

# RL/M Series Modulating Light Oil Burners

| RL28/M  | 90/166 ÷ 33   | 2 kW  |
|---------|---------------|-------|
| RL38/M  | 101/237 ÷ 45  | 0 kW  |
| RL50/M  | 130/296 ÷ 59  | 3 kW  |
| RL70/M  | 261/474 ÷ 10  | 43 kW |
| RL100/M | 332/711 ÷ 14  | 82 kW |
| RL130/M | 498/948 ÷ 177 | 79 kW |
| RL190/M | 534/1423 ÷ 24 | 31 kW |







www.riello.com

The Riello RL/M series of burners covers a firing range from 166 to 2431 kW, and they have been designed for use in hot or superheater water boilers, hot air or steam generators, diathermic oil boilers.

Operation can be "two stage progressive" or, alternatively, "modulating" with the installation of a PID logic regulator and respective probes. RL/M series burners guarantees high efficiency levels in all the various applications, thus reducing fuel consumption and running costs. Optimisation of sound emissions is guaranteed by the use of fans with forward inclined 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.

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### **Technical Data**

| Model                          |                | RL28/M RL38/M RL50/M                               |                            |               |  |  |  |
|--------------------------------|----------------|--|----------------------------|---------------|--|--|--|
| Burner operation mode          |                | Modulating (with regulator and probes accessories) |                            |               |  |  |  |
| Modulation ratio at max. ou    | tput           | 3 <del>:</del> 1                                   |                            |               |  |  |  |
| Servomotor                     | type           |  | SQN90                      |               |  |  |  |
| run time                       | S              |  | 24                         |               |  |  |  |
|                                | kW             | 90/166 <b>-</b> 332                                | 101/237 - 450              | 130/296 - 593 |  |  |  |
| Heat output                    | Mcal/h         | 81,7/143 - 286                                     | 87/204 - 387               | 112/255 - 510 |  |  |  |
|                                | kg/h           | 8/14 - 28  | 8,5/20 - 38                | 11/25 - 50    |  |  |  |
| Working temperature            | °C min./max.   |  | 0/40                       |               |  |  |  |
| Not colorific volue            | kWh/kg         |  | 11,8                       |               |  |  |  |
| Net calorific value            | kcal/kg        |  | 10.200                     |               |  |  |  |
| Viscosity                      | mm2/s (cSt)    |  | 4 - 6                      |               |  |  |  |
| Pump                           | type           | AL 75C   | AL 95C                     | AL 95C        |  |  |  |
| output                         | kg/h at 20 bar | 74   | 99                         | 99            |  |  |  |
| Atomised pressure              | bar            |  | 20                         |               |  |  |  |
| Fuel temperature               | max. °C        |  | 50                         |               |  |  |  |
| Fuel pre-heater                |                |  |                            |               |  |  |  |
| Fan                            | type           |  | (01)                       |               |  |  |  |
| Air temperature                | max. °C        |  | 60                         |               |  |  |  |
| Electrical supply              | Ph/Hz/V        | (03)   | (04)                       | (04)          |  |  |  |
| Auxiliary electrical supply    | Ph/Hz/V        |  | (03)                       |               |  |  |  |
| Control box                    | type           |  | LAL 1.25                   |               |  |  |  |
| Total electrical power         | kW             | 0,4  | 0,6                        | 0,8           |  |  |  |
| Auxiliary electrical power     | kW             | 0.15   |                            |               |  |  |  |
| Heaters electrical power       | kW             |  |                            |               |  |  |  |
| Protection level               | IP             |  | 44                         |               |  |  |  |
| Pump motor electrical          |                |  |                            |               |  |  |  |
| power                          | K V V          |  |                            |               |  |  |  |
| Rated pump motor current       | А              |  |                            |               |  |  |  |
| Pump motor start up            | ٨              |  |                            |               |  |  |  |
| current                        |                |  |                            |               |  |  |  |
| Pump motor protection<br>level | IP             |  |                            |               |  |  |  |
| Fan motor electrical power     | kW             | 0,25   | 0,45                       | 0,65          |  |  |  |
| Rated fan motor current        | Α              | 2,1  | 2 - 1,2                    | 3 - 1,7       |  |  |  |
| Fan motor start up current     | Α              | 10   | 9,5 - 5,5                  | 13.8 - 8      |  |  |  |
| Fan motor protection level     | IP             | 40   | 54                         | 54            |  |  |  |
|                                | type           |  |                            |               |  |  |  |
| Ignition transformer           | V1 – V2        |  | 230V - 2x5kV               |               |  |  |  |
|                                | l1 – l2        |  | 1,9A - 30 mA               |               |  |  |  |
| Operation                      |                |  | (10)                       |               |  |  |  |
| Sound pressure                 | dB (A)         | 68   | 70                         | 75            |  |  |  |
| Sound power                    | W              |  |                            |               |  |  |  |
| C0 emission                    | mg/kWh         |  | < 40                       |               |  |  |  |
| Grade of smoke indicator       | N° Bacharach   |  | < 10                       |               |  |  |  |
| CxHy emission                  | mg/kWh         |  | < 10 (after the first 20s) |               |  |  |  |
| N0x emission                   | mg/kWh         |  | <200                       |               |  |  |  |
| Directive                      |                | 2006   | 6/95 - 2004/108 - 2006/4   | +2 EC         |  |  |  |
| Conforming to                  |                |  | CE 1001/R                  |               |  |  |  |

 (01) Centrifugal with reverse curve blades
 (02) Centrifugal with forward curve blades
 (03) 1/50/230~(±10%)
 (04) 3N/50/400~(±10%)
 3/50/230~(±10%) 3/50/230~(±10%)

(\*) - available also with M0 535

(05) Intermittent (at least one stop every 24 h)
(06) Intermittent (at least one stop every 24 h) - Continuous as optional (at least one stop every 72

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

| Model                          | RL70/M RL100/M RL130/M R |                 |                    |                    |                 |  |
|--------------------------------|--------------------------|-----------------|--------------------|--------------------|-----------------|--|
| Burner operation mode          |                          | Modulat         | ing (with regulato | or and probes acco | essories)       |  |
| Modulation ratio at max. ou    | 3 - 1                    |                 |                    |                    |                 |  |
| Servomotor                     | type                     |                 | SQI                | N31                |                 |  |
| run time                       | S                        |                 | 4                  | 2                  |                 |  |
| Heat output                    | kW                       | 261/474 - 1043  | 332/711 - 1482     | 498/948 - 1779     | 534/1423 - 2431 |  |
|                                | Mcal/h                   | 224/408 - 897   | 286/612 - 1275     | 428/816 - 1530     | 459/1224 - 2091 |  |
|                                | kg/h                     | 22/40 - 88      | 28/60 - 125        | 42/80 - 150        | 45/120 - 205    |  |
| Working temperature            | °C min./max.             |                 | 0//                | +0                 |                 |  |
| Net calorific value            | kWh/kg                   |                 | 11,                | ,8                 |                 |  |
|                                | kcal/kg                  |                 | 10.2               | 200                |                 |  |
| Viscosity                      | mm2/s (cSt)              |                 | 4 -                | · 6                |                 |  |
| Pump                           | type                     |                 | J 7C               |                    | TA 3            |  |
| output                         | kg/h at 12 bar           |                 | 190                |                    | 665             |  |
| Atomised pressure              | bar                      |                 | 2                  | 0                  |                 |  |
| Fuel temperature               | max. °C                  |                 | 5                  | 0                  |                 |  |
| Fuel pre-heater                |                          |                 | -                  | -                  |                 |  |
| Fan                            | type                     |                 | (01)               |                    | (02)            |  |
| Air temperature                | max. °C                  |                 | 6                  | 0                  |                 |  |
| Electrical supply              | Ph/Hz/V                  |                 | (0                 | 4)                 |                 |  |
| Auxiliary electrical supply    | Ph/Hz/V                  |                 | (0                 | 3)                 |                 |  |
| Control box                    | type                     | LAL 1.25 (Inter | mittent working)   | - LOK 16 (Continu  | ious working)   |  |
| Total electrical power         | kW                       | 1,4             | 2,1                | 2,6                | 5,5             |  |
| Auxiliary electrical power     | kW                       | 0,3             | 0,3                | 0,4                | 1               |  |
| Heaters electrical power       | kW                       |                 | -                  | -                  |                 |  |
| Protection level               | IP                       |                 | 4                  | 4                  |                 |  |
| Pump motor electrical          | kW                       |                 | -                  | -                  |                 |  |
| power                          |                          |                 |                    |                    |                 |  |
| Rated pump motor current       | Α                        |                 | -                  | -                  |                 |  |
| Pump motor start up<br>current | A                        |                 | -                  | -                  |                 |  |
| Pump motor protection level    | IP                       |                 | -                  | -                  |                 |  |
| Fan motor electrical           | kW                       | 1,1             | 1,8                | 2,2                | 4,5             |  |
| power                          |                          |                 |                    |                    |                 |  |
| Rated fan motor current        | Α                        | 4,8 - 2,8       | 7,3 - 4,2          | 8,8 - 5,1          | 15,8 - 9,1      |  |
| Fan motor start up current     | Α                        | 25 - 14,6       | 37,6 - 21,8        | 57,2 - 33,2        | 126 - 73        |  |
| Fan motor protection level     | IP                       |                 | 5                  | 4                  |                 |  |
| Ignition transformer           | type                     |                 | -                  | -                  |                 |  |
|                                | V1 - V2                  |                 | 230V -             | 2x5kV              |                 |  |
|                                | 1 -  2                   |                 | 1,9 A - 30 mA      |                    | 1,9 A - 35 mA   |  |
| Operation                      |                          |                 | (0                 | 6)                 |                 |  |
| Sound pressure                 | dB (A)                   | 75              | 77                 | 78,5               | 84,9            |  |
| Sound power                    | W                        |                 | -                  | -                  |                 |  |
| C0 emission                    | mg/kWh                   |                 | < 1                | +0                 |                 |  |
| Grade of smoke indicator       | N° Bacharach             | <1              |                    |                    |                 |  |
| CxHy emission                  | mg/kWh                   |                 | < 10 (after t      | he first 20s)      |                 |  |
| N0x emission                   | mg/kWh                   |                 | <2                 | 00                 |                 |  |
| Directive                      |                          |                 | 2006/95 - 2004/    | 108 - 2006/42 EC   |                 |  |
| Conforming to                  |                          |                 | CE 04              | 40/B               |                 |  |

(01) Centrifugal with reverse curve blades (02) Centrifugal with forward curve blades (03) 1/50/230~(±10%) (04) 3N/50/400~(±10%) 3/50/230~(±10%) (\*) - available also with M0 535

(05) Intermittent (at least one stop every 24 h)
(06) Intermittent (at least one stop every 24 h) - Continuous as optional (at least one stop every 72

Reference conditions: Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter. 4



## **Firing Rates**



# **Fuel Supply**

## **Hydraulic Circuit**

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.

Beginning with the RL100/M model, the burners have a double safety valve on the return circuit.

The models fitted with a minimum pressure switch on the oil delivery circuit can be installed on steam generators according to TRD-72 standard (Germany) and NBN standard (Belgium).



Example of the hydraulic circuit on RL70/M burners





#### Versions for TRD-72, NBN steam generators





| Ρ      | Pump with filter and pressure regulator on the output circuit |
|--------|---|
| VS     | Safety valve on the output circuit                            |
| VF     | Working valve on the output circuit                           |
| P0 min | Min. Oil pressure switch on the output circuit                |
| U      | Nozzle  |
| MR     | Pressure gauge on the return circuit                          |
| SM     | Servomotor  |
| RO     | Pressure regulator on the return circuit                      |
| P0 max | Max. Oil pressure switch on the return circuit                |
| VR     | 1 <sup>st</sup> safety valve on the return circuit            |
| VR1    | 2 <sup>nd</sup> safety valve on the return circuit            |

EN 267 < 100 Kg/h

### **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] |              |              |              |              |              |              |                 |              |              |              |              |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|--------------|
| Model   |              | RL 28/M      |              | I            | RL 38-50/N   | 1            | RL 70-100-130/M |              |              | RL 190/M     |              |
| Diameter piping                                 | ø10 mm       | ø12 mm       | ø14 mm       | ø10 mm       | ø12 mm       | ø14 mm       | ø12 mm          | ø14 mm       | ø16 mm       | ø16 mm       | ø18 mm       |
| +H -H (m)                                       | L max<br>(m)    | L max<br>(m) | L max<br>(m) | L max<br>(m) | L max<br>(m) |
| +4,0  | 83           | 144          | 150          | 51           | 112          | 150          | 71              | 138          | 150          | 60           | 80           |
| +3,0  | 55           | 127          | 150          | 46           | 99           | 150          | 62              | 122          | 150          | 50           | 70           |
| +2,0  | 48           | 111          | 150          | 39           | 86           | 150          | 58              | 106          | 150          | 40           | 60           |
| +1,5  | 44           | 102          | 150          | 35           | 79           | 147          | 51              | 98           | 150          | 35           | 55           |
| +1,0  | 40           | 94           | 150          | 32           | 73           | 144          | 44              | 90           | 150          | 30           | 50           |
| +0,5  | 37           | 86           | 150          | 29           | 65           | 132          | 40              | 82           | 150          | 25           | 45           |
| 0   | 33           | 78           | 150          | 26           | 60           | 120          | 36              | 74           | 137          | 20           | 40           |
| -0,5  | 29           | 70           | 133          | 23           | 54           | 106          | 32              | 66           | 123          | 18           | 35           |
| -1,0  | 25           | 82           | 118          | 20           | 47           | 96           | 28              | 56           | 109          | 15           | 30           |
| -1,5  | 21           | 63           | 103          | 16           | 40           | 83           | 23              | 49           | 95           | 13           | 25           |
| -2,0  | 17           | 45           | 88           | 13           | 34           | 71           | 19              | 42           | 81           | 10           | 20           |
| -3,0  | 10           | 29           | 58           | 7            | 21           | 46           | 10              | 26           | 53           | 5            | 10           |
| -4,0  | 4            | 12           | 28           | 2            | 8            | 21           | 3               | 10           | 25           | 3            | 6            |

### Type of system that can be installed



- 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.

Except for the RL 190/M model, the use of reverse curve blades and sound proofing material keeps noise level very low.

In the RL 190/M model, sound has been reduced by the special design of the air suction circuit.

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**

Different lengths of the combustion head can be chosen for the RL series of burners.

The choice depends on the thickness of the front panel and the type of boiler.

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

The internal position 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 burner combustion head.

#### Comparison champer Compar



Example: Burner thermal output = 2000 kW; L Combustion chamber (m) = 2,7 m (medium value); D Combustion chamber (m) = 0,8 m (medium value)

#### DIMENSIONS OF THE COMBUSTION CHAMBER

### **Burner Operation Mode**

The RL/M 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 picture B).



Example of a regulator.

#### "TWO-STAGE PROGRESSIVE" OPERATION



Picture A

#### "MODULATING" OPERATION

![](_page_8_Figure_11.jpeg)

Picture B

#### **RL/M Series**

### **Emissions**

![](_page_9_Figure_3.jpeg)

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

![](_page_9_Figure_5.jpeg)

![](_page_9_Figure_6.jpeg)

The noise emissions have been measured at the maximum output.

![](_page_10_Picture_0.jpeg)

### **Overall Dimensions (mm)**

#### RL28/M - RL38/M - RL50/M

![](_page_10_Figure_3.jpeg)

![](_page_10_Figure_4.jpeg)

![](_page_10_Figure_5.jpeg)

![](_page_10_Figure_6.jpeg)

| Model   | А   | В   | С   | D   | E   | F – F (1) | Н   | - I | 0 - 0 (1)  |
|---------|-----|-----|-----|-----|-----|-----------|-----|-----|------------|
| RL28/M  | 476 | -   | -   | 474 | 468 | 241 - 351 | 140 | 352 | 672 - 807  |
| RL38/M  | 476 | -   | -   | 474 | 468 | 241 - 351 | 140 | 352 | 672 - 807  |
| RL50/M  | 476 | -   | -   | 474 | 468 | 241 - 351 | 152 | 352 | 672 - 807  |
| RL70/M  | 663 | 296 | 367 | 555 | 680 | 272 - 385 | 179 | 430 | 951 - 1086 |
| RL100/M | 679 | 312 | 367 | 555 | 680 | 272 - 385 | 179 | 430 | 951 - 1086 |
| RL130/M | 705 | 338 | 367 | 555 | 680 | 272 - 385 | 189 | 430 | 951 - 1086 |
| RL190/M | 813 | 366 | 447 | 555 | 712 | 370       | 222 | 430 | 1166       |

D

(1) Length with extended combustion head.

#### **BURNER – BOILER MOUNTING FLANGE**

![](_page_10_Figure_10.jpeg)

Model D1 D2 Ø RL28/M 160 224 Μ8 RL38/M 160 224 Μ8 RL50/M 224 160 Μ8 RL70/M 275 - 325 185 M12 RL100/M 185 275 - 325 M12 RL130/M 195 275 - 325 M12 RL190/M M16 230 325 **-** 368

#### PACKAGING

![](_page_10_Figure_13.jpeg)

| Model   | X – X (1) | Y   | Z   | Kg |
|---------|-----------|-----|-----|----|
| RL28/M  | 872       | 540 | 550 | 39 |
| RL38/M  | 872       | 540 | 550 | 41 |
| RL50/M  | 872       | 540 | 550 | 42 |
| RL70/M  | 1150      | 792 | 600 | 65 |
| RL100/M | 1150      | 792 | 600 | 68 |
| RL130/M | 1150      | 792 | 600 | 71 |
| RL190/M | 1200      | 800 | 850 | 95 |

(1) Length with extended combustion head.

**RL/M** Series

### **Installation Description**

Skilled and qualified personnel must perform installation, start up and maintenance.

All operations must be carried out as described in 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 AND 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 (after checking rotation direction if it is a three phase motor).

On start up, check:

- Pressure pump and valve unit regulator (to max. and min.)

- Combustion quality, in terms of unburned substances and excess air.

![](_page_11_Picture_19.jpeg)

![](_page_11_Picture_20.jpeg)

![](_page_11_Picture_21.jpeg)

![](_page_11_Picture_22.jpeg)

### **Burner accessories**

### RETURN NOZZLES TYPE A3, A4 45°

![](_page_12_Picture_3.jpeg)

The following list shows the features and codes on the basis of the maximum required fuel output.

NOTE: each burner needs N° 1 nozzle.

| BURNER               | RATED OUTPUT<br>kg/h | A3 NOZZLE CODE | A4 NOZZLE CODE |
|----------------------|----------------------|----------------|----------------|
| RL28/M               | 15                   | 3009850        | _              |
| RL28/M - 38/M        | 20                   | 3009851        | -              |
| RL28/M - 38/M - 50/M | 30                   | 3009852        | -              |
| RL38/M - 50/M - 70/M | 40                   | 3009853        | 20067277       |
| RL50/M - 70/M        | 50                   | 3009854        | 20067279       |
| RL70/M - 100/M       | 60                   | 3009855        | 20067281       |
| RL70/M - 100/M       | 70                   | 3009856        | 20067283       |
| RL100/M - 130/M      | 80                   | 3009857        | 20067284       |
| RL100/M - 130/M      | 90                   | 3009858        | 20067285       |
| RL100/M - 130/M      | 100                  | 3009859        | 20067286       |
| RL130/M              | 110                  | 3009860        | 20067287       |
| RL130/M - 190/M      | 120                  | 3009861        | 20067288       |
| RL130/M - 190/M      | 130                  | 3009862        | 20067289       |
| RL190/M              | 140                  | 3009863        | 20067290       |
| RL190/M              | 150                  | 20059496*      | 20067290       |
| RL190/M              | 160                  | 3009864        | 20067293       |
| RL190/M              | 180                  | 3009865        | 20067295       |
| RL190/M              | 200                  | 3009866        | 20067297       |
| * 60° Angle          |                      |                |                |

#### EXTENDED HEAD KIT

![](_page_12_Picture_8.jpeg)

"Standard head" burners can be transformed into "extended head" versions, by using the special kit.

| BURNER  | STANDARD HEAD | EXTENDED HEAD | KIT CODE |
|---------|---------------|---------------|----------|
|         | LENGTH (mm)   | LENGTH (mm)   |          |
| RL28/M  | 241           | 351           | 3010120  |
| RL38/M  | 241           | 351           | 3010121  |
| RL50/M  | 241           | 351           | 3010122  |
| RL70/M  | 272           | 385           | 3010159  |
| RL100/M | 272           | 385           | 3010160  |
| RL130/M | 272           | 385           | 3010161  |
| RL190/M | 370           | 526           | 20058084 |

#### **SPACER KIT**

![](_page_12_Picture_12.jpeg)

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

| BURNER                 | SPACER THICKNESS S (mm) | KIT CODE |
|------------------------|-------------------------|----------|
| RL28/M - 38/M - 50/M   | 110                     | 3010095  |
| RL70/M - 100/M - 130/M | 135                     | 3010129  |
| RL190/M                | 102                     | 3000722  |

#### SOUND PROOFING BOX

![](_page_13_Figure_3.jpeg)

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. The useful dimensions are 40 mm less than the total dimensions indicated in the table (A, D, E). Not suitable for outdoor use.

| BURNER                            | BOX  | Α    | B (mm)    | С    | D    | Е    | [dB(A)] | BOX     |
|-----------------------------------|------|------|-----------|------|------|------|---------|---------|
|                                   | TYPE | (mm) | min-max   | (mm) | (mm) | (mm) | (*)     | CODE    |
| RL28/M - 38/M<br>RL50/M           | C1/3 | 650  | 372 - 980 | 110  | 690  | 770  | 10      | 3010403 |
| RL70/M - 100/M<br>RL130/M - 190/M | C4/5 | 850  | 160 - 980 | 110  | 980  | 930  | 10      | 3010404 |

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

#### **DEGASING UNIT**

![](_page_13_Picture_9.jpeg)

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

| BURNER        | FILTER         | FILTERING DEGREE | DEGASING UNIT |
|---------------|----------------|------------------|---------------|
|               |                | (                | CODE (*)      |
|               |                | (µm)             | CODE (*)      |
| RL28/M - 38/M |                |                  |               |
| RL50/M - 70/M | With filter    | 50 <b>-</b> 75   | 3010055       |
| RL100/M       |                |                  |               |
| RL28/M - 38/M |                |                  |               |
| RL50/M - 70/M | Without filter | -                | 3010054       |
| RL100/M       |                |                  |               |
|               |                |                  |               |

(\*) Max capability 80 kg/h (more filters are needed for higher flow).

#### HEAD KIT FOR "REVERSE FLAME CHAMBER"

![](_page_13_Picture_14.jpeg)

In certain cases, the use of the burner on reverse flame boilers can be improved by using an additional cylinder.

| BURNER         | STANDARD HEAD<br>LENGTH WITH<br>CYLINDER (mm) | EXTENDED HEAD<br>LENGTH WITH<br>CYLINDER (mm) | KIT CODE |
|----------------|---|---|----------|
| RL28/M - 38/M  | 319   | 429   | 3010178  |
| RL50/M         | 319   | 429   | 3010179  |
| RL70/M - 100/M | 375   | 488   | 3010180  |
| RL130/M        | 375   | 488   | 3010183  |
| RL190/M        | 493   | _   | 3010241  |

#### CONNECTION FLANGE KIT

![](_page_13_Picture_18.jpeg)

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

| BURNER                  | KIT CODE |
|-------------------------|----------|
| RL28/M - 38/M<br>RL50/M | 3010138  |

![](_page_14_Picture_0.jpeg)

### **Burner accessories**

### Accessories for modulating operation

![](_page_14_Picture_3.jpeg)

To obtain modulating operation, the RL/M series of burners requires a regulator.

| BURNER                         | REGULATOR TYPE | REGULATOR CODE |
|--------------------------------|----------------|----------------|
| RL28/M - 38/M - 50/M           | RWF 50.2       | 20082208       |
| RL70/M - 100/M - 130/M - 190/M | RWF 55.5       | 20099657       |

![](_page_14_Picture_6.jpeg)

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 |
|------------------------|--------------------|------------------|------------|
| RL28/M - 38/M - 50/M   | Temperature PT 100 | -100 ÷ 500°C     | 3010110    |
| RL70/M - 100/M - 130/M | Pressure 4 ÷ 20 mA | 0 ÷ 2,5 bar      | 3010213    |
| RL190/M                | Pressure 4 ÷ 20 mA | 0 ÷ 16 bar       | 3010214    |
|                        | Pressure 4 ÷ 20 mA | 0 ÷ 25 bar       | 3090873    |

![](_page_14_Picture_9.jpeg)

Depending on the servomotor fitted to the burner, a three-pole potentiometer (1000  $\Omega$ ) can be installed to check the position of the servomotor.

| BURNER                            | POTENTIOMETER KIT CODE |
|-----------------------------------|------------------------|
| RL28/M - 38/M - 50/M              | 3010109                |
| RL70/M - 100/M - 130/M<br>RL190/M | 3010416                |

### Specification

#### DESIGNATION OF SERIES

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

| Serie | s: R       |      |           |          |          |      |               |                  |   |
|-------|------------|------|-----------|----------|----------|------|---------------|------------------|---|
|       | Fuel       | c    | Notural   |          |          |      |               |                  |   |
|       | ruei:      | 5    | Natural ; | gas      |          |      |               |                  |   |
|       |            | IS   | Light oil | / Natura | امعد     |      |               |                  |   |
|       |            | N    | Heavy oi  | i Natura | gas      |      |               |                  |   |
| -     |            |      | incury of | •        |          |      |               |                  |   |
|       |            | Size | 9         |          |          |      |               |                  |   |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      | 0pe       | ration : | /1       |      | One stage     |                  |   |
|       |            |      |           |          |          |      | Two stage     |                  |   |
|       |            |      |           |          | /M       |      | Modulating    |                  |   |
|       |            |      |           |          | /E       |      | Electronic ca | m                |   |
|       |            |      |           |          | /P       |      | Proportionir  | ig air/gas       | s valve                                   |
|       |            |      |           |          | /EV      |      | Electronic ca | m predis         | sposed for variable speed (with inverter) |
|       |            |      |           |          | •        |      |               |                  |   |
|       |            |      |           | Emis     | ssion:   | •••• | Class 1 EN267 | - EN676          |   |
|       |            |      |           |          |          | MZ   | Class 2 EN26  | 7 - EN676        | )   |
|       |            |      |           |          |          | BLU  | Class 3 EN26  | 7 <b>-</b> EN676 |   |
|       |            |      |           |          |          | мх   | Class 2 EN26  | 7                |   |
|       |            |      |           |          |          |      | Class 3 EN67  | 5                |   |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          | He       | ad:  | TC Standar    | d head           |   |
|       |            |      |           |          |          |      | TL Extende    | d head           |   |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          |          |      | Flame contro  | ol system        | 1:  |
|       |            |      |           |          |          |      | FS1 Star      | ndard (1 s       | stop every 24 h)                          |
|       |            |      |           |          |          |      | FS2 Con       | tinuous w        | working (1 stop every 72 h)               |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          |          |      | Elec          | trical sup       | pply to the system :                      |
|       |            |      |           |          |          |      | 1/23          | 0/50             | 1/230V/50Hz                               |
|       |            |      |           |          |          |      | 3/23          | 0/50             | 3/230V/50Hz                               |
|       |            |      |           |          |          |      | 3/40          | 0/50             | 3N/400V/50Hz                              |
|       |            |      |           |          |          |      | 3/23          | 0-400/50         | 0 3/230V/50Hz - 3N/400V/50Hz              |
|       |            |      |           |          |          |      | 3/22          | 0/60             | 3/220V/60Hz                               |
|       |            |      |           |          |          |      | 3/38          | 80/60            | 3N/380V/60Hz                              |
|       |            |      |           |          |          |      | 3/22          | 0-380/60         | 0 3/220V/60Hz - 3N/380V/60Hz              |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          |          |      |               |                  | Auxiliary voltage :                       |
|       |            |      |           |          |          |      |               | ]                | 230/50-60 230V/50-60Hz                    |
|       |            |      |           |          |          |      |               |                  | 110/50-60 110V/50-60Hz                    |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          |          |      |               |                  | ID : Differential switch                  |
|       |            |      |           |          |          |      |               |                  |   |
|       |            |      |           |          |          |      |               |                  |   |
|       | 50         | /M   |           | тс       | FC1      | 2    | 230-400/50    | 230/50-          | -60                                       |
| PASIC |            | אר   |           |          | -31      | 51   | 250 400/50    | 250150-          |   |
| BASIC | DESIGNATIO | JN   |           |          |          |      |               |                  |   |
| BASIC | DESIGNATIO | Л    | EXTE      | NDED DES | GIGNATIO | )N   |               |                  |   |

#### AVAILABLE BURNER MODELS

| BURNER MODELS | HEAD LENGTH | FLAME CONTROL SYSTEM | ELECTRICAL SUPPLY    | AUXILIARY VOLTAGE |
|---------------|-------------|----------------------|----------------------|-------------------|
| RL 28/M       | тс          | FS1                  | 1/230/50             | 230/50-60         |
| RL 28/M       | TL          | FS1                  | 1/230/50             | 230/50-60         |
| RL 28/M       | ТС          | FS1                  | 1/220-230/60         | 230/50-60         |
| RL 28/M       | TL          | FS1                  | 1/220-230/60         | 230/50-60         |
| RL 38/M       | тс          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 38/M       | TL          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 38/M       | тс          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 38/M       | TL          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 50/M       | тс          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 50/M       | TL          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 50/M       | тс          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 50/M       | TL          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 70/M       | тс          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 70/M       | TL          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 70/M       | тс          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 70/M       | TL          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 70/M       | тс          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 70/M       | TL          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 100/M      | тс          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 100/M      | TL          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 100/M      | тс          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 100/M      | TL          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 100/M      | тс          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 100/M      | TL          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 130/M      | тс          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 130/M      | TL          | FS1                  | 3/230-400/50         | 230/50-60         |
| RL 130/M      | тс          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 130/M      | TL          | FS1                  | 3/208-230/380-460/60 | 230/50-60         |
| RL 130/M      | тс          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 130/M      | TL          | FS2                  | 3/230-400/50         | 230/50-60         |
| RL 190/M      | тс          | FS1                  | 3/400/50             | 230/50-60         |
| RL 190/M      | тс          | FS1                  | 3/230/50             | 230/50-60         |
| RL 190/M      | ТС          | FS1                  | 3/460/60             | 220/60            |
| RL 190/M      | ТС          | FS1                  | 3/220/60             | 220/60            |
| RL 190/M      | ТС          | FS2                  | 3/400/50             | 230/50-60         |
| RL 190/M      | тс          | FS2                  | 3/230/50             | 230/50-60         |
| RL 190/M      | TL          | FS1                  | 3/400/50             | 230/50-60         |
|               |             |                      |                      |                   |

Other versions are available on request.

#### SPECIFICATION

STATE OF SUPPLY

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 (forward curve blades on the 190/M model) 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 (single-phase, 230V and 50Hz for the 28/M model)

- 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 for models RL 100/M, RL 130/M, RL 190/M and for all models in the TRD-72, NBN version

- safety oil pressure switch for stop the burner in case of problems in the return circuit

- minimum oil pressure switch in the output circuit for the TRD-72, NBN versions

- photocell for flame detection

- flame control panel, 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:

- (2004/108) EC directive (electromagnetic compatibility)
- (2006/95) EC directive (low voltage)
- (2006/42) EC directive (machinery)
- 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
- 4 extensions for slide bar (for models with 385 mm blast tube)
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

Available accessories to be ordered separately:

- return nozzles
- extended head kit (except for the RL 190/M model)
- spacer kit
- sound-proofing box
- degasing unit
- head kit for "reverse flame chamber"
- connection flange kit
- RWF 40 output regulator
- temperature probe
- pressure probe
- potentiometer kit for the servomotor.

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

![](_page_19_Picture_2.jpeg)

![](_page_19_Picture_3.jpeg)

[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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![](_page_19_Picture_14.jpeg)