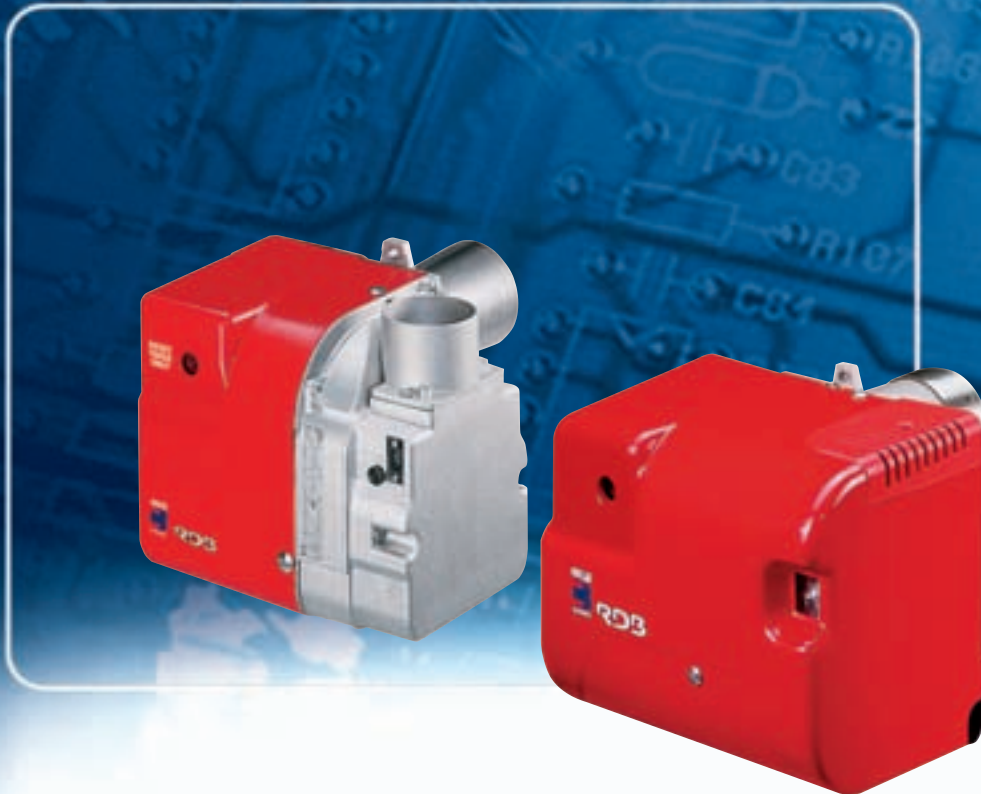


ONE STAGE LIGHT OIL AND KEROSENE BURNERS

▶ **RDB SERIES**

▶ RDB1-1R	16,8 ÷ 40,6 kW
▶ RDB2-2R	24,0 ÷ 46,2 kW
▶ RDB2.1-2.1R	21,0 ÷ 54,0 kW
▶ RDB2.2-2.2R	21,0 ÷ 51,0 kW
▶ RDB3	35,6 ÷ 68,7 kW
▶ RDB3.2	41,0 ÷ 120,0 kW
▶ RDB4	55,7 ÷ 113,0 kW



The Riello RDB series of one stage light oil and kerosene burners is available in 8 basic models, with an output ranging from 16,8 to 120 kW, in three different structures. The models are available in light oil and kerosene versions, conventional flue and balanced flue, with or without the fuel pre-heater fitted.

A new model has been specifically designed to meet the increasing trends towards high pressure working field demand.

These models are distinguished by their compact size.

All the models use the same components designed by Riello for the RDB 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.

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 RDB burners are fired before leaving the factory.



TECHNICAL DATA

Model		▼ RDB1	▼ RDB1R	▼ RDB2	▼ RDB2R	▼ RDB2.1	▼ RDB2.1R	▼ RDB2.2	▼ RDB2.2R	▼ RDB3	▼ RDB3.2	▼ RDB4	
Burner operation mode		One stage											
Modulation ratio at max. output		--											
Servomotor	type	--											
	run time	s											
Heat output	kW	16,8 - 26,3	21,6 - 40,6	24 - 38,3	33,2 - 46,2	21 - 42	33 - 54	21 - 41,5	33,5 - 51	35,6 - 68,7	41 - 120	55,7 - 113	
	Mcal/h	14,4 - 22,6	18,6 - 34,9	20,6 - 32,9	28,5 - 39,7	18 - 36,1	28,4 - 45,9	18,1 - 35,7	28,9 - 44	30,6 - 59	35,26 - 103,2	48 - 97,2	
	kg/h	1,4 - 2,2	1,8 - 3,4	2 - 3,2	2,8 - 3,9	1,8 - 3,5	2,8 - 4,5	1,8 - 3,5	2,9 - 4,3	3 - 5,8	3,5 - 10	4,7 - 9,5	
Working temperature	°C min./max.	0/40											
Net calorific value	kWh/kg	11,9											
	kcal/kg	10.200											
Viscosity	mm ² /s (cSt)	4 ÷ 6 (at 20°C) for light oil models / 1,5 ÷ 6 (at 20°C) for kerosene models											
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		NO	YES	NO	YES	NO	YES	NO	YES	NO	NO	NO	
Fan	type	centrifugal with forward curve blades											
Air temperature	max. °C	40											
Electrical supply	Ph/Hz/V	1/50/230 ±10%											
Auxiliary electrical supply	Ph/Hz/V	--											
Control box	type	R.B.L.535 SE/LD	R.B.L.535R SE/LD	R.B.L.535 SE/LD	R.B.L.535R SE/LD	R.B.L.535 SE/LD	R.B.L.535R SE/LD	R.B.L.535 SE/LD	R.B.L.535R SE/LD	R.B.L.535 SE/LD	R.B.L.535 SE/LD	R.B.L.535R SE/LD	
Total electrical power	kW	0,115	0,175	0,125	0,175	0,124	0,174	0,124	0,174	0,16	0,16	0,16	
Auxiliary electrical power	kW	--											
Heaters electrical power	kW	--	0,055/0,025	--	0,055	--	0,055	--	0,055	--	--	--	
Protection level	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								0,15			
Rated fan motor current	A	0,75								1,3			
Fan motor start up current	A	3								4,3			
Fan motor protection level	IP	20											
Ignition transformer	type	Incorporated in the control box											
	V1 - V2	(-) - 8 kV											
I1 - I2		(-) - 16 mA											
Operation		Intermittent (at least one stop every 24 h)											
Sound pressure	dB (A)	60	60	61,5	61,5	62	62	62	62	63	63	66	
Sound power	W	--											
CO emission	mg/kWh	< 30											
Grade of smoke indicator	N° Bacharach	< 1											
C _x H _y emission	mg/kWh	< 10 (after the first 20s)											
NO _x emission	mg/kWh	< 200									< 185		< 200
Directive		89/336/EEC, 73/23/EEC, 98/37/EEC, 92/42/EEC											
Conforming to		EN 267											
Certification		CE-0036 0316/01	CE-0036 0326/01	CE-0036 0316/01	CE-0036 0316/01	CE-0036 0316/01	CE-0036 0316/01	CE-0036 0316/01	CE-0036 0316/01	CE-0036 0275/99	in progress	CE-0036 0274/99	

Reference conditions:

Temperature: 20 °C

Pressure: 1013 mbar

Altitude: 0 m a.s.l.

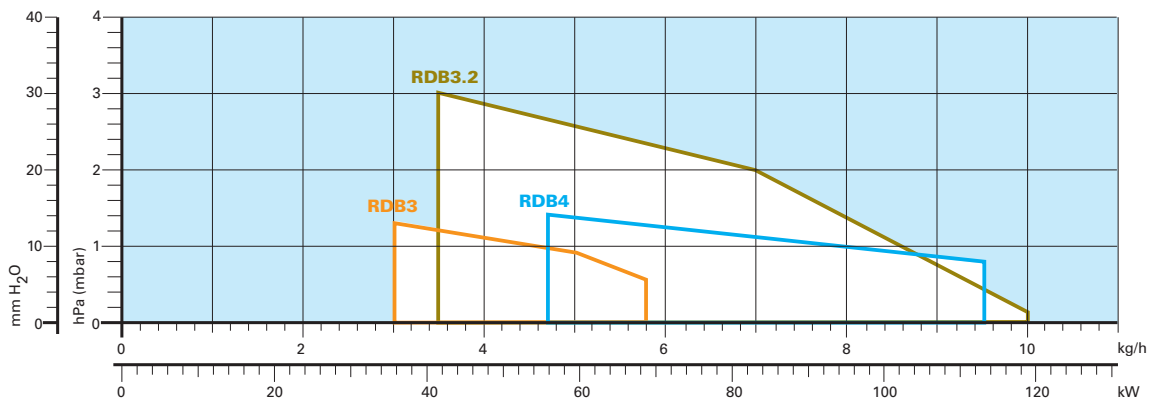
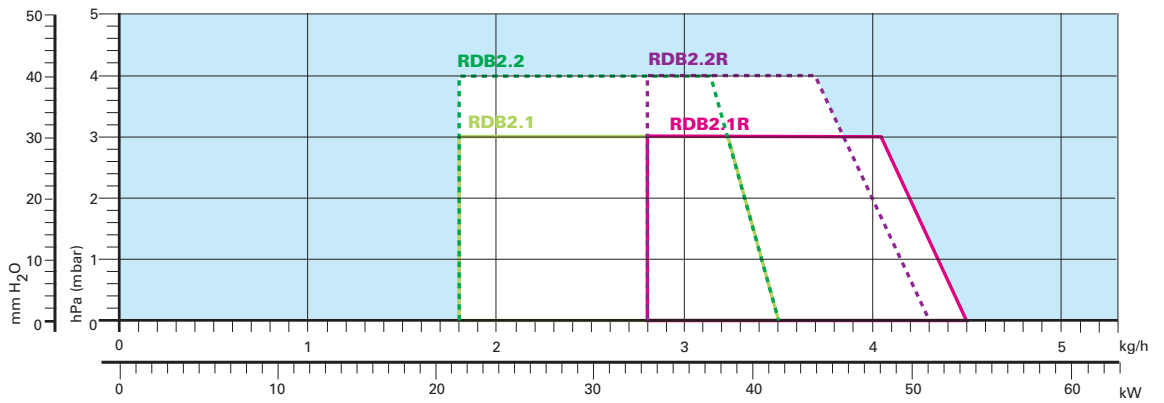
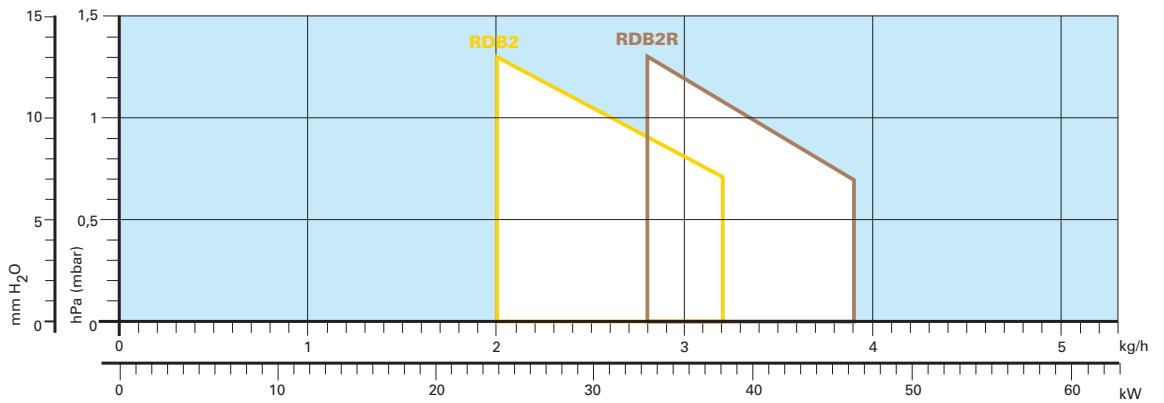
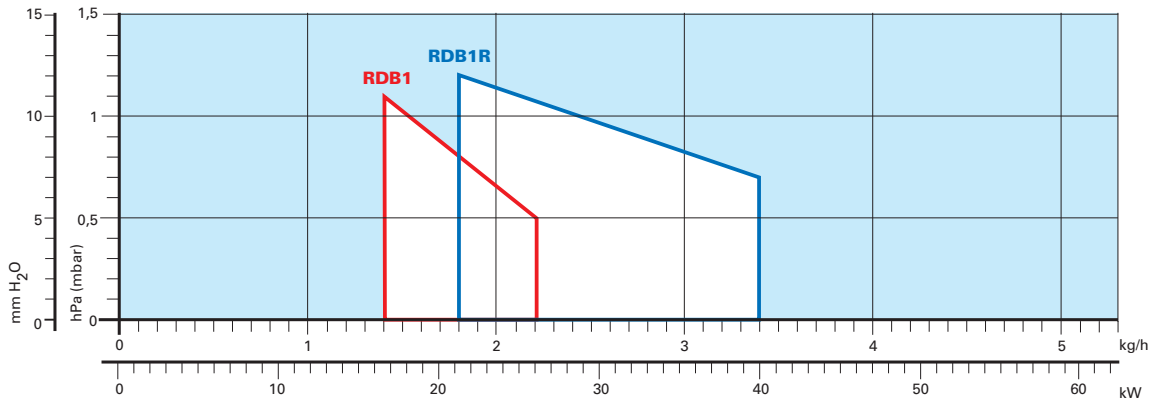
Noise measured at a distance of 1 meter.



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

For every models (e.g. RDB1) are available many combustion heads that allows to optimize the working field.



 Useful working field for choosing the burner
 Firing rate in progress

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



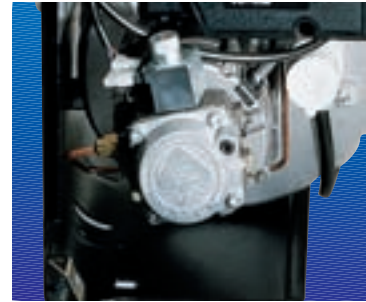


FUEL SUPPLY



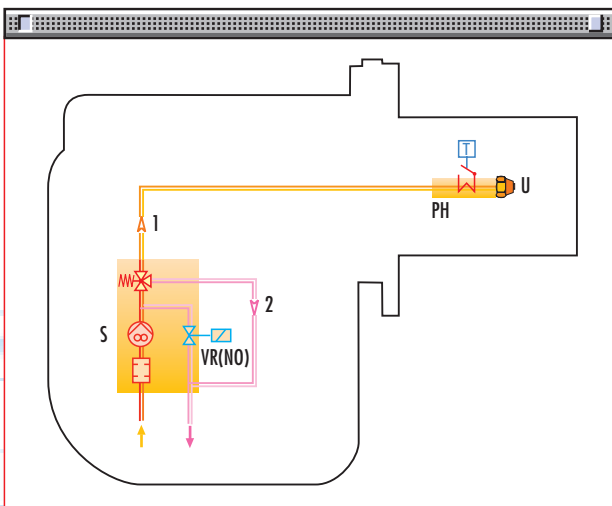
HYDRAULIC CIRCUIT

All the models have a Riello geared pump with safety valve on the return circuit, and some are fitted with a fuel pre-heater. The kerosene models have a special kerosene pump, which guarantees reliable operations with this type of fuel.



Fuel pump

RDB - RDB R



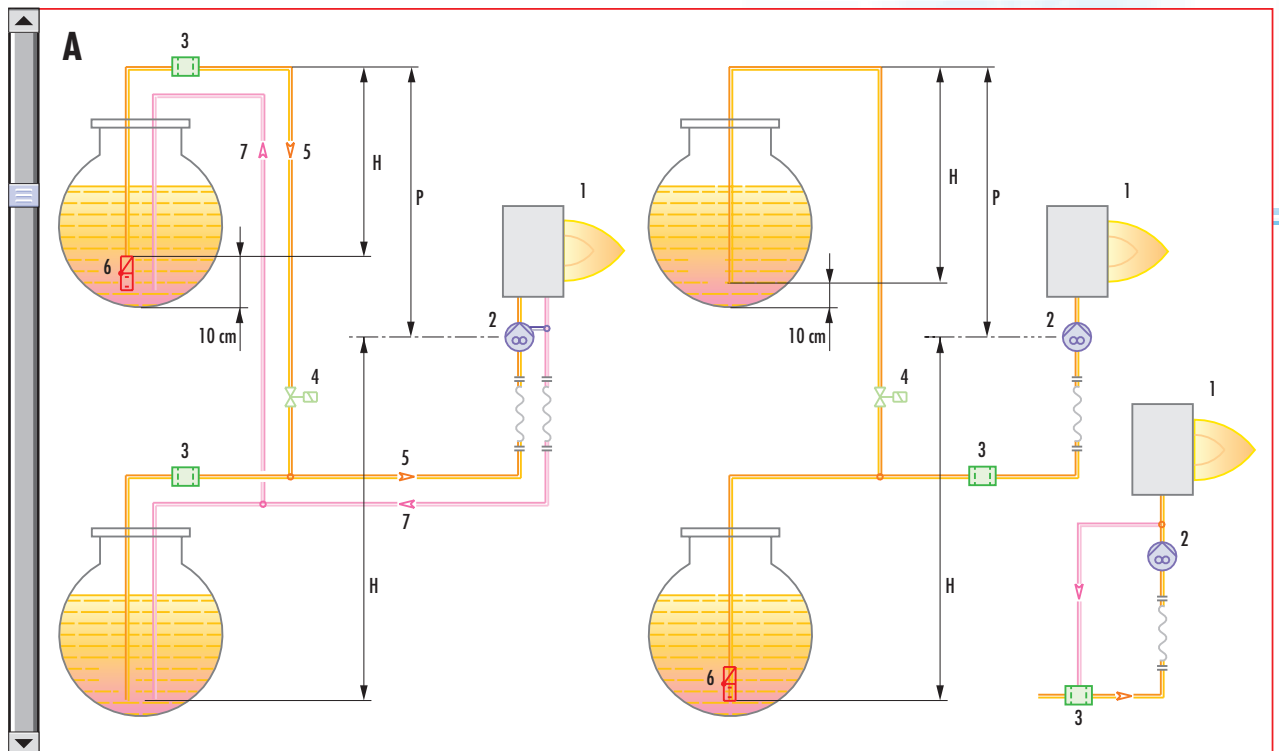
S	Pump with filter and pressure regulator on the delivery pipe
VR(NO)	Oil return valve normally open
1	Oil input pipe to the nozzle
2	Oil return pipe from the regulator
PH	Oil pre-heater with thermostat (where provided)
U	Nozzle

SELECTING THE FUEL SUPPLY LINES

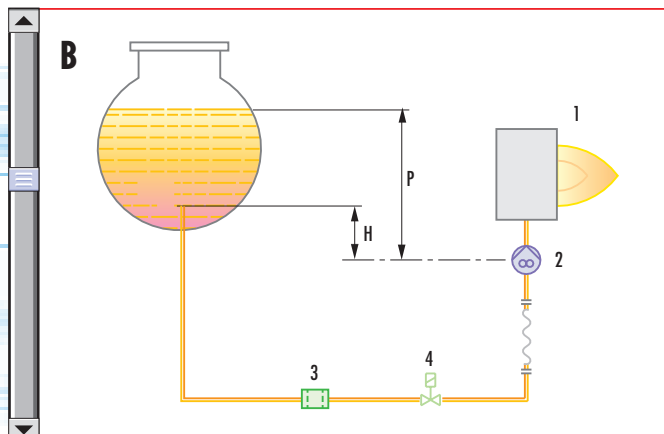
The fuel feed must be completed with the safety devices required by the local regulations in force.

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 LENGTH OF THE PIPEWORK L[m]				
Pipe size	Type A system		Type B system	
	Ø8mm	Ø10mm	Ø8mm	Ø10mm
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 RDB series has been designed and developed paying special attention to reducing noise levels, while guaranteeing high performance of pressure and air delivery, inspite of their compact size.

Special attention has also been paid to the air-tightness of the air circuit (this is also checked during the functional tests to the burners on the production line); the air-tightness is guaranteed by special technical solutions and seals, and is always conserved after any servicing operations. All the conventional flue models can be easily converted to balanced flue, and vice versa, by using a special kit.



Air suction



COMBUSTION HEAD

There are several types of available combustion heads, to optimise all the various burner-boiler matchings. A simple adjustment to the combustion head (where fitted) allows adapting secondary air to the burner output.

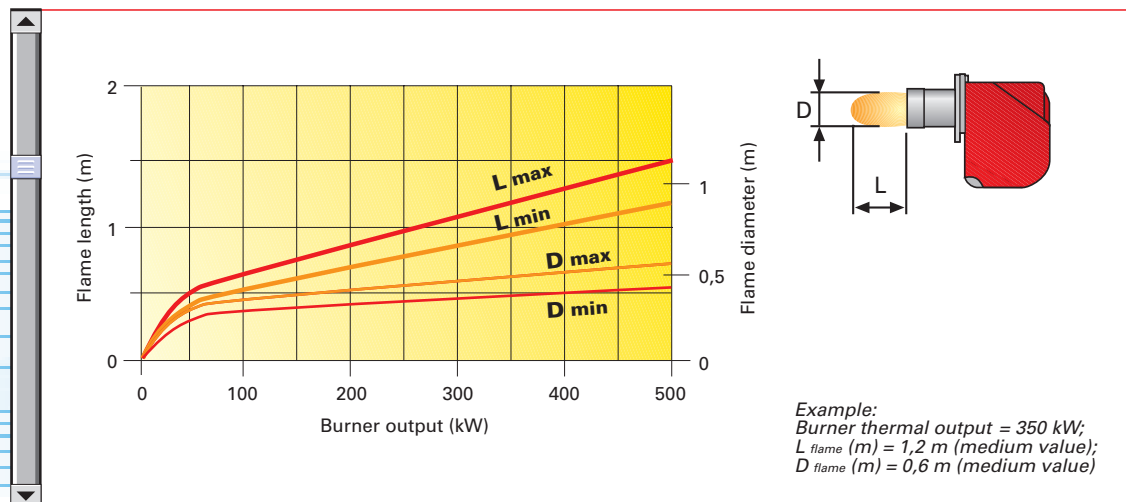


Adjustable combustion head



Fixed combustion head

Dimensions of the flame



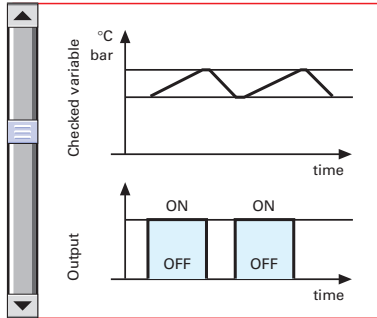
ADJUSTMENT

BURNER OPERATION MODE

All these models are one stage operation; the special profile on the air-damper and its micrometric adjustment, ensure precise working even at the lowest output levels of the burner.



"One stage" operation

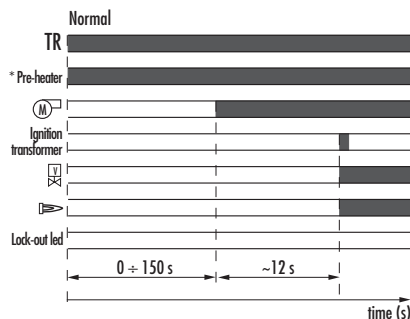


Air damper



Air damper adjustment

START UP CYCLE



* only model with pre-heater

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 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. The lock-out is shown by a led on the appliance.



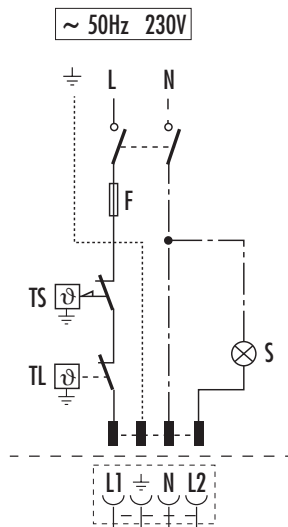
WIRING DIAGRAMS

Electrical connections must be made by qualified and skilled personnel in conformity with the local regulations in force. The terminal board is incorporated in the burner control box and connection is easy following the clear instructions that are given.



Appliance fitted with an ignition transformer

▶ "ONE STAGE" OPERATION

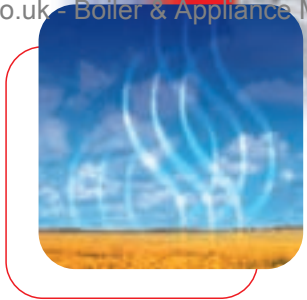


- S** - Lock out led
- TL** - Regulation thermostat
- TS** - Safety thermostat (manual reset)
- F** - Fuse

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

Model	▼RDB1-1R	▼RDB2-2R	▼RDB2.1-2.1R	▼RDB2.2-2.2R	▼RDB3	▼RDB3.2	▼RDB4
	230V	230V	230V	230V	230V	230V	230V
F A	6	6	T6	T6	T6	T6	T6
L mm ²	1	1	1	1	1	1	1

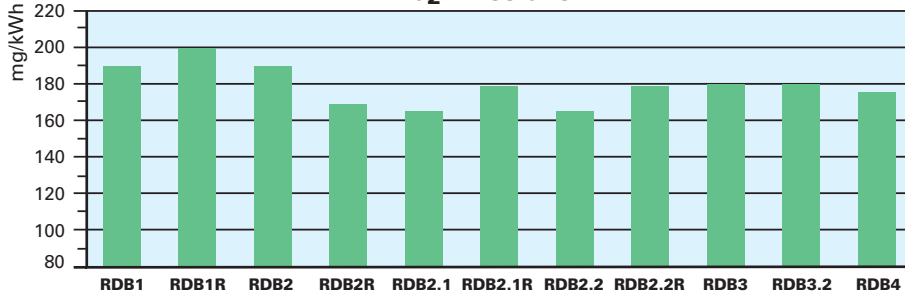
F = Fuse L = Lead section



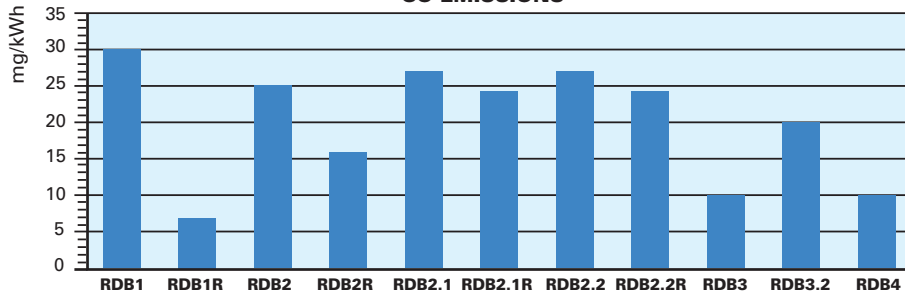
EMISSIONS



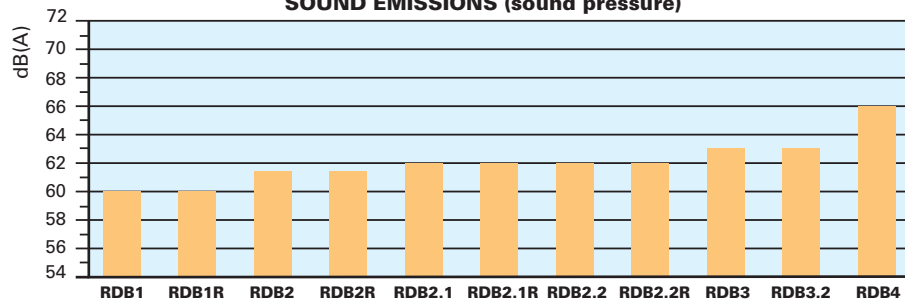
NO₂ EMISSIONS



CO EMISSIONS



SOUND EMISSIONS (sound pressure)



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



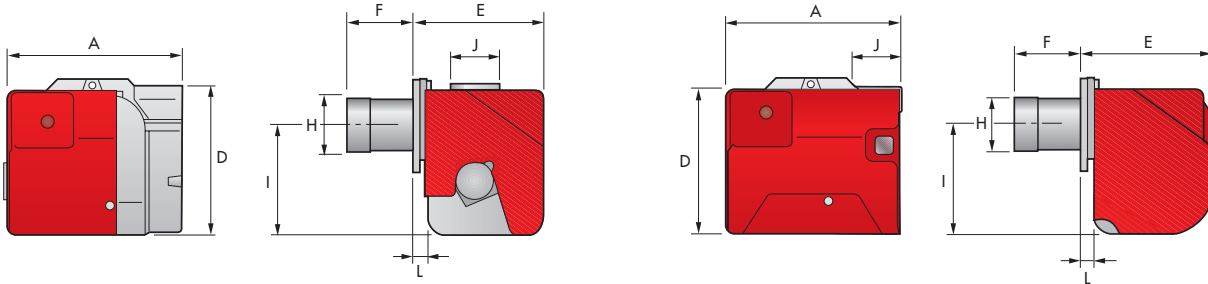
OVERALL DIMENSIONS (mm)

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

BURNER

RDB1-1R - RDB2-2R - RDB2.1-2.1R - RDB2.2-2.2R

RDB3 - RDB3.2 - RDB4

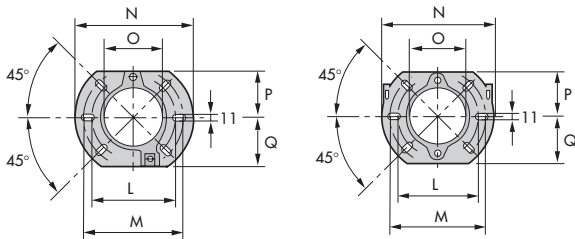


Model	A	D	H	F	E	L	I	J
▶ RDB1-1R	276	230	89-90	76-86	202	20	168	75
▶ RDB2-2R	276	230	89-90	76-86	202	20	168	75
▶ RDB2.1-2.1R	286	230	85	77	202	20	168	75
▶ RDB2.2-2.2R	286	230	85	77	202	20	168	75
▶ RDB3	325	268	88	78	253	30	204	75
▶ RDB3.2	325	268	95	69,5	253	30	204	75
▶ RDB4	325	268	105	111	253	30	204	75

BURNER-BOILER MOUNTING FLANGE

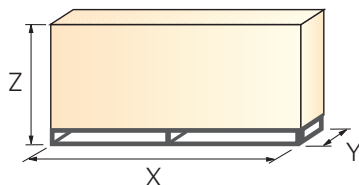
RDB1-1R - RDB2-2R
RDB2.1-2.1R - RDB2.2-2.2R

RDB3 - RDB3.2
RDB4



Model	L	M	N	O	P	Q
▶ RDB1-1R	130	150	180	91	72	72
▶ RDB2-2R	130	150	180	91	72	72
▶ RDB2.1-2.1R	130	150	180	91	72	72
▶ RDB2.2-2.2R	130	150	180	91	72	72
▶ RDB3	140	168	189	106	83	83
▶ RDB3.2	140	168	189	106	83	83
▶ RDB4	140	168	189	106	83	83

PACKAGING



Model	X	Y	Z	kg
▶ RDB1-1R	395	305	295	11
▶ RDB2-2R	395	305	295	11
▶ RDB2.1-2.1R	395	305	295	11
▶ RDB2.2-2.2R	395	305	295	11
▶ RDB3	435	360	355	15
▶ RDB3.2	435	360	355	15
▶ RDB4	435	360	355	15

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.



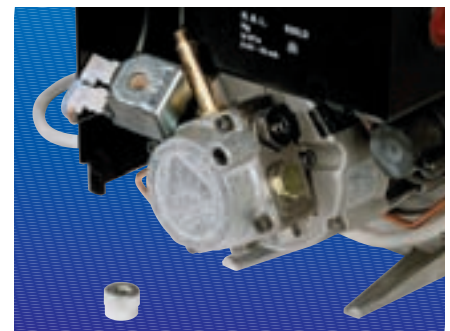
BURNER SETTING

- ▶ RDB series burners can be adjusted from the back of the burner just using a single tool; the air damper is easily adjustable (thanks to a micrometric screw and a position indicator) without removing the burner cover.
- ▶ Head setting area is easily accessible and the operation is simple thanks to a graduated scale.



MAINTENANCE

- ▶ In models RDB3 and RDB4, the maintenance position is easily carried out by hooking the burner to the flange, after removing it from the fixing screws.
- ▶ Maintenance is easy because all the components, including the combustion head, are easily accessed by just unscrewing a single nut.
- ▶ The main components - the control box, motor and pump - are outside the air circuit, thus avoiding any risk of oil build up inside the circuit.
- ▶ All the electrical components are connected by socket-plugs and they are easy to reach for controls.





BURNER ACCESSORIES

Balanced-conventional flue conversion kit

All the RDB series models are easily converted from conventional flue to balanced flue, by replacing the plastic screen on the air intake with the connector for the air supply pipe.

The reverse operation can be carried out on all the models from balanced flue to conventional flue burner, by replacing the connector on the air supply pipe with the plastic screen on the air intake.



Balanced-conventional flue conversion kit		
Burner	Balanced flue kit code	Conventional flue kit code
RDB1-1R - RDB2-2R RDB2.1-2.1R - RDB2.2-2.2R	3062774	3062775
RDB3 - RDB4	3062774	3062876

Tester

The tester controls the correct working of the burner components in the RDB series. It can be fitted to all the models, with or without pre-heater.

It is made up of two parts: a control instrument and a "control box" which replaces and simulates the one on the burner.

This tester is very simple to use: just replace the burner control box with the tester to check correct working of the motor, valve, pre-heater and flame probe (only photo-resistance).

This device has a display showing the levels that have been measured, a selection switch for selecting the component to be tested and four switches to be used in the various working stages of the burner.



Tester	
Burner	Kit code
RDB - RDB R	3087216



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

Light oil filter

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



Light oil filter		
Burner	Filtering degree (μm)	Kit code
All models	60	3006561

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

Light oil filter		
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.

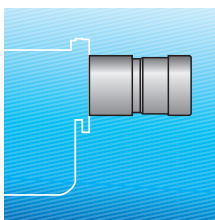
Light oil filter/degassing unit

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.



Light oil filter/degassing unit		
Burner	Filtering degree (μm)	Kit code
All models	100	3000926

Extended head kit



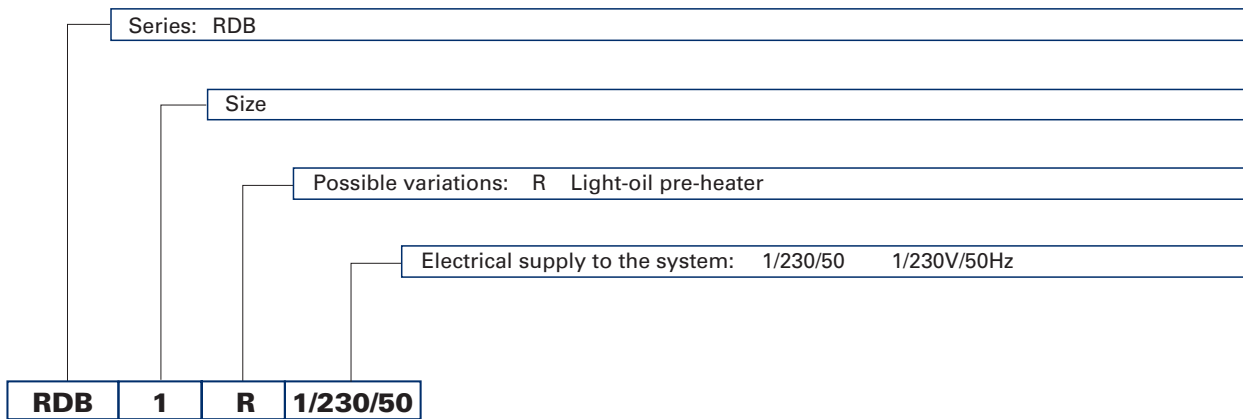
Extended head kit			
Burner	Standard head length (mm)	Extended head length (mm)	Kit code
RDB4	111	170	3004590



SPECIFICATION

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

DESIGNATION OF SERIES



AVAILABLE BURNER MODEL

RDB1-1R	1/230/50
RDB2-2R	1/230/50
RDB2.1-2.1R	1/230/50
RDB2.2-2.2R	1/230/50
RDB3	1/230/50
RDB3.2	1/230/50
RDB4	1/230/50



▶ PRODUCT SPECIFICATION

Burner

Completely automatic monobloc light oil and kerosene burners, with single-stage operation fitted with:

- Fan with forward inclined blades
- Air damper with external adjustment, with no need to remove the cover
- Air-tight air circuit, also available in the balanced flue version
- 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 (specific version for kerosene) 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
- Protective filter against radio interference
- Light oil nozzle
- IP 40 protection level
- Fuel pre-heater (optional).

Approval:

- EN 267 standard
- for RDB 2.2 - 2.2R in progress.

Conforming to:

- Directive 89/336/EEC (electromagnetic compatibility)
- Directive 73/23/EEC (low voltage)
- Directive 98/37/EEC (machinery)
- Directive 92/42/EEC (efficiency).

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
- Air intake
- Protection grill
- Exagonal key
- Instruction handbook for installation, use and maintenance
- Spare parts list.

Available accessories to be ordered separately:

- Balanced-conventional flue conversion kit
- Tester
- Light oil filter
- Light oil filter/ degassing unit
- Extended head kit (only for RDB4).



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