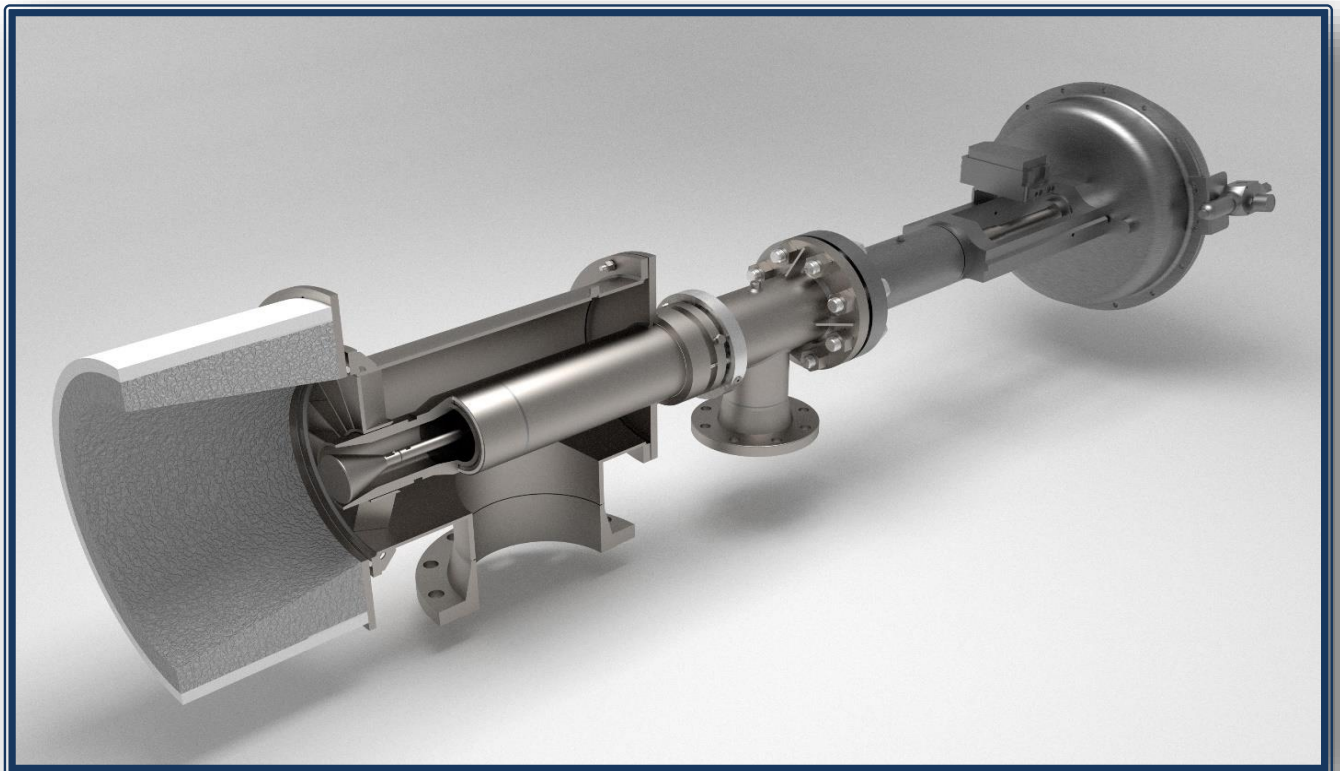


DUMAG® Constant Speed Burner CSB

A gas burner for supplying gaseous media into the combustion chamber at a constant outlet velocity and a high flow rate range



**General
Application
Assembly
Function**

**Standards
Certificates
Material
Dimensions**

Data sheet

1. General

The construction of the DUMAG® Constant Speed burner maintains a high minimum outlet speed to prevent flame flashback into the lance.
 The construction is based on a proven construction from the 1970s which was further developed by DUMAG.
 This explosion decoupling also works at high control range and at low pressure.
 The "Technische Regeln für Gefahrstoffe TRGS 724" (Technical Regulations for Hazardous Substances TRGS 724) state, among other things, that in the case of openings

of system parts in which a hazardous explosive atmosphere is present and which are not sufficiently equipped explosion-proofed, the necessity of protecting the system parts against the running in of explosions must be checked.
 The construction of the CSB Constant Speed Burner CSB fulfills the determination to obtain a minimum exit velocity to prevent a flashback into the inside of the lance

2. Application

The DUMAG® Constant Speed burner CSB is applied when a conventional burner lance with predetermined holes cannot meet the required control range, so that at minimum pressure the minimum gas speed falls below the minimum required speed to safely prevent backfire.

The DUMAG® Constant Speed Burner CSB can be used:

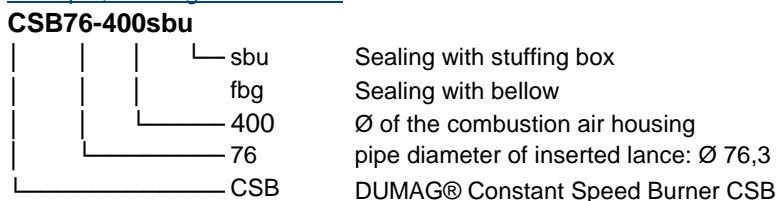
- as Constant Speed Burner CSB with combustion air housing, usually used at lining temperatures above 850°C. The burner is used as a cross-igniting burner to the main burner and must be ignited by it or by the glowing refractory according to EN746-2.
- As lance of Constant Speed burner CSB (without combustion burner case [2]), used in the lance holder LZH or LZHK for gases whose calorific value goes to Zero (see datasheet LZH, LZHK). Used directly in the combustion chamber at a correspondingly high refractory lining temperature.
- As additional lance CSB inserted in the DUMAG® Industrial Burner IB as main burner

Main advantage of the DUMAG® Constant Speed Burner CSB:

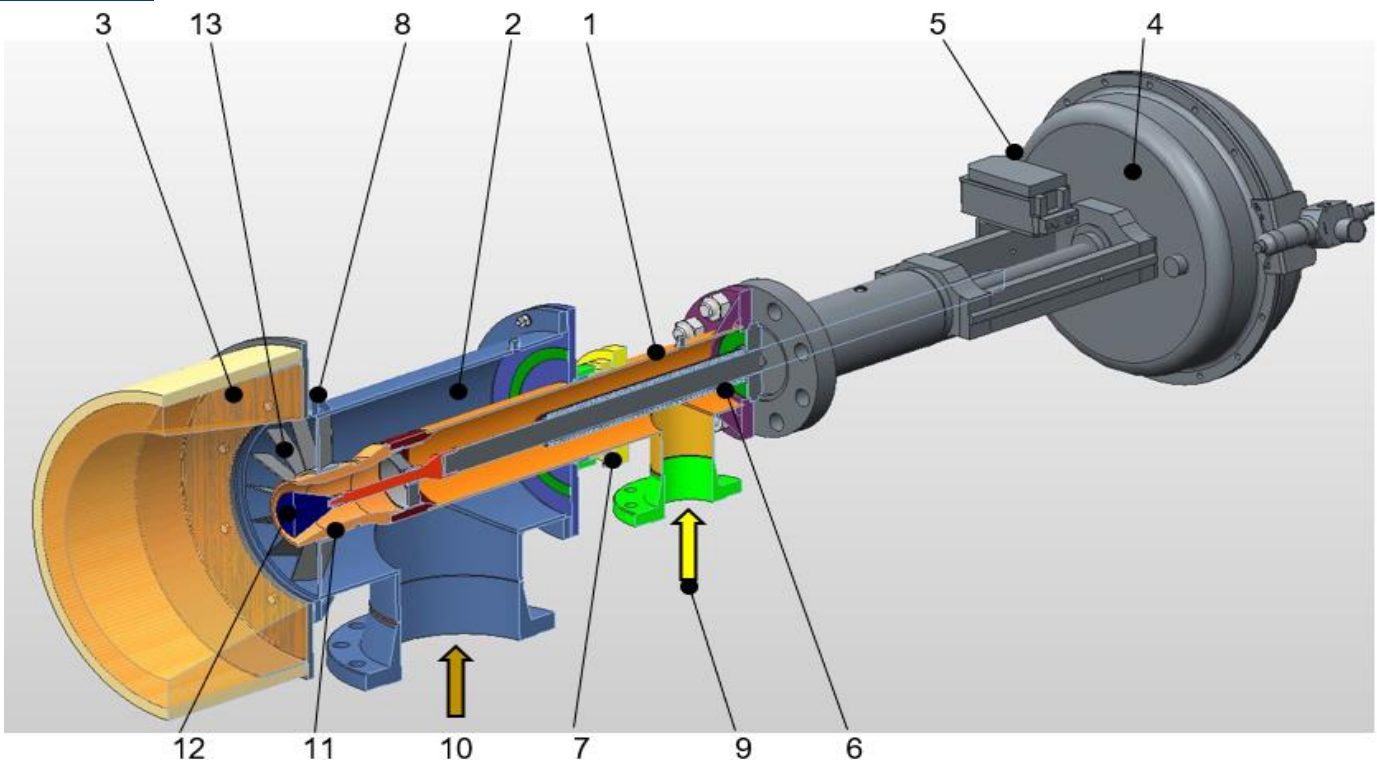
If in the case of burners with conventional gas lances with rigid bore diameter a wide control range is required, then at a low flow rate of the gas nitrogen or another inert gas may be added to maintain a sufficient minimum exit velocity. This continuous addition of the inert gas can cause major operating costs.
 The main advantage of this burner and his lance with sliding cone is that very large control ranges are achieved which makes the addition of inert gases superfluous.
 The burner will have a relatively short pay-back time.

The Constant Speed Burner CSB is designed to comply with the "Technische Regeln für Gefahrstoffe TRGS 724, Gefährliche explosionsfähige Gemische -Maßnahmen des konstruktiven Explosionsschutzes, welche die Auswirkung einer Explosion auf ein unbedenkliches Maß beschränken" ("Technical Rules for Hazardous Substances TRGS 724, Dangerous Explosive Mixtures - Measures of constructive explosion protection which limit the effects of an explosion to a harmless level") according to Artikel 7.3 "Strömungsüberwachte rückzündsichere Einrichtungen" (article 7.3 "Flow-monitored backfire-proof devices").

Example, to designate a burner



3. Assembly



- | | |
|---------------------------------------|-------------------------|
| 1 Gas lance CSB | 8 Burner flange |
| 2 Combustion air case | 9 Gas inlet |
| 3 Burner block (Option) | 10 Combustion air inlet |
| 4 Pneumatic cylinder or membran drive | 11 outer cone |
| 5 Positioner | 12 inner movable cone |
| 6 Sealing | 13 Combustion air swirl |
| 7 Stuffing box | |

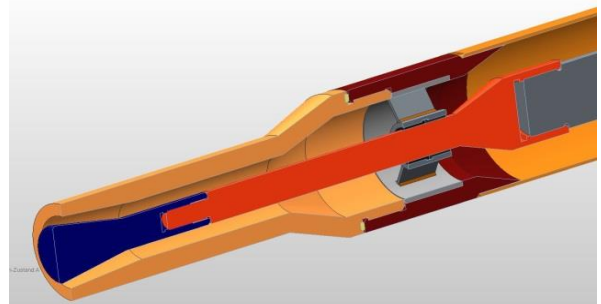
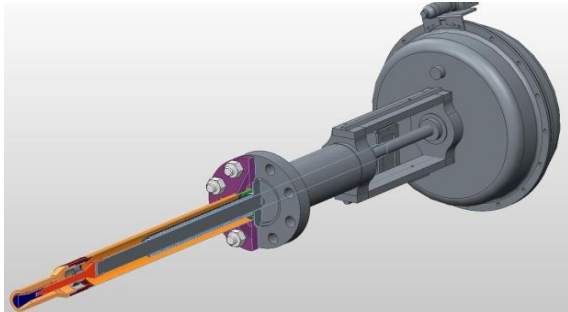
4. Function

- The front part of the burner consists of the CSB gas lance [1] with an outer cone [11] and an inner movable cone [12].
- Gas comes through the gas inlet [9] into the lance [1] and streams over the cones [11], [12] into the burner block [3].
- The inner cone [12] is moved by the pneumatic cylinder or membran drive [4] and different annular areas between
- But the pressure of the gas is measured and by the control the inner cone [12] is moved outwardly or inwardly so that there is always the same pressure in the lance [1] and therefore the same outlet velocity between the 2 cones [11], [12].
- Combustion air comes through the combustion air inlet [10] into the combustion air case [2] and streams over combustion air swirl [13] into the burner block [3].
- In the burner block [3] gas and air is mixed and outside in the combustion chamber the gas/air mixture is ignited
- The burner is flanged to the combustion chamber bi the burner flange [8]

Data sheet

Lance from CSB as gas lance inserted in DUMAG® Burner

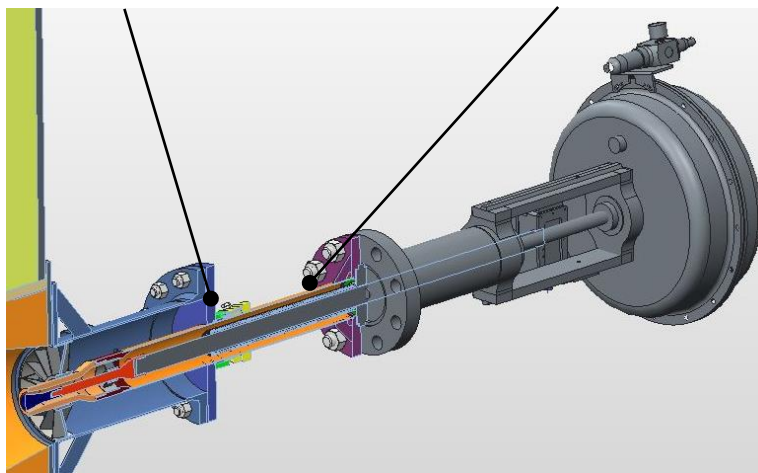
This lance can be inserted also in the DUMAG® Lance Holder LZH. It is done when the gas has no LHV and does not need combustion air.



Sealing of CSB between inside lance to outside area:

Combustion air: Sealing by stuffing box [7]

Gas: Sealing by bellow or by stuffing box [6]



Notice:

It should be noted that this decoupling is not usually applied as a sole means of protection and often requires an upstream in the flow direction flame arrester

As the gas lance with slide cone cannot completely cut off the gas flow, it is no substitute for a shut-off valve

Customer Requirements:

- Flow speed of gases and steam is to be monitored in an appropriate manner.
- At underrun of the required minimum flow rate of the gas must be interrupted immediately.
- Safety valves in accordance with the required standards and laws.
- Flame trap if required

Minimal speed is usually monitored by pressure or flow control devices.

5. Applied standards, regulations and rules, depending on the design of the burner

EN 746-1	Industrial thermo processing equipment – Common safety requirements for industrial thermo processing equipment
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 12952-16	Water tube boilers and auxiliary installations – Part 16: Requirements for grate and fluidized bed firing systems for solid fuels for the boiler
EN 50156-1	Electrical equipment for furnaces and ancillary equipment. (VDE 0116)
TRG	Technical Rules for Pressurized Gases
TRbF	Technical Rules for flammable liquids
97/23/EG	Pressure Equipment Directive
2006/42/EC	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 (NFP AZ223.1)	Regulation of Fuel Gas Piping
ASME B31.3	Regulation of Process Piping
ASME IX	Welding Qualifications
ASTM	Material Specifications
EAC	Euroasian Conformity

6. Certificates

certified according to ISO9001, EAC (Euroasian Conformity)

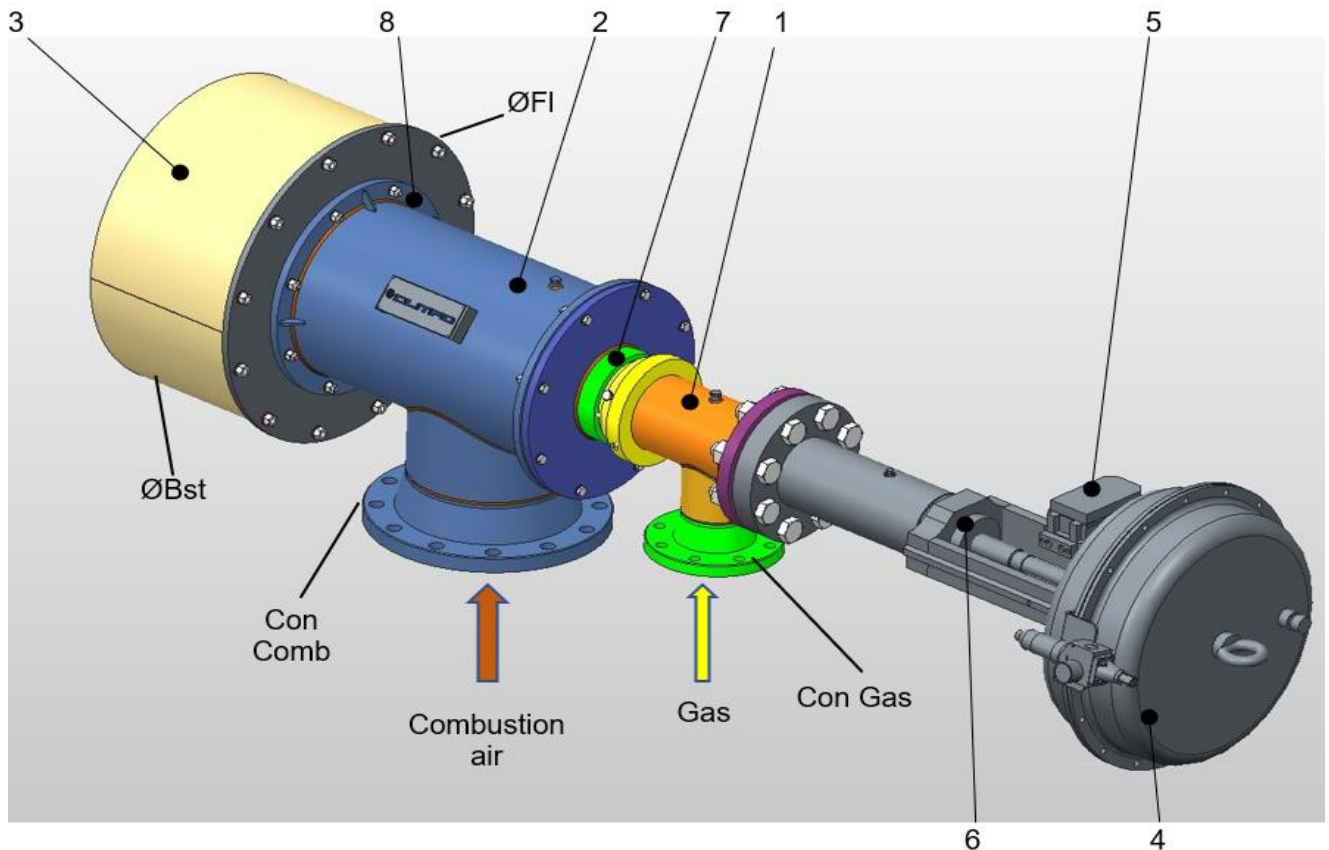
Produced according to European and American standards, regulations and quality certificates

7. Materials

- Burner housing: standard 1.4571 or 1.4404 (AISI316L/AISI316Ti), upon request P265GH or other materials on request.
Turned parts of stainless steel, at least the same quality as the burner.
- Burner lance: standard 1.4571 or 1.4404 (AISI316L/AISI316Ti), upon request Hastelloy or others.
- Nozzle: standard 1.4841 (AISI314 or AISI310), upon request 1.4571 or 1.4404 (AISI316L/AISI316Ti), Hastelloy
Components exposed to the radiation of the combustion chamber may also be made of 1.4841 (AISI314 oder AISI310).

Data sheet

8. Dimensons



- 1 Gas lance CSB
- 2 Combustion air case
- 3 Burner block (Option)
- 4 Pneumatic cylinder or membran c
- 5 Positioner
- 6 Sealing (stuffing box or bellow)
- 7 Stuffing box CSB Gas lance/combustion air case
- 8 Burner flange

!! The DUMAG® Constant Speed Burner CSB is designed individually, so the data below are a guideline only !!

Examples of realized Burner CSB

DUMAG® Constant Speed Burner CSB...	Burner Capacity	Name of Gas	Flow rate gas	Control range gas	Flow rate Combustion air	Connec-tion gas	Conn.Com-bustion air	Ø Burner Block	Ø Burner Flange	Weight ca.
Type	MW	-	Nm³/h	-	Nm³/h	-	-	mm	mm	kg
CSB76-450	0,93	H1	225	1:25	1.040	2 1/2"	5"	310	533	120
CSB88-400	0,18	H2	153	1:50	205	3"	2 1/2"	250	484	95
CSB168-500	1,1	H3	1545	1:50	1.250	8"	6"	420	587	150

Approximate dimensions of the offered burner:

CSB.....										
CSB.....										
CSB.....										