Technical Data Leaflet

Light Oil

TS0001UK04

Gulliver RG Series

One Stage Light Oil Burners

RG0.R	16,6	÷	27,3	kW
RG0.1	22,5	÷	35,6	kW
RG0.1R	21,3	÷	36,7	kW
RG1	32,0	÷	60,0	kW
RG1R	20,0	÷	60,0	kW
RG1RK	15,0	÷	60,0	kW
RG2	47,0	÷	119,0	kW
RG3	83,0	÷	178,0	kW
RG4S	118,5	÷	237,0	kW
RG5S	160,0	÷	309,5	kW

The Riello Gulliver RG one stage light oil burners series, is a complete range of products developed to respond to any request for home heating. The Gulliver RG series is available in ten different models, with an output ranging from 16,6 to 309,5 kW, divided in five different structures.

All the models use the same components designed by Riello for the Gulliver series. The high quality level guarantees safe working.

In developing these burners, special attention was paid to reducing noise, to the easiness 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 267 European Standard and conform to European Directives for EMC, Low Voltage, Machinery and Boiler Efficiency.

All the Gulliver RG burners are fired before leaving the factory.

RIELLO BURNERS

Technical Data

MODEL			RG0.R	RG0.1	RG0.1R	RG1	RG1R
Burner operation mode					One stage		
Modulation ratio to max. output					--		
Servomotor	type				--		
	run time	s			--		
Heat output		kW	16,6 - 27,3	22,5 - 35,6	21,3 - 36,7	32 - 60	20 - 60
		Mcal/h	14,3 - 23,4	19,4 - 30,6	18,3 - 31,6	27,5 - 51,6	17,2 - 51,6
		Kg/h	1,4 - 2,3	1,9 - 3	1,8 - 3,1	2,7 - 5	1,7 - 5
Working temperature		°C min./max.			0/40		
FUEL/AIR DATA							
Net calorific value		kWh/kg			11,8		
		Kcal/kg			10200		
Viscosity at 20°C		mm^2/s (cSt)			4 ÷ 6		
Pump	type				R.B.L.		
	delivery	kg/h at 12 bar			30		
Atomised pressure		bar			8 ÷ 15		
Fuel temperature		Max. °C			50		
Fuel pre-heater			YES	NO	YES	NO	YES
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	R.B.L.553 SE* or MO 550	R.B.L.552 SE	R.B.L.553 SE	R.B.L.552 SE	R.B.L.553 SE
Total electrical power		kW	0,290	0,170	0,290	0,170	0,290
Auxiliary electrical power		kW			--		
Heaters electrical power		kW	0,07 (PTC)	--	0,07 (PTC)	--	0,12 (PTC)
Protection level		IP			X0D (IP 40)		
Pump motor electrical power		kW			--		
Rated pump motor current		A			--		
Pump motor start up current		A			--		
Pump motor protection level		IP			--		
Fan motor electrical power		kW	0,09	0,09	0,09	0,09	0,09
Rated fan motor current		A	0,85	0,85	0,85	0,85	0,85
Fan motor start up current		A	3,4	3,4	3,4	3,4	3,4
Fan motor protection level		IP			20		
Ignition transformer		type			Incorporated in the control box		
		V1 - V2			(-) - 8 kV		
		I1 - I2			(-) - 30 mA		
Operation					Intermittent (at least one stop every 24 h)		
EMISSIONS							
Sound pressure		dB(A)	56	57	57	60	60
Sound output		W			--		
CO emission		mg/kWh	28	19	10	15	13
Grade of smoke indicator		N° Bach.			< 1		
CxHy emission		mg/kWh			<10 (after the first 20 s.)		
NOx emission		mg/kWh	200	181	190	220	180
APPROVAL							
Directive					73/23 (2006/95) - 89/336 (2004/108) - 98/37 - 92/42 EC		
According to					EN 267		
Certification			CE - 0036 0272/99	CE - 0036 0294/99	CE - 0036 0273/99	CE - 0036 0341/03	CE - 0036 0341/03

* For this model are available different codes, according to the control box type. Contact Riello Burners for further details.

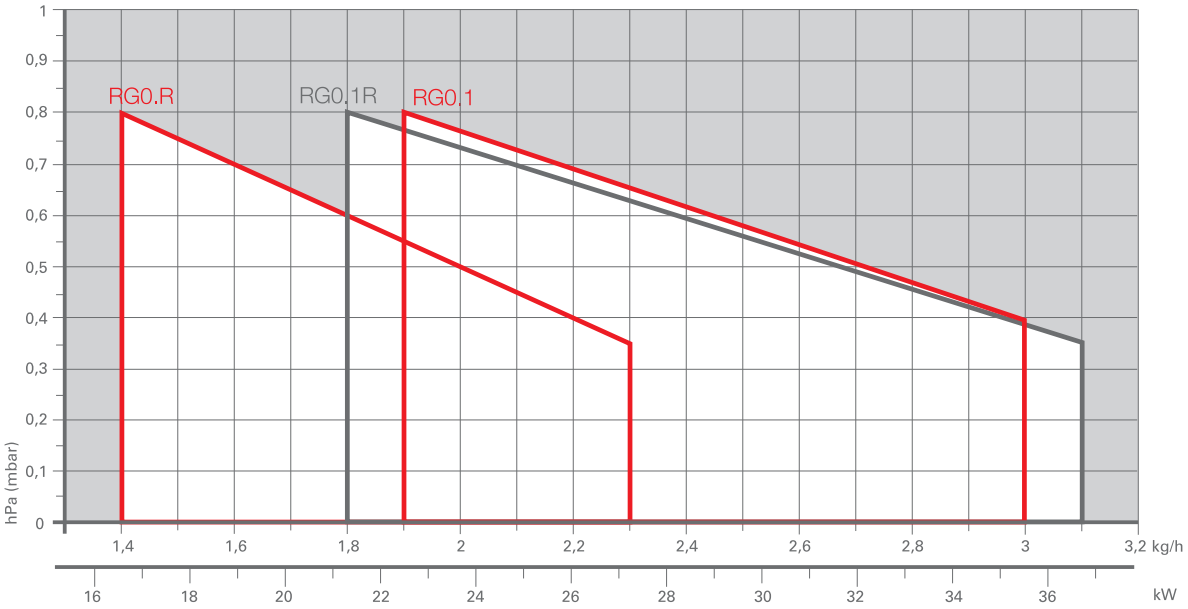
Reference conditions:
Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.

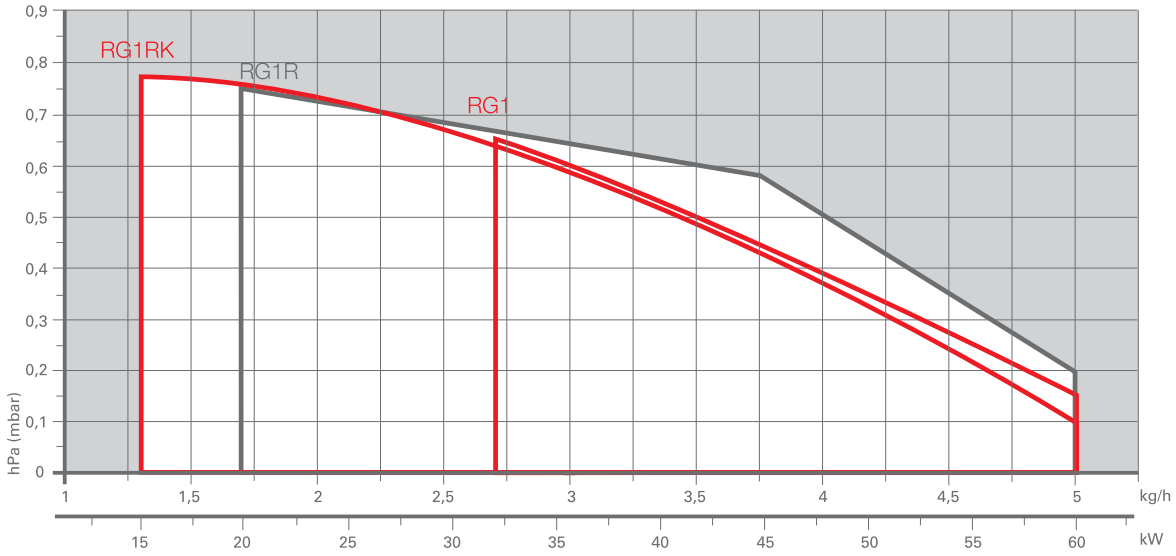
MODEL			RG1RK	RG2	RG3	RG4S	RG5S
Burner operation mode					One stage		
Modulation ratio to max. output					--		
Servomotor	type				--		
	run time	s			--		
Heat output		kW	15 - 60	47 - 119	83 - 178	118,5 - 237	160 - 309,5
		Mcal/h	13 - 51,6	40,4 - 102,3	71,4 - 153	102 - 203,8	137,6 - 266,2
		Kg/h	1,3 - 5	4 - 10	7 - 15	10 - 20	13,5 - 26,1
Working temperature		°C min./max.			0/40		
FUEL/AIR DATA							
Net calorific value		kWh/kg			11,8		
		Kcal/kg			10200		
Viscosity at 20°C		mm^2/s (cSt)			4 ÷ 6		
Pump	type				R.B.L.		
	delivery	kg/h at 12 bar	30	30	30	30	39
Atomised pressure		bar			8 ÷ 15		
Fuel temperature		Max. °C			50		
Fuel pre-heater			YES	NO	NO	NO	NO
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	R.B.L.553 SE* or MO 550	R.B.L.552 SE* or MO 550	R.B.L.552 SE* or MO 550	R.B.L.552 SE* or MO 550	R.B.L.552 SE*
Total electrical power		kW	0,290	0,180	0,390	0,390	0,470
Auxiliary electrical power		kW			--		
Heaters electrical power		kW	0,12 (PTC)	--	--	--	--
Protection level		IP			X0D (IP 40)		
Pump motor electrical power		kW			--		
Rated pump motor current		A			--		
Pump motor start up current		A			--		
Pump motor protection level		IP			--		
Fan motor electrical power		kW	0,09	0,09	0,15	0,15	0,25
Rated fan motor current		A	0,85	0,9	1,9	2	2,1
Fan motor start up current		A	3,4	3,6	7,6	8	8,4
Fan motor protection level		IP			20		
Ignition transformer		type			Incorporated in the control box		
		V1 - V2			(-) - 8 kV		
		I1 - I2			(-) - 30 mA		
Operation					Intermittent (at least one stop every 24 h)		
EMISSIONS							
Sound pressure		dB(A)	60	61	64	64	71
Sound output		W			--		
CO emission		mg/kWh	12	5	6	6	38
Grade of smoke indicator		N° Bach.			< 1		
CxHy emission		mg/kWh			<10 (after the first 20 s.)		
NOx emission		mg/kWh	160	137	180	150	150
APPROVAL							
Directive					73/23 (2006/95) - 89/336 (2004/108) - 98/37 - 92/42 EC		
According to					EN 267		
Certification			CE - 0036 0341/03	CE - 0036 0344/03	DIN - Reg.-Nr.5G264/98	DIN - Reg.-Nr.5G265/98	CE - 0036 0310/01

* For this model are available different codes, according to the control box type. Contact Riello Burners for further details.

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

FIRING RATES

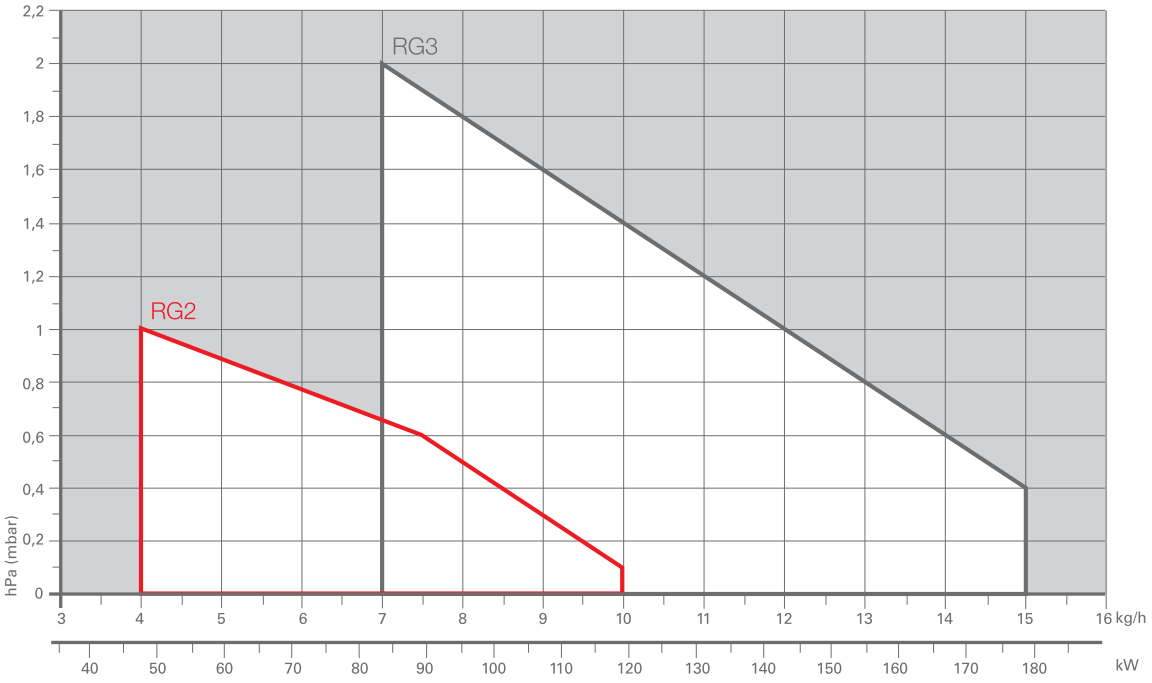


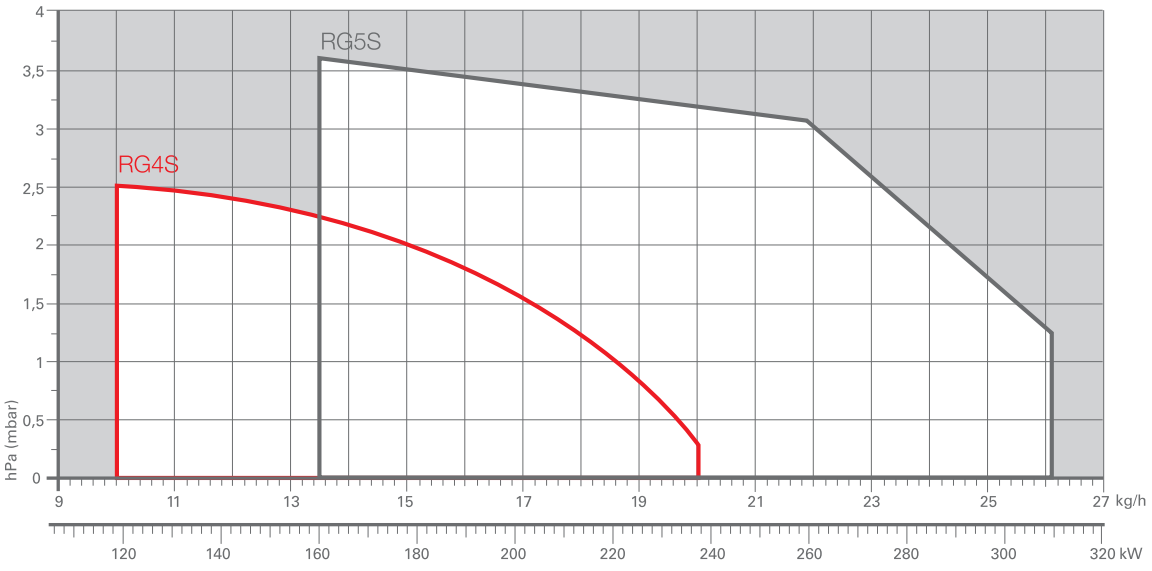


Useful working field for choosing the burner

Test conditions conforming to EN 267:
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

FIRING RATES





Useful working field for choosing the burner

Test conditions conforming to EN 267:
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

Fuel Supply

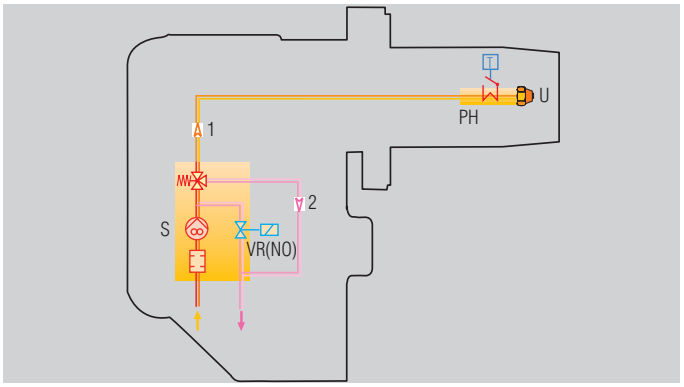
HYDRAULIC CIRCUITS

All the burners have a geared pump with safety valve on the return circuit.
All models are fitted with Riello R.B.L. pump.

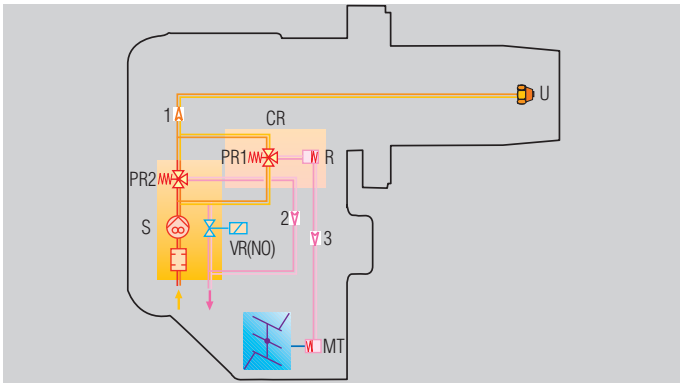
Fuel pump

Fuel feed to the burner can be from the right or the left side on all models.

RG0.R - RG0.1 - RG0.1R - RG1 - RG1R - RG1RK - RG2 - RG3



RG4S - RG5S



S	Pump with filter and pressure regulator on the delivery pipe
VR(NO)	Oil return valve on the delivery pipe
1	Oil input pipe to the nozzle
2	Oil return pipe from the regulator
3	Oil delivery pipe to the air damper hydraulic jack
MT	Air damper hydraulic jack for high pressure working
PR1	Low pressure oil regulator
PR2	High pressure oil regulator
R	Delayer
CR	Delayer casing
PH	Oil pre-heater with thermostat (where provided)
U	Nozzle

LIGHT OIL PRE-HEATER

The light oil pre-heater is a PTC type.
On the RG0.R and RG0.1R models, the pre-heater can be accessed by just removing the burner cover. In the other models, the rear cover inside the burner must also be removed.

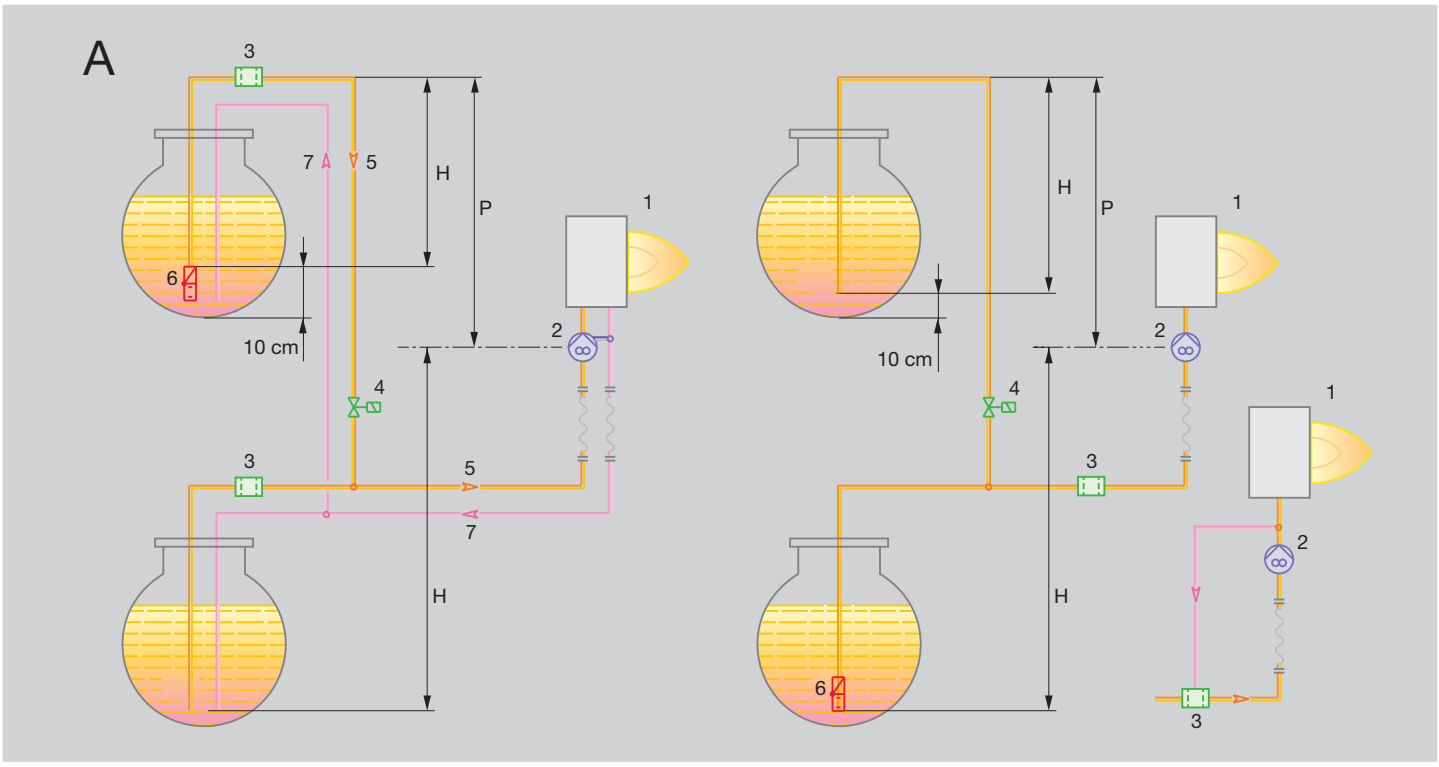
SELECTING THE FUEL SUPPLY LINES

The fuel feed must be completed with the safety devices required by the local regulations in force.

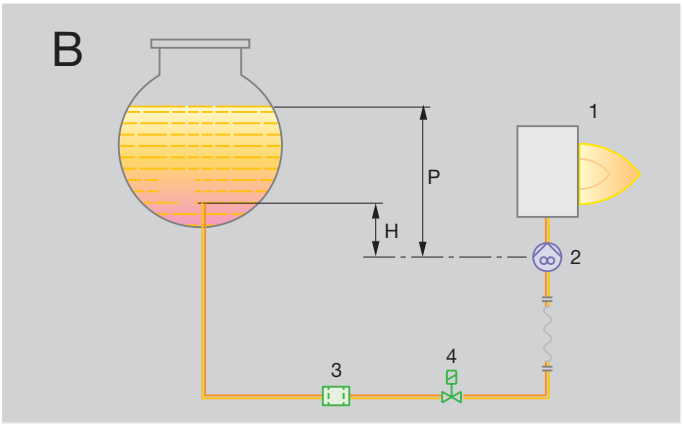
The table shows the choice of piping diameter for the various burners, depending on the difference in the height between the burner and the tank and the distance between them.

MAXIMUM EQUIVALENT LENGTH OF THE PIPEWORK L[m]

	Type A system		Type B system	
Pipe size	Ø8 mm	Ø10 mm	Ø8 mm	Ø10 mm
H (m)	L max (m)	L max (m)	L max (m)	L max (m)
0	35	100	-	-
0,5	30	100	10	20
1,0	25	100	20	40
1,5	20	90	40	80
2,0	15	70	60	100
3,0	8	30	-	-
3,5	6	20	-	-



TYPE OF SYSTEM THAT CAN BE INSTALLED



H	Difference in height
Ø	Internal pipe diameter
P	Difference in height ≤ 4 m
1	Burner
2	Pump
3	Filter
4	Shut-off solenoid valve
5	Suction pipework
6	Bottom valve
7	Return pipework

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 (RG0.R)

Air suction (RG5S)

Combustion Head

The RG0.R, RG0.1 and RG0.1R models all have fixed heads. Certain models allow you to choose the length of the combustion head.

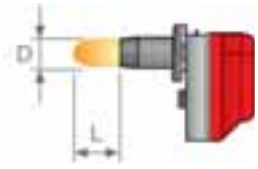
This choice depends on the thickness of the front wall and the type of the boiler.

Depending on the type of generator, you should check the correct penetration of the head into the combustion chamber.

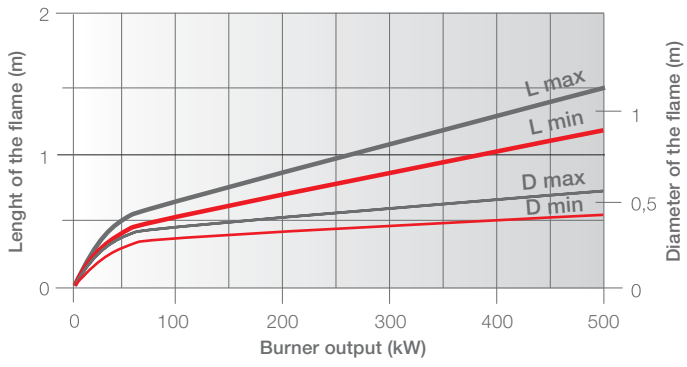
Simple adjustment to the combustion head allows adapting internal geometry of the head to the maximum rated output of the burner.

Gulliver burner combustion head

DIMENSIONS OF THE FLAME



Example:
Burner thermal output = 350 kW;
L flame (m) = 1,2 m (medium value);
D flame (m) = 0,6 m (medium value)



Operation

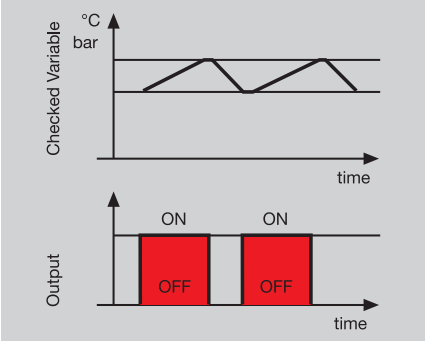
BURNER OPERATION MODE

All these models are one stage operation; the RG4S and RG5S models are one stage operation with reduced output ignition.

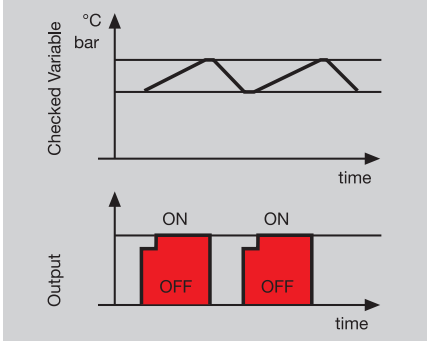
Air damper adjustment (Gulliver RG0)

Air damper adjustment (Gulliver RG)

"ONE STAGE" OPERATION

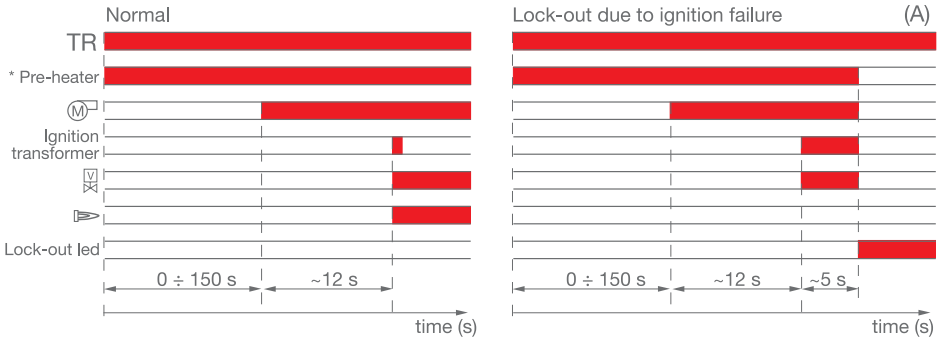


"ONE STAGE" OPERATION WITH REDUCED OUTPUT IGNITION



Reduced output ignition device (RG5S)

START UP CYCLE



* Only model with pre-heater.

(A) Lock-out is shown by a led on the appliance.

Correct operation

0s	The burner begins the ignition cycle.
0s-12s	Pre-purge with the air damper open.
12s	Ignition.

* If the pre-heater is fitted (RG…R series), there is a further delay before pre-purge; this delay can reach 150s depending on room and fuel temperatures.

Lock-out due to ignition failure

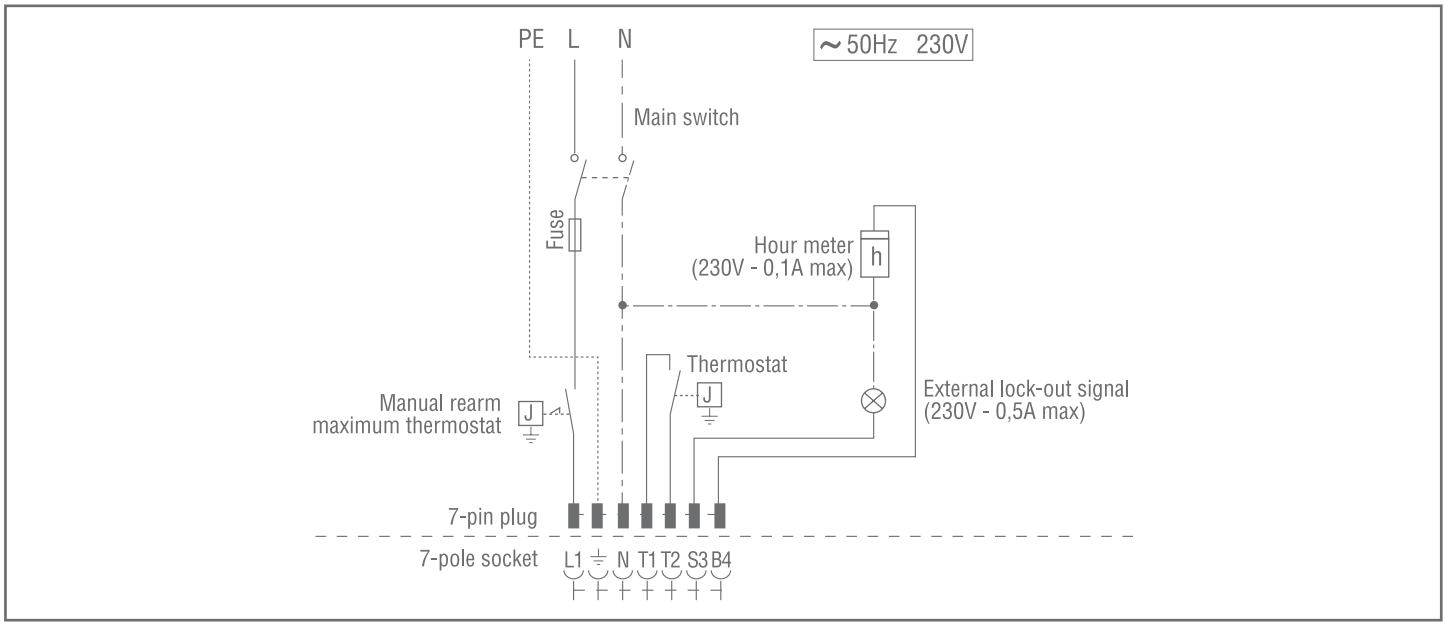
If the flame does not light within the safety limit (~ 5s) the burner locks-out.

Burner Wiring

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

Control box fitted with ignition transformer

ONE STAGE OPERATION



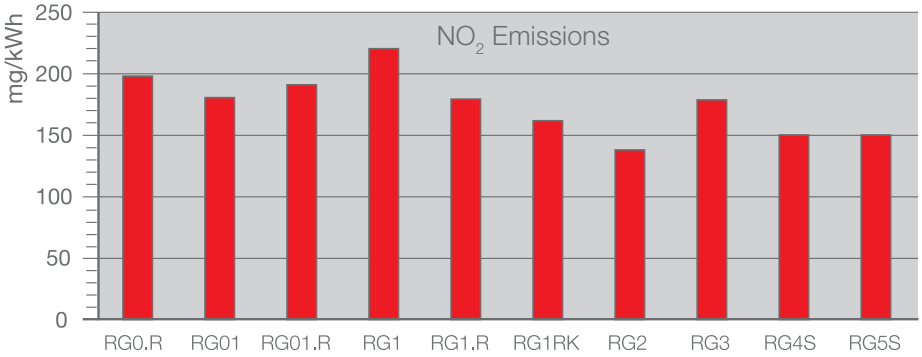
The following table shows the supply lead sections and the type of fuse to be used.

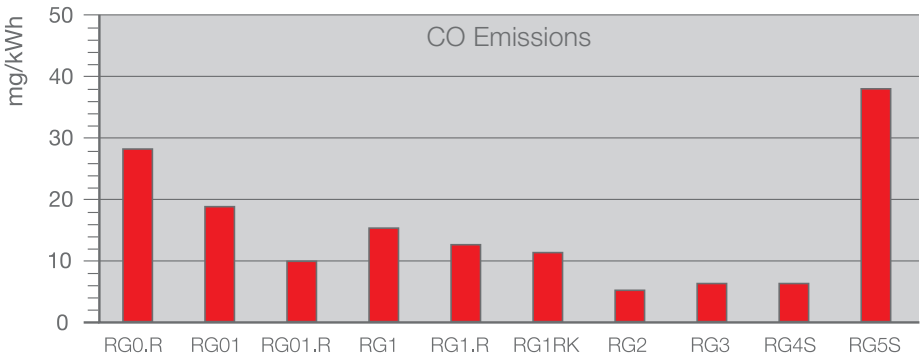
MODEL	V	F (A)	L (mm²)
▶ RG0.R	230	6	1
▶ RG0.1R	230	6	1
▶ RG0.1	230	6	1
▶ RG1	230	6	1
▶ RG1R	230	6	1

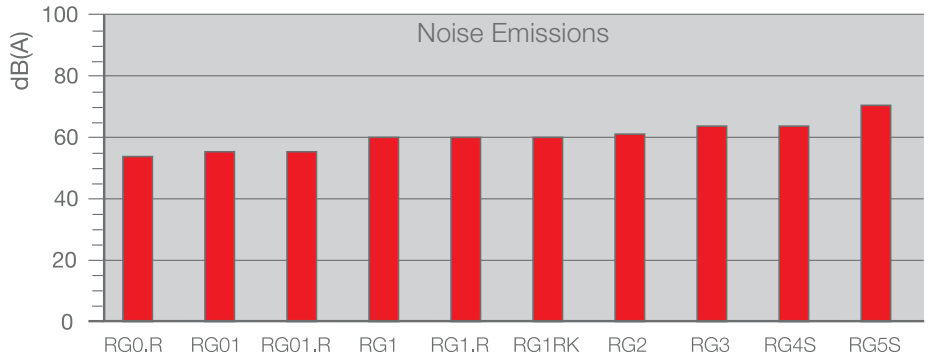
MODEL	V	F (A)	L (mm²)
▶ RG1RK	230	6	1
▶ RG2	230	6	1
▶ RG3	230	T6	1
▶ RG4S	230	T6	1
▶ RG5S	230	T6	1

V = Electrical supply F = Fuse L = Lead section

Emissions







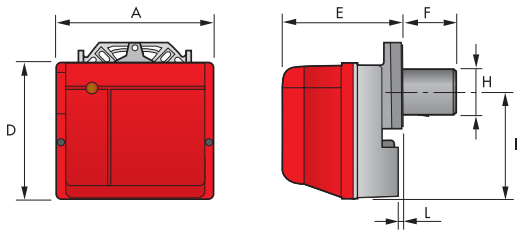
The emission data has been measured in the various models at maximum output, according to EN 267 standard.

Special attention has been paid to noise reduction. All models are fitted with sound-proofing material inside the cover.

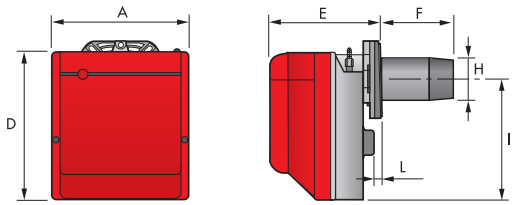
Overall Dimensions (mm)

BURNERS

GULLIVER RG0



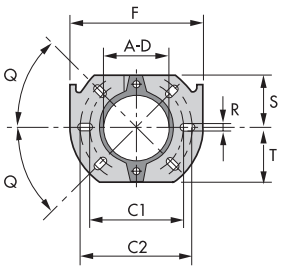
GULLIVER RG



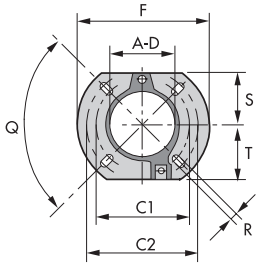
MODEL	A	D	E	F	H	I	L
▶ RG0.R	255	210	205	93	84	168	5
▶ RG0.1R	255	210	205	93	84	168	5
▶ RG0.1	255	210	205	93	84	168	5
▶ RG1	234	254	196	93	84	210	4
▶ RG1R	234	254	196	93	84	210	4
▶ RG1RK	234	254	196	111	84	210	4
▶ RG2	255	280	202	115	95	230	10
▶ RG3	300	345	228	142	123	285	12
▶ RG4S	300	345	228	142	123	285	12
▶ RG5S	300	345	247	155	125	285	12,5

BURNER - BOILER MOUNTING FLANGE

RG0.R - RG0.1R - RG0.1
RG1 - RG1R - RG1RK - RG2

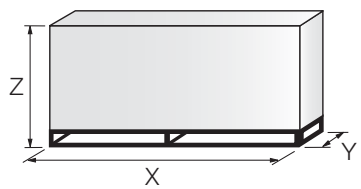


RG3 - RG4S
RG5S



MODEL	A-D	C1	C2	F	Q	R	S	T
▶ RG0.R - RG0.1R - RG0.1 RG1- RG1R - RG1RK	91	130	150	180	45	11	72	72
▶ RG2	106	140	168	189	45	11	83	83
▶ RG3 - RG4S - RG5S	127	160	190	213	90	11	99	99

PACKAGING



MODEL	X	Y	Z	kg
▶ RG0.R	358	300	300	9
▶ RG0.1R	358	300	300	9
▶ RG0.1	358	300	300	11
▶ RG1	353	278	320	13
▶ RG1R	353	278	320	13
▶ RG1RK	353	278	320	13
▶ RG2	363	298	350	13
▶ RG3	430	345	430	15
▶ RG4S	430	345	430	18
▶ RG5S	510	345	430	18

Installation Description

Skilled and qualified personnel must perform installation, start up and maintenance. A nozzle is fitted to the burner and used for fire tests in the factory. If necessary, change the nozzle on the basis of the maximum output of the boiler.
All operations must be carried out as described in the technical handbook supplied with the burner.

BURNER SETTING

In models RG0.R, RG0.1 and RG0.1R, the air damper opening is easily adjusted without any special tools, thanks to the small wheel that can be turned by hand after releasing the protective flap. The air damper is held open by a special anti-banging device with an electromagnetic coil.

The air damper can be opened without removing the burner cover.

Head setting area is easily accessible and the operation is simple thanks to a graduated scale.

MAINTENANCE AND ELECTRICAL CONNECTIONS

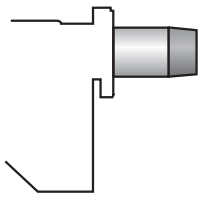
The maintenance position is easily carried out by hooking the burner to the flange after removing it from the fixing screw (except for RG3, RG4S and RG5S models).

Except for models RG0.R, RG0.1 and RG0.1R, the nozzle holder can be serviced through the rear cover without detaching the burner from the boiler.

The 7-pole socket is incorpo-rated in the control box.
The 7-pin plug is also supplied for connection to the boiler.

Burner Accessories

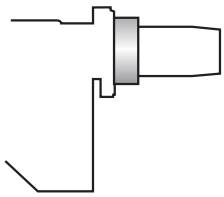
Extended head kit



Kits of extended heads are available.

BURNER	STANDARD HEAD LENGTH (mm)	EXTENDED HEAD LENGTH (mm)	KIT CODE
▶ RG1 - RG1R	93	163	3000963
▶ RG1RK	111	181	3000982
▶ RG2	115	180	3000964
▶ RG2	115	300	3000967
▶ RG3	142	210	3000965
▶ RG3	142	300	3000968
▶ RG4S	142	210	3000966
▶ RG4S	142	300	3000969
▶ RG5S	155	300	3001068

Spacer kit



By using the special accessories, the burner can be with-drawn to reduce head penetration into the combustion chamber.

BURNER	SPACER THICKNESS S (mm)	KIT CODE
▶ RG0.R - RG0.1R - RG0.1 - RG1 - RG1R - RG1RK	15	3007931
▶ RG2	25	3000672
▶ RG3 - RG4S - RG5S	25	3000673

Pre-heater kit

There is a special kit available (only for RG1 model) that, when installed in the combustion head, allows fuel to be heated so as to assure regular burner firing and operation. It can basically used in special atmospheric conditions (low temperatures), with high diesel oil viscosity and with low deliveries. Refer to the instructions supplied with the “pre-heater kit” for installation.
This kit must be installed in conformity with laws and local regulations.

BURNER	KIT CODE
▶ RG1	3001083

Light oil filter

For cleaning light oil from dirty particles and impurities filters with the following features are available:

BURNER	FILTERING DEGREE (µm)	KIT CODE
▶ All models	60	3006561

Filter made up of aluminium body and stainless steel filtering cartridge; available singularly.

BURNER	FILTERING DEGREE (µm)	KIT CODE
▶ All models	60	3075011

Filter made up of aluminium cover, plastic tank and nylon filtering cartridge; available in packaging of 50 pieces.

Light oil filter/degassing unit

To solve problems of air or water in the oil circuit a special filter/degassing unit is available, made up of aluminium cover, plastic tank, stainless steel filtering cartridge, air release cap and water purge valve. It is available singularly.

BURNER	FILTERING DEGREE (µm)	KIT CODE
▶ All models	100	3000926

7-pin plug kit

If necessary a 7-pin plug kit is available (in packaging of n. 5 pieces).

BURNER	KIT CODE
▶ All models	3000945

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.

BURNER	KIT CODE
▶ RG0.R - RG1RK - RG2 - RG3 - RG4S	3002731

Control box MO 550, sensor flame and short circuit plug

On request, we can supply a more efficient control box with following features:
- Digital technology
- Post-ignition of 3 seconds after safety time (total ignition time of 8 seconds)
- Multi-color LED signalling the various working stage
- Visual or PC interface diagnostic functions through multi-color LED device
- Remote lock-out reset (the connection is supplied with the MO 550 accessory)
- Recycling for 3 attemps if there is flame failure during operation
- Programmable post-purge (up to 6 minutes), continuous purge, long pre-purge (2 minutes)
- Post-combustion lock-out
- Logging of burner operation parameters (for example operating time, number and type of lock-outs)

BURNER	KIT CODE
▶ RG0.R - RG0.1R - RG0.1 - RG1R - RG1RK	3001168+3007492
▶ RG1 - RG2 - RG3 - RG4S - RG5S	3001168+3007492+3007792

Tester

The tester controls the correct working of the burner components. It can be fitted to all the light-oil models, with or without pre-heater. It is made up of two parts: a control instrument and a “control box”.

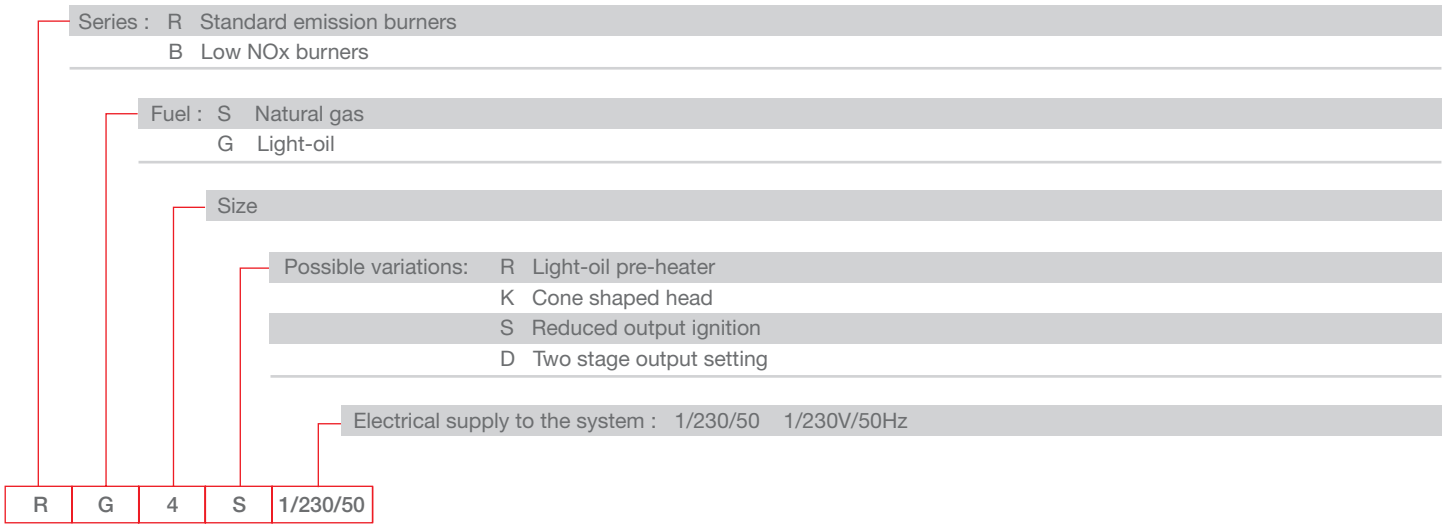
BURNER	KIT CODE
▶ All models	3087211

DIRECT TESTING	MEASUREMENTS
M MOTOR The switch feeds the motor.	V L1-N Main voltage (230 V)
VALVE The switch feeds electromagnetic winding of the coil. A red led signals excitation stage, and a green led signals retainer stage.	A Pre-heater current consumption
PRE-HEATER The switch feeds the light oil pre-heater; a green led signals the thermostat cut-in.	V M Secondary voltage (low voltage)
TRANSFORMER The switch feeds the firing transformer inside the control box and excites the oil valve.	A Photo-resistance current consumption

Specification

DESIGNATION OF SERIES

A special index will help you choose the right burner from the RG models available.
There is also a clear and detailed product specification and description.



AVAILABLE BURNER MODELS

RG0.R	1/230/50
RG0.1	1/230/50
RG0.1R	1/230/50
RG1	1/230/50
RG1R	1/230/50
RG1RK	1/230/50
RG2	1/230/50
RG3	1/230/50
RG4S	1/230/50
RG5S	1/230/50

PRODUCT SPECIFICATION

Burner
Completely automatic monobloc light oil burners, with one stage operation fitted with:
- Fan with forward inclined blades
- Cover lined with sound-proofing material
- Air damper, completely closed in stand by, with external adjustment, without need to remove the cover
- Single phase electric motor 230 V, 50 Hz
- Combustion head fitted with:
    - stainless steel head cone, resistant to high temperatures
    - ignition electrodes
    - flame stability disk
- Geared pump for fuel supply, fitted with:
    - filter
    - pressure regulator
    - attachments for fitting a pressure gauge and vacuum meter
    - internal by-pass for preparing for single-pipe installations
- Fuel feed solenoid valve incorporated in the pump
- Photocell for flame detection
- Electronic flame control equipment
- Light oil nozzle
- IP X0D (IP 40) protection level
- PTC fuel pre-heater (optional)
- Reduced output ignition mechanism (optional).

Approval:
- EN 267 standard.

Conforming to:
- 89/336 (2004/108) EC directive (electromagnetic compatibility)
- 73/23 (2006/95) EC directive (low voltage)
- 92/42/EC directive (performance)
- 98/37/EC directive (machinery).

Standard equipment:
- Two flexible pipes for connection to the light oil supply line
- Two nipples for connection to the pump
- Flange, screws and nuts for fixing
- Thermal screen
- 7-pin plug
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

Available accessories to be ordered separately:
- Extended head kit
- Spacer kit
- Pre-heater kit
- Light oil filter
- Light oil filter/degassing unit
- 7-pin plug kit
- Pc interface kit
- Control box MO 550, sensor flame and short circuit plug
- Tester.

TS0001UK04 - 10/2008

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RIELLO BURNERS
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