Ecoflam

# DUOBLOCK RANGE

# TS




www.ecoflam.co.uk

# ECOFLAM

## THE COMPANY

### Our proposal

Ecoflam offers a full range of blown air pressure jet burners granting high efficiency and reliable operation with significant energy savings. All models feature extreme ease of installation maintenance and flexible boiler–burner matching.
All products are conform to CE standards and are manufactured in accordance with ISO 9001(quality management system), ISO 14001 (environmental management) and OHSAS 18001 (occupational health and safety management).




### Our expertise

Thanks to its strong attitude in customization, besides its wide range of standard burners for all fuels, Ecoflam boasts many different solutions for different applications.



For more than 40 years, Ecoflam has been working continuously on new developments and the optimisation of existing products. The Ecoflam philosophy of continuous development, implemented in our laboratories, allows us to go forward and produce better results, such as the reduced NOx level emissions.

HEATING · INCINERATORS & WASTE · AGRICULTURE · ASPHALT & BUILDING · TEXTILE DRYING · FOOD PRODUCTION · WOOD BOILERS · CHEMICAL PLANTS · ENGINEERING · PLANT MODERNIZATION

### Our worldwide network

Manufacturing is carried out in the factory of Resana (Treviso - Italy) and products are distributed worldwide thanks to a wide network of partners. In fourty years, Ecoflam has been capable to build loyal partnerships and today can count on reliable Partners in more than 60 Countries.
You can fully trust in our partners, they distribute Ecoflam products in their Countries of competence, they have good knowledge of the products, they are well trained under the technical point of view and they carry out commissioning and service by keeping constantly in touch with the headquarter.

# TS RANGE

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### Burner designation

**RANGE**
**BLU**: gas
**MAIOR**: light oil
**OILFLAM**: heavy oil
**MULTICALOR**: dual fuel (gas/light oil)
**MULTIFLAM**: dual fuel (gas/heavy oil)

**NOx EMISSIONS**
**-** = class 1 or class 2
**LN** = class 3 (EN676/EN267)

**OUT OF STANDARD CONFIGURATIONS**
**O** = Version for OEM
**S4** = 4-head configuration
**SW** = Blast tube with swirl
**HT** = High temperature version
**CV** = Continuous ventilation
**FGR** = Flue gas recirculation
**S** = Out of standard burner

**FUEL TYPE**
**BF** = Biofuel
**HV** = High viscosity oil up to 50°E at 50°C
**LPG** = LPG
**K** = Kerosene

**MULTICALOR TS 1200.1 LN PR TC HT LPG 380-60**

**SIZE** (rough output)
Gas: in **kW**
Oil and dual fuel: in **kg/h**

**OPERATION TYPE**
**AB** = 2 stages
**PR** = 2 stage progressive mechanical
**PRE** = 2 stage progressive electronic
**MD** = modulating with PID

**HEAD LENGHT**
**TC** = short
**TL** = long

**ELECTRICAL POWER SUPPLY**
**-** = Standard configurations:
1 phase: 230V - 50Hz
3 phase: 400V-50Hz
**230V 50-60** = 230V - 50-60Hz
**380-60** = 380V - 60Hz
**460-60** = 460V - 60Hz

### Gas train designation

**MANUFACTURER**
**D** = Dungs
**K** = Kromschröder
**S** = Siemens

**VALVE MODEL** *(Examples)*
**MBDLE415** = MultiBloc model MB-DLE 415
**VGD20503** = Siemens model VGD 20.503
**VCS240** = Kromschröder model VCS240

**VALVE NOMINAL DIAMETER** (Examples)
Threaded connection:
**RP40** = Rp 1"1/2
**RP50** = Rp 2"
Flanged connection:
**DN65** = DN65
**DN125** = DN125

**OTHER DEVICES** (empty if not applicable)
**F** = Filter included (either as a component or included in the regulator)
**G** = Governor
**A** = Anti-vibration joint
**M** = Manual valve

**GT - S2 - VGD40 - DN80 PS2**

**VALVE FEATURES**
**1** = Valve with built in pressure governor
**2** = Two-stage valve with built in pressure governor
**3** = Valve without built in pressure governor

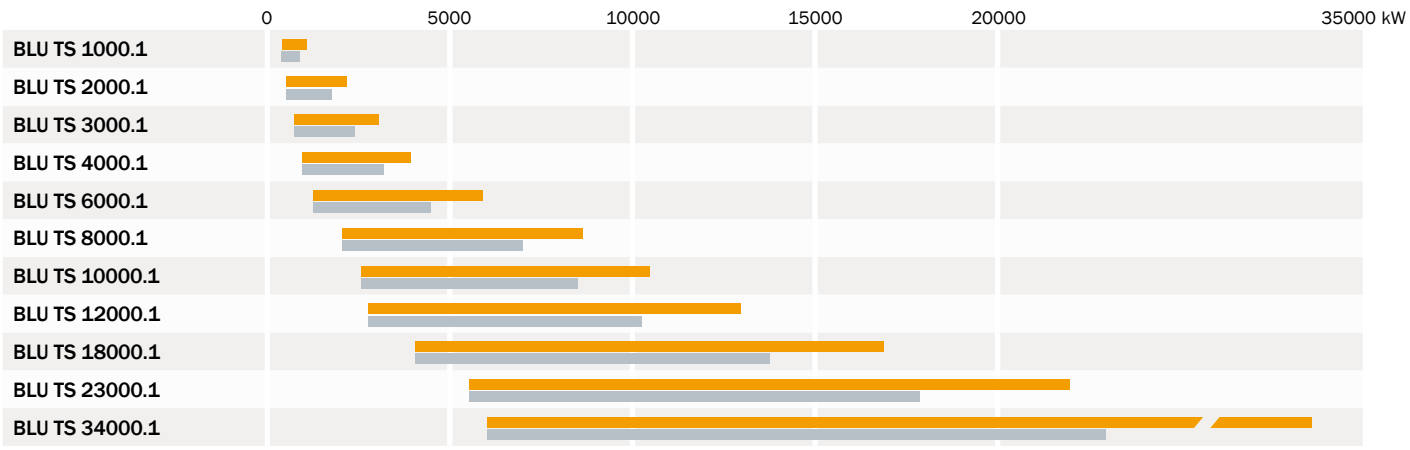
**GAS PRESSURE SWITCH ARRANGEMENT**
**PS1** = Single gas pressure switch upstream of the first shutter
**PS2** = Single pressure switch between the two shutters
**PS3** = Two minimum gas pressure switches, before and between the valves

# TS RANGE

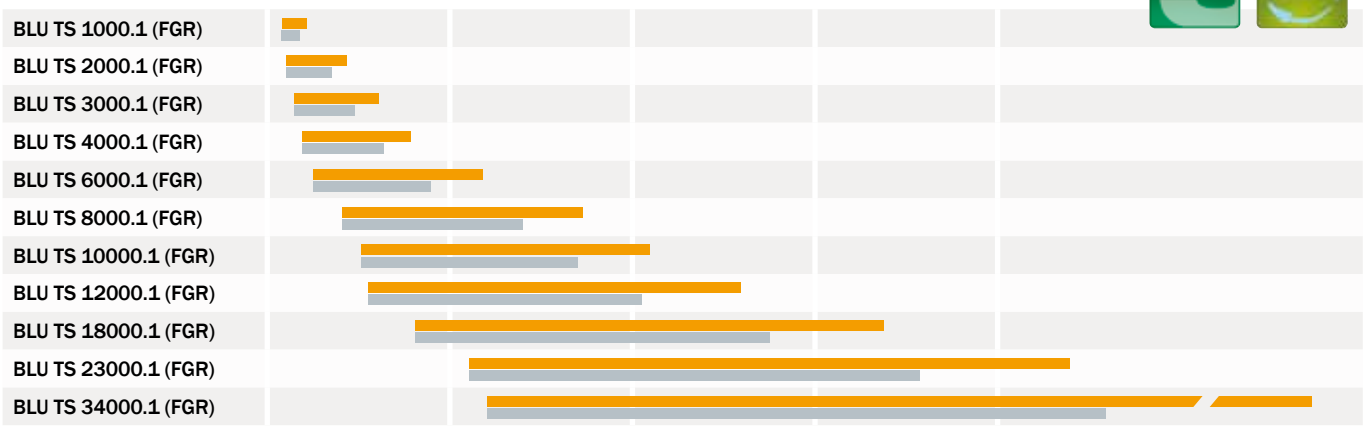
## RANGE OVERVIEW

### BLU

#### Natural gas - Low NOx Class 2 (< 120 mg/kWh)




#### Gas - Low NOx Class 3 (< 80 mg/kWh) / ULTRA Low NOx (< 30 mg/kWh)



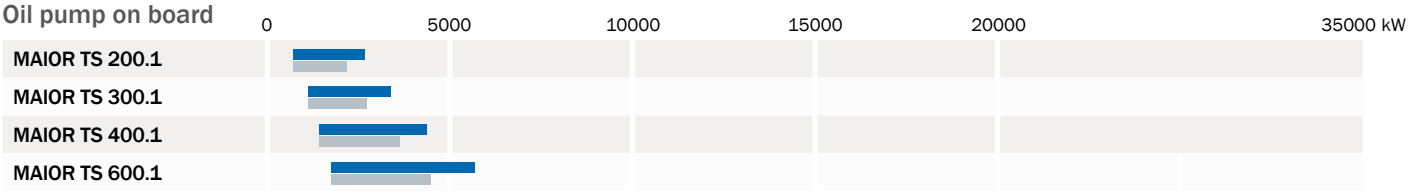

Standard version $T_{air}$ = 20 °C  Hot air version $T_{air}$ = 200 °C

NOTE: maximum power of Ultra low NOx models depends on FGR percentage
Two stages and two stage progressive mechanical versions are available on request

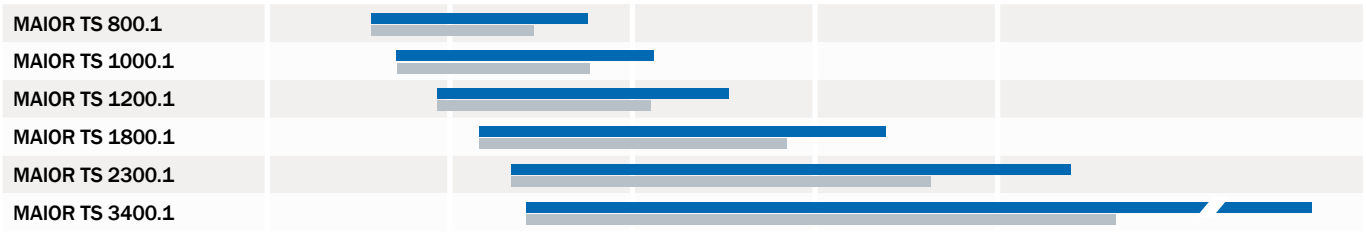
### MAIOR

#### Light oil - Low NOx Class 2 (< 185 mg/kWh)

Oil pump on board




Separated oil pumping unit (not included)




Standard version $T_{air}$ = 20 °C  Hot air version $T_{air}$ = 200 °C

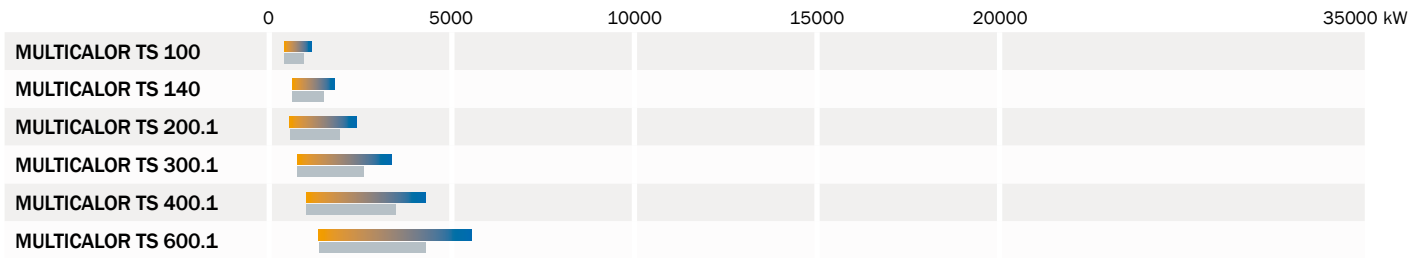
# TS RANGE

## RANGE OVERVIEW

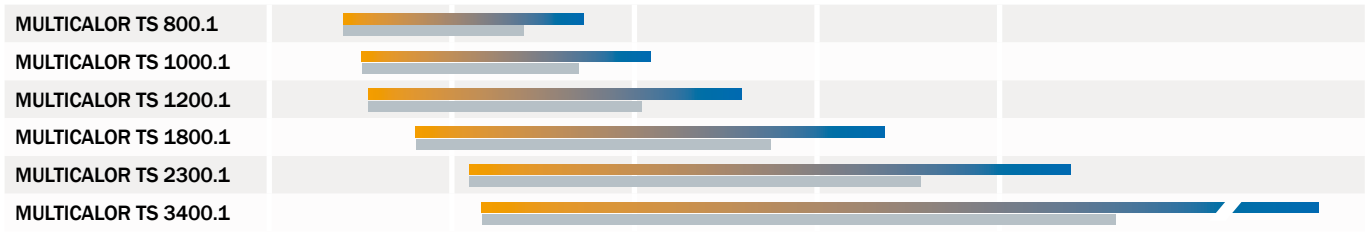
### MULTICALOR

**Natural gas/light oil**

**Oil pump on board**




**Separated oil pumping unit (not included)**

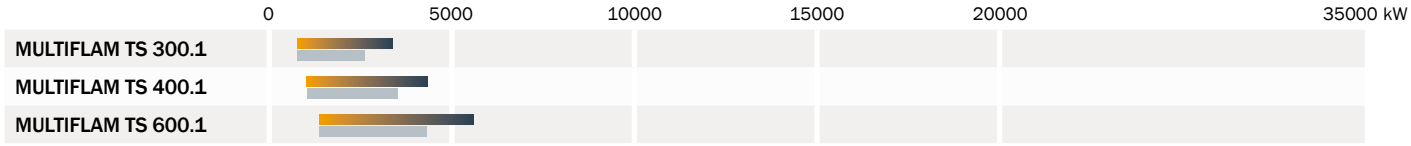



Standard version $T_{air}$ = 20 °C  Hot air version $T_{air}$ = 200 °C

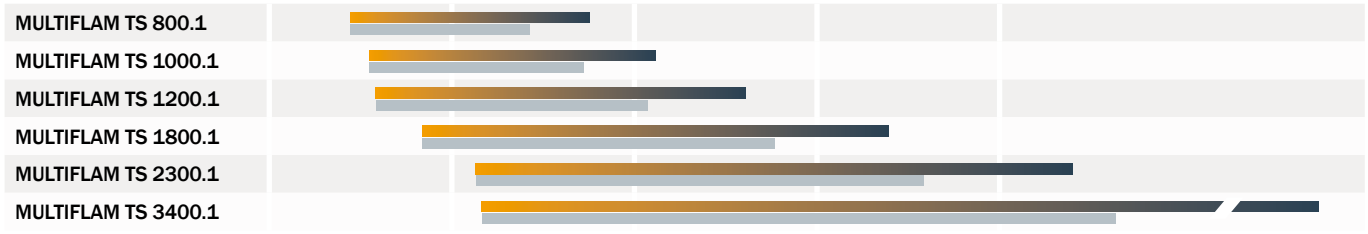
### MULTIFLAM

**Natural gas/heavy oil - max viscosity 50 °E at 50 °C**

**Oil pump/heater on board**




**Separated oil pumping unit (not included)**




Standard version $T_{air}$ = 20 °C  Hot air version $T_{air}$ = 200 °C

# TS RANGE

## MAIN CHARACTERISTICS

### All the benefits of the separate ventilation

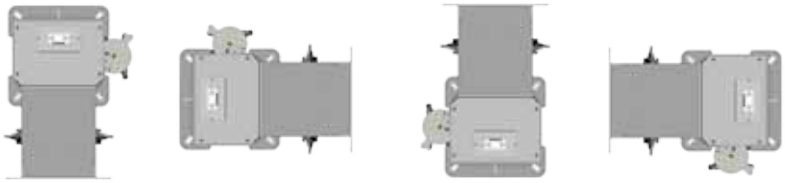
In contrast to monoblock burners, duoblock burners are made up of two units, or blocks, as the name implies: the burner head with the air inlet, and the separately-installed fan; the two units are connected via an air duct.
The separate installation of the fan offers several benefits:

- the fan can be installed in a separate room, for instance in the cellar; this results in considerably lower noise levels in the boiler room; when the fan is installed in the same room, a fan enclosure can be used to achieve optimum sound absorption, without inhibiting access to the burner;
- less space required in front of the boiler and in the combustion chamber;
- individual fan layout with optimum adaptation of the fan characteristic curve to suit the pressure ratio of the heat generator; this guarantees pulsation-free and stable burner behaviour, even on heat generators with high resistance on the exhaust side;
- combustion air can be pre-heated to increase installation efficiency;
- lower weight loading on the boiler front.



### Maximum flexibility for highly customized solutions

Thanks to their extreme flexibility and ease of use TS burners are suitable for all types of installation from 200 kW up to 34 MW.
Terminal block configuration is provided as standard; versions with integrated control panel are available on request.



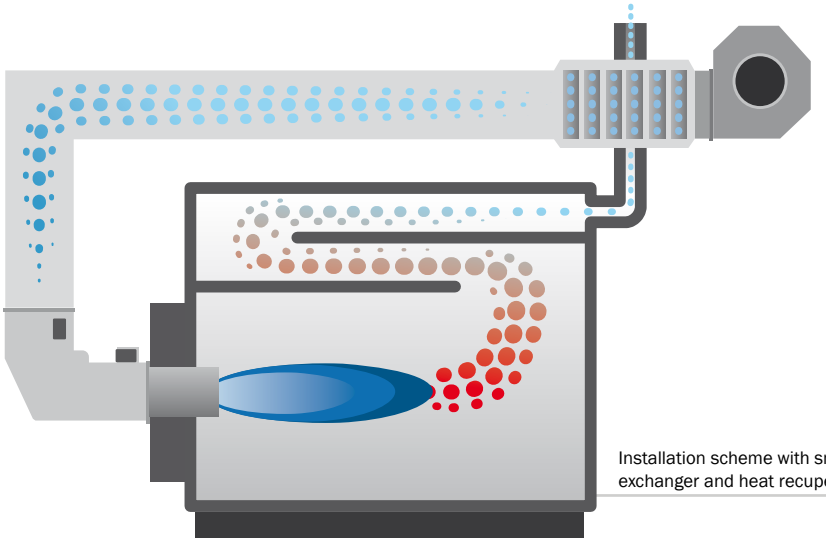
Burners can be assembled with air duct connection in different layouts in order to meet a wide range of specifications in terms of performance and overall dimensions.

### Low maintenance, high reliability

All TS range models feature easy maintenance.
Access to the combustion head and to the internal components is allowed from the housing top cover with a single operation, without removing the burner from the boiler.
The clear layout allows rapid cleaning of the mechanical components, keeping the installation always in good conditions.

### Hot air configuration

TS range can run in standard configuration with air up to 60 °C.
Versions suitable to work with pre-heated combustion air up to 200 °C can be used in order to achieve greater values of efficiency.



Installation scheme with smoke exchanger and heat recuperator

# TS RANGE

## CONFIGURATIONS, VARIANTS AND ACCESSORIES



Standard configuration:
loose version with
derivative panel

IP55 Switch cabinet
configuration:
version with assembled
or remote switch cabinet



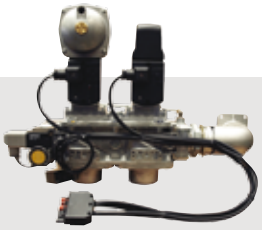
FGR System



Pre-heating
pump station



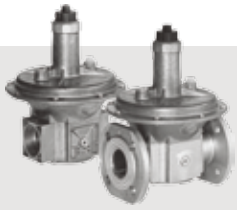
Separate ventilator



Gas train unit



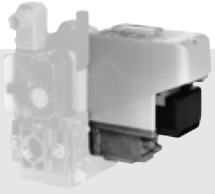
Modulation Kit



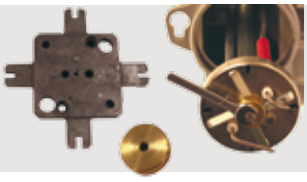
Gas governor/filter
Compulsory EN676



Max pressure switch



Tightness control
Compulsory over 1200 kW

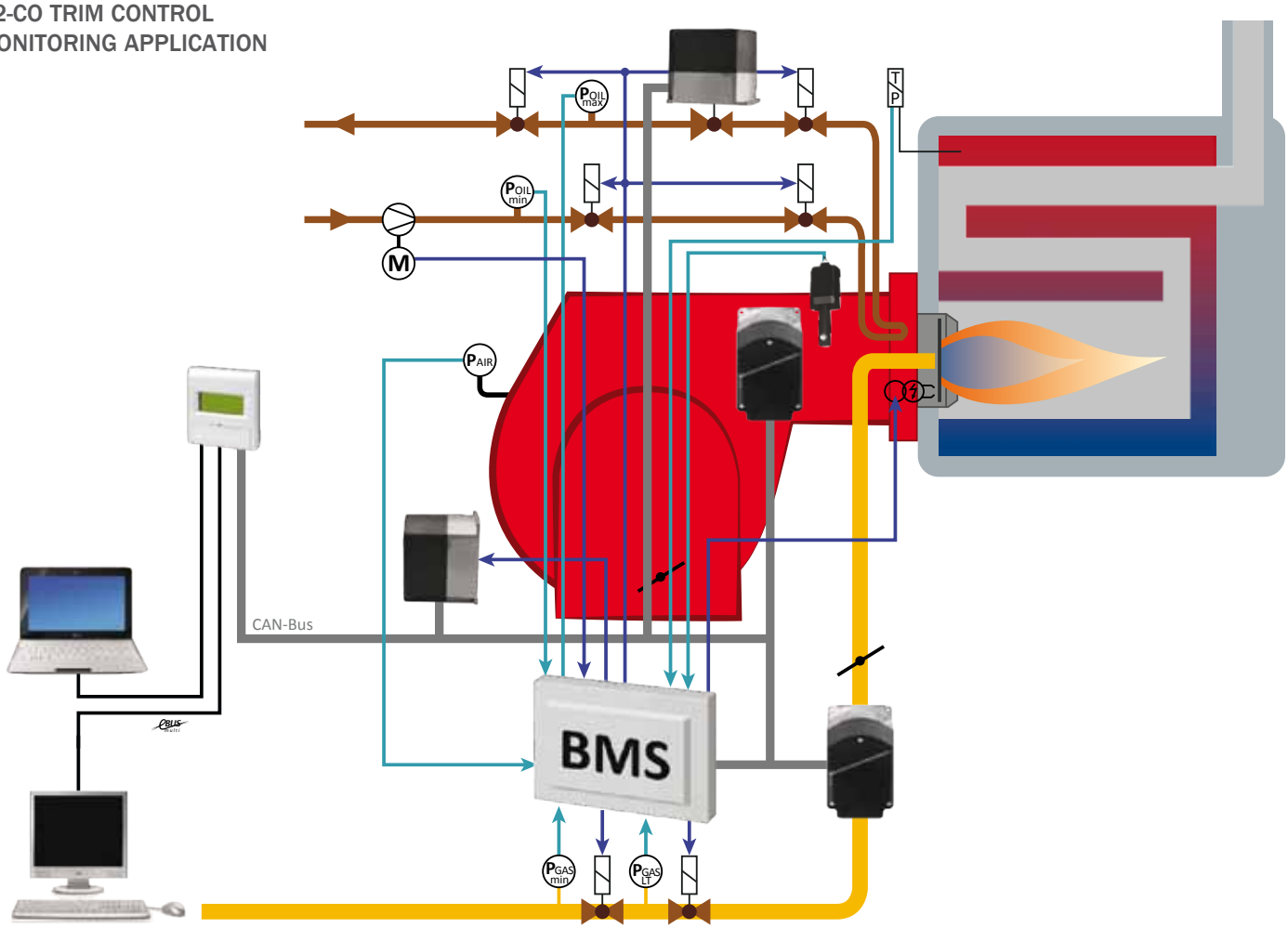


LPG/Natural gas kit

# TS RANGE

## ELECTRONIC VERSION WITH BMS

### INVERTER SYSTEM
### O2-CO TRIM CONTROL
### MONITORING APPLICATION




BMS (Burner Management System) allows to improve performance and efficiency of modern firing installation. This system is designed to be matched with an extensive range of components such as flame, temperature and pressure sensors, gas valves, variable speed fan motors and oxygen control that can be managed from different bus interfaces

| | Turndown ratio | | | Kit VSD-inverter | Kit $O_2$-CO trim | Additional functions |
|---|---|---|---|---|---|---|
| | standard | with inverter | oil side | | | |
| **BLU** | 1÷6 | 1÷8 | - | Kit | Kit | Flame monitoring sensors<br>Communication interfaces<br>Display interface |
| **MAIOR** | - | 1÷5 | 1÷4 | Kit | Kit | |
| **OILFLAM** | - | 1÷4 | 1÷4 | Kit | Kit | |
| **MULTICALOR** | 1÷6 | 1÷8 | 1÷4 | Kit | Kit | |
| **MULTIFLAM** | 1÷6 | 1÷8 | 1÷4 | Kit | Kit | |

## HOW TO CHOOSE THE CORRECT VENTILATOR

According to the application output or the fuel flow rate we need to calculate the **air needed** considering the following data:
- Output / Fuel air flow;
- Temperature of combustion air;
- Backpressure in the combustion chamber;
- Sea level altitude.

In order to dimension the correct ventilator the following calculation has to be made:
**1. Air flow needed**
**2. Pressure needed**

First of all we need to calculate the air flow needed in function of $Nm^3/h$ for gas or kg/h for oil and multiply it for the following suggested coefficients:
**Natural gas: K=12**
**Light oil: K=15,7**
**Heavy oil: K=15**

Example:
**1000 $Nm^3/h$ of gas**
The quantity of air will be:
**1000 [$Nm^3/h$] x 12 = 12000 $m^3/h$ of air**

This value must be adjusted according to the following:
1. temperature of combustion air (standard 20° C; see table for different temperature);
2. sea level (refer to the table for correction factors);
3. air loss of the connecting pipes between burner head and ventilator (estimated to 5%).

Results will be the following for an installation at 500 m from the sea level and with air at 50°C:
**12000 [$m^3/h$] x 1,05 / 0,855 = 14737 $m^3/h$**

Total air pressure:
to finalize the calculation we shall consider the following factors:
- head loss of the burner* (see following pages);
- backpressure in the combustion chamber;
- additional loss given from accessories like heat exchanger, filters, ...

*: pressure losses calculated at sea level at 20°C; the value must be adjusted according to the correction factor

**1000 $Nm^3/h$ gas for BLU 10000.1**
10000 kW (L.C.V. 8570 kcal/$Nm^3$)
- head loss = **35/0,855 = 42 mbar**
- backpressure installation = **15 mbar**
- additional exchanger = **15 mbar**
**Total: 42+15+15 = 72 mbar**

Final data achieved for selecting the ventilator:
**1. Air needed = 14737 $m^3/h$**
**2. Pressure = 72 mbar**

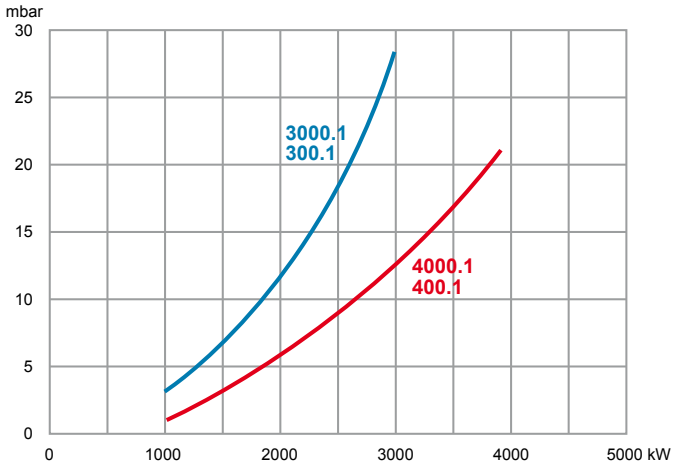
### Correction factors

| Temp. (°C) | Air density (kg/m) | Sea level altitude (m) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 250 | 500 | 750 | 1000 | 1250 | 1500 | 1750 | 2000 | 2250 | 2500 | 2750 | 3000 |
| **0** | **1,293** | 1,073 | 1,042 | 1,012 | 0,982 | 0,954 | 0,926 | 0,899 | 0,873 | 0,847 | 0,823 | 0,799 | 0,775 | 0,753 |
| **5** | **1,270** | 1,054 | 1,023 | 0,993 | 0,965 | 0,936 | 0,909 | 0,883 | 0,857 | 0,832 | 0,808 | 0,784 | 0,761 | 0,739 |
| **10** | **1,247** | 1,035 | 1,005 | 0,976 | 0,947 | 0,920 | 0,893 | 0,867 | 0,842 | 0,817 | 0,793 | 0,770 | 0,748 | 0,726 |
| **15** | **1,226** | 1,017 | 0,988 | 0,959 | 0,931 | 0,904 | 0,878 | 0,852 | 0,827 | 0,803 | 0,780 | 0,757 | 0,735 | 0,714 |
| **20** | **1,205** | 1,000 | 0,971 | 0,943 | 0,915 | 0,888 | 0,863 | 0,837 | 0,813 | 0,789 | 0,766 | 0,744 | 0,722 | 0,701 |
| **25** | **1,185** | 0,983 | 0,955 | 0,927 | 0,900 | 0,874 | 0,848 | 0,823 | 0,799 | 0,776 | 0,754 | 0,732 | 0,710 | 0,690 |
| **30** | **1,165** | 0,967 | 0,939 | 0,911 | 0,885 | 0,859 | 0,834 | 0,810 | 0,786 | 0,763 | 0,741 | 0,720 | 0,699 | 0,678 |
| **40** | **1,128** | 0,936 | 0,909 | 0,882 | 0,857 | 0,832 | 0,807 | 0,784 | 0,761 | 0,739 | 0,717 | 0,697 | 0,676 | 0,657 |
| **50** | **1,093** | 0,907 | 0,881 | **0,855** | 0,830 | 0,806 | 0,782 | 0,760 | 0,738 | 0,716 | 0,695 | 0,675 | 0,655 | 0,636 |
| **60** | **1,060** | 0,880 | 0,854 | 0,829 | 0,805 | 0,782 | 0,759 | 0,737 | 0,715 | 0,695 | 0,674 | 0,655 | 0,636 | 0,617 |
| **80** | **1,000** | 0,830 | 0,806 | 0,782 | 0,760 | 0,737 | 0,716 | 0,695 | 0,675 | 0,655 | 0,636 | 0,618 | 0,600 | 0,582 |
| **100** | **0,946** | 0,786 | 0,763 | 0,740 | 0,719 | 0,698 | 0,678 | 0,658 | 0,639 | 0,620 | 0,602 | 0,585 | 0,567 | 0,551 |
| **150** | **0,834** | 0,693 | 0,672 | 0,653 | 0,634 | 0,615 | 0,598 | 0,580 | 0,563 | 0,547 | 0,531 | 0,515 | 0,500 | 0,486 |
| **200** | **0,746** | 0,619 | 0,601 | 0,584 | 0,567 | 0,550 | 0,534 | 0,519 | 0,504 | 0,489 | 0,475 | 0,461 | 0,448 | 0,434 |
| **250** | **0,675** | 0,560 | 0,544 | 0,528 | 0,513 | 0,498 | 0,483 | 0,469 | 0,456 | 0,442 | 0,429 | 0,417 | 0,405 | 0,393 |
| **300** | **0,616** | 0,511 | 0,496 | 0,482 | 0,468 | 0,454 | 0,441 | 0,428 | 0,416 | 0,404 | 0,392 | 0,380 | 0,369 | 0,359 |

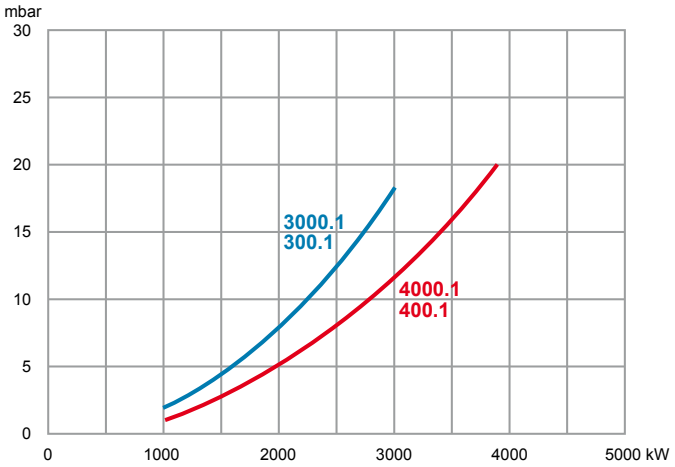
# TS RANGE

## PRESSURE DROPS

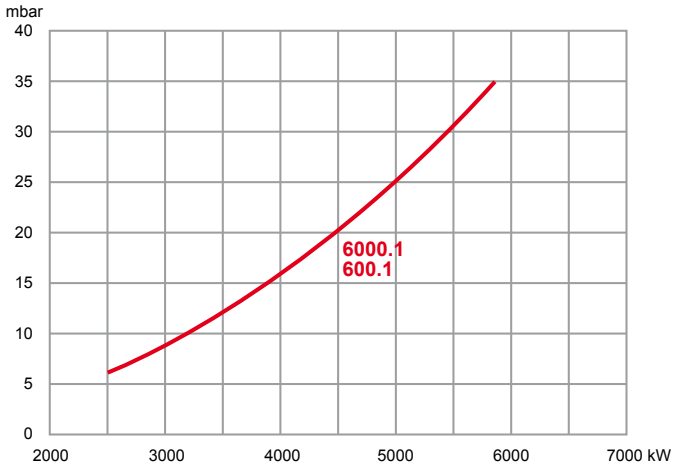
### Burner head AIR pressure drop



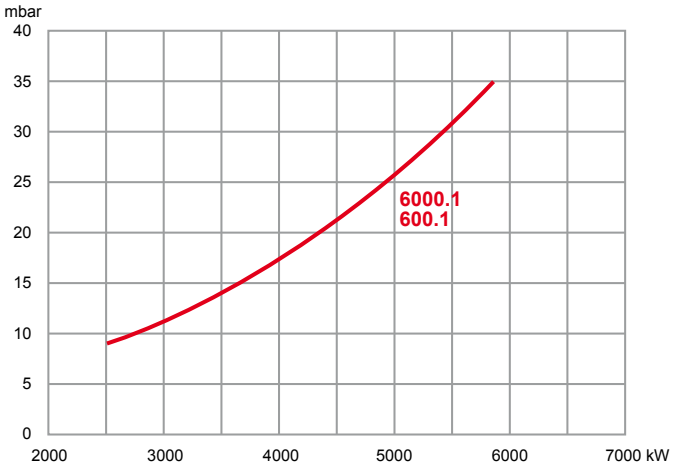

### Burner head GAS pressure drop



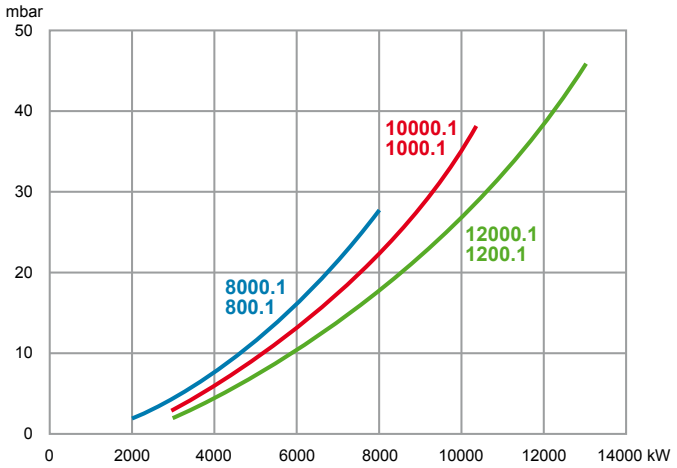

### Pressure drop on AIR side



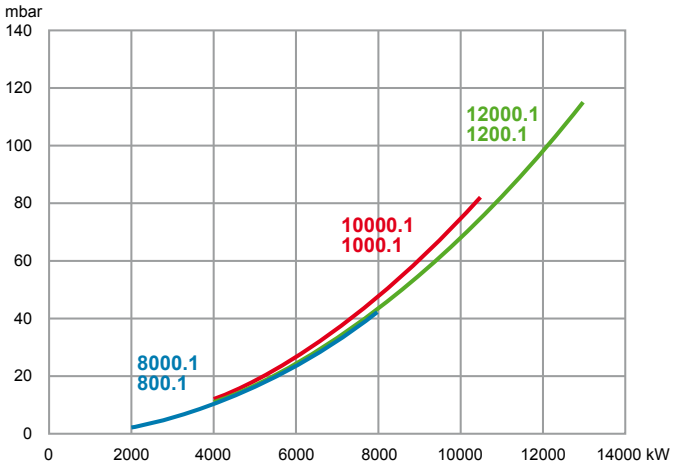

### Pressure drop on GAS side




### Pressure drop on AIR side



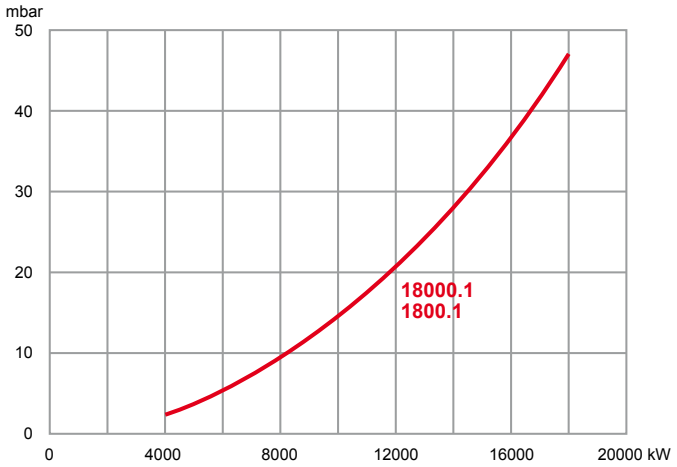

### Pressure drop on GAS side



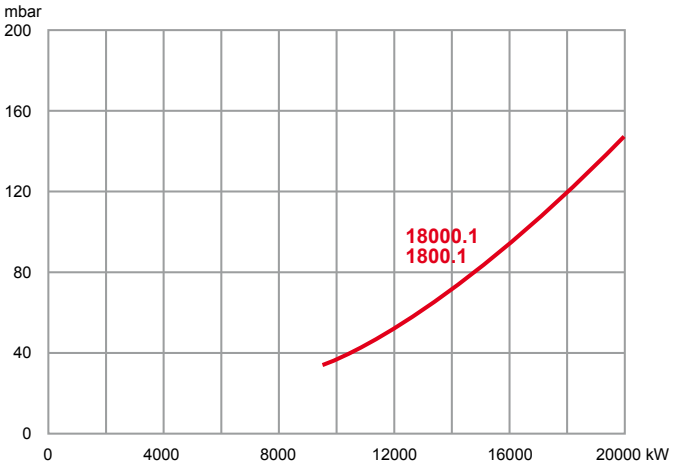
# TS RANGE

## PRESSURE DROPS

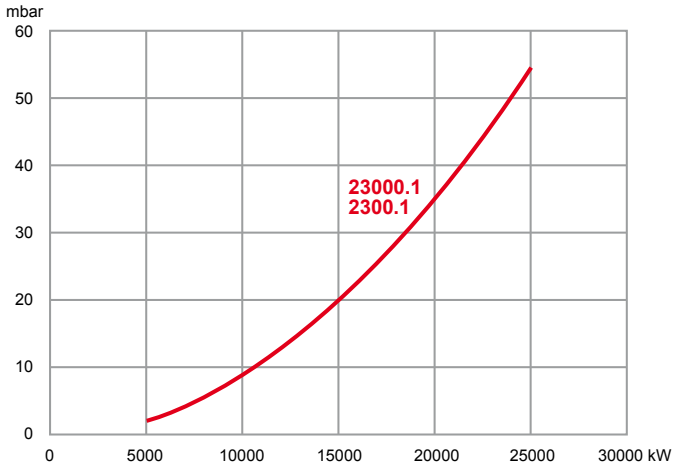
### Pressure drop on AIR side



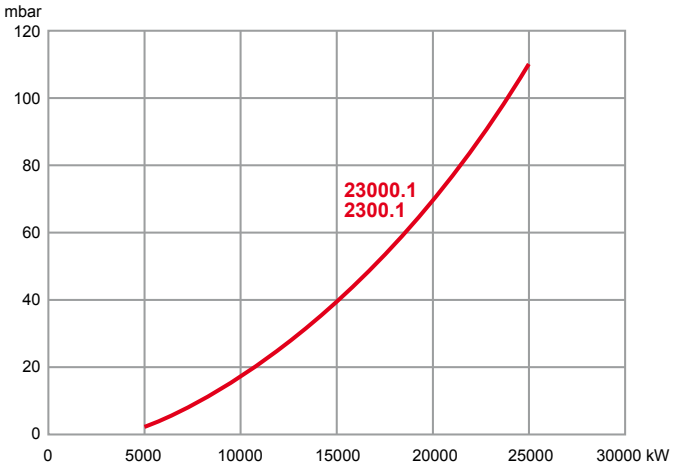

### Pressure drop on GAS side



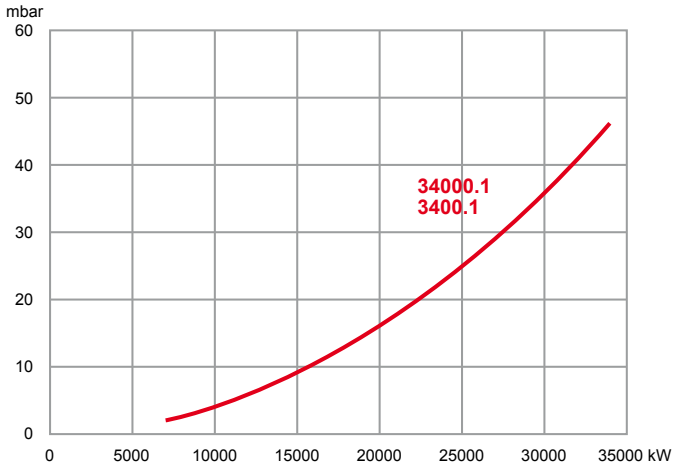

### Pressure drop on AIR side



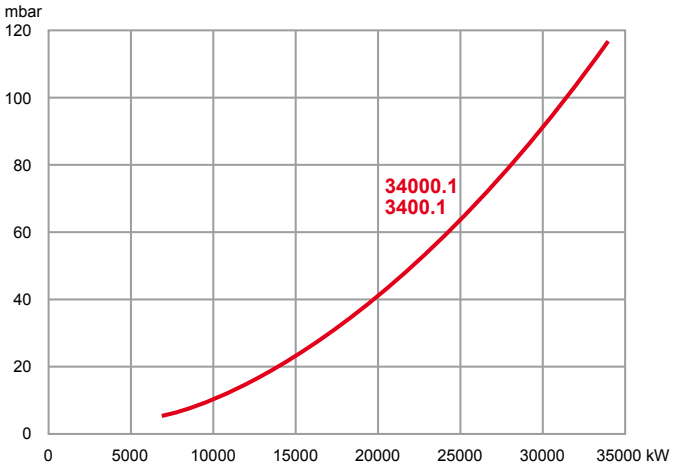

### Pressure drop on GAS side




### Pressure drop on AIR side



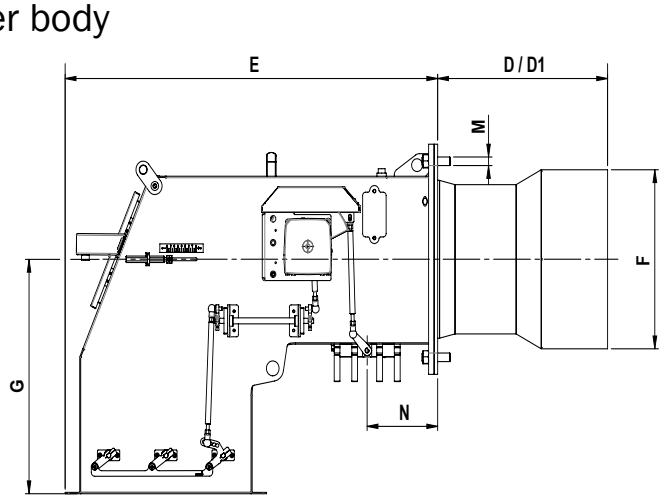

### Pressure drop on GAS side

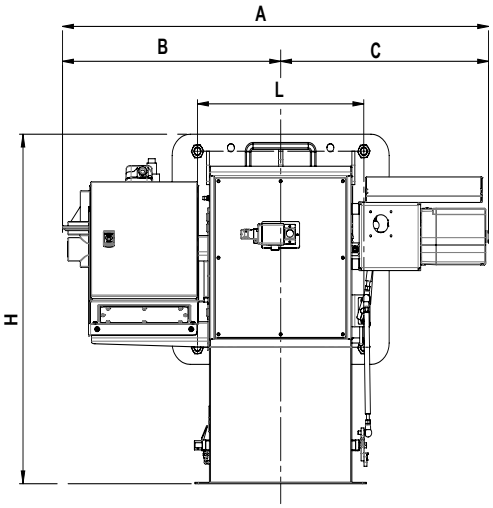


# TS RANGE

## OVERALL DIMENSIONS - Class 2 models

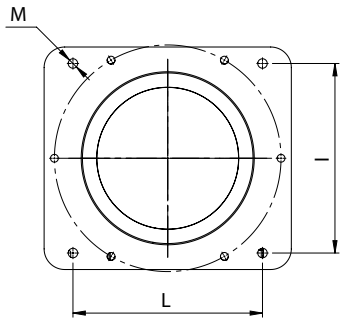
### Burner body



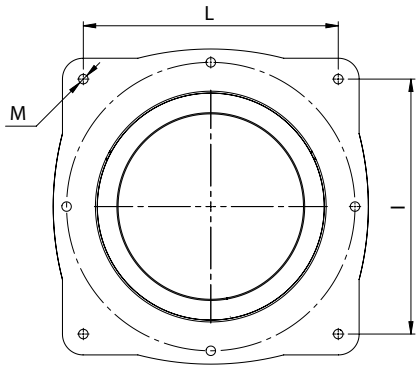




### Connecting flange

Gas: TS 500.1 ... 12000.1
Oil and dual: TS 100 ... 1200.1




Gas: TS 1800.1 ... 34000.1
Oil and dual: TS 1800.1 ... 3400.1



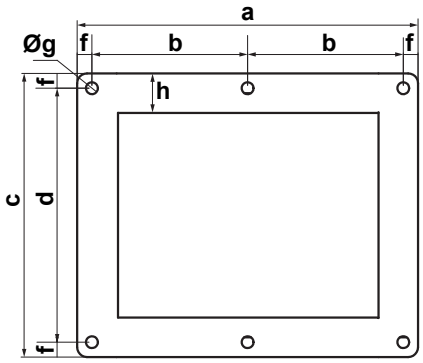

| | A | B | C | D | D1 | E | F | G | H | I | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TS 1000.1 / TS 100** | 523 | 216 | 307 | 174 | 394 | 556 | 190 | 290 | 370 | 190 | 190 | 4xM10 | 139* |
| **TS 1500.1 / TS 140** | 523 | 216 | 307 | 342 | 492 | 556 | 200 | 290 | 385 | 190 | 190 | 4xM10 | 139* |
| **TS 2000.1 / TS 200.1** | 523 | 216 | 307 | 342 | 492 | 556 | 200 | 290 | 390 | 190 | 190 | 4xM10 | 139* |
| **TS 3000.1 / TS 300.1** | 848 | 407 | 441 | 348 | 548 | 669 | 270 | 392 | 568 | 270 | 270 | 4xM16 | 125 |
| **TS 4000.1 / TS 400.1** | 986 | 472 | 514 | 330 | 530 | 763 | 290 | 392 | 575 | 270 | 270 | 4xM16 | 180 |
| **TS 6000.1 / TS 600.1** | 986 | 472 | 514 | 365 | 640 | 775 | 320 | 392 | 587 | 315 | 315 | 4xM16 | 188 |
| **TS 8000.1 / TS 800.1** | 998 | 478 | 520 | 373 | 698 | 838 | 325 | 405 | 614 | 330 | 330 | 4xM16 | 185 |
| **TS 10000.1 / TS 1000.1** | 1251 | 633 | 618 | 470 | 770 | 1030 | 369 | 616 | 976 | 619 | 619 | 4xM20 | 195 |
| **TS 12000.1 / TS 1200.1** | 1178 | 603 | 575 | 470 | 770 | 1030 | 420 | 550 | 820 | 619 | 619 | 4xM20 | 195 |
| **TS 18000.1 / TS 1800.1** | 1178 | 603 | 575 | 470 | 770 | 1030 | 450 | 550 | 820 | 619 | 619 | 4xM20 | 195 |
| **TS 23000.1 / TS 2300.1** | 1330 | 620 | 710 | 590 | 710 | 1480 | 551 | 670 | 1063 | 619 | 619 | 4xM20 | 200 |
| **TS 34000.1 / TS 3400.1** | 1308 | 472 | 836 | 530 | 760 | 1549 | 720 | 760 | 1242 | 800 | 800 | 4xM20 | 210 |

*: gas train connection on the right side of the burner
D: short head - D1: long head
Dimensions (in mm) make reference to the electronic versions; data may vary according to the configuration and options installed

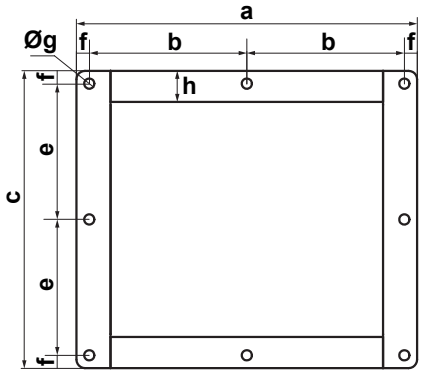
## OVERALL DIMENSIONS - Class 2 models

### Air duct

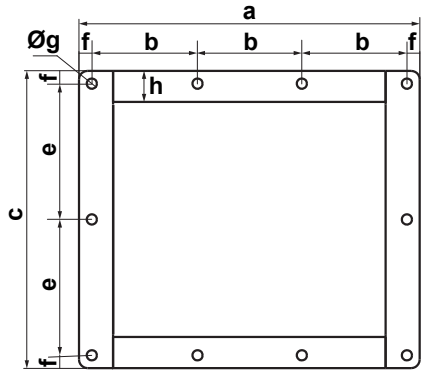
Gas: TS 500.1 ... 2000.1
Oil and dual: TS 100 ... 200.1



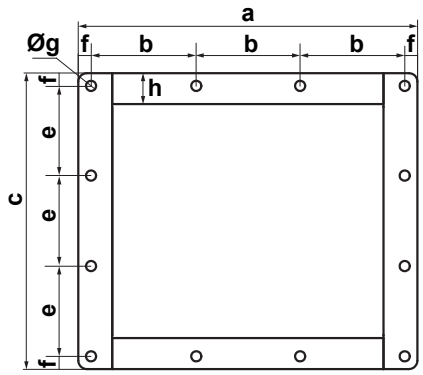

Gas: TS 3000.1 ... 6000.1
Oil and dual: TS 300 ... 600.1



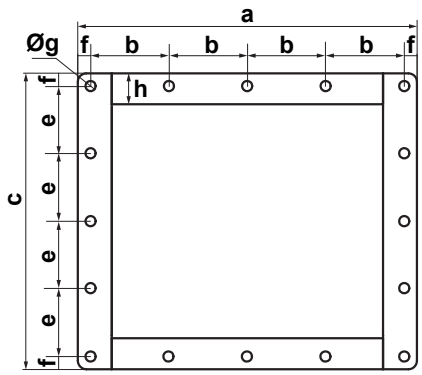

Gas: TS 8000.1 ... 12000.1
Oil and dual: TS 800.1 ... 1200.1




Gas: TS 18000.1
Oil and dual: TS 1800.1




Gas: TS 23000.1 ... 34000.1
Oil and dual: TS 2300.1 ... 3400.1



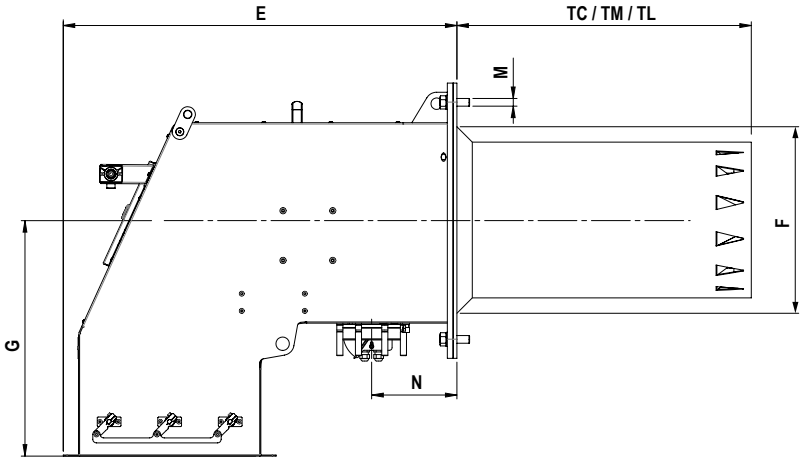

| | a | b | c | d | e | f | Øg | h |
|---|---|---|---|---|---|---|---|---|
| **TS 1000.1 / TS 100** | 303 | 136,5 | 252 | 222 | - | 15 | 6x R12 | 40 |
| **TS 1500.1 / TS 140** | 303 | 136,5 | 252 | 222 | - | 15 | 6x R12 | 40 |
| **TS 2000.1 / TS 200.1** | 345 | 157,5 | 287 | 257 | - | 15 | 6x R12 | 40 |
| **TS 3000.1 / TS 300.1** | 400 | 185 | 349 | - | 159,5 | 15 | 8x R12 | 40 |
| **TS 4000.1 / TS 400.1** | 400 | 185 | 349 | - | 159,5 | 15 | 8x R12 | 40 |
| **TS 6000.1 / TS 600.1** | 470 | 220 | 361 | - | 165,5 | 15 | 8x R12 | 40 |
| **TS 8000.1 / TS 800.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 10000.1 / TS 1000.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 12000.1 / TS 1200.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 18000.1 / TS 1800.1** | 730 | 230,7 | 650 | - | 204 | 19 | 12x R14 | 43 |
| **TS 23000.1 / TS 2300.1** | 930 | 223 | 828 | - | 197,5 | 19 | 16x R14 | 40 |
| **TS 34000.1 / TS 3400.1** | 930 | 223 | 828 | - | 197,5 | 19 | 16x R14 | 40 |

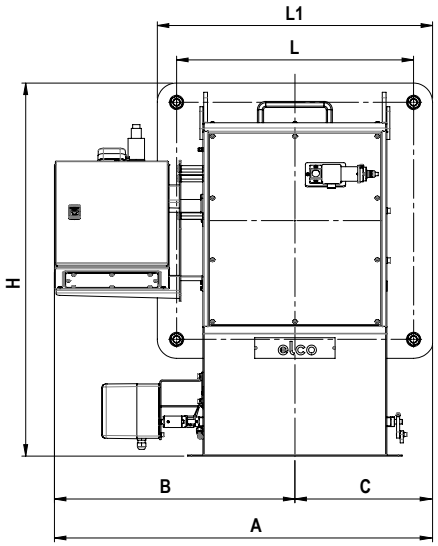
Dimensions in mm

# TS RANGE

## OVERALL DIMENSIONS - LOW NOx Class 3 models

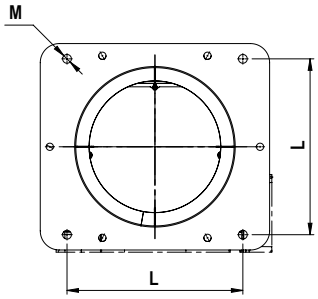
### Burner body



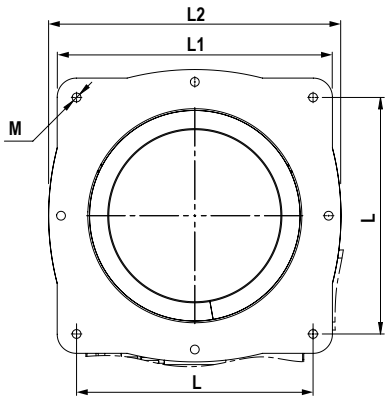




### Connecting flange

Gas: TS 500.1 ... 12000.1
Oil and dual: TS 100 ... 1200.1




Gas: TS 1800.1 ... 34000.1
Oil and dual: TS 1800.1 ... 3400.1



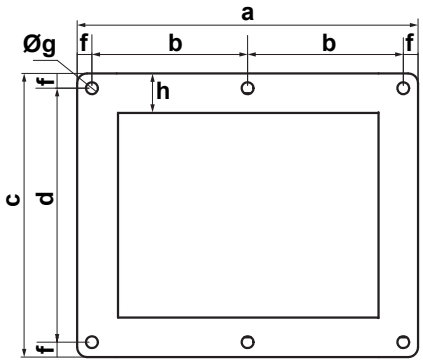

| | A | B | C | D | D1 | E | F | G | H | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TS 1000.1 / TS 100** | 523 | 216 | 307 | 174 | 394 | 556 | 190 | 290 | 370 | 190 | 4xM10 | 139* |
| **TS 1500.1 / TS 140** | 523 | 216 | 307 | 342 | 492 | 556 | 200 | 290 | 385 | 190 | 4xM10 | 139* |
| **TS 2000.1 / TS 200.1** | 848 | 407 | 441 | 348 | 548 | 669 | 270 | 392 | 568 | 270 | 4X M16 | 125 |
| **TS 3000.1 / TS 300.1** | 986 | 472 | 514 | 330 | 530 | 763 | 290 | 392 | 575 | 270 | 4X M16 | 180 |
| **TS 4000.1 / TS 400.1** | 986 | 472 | 514 | 365 | 640 | 775 | 320 | 392 | 587 | 315 | 4X M16 | 188 |
| **TS 6000.1 / TS 600.1** | 998 | 478 | 520 | 373 | 698 | 838 | 325 | 405 | 614 | 330 | 4X M16 | 185 |
| **TS 8000.1 / TS 800.1** | 1251 | 633 | 618 | 470 | 770 | 1030 | 369 | 616 | 976 | 619 | 4X M20 | 195 |
| **TS 10000.1 / TS 1000.1** | 1178 | 603 | 575 | 470 | 770 | 1030 | 420 | 550 | 820 | 619 | 4X M20 | 195 |
| **TS 12000.1 / TS 1200.1** | 1178 | 603 | 575 | 470 | 770 | 1030 | 450 | 550 | 820 | 619 | 4X M20 | 195 |
| **TS 18000.1 / TS 1800.1** | 1330 | 620 | 710 | 590 | 710 | 1480 | 551 | 670 | 1063 | 619 | 4xM20 | 200 |
| **TS 23000.1 / TS 2300.1** | 1308 | 472 | 836 | 530 | 760 | 1549 | 720 | 760 | 1242 | 800 | 4xM20 | 210 |
| **TS 34000.1 / TS 3400.1** | 1308 | 472 | 836 | 530 | 760 | 1549 | 720 | 760 | 1242 | 800 | 4xM20 | 210 |

*: gas train connection on the right side of the burner
D: short head - D1: long head
Dimensions (in mm) make reference to the electronic versions; data may vary according to the configuration and options installed

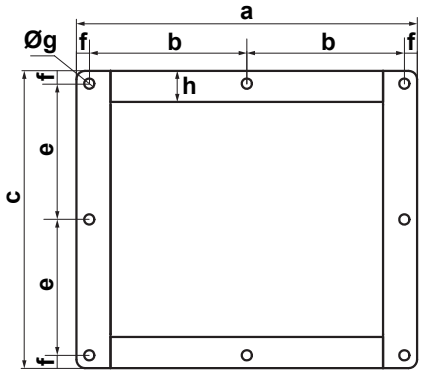
## OVERALL DIMENSIONS - LOW NOx Class 3 models

### Air duct

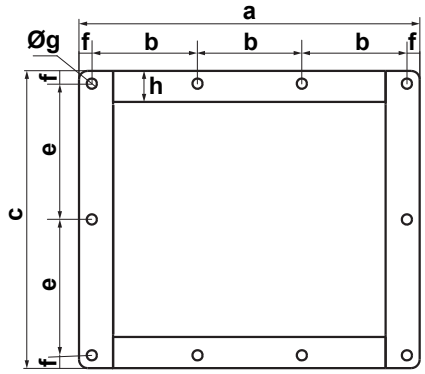
Gas: TS 500.1 ... 2000.1
Oil and dual: TS 100 ... 200.1



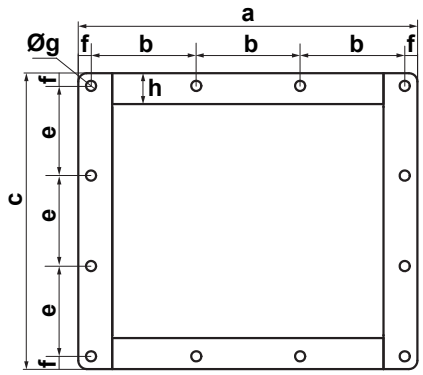

Gas: TS 3000.1 ... 6000.1
Oil and dual: TS 300 ... 600.1



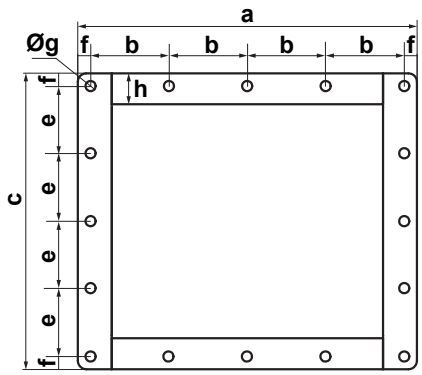

Gas: TS 8000.1 ... 12000.1
Oil and dual: TS 800.1 ... 1200.1




Gas: TS 18000.1
Oil and dual: TS 1800.1




Gas: TS 23000.1 ... 34000.1
Oil and dual: TS 2300.1 ... 3400.1

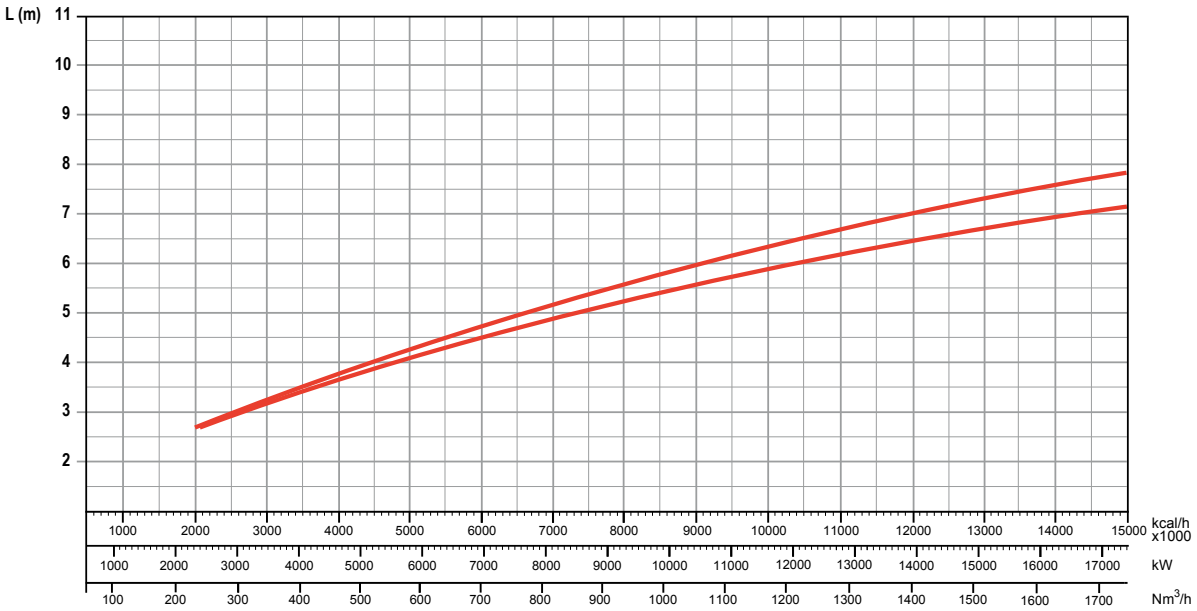



| | a | b | c | d | e | f | Øg | h |
|---|---|---|---|---|---|---|---|---|
| **TS 1000.1 / TS 100** | 303 | 136,5 | 252 | 222 | - | 15 | 6x R12 | 40 |
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| **TS 2000.1 / TS 200.1** | 345 | 157,5 | 287 | 257 | - | 15 | 6x R12 | 40 |
| **TS 3000.1 / TS 300.1** | 400 | 185 | 349 | - | 159,5 | 15 | 8x R12 | 40 |
| **TS 4000.1 / TS 400.1** | 400 | 185 | 349 | - | 159,5 | 15 | 8x R12 | 40 |
| **TS 6000.1 / TS 600.1** | 470 | 220 | 361 | - | 165,5 | 15 | 8x R12 | 40 |
| **TS 8000.1 / TS 800.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 10000.1 / TS 1000.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 12000.1 / TS 1200.1** | 557 | 173 | 474 | - | 218 | 19 | 10x R14 | 43 |
| **TS 18000.1 / TS 1800.1** | 730 | 230,7 | 650 | - | 204 | 19 | 12x R14 | 43 |
| **TS 23000.1 / TS 2300.1** | 930 | 223 | 828 | - | 197,5 | 19 | 16x R14 | 40 |
| **TS 34000.1 / TS 3400.1** | 930 | 223 | 828 | - | 197,5 | 19 | 16x R14 | 40 |

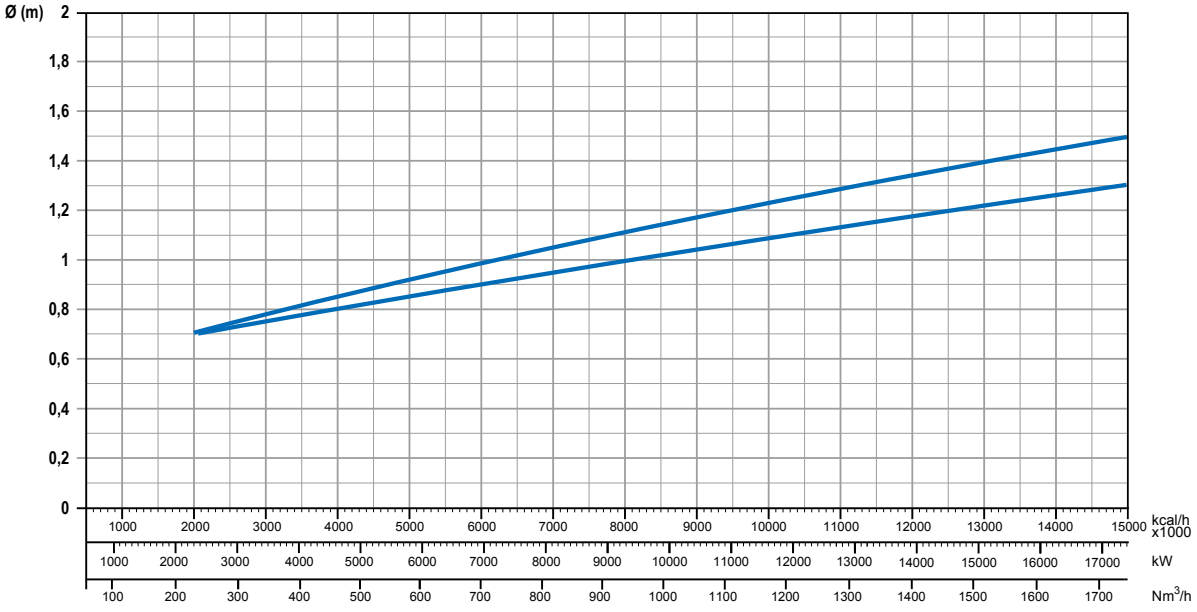
Dimensions in mm

## FLAME DIMENSIONS

### Flame lenght (gas burners)




### Flame diameter (gas burners)




Data may vary depending on the configuration of the burner, the pressure of the combustion chamber and the draught.
The values in the graphs refer to tests carried out with flame tubes.

Example:
Burner output: 8000 kW
L flame (m) = 5 (medium value)
D flame (m) = 1 (medium value)

Modifications to the flame can be made in our Flexshop in order to shape the flame and meet specific requirements for special boilers or applications

# TS RANGE

## FGR SYSTEM (NOx ≤ 30 mg/kWh)

Ecoflam is renowned worldwide for providing high efficiency and reliable burners with significant energy savings and extreme ease of installation, maintenance and flexible boiler-burner matching.
Following a philosophy of continuous improving, the R&D Laboratory is constantly working to produce better results, such as the reduced NOx level emissions.
Decades of presence on the international market have enabled Ecoflam to develop a considerable experience in customizing burners and developing innovative technologies which are attentive to the issue of polluting emissions, even in the most demanding applications.
Ecoflam is therefore well placed to provide solutions for the growing number of markets which are enacting ever more restrictive emissions regulations.

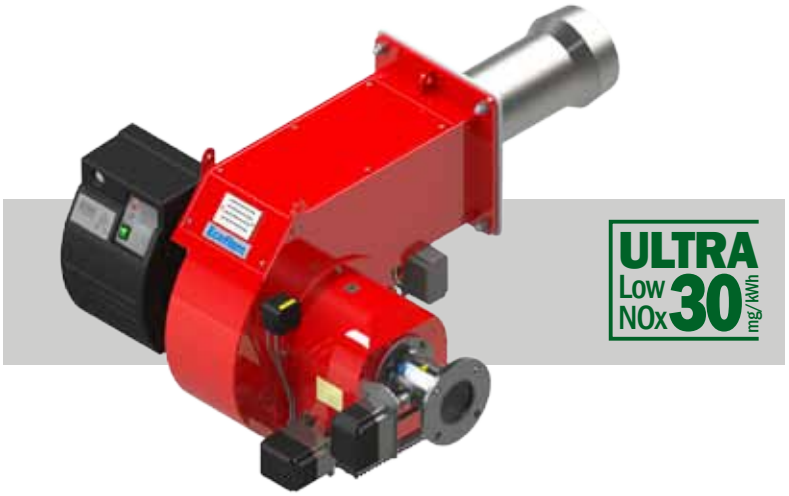
In the laboratory of Resana, Italy, the R&D technicians are able to simulate real-life working conditions and measure the performance of burners fitted with Low NOx combustion heads and the **FGR system**.
The excellent results obtained in this field have enabled Ecoflam to offer a complete range of monoblock and duoblock products equipped with the FGR technology.






The principle of external flue gas recirculation consists in sending a mixture of comburent air and flue gas to the combustion head, thus reducing the NOx emissions.

This technology enables Ecoflam to guarantee emissions of less than **30 mg/kWh**, a value which is hard to obtain with conventional combustion systems, and offer cutting-edge products which satisfy the requirements of any current regulations.

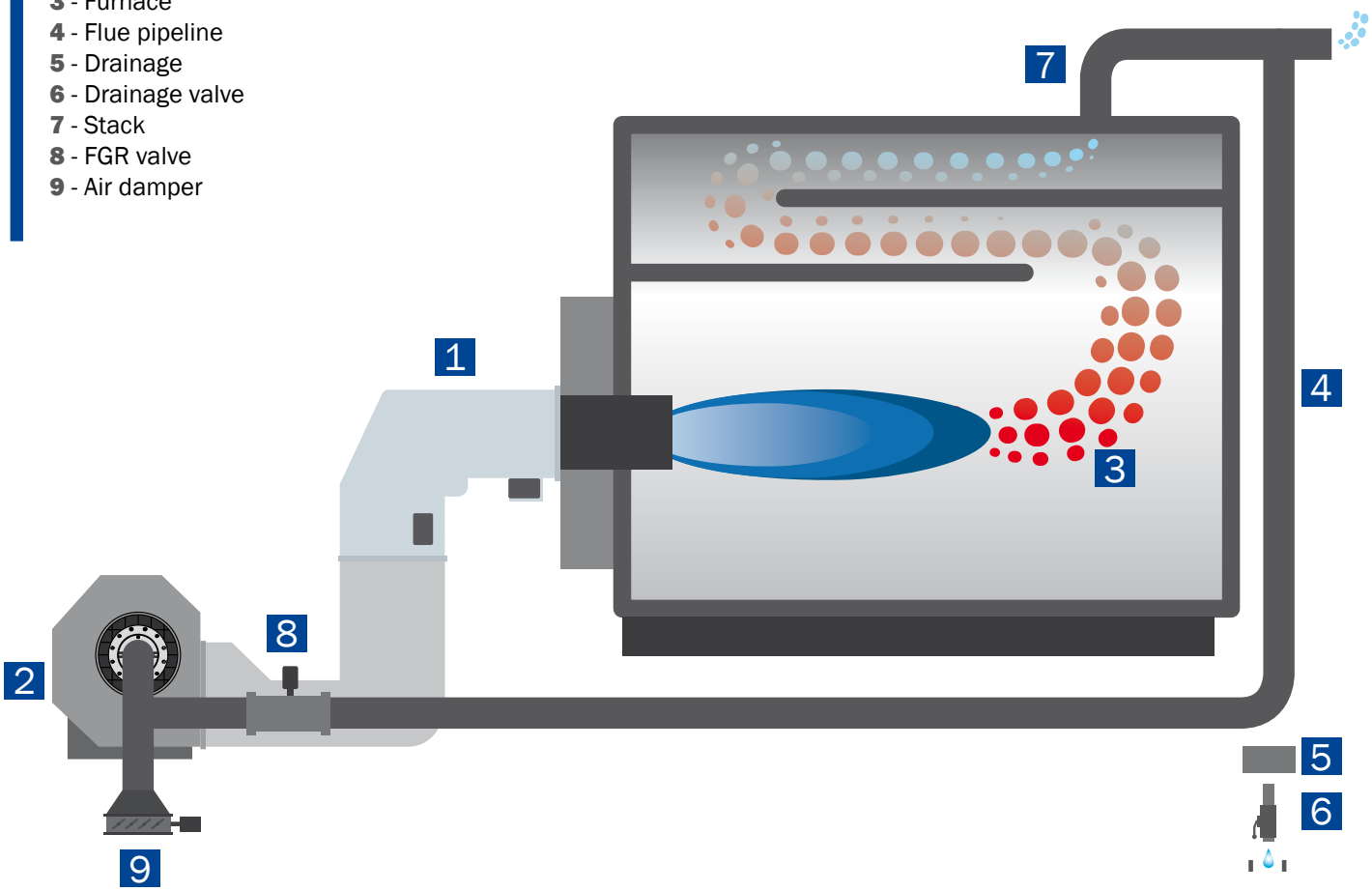


FGR SYSTEM (NOx ≤ 30 mg/kWh)

## FGR ON DUOBLOCK BURNERS - LAYOUT 1

The FGR system for duoblock burners, in which the drughtfan is installed in a remote position, has a different layout, since the flue gas line must enter the circuit upstream of the fan itself. Furthermore, to generate the required suction to convey the flue gas into the fan and mix it with the comburent air, the flow regulation device must be located upstream of the flue gas inlet into the fan suction circuit. As for monoblock units, also here the flue gas line must be properly sized.

Legenda
**1** - Burner
**2** - Draught fan
**3** - Furnace
**4** - Flue pipeline
**5** - Drainage
**6** - Drainage valve
**7** - Stack
**8** - FGR valve
**9** - Air damper

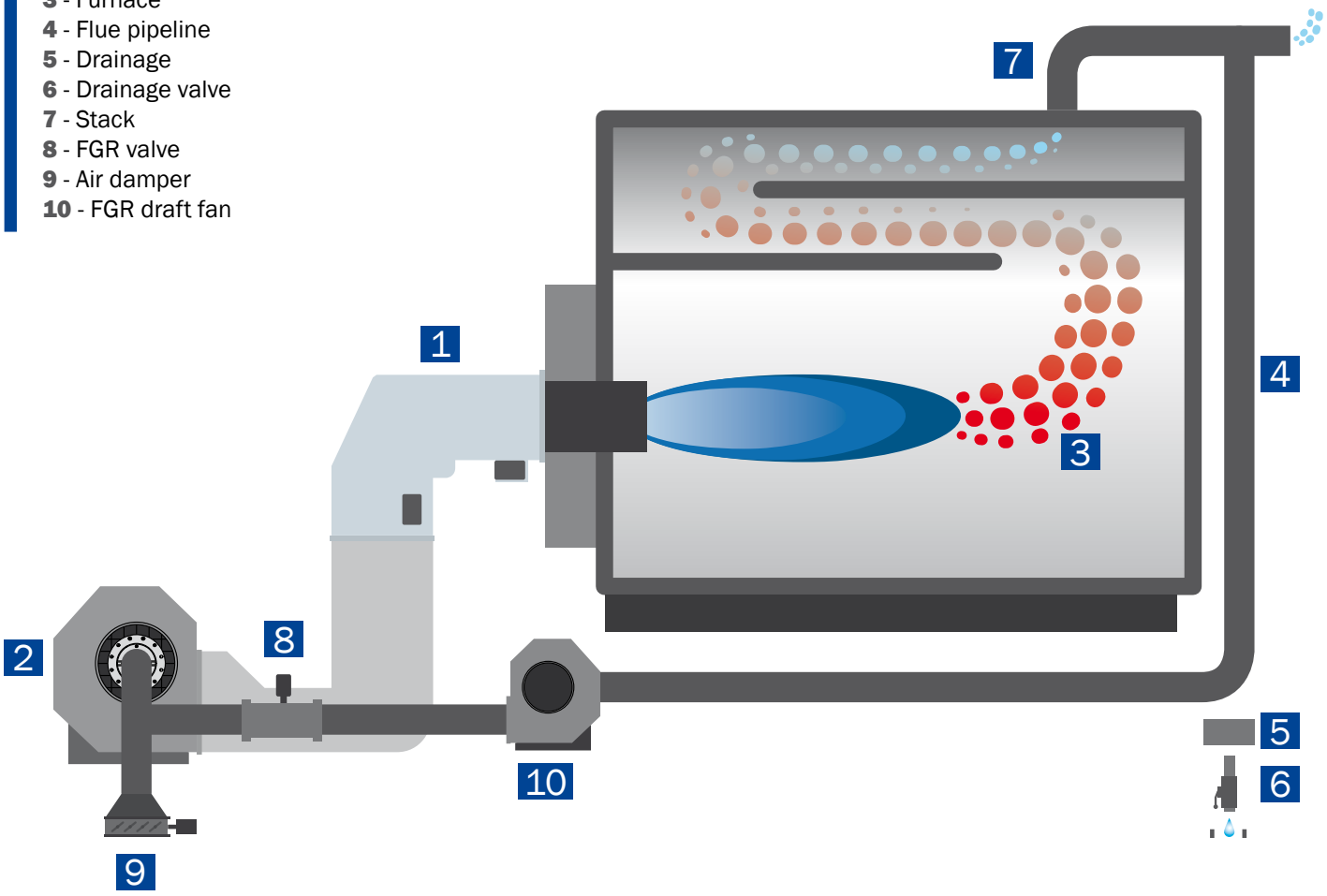


## FGR SYSTEM (NOx ≤ 30 mg/kWh)

### FGR ON DUOBLOCK BURNERS - LAYOUT 2

In case of installations with duoblock burners there is an alternative option to layout 1.
In this scenario there is a further draught fan dedicated to the flue: it takes the flue from the stack and pushes it into the duct between the burner and the fresh air draught fan.
The flue damper is just after the flue fan. The air damper is on burner board and therefore it adjusts the rate of the mixture between the flue and the fresh air.
Also in this case the flue duct has to be properly sized in order to minimize the pressure drop.

**Legenda**
**1** - Burner
**2** - Fresh air draught fan
**3** - Furnace
**4** - Flue pipeline
**5** - Drainage
**6** - Drainage valve
**7** - Stack
**8** - FGR valve
**9** - Air damper
**10** - FGR draft fan



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Company subject to the direction and coordination of Ariston Group.

**Version 2.4 - 16/04/2021**

ECOFLAM Bruciatori S.p.A. reserve the right to make any adjustments, without prior notice, which is considered necessary or useful to its products, without affecting their main features.