# LOW NOx MODULATING GAS BURNERS

| RS/M BLU SERIES | |
|---|---|
| **RS 25/M BLU** | 76/125 ÷ 370 kW |
| **RS 35/M BLU** | 100/200 ÷ 480 kW |
| **RS 45/M BLU** | 90/190 ÷ 550 kW |
| **RS 68/M BLU** | 150/350 ÷ 860 kW |
| **RS 120/M BLU** | 300/600 ÷ 1300 kW |
| **RS 160/M BLU** | 300/930 ÷ 1860 kW |
| **RS 200/M BLU** | 506/1383 ÷ 2400 kW |

The RS/M BLU burners series covers a firing range from 125 to 2400 kW, and it has been designed for use in low or medium temperature hot water boilers, hot air or steam boilers, diathermic oil boilers.
Operation can be "two stage progressive" or, alternatively, "modulating" with the installation of a PID logic regulator and respective probes.
RS/M BLU burners series guarantees high efficiency levels in all the various applications, thus reducing fuel consumption and running costs.
The exclusive design ensures reduced dimensions, simple use and maintenance. A wide range of accessories guarantees elevated working flexibility.

# TECHNICAL DATA

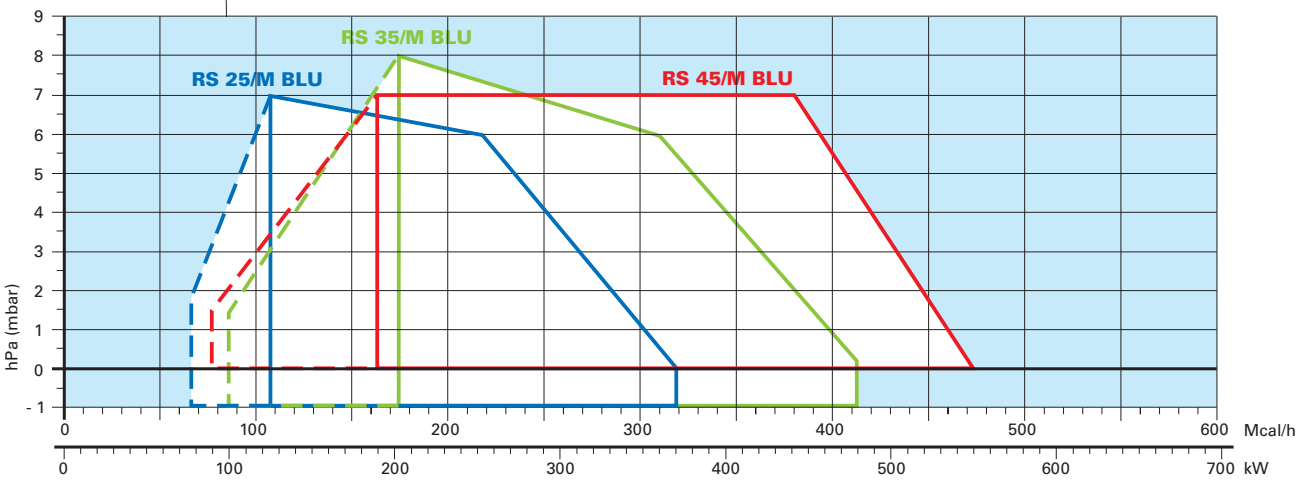
| | Model | | RS25/M BLU | RS35/M BLU | | RS45/M BLU | RS68/M BLU | RS120/M BLU | RS160/M BLU | RS200/M BLU | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Burner operation mode | | Modulating (with regulator and probes accessories) | | | | | | | | |
| | Modulation ratio at max. output | | 4 ÷ 1 | | | 3 ÷ 1 | | | 4 ÷ 1 | | |
| | Servo-motor Type | | SQN90 | | | | SQN31 | | | | |
| | Servo-motor Run time | s | 24 | | | | 42 | | | | |
| | Heat output | kW | 76/125÷370 | 100/200÷480 | | 90/190÷550 | 150/350÷860 | 300/600÷1300 | 300/930÷1860 | 506/1383÷2400 | |
| | Heat output | Mcal/h | 65/108÷318 | 86/172÷413 | | 77/164÷473 | 129/301÷740 | 258/516÷1118 | 258/800÷1600 | 435/1189÷2064 | |
| | Working temperature | °C min./max. | 0/40 | | | | | | | | |
| Fuel / air data | Net calorific value G20 gas | kWh/Nm³ | 10 | | | | | | | | |
| Fuel / air data | Density gas G20 | kg/Nm³ | 0,71 | | | | | | | | |
| Fuel / air data | Output gas G20 | Nm³/h | 8/13÷37 | 10/20÷48 | | 9/19÷55 | 15/35÷86 | 30/60÷130 | 30/93÷186 | 51/138÷240 | |
| Fuel / air data | Net calorific value G25 gas | kWh/Nm³ | 8,6 | | | | | | | | |
| Fuel / air data | Density gas G25 | kg/Nm³ | 0,78 | | | | | | | | |
| Fuel / air data | Output gas G25 | Nm³/h | 9/15÷43 | 12/23÷56 | | 10,5/22÷64 | 17,5/41÷100 | 35/70÷151 | 35/108÷216 | 58/161÷279 | |
| Fuel / air data | Net calorific value LPG gas | kWh/Nm³ | 25,8 | | | | | | | | |
| Fuel / air data | Density LPG gas | kg/Nm³ | 2,02 | | | | | | | | |
| Fuel / air data | Output LPG gas | Nm³/h | 3/5÷14 | 4/8÷19 | | -- | | | | | |
| Fuel / air data | Fan | Type | (02) | | | (01) | | | (02) | | |
| Fuel / air data | Air temperature | Max. °C | 60 | | | | | | | | |
| Electrical data | Electrical supply | Ph/Hz/V | (04) | (04) | (06) | (03) | (05) | (05) | (05) | (07) | (08) |
| Electrical data | Auxiliary electrical supply | Ph/Hz/V | (04) | (04) | (04) | (03) | (03) | (03) | (03) | (03) | |
| Electrical data | Control box | Type | RMG/M (intermittent operation) - LGK16 (continuous operation) | | | | | | | | |
| Electrical data | Total electrical power | kW | 0,6 | 0,7 | 0,75 | 0,6 | 2,0 | 2,8 | 5,3 | 8,2 | |
| Electrical data | Auxiliary electrical power | kW | 0,3 | 0,28 | 0,3 | 0,18 | 0,3 | 0,3 | 0,3 | 0,3 | |
| Electrical data | Protection level | IP | 40 | | | 44 | | | | | |
| Electrical data | Motor electrical power | kW | 0,3 | 0,42 | 0,45 | 0,42 | 1,5 | 2,2 | 4,5 | 6,6 | |
| Electrical data | Rated motor current | A | 3,2 | 3,5 | 2 - 1,4 | 2,9 | 5,9 - 3,4 | 8,8 - 5,1 | 15,8 - 9,1 | 14 | 24 |
| Electrical data | Motor start current | A | 15 | 17 | 14 -10 | 9,2 | 32,8 - 19 | 55,4 - 32 | 126 - 72,8 | 116 | 204 |
| Electrical data | Motor protection level | IP | 54 | | | | | | | | |
| Electrical data | Ignition transformer | V1 - V2 | 230V - 1x15 kV | | | | 230V - 1x8 kV | | | | |
| Electrical data | Ignition transformer | I1 - I2 | 1A - 25 mA | | | 45vA - 25 mA | 1A - 20 mA | | | | |
| Electrical data | Operation | | Intermittent (at least one stop every 24 h) - Continuous (at least one stop every 72 h) | | | | | | | | |
| Emissions | Sound pressure | dBA | 70 | 72 | | 70 | 77 | 78,5 | 80,5 | 83 | |
| Emissions | Sound output | W | -- | | | | | | | | |
| Emissions | CO Emission | mg/kWh | < 20 | | | | | | | | |
| Emissions | NOx Emission | mg/kWh | < 80 | | | | | | | | |
| Approval | Directive | | 90/396 - 89/336 (2004/108) - 73/23 - 92/42 EC | | | | | 90/396 - 89/336 (2004/108) - 73/23 EC | | | |
| Approval | Conforming to | | EN 676 | | | | | | | | |
| Approval | Certification | | CE-0085BR0379 | | | CE 0085 BM 0104 BUWAL n°101011 | CE 0085 BM 0452 | | | in progress | |

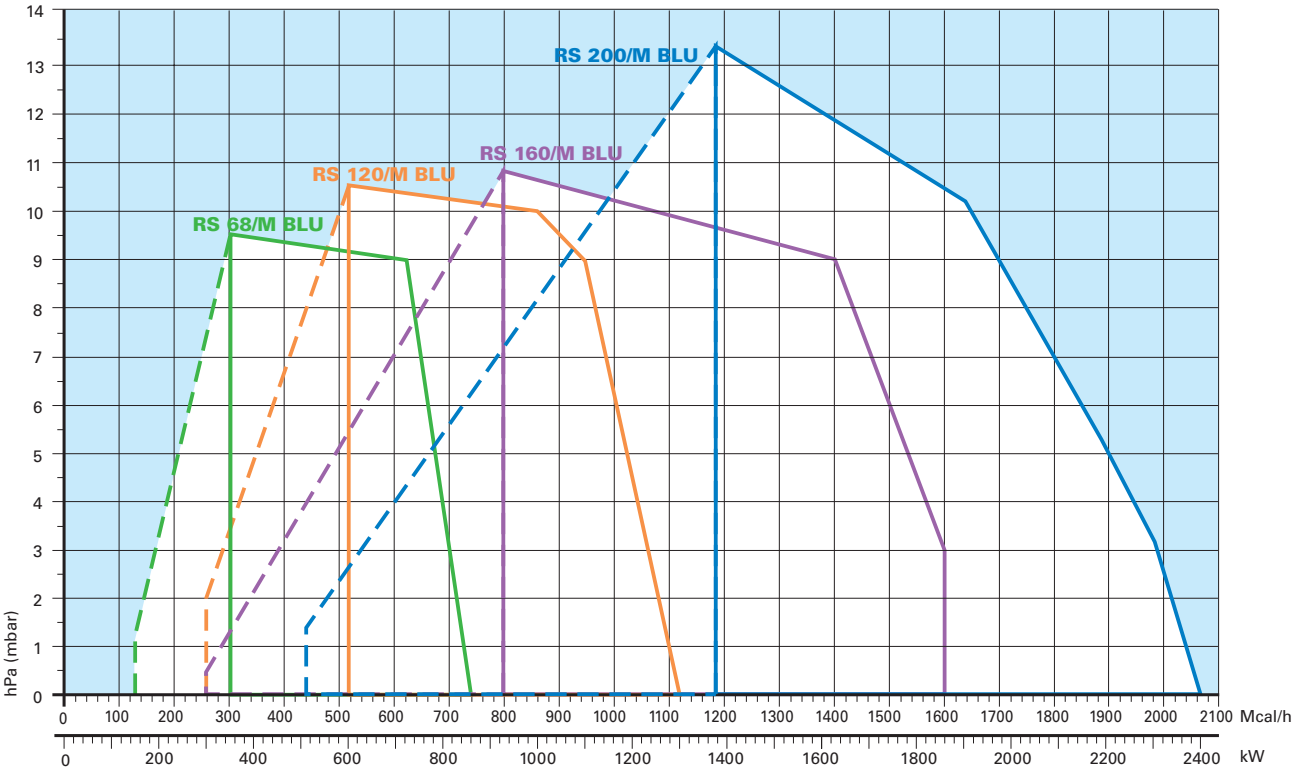
(01) Centrifugal with reverse curve blades
(02) Centrifugal with forward curve blades
(03) 1/50/230~(±10%)
(04) 1/50-60/220-230~(±10%)
(05) 3/50/230-400~(±10%)
(06) 3/50-60/220-400~(±10%)
(07) 3/50/400~(±10%)
(08) 3/50/230~(±10%)

**Reference conditions:**
Temperature: 20°C
Pressure: 1013.5 mbar
Altitude: 100 m a.s.l.
Noise measured at a distance of 1 meter.

*Since the Company is constantly engaged in the production improvement, the aesthetic and dimensional features, the technical data, the equipment and the accessories can be changed.*

# FIRING RATES




Useful working field for choosing the burner

Modulation range

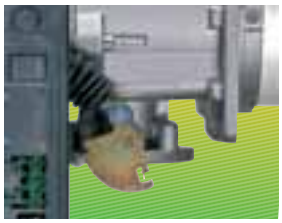
**Test conditions conforming to EN 676:**
Temperature: 20°C
Pressure: 1000 mbar
Altitude: 100 m a.s.l.

# FUEL SUPPLY

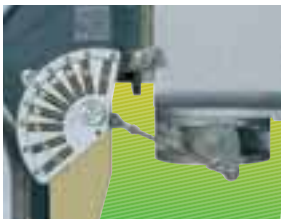
## GAS TRAIN

The burners are fitted with a butterfly valve to regulate the fuel, controlled by a variable profile cam servomotor. Fuel can be supplied either from the right or left hand sides.
A maximum gas pressure switch stops the burner in case of excess pressure in the fuel line (as accessory on RS 25-35/M BLU).

The gas train can be selected to best fit system requirements depending on the fuel output and pressure in the supply line.
The gas train can be "Multibloc" type (containing the main components in a single unit) or "Composed" type (assembly of the single components).

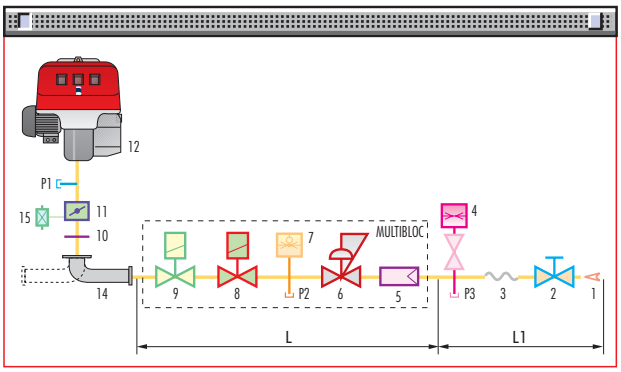


*Example of the variable profile cam on RS 25-35/M BLU burners.*

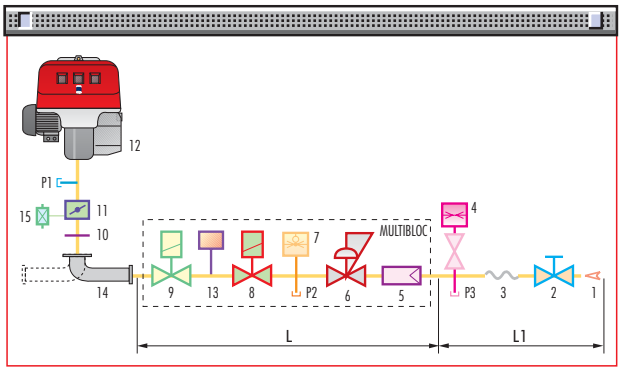


*Example of the variable profile cam on RS 160/M BLU burners.*

### MULTIBLOC MBD gas train without seal control

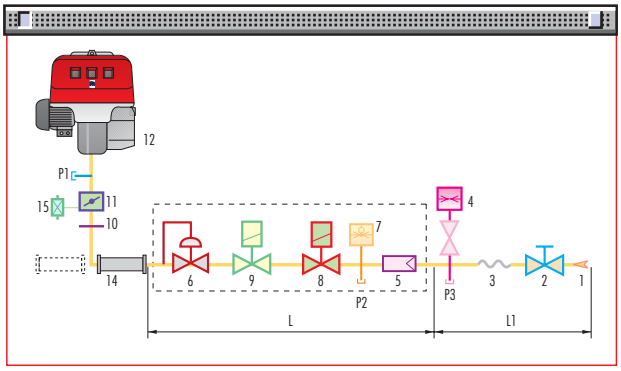



### MULTIBLOC MBD gas train with seal control

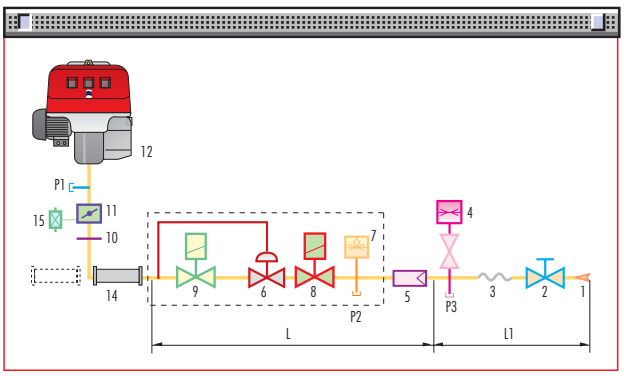


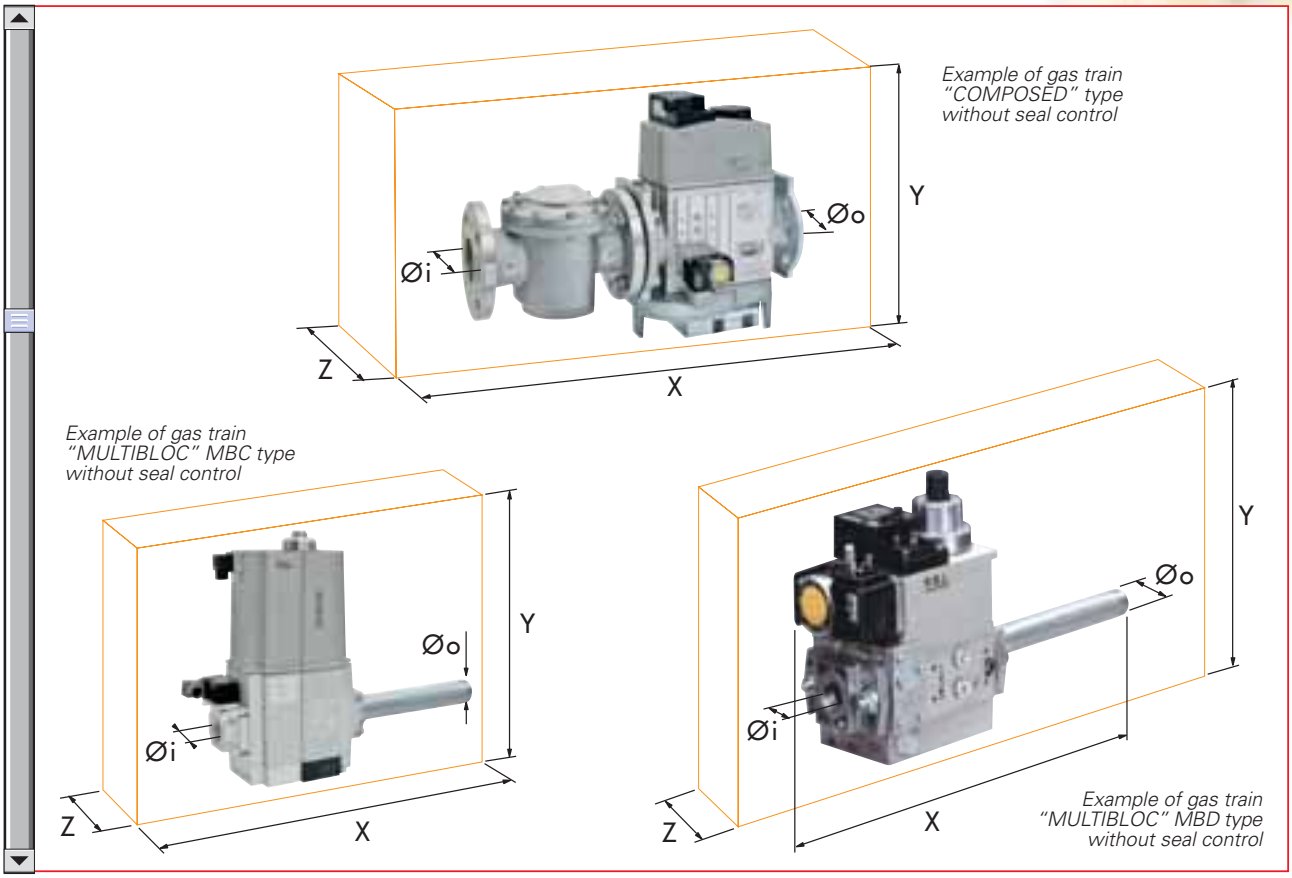

| | |
|---|---|
| 1 | Gas input pipework |
| 2 | Manual valve |
| 3 | Anti-vibration joint |
| 4 | Pressure gauge with pushbutton cock |
| 5 | Filter |
| 6 | Pressure regulator (vertical) |
| 7 | Minimum gas pressure switch |
| 8 | VS safety solenoid (vertical) |
| 9 | VR regulation solenoid (vertical)<br>Two settings: - firing output (rapid opening)<br>- maximum output (slow opening) |
| 10 | Gasket and flange supplied with the burner |
| 11 | Gas adjustment butterfly valve |
| 12 | Burner |
| 13 | Seal control mechanism for valves 8-9. According to standard EN 676, the seal control is compulsory for burners with maximum output above 1200 kW |
| 14 | Gas train-burner adapter. |
| 15 | Maximum gas pressure switch |
| P1 | Combustion head pressure |
| P2 | Pressure downstream from the regulator |
| P3 | Pressure upstream from the filter |
| L | Gas train supplied separately, with the code given in the table |
| L1 | Installer's responsibility |

### MULTIBLOC MBC gas train




### COMPOSED gas train






Gas trains are approved by standard EN 676 together with the burner.
The overall dimensions of the gas train depends on how they are constructed. The following table shows the maximum dimensions of the gas trains that can be fitted to RS/M BLU burners, intake and outlet diameters and seal control if fitted.
Please note that the seal control can be installed as an accessory, if not already installed on the gas train.
The maximum gas pressure of gas train "Multibloc" type is 360 mbar, and the one of gas train "Composed" type is 500 mbar.
The range of pressure in the MULTIBLOC with flange can be modified choosing the stabiliser spring (see gas train accessory).

| | Name | Code | Ø i | Ø o | X mm | Y mm | Z mm | Output pressure range (mbar) | Seal Control |
|---|---|---|---|---|---|---|---|---|---|
| MULTIBLOC GAS TRAINS | **MBD 405** | 3970500 (1) | 3/4" | 3/4" | 371 | 186 | 120 | 4 - 20 | Accessory |
| | **MBD 407** | 3970553 (1)<br>3970229 (2) | 3/4" | 3/4" | 371 | 196 | 120 | 4 - 20 | Accessory |
| | **MBD 410** | 3970554 (1)<br>3970230 (2) | 1" | 3/4" | 405 | 217 | 145 | 4 - 20 | Accessory |
| | **MBD 412** | 3970144 (1)<br>3970231 (2) | 1"1/4 | 1"1/4 | 433 | 217 | 145 | 4 - 20 | Accessory |
| | **MBD 412 CT** | 3970197 (1) | 1"1/4 | 1"1/4 | 433 | 217 | 262 | 4 - 20 | Incorporated |
| | **MBD 415** | 3970180 (1)<br>3970232 (2) | 1"1/2 | 1"1/2 | 523 | 250 | 100 | 4 - 33 | Accessory |
| | **MBD 415 CT** | 3970198 (1) | 1"1/2 | 1"1/2 | 523 | 250 | 227 | 4 - 33 | Incorporated |
| | **MBD 420** | 3970181 (1)<br>3970233 (2) | 2" | 2" | 523 | 300 | 100 | 4 - 33 | Accessory |
| | **MBD 420 CT** | 3970182 (1)<br>3970234 (2) | 2" | 2" | 523 | 300 | 227 | 4 - 33 | Incorporated |
| | **MBC 1200 SE 50** | 3970221 (2) | 2" | 2" | 573 | 425 | 161 | 4 - 60 | Accessory |
| | **MBC 1200 SE 50 CT** | 3970225 (2) | 2" | 2" | 573 | 425 | 288 | 4 - 60 | Incorporated |
| COMPOSED GAS TRAINS | **MBC 1900 SE 65 FC** | 3970222 (2) | DN 65 | DN 65 | 583 | 430 | 237 | 20 - 40 | Accessory |
| | **MBC 1900 SE 65 FC CT** | 3970226 (2) | DN 65 | DN 65 | 583 | 430 | 364 | 20 - 40 | Incorporated |
| | **MBC 3100 SE 80 FC** | 3970223 (2) | DN 80 | DN 80 | 633 | 500 | 240 | 20 - 40 | Accessory |
| | **MBC 3100 SE 80 FC CT** | 3970227 (2) | DN 80 | DN 80 | 633 | 500 | 367 | 20 - 40 | Incorporated |

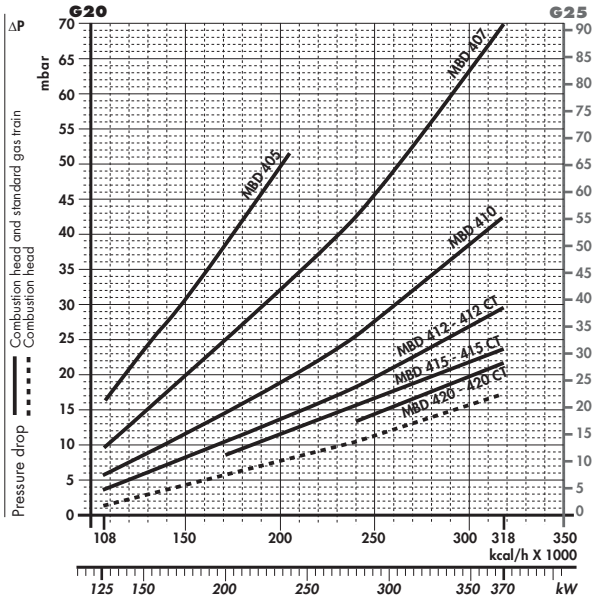
(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

## PRESSURE DROP DIAGRAM

The diagrams indicate the minimum pressure drop of the burners with the various gas trains that can be matched with them; at the value of these pressure drop add the combustion chamber pressure. The value thus calculated represents the minimum required input pressure to the gas train.

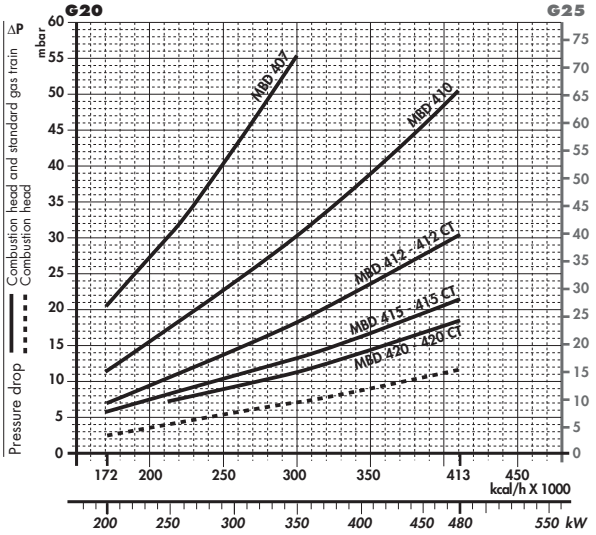
### *NATURAL GAS*

### RS 25/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 405** | 3970500 (1) | 3000824 | Accessory |
| **MBD 407** | 3970553 (1) | 3000824 | Accessory |
| | 3970229 (2) | 3000824 | Accessory |
| **MBD 410** | 3970554 (1) | 3000824 | Accessory |
| | 3970230 (2) | 3000824 | Accessory |
| **MBD 412** | 3970144 (1) | - | Accessory |
| | 3970231 (2) | - | Accessory |
| **MBD 412 CT** | 3970197 (1) | - | Incorporated |

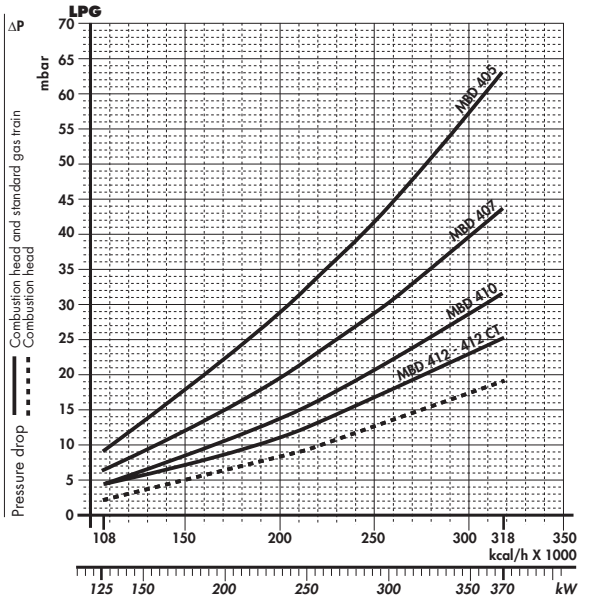
### RS 35/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 405** | 3970500 (1) | 3000824 | Accessory |
| **MBD 407** | 3970553 (1) | 3000824 | Accessory |
| | 3970229 (2) | 3000824 | Accessory |
| **MBD 410** | 3970554 (1) | 3000824 | Accessory |
| | 3970230 (2) | 3000824 | Accessory |
| **MBD 412** | 3970144 (1) | - | Accessory |
| | 3970231 (2) | - | Accessory |
| **MBD 412 CT** | 3970197 (1) | - | Incorporated |

### *LPG*

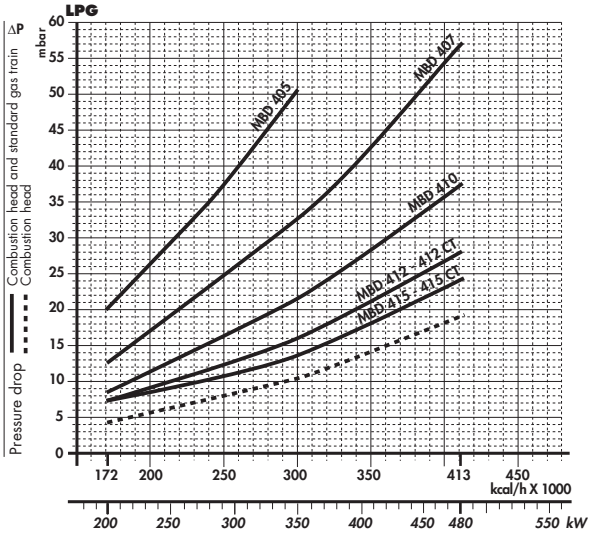
### RS 25/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 415** | 3970180 (1) | - | Accessory |
| | 3970232 (2) | - | Accessory |
| **MBD 415 CT** | 3970198 (1) | - | Incorporated |
| **MBD 420** | 3970181 (1) | 3000822 | Accessory |
| | 3970233 (2) | 3000822 | Accessory |
| **MBD 420 CT** | 3970182 (1) | 3000822 | Incorporated |
| | 3970234 (2) | 3000822 | Incorporated |

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

### RS 35/M BLU

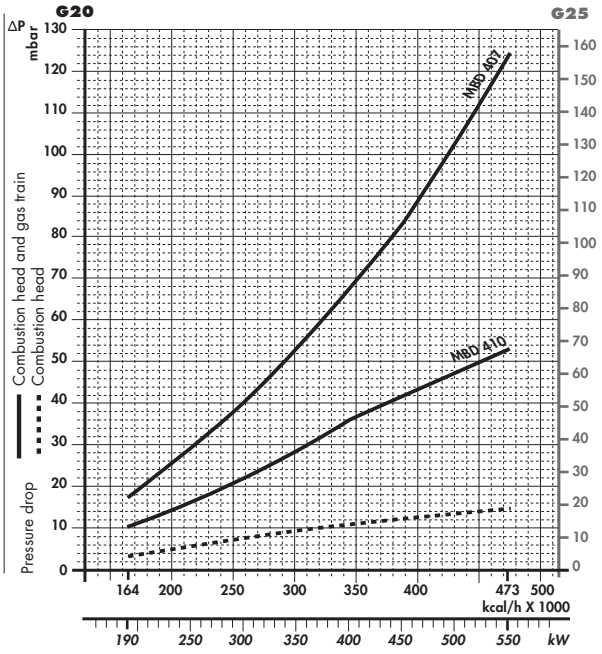



| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 415** | 3970180 (1) | - | Accessory |
| | 3970232 (2) | - | Accessory |
| **MBD 415 CT** | 3970198 (1) | - | Incorporated |
| **MBD 420** | 3970181 (1) | 3000822 | Accessory |
| | 3970233 (2) | 3000822 | Accessory |
| **MBD 420 CT** | 3970182 (1) | 3000822 | Incorporated |
| | 3970234 (2) | 3000822 | Incorporated |

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

## *NATURAL GAS*

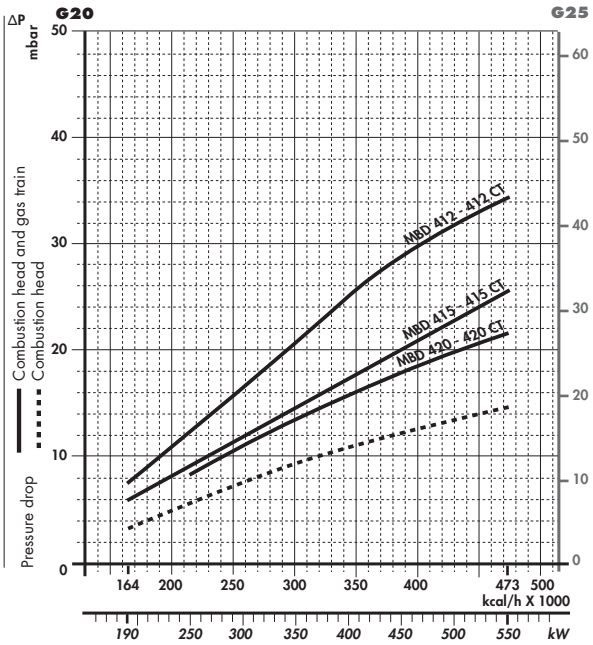
### RS 45/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 407** | 3970553 (1) | 3000824 | Accessory |
| | 3970229 (2) | 3000824 | Accessory |
| **MBD 410** | 3970554 (1) | 3000824 | Accessory |
| | 3970230 (2) | 3000824 | Accessory |

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

### RS 45/M BLU

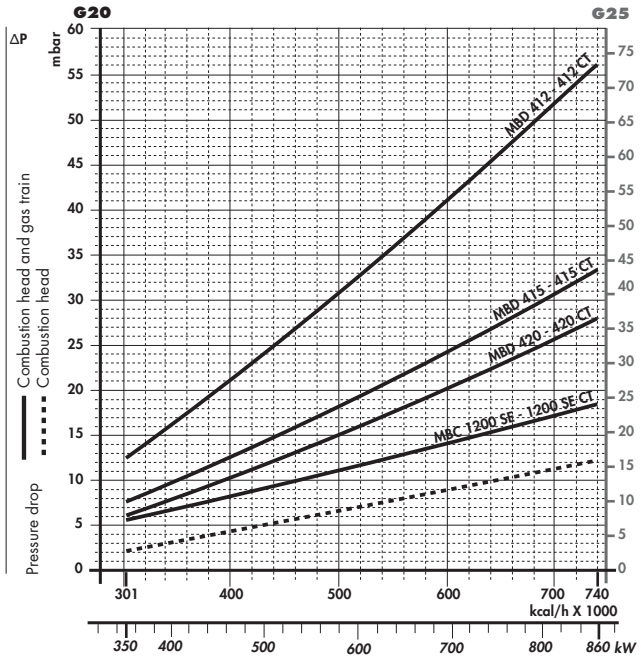



| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 412** | 3970144 (1) | - | Accessory |
| | 3970231(2) | - | Accessory |
| **MBD 412 CT** | 3970197 (1) | - | Incorporated |
| **MBD 415** | 3970180 (1) | - | Accessory |
| | 3970232 (2) | - | Accessory |
| **MBD 415 CT** | 3970198 (1) | - | Incorporated |
| **MBD 420** | 3970181 (1) | 3000822 | Accessory |
| | 3970233 (2) | 3000822 | Accessory |
| **MBD 420 CT** | 3970182 (1) | 3000822 | Incorporated |
| | 3970234 (2) | 3000822 | Incorporated |

(1) Gas Train with 6-pin plug to install for connection to the burner.
(2) Gas Train with 6-pin plug installed for connection to the burner.

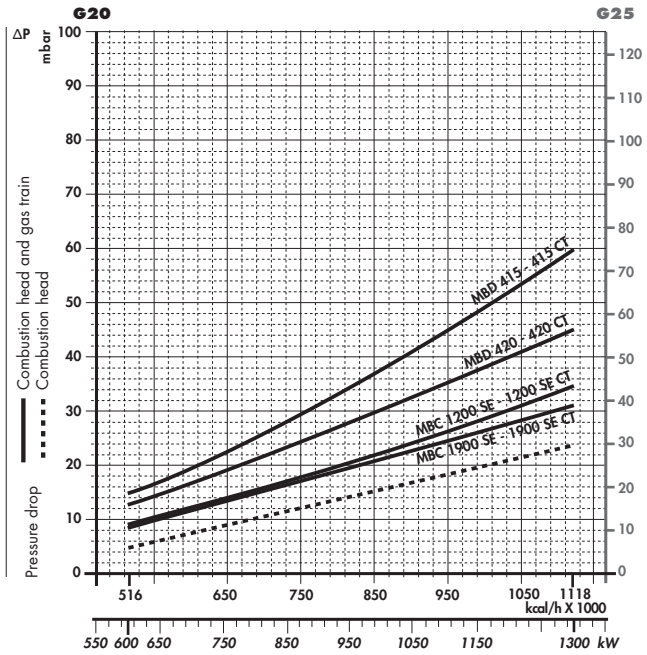
## *NATURAL GAS*

### RS 68/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 412** | 3970144 | 3000843 | Accessory |
| **MBD 412 CT** | 3970197 | 3000843 | Incorporated |
| **MBD 415** | 3970180 | 3000843 | Accessory |
| **MBD 415 CT** | 3970198 | 3000843 | Incorporated |
| **MBD 420** | 3970181 | - | Accessory |
| **MBD 420 CT** | 3970182 | - | Incorporated |
| **MBC 1200 SE** | 3970221 | - | Accessory |
| **MBC 1200 SE CT** | 3970225 | - | Incorporated |

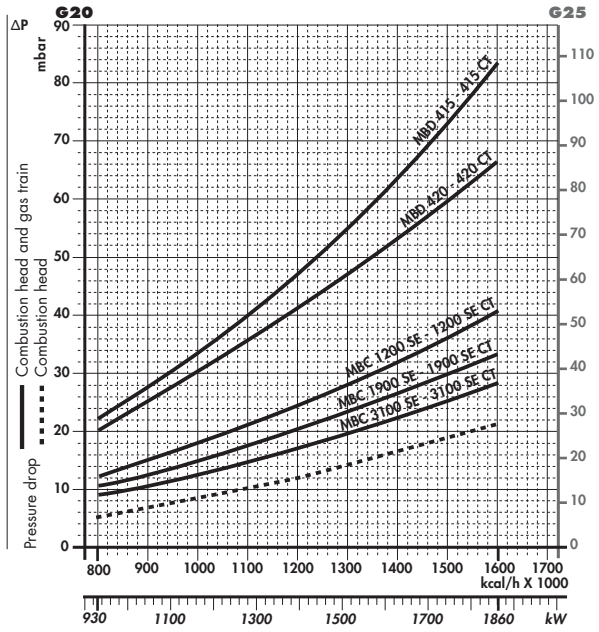
### RS 120/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 415** | 3970180 | 3000843 | Accessory |
| **MBD 415 CT** | 3970198 | 3000843 | Incorporated |
| **MBD 420** | 3970181 | - | Accessory |
| **MBD 420 CT** | 3970182 | - | Incorporated |
| **MBC 1200 SE** | 3970221 | - | Accessory |
| **MBC 1200 SE CT** | 3970225 | - | Incorporated |
| **MBC 1900 SE** | 3970222 | 3000825 | Accessory |
| **MBC 1900 SE CT** | 3970226 | 3000825 | Incorporated |

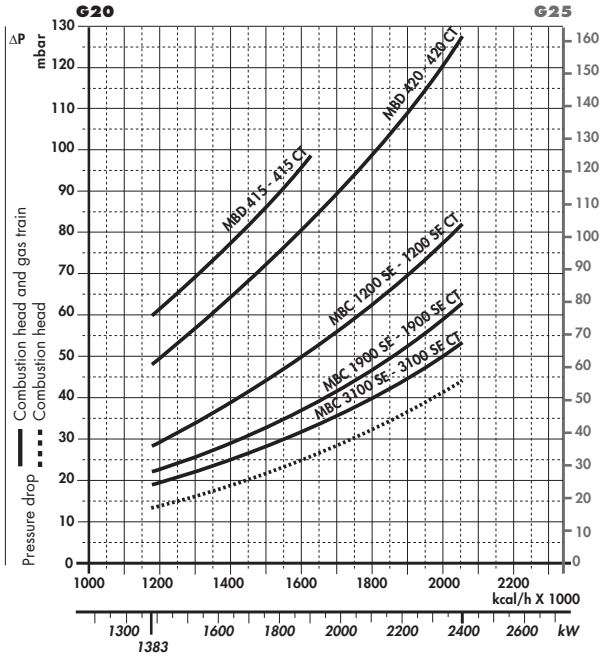
## *NATURAL GAS*

### RS 160/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 415** | 3970180 | 3000843 | Accessory |
| **MBD 415 CT** | 3970198 | 3000843 | Incorporated |
| **MBD 420** | 3970181 | - | Accessory |
| **MBD 420 CT** | 3970182 | - | Incorporated |
| **MBC 1200 SE** | 3970221 | - | Accessory |
| **MBC 1200 SE CT** | 3970225 | - | Incorporated |
| **MBC 1900 SE** | 3970222 | 3000825 | Accessory |
| **MBC 1900 SE CT** | 3970226 | 3000825 | Incorporated |
| **MBC 3100 SE** | 3970223 | 3000826 | Accessory |
| **MBC 3100 SE CT** | 3970227 | 3000826 | Incorporated |

### RS 200/M BLU




| Gas train | Code | Adapter | Seal Control |
|---|---|---|---|
| **MBD 415** | 3970180 | 3000843 | Accessory |
| **MBD 415 CT** | 3970198 | 3000843 | Incorporated |
| **MBD 420** | 3970181 | - | Accessory |
| **MBD 420 CT** | 3970182 | - | Incorporated |
| **MBC 1200 SE** | 3970221 | - | Accessory |
| **MBC 1200 SE CT** | 3970225 | - | Incorporated |
| **MBC 1900 SE** | 3970222 | 3000825 | Accessory |
| **MBC 1900 SE CT** | 3970226 | 3000825 | Incorporated |
| **MBC 3100 SE** | 3970223 | 3000826 | Accessory |
| **MBC 3100 SE CT** | 3970227 | 3000826 | Incorporated |

**note** *Please contact the Riello Burner Technical Office for different pressure levels from those above indicated and refer to the technical manual for the correct choice of the spring.*

*In LPG plants, Multibloc gas trains do not operate below 0° C. They are only suitable for gaseous LPG (liquid hydrocarbons destroy the seal materials).*

*MBC 1200 gas train: the minimum operating pressure (*) is higher or equal to 10 mbar. The gas train has to be installed next to the burner (if needed, only with the adapters listed in the catalogue) and it has to operate in its own working field.*

*MBC 1900-3100 gas train: the minimum operating pressure (*) is higher or equal to 15 mbar. The gas train has to be installed next to the burner (if needed, with the adapters listed in the catalogue) and it has to operate in its own working field.*

*(*) it is the upstream gas train pressure in full load operation conditions.*

## SELECTING THE FUEL SUPPLY LINES

The following diagram enables pressure drop in a pre-existing gas line to be calculated and to select the correct gas train.
The diagram can also be used to select a new gas line when fuel output and pipe length are known. The pipe diameter is selected on the basis of the desired pressure drop. The diagram uses methane gas as reference; if another gas is used, conversion coefficient and a simple formula (on the diagram) transform the gas output to a methane equivalent (refer to figure A). Please note that the gas train dimensions must take into account the back pressure of the combustion chamber during operations.

**Control of the pressure drop in an existing gas line or selecting a new gas supply line.**
The methane output equivalent is determined by the formula fig. A on the diagram and the conversion coefficient.

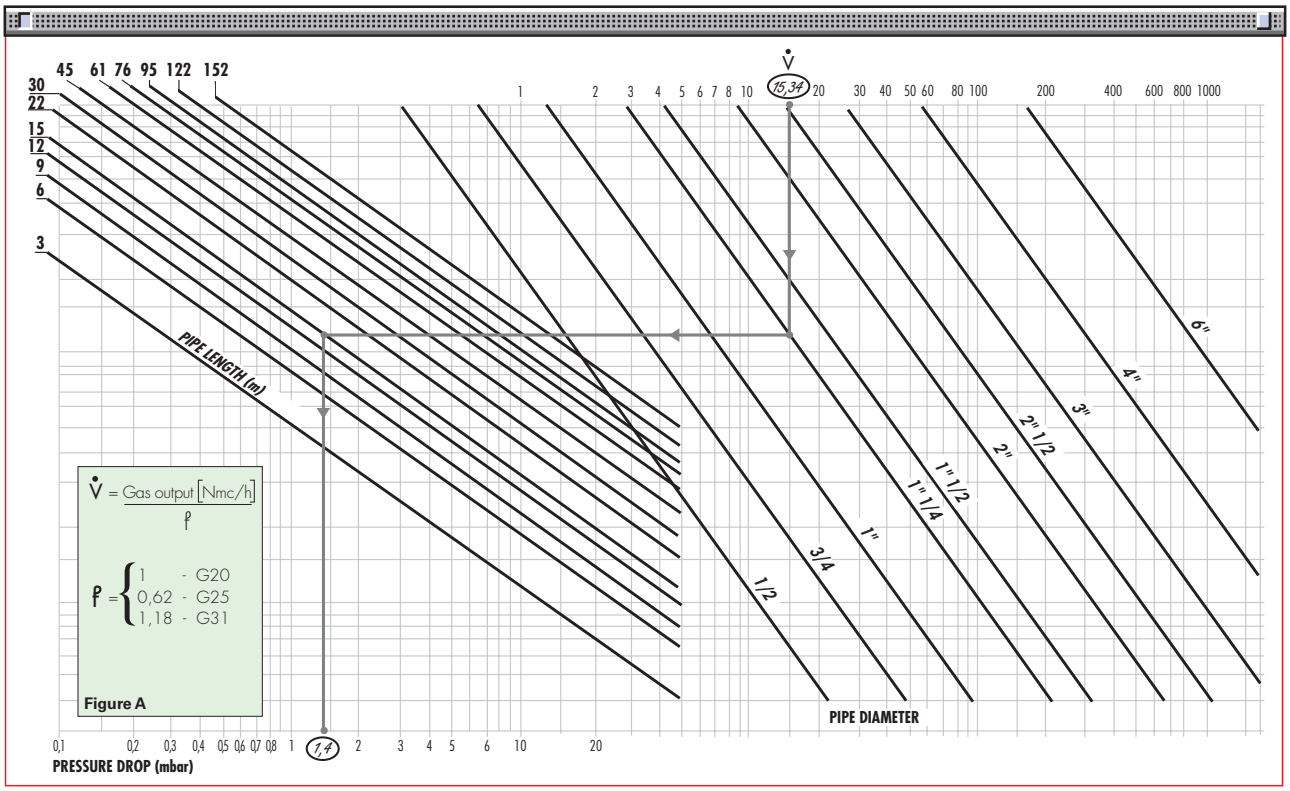
Once the equivalent output has been determined on the delivery scale ( $\dot{V}$ ), shown at the top of the diagram, move vertically downwards until you cross the line that represents the pipe diameter; at this point, move horizontally to the left until you meet the line that represents the pipe length. Once this point is established you can verify, by moving vertically downwards, the pipe pressure drop on the botton scale (mbar).
By subtracting this value from the pressure measured on the gas meter, the correct pressure value will be found for the choice of gas train.

**Example:**

| | | |
|---|---|---|
| | - gas used | G25 |
| | - gas output | 9.51 mc/h |
| | - pressure at the gas meter | 20 mbar |
| | - gas line length | 15 m |
| | - conversion coefficient | 0.62 (see figure A) |

- equivalent methane output $\dot{V} = \left[ \frac{9.51}{0.62} \right] = 15.34$ mc/h
- once the value of 15.34 has been identified on the output scale ( $\dot{V}$ ), moving vertically downwards you cross the line that represents 1" 1/4 (the chosen diameter for the piping);
- from this point, move horizontally to the left until you meet the line that represents the length of 15 m of the piping;
- move vertically downwards to determine a value of 1.4 mbar in the pressure drop botton scale;
- subtract the determined pressure drop from the meter pressure, the correct pressure level will be found for the choice of gas train;

- correct pressure = ( 20-1.4 ) = 18.6 mbar



# VENTILATION

*Example of the servomotor for air/gas setting*

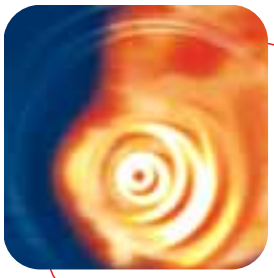
The ventilation circuit produces low noise levels with high performance pressure and air output, in despite of the compact dimensions.

On RS 45 - 68 - 120/M BLU models, the use of reverse curve blades and sound- proofing material keeps noise level very low. In the RS 25 - 35 - 160 - 200/M BLU models, noise has been reduced by the special design of the air suction circuit.

A variable profile cam connects the fuel and air regulations, ensuring high fuel efficiency at all firing ranges.
A minimum air pressure switch stops the burner when there is an insufficient quantity of air at the combustion head.
Models with a special control panel and servomotor are suitable for steam generators which conform to TRD 604 (Germany) and NBN (Belgium).

The RS 25/M BLU and RS 35/M BLU are realised with a new structure made by an innovative technology based on a new fibreglass reinforced polyamide material, with high thermal and mechanical characteristics, instead of the traditional aluminium.
This allows big advantages in terms of lay-out rationalisation, weight and dimensions reduction.
In order to guarantee the correct exercise temperature for the internal burner components in every working conditions, the new structure includes an innovative patented cooling technology.
Between the burner front base and the reinforcing steel front plate, had been create an air cavity offering an high thermal insulation against the front boiler reflection heat, and to further improve the insulation efficiency the innovative **HCS (Housing Cooling System)** technology had been developed.
Inside the front base cavity an air circulation is activated with continuous air volume refresh to obtain an active cooling system and avoid any heat transfer to the electrical component housing.

*Example of HCS (Housing Cooling System) working concept*



# COMBUSTION HEAD

Different lengths of the combustion head can be chosen for the RS/M BLU series of burners.

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

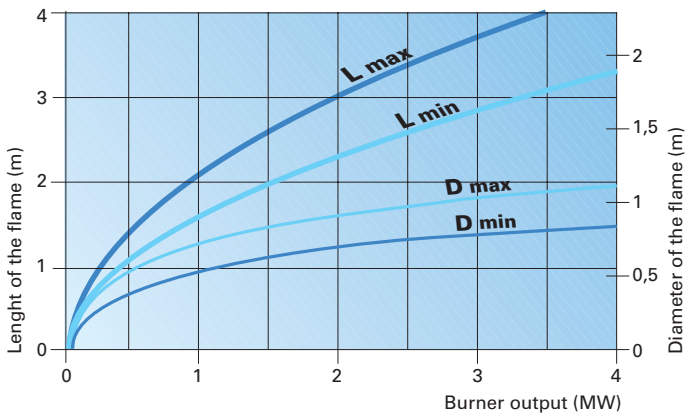
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

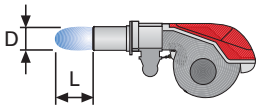
The internal positioning of the combustion head can easily be adjusted to the maximum defined output by adjusting a screw fixed to the flange.

*Example of a RS 45/M BLU burner combustion head*

*Example of a RS 160/M BLU burner combustion head*

## Dimensions of the flame



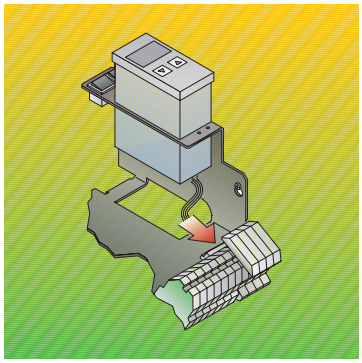




***Example:***
*Burner thermal output = 2000 kW;*
*$L_{flame}$ (m) = 2,7 m (medium value);*
*$D_{flame}$ (m) = 0,8 m (medium value)*

# OPERATION

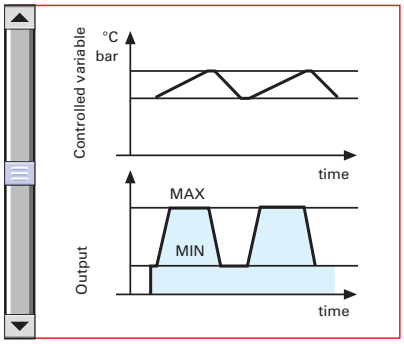
## BURNER OPERATION MODE

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



*Example of a regulator*

### “Two-stage progressive” operation

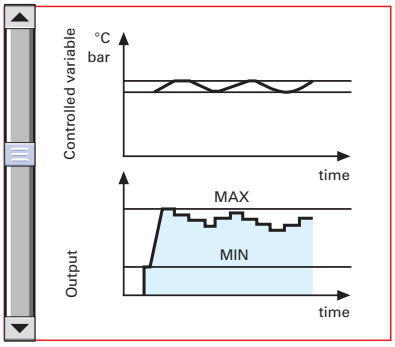



**Picture A**

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).

### “Modulating” operation

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).



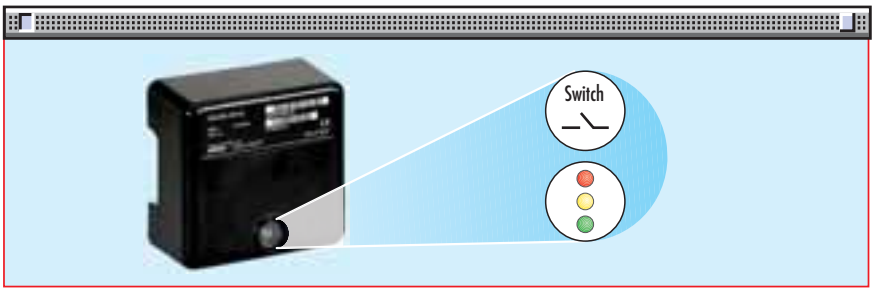

**Picture B**

All RS/M BLU series burners are fitted with a new microprocessor control panel for the supervision during intermittent operation.
For helping the commissioning and maintenance work, there are two main elements:


The lock-out reset button is the central **operating element** for resetting the burner control and for activating / deactivating the diagnostic functions.

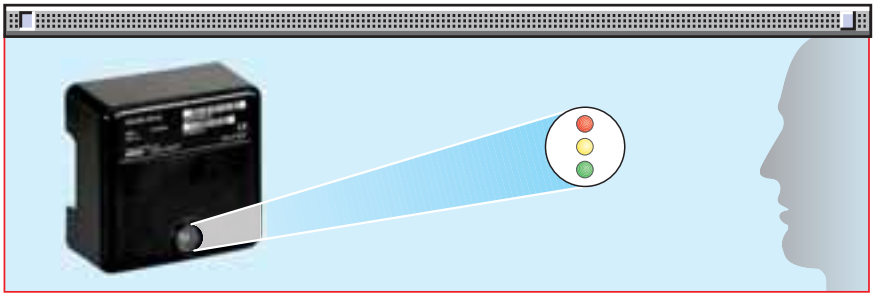
The multi-color LED is the central **indication element** for visual diagnosis and interface diagnosis.

Both elements are located under the transparent cover of lock-out reset button, as showed below.

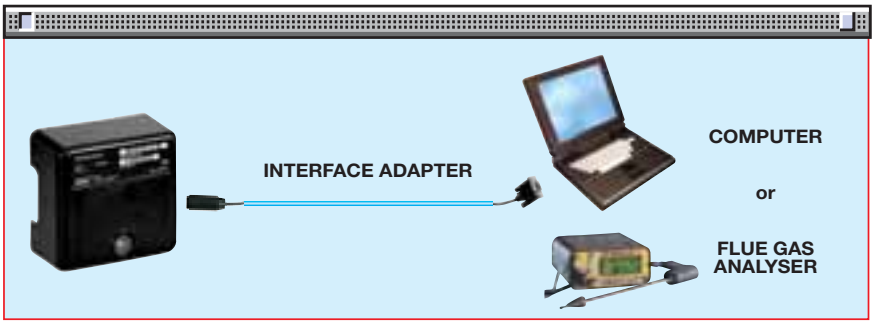



There are two diagnostic choices, for indication of operation and diagnosis of fault cause:

- **visual diagnosis**:



- **interface diagnosis**:




by the interface adapter and a PC with dedicated software or by a predisposed flue gas analyzer (see paragraph accessories).

## Indication of operation:

| Color code table | |
|---|---|
| **Operation status** | **Color code table** |
| Stand-by | ○ ○ ○ ○ ○ ○ ○ ○ |
| Pre-purging | ☀ ☀ ☀ ☀ ☀ ☀ ☀ ☀ |
| Ignition phase | ☀ ○ ☀ ○ ☀ ○ ☀ ○ |
| Flame OK | ● ● ● ● ● ● ● ● |
| Poor flame | ● ○ ● ○ ● ○ ● ○ |
| Undervoltage, built-in fuse | ☀ ● ☀ ● ☀ ● ☀ ● |
| Fault, alarm | ● ● ● ● ● ● ● ● |
| Flame simulation | ● ● ● ● ● ● ● ● |

○ **LED off**

In normal operation, the various status are indicated in the form of colour codes according to the table below.
The interface diagnosis (with adapter) can be activated by pressing the lock-out button for > 3 seconds.

**Diagnosis of fault causes:**
After lock-out has occurred, the red signal lamp is steady on. In this status, the visual fault diagnosis according to the error code table can be activated by pressing the lock-out reset button for > 3 seconds. The interface diagnosis (with adapter) can be activated by pressing again the lock-out button for > 3 seconds.
The flashing of red LED are a signal with this sequence:

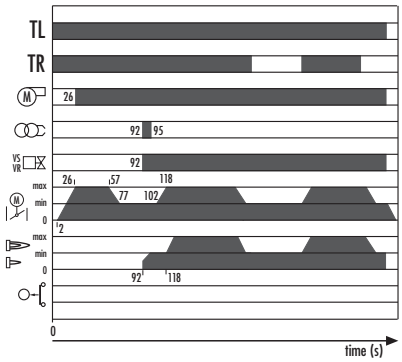
*(e.g. signal with n° 3 flashes – faulty air pressure monitor)*


**Error code table**

| Possible cause of fault | | Flash code |
|---|---|---|
| No establishment of flame at the end of safety time : | - faulty or soiled fuel valves<br>- faulty or soiled flame detector<br>- poor adjustment of burner, no fuel<br>- faulty ignition equipment | 2 flashes |
| Faulty air pressure monitor | | 3 flashes |
| Extraneous light or simulation of flame on burner start up | | 4 flashes |
| Flame presence during pre-purging | | 5 flashes |
| Loss of flame during operation : | - faulty or soiled fuel valves<br>- faulty or soiled flame detector<br>- poor adjustment of burner | 7 flashes |
| Minimum air pressure switch opens during operation | | 18 flashes |
| Wrong electrical connections | | 19 flashes |
| Faulty control box | | 20 flashes |

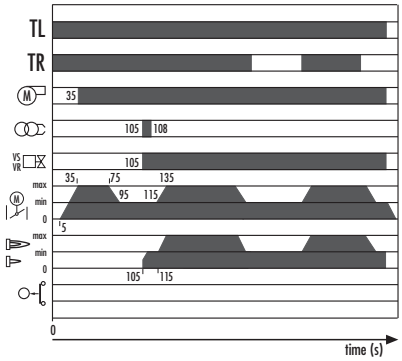
## START UP CYCLE

### RS 25/M - 35/M - 45/M BLU




0″ The TL remote control closes.
2″ - 26″ The servomotor opens the air-damper.
26″ - 57″ Pre-ventilation with air delivery at max output.
57″ - 77″ The air damper and the gas butterfly valve are positioned on MIN output.
92″ The ignition electrode sparks.
Firing : the VS safety valve and the VR adjustment valve open.
118″ The start up cycle of the control box is concluded.

### RS 68/M - 120/M - 160 - 200/M BLU

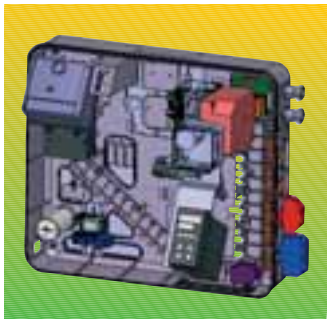


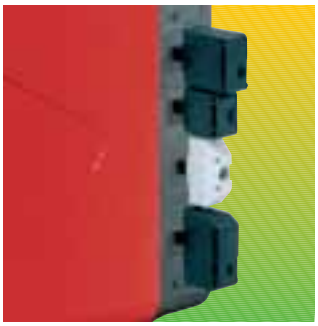

0″ The TL remote control closes.
5″ - 35″ The servomotor opens the air-damper.
35″ - 75″ Pre-ventilation with air delivery at max output.
75″ - 95″ The air damper and the gas butterfly valve are positioned on MIN output.
105″ The ignition electrode sparks.
Firing : the VS safety valve and the VR adjustment valve open.
115″ The start up cycle of the control box is concluded.

# BURNER WIRING

All models of the RS/M BLU burner series have an easily accessible control panel for the electrical components housing and wiring.
In particular the new RS 25 - 35/M BLU models, thanks to the new structure concept, have a extremely clean electrical layout to optimise the commissioning and maintenance speed.
On these models the electrical connection are done by a Plug&Socket system, accessible from the external of the cover, and some of the main components as the servomotor, the air pressure switch, the electronic regulator (accessory) and the gas max pressure switch (accessory) are connected to the burner electrical wiring trough plugs & sockets system in order to facilitate the connection in case of maintenance.
The electrical wiring of all RS/M BLU burner models are very easy to do following the wiring diagrams included in the instruction handbook.
Electrical connections must be made by qualified and skilled personnel, according to the local norms.

*Example of the terminal board for electrical connections for the RS 68-120-160-200/M BLU models*





*Example of electrical components housing and Plug&Socket system for electrical connection of RS 25-35/M BLU*

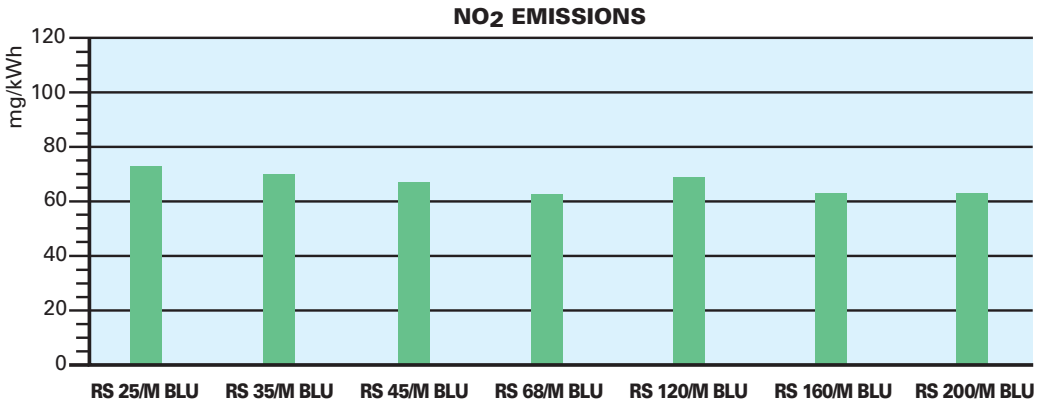
The following table shows the supply lead sections and the type of fuse to be used.

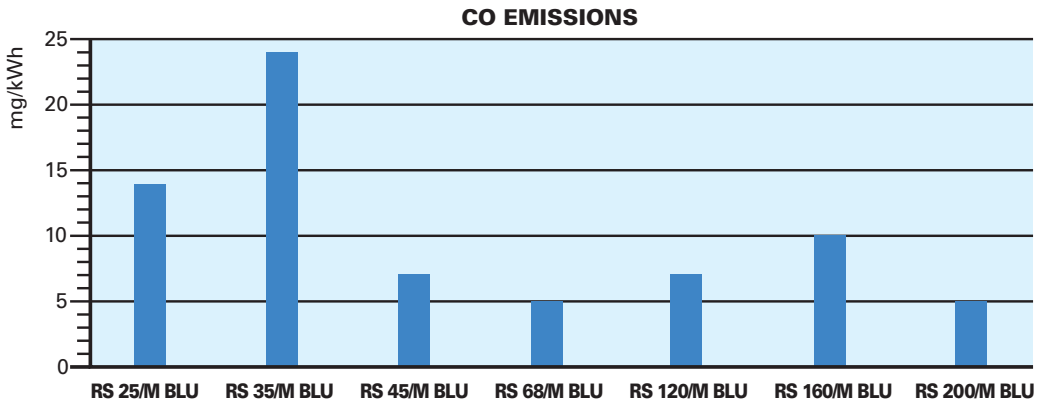
| Model | | RS 25/M BLU | RS 35/M BLU | | RS 45/M BLU | RS 68/M BLU | | RS 120/M BLU | | RS 160/M BLU | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 230V | 230V | 400V | 230V | 230V | 400V | 230V | 400V | 230V | 400V |
| F | A | T6 | T6 | T6 | T6 | T16 | T10 | T16 | T10 | T25 | T20 |
| L | mm² | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 2,5 | 2,5 |

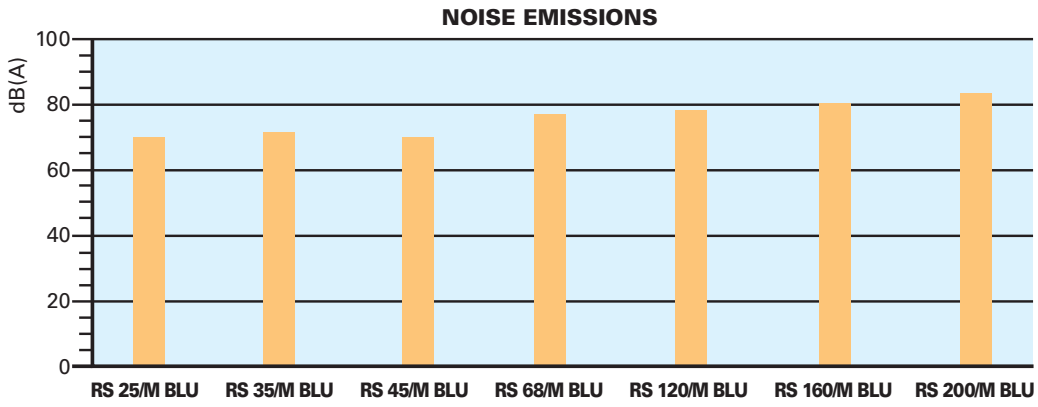
| Model | | RS 200/M BLU | |
|---|---|---|---|
| | | 230V | 400V |
| F | A | 32A aM - 40A gG | 16A aM - 32A gG |
| L | mm² | 6 | 4 |

# EMISSIONS

The emissions have been measured in various models at maximum output, according to EN 676 standard.



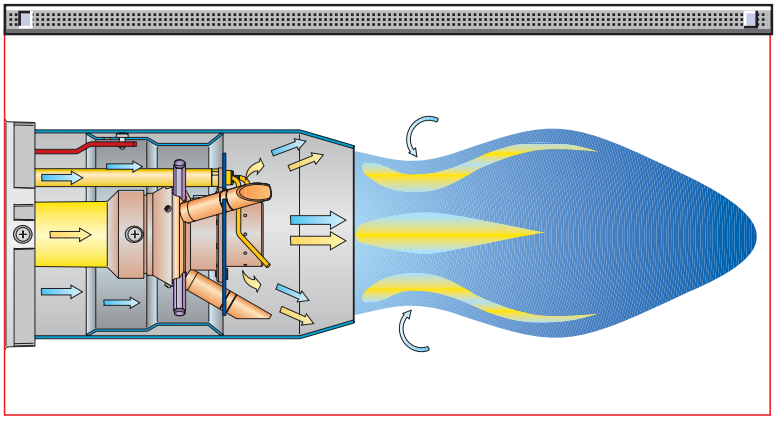




The noise emission have been measured at maximum output.

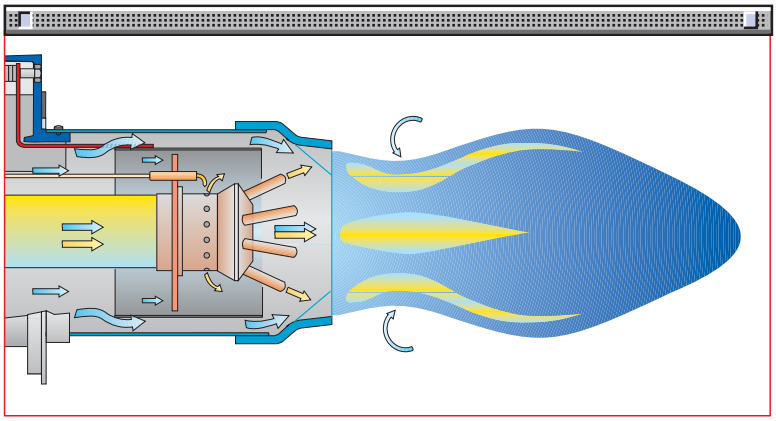
The RS/M BLU series combustion heads reduce polluting emissions thanks to their special design which optimises the air fuel mix.

**Combustion head operating diagram of RS 25/M - 35/M BLU models**

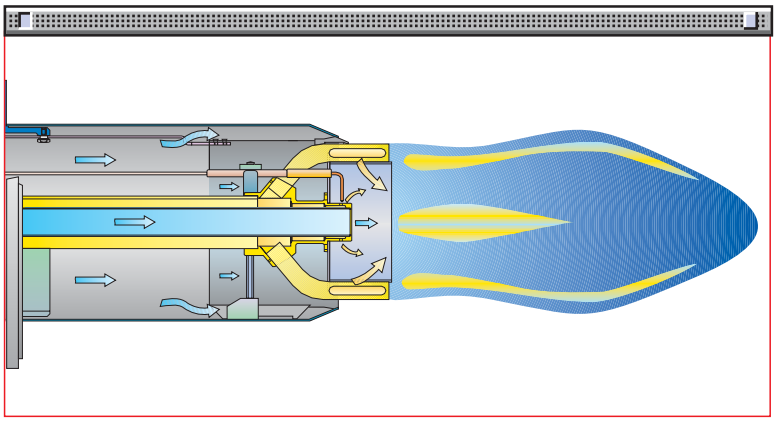


The RS 25/M - 35/M - 45/M BLU models have an oblique radial pipe distributor through which gas is injected directly into the passing air flow for a perfect distribution. This prevents no homogeneous concentrations in the flame with areas of high oxidation; part of the premixed gas/air is injected into the centre of the flame.
These methods produce a very stable flame with gradual and progressive combustion as the flame develops, thus giving polluting emission values below even the most restrictive norm values.

**Combustion head operating diagram of RS 45/M BLU model**



**Combustion head operating diagram of RS 68/M - 120/M - 160/M - 200/M BLU models**

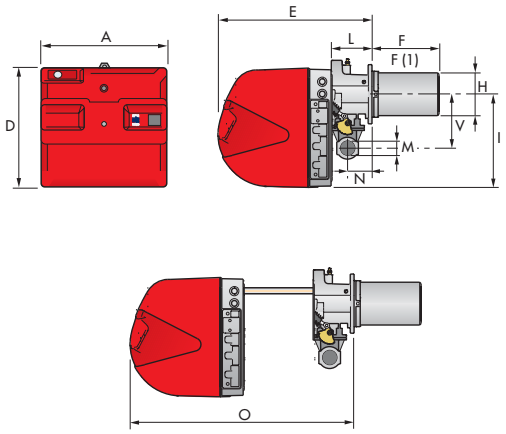


In RS 68/M - 120/M - 160/M - 200/M BLU models part of the gas is distributed through outlets which are perpendicular to the air flow, while the remaining gas is injected directly into the centre of the flame. This prevents no homogeneous concentrations in the flame with areas of high oxidation,
producing very stable flame with gradual and progressive combustion as the flame develops, thus giving polluting emission values below even the most restrictive norm values.

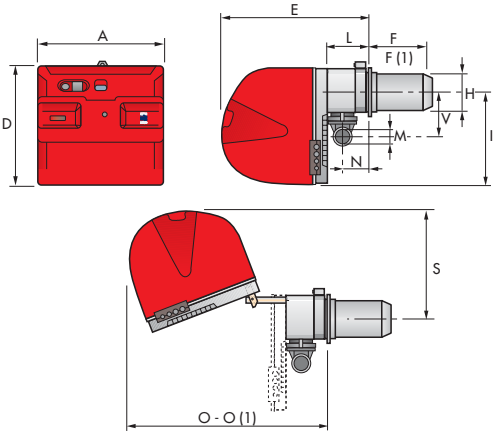
# OVERALL DIMENSIONS (mm)

## BURNER

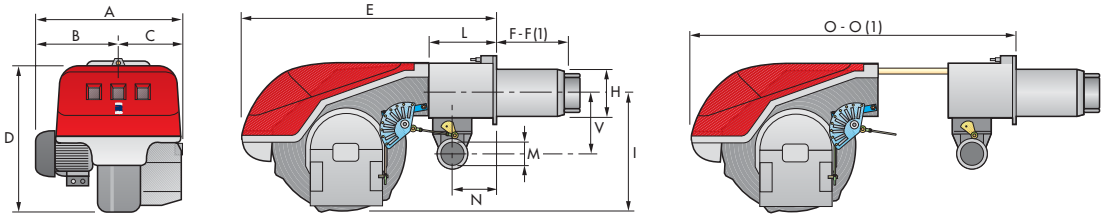
### RS 25/M - 35/M BLU




### RS 45/M BLU



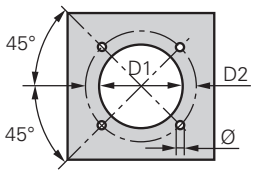

### RS 68/M - 120/M - 160/M - 200/M BLU




| Model | A | B | C | D | E | F - F (1) | H | I | L | M | N | O - O(1) | S | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RS 25/M BLU | 442 | - | - | 422 | 508 | 230 - 365 | 140 | 305 | 138 | 1"1/2 | 84 | 780 - - | - | 177 |
| RS 35/M BLU | 442 | - | - | 422 | 508 | 230 - 365 | 152 | 305 | 138 | 1"1/2 | 84 | 780 - - | - | 177 |
| RS 45/M BLU | 476 | - | - | 474 | 580 | 229 - 354 | 160 | 352 | 164 | 1"1/2 | 108 | 810 - 810 | 367 | 168 |
| RS 68/M BLU | 527 | 312 | 215 | 555 | 840 | 255 - 390 | 189 | 430 | 214 | 2" | 134 | 1161 - 1296 | - | 221 |
| RS 120/M BLU | 553 | 338 | 215 | 555 | 840 | 255 - 390 | 189 | 430 | 214 | 2" | 134 | 1161 - 1296 | - | 221 |
| RS 160/M BLU | 671 | 366 | 305 | 555 | 863 | 373 - 503 | 221 | 436 | 221 | 2" | 141 | 1442 - 1587 | - | 264 |
| RS 200/M BLU | 737 | 432 | 305 | 555 | 863 | 373 - 503 | 221 | 436 | 221 | 2" | 141 | 1442 - 1587 | - | 264 |

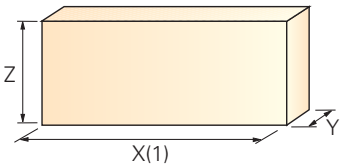
(1) Length with extended combustion head

## BURNER – BOILER MOUNTING FLANGE




| Model | D1 | D2 | Ø |
|---|---|---|---|
| RS 25/M BLU | 160 | 224 | M8 |
| RS 35/M BLU | 160 | 224 | M8 |
| RS 45/M BLU | 165 | 224 | M8 |
| RS 68/M BLU | 195 | 275-325 | M12 |
| RS 120/M BLU | 195 | 275-325 | M12 |
| RS 160/M BLU | 230 | 325-368 | M16 |
| RS 200/M BLU | 230 | 325-368 | M16 |

## PACKAGING




| Model | X(1) | Y | Z | kg |
|---|---|---|---|---|
| RS 25/M BLU | 1000 | 485 | 500 | 39 |
| RS 35/M BLU | 1000 | 485 | 500 | 40 |
| RS 45/M BLU | 1015 | 500 | 630 | 48 |
| RS 68/M BLU | 1405 | 700 | 660 | 78 |
| RS 120/M BLU | 1405 | 700 | 660 | 84 |
| RS 160/M BLU | 1405-1420 | 1000 | 660 | 89 |
| RS 200/M BLU | 1405-1420 | 1000 | 660 | 125 |

(1) dimension with standard and extended head

# 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

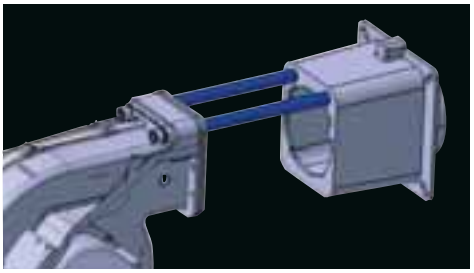
- All the burners have slide bars, for easier installation and maintenance.
- After drilling the boilerplate, using the supplied gasket as a template, dismantle the blast tube from the burner and fix it to the boiler.
- Adjust the combustion head.
- Fit the gas train, choosing this on the basis of the maximum output of the boiler and considering the enclosed diagrams.
- Refit the burner casing to the slide bars.
- Close the burner, sliding it up to the flange.

## ELECTRICAL CONNECTIONS AND START UP

- Make the electrical connections to the boiler following the wiring diagrams included in the instruction handbook.
- Turn the motor to check rotation direction (if it is a three-phase motor).
- Perform a first ignition calibration on the gas train.
- On start up, check:
  - Gas pressure at the combustion head (to max. and min. output)
  - Combustion quality, in terms of unburned substances and excess air.

## BURNER MAINTENANCE

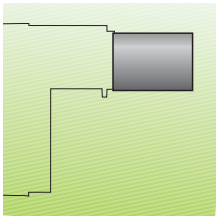
- The maintenance of RS/M BLU burners is very simple thanks to the sliding bars system that allows an easy access to the internal components.
- In particular the RS 25-35/M BLU models have a new sliding bars system to make easier the access to the combustion head.
- The RS 160-200/M BLU have new reinforced sliding bars that make very strong the burner structure during maintenance.



# BURNER ACCESSORIES

## Extended head kit

"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.



| Extended head kit | | | |
|---|---|---|---|
| **Burner** | **Standard head length (mm)** | **Extended head length (mm)** | **Kit code** |
| RS 25/M BLU | 230 | 365 | **3010430** |
| RS 35/M BLU | 230 | 365 | **3010431** |
| RS 45/M BLU | 229 | 354 | **3010240** |
| RS 68/M - 120/M BLU | 255 | 390 | **3010177** |
| RS 160/M BLU | 373 | 503 | **3010442** |
| RS 200/M BLU | 373 | 503 | **3010474** |

## Spacer kit

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


| Spacer kit | | |
|---|---|---|
| **Burner** | **Spacer thickness S (mm)** | **Kit code** |
| RS 25/M - 35/M - 45/M BLU | 90 | **3010095** |
| RS 68/M - 120/M BLU | 135 | **3010129** |
| RS 160-200/M BLU | 110 | **3000722** |

## 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:

| Continuous ventilation kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25 - 35/M BLU | **3010449** |
| RS 45 - 68 - 120 - 160 - 200/M BLU | **3010094** |

## 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** |
| RS 25/M - 35/M - 45/M BLU | C1/3 | 10 | **3010403** |
| RS 68/M - 120/M - 160/M - 200/M BLU | C4/5 | 10 | **3010404** |

(*) according to EN 15036-1 standard

## Head kit for “reverse flame chamber”

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

| Head kit for “reverse flame chamber” | |
|---|---|
| **Burner** | **Code** |
| RS 68/M BLU | **3010247** |
| RS 120/M BLU | **3010248** |
| RS 160/M BLU | **3010249** |
| RS 200/M BLU | **3010475** |

## Accessories for modulating operation

To obtain modulating operation, the RS/M BLU series of burners requires a regulator with three point outlet controls. On RS 25/M - 35/M BLU the regulator is connected to the burner electrical wiring by plug-in system in order to make the connection easier and faster.
The following table lists the accessories for modulating operation with their application range.

| Regulator | | |
|---|---|---|
| **Burner** | **Type** | **Code** |
| RS 25/M - 35/M BLU | RWF 40 | **3010417** |
| RS 45/M - 68/M - 120/M - 160/M BLU | RWF 40 | **3010212** |
| RS 200/M BLU | RWF 40 | **3010414** |

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

| Probe | | |
|---|---|---|
| **Type** | **Range (°C) (bar)** | **Code** |
| Temperature PT 100 | -100 ÷ 500°C | **3010110** |
| Pressure 4 ÷ 20 mA | 0 ÷ 2,5 bar | **3010213** |
| Pressure 4 ÷ 20 mA | 0 ÷ 16 bar | **3010214** |

Modulating operation can also be obtained with an analog control signal converter and a feedback three-pole potentiometer.
Alternatively, the potentiometer can be used to check the servomotor position.

| Analog control signal converter | | |
|---|---|---|
| **Burner** | **Type (input signal)** | **Code** |
| RS 25/M - 35/M BLU | 0/2 - 10 V (impedance 200 KΩ)<br>0/4 - 20 mA (impedance 250 Ω) | **3010410** |
| RS 45/M - 68/M BLU<br>RS 120/M - 160/M BLU | 0/2 - 10 V (impedance 200 KΩ)<br>0/4 - 20 mA (impedance 250 Ω) | **on demand** |
| RS 200/M BLU | 0/2 - 10 V (impedance 200 KΩ)<br>0/4 - 20 mA (impedance 250 Ω) | **3010415** |

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.

| Potentiometer kit | |
|---|---|
| **Burner** | **Code** |
| RS 25/M - 35/M BLU | **3010420** |
| RS 45/M BLU | **3010109** |
| RS 68/M - 120/M - 160/M BLU | **3010021** |
| RS 200/M BLU | **3010416** |

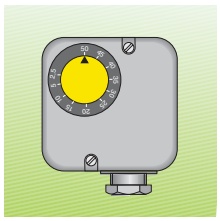
## Ground fault interrupter kit

A “Ground fault interrupter kit” is available as a safety device for electrical system fault.

| Ground fault interrupter kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25/M - 35/M BLU | **3010448** |

## Gas max pressure switch

If necessary a Gas max pressure Switch kit is available and connectable to the burner electrical wiring trough Plugs & Sockets system.



| Gas max pressure switch | |
|---|---|
| **Burner** | **Code** |
| RS 25/M - 35/M BLU | **3010418** |

## Volt free contact kit

A volt free contact kit is available for installation onto the burner. It can be used for a remote interface between burner operating signals. Every burner can be equipped with a single kit for a remote check of the flame presence signal or the burner lockout indication.

| Volt free contact kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25/M - 35/M BLU | **3010419** |

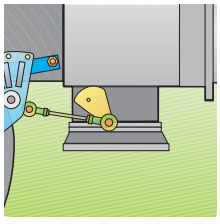
## PC interface kit

To connect the flame control panel to a personal computer for the transmission of operation, fault signals and detailed service information, an interface adapter with PC software is available.

| PC interface kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25/M - 35/M - 45/M - 68/M - 120/M - 160/M - 200/M BLU | **3002719** |

## DN80 gas flange kit

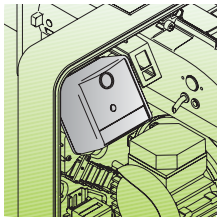
To modify the standard 2” burner gas input connection in to DN80 connection, a specific gas flange is available.



| DN80 gas flange kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 68/M - 120/M - 160/M - 200/M BLU | **3010439** |

## Post-ventilation kit

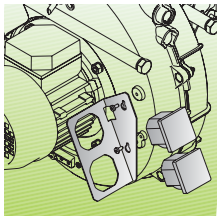
To have 20 s ventilation after opening of thermostats chain, a special kit is available.



| Post-ventilation kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25/M - 35/M BLU | **3010451** |

## Hours counter kit

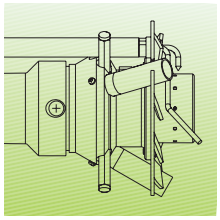
To measure the burner working time a hour counter kit is available.



| Hours counter kit | |
|---|---|
| **Burner** | **Kit code** |
| RS 25/M - 35/M BLU | **3010450** |

## LPG kit

For burning LPG gas, a special kit is available to be fitted to the combustion head on the burner, as given in the following table:

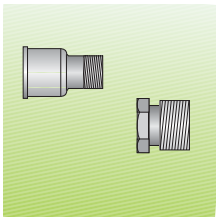


| LPG kit | | |
|---|---|---|
| **Burner** | **Kit code for 'standard head'** | **Kit code for 'extended head'** |
| RS 25/M BLU | **3010423** | **3010423** |
| RS 35/M BLU | **3010424** | **3010424** |

# GAS TRAIN ACCESSORIES

## Adapters

When the diameter of the gas train is different from the set diameter of the burners, an adapter must be fitted between the gas train and the burner. The following table lists the adapters for various burners.



| Adapters | | | |
|---|---|---|---|
| **Burner** | **Gas train** | **Dimensions** | **Adapter code** |
| RS 25/M BLU | MBD 405 - 407 - 410 | 3/4" 1" 1/2 | **3000824** |
| | MBD 420 | 2" 1" 1/2 | **3000822** |
| RS 35/M BLU | MBD 405 - 407 - 410 | 3/4" 1" 1/2 | **3000824** |
| | MBD 420 | 2" 1" 1/2 | **3000822** |
| RS 45/M BLU | MBD 407 - 410 | 3/4" 1" 1/2 | **3000824** |
| | MBD 420 | 2" 1" 1/2 | **3000822** |
| RS 68/M BLU | MBD 412 - 415 | 1" 1/2 2" | **3000843** |
| RS 120/M BLU | MBD 415 | 1" 1/2 2" | **3000843** |
| | MBC 1900 | DN 65 2"1/2 1" 1/2 2" | **3000825** |
| RS 160/M BLU | MBD 415 | 1" 1/2 2" | **3000843** |
| | MBC 1900 | DN 65 2"1/2 1" 1/2 2" | **3000825** |
| | MBC 3100 | DN 80 2"1/2 2" | **3000826** |
| RS 200/M BLU | MBD 415 | 1" 1/2 2" | **3000843** |
| | MBC 1900 | DN 65 2"1/2 1" 1/2 2" | **3000825** |
| | MBC 3100 | DN 80 2"1/2 2" | **3000826** |

## 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.

| Seal control kit | |
|---|---|
| **Gas train** | **Kit code** |
| MBD type | **3010123** |
| MBC type | **3010367** |

## Stabiliser spring for multibloc composed

Accessory springs are available to vary the pressure range of the gas train composed. The following table shows these accessories with their application range.

| Stabiliser springs | | |
|---|---|---|
| **Gas train** | **Spring** | **Spring code** |
| MBC 1900 SE 65 FC (CT)* | White from 4 to 20 mbar | **3010381** |
| MBC 3100 SE 80 FC (CT)* | Red from 20 to 40 mbar | **3010382** |
| | Black from 40 to 80 mbar | **3010383** |
| | Green from 80 to 150 mbar | **3010384** |

* with and without seal control.

Please refer to the technical manual for the correct choice of spring.

# SPECIFICATION

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

## DESIGNATION OF SERIES

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
- /E Electronic cam
- /P Proportioning air/gas valve
- /EV Electronic cam predisposed for variable speed (with inverter)

Emission :
- ... Class 1 EN267 - EN676
- MZ Class 2 EN267 - EN676
- BLU Class 3 EN267 - EN676
- MX Class 2 EN267 Class 3 EN676

Head :
- TC Standard head
- TL Extended head

Diagnostic :
- LP Led panel
- ST Status panel

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 |
| 110/50-60 | 110V/50-60Hz |

ID: Differential switch

| R | S | 120 | /M | BLU | TC | | FS1 | 3/230-400/50 | 230/50-60 | |
|---|---|---|---|---|---|---|---|---|---|---|

BASIC DESIGNATION

EXTENDED DESIGNATION

## AVAILABLE BURNER MODELS

| | | | | | | |
|---|---|---|---|---|---|---|
| RS 25/M | BLU | TC | FS1 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 25/M | BLU | TL | FS1 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 25/M | BLU | TC | FS2 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 25/M | BLU | TL | FS2 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TC | FS1 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TL | FS1 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TC | FS1 | 3/220-400/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TL | FS1 | 3/220-400/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TC | FS2 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TL | FS2 | 1/220-230/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TC | FS2 | 3/220-400/50-60 | 220-230/50-60 | |
| RS 35/M | BLU | TL | FS2 | 3/220-400/50-60 | 220-230/50-60 | |
| RS 45/M | BLU | TC | FS1 | 1/230/50 | 230/50-60 | |
| RS 45/M | BLU | TL | FS1 | 1/230/50 | 230/50-60 | |
| RS 45/M | BLU | TC | FS2 | 1/230/50 | 230/50-60 | |
| RS 45/M | BLU | TL | FS2 | 1/230/50 | 230/50-60 | |
| RS 45/M | BLU | TC | FS1 | 1/230/50 | 230/50-60 | ID |
| RS 45/M | BLU | TL | FS1 | 1/230/50 | 230/50-60 | ID |
| RS 45/M | BLU | TC | FS2 | 1/230/50 | 230/50-60 | ID |
| RS 45/M | BLU | TL | FS2 | 1/230/50 | 230/50-60 | ID |
| RS 68/M | BLU | TC | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 68/M | BLU | TL | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 68/M | BLU | TC | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 68/M | BLU | TL | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 120/M | BLU | TC | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 120/M | BLU | TL | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 120/M | BLU | TC | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 120/M | BLU | TL | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 160/M | BLU | TC | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 160/M | BLU | TL | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 160/M | BLU | TC | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 160/M | BLU | TL | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 200/M | BLU | TC | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 200/M | BLU | TL | FS1 | 3/230-400/50 | 230/50-60 | |
| RS 200/M | BLU | TC | FS2 | 3/230-400/50 | 230/50-60 | |
| RS 200/M | BLU | TL | FS2 | 3/230-400/50 | 230/50-60 | |

**Other versions are available on request**

## PRODUCT SPECIFICATION

**RS 25/M - 35/M BLU models**

***Burner:***
Monoblock forced draught LOW NOx gas burner with two stage progressive or modulating operation, with a specific kit, fully automatic, made up of:
- air suction circuit
- high performance fan with straight blades
- air damper for air flow setting and butterfly valve for regulating fuel output controlled by a servomotor with variable cam
- starting motor at 2800 rpm, single-phase / 220-230V / 50-60Hz or three-phase 380-400V / 50-60Hz
- 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
    - ionisation probe
    - gas distributor
    - flame stability disk
- exclusive patented HCS (Housing Cooling System) with high thermal insulation and air circulation with continuous air volume refresh for an active cooling system and avoid heat transfer to the electrical component housing
- minimum air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- microprocessor-based flame control panel, with diagnostic functions
- plugs and sockets for electrical connection, accessible from the external of the cover
- burner on/off selection switch
- manual or automatic output increase/decrease selection switch
- flame inspection window
- slide bars for easier installation and maintenance
- protection filter against radio interference
- IP 40 electric protection level.

**Gas train:**
Fuel supply line in the MULTIBLOC configuration (from a diameter of 3/4" until a diameter of 2") fitted with:
- MULTIBLOC with integrated filter
- Minimum gas pressure switch

**Conforming to:**
- 89/336/EC (2004/108/EC) directive (electromagnetic compatibility)
- 73/23/EC directive (low voltage)
- 92/42/EC directive (performance)
- 90/396/EC directive (gas)
- EN 676 (gas burners).

**Standard equipment:**
- 1 gas train gasket
- 1 flange gasket
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- 3 plugs for electrical connection (RS 25-35/M BLU single-phase)
- 4 plugs for electrical connection (RS 35/M BLU three-phase)
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

**Available accessories to be ordered separately:**
- Extended head kit
- Spacer kit
- Sound-proofing box
- RWF 40 output regulator
- Temperature probe -100 ÷ 500°C
- Pressure probe 0 ÷ 2.4 bar
- Pressure probe 0 ÷ 16 bar
- Analog control signal converter
- Potentiometer kit for the servomotor
- Ground fault interrupter kit
- Gas max pressure switch
- Volt free contact kit
- PC interface kit
- Gas train adapter
- Seal control kit
- Stabiliser spring
- Post-ventilation kit
- Hours counter kit
- LPG kit.

## PRODUCT SPECIFICATION

**RS 45/M - 68/M - 120/M - 160/M - 200/M BLU models**

***Burner:***
Monoblock forced draught LOW NOx gas burner with two stage progressive or modulating operation, with a specific kit, fully automatic, made up of:
- air suction circuit lined with sound-proofing material
- fan with reverse curve blades (straight blades on the 160-200/M BLU models) high performance with low sound emissions
- air damper for air flow setting and butterfly valve for regulating fuel output 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 45/M BLU model)
- 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
    - ionisation probe
    - gas distributor
    - flame stability disk
- maximum gas pressure switch to stop the burner in the case of excess pressure on the fuel supply line
- minimum air pressure switch stops the burner in case of insufficient air quantity at the combustion head
- microprocessor-based flame control panel, with diagnostic functions
- burner on/off selection switch
- manual or automatic output increase/decrease selection switch
- flame inspection window
- slide bars for easier installation and maintenance
- protection filter against radio interference
- IP 44 electric protection level.

**Gas train:**
Fuel supply line in the MULTIBLOC configuration (from a diameter of 3/4" until a diameter of 2") fitted with:
- MULTIBLOC with integrated filter
- Minimum gas pressure switch

Fuel supply line the COMPOSED configuration (from a diameter of DN 65 until a diameter of DN 80), fitted with:
- Filter
- MULTIBLOC
- Minimum gas pressure switch
- Valve seal control (for output > 1200 kW)

**Conforming to:**
- 89/336/EC (2004/108/EC) directive (electromagnetic compatibility)
- 73/23/EC directive (low voltage)
- 92/42/EC directive (performance)
- 90/396/EC directive (gas)
- EN 676 (gas burners).

**Standard equipment:**
- 1 gas train gasket
- 1 flange gasket
- 4 screws for fixing the flange
- 1 thermal screen
- 4 screws for fixing the burner flange to the boiler
- wiring loom fittings for the electrical connection (for RS 45/M BLU model)
- 2 slide bar extensions (for extended head models and RS 160-200/M BLU)
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

**Available accessories to be ordered separately:**
- Extended head kit
- Spacer kit
- Continuous ventilation kit
- Head kit for reverse flame chamber
- Sound-proofing box
- RWF 40 output regulator
- Temperature probe -100 ÷ 500°C
- Pressure probe 0 ÷ 2.4 bar
- Pressure probe 0 ÷ 16 bar
- Potentiometer kit for the servomotor
- Analog control signal converter
- PC interface kit
- Gas train adapter
- DN80 gas flange kit
- Seal control kit
- Stabiliser spring.

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