Industrial Burners

IB SERIES

baltur
Energy for People

INDEX

A real answer to anyone looking for Energy

BURNER CONFIGURATION WORKFLOW

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IB SERIES

industrial burners with separated fan

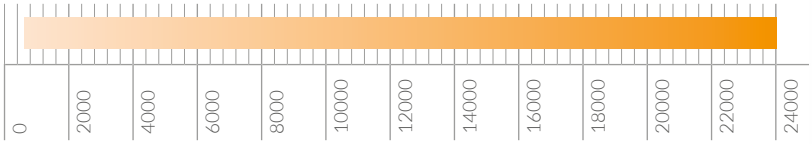
STABLE PERFORMANCE OVER TIME

HIGH EFFICIENCY COMBUSTION

The IB burner series has been designed to meet the most demanding request of industrial applications.
The modular design concept allow for the maximum flexibility of configuration enabling the IB burner to be the optimal solution for a variety of industrial applications.
The IB is composed by different functional blocks:

- Combustion head
- Ventilating unit
- Control panel
- Gas valve train (for gas aplications)
- Pumping skid (for liquid fuel applications)

THE IB RANGE INCLUDES **8 MODELS FULLY CONFIGURABLE** FROM **200** KW TO **24000 KW**



BURNER IN ACCORDING TO:

NORMS:
- EN 676:2020
- EN 267:2020
- EN 746-2:2011

STANDARDS EXTRA EUROPEAN:
- GB/T 36699-2018

REGULATIONS AND DIRECTIVES:
- 2006/42/CE
- 2014/35/UE

FLEXIBLE SOLUTIONS FOR DIFFERENT APPLICATIONS

HIGH MODULATION RATIO:

The IB series features modulation ratios of 1:10.
This extremely reduces the number of burner ignitions and grants high operation efficiency and low polluting emissions.

LOW COMBUSTION HEAD LOSSES:

Thanks to the new combustion heads, designed to limit air flow losses to the minimum, the IB series burners allow a reduction of fan power and therefore lower cost of investment and operating costs.

ENERGY SAVING:

The electronic version is equipped with electronic control that allow a precise regulation of the air-gas mix optimising energy consumption.

EASY MAINTENANCE:

Maintenance operations are quick and easy. The large lid opening grants total accessibility to the mixing head and internal components.

COMBUSTION AIR TEMPERATURE:

Standard construction up to 50°C.
Special construction for temperatures up to 250°C.

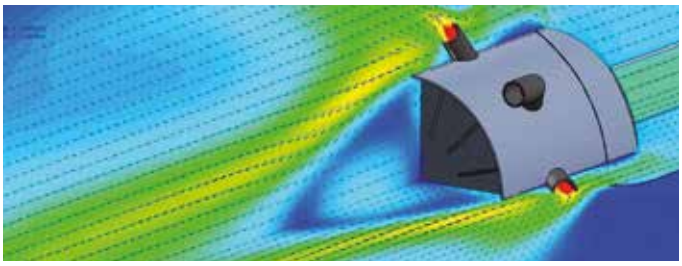
AIR INLET POSITION:

Combustion air may be let in from above, below, right or left.

NEW TECHNOLOGIES, LOW EMISSIONS OF THE OXIDES OF NITROGEN

LOW NOX TECHNOLOGY (IB 100-2400)

The IB series is available with different head geometries according to the requirement of the specific national regulation. Burners certified in Class 3 according to EN676 are available with NOx emissions level lower than 80mg/kWh.
These machines featured a combustion head with and enhanced premixing of air and gas streams in order to ensure a stable flame. The solution is paired off with a special design of gas nozzles which ensures a progessive combustion and reduce the formation of thermal NOx.



The natural gas supply is separated at gas train level in two different stream lines which serve respectively the central area of the flame and the lateral one.
The independent management of gas flow over different combustion area allow to reach multiple benefits: - Great stability of root flame ain any working conditions reducing vibrations, noise and risk of shut down

- Low thermal NOx formation thanks to mixing with flue gas
- Performance of the machine granted over the complete working field thanks to fine tuning capability

SUPER LOW NOX TECHNOLOGY (IB 100-850)

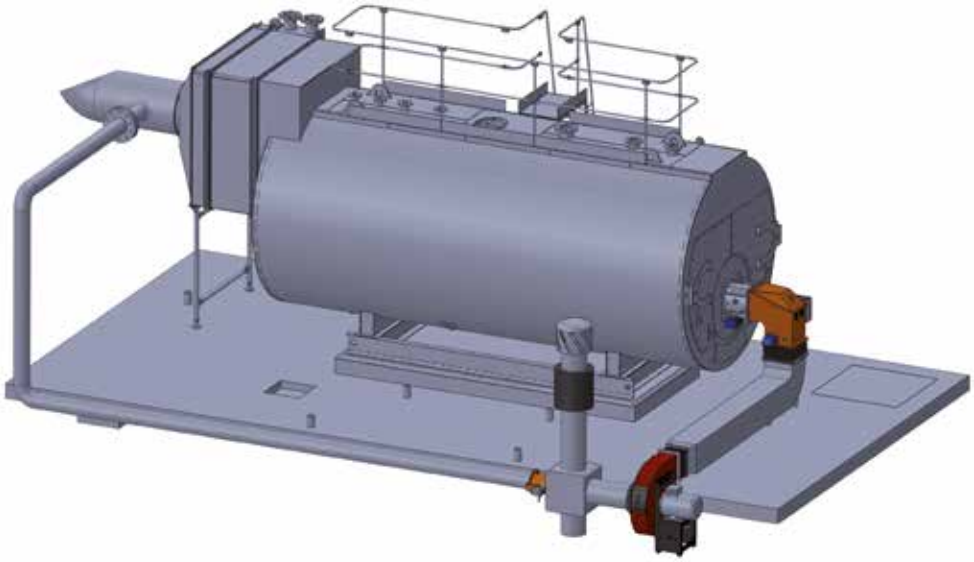
IB range is also available with super low emissions level, with NOx lower than 30/50 mg/kWh without FGR system.
The exclusive design of the combustion head of these burners is the result of an optimization process of gas and air flow channels with the targets to reduce NOx emissions and ensure stability over the complete working field of the machine.

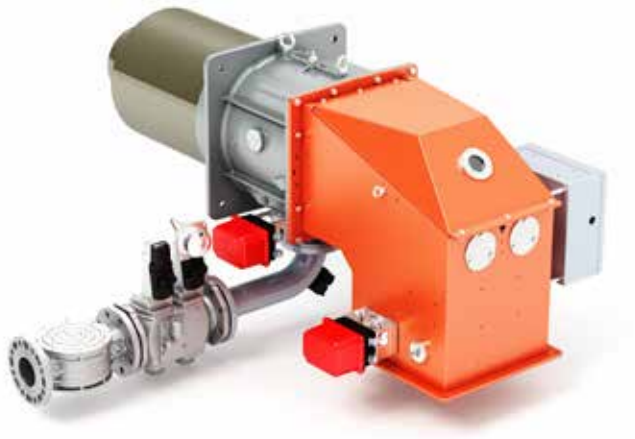
LOW NOX WITH SYSTEM FGR (IB 100-2400)

IB range is finally available with minimum emissions level of NOx, lower than 30 mg/kWh by means of FGR system.

Recirculation of combustion products is a technique to reduce the flame temperature. It consists in withdrawing a part of combustion fumes from the chimney and dilute them with combustion air, in order to reduce the concentration of oxygen and increase the concentration of inerts (N_2 and CO_2), which in turn will absorb a part of the energy developed during combustion, thus reducing the flame temperature.

IB burner range allow flue gas inlet either at before or after air throttle valve. The flue gas flow rate adjustment is performed by a servocontrolled throttle valve that can be managed by the control panel.
Adding a given % of recircualtion of flue gas has nevertheless an impact on burner performances. Baltur has developed a large experiece on this technology and can provide burner design and fitted with the stae-of-art technology in order to provide safe and long lasting operating life of the machine.





TECHNICAL AND FUNCTIONAL FEATURES

Industrial methane gas burner (G20) of the modulating type, suitable for gas pressures from 150 to 500 mbar (for different values contact our sales department).

- Turndow ratio 1:6 to 1:10.
- Suitable to be used on any type of furnace (check flame sizes).
- Electronic servo motors directly connected to combustion air and fuel regulation components (ME version).

The combustion air that reaches the head is adjusted by the main input throttle valves. The servomotor varies the heat output through a PID-type electronic adjustment system, while keeping an optimal generator overall heat efficiency rating.

DESIGN CHARACTERISTICS

The burner consists of:

- body made of painted steel sheet fitted with connection flange and insulating gasket;
- flame pipe made of special steel, resistant to high temperatures;
- air/fuel mixing and combustion head;
- flame disc;
- flame viewer;
- multiple throttle dampers for automatic adjustment of combustion air;
- dampers fitted on bearings;
- continuous air/fuel intake modulation unit consisting of electric servomotors directly connected to regulation components for the simultaneous calibration of combustion air and fuel (ME version);
- gas intake throttle valve;
- direct ignition with electrodes (Ignition gas pilot mod. 1800 – 2400);
- gas supply unit to gas distributor in combustion head;
- flame detection (ionization or photocell for models with gas pilot);
- box containing terminals for connection to the main electric panel, ignition transformer and manual modulation control;
- electric system with protection class IP54;
- on board electronic control available

VERSIONS FOR HOT AIR

- Insulating coat.
- Flame sensor cooling system.
- Mechanical components and electric panel, distanced from machine body to make maintenance easier.
- UV photocell.

SYMBOLS

1	2	3	4	5	6	7	8	9
IB	100	G	ME	LN4	LX FGR	AC	AIB	FR

1 TYPE OF BURNER

IB Industrial Burners

2 CAPACITY

100 - 350 - 550 - 850 -1000 - 1200 - 1800 - 2400

3 FUEL

G natural gas
B biogas
P L.P.G.
L diesel
LA diesel with compressed air assisted atomisation
N fuel oil
NS fuel oil with steam assisted atomisation
GL gas/diesel combination
GN gas/fuel oil combination
GNS gas/fuel oil combination with steam assisted atomisation

4 AIR GAS CONTROL

ME with electronic cams
MEV with electronic cams and inverters
MEV O_2 with electronic cams and inverter and O_2 control
MEV CO with electronic cams and inverters and CO control

5 NATURAL GAS NOx EMISSIONS

LN2 <120 mg/kWh
LN3 < 80 mg/kWh
LN4 < 50 mg/kWh
LN5 < 30 mg/kWh

6 FLUE RECIRCULATION

LX FGR with flue gas recirculation system at 50° C
SLX Low NOx combustion head

7 HOT AIR

/ for combustion air temperature operation at 50° C
AC for combustion air temperature operation at 250° C

8 AIR SUPPLY

AIB air inlet from below
AIL air inlet from left
AIT air inlet from top
AIR air inlet from right

9 FUEL SUPPLY*

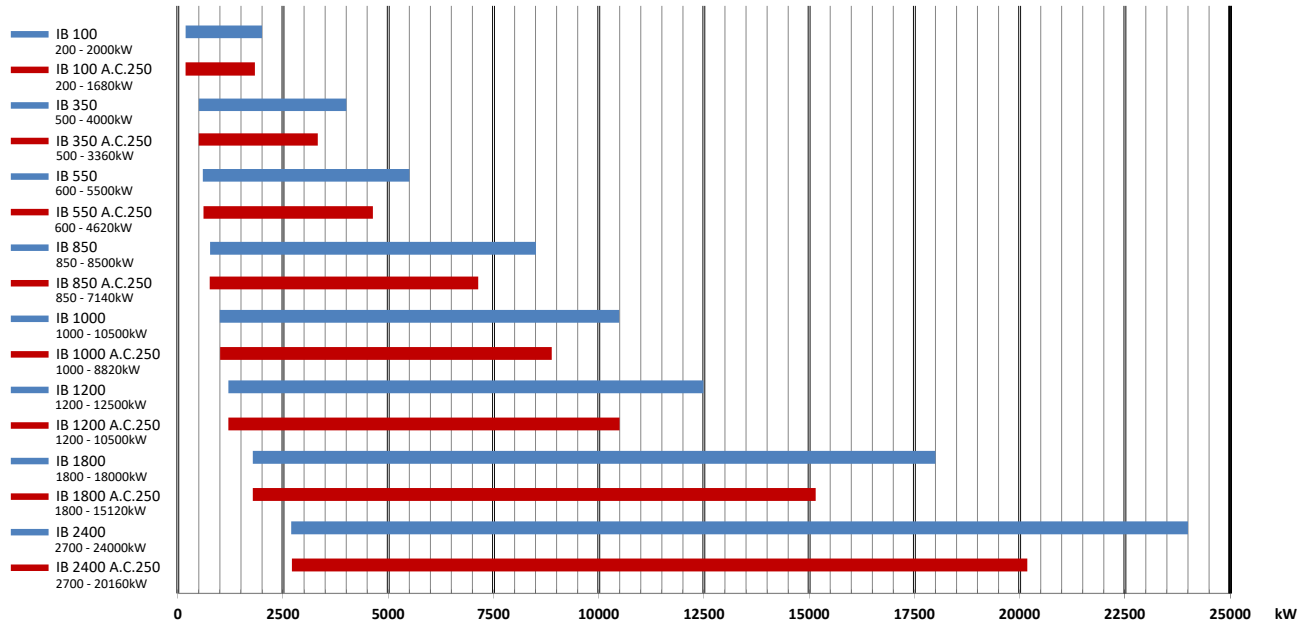
FR from right
FL from left
FB from below
FT from top
* this is the supply system of gaseous fuel

PRODUCT CONFIGURATION	IB ... ME	IB ... ME AC	IB ... ME FGR	IB ... ME FGR AC
Electric protection rating IP 54	●	●	●	●
Air/gas modulation check	●	●	●	●
- throttle valve	●	●	●	●
- servomotor for air and gas	●	●	●	●
- FGR adjustment unit	NA	NA	●	●
Potentiometer installed on servomotor	o	o	o	o
LPG gas nozzle kit	o	o	o	o
Nozzle kit for inversion boilers	o	o	o	o
Combustion head gas pressure port	●	●	●	●
Air pressure switch	●	●	●	●
Ignition transformer	●	●	●	●
Cable and ignition electrode	●	●	●	●
Flame detecting sensor with photocell	●	●	●	●
Flame detecting sensor with variable frequency photocell	o	o	o	o
Flame detecting sensor with photocell for continuous operation	o	o	o	o
Flame sensor cooling system preparation	o	●	o	●
Air gates	●	●	●	●
Air pressure port	●	●	●	●
Pilot gas train ignition (natural gas and LPG) for models 100 to 1200	o	o	o	o
Pilot gas train ignition (natural gas and LPG) for models 1800 to 2400	●	●	●	●
Electrical connection j-box	o	o	●	●
Lifting eyebolts	●	●	●	●
Input modulation signal 4-20 mA	o	o	o	o
Supplied with the burner: - Stud bolt screws, nuts and washers for fastening to boiler - Stud bolt screws, nuts and washers for fastening gas train - Burner flange seal - Instruction manual	●	●	●	●
External insulation for AC versions 250°C	NA	●	NA	●
Fumigated wood packaging	●	●	●	●
On board electrical panel	●	●	o	o

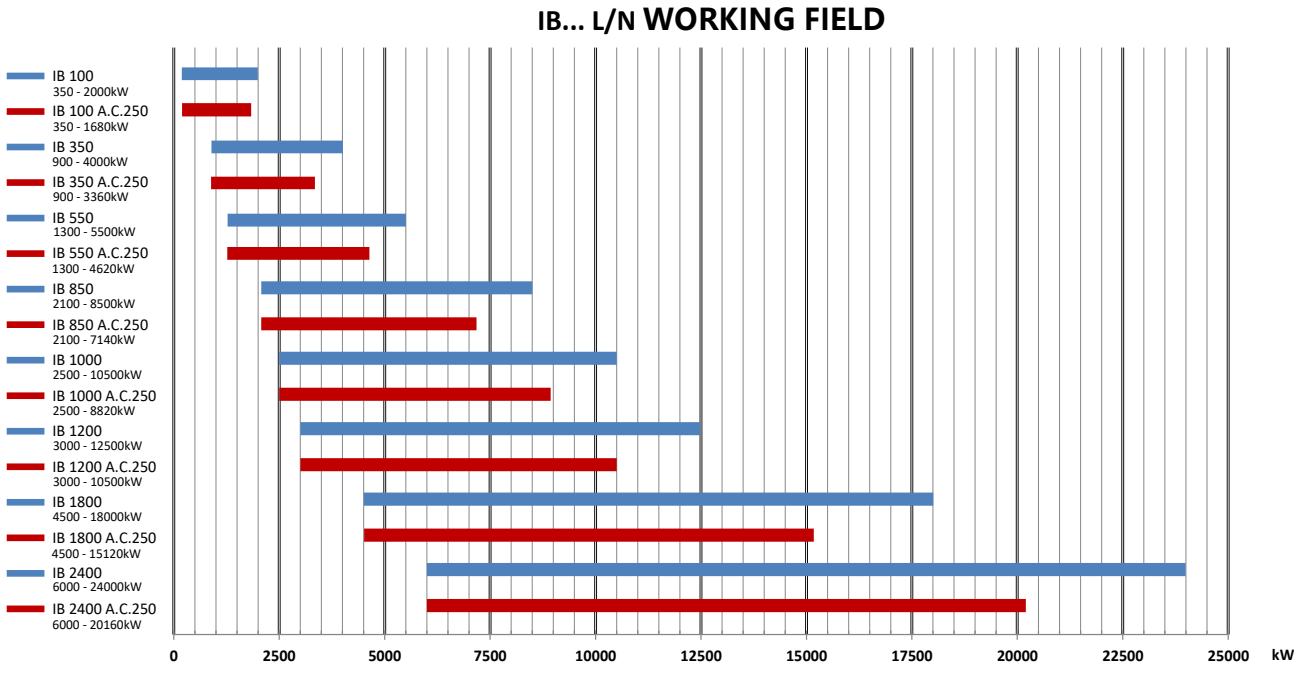
● As standard o Optional NA Not Available

WORKING FIELDS

IB...G WORKING FIELD

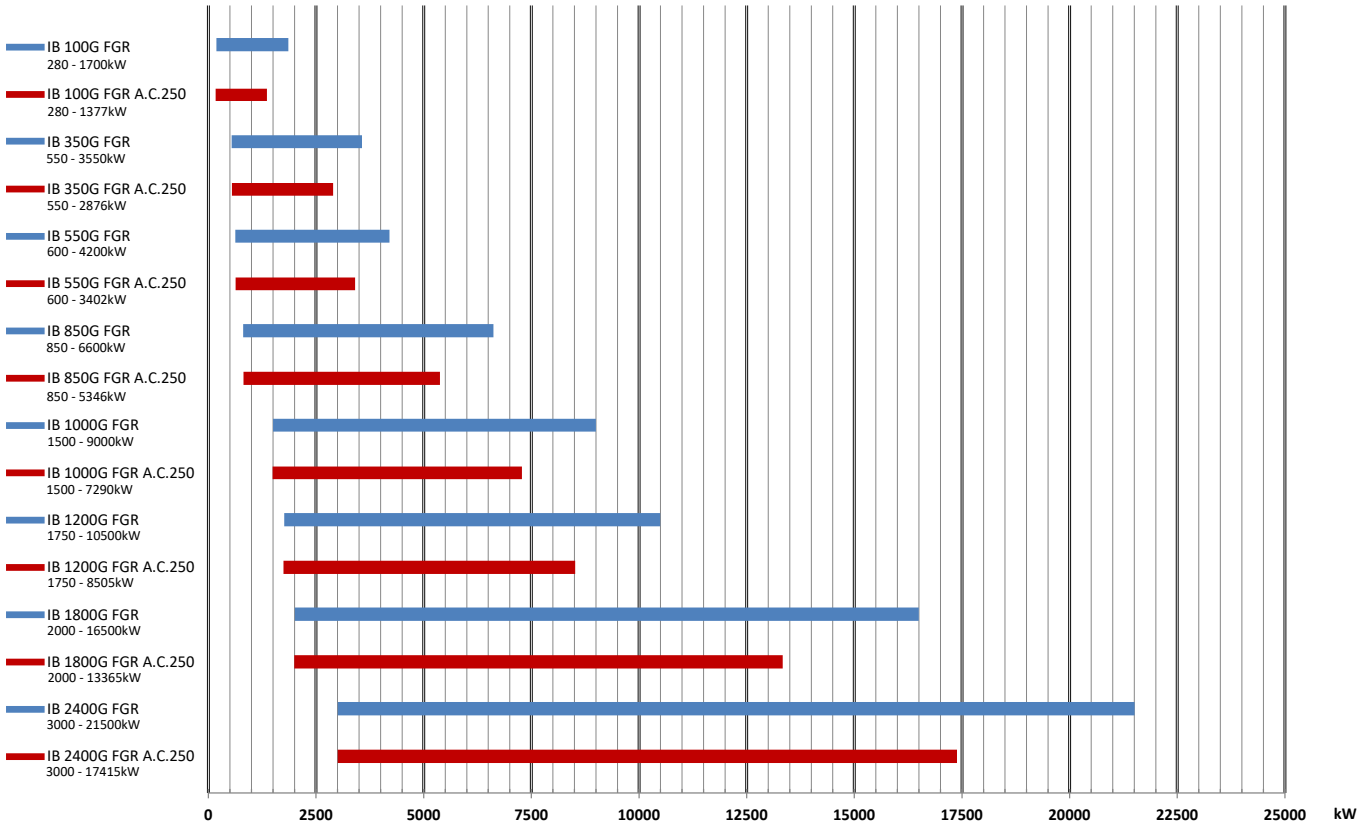


IB... L/N WORKING FIELD

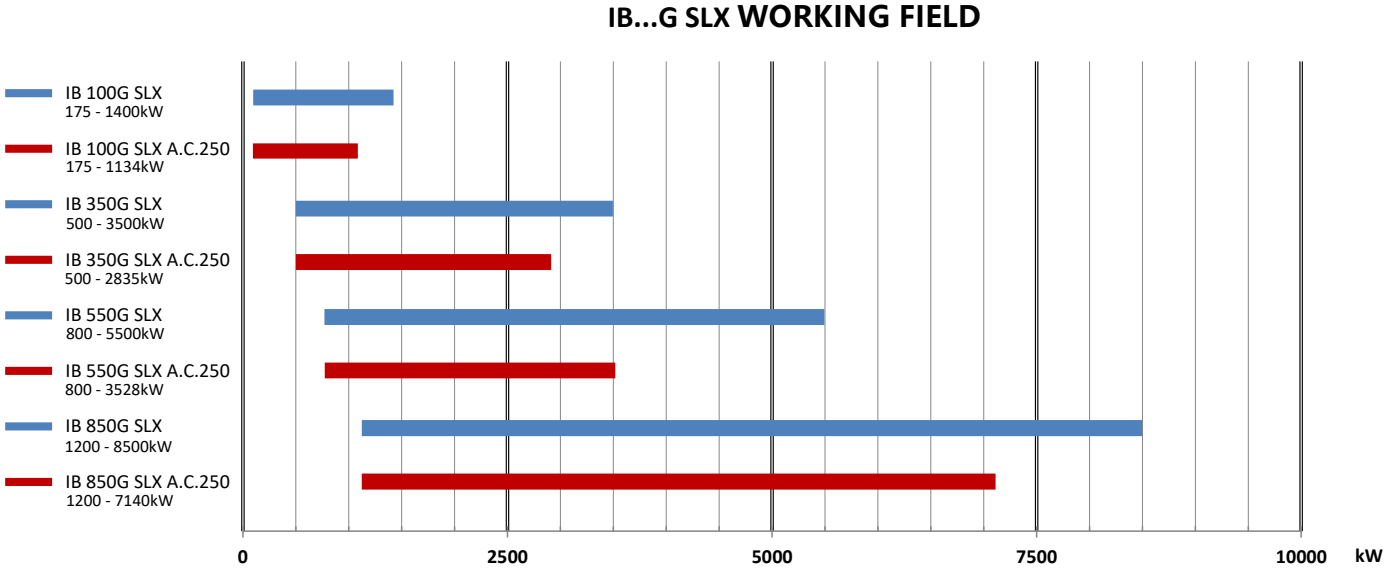


WORKING FIELDS

IB...G FGR WORKING FIELD



IB...G SLX WORKING FIELD



NATURAL GAS

Model	IB 100 G	IB 350 G	IB 550 G	IB 850 G	IB 1000 G	IB 1200 G	IB 1800 G	IB 2400 G
Thermal power (1) kW (min-max)	200-2000	500-4000	600-5500	850-8500	1000-10500	1200-12500	1800-18000	2700-24000
Modulation ratio	1:10	1:8	1:9	1:10	1:10	1:10	1:10	1:9
Ignition system	Direct						Gas Pilot	
Maximum temperature of the combustion air °C	250	250	250	250	250	250	250	250
Min-Max operation temperature °C	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60
Power supply voltage V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Emission class *	Class III	Class III	Class III	Class III	Class III	Class III	Class III	Class III

LIGHT OIL / HEAVY OIL

Model	IB 100 L/N	IB 350 L/N	IB 550 L/N	IB 850 L/N	IB 1000 L/N	IB 1200 L/N	IB 1800 L/N	IB 2400 L/N
Thermal power (1) kW (min-max)	350-2000	900-4000	1300-5500	2100-8500	2500-10500	3000-12500	4500-18000	6000-24000
Modulation ratio	1:5	1:4	1:4	1:4	1:4	1:4	1:4	1:4
Ignition system	Direct						Gas Pilot	
Maximum temperature of the combustion air °C	250	250	250	250	250	250	250	250
Min-Max temperatura di esercizio °C	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60
Power supply voltage V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Light oil emission class **	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Class II

DUAL FUEL GAS - LIGHT OIL
DUAL FUEL GAS - HEAVY OIL

Model	IB 100 GL/GN		IB 350 GL/GN		IB 550 GL/GN		IB 850 GL/GN		IB 1000 GL/GN		IB 1200 GL/GN		IB 1800 GL/GN		IB 2400 GL/GN	
	natural gas	light oil	natural gas	light oil	natural gas	light oil	natural gas	light oil	natural gas	light oil	natural gas	light oil	natural gas	light oil	natural gas	light oil
Thermal power (1) kW (min-max)	200-2000	350-2000	500-4000	900-4000	600-5500	1300-5500	850-8500	2100-8500	1000-10500	2500-10500	1200-12500	3000-12500	1800-18000	4500-18000	2700-24000	6000-24000
Modulation ratio	1:10	1:5	1:8	1:4	1:9	1:4	1:10	1:4	1:10	1:4	1:10	1:4	1:10	1:4	1:9	1:4
Ignition system	Direct												Gas Pilot			
Maximum temperature of the combustion air °C	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Min-Max operation temperature °C	-15/+60															
Power supply voltage V/Ph/Hz	230/1/50															
Gas emission class *	Class III		Class III		Class III		Class III		Class II		Class II		Class II		Class II	
Light oil emission class **		Class II		Class II		Class II		Class II		Class II		Class II		Class II		Class II

(1) Cold Air Versions

* The NOx emission class (Class I ≤ 170 mg/kWh, Class II ≤ 120, Class III ≤ 80 mg/kWh) is determined according to the EN 676 in standard conditions (furnace dimensions, thermal fluid temperature, atmospheric temperature/humidity, ...) and takes into consideration the average of emissions in the operating range points. Under any operating conditions other than the standard test conditions, the emission values corresponding to the classes stated in the table are not guaranteed.

** The NOx emission class (Class II ≤ 185, Class III ≤ 120 mg/kWh) is determined according to the EN 267 in standard conditions (furnace dimensions, thermal fluid temperature, atmospheric temperature/humidity, ...) and takes into consideration the average of emissions in the operating range points. Under any operating conditions other than the standard test conditions, the emission values corresponding to the classes stated in the table are not guaranteed.

FGR - GAS

Model	IB 100G FGR	IB 350G FGR	IB 550G FGR	IB 850G FGR	IB 1000G FGR	IB 1200G FGR	IB 1800G FGR	IB 2400G FGR
Thermal power (1) kW (min-max)	280-1700	550-3550	600-4200	850-6600	1500-9000	1750-10500	2000-16500	3000-21500
Modulation ratio	1:6	1:6	1:7	1:7	1:6	1:6	1:8	1:7
Ignition system	Direct						Gas Pilot	
Maximum temperature of the combustion air °C	250	250	250	250	250	250	250	250
Min-Max operation temperature °C	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60	-15/+60
Power supply voltage V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Emission class	NOx <30 mg/kWh							

SLX - GAS

Model	IB 100G SLX	IB 350G SLX	IB 550G SLX	IB 850G SLX
Thermal power (1) kW (min-max)	175-1400	500-3500	800-5500	1200-8500
Modulation ratio	1:8	1:7	1:7	1:7
Ignition system	Direct			
Maximum temperature of the combustion air °C	250	250	250	250
Min-Max operation temperature °C	-15/+60	-15/+60	-15/+60	-15/+60
Power supply voltage V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50
Emission class	LN4/LN5 Class NOx <50/30 mg/kWh			

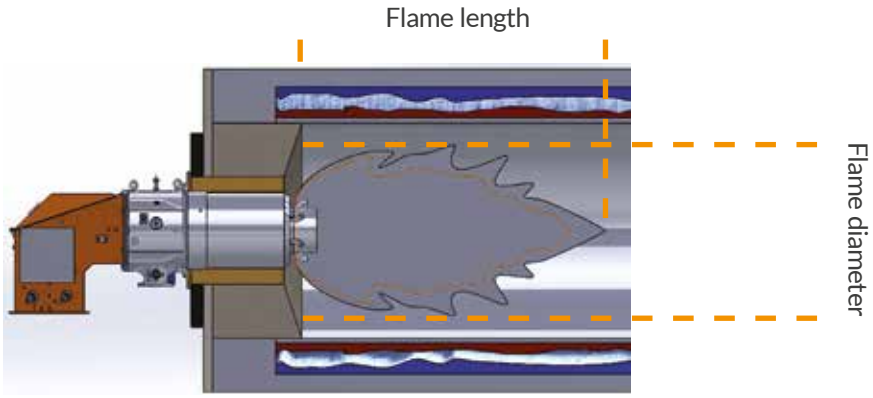
(1) Cold Air Versions

* The NOx emission class (Class I ≤ 170 mg/kWh, Class II ≤ 120, Class III ≤ 80 mg/kWh) is determined according to the EN 676 in standard conditions (furnace dimensions, thermal fluid temperature, atmospheric temperature/humidity, ...) and takes into consideration the average of emissions in the operating range points. Under any operating conditions other than the standard test conditions, the emission values corresponding to the classes stated in the table are not guaranteed.

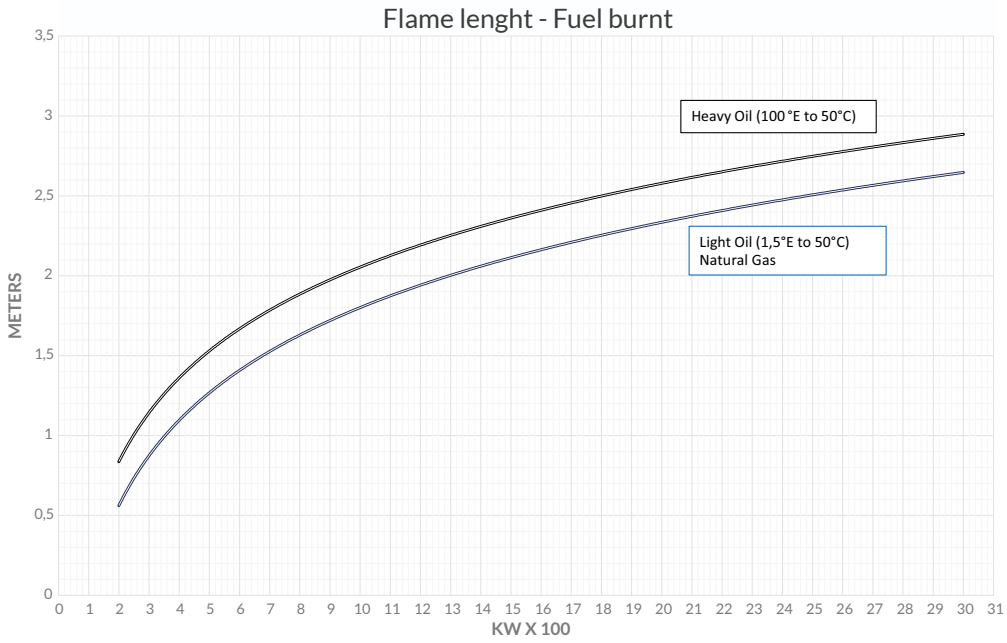
** The NOx emission class (Class II ≤ 185, Class III ≤ 120 mg/kWh) is determined according to the EN 267 in standard conditions (furnace dimensions, thermal fluid temperature, atmospheric temperature/humidity, ...) and takes into consideration the average of emissions in the operating range points. Under any operating conditions other than the standard test conditions, the emission values corresponding to the classes stated in the table are not guaranteed.

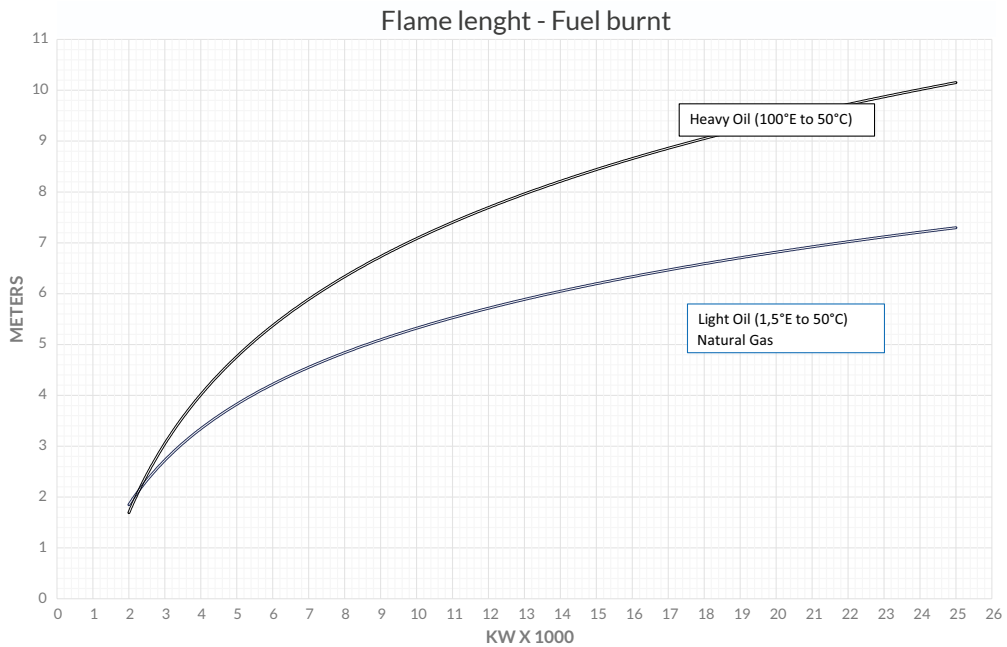
NOTE: FGR hot air versions with NOx <50 mg/kWh

FLAME SIZE

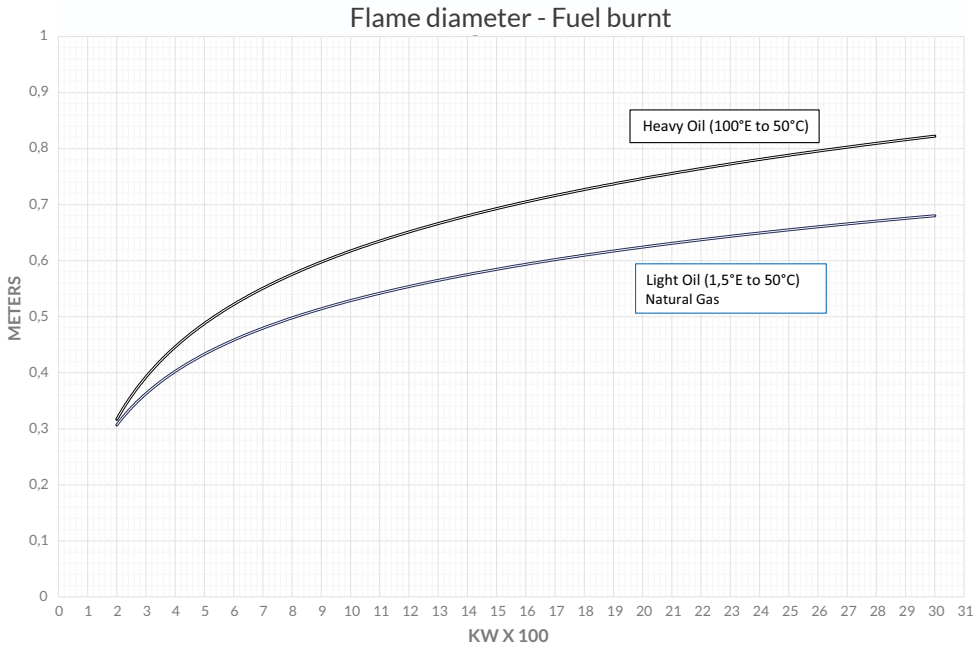


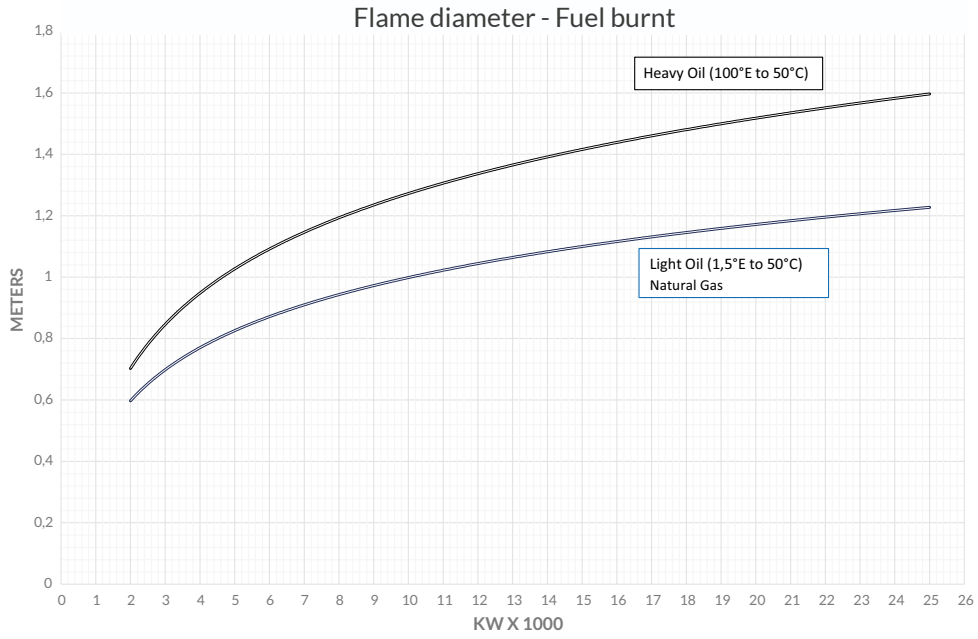
LENGTH AND DIAMETER OF NATURAL GAS FLAME





LENGTH AND DIAMETER OF NATURAL GAS FLAME





ELECTRIC PANEL

The size of the electric panel changes depending on the number of commands and controls it has to manage therefore a specific panel is supplied sized according to each need. The components, such as equipments, remote control switches and protections are fixed to the metal plate inside the panel; switches, lights, regulators and indicators are fixed to the panel top.
The electric panel is in protection class IP54.

Description	ON BOARD CONTROL Electronic burner control fit on board on burner side	CONTROL PANEL Electronic control on separated panel "lecture" style	CONTROL CABINET Electronic control on separeted cabinet
Control device	BT300/CMS / ETAMATIC	CMS / ETAMATIC	CMS / ETAMATIC
Graphic panel	●	●	●
Modulation control	●	●	●
Gas valve leakage control	●	●	●
J-box		●	●
Main switch with panel door block	●	●	●
Protection with fuses	●	●	●
Protection thermal/magnetic switch		●	●
Emergency stop	●	●	●
Remote control switches	●	●	●
Remote emergency switches		●	●
Electrical protection rate	IP 54*	IP 54*	IP 54*
Cooling system (depending on ambient temperature)	○	○	○
Inverter	External	Internal/External	Internal/External
LED signals	According to the customer application		
Selectors	According to the customer application		
Push buttons	According to the customer application		
Internal lighting		●	●
Acustic signal	According to the specific application		
Auxiliary relays	According to the specific application		

* Higher IP rate available on demand - ● As standard ○ Optional

The table below shows the configuration of the controls installed as standard on all versions and the options that can be activated upon request (optional).

	Feature	ETAMATIC OEM	CMS	BT300
Display	Alphanumeric external display	●		
	Graphic touchpanel 7”		○	
	Graphic touchpanel 10”		○	
	Graphic touchpanel 15”		○	
	User Interface UI400		●	
	User Interface UI300			●
	Commissioning via display		●	●
	Commissioning via software	●	●	●
Control	Gas/Light oil	●	●	●
	Gas/Gas	●	●	●
	Heavy oil/Light oil	●	●	●
	Fuels managed	2	4	2
	Leakage tests managed	1	4	1
	Extended I/O	○	●	
	Integrated PLC (not Failsafe)		●	
	Simultaneous combustion		●	
	I/O freely configurable (PSSW Level 2)		●	
Electronics	Operating modes	2	16	2
	Outputs for servomotors	4	10	3
	VFD	● (OEM/S)	○	○
	Continous actuator outputs	1	10	1
	TPS actuator outputs	4	10	3
	Continous operation	●	●	●
	Max cable lenght	100 m	100 m	10 m
	Max servomotor torque	180 Nm	180 Nm	9 Nm
Corrections	Integrated O_2 regulator	●	●	●
	Integrated CO control	●	●	●
	Other external inputs	●	●	
	Correction inputs	1	4	
Flame monitoring	Integrated ionisation monitoring	○	●	●
	Integrated optical flame monitoring	●	●	●
	Digital inputs	1	2	1
Fuel changeover	Changeover with burner off	●	●	●
	Changeover in operation with the same fuel		●	
	Curve set changeover with the same fuel	●	●	
	Stage mixed combustion		●	●
BUS system	Modbus TCP	○	●	○
	Profibus DP	○	○	○
	Profinet	○	○	○
	Modbus RTU	○	○	
Analogue inputs	Non-failsafe/ Failsafe		18/9	

● Standard ○ Additional module

FAN SELECTION

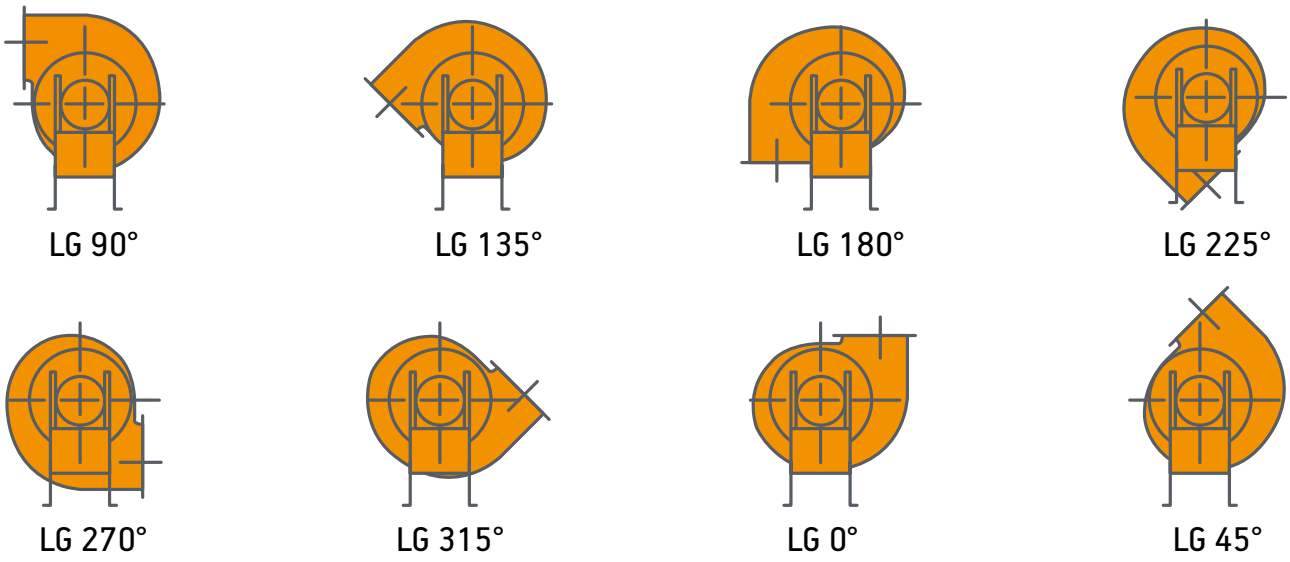
DIRECTION AND ROTATION

The fans are selected depending on the needs of each installation, in relation to the flow rate and the temperature of the combustion air, the backpressure in the combustion chamber, the altitude of the system and the maximum noise level allowed.

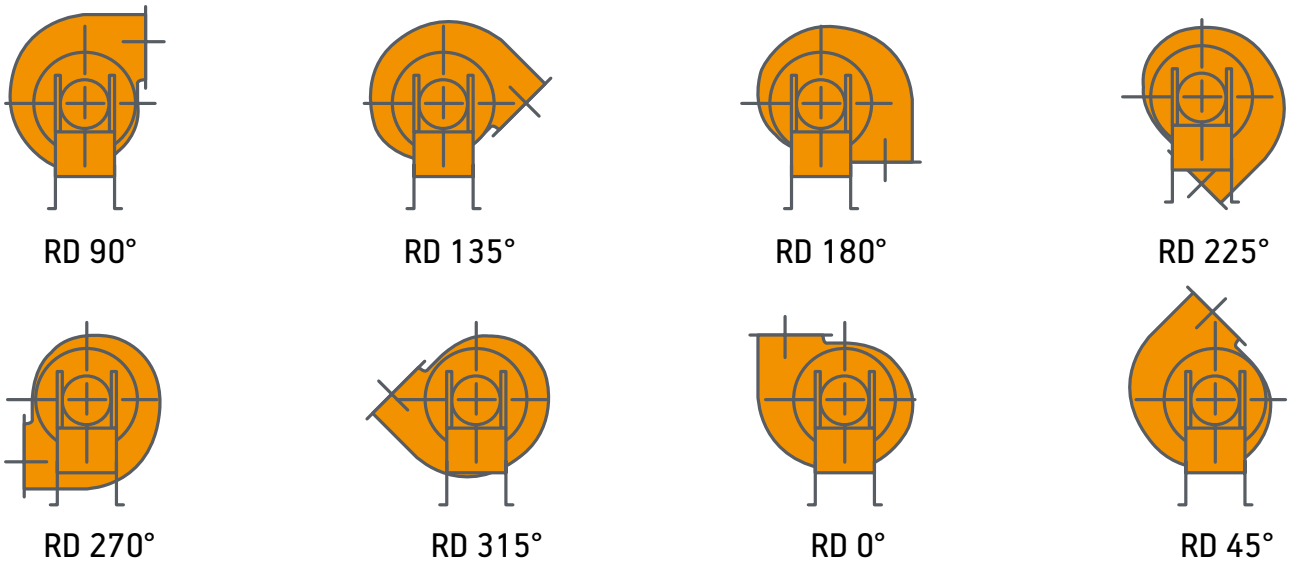
Scope of delivery
The fan consists of:
- fan;
- electric motor;
- protection grille on suction side;
- anti-vibration and compensation joint.

To order a fan please indicate:
- combustion air flow rate [Qtot];
- total static pressure [Pst];
- orentation + direction (LG or RD)
- maximum noise level.

ANTICLOCKWISE (LG)



CLOCKWISE (RD)



FAN SELECTION

DATABASE FOR FAN SELECTION

Search by: - operating condition - features of combined burner	**Qa**	Sm^3/h	Combustion air flow rate
	Pst	mbar	Total static pressure of system

COMBUSTION AIR FLOW RATE Qa CALCULATION

The combustion air flow rate is directly proportional to the flow of burned fuel. To calculate the air flow rate Qa, necessary for combustion of a fuel gas (with known net heating value Hi), it is necessary to know the flow rate of fuel and the percentage value of the remaining oxygen content in the fumes.

Qc calculation (fuel flow rate)

Qc = Pf/Hi

Qc	Sm^3/h	Fuel flow rate
0_2	%	Dry smoke residue oxygen
Hi	kWh/Sm^3	Net heating value
Pf*	kW	Burner thermal power

* If the data is available it is the rated thermal input of heat generator Pn (kW) and its efficiency ŋ, the thermal power at the furnace is calculated as: **Pf** = Pn/ŋ

Qa calculation (combustion air flow rate)

Qa = (Qc x Kc) / fc*

Qa	Sm^3/h	Combustion flow rate
Qc	Sm^3/h	Fuel flow rate
Kc	-	Air flow per fuel unit (Diagram1)
fc	-	Correction factor (Table 2)

ection factor of the air flow depending on intake air temperature and altitude above sea level.
fc = 1,000 if Room Temp. = 15°C. Atmospheric pressure = 1013 mbar and Altitude = 0 m.a.s.l.

CALCULATION OF THE AVAILABLE STATIC PRESSURE Hu OF THE FAN

For the selection of the fan to match to the burner, the static pressure of the system must be known. The value is obtained from all the losses in the actual working conditions (Air temperature and altitude), arising from the individual components of the thermal system:

Pst = Pcc + ΔPtc + ΔPpa + ΔPca

Pcc	mbar	Combustion chamber pressure
ΔPtc	mbar	Combustion head pressure drop
ΔPpa	mbar	Pre-heating pressure drop
ΔPca	mbar	Air duct pressure drop

As a consequence: **Hu ≥ Pst**

Hu calculation (minimum available static pressure of fan)

Hu ≥ Pcc + (ΔPtc/fc) + ΔPpa + Δpca

Pcc → the value must be given by the boiler manufacturer, specifying the installation conditions.

ΔPtceff* → combustion head load loss, obtained in std. conditions (Diagram 2), corrected by the **fc** factor (Table 2) according to air temperature and altitude: **fc = 1** with air at 15°C, an atmospheric pressure of 1013 mbar and at 0 m.a.s.l.

ΔPpa → the value must be given by the manufacturer of the heat exchanger.

ΔPca → to be determined according to the size and geometry of the air pipes.

* If the value of **Δpteff**, relevant to the burner model evaluated, exceeds the one shown in the table below, it is necessary to move to the next higher model in order to ensure proper combustion:

Table 3: maximum combustion head load loss referred to various IB models

Model GAS	ΔPteff MAX mbar
IB 100G	22
IB 350G	22
IB 550G	40
IB 850G	50
IB 1000G	46
IB 1200G	44
IB 1800G	27
IB 2400G	45

Model GAS FGR	ΔPteff MAX mbar
IB 100G FGR	32
IB 350G FGR	25
IB 550G FGR	28
IB 850G FGR	42
IB 1000G FGR	42
IB 1200G FGR	35
IB 1800G FGR	40
IB 2400G FGR	40

Model GAS SLX	ΔPteff MAX mbar
IB 100G SLX	25
IB 350G SLX	20
IB 550G SLX	28
IB 850G SLX	30

Model L/N/GL/GN	ΔPteff MAX mbar
IB 100	20
IB 350	30
IB 550	36
IB 850	39
IB 1000	38
IB 1200	32
IB 1800	36
IB 2400	45

FAN SELECTION EXAMPLE

DATABASE				
Generator with **THERMAL FLUID HEATER OIL** at three smoke passes	**Pn**	kW	6360	Generator power
	ŋ	%	90	Generator efficiency
	Pcc	mbar	13	Combustion chamber backpressure
	H	mslm	1500	Altitude
	Tac	°C	250	Combustion air temperature
	Ta	°C	30	Room temperature
	ΔPpa	mbar	4	Pre-heater load loss
	O_2	%	3,5	Dry smoke residue oxygen
	Natural gas	-	-	Fuel
	Hi	kWh/Sm³	9,7	Net heating value
	Air channel	-	-	Length 15 m Straight duct + 3 90° curves
	Power supply	-	-	AC 400V/3Ph/50Hz
	Sound level	dB(A)	85	Maximum required

Qa COMBUSTION AIR FLOW RATE CALCULATION

Qc calculation (fuel flow rate)

Qc = Pf/Hi = (Pn/ŋ) / Hi = (6.360/0,9) / 9,7 = 7.066[(1)] / 9,7 = 728,5 Sm³/h

[(1)] Value of **Pf (furnace power)**

Qa calculation (combustion air flow rate)

Qa = (Qc x Kc) / fc* = (728,5 x 11,5[(2)]) / 0,793[(3)] = 10.565 Sm³/h

[(2)] Value obtained from **Diagram 1**, according to the type of fuel (Natural gas) and value 0^2 (3,5%)
[(3)] Value obtained from **Table 2**, according to room air temperature (30°) and altitude (1500 mslm)

CALCULATION OF AVAILABLE STATIC PRESSURE Hu OF THE FAN

According to **Pf** = 7,065 kW, the burner model to consider is **IB 850**

ΔPtceff IB850 = (ΔPtc / fc) = 28[(5)] / 0,460[(6)] = 60,9 mbar

* The resulting value exceeds the maximum (Table 3) for the model under consideration, therefore it is necessary to choose the next model that is IB1000:

ΔPtceff IB1000 = (ΔPtc / fc) = 17[(5)] / 0,460[(6)] = 34 mbar

The resulting value is below the maximum allowed (46 mbar) therefore the IB1000 choice is correct!

[(5)] value obtaned from diagram 2: head load loss curve.
[(6)] value obtained from Table 2, according to combustion air temperature (250°C) and altitude (1500 mslm).
[7] according to the given air pipe data, we can consider a load loss Pca = 3 mbar.

Hu calculation (minimum available static pressure)

Hu = Pcc + (ΔPtc/fc) + ΔPpa + Δpca = 13 + 34 + 4 + 3[(7)] = 54 mbar

VENTILATION

DIAGRAM 1: air flow per fuel unit referred to the most common fuels.

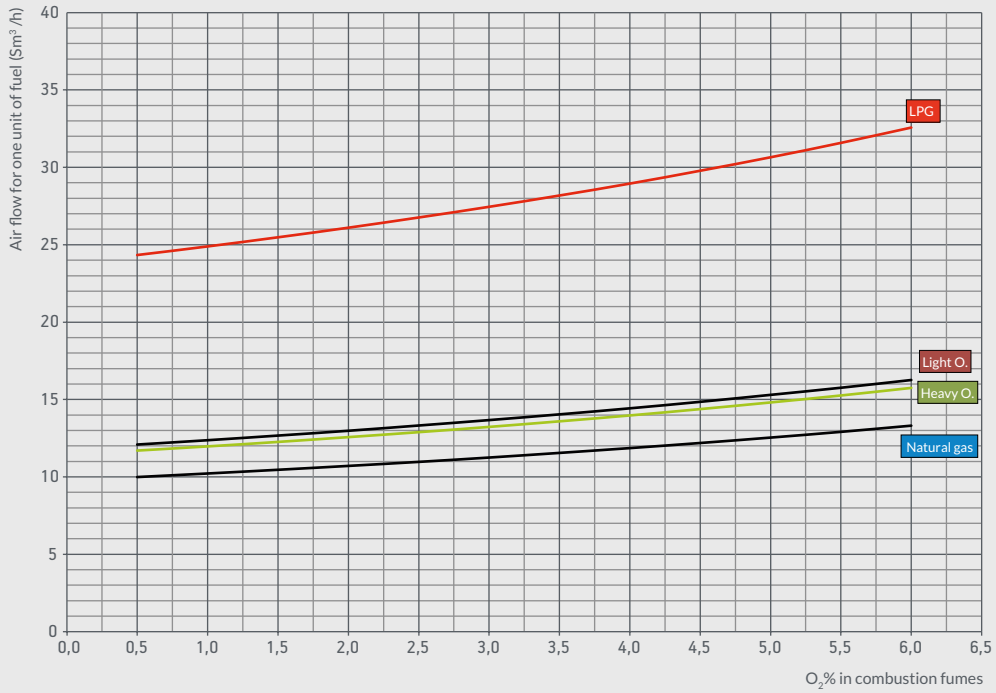


TABLE 2: correction factor **(fc)** of the flow depending on intake air temperature and altitude above sea level.

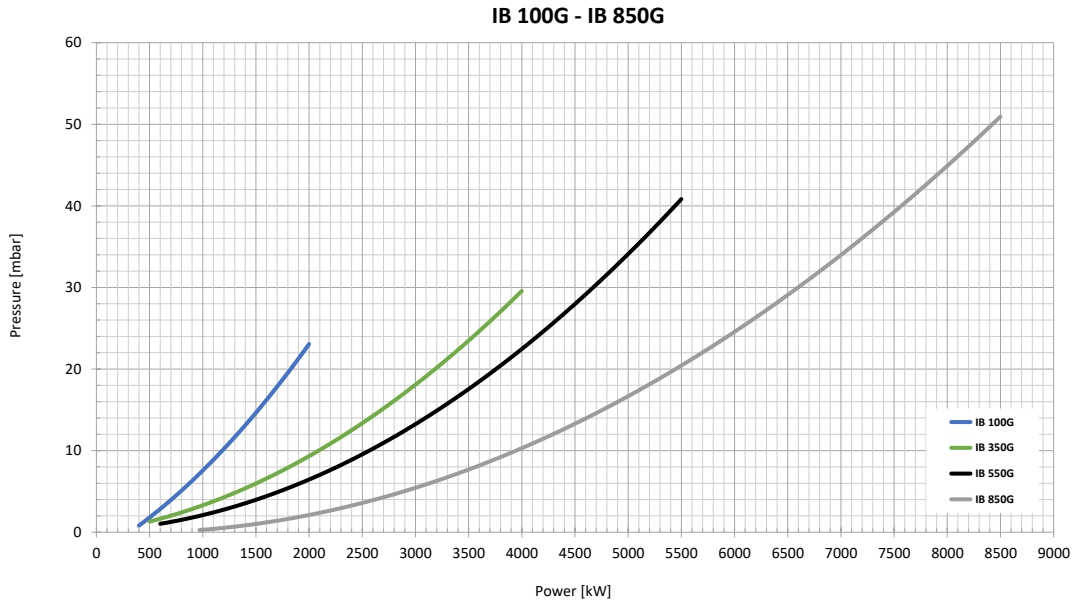
factor **fc**	Air temperature (°C)															
Altitude (m.a.s.l.)	0	10	15	20	30	50	70	90	110	130	150	170	190	210	230	250
0	1,055	1,018	1,000	0,983	0,951	0,892	0,840	0,793	0,752	0,715	0,681	0,650	0,622	0,596	0,573	0,551
100	1,042	1,006	0,988	0,971	0,939	0,881	0,830	0,784	0,743	0,706	0,673	0,643	0,615	0,589	0,566	0,544
200	1,030	0,994	0,977	0,960	0,928	0,871	0,820	0,775	0,734	0,698	0,665	0,635	0,608	0,582	0,559	0,538
300	1,018	0,982	0,965	0,948	0,917	0,860	0,810	0,766	0,726	0,690	0,657	0,627	0,600	0,575	0,553	0,531
400	1,006	0,970	0,953	0,937	0,906	0,850	0,801	0,757	0,717	0,681	0,649	0,620	0,593	0,569	0,546	0,525
500	0,994	0,959	0,942	0,926	0,895	0,840	0,791	0,748	0,709	0,673	0,642	0,613	0,586	0,562	0,540	0,519
600	0,982	0,947	0,931	0,915	0,885	0,830	0,782	0,739	0,700	0,665	0,634	0,605	0,579	0,555	0,533	0,513
700	0,970	0,936	0,920	0,904	0,874	0,820	0,772	0,730	0,692	0,657	0,626	0,598	0,572	0,549	0,527	0,507
800	0,959	0,925	0,909	0,893	0,864	0,810	0,763	0,721	0,683	0,649	0,619	0,591	0,565	0,542	0,520	0,501
900	0,947	0,914	0,898	0,882	0,853	0,801	0,754	0,712	0,675	0,642	0,611	0,584	0,559	0,535	0,514	0,494
1000	0,936	0,903	0,887	0,872	0,843	0,791	0,745	0,704	0,667	0,634	0,604	0,577	0,552	0,529	0,508	0,489
1100	0,924	0,892	0,876	0,861	0,833	0,781	0,736	0,695	0,659	0,626	0,597	0,570	0,545	0,523	0,502	0,483
1200	0,913	0,881	0,866	0,851	0,823	0,772	0,727	0,687	0,651	0,619	0,589	0,563	0,539	0,516	0,496	0,477
1300	0,902	0,870	0,855	0,841	0,813	0,763	0,718	0,679	0,643	0,611	0,582	0,556	0,532	0,510	0,490	0,471
1400	0,891	0,860	0,845	0,830	0,803	0,753	0,709	0,670	0,635	0,604	0,575	0,549	0,526	0,504	0,484	0,465
1500	0,880	0,849	0,834	0,820	0,793	0,744	0,701	0,662	0,628	0,596	0,568	0,543	0,519	0,498	0,478	0,460
1600	0,870	0,839	0,824	0,810	0,783	0,735	0,692	0,654	0,620	0,589	0,561	0,536	0,513	0,492	0,472	0,454
1700	0,859	0,829	0,814	0,800	0,774	0,726	0,684	0,646	0,612	0,582	0,554	0,529	0,507	0,486	0,466	0,448
1800	0,848	0,818	0,804	0,790	0,764	0,717	0,675	0,638	0,605	0,575	0,548	0,523	0,500	0,480	0,461	0,443
1900	0,838	0,808	0,794	0,781	0,755	0,708	0,667	0,630	0,597	0,568	0,541	0,516	0,494	0,474	0,455	0,438
1950	0,833	0,803	0,789	0,776	0,750	0,704	0,663	0,626	0,594	0,564	0,538	0,513	0,491	0,471	0,452	0,435
2000	0,828	0,798	0,785	0,771	0,746	0,700	0,659	0,622	0,590	0,561	0,534	0,510	0,488	0,468	0,449	0,432
2100	0,817	0,789	0,775	0,762	0,736	0,691	0,651	0,615	0,583	0,554	0,528	0,504	0,482	0,462	0,444	0,427
2200	0,807	0,779	0,765	0,752	0,727	0,682	0,643	0,607	0,575	0,547	0,521	0,498	0,476	0,456	0,438	0,421
2300	0,797	0,769	0,756	0,743	0,718	0,674	0,635	0,600	0,568	0,540	0,515	0,491	0,470	0,451	0,433	0,416
2400	0,787	0,759	0,746	0,734	0,709	0,665	0,627	0,592	0,561	0,533	0,508	0,485	0,464	0,445	0,427	0,411
2500	0,777	0,750	0,737	0,724	0,701	0,657	0,619	0,585	0,554	0,527	0,502	0,479	0,459	0,440	0,422	0,406
2600	0,768	0,741	0,728	0,715	0,692	0,649	0,611	0,577	0,547	0,520	0,496	0,473	0,453	0,434	0,417	0,401
2700	0,758	0,731	0,719	0,706	0,683	0,641	0,603	0,570	0,540	0,514	0,489	0,467	0,447	0,429	0,412	0,396
2800	0,749	0,722	0,710	0,698	0,675	0,633	0,596	0,563	0,534	0,507	0,483	0,461	0,442	0,423	0,406	0,391
2900	0,739	0,713	0,701	0,689	0,666	0,625	0,588	0,556	0,527	0,501	0,477	0,456	0,436	0,418	0,401	0,386
3000	0,730	0,704	0,692	0,680	0,658	0,617	0,581	0,549	0,520	0,495	0,471	0,450	0,430	0,413	0,396	0,381

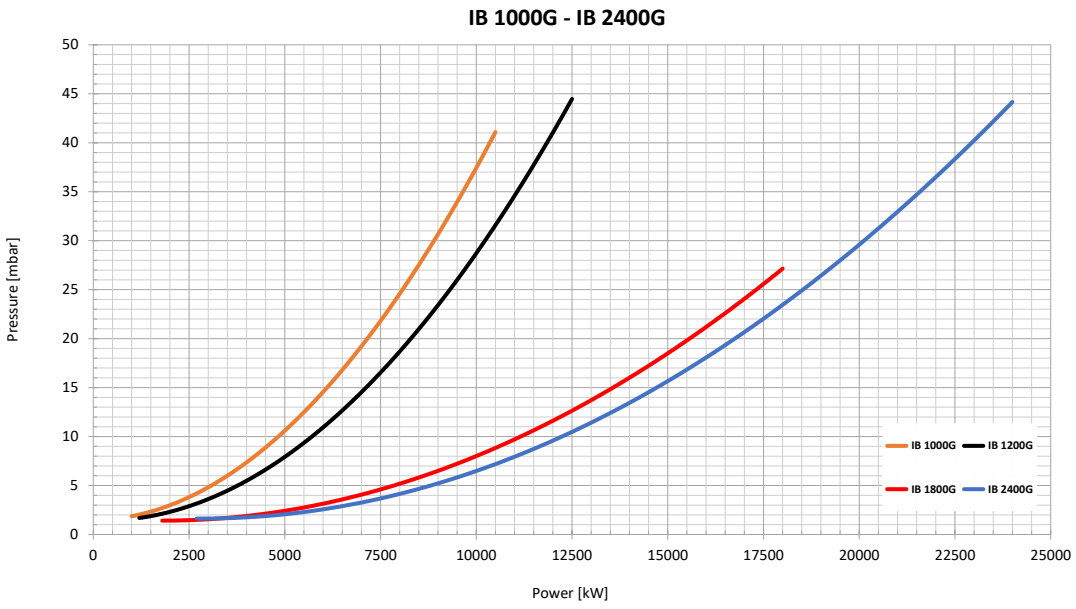
AIR PRESSURE LOSS ON BURNER HEAD

Identify the burner thermal output on the abscissa axis (kW).
Mark the value on the curve of the concerned burner in a vertical direction.
Move horizontally to the axis of ordinates (mbar).
The value obtained is equivalent to the head loss on air side of the concerned burner.

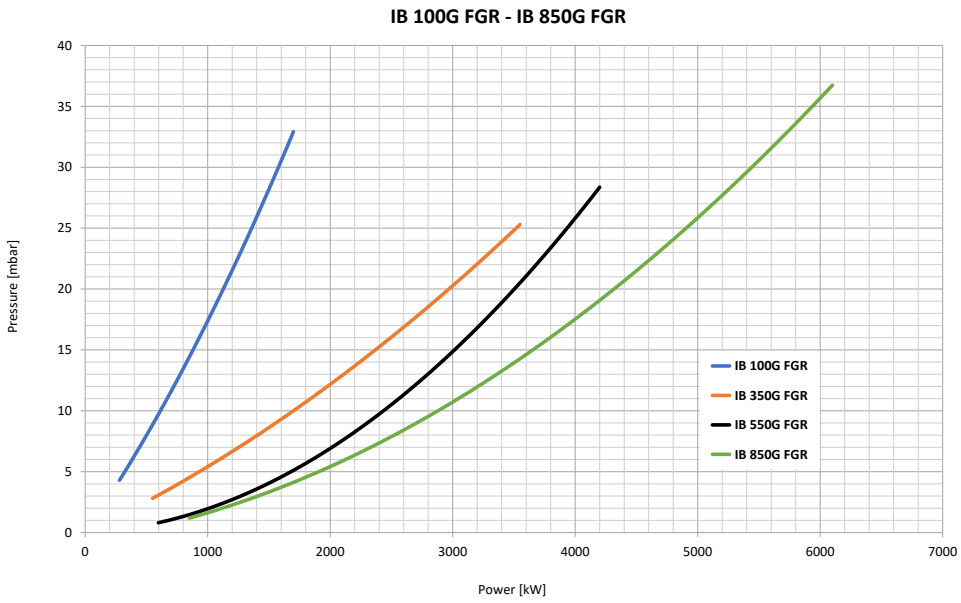
Example:
thermal output = 7500 kW burner =IB 850
head loss on air side = 40mbar

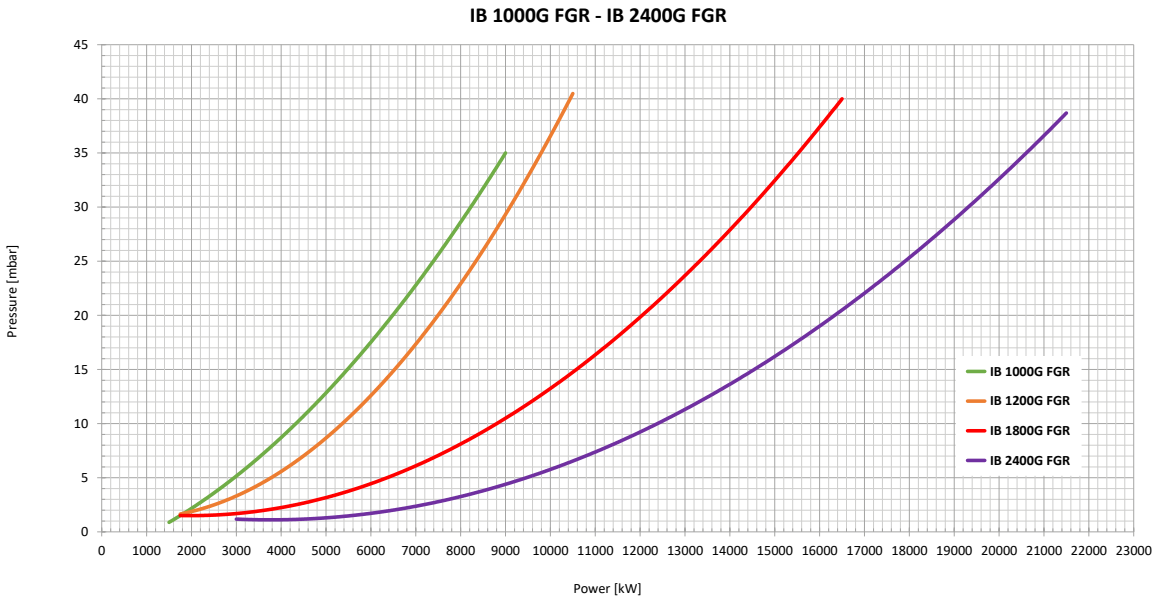
DIAGRAM 2: head load loss curve referred to various IB... models.

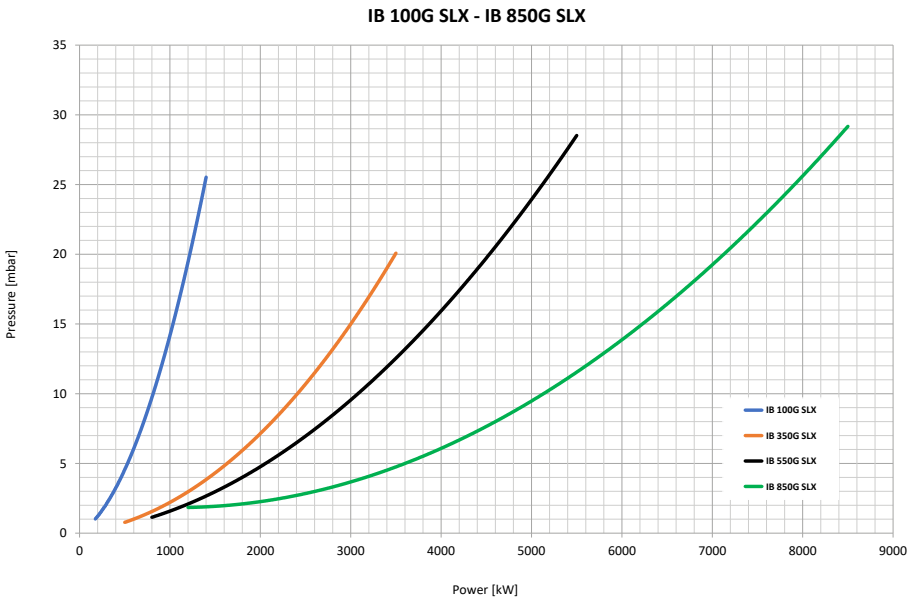




AIR PRESSURE LOSS ON BURNER HEAD

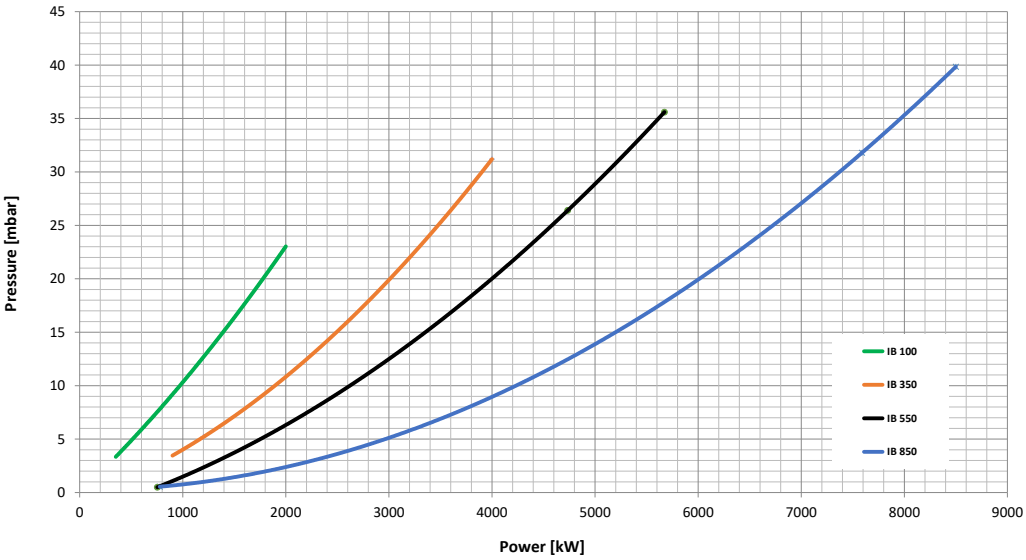




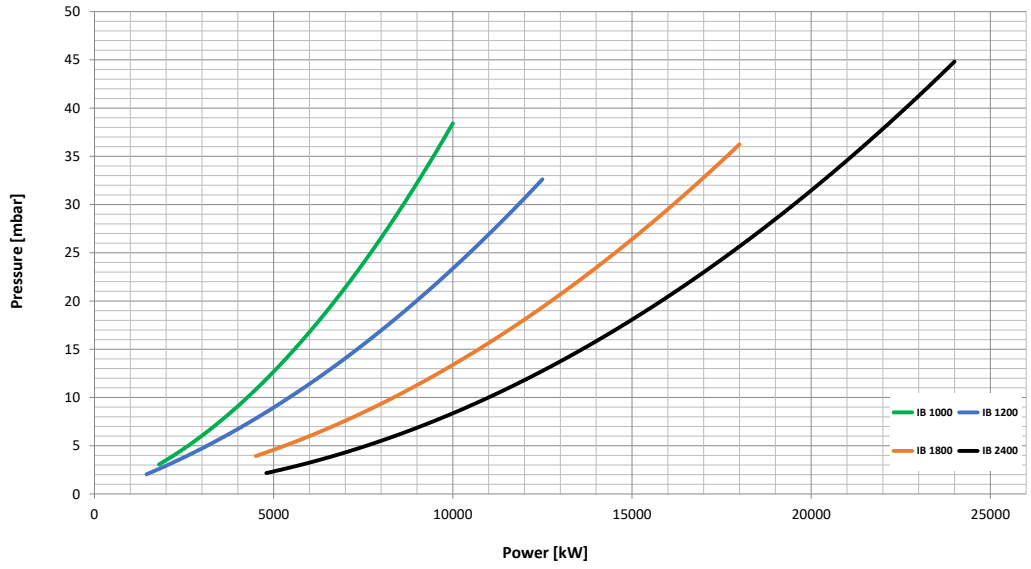


AIR PRESSURE LOSS ON BURNER HEAD

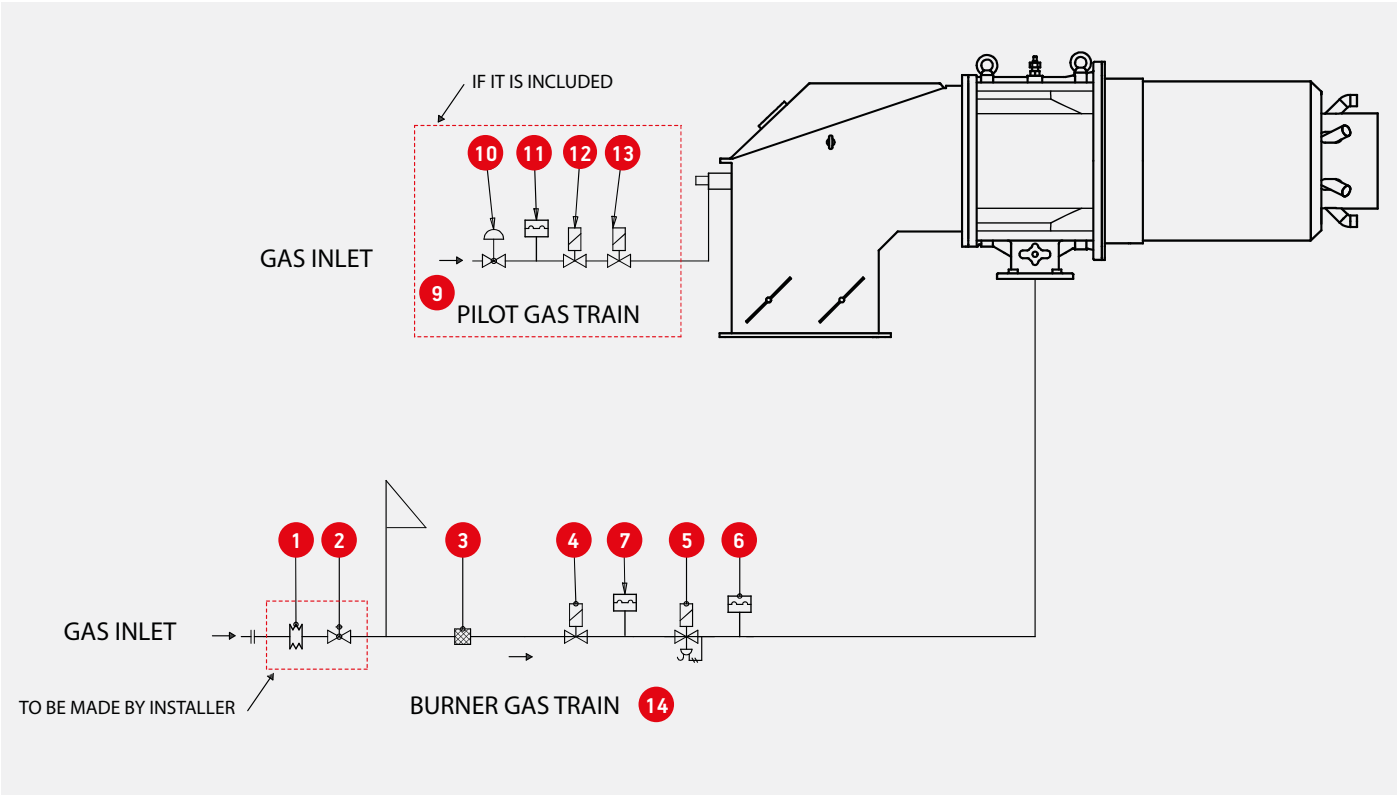
IB 100 - IB 850 dual fuel/light oil/heavy oil **GL-GN-L-N**



IB 1000 - IB 2400 dual fuel/light oil/heavy oil **GL-GN-L-N**



GAS TRAIN CONFIGURATION



DESCRIPTION	IB ...ME/ME FGR	
Gas Train composed by:		(14)
Electric protection rating IP 54	●	(14)
Electric protection rating IP 65	○	(14)
Operating gas valve with pressure regulator	●	(5)
Safety gas valve	●	(4)
Maximum gas pressure switch	●	(6)
Low gas pressure switch / tightness control	●	(7)
Gas filter	●	(3)
Ball gas shut-off valve	○	(2)
Antivibration joint	○	(1)
Gas Train Pilot composed by:		(9)
Electric protection rating IP 54	●	(9)
Electric protection rating IP 65	○	(9)
Pressure regulator with integrated filter (pilot gas train)	●	(10)
Minimum gas pressure switch (pilot gas train)	●	(11)
Ignition flame safety gas valve (pilot gas train)	●	(12/13)

● Standard ○ Optional

GAS TRAIN CHOICE

It is possible to choose the most suitable gas train to match to the burner, using the diagram below. First of all identify:

- The burnt flow of the burner Qi [kW] to find along the abscissa axis.
- The gas pressure available at the gas train Pg (mbar) to find along the axis of ordinates.

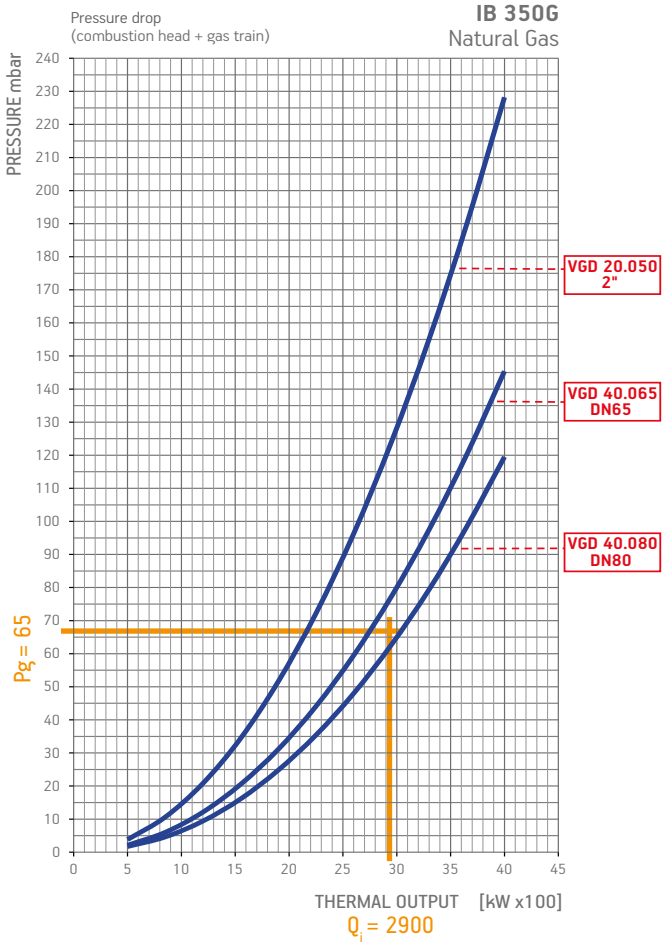
Such pressure is obtained with the following formula:

Pg = Pa- Pc

Where:
Pa = pressure of the gas available in the network.
Pc = pressure in the combustion chamber of the heat generator.
The intersection of the two lines defines the operating point of the gas train.

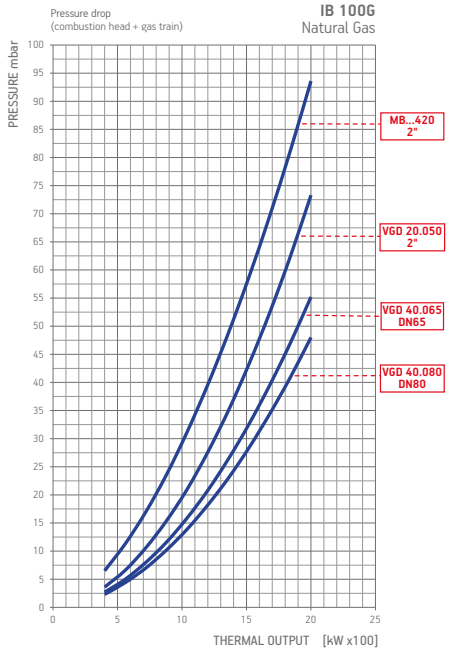
Choose the gas train characterized by the first curve below the operating point.

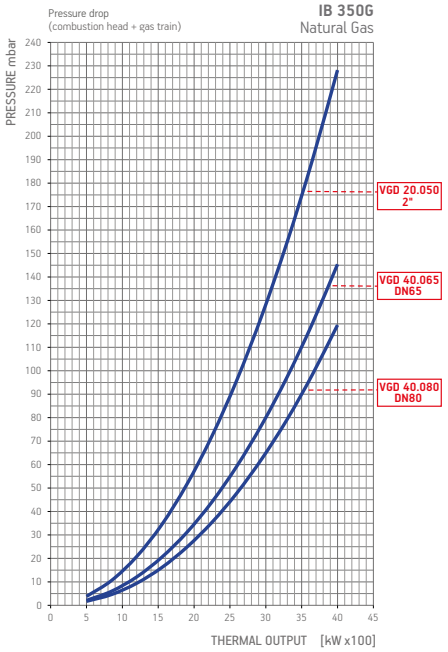
Example:
Burner Model: IB 350 G ME
Qi = 2900 kW
Pa = 80 mbar Pc = 15 mbar
Pg = 80 - 15 = 65 mbar
Choose green curve.
Order gas train:
Code 19990542 (Vers. ME)

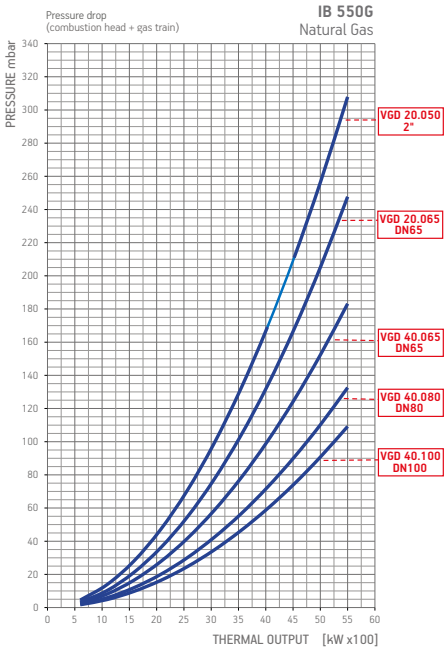


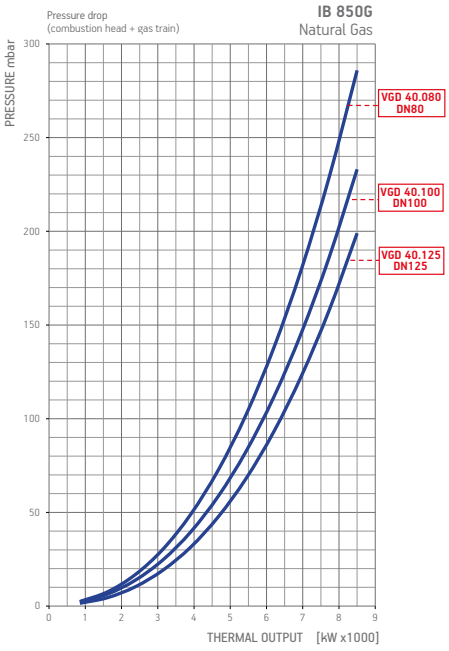
NOTE: For operating points not captured in the diagram, please contact our sales department.

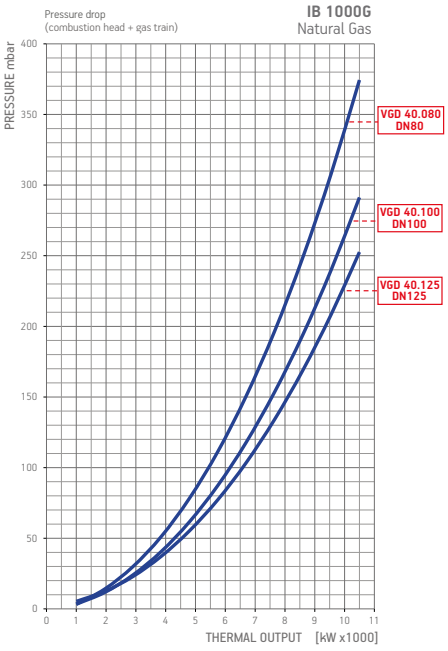
GAS TRAIN

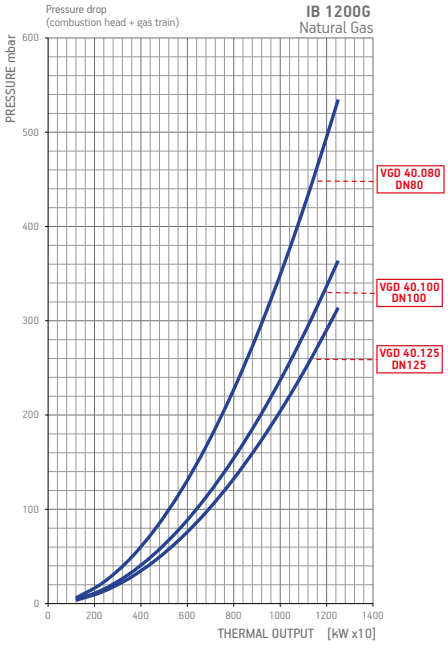

Pressure drop
(combustion head + gas train)
IB 100G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
MB...420 2"
VGD 20.050 2"
VGD 40.065 DN65
VGD 40.080 DN80


Pressure drop
(combustion head + gas train)
IB 350G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.050 2"
VGD 40.065 DN65
VGD 40.080 DN80

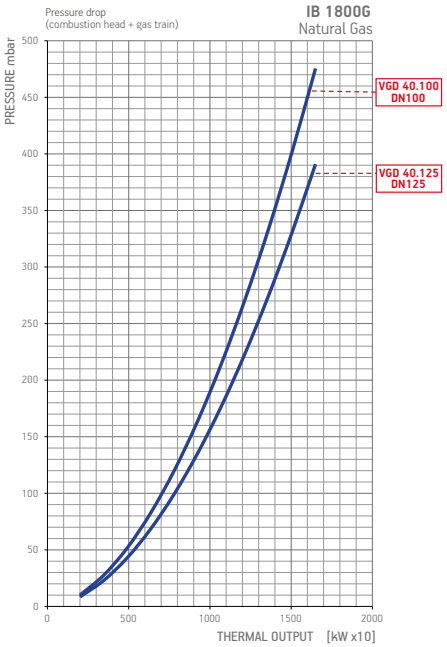

Pressure drop
(combustion head + gas train)
IB 550G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.050 2"
VGD 20.065 DN65
VGD 40.065 DN65
VGD 40.080 DN80
VGD 40.100 DN100

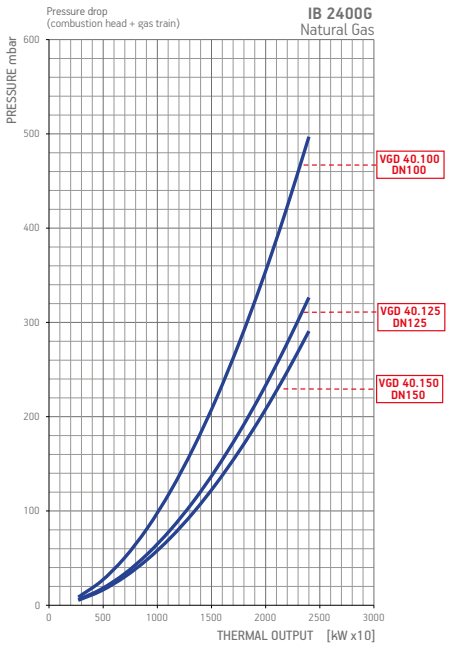

Pressure drop
(combustion head + gas train)
IB 850G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x1000]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125


Pressure drop
(combustion head + gas train)
IB 1000G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x1000]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125


Pressure drop
(combustion head + gas train)
IB 1200G
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x10]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125

GAS TRAIN





BURNER/GAS TRAIN MATCH

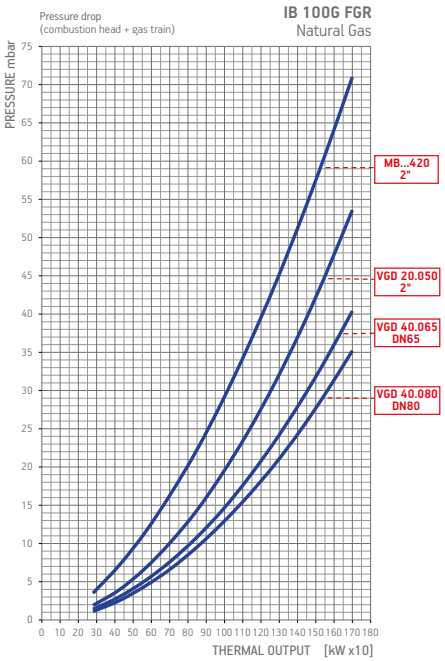
CE gas train version complies with EN676, EXP gas train version is for extra-European markets

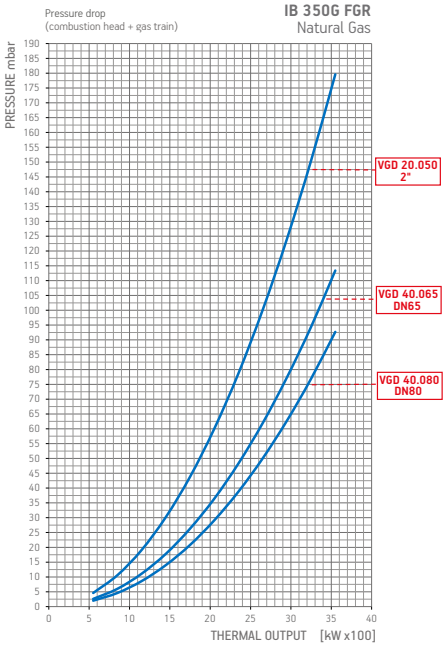
Burner model	Gas type	P.Max ** mbar	Execution	Gas train	Regulator with incorporated filter	Burner/gas train adapter	Valve tightness control kit	Pic.
				Part no.	Part no.	Part no.	Part no.	
IB 100G LX ME	Natural gas	360	CTV	19990755	Included	–	Included	D2
		500	CTV	19990751	Included	–	Included	D4
		500	CTV	19990752	Included	–	Included	D4
		500	CTV	19990753	Included	–	Included	D4
IB 350G LX ME	Natural gas	500	CTV	19990751	Included	96000035	Included	D4
		500	CTV	19990756	Included	-	Included	D4
		500	CTV	19990757	Included	-	Included	D4
IB 550G LX ME	Natural gas	500	CTV	19990541	Included	–	Included	D4
		500	CTV	19990666	Included	–	Included	D4
		500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 850G LX ME	Natural gas	500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 1000G LX ME	Natural gas	500	CTV	19990633	Included	–	Included	D4
		500	CTV	19990634	Included	–	Included	D4
		500	CTV	19990674	Included	–	Included	D4
IB 1200G LX ME	Natural gas	500	CTV	19990633	Included	–	Included	D4
		500	CTV	19990634	Included	–	Included	D4
		500	CTV	19990674	Included	–	Included	D4
IB 1800G LX ME	Natural gas	500	CTV	19990732	Included	–	Included	D4
		500	CTV	19990733	Included	–	Included	D4
IB 2400G LX ME	Natural gas	500	CTV	19990648	Included	–	Included	D4
		500	CTV	19990649	Included	–	Included	D4
		500	CTV	19990650	Included	–	Included	D4

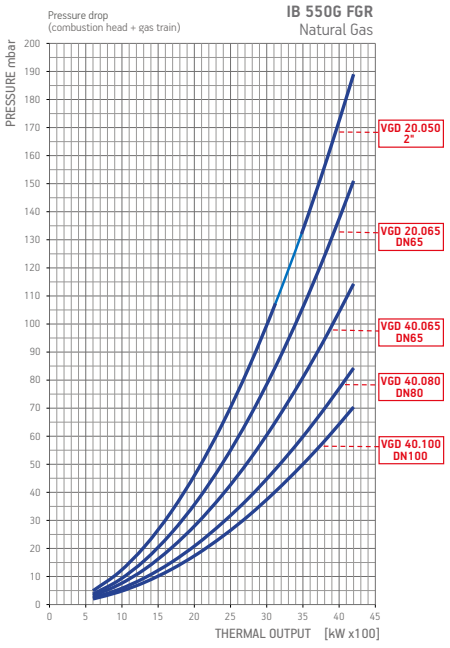
NOTE

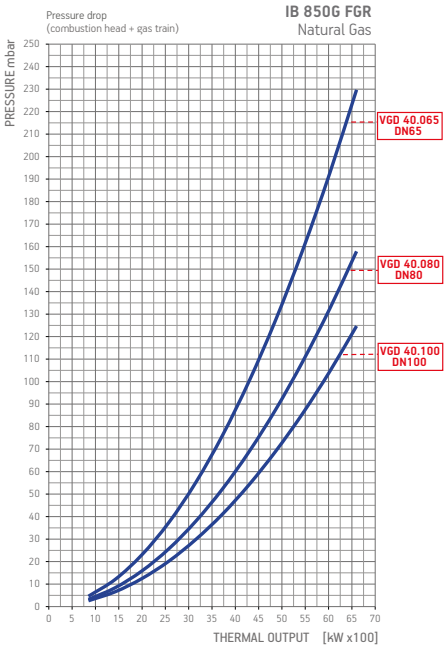
CTV Gas train with Valve Tightness Control.
**) Maximum gas inlet pressure at pressure regulator.

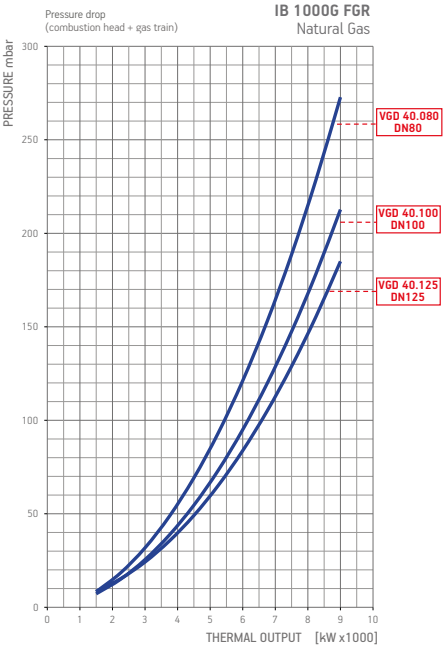
GAS TRAIN

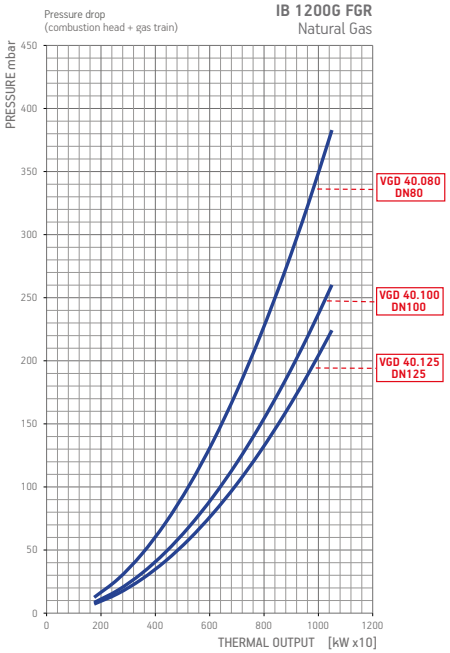

IB 100G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x10]
MB...420 2"
VGD 20.050 2"
VGD 40.065 DN65
VGD 40.080 DN80


IB 350G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.050 2"
VGD 40.065 DN65
VGD 40.080 DN80

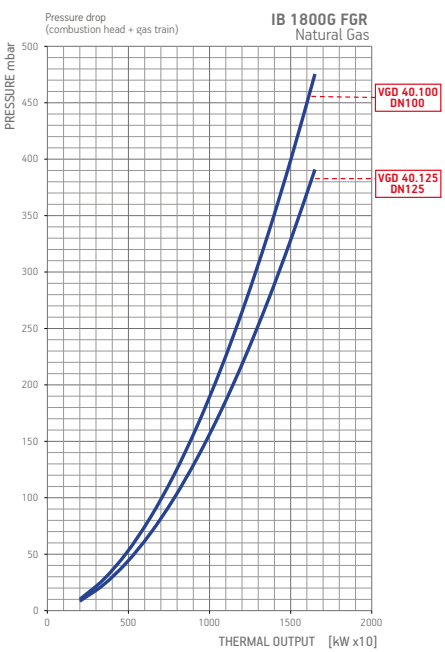

IB 550G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.050 2"
VGD 20.065 DN65
VGD 40.065 DN65
VGD 40.080 DN80
VGD 40.100 DN100

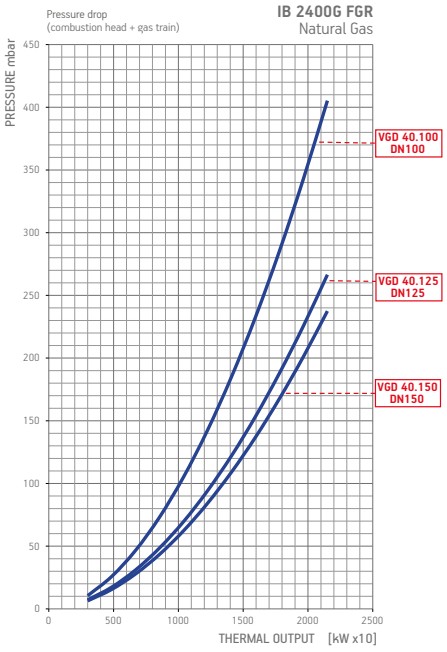

IB 850G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 40.065 DN65
VGD 40.080 DN80
VGD 40.100 DN100


IB 1000G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x1000]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125


IB 1200G FGR
Natural Gas
Pressure drop
(combustion head + gas train)
PRESSURE mbar
THERMAL OUTPUT [kW x10]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125

GAS TRAIN





BURNER/GAS TRAIN MATCH

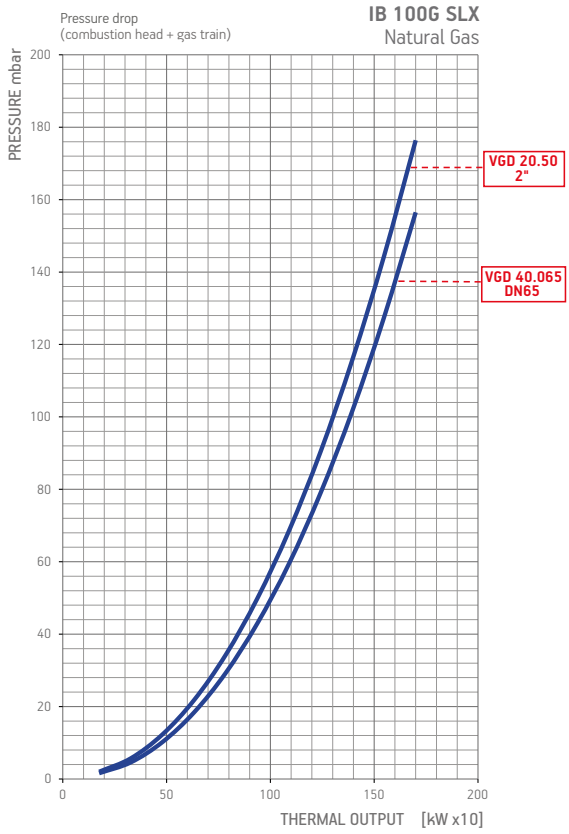
CE gas train version complies with EN676, EXP gas train version is for extra-European markets.

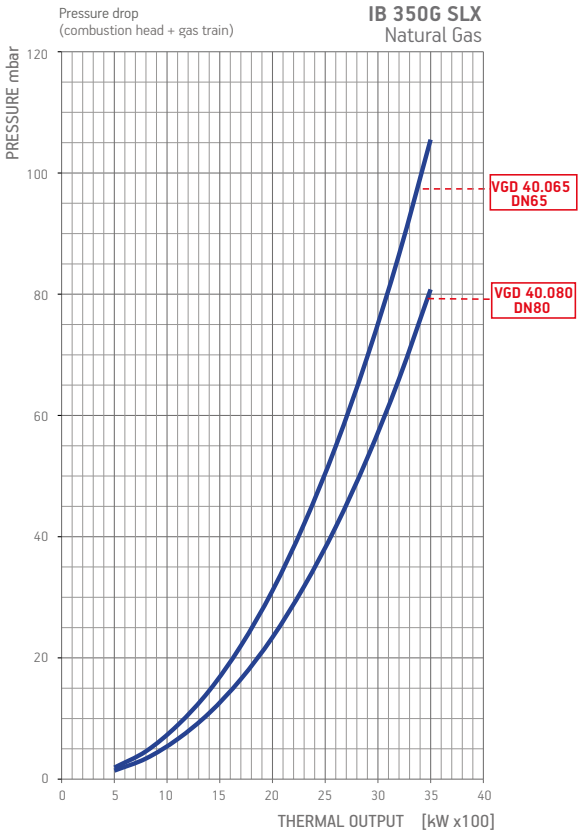
Burner model	Gas type	P.Max ** mbar	Execution	Gas train	Regulator with incorporated filter	Burner/gas train adapter	Valve tightness control kit	Pic.
				Part no.	Part no.	Part no.	Part no.	
IB 100G FGR	Natural gas	360	CTV	19990755	Included	–	Included	D2
		500	CTV	19990751	Included	–	Included	D4
		500	CTV	19990752	Included	–	Included	D4
		500	CTV	19990753	Included	–	Included	D4
IB 350G FGR	Natural gas	500	CTV	19990751	Included	96000035	Included	D4
		500	CTV	19990756	Included	-	Included	D4
		500	CTV	19990757	Included	-	Included	D4
IB 550G FGR	Natural gas	500	CTV	19990541	Included	–	Included	D4
		500	CTV	19990666	Included	–	Included	D4
		500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 850G FGR	Natural gas	500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 1000G FGR	Natural gas	500	CTV	19990633	Included	–	Included	D4
		500	CTV	19990634	Included	–	Included	D4
		500	CTV	19990674	Included	–	Included	D4
IB 1200G FGR	Natural gas	500	CTV	19990633	Included	–	Included	D4
		500	CTV	19990634	Included	–	Included	D4
		500	CTV	19990674	Included	–	Included	D4
IB 1800G FGR	Natural gas	500	CTV	19990732	Included	–	Included	D4
		500	CTV	19990733	Included	–	Included	D4
IB 2400G FGR	Natural gas	500	CTV	19990648	Included	–	Included	D4
		500	CTV	19990649	Included	–	Included	D4
		500	CTV	19990650	Included	–	Included	D4

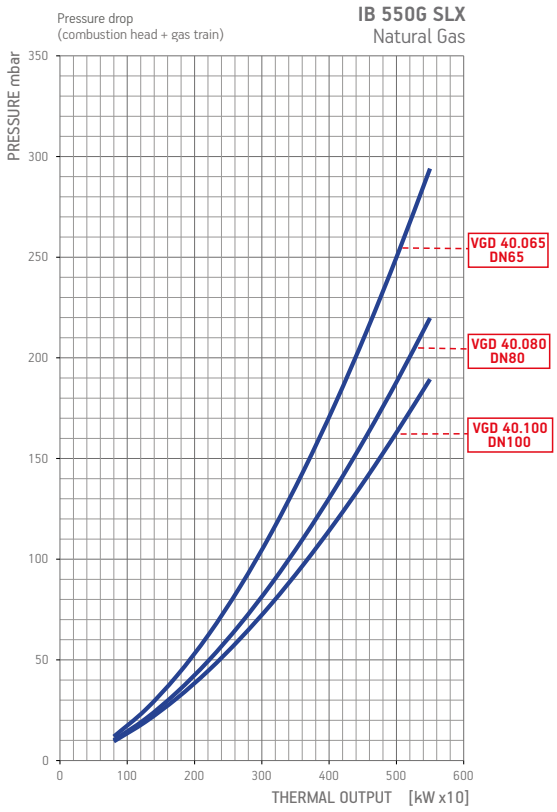
NOTE

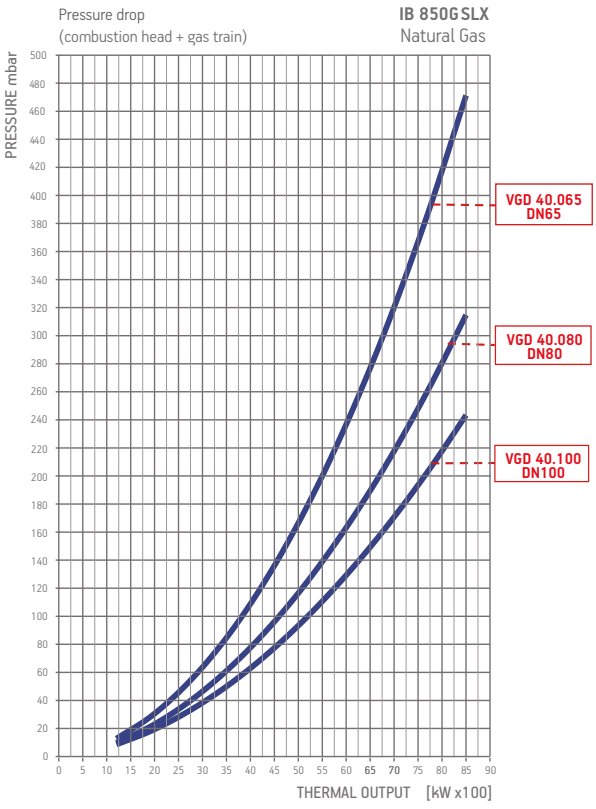
CTV Gas train with Valve Tightness Control.
**) Maximum gas inlet pressure at pressure regulator.

GAS TRAIN


Pressure drop
(combustion head + gas train)
IB 100G SLX
Natural Gas
PRESSURE mbar
200
180
160
140
120
100
80
60
40
20
0
0
50
100
150
200
THERMAL OUTPUT [kW x10]
VGD 20.50
2"
VGD 40.065
DN65


Pressure drop
(combustion head + gas train)
IB 350G SLX
Natural Gas
PRESSURE mbar
120
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
THERMAL OUTPUT [kW x100]
VGD 40.065
DN65
VGD 40.080
DN80


Pressure drop
(combustion head + gas train)
IB 550G SLX
Natural Gas
PRESSURE mbar
350
300
250
200
150
100
50
0
0
100
200
300
400
500
600
THERMAL OUTPUT [kW x10]
VGD 40.065
DN65
VGD 40.080
DN80
VGD 40.100
DN100


Pressure drop
(combustion head + gas train)
IB 850G SLX
Natural Gas
PRESSURE mbar
500
480
460
440
420
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
THERMAL OUTPUT [kW x100]
VGD 40.065
DN65
VGD 40.080
DN80
VGD 40.100
DN100

BURNER/GAS TRAIN MATCH

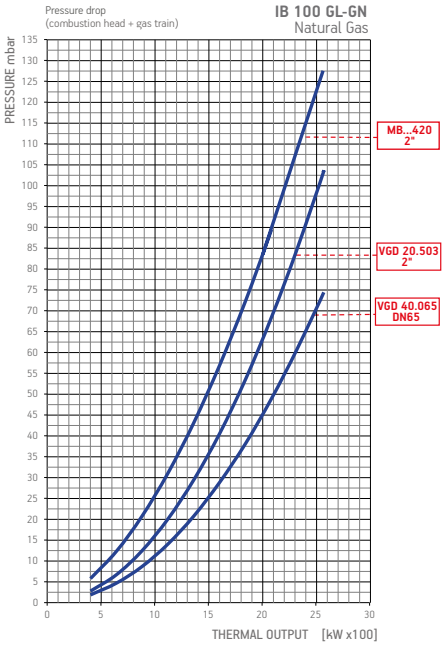
CE gas train version complies with EN676, EXP gas train version is for extra-European markets.

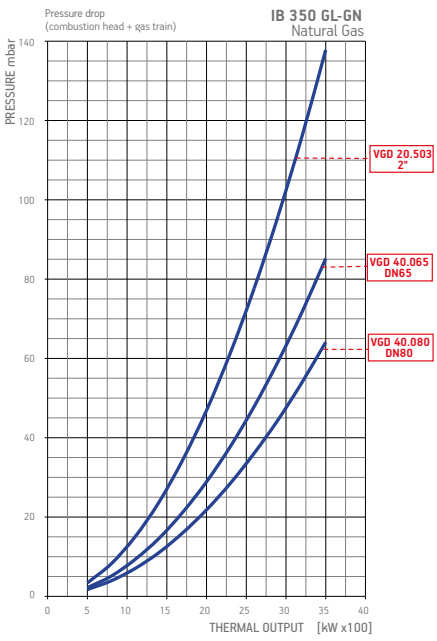
Burner model	Gas type	P.Max ** mbar	Execution	Gas train	Regulator with incorporated filter	Burner/gas train adapter	Valve tightness control kit	Pic.
				Part no.	Part no.	Part no.	Part no.	
IB 100G ME SLX	Natural gas	500	CTV	19990667	Included	–	Included	F1
		500	CTV	19990668	Included	–	Included	F1
IB 350G ME SLX	Natural gas	500	CTV	19990676	Included	–	Included	F1
		500	CTV	19990677	Included	–	Included	F1
IB 550G ME SLX	Natural gas	500	CTV	19990676	Included	–	Included	F1
		500	CTV	19990677	Included	–	Included	F1
		500	CTV	19990678	Included	–	Included	F1
IB 850G ME SLX	Natural gas	500	CTV	19990676	Included	–	Included	F1
		500	CTV	19990677	Included	–	Included	F1
		500	CTV	19990678	Included	–	Included	F1

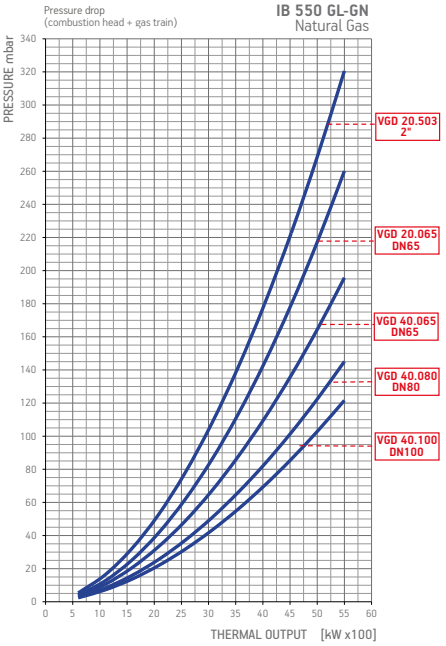
NOTE

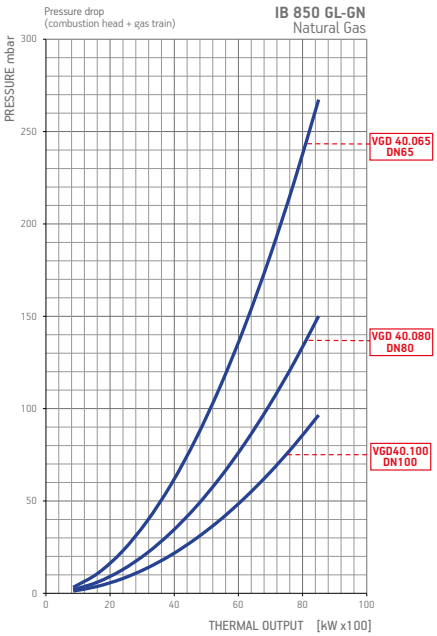
CTV Gas train with Valve Tightness Control.
**) Maximum gas inlet pressure at pressure regulator.

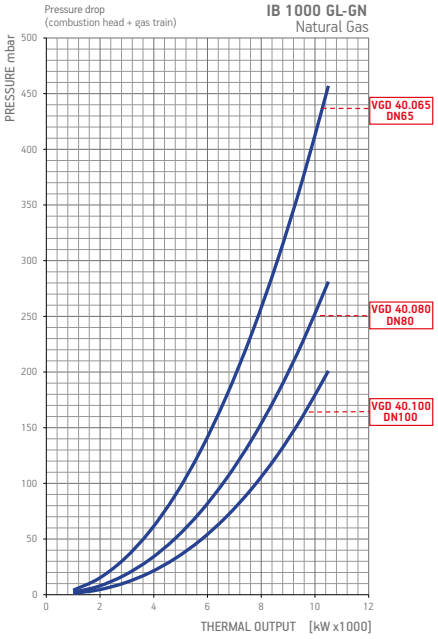
GAS TRAIN

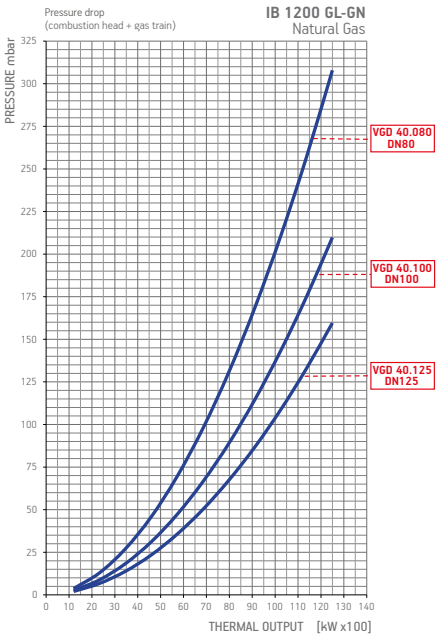

Pressure drop
(combustion head + gas train)
IB 100 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
MB...420 2"
VGD 20.503 2"
VGD 40.065 DN65


Pressure drop
(combustion head + gas train)
IB 350 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.503 2"
VGD 40.065 DN65
VGD 40.080 DN80

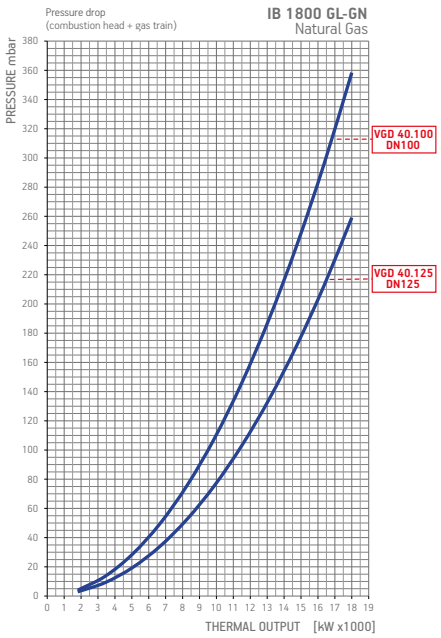

Pressure drop
(combustion head + gas train)
IB 550 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 20.503 2"
VGD 20.065 DN65
VGD 40.065 DN65
VGD 40.080 DN80
VGD 40.100 DN100

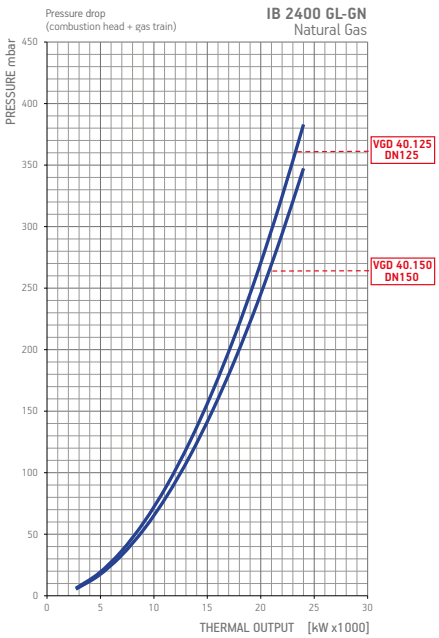

Pressure drop
(combustion head + gas train)
IB 850 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 40.065 DN65
VGD 40.080 DN80
VGD40.100 DN100


Pressure drop
(combustion head + gas train)
IB 1000 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x1000]
VGD 40.065 DN65
VGD 40.080 DN80
VGD 40.100 DN100


Pressure drop
(combustion head + gas train)
IB 1200 GL-GN
Natural Gas
PRESSURE mbar
THERMAL OUTPUT [kW x100]
VGD 40.080 DN80
VGD 40.100 DN100
VGD 40.125 DN125

GAS TRAIN





BURNER/GAS TRAIN MATCH

CE gas train version complies with EN676, EXP gas train version is for extra-European markets.

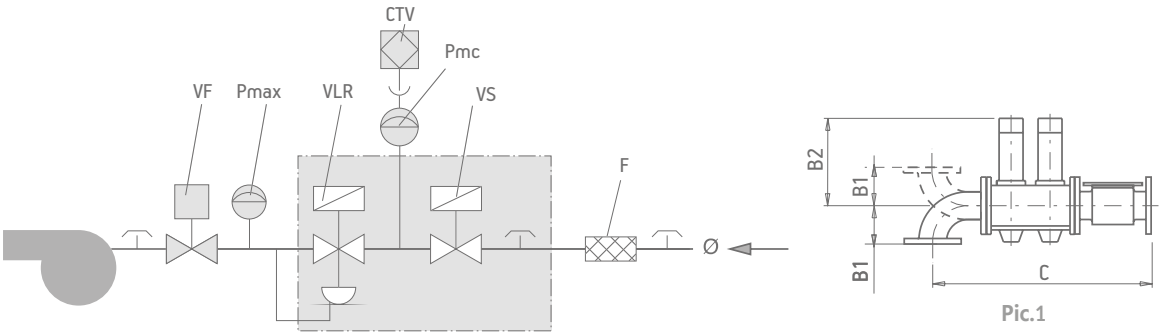
Burner model	Gas type	P.Max ** mbar	Execution	Gas train	Regulator with incorporated filter	Burner/gas train adapter	Valve tightness control kit	Pic.
				Part no.	Part no.	Part no.	Part no.	
IB 100 GL-GN	Natural gas	360	CTV	19990750	Included	–	Included	D2
		360	CTV	19990751	Included	–	Included	D4
		500	CTV	19990752	Included	–	Included	D4
IB 350 GL-GN	Natural gas	500	CTV	19990541	Included	–	Included	D4
		500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
IB 550 GL-GN	Natural gas	500	CTV	19990541	Included	–	Included	D4
		500	CTV	19990666	Included	–	Included	D4
		500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 850 GL-GN	Natural gas	500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 1000 GL-GN	Natural gas	500	CTV	19990542	Included	–	Included	D4
		500	CTV	19990543	Included	–	Included	D4
		500	CTV	19990544	Included	–	Included	D4
IB 1200 GL-GN	Natural gas	500	CTV	19990606	Included	–	Included	D4
		500	CTV	19990607	Included	–	Included	D4
		500	CTV	19990608	Included	–	Included	D4
IB 1800 GL-GN	Natural gas	500	CTV	19990640	Included	–	Included	D4
		500	CTV	19990641	Included	–	Included	D4
IB 2400 GL-GN	Natural gas	500	CTV	19990649	Included	–	Included	D4
		500	CTV	19990650	Included	–	Included	D4

NOTE

CTV Gas train with Valve Tightness Control.
**) Maximum gas inlet pressure at pressure regulator.

GAS TRAIN STRUCTURE AND COMPOSITION

D4



Pic.1

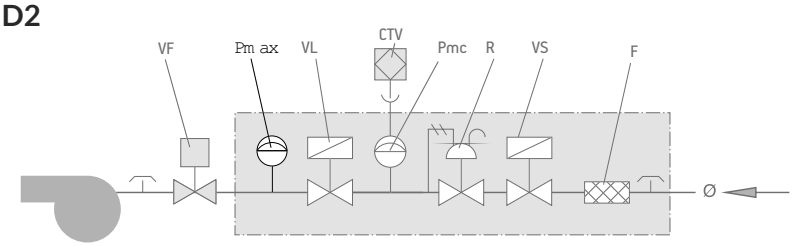
Gas train Part no.	Position								Gas train dimensions mm			Size of packaging mm	Weight	Pic.
	CTV	F	Pmax	Pmc	VF	VLR	VS	Ø	B1	B2	C	L x P x H	kg	
19990541 (VGD20.503 - 2")	●	2"	●	●	◆	●	●	2"	145	285	890	990 x 300 x 500	23	1
19990542 (VGD40.065 - 2"1/2)	●	DN65	●	●	◆	●	●	DN65	135	320	970	1380 x 430 x 700	36	1
19990543 (VGD40.080 - 3")	●	DN80	●	●	◆	●	●	DN80	135	325	1010	1380 x 430 x 700	38	1
19990544 (VGD40.100 - 4")	●	DN100	●	●	◆	●	●	DN100	175	330	1100	1380 x 430 x 700	44	1
19990606 (VGD40.080 - 3")	●	DN80	●	●	◆	●	●	DN80	165	325	1015	1380 x 430 x 700	38	1
19990607 (VGD40.100 - 4")	●	DN100	●	●	◆	●	●	DN100	175	330	1100	1380 x 430 x 700	44	1
19990608 (VGD40.125 - 5")	●	DN125	●	●	◆	●	●	DN125	170	350	1275	1580 x 430 x 720	60	1
19990633 (VGD40.080 - F080)	●	DN80	●	●	◆	●	●	DN80	132	314	1006	1380 x 430 x 600	15	1
19990634 (VGD40.100 - F080)	●	DN100	●	●	◆	●	●	DN100	163	331	1096	1380 x 430 x 610	30	1
19990640 (VGD40.100 - 4")	●	DN100	●	●	◆	●	●	DN100	175	330	1100	1380 x 430 x 700	44	1
19990641 (VGD40.125 - 5")	●	DN125	●	●	◆	●	●	DN125	170	350	1275	1580 x 430 x 720	60	1
19990648 (VGD40.100 - 4")	●	DN100	●	●	◆	●	●	DN100	200	330	1260	1380 x 430 x 710	45	1
19990649 (VGD40.125 - 5")	●	DN125	●	●	◆	●	●	DN125	207	350	1312	1580 x 430 x 740	83	1
19990650 (VGD40.150 - 6")	●	DN150	●	●	◆	●	●	DN150	200	370	1485	1580 x 430 x 740	95	1
19990666 (VGD20.065 - 2"1/2)	●	DN65	●	●	◆	●	●	DN65	135	285	1120	1380 x 430 x 700	45	1
19990674 (VGD40.125 - F080)	●	DN125	●	●	◆	●	●	DN125	163	349	1173	1580 x 430 x 700	42	1
19990732 (VGD40.100 - F100)	●	DN100	●	●	◆	●	●	DN100	170	525	1100	1380 x 430 x 700	40	1
19990733 (VGD40.125 - F100)	●	DN125	●	●	◆	●	●	DN125	170	525	1280	1380 x 430 x 700	42	1
19990751 (VGD20.050-R2)	●	2"	●	●	◆	●	●	2"	114	285	890	990 x 300 x 500	14	1
19990752 (VGD40.065-R2)	●	DN65	●	●	◆	●	●	DN65	114	320	1120	1380 x 430 x 700	26	1
19990753 (VGD40.080 - R2)	●	DN80	●	●	◆	●	●	DN80	114	320	1190	1380 x 430 x 700	30	1
19990756 (VGD40.065-F065)	●	DN65	●	●	◆	●	●	DN65	125	320	760	1030 x 430 x 650	50	1
19990757 (VGD40.080-F065)	●	DN80	●	●	◆	●	●	DN80	175	325	860	1030 x 430 x 650	57	1

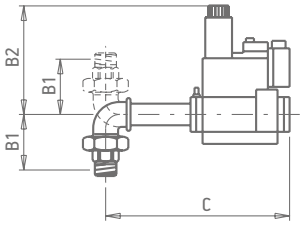
CTV Valve tightness control.
F Filter.
LDU LDU valve tightness control.
Pct Pressure switch for gas control.
Pmax Maximum pressure switch.
Pmc Minimum and control pressure switch gas leaks.
Pmin Minimum pressure switch.
R Pressure regulator.
RF Pressure regulator with filter.
RFP Pressure regulator with filter for pilot gas train.
RM Manual flow rate regulator.
RP Pneumatic regualtor.
VF Regulator throttle valve.
VL Operating valve.
VL2 Two-stage operating valve.
VLP Operating pilot valve.
VLR Operating valve with pressure regulator.
VP Pilot valve.
VPS VPS valve tightness control.
VS Safety valve.
VSP Safety pilot valve.
Ø Gas train diameter.
Ø1 Main gas train diameter.
Ø2 Pilot gas train diameter.

● As Standard.
▲ As standard for burners with an output of more than 1200 kW, on request for burners with an output of less than 1200 kW.
■ On request.
◆ Mounted on burner.

GAS TRAIN STRUCTURE AND COMPOSITION

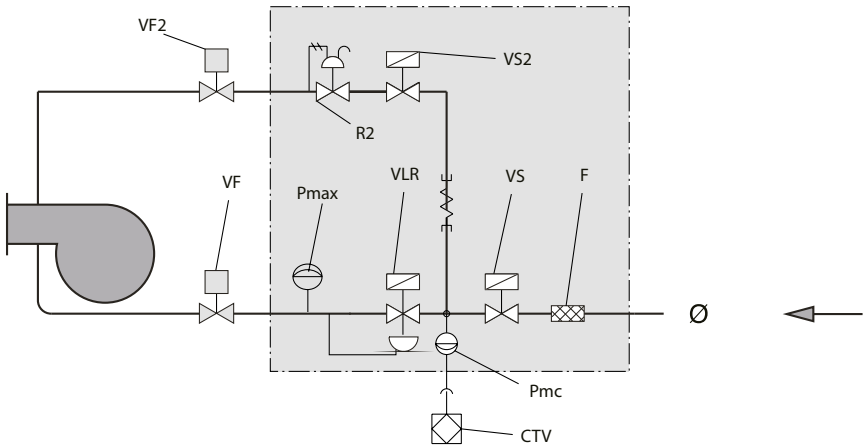
D2

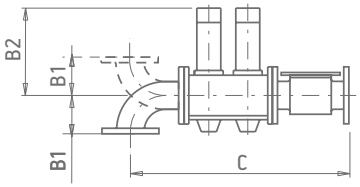




Gas train Part no.	Position									Gas train dimensions mm			Size of packaging mm	Weight
	CTV	F	Pmax	Pmc	R	VF	VL	VS	Ø	B1	B2	C	L x P x H	kg
19990750 (MM420G20S-R2)	●	●	●	●	◆	◆	●	●	2"	114	220	500	520 x 410 x 410	13
19990755 (MM420G50S-R2)	●	●	●	●	●	◆	●	●	2"	114	220	520	520 x 410 x 410	13

F1





Pic. 1

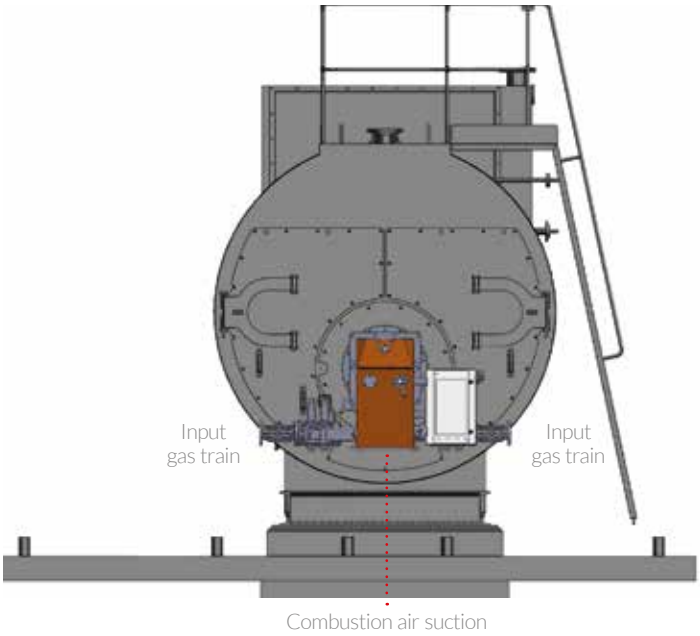
Gas train Part no.	Position											Gas train dimensions mm			Size of packaging mm	Weight	Pic.
	CTV	F	Pmax	Pmc	VF	VF2	VLR	VS	R2	VS2	Ø	B1	B2	C	L x P x H	kg	
19990667 (MM20.503F250S-SLX)	●	2"	●	●	◆	◆	●	●	●	●	2"	165	278	755	990 x 300 x 500	23	1
19990668 (MM40.065F250S-SLX)	●	DN65	●	●	◆	◆	●	●	●	●	DN65	165	302	784	1380 x 430 x 700	36	1
19990676 (VGD40.065-2"1/2)	●	DN65	●	●	◆	◆	●	●	●	●	DN65	131	303	969	1380 x 430 x 700	40	1
19990677 (VGD40.080-3")	●	DN80	●	●	◆	◆	●	●	●	●	DN80	131	313	1004	1380 x 430 x 700	42	1
19990678 (VGD40.100-4")	●	DN100	●	●	◆	◆	●	●	●	●	DN100	163	331	1096	1380 x 430 x 700	48	1

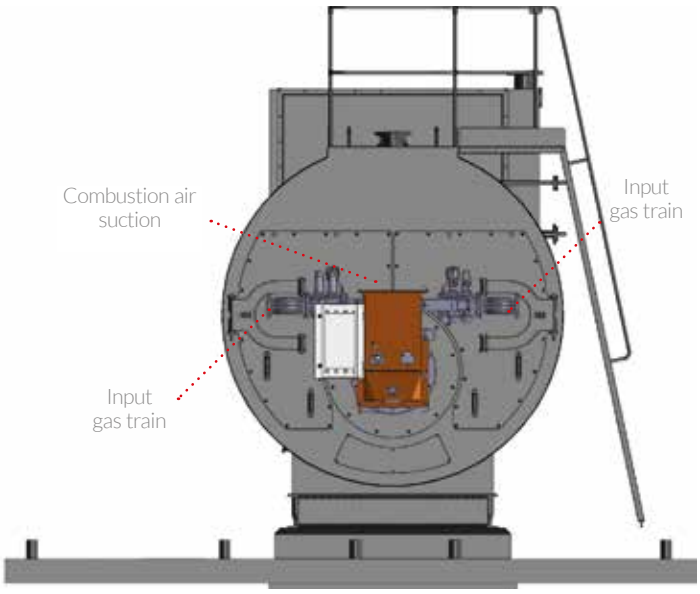
CTV Valve tightness control.
F Filter.
LDU LDU valve tightness control.
Pct Pressure switch for gas control.
Pmax Maximum pressure switch.
Pmc Minimum and control pressure switch gas leaks.
Pmin Minimum pressure switch.
R Pressure regulator.
RF Pressure regulator with filter.
RFP Pressure regulator with filter for pilot gas train.
RM Manual flow rate regulator.
RP Pneumatic regualtor.
VF Regulator throttle valve.
VL Operating valve.
VL2 Two-stage operating valve.
VLP Operating pilot valve.
VLR Operating valve with pressure regulator.
VP Pilot valve.
VPS VPS valve tightness control.
VS Safety valve.
VSP Safety pilot valve.
Ø Gas train diameter.
Ø1 Main gas train diameter.
Ø2 Pilot gas train diameter.

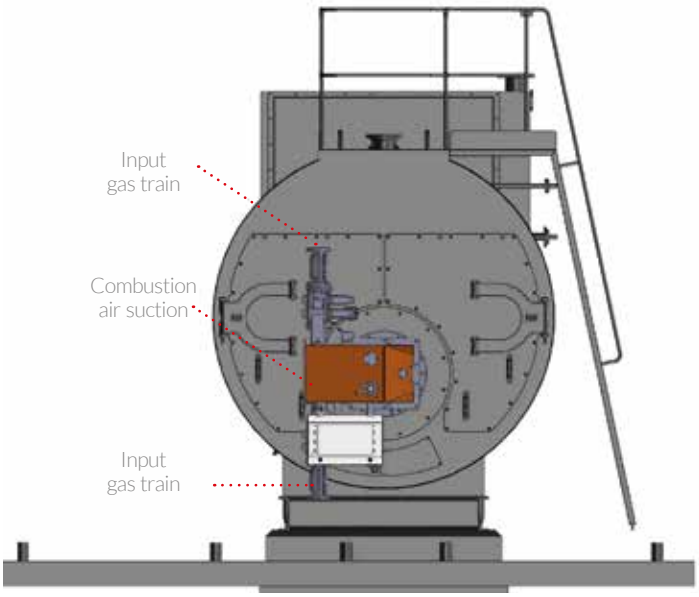
● As Standard.
▲ As standard for burners with an output of more than 1200 kW, on request for burners with an output of less than 1200 kW.
■ On request.
◆ Mounted on burner.

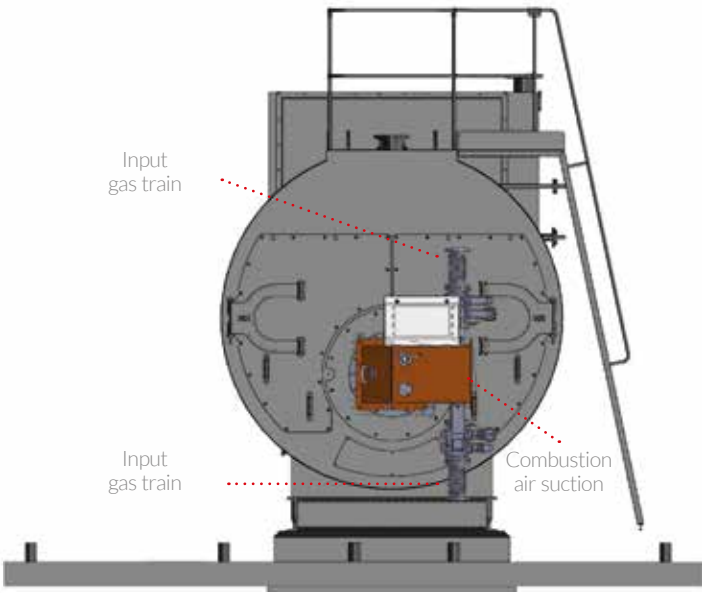
GAS TRAIN AND BURNER DIRECTION

The burners of the IB series are designed to be absolutely versatile, therefore with the possibility of being installed on the heat generator in various directions, as represented in the figures below:



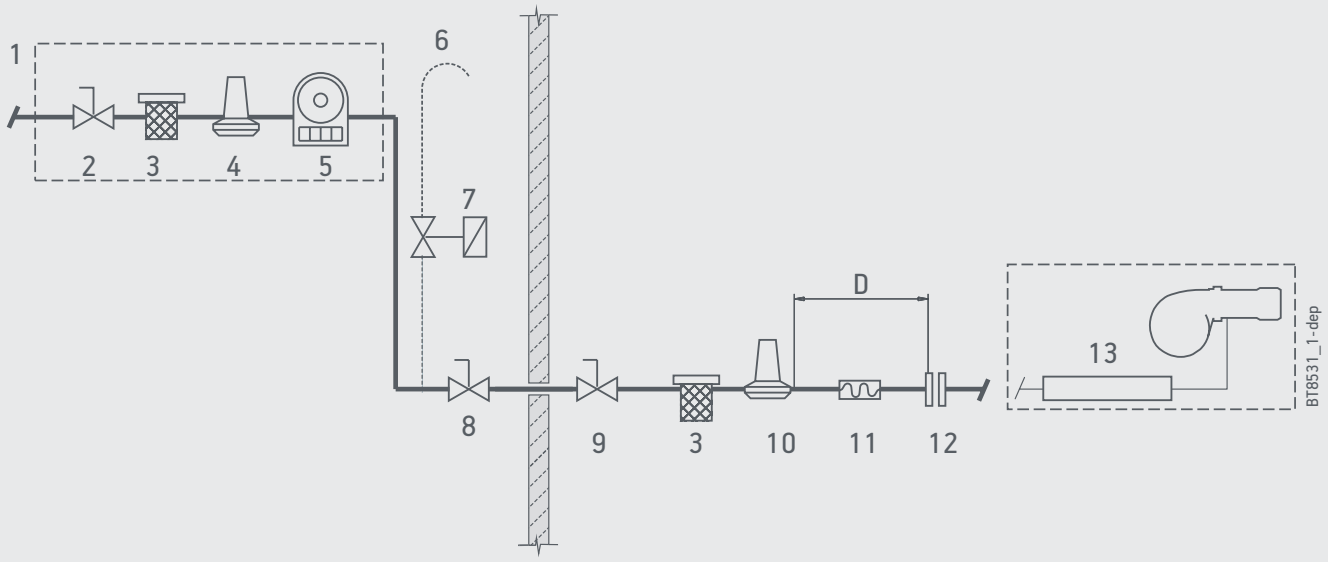




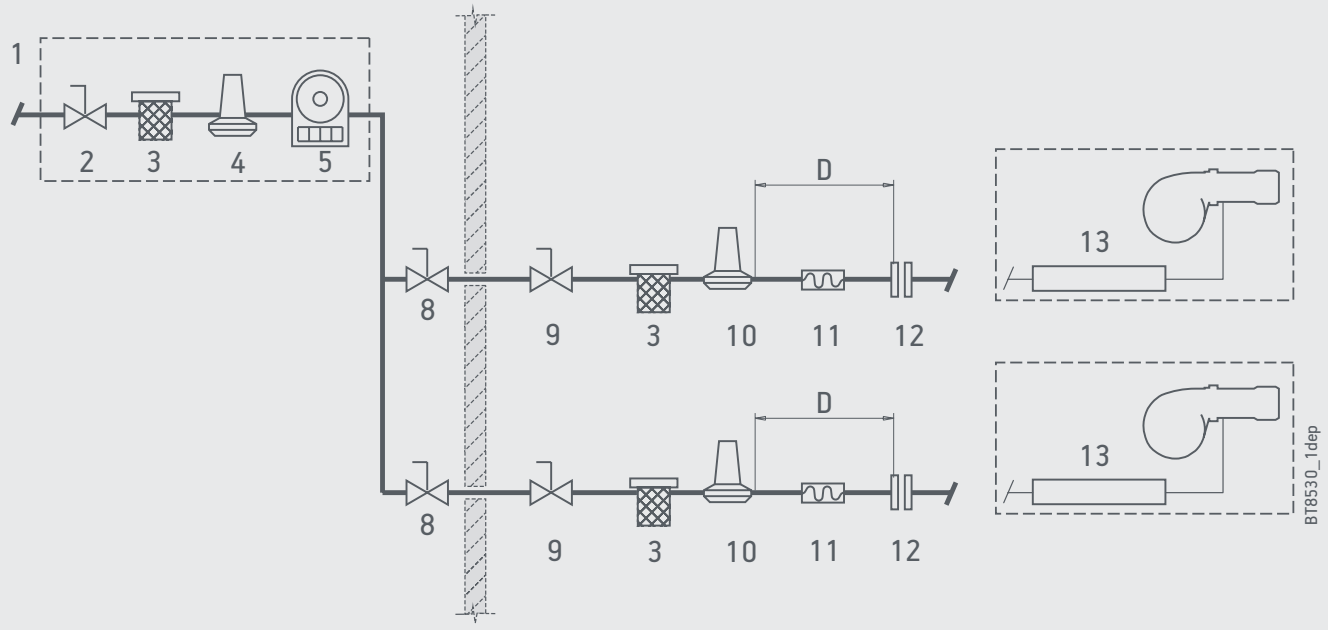


CONNECTION DIAGRAMS

SCHEMATIC DIAGRAM FOR CONNECTING A BURNER TO THE MEDIUM PRESSURE GAS SUPPLY NETWORK.



SCHEMATIC DIAGRAM FOR CONNECTING A BURNER TO THE MEDIUM PRESSURE GAS SUPPLY NETWORK.

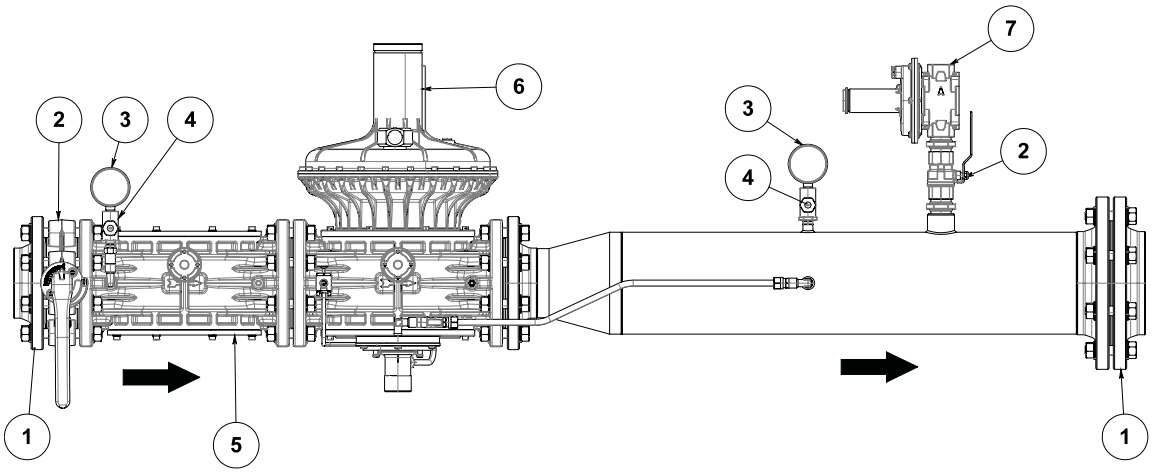


LEGEND:

1 Measuring and reducing unit.
2 Shut-off cock.
3 Gas filter.
4 Pressure reducer.
5 Meter.
6 Wire mesh flame trap at the outlet to the atmosphere.
7 Automatic vent valve, if necessary (it should discharge outside in a suitable place).
8 Emergency shut-off valve
9 Ball valve.
10 Pressure reducer (suitable for the specific case).
11 Anti-vibration joint.
12 Flanged coupling.
13 Gas train.
D Distance between pressure stabilizer (or regulator/ stabilizer) and gas valves at least 1.5 - 2 m.

SKID GAS

PRESSURE REDUCING UNIT



LEGEND

1 Welding Counterflange
2 Ball Valve
3 Pressure gauge
4 Pressure gauge Holder
5 Gas Filter
6 Gas Pressure Regulator
7 Relief valve

PRU 1"- 1" 1/4 6 BAR

Cod. 69850020	Max Inlet Pressure (bar)	Outlet pressure (mbar)
Gas speed= 30 m/s	6	200
Max Gas Flow rate (Nm3/h)	100	

PRU 1" 1/2- 2" 6 BAR

Cod. 69850021	Max Inlet Pressure (bar)	Outlet pressure (mbar)	Max Inlet Pressure (bar)	Outlet pressure (mbar)
Gas speed= 30 m/s	6	200	6	300
Max Gas Flow rate (Nm3/h)	260		280	

PRU DN50 - DN65 6 BAR

Cod. 69850022	Max Inlet Pressure (bar)	Outlet pressure (mbar)
Gas speed= 30 m/s	6	300
Max Gas Flow rate (Nm3/h)	475	

PRU DN80 - DN100 6 BAR

Cod. 69850023	Max Inlet Pressure (bar)	Outlet pressure (mbar)	Max Inlet Pressure (bar)	Outlet pressure (mbar)
Gas speed= 30 m/s	6	300	6	450
Max Gas Flow rate (Nm3/h)	1100		1260	

PRU DN100 - DN150 6 BAR

Cod. 69850024	Max Inlet Pressure (bar)	Outlet pressure (mbar)	Max Inlet Pressure (bar)	Outlet pressure (mbar)
Gas speed= 30 m/s	6	300	6	450
Max Gas Flow rate (Nm3/h)	2500		2800	

*Higher flow rates with speeds up to 50 m/s are available on request, subject to verification with local regulations.
For dimensioning, please contact technical department.

EXAMPLE Burner power: **24850 kw 2500 Nm³/h**
Pressione alimentazione gas: **6 bar**

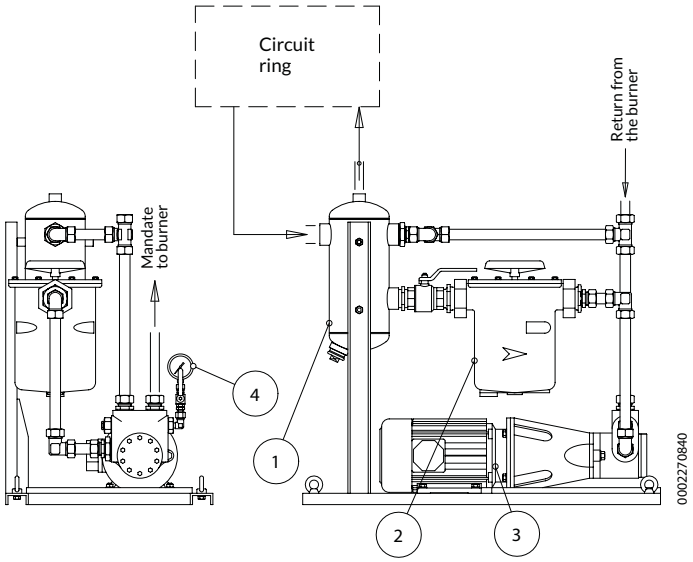
SKID: **PRU DN100-DN150 2800 Nm³/h** adjustment of the flow regulator's spring at 300mbar of outlet pressure.

PUMPING CONTROL UNIT

Model	CSG	CSOE	CSOEV
Description	Pumping unit for light oil	Pumping unit for heavy oil with electric pre-heating	Pumping unit for heavy oil with mixed electric-steam pre-heating
Supply Status	Fully assembled on metal frame	Fully assembled on metal frame	Fully assembled on metal frame
Maximum viscosity	1,5 E° at 50°C	100 E° at 50°C	100 E° at 50°C
Recovery and degasing tank	●	●	●
Self-Cleaning filter	●	●	●
Pump motor with pressure regulator	●	●	●
Pressure Gauge (40 bar)	●	●	●
Inlet / Exit ball valve	●	●	●
Water purging ball valve	●	●	●
Oil drain tank	●	●	●
Level Sensor for drain tank	○	○	○
Pressure Switch	○	●	●
Non-return valve	○	●	●
Differential pressure switch (For Filter)	○	○	○
Ball valve with micro switch	○	○	○
Maximum thermostat		●	●
Thermostat probe		●	●
Temperature probe		●	●
Electric heaters		●	●
Electronic regulator with digital interface and password protection		●	●
Steam heater			●
Temperature probe for steam heater			●
Steam filter			●
Condensating drain			●
Steam ball valve			●
Heated connection piping		○	○
Insulated electric pre-heater		○	○
Insulated steam pre-heater			○

● Standard ○ Optional

PUSHING UNIT FOR LIGHT OIL (CSG)



Supply status for electric pumping unit fully assembled on metal frame.

When ordering, please indicate the control unit model chosen.

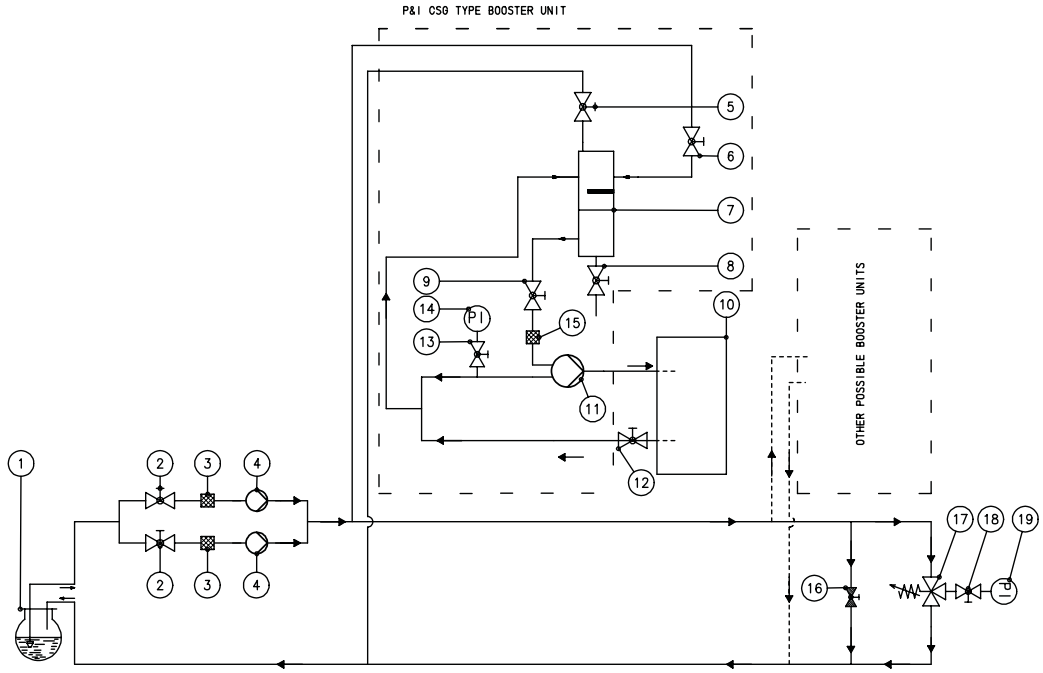
LEGEND

1 Recovery and degassing tank.
2 Fuel self-cleaning filter.
3 Burner pump motor with incorporated pressure regulator.
4 Pressure gauge (40 bar).

NOTE

- Non-insulated degasser tank, threaded version with drainage tap.

HYDRAULIC DIAGRAM OF CSG



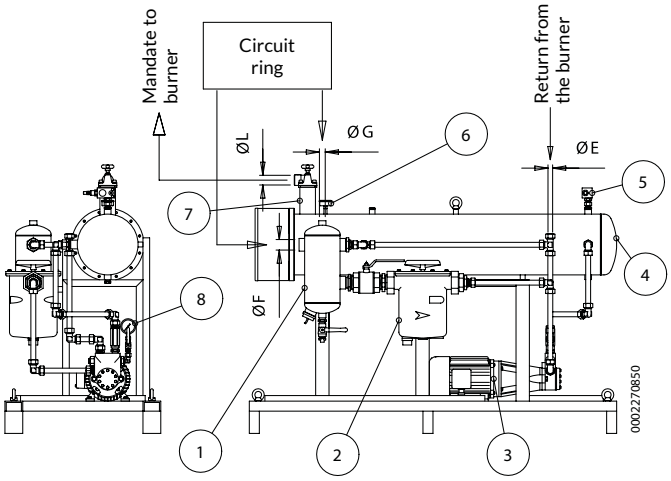
LEGEND

1 Main tank
2 Ball valve
3 Filter
4 Fuel pumping unit
5 Air/gas exhaust ball valve
6 Ball valve for light oil inlet
7 Degasator
8 Manual ball valve water discharge
9 Burner outlet ball valve
10 Burner
11 Pump unit with pressure regulator
12 Ball valve for burner return
13 Ball valve
14 Pressure gauge for pump return
15 Gasoil filter
16 Manually operated by-pass ball valve
17 Ring pressure regulator
18 Ball valve
19 Pressure gauge

Scope of supply

Model	Max Power (kW)	Pump flow rate at 25 bar (l/h)	Electrical Supply (V/Hz)	Motor revolution speed (rpm)	Motor pump (Kw)	Self cleaning filter (Ø)	Pipe diameter (Ø)
CSG 180	2000	260	400/50	3000	0,75	1-1/4”	15
CSG 200	2500	560	400/50	1500	1,1	1-1/2”	15
CSG 250	3000	700	400/50	1500	2,2	1-1/2”	22
CSG 450	5500	1300	400/50	1500	2,2	1-1/2”	22
CSG 650	8000	1800	400/50	1500	2,2	1-1/2”	22
CSG 850	10000	2375	400/50	1500	4	2”	28
CSG 1150	13500	3200	400/50	1500	4	2”	28
CSG 1350	16000	3800	400/50	1500	5,5	2”	28
CSG 1850	22000	5150	400/50	1500	7,5	2”	28
CSG 2150	25500	6000	400/50	1500	9,2	2”	28
CSG 2850	34000	7920	400/50	3000	11	DN50	DN32
CSG 3700	44000	10260	400/50	3000	11	DN50	DN32
CSG 4600	54500	12780	400/50	3000	15	DN50	DN32
CSG 6300	75000	17400	400/50	3000	18,5	DN50	DN32

PUSHING UNIT FOR HEAVY OIL, ELECTRIC VERSION (CSOE)



Supply status for electric pumping unit fully assembled on metal frame.

When ordering, please indicate the control unit model chosen.

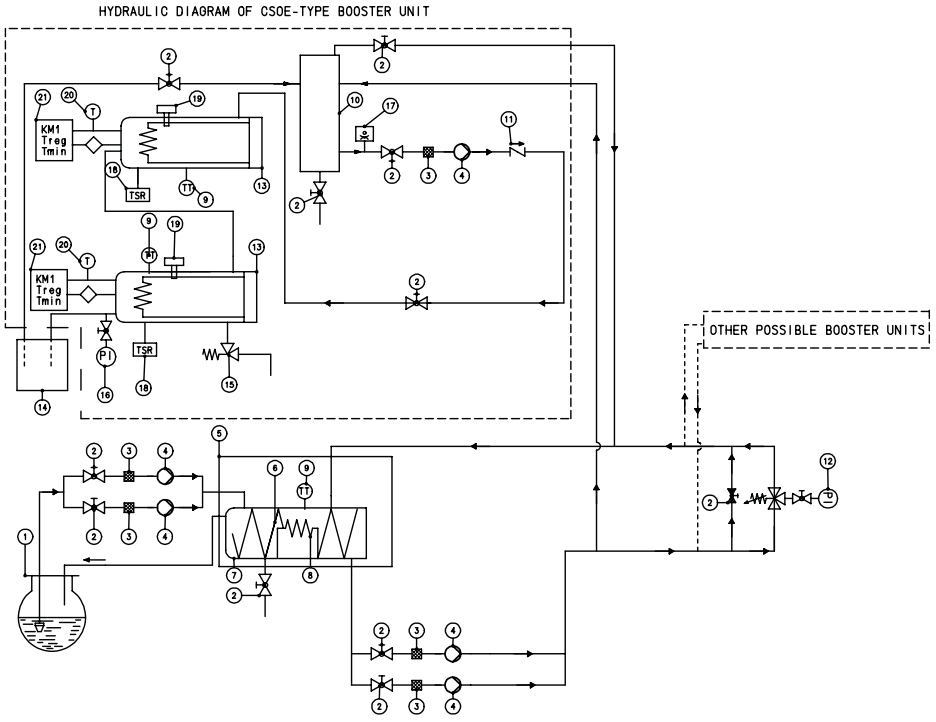
LEGEND

1 Recovery and degassing tank.
2 Fuel self-cleaning filter.
3 Burner pump motor with incorporated pressure regulator.
4 Electric pre-heaters.
5 Pre-heater safety valve (adjusted to 35 bars).
6 Thermometer.
7 Outlet self-cleaning filter.
8 Manometer (40 bar).

NOTE

- Non-insulated degasser tank, threaded version with drainage tap.

HYDRAULIC DIAGRAM OF CSOE



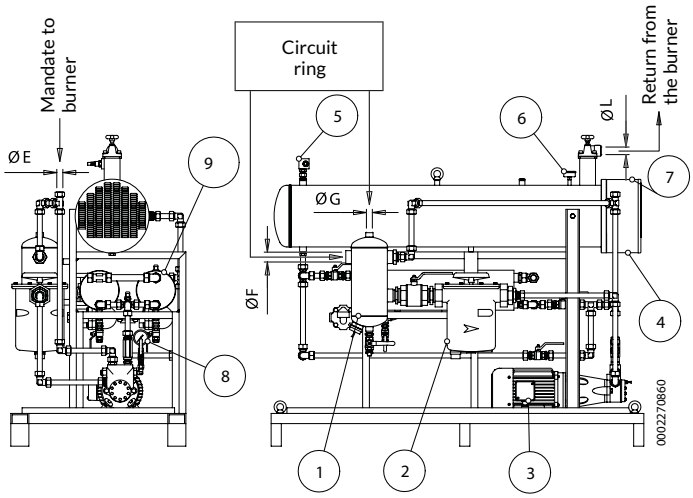
LEGEND

1 Main tank
2 Heavy oil ball valve
3 Heavy oil filter
4 Fuel pumping unit
5 Auxiliary service tank
6 Steam coil
7 Heavy oil heating tank electric/steam or both
8 Electrical starting resistance
9 Temperature probe
10 Degassing tank
11 Heavy oil non-return valve
12 Heavy oil pressure regulator
13 Electric oil preheater, set to 30 bar
14 Burner
15 Safety heavy oil valve
16 Heavy oil pressure gauge
17 Heavy oil pressure switch
18 Maximum thermostat
19 Autocleaning filter
20 Thermostat probe PT100
21 Electronic regulator KM1

– – Scope of supply

Model	Max Power (kW)	Pump flow rateat 25 bar (l/h)	Electrical Supply (V/Hz)	Motor revolution speed (rpm)	Motor pump (Kw)	Self cleaning filter (Ø)	Pipe diameter (Ø)	Electrical preheating (Kw)
CSOE 200	2000	560	400/50	1500	1,1	2”	15	15
CSOE 250	2500	700	400/50	1500	2,2	2”	22	28,5
CSOE 500	5500	1300	400/50	1500	2,2	2”	22	28,5
CSOE 900	10000	2375	400/50	1500	4	2”	22	40
CSOE 1200	13500	3200	400/50	1500	4	2”	22	40
CSOE 2000	22500	5150	400/50	1500	7,5	2”	28	40
CSOE 2400	27000	6000	400/50	1500	9,2	2”	28	40
CSOE 3500	39000	8820	400/50	3000	11	DN50	32	40
CSOE 4700	52500	11820	400/50	3000	15	DN50	32	40

PUSHING UNIT FOR HEAVY OIL, MIXED ELECTRIC STEAM VERSION (CSOEV)



Supply status for electric pumping unit fully assembled on metal frame.

When ordering, please indicate the control unit model chosen.

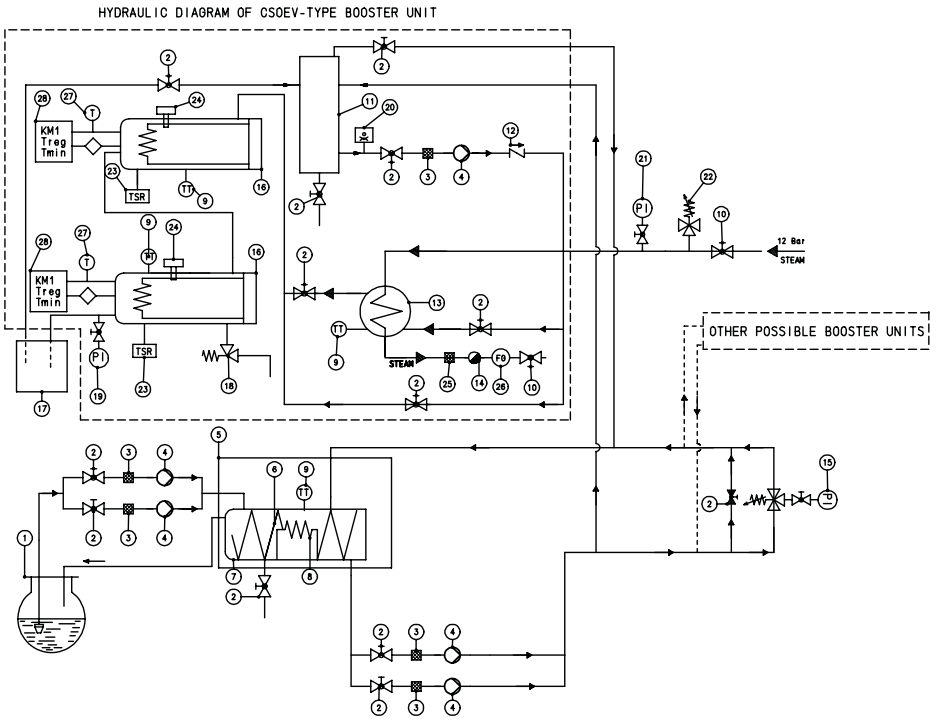
LEGEND

1 Recovery and degassing tank.
2 Fuel self-cleaning filter.
3 Burner pump motor with incorporated pressure regulator.
4 Electric pre-heaters.
5 Pre-heater safety valve (adjusted to 35 bars).
6 Thermometer.
7 Outlet self-cleaning filter.
8 Manometer (40 bar).
9 Steam pre-heater.

NOTE

- Non-insulated degasser tank, threaded version with drainage tap.

HYDRAULIC DIAGRAM OF CSOEV



LEGEND

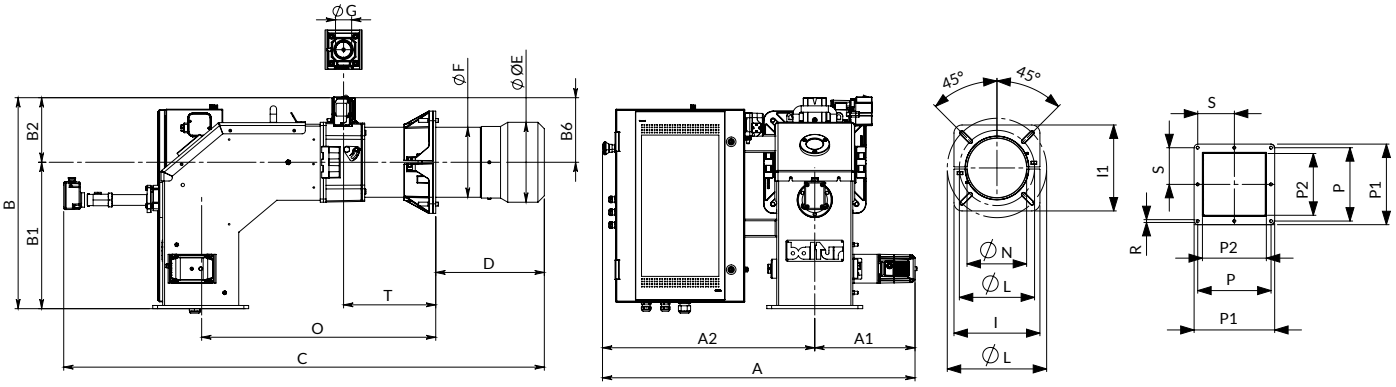
1 Main oil tank
2 Heavy oil ball valve
3 Heavy oil filter
4 Fuel pumping unit
5 Auxiliary service tank
6 Steam coil
7 Heavy oil heating tank electric/steam or both
8 Electrical starting resistance
9 Temperature probe
10 Steam ball valve
11 Degassing tank
12 Heavy oil non-return valve
13 Steam preheating
14 Condensating drain
15 Heavy oil pressure regulator
16 Electric oil preheater, set to 30 bar
17 Burner
18 Safety heavy oil valve
19 Heavy oil pressure gauge
20 Heavy oil pressure switch
21 Steam pressure gauge
22 Steam pressure regulator (set to 1-8 bar)
23 Maximum thermostat
24 Autocleaning filter
25 Steam filter
26 Condensation passage indicator
27 Thermostat probe PT100
28 Electronic regulator KM1

– – Scope of supply

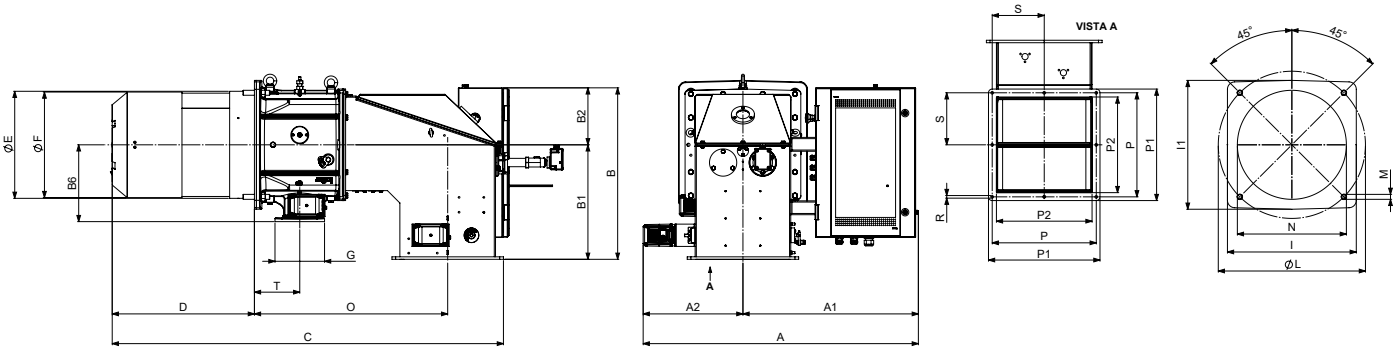
Model	Max Power (kW)	Pump flow rateat 25 bar (l/h)	Electrical Supply (V/Hz)	Motor revolution speed (rpm)	Motor pump (Kw)	Self cleaning filter (Ø)	Pipe diameter (Ø)	Electrical preheating (Kw)	Steam preheating (NR)
CSOEV 200	2000	560	400/50	1500	1,1	2”	15	15	1
CSOEV 250	2500	700	400/50	1500	2,2	2”	22	28,5	1
CSOEV 500	5500	1300	400/50	1500	2,2	2”	22	28,5	1
CSOEV 900	10000	2375	400/50	1500	4	2”	22	40	2
CSOEV 1200	13500	3200	400/50	1500	4	2”	22	40	2
CSOEV 2000	22500	5150	400/50	1500	7,5	2”	28	40	3
CSOEV 2400	27000	6000	400/50	1500	9,2	2”	28	40	4
CSOEV 3500	39000	8820	400/50	3000	11	DN50	32	40	5

BURNERS DIMENSIONS

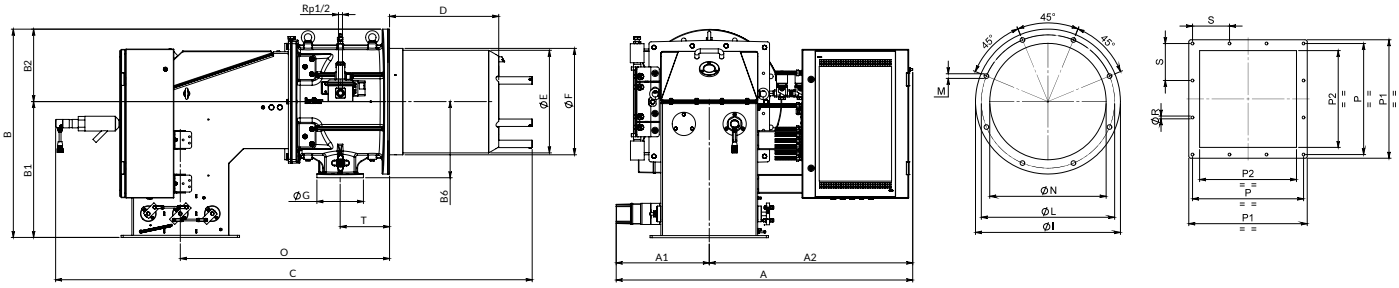
IB 100G - 350G GAS



IB 550G - 850G - 1000G - 1200G GAS



IB 1800G - 2400G GAS

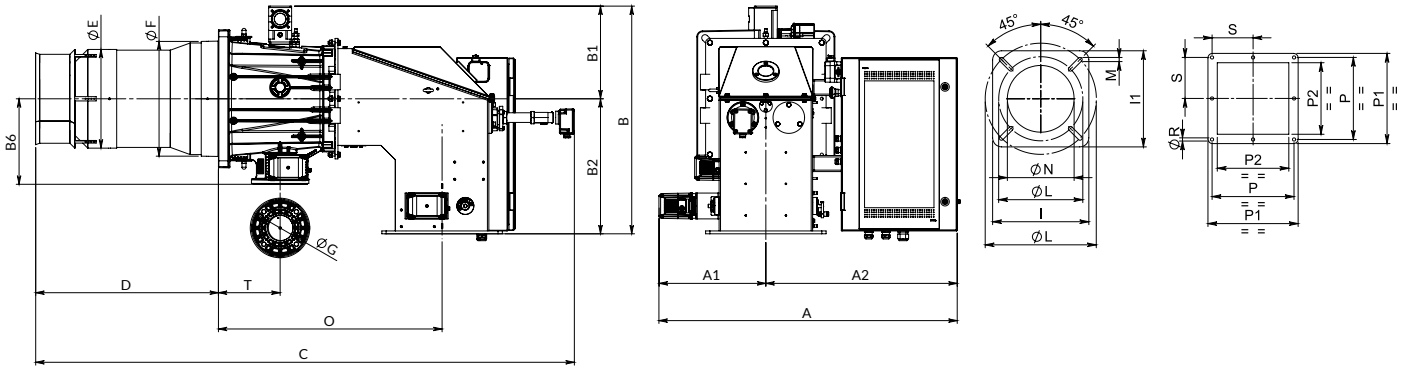


Model	BURNER SIZE								HEAD SIZE				BOILER mounting FLANGE						Burners connection FLANGE					
	A	A1	A2	B	B1	B2	B6	C	D	E	F	G	I	I1	L	M	N	O	P	P1	P2	R	S	T
IB100G	1079	314	765	660	458	202	200	1467	200-450	250	219	G2"	320	320	Ø280-Ø370	M12	255	609 - 859	273	300	238	10,5	137	165,3 - 415,3
IB350G	1079	314	765	660	458	202	200	1477	200-450	270	219	DN65	320	320	Ø310-Ø370	M12	275	624 - 874	273	300	238	10,5	137	172 - 422
IB550G	1168	360	808	755	471	284	298	1870	624	397	400	DN80	480	480	Ø520-Ø600	M20	415	795	390	420	320	10,5	195	223
IB850G	1211	403	808	748	462	286	310	1848	574	418	432	DN80	520	520	Ø520-Ø600	M20	440	780	420	450	386	10,5	210	183
IB1000G	1211	403	808	748	462	286	310	1820	574	425	432	DN80	520	520	Ø594	M20	440	780	420	450	386	10,5	210	183
IB 1200G	1211	403	808	748	462	286	310	1820	574	425	432	DN80	520	520	Ø594	M20	440	780	420	450	386	10,5	210	183
IB 1800G	1402	440	962	985	642	343	359	2253	516	485	503	DN100	685	685	Ø630	M20	535	989,4	525	560	450	13	175	233,5
IB 2400G	1552	515	1037	1124	725	399	467	2693	610,4	600	625	DN 125	790	790	Ø730	M20	670	1212	658,5	708,5	600	14	219,5	258

BURNERS DIMENSIONS

SLX

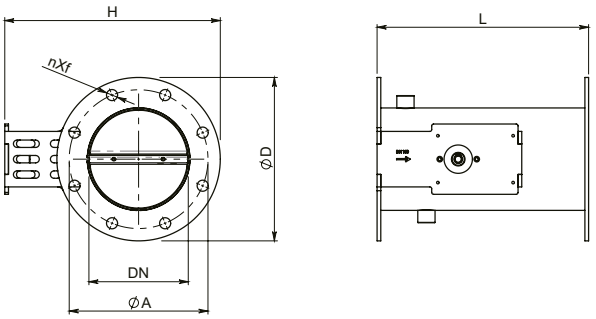
IB 100G - 350G - 550G SLX ME GAS

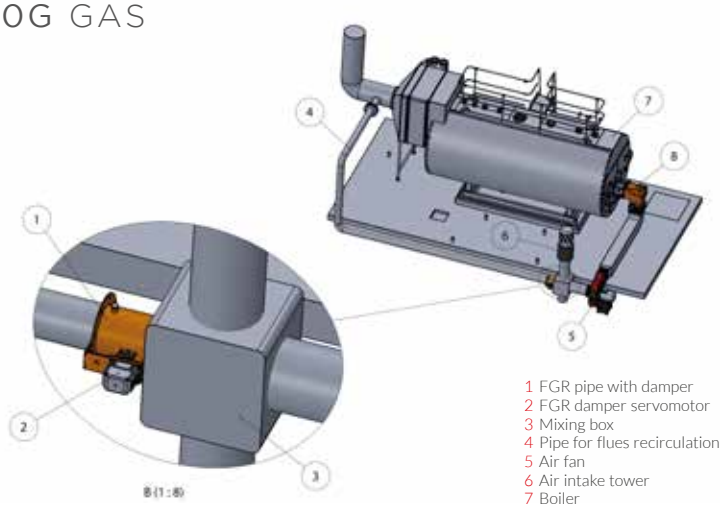


Model	BURNER SIZE								HEAD SIZE				BOILER mounting FLANGE						Burners connection FLANGE					
	A	A1	A2	B	B1	B2	B6	C	D	E	F	G	I	I1	L	M	N	O	P	P1	P2	R	S	T
IB100G SLX	1079	314	765	669	458	211	200	1512	471	250	225	G2"	328	328	Ø280-Ø370	M12	254	649	273	300	238	10,5	137	165
IB350G SLX	1079	314	765	669	458	211	200	1512	471	250	225	G2"	328	328	Ø280-Ø370	M12	254	649	273	300	238	10,5	137	165
IB550G SLX	1168	360	808	751	471	280	295	1890,2	650	344	410	DN80	480	480	Ø520-Ø600	M20	415	779,5	390	420	320	10,5	195	223
IB850G SLX	on request																							

FGR

IB 100G - 250G - 550G - 850G - 1200G GAS





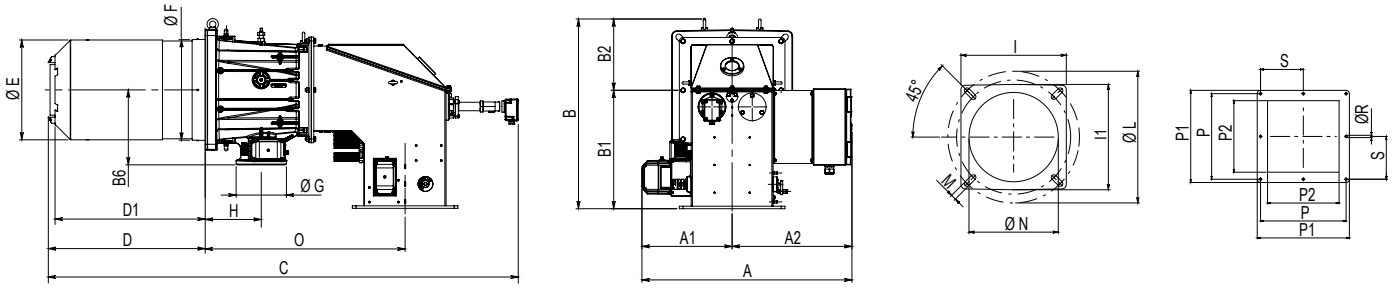
1 FGR pipe with damper
2 FGR damper servomotor
3 Mixing box
4 Pipe for flues recirculation
5 Air fan
6 Air intake tower
7 Boiler
8 Burner

FGR Dimensions						
Model	DN	L	H	A	D	f
IB 100G	80	213	233	150	190	18
IB 350G	100	213	250	170	210	18
IB 550G	150	343	350	228	265	18
IB 850G	150	343	350	228	265	18
IB 1000G	200	370	402	280	320	18
IB 1200G	200	370	402	280	320	18
IB 1800G	300	400	527	410	460	22
IB 2400G	350	430	575	470	520	26

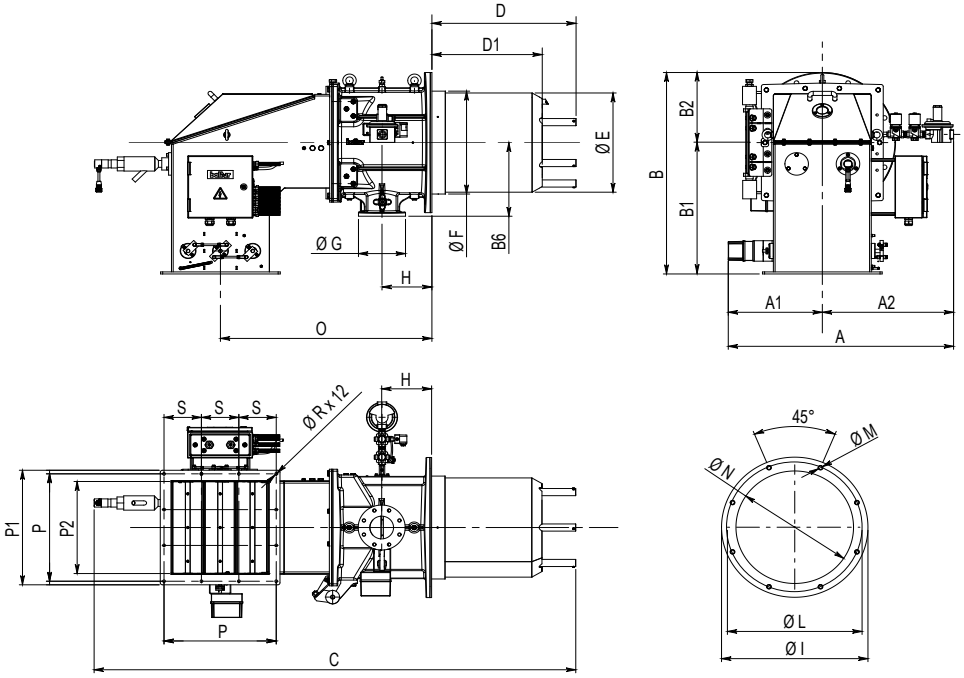
BURNERS DIMENSIONS

FGR

IB 100G - 350G - 550G - 850G - 1000G - 1200G FGR GAS



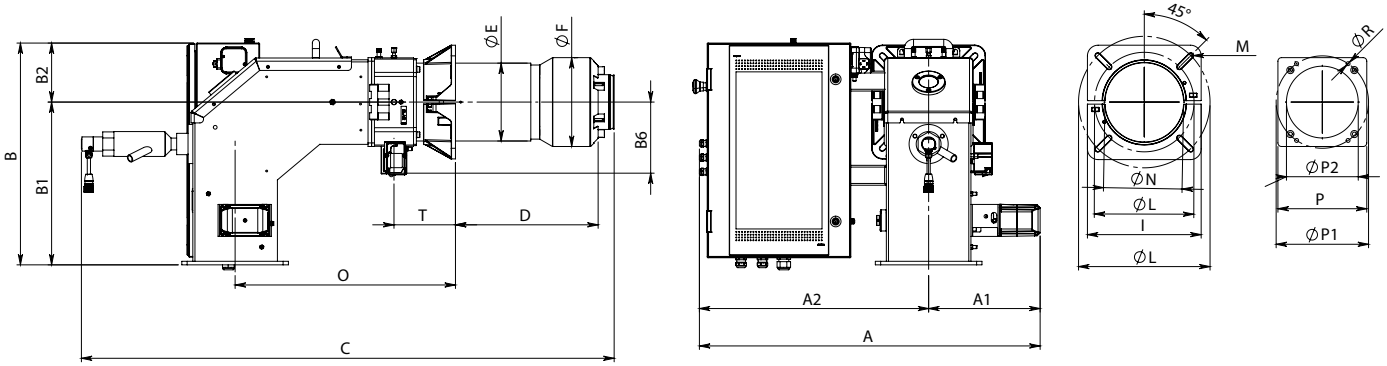
IB 1800G - 2400G FGR GAS



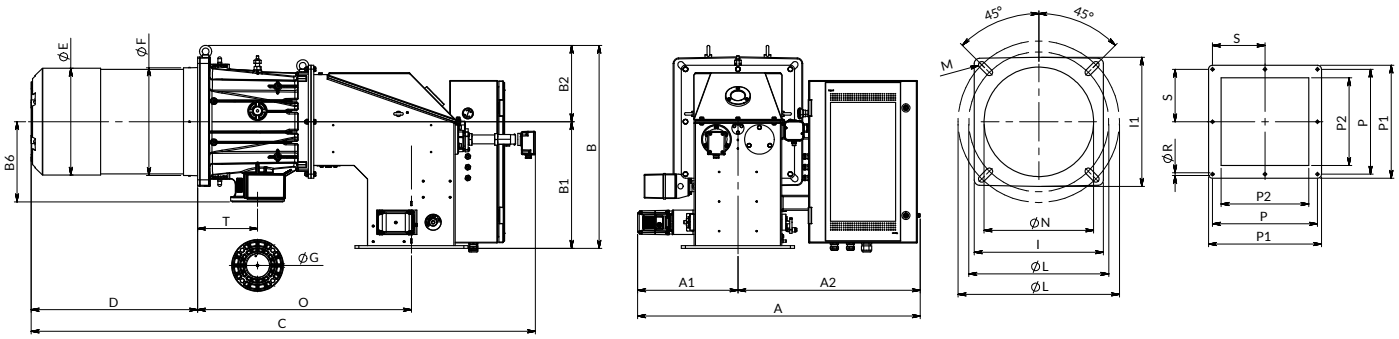
	BURNER SIZE								HEAD SIZE					BOILER mounting FLANGE						Burners connection FLANGE					
Model	A	A1	A2	B	B1	B2	B6	C	D	D1	E	F	G	I	I1	L	M	N	H	P	P1	P2	R	S	O
IB100G	593	160	433	660	458	202	202	1474	450	200-450	250	219	G2"	320	320	Ø280-Ø370	M12	222	177	273	300	230	10.5	136.5	520
IB350G	593	160	433	660	458	202	202	1500	450	200-450	270	219	G2"	320	320	Ø280-Ø370	M12	222	183	273	300	230	10.5	136.5	520
IB550G	840	360	480	755	471	284	298	1870	624	572-622	397	400	DN80	480	480	Ø520-Ø600	M20	415	223	390	420	320	10.5	195	795
IB850G	832	403	429	747	462	285	310	1845	574	566-590	425	432	DN80	520	520	Ø594	M20	445	183	420	450	380	10.5	210	780
IB1000G	832	403	429	747	462	285	310	1820	574	545-574	426	432	DN80	520	520	Ø594	M20	445	183	420	450	380	10.5	210	780
IB 1200G	832	403	429	747	462	285	310	1820	574	545-574	426	432	DN80	520	520	Ø594	M20	445	183	420	450	380	10.5	210	780
IB 1800G	1054	440	614	985	642	343	360	2095	674	516	485	503	DN100	685	-	Ø630	M20	535	233.5	525	560	450	13	175	989.5
IB 2400G	1224	515	709	1108	713	395	467	2695	822	610	600	612	DN125	790	-	Ø730	M20	635	258	658.5	708.5	600	14	219.5	1209

BURNERS DIMENSIONS - DUAL FUEL

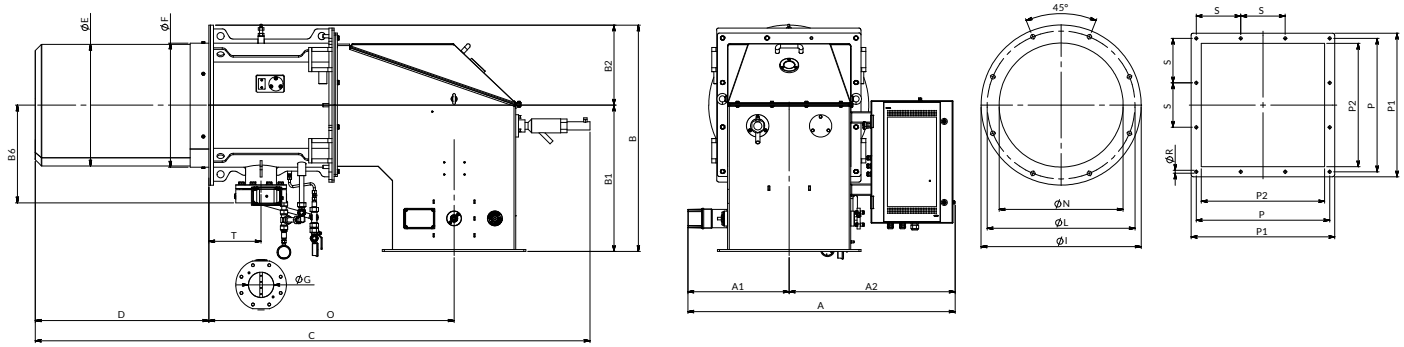
IB 100 - 350 GL/GN GAS-LIGHTOIL/GAS-HEAVY OIL



IB 550 - 850 - 1000 GL/GN GAS-LIGHTOIL/GAS-HEAVY OIL



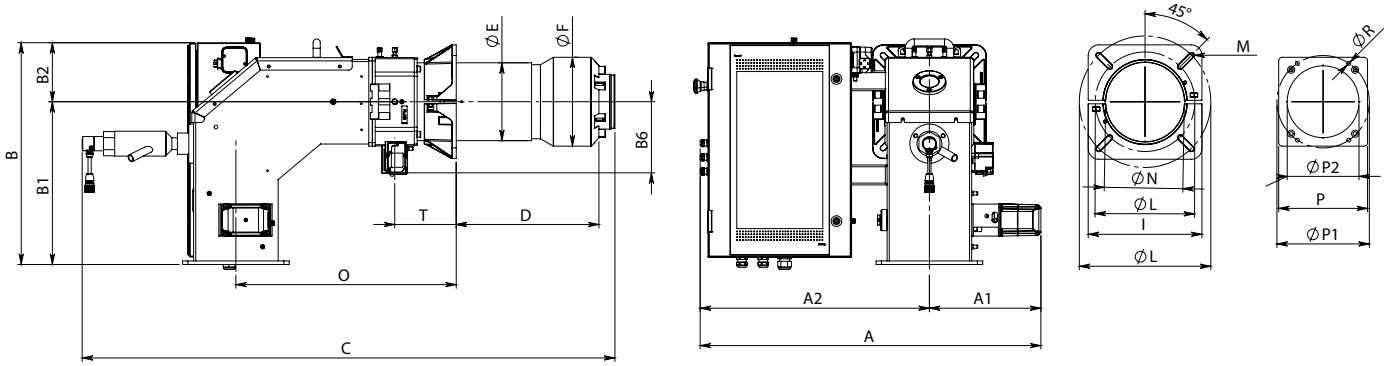
IB 1200-1800-2400 GL/GN GAS-LIGHTOIL/GAS-HEAVY OIL



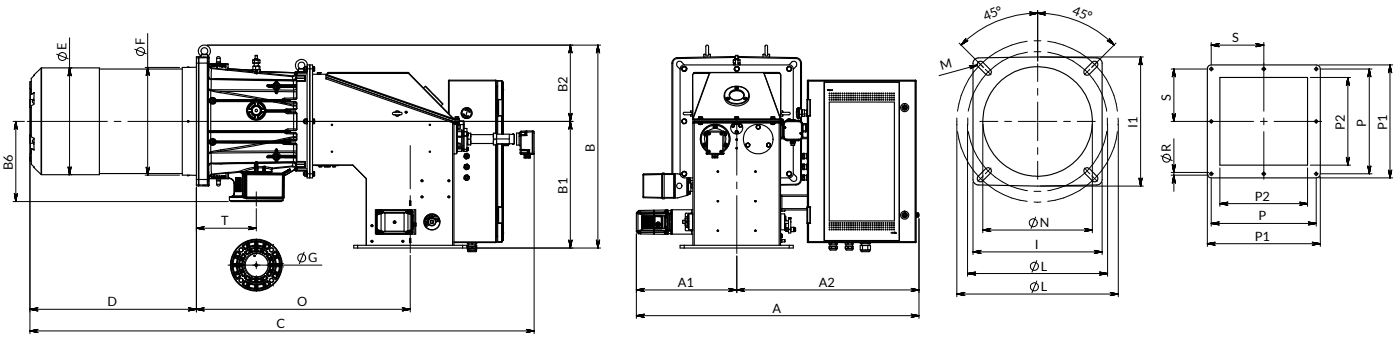
	BURNER SIZE								HEAD SIZE				BOILER mounting FLANGE						Burners connection FLANGE					
Model	A	A1	A2	B	B1	B2	B6	C	D	E	F	G	I	I1	L	M	N	O	P	P1	P2	R	S	T
IB100 GL-GN	979	314	665	660	458	202	202	1509	280-450	224	219	G2"	320	320	Ø280- Ø370	M12	239	587 - 757	273	300	238	10,5	137	159 - 329
IB350 GL-GN	1012	347	665	660	458	202	202	1509	230-440	250	219	DN65	320	320	Ø310- Ø370	M12	255	592 - 802	273	300	238	10,5	137	164 - 374
IB550 GL-GN	1068	360	708	755	471	284	298	1862	632	397	400	DN80	480	480	Ø520- Ø600	M20	415	779,5	390	420	320	10,5	195	215
IB850 GL-GN	1111	403	708	748	462	286	310	1960	715	418	432	DN80	520	520	Ø594	M20	440	772	420	450	386	10,5	210	190
IB1000 GL-GN	1111	403	708	748	462	286	310	1949	715	426	432	DN80	520	520	Ø594	M20	440	769	420	450	386	10,5	210	183
IB 1200 GL-GN	1143	403	740	805	462	343	360	2097	757	496	503	DN100	Ø685	-	Ø630	M20	533	874	420	450	386	10,5	210	226,5
IB 1800 GL-GN	1180	440	740	985	642	343	360	2321	755	563	503	DN100	Ø685	-	Ø630	M20	580	976	525	560	450	13	175	226,5
IB 2400 GL-GN	1323	515	808	1120	725	395	482	2722	864	600	612	DN 125	Ø790	-	Ø730	M20	640	1201	658,5	708,5	600	14	219,5	250

BURNERS DIMENSIONS

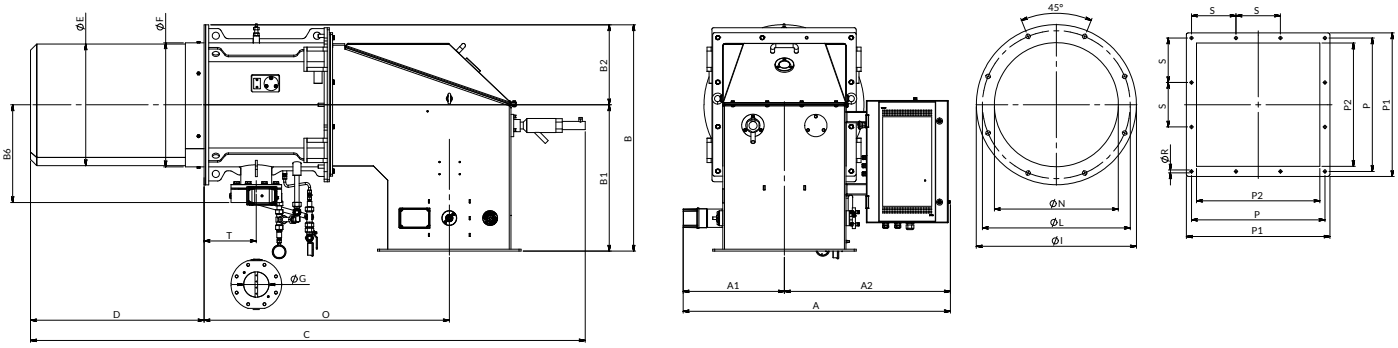
IB 100 - 350 L/N LIGHT OIL/HEAVY OIL



IB 550 - 850 - 1000 L/N LIGHT OIL/HEAVY OIL



IB 1200-1800-2400 L/N LIGHT OIL/HEAVY OIL



	BURNER SIZE								HEAD SIZE				BOILER mounting FLANGE						Burners connection FLANGE					
Model	A	A1	A2	B	B1	B2	B6	C	D	E	F	G	I	I1	L	M	N	O	P	P1	P2	R	S	T
IB100 L-N	979	314	665	660	458	202	202	1509	280-450	224	219	G2"	320	320	Ø280-Ø370	M12	239	587 - 757	273	300	238	10,5	137	159 - 329
IB350 L-N	1012	347	665	660	458	202	202	1509	230-440	250	219	DN65	320	320	Ø310-Ø370	M12	255	592 - 802	273	300	238	10,5	137	164 - 374
IB550 L-N	1068	360	708	755	471	284	298	1862	632	397	400	DN80	480	480	Ø520-Ø600	M20	415	779,5	390	420	320	10,5	195	215
IB850 L-N	1111	403	708	748	462	286	310	1960	715	418	432	DN80	520	520	Ø594	M20	440	772	420	450	386	10,5	210	190
IB1000 L-N	1111	403	708	748	462	286	310	1949	715	426	432	DN80	520	520	Ø594	M20	440	769	420	450	386	10,5	210	183
IB 1200 L-N	1143	403	740	805	462	343	360	2097	757	496	503	DN100	Ø685	-	Ø630	M20	533	874	420	450	386	10,5	210	226,5
IB 1800 L-N	1180	440	740	985	642	343	360	2321	755	563	503	DN100	Ø685	-	Ø630	M20	580	976	525	560	450	13	175	226,5
IB 2400 L-N	1323	515	808	1120	725	395	482	2722	864	600	612	DN 125	Ø790	-	Ø730	M20	640	1201	658,5	708,5	600	14	219,5	250

ENERGY SAVING

INVERTER

The reduction of consumption of primary energy represent for many companies a key element for cutting operating costs especially for high power intensity activities.
In Baltur we recognise the need for energy saving across different industries and markets and propose different solutions to suit our customer's expectations.
The IB series featured ventilation unit with IE3 drive motor efficiency class, granting a superior energy saving. In addition, thanks to its modularity, it allow to upgrade the ventilation unit with Variable Frequency Drive device improving enormously the overall system efficiency.
However, when it comes to the balancing of investment cost and operating cost, many companies still have some difficulties having correct numbers to look at. The most of times the choice is made on the budget available or on a specific idea.
To overcome these limitations in Baltur we have developed a tool to guide customers and provide a feedback about the expected return of the investment.
Our engineers can provide an expectation of cost savings given few inout data on the specific application and market, such as: annual working hours, average load distribution and energy cost. With this basic information and the knowledge of our machine behaviour there're able to calculate the savings in operating cost and provide useful insight to our costumer for the right choice.

AN EXAMPLE:

Burner data	
Model	IB 550 G ME
Motor size	15 kW
Overall efficiency	96.6%

APPLICATION DATA

- 4500 annual working hours
- Power distribution

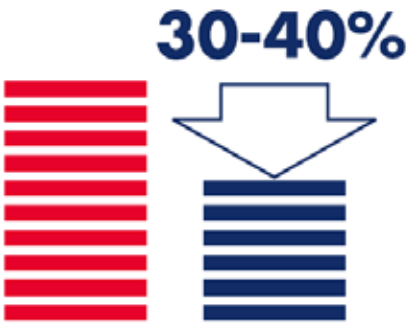
Capacity	**Time**
30%	10%
50%	25%
70%	45%
90%	15%
100%	5%

THE RESULTS ARE AS FOLLOW:

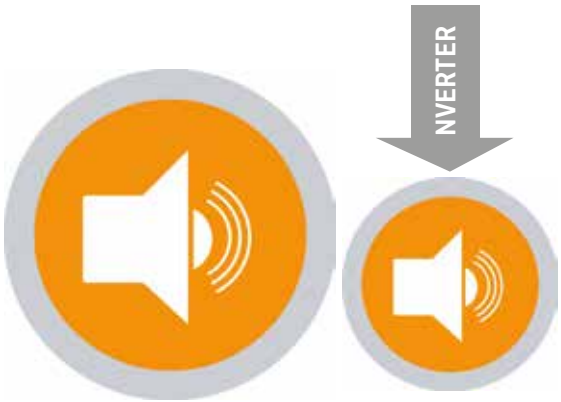
- Consumption of standard IE3 configuration: 69,875 kWh/year
- Consumption with VFD motor: 46,785 kWh/year

In this scenario the total saving of costs in primary energy is expected by 33%.

In addition to cost savings a secondary important benefit is achieved too, this is the noise reduction. Generally the burner is sized in order to satisfy the nominal load at 70÷80% of its maximum capacity, as a consequence the ventilation unit is generally oversized at nominal load. By upgrading with a VFD device the ventilation unit can work at the correct power level without dissipating energy and reducing significantly the overall noise.



The second major advantage that the use of an inverter for fan revolution speed allows, is the high reduction of the sound pressure level at partial burner loads, with peaks that are as high as 30% at minimum burner output with respect to the standard solution with air flow control carried out exclusively by the dampers and fan always at motor rated speed.
Baltur firmly believes that energy efficiency is a key driver to change the way we preserve the environment. With this spirit we are anticipating the future trend enabling the ventilation unit of IB series to be upgraded with new conception of motors rated IE4 featuring integrated inverter. With this premium technology we are enabling our customer to achieve much higher efficiency and further reduce operating cost.



ENERGY SAVING

O_2 - CO

Nowadays ensuring the maximum efficiency of combustion system is mandatory both from economical and ethical points of view. An accurate and professional commissioning and installation are always highly recommended but still not sufficient to achieve the maximum performances. In facts the combustion efficiency, even if optimized by a senior professional, is not constant over time and depends on many variables internal and external to the system itself, such as:

- Air pressure, temperature and relative moisture variations
- Drag force on chimney
- Fluctuations of fuel thermal power
- Ageing of filters
- Wearing and mechanical isteresis of moving parts

For this reasons Baltur suggest a precise monitoring of combustion efficiency by means of a O_2 sensor. This technology, easy to install and adopt, simply monitor continuously the % of oxygen in the exaust gas at chimney and provide a feedback to correct the air excess at inlet in order to always ensure the best air-gas ratio and achieved the maximum efficiency possible independently from external conditions.

THE SYSTEM FOR O_2 ACTIVE CONTROL COMPRISES:

- a zirconium oxide probe positioned at the exit of the combustion chamber or in the chimney
- a close-loop control equipment

THE ADVANTAGES OF THIS SYSTEM CAN BE BETTER UNDERSTOOD WITH AN EXAMPLE:

- system power from 6MW
- fuel: natural gas
- Use: 50 weeks per year, 5 days per week, 16 hours per day.

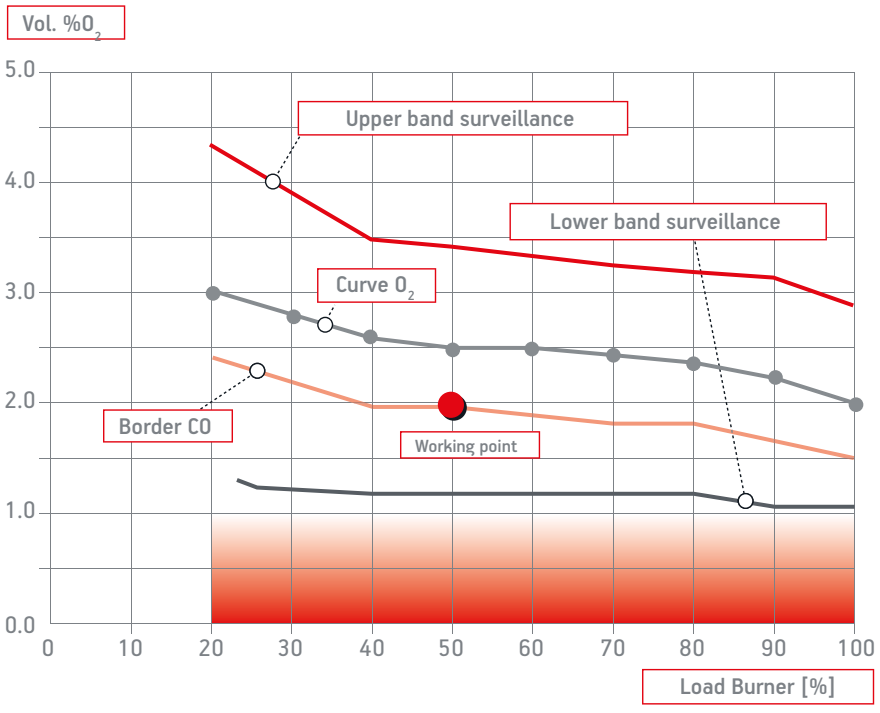
With the insertion of O_2 control on the system where the oxygen percentage can be reduced by 2.5 %, we would get an energy saving of:

- 52TEP (Tonne oil equivalent) and 142 tonnes per year of CO_2 , equal to 2%.

Alternatevely to O_2 monitoring the CO monitoring can provide even superior benefits.

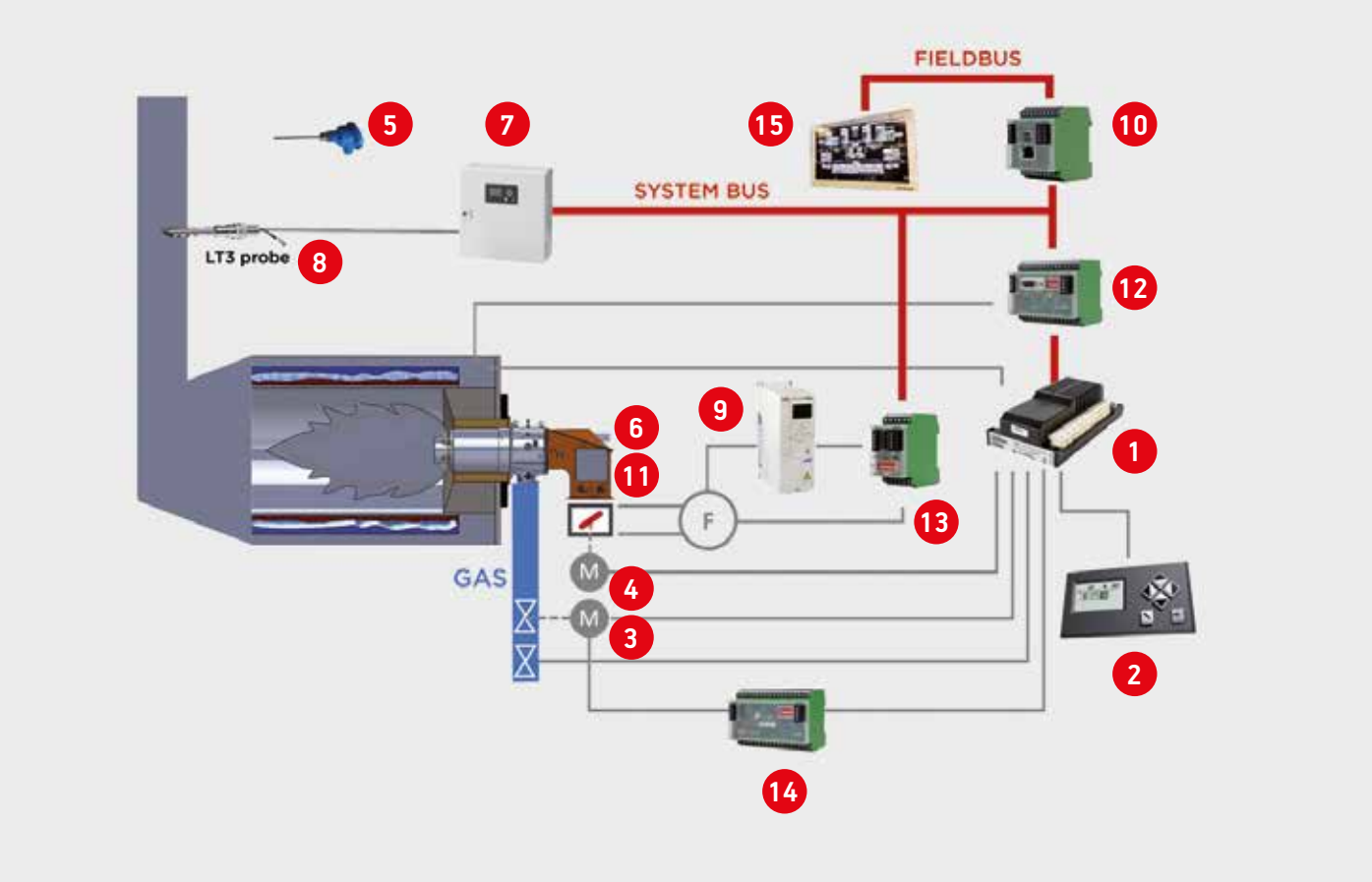
In this case the probe scan the exaust gases to measure the % of CO driving the % of excess air closer to the limit of CO presence. In this way the CO monitoring can grant
Higher fuel saving: up to additional +0.5% compared to O_2 control

Higher reliability: the system is based on CO, so it is not affected by undesired air infliltration along boiler and chimney connections
Total safety: the unburnt particles are directly measured, no just estimated, through a certified sensor.



The oxygen values are approximate and refer to heat generators at 3 smoke passes. The best oxygen values may change depending on the type of the boiler.

IB .... G ME (INVERTER AND 0_2-CO VERSION)



LEGEND:

1 BT300 control
2 User interface
3 GAS damper actuator
4 AIR damper actuator
5 Temperature sensor (hot water generators) or pressure transducer (steam generators) (Optional)
6 Flame detection sensor
7 CO/O_2 probe transmitter with display (Optional)
8 CO/O_2 probe (Optional)
9 Inverter (Optional)
10 BUS interface board (available for MODBUS, PROFIBUS, INTERBUS-S, E-BUS protocols) (Optional)
11 J-box
12 Load control unit
13 Variable system module
14 Dual Fuel modul
15 Control room

ACCESSORIES

MODULATION PROBES

PROBE CHOICE

Depending on the parameter to be controlled: temperature (° C) or pressure (bar), choose the adjustment range comprising the operating value of the boiler.

AUTOMATIC PROPORTIONAL MODULATION REGULATOR PID

Part no.	Model
98000055	Modulation kit LC3
98000059	Modulation kit LCM 100

TEMPERATURE PROBE FOR MODULATION

Part no.	Temperature	Type robe	Probe length	Male coupling
98000023	0 °C ÷ 130 °C	PT 1000	85 [1)]	R 1/2"
98000021	0 °C ÷ 500 °C	PT 1000	200 [1)]	G 1/2"
98000022	0 °C ÷ 1100 °C	Thermocouple	425 [1)]	R 1/2"
98000035	0 °C ÷ 500 °C	PT 100	100 [1)]	G 1/2"

STEAM PRESSURE PROBE (FOR ALL TYPES OF AUTOMATIC REGULATOR)*

Part no.	Pressure steam	Signal output	Male coupling
98000045	0 ÷ 1 bar	4 ÷ 20 mA	G 1/2"
98000074	0 ÷ 3,5 bar	4 ÷ 20 mA	G 1/2"
98000046	0 ÷ 10 bar	4 ÷ 20 mA	G 1/2"
98000047	0 ÷ 16 bar	4 ÷ 20 mA	G 1/2"
98000048	0 ÷ 25 bar	4 ÷ 20 mA	G 1/2"
98000049	0 ÷ 40 bar	4 ÷ 20 mA	G 1/2"

*) In the case of using applications where temperatures exceed 90°C you need to match the kit codes: 98000062

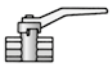
ACCESSORIES FOR THE CONNECTION TO THE NETWORK

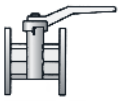
EC APPROVED ANTI-VIBRATION AND COMPENSATION JOINTS made of stainless steel according to DIN 30681

Code	Model	Gas connector
97079999	BTGA	2" MM
97089999	BTGA	DN 65 - PN 16
97099999	BTGA	DN 80 - PN 16
97109999	BTGA	DN 100 - PN 16
97119999	BTGA	DN 125 - PN 16
97129999	BTGA	DN 150 - PN 16

CE APPROVED BALL VALVES

Code	Model	Gas connector
97739999	BTVS	2" FF
97749999	BTVS	DN 65 - PN 16
97759999	BTVS	DN 80 - PN 16
97769999	BTVS	DN 100 - PN 16
97179999	BTVS	DN 125 - PN 16
97189999	BTVS	DN 150 - PN 16





RETURN NOZZLES

Nozzle with fuel return for diesel and mixed series two-stage progressive / modulating and modulating burners. This kind of nozzle, while keeping the pump pressure constant, varies the amount of fuel supplied according to the return pressure of the nozzle.
To be ordered together with the burner when placing the order according to the power required by the application.

NOZZLES FOR LIGHT OIL (IB 100 -350)

Part no.	Rated flow-rate kg/h	Flow-rate angle	Modulation
98000292	100	45°	1÷4
98000293	115	45°	1÷4
98000294	130	45°	1÷4
98000295	145	45°	1÷4
98000296	160	45°	1÷4
98000297	180	45°	1÷4

NOZZLES FOR LIGHT OIL (IB 350 -1000)

Part no.	Rated flow-rate kg/h	Flow-rate angle	Modulation
98000264	200	45°	1÷4
98000265	225	45°	1÷4
98000266	250	45°	1÷4
98000267	275	45°	1÷4
98000268	300	45°	1÷4
98000269	330	45°	1÷4
98000270	360	45°	1÷4
98000272	400	45°	1÷4
98000274	450	45°	1÷4
98000275	500	45°	1÷4
98000277	550	45°	1÷4
98000278	600	45°	1÷4
98000279	650	45°	1÷4
98000271	700	45°	1÷4
98000273	750	45°	1÷4
98000276	800	45°	1÷4
98000287	850	50°	1÷4
98000288	900	50°	1÷4

NOTE:
From IB1200 L/GL burners have lance with fit nozzle.

NOZZLES FOR HEAVY OIL (IB 100 -850)

Part no.	Rated flow-rate kg/h	Flow-rate angle	Modulation
on request	50	45°	1:5
on request	70	45°	1:5
on request	100	45°	1:5
on request	145	45°	1:5
on request	180	45°	1:5
on request	250	45°	1:5
98000500	300	45°	1:5
98000501	325	45°	1:5
98000502	350	45°	1:5
98000503	375	45°	1:5
98000504	400	45°	1:5
98000505	425	45°	1:5
98000506	450	45°	1:5
98000507	475	45°	1:5
98000508	500	45°	1:5
98000509	525	45°	1:5
98000510	550	45°	1:5
98000511	600	45°	1:5
98000512	650	45°	1:5
98000513	700	45°	1:5
98000514	750	45°	1:5

NOTE:
From IB1000 N/GN burners have lance with fit nozzle.

HEAVY AND LIGHT OIL ACCESSORIES FOR PUSHING UNIT

GAS SEPARATOR BOTTLE

Part no.	DESCRIPTION
98000332	OIL DEGASER TANK KIT
98000335	LIGHT OIL DEGASER TANK KIT

OVERFLOW VALVE

Part no.	DESCRIPTION
98000340	PRESSURE REGULATOR C.A. 3/8" 450L/H
98000341	PRESSURE REGULATOR C.A. 3/4" 1600L/H
98000342	PRESSURE REGULATOR C.A. 1" 4000L/H
98000343	PRESSURE REGULATOR C.A. 1"1/4 7000L/H
98000330	PRESSURE REGULATOR C.A. 1"1/2 10000L/H

PRESSURE GAUGE

Part no.	DESCRIPTION
98000300	MANOMETER KIT - TAP 0-40BAR
98000339	MANOMETER KIT - TAP 0-4 BAR

FILTER

Part no.	DESCRIPTION
98000384	LIGHT OIL LINE FILTER 1"1/4
98000385	LIGHT OIL LINE FILTER 1"1/2
98000386	LIGHT OIL LINE FILTER 1"1/2 AUT
98000387	LIGHT OIL LINE FILTER 2" AUTOP.
98000388	HEAVY OIL LINE FILTER 2" AUTOP.
98000389	HEAVY OIL LINE FILTER DN50 AUT

MAIN RING PUMP

Part no.	DESCRIPTION
98000400	MOTOR / PUMP 4P 45L/H
98000401	MOTOR / PUMP 4P 80L/H
98000402	MOTOR / PUMP 4P 120L/H
98000403	MOTOR / PUMP 4P 160L/H
98000404	MOTOR / PUMP 4P 300L/H
98000405	MOTOR / PUMP 4P 450L/H
98000406	MOTOR / PUMP 4P 600L/H
98000407	MOTOR / PUMP 4P 1000L/H
98000408	MOTOR / PUMP 4P 1500L/H
98000409	MOTOR / PUMP 4P 2000L/H
98000410	MOTOR / PUMP 4P 3000L/H
98000411	MOTOR / PUMP 4P 3700L/H
98000412	MOTOR / PUMP 4P 4500L/H
98000413	MOTOR / PUMP 4P 6000L/H
98000414	MOTOR / PUMP 6P 30L/H
98000415	MOTOR / PUMP 6P 55L/H
98000416	MOTOR / PUMP 6P 80L/H
98000417	MOTOR / PUMP 6P 105L/H
98000418	MOTOR / PUMP 6P 200L/H
98000419	MOTOR / PUMP 6P 300L/H
98000420	MOTOR / PUMP 6P 400L/H
98000421	MOTOR / PUMP 6P 670L/H
98000422	MOTOR / PUMP 6P 1000L/H
98000423	MOTOR / PUMP 6P 1330L/H
98000424	MOTOR / PUMP 6P 2000L/H
98000425	MOTOR / PUMP 6P 2400L/H
98000426	MOTOR / PUMP 6P 3000L/H
98000427	MOTOR / PUMP 6P 4000L/H

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Baltur S.p.A.
Via Ferrarese, 10 - 44042 Cento (FE) - Italy
Tel. +39 051 684.37.11
info@baltur.it

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