

DB SERIES

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.

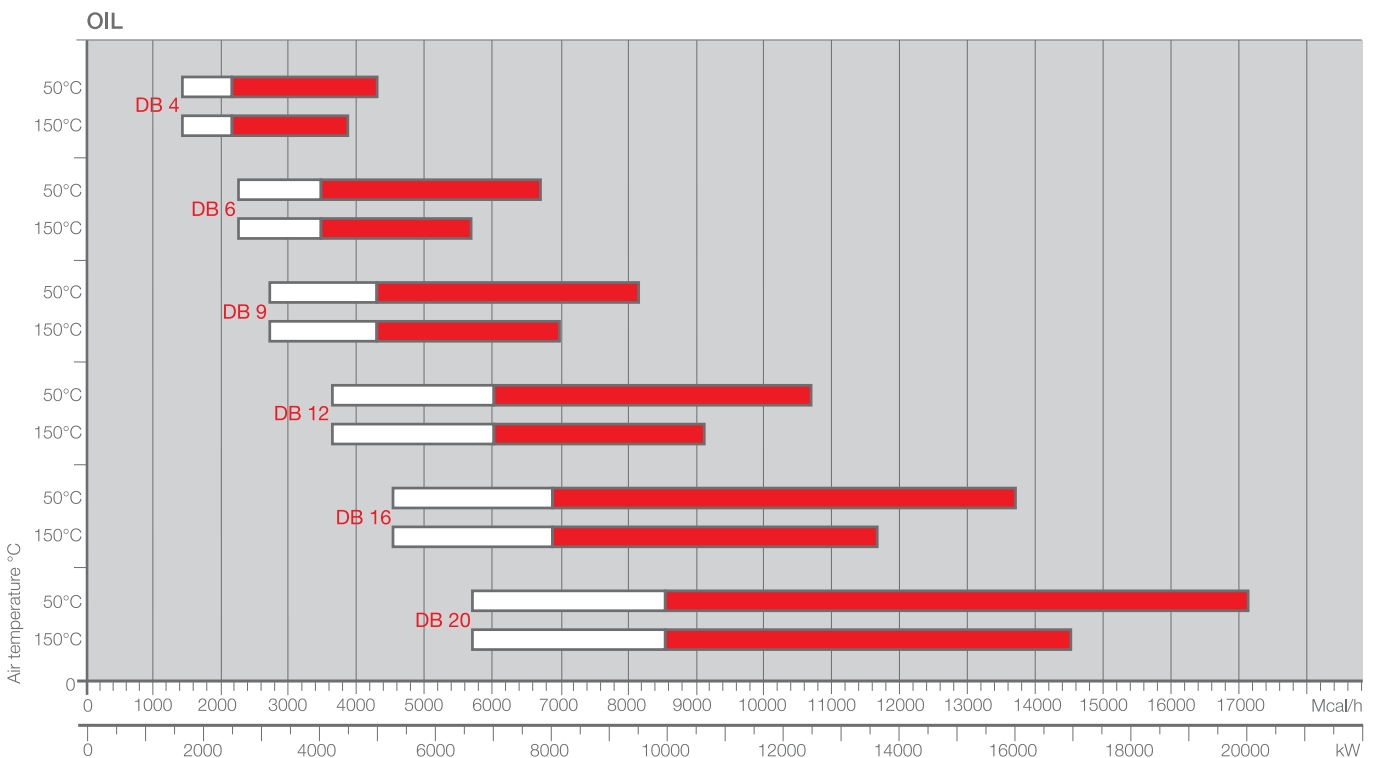
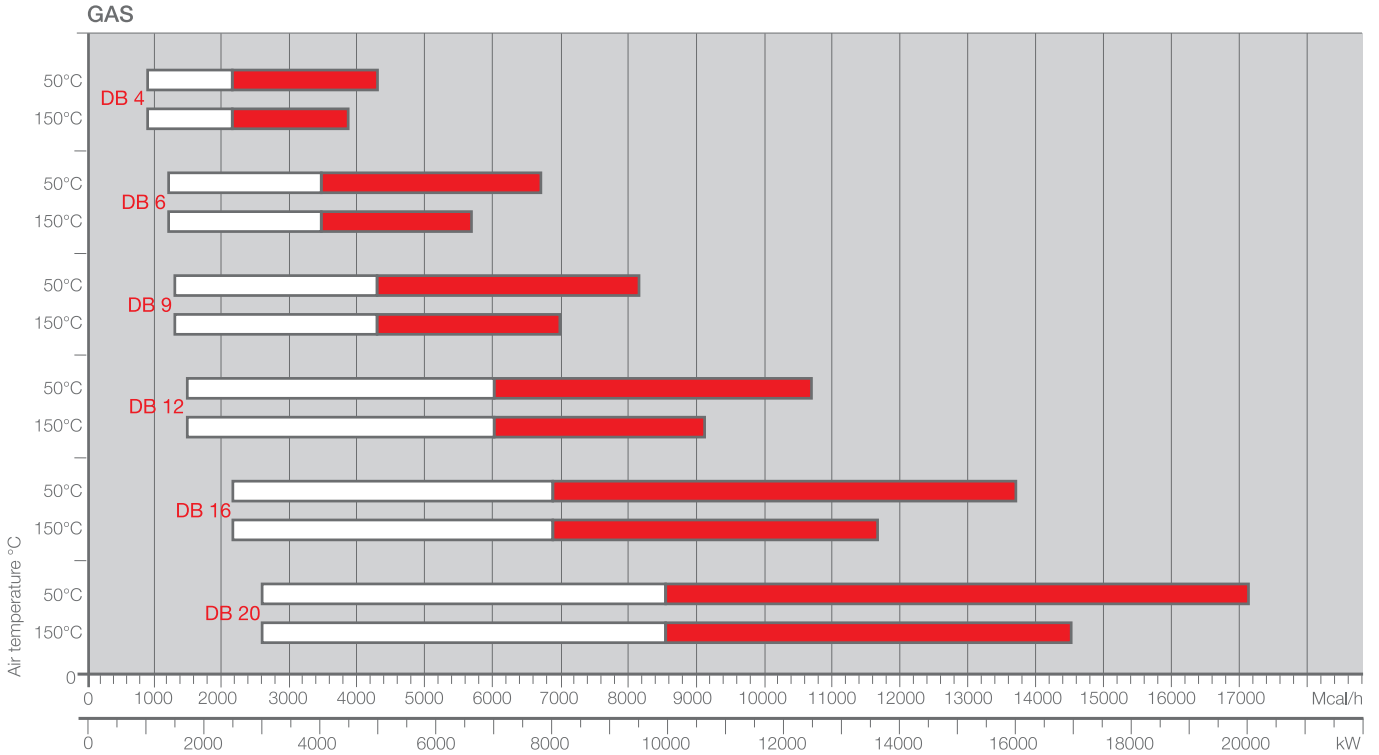


DB 4	1000/2500 ÷	5000 kW
DB 6	1400/4000 ÷	7800 kW
DB 9	1500/5000 ÷	9500 kW
DB 12	1700/7000 ÷	12500 kW
DB 16	2500/8000 ÷	16000 kW
DB 20	3000/10000 ÷	20000 kW

Industrial Dual Block Oil, Gas and Dual Fuel Burners

DB SERIES

FIRING RATES



Modulation range Working field

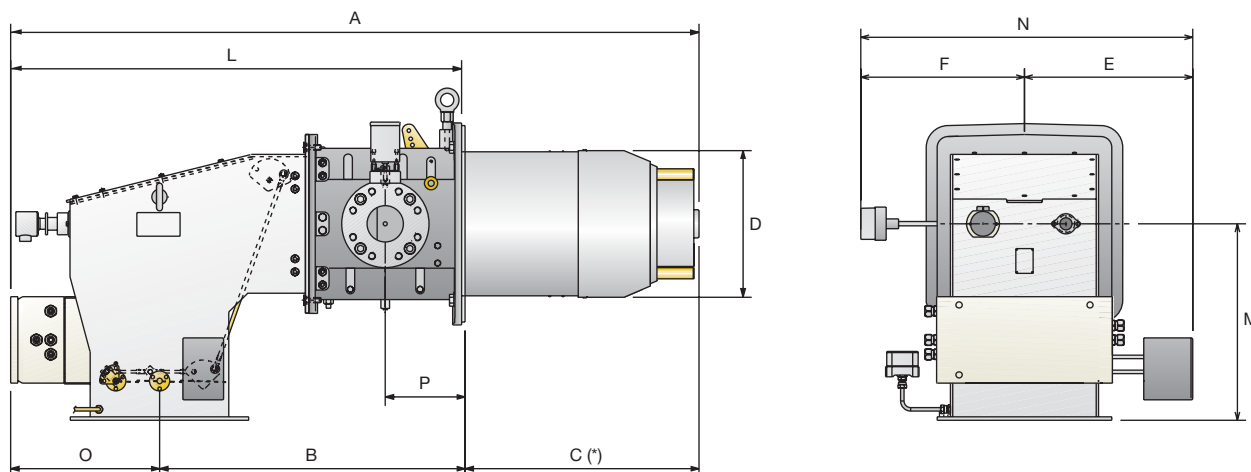
Test conditions conforming to EN 267- EN676
 Temperature: 20°C
 Pressure: 1013.5 mbar
 Altitude: 100 m a.s.l.

DB SERIES

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

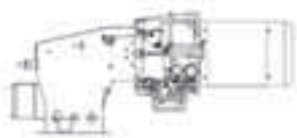
L = gas version

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



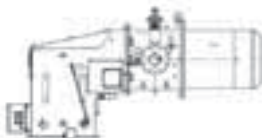
DN 65 gas connection from below
L-shape DN 65 gas adapter required

DB 6



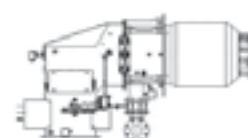
DN 80 gas connection from below
L-shape DN 80 gas adapter required

DB 9 - 12



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

DB 16 - 20



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

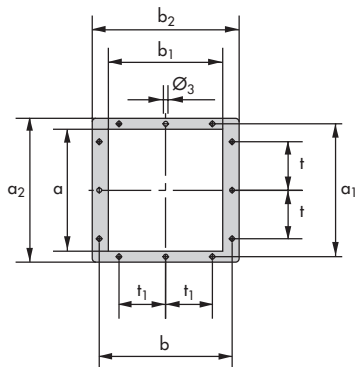
Industrial Dual Block Oil, Gas and Dual Fuel Burners

DB SERIES

Overall dimensions (mm)

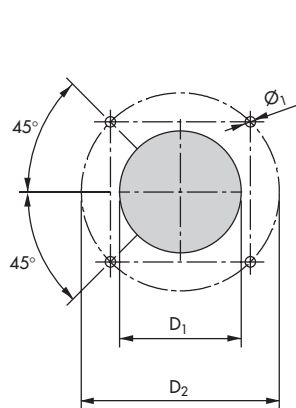
BURNER - BOILER MOUNTING FLANGE

AIR DUCT CONNECTION

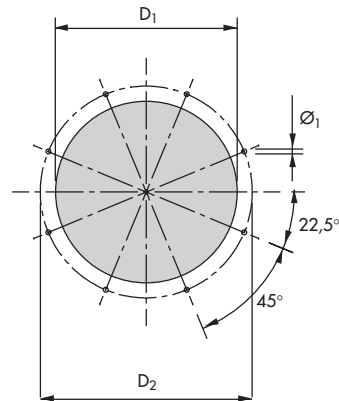


FIXING TO THE BOILER

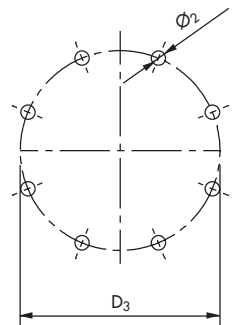
DB 4 - 6 - 9 - 12



DB 16 - 20



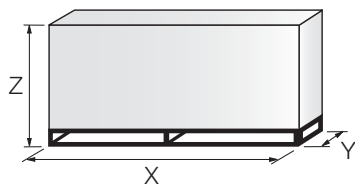
GAS SUPPLY



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.

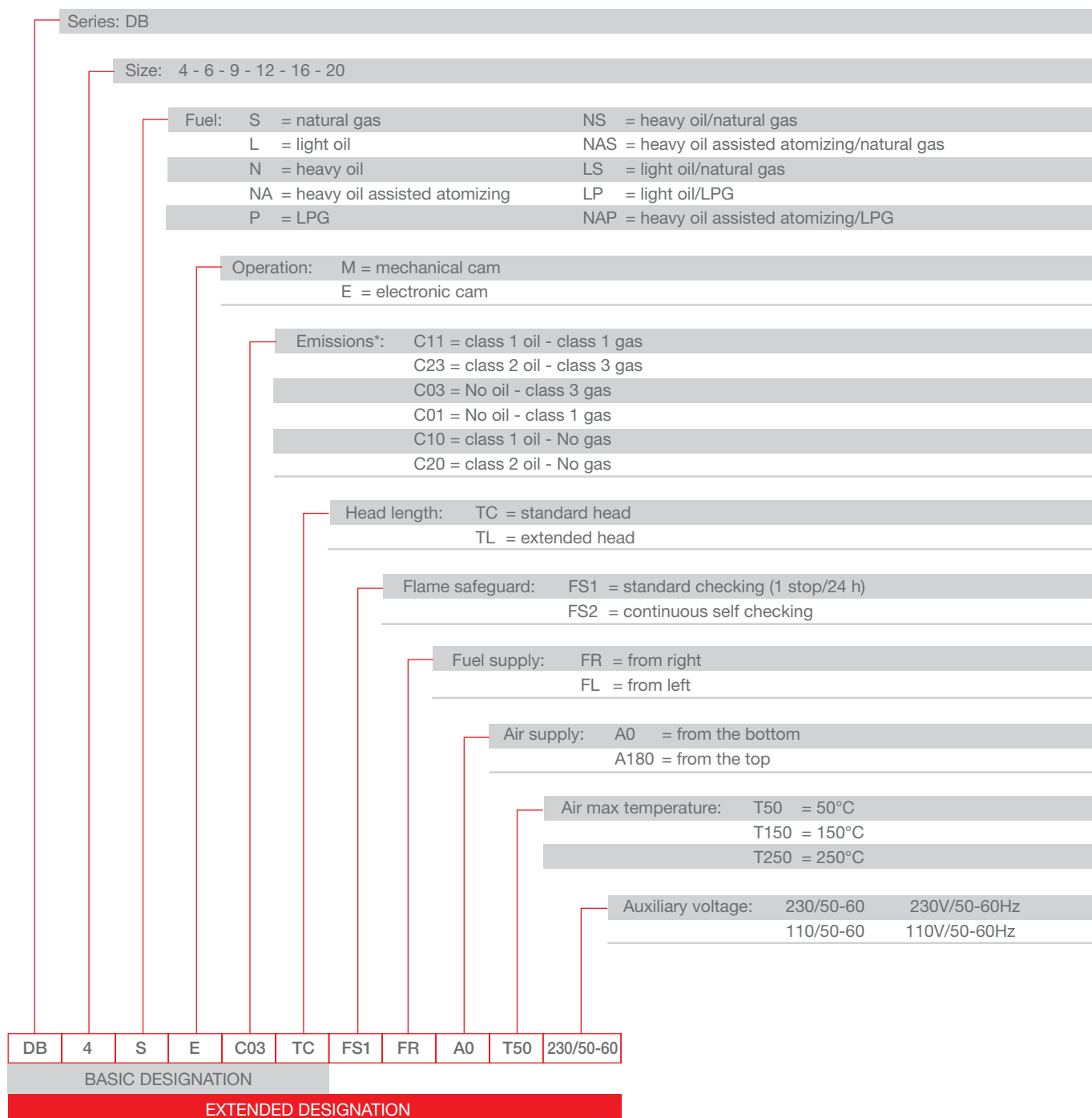


MODEL	X	Y	Z	kg
▶ DB 4	2100	1000	1200	200
▶ DB 6	2100	1000	1200	200
▶ DB 9	2100	1000	1200	250
▶ DB 12	2100	1000	1200	250
▶ DB 16	2200	1000	1300	300
▶ DB 20	2200	1000	1300	300

DB SERIES

Specification

DESIGNATION OF SERIES



* 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 characteristics

Specification

DB SERIES - STATE OF SUPPLY

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

- Photocell 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.

Standard equipment:

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

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.

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.

DB SERIES

Specification

DB SERIES - STATE OF SUPPLY

Dual fuel Burner (Oil/Gas)

- Photocell 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.

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.

Industrial Dual Block Oil, Gas and Dual Fuel Burners

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Models available

Burners

	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/kg - 10200 kcal/kg - Viscosity at 20°C 4-6 mm²/s (cSt)
 Heavy oil net calorific value 11,1-11,3 kWh/kg - 9545-9720 kcal/kg - Viscosity at 20°C 500 mm²/s (cSt)
 G20 net calorific value 10 kWh/Nm³ - Density 0,71 kg/Nm³
 G25 net calorific value 8,6 kWh/Nm³ - Density 0,78 kg/Nm³
 LPG net calorific value 25,8 kWh/Nm³ - Density 2,02 kg/Nm³

** FS1 operation as standard. FS2 on demand.

DB SERIES

Models available

Burners

	MODEL **						FUEL	HEAT OUTPUT *		
								(kW)	OIL (kg/h)	GAS (Nm ³ /h)
OTHER MODELS AVAILABLE	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/kg - 10200 kcal/kg - Viscosity at 20°C 4-6 mm²/s (cSt)
 Heavy oil net calorific value 11,1-11,3 kWh/kg - 9545-9720 kcal/kg - Viscosity at 20°C 500 mm²/s (cSt)
 G20 net calorific value 10 kWh/Nm³ - Density 0,71 kg/Nm³
 G25 net calorific value 8,6 kWh/Nm³ - Density 0,78 kg/Nm³
 LPG net calorific value 25,8 kWh/Nm³ - Density 2,02 kg/Nm³

** FS1 operation as standard. FS2 on demand.

Other versions are available on request.

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	FLDCS - W2 45° kg/h	CODE	BRGZ - B5 45° AA kg/h	CODE	BRGZ - C5 45° kg/h	CODE
▶ DB 4 - 6 - 9	3	3045438	200	3009800		
			225	3009801		
			250	3009802		
	4	3045444	275	3009803		
			300	3009804		
			325	3009805		
	5	3045450	350	3009806		
			375	3009807		
	6	3045454	400	3009808		
			425	3009809		
▶ DB 6 - 9 - 12			450	3009810		
			475	3009811		
			500	3009812		
			525	3009813		
	8	3045460	550	3009814		
			575	3009815		
			600	3009816		
			650	3009817		
	10	3045464	700	3009818	700	in progress
			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
▶ DB 12 - 16 - 20					1000	in progress
	15				1050	in progress
	16				1100	in progress
					1150	in progress
▶ DB 16 - 20					1200	in progress
	18				1250	in progress
					1300	in progress
	20				1400	in progress
▶ DB 20					1500	in progress
	22				1600	in progress
					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.

DB SERIES

Burner accessories

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

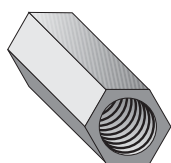
Circulation group (by-pass valve)



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/M	3010021