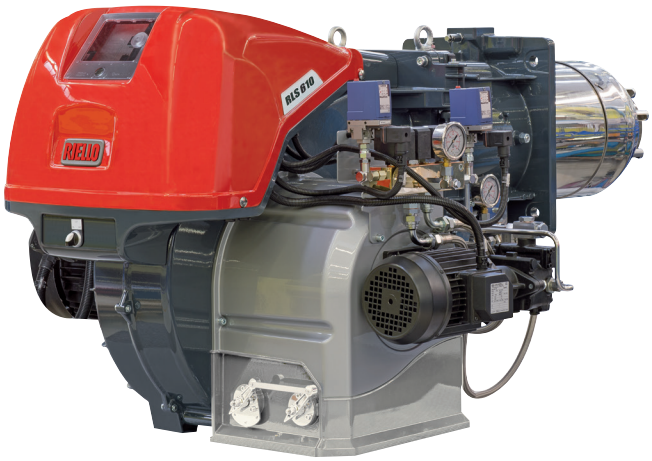
# RLS 310÷610/M MX SERIES

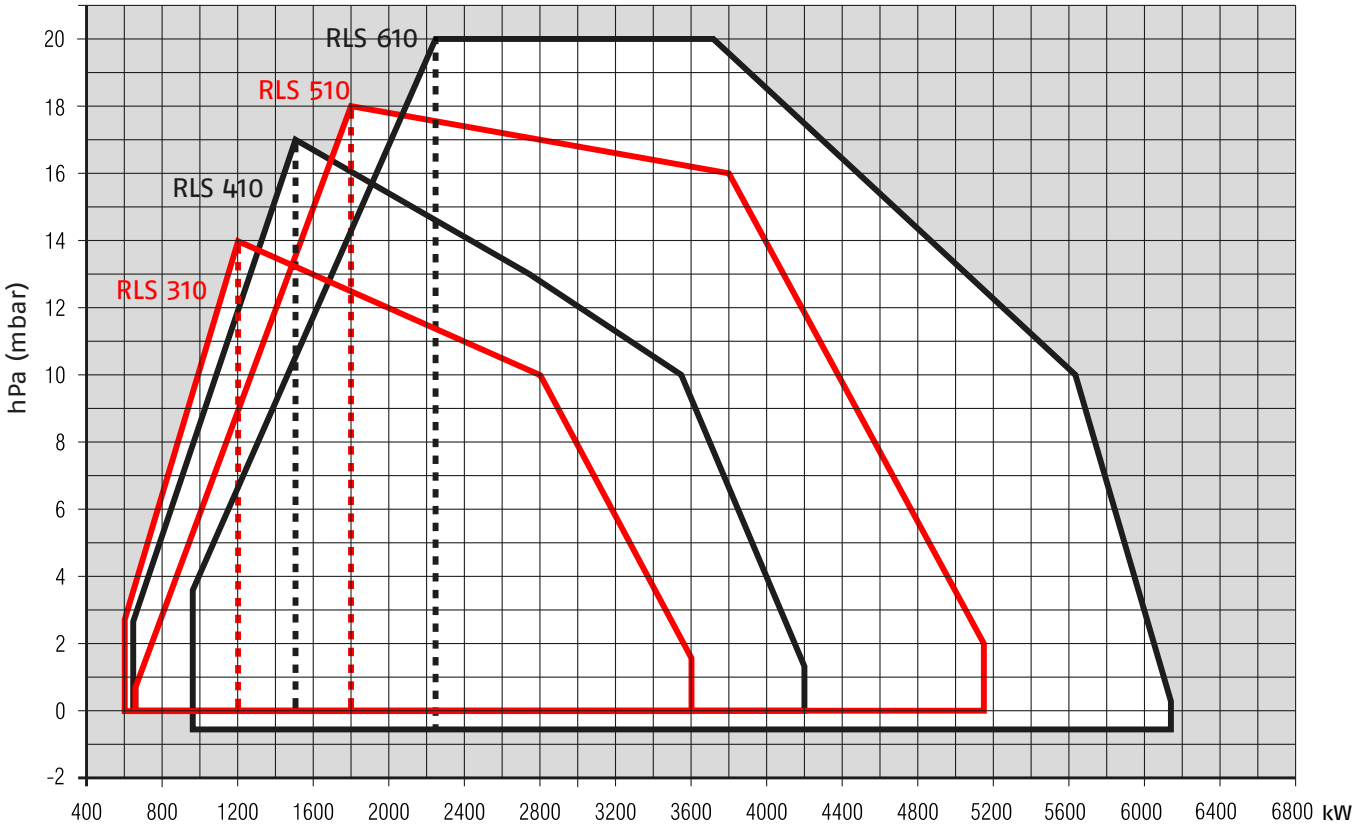
The RLS/M MX series of burners are characterised by a modular monoblock structure that means all necessary components can be combined in a single unit thus making installation easier, faster and, above all, more flexible.
The series covers a firing range from 1200 to 6155 kW, and it has been designed for use in hot water boilers, overheated water boilers as well as steam boilers.
Operation can be "two stage progressive" or alternatively "modulating", for both fuels, light oil and gas, with the installation of a PID logic regulator .
The mechanical cam device of regulation allows to catch up a high modulation ratio on all firing rates range. The burners can, therefore, supply with precision the demanded power, guaranteeing a high efficiency system level and the stability setting, obtaining fuel consumption and operating costs reduction.
The combustion head guarantees reduced polluting emissions (NOx < 60 mg/kWh on gas operation). An exclusive design guarantees low sound emissions, low electrical consumption, easy use and maintenance.




| | |
|---|---|
| RLS 310/M MX | 600/1200 ÷ 3600 kW |
| RLS 410/M MX | 640/1500 ÷ 4200 kW |
| RLS 510/M MX | 660/1800 ÷ 5170 kW |
| RLS 610/M MX | 1000/2200 ÷ 6155 kW |

# RLS 310÷610/M MX SERIES

## FIRING RATES



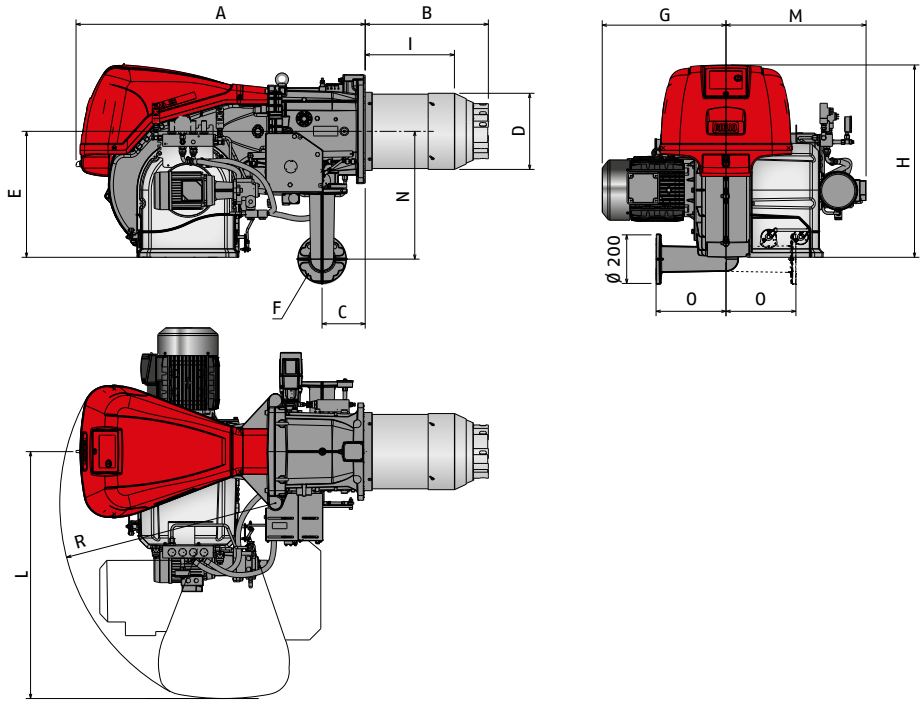

Useful working field for choosing the burner

Modulation range

Test conditions conforming to EN267- EN676
Temperature: 20°C
Pressure: 1013,5 mbar
Altitude: 0 m a.s.l.

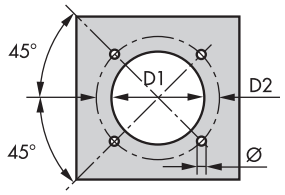
# Overall dimensions (mm)

## BURNER



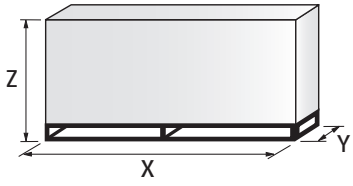

| MODEL | A | B | C | D | E | F | G | H | I | L | M | N | O | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ▶ RLS 310/M MX | 1190 | 507 | 178 | 313 | 520 | DN65 | 490 | 790 | 340 | 1015 | 576 | 528 | 290 | 890 |
| ▶ RLS 410/M MX | 1190 | 507 | 178 | 313 | 520 | DN65 | 508 | 790 | 340 | 1015 | 576 | 528 | 290 | 890 |
| ▶ RLS 510/M MX | 1190 | 507 | 178 | 313 | 520 | DN65 | 508 | 790 | 340 | 1015 | 576 | 528 | 290 | 890 |
| ▶ RLS 610/M MX | 1190 | 510 | 178 | 334 | 520 | DN65 | 580 | 790 | 360 | 1015 | 576 | 528 | 290 | 890 |

## BURNER - BOILER MOUNTING FLANGE




| MODEL | D1 | D2 | Ø |
|---|---|---|---|
| ▶ RLS 310/M MX | 335 | 452 | M18 |
| ▶ RLS 410/M MX | 335 | 452 | M18 |
| ▶ RLS 510/M MX | 335 | 452 | M18 |
| ▶ RLS 610/M MX | 350 | 452 | M18 |

## PACKAGING




| MODEL | X | Y | Z | kg |
|---|---|---|---|---|
| ▶ RLS 310/M MX | 2040 | 1180 | 1125 | 300 |
| ▶ RLS 410/M MX | 2040 | 1180 | 1125 | 300 |
| ▶ RLS 510/M MX | 2040 | 1180 | 1125 | 300 |
| ▶ RLS 610/M MX | 2400 | 1400 | 1595 | 320 |

# RLS 310÷610/M MX SERIES

# Specification

## DESIGNATION OF SERIES

Series: R

| | | |
|---|---|---|
| Fuel: | S | Natural Gas |
| | L | Light oil |
| | LS | Light oil/Natural Gas |
| | N | Heavy oil |

Size

| | | |
|---|---|---|
| Setting: | /1 | Single stage |
| | /B | Two stage |
| | /M | Modulating - Mechanical cam |
| | /P | Proportioning air/gas valve |
| | /E | Electronic cam |
| | /EV | Electronic cam predisposed for variable speed (with inverter) |

| | | |
|---|---|---|
| Emission: | C11 or ... | Class 1 EN267 - EN676 |
| | C22 or MZ | Class 2 EN267 - EN676 |
| | C33 or BLU | Class 3 EN267 - EN676 |
| | C23 or MX | Class 2 EN267 - Class 3 EN676 |
| | C13 | 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 |
| 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 | 3/220/60Hz - 3N/380V/60Hz |

| | | |
|---|---|---|
| Auxiliary voltage: | 230/50-60 | 230V/50-60Hz |
| | 110/50-60 | 110V/50-60Hz |

| R | LS | 310 | /M | MX | TC | FS1 | 3/400/50 | 230/50-60 |
|---|---|---|---|---|---|---|---|---|

BASIC DESIGNATION

EXTENDED DESIGNATION

# RLS 310÷610/M MX SERIES

# Specification

## STATE OF SUPPLY

Monoblock forced draught dual fuel burners with modulating operation, fully automatic, made up of:
- High performance fan
- Air suction circuit lined with sound-proofing material
- Air damper for air setting controlled by a high precision servomotor
- Air pressure switch
- Fan starting motor at 2800 rpm, three-phase, 400V, 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
- Mechanical cam with gas and oil modulator
- Maximum gas pressure switch, with pressure test point, to stop the burner in the case of over pressure on the fuel supply line
- Flame control panel for controlling the system safety - UV flame sensor
- Star/delta starter or direct starter (RLS 310-410) for the fan motor - Main electrical supply terminal board
- Burner on/off switch
- Auxiliary voltage led signal
- Burner working led signal
- Contacts motor and thermal relay with release button
- Motor internal thermal protection
- Motor failure led signal
- Burner failure led signal and lighted release button
- Emergency button
- Coded connection plugs-sockets
- Burner opening hinge
- Lifting rings
- IP 54 electric protection level
- Light oil gears pump for high pressure fuel supply
- Dedicated pump starting motor
- Valve unit with double oil safety valve on the output circuit and double safety valve on the return circuit
- Maximum an minimum oil pressure switches
- Oil pressure gauges on supply and return oil lines
- Oil/Gas selector
- Flame inspection window.

**Standard equipment:**
- 1 flange gasket for gas train adaptor
- 1 adaptor for gas train
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- 2 flexible pipes for connection to the oil supply network
- 2 nipples for connection to the pump with gaskets
- 8 gas nozzles (only for RLS 310/M)
- Instruction handbook for installation, use and maintenance
- Spare parts catalogue.

# RLS 310÷610/M MX SERIES

# Available models

## Burners

| CODE | MODEL | HEAT OUTPUT (kW) | HEAT OUTPUT LIGHT OIL (kg/h) | HEAT OUTPUT NATURAL GAS (Nm³/h) | TOTAL ELECTRICAL POWER (kW) | CERTIFICATION |
|---|---|---|---|---|---|---|
| 20087647 | RLS 310/M MX TC FS1 3/230/50 | 600/1200-3600 | 50/100-305 | 60/120-360 | 10,9 (oil)<br>9,1 (gas) | In progress |
| 20087648 | RLS 310/M MX TC FS1 3/400/50 | 600/1200-3600 | 50/100-305 | 60/120-360 | 10,9 (oil)<br>9,1 (gas) | In progress |
| 20087651 | RLS 310/M MX TC FS1 3/400/50 | 600/1200-3600 | 50/100-305 | 60/120-360 | 10,9 (oil)<br>9,1 (gas) | In progress |
| 20087649 | RLS 410/M MX TC FS1 3/230/50 | 640/1500-4200 | 55/126-352 | 64/150-420 | 12,6 (oil)<br>10,8 (gas) | In progress |
| 20087650 | RLS 410/M MX TC FS1 3/400/50 | 640/1500-4200 | 55/126-352 | 64/150-420 | 12,6 (oil)<br>10,8 (gas) | In progress |
| 20076483 | RLS 410/M MX TC FS1 3/400/50 | 640/1500-4200 | 55/126-352 | 64/150-420 | 12,6 (oil)<br>10,8 (gas) | In progress |
| 20087652 | RLS 510/M MX TC FS1 3/400/50 | 660/1800-5170 | 55/195-435 | 66/180-517 | 15,8 (oil)<br>14 (gas) | In progress |
| 20087653 | RLS 610/M MX TC FS1 3/400/50 | 1000/2200-6155 | 86/185-516 | 100/220-615,5 | 18,8 (oil)<br>17 (gas) | In progress |

Net calorific value light oil: 11,8 kWh/kg; 10.200 kcal/kg - Viscosity at 20°C: 4-6 $mm^2/s$ (cSt).
Net calorific value G20 gas: 10 kWh/$Nm^3$; 8.600 kcal/$Nm^3$ - Density: 0,71 kg/$Nm^3$.
The burners of RLS/M MX series are in according to 2009/142 EC - 2004/108 - 2006/95 - EC Directive and EN 267 - 676 Norm.

# Available models

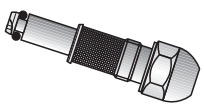
## Gas Trains

| GAS TRAIN | | | | VPS | ADAPTER CODE | | | |
|---|---|---|---|---|---|---|---|---|
| CODE | MODEL | Ø | C.T. | Code | RLS 310 | RLS 410 | RLS 510 | RLS 610 |
| 3970180* | MB 415/1 - RT 30 | Rp 1" ½ | - | 3010123 | 3000826 + 20064220 | ● | ● | ● |
| 3970198** | MB 415/1 CT RT 30 | Rp 1" ½ | ◆ | - | | ● | ● | ● |
| 3970250* | MB 415/1 - RT 52 | Rp 1" ½ | - | 3010123 | | ● | ● | ● |
| 3970253** | MB 415/1 CT RT 52 | Rp 1" ½ | ◆ | - | | ● | ● | ● |
| 3970232* | MB 415/1 - RSM 30 | Rp 1" ½ | - | 3010123 | | ● | ● | ● |
| 3970181* | MB 420/1 - RT 30 | Rp 2" | - | 3010123 | 3000826 + 20042324 | ● | ● | ● |
| 3970182** | MB 420/1 CT RT 30 | Rp 2" | ◆ | - | | ● | ● | ● |
| 3970257* | MB 420/1 - RT 52 | Rp 2" | - | 3010123 | | ● | ● | ● |
| 3970252** | MB 420/1 CT RT 52 | Rp 2" | ◆ | - | | ● | ● | ● |
| 3970233* | MB 420/1 - RSM 30 | Rp 2" | - | 3010123 | | ● | ● | ● |
| 3970234** | MB 420/1 CT RSM 30 | Rp 2" | ◆ | - | | ● | ● | ● |
| 3970221* | MBC 1200/1 - RSM 60 | Rp 2" | - | 3010367 | 3000826 + 20042324 | | | |
| 3970225** | MBC 1200/1 CT RSM 60 | Rp 2" | ◆ | - | | | | |
| 3970222* | MBC 1900/1 - FSM 40 | DN 65 | - | 3010367 | 3010221 | | | |
| 3970226** | MBC 1900/1 CT FSM 40 | DN 65 | ◆ | - | | | | |
| 3970223* | MBC 3100/1 - FSM 40 | DN 80 | - | 3010367 | 3010222 | | | |
| 3970227** | MBC 3100/1 CT FSM 40 | DN 80 | ◆ | - | | | | |
| 3970224* | MBC 5000/1 - FSM 80 | DN 100 | - | 3010367 | 3010222 - 3010370 | | | |
| 3970228** | MBC 5000/1 CT FSM 80 | DN 100 | ◆ | - | | | | |
| 3970145* | CB 512/1 - RSM 30 | Rp 1" ½ | - | 3010367 | 3000826 + 20064220 | | ● | ● |
| 20045589** | CB 512/1 CT RSM 30 | Rp 1" ½ | ◆ | - | | | ● | ● |
| 3970146* | CB 520/1 - RSM 30 | Rp 2" | - | 3010367 | 3000826 + 20042324 | | | ● |
| 3970160** | CB 520/1 CT RSM 30 | Rp 2" | ◆ | - | | | | ● |
| 20044659* | CB 525/1 - RSM 30 | Rp 2" | - | 3010367 | 3000826 + 20042324 | | | |
| 20044660** | CB 525/1 CT RSM 30 | Rp 2" | ◆ | - | | | | |
| 3970147* | CB 5065/1 - FSM 30 | DN 65 | - | 3010367 | 3010221 | | | |
| 3970161** | CB 5065/1 CT FSM 30 | DN 65 | ◆ | - | | | | |
| 3970148* | CB 5080/1 - FSM 30 | DN 80 | - | 3010367 | 3010222 | | | |
| 3970162** | CB 5080/1 CT FSM 30 | DN 80 | ◆ | - | | | | |
| 3970149* | CB 50100/1 - FSM 30 | DN 100 | - | 3010367 | 3010223 - 3010370 | | | |
| 3970163** | CB 50100/1 CT FSM 30 | DN 100 | ◆ | - | | | | |
| 20015871* | CB 50125/1 - FSM 30 | DN 125 | - | 3010367 | 3010224 | | | |
| 3970196** | CB 50125/1 CT FSM 30 | DN 125 | ◆ | - | | | | |

Please see designation of Gas Train Series in the page before the Catalogue index.
* 230V/50Hz -220V/60Hz electrical supply.
** 230V/50Hz electrical supply.
The valve seal control device is compulsory (conforming to EN 676) on gas trains to burners with a maximum output over 1200 kW.
To select the gas train please refer to the technical data leaflet and/or instruction manual.
C.T. Gas valve leak detection control device:
- gas train not equipped with leak detection control device; this device can be ordered separately - see VPS column - and installed later.
◆ gas train equipped with leak detection control device.
VPS Valve leak detection control device. Supplied separately from the gas train (please see Gas train accessories paragraph for both 50 Hz and 60 Hz codes).
● Not available.

# Burner accessories

## Nozzles



Return nozzles without needle are used on RLS/M MX burners. The nozzle must be ordered as accessory. The following table shows the features and codes on the basis of the maximum required fuel output.

| BURNER | RATED DELIVERY (kg/h) | NOZZLE CODE |
|---|---|---|
| ▶ RLS 310-410/M MX | 150 | 3009363 |
| ▶ RLS 310-410/M MX | 200 | 3009364 |
| ▶ RLS 310-410/M MX | 225 | 3009365 |
| ▶ RLS 310-410/M MX | 250 | 3009366 |
| ▶ RLS 310-410/M MX | 275 | 3009367 |
| ▶ RLS 310-410/M MX | 300 | 3009368 |
| ▶ RLS 410/M MX | 325 | 3009369 |
| ▶ RLS 410/M MX | 350 | 3009370 |
| ▶ RLS 410/M MX | 375 | 3009371 |
| ▶ RLS 410/M MX | 400 | 3009372 |
| ▶ RLS 410/M MX | 425 | 3009373 |
| ▶ RLS 510/M MX | 350 | 3045495 |
| ▶ RLS 510/M MX | 400 | 3045499 |
| ▶ RLS 510/M MX | 450 | 3045501 |
| ▶ RLS 510/M MX | 500 | 3045503 |
| ▶ RLS 610/M MX | 350 | 3045495 |
| ▶ RLS 610/M MX | 450 | 3045501 |
| ▶ RLS 610/M MX | 550 | 3045505 |
| ▶ RLS 610/M MX | 600 | 3045507 |

For more information please contact Riello Burners Commercial and Technical Department, our Application Engineers will be pleased to help you.

# Burner accessories

## Accessories for modulating operation

### POWER CONTROLLER

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

| BURNER | REGULATOR TYPE | REGULATOR CODE |
|---|---|---|
| ▶ All models | RWF 50.2 - Basic version with - 3 position output | 20073595 |
| ▶ All models | RWF 55.5 - Complete with RS-485 interface | 20074441 |
| ▶ All models | RWF 55.6 - Complete with RS-485/ PROFIBUS interface | 20074442 |

### PROBE

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 |
|---|---|---|---|
| ▶ All models | Temperature PT 100 | -100 ÷ 500°C | 3010110 |
| ▶ All models | Pressure 4 ÷ 20 mA | 0 ÷ 2,5 bar | 3010213 |
| ▶ All models | Pressure 4 ÷ 20 mA | 0 ÷ 16 bar | 3010214 |

### ANALOG CONTROL SIGNAL CONVERTER

| BURNER | TYPE (INPUT SIGNAL) | CODE |
|---|---|---|
| ▶ All models | 0/2 - 10 V (impedance 200 KΩ)<br>0/4 - 20 mA (impedance 250 Ω) | 20074479 |

### POTENTIOMETER

| BURNER | KIT CODE |
|---|---|
| ▶ All models | 20096322 |

It is necessary for analogic control signal converter operation.

## Fuel remote selection kit

| BURNER | KIT CODE |
|---|---|
| ▶ All models | on demand |

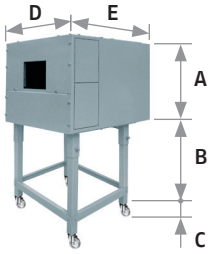
# Burner accessories

## Continuous ventilation kit

If the burner requires continuous ventilation in the stages without flame, a special kit is available as given in the following table:

| BURNER | KIT CODE |
|---|---|
| ▶ All models | 20074542 |

## Sound proofing box

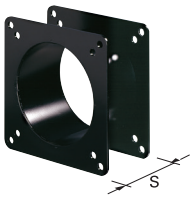



If noise emission needs reducing even further, sound-proofing boxes are available. In case of generator heights, where a lower dimension "B" is required, ask for the Box Support Kit code 20065135. The useful dimensions are 40 mm less than the total dimensions indicated in the table (A, D, E). Not suitable for outdoor use.

| BURNER | BOX TYPE | A (mm) | B (mm) min-max | C (mm) | D (mm) | E (mm) | [dB(A)] (*) | BOX CODE |
|---|---|---|---|---|---|---|---|---|
| ▶ RLS 310-410/M | C7 | 1255 | 160 - 980 | 110 | 1140 | 1345 | 10 | 3010376 |
| ▶ RLS 510-610/M | C7 Plus | 1255 | 160 - 980 | 110 | 1240 | 1345 | 10 | 20085111 |

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

## 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 |
|---|---|---|
| ▶ All models | 180 | 20008903 |

# Gas train accessories

## Adapters

In certain cases, an adapter must be fitted between the gas train and the burner, when the diameter of the gas train is different from the set diameter of the burner. Below are given the available adapters; please see on the Gas Train list the correct adapter codes to select.

| ADAPTER | DIMENSIONS Ø1 DN | Ø2 DN | A mm | B mm | ADAPTER CODE |
|---|---|---|---|---|---|
| 1" 1/2 — 2" | - | - | 65 | - | 20064220 |
| 2" — 2" | - | - | 65 | - | 20042324 |
| DN 80 — 2" 1/2 — 2" | - | - | 300 | - | 3000826 |
| Ø1 — Ø2, A | 65 | 80 | 400 | - | 3010221 |
| | 80 | 80 | 400 | - | 3010222 |
| | 100 | 80 | 400 | - | 3010223 |
| | 125 | 80 | 320 | - | 3010224 |

# Gas train accessories

## Stabiliser spring

To vary the pressure range of the gas train stabilisers, accessory springs are available. The following table shows these accessories with their application range. Please refer to the technical manual for the correct choice of spring.

| GAS TRAIN | SPRING COLOUR | SPRING Pressure range mbar | SPRING CODE |
|---|---|---|---|
| MBC 1900/1 - 3100/1 MBC 5000/1 | White | 4 - 20 | 3010381 |
| | Red | 20 - 40 | 3010382 |
| | Black | 40 - 80 | 3010383 |
| | Green | 80 - 150 | 3010384 |
| CB 512/1 | Red | 25 - 55 | 3010131 |
| | Black | 60 - 110 | 3010157 |
| | Pink | 90 - 150 | 3090486 |
| CB 520/1 - 525/1 | Red | 25 - 55 | 3010132 |
| | Black | 60 - 110 | 3010158 |
| | Pink | 100 - 150 | 3090487 |
| CB 5065/1 - 5080/1 | Red | 25 - 55 | 3010133 |
| | Black | 60 - 110 | 3010135 |
| | Pink | 100 - 150 | 3090456 |
| | Grey | 140 - 200 | 3090992 |
| CB 50100/1 | Red | 25 - 55 | 3010134 |
| | Black | 60 - 110 | 3010136 |
| | Pink | 100 - 150 | 3090489 |
| | Grey | 140 - 200 | 3092174 |
| CB 50125/1 | Red | 25 - 55 | 3010315 |
| | Yellow | 30 - 70 | 3010316 |
| | Black | 60 - 110 | 3010317 |
| | Pink | 100 - 150 | 3010318 |

## Seal control kit


To test the valve seals on the gas train, a special "seal control kit" is available. The valve seal control device is compulsory (EN 676) on gas trains to burners with a maximum output over 1200 kW.
The seal control is type VPS 504.

| GAS TRAIN | Kit code for 50 Hz operation |
|---|---|
| ▶ MB type | 3010123 |
| ▶ MCB - CB - DMV type | 3010367 |