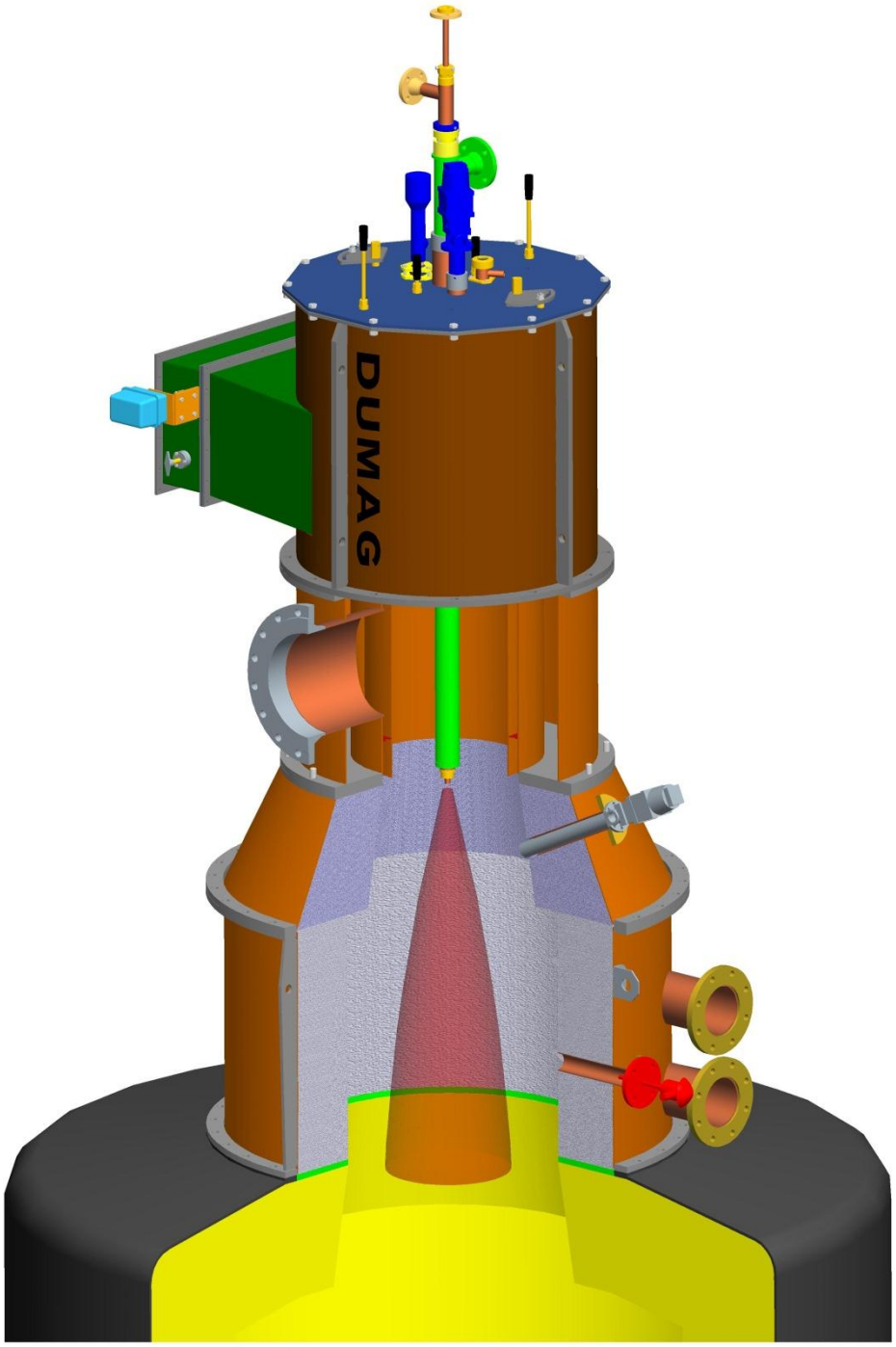
Combined Multifuel Offgas System

COMOFF



A combined DUMAG® Burner System
for Fuel Gas, Fuel Oil, Waste Liquid, Waste Gas, Waste air, Offgas

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1. COMOFF - a Combined Multifuel Offgas System:

COMOFF - a combined multifuel offgas system is a modular burner consisting of various DUMAG® module units and is used to burn liquid and gaseous waste materials in combustion chambers and waste incineration plants.
The heat generated in the combustion chamber is mostly converted via a waste heat recovery boiler into warm water, hot water, or steam and used for commercial purposes.

The system was developed to supply a multiplicity of fuels and waste liquids – with or without heat value – together with the waste gas and/or exhaust air to the combustion system.
It is therefore a closed system that can be placed on the combustion chamber as a top-down burner or a horizontal burner.

Use of the ultrasonic nozzle has the considerable advantage that no flame stabilizers are needed in the burner; the nozzle itself with its characteristic atomization and the high level of turbulence acts as a flame stabilizer. This eliminates the risk of contamination and damage to a mechanical stabilizer.

The other advantage of the ultrasonic nozzle is that contaminated liquids or liquids with a high water content can be finely atomized together with fuel oil. It is intimately mixed with the waste gas, exhaust air or combustion air inside the system and reaches the combustion chamber as a homogeneous flame.

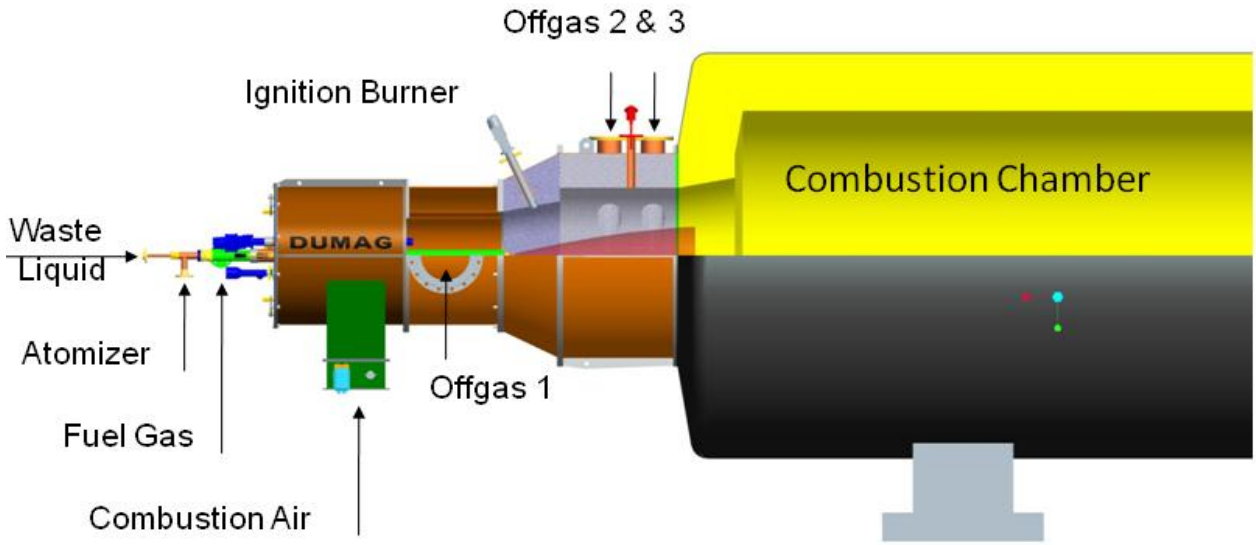
It is, however, also possible to supply waste liquids, waste gases, or exhaust air directly to the combustion chamber:

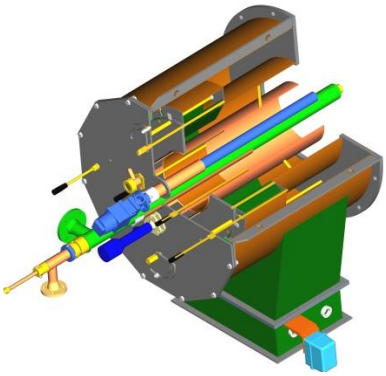
In the case of waste liquids sprayed directly into the combustion chamber, it must be ensured that these are introduced with the highest possible degree of rotational symmetry, in order not to disrupt the axial flow.

Exhaust air or offgases that are introduced directly into the combustion chamber should also be introduced in a rotationally symmetrical manner.
Alternatively, these gases may be introduced tangentially

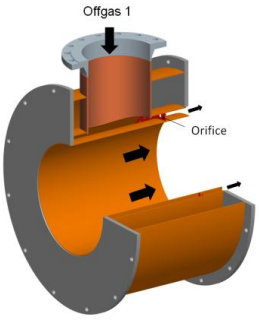
For other possible variations, see the section “4. Example combinations of module units”

2. Configuration:

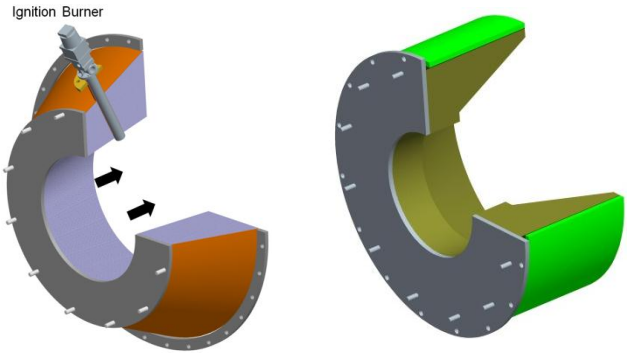




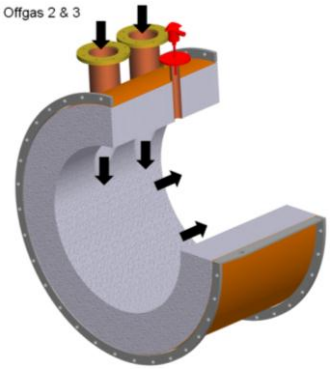
DUMAG® Burner IB…:
- with lance and ultrasonic nozzle for liquid
- or with lances for gas



DUMAG® Gas ring distributor RVT
for off gases with orifice for high velocity at min. flow rate



Burner block
- built as burner block for precombustion chamber or
- built as burner block for burner mounted directly to the combustion chamber



DUMAG® Precombustion chamber VBK
- Precombustion chamber made of bricks heat resistant up to 1400°C
- with 1 or 2 gas lances GE for off gas with orifice for high velocity at min. flow rate
- with temperature sensor

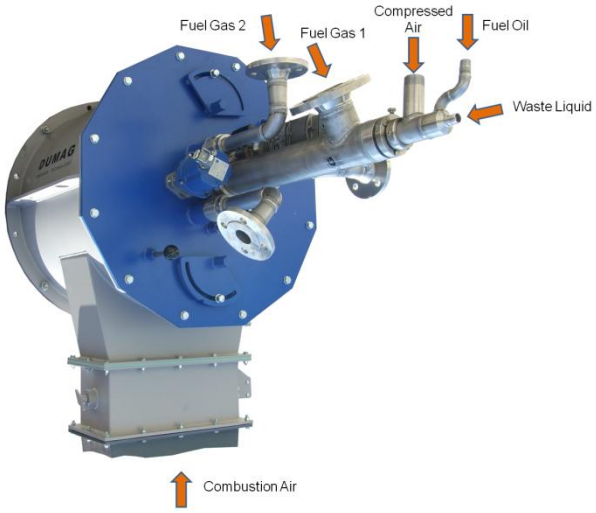
3. Description of module units:

3.1) DUMAG® Industrial burner IB..:

The most important part of the system is the industrial burner, which houses the burner lance with the DUMAG® ultrasonic nozzle or with gas lances.

This nozzle for liquid may be a two-substance (GS) or three-substance (GOS) ultrasonic nozzle.

As a gas burner or as a combined fuel/gas burner it will be fitted with gas sleeve tubes GU or gas lances GE.

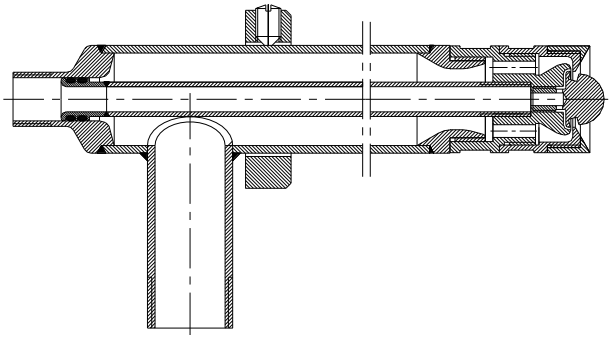


3.2) DUMAG® Burner lance with two-substance nozzle GS

In the two-substance nozzle GS, either fuel oil or energy-containing waste liquid is atomized with the atomizing medium (steam or compressed air) and subsequently burned.

Depending on the design of the nozzle, the waste liquid may contain solids.

The atomizing medium is mixed with the liquid outside of the nozzle

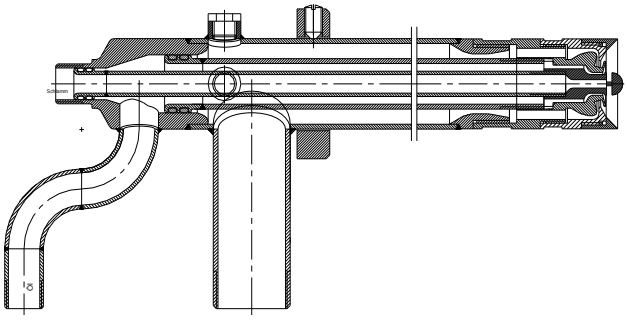


3.3) DUMAG® Burner lance with three-substance nozzle GOS

The three-substance nozzle has an additional central channel used exclusively for supplying fuel oil. The fuel oil acts as an auxiliary fuel for the centrally-supplied waste liquid.

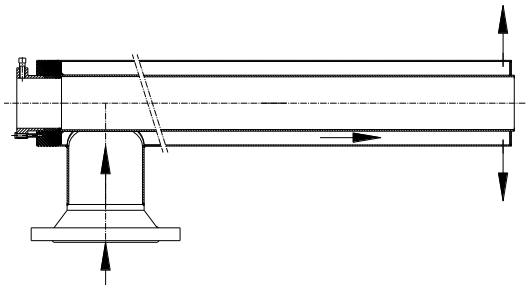
The waste liquid may have a high heat value but may also be atomized at a water-like consistency with no heat value (e.g. waste water with traces of solvent) together with the fuel oil.

The atomizing medium is mixed with the liquid outside of the nozzle.



3.4) DUMAG® Gas lance GU

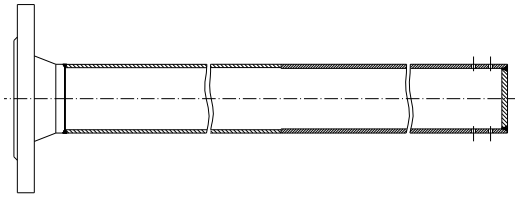
If the burner is designed to be a gas/oil burner, then the Gas lance GU is positioned centrally, so that the gas at the end of the sleeve tube emerges into correspondingly designed holes and at the desired angle.
The burner lance with the GS or GOS nozzle or the gaslance GE or a smaller Gas lance GU is inserted into the gas lance GU built as gas sleeve tube.



3.5) DUMAG® Gas lance GE

With the gas lance GE, gas can be used as the sole fuel. In this case, the gas lance is arranged in the center.

In the case of burners operated with several different types of gas (with no liquid fuel), the gas A is supplied via a central gas lance GU.



The gas lance GE is arranged inside the gas sleeve tube; through the GE, gas B is supplied.

If it is necessary to burn a further gas C, then several gas lances GE are arranged around the center.

The gases A – C are usually combustible gases and therefore the waste gases are also combustible and have a corresponding heat value.

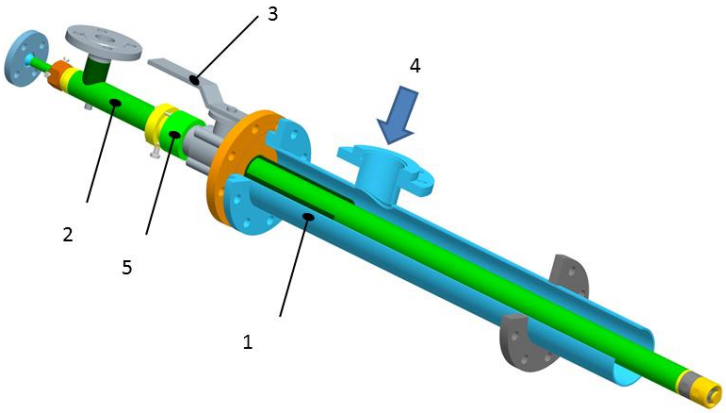
3.6) Lance Holder [1] with Cooling Air [4] and Ball Valve [3]:

Designed for mounting lances for gas or liquid [2] into the combustion burner wall.

Equipped with cooling air connection [4].

When lance is removed ball valve [3] is closed.

5 … Stuffing box

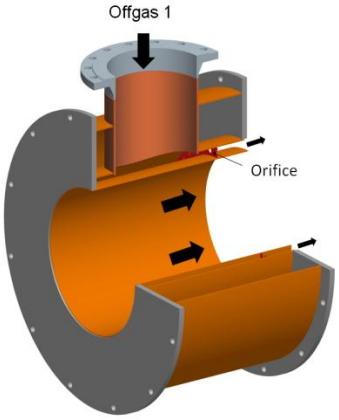


3.7) DUMAG® Gas ring distributor RVT

The gas ring distributor RVT is arranged between industrial burner IB and combustion chamber or between industrial burner IB and precombustion chamber

It is designed for exhaust air (e.g. air mixed with solvent vapor) or else for waste gas with a low O2 content but also for waste gas with a low heat value.

Whether this waste gas is used as fuel or as an O2 source determines the amount of air supplied via the burner.



For potentially explosive waste gases, an orifice is provided in the ring distributor, which is designed such that, at minimum load, no burn back can occur.

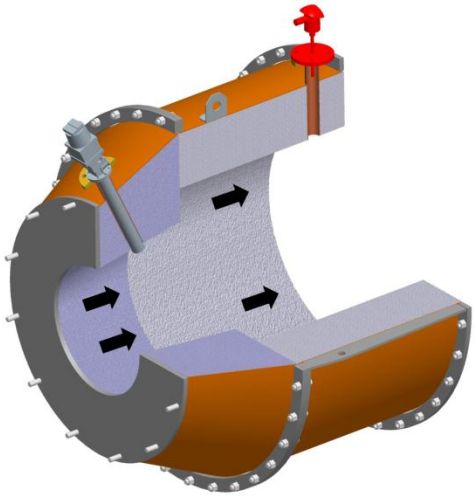
3.8) DUMAG® Precombustion chamber VBK

The precombustion chamber is a walled combustion chamber, constructed in front of the actual combustion chamber.
It is used to intimately mix the fuel with the air or the O2-rich offgas but also with the atomized waste liquid - in particular the aqueous waste liquid - as, in this space, the level of turbulence caused by the swirl of the burner, by the high exit speed of the combustion gas and by the ultrasonic nozzle is high.

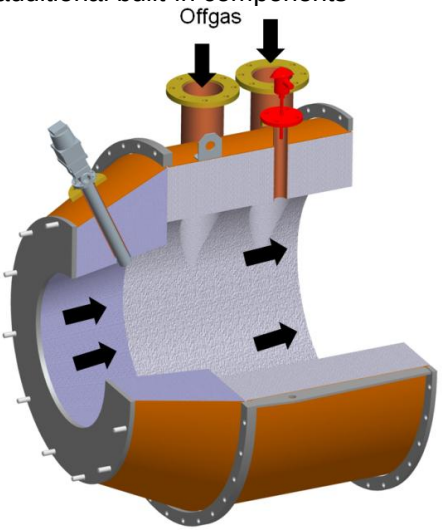
Up to 2 different waste gases/exhaust air can be supplied to the combustion chamber, which may have a low or no heat value or may alternatively contain O2 and supply additional oxygen to the flame.

Both gases are supplied via oblique or tangential channels in the combustion chamber. For potentially explosive waste gases, an orifice is provided at the end of the channel, which is designed such that, at minimum load, no burnback can occur.

After the precombustion chamber then, a homogeneous flame with uniform temperature distribution reaches the actual combustion chamber



without additional built-in components



precombustion chamber with additional gas lances for 1 or 2 off gases