

# Ecoflam

[www.ecoflam-burners.com](http://www.ecoflam-burners.com)

## TS RANGE

GAS, LIGHT OIL, HEAVY OIL  
AND DUAL FUEL



---

DUOBLOCK BURNERS FROM 230 TO 34000 kW

## 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



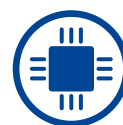
WOOD  
BOILERS



CHEMICAL  
PLANTS



ENGINEERING



PLANT  
MODERNIZATION

## Our worldwide network

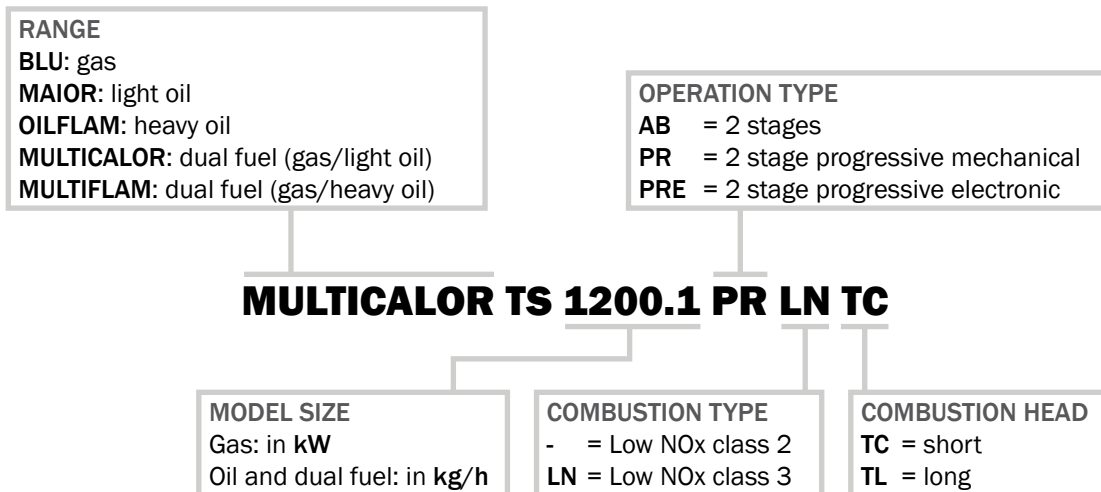
Manufacturing is carried out in the factory of Resana (Treviso - Italy) and products are distributed worldwide thanks to a wide network of partners. In forty years, Ecoflam has been capable to build loyal partnerships and today can count on reliable Partners in more than 60 Countries.

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.

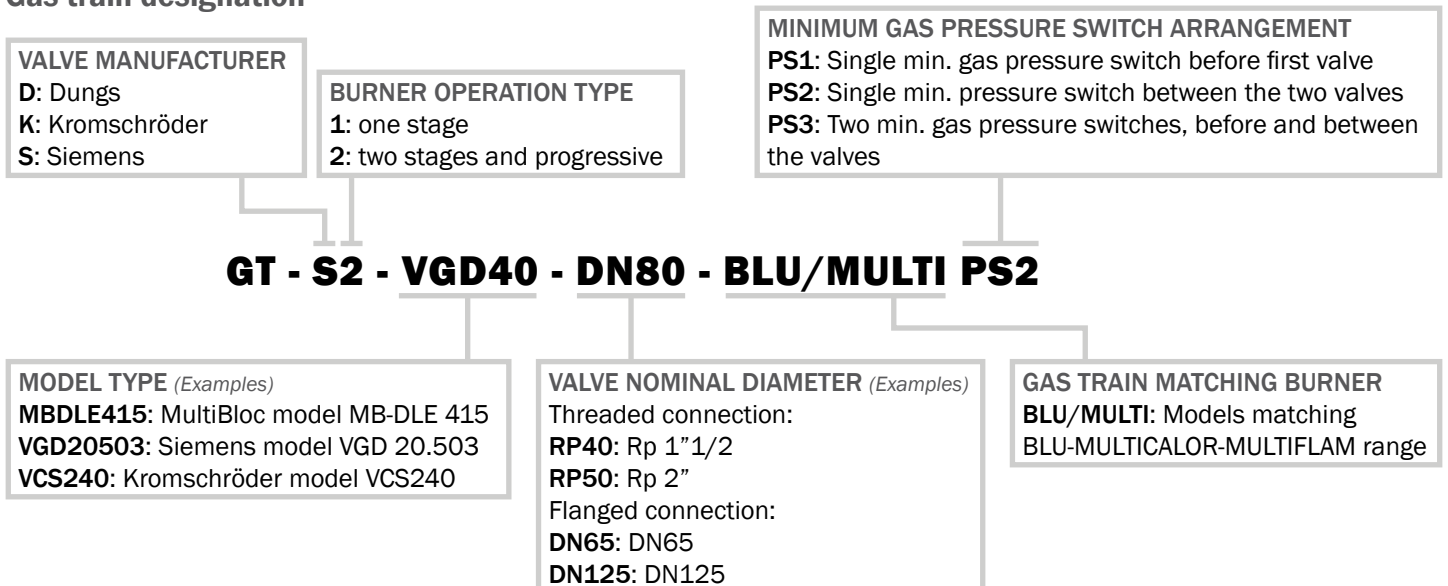
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### Burner designation



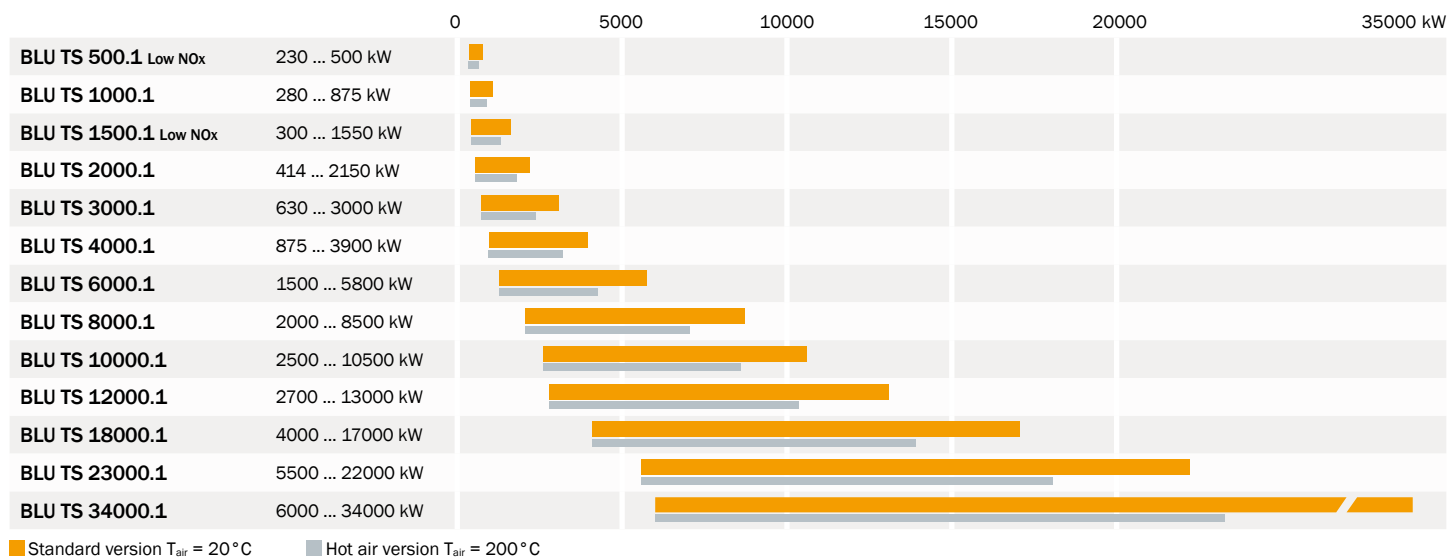
### Gas train designation



## RANGE OVERVIEW

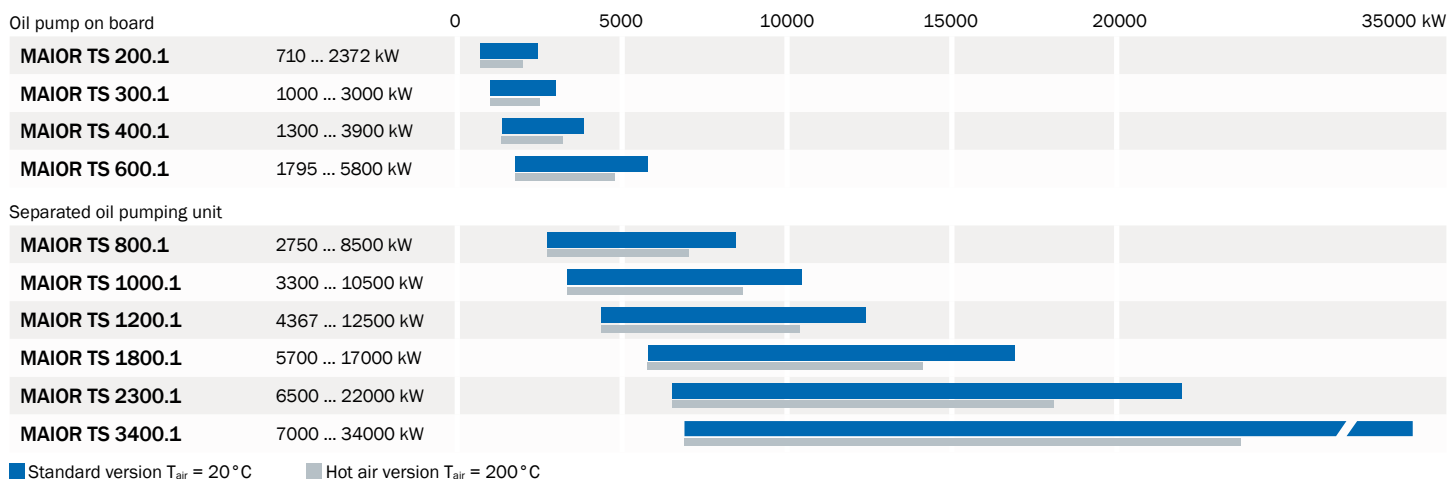
### BLU

Gas - Low NOx Class 2 (< 120 mg/kWh) and Class 3 (< 80 mg/kWh)



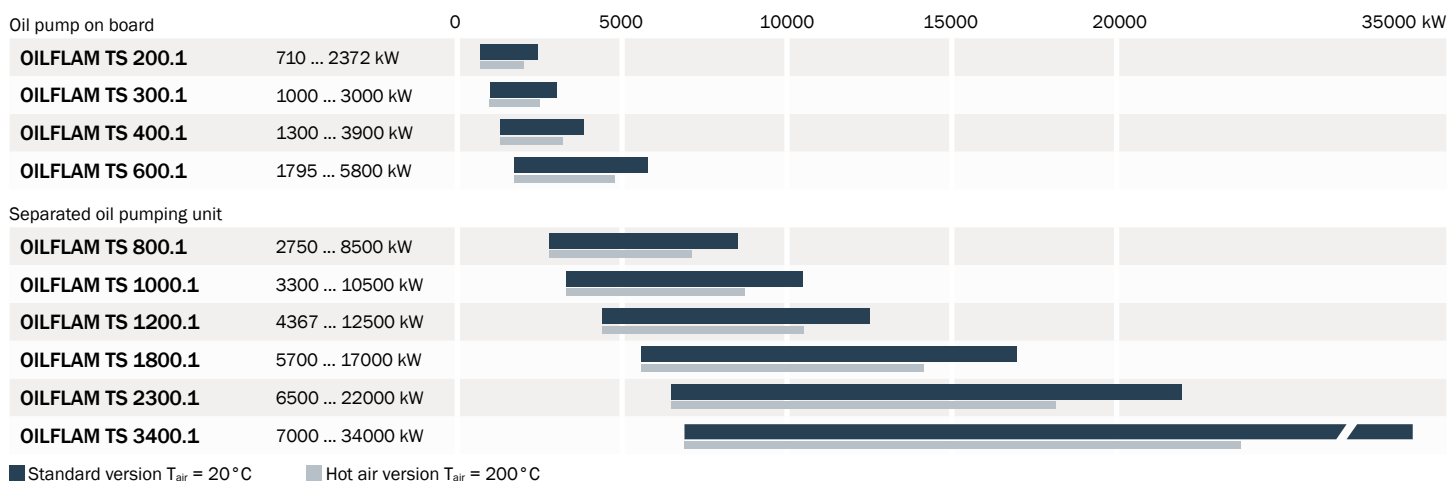
### MAIOR

Light oil



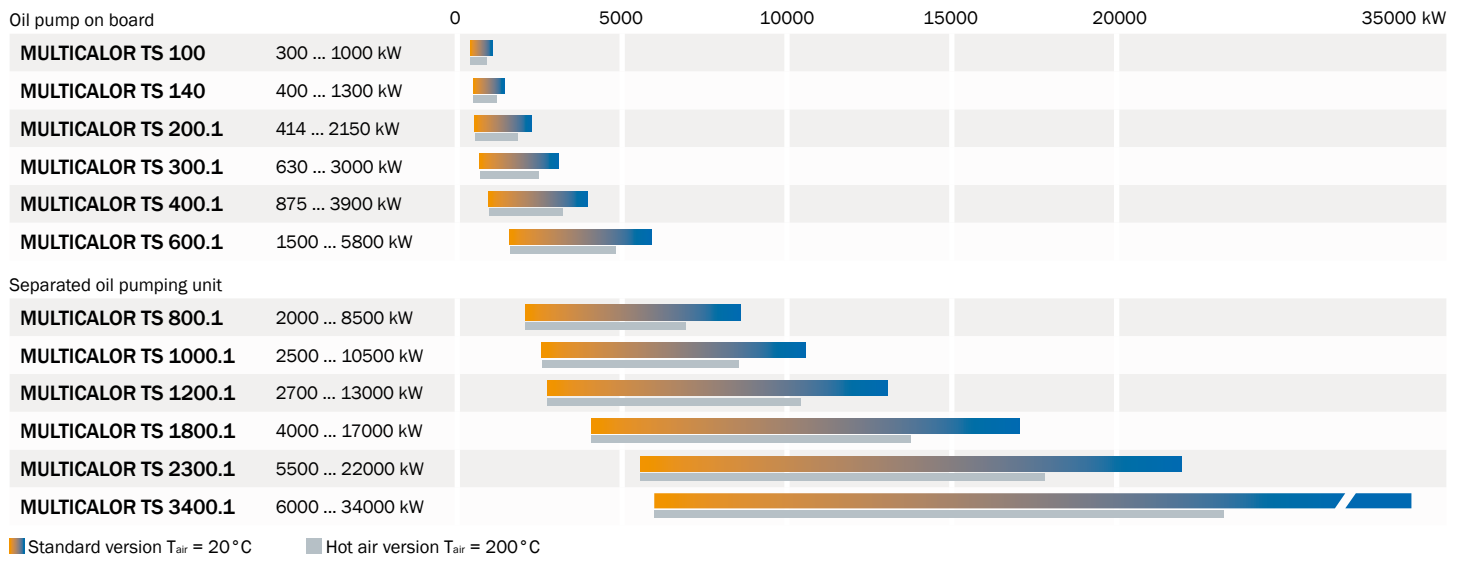
### OILFLAM

Heavy oil



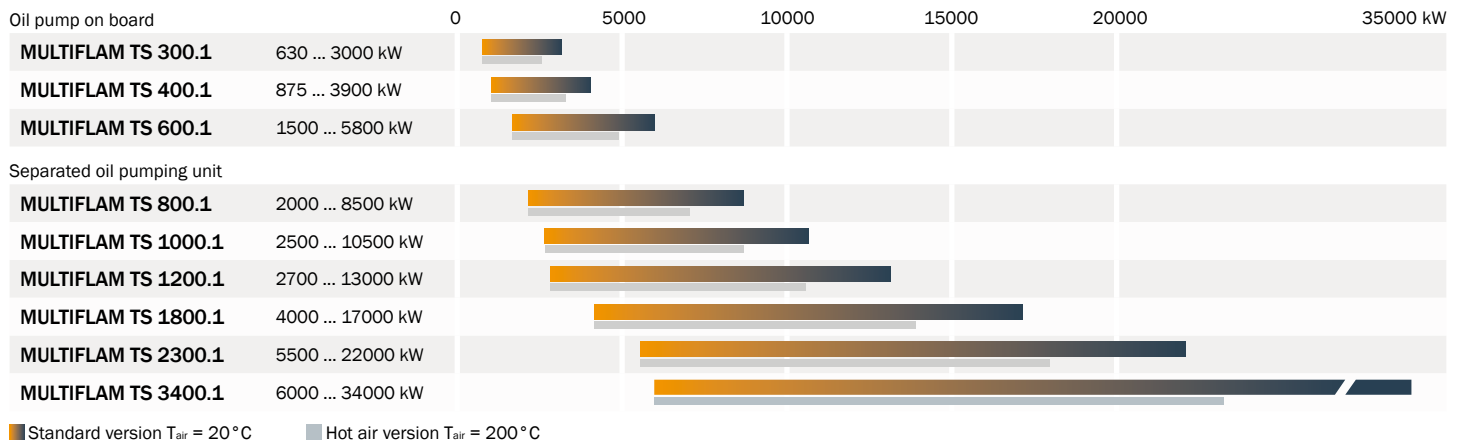
### MULTICALOR

Natural gas/light oil



### MULTIFLAM

Natural gas/heavy oil



## 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.

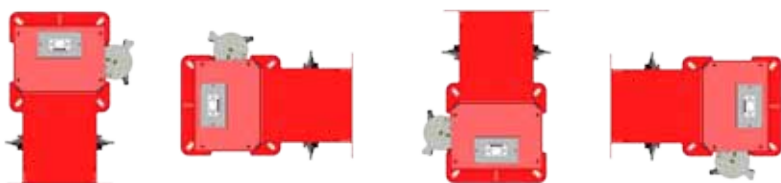
The separate installation of the fan offers several benefits:

- 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.



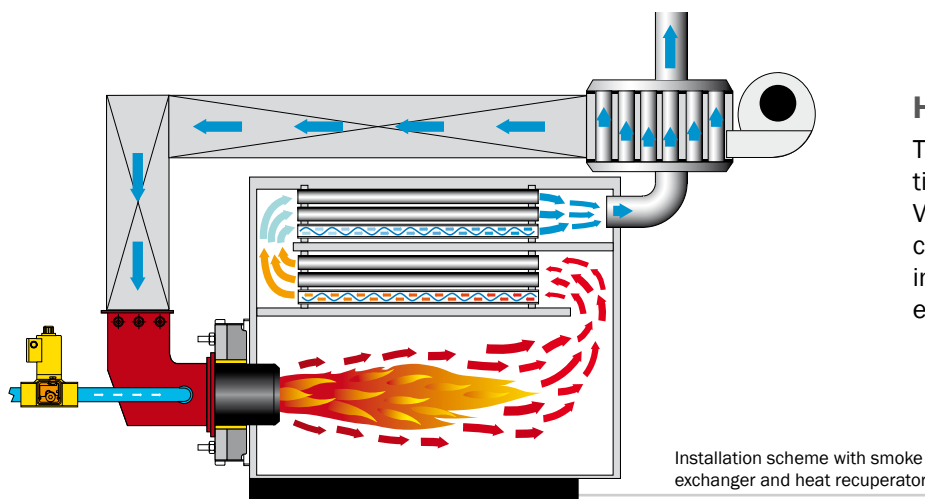
Burners can be assembled with air duct connection in different layouts in order to meet a wide range of specifications in terms of performance and overall dimensions.

### 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.



Installation scheme with smoke exchanger and heat recuperator

### 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.





Standard configuration:  
loose version with  
derivative panel



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



Pre-heating  
pump station



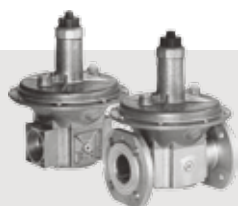
Separate ventilator



Gas train unit



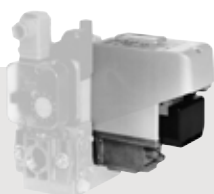
Modulation Kit



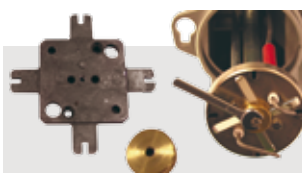
Gas governor/filter  
*Compulsory EN676*



Max pressure switch

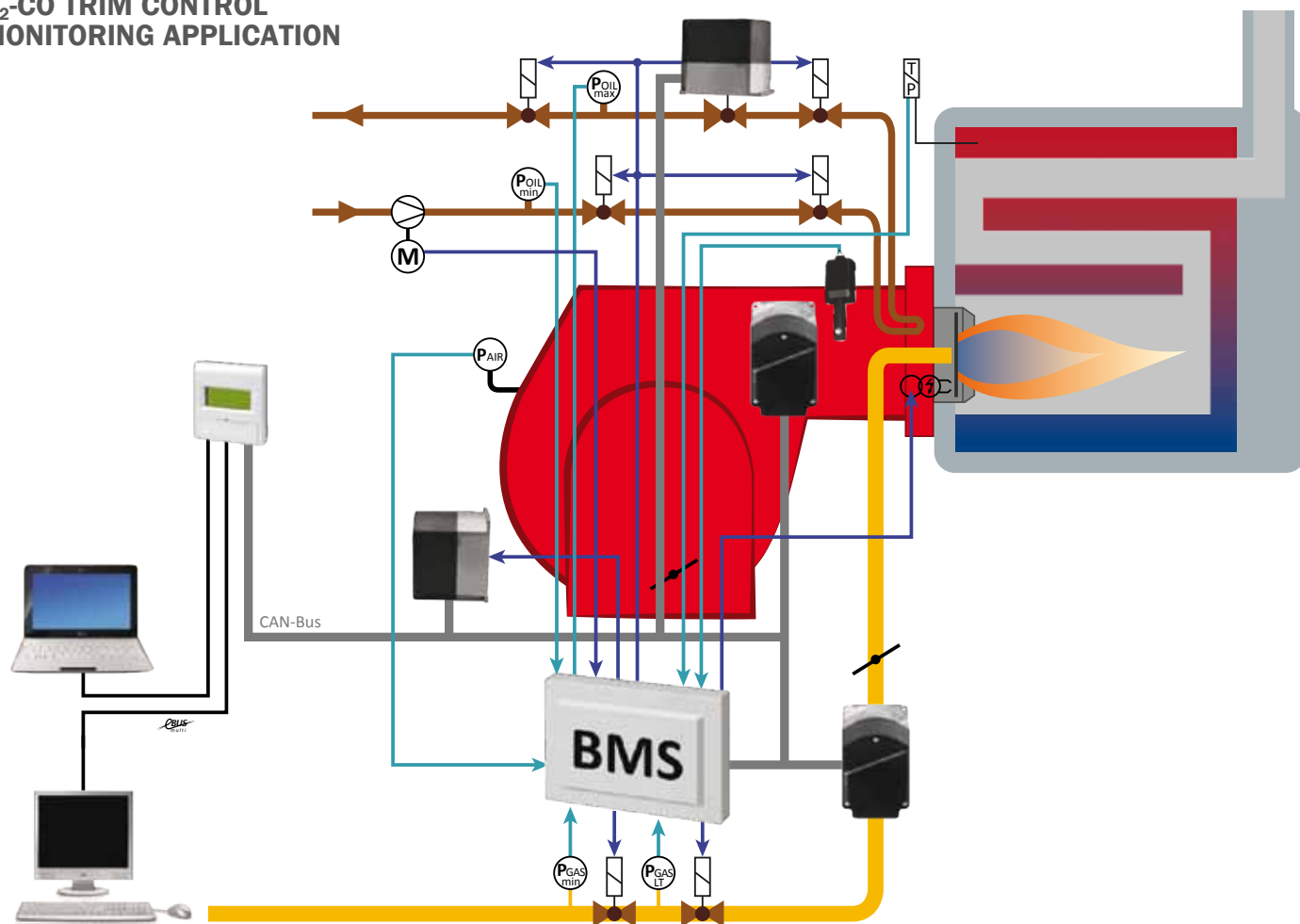


Tightness control  
*Compulsory EN676*  
*(over 1200 kW)*



LPG/Natural gas

**INVERTER SYSTEM  
O<sub>2</sub>-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 <sub>2</sub> -CO trim	Additional functions
	standard	with inverter	oil side			
BLU	1÷6	1÷8	-	Kit	Kit	Flame monitoring sensors Communication interfaces 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<sup>3</sup>/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<sup>3</sup>/h of gas**

The quantity of air will be:

$$1000 \text{ [Nm}^3\text{/h]} \times 12 = 12000 \text{ m}^3\text{/h of air}$$

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:

$$12000 \text{ [m}^3\text{/h]} \times 1,05 / 0,855 = 14737 \text{ m}^3\text{/h}$$

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<sup>3</sup>/h gas for BLU 10000.1

10000 kW (L.C.V. 8570 kcal/Nm<sup>3</sup>)

- 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:

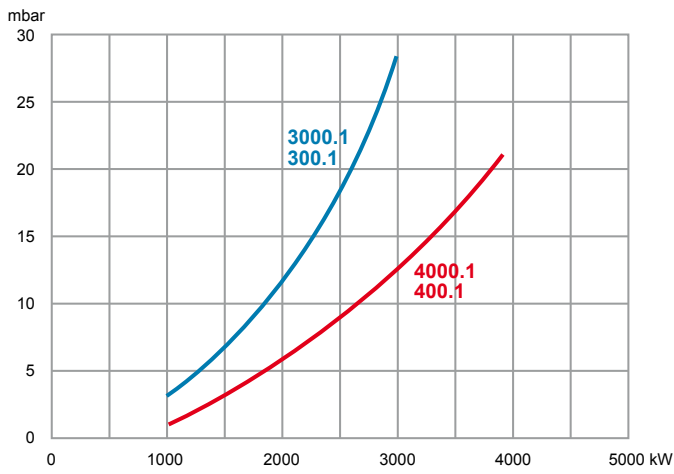
**1. Air needed = 14737 m<sup>3</sup>/h**

**2. Pressure = 72 mbar**

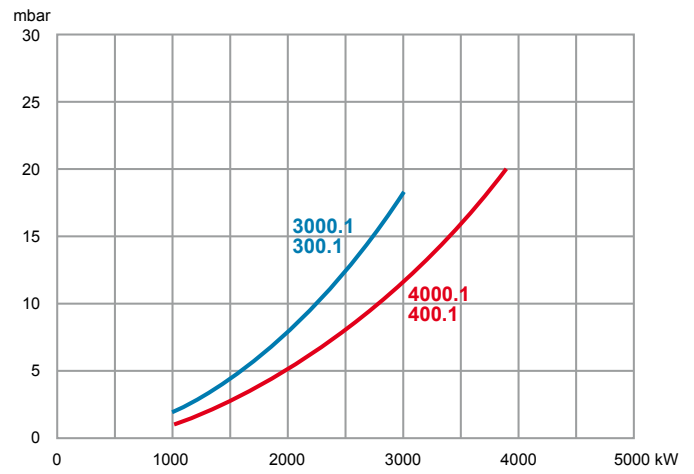
### Correction factors

Temp. (°C)	Air density (kg/m <sup>3</sup> )	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

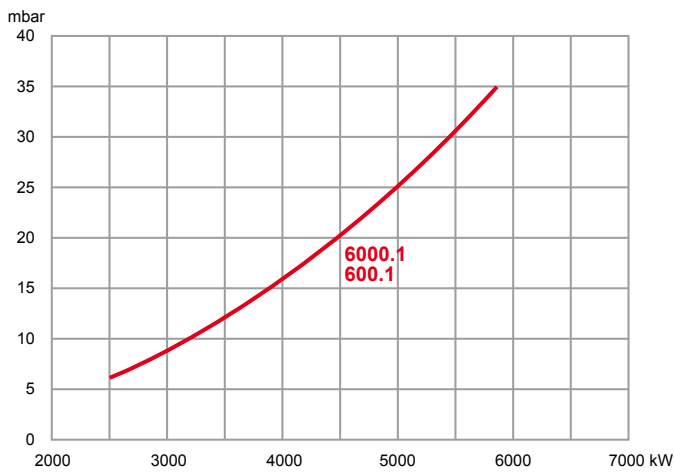
Burner head AIR pressure drop



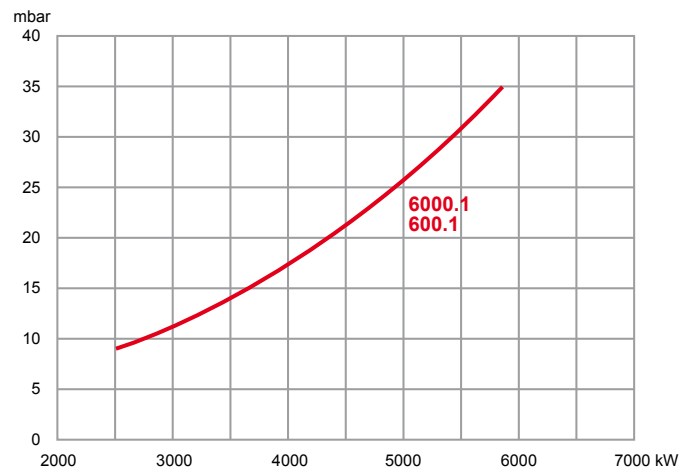
Burner head GAS pressure drop



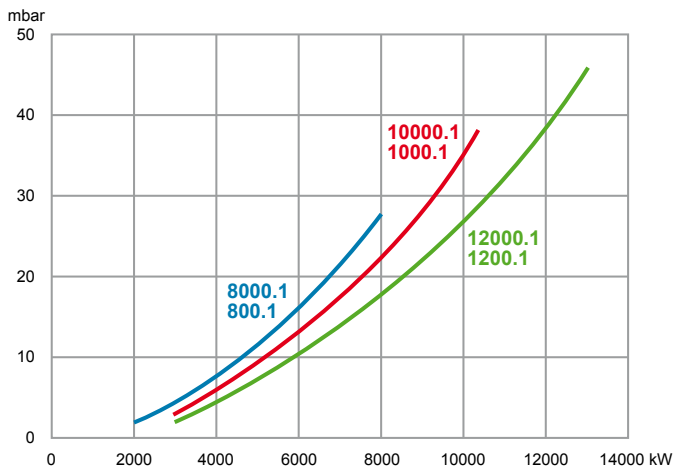
Pressure drop on AIR side



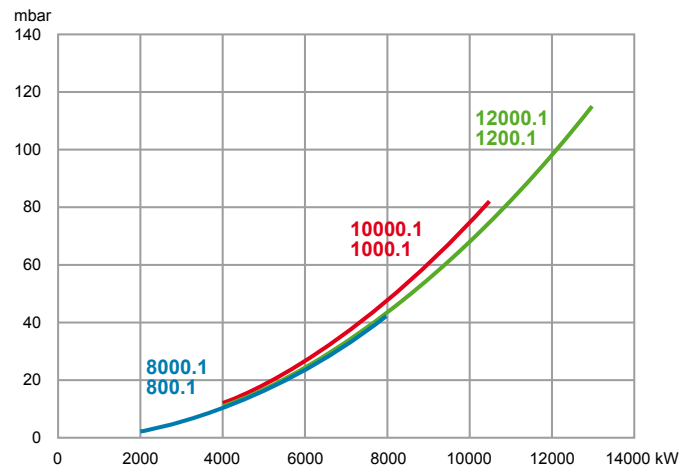
Pressure drop on GAS side



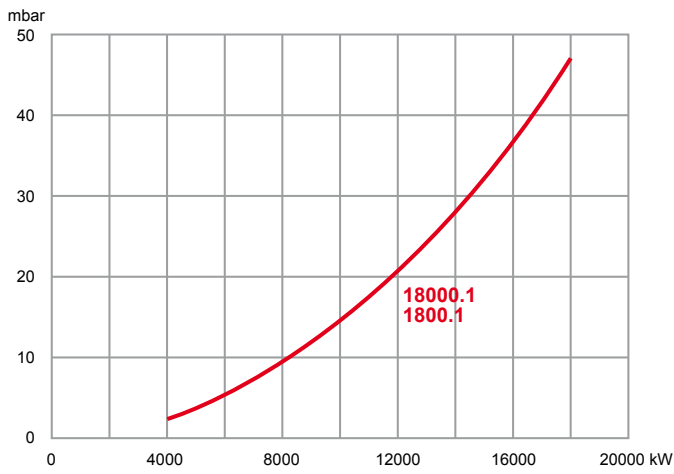
Pressure drop on AIR side



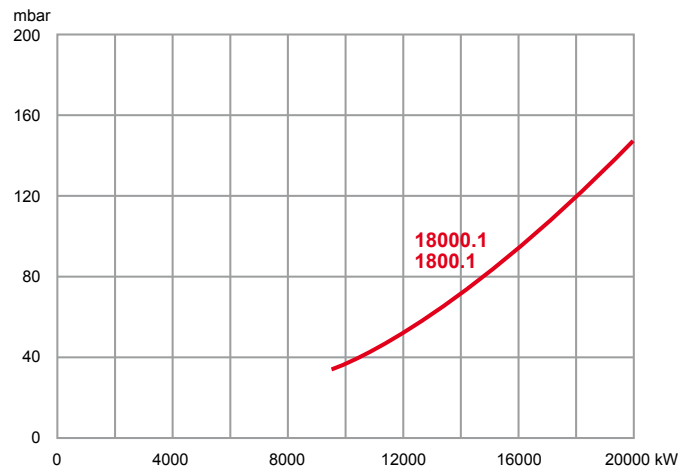
Pressure drop on GAS side



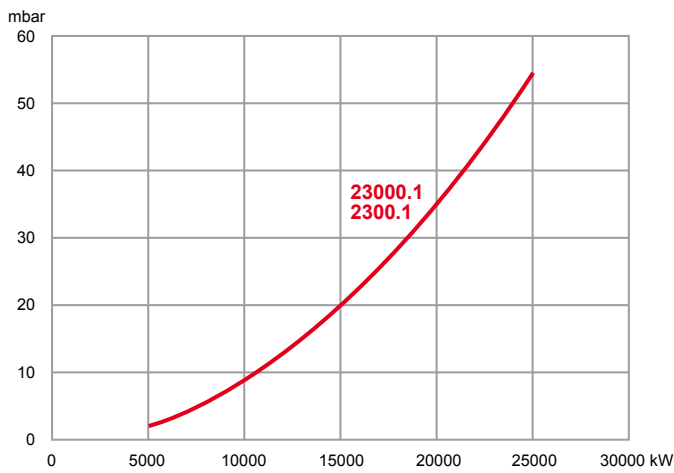
Pressure drop on AIR side



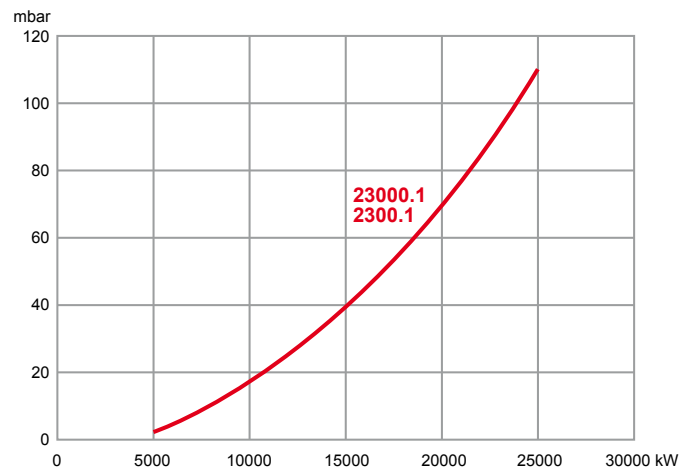
Pressure drop on GAS side



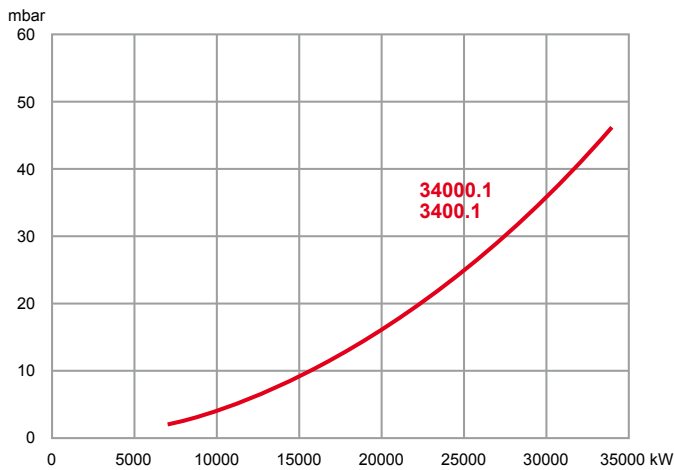
Pressure drop on AIR side



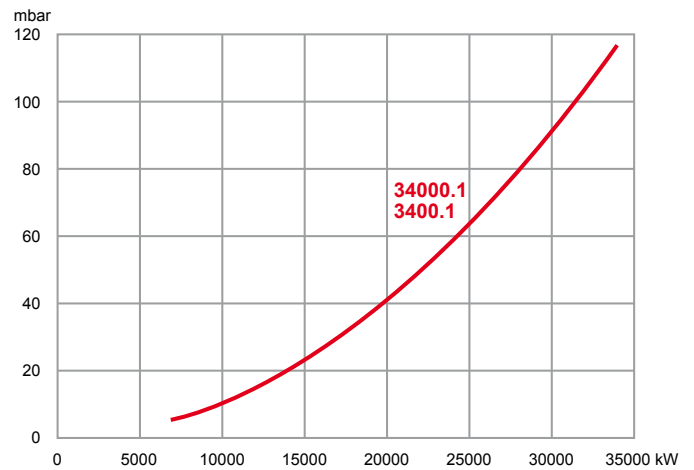
Pressure drop on GAS side



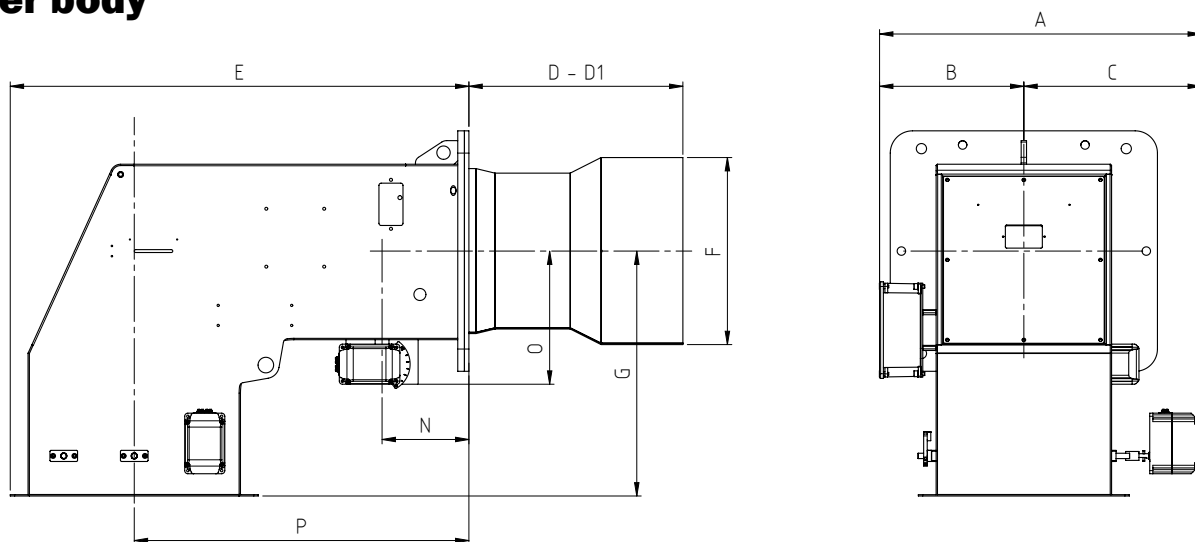
Pressure drop on AIR side



Pressure drop on GAS side



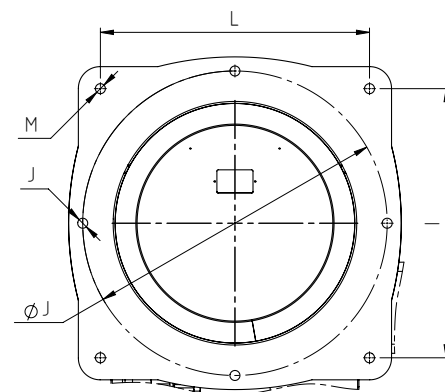
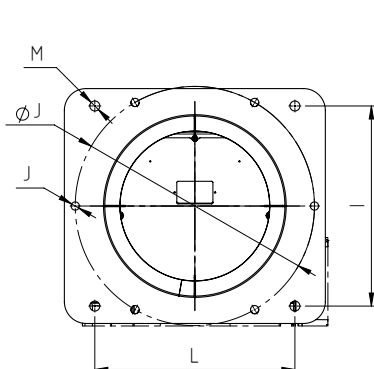
**Burner body**



**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	I	L	M	ØJ	J	N	O	
TS 500.1, 1000.1	523	216	307	202	402	556	200	290	190	190	4xM10	-	-	139	175*	405
TS 100																
TS 1500.1, 2000.1	543	234	309	366	566	620	270	375	270	270	4xM16	-	-	125	250	448
TS 140, 200.1																
TS 3000.1, 4000.1	605	265	340	351	551	728	290	392	315	315	4xM16	-	-	188	250	528
TS 300.1, 400.1																
TS 6000.1	617	271	346	393	593	810	320	404	330	330	4xM16	-	-	195	250	575
TS 600.1																
TS 8000.1	723	324	399	481	-	1030	420	550	460	460	4xM20	550	6xM16	195	299	752
TS 800.1																
TS 10000.1, 12000.1	723	324	399	481	-	1030	420	550	460	460	4xM20	550	6xM16	195	299	752
TS 1000.1, 1200.1																
TS 18000.1	899	412	487	600	-	1480	551	670	619	619	4xM20	700	4xM20	200	390	1115
TS 1800.1																
TS 23000.1, 34000.1	1080	501	579	530	-	1549	626	760	800	800	4xM20	700	4xM20	210	412	1084
TS 2300.1, 3400.1																

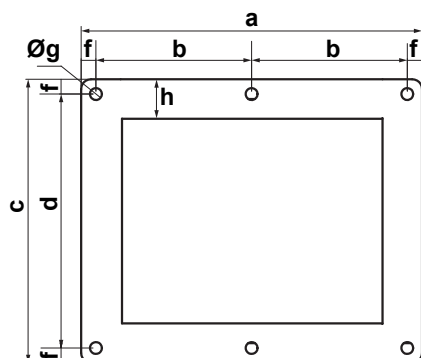
\*: gas train connection on the right side of the burner

D: short head - D1: long head

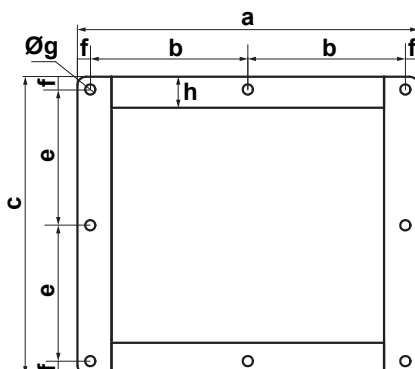
Dimensions (in mm) make reference to the electronic versions; data may vary according to the configuration and options installed

### Air duct

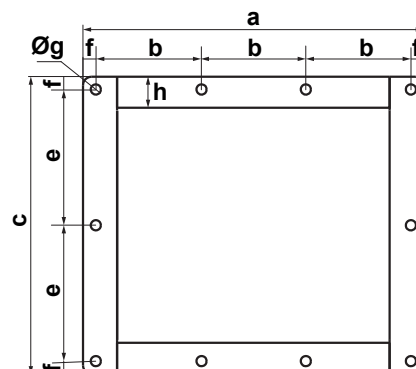
Gas: **TS 500.1 ... 2000.1**  
Oil and dual: **TS 100 ... 200.1**



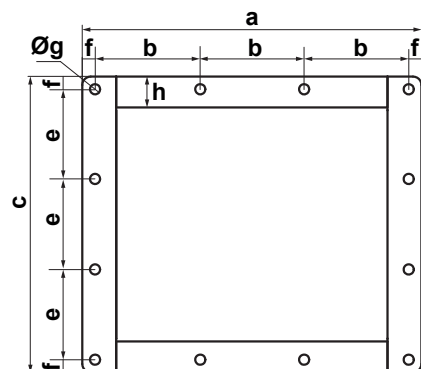
Gas: **TS 3000.1 ... 6000.1**  
Oil and dual: **TS 300 ... 600.1**



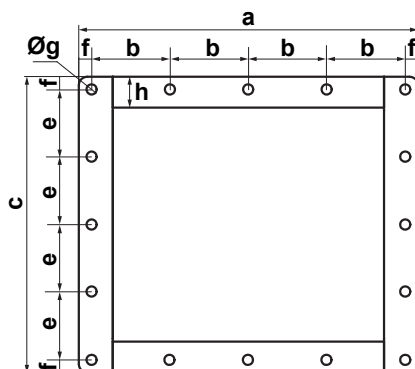
Gas: **TS 8000.1 ... 12000.1**  
Oil and dual: **TS 800.1 ... 1200.1**



Gas: **TS 18000.1**  
Oil and dual: **TS 1800.1**



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

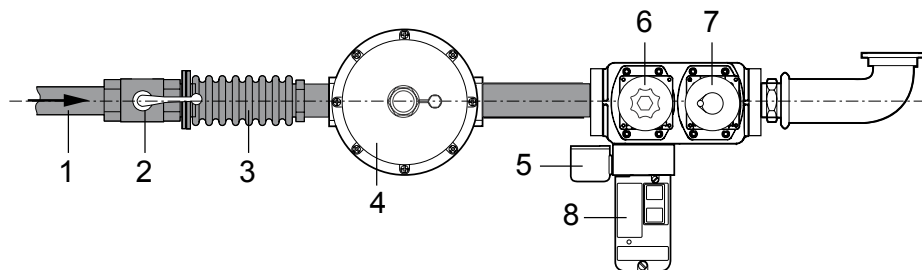


	a	b	c	d	e	f	Øg	h
TS 500.1, 1000.1	303	136,5	252	222	-	15	6x R12	40
TS 100								
TS 1500.1, 2000.1	345	157,5	287	257	-	15	6x R12	40
TS 140, 200.1								
TS 3000.1, 4000.1	400	185	349	-	159,5	15	8x R12	40
TS 300.1, 400.1								
TS 6000.1	470	220	361	-	165,5	15	8x R12	40
TS 600.1								
TS 8000.1	557	173	474	-	218	19	10x R14	43
TS 800.1								
TS 10000.1, 12000.1	730	230,7	650	-	204	19	12x R14	43
TS 1000.1, 1200.1								
TS 18000.1	930	223	828	-	197,5	19	16x R14	40
TS 1800.1								
TS 23000.1, 34000.1	930	223	828	-	197,5	19	16x R14	40
TS 2300.1, 3400.1								

Dimensions in mm

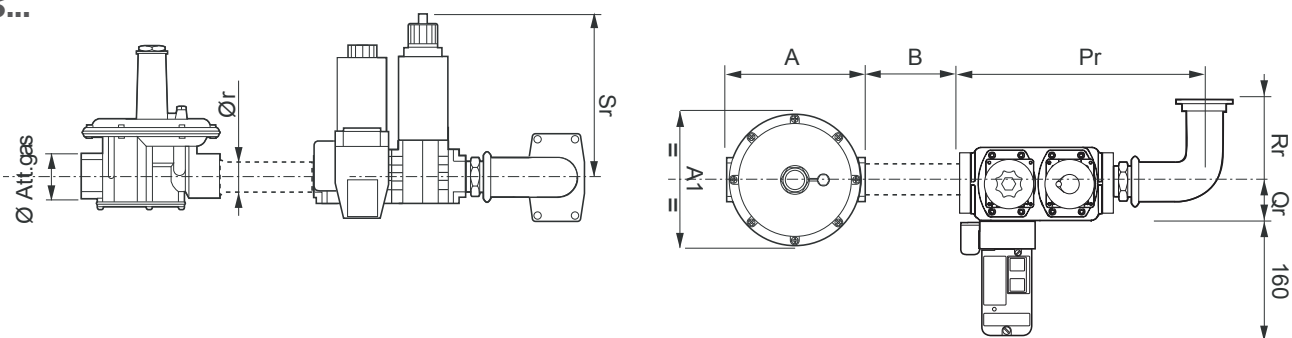
### Gas train

#### VCS Kromschroder



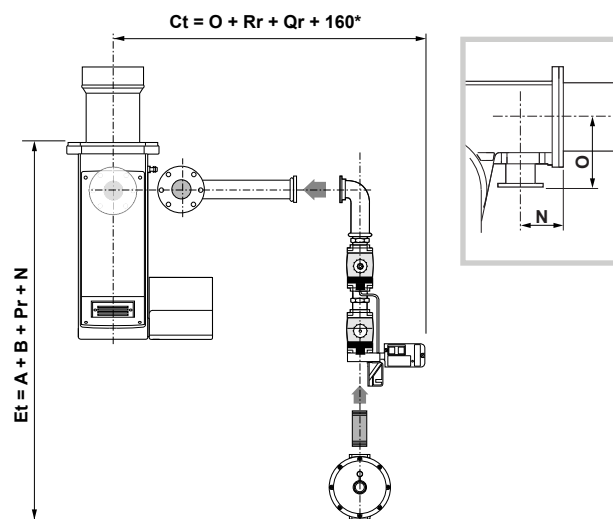
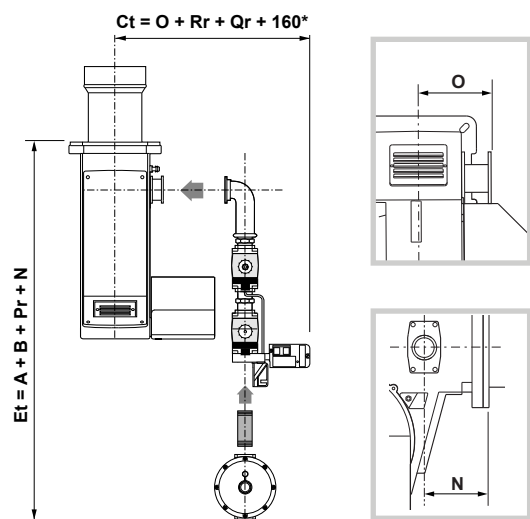
- 1 Main gas pipe
- 2 Ball valve
- 3 Antivibration coupling
- 4 Gas governor
- 5 Gas pressure switch
- 6 Safety gas valve
- 7 Working gas valve
- 8 Leakage control

#### VCS...



Gas: **TS 500.1, TS 1000.1**  
 Oil and dual: **TS 100**

Gas: **TS 1500.1 ... 34000.1**  
 Oil and dual: **TS 140 ... 3400.1**



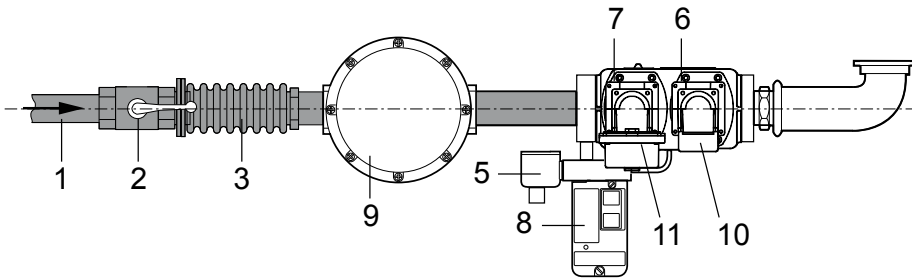
\*: kit VPS

#### Note

In order to calculate the overall dimension of the burner complete with gas train (Et and Ct) you need to consider the dimensions of the gas train, chosen according to the inlet gas pressure, and the dimension of the connection pipe (if needed): see page 17. If the value Et is lower than E, consider Et = E.

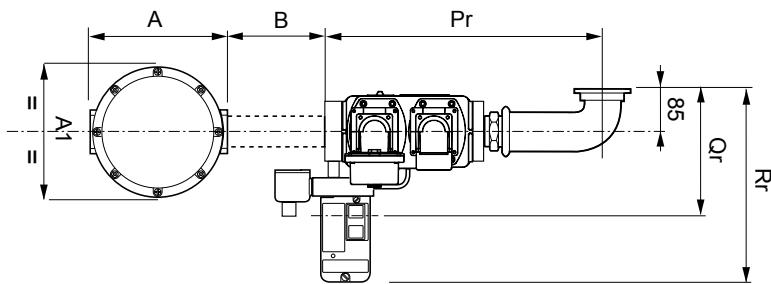
### Gas train

#### VGD Siemens

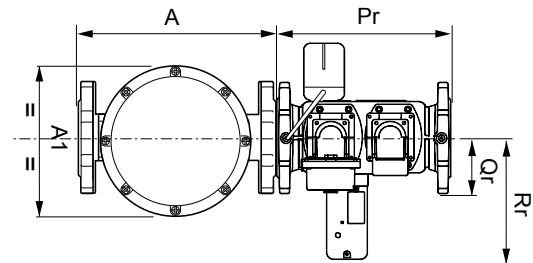


- 1 Main gas pipe
- 2 Ball valve
- 3 Antivibration coupling
- 4 Gas governor
- 5 Gas pressure switch
- 6 Safety gas valve
- 7 Working gas valve
- 8 Leakage control
- 9 Gas filter
- 10 Actuator
- 11 Actuator

#### VGD20...

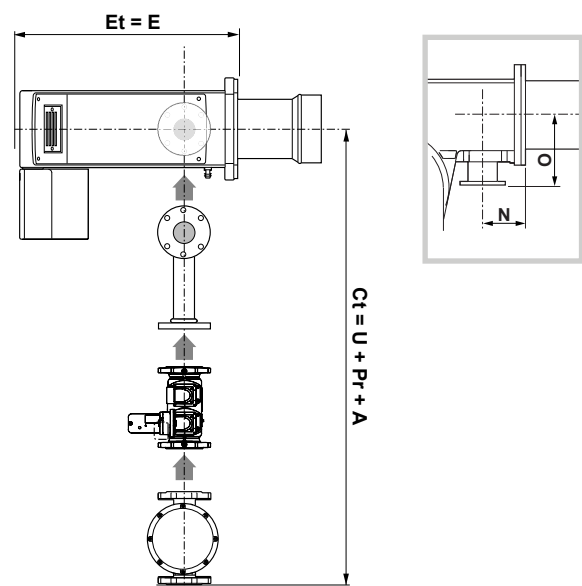
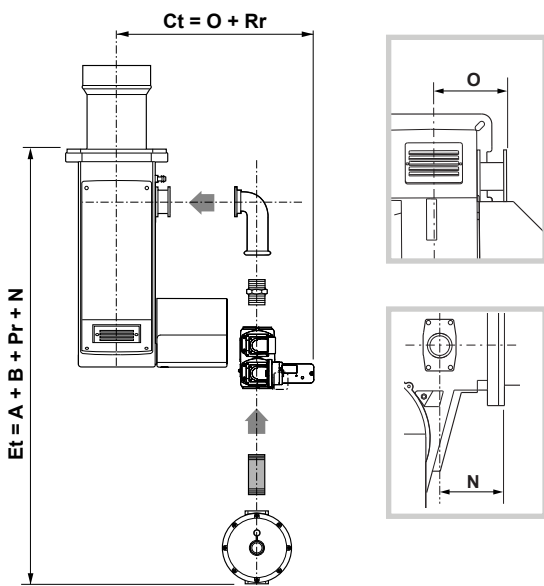


#### VGD40...



Gas: **TS 500.1, TS 1000.1**  
Oil and dual: **TS 100**

Gas: **TS 1500.1 ... 34000.1**  
Oil and dual: **TS 140 ... 3400.1**



#### Note

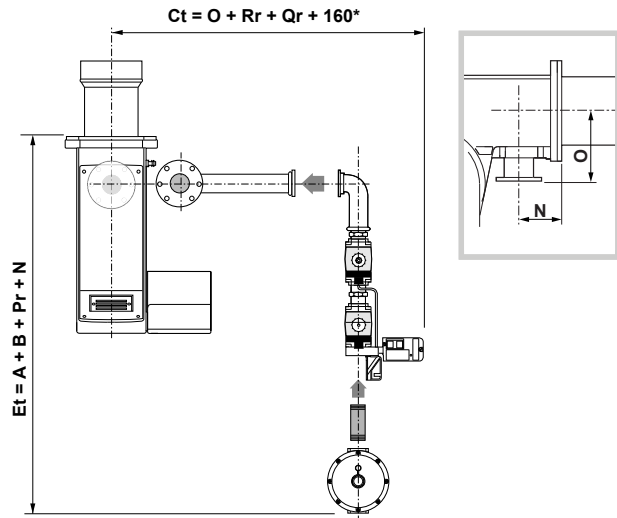
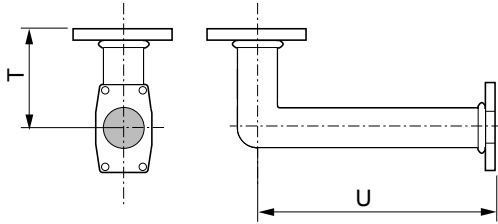
In order to calculate the overall dimension of the burner complete with gas train (Et and Ct) you need to consider the dimensions of the gas train, chosen according to the inlet gas pressure, and the dimension of the connection pipe (if needed): see page 17.



**Gas train connection pipe**

**VCS Kromschröder**

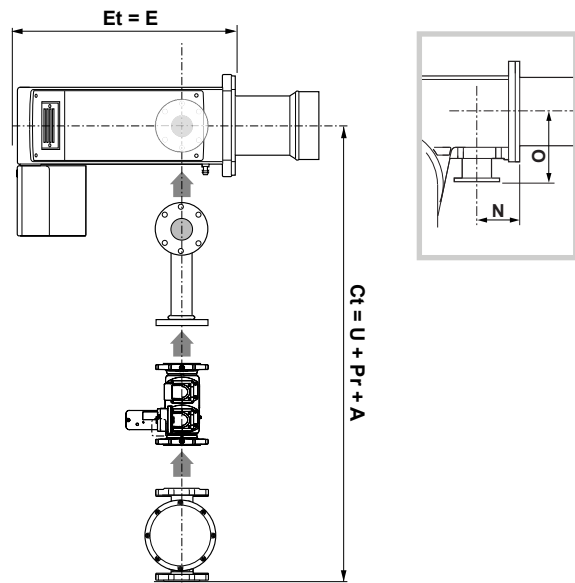
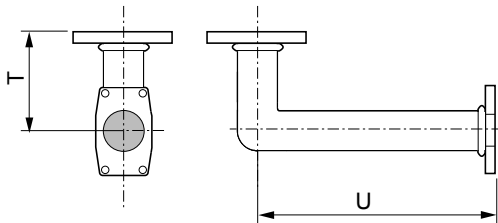
Gas: TS 1500.1 ... 4000.1  
 Dual fuel: TS 140 ... 400.1



**VGD Siemens**

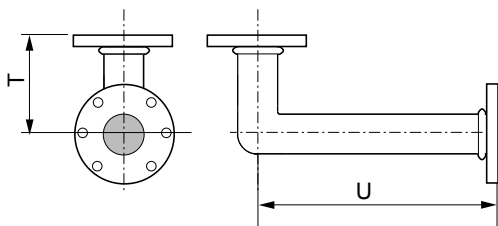
**VGD20...**

Gas: TS 1500.1 ... 6000.1  
 Dual fuel: TS 140 ... 600.1



**VGD40...**

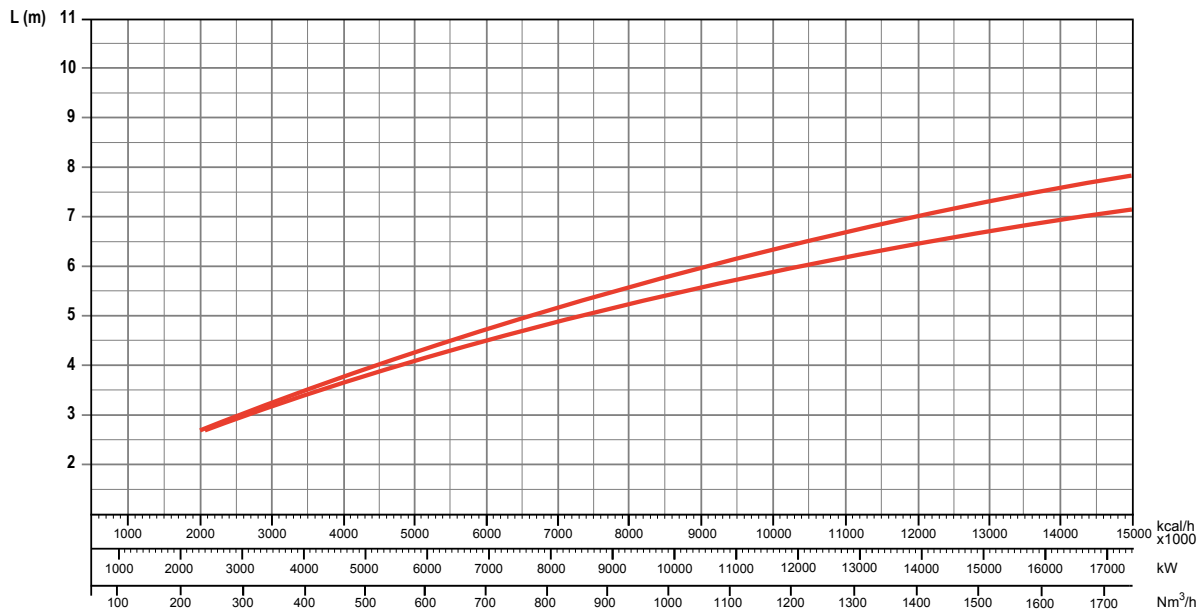
Gas: TS 1500.1 ... 34000.1  
 Dual fuel: TS 140 ... 3400.1



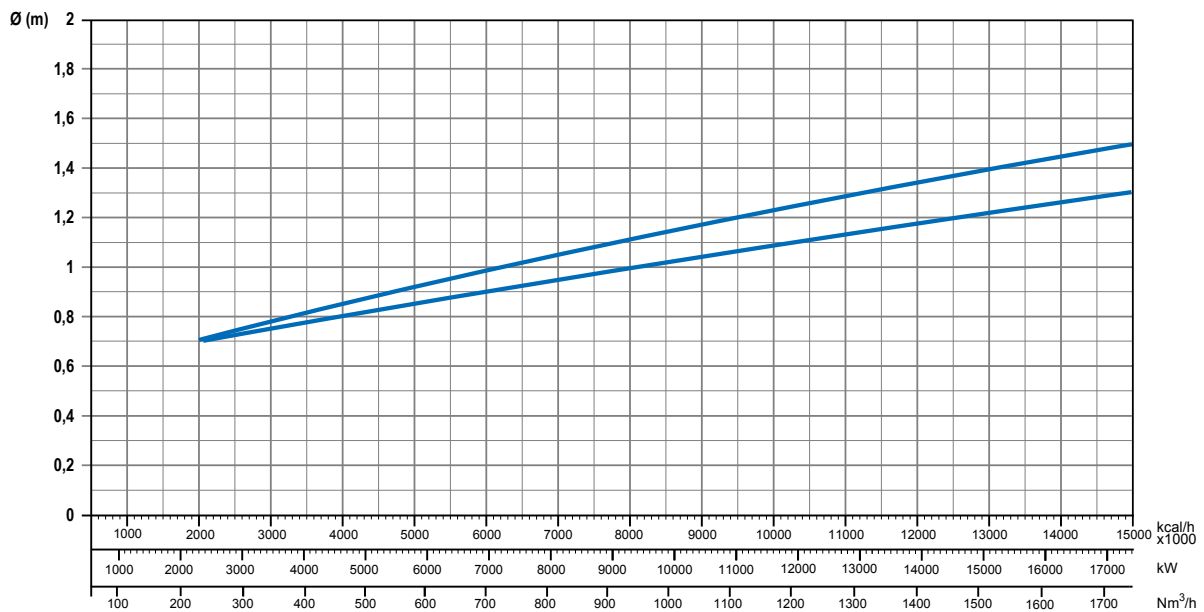
### Matching

	Gas train model	GTCP Dimension			GT Dimension					Gas governor & filter / Filter	FGDR - Filter		
		T	U	V	Pr	Qr	Rr	Sr	Ør		A	A1	B
Gas: TS 500.1, 1000.1 Dual fuel: TS 100	VCS-125	-	-	-	310	65	155	215	1"	FGDR-RP25	146	131	>100
	VCS-240				310	82	155	240	1"1/2	FGDR-RP40	194	178	>100
	VCS-350				372	95	155	250	2"	FGDR-RP50	260	225	>100
Gas: TS 1500.1, 2000.1 Dual fuel: TS 140, 200.1	VCS-240	85	400	-	310	82	155	240	1"1/2	FGDR-RP40	194	178	>100
	VCS-240	85	400		310	82	155	240	1"1/2	FGDR-RP50	260	225	>100
	VCS-350	85	400		372	95	155	250	2"	FGDR-RP50	260	225	>100
	VGD20.503	85	400	-	450	185	315	-	2"	Filter 2"	186	186	>100
	VGD40.065	104	560	104	290	97	211	-	DN65	Filter DN65	290	212	-
	VGD40.080	125	560	125	310	102	218	-	DN80	Filter DN80	320	240	-
Gas: TS 3000.1, 4000.1 Dual fuel: TS 300.1, 400.1	VCS-350	85	588	-	372	95	155	250	2"	FGDR-RP50	260	225	>100
	VGD20.503	85	588	-	450	185	315	-	2"	Filter 2"	186	186	>100
	VGD40.065	104	560	104	290	97	211	-	DN65	Filter DN65	290	212	-
	VGD40.080	125	560	125	310	102	218	-	DN80	Filter DN80	320	240	-
	VGD40.100	125	560	255	350	113,5	229	-	DN100	Filter DN100	380	280	-
Gas: TS 6000.1 Dual fuel: TS 600.1	VGD20.503	85	588	-	450	185	315	-	2"	Filter 2"	186	186	>100
	VGD40.065	125	668	125	290	97	211	-	DN65	Filter DN65	290	212	-
	VGD40.080	125	668	125	310	102	218	-	DN80	Filter DN80	320	240	-
	VGD40.100	125	560	255	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	125	718	164	400	127,5	243	-	DN125	Filter DN125	380	280	-
Gas: TS 8000.1, 10000.1 Dual fuel: TS 800.1, 1000.1	VGD40.065	202	820	108	290	97	211	-	DN65	Filter DN65	290	212	-
	VGD40.080	221	820	129	310	102	218	-	DN80	Filter DN80	320	240	-
	VGD40.100	165	820	165	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	165	820	441	400	127,5	243	-	DN125	Filter DN125	380	280	-
Gas: TS 12000.1 Dual fuel: TS 1200.1	VGD40.080	221	820	129	310	102	218	-	DN80	Filter DN80	320	240	-
	VGD40.100	165	820	165	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	165	820	441	400	127,5	243	-	DN125	Filter DN125	380	280	-
Gas: TS 18000.1 Dual fuel: TS 1800.1	VGD40.080	221	820	129	310	102	218	-	DN80	Filter DN80	320	240	-
	VGD40.100	165	820	165	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	165	820	441	400	127,5	243	-	DN125	Filter DN125	380	280	-
Gas: TS 23000.1 Dual fuel: TS 2300.1	VGD40.100	165	820	165	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	165	820	441	400	127,5	243	-	DN125	Filter DN125	380	280	
Gas: TS 34000.1 Dual fuel: TS 3400.1	VGD40.100	165	820	165	350	113,5	229	-	DN100	Filter DN100	380	280	-
	VGD40.125	165	820	441	400	127,5	243	-	DN125	Filter DN125	380	280	

**Flame length (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

A series of horizontal dotted lines for writing notes, spanning the width of the page.

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## Version 2.3 - 28/02/2017

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