CLAIMS

1. A gas circulation loop for a laser discharge tube comprising a gas supply duct and a gas exhaust duct, wherein the gas supply duct and/or the gas exhaust duct is elongated in the longitudinal direction of the laser discharge tube and the gas supply duct being connected to the laser discharge tube by an inlet flow distributor adapted for controlled transversal gas inlet, and/or respectively the gas exhaust duct being connected to the laser discharge tube by an outlet flow distributor, adapted for controlled transversal gas outlet, over at least part of the laser discharge tube, and wherein the inlet flow distributor and/or the outlet flow distributor comprise a plurality of respective inlet channels or outlet channels,

characterized in that:

the laser discharge tube has a flat rectangular cuboid form,

the gas circulation loop has a planar configuration,

the gas supply duct and the gas exhaust duct being located at two opposite sides of the laser discharge tube,

the gas circulation loop providing free access to both sides of the laser discharge tube on electrodes sides,

said inlet channels and/or outlet channels being small tubes, the length of the inlet channels and/or outlet channels being comprised between 0.25 and 2.5 times gas supply duct diameter, spacing between two consecutive inlet channels being one inlet channel diameter or over one inlet channel diameter, and/or, respectively, spacing between two consecutive outlet channels being one outlet channel diameter or over one outlet channel diameter, and

the ratio between the diameter of the gas supply duct and the diameter of the inlet channels, and/or the ratio between the diameter of the gas exhaust duct and the diameter of the outlet channels is at least 2.

2. The gas circulation loop according to claim 1, wherein the gas supply duct is positioned in parallel with the longitudinal direction of the laser discharge tube.

3. The gas circulation loop according to claim 1 or 2, wherein the gas exhaust duct is positioned in parallel with the longitudinal direction of the laser discharge tube.

4. The A gas circulation loop according to claims 1 to 3, wherein the inlet flow distributor and/or the gas outlet distributor comprise a porous or capillary material.

5. The gas circulation loop according to claims 1 to 4, wherein the inlet flow distributor comprises a grid assembly extending in the longitudinal direction of the laser discharge tube.

6. The gas circulation loop according to claim 5, wherein the grid assembly comprises a number of grids of different transparency positioned consecutively in transverse direction.

7. The gas circulation loop according to any of the above claims, wherein a blower connects the gas supply duct and the gas exhaust duct in a plane defined by the longitudinal direction of the laser discharge tube and the longitudinal direction of the gas supply duct.

8. A laser apparatus comprising a gas circulation loop according to any of the above claims.

CLAIMS

1. A gas circulation loop for a laser discharge tube having a flat rectangular cuboid form, comprising:

a gas supply duct; and

a gas exhaust duct,

wherein the gas supply duct and/or the gas exhaust duct is elongated in a longitudinal direction of the laser discharge tube,

the gas supply duct being connected to the laser discharge tube by an inlet flow distributor adapted for controlled transversal gas inlet, and/or respectively the gas exhaust duct being connected to the laser discharge tube by an outlet flow distributor, adapted for controlled transversal gas outlet, over at least part of the laser discharge tube,

the inlet flow distributor and/or the outlet flow distributor comprised of a plurality of respective inlet channels or outlet channels,

wherein the gas circulation loop has a planar configuration,

the gas supply duct and the gas exhaust duct being located at two opposite sides of the laser discharge tube,

the gas circulation loop providing free access to both sides of the laser discharge tube on electrodes sides,

said inlet channels or outlet channels each having lengths between 0.25 and 2.5 times a diameter of the gas supply duct,

a spacing between two consecutive inlet channels being equal to or greater than a diameter of one inlet channel, and/or, respectively, a spacing between two consecutive outlet channels being equal to or greater than a diameter of one outlet channel,

the plurality of respective inlet channels and/or outlet channels being gradually divided over the length of the discharge tube, and

a ratio between a diameter of the gas supply duct and a diameter of the inlet channels, and/or a ratio between a diameter of the gas exhaust duct and a diameter of the outlet channels being at least 2.

2. The gas circulation loop according to claim 1, wherein the gas supply duct is positioned in parallel with the longitudinal direction of the laser discharge tube.

3. The gas circulation loop according to claim 1, wherein the gas exhaust duct is positioned in parallel with the longitudinal direction of the laser discharge tube.

4. The gas circulation loop according to claim 1, wherein the inlet flow distributor and/or the gas outlet distributor comprise a porous or capillary material.

5. The gas circulation loop according to claim 1, wherein the inlet flow distributor comprises a grid assembly extending in the longitudinal direction of the laser discharge tube.

6. The gas circulation loop according to claim 5, wherein the grid assembly comprises a number of grids of different transparency positioned consecutively in transverse direction.

7. The gas circulation loop according to claim 1, wherein a blower connects the gas supply duct and the gas exhaust duct in a plane defined by the longitudinal direction of the laser discharge tube and a longitudinal direction of the gas supply duct.

8. A laser apparatus comprising a gas circulation loop according to claim 1.