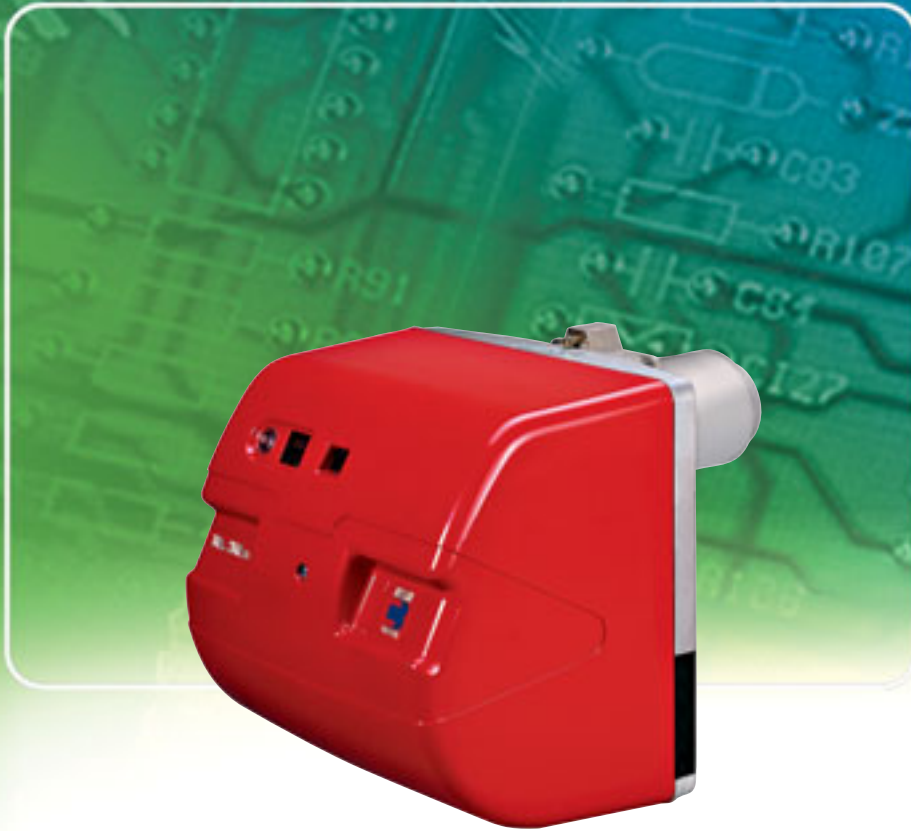


TWO STAGE LOW NO_x OIL BURNERS

▶ **RL BLU SERIES**

▶ **RL 22 BLU** 89/116 ÷ 261 kW

▶ **RL 32 BLU** 166/228 ÷ 356 kW



The RL BLU series of burners have been designed for use in hot or superheated water boilers, hot air or steam generators, diathermic oil boilers. The series includes two models with output range from 89 to 356 kW. A servomotor with three adjustable positions guarantees correct air output and air damper closing when the burner is turned off.

The burners are fitted with an electronic device STATUS PANEL, which supplies complete diagnostic: hour meter, ignition meter, identification of trouble shooting. Special care has been paid to keeping overall dimensions compact, to easy servicing, to design and to noise emissions.

The elevated performance of the fans and combustion head, guarantee flexibility of use and excellent working at all firing rates and low NO_x emissions.



TECHNICAL DATA

Model		▼ RL 22 BLU	▼ RL 32 BLU
Burner operation mode		Two-stage	
Modulation ratio at max. output		1,3 ÷ 1	
Servomotor	type	STA4,5 B0.37/6	
	run time	4,5	
Heat output	kW	89/116÷261	166/228÷356
	Mcal/h	77/100÷224	143/196÷306
	kg/h	7,5/15÷22	14/21÷30
Working temperature	°C min./max.	0/40	
Net calorific value	kWh/kg	11,8	
	kcal/kg	10200	
Viscosity	mm ² /s (cSt)	4 ÷ 6 (at 20°C)	
Pump	type	AT 2 55 C	
	delivery	60 (20 bar)	
Atomised pressure	bar	20	
Fuel temperature	Max. °C	50	
Fuel pre-heater			
Fan	type	Centrifugal with reverse curve blades	
Air temperature	Max. °C	60	
Electrical supply	Ph/Hz/V	1/50/230~(±10%)	
Auxiliary electrical supply	Ph/Hz/V	1/50/230~(±10%)	
Control box	type	LOA 24	
Total electrical power	kW	0,6	0,6
Auxiliary electrical power	kW	0,18	0,18
Heaters electrical power	kW	-	
Protection level	IP	44	
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	0,42	0,42
Rated fan motor current	A	2,9	2,9
Fan motor start up current	A	11	11
Fan motor protection level	IP	54	
Ignition transformer	type		
	V1 - V2	230V - 2x5 kV	
	I1 - I2	1,9A - 30 mA	
Operation		Intermittent (at least one stop every 24 h)	
Sound pressure	dBA	71	72
Sound power	W	--	--
CO emission	mg/kWh	< 10	
Grade of smoke indicator	N° Bacharach	< 1	
C _x H _y emission	mg/kWh	10 (After the first 20 s)	
NO _x emission	mg/kWh	< 120	
Directive		73/23 - 89/336 - 98/37 - 92/42 EEC	
Conforming to		EN 267	
Certification		CE 0036 0308/01	

Reference conditions:

Temperature: 20°C

Pressure: 1013.5 mbar

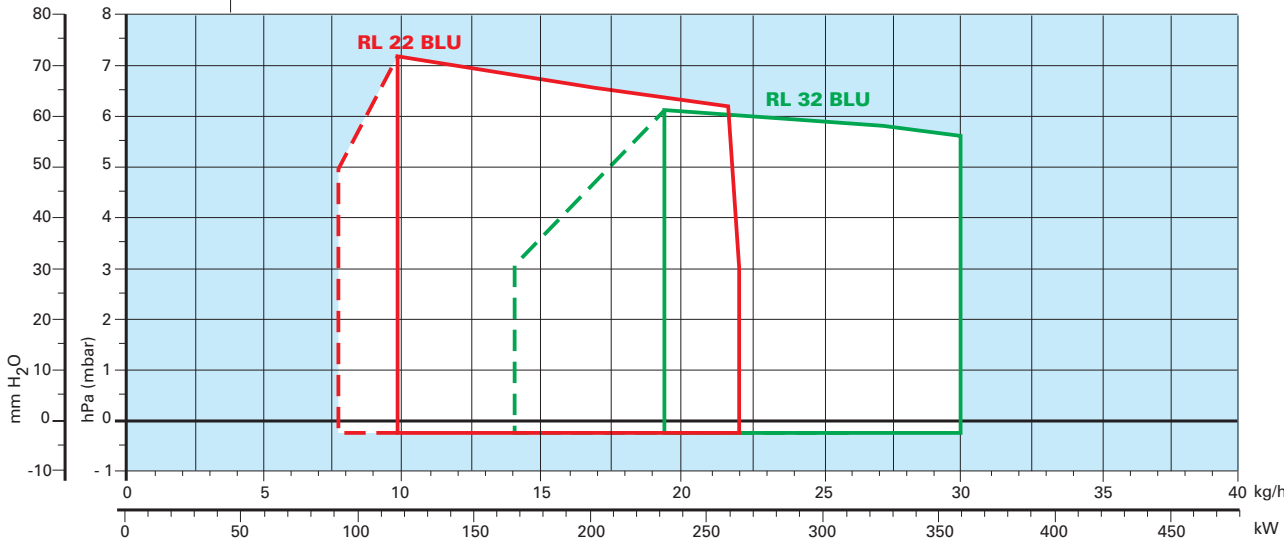
Altitude: 100 meters a.s.l.

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

 1st stage operating rate

Test conditions conforming to EN 267:

Temperature: 20°C
 Pressure: 1013,5 mbar
 Altitude: 100 m a.s.l.





FUEL SUPPLY

▶ HYDRAULIC CIRCUIT

The burners are fitted with a pump that controls passage from first to second stage by a pressure jump.

The pump is fitted with a safety valve, supplied on ignition and constantly during working, and a control valve for the passage from low to high pressure.

In first stage the control valve remains open and the fuel reaches the nozzle at low pressure; when the thermostat of the second stage triggers because greater heat is required, the control valve closes allowing the fuel to reach the nozzle at high pressure.

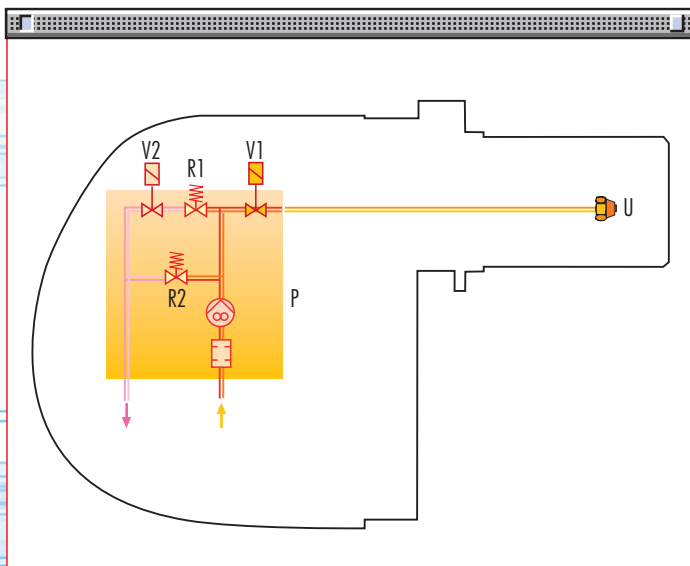
The pump does not need calibrating, as it is set in the factory at 22 bar in high pressure and 9 bar in low pressure; however, both pressure levels can be changed if necessary, by adjusting the regulators fitted on the pump.

The pump has a by-pass that links the return circuit with suction, in the case of single pipe working. The pump is fitted with the by-pass closed, which means it is set for working with two pipes.



Example of the hydraulic circuit on RL 32 BLU burners

Hydraulic layout of RL 22 - 32 BLU burners



P	Pump with filter and control of two stage output
V2	2 nd stage valve (normally open)
R1	1 st stage regulator
V1	1 st stage valve
U	Nozzle
R2	2 nd stage regulator

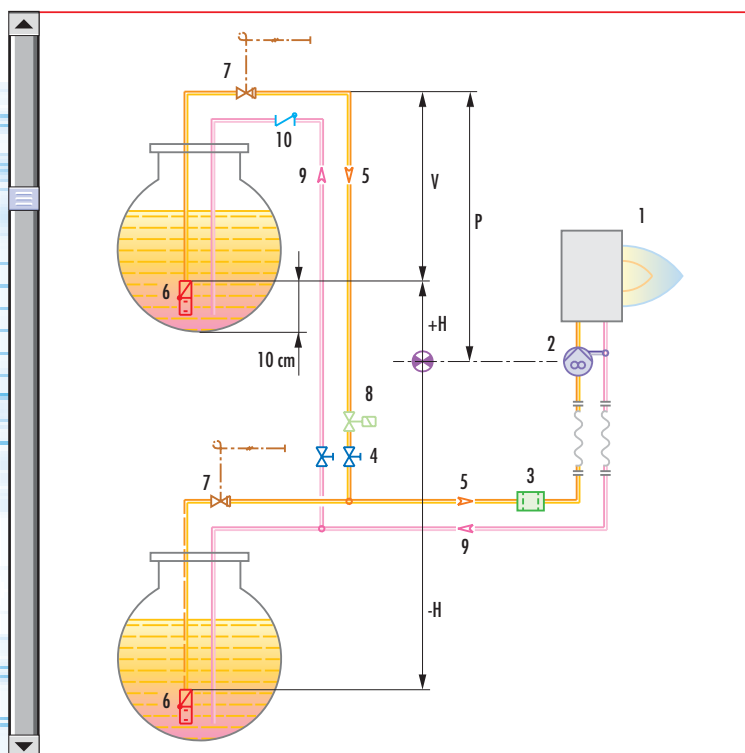


▶ SELECTING THE FUEL SUPPLY LINES

The fuel feed must be completed with the safety devices required by the local norms.

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

MAXIMUM EQUIVALENT LENGTH FOR THE PIPING L (m)			
Model	▼ RL22 BLU - RL32 BLU		
Piping diameter	Ø8mm	Ø10mm	Ø12mm
+H, -H (m)	L _{max} (m)	L _{max} (m)	L _{max} (m)
+4,0	52	134	160
+3,0	46	119	160
+2,0	39	104	160
+1,0	33	89	160
+0,5	30	80	160
0	27	73	160
-0,5	24	66	144
-1,0	21	58	128
-2,0	15	43	96
-3,0	8	28	65
-4,0	3	12	33



H	Difference in height pump-foot valve
Ø	Internal pipe diameter
P	Height ≤ 10 m
V	Height ≤ 4 m
1	Burner
2	Burner pump
3	Filter
4	Manual shut off valve
5	Suction pipework
6	Bottom valve
7	Remote controlled rapid manual shut off valve (compulsory in Italy)
8	Type approved shut off solenoid valve (compulsory in Italy)
9	Return pipework
10	Check valve

▶ **note** with ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.



VENTILATION

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

The use of reverse curve blades and sound-proofing material keeps noise level very low.

Air setting through the servomotor guarantees correct fuel output at each working stage.



Example of air setting servomotor



COMBUSTION HEAD

The combustion head has been designed to create partial smoke recirculation; this way, thanks to lower temperatures reached, NOx emissions are reduced, taking the value below the level allowed by the strictest norms.

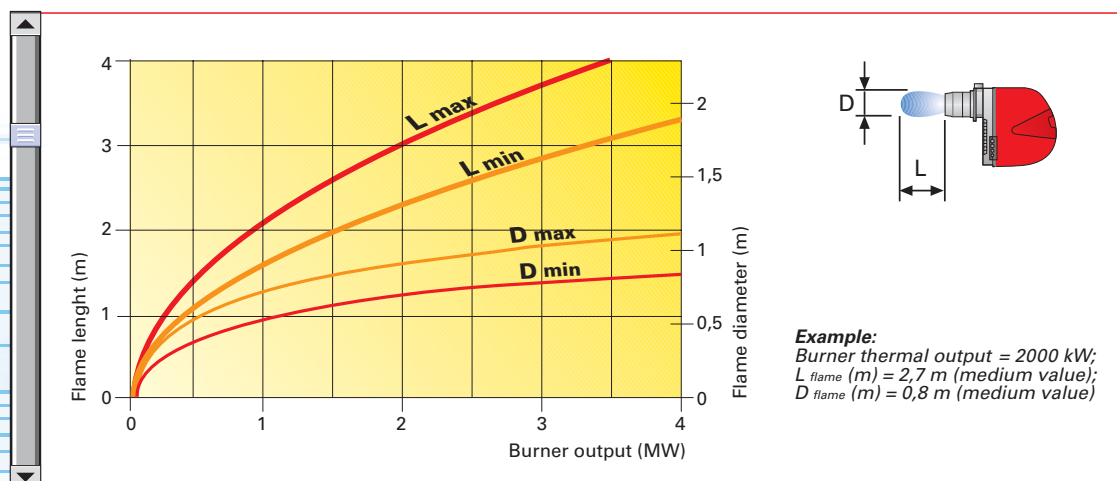
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

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



Example of a RL/BLU burner combustion head

Flame dimensions



ADJUSTMENT



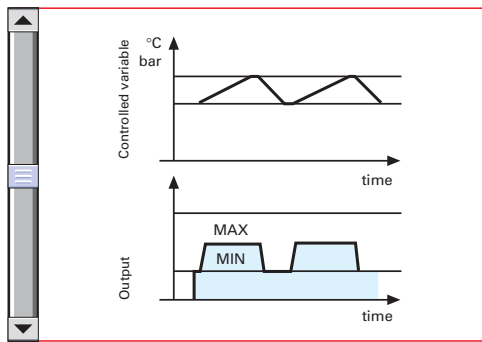
BURNER OPERATION MODE

With two-stage setting, the RL 22 and 32 BLU burners can follow the temperature load requested by the system.

A modulation ratio of 1.3:1 is reached, thanks to the "pressure jump" technique; the air is adapted to the servomotor rotations.

On "two stage" setting, the burner gradually adjusts output to the requested level, by varying between the two pre-set levels (see picture A).

Two-stage setting



Picture A

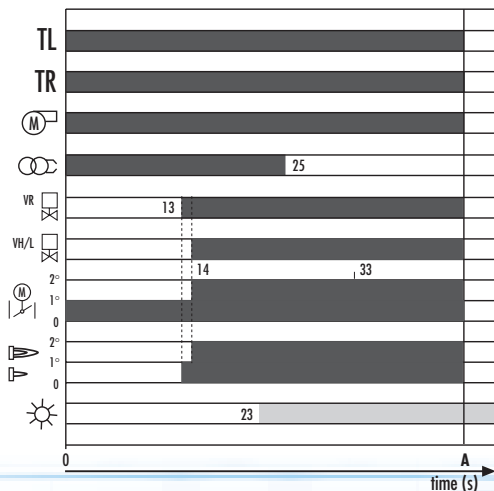
●	⊗	🔥	🔥	🔥	🔥	⚡	●	"0"
●	●	●	●	●	●	●	●	"T"
●	●	●	⚡	●	●	●	●	"T"
●	●	●	⚡	●	●	●	●	"1111"
●	●	●	⚡	●	●	●	●	"1111"
●	●	●	●	●	●	●	●	"..."

- = Electrical supply on
- = Fan motor lock-out
- = Burner lock-out
- = 2nd stage operation
- = 1st stage operation
- = Heating load reached (Stand-by)
- = LED flashing
- = LED steady

The RL 22-32 BLU burners are equipped of an exclusive electronic device "Status Panel" that, in every moments, shows all burners operational modes and finds eventual anomalies during the operational cycle.

START UP CYCLE

RL 22 BLU - RL 32 BLU



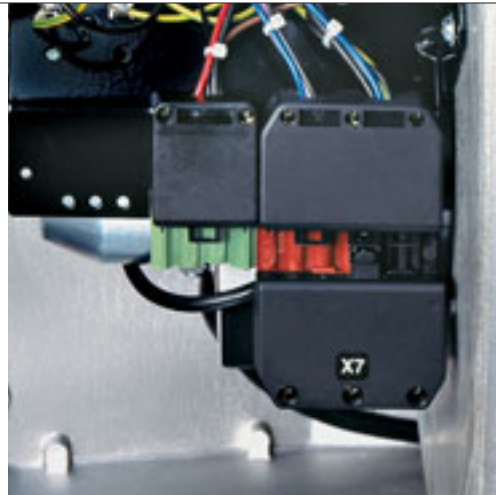
- 0" The burner begins the firing cycle: the motor and transformer are supplied; the servomotor opens in the pre-purge position.
- 13" Ignition: the VR valve is supplied.
- 14" Output can be increased: the servomotor opens in the 2nd stage position and the VH/L valve is supplied.



WIRING DIAGRAMS

Electrical connections must be made by qualified and skilled personnel, according to the local norms.

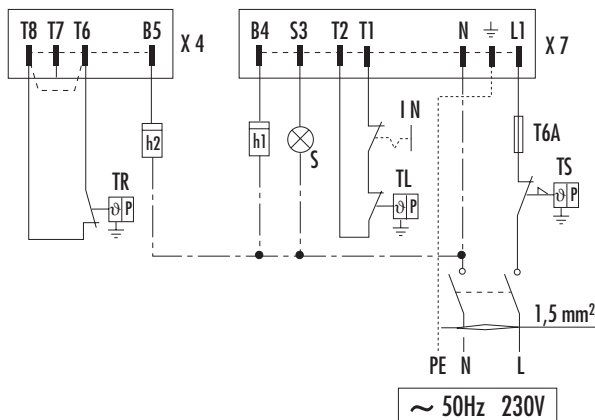
RL22 and 32 BLU burners are supplied with sockets and plugs for easier electrical connections.



Example of the terminal board for electrical connections

"TWO-STAGE" OPERATION

RL 22 BLU - RL 32 BLU

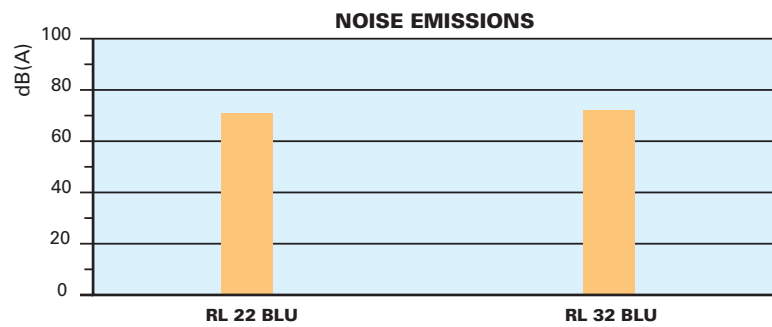
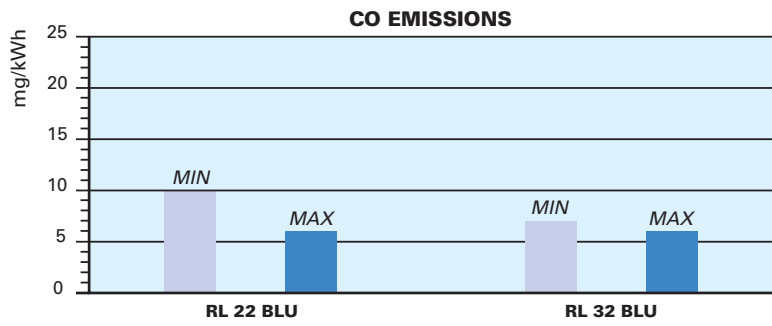
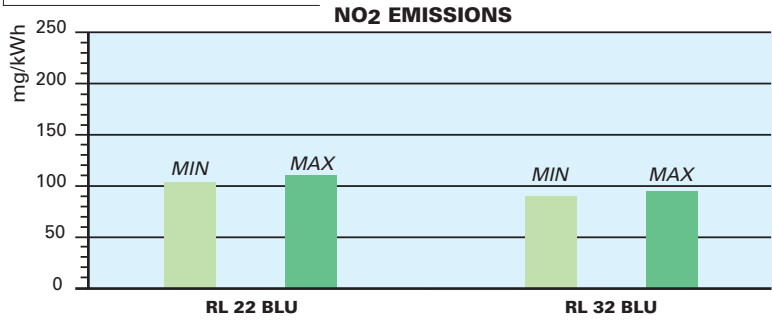


- h1** - First stage hour meter
- h2** - Second stage hour meter
- IN** - Manual switch
- X4** - 4 pin plug
- X7** - 7 pin plug
- S** - External lock-out signal
- TL** - Threshold thermostat
- TR** - High/low flame setting thermostat
- TS** - Safety thermostat
- T6A** - 6a fuse

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

Model	▼ RL 22 BLU	▼ RL 32 BLU
	230V	230V
F A	T6	T6
L mm ²	1,5	1,5

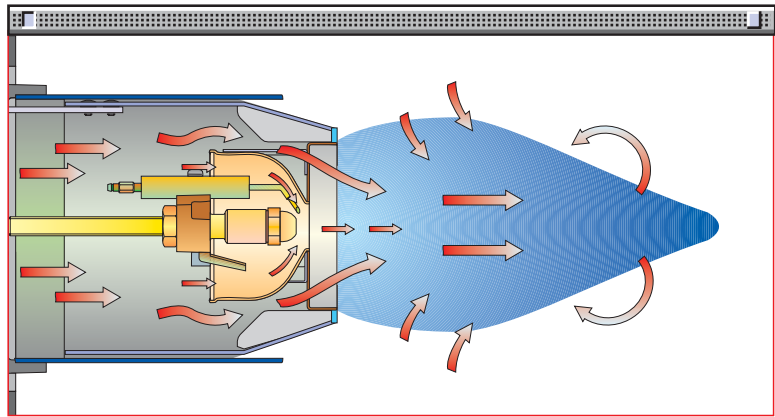
EMISSIONS



The emissions of NO₂ and CO have been measured, for the various models, at minimum and maximum output according to EN 267 standard.

Sound emissions have been measured at maximum output.

Combustion head operating diagram



The combustion head on the RL 22 - 32 BLU burners is a conical type, and its operating principle is based on recirculating the combustion exhaust gas; even distribution of air to the head guarantees optimum mix to the elements.

The special design of the central diffuser also allows optimum ignition and air control.

The first quantity of air is aimed towards the centre of the head, where combustion develops to avoid strong flame oxidation. A second part is directed towards

the flame stability disc where, due to the conic shape of the mobile shutter, it gains speed and activates smoke recirculation. All this aids reduction of polluting emissions, obtaining values lower than the levels allowed by the strictest regulations norms.

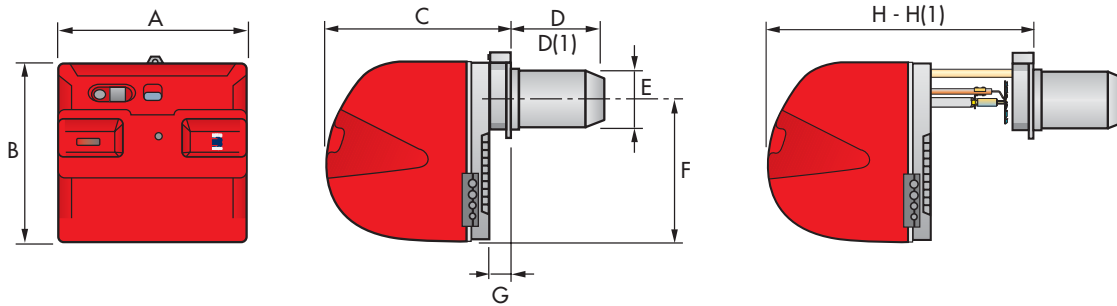




OVERALL DIMENSIONS (mm)

BURNER

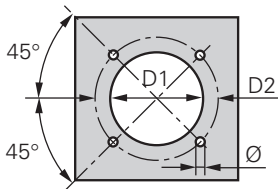
RL 22 BLU - RL 32 BLU



Model	A	B	C	D - D(1)	E	F	G	H - H(1)
▶ RL 22 BLU	476	474	468	197 - 276	140	352	52	604 - 739
▶ RL 32 BLU	476	474	468	217 - 293	140	352	52	604 - 739

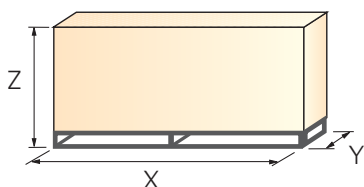
(1) dimension with extended head

BURNER - BOILER MOUNTING FLANGE



Model	D1	D2	Ø
▶ RL 22 BLU	160	224	M8
▶ RL 32 BLU	160	224	M8

PACKAGING



Model	X	Y	Z	kg
▶ RL 22 BLU	850	540	550	40
▶ RL 32 BLU	850	540	550	41

INSTALLATION DESCRIPTION

Installation, start up and maintenance must be carried out by qualified and skilled personnel.
All operations must be performed in accordance with the technical handbook supplied with the burner.



BURNER SETTING

- ▶ All the burners have slide bars, for easier installation and maintenance.
- ▶ After drilling the boilerplate, using the supplied gasket as a template, dismantle the blast tube from the burner and fix it to the boiler.
- ▶ Adjust the combustion head.
- ▶ Refit the burner casing to the slide bars.
- ▶ Install the nozzle, choosing this on the basis of the maximum boiler output and following the diagrams included in the burner instruction handbook.
- ▶ Check the position of the electrodes.
- ▶ Close the burner, sliding it up to the flange, keeping it slightly raised to avoid the flame stability disk rubbing against the blast tube.



HYDRAULIC / ELECTRICAL CONNECTIONS AND START UP

- ▶ The burners are supplied for connection to two pipes fuel supply system.
- ▶ Connect the ends of the flexible pipes to the suction and return pipework using the supplied nipples.
- ▶ Make the electrical connections to the burner following the wiring diagrams included in the instruction handbook.
- ▶ Prime the pump by turning the motor.
- ▶ On start up, check:
 - Pressure pump (to max. and min.)
 - Combustion quality, in terms of unburned substances and excess air.





BURNER ACCESSORIES

Nozzles

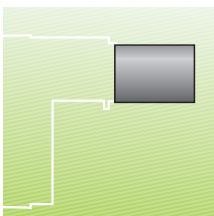
Normally, RL 22 and 32 BLU burners require standard or full nozzles; the nozzles are chosen on the basis of the maximum output required from the application. The features of the recommended nozzles are listed below.



Nozzles				
GPH	Rated output [kg/h] at 8 [bar]	Rated output [kg/h] at 20 [bar]	Delavan 60° A Code	Monarch 60° PLP Code
2.25	7.4	11.9	3042134	3041132
2.50	8.2	13.4	3042144	3041142
3.00	9.9	16.1	3042148	3041152
3.50	11.5	18.8	3042164	3041162
4.00	13.2	21.5	3042174	3041172
4.50	14.8	24.0	3042184	3041182
5.00	16.5	26.8	3042194	3041192
5.50	18.1	29.5	3042204	3041202
6.00	19.8	32.2	3042214	3041212

Extended heads

“Standard head” burners can be transformed into “extended head” versions, by using the special kit. The kits available for the various burners, giving the original and the extended lengths, are listed below.



Combustion head extension kits			
Burner	Standard head length (mm)	Extended head length (mm)	Kit code
RL 22 BLU	197	276	3010204
RL 32 BLU	217	293	3010205

Sound proofing box

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



Sound proofing box			
Burner	Box type	Average noise reduction [dB(A)] (*)	Box code
RL 22 BLU - RL 32 BLU	C1/3	10	3010403

(*) according to EN 15036-1 standard



Degassing unit

With single pipe systems, you can find air in the oil sucked by the pump that comes from the oil itself due to negative pressure or to a faulty seal.

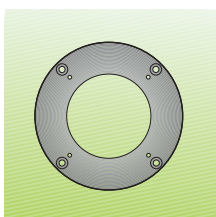
To solve this problem, we recommend fitting a degassing unit near the burner. Two versions are available with or without filter:



Degassing unit			
Burner	Filter	Filtering degree (μm)	Degassing unit code
RL 22 BLU - RL 32 BLU	With filter	50 - 75	3010055
RL 22 BLU - RL 32 BLU	Without filter	-	3010054

Connection flange kit

A kit is available for use where the burner opening on the boiler is of excessive diameter.



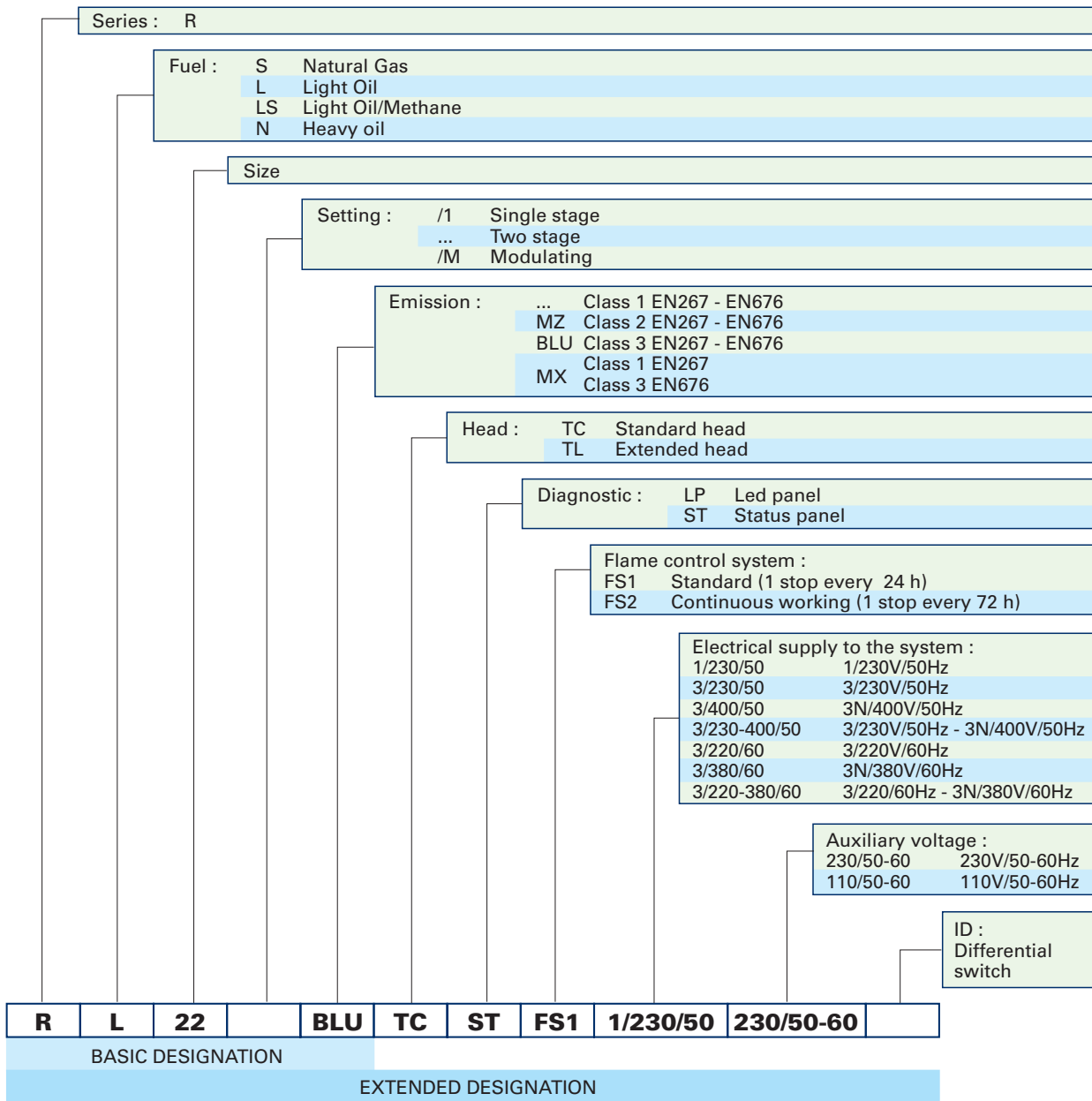
Connection flange kit	
Burner	Kit code
RL 22 BLU - RL 32 BLU	3010138



SPECIFICATION

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

DESIGNATION OF SERIES



AVAILABLE BURNER MODELS

RL	22	BLU	TC	ST	FS1	1/230/50	230/50-60
RL	32	BLU	TC	ST	FS1	1/230/50	230/50-60

Other versions are available on request.



▶ PRODUCT SPECIFICATION

Burner:

Monoblock forced LOW NOx oil burner with completely automatic two stage setting, made up of:

- air suction circuit lined with sound-deadening material
- fan with reverse curve blades high performance with low sound emissions
- air damper for air setting, driven by the adjustable servomotor
- starting motor at 2800 rpm, single-phase, 230V and 50Hz
- low emission combustion head, that can be set on the basis of required output, fitted with:
 - stainless steel end cone, resistant to corrosion and high temperatures
 - ignition electrodes
 - flame stability disk
- gears pump for high pressure fuel supply, fitted with:
 - filter
 - pressure regulator
 - connections for installing a pressure gauge and vacuumeter
 - internal by pass for single pipe installation
- two oil valves fitted directly on to the pump
- photocell for flame detection
- flame control panel
- electronic device to check all burners operational modes (status panel)
- burner on/off switch
- manual high/low flame switch
- flame inspection window
- slide bars for easier installation and maintenance
- protection filter against radio interference
- IP 44 electric protection level.

Conforming to:

- 89/336/EEC directive (electromagnetic compatibility)
- 73/23/EEC directive (low voltage)
- 92/42/EEC directive (performance)
- 98/37/EEC directive (machinery)
- EN 267 (liquid fuel burners).

Standard equipment:

- 1 nozzle
- 2 flexible pipes for connection to the oil supply network
- 2 gaskets for the flexible pipes
- 2 nipples for connection to the pump
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- wiring loom fittings for electrical connections
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

Available accessories to be ordered separately:

- nozzles
- extended head kit
- sound-proofing box
- degassing unit
- connection flange kit.



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