"1/4	433	217	145	4 - 20	Accessory
			3970144 (1)							
		MBD 412 CT	3970231 (2)	1"1/4	1"1/4	433	217	262	4 - 20	Incorporated
			In progress (1)(3)							
	MBD 415	3970197 (1)	1"1/2	1"1/2	523	250	100	4 - 33	Accessory	
		3970180 (1)								
MBD 415 CT	3970232 (2)	1"1/2	1"1/2	523	250	227	4 - 33	Incorporated		
	3970250 (1)(3)									
MBD 420	3970198 (1)	2"	2"	523	300	100	4 - 33	Accessory		
	3970253 (1)(3)									
MBD 420 CT	3970181 (1)	2"	2"	523	300	227	4 - 33	Incorporated		
	3970233 (2)									
COMPOSED GAS TRAINS	CB 40/1	3970182 (1)	1"1/2	1"1/2	891	261	195	4 - 20	-	
	CB 50/1	3970234 (2)	2"	2"	986	328	250	4 - 20	-	
	CB 50/1 CT	3970252 (1)(3)	2"	2"	986	328	300	4 - 20	Incorporated	
TWO STAGE GAS TRAINS	MULTIBLOC GAS TRAINS	MBZRDLE 407	3970145 (1)	3/4"	3/4"	371	256	120	4 - 20	-
		MBZRDLE 410	3970079 (1)	1"	3/4"	405	315	145	4 - 20	-
		MBZRDLE 412	3970152 (1)	1"1/4	1"1/4	433	315	145	4 - 20	-
		MBZRDLE 415	3970183 (1)	1"1/2	1"1/2	523	350	100	4 - 33	-
		MBZRDLE 420	3970184 (1)	2"	2"	523	410	100	4 - 33	-
		MBZRDLE 420 CT	3970185 (1)	2"	2"	523	410	227	4 - 33	Incorporated
	COMPOSED GAS TRAINS	CB 40/2	3970153 (1)	1"1/2	1"1/2	1013	345	195	4 - 33	-
		CB 50/2	3970154 (1)	2"	2"	1150	350	250	4 - 33	-
		CB 50/2 CT	3970166 (1)	2"	2"	1150	350	320	4 - 33	Incorporated

- (1) Gas Train with 6-pin plug to install for connection to the burner.
 (2) Gas Train with 6-pin plug installed for connection to the burner.
 (3) Gas Train S52 type for application with high combustion head pressure drop.

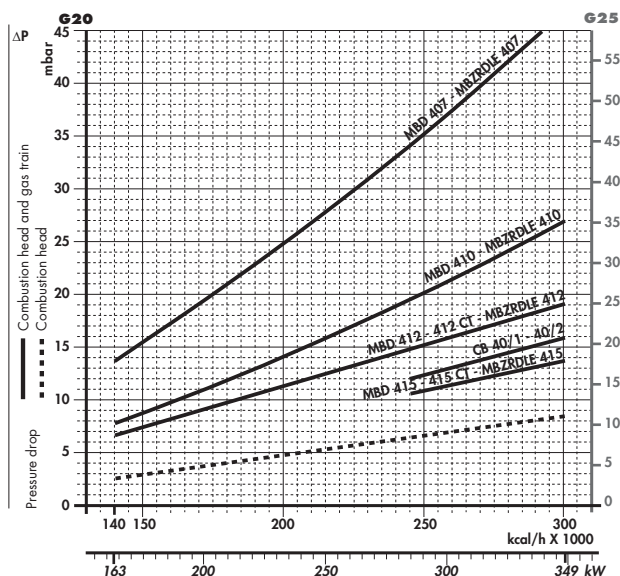


PRESSURE DROP DIAGRAM

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.

NATURAL GAS

RS 28/1

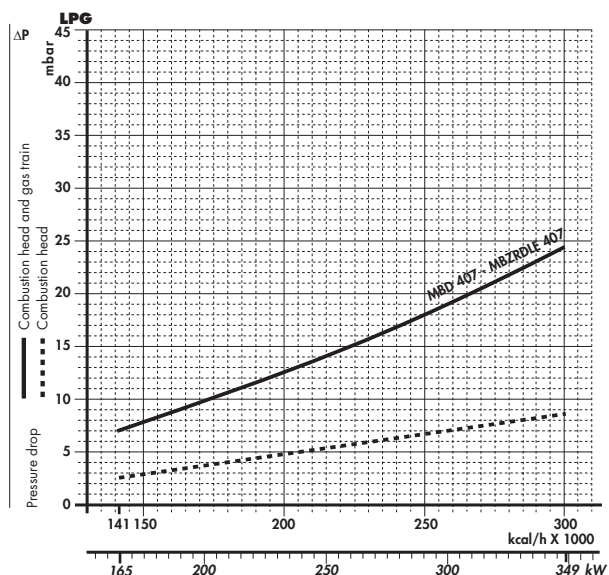


Gas train	Code	Adapter	Seal Control
MBD 407	3970553 (1) 3970229 (2)	3000824	Accessory
MBZRDLE 407	3970046 (1)	3000824	Accessory
MBD 410	3970554 (1) 3970230 (2)	3000824	Accessory
MBZRDLE 410	3970079 (1)	3000824	Accessory
MBD 412	3970144 (1) 3970231 (2)	-	Accessory
MBD 412 CT	3970197 (1)	-	Incorporated
MBZRDLE 412	3970152 (1)	-	Accessory
MBD 415	3970180 (1) 3970232 (2)	-	Accessory
MBD 415 CT	3970198 (1)	-	Incorporated
MBZRDLE 415	3970183 (1)	-	Accessory
CB 40/1	3970145	-	Accessory
CB 40/2	3970153	-	Accessory

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

LPG

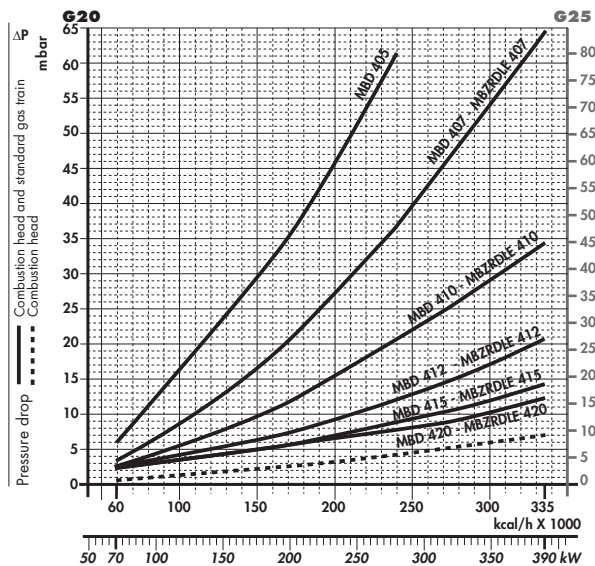
RS 28/1





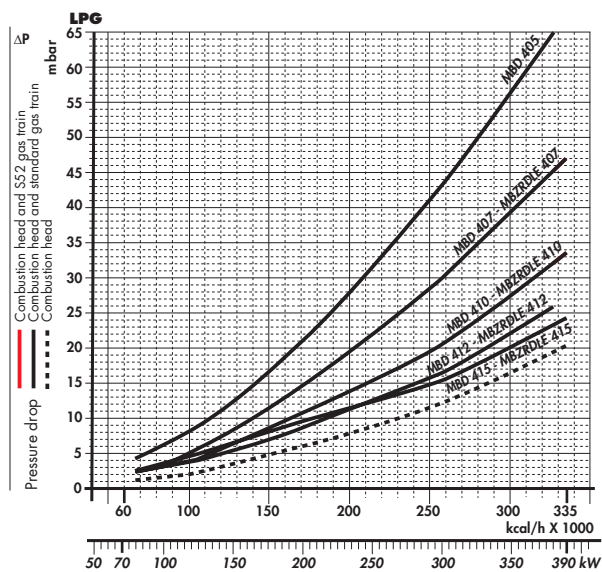
NATURAL GAS

RS 34/1 MZ



LPG

RS 34/1 MZ



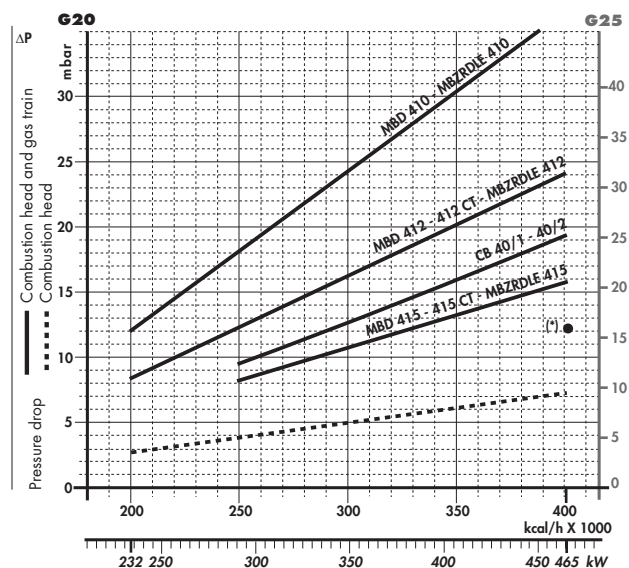
Gas train	Code	Adapter	Seal Control
MBD 405	3970500 (1)	3000824	Accessory
MBD 407	3970553 (1)	3000824	Accessory
	3970229 (2)	3000824	Accessory
	3970599 (1)(3)	3000824	Accessory
MBZRDLE 407	3970046 (1)	3000824	Accessory
MBD 410	3970554 (1)	3000824	Accessory
	3970230 (2)	3000824	Accessory
	3970600 (1)(3)	3000824	Accessory
MBZRDLE 410	3970079 (1)	3000824	Accessory
MBD 412	3970144 (1)	-	Accessory
	3970231 (2)	-	Accessory
MBD 412 CT	3970197 (1)	-	Incorporated
MBZRDLE 412	3970152 (1)	-	Accessory
MBD 415	3970180 (1)	-	Accessory
	3970232 (2)	-	Accessory
MBD 415 CT	3970198 (1)	-	Incorporated
	3970253 (1)(3)	-	Incorporated
MBZRDLE 415	3970183 (1)	-	Accessory
MBD 420	3970181 (1)	3000822	Accessory
	3970233 (2)	3000822	Accessory
MBD 420 CT	3970182 (1)	3000822	Incorporated
	3970234 (2)	3000822	Incorporated
	3970252 (1)(3)	3000822	Incorporated
MBZRDLE 420	3970184 (1)	3000822	Accessory
MBZRDLE 420 CT	3970185 (1)	3000822	Incorporated

- (1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.
(3) Gas Train S52 type for application with high combustion head pressure drop.



NATURAL GAS

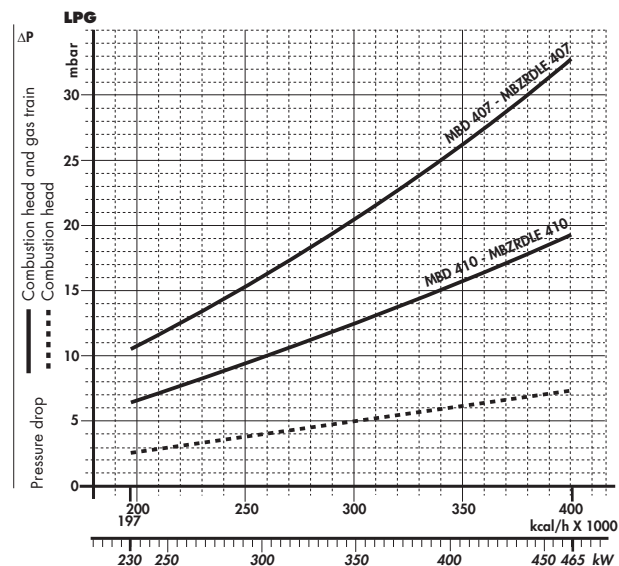
RS 38/1



(*) MBD 420 - MBD 420 CT - MBZRDLE 420 - MBZRDLE 420 CT - CB 50/1 - CB 50/1 CT - CB 50/2 - CB 50/2 CT

LPG

RS 38/1



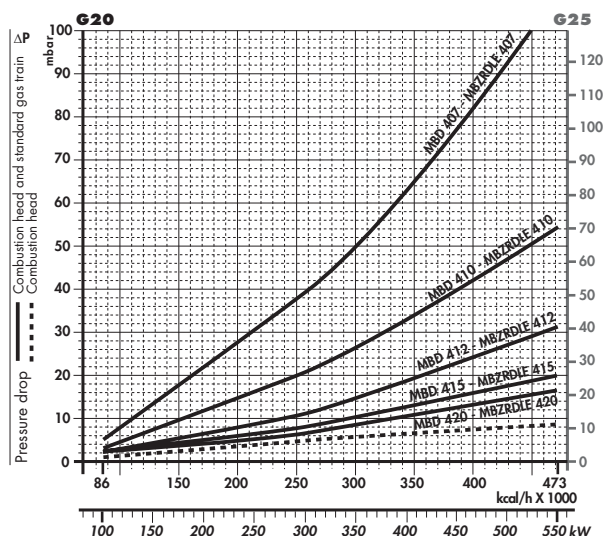
Gas train	Code	Adapter	Seal Control
MBD 407	3970553 (1)	3000824	Accessory
MBZRDLE 407	3970229 (2)	3000824	Accessory
MBD 410	3970554 (1)	3000824	Accessory
MBZRDLE 410	3970230 (2)	3000824	Accessory
MBD 412	3970079 (1)	3000824	Accessory
MBD 412 CT	3970144 (1)	-	Accessory
MBZRDLE 412	3970231 (2)	-	Accessory
MBD 415	3970197 (1)	-	Incorporated
MBZRDLE 415	3970152 (1)	-	Accessory
MBD 415 CT	3970180 (1)	-	Accessory
MBZRDLE 415	3970232 (2)	-	Accessory
CB 40/1	3970198 (1)	-	Incorporated
CB 40/2	3970183 (1)	-	Accessory
MBD 420	3970145	-	Accessory
MBD 420 CT	3970153	-	Accessory
MBZRDLE 420	3970181 (1)	3000822	Accessory
MBZRDLE 420 CT	3970233 (2)	3000822	Accessory
CB 50/1	3970182 (1)	3000822	Incorporated
CB 50/1 CT	3970234 (2)	3000822	Incorporated
CB 50/2	3970184 (1)	3000822	Accessory
CB 50/2 CT	3970185 (1)	3000822	Incorporated
	3970146	3000822	Accessory
	3970160	3000822	Incorporated
	3970154	3000822	Accessory
	3970166	3000822	Incorporated

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.



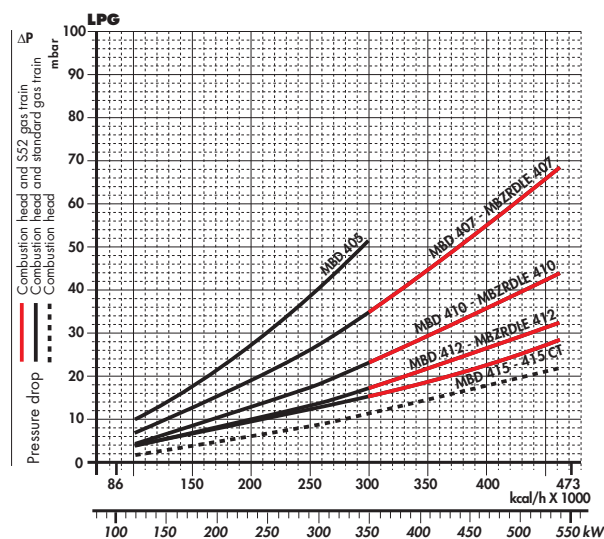
NATURAL GAS

RS 44/1 MZ



LPG

RS 44/1 MZ



Gas train	Code	Adapter	Seal Control
MBD 405	3970500 (1)	3000824	Accessory
MBD 407	3970553 (1)	3000824	Accessory
	3970229 (2)	3000824	Accessory
	3970599 (1)(3)	3000824	Accessory
MBZRDLE 407	3970046 (1)	3000824	Accessory
MBD 410	3970554 (1)	3000824	Accessory
	3970230 (2)	3000824	Accessory
	3970600 (1)(3)	3000824	Accessory
MBZRDLE 410	3970079 (1)	3000824	Accessory
MBD 412	3970144 (1)	-	Accessory
	3970231 (2)	-	Accessory
MBD 412 CT	3970197 (1)	-	Incorporated
MBZRDLE 412	3970152 (1)	-	Accessory
MBD 415	3970180 (1)	-	Accessory
	3970232 (2)	-	Accessory
	3970250 (1)(3)	-	Accessory
MBD 415 CT	3970198 (1)	-	Incorporated
	3970253 (1)(3)	-	Incorporated
MBZRDLE 415	3970183 (1)	-	Accessory
MBD 420	3970181 (1)	3000822	Accessory
	3970233 (2)	3000822	Accessory
MBD 420 CT	3970182 (1)	3000822	Incorporated
	3970234 (2)	3000822	Incorporated
	3970252 (1)(3)	3000822	Incorporated
MBZRDLE 420	3970184 (1)	3000822	Accessory
MBZRDLE 420 CT	3970185 (1)	3000822	Incorporated

- (1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.
(3) Gas Train S52 type for application with high combustion head pressure drop.

note

Please contact the Riello Burner Technical Office for different pressure levels from those above indicated and refer to the technical manual for the correct choice of the spring.

SELECTING THE FUEL SUPPLY LINES

The following diagram enables pressure drop in a pre-existing gas line to be calculated and to select the correct gas train.

The diagram can also be used to select a new gas line when fuel output and pipe length are known. The pipe diameter is selected on the basis of the desired pressure drop. The diagram uses methane gas as reference; if another gas is used, conversion coefficient and a simple formula (on the diagram) transform the gas output to a methane equivalent (refer to figure A). Please note that the gas train dimensions must take into account the back pressure of the combustion chamber during operations.

Control of the pressure drop in an existing gas line or selecting a new gas supply line.

The methane output equivalent is determined by the formula fig. A on the diagram and the conversion coefficient.

Once the equivalent output has been determined on the delivery scale ($\dot{V}$), shown at the top of the diagram, move vertically downwards until you cross the line that represents the pipe diameter; at this point, move horizontally to the left until you meet the line that represents the pipe length. Once this point is established you can verify, by moving vertically downwards, the pipe pressure drop of on the bottom scale below (mbar).

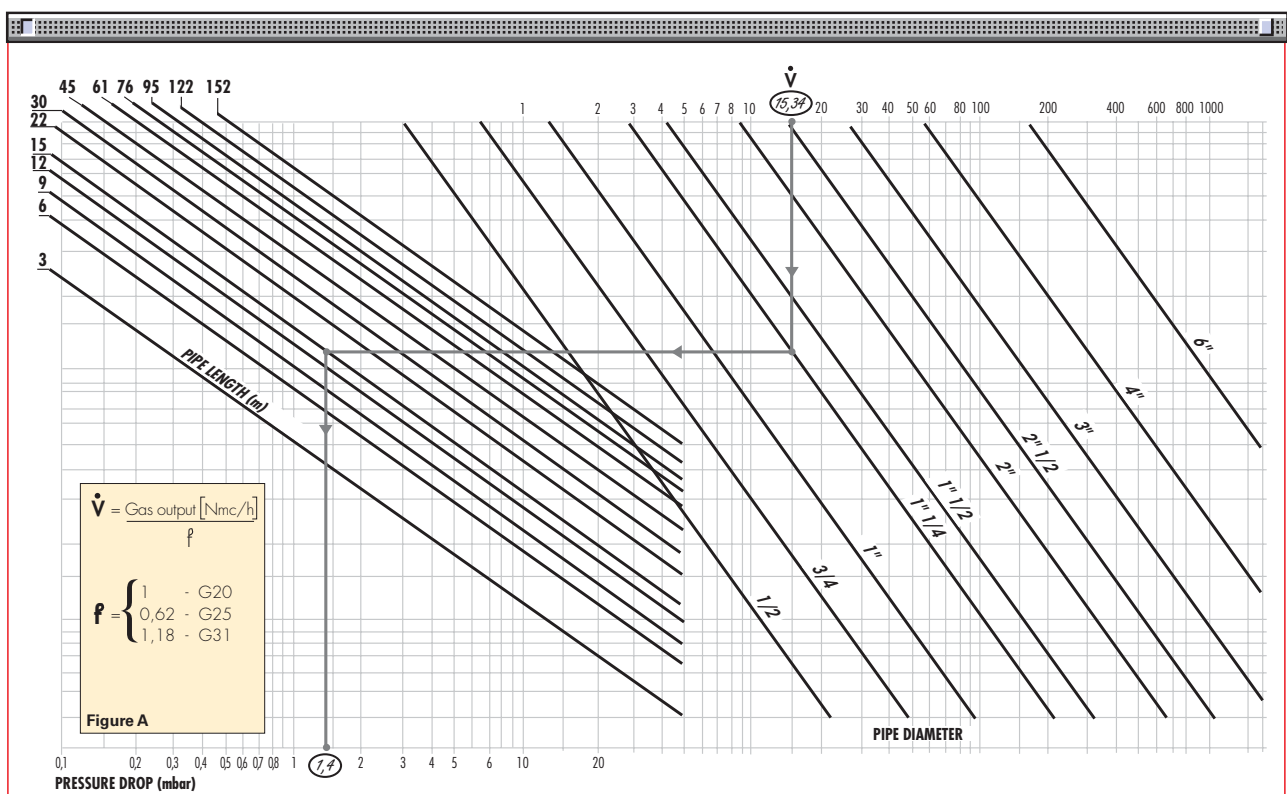
By subtracting this value from the pressure measured on the gas meter, the correct pressure value will be found for the choice of gas train.

Example:

- gas used G25
- gas output 9.51 mc/h
- pressure at the gas meter 20 mbar
- gas line length 15 m
- conversion coefficient 0.62 (see figure A)

- equivalent methane output $\dot{V} = \left[\frac{9.51}{0.62} \right] = 15.34 \text{ mc/h}$

- once the value of 15.34 has been identified on the output scale ($\dot{V}$), moving vertically downwards you cross the line that represents 1" 1/4 (the chosen diameter for the piping);
- from this point, move horizontally to the left until you meet the line that represents the length of 15 m of the piping;
- move vertically downwards to determine a value of 1.4 mbar in the pressure drop bottom scale;
- subtract the determined pressure drop from the meter pressure, the correct pressure level will be found for the choice of gas train;
- correct pressure = (20-1.4) = 18.6 mbar



VENTILATION



Example of the air damper on RS 28/1 burner

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

On RS 28-38/1 models, the use of reverse curve blades and sound-proofing material keeps extremely noise level very low. In the RS 34-44/1 MZ models, noise has been reduced by the special design of the air suction circuit.

The RS 34/1 MZ and RS 44/1 MZ are realised with a new structure made by an innovative technology based on a new fibreglass reinforced polyamide material, with high thermal and mechanical characteristics, instead of the traditional aluminium.

This allows big advantages in terms of lay-out rationalisation, weight and dimensions reduction. In order to guarantee the correct exercise temperature for the internal burner components in every working conditions, the new structure includes an innovative patented cooling technology.

Between the burner front base and the reinforcing steel front plate, had been create an air cavity offering an high thermal insulation against the front boiler reflection heat, and to further improve the insulation efficiency the innovative **HCS (Housing Cooling System)** technology had been developed. Inside the front base cavity an air circulation is activated with continuous air volume refresh to obtain an active cooling system and avoid any heat transfer to the electrical component housing.



Example of HCS (Housing Cooling System) working concept



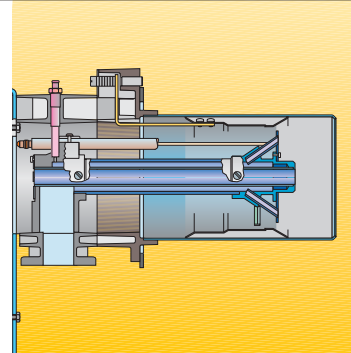
COMBUSTION HEAD

Different lengths of the combustion head can be chosen for the RS/1 series of burners.

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

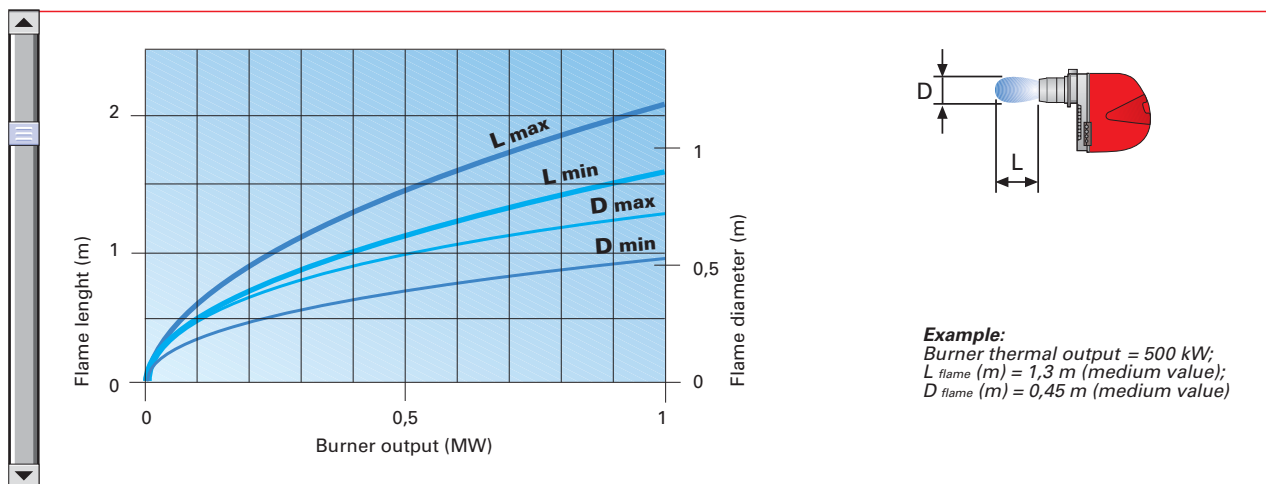
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

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



Example of a RS/1 burner combustion head

Flame dimensions



ADJUSTMENT

BURNER OPERATION MODE

One stage operation

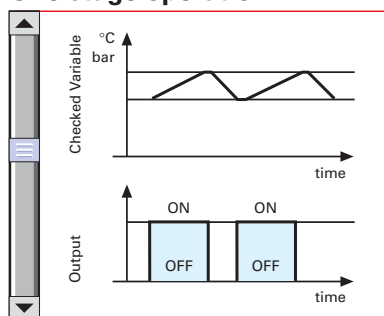


Figure A

The burner of RS/1 series is one stage working.

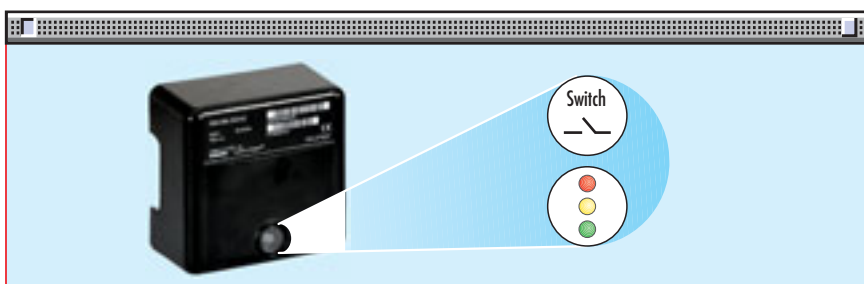
On "one stage" operation, the burner adjusts output to the requested level, by varying between on-off phases (see figure A).

All RS/1 series burners are fitted with a new microprocessor control panel for the supervision during intermittent operation.

For helping the commissioning and maintenance work, there are two main elements:

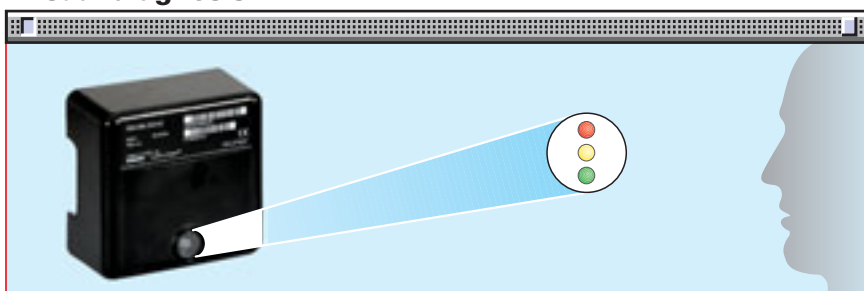
-  The lock-out reset button is the central **operating element** for resetting the burner control and for activating / deactivating the diagnostic functions.
-  The multi-color LED is the central **indication element** for visual diagnosis and interface diagnosis.

Both elements are located under the transparent cover of lock-out reset button, as showed below.



There are two diagnostic choices, for indication of operation and diagnosis of fault cause:

- visual diagnosis :



- interface diagnosis :



by the interface adapter and a PC with dedicated software or by a predisposed flue gas analyzer (see paragraph accessories).



Indication of operation:

In normal operation, the various status are indicated in the form of colour codes according to the table below.

The interface diagnosis (with adapter) can be activated by pressing the lock-out button for > 3 seconds.

Color code table	
Operation status	Color code table
Stand-by	○ ○ ○ ○ ○ ○ ○ ○
Pre-purging	● ● ● ● ● ● ● ●
Ignition phase	● ○ ● ○ ● ○ ● ○
Flame OK	● ● ● ● ● ● ● ●
Poor flame	● ○ ● ○ ● ○ ● ○
Undervoltage, built-in fuse	● ● ● ● ● ● ● ●
Fault, alarm	● ● ● ● ● ● ● ●
Flame simulation	● ● ● ● ● ● ● ●

○ LED off

Diagnosis of fault causes:

After lock-out has occurred, the red signal lamp is steady on. In this status, the visual fault diagnosis according to the error code table can be activated by pressing the lock-out reset button for > 3 seconds. The interface diagnosis (with adapter) can be activated by pressing again the lock-out button for > 3 seconds.

The flashing of red LED are a signal with this sequence:

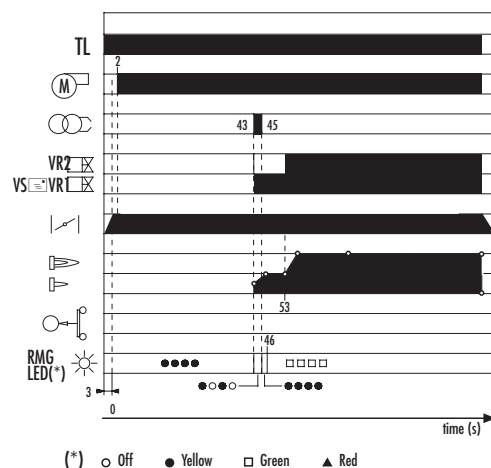
(e.g. signal with n° 3 flashes – faulty air pressure monitor)



Error code table	
Possible cause of fault	Flash code
No establishment of flame at the end of safety time : - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner, no fuel - faulty ignition equipment	2 flashes ● ●
Faulty air pressure monitor	3 flashes ● ● ●
Extraneous light or simulation of flame on burner start up	4 flashes ● ● ● ●
Loss of flame during operation : - faulty or soiled fuel valves - faulty or soiled flame detector - poor adjustment of burner	7 flashes ● ● ● ● ● ● ●
Wiring error or internal fault	10 flashes ● ● ● ● ● ● ● ● ● ●

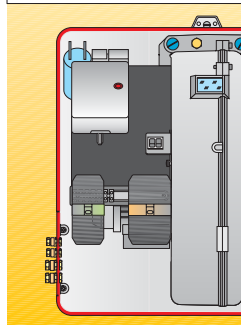
STAR UP CYCLE

RS 28/1 - 34/1 MZ - 38/1 - 44/1 MZ



- 0 s The burner begins the firing cycle.
- 2 s The motor starts: pre-purge phase.
- 43 s Ignition electrode sparks; safety valve VS and adjustment valve VR open.
- 45 s The spark goes out.
- 53 s Output can be increased; start up cycle is concluded.

BURNER WIRING

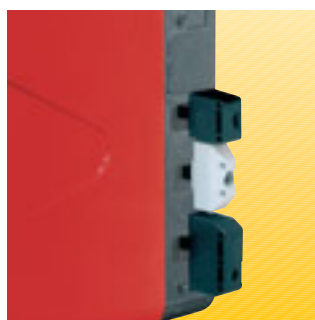
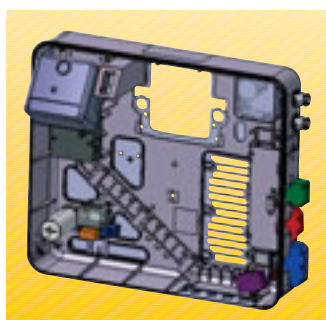


Example of plugs and sockets for electrical connections and control panel on RS 28 /1

All models of the RS/1 burner series have an easily accessible control panel for the electrical components housing and wiring.

In particular the new RS 34-44/1 MZ models, thanks to the new structure concept, have a extremely clean electrical layout to optimise the commissioning and maintenance speed.

On these models the electrical connection are done by a Plug&Socket system, accessible from the external of the cover, and some of the main components as the air pressure switch and the gas max pressure switch (accessory) are connected to the burner electrical wiring trough plugs & sockets system in order to facilitate the connection in case of maintenance. The electrical wiring of all RS/1 burner models are very easy to do following the wiring diagrams included in the instruction handbook. Electrical connections must be made by qualified and skilled personnel, according to the local norms.



Example of electrical components housing and Plug&Socket system for electrical connection of RS 34-44/1 MZ

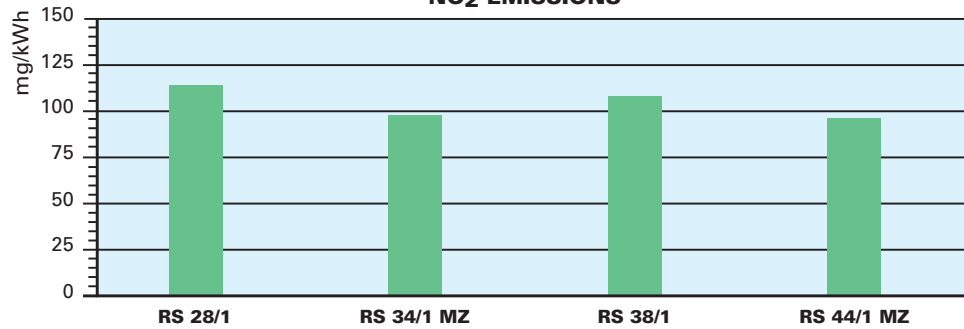
The following table shows the supply lead sections and the type of fuse to be used.

Model	▼ RS 28/1	▼ RS 34/1 MZ	▼ RS 38/1	▼ RS 44/1 MZ
	230V	230V	230V	230V
F A	T6	T6	T6	T6
L mm ²	1,5	1,5	1,5	1,5

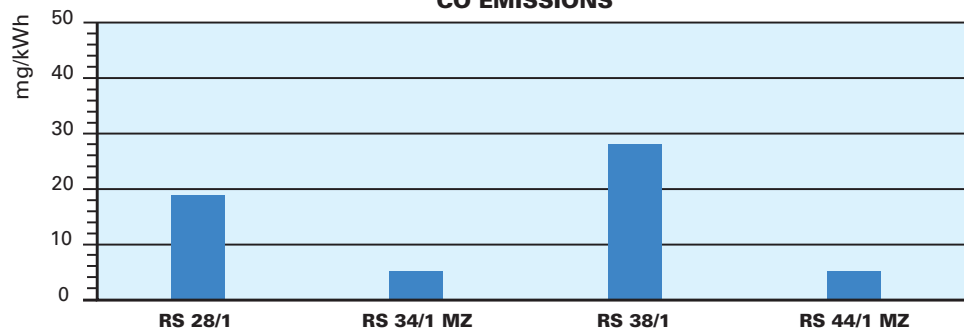


EMISSIONS

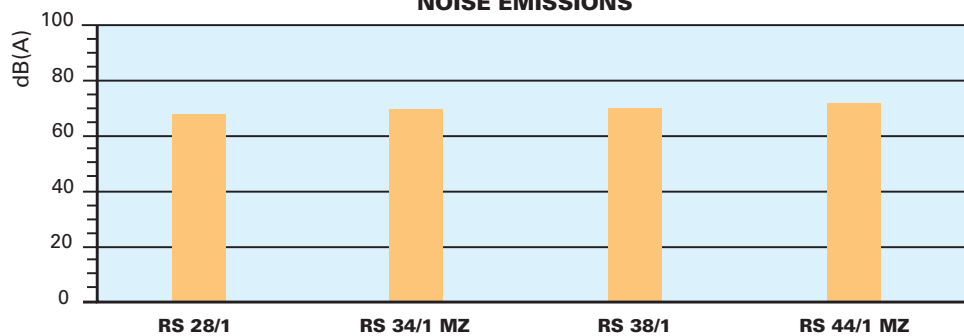
NO₂ EMISSIONS



CO EMISSIONS



NOISE EMISSIONS



The emission data has been measured in the various models at maximum output, according to EN 676 standard.

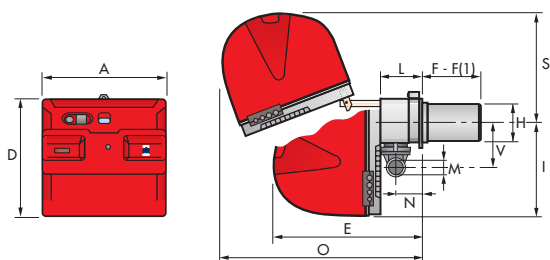
The NO_x emissions of RS 34-44/1 MZ models are conforming to the class 2 of EN 676.

OVERALL DIMENSIONS (mm)

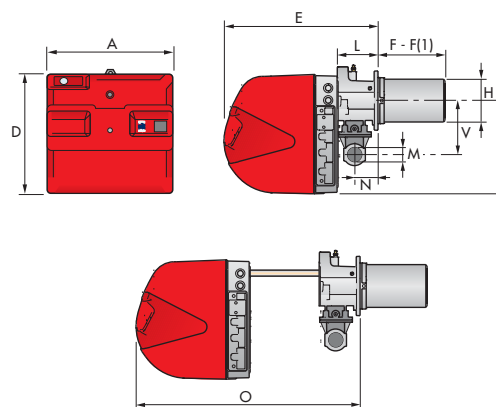


BURNER

RS 28/1 - 38/1



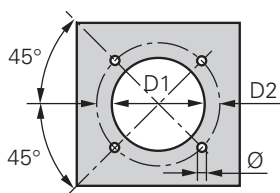
RS 34/1 MZ - 44/1 MZ



Model	A	D	E	F - F(1)	H	I	L	M	N	O	S	V
► RS 28/1	476	474	580	216 - 351	140	352	164	1"1/2	108	810	367	168
► RS 34/1 MZ	442	422	508	216 - 351	140	305	138	1"1/2	84	780	-	177
► RS 38/1	476	474	580	216 - 351	140	352	164	1"1/2	108	810	367	168
► RS 44/1 MZ	442	422	508	216 - 351	152	305	138	1"1/2	84	780	-	177

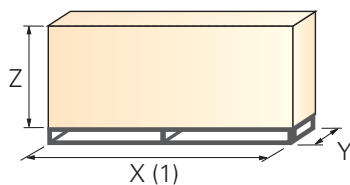
(1) Length with extended combustion head

BURNER - BOILER MOUNTING FLANGE



Model	D1	D2	Ø
► RS 28/1	160	224	M8
► RS 34/1 MZ	160	224	M8
► RS 38/1	160	224	M8
► RS 44/1 MZ	160	224	M8

PACKAGING



Model	X (1)	Y	Z	kg
► RS 28/1	1200	502	520	37
► RS 34/1 MZ	1000	485	500	32
► RS 38/1	1200	502	520	39
► RS 44/1 MZ	1000	485	500	33

(1) dimension with standard and extended 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 output of the boiler and considering the enclosed diagrams.
- ▶ Refit the burner casing to the slide bars.
- ▶ Close the burner, sliding it up to the flange.

ELECTRICAL CONNECTIONS AND START UP

- ▶ Make the electrical connections to the boiler following the wiring diagrams included in the instruction handbook.
- ▶ Perform a first ignition calibration on the gas train.
- ▶ On start up, check:
 - Gas pressure at the combustion head (to max. and min. output)
 - Combustion quality, in terms of unburned substances and excess air.

BURNER MAINTENANCE

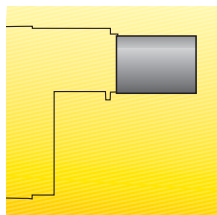
- ▶ The maintenance of RS/1 burners is very simple thanks to the sliding bars system that allows an easy access to the internal components.
- ▶ In particular the RS 34-44/1 MZ models have a new sliding bars system to make easier the access to the combustion head.

BURNER ACCESSORIES



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.



Extended head kit			
Burner	'Standard' head length (mm)	'Extended' head length (mm)	Kit code
RS 28/1	216	351	3010091
RS 34/1 MZ	216	351	3010428
RS 38/1	216	351	3010092
RS 44/1 MZ	216	351	3010429

Spacer kit

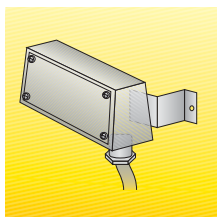
If burner head penetration into the combustion chamber needs reducing, varying thickness spacers are available, as given in the following table:



Spacer kit		
Burner	Spacer thickness S (mm)	Kit code
RS 28/1 - 34/1 MZ - 38/1 - 44/1 MZ	90	3010095

Post-ventilation kit

To prolong ventilation for approximately 5 seconds after opening of thermostats chain, a special kit is available.



Post-ventilation kit	
Burner	Kit code
RS 28/1 - 38/1	3010004

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:



Continuous ventilation kit	
Burner	Kit code
RS 28/1 - 38/1	in progress



Sound proofing box

If noise emission needs reducing even further, sound-proofing boxes are available, as given in the following table:



Sound proofing box			
Burner	Box type	Average noise reduction [dB(A)](*)	Box code
RS 28/1 - 34/1 MZ RS 38/1 - 44/1 MZ	C1/3	10	3010403

(*) according to EN 15036-1 standard

LPG kit

For burning LPG gas, a special kit is available to be fitted to the combustion head on the burner, as given in the following table:



LPG kit	
Burner	Kit code
RS 28/1	3010089
RS 34/1 MZ	3010423
RS 38/1	3010090
RS 44/1 MZ	3010424

Town gas kit

For burning Town gas, a special kit is available:



Town gas kit		
Burner	Kit code for standard head (*)	Kit code for extended head (*)
RS 28/1	3010283	3010283
RS 38/1	3010284	3010284

(*) Without CE certification

Status Panel kit

The RS burners can be equipped with an exclusive electronic device "Status Panel" which continuously monitors and displays all the burner operational modes and picks up any anomalies during the operational cycle.



Status Panel kit	
Burner	Kit code
RS 28/1 - 38/1	3010322



Ground fault interrupter kit

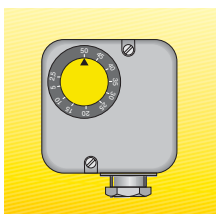
A "Ground fault interrupter kit" is available as a safety device for electrical system fault.



Ground fault interrupter kit	
Burner	Kit code
RS 28/1 - 34/1 MZ - 38/1 - 44/1 MZ	3010321

Gas max pressure switch

If necessary a Gas max pressure Switch kit is available and connectable to the burner electrical wiring trough Plugs & Sockets system.



Gas max pressure switch	
Burner	Code
RS 34/1 MZ - 44/1 MZ	3010418

Volt free contact kit

A volt free contact kit is available for installation onto the burner. This can be used for a remote interface between burner operating signals, for example, burner run or lockout indication.



Volt free contact kit	
Burner	Kit code
RS 34/1 MZ - 44/1 MZ	3010419

PC interface kit

To connect the flame control panel to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software are available.

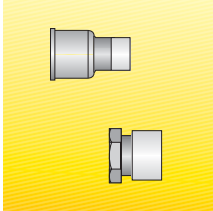


PC interface kit	
Burner	Kit code
RS 28/1 - 34/1 MZ - 38/1 - 44/1 MZ	3002719

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. The following table lists the adapters for various burners.



Adapters				
Burner	Gas train	Dimensions		Adapter code
RS 28/1	MBD 407 - 410	3/4"	 1" 1/2	3000824
	MBZRDLE 407 - 410	3/4"	 1" 1/2	3000824
RS 34/1 MZ	MBD 405 - 407 - 410	3/4"	 1" 1/2	3000824
	MBZRDLE 407 - 410	3/4"	 1" 1/2	3000824
	MBD 420 - 420 CT	2"	 1" 1/2	3000822
	MBZRDLE 420 - 420 CT	2"	 1" 1/2	3000822
RS 38/1	MBD 407 - 410	3/4"	 1" 1/2	3000824
	MBZRDLE 407 - 410	3/4"	 1" 1/2	3000824
	MBD 420 - CB 50/1	2"	 1" 1/2	3000822
	MBD 420 CT - CB 50/1 CT	2"	 1" 1/2	3000822
	MBZRDLE 420 - CB 50/2	2"	 1" 1/2	3000822
	MBZRDLE 420 CT - CB 50/2 CT	2"	 1" 1/2	3000822
RS 44/1 MZ	MBD 407 - 410	3/4"	 1" 1/2	3000824
	MBZRDLE 407 - 410	3/4"	 1" 1/2	3000824
	MBD 420 - 420 CT	2"	 1" 1/2	3000822
	MBZRDLE 420 - 420 CT	2"	 1" 1/2	3000822

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 sealing control is type VPS 504.



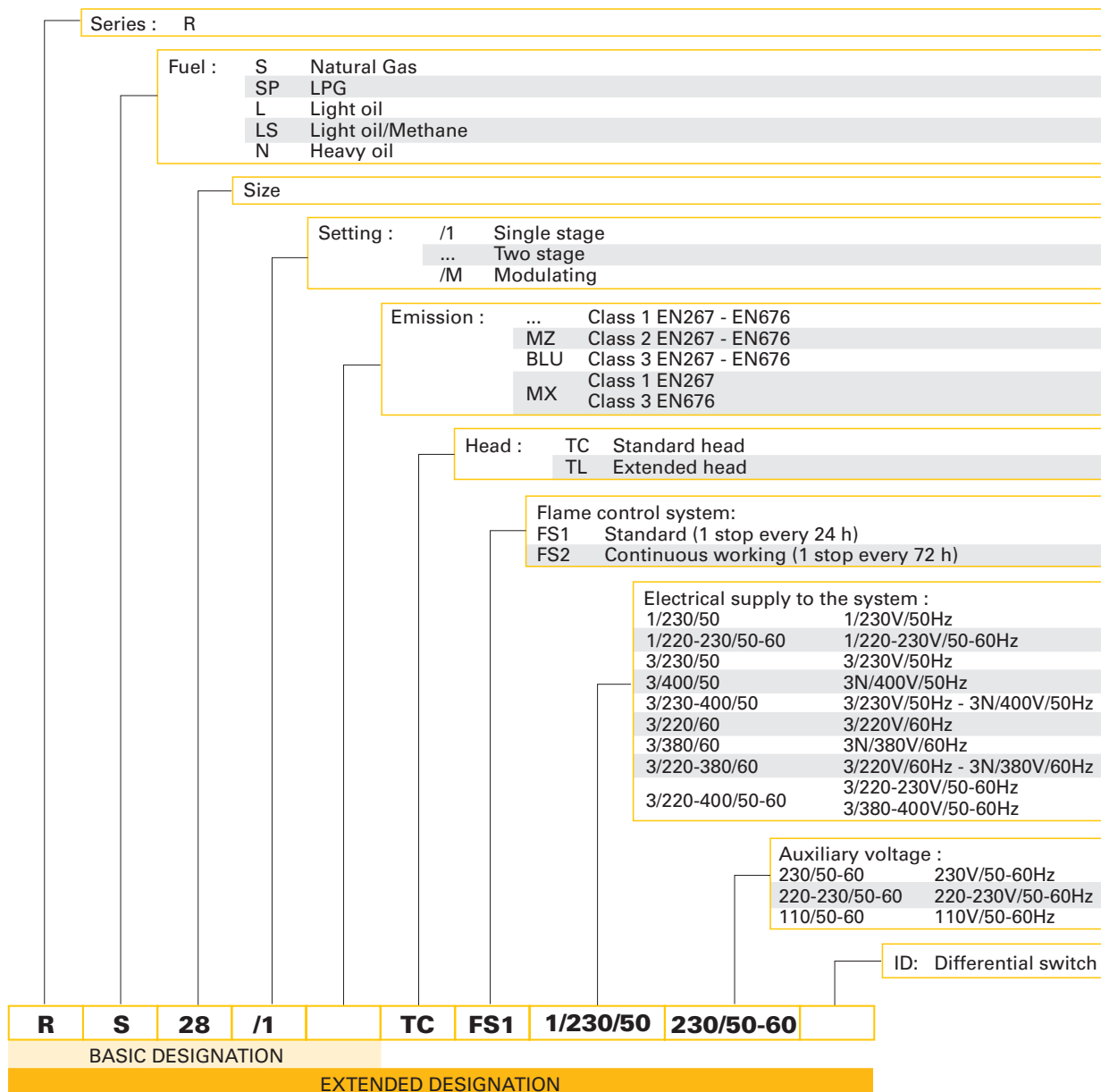
Seal control kit	
Gas train	Kit code
MBD 405 MBD 407 - MBZRDLE 407 MBD 410 - MBZRDLE 410 MBD 412 - MBZRDLE 412 MBD 415 - CB 40/1	3010123
MBZRDLE 415 - CB 40/2	
MBZRDLE 420 - CB 50/2	
	3010125

SPECIFICATION

A specific index guides your choice of burner from the various models available in the RS/1 series.
Below is a clear and detailed specification description of the product.



DESIGNATION OF SERIES



AVAILABLE BURNER MODELS

RS 28/1	TC	FS1	1/230/50	230/50-60
RS 28/1	TL	FS1	1/230/50	230/50-60
RS 34/1 MZ	TC	FS1	1/220-230/50-60	220-230/50-60
RS 34/1 MZ	TL	FS1	1/220-230/50-60	220-230/50-60
RS 38/1	TC	FS1	1/230/50	230/50-60
RS 38/1	TL	FS1	1/230/50	230/50-60
RS 44/1 MZ	TC	FS1	1/220-230/50-60	220-230/50-60
RS 44/1 MZ	TL	FS1	1/220-230/50-60	220-230/50-60

Other versions are available on request.





▶ PRODUCT SPECIFICATION

RS 28/1 - 38/1 models

Burner:

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

- Air suction circuit lined with sound-proofing material
- Fan with reverse curve blades high performance with low sound emissions
- Air damper for air flow setting
- Starting motor at 2800 rpm, (single-phase, 230V, 50Hz)
- 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
 - ionisation probe
 - gas distributor
 - flame stability disk
- Minimum air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- Microprocessor-based flame control panel, with diagnostic functions
- Plug and socket for electrical connections
- Flame inspection window
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP 44 electric protection level.

Gas train

Fuel supply line, in the MULTIBLOC configuration (from a diameter of 3/4" until a diameter 2") or COMPOSED configuration (from a diameter of DN 40 until a diameter of DN 50), fitted with:

- Filter
- Stabiliser
- Minimum gas pressure switch
- Safety valve
- One stage or two stage working valve with ignition gas output regulator.

Conforming to:

- 89/336/EEC directive (electromagnetic compatibility)
- 73/23/EEC directive (low voltage)
- 92/42/EEC directive (performance)
- 90/396/EEC directive (gas)
- EN 676 (gas burners).

Standard equipment:

- 1 gas train gasket
- 1 flange gasket
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- 4 fairleads for electrical connection
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

Available accessories to be ordered separately:

- Extended head kit
- Spacer kit
- Post-ventilation kit
- Continuous ventilation kit
- Sound-proofing box
- LPG kit
- Town gas kit
- Status panel kit
- Ground fault interrupter kit
- PC interface kit
- Gas train adapter
- Seal control kit.



▶ **PRODUCT SPECIFICATION**

RS 34/1 MZ - 44/1 MZ models

Burner:

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

- Air suction circuit
- High performance fan with straight blades
- Air damper for air flow setting
- Starting motor at 2800 rpm, single-phase / 220-230V / 50-60Hz
- 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
 - ionisation probe
 - gas distributor
 - flame stability disk
- Minimum air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- Microprocessor-based flame control panel, with diagnostic functions
- Plug and socket for electrical connections accessible from the external of the cover
- Flame inspection window
- Slide bars for easier installation and maintenance
- Protection filter against radio interference
- IP 40 electric protection level.

Gas train

Fuel supply line, in the MULTIBLOC configuration (from a diameter of 3/4" until a diameter 2") fitted with:

- Filter
- Stabiliser
- Minimum gas pressure switch
- Safety valve
- One stage or two stage working valve with ignition gas output regulator.

Conforming to:

- 89/336/EEC directive (electromagnetic compatibility)
- 73/23/EEC directive (low voltage)
- 92/42/EEC directive (performance)
- 90/396/EEC directive (gas)
- EN 676 (gas burners).

Standard equipment:

- 1 gas train gasket
- 1 flange gasket
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- 3 plugs for electrical connection
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

Available accessories to be ordered separately:

- Extended head kit
- Spacer kit
- Sound-proofing box
- LPG kit
- Ground fault interrupter kit
- Gas max pressure switch
- Volt free contact kit
- Interface adapter kit
- Gas train adapter
- Seal control kit.





RIELLO S.p.A. - Via Ing. Pilade Riello, 5 - 37045 Legnago (VR) Italy
Tel. ++39.0442630111 - Fax ++39.044221980

Internet: <http://www.rielloburners.com> - E-mail: info@rielloburners.com

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