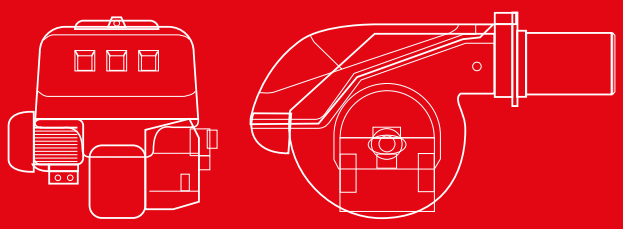
TECHNICAL DATA LEAFLET

LOW NOx LIGHT OIL

RL/M BLU Series

Low NOx Modulating Light Oil Burners

RL 55/M BLU	190/356	÷	712	kW
RL 85/M BLU	223/594	÷	1023	kW



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Energy For Life

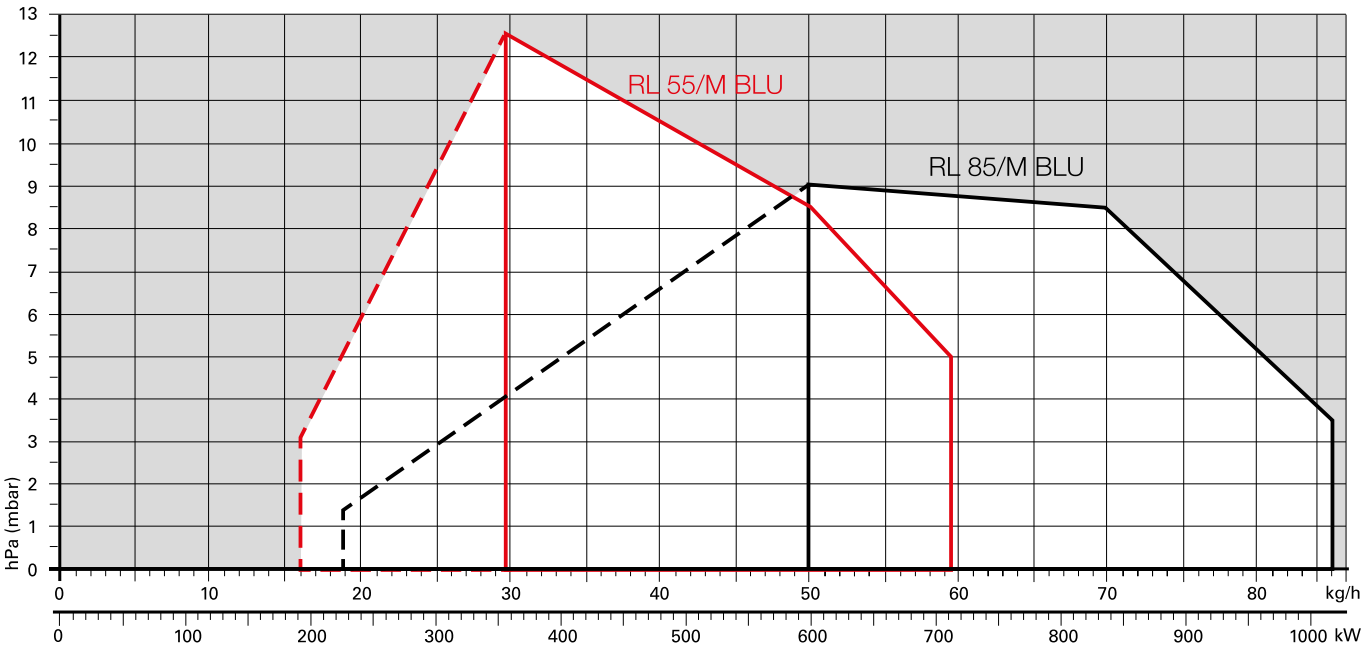
The RL/M BLU burners series covers a firing range from 360 to 1023 kW, and it has been designed for use in hot or superheated water boilers, hot air or steam generators and diathermic oil boilers.
0peration can be "two stage progressive" or, alternatively, "modulating" with the installation of a PID logic regulator and respective probes.
RL/M BLU burners series guarantees high efficiency levels in all applications, thus reducing fuel consumption and running costs.
Sound emissions optimisation is guaranteed by the use of fans with reverse curve blades and sound deadening material incorporated in the air suction circuit.
The exclusive design ensures reduced dimensions, simple use and maintenance. A wide range of accessories guarantees elevated working flexibility.

Technical Data

MODEL			RL 55/M BLU	RL 85/M BLU
OUTPUT	MAX.	kW Mcal/h kg/h	356 - 712 307 - 614 30 - 60	594 - 1023 512 - 882 50 - 86.2
	MIN.	kW Mcal/h kg/h	190 - 356 164 - 307 16 - 30	223 - 594 192 - 512 18.8 - 50
FUEL			LIGHT OIL	
- net calorific value		kWh/kg Mcal/kg	11.86 10.2 (10.200 kcal/kg)	
- density		kg/dm³	0.82 - 0.85	
- viscosity at 20 °C		mm²/s	max 6 (1.5 °E - 6 cSt)	
OPERATION			On-Off (min 1 stop each 24 hours). These burners are also fiitted for the continuous operation, if they are equipped with the control box LANDIS type LOK 16.250 A27 (interchangeable with the burner control box LANDIS LAL 1.25). Progressive two-stage (modulating by Kit)	
NOZZLE		number	1 (nozzle with return)	
STANDARD APPLICATIONS			Boilers: water, steam, diathermic oil	
AMBIENT TEMPERATURE		°C	0 - 40	
COMBUSTION AIR TEMPERATURE		°C max	60	
ELECTRICAL SUPPLY		V Hz	230 - 400 with neutral +/-10% 50 - three-phase ~	
ELECTRIC MOTOR		rpm W V A	2850 1800 230 - 400 6.1 - 3.5	2860 2200 230 - 400 7.9 - 4.6
IGNITION TRANSFORMER		V1 - V2 I1 - I2	230 V - 2 x 5 kV 1.9 A - 30 mA	
PUMP	delivery (at 20 bar) pressure range fuel temperature	kg/h bar °C max	163 10 - 21 90	
ELECTRICAL POWER CONSUMPTION		W max	2200	2600
ELECTRICAL PROTECTION			IP 44	
EMISSIONS				
Noise levels	sound pressure	dB (A)	78.5	78.5
	sound power	dB (A)	89.5	89.5
Light oil	CO emission	mg/kWh	< 10	
	NOx emission	mg/kWh	< 185	
APPROVAL				
Directive			2006/42/EC - 2014/30/UE - 2014/35 UE	
Conforming to			EN 267	
Certification			CE-0440/B	

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

Modulation range

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

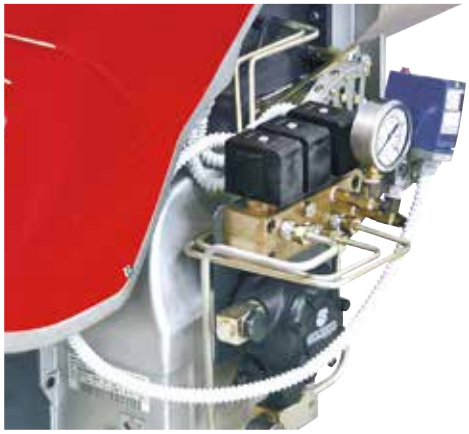
NOTE:
the RL 55-85/M BLU burners are designed exclusively for combustion chambers with flue gas outlet from the bottom, for example three flue gas passes (not reverse flame boilers) accessible through the door.
Maximum thickness of the frontal boiler wall: 250 mm.
Exhaust gases ducts must be always and exclusively directed upwards; change in directions must be realized only by bent elements; the angle between the axis of the stroke coming out of the combustion chamber and the axis of the chimney must be smaller than 45°.

Fuel Supply

HYDRAULIC CIRCUITS

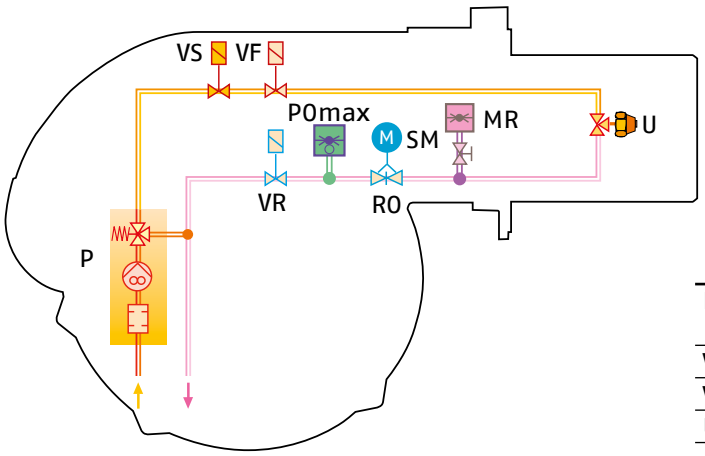
Various hydraulic circuits are available, depending on fuel output asset according to local norms of steam generators.

The burners are fitted with two valves for oil output from the pump: a pressure regulator on the return circuit from the nozzle allows varying the quantity of burnt fuel.
A safety valve on the return circuit impedes oil leakage from the nozzle when the burner is in stand by and pre-purge phases.



Example of the hydraulic circuit on RL 85/M BLU burners

Hydraulic layout of RL/M BLU burner

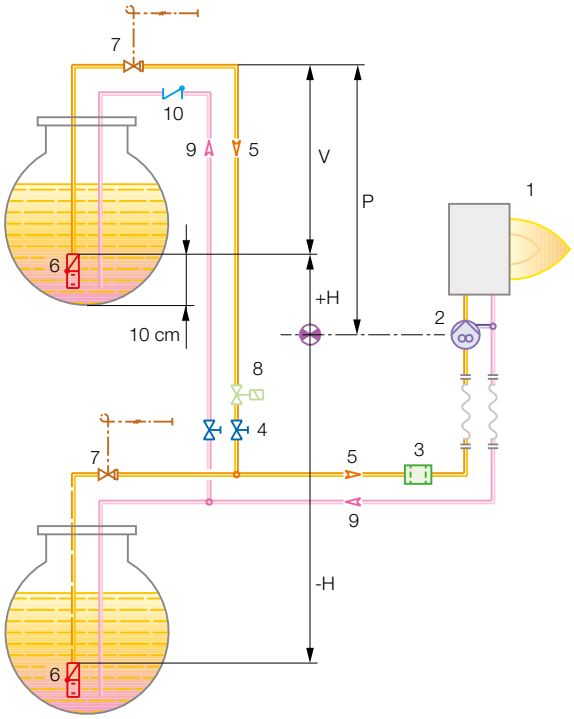


P	Pump with filter and pressure regulator on the output circuit
VS	Safety valve on the output circuit
VF	Working valve on the output circuit
U	Nozzle
MR	Pressure gauge on the return circuit
SM	Servomotor
R0	Pressure regulator on the return circuit
P0 max	Max. 0il pressure switch on the return circuit
VR	1st safety valve on the return circuit

DIMENSIONING OF 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]

Diameter piping	Ø12 mm	Ø14 mm	Ø16 mm
+ H - H (m)	L max (m)	L max (m)	Lmax (m)
+ 4,0	71	138	150
+ 3,0	62	122	150
+ 2,0	53	106	150
+ 1,0	44	90	150
+ 0,5	40	82	150
0	36	74	137
- 0,5	32	66	123
- 1,0	28	58	109
- 2,0	19	42	81
- 3,0	10	26	53
- 4,0	-	10	25

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

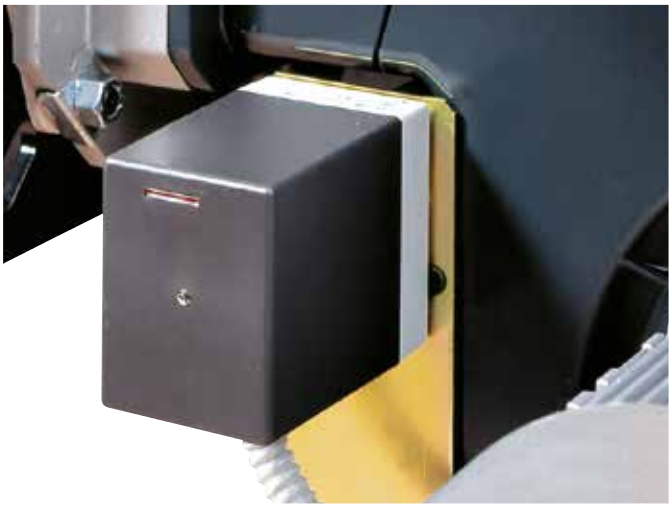
With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.

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.

A variable profile cam connects fuel and air setting, ensuring high fuel efficiency in all firing ranges.



Example of the servomotor for air/oil setting

Combustion Head

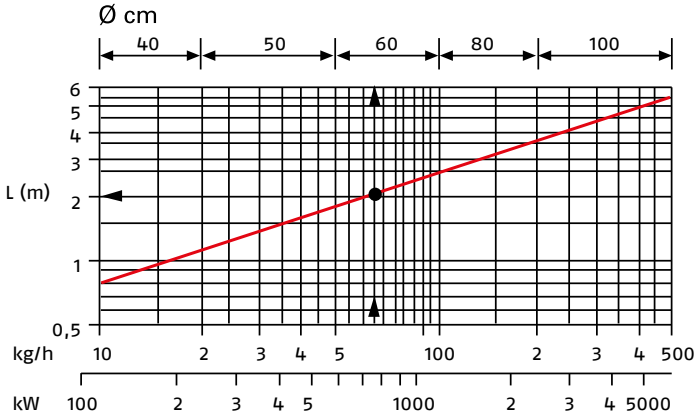
The combustion head has been designed to create partial smoke recirculation; this way, thanks to lower temperatures reached, NOx emissions are reduced, taking the value below the level allowed by the strictest norms.

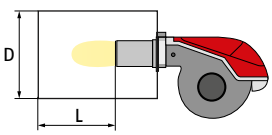
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

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/M BLU burner combustion head

DIMENSIONS OF THE COMBUSTION CHAMBER





$L\ (m) = 0{,}25 \sqrt{kg/h}$

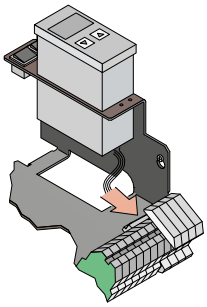
Operation

BURNER OPERATION MODE

The RL/M BLU series of burners can have “two-stage progressive” or “modulating” operation.

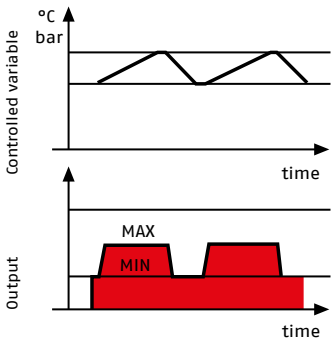
On “two-stage progressive” operation, the burner gradually adapts the output to the requested level, by varying between two pre-set levels (see picture A).

On “modulating” operation, normally required in steam generators, in superheater boilers or diathermic oil burners, a specific regulator and probes are required. These are supplied as accessories that must be ordered separately. The burner can work for long periods at intermediate output levels (see figure B).



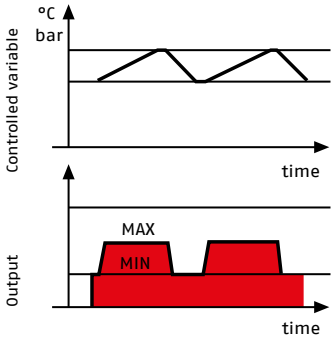
Example of a regulator

“TWO-STAGE PROGRESSIVE” OPERATION



Picture A

“MODULATING” OPERATION

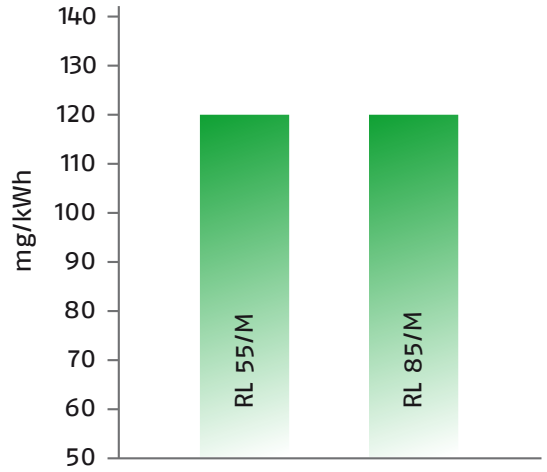


Picture B

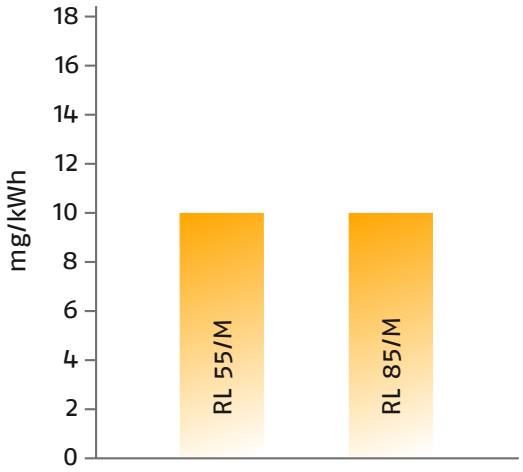
Emissions

The emissions of N02 and C0 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.

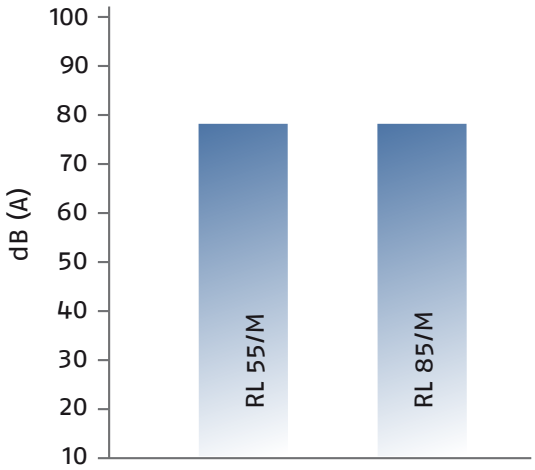
NO_2 EMISSIONS



CO EMISSIONS

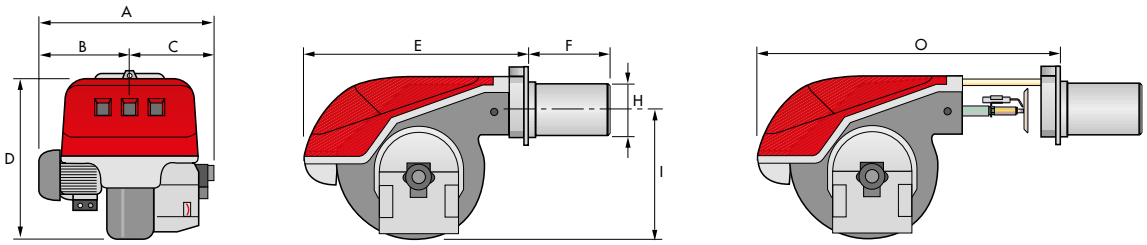


NOISE EMISSIONS



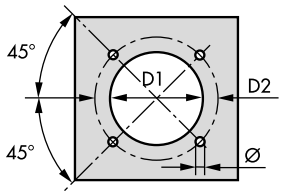
Overall Dimensions (mm)

BURNER



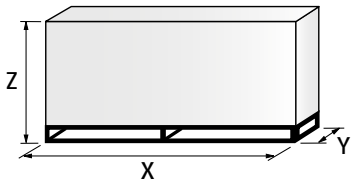
MODEL	A	B	C	D	E	F	H	I	O
RL 55/M BLU	663	296	367	555	680	365	189	430	951
RL 85/M BLU	705	338	367	555	680	365	189	430	951

BURNER – BOILER MOUNTING FLANGE



MODEL	D1	D2	Ø
RL 55/M BLU	195	275-325	M12
RL 85/M BLU	195	275-325	M12

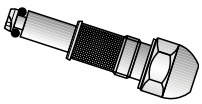
PACKAGING



MODEL	X	Y	Z	KG
RL 55/M BLU	1270	745	885	65
RL 85/M BLU	1270	745	885	70

Burner Accessories

Nozzles type A3 60°



The return nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required fuel output.

BURNER	RATED DELIVERY (kg/h) (*)	NOZZLE CODE
RL 55-85/M BLU	30	3009867
	40	3009868
	50	3009869
	60	3009870
	90	3009871

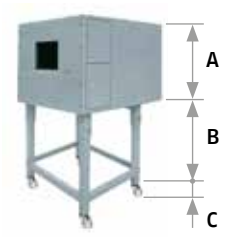
(*) Nozzle rated delivery is referred to atomised pressure

Spacer kit

If burner head penetration into the combustion chamber needs reducing, varying thickness spacers are available, as given in the following table:

BURNER	SPACER THICKNESS S (mm)	KIT CODE
RL 55-85/M BLU	135	3010129

Sound proofing box



If noise emission needs reducing even further, sound-proofing boxes are available.
In case of generator heights, where a lower dimension "B" is required, ask for the Box Support Kit code 20065135.

BURNER	BOX TYPE	A (mm)	B (mm) min-max	C (mm)	[dB(A)] (*)	BOX CODE
RL 55-85/M BLU	C4/5	850	160 - 980	110	10	3010404

(*) Average noise reduction according to EN 15036-1 standard

Degasing unit

To solve problem of air in the oil sucked, two versions of degasing unit are available.

BURNER	FILTER	FILTERING DEGREE (µm)	DEGASING UNIT CODE
RL 55-85/M BLU	With filter	50 - 75	3010055
RL 55-85/M BLU	Without filter	-	3010054

NOTE: For burner deliveries higher than 80 kg/h, install two parallel degasing units.

Accessories for modulating operation

To obtain modulating operation, the RL/M BLU series of burners requires a regulator with three point outlet controls. The following table lists the accessories for modulating operation with their application range.

BURNER	REGULATOR TYPE	REGULATOR CODE
RL 55-85/M BLU	RWF 50.2	20082208
	RWF 55.5	20099657

The relative temperature or pressure probes fitted to the regulator must be chosen on the basis of the application.

BURNER	PROBE TYPE	RANGE (°C) (bar)	PROBE CODE
RL/M BLU	Temperature PT 100	-100 ÷ 500°C	3010110
RL/M BLU	Pressure 4 ÷ 20 mA	0 ÷ 2,5 bar	3010213
RL/M BLU	Pressure 4 ÷ 20 mA	0 ÷ 16 bar	3010214

Depending on the servomotor fitted to the burner, a three-pole potentiometer (1000 Ω) can be installed to check the position of the servomotor. The KITS available for the various burners are listed below.

BURNER	POTENTIOMETER KIT CODE
RL 55-85/M BLU	3010021

Specification

DESIGNATION OF SERIES

A specific index guides your choice of burner. Below is a clear and detailed specification description of the product.

Series:	R	
Fuel:	S	Natural Gas
	SP	LPG
	L	Light oil
	LS	Light oil/Methane
	N	Heavy oil
Size		
Setting:	/1	Single stage
	...	Two stage
	/M	Modulating
Emission:	...	Class 1 EN267 - EN676
	MZ	Class 2 EN267 - EN676
	BLU	Class 3 EN267 - EN676
	MX	Class 1 EN267 Class 3 EN676
Head length:	TC	standard head
	TL	extended head
Flame control system:	FS1	Standard (1 stop every 24 h)
	FS2	Continuous working (1 stop every 72 h)
Electrical supply to the system:		
1/230/50		1/230V/50Hz
1/220-230/50-60		1/220-230V/50-60Hz
3/230/50		3/230V/50Hz
3/400/50		3N/400V/50Hz
3/230-400/50		3/230V/50Hz - 3N/400V/50Hz
3/220/60		3/220V/60Hz
3/380/60		3N/380V/60Hz
3/220-380/60		3/220V/60Hz - 3N/380V/60Hz
3/220-400/50-60		3/220-230V/50-60Hz 3/380-400V/50-60Hz
Auxiliary voltage:	230/50-60	230V/50-60Hz
	220-230/50-60	220-230V/50-60Hz
	110/50-60	110V/50-60Hz
ID:	Differential switch	

R	L	55	/M	BLU	TC	FS1	1/230/50	230/50-60	
BASIC DESIGNATION									
EXTENDED DESIGNATION									

AVAILABLE BURNER MODELS

RL 55/M BLU	TC	FS1	3/230-400/50	230/50-60
RL 85/M BLU	TC	FS1	3/230-400/50	230/50-60

0ther versions are available on request.

PRODUCT SPECIFICATION

Monoblock forced draught oil burner with two stage progressive or modulating setting, with a specific kit, fully automatic, made up of:
- air suction circuit lined with sound-proofing material
- fan with reverse curve blades high performance with low sound emissions
- air damper for air setting and automatic oil output regulator controlled by a servomotor with variable cam
- starting motor at 2800 rpm, three-phase 400V with neutral, 50Hz
- 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 vacuometer
- internal by-pass for single pipe installation
- valve unit with a double oil safety valve on the output circuit and safety valve on the return circuit; double safety valve on the return circuit
- safety oil pressure switch for stop the burner in case of problems in the return circuit
- photocell for flame detection
- burner safety control box, fitted with control function for the correct positioning of the servomotor and possibility of post-ventilation by just changing the electric wiring
- burner on/off switch
- flame inspection window
- manual or automatic output increase/decrease switch
- slide bars for easier installation and maintenance
- protection filter against radio interference
- IP 44 electric protection level.

Conforming to:
- 2014/30 UE Directive (electromagnetic compatibility)
- 2014/35 UE Directive (low voltage)
- 2006/42 EC Directive (machine)
- EN 267 (liquid fuel burners)

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

Available accessories to be ordered separately:
- nozzle
- spacer kit
- sound-proofing box
- degasing unit
- accessories for modulating operation

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

10/2016
TS0071UK04

[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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