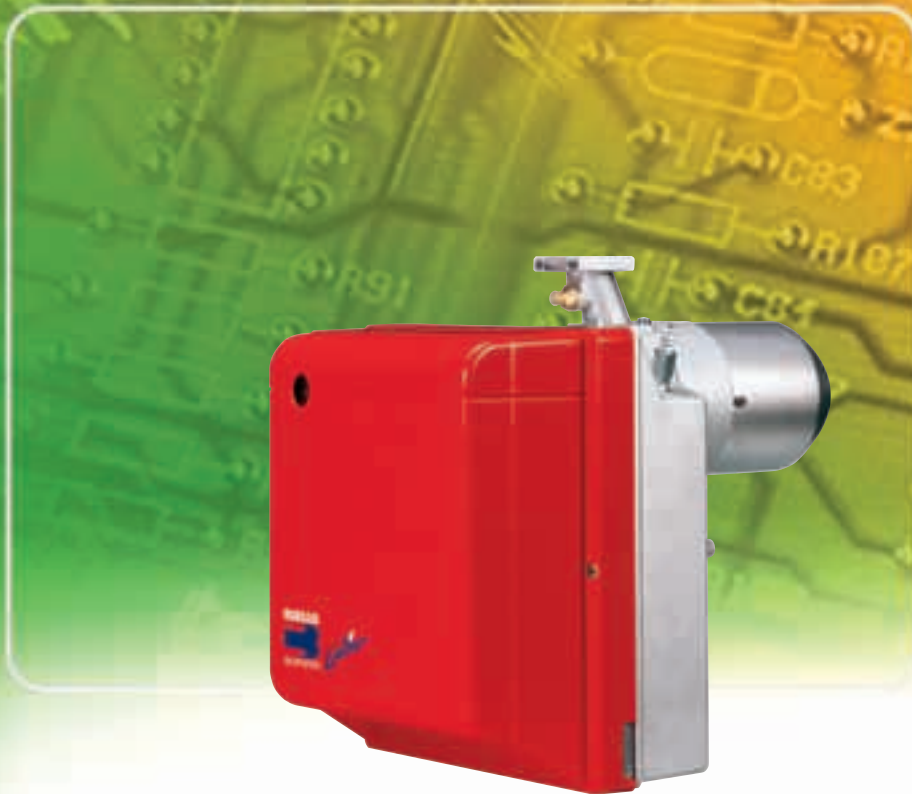


**LOW NO<sub>x</sub> ONE STAGE GAS BURNERS**

▶ **GULLIVER BS SERIES**

▶ <b>BS1</b>	16 ÷ 52 kW
▶ <b>BS2</b>	35 ÷ 91 kW
▶ <b>BS3</b>	65 ÷ 189 kW
▶ <b>BS4</b>	110 ÷ 246 kW



The Riello Gulliver BS series of one stage gas burners, is a complete range of Low NO<sub>x</sub> emission products, developed to respond to any request for home heating, conforming to the most severe standards regarding the reduction of polluting emissions.

This series of burners is available in four different models with an output ranging from 16 to 246 kW, divided in four different structures.

All the models use the same components designed by Riello for the Gulliver series. The high quality level guarantees safe working. The Gulliver BS burners are fitted with a microprocessor - based flame control panel, with diagnostic functions.

In developing these burners, special attention was paid to reducing noise, the ease of installation and adjustment, to obtaining the smallest size possible to fit into any sort of boiler available on the market.

All the models are approved by the EN 676 European Standard and LRV-92 Swiss standards, and conform to BImSchV 1996 and European Directives, Gas Appliance, EMC, Low Voltage, Boiler Efficiency.

All the Gulliver BS burners are tested before leaving the factory.

# TECHNICAL DATA

Model			▼ BS1	▼ BS2	▼ BS3	▼ BS4
Burner operation mode			One stage			
Modulation ratio at max. output			--			
Servomotor	run time	type	--			
		s	--			
Heat output	kW	16 - 52	35 - 91	65 - 189	110 - 246	
	Mcal/h	13,8 - 44,7	30,1 - 78,3	55,9 - 162,5	94,6 - 211,6	
Working temperature		°C min./max.	0/40			
Fuel / air data	Net calorific value G20 gas		kWh/Nm <sup>3</sup> 10			
	G20 gas density		kg/Nm <sup>3</sup> 0,71			
	G20 gas delivery		Nm <sup>3</sup> /h 1,6 - 5,2	3,5 - 9,1	6,5 - 18,9	11 - 24,6
	Net calorific value G25 gas		kWh/Nm <sup>3</sup> 8,6			
	G25 gas density		kg/Nm <sup>3</sup> 0,78			
	G25 gas delivery		Nm <sup>3</sup> /h 1,9 - 6	4 - 10,6	7,6 - 22	12,8 - 28,6
	Net calorific value LPG gas		kWh/Nm <sup>3</sup> 25,8			
	LPG gas density		kg/Nm <sup>3</sup> 2,02			
	LPG gas delivery		Nm <sup>3</sup> /h 0,6 - 2	1,3 - 3,5	2,5 - 7,3	4,3 - 9,5
	Fan		type Centrifugal with forward curve blades			
	Air temperature		max °C 40			
	Electrical data	Electrical supply		Ph/Hz/V 1/50/230 ±10%		
Auxiliary electrical supply		Ph/Hz/V --				
Control box		type MG 569				
Total electrical power		kW 0,150	0,180	0,350	0,530	
Auxiliary electrical power		kW --				
Protection level		IP X0D				
Motor electrical power		kW 0,09	0,09	0,15	0,25	
Rated motor current		A 0,64	0,67	1,4	2	
Motor start up current		A 2,6	2,7	5,6	8	
Motor protection level		IP 20				
Ignition transformer		type Incorporated in the control box				
		V1 - V2 ( - ) - 8 kV				
		I1 - I2 ( - ) - 12 mA				
Operation		Intermittent (at least one stop every 24 h)				
Emissions	Sound pressure		dB (A) 61	62	66	71
	Sound power		W --			
	CO emission		mg/kWh < 40			
	NOx emission		mg/kWh < 80			
Approval	Directive		90/396/EEC, 89/336/EEC, 73/23/EEC, 98/37/EEC, 92/42/EEC			
	Conforming to		EN 676 - LRV 92 - BImSchV 1996			
	Certification		CE - 0085 AQ0409 BUWAL - Nr.100010	CE - 0085 AQ0409 BUWAL - Nr.197011	CE - 0085 AQ0409 BUWAL - Nr.100010	CE - 0085 AQ0409 BUWAL - Nr.100010

## Reference conditions:

Temperature: 20°C

Pressure: 1013,5 mbar

Altitude: 100 m a.s.l.

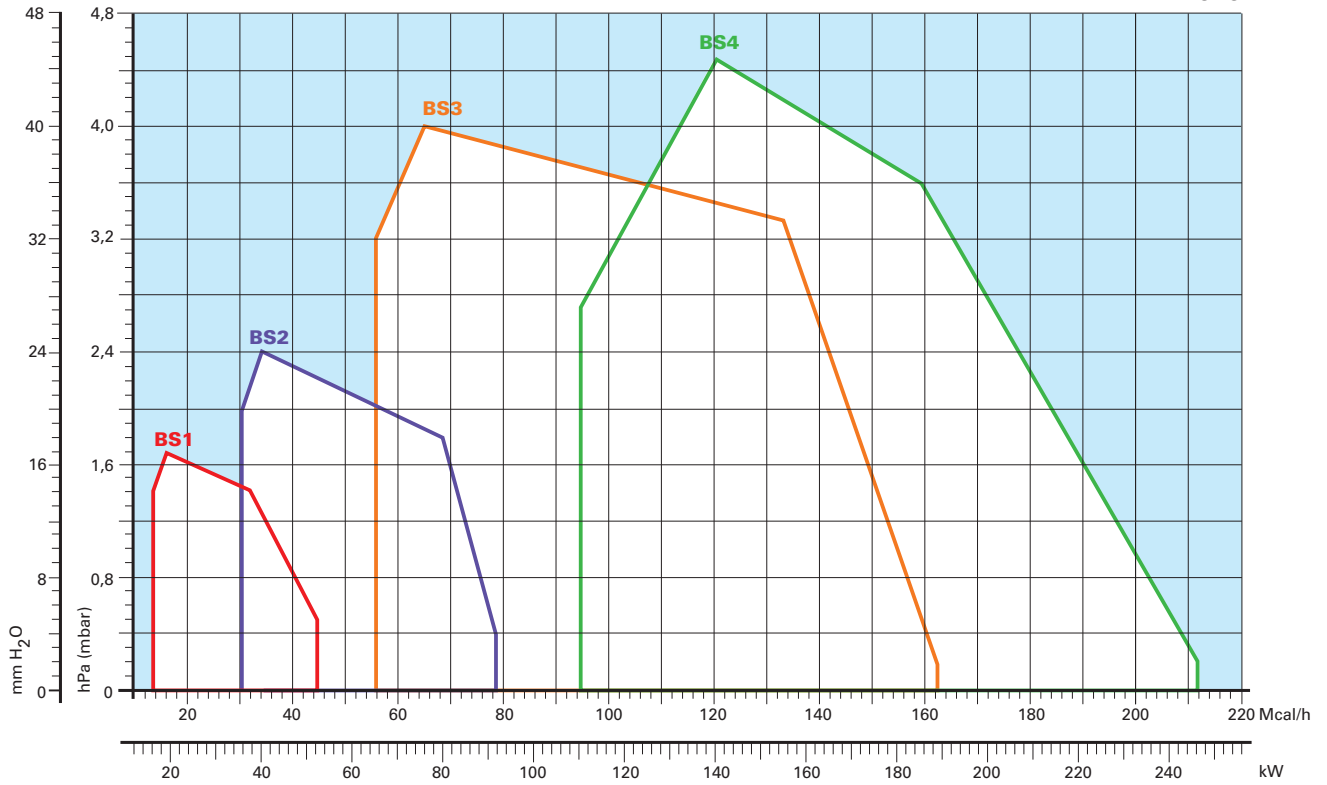
Noise measured at a distance of 1 meter.

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.

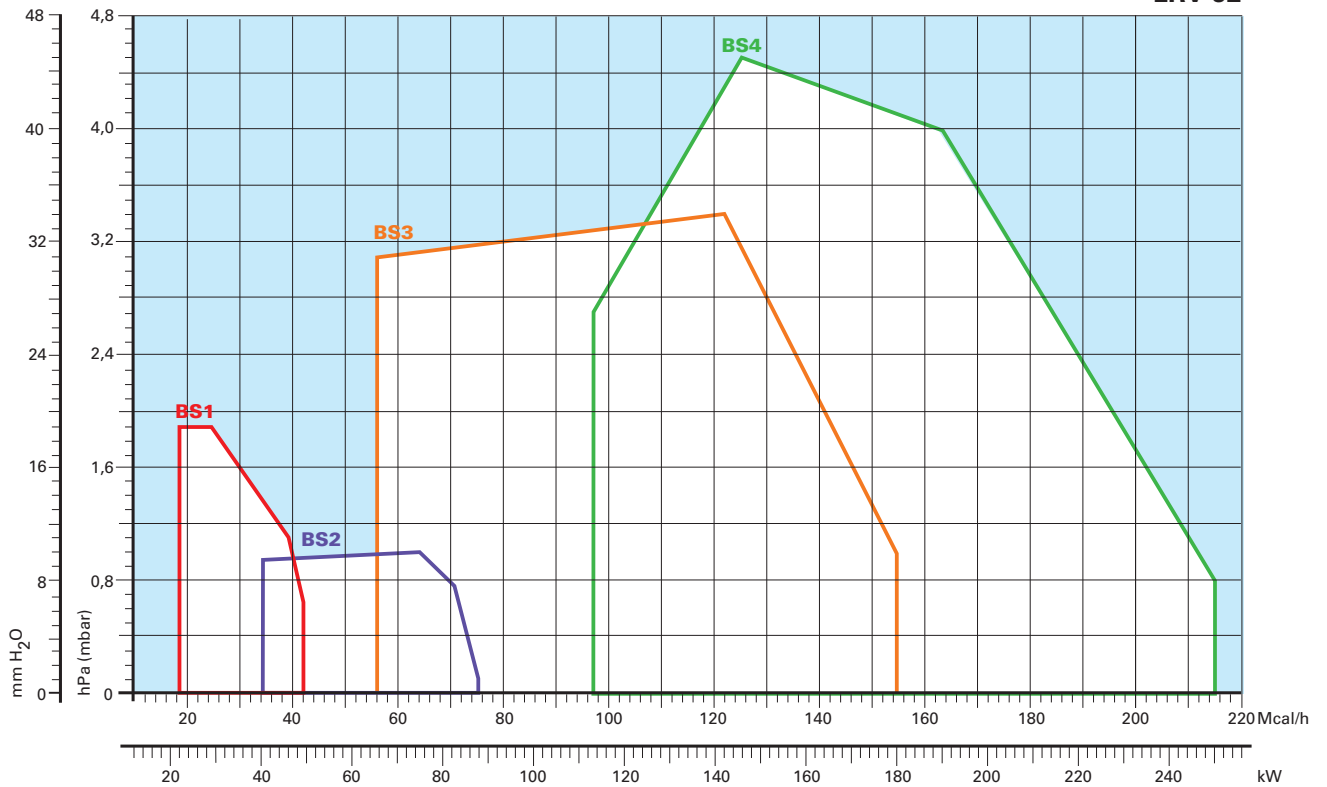
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# FIRING RATES

EN 676



LRV 92



Useful working field for choosing the burner

Test conditions conforming to EN 676 and LRV 92:

Temperature: 20 °C

Pressure: 1013,5 mbar

Altitude: 100 m a.s.l.





## FUEL SUPPLY

### GASTRAIN

The burners are set for fuel supply from either the right or left hand sides.

Depending on the fuel output and the available pressure in the supply line, you should check the correct gas train to be adapted to the system requirements.

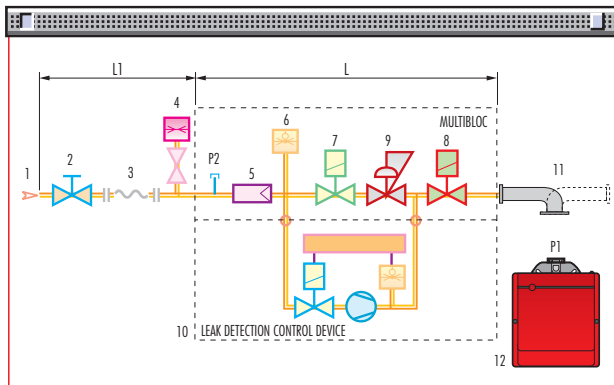
The gas train is Multibloc type, containing the main components in a single unit. Except for the MBC 65 DLE model, a valve seal control (as accessory) can be fitted to the Multibloc gas trains.

The MBC 65 DLE Multibloc gas train can be fitted only to the left of the burner.

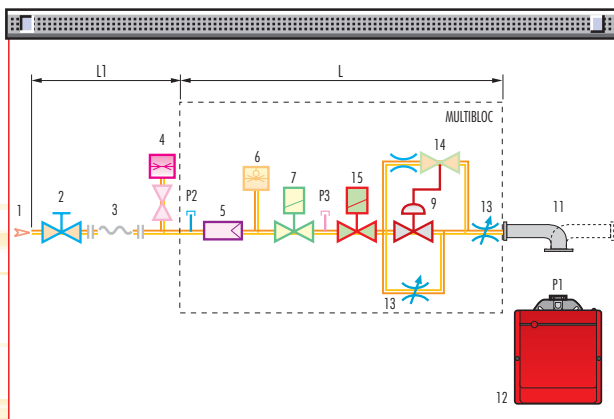


Gas train installed on the burner

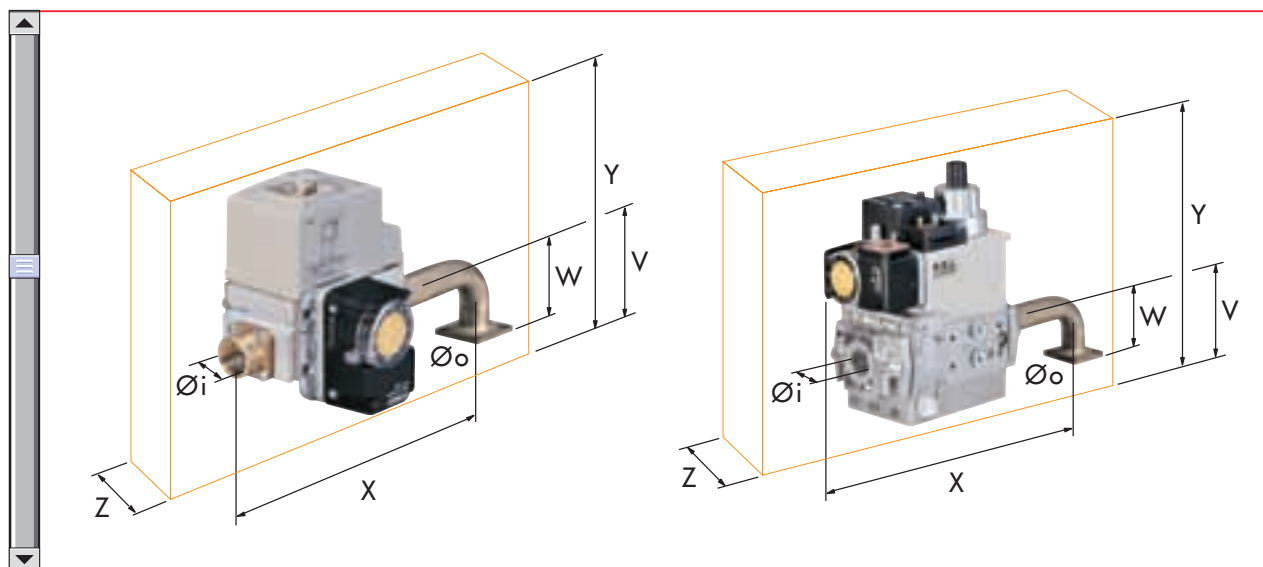
### MBDLE 403 - 405 - 407 - 410 - 412



### MBC 65 DLE



1	Gas delivery pipe
2	Manual valve
3	Vibration damping joint
4	Gas pressure gauge
5	Filter
6	Gas pressure switch
7	Safety solenoid
8	Adjustment solenoid: firing delivery adjustment (rapid opening) maximum delivery adjustment (slow opening)
9	Pressure regulator
10	Leak detection control device for valves 7 and 8 (accessory)
11	Gas train-burner adapter
12	Burner
13	Shutter with adjustment screws
14	Pressure regulator setting device
15	Regulation solenoid
P1	Combustion head pressure
P2	Upstream pressure from the filter
P3	Upstream pressure from the control valve
L	Gas train supplied separately
L1	To be performed by the installer



The dimensions of the gas trains vary depending on their construction features. The following table shows the dimensions of the gas trains that can be fitted to Gulliver BS burners, intake diameter and the coupling flange to the burner.

	Name	Code	Ø i	Ø o	X mm	Y mm	W mm	Z mm	V mm	mbar max*
<b>MULTIBLOC</b>	<b>MBC 65 DLE</b>	3970570	1/2"	FLANGE 1	232	126	45	122	31	65
	<b>MBDLE 403</b>	3970545	1/2"	FLANGE 1	200	137	45	100	26	200
	<b>MBDLE 405</b>	3970546	1/2"	FLANGE 1	246	186	45	120	46	300
	<b>MBDLE 405</b>	3970547	3/4"	FLANGE 2	236	186	47	120	46	300
	<b>MBDLE 407</b>	3970544	3/4"	FLANGE 2	236	186	47	120	46	300
	<b>MBDLE 407</b>	3970548	3/4"	FLANGE 3	236	186	47	120	46	300
	<b>MBDLE 410</b>	3970549	1" 1/4	FLANGE 3	259	215	47	145	55	300
	<b>MBDLE 412</b>	3970550	1" 1/4	FLANGE 3	259	215	47	145	55	300

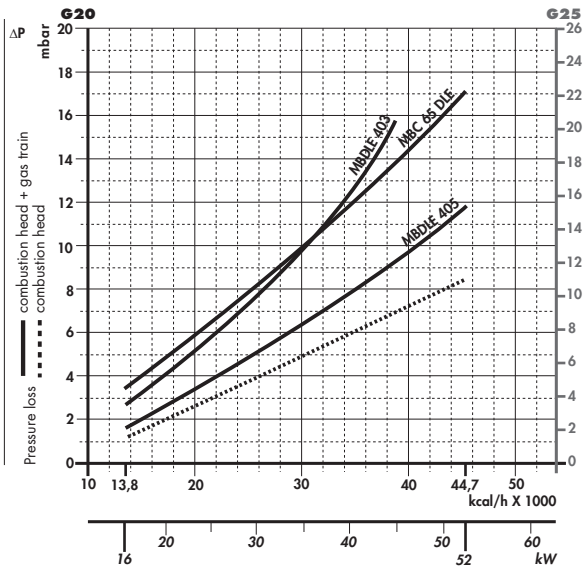
\* max inlet gas pressure (mbar)

## ► PRESSURE DROP DIAGRAM

The diagrams indicate the minimum pressure drop of the burners with the various gas trains that can be combined with them; the value thus calculated represents the minimum required input pressure to the gas train.

### NATURAL GAS

#### BS1

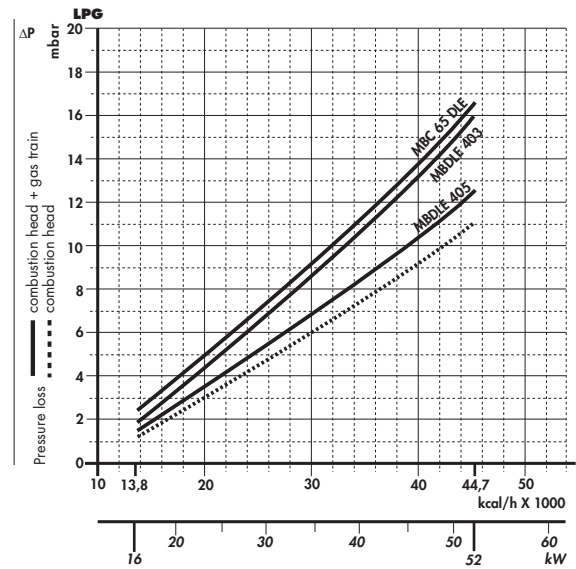


Gas Train	Code	Output	Plug and socket
MBDL E 403	3970545	≤ 45 kW *	•
MBDL E 405	3970546	-	•
MBC 65 DLE	3970570	-	•

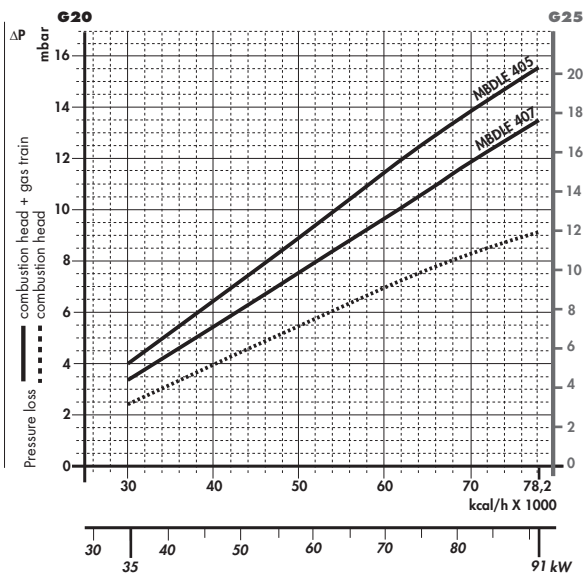
\* with natural gas.

### LPG

#### BS1

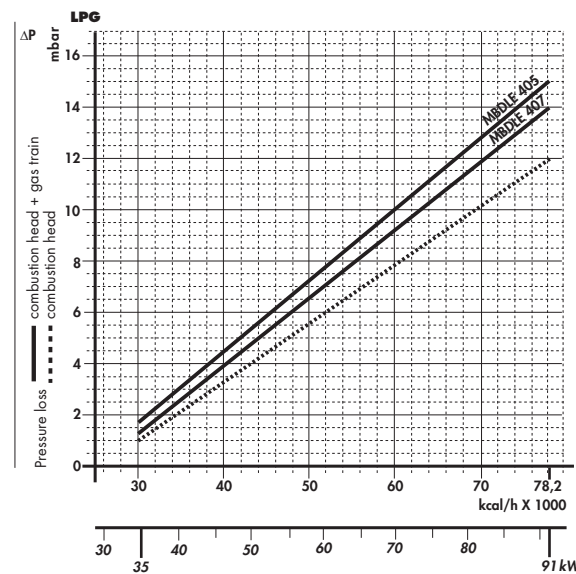


#### BS2



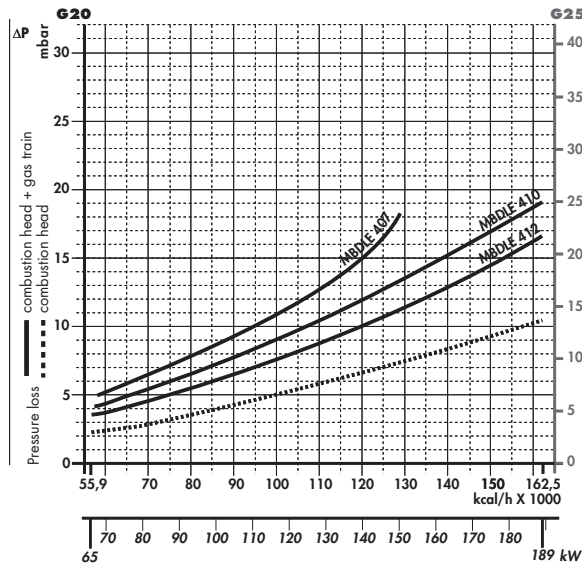
Gas Train	Code	Plug and socket
MBDL E 405	3970547	•
MBDL E 407	3970544	•

#### BS2



## NATURAL GAS

### BS3

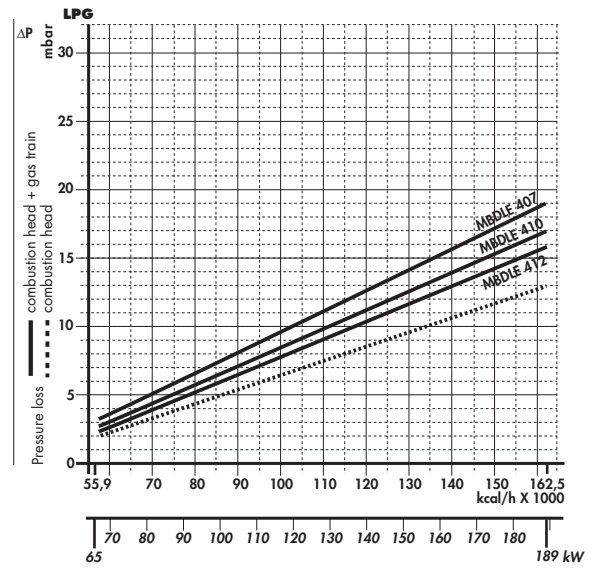


Gas Train	Code	Output	Plug and socket
MBDLE 407	3970548	≤ 150 kW *	•
MBDLE 410	3970549	-	•
MBDLE 412	3970550	-	•

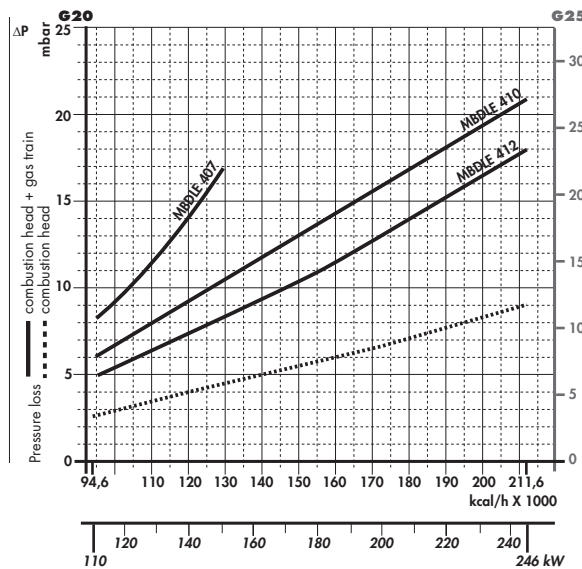
\* with natural gas.

## LPG

### BS3



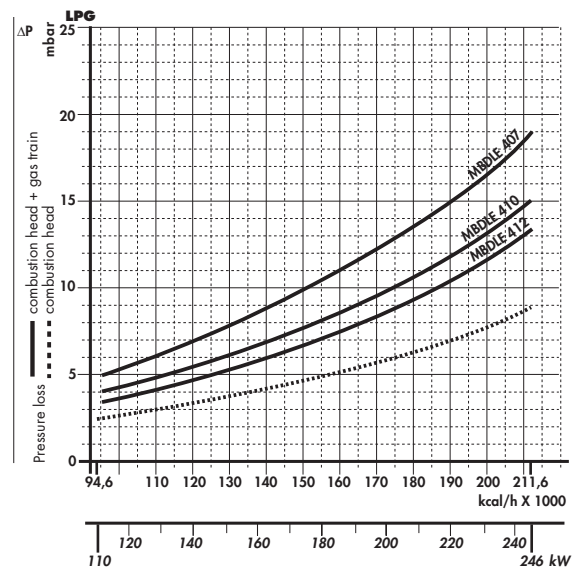
### BS4



Gas Train	Code	Output	Plug and socket
MBDLE 407	3970548	≤ 150 kW *	•
MBDLE 410	3970549	-	•
MBDLE 412	3970550	-	•

\* with natural gas.

### BS4



**note** For pressure levels different from those indicated above, please contact Riello Burners Technical Office.  
In LPG plants, Multibloc gas trains do not operate below 0°C.  
They are only suitable for gaseous LPG (liquid hydrocarbons destroy the seal materials).



## VENTILATION



The different ventilation circuits always ensure low noise levels with high performance of pressure and air delivery, inspite of their compact size.



Air suction



Air pressure switch

The burners are fitted with an adjustable air pressure switch, conforming to EN 676 standards.

## COMBUSTION HEAD



The combustion head in Gulliver BS burners is the result of an innovative design, which allows combustion with low polluting emissions, while being easy to adapt to all the various types of boilers and combustion chambers.



Combustion head

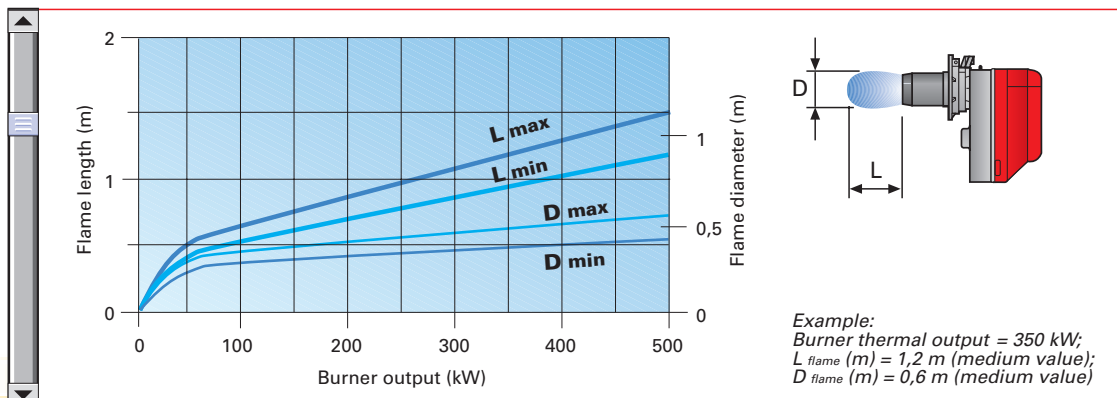


Mobile flange

Thanks to the use of a mobile coupling flange, the penetration of the head into the combustion chamber can be adjusted.

Simple adjustment allows the internal geometry of the combustion head to be adapted to the burner output.

### Dimensions of the flame



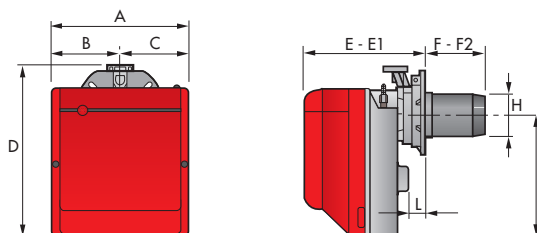




## OVERALL DIMENSIONS (mm)

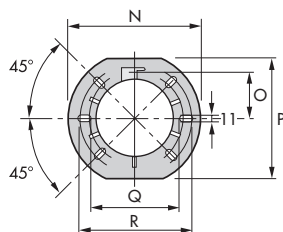
These models are distinguished by their reduced size, in relation to the outputs achieved, which means they can be fitted to any boiler on the market.

### BURNER



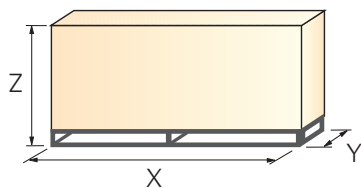
Model	A	B	C	D	E	E1	F	F2	H	I	L
▶ BS1	234	122	112	295	230	276	116	70	89	210	41
▶ BS2	255	125,5	125,5	325	238	252	114	100	106	230	45
▶ BS3	300	150	150	391	262	280	128	110	129	285	45
▶ BS4	300	150	150	392	271	301	168	145	137	286	45

### BURNER-BOILER MOUNTING FLANGE



Model	N	O	P	Q	R
▶ BS1	192	66	167	140	170
▶ BS2	192	66	167	140	170
▶ BS3	216	76,5	201	160	190
▶ BS4	218	80,5	203	170	200

### PACKAGING



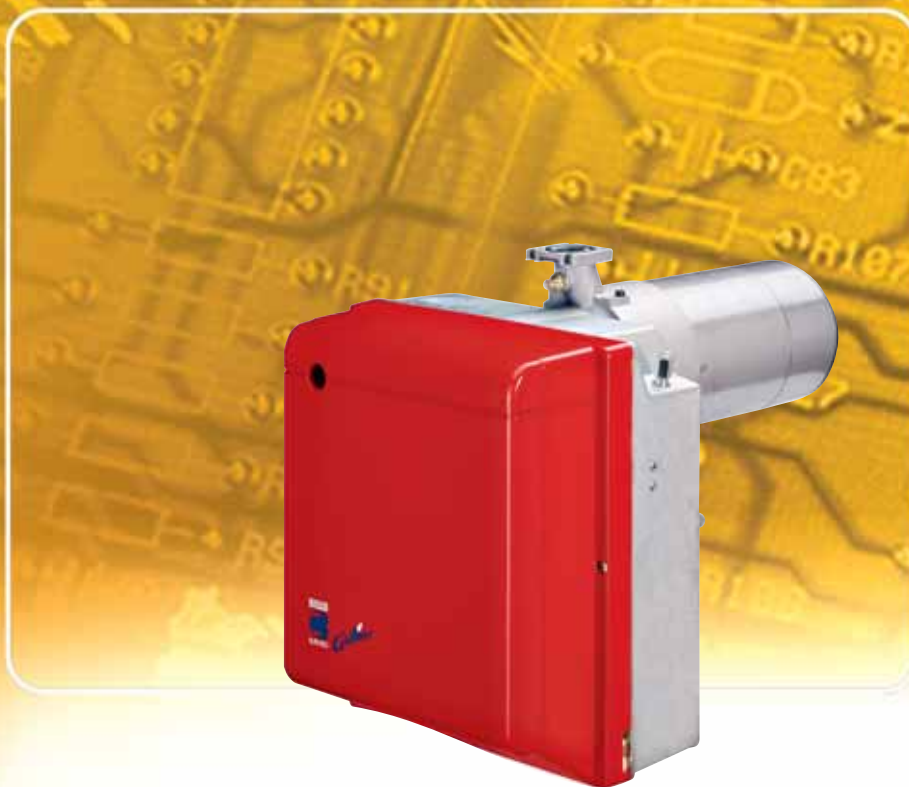
Model	X	Y	Z	kg
▶ BS1	385	268	340	10
▶ BS2	395	288	365	11
▶ BS3	440	335	430	15
▶ BS4	500	335	430	16,5

**ONE STAGE GAS BURNER**

▶ GULLIVER RS SERIES

▶ RS5

160 ÷ 330 kW



The Riello Gulliver RS5 is a new model of the series of one stage gas burners, characterized for its small dimensions in spite of its high combustion performance. It has been developed to respond to any request for home heating, conforming to current regulations in force. This model uses the same components designed by Riello for the Gulliver series. The high quality level guarantees safe working. The Gulliver RS burners are fitted with a microprocessor - based flame control panel, with diagnostic functions.

In developing this burner, special attention was paid to reducing noise, the ease of installation and adjustment, to obtaining the smallest size possible to fit into any sort of boiler available on the market.

This model is approved by the EN 676 European Standard and European Directives, Gas Appliance, EMC, Low Voltage, Boiler Efficiency.

The Gulliver RS5 burner is tested before leaving the factory.



# TECHNICAL DATA

Model		▼ RS5		
Bumer operation mode		One stage		
Modulation ratio at max. output		--		
Servomotor	type	R.B.L.		
	run time	s 8 ÷ 27		
Heat output	kW	160 - 330		
	Mcal/h	137,6 - 283,8		
Working temperature		°C min./max. 0/40		
Fuel / air data	Net calorific value G20 gas	kWh/Nm <sup>3</sup>	10	
	G20 gas density	kg/Nm <sup>3</sup>	0,71	
	G20 gas delivery	Nm <sup>3</sup> /h	16 - 33	
	Net calorific value G25 gas	kWh/Nm <sup>3</sup>	8,6	
	G25 gas density	kg/Nm <sup>3</sup>	0,78	
	G25 gas delivery	Nm <sup>3</sup> /h	18,6 - 38,4	
	Net calorific value LPG gas	kWh/Nm <sup>3</sup>	25,8	
	LPG gas density	kg/Nm <sup>3</sup>	2,02	
	LPG gas delivery	Nm <sup>3</sup> /h	6,2 - 12,8	
	Fan	type	Centrifugal with forward curve blades	
	Air temperature	max °C	40	
	Electrical data	Electrical supply	Ph/Hz/V	1/50/230 ±10%
Auxiliary electrical supply		Ph/Hz/V	--	
Control box		type	MG 569	
Total electrical power		kW	0,430	
Auxiliary electrical power		kW	--	
Protection level		IP	X0D	
Motor electrical power		kW	0,25	
Rated motor current		A	2	
Motor start up current		A	8	
Motor protection level		IP	20	
Ignition transformer	type	Incorporated in the control box		
	V1 - V2	(-) - 8 kV		
	I1 - I2	(-) - 12 mA		
Operation		Intermittent (at least one stop every 24 h)		
Approval Emissions	Sound pressure	dB (A)	70	
	Sound power	W	--	
	CO emission	mg/kWh	< 40	
	NOx emission	mg/kWh	≤ 120	
	Directive		90/396/EEC, 73/23/EEC, 89/336/EEC, 92/42/EEC, 98/37/EEC	
	Conforming to		EN 676	
Certification		CE - 0085 BM0114		

## Reference conditions:

Temperature: 20 °C

Pressure: 1013,5 mbar

Altitude: 100 m a.s.l.

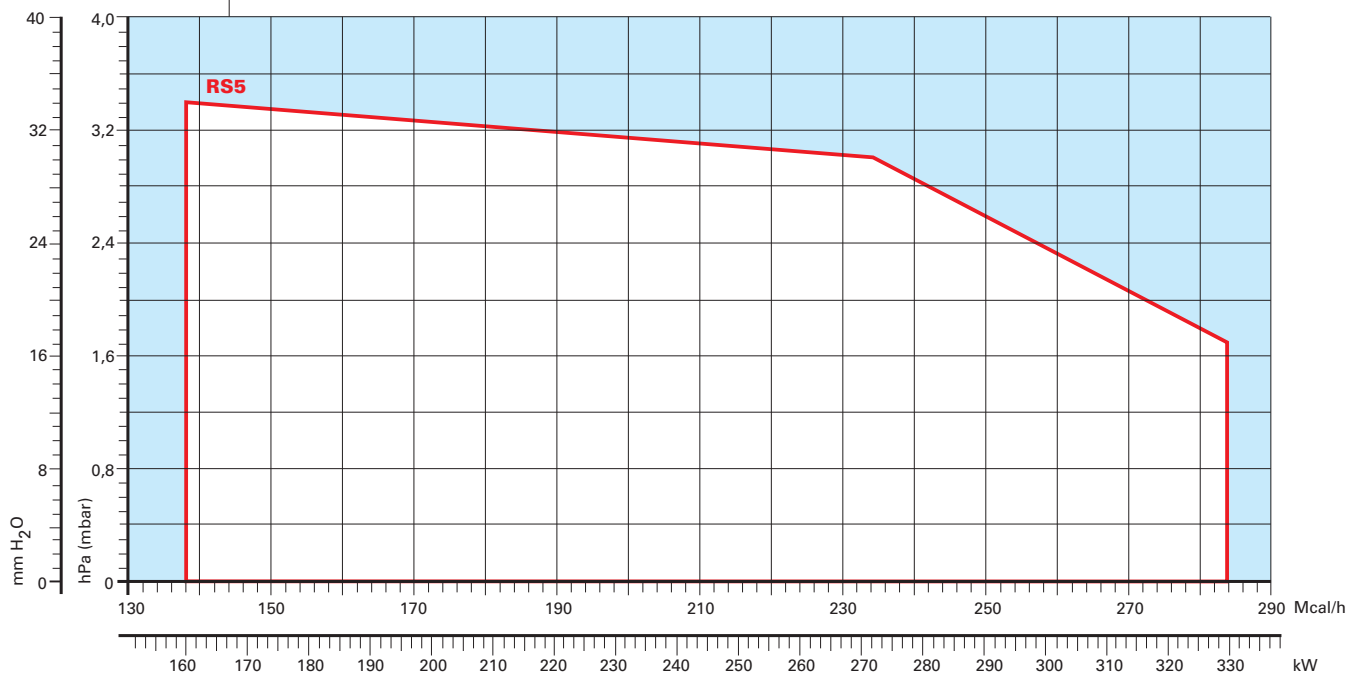
Noise measured at a distance of 1 meter.

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: 1013,5 mbar  
Altitude: 100 m a.s.l.





## FUEL SUPPLY

### GASTRAIN

The burner is set for fuel supply from either the right or left hand sides.

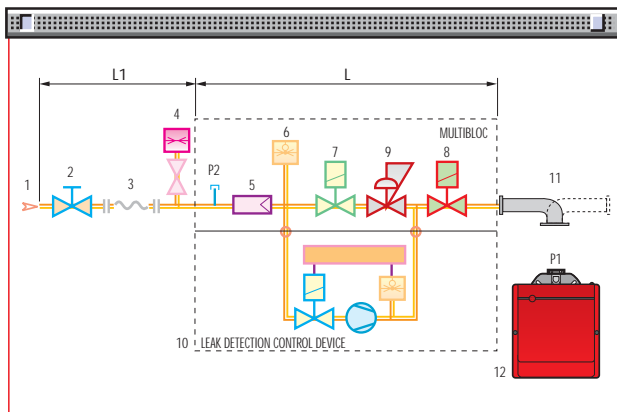
Depending on the fuel output and the available pressure in the supply line, you should check the correct gas train to be adapted to the system requirements.

The gas train is Multibloc type, containing the main components in a single unit, and a valve seal control (as accessory) can be fitted.

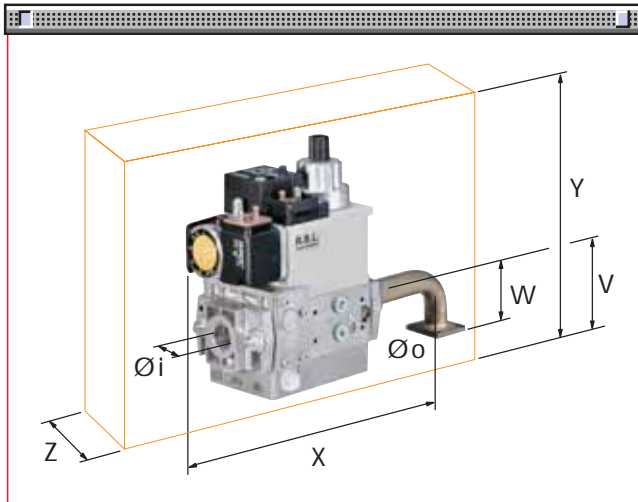


Gas train installed on the burner

### MBDLE 410 - 412 - 415



1	Gas delivery pipe
2	Manual valve
3	Vibration damping joint
4	Gas pressure gauge
5	Filter
6	Gas pressure switch
7	Safety solenoid
8	Adjustment solenoid: - firing delivery adjustment (rapid opening) - maximum delivery adjustment (slow opening)
9	Pressure regulator
10	Leak detection control device for valves 7 and 8 (accessory)
11	Gas train-burner adapter
12	Burner
P1	Combustion head pressure
P2	Upstream pressure from the filter
L	Gas train supplied separately
L1	To be performed by the installer



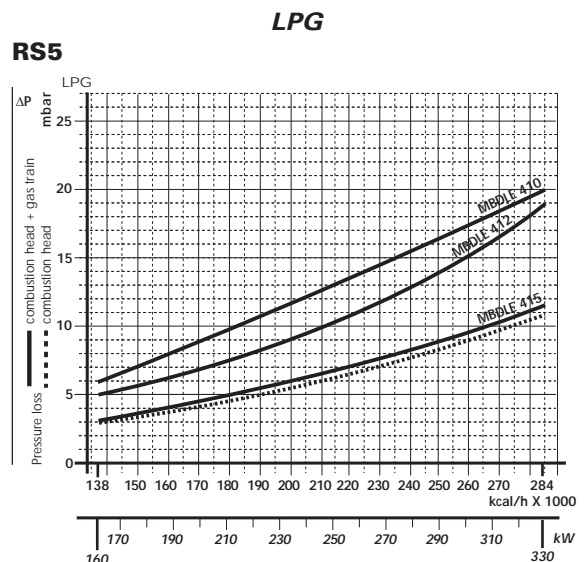
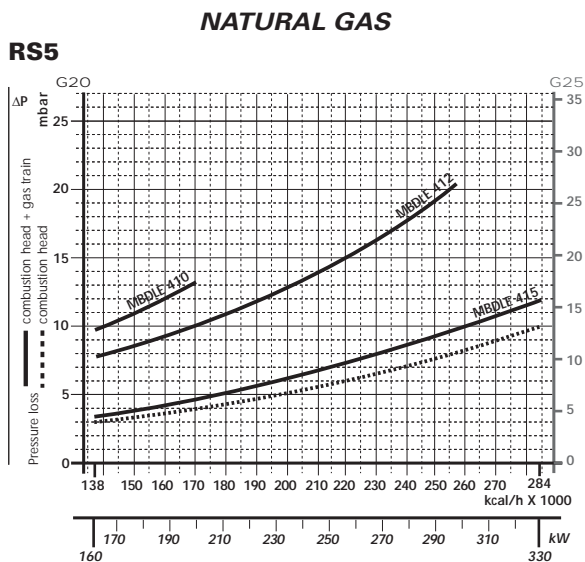
The dimensions of the gas trains vary depending on their construction features. The following table shows the maximum dimensions of the gas trains that can be fitted to Gulliver RS5 burner, intake diameter and the coupling flange to the burner.

	Name	Code	Ø i	Øo	X mm	Y mm	W mm	Z mm	V mm	mbar max*
<b>MULTIBLOC</b>	<b>MBDLE 410</b>	3970549	1" 1/4	FLANGE 3	259	215	47	145	55	300
	<b>MBDLE 412</b>	3970550	1" 1/4	FLANGE 3	259	215	47	145	55	300
	<b>MBDLE 415</b>	3970558	1" 1/2	FLANGE 3	330	250	47	100	80	300

\* max inlet gas pressure (mbar)

## ► PRESSURE DROP DIAGRAM

The diagrams indicate the minimum pressure drop of the burners with the various gas trains that can be combined with them; the value thus calculated represents the minimum required input pressure to the gas train.



Gas train	Code	Output	Plug and socket
<b>MBDLE 410</b>	3970549	≤200 kW*	•
<b>MBDLE 412</b>	3970550	≤300 kW*	•
<b>MBDLE 415</b>	3970558	-	•

\* With natural gas.

► **note** For pressure levels different from those indicated above, please contact Riello Burners Technical Office.  
In LPG plants, Multibloc gas trains do not operate below 0°C.  
They are only suitable for gaseous LPG (liquid hydrocarbons destroy the seal materials).

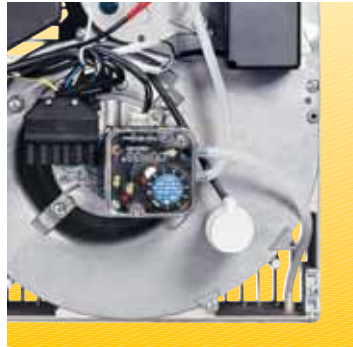


## VENTILATION

The ventilation circuit ensures low noise level with high performance of pressure and air delivery, inspite of their compact size.



Air suction



Air pressure switch



The burner is fitted with an adjustable air pressure switch, conforming to EN 676 standards.

## COMBUSTION HEAD

The combustion head in Gulliver RS5 burner is the result of an innovative design, which allows combustion with low polluting emissions, while being easy to adapt to all various



Combustion head



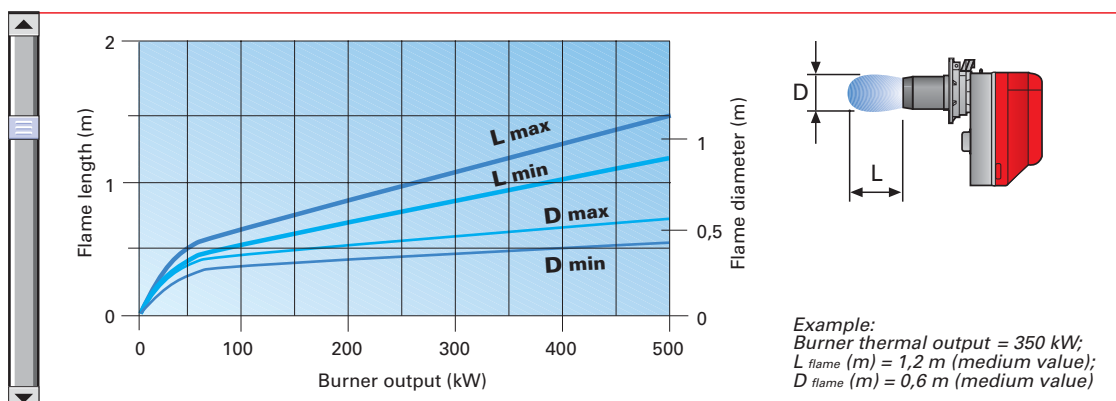
Mobile coupling flange

types of boilers and combustion chambers.

Thanks to the use of a mobile coupling flange, the penetration of the head into the combustion chamber can be adjusted.

Simple adjustment allows the internal geometry of the combustion head to be adapted to the burner output.

### Dimensions of the flame



## WIRING DIAGRAMS



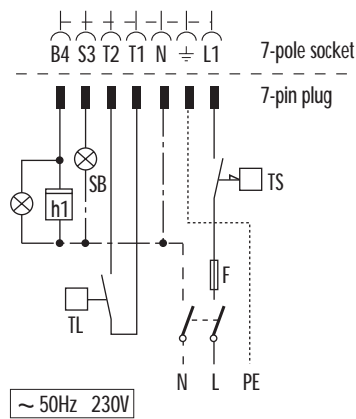
Control - box fitted with ignition transformer

Electrical connections must be made by qualified and skilled personnel, in conformity with the local regulations in force.



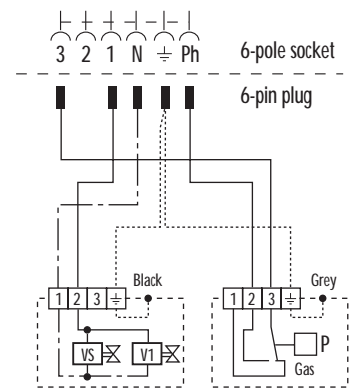
### ▶ "ONE STAGE" OPERATION

#### Burner electrical wiring



- h1** - One stage hours counter (230V 0,1A max)
- SB** - Remote lock-out signal (230V 0,1A max)
- TL** - Limit thermostat
- TS** - Safety thermostat (manual reset)
- VS** - Safety valve
- V1** - One stage valve
- P** - Gas pressure switch
- F** - Fuse

#### Gas train electrical wiring



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

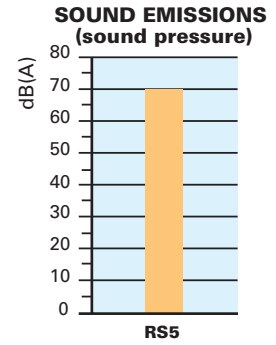
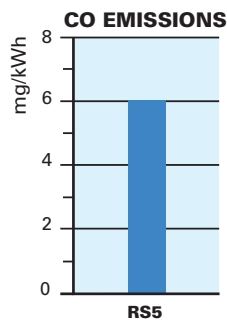
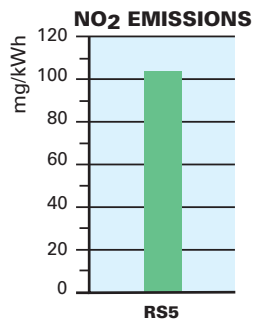
Model	▼ RS5
	230V
F A	T6
L mm <sup>2</sup>	1

F = Fuse      L = Lead section





## EMISSIONS



The emission data have been measured in the RS5 at maximum output, in conformity with EN 676 standard.

Special attention has been paid to noise reduction. This model is fitted with sound-proofing material inside the cover.

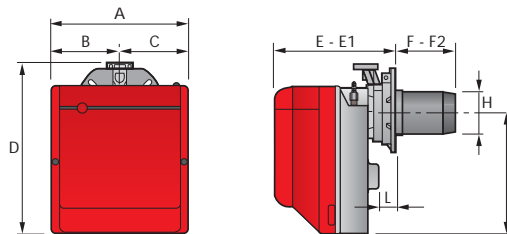


## OVERALL DIMENSIONS (mm)



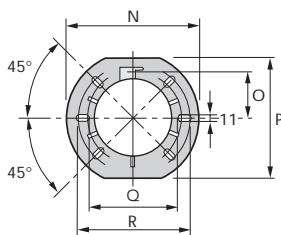
Thanks to certain construction features, this model can be fitted to any boiler on the market.

### BURNER



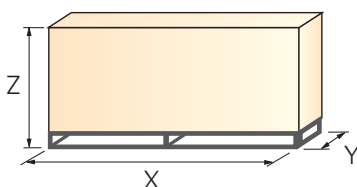
Model	A	B	C	D	E	E1	F	F2	H	I	L
► RS5	300	150	150	392	278	300	203	225	137	286	45

### BURNER-BOILER MOUNTING FLANGE



Model	N	O	P	Q	R
► RS5	218	80,5	203	170	200

### PACKAGING



Model	X	Y	Z	kg
► RS5	590	335	420	18