Technical Data Leaflet

Industrial

TS0086UK00

DB Series

Industrial Dual Block Oil, Gas and Dual Fuel Burners

DB 4	1000/2500	÷	5000	kW
DB 6	1400/4000	÷	7800	kW
DB 9	1500/5000	÷	9500	kW
DB 12	1700/7000	÷	12500	kW
DB 16	2500/8000	÷	16000	kW
DB 20	3000/10000	÷	20000	kW

The new DB burners platform represents the evolution in Riello Burners industrial product range.
They are dual block burners for application in big plants (district heating, hospitals) as well as in food, chemicals, textile industry for matching with hot water boilers, steam and thermal oil generators.
DB series burners can be supplied with electronic or mechanical air-fuel ratio control according to customer specification.
DB 9-12-16-20 are equipped with pilot ignition, while for DB 4-6 models it can be supplied on demand. DB series can work with pre-heated air up to 150°C as standard, up to 250°C with special construction. New variable geometry combustion head allows to reach < 80 mg/kWh NOx emission on natural gas operations.
An hinge system for easier combustion head maintenance is available on all models.
As part of the offer, various accessories (air fan, control panels, high pressure gas train, etc) are available.

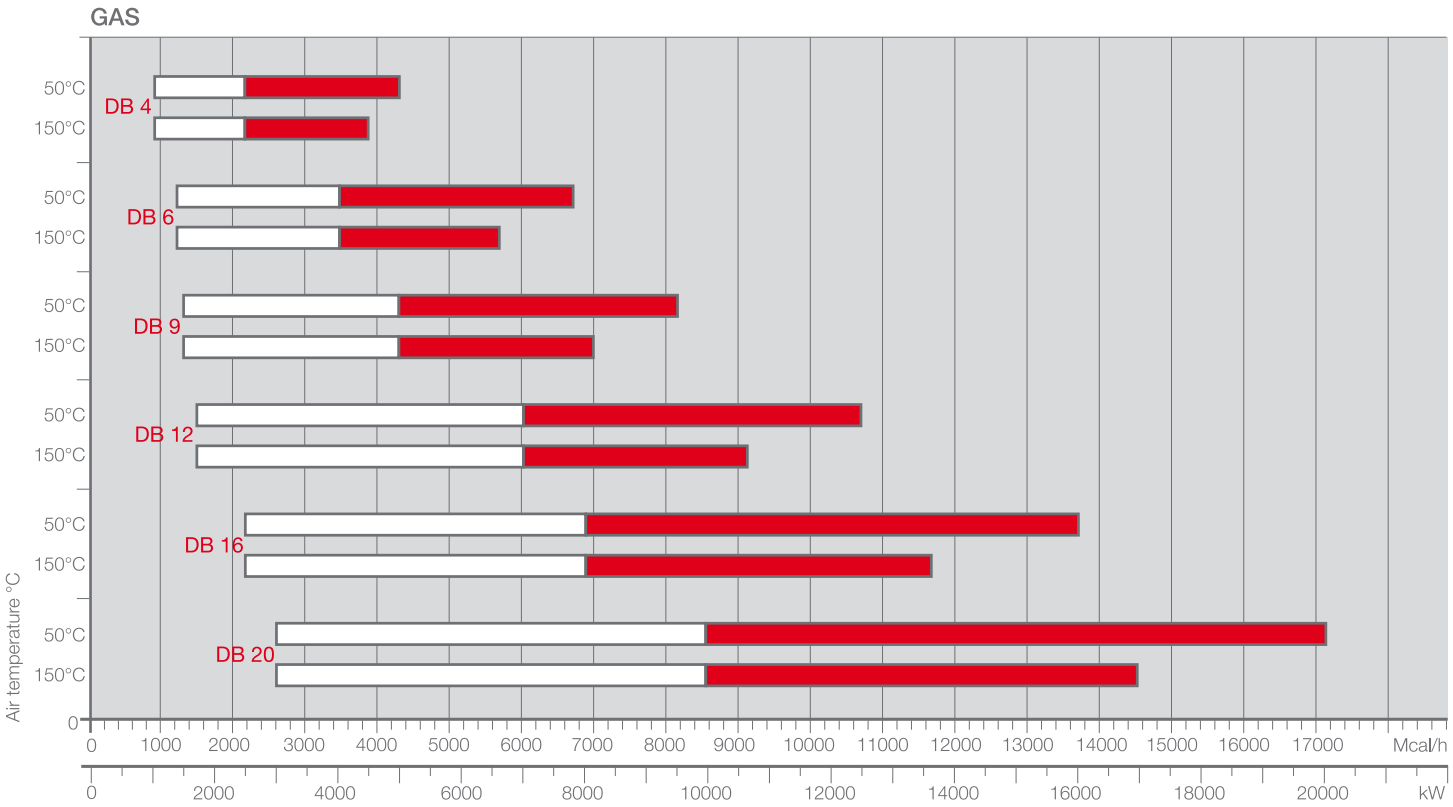
RIELLO BURNERS

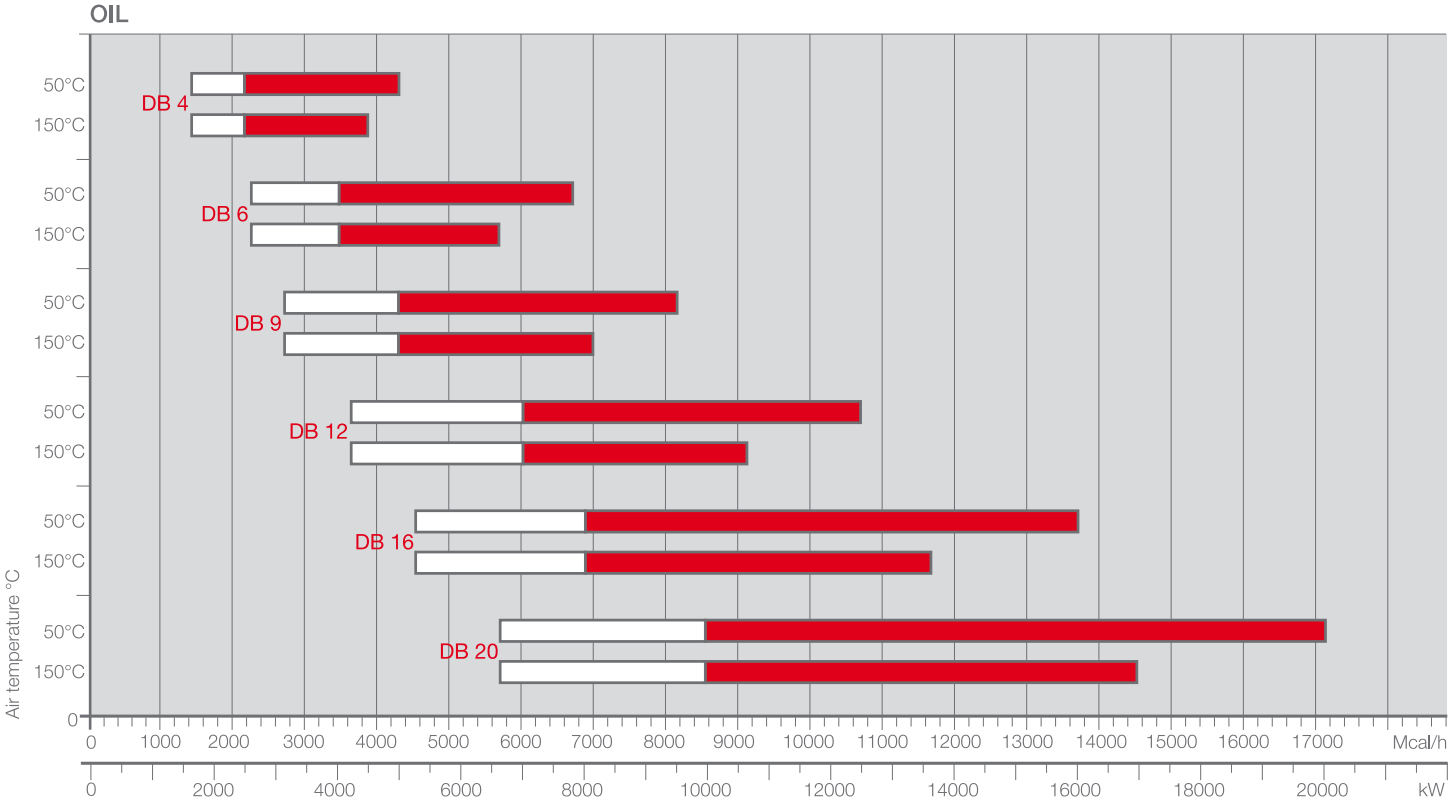
Technical Data

MODEL			DB 4	DB 6	DB 9	DB 12	DB 16	DB 20
Burner operation mode			modulating					
Modulation ratio at max output	natural gas		1:5	1:5	1:6	1:6	1:6	1:6
	LPG		1:4	1:5	1:5	1:5	1:5	1:6
	light oil		1:4	1:4	1:4	1:4	1:4	1:4
	heavy oil		1:3	1:3	1:3	1:3	1:3	1:3
Servomotor	type - mechanical cam		SQM 10	SQM 10	SQM 20	SQM 20	SQM 50	SQM 50
	type - electronic cam		MM 10004 / MM10005					
Heat output	natural gas	kW	1000/2500÷5000	1400/4000÷7800	1500/5000÷9500	1700/7000÷12500	2500/8000÷16000	3000/10000÷20000
	LPG	kW	1200/2500÷5000	1600/4000÷7800	1900/5000÷9500	2100/7000÷12500	3100/8000÷16000	3600/10000÷20000
	light oil	kW	1250/2500÷5000	1950/4000÷7800	2400/5000÷9500	3200/7000÷12500	4000/8000÷16000	5000/10000÷20000
	heavy oil	kW	1650/2500÷5000	2600/4000÷7800	3150/5000÷9500	4150/7000÷12500	5300/8000÷16000	6600/10000÷20000
Working temperature	min./max.	°C	-15/60					
FUEL/AIR DATA								
Light oil	net calorific value	kWh/kg	11,8					
		Kcal/kg	10200					
	viscosity at 20°C	mm^2/s (cSt)	4 ÷ 6					
	delivery	kg/h	85/212 - 424	119/339 - 661	127/424 - 805	144/593 - 1059	212/678 - 1356	254/847 - 1695
	fuel temperature	max. °C	50					
Heavy oil	net calorific value	kWh/kg	11,1÷11,3					
		Kcal/kg	9545÷9720					
	viscosity at 20°C	mm^2/s (cSt)	500					
	delivery	kg/h	90/224 - 448	125/358 - 699	134/448 - 851	152/627 - 1120	224/717 - 1434	269/896 - 1792
	fuel temperature	max. °C	140					
Atomizing pressure		bar	25÷30					
Natural gas (G20)	net calorific value	kWh/kg	10					
	density		0,71					
	gas delivery	Nm^3/h	100/250 - 500	140/400 - 780	150/500 - 950	170/700 - 1250	250/800 - 1600	300/1000 - 2000
Natural gas (G25)	net calorific value		8,6					
	density		0,78					
	gas delivery	Nm^3/h	116/291 - 581	163/465 - 907	174/581 - 1105	194/814 - 1453	291/930 -1860	349/1163 - 2326
LPG	net calorific value		25,8					
	density		2,02					
	gas delivery	Nm^3/h	39/97 - 194	54/155 - 302	58/194 - 368	66/271 -484	97/310 - 620	116/388 - 775
ELECTRICAL DATA								
Electrical supply		Ph/Hz/V	1/50-60/230 - (1/50-60/110 on request)					
Control box		type	LFL 1.333 - LFL 1.335 (Intermittent working) - LGK 16 (Continuos working) - Mini MK5 EVO - Mini MK6 - MK 6 EVO					
Auxiliary electrical power		kW	0,63					
Total current		A	2,7 - 5,7					
Protection level		IP	54					
Ignition transformer		V1 - V2	230 V - 1x8 KV					
		I1 - I2	1,4A - 30 mA					
Operation			Intermittent (at least one stop every 24 h) - Continuos (at least one stop every 72 h)					
EMISSIONS								
Light oil	CO emission	mg/kWh	< 110					
	Grade of smoke indicator	N° Bacharach	< 1					
	NOx emission	mg/kWh	< 185 for C20 and C23 versions					
Heavy oil	CO emission	mg/kWh	Depending on the fuel composition					
	Grade of smoke indicator	N° Bacharach	Depending on the fuel composition					
	NOx emission	mg/kWh	Depending on the fuel composition					
G20	CO emission	mg/kWh	< 100					
	NOx emission	mg/kWh	< 80 for C03 and C23 versions					
APPROVAL								
Directive			89/336 - 73/23 - 98/37 - 90/396 CEE					
Conforming to			EN 267 - EN 676					
Certification			--					

Reference conditions:
Temperature: 20°C - Pressure: 1013,5 mbar - Altitude: 0 m a.s.l. - Noise measured at a distance of 1 meter.

FIRING RATES





Test conditions conforming EN 267; EN 676:
Temperature: 20°C
Pressure: 1013.5 mbar
Altitude: 0 m a.s.l.

Useful working field for choosing the burner

Modulating range

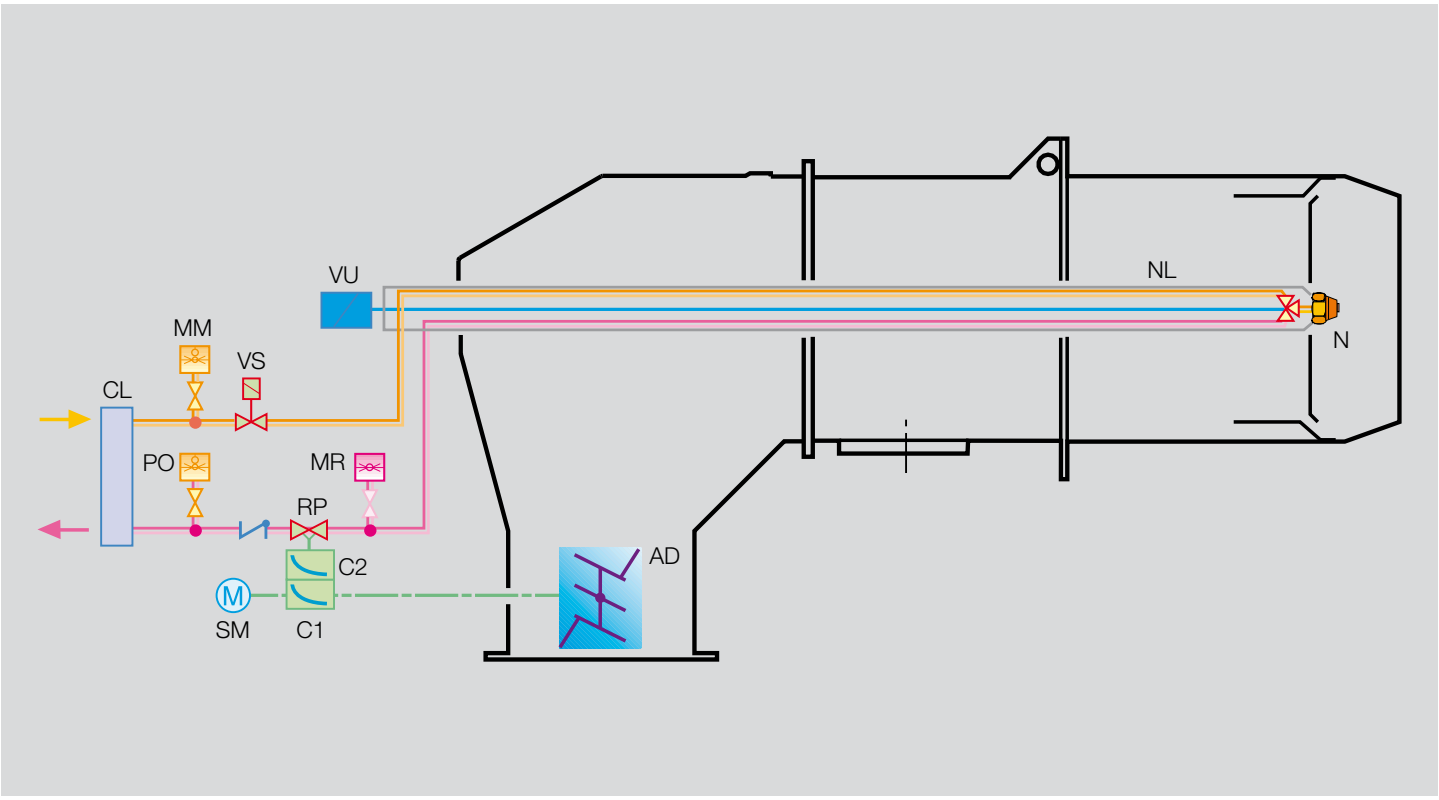
Fuel Supply

EXAMPLE OF HYDRAULIC CIRCUIT (mechanical cam - mechanical atomisation)

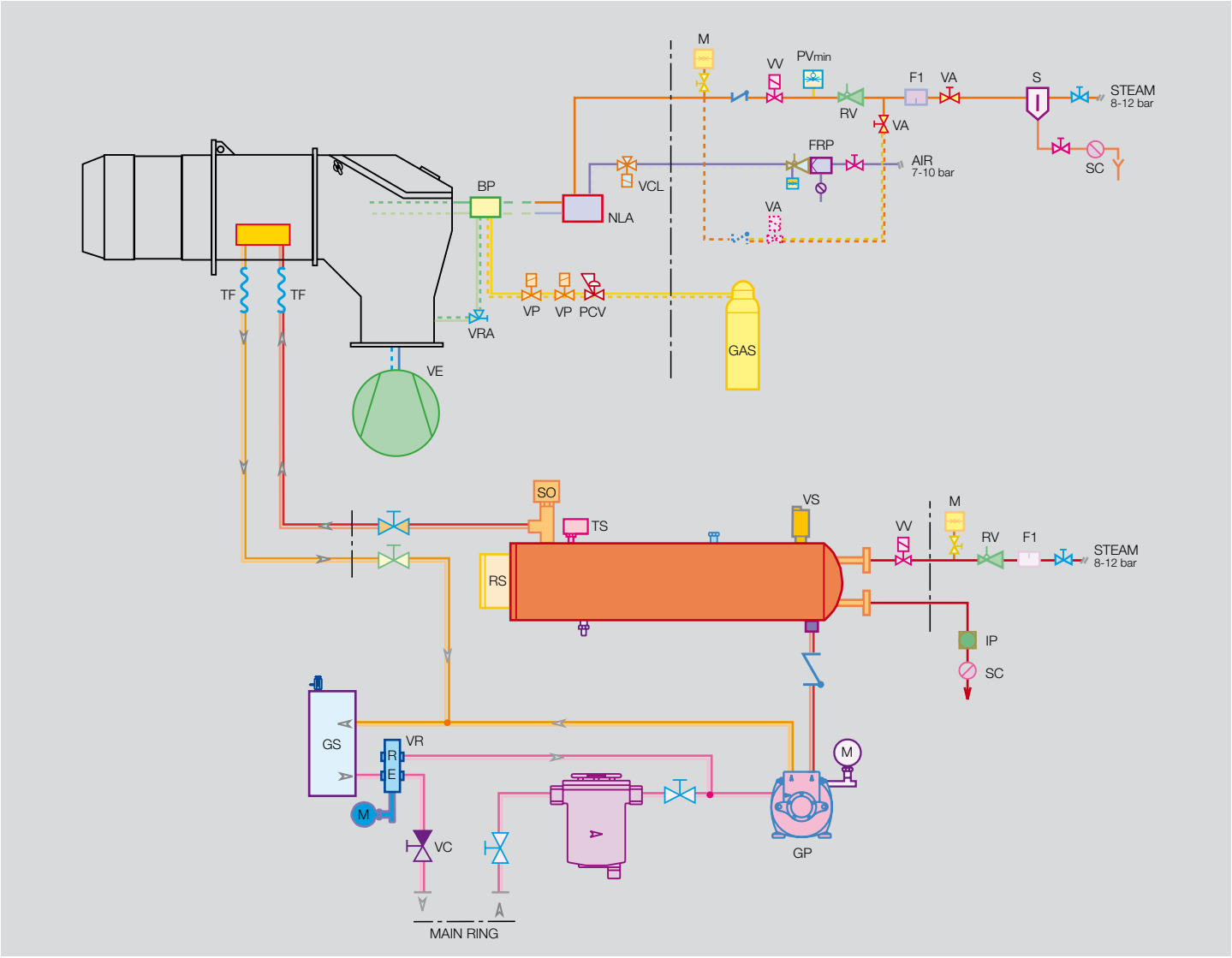
The hydraulic circuit of industrial burner DB series is composed by two main blocks; the first one, on bord, includes the emergency and regulation units; the second, separate to the burner, constitutes the pumping group.
A variable profile cam connects the regulation of the fuel and the air guaranteeing an elevate combustion efficiency on all firing rates.

AD	Air damper
CL	Oil collector
C1	First adjusting cam
C2	Second adjusting cam
MM	Pressure gauge on the delivery circuit
MR	Pressure gauge on the return circuit
NL	Oil pipe
N	Nozzle
PO	Max. oil pressure switch on the return circuit
RP	Pressure regulator on the return circuit
SM	Servomotor
VS	Safety oil valve
VU	Nozzle safety valve

Example of oil unit DB



EXAMPLE OF COMPLETE SUPPLY OIL CIRCUIT (steam atomizing)



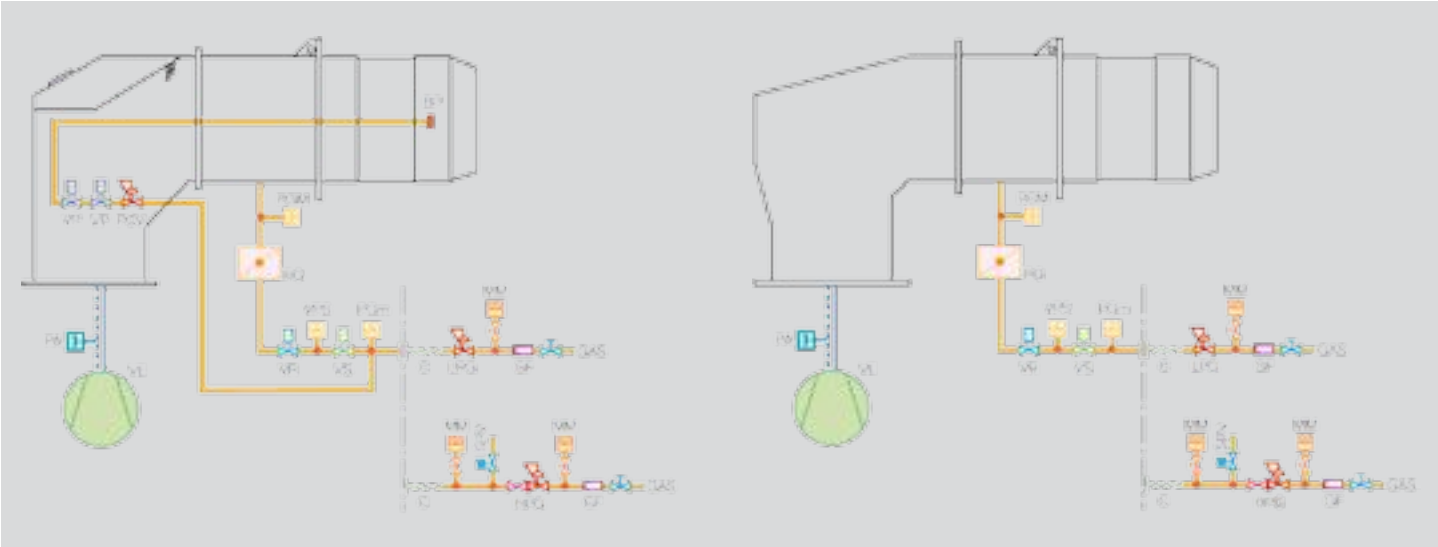
BP	Pilot burner
ELV	Electric/steam oil preheater
F	Self-cleaning filter
FRP	Air pressure regulation filter
F1	Filter
GP	Pump with pressure regulator
	A : suction
	BP : by-pass
	S : delivery
GS	Degassing unit
IP	Condensation passage indicator
PCV	Gas pressure regulator
PVmin	Minimum steam pressure switch
M	Pressure gauge
NLA	Oil lance
RS	Pre-heater heating element

RV	Steam/air pressure regulator
S	Condensation separator
SC	Condensation outlet
SO	Oil temperature probe (PT 100)
TF	Flexible hose
TS	Maximum and minimum oil thermostat
VA	Air/steam adjustment valve (manual selection)
VCL	Oil lance hydraulic control valve
VRA	Air pressure regulation valve
VC	Relief valve (normally closed)
VE	Fan
VP	Pilot valve
VR	Oil pressure regulator valve
VS	Safety valve (maximum pressure)
VV	Steam solenoid valve

NOTE: With ring distribution oil systems, the feasible drawings and dimensioning are the responsibility of specialised engineering studios, who must check compatibility with the requirements and features of each single installation.

EXAMPLE OF COMPLETE SUPPLY GAS LINE

The DB burners series are fitted with a butterfly valve to regulate the fuel, controlled by a variable profile cam servomotor which guarantees, through the association of the air and fuel regulation, high thermal efficency all over the firing rates.



BP	Pilot burner
GAS	Supply gas line
VE	Fan
PA	Minimum air pressure switch
PGM	Maximum gas pressure switch
RG	Butterfly valve
VP	Pilot gas train valve
PCV	Pilot gas train regulator
VR	Gas train adjusting valve

VPS	Seal control
VS	Gas train safety valve
PGm	Minimum gas pressure switch
C	Anti-vibrant joint
LPG	Low pressure regulator
MM	Pressure gauge
GF	Filter
SRV	Vent safety valve
HPG	High pressure regulator

Combustion Head

Different lengths of the combustion head can be chosen for the DB series of burners. The choice depends on the thickness of the front panel and the type of boiler.
Depending on the type of generator, check that the penetration of the head into the combustion chamber is correct.

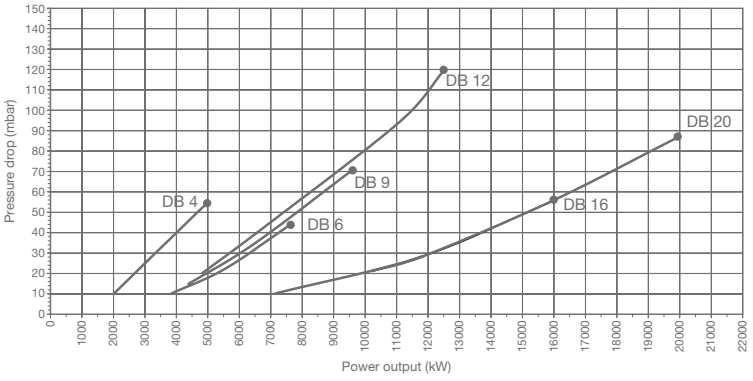
Example of DB low NOx combustion head (gas operation).

COMBUSTION HEAD PRESSURE DROP DIAGRAMS

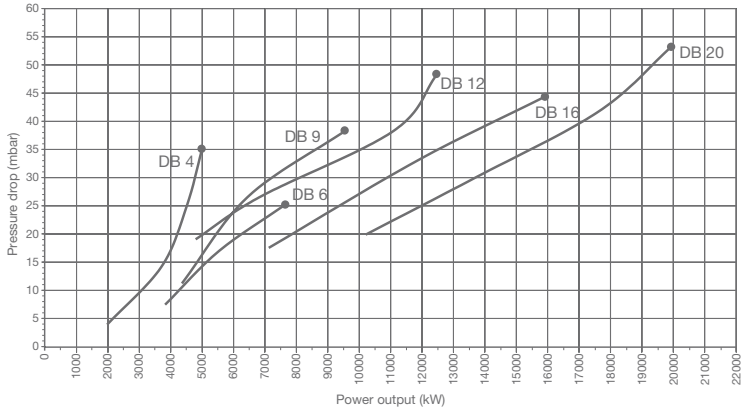
GAS PRESSURE LOSSES

The following diagrams indicate the gas side losses of the combustion head. Adding to the value of these losses the combustion chamber pressure and total gas train loss, it is obtained the minimal input pressure necessary to the gas train.

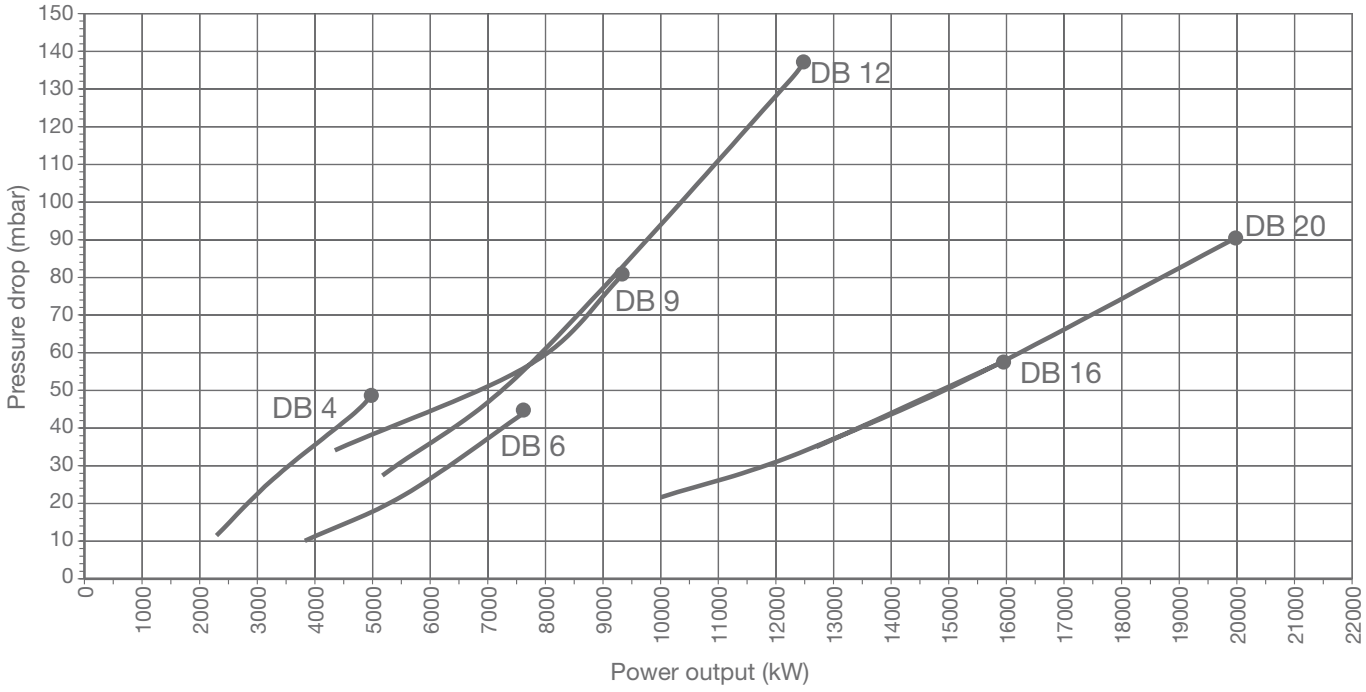
Burner head GAS pressure drop (including butterfly valve and ref to G20)
DB - Natural Gas - Low NOx Emissions



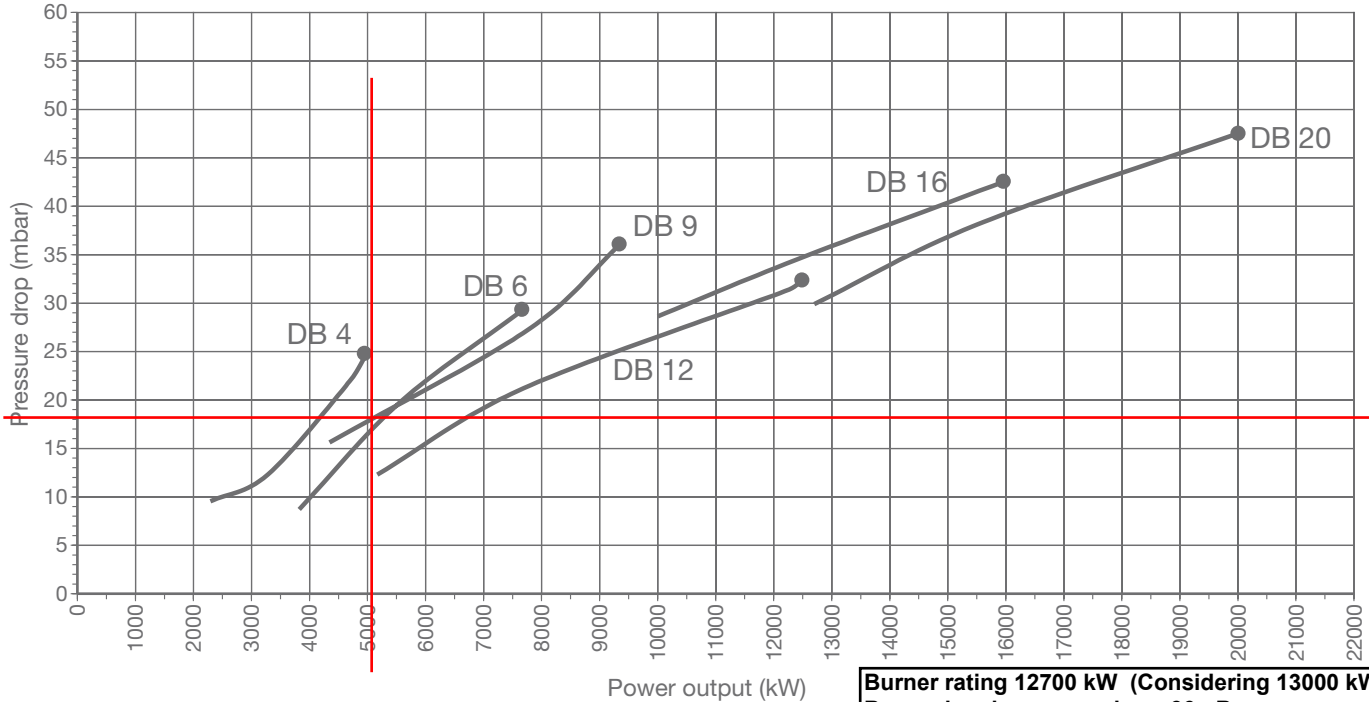
Burner head AIR pressure drop (including air damper - AIR temp = 40°C)
DB - Natural Gas - Low NOx Emissions



Burner head GAS pressure drop (including butterfly valve and ref to G20)



Burner head AIR pressure drop (including air damper - AIR temp = 40°C)

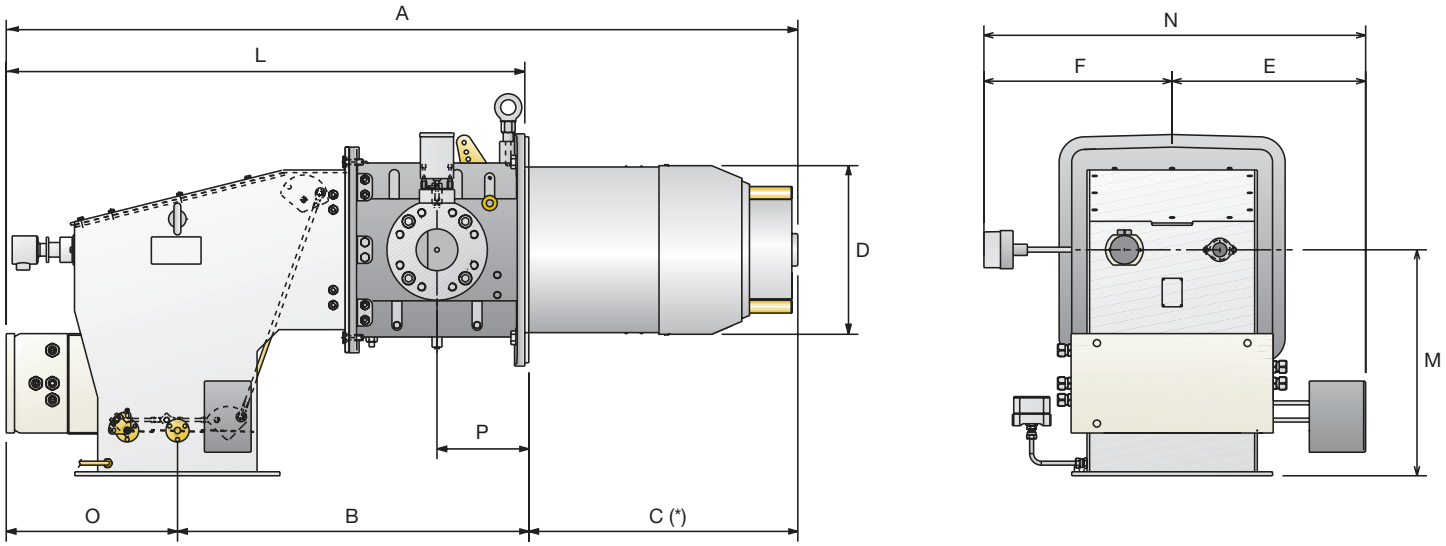


Burner rating 12700 kW (Considering 13000 kW)
Burner head pressure drop: 36mBar
Correction factor for preheated air 220°C : 1.68
Burner head pressure drop : 60 mBar
Heater 60mbar + 30mbar (Heater + APH + ducting)
~ 90 m bar

Overall Dimensions (mm)

All dimensions are approximate and mentioned just as an indication. Please refer to Riello Burners Technical Department for further detailed information.

BURNER

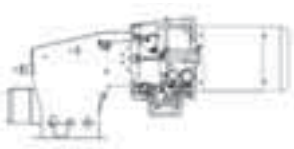


MODEL	A	B	C	D	E	F	L (L*)	M	N	O	P
▶ DB 4	1577	700	536	336	385	375	1033 (1217)	450	760	341	183
▶ DB 6	1577	700	536	336	385	375	1033 (1217)	450	760	341	183
▶ DB 9	1857	851	662	413	420	333	1195 (1539)	550	753	344	208
▶ DB 12	1857	851	662	456	420	333	1195 (1539)	550	753	344	208
▶ DB 16	2080	852	797	544	486	448	1283 (1600)	761	934	431	258
▶ DB 20	2080	852	797	590	486	448	1283 (1600)	761	934	431	258

L = gas version
L* = oil and dual fuel versions
(*) Instructions about how to realize the fettling are reported in the manual of the burner in the chapter “Fixing to the boiler”.

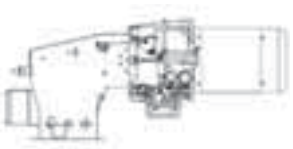
GAS CONNECTIONS

DB 4



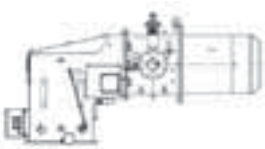
DN 65 gas connection from below
L-shape DN 65 gas adapter required

DB 6



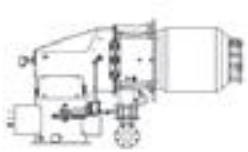
DN 80 gas connection from below
L-shape DN 80 gas adapter required

DB 9 - 12



DN 80 gas connection from the side
I-shape DN 80 gas adapter required

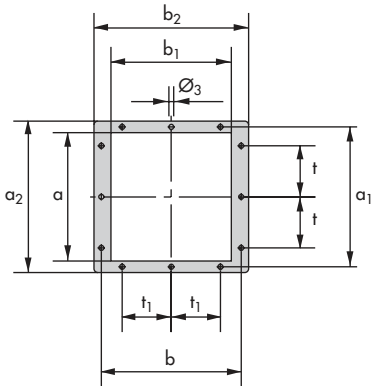
DB 16 - 20



DN 100 gas connection from the side
L 100/100 adapter already included

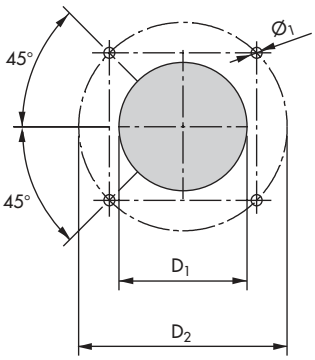
BURNER - BOILER MOUNTING FLANGE

AIR DUCT CONNECTION

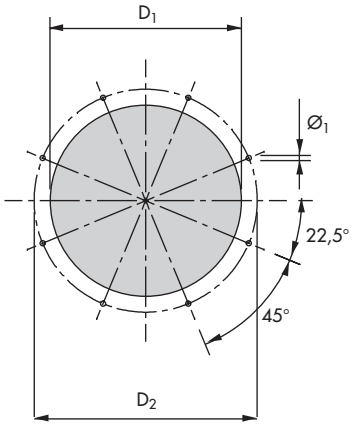


FIXING TO THE BOILER

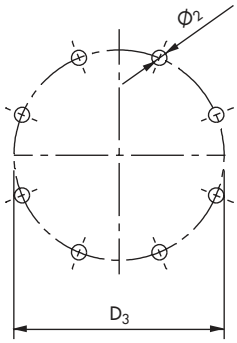
DB 4 - 6 - 9 - 12



DB 16 - 20



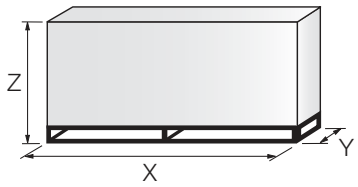
GAS SUPPLY



MODEL	a	a_1	a_2	b	b_1	b_2	D_1	D_2	D_3	t	t_1	$Ø_1$	$Ø_2$	$Ø_3$
▶ DB 4	329	370	400	370	308	409	350	498	160 - DN 65	135	130	M20	18	13
▶ DB 6	329	370	400	370	308	409	350	498	160 - DN 80	135	130	M20	18	13
▶ DB 9	436	476	506	440	400	470	420	608	160 - DN 80	200	180	M18	18	11
▶ DB 12	436	476	506	440	400	470	465	608	160 - DN 80	200	180	M18	18	11
▶ DB 16	562	tbd	400	520	452	542	560	700	160 - DN 100	410	205	M14	18	11
▶ DB 20	562	tbd	400	520	452	542	560	700	160 - DN 100	410	205	M14	18	11

PACKAGING

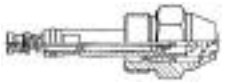
Overall dimensions and weights to estimate the delivery.



MODEL	X	Y	Z	kg
▶ DB 4	2100	1000	1200	200
▶ DB 6	2100	1000	1200	200
▶ DB 9	2100	1000	1200	250
▶ DB 12	2100	1000	1200	250
▶ DB 16	2200	1000	1300	300
▶ DB 20	2200	1000	1300	300

Burner Accessories

Nozzles for DB 4 - 6 - 9 - 12 - 16 - 20



The nozzles must be ordered separately. The following table shows the features and codes on the basis of the maximum required fuel output. One nozzle required for each burner, able to guarantee the calculated oil delivery.

BURNER	ton/h*	FLDCS - W2 45° kg/h	CODE	BRGZ - B5 45° AA kg/h	CODE	BRGZ - C5 45° kg/h	CODE
	3	200	3045438	200	3009800		
		225	3045440	225	3009801		
		250	3045442	250	3009802		
	4	275	3045444	275	3009803		
		300	3045446	300	3009804		
▶ DB 4 - 6 - 9		325	3045448	325	3009805		
	5	350	3045450	350	3009806		
		375	3045452	375	3009807		
	6	400	3045454	400	3009808		
		425	3045455	425	3009809		
		450	3045456	450	3009810		
		475	3045457	475	3009811		
		500	3045458	500	3009812		
		525	3045459	525	3009813		
	8	550	3045460	550	3009814		
▶ DB 6 - 9 - 12		575	3045461	575	3009815		
		600	3045462	600	3009816		
		650	3045463	650	3009817		
	10	700	3045464	700	3009818	700	in progress
		750	3045465	750	3009819	750	in progress
▶ DB 9 - 12 - 16				800	3009820	800	in progress
	12			850	3009821	850	in progress
						900	in progress
						950	in progress
						1000	in progress
▶ DB 12 - 16 - 20	15					1050	in progress
	16					1100	in progress
						1150	in progress
						1200	in progress
	18					1250	in progress
▶ DB 16 - 20						1300	in progress
	20					1400	in progress
						1500	in progress
	22					1600	in progress
▶ DB 20						1700	in progress
	25					1800	in progress

*steam boiler size according to:
N.C.V. heavy oil = 11,16 kWh/kg
combustion air = 50°C
1 ton/h = 775 kW (eff = 90%)

For steam/air assisted atomizing, special nozzles available on demand.

High pressure flexible tubes

In order to facilitate the connection of the burner to the fuel line adduction there are flexible tubes available according to the following table.

BURNER	TUBE DIAMETER	TUBE LENGTH (mm)	MAXIMUM WORKING PRESSURE (bar)	TUBE CODE
▶ DB 4 - 6	1/2”	1500	40	3094227
▶ DB 9 - 12 - 16 - 20	3/4”	2000	40	3094226

High pressure oil filter

In order to protect the hydraulic circuit of the burner from the possible presence of particles in the combustion line, these following filters are available.

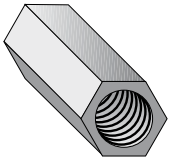
BURNER	FILTER DIAMETER	FILTERING DEGREE (µm)	FILTER CODE
▶ DB 4 - 6	1/2”	500	in progress
▶ DB 9 - 12 - 16 - 20	3/4”	500	in progress

Circulation group (by-pass valve)

If the burner is far away from the pumping group it is possible to install a circulation group that allows the circulates of the heated fuel during the stand-by phase.

BURNER	GROUP DIAMETER	GROUP CODE
▶ DB 4 - 6	1/2”	in progress
▶ DB 9 - 12 - 16 - 20	3/4”	in progress

Check valve



In order to avoid fuel return, that could damage the hydraulic circuit, “check valve” are available.

BURNER	VALVE DIAMETER	VALVE CODE
▶ DB 4 - 6	1/2”	in progress
▶ DB 9 - 12 - 16 - 20	3/4”	in progress

Potentiometer kit

Depending on the servomotor fitted to the burner, a three-pole potentiometer (1000 Ω) can be installed to check the position of the servomotor. The KITS available for the various burners are listed below.

BURNER	POTENTIOMETER KIT CODE
▶ DB 4 - 6 - 9 - 12 - 16 - 20	3010021

Specification

DESIGNATION OF VERSIONS

A specific index guides your choice of burner from the various models available in the DB series.
Follows a clear and detailed specification description of the product.

Series: DB

Size: 4 - 6 - 9 - 12 - 16 - 20

Fuel:
- S = natural gas
- L = light oil
- N = heavy oil
- NA = heavy oil assisted atomizing
- P = LPG
- NS = heavy oil/natural gas
- NAS = heavy oil assisted atomizing/natural gas
- LS = light oil/natural gas
- LP = light oil/LPG
- NAP = heavy oil assisted atomizing/LPG

Operation:
- M = mechanical cam
- E = electronic cam

Emissions*:
- C11 = class 1 oil - class 1 gas
- C23 = class 2 oil - class 3 gas
- C03 = No oil - class 3 gas
- C01 = No oil - class 1 gas
- C10 = class 1 oil - No gas
- C20 = class 2 oil - No gas

Head length:
- TC = standard head
- TL = extended head

Flame safeguard:
- FS1 = standard checking (1 stop/24 h)
- FS2 = continuous self checking

Fuel supply:
- FR = from right
- FL = from left

Air supply:
- A0 = from the bottom
- A180 = from the top

Air max temperature:
- T50 = 50°C
- T150 = 150°C
- T250 = 250°C

Auxiliary voltage:
- 230/50-60 230V/50-60Hz
- 110/50-60 110V/50-60Hz

DB	4	S	E	C03	TC	FS1	FR	A0	T50	230/50-60

BASIC DESIGNATION

EXTENDED DESIGNATION

* Estimated, emissions values, considering a hot water boiler with thermal load of 1,1 MW/m³
Guaranteed values to be confirmed after the verification of the combustion chamber charachteristics

AVAILABLE BURNER MODELS

In the following table you can find the DB models available. Further versions are available on demand (heavy oil air/steam atomising models, preheated air up to 250°C construction, specific equipment and many others). For other low NOx versions, please contact Riello Burners Headquarter.

	MODEL **						FUEL	HEAT OUTPUT *		
								(kW)	OIL (kg/h)	GAS (Nm^3/h)
LOW NOX MODELS	DB 4	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	1000/2500-5000	-	500
	DB 4	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	500
	DB 6	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	1400/4000-7800	-	780
	DB 6	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	780
	DB 9	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	1500/5000-9500	-	950
	DB 9	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	950
	DB 12	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	1700/7000-12500	-	1250
	DB 12	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	1250
	DB 16	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	2500/8000-16000	-	1600
	DB 16	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	1600
	DB 20	SE	TC	A 0	FS1	230/50-60 T50	Natural gas	3000/10000-20000	-	2000
	DB 20	SE	TC	A 180	FS1	230/50-60 T50	Natural gas		-	2000
OTHER MODELS AVAILABLE	DB 4	SM	TC	A 0	FS1	230/50-60 T50	Natural gas	1000/2500-5000	-	500
	DB 4	SM	TC	A 180	FS1	230/50-60 T50	Natural gas		-	500
	DB 4	LE	TC	A 0	FS1	230/50-60 T50	Light oil		422	-
	DB 4	LE	TC	A 180	FS1	230/50-60 T50	Light oil		422	-
	DB 4	LSE	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		422	500
	DB 4	LSE	TC	A 180	FS1	230/50-60 T50	Light oil / Natural gas		422	500
	DB 4	LSM	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		422	500
	DB 4	LSM	TC	A 180	FS1	230/50-60 T50	Light oil / Natural gas		422	500
	DB 4	NM	TC	A 0	FS1	230/50-60 T50	Heavy oil		450	-
	DB 4	NM	TC	A 180	FS1	230/50-60 T50	Heavy oil		450	-
	DB 4	NSM	TC	A 0	FS1	230/50-60 T50	Heavy oil / Natural gas		450	500
	DB 4	NSM	TC	A 180	FS1	230/50-60 T50	Heavy oil / Natural gas		450	500
	DB 6	SM	TC	A 0	FS1	230/50-60 T50	Natural gas	1400/4000-7800	-	780
	DB 6	SM	TC	A 180	FS1	230/50-60 T50	Natural gas		-	780
	DB 6	LE	TC	A 0	FS1	230/50-60 T50	Light oil		658	-
	DB 6	LE	TC	A 180	FS1	230/50-60 T50	Light oil		658	-
	DB 6	LSE	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		658	780
	DB 6	LSE	TC	A 180	FS1	230/50-60 T50	Light oil / Natural gas		658	780
	DB 6	LSM	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		658	780
	DB 6	LSM	TC	A 180	FS1	230/50-60 T50	Light oil / Natural gas		658	780
	DB 6	NM	TC	A 0	FS1	230/50-60 T50	Heavy oil		703	-
	DB 6	NM	TC	A 180	FS1	230/50-60 T50	Heavy oil		703	-
	DB 6	NSM	TC	A 0	FS1	230/50-60 T50	Heavy oil / Natural gas		703	780
	DB 6	NSM	TC	A 180	FS1	230/50-60 T50	Heavy oil / Natural gas		703	780
	DB 9	SM	TC	A 0	FS1	230/50-60 T50	Natural gas	1500/5000-9500	-	950
	DB 9	SM	TC	A 180	FS1	230/50-60 T50	Natural gas		-	950
	DB 9	LE	TC	A 0	FS1	230/50-60 T50	Light oil		801	-
	DB 9	LE	TC	A 180	FS1	230/50-60 T50	Light oil		801	-
	DB 9	LSE	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		801	950
	DB 9	LSE	TC	A 180	FS1	230/50-60 T50	Light oil / Natural gas		801	950
	DB 9	LSM	TC	A 0	FS1	230/50-60 T50	Light oil / Natural gas		801	950

* Max capacity is referred to:
Light oil net calorific value 11,8 kWh/kh - 10200 kcal/kg - Viscosity at 20°C 4-6 mm^2/s (cSt)
Heavy oil net calorific value 11,1-11,3 kWh/kg - 9545-9720 kcal/kg - Viscosity at 20°C 500 mm^2/s (cSt)
G20 net calorific value 10 kWh/Nm^3 - Density 0,71 kg/Nm^3
G25 net calorific value 8,6 kWh/Nm^3 - Density 0,78 kg/Nm^3
LPG net calorific value 25,8 kWh/Nm^3 - Density 2,02 kg/Nm^3

** FS1 operation as standard. FS2 on demand.

OTHER MODELS AVAILABLE

MODEL **	FUEL	HEAT OUTPUT *		
		(kW)	OIL (kg/h)	GAS (Nm^3/h)
DB 9 LSM TC A 180 FS1 230/50-60 T50	Light oil / Natural gas	1500/5000-9500	801	950
DB 9 NM TC A 0 FS1 230/50-60 T50	Heavy oil		856	-
DB 9 NM TC A 180 FS1 230/50-60 T50	Heavy oil		856	-
DB 9 NSM TC A 0 FS1 230/50-60 T50	Heavy oil / Natural gas		856	950
DB 9 NSM TC A 180 FS1 230/50-60 T50	Heavy oil / Natural gas		856	950
DB 12 SM TC A 0 FS1 230/50-60 T50	Natural gas	1700/7000-12500	-	1250
DB 12 SM TC A 180 FS1 230/50-60 T50	Natural gas		-	1250
DB 12 LE TC A 0 FS1 230/50-60 T50	Light oil		1054	-
DB 12 LE TC A 180 FS1 230/50-60 T50	Light oil		1054	-
DB 12 LSE TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1054	1250
DB 12 LSE TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1054	1250
DB 12 LSM TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1054	1250
DB 12 LSM TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1054	1250
DB 12 NM TC A 0 FS1 230/50-60 T50	Heavy oil		1126	-
DB 12 NM TC A 180 FS1 230/50-60 T50	Heavy oil		1126	-
DB 12 NSM TC A 0 FS1 230/50-60 T50	Heavy oil / Natural gas		1126	1250
DB 12 NSM TC A 180 FS1 230/50-60 T50	Heavy oil / Natural gas		1126	1250
DB 16 SM TC A 0 FS1 230/50-60 T50	Natural gas	2500/8000-16000	-	1600
DB 16 SM TC A 180 FS1 230/50-60 T50	Natural gas		-	1600
DB 16 LE TC A 0 FS1 230/50-60 T50	Light oil		1349	-
DB 16 LE TC A 180 FS1 230/50-60 T50	Light oil		1349	-
DB 16 LSE TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1349	1600
DB 16 LSE TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1349	1600
DB 16 LSM TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1349	1600
DB 16 LSM TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1349	1600
DB 16 NM TC A 0 FS1 230/50-60 T50	Heavy oil		1441	-
DB 16 NM TC A 180 FS1 230/50-60 T50	Heavy oil		1441	-
DB 16 NSM TC A 0 FS1 230/50-60 T50	Heavy oil / Natural gas		1441	1600
DB 16 NSM TC A 180 FS1 230/50-60 T50	Heavy oil / Natural gas		1441	1600
DB 20 SM TC A 0 FS1 230/50-60 T50	Natural gas	3000/10000-20000	-	2000
DB 20 SM TC A 180 FS1 230/50-60 T50	Natural gas		-	2000
DB 20 LE TC A 0 FS1 230/50-60 T50	Light oil		1686	-
DB 20 LE TC A 180 FS1 230/50-60 T50	Light oil		1686	-
DB 20 LSE TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1686	2000
DB 20 LSE TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1686	2000
DB 20 LSM TC A 0 FS1 230/50-60 T50	Light oil / Natural gas		1686	2000
DB 20 LSM TC A 180 FS1 230/50-60 T50	Light oil / Natural gas		1686	2000
DB 20 NM TC A 0 FS1 230/50-60 T50	Heavy oil		1802	-
DB 20 NM TC A 180 FS1 230/50-60 T50	Heavy oil		1802	-
DB 20 NSM TC A 0 FS1 230/50-60 T50	Heavy oil / Natural gas		1802	2000
DB 20 NSM TC A 180 FS1 230/50-60 T50	Heavy oil / Natural gas		1802	2000

* Max capacity is referred to:
Light oil net calorific value 11,8 kWh/kh - 10200 kcal/kg - Viscosity at 20°C 4-6 mm^2/s (cSt)
Heavy oil net calorific value 11,1-11,3 kWh/kg - 9545-9720 kcal/kg - Viscosity at 20°C 500 mm^2/s (cSt)
G20 net calorific value 10 kWh/Nm^3 - Density 0,71 kg/Nm^3
G25 net calorific value 8,6 kWh/Nm^3 - Density 0,78 kg/Nm^3
LPG net calorific value 25,8 kWh/Nm^3 - Density 2,02 kg/Nm^3
** FS1 operation as standard. FS2 on demand.

Other versions are available on request.

PRODUCT SPECIFICATION

ALL BURNERS
Dual block forced draught burner, two stages progressive or modulating operation (with a kit), separate supply, fully automatic, made up of:
- Air damper for air setting with variable profile cam controlled by a servomotor (version /M – mechanical cam)
- Air damper for air setting with air servomotor managed by microprocessor (version /E – electronic cam)
- Variable geometry combustion head that can be set according the required output
- Combustion head servomotor managed by microprocessor (version /E – electronic cam DB16-20 only)
- Pilot burner with two gas valves and pressure regulator (as standard on DB9-12-16-20 only)
- Minimum air pressure switch
- Flame inspection window
- Electrical interface box with ignition transformer inside
- Opening hinge to have easier combustion head inspection and maintenance
- IP54 protection level.

OIL BURNER
- Phototcell for flame detection
- Nozzle pipe
- Safety nozzle valve
- Oil lance without nozzle (nozzle must be ordered separately)
- Valves group with safety oil valves
- Oil capacity regulator controlled by air servomotor linkage (version /M – mechanical cam)
- Oil capacity regulator with servomotor managed by microprocessor (version /E – electronic cam)
- Maximum oil pressure switch on the return circuit
- Pressure gauge on delivery and return circuit.

Conforming to:
- 89/336 (2004/108) EC directive (electromagnetic compatibility)
- 73/23/EC directive (low voltage)
- 98/37/EC directive (machinery)
- EN 267 (liquid fuel burners).

Standard equipment:
- screws for fixing the burner flange to the boiler
- thermal screen
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

Available accessories to be ordered separately:
- flexible tubes
- return nozzles
- high pressure oil filter
- circulation group (by-pass valve)
- check valve
- potentiometer kit for the servomotor.

GAS BURNER
- Photocell for flame detection
- Maximum gas pressure switch
- Butterfly gas valve controlled by air servomotor linkage (version /M – mechanical cam)
- Butterfly gas valve with servomotor managed by microprocessor (version /E – electronic cam)
- Gas pressure test point to the combustion head.

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

Standard equipment:
- screws for fixing the burner flange to the boiler
- thermal screen
- screws for fixing the gas train flange to the burner
- gas train gasket
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

Available accessories to be ordered separately:
- potentiometer kit for the servomotor.

DUAL FUEL BURNER (OIL/GAS)
- Phototcell for flame detection
- Nozzle pipe
- Safety nozzle valve
- Oil lance without nozzle (nozzle must be ordered separately)
- Valves group with safety oil valves
- Oil capacity regulator controlled by air servomotor linkage (version /M – mechanical cam)
- Maximum oil pressure switch on the return circuit
- Pressure gauge on delivery and return circuit
- Maximum gas pressure switch
- Butterfly gas valve controlled by air servomotor linkage (version /M – mechanical cam)
- Gas/oil servomotor managed by microprocessor (version /E – electronic cam) for butterfly gas valve / oil capacity regulator control
- Gas pressure test point to the combustion head.

Conforming to:
- 89/336 (2004/108) EC directive (electromagnetic compatibility)
- 73/23/EC directive (low voltage)
- 98/37/EC directive (machinery)
- 90/396/EC directive (gas)
- EN 267 (liquid fuel burners)
- EN 676 (gas burners)

Standard equipment:
- screws for fixing the burner flange to the boiler
- thermal screen
- screws for fixing the gas train flange to the burner
- gas train gasket
- instruction handbook for installation, use and maintenance
- spare parts catalogue.

Available accessories to be ordered separately:
- flexible tubes
- return nozzles
- high pressure oil filter
- circulation group (by-pass valve)
- check valve
- potentiometer kit for the servomotor.

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RIELLO BURNERS
Riello Burners is a brand of Riello Group.