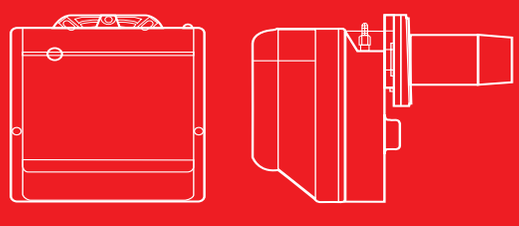


Gulliver RGD Series

Two Stage Light Oil Burners

RG0.RKD	14	÷	60	kW
RG2D	42	÷	118	kW
RG3D	65	÷	178	kW
RG4D	106	÷	237	kW
RG5D	95	÷	296	kW



RIELLO
Energy For Life

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The Riello Gulliver RGD series of two stage light oil burners, is a complete range of products developed to respond to any request for home heating. The Gulliver RGD series is available in five different models, with an output ranging from 14 to 296 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.
In developing these burners, special attention was paid to reducing noise, to the ease of installation and adjustment, to obtaining the smallest size possible to fit into any sort of boiler available on the market.
The two stage operation guarantees high level of thermal unit efficiency.
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 RGD burners are fired before leaving the factory.

Technical Data

MODEL			RG1RKD	RG2D	RG3D
Burner operation mode				Two stage	
Modulation ratio at max. output				===	
Servomotor		type		===	
		run time s		===	
Heat output		kW	14/17 ÷ 60	42/49 ÷ 118	65/83 ÷ 178
		Mcal/h	12/14.6 ÷ 51.6	36.1/42.1 ÷ 101.4	55.9/71.4 ÷ 153
		Kg/h	1.2/1.45 - 5	3.6/4.1 - 10	5.5/7 - 15
Working temperature		°C min./max.		0/40	
FUEL/AIR DATA					
Light oil	net calorific value	kWh/kg		11.8	
		kcal/kg		10200	
	viscosity at 20°C	mm^2/s (cSt)		4 - 6 (at 20°C)	
Pump	type			R.B.L	
	delivery	Kg/h		30 (at 12 bar)	
Atomised pressure		bar		8 - 15	
Fuel temperature		max. °C		50	
Fuel pre-heater			YES	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	RBL 553 SE	RBL 552 SE	RBL 552 SE
Total electrical power		kW	0.290	0.180	0.390
Auxiliary electrical power		kW		===	
Heaters electrical power		kW	0.12 (PTC)	===	===
Protection level		IP		40	
Fan motor	electrical power	kW	0.09	0.09	0.15
	rated current	A	0.85	0.9	1.9
	start up current	A	3.4	3.6	7.6
	protection level	IP		20	
Pump motor	electrical power	kW		===	
	rated current	A		===	
	start up current	A		===	
	protection level	IP		===	
Ignition transformer		type		Incorporated in the control box	
		V1 - V2		(-) - 8 Kv	
		I1 - I2		(-) - 16 mA	
Operation				Intermittent (at least one stop every 24h)	
EMISSIONS					
Noise levels	Sound pressure	dB (A)	60	61	64
	Sound power	dB (A)	71	72	75
Light oil	CO emission	mg/kWh		< 60	
	grade of smoke indicator	N° Bacharach		< 1	
	CxHy emission	mg/kWh		< 10 (after the first 20s)	
	NOx emission	mg/kWh		< 250	
APPROVAL					
Directive				2006/42/EC - 92/42/EC - 2014/30/UE - 2014/35/UE	
Conforming to				EN 267	
Certification			CE-0036O347/04	CE-0036O348/04	CE-0036O298/00

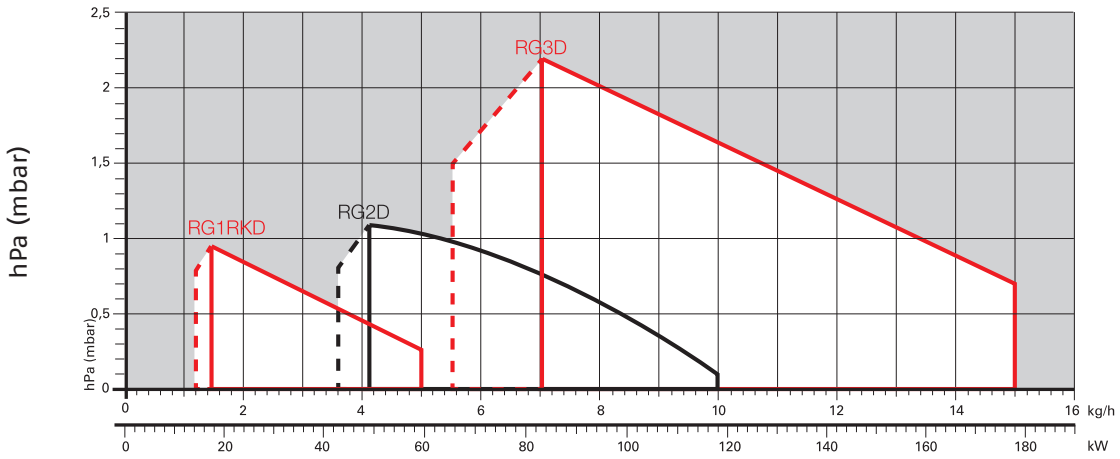
Reference conditions:
Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter. Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.

MODEL			RG4D	RG5D
Burner operation mode			Two stage	
Modulation ratio at max. output			===	
Servomotor		type	===	
		run time s	===	
Heat output		kW	106/130 ÷ 237	95/142 ÷ 296
		Mcal/h	91.2/111.8 ÷ 203.8	81.7/122.1 ÷ 254.6
		Kg/h	9/11 - 20	8/12 - 25
Working temperature		°C min./max.	0/40	
FUEL/AIR DATA				
Light oil	net calorific value	kWh/kg	11.8	
		kcal/kg	10200	
	viscosity at 20°C	mm^2/s (cSt)	4 - 6 (at 20°C)	
Pump	type		R.B.L	
	delivery	Kg/h	30 (at 12 bar)	35 (at 12 bar)
Atomised pressure		bar	8 - 15	
Fuel temperature		max. °C	50	
Fuel pre-heater			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	RBL 552 SE	RBL 552 SE
Total electrical power		kW	0.390	0.470
Auxiliary electrical power		kW	===	
Heaters electrical power		kW	===	
Protection level		IP	40	
Fan motor	electrical power	kW	0.15	0.25
	rated current	A	2	2.1
	start up current	A	8	8.4
	protection level	IP	20	
Pump motor	electrical power	kW	===	
	rated current	A	===	
	start up current	A	===	
	protection level	IP	===	
Ignition transformer		type	Incorporated in the control box	
		V1 - V2	(-) - 8 Kv	
		I1 - I2	(-) - 16 mA	
Operation			Intermittent (at least one stop every 24h)	
EMISSIONS				
Noise levels	Sound pressure	dB (A)	64	71
	Sound power	dB (A)	75	82
Light oil	CO emission	mg/kWh	< 60	
	grade of smoke indicator	N° Bacharach	< 1	
	CxHy emission	mg/kWh	< 10 (after the first 20s)	
	NOx emission	mg/kWh	< 250	
APPROVAL				
Directive			2006/42 EC - 92/42 EC - 2004/108 EC - 2006/95 EC	
Conforming to			EN 267	
Certification			CE-00360348/04	CE-00360325/01

Reference conditions:
Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter. Sound pressure measured in manufacturer's combustion laboratory, with burner operating on test boiler and at maximum rated output. The sound power is measured with the "Free Field" method, as per EN 15036, and according to an "Accuracy: Category 3" measuring accuracy, as set out in EN ISO 3746.

Firing Rates

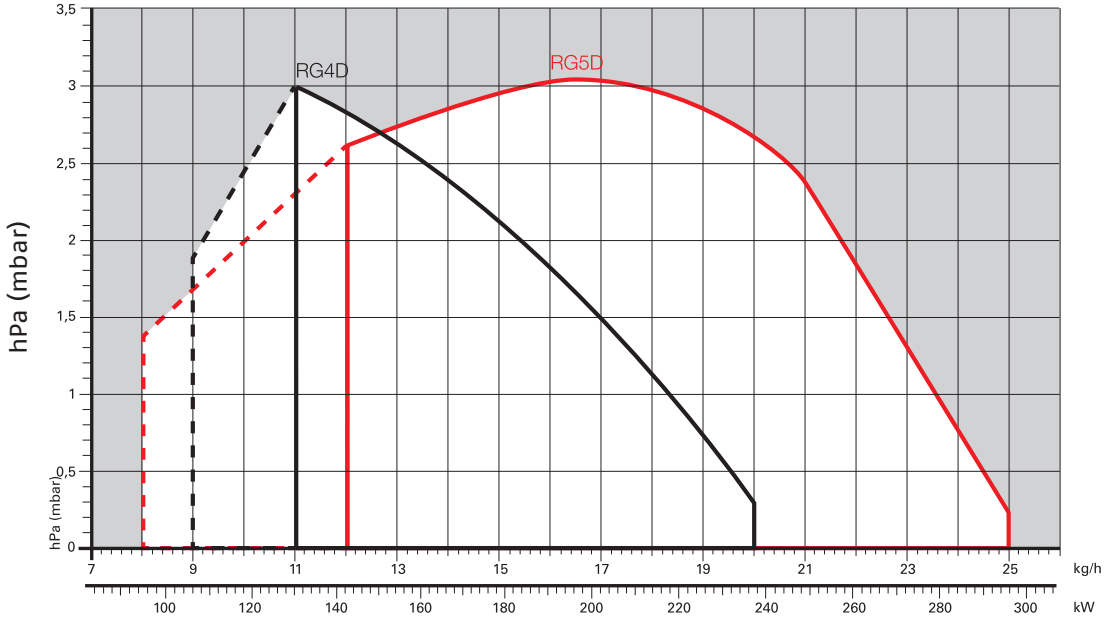
GULLIVER RG1RKD- RG2D - RG3D



Useful working field for choosing the burner

Test conditions conforming to EN267
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

GULLIVER RG4D - RG5D

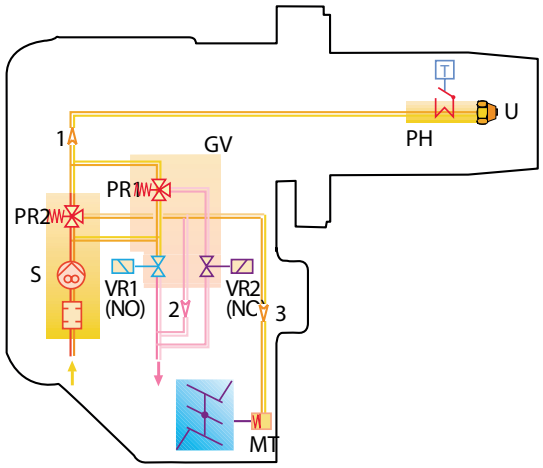


Fuel Supply

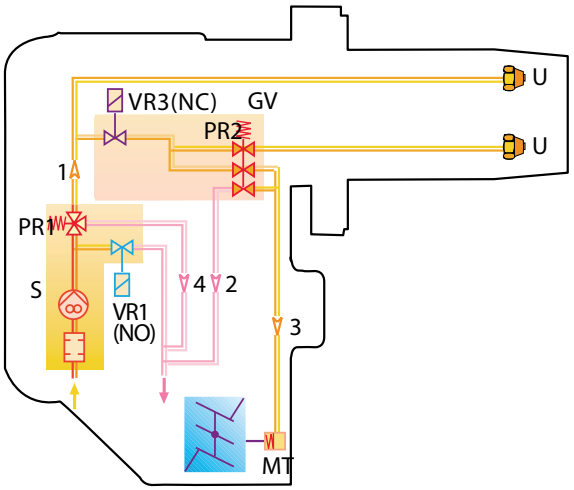
Hydraulic Circuit

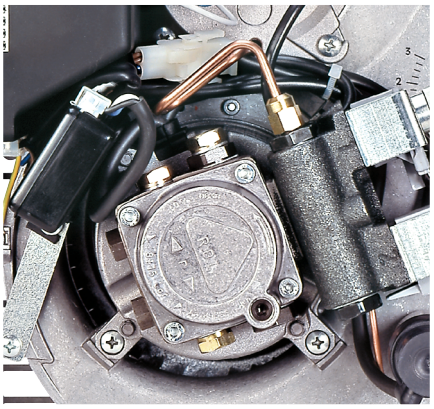
All the burners have a geared pump R.B.L with double safety valve on the return circuit; the model RG1RKD is equipped by light oil pre-heater PTC type.
Fuel feed to the burner can be from the right or the left side on all models.

RG1RKD - RG2D - RG3D - RG4D

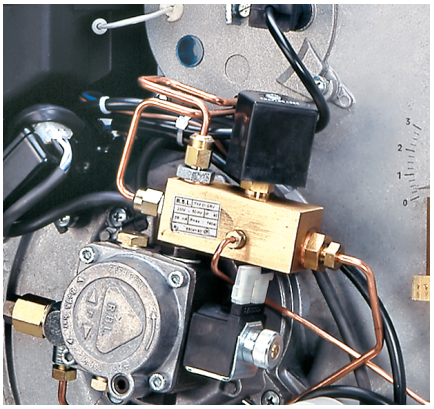


RG5D





Fuel pump



Fuel pump (RG5D)

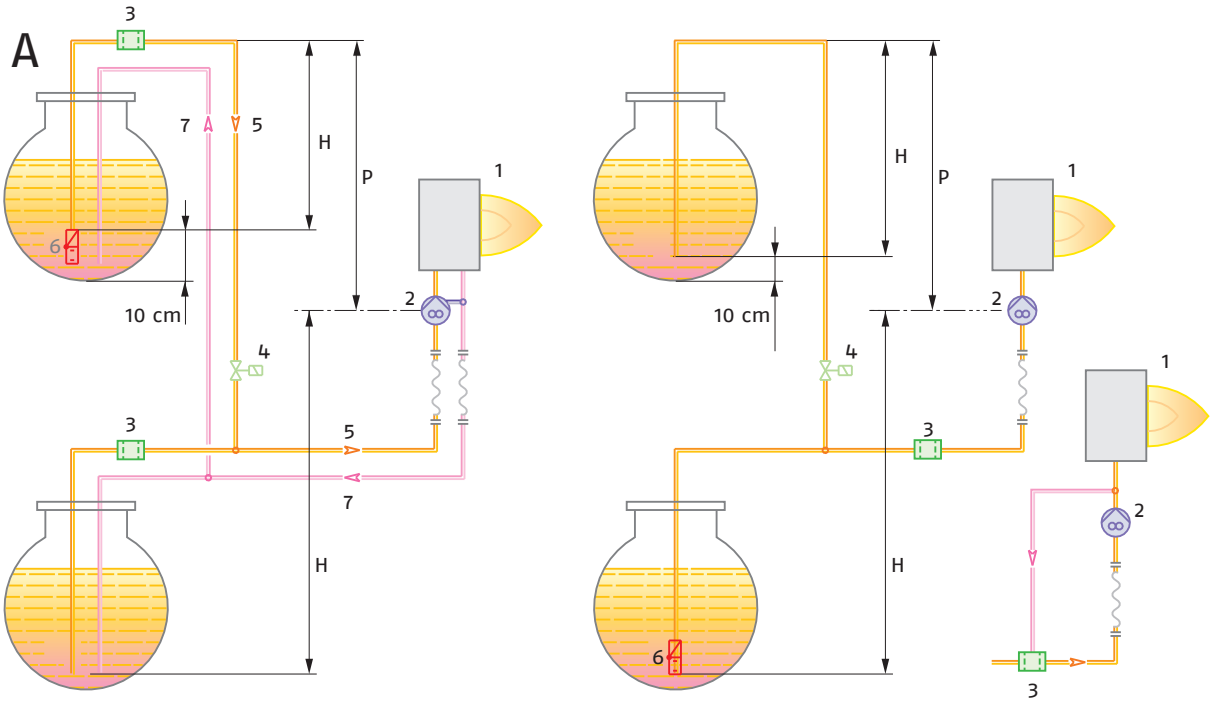
S	Pump with filter and pressure regulator on the delivery pipework
VR1 (NO)	1st stage oil return valve normally open
VR2 (NO)	2nd stage oil return valve normally open
VR3 (NC)	2nd stage oil return valve normally closed
1	Oil delivery pipe to the nozzle/s
2	Oil return pipe from the 2nd stage regulator
3	Oil delivery pipe to the air damper hydraulic jack
4	Oil return pipe from the 1st stage regulator
MT	Air damper hydraulic jack for the 2nd stage
PR1	1st stage oil regulator
PR2	2nd stage oil regulator
PH	Oil pre-heater with thermostat (where provided)
GV	Valve unit
U	Nozzle

Selecting the fuel supply lines

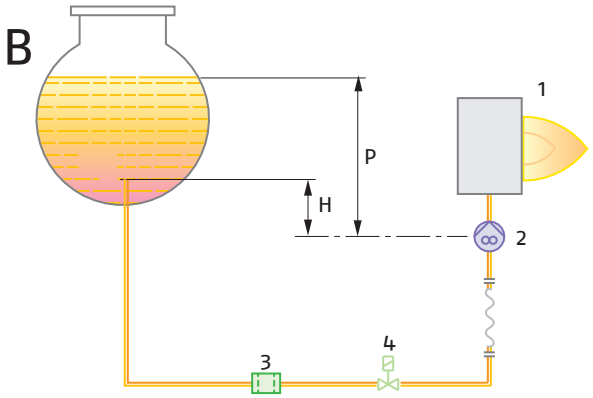
The fuel feed must be completed with the safety devices required by the local regulations in force.

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 lenght of the pipework L (m)				
	Type A system		Type B system	
Pipe size	Ø 8 mm	Ø 10 mm	Ø 8 mm	Ø 10 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	-	-



SELECTING THE FUEL SUPPLY LINES



H	Pump/Foot valve height difference
Ø	Inside 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

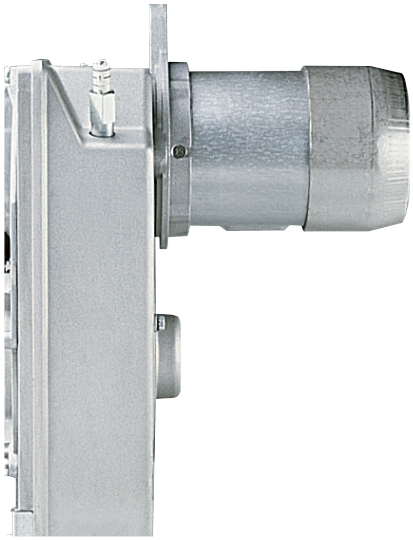
The different ventilation circuits always ensure low noise levels with high performance of pressure and air delivery, inspite of their compact size.



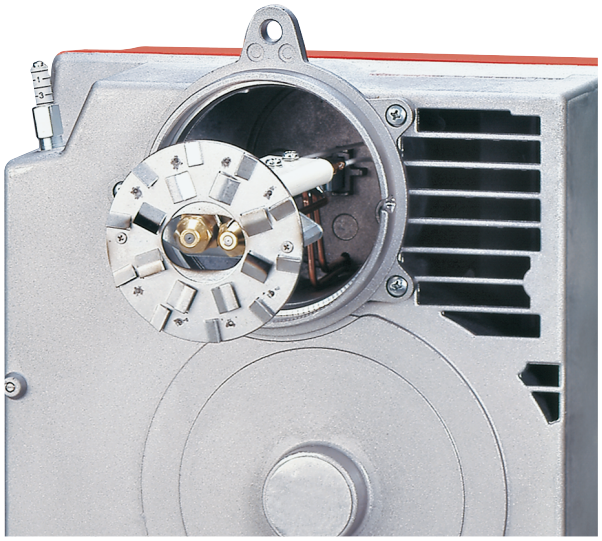
Air suction

Combustion Head

The RGD series of burners allows you to choose the length of the combustion head. This choice depends on the thickness of the front wall and 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.

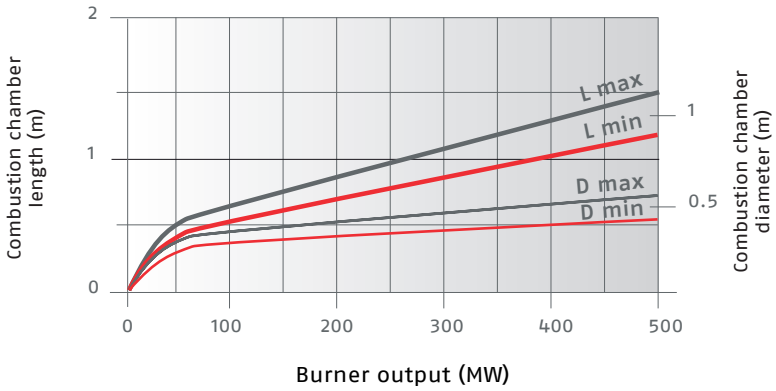


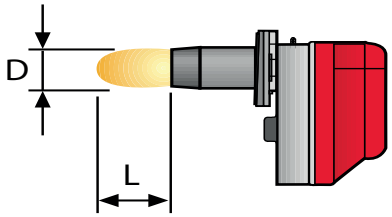
Combustion head



Combustion head (RG5D)

SUGGESTED COMBUSTION CHAMBER DIMENSIONS



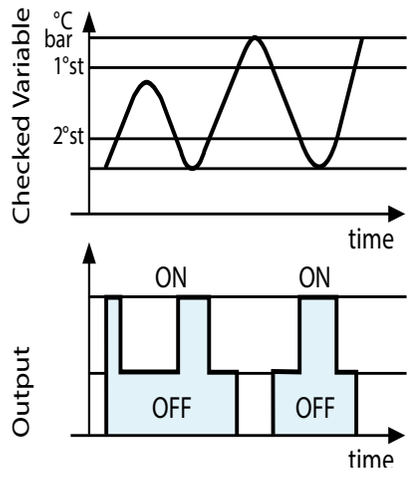


Example:
Burner thermal output = 350 kW;
L Combustion Chamber (m) = 1.2 m (medium value);
D Combustion Chamber (m) = 0.6 m (medium value)

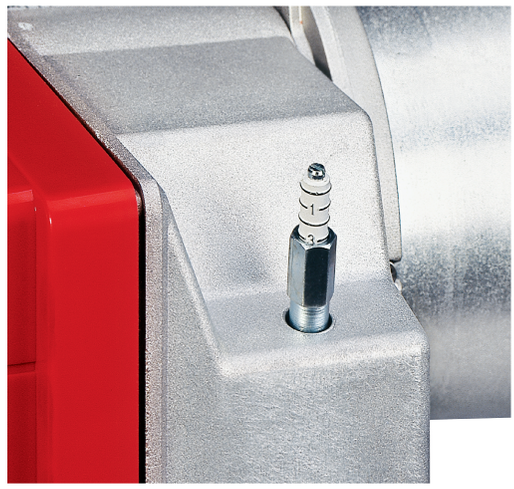
BURNER OPERATION MODE

All these models have two stage output operation at 2 pressure levels (each having its respective pressure regulator) except for the RG5D model, which has 2 nozzles (one for each stage) that work at the same pressure.

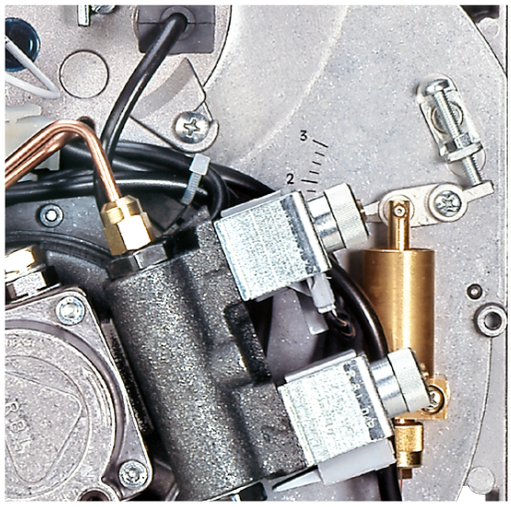
"TWO STAGE" OPERATION



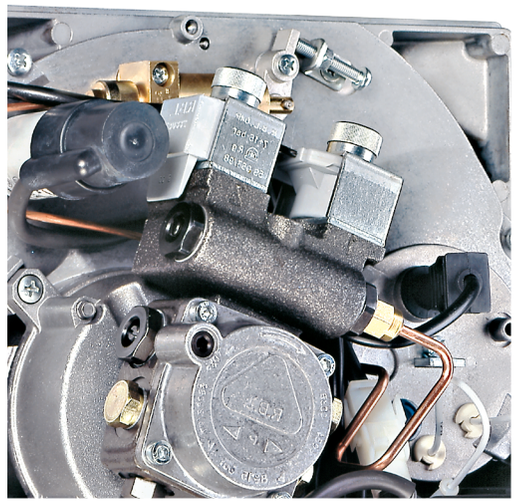
2nd STAGE AIR DAMPER ADJUSTMENT



1st STAGE AIR DAMPER ADJUSTMENT



LIGHT OIL PRESSURE ADJUSTMENT



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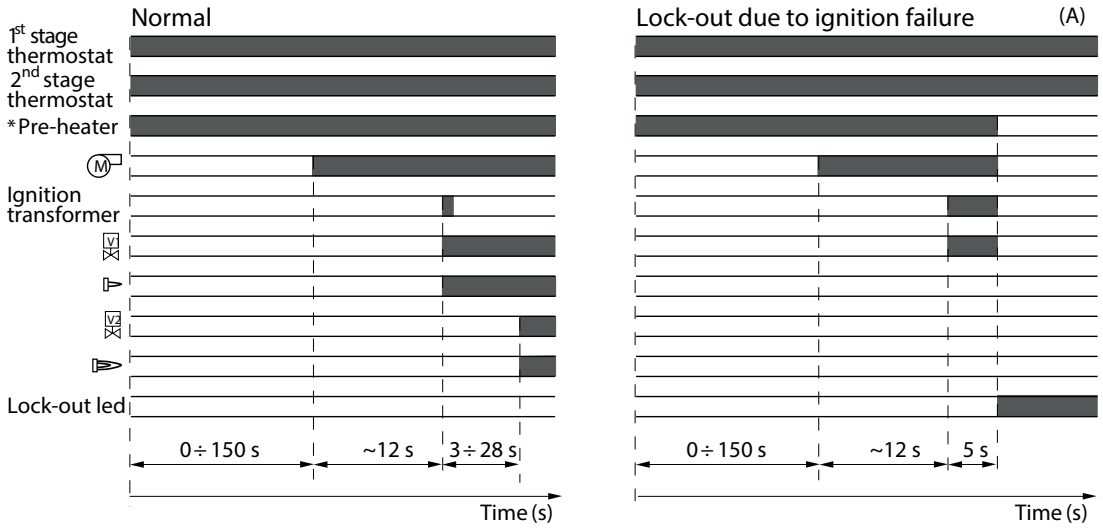
Start Up Cycle



* Only for RG1RKD.
(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 air damper open.
12s	1st ignition.
15s-40s	2nd ignition.

* If the pre-heater is fitted (RG1RKD serie), 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

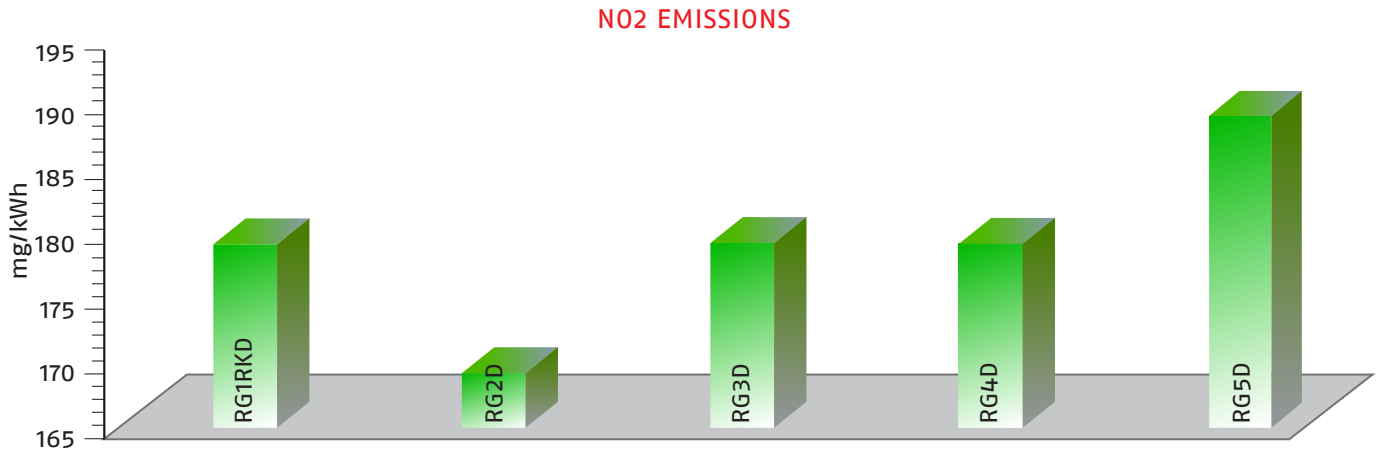
Electrical connections must be made by qualified and skilled personnel in conformity with the local regulations in force.

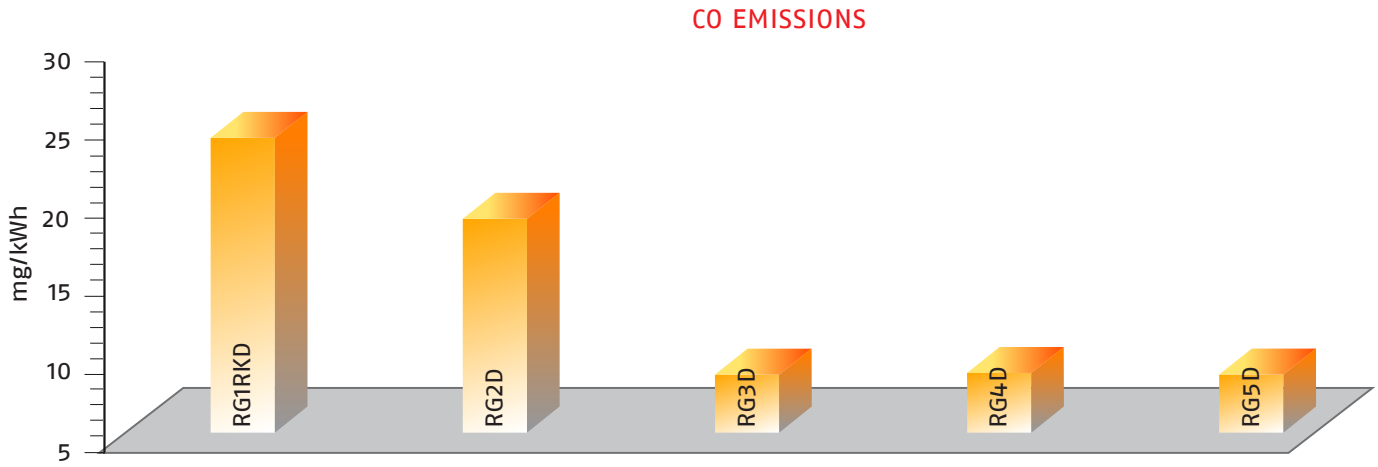


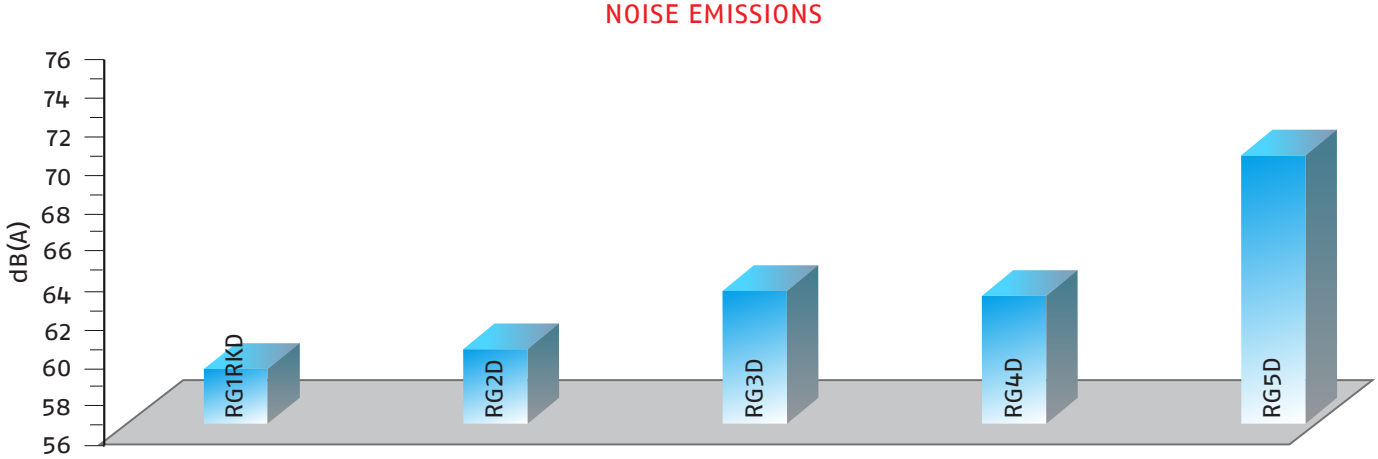
Control box fitted with ignition transforner

Emissions

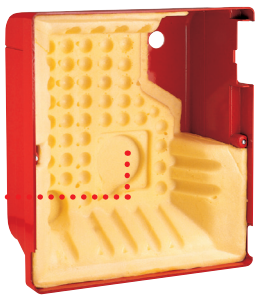
The emission data have been measured in the various models at maximum output, in conformity with EN 267 standard.





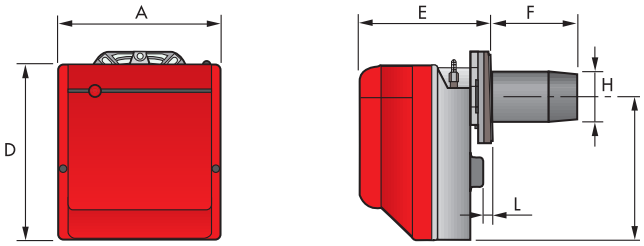


Special attention has been paid to noise reduction.
All models are fitted with sound-proofing material inside the cover.



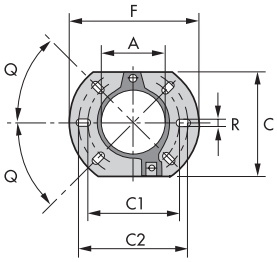
Overall Dimensions (mm)

GULLIVER RGD



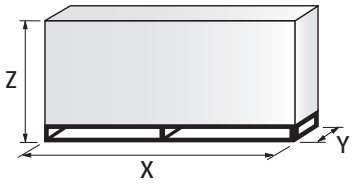
Model	A	D	E	F	H	I	L
RG1RKD	234	254	196	111	84	210	4
RG2D	255	280	202	115 - 185	95	230	10
RG3D	300	345	228	142 - 212	123	285	12
RG4D	300	345	228	142 - 212	123	285	12
RG5D	300	345	247	154 - 294	125	285	12.5

BURNER - BOILER MOUNTING FLANGE



Model	A	C	C1	C2	F	Q	R
RG1RKD	91	144	130	150	180	45°	11
RG2D	106	166	140	168	189	45°	11
RG3D	127	198	160	190	213	45°	11
RG4D	127	198	160	190	213	45°	11
RG5D	127	198	160	190	213	45°	11

PACKAGING



Model	X	Y	Z	Kg
RG1RKD	353	278	320	12
RG2D	363	298	350	13
RG3D	430	345	430	13
RG4D	430	345	430	13
RG5D	510	345	440	18

Installation Description

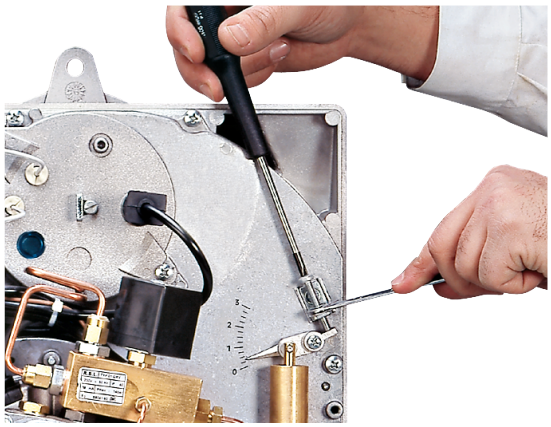
Skilled and qualified personnel must perform installation, start up and maintenance. A nozzle (2 for the RG5D) is fitted to the burner and used for fire tests in the factory.
If necessary, change the nozzle on the basis of the maximum output of the boiler.
All operations must be carried out as described in the technical handbook supplied with the burner.

BURNER SETTING

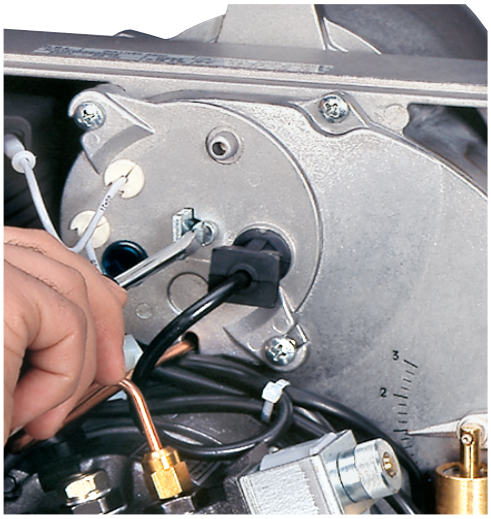
2nd stage air damper position adjustment can be made without removing the burner casing.



1st sage air damper position adjustment.

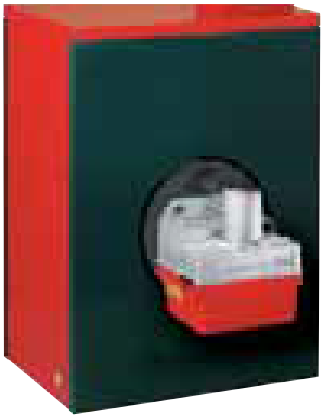


Head setting area is easily accessible and the operation is simple thanks to a graduated scale.

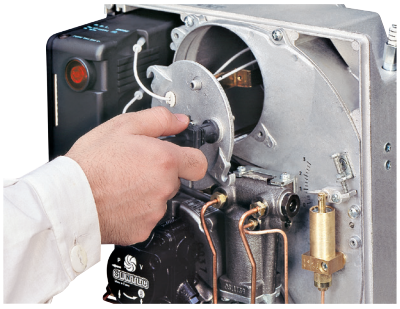


MAINTENANCE AND ELECTRICAL CONNECTIONS

The maintenance position is easily carried out by hooking the burner to the flange after removing it from the fixing screw.

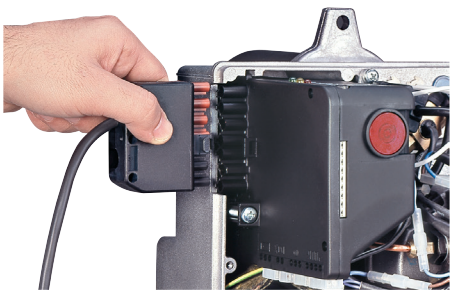


The nozzle holder can be serviced through the rear cover, without detaching the burner from the boiler.



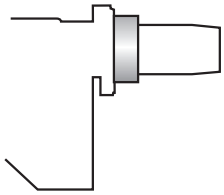
The 7-pole socket is incorporated in the control box, the 4-pole socket is already connected.
The 4 and 7-pin plugs are also supplied for connection to the boiler.





Burner accessories

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
RG1RKD	15	3007931
RG2D	25	3000672
RG3D - RG4D - RG5D	15	20103452

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

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 prepurge (2 minutes).
- Post-combustion lock-out.
- Logging of burner operation parameters (for example operating time, number and type of lock-outs).

BURNER		KIT CODE
RG1RKD		3001168+3007492
RG2D - RG3D - RG4D - RG5D		3001168+3007492+3007792

PC INTERFACE KIT



To connect the control box 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
RG1RKD - RG2D - RG3D - RG4D - RG5D		3002731

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

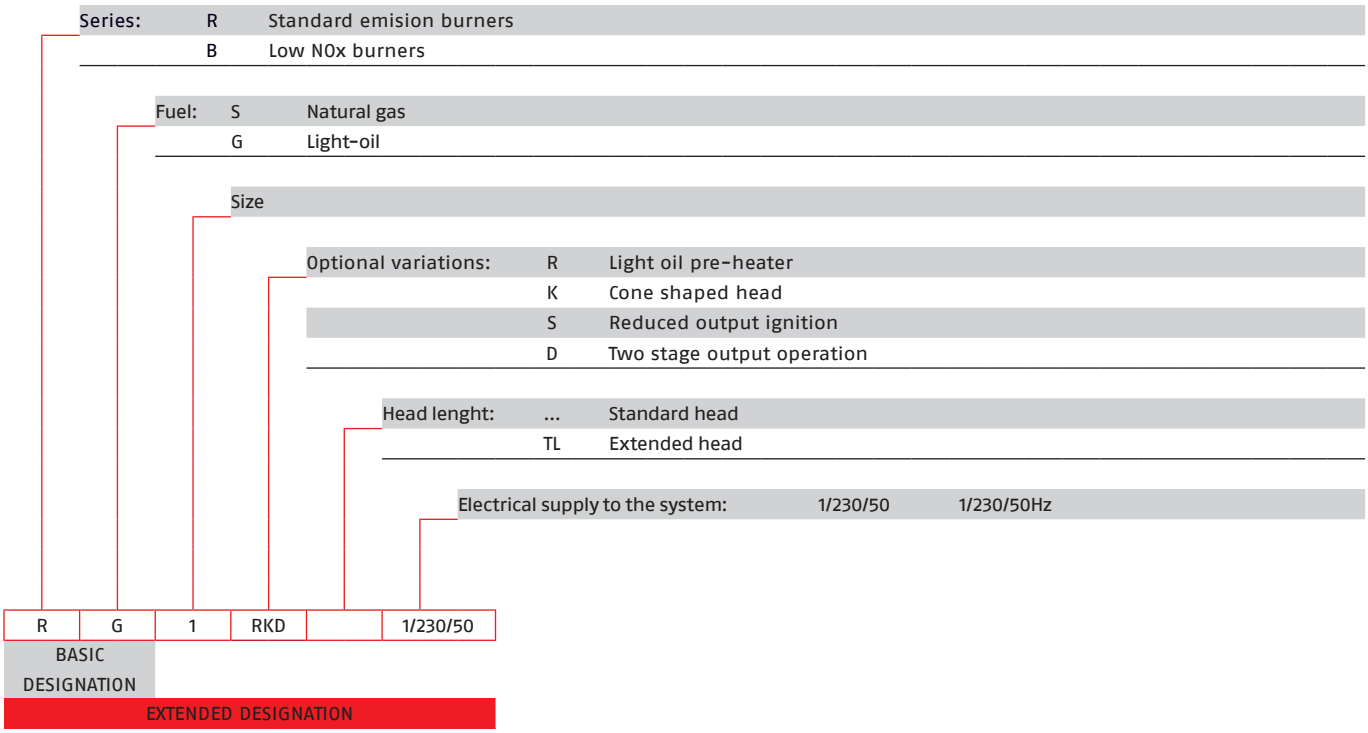


To solve problems of air or water in the oil circuit a special filter/degassing unit is available, made up of aluminium cover, plastic tank, stainless steel filtering cartridge, air release cap and water purge valve. It is available singularly.

BURNER	FILTERING DEGREE (μm)	KIT CODE
ALL MODELS	100	3000926

Specification

DESIGNATION OF SERIES



STATE OF SUPPLY

Completely automatic monobloc light oil burners, two stage operation, made up of:
- Fan with forward curve blades
- Cover lined with sound-proofing material
- Air damper, completely closed in stand by
- Air damper, with 1st and 2nd stage adjustment (2nd stage adjustment without removing the casing)
- 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).

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 (not included in models with digital control box M0 550)
- 4-pin plug
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

NOTES

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

05/2016
TS0002UK02



[1]



[2]

[1] BURNERS PRODUCTION PLANT
S. PIETRO, LEGNAGO (VERONA) – ITALIA

[2] HEADQUARTER BURNERS DIVISION
S. PIETRO, LEGNAGO (VERONA) – ITALIA

Across the world, Riello sets the standard in reliable and high efficiency burner technology.
With burner capacity from 5 kW to 48 MW, Riello gas, oil, dual fuel and Low Nox burners deliver unbeatable performance across the full range of residential and commercial heating applications, as well as in industrial processes.
With headquarter in Legnago, Italy, Riello has been manufacturing premium quality burners for over 90 year.
The manufacturing plant is equipped with the most innovative systems of assembling lines and modern manufacturing cells for a quick and flexible response to the market.
Besides, the Riello Combustion Research Centre, located in Angiari, Italy, represents one of the most modern facility in Europe and one of the most advanced in the world for the development of the combustion technology.
Today, the company's presence on worldwide markets is distinguished by a well-constructed and efficient sales network, alongside many important Training Centres located in various countries to meet its customers' needs.
Riello has 13 operational branches abroad (in Europe, America and Asia), with customers in over 60 countries.

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