

Bruciatori

N-BFN Burners

[Bulletin 10-1 N/BFN Series – 13/09/2019-]

MADE IN ITALY



Low emissions


Santin
Bruciatori Industriali

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Tech. data N-BFN-Std flame with stainless steel burner tube 310S/cylindrical concrete block

Description	S-BFN	N-BFN76	N-BFN102	N-BFN140	N-BFN170
KW (Kcal/h) max	40 (34.400)	90 (68.800)	210 (180.000)	370 (320.000)	580 (500.000)
Gas Type	Natural gas / LPG / Others				
Turndown	10:1				
Gas Connection (inch)	1/2"	1/2"	3/4"	1"-1/2	1"-1/2
Air Connection (inch)	1"-1/2	1"-1/2	2"	3"	3"
Control Type	On-Off Low-High Modulating				
Flame detection	With ionization electrode or UV sensor as option				
Ignition	With ignition transformer 8 KV				
Max Furnace Temperature (°C)	AlSi versions only N-BFN76/102/A with tube INOX310S max 500°C Cast Steel models (all) with tube INOX310S max 1100°C Cast Steel models (all) with concrete block max 1600°C				
Max Air Temperature (°C)	Alsi versions 200°C Cast Steel versions 450°C				
Flame Length and velocity (cm - m/s)*	Cold air: 30 -55 Hot air: 50 - 50	Cold air: 60 -75 Hot air: 70 - 70	Cold air: 70 -75 Hot air: 80 - 70	Cold air: 120 -75 Hot air: 140 - 70	Cold air: 120 -75 Hot air: 160 - 70
Material	Cast steel	Alsi Cast steel	Alsi Cast steel	Cast steel	Cast steel
Weight (Kg) Approx.	Cast Steel 10	Alsi 5,5 Cast Steel 10	Alsi 6 Cast Steel 10,5	Cast Steel 30	Cast Steel 30,5
Certification	CE				

Tech. data N-BFN FF – Flat Flame with concrete tube

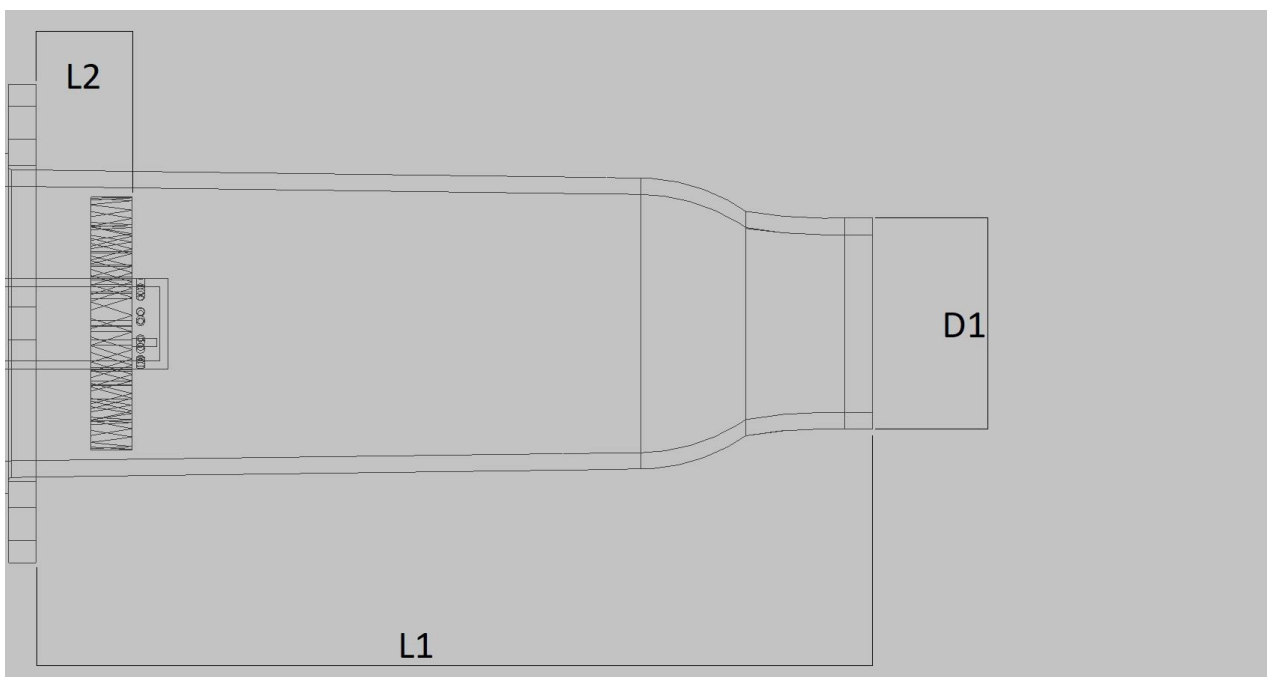
Description	N-BFN76	N-BFN102	N-BFN140	N-BFN170
KW (Kcal/h) max	90 (68.800)	210 (180.000)	370 (320.000)	580 (500.000)
Gas Type	Natural gas / LPG / Others			
Turndown	10:1 (FF 2:1)			
Gas Connection (inch)	1/2"	3/4"	1"-1/2	1"-1/2
Air Connection (inch)	1"-1/2	2"	3"	3"
Control Type	On-Off Low-High Modulating (limited control range >50%)			
Flame detection	With ionization electrode or UV sensor as option			
Ignition	With ignition transformer 8 KV			
Max Furnace Temperature (°C)	Cast Steel models (all) with concrete block max 1600°C			
Max Air Temperature (°C)	Cast Steel versions 450°C			
Flame Length and velocity (cm - m/s)*	---	---	---	---
Material	Alsi Cast steel	Alsi Cast steel	Cast steel	Cast steel
Weight (Kg)	Cast steel + block 60	Cast steel + block 60,5	Cast steel + block 88	Cast steel + block 88,5
Certification	CE			

Tech. Data N-BFN HV – High Velocity flame with SIC tube

Description	N-BFN76	N-BFN102	N-BFN140
KW (Kcal/h) max	See table page 6		
Gas Type	Natural gas / LPG / Others		
Turndown	10:1		
Gas Connection	1/2"	3/4"	1"-1/2
Air Connection	1"-1/2	2"	3"
Control Type	On-Off Low-High Modulating		
Flame detection	With ionization electrode or UV sensor as option		
Ignition	With ignition transformer 8 KV		
Max Furnace Temperature °C	Alsi models (76/102) with SIC Tube max 500°C Cast Steel models (all) with SIC Tube max 1380°C		
Max Air Temperature °C	Alsi versions 200°C Cast Steel versions 450°C		
Flame Length	See table page 6		
Material	Alsi Cast steel	Alsi Cast steel	Cast steel
Weight	Alsi 7,5 Cast Steel 12	Alsi 8 Cast Steel 12,5	Cast Steel 33
Certification	CE		

Technical Data SIC tube

Burner model	KW	D1 mm	L1 mm	L2 mm
N-BFN76	90	40	250	35
N-BFN102	160	65	300	35
N-BFN140	320	85	300	35



Certification

Declaration of Incorporation pursuant to the Machinery Directive Burners N-BFN comply with the requirements of EN 746-2 and the Machinery Directive 2006/42/EC. This is confirmed by the manufacturer's Declaration of Incorporation.

Applications

N-BFN is a new series designed for industrial furnaces in iron and steel industries, in the fusion and treatment of precious metals, non ferrous metals, light alloys and all industrial alloys. They are also suitable for warm air generators and drying plants, in ceramic, glass and clay manufacturing, paint industries, industrial ladles, for post-combustion thermic plants, in plastic industries and paper manufactory.

N-BFN is a low emissions series and thanks to aluminium and cast iron burner house it offers robust and reliable performance.

N-BFN is available in the following versions:

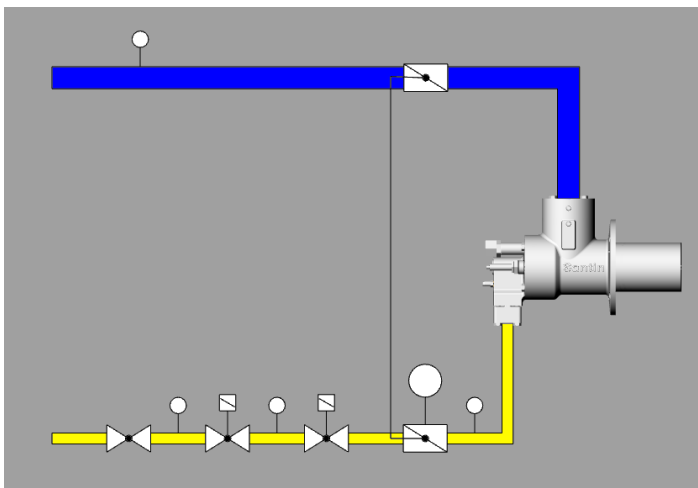
N-BFN- Standard flame with standard Stainless Steel cone 310S

N-BFN-FF – Flat flame with concrete block FF as optional

N-BFN-HV – High velocity with SIC Tube

N-BFN-HT – High temperature with Concrete block

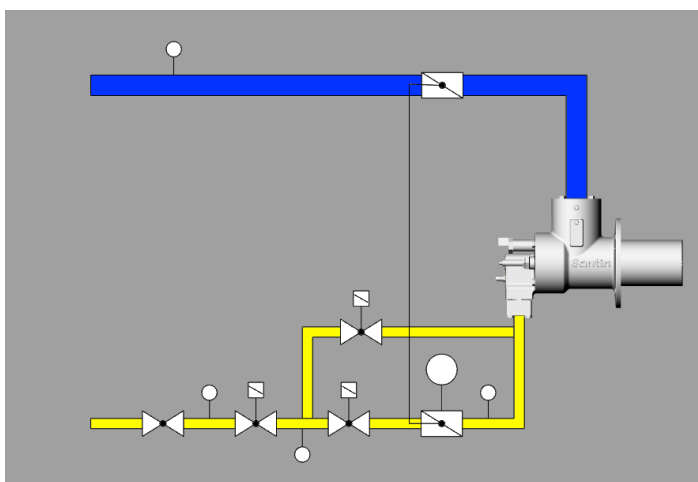
Examples of System



Two-Stages or Modulating System with MLRC-

MLRC is a system that allows to control stoichiometric ratio through levers. This solution allows to keep correct ratio in the entire turndown range of the burners.

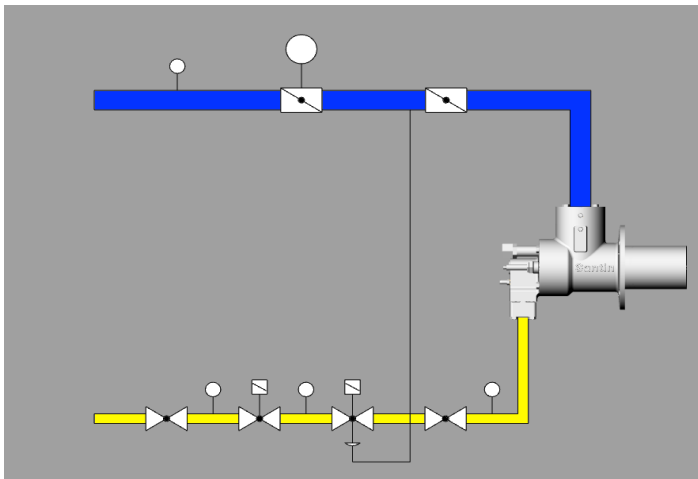
The actuator on modulating valve can be controlled by Thermoregulator or PLC with 230/110V and/or 4.20mA / 0-10V



Two-Stages or Modulating System with MLRC + Bypass

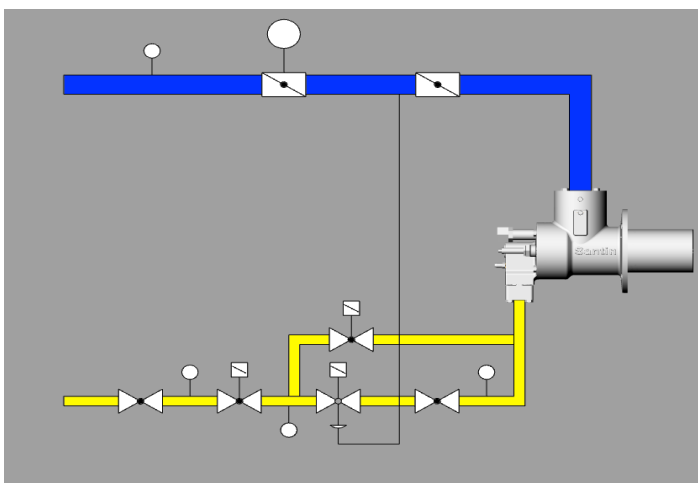
This system works with MLRC ratio controller but it is equipped with a bypass gas valve that allows to ignite the burner with a smaller flame.

This solution helps to avoid over-temperature issues when burner turndown (10:1 for N-BFN) is not enough.



Modulating/Two-stages control with pneumatic ratio control system

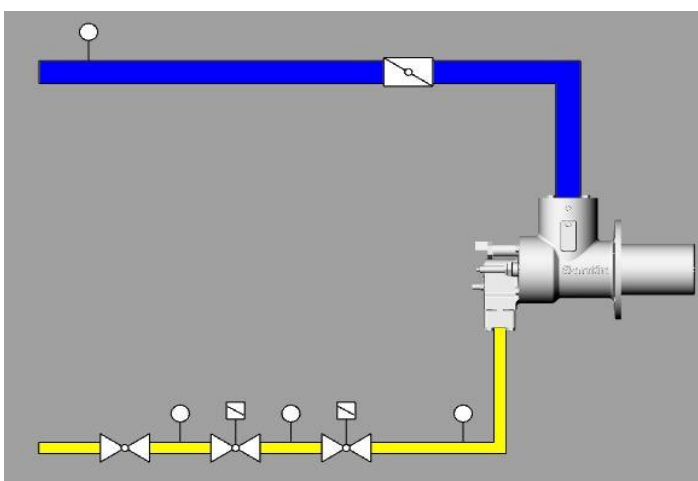
Butterfly air valve, managed by continuous/three points actuator, control the burner in modulating mode. The impulse line on the air/gas ratio control (MBC-VEF) allow to keep gas ratio constant.



Modulating/Two-stages control with pneumatic ratio control system + Bypass

This system works with pneumatic ratio control system but it also equipped with by pass gas valve that allows to ignite the burner with a smaller flame.

This solution helps to avoid over-temperature issues when burner turndown (10:1 for N-BFN) is not enough.



One-stage system

This is the simpler system. The burner in this solution work on/off with simple gas train according to EN746-2 (other standards available)

Burners N-BFN comply with the requirements of EN 746-2 and the Machinery Directive 2006/42/EC. This is confirmed by the manufacturer's Declaration of Incorporation.



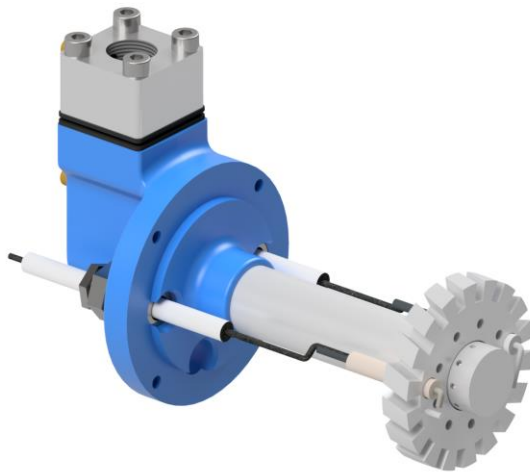
Mechanical Construction

N-BFN are composed of three parts; burner insert with nozzle, burner housing and burner tube. Thanks to its construction N-BFN is easily installed in new or existing system.

Burner Insert:

Burner insert includes, gas connection flange, Stainless steel nozzle, spark and flame rods with ceramic plugs and peep sight.

Gas inlet can be equipped with orifice.



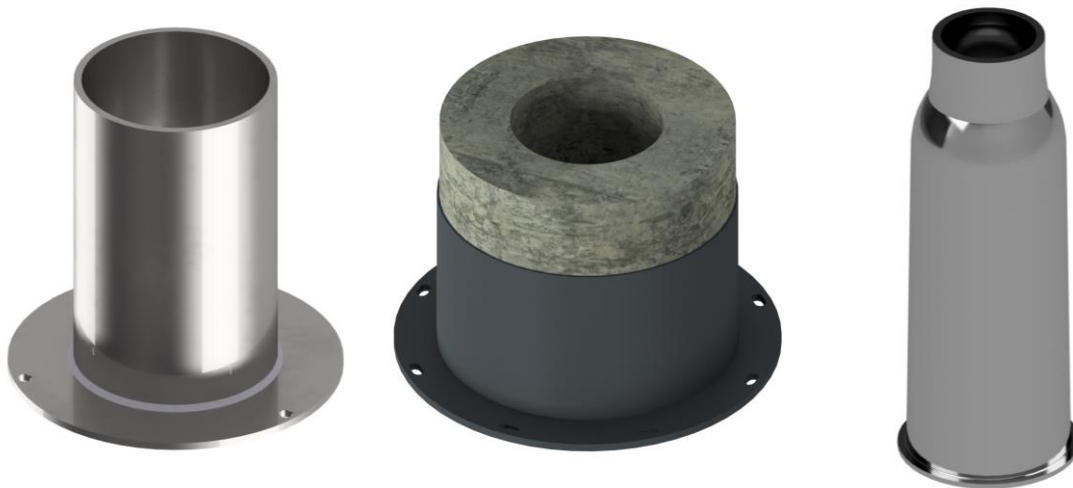
Burner Housing:

The burner are secured to the oven/furnace by the burner housing. Burner housing is available in aluminium or cast iron material. Air inlet can be equipped with orifice.



Burner Tube:

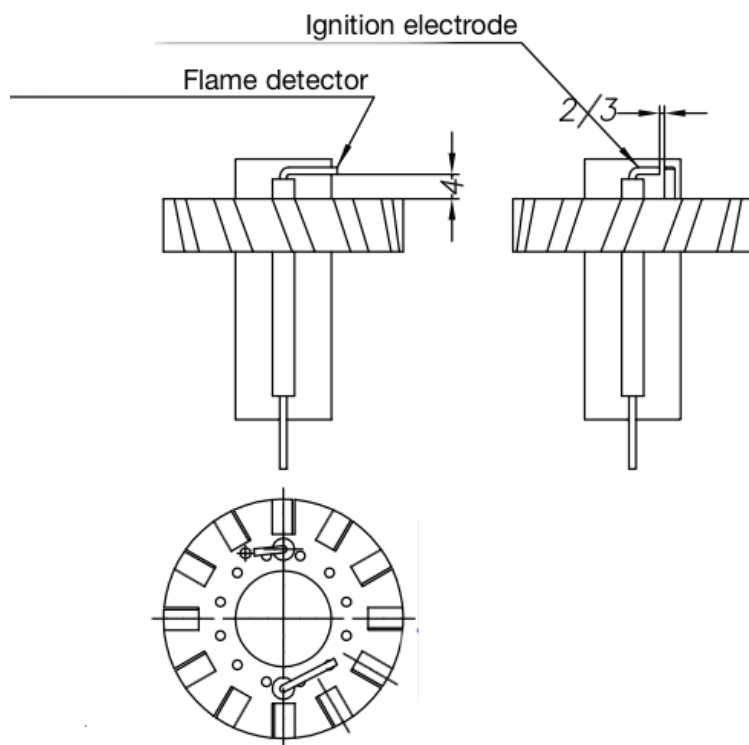
Standard tube is stainless steel 310S, also available for high temperature application and flat-flame burners the refractory block. SIC tube is available for high velocity solutions.



Electrodes position:

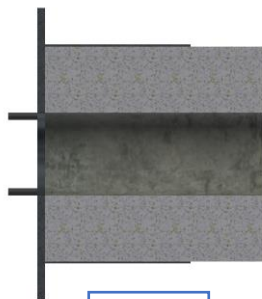
Ignition and flame rods are properly installed in the burner. Correct position is very important for a correct burner operation. See picture below

Correct position - Electrodes -

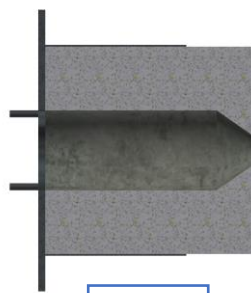


Refractory block info:

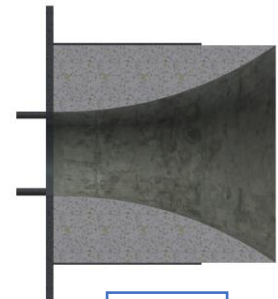
Illustration	Model	Control	Max capacity	Notes
A	Cylindrical	On/Off Modulating Low/High	100%	Standard flame normal to medium flow velocity
B	Tapered	On/Off Modulating Low/High	80%	Medium and high velocity, max capacity depends on the diameter
C	Flat Flame	On/Off Modulating* Low/High	100%	Modulating control limited at >50% of the range



A



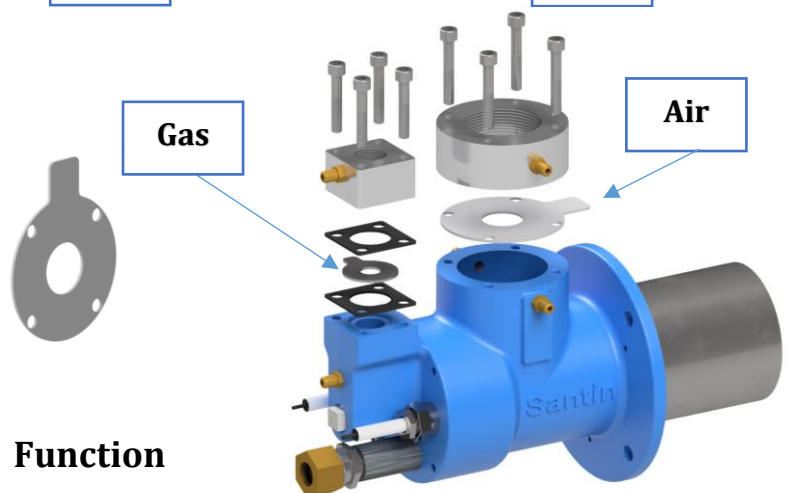
B



C

Orifices Available:

Model	Gas mm	Air mm
N-BFN76	12	32
N-BFN102	18	54
N-BFN140	25	72
N-BFN170	32	80



Function

Burner must be managed by a control unit that opens the gas and air control vales. The mixture produced downstream of the burner head is electrically ignited by an ignition rod.

Flame is controlled by an ionization electrode or UV sensor as optional.

Note. Burner and orifice flow chart are available. Contact our technical support.

Drawing

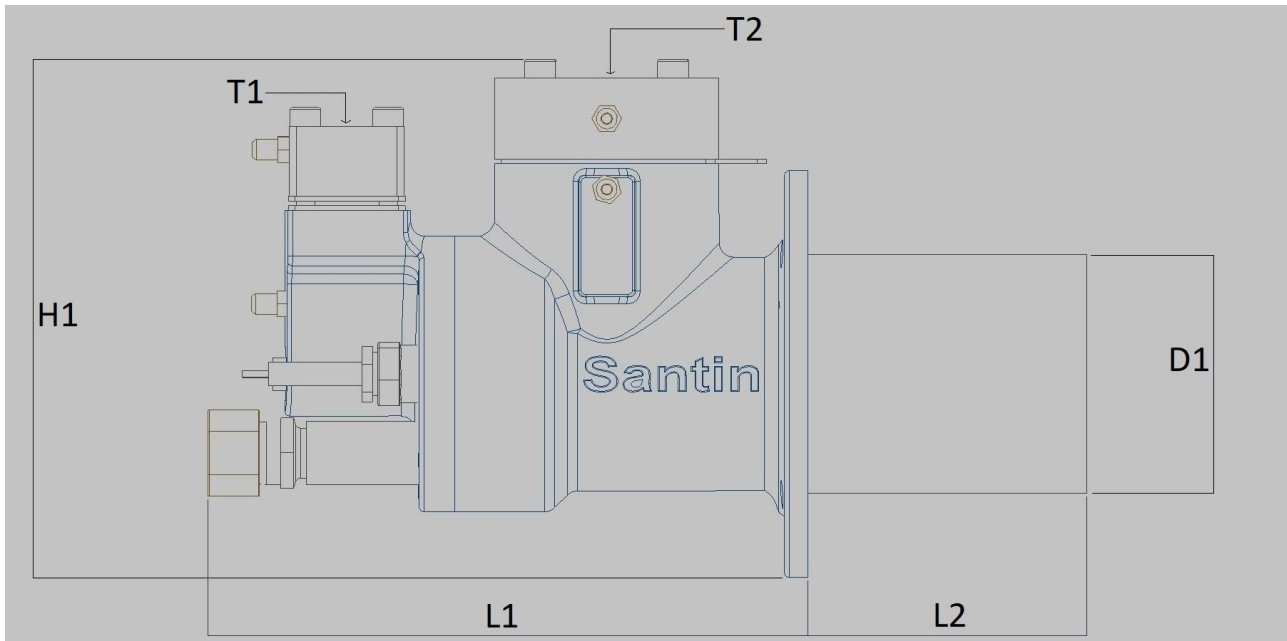
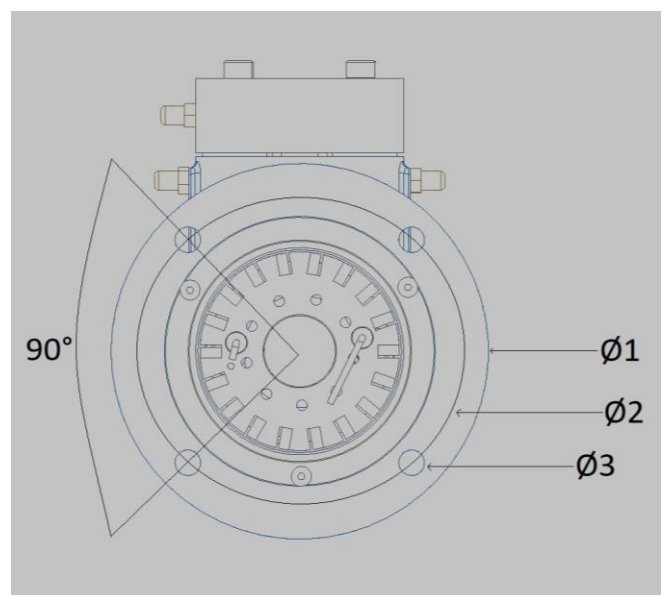


Table N-BFN with Stainless Steel 310S Tube:

Model	H1 mm	L1 mm	L2 mm *	D1 mm	T1 inch	T2 inch
N-BFN76	221	256	120	76	1/2	1-1/2
N-BFN102	221	256	120	102	3/4	2
N-BFN140	310	352	120	140	1-1/2	3
N-BFN170	310	352	120	170	1-1/2	3

*Burner tube can be extended until 1500 mm.

Model	Ø1 mm	Ø 2mm	Ø 3 mm
N-BFN76	174	146	12
N-BFN102	174	146	12
N-BFN140	250	225	12,5
N-BFN170	250	225	12,5



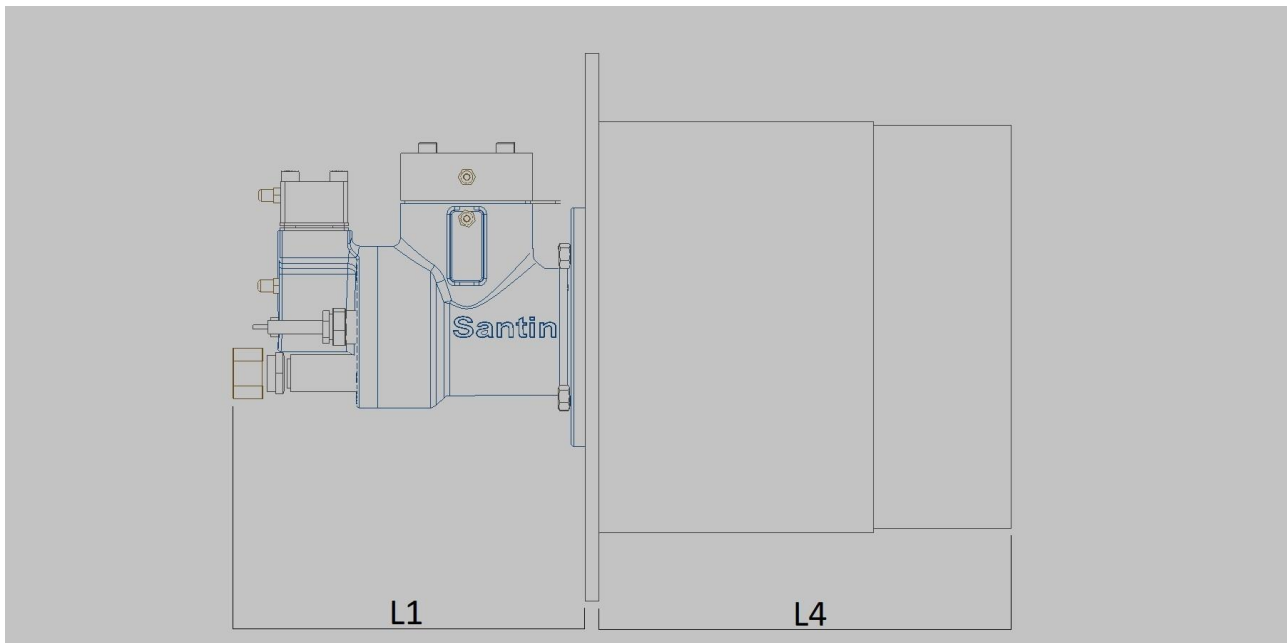
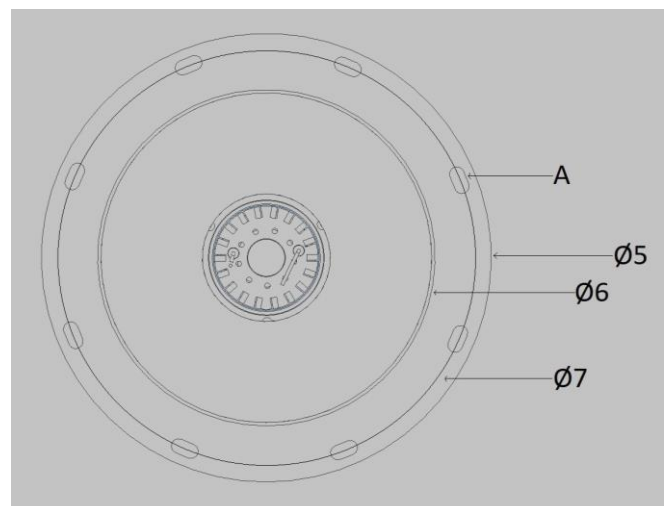


Table N-BFN with cylindrical refractory block std **

Model	L1 mm	L4 mm
N-BFN76	256	300
N-BFN102	256	300
N-BFN140	352	300
N-BFN170	352	300

Model	Ø5 mm	Ø6mm	Ø7 mm
N-BFN76	400	300	370
N-BFN102	400	300	370
N-BFN140	450	350	420
N-BFN170	450	350	420



** For Flat Flame and Tapered block, contact our technical support.

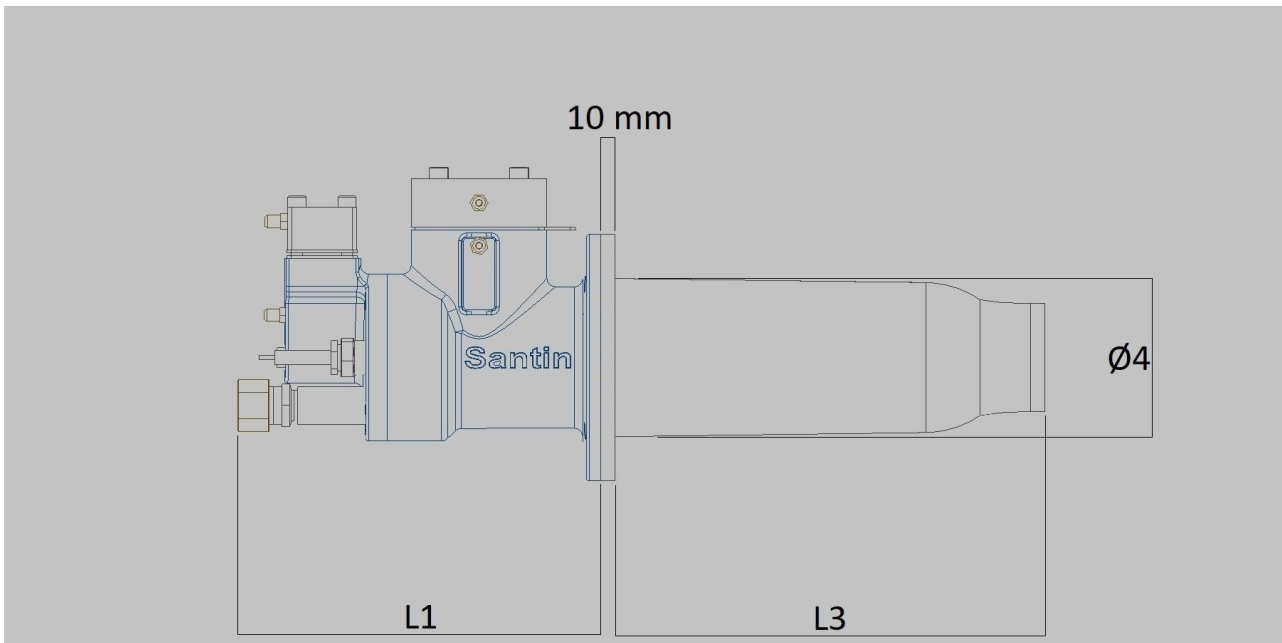
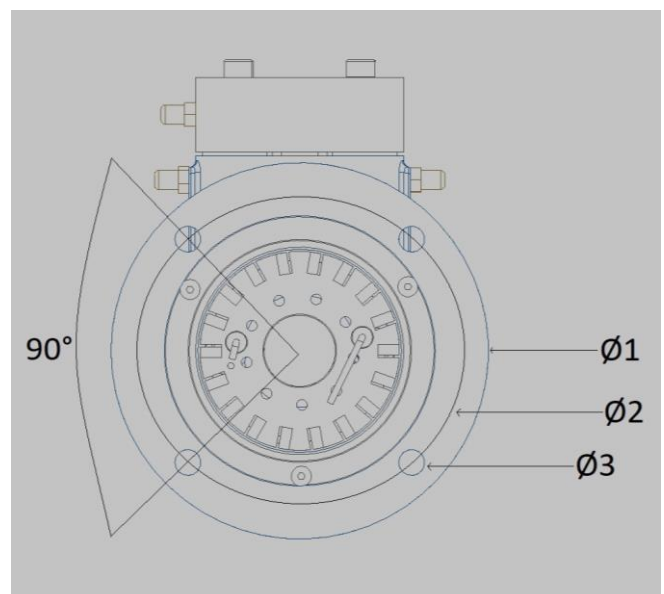


Table N-BFN with Stainless Steel 310S Tube:

Model	L1 mm	L3 mm *	Ø 4 mm
N-BFN76	256	250	86
N-BFN102	256	300	112
N-BFN140	352	300	142

*Burner tube can be extended until 1500 mm.

Model	Ø1 mm	Ø 2mm	Ø 3 mm
N-BFN76	174	146	12
N-BFN102	174	146	12
N-BFN140	250	225	12,5



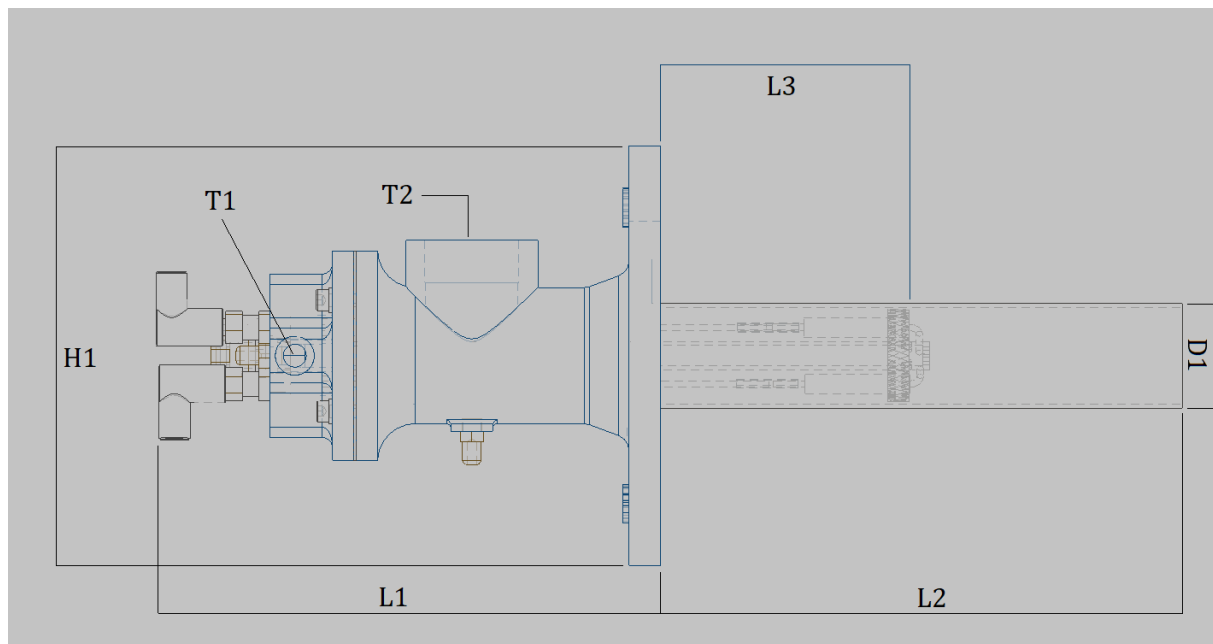
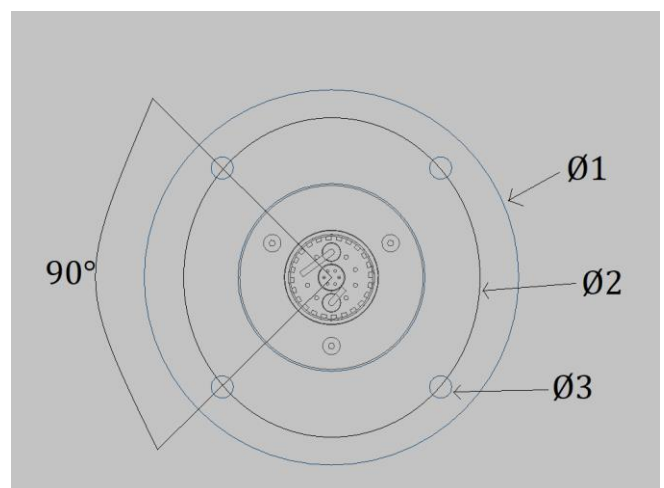


Table S-BFN with Stainless Steel 310S Tube:

Model	H1 mm	L1 mm	L2 mm *	L3 mm	D1 mm	T1 inch	T2 inch
S-BFN	200	240	250	120	50	1/2	1-1/2

*Burner tube can be extended until 1500 mm.

Model	Ø1 mm	Ø 2mm	Ø 3 mm
S-BFN	200	165	12



Project information

N-BFN can be installed in any position and air and gas connection can be rated in 90° steps. Flat Flame solutions need minimum spacing between burners and furnace wall.

Model	Distance between burners and furnace wall (mm)
N-BFN76-FF	600
N-BFN102-FF	800
N-BFN140-FF	1100
N-BFN170-FF	1300

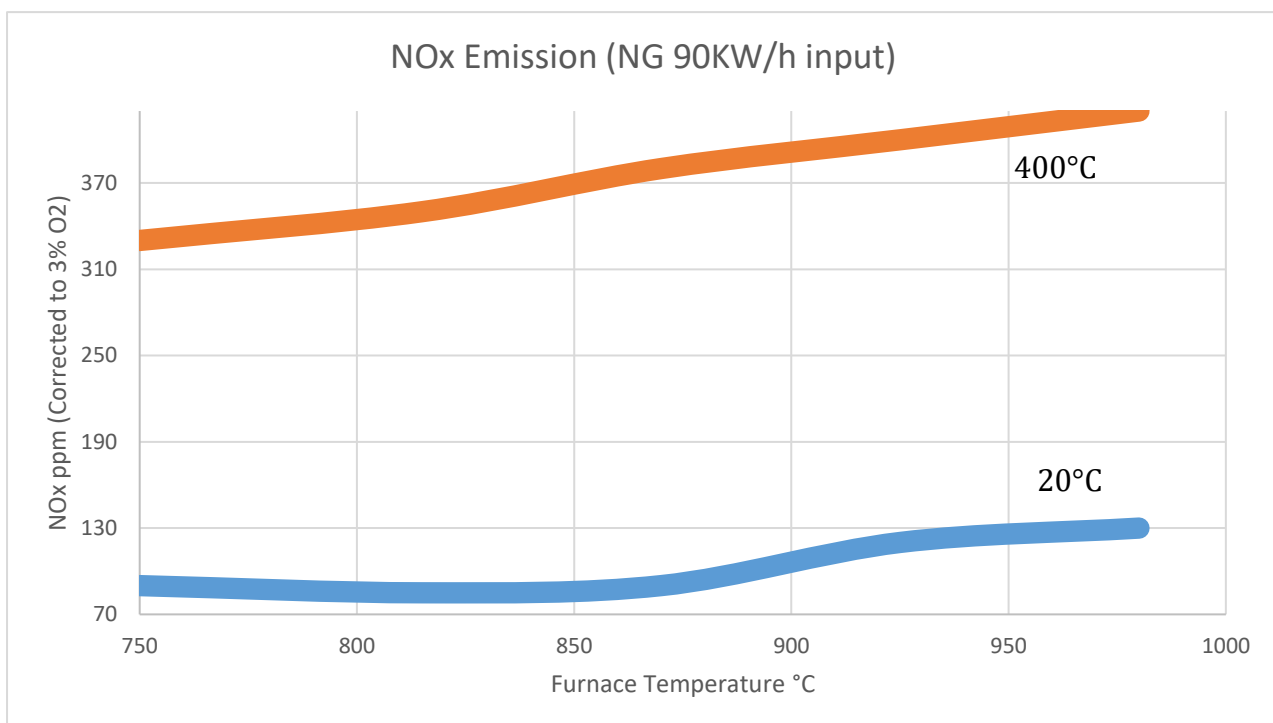
Ignition transformer must be > 7,5 kV – Santin model 1820

Return gas valve are not required and flame control is performed with electrode or UV sensor as optional.

While the burner is switched off, there must air flow in order to ensure safe ignition and monitoring of the burners, and for cooling the burner components. For this, leave the air fan switched on until the furnace has cooled down completely.

CO emissions are less than 10ppm corrected to 3% O₂ for furnace temperatures between 750-1000°C. Emissions are influenced by:

- Fuel type
- Combustion air temperature
- Chamber conditions
- % of excess air
- If operated with LPG, NO_x values are approx. 25% higher.



Please note. Do not forget to inert the gasket insulation between furnace wall and burner. Contact us for the correct product tecnico@bruciatorisantin.com

Please note.

The pipe connection is a critical choice. The following suggestions can help you:

- Ensure that size of air and gas pipe are large enough to avoid excessive pressure losses.
- The number of elbows is kept to a minimum.
- Flexible pipe can cause more pressure drop than standard pipe. Check flexible detail.
- Put in a pipe union in a burner can simplify maintenance service.

 **Note**

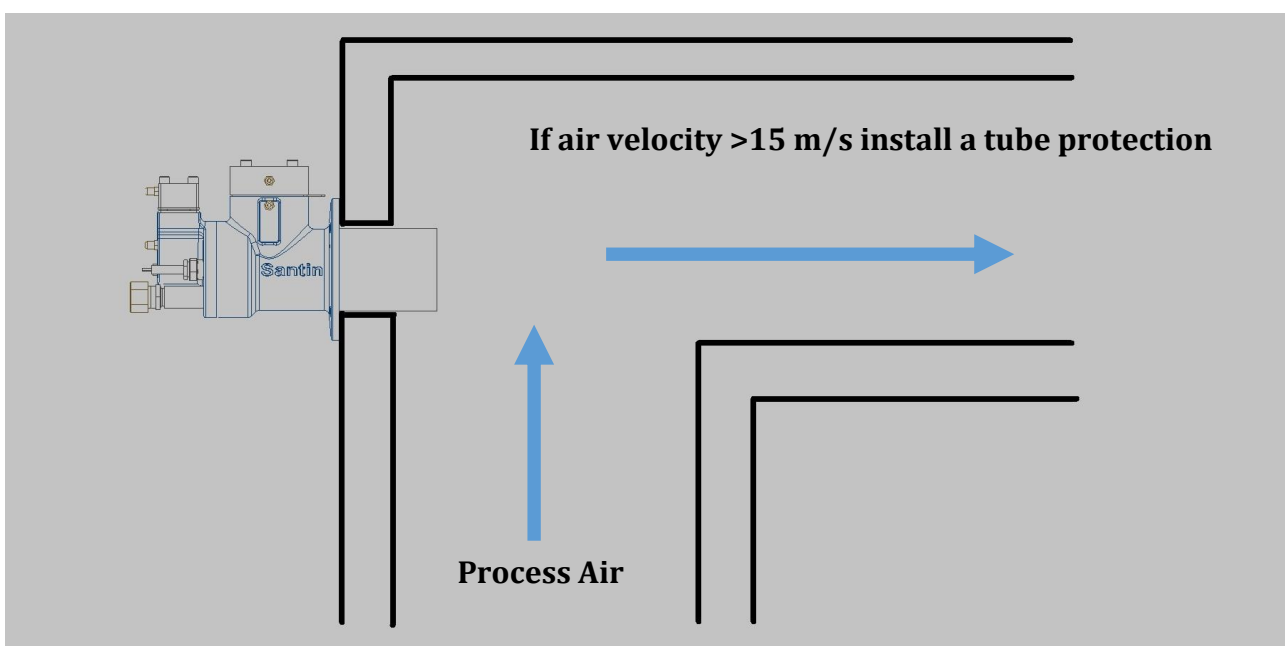
Before switch on the burner please make the following checks:

- Control air and gas leaks
- Ensure that bolts and all components are properly installed
- Ensure that power supply is correct, according to wiring diagram
- Ensure that gas train is properly installed and in the correctly oriented.
- Ensure the correct blower rotation.

It is recommended to install a measuring orifice to determinate the air/gas flow rate.

Noise volume of the burner depends on refractory block geometry and installation (for example inside a furnace). Noise volume at a distance of 1 m is about from 75 dBA to 95 dBA

For air heating application we suggest to keep air flow velocity < 15 m/s. For higher velocity a tube protection is needed. (See picture below)



Accessories

Id	Picture	Description
1		Mounting Gasket
2		Stainless Steel Air/Gas Orifices
3		UV Sensor
4		Solenoids
5		Modulating valves with servomotors
6		Gas Stabiliser with filter
7		Gas/Air stoichiometric system MLRC
8		Pressure switch
9		Air valve
10		Ball valve
11		Control unit
12		Ignition transformer
13		Thermoregulators / PLC
14		Pressure gauge
15		Blower

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- Tutti di dati / grafici indicati e presentati in questo documento sono approssimativi.
- The performances mentioned are indicative. Performance and dimensions are guidelines only. The information contained in this catalogue is updated at the time of printing but can be changed without notice or obligation to notify.
- All data / graphs shown in this document are approximate.

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