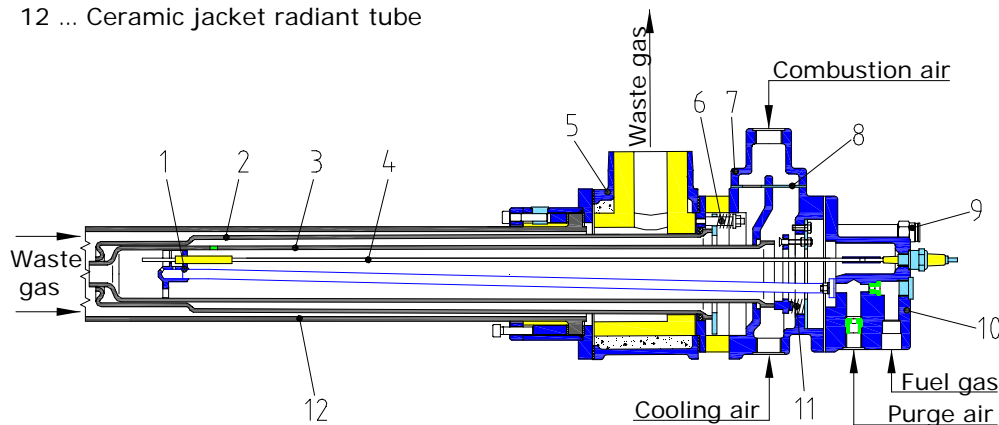


# Recuperated High-Velocity Burner NOXMAT® K-RHGB

- indirect heating -

## Constructive design / Mode of function

- 1 ... Gas lance with swirl plate
- 2 ... Ceramic recuperator
- 3 ... Ceramic burner tube
- 4 ... Electrode
- 5 ... Waste-gas part
- 6 ... Recuperator retainer
- 7 ... Air part
- 8 ... Air guide plate
- 9 ... UV-sensor location
- 10 ... Gas part
- 11 ... Burner-tube retainer
- 12 ... Ceramic jacket radiant tube



The **burner** is comprised of a three-part burner head, recuperator as well as such components as burner tube, gas lance, and electrode installed inside.

**Combustion air** is flowing via connecting line through air part and recuperator being preheated by utilizing the waste-gas heat. The major portion of combustion air (primary air) is flowing from recuperator outlet through holes into the interior of burner tube and, further, through swirl plate into the combustion chamber. The minor portion of combustion air (secondary air) exits the recuperator in the annular gap on combustion-air chamber mouth and is mixed with the flame gases escaping from the combustion chamber.

The air guide plate is to split-up the volumetric combustion-air flow at the intake of air part. Combustion air may flow either completely through recuperator or partially directly through burner tube inside the burner. This is to protect the inner burner components from overheating in case of high thermal loads.

**Fuel gas** is flowing via connecting line through gas part and gas lance to swirl plate. The gas flow is dividing there. The major portion of fuel gas flows into the combustion chamber and is mixed there with the intensively swirled combustion air. The minor fuel-gas portion is led into the ignition chamber of swirl plate and ignited there by means of high-voltage ignition spark. Exactly matched conditions in the ignition chamber ensure eased ignition and start-up of burner (cold start).

The flame gases escape with high velocity from the burner tube. They are mixing with secondary air, thus achieving complete combustion. Graded fuel-gas and combustion-air supplies effect a delayed combustion process, entailing a low combustion temperature and, thus, reduced NO<sub>x</sub>-emission.

**Waste gas** is flowing via recuperator into the waste-gas part and finally exits the burner from there. The waste gas conveys a part of its heat to combustion air in the recuperator in the recuperator to preheat the combustion air. Said preheating cycle entails fuel savings.

**Purge air** is supplied to fuel gas in the gas part through a purge-air nozzle in metered quantities to achieve excellent conditions for ignition. Further, said purge air is purging the gas lance to remove residual fuel gas in case of burner shutdown. So, any afterburning is precluded.

NOXMAT Recuperated Burners are equipped with a separate cooling-air connection. **Cooling air** is directly flowing from there through burner tube into the radiant tube.

**Flame monitoring** takes place as a function of process via flame monitoring current of an UV-sensor or ionization current of electrode, concurrently acting as ignition and monitoring electrode.