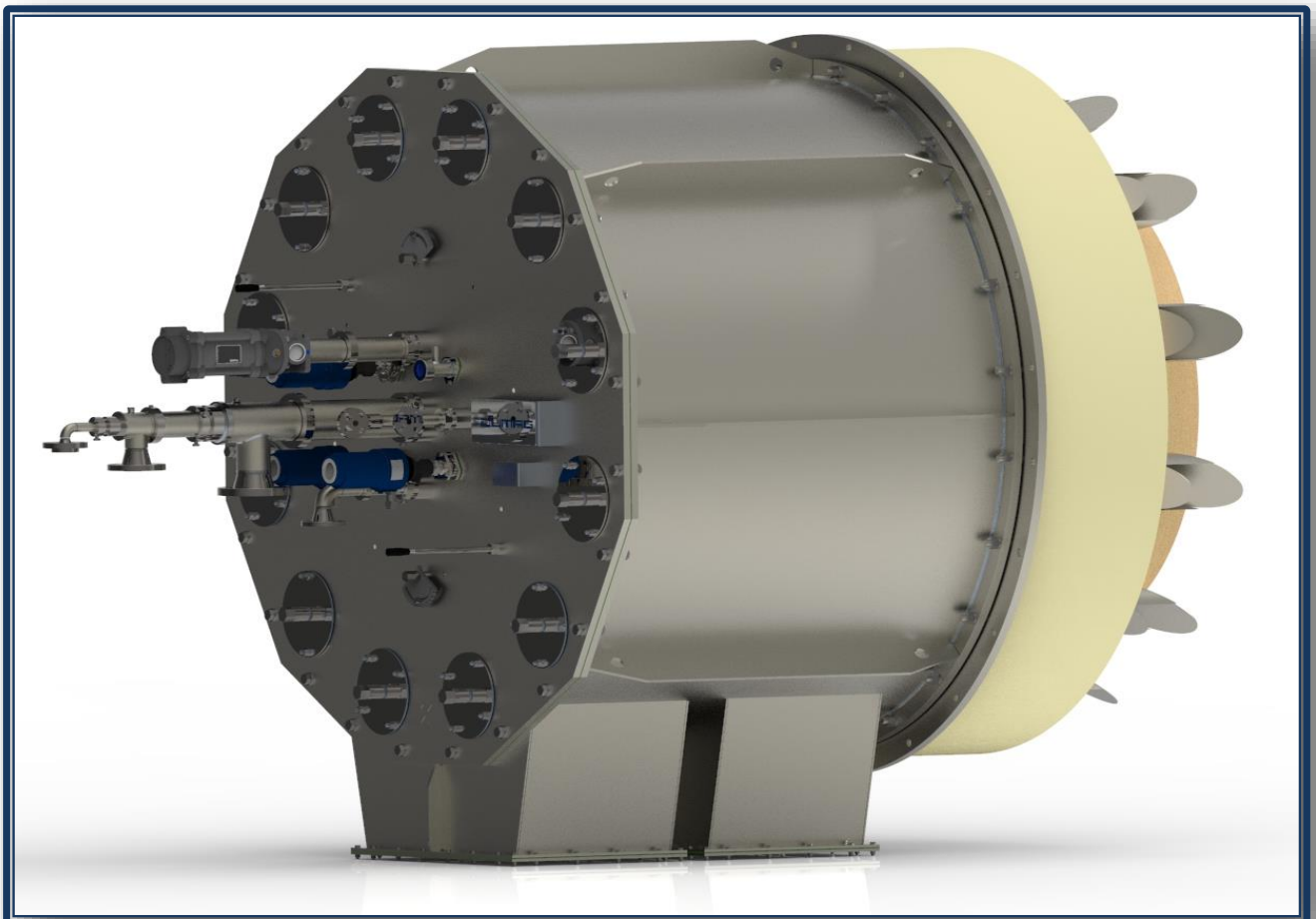


DUMAG® - LowNOx-Burner IBX

Multifuel burner for gaseous and liquid fuel
used in combustion chambers for NOx reduction by internal flue gas recirculation

two stages / triple flow / internal flue gas recirculation



**General
Assembly
Description**

**Standards
Certificates
Materials
Dimensions**

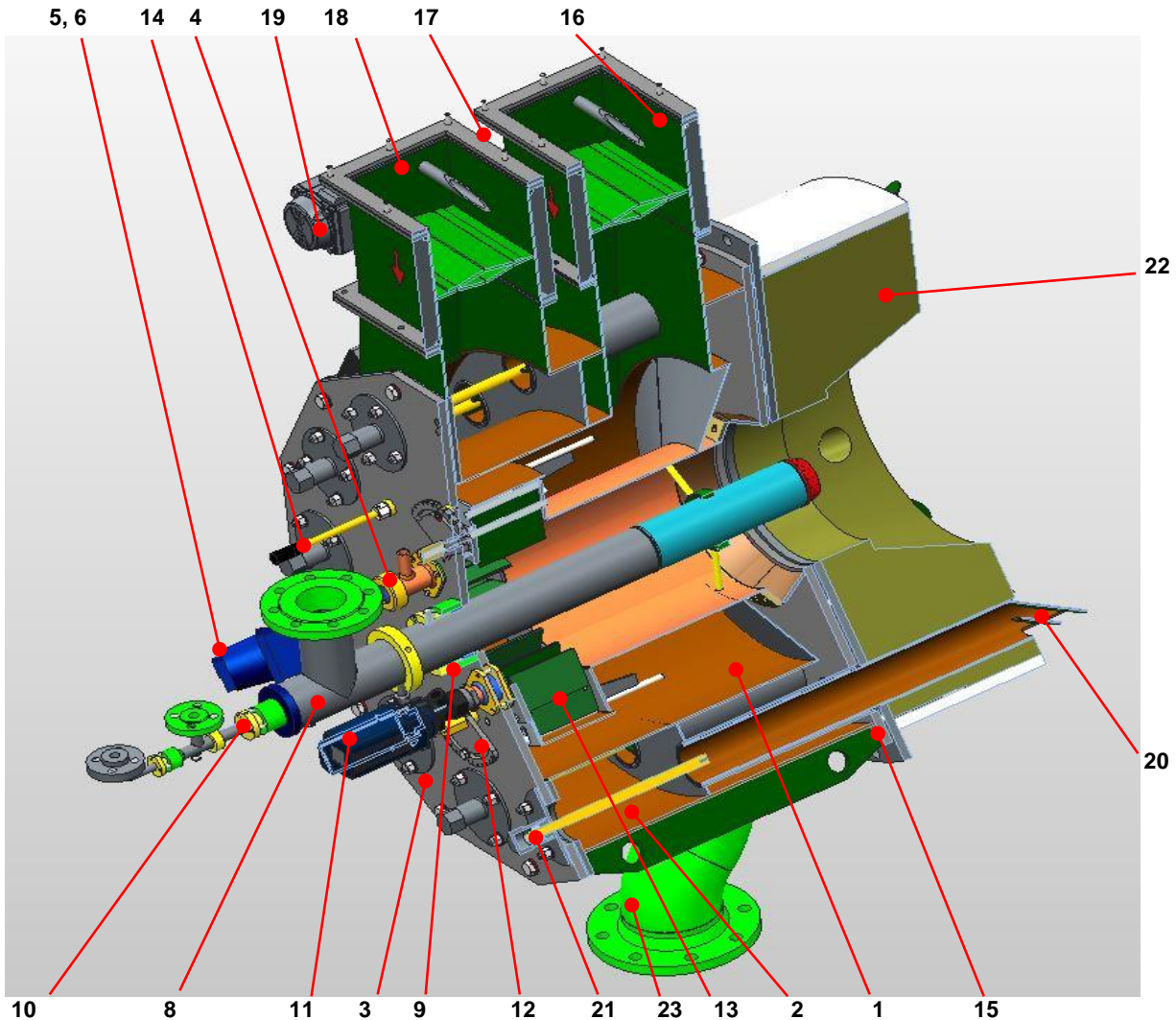
Data Sheet

1. General

The DUMAG®- LowNOx-burner IBX is a burner with 2-staged combustion air supply. The secondary air supply is bunched into three flows and creates an internal flue gas recirculation. The combination of primary and secondary air and triple flow can be adjusted individually and thus reduces NOx creation

to a minimum.
The burner is primarily used in combustion chambers. Combustion air temperature may be pre-heated up to 400°C.

2. Assembly



- | | |
|--|--|
| <ul style="list-style-type: none"> 1 burner housing, primary üart 2 burner housing, secondary part 3 burner plate 4 sight port with cooling air connetion 5 pilot burner with air and gas connection 6 stuffing box for pilot burner (not shown) 7 DUMAG® Gas Lances GE assembled circularly around the center (not pictured), attached to the burner plate or in secondary section 8 DUMAG® gas lance GU 9 stuffing box for gas lance GU 10 DUMAG® Burner Lance LS..GS with DUMAG® Ultrasonic Nozzle GS for liquids 11 flame scanner/detector with cooling air connection and ball joint | <ul style="list-style-type: none"> 12 adjustment lever for primary air swirler 13 swirler for primary air 14 slide rod for primary air 15 burner flange 16 primary air flap 17 electro-pneumatic or electric actuator for primary air flap (not shown) 18 secondary air flap 19 electro-pneumatic or electric actuator for secondary air flap 20 secondary air nozzle 21 adjusting rods with square end to adjust air nozzle 22 burner block 23 Connection for Gas Ring Distributor (option) |
|--|--|

Data Sheet

3. Description

To reduce NOx, combustion air is supplied at two stages via primary and secondary air flaps [16, 18]. The split supply of combustion air delays the burning process. In the first flame stage, CO is produced, thereby reducing NOx. But the CO will be burned at the flame end completely to CO2.

Additionally, a triple flow of the combustion air/flue gas stream is created in the combustion chamber.

The secondary air nozzles [20] are arranged in three groups to thus create the triple flow combustion air stream - which later becomes a triple flow flue gas stream.

Via the gas lance GU [8] or the burner lance LS..GS [10] the fuel flows into the flame centrally.

Gas lances GE [7] are arranged circularly around the center. Gas exits eccentrically, the lance is rotatable. The gas flow is to be directed in a way that it doesn't immediately enter the triple flow air stream.

This arrangement of air nozzles [20] and gas lances [7] grants on one hand that the air nozzles arranged for triple flow operation create a back-flow area in which flue gas and thus a huge portion of CO2 flows back close to the burner root.

The back-flowing flue gas thins the oxygen portion of the combustion air, the combustion is delayed and the flame distance increases. The temperature peaks of the flame are reduced.

A reduction of flame temperature peaks also reduces the possibility of NOx creation.

4. Applied standards, rules and regulations, depending on the design of the burner (excerpt)

EN 746-2	Industrial thermo processing equipment – Safety requirements for combustion and fuel handling systems
EN 12952-8	Water-tube boilers and auxiliary installations – Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler
EN 50156-1	Electrical equipment for furnaces and ancillary equipment (VDE 0116)
97/23/EG	Pressure equipment directive
2006/42/EG	Machinery directive
API 535	Standard for burners for fired heaters in General Refinery Services
API 560	Standard for design and manufacture of fired heaters
API 660	Shell and Tube Heat exchangers for General Refinery Services.
ASME VIII/Div.1	American Boiler and Pressure Vessel Code. Regulation for Design and Construction
API RP 582	Recommended Practice and Supplementary Welding Guidelines for the Chemical, Oil, and Gas Industries
ASME B31.2	Regulation of Fuel Gas Piping
ASME IX	Welding Qualifications
ASTM	Material Specifications
EAC	Euroasian Conformity

5. Certificates

certified according to ISO9001, EAC (Certification for Import in Euroasien countries)

Produced according to European and American standards, regulations and quality certificates

6. Materials

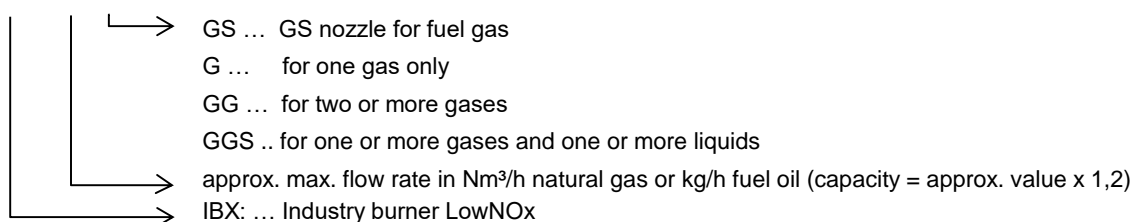
- Primary and secondary part of burner housing: Standard 1.4571 or 1.4404 (AISI316L/AISI316Ti) or S235JRG2, P265GH.
- Burner block: Steel construction P265GH, lining dependent on combustion chamber temperature, consistency and customer requests
- Burner lances for liquid and gaseous media: 1.4571 or 1.4404 (AISI316L/AISI316Ti), Hastelloy
- Gas lances: AISI316L / AISI316Ti (1.4404 / 1.4571), exterior pipe end in AISI314 (1.4841), Hastelloy
- Nozzle: Standard 1.4841 (AISI314 oder AISI310) or 1.4571/1.4404 (AISI316L/AISI316Ti) or Hastelloy

Parts exposed to combustion chamber irradiation may also be made from 1.4841 (AISI314 or AISI310)

Other materials upon request.

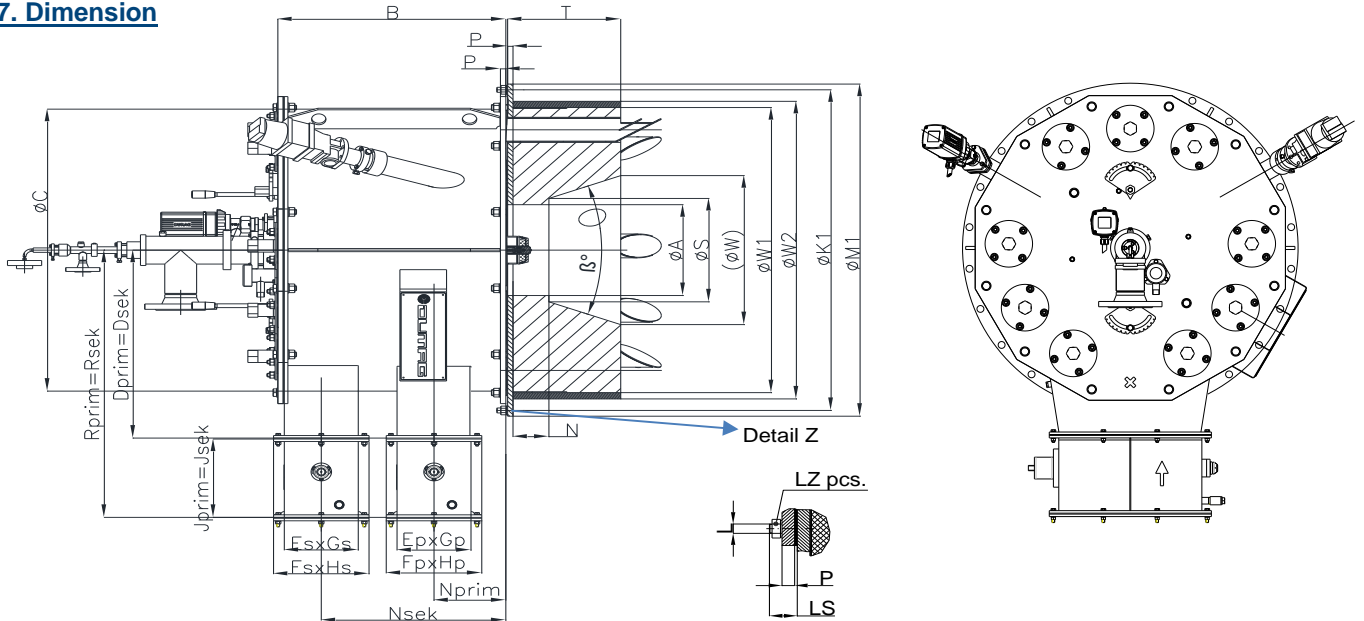
Designation of the burner (example)

IBX1500GS



Data Sheet

7. Dimension



Type	Capacity		VBL Nm³/h	ØA mm	B mm	ØC mm	Dpr= Dsek mm	Ep = Es mm	Fp= Fs mm	Gp = Gs mm	Hp= Hs mm	Jpr= Jsek mm	ØK1 mm	L M...	LS mm	LZ pcs
	MW	GJ/h														
IBX150	1,7	6,1	2.100	165	462	560	373	96	156	186	246	160	688	M16	40	12
IBX250	3,0	10,8	3.700	200	494	682	455	112	172	232	292	160	810	M16	40	12
IBX400	5,0	18,0	6.100	240	554	813	542	142	202	292	352	200	1.010	M16	40	16
IBX600	7,0	25,2	8.500	290	635	900	600	206	266	452	512	250	1.075	M16	40	16
IBX800	9,0	32	11.000	355	682	1.019	679	206	266	452	512	250	1.150	M16	45	20
IBX1000	12,0	43	15.000	400	754	1.254	836	242	302	522	582	290	1.380	M16	45	20
IBX1500	18,0	65	22.000	450	794	1.340	893	262	322	582	642	305	1.505	M20	45	24
IBX2000	23,0	83	28.000	520	930	1.468	979	330	390	533	593	330	1.630	M20	50	24
IBX2500	29,0	104	35.000	600	998	1.719	1.146	364	424	594	654	330	1.870	M20	50	32
IBX3000	35,0	126	43.000	670	992	1.811	1.207	361	421	650	710	360	1.970	M20	50	32
IBX4000	46,0	166	56.000	730	1.218	1.894	1.263	474	534	749	809	270	2.070	M20	50	32
IBX5000	58,0	209	71.000	840	1.394	2.159	1.439	520	622	836	936	270	2.400	M20	65	40
IBX6000	70,0	252	85.000	940	1.482	2.269	1.513	566	666	915	1.015	280	2.440	M20	50	40
IBX8000	93,0	335	113.000	1.030	1.686	2.483	1.655	668	768	1.055	1.155	300	2.660	M20	50	40
IBX10000	116,0	418	142.000	1.190	1.822	2.663	1.775	736	836	1.178	1.278	340	2.840	M20	50	40

Type	Capacity		VBL Nm³/h	ØM1 mm	Nsek mm	Npr mm	N mm	P mm	Rpr= Rsek mm	ØS mm	T mm	(ØW) mm	ØW1 mm	ØW2 mm	β °	Weight ca. kg
	MW	GJ/h														
IBX150	1,7	6,1	2.100	730	384	178	100	15	536	190	300	325	570	610	40	390
IBX250	3,0	10,8	3.700	850	408	186	100	15	618	230	300	365	690	730	40	510
IBX400	5,0	18,0	6.100	1.060	453	201	100	15	745	275	300	410	900	940	40	787
IBX600	7,0	25,2	8.500	1.110	502	200	100	15	853	330	300	465	960	1.000	40	950
IBX800	9,0	32	11.000	1.190	559	233	150	20	932	410	350	541	1.040	1.080	40	1.170
IBX1000	12,0	43	15.000	1.420	603	251	150	20	1.129	460	350	591	1.300	1.340	40	1.840
IBX1500	18,0	65	22.000	1.550	633	261	150	20	1.201	520	350	651	1.385	1.425	40	2.200
IBX2000	23,0	83	28.000	1.680	735	295	150	25	1.312	600	400	764	1.510	1.550	40	2.790
IBX2500	29,0	104	35.000	1.920	786	312	180	25	1.479	690	400	832	1.780	1.820	40	3.620
IBX3000	35,0	126	43.000	2.020	782	311	220	25	1.570	770	400	883	1.880	1.920	40	4.180
IBX4000	46,0	166	56.000	2.120	951	367	250	25	1.536	830	400	921	1.980	2.020	40	4.750
IBX5000	58,0	209	71.000	2.470	1.096	411	150	25	1.712	840	425	1.135	2.240	2.280	30	6.500
IBX6000	70,0	252	85.000	2.490	1.149	433	250	25	1.796	1.080	400	1.171	2.350	2.390	40	6.660
IBX8000	93,0	335	113.000	2.710	1.302	484	250	25	1.958	1.190	400	1.281	2.570	2.610	40	7.900
IBX10000	116,0	418	142.000	2.890	1.404	518	250	25	2.118	1.370	400	1.461	2.750	2.790	40	9.030

Subject to change without notice

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