

Claims

1. Plasma source on a vacuum chamber for generating a plasma in the vacuum chamber, wherein the plasma source comprises a source housing with an opening protruding into the vacuum chamber and wherein, in the source housing, a filament is provided to which a heater voltage V_{heiz} can be applied through electric lines running insulated through the source housing, so that the filament can be heated by means of the current flow, ~~characterized in that~~wherein the source housing is placed on the vacuum chamber in a manner electrically insulated therefrom, ~~and in that~~wherein means are provided for measuring the potential drop U_{float} between the ~~electric lines supply line to the filament~~ and the source housing as characteristic for the state of the potential drop between the filament and plasma ignited inside the source housing and means are provided for regulating the heater voltage V_{heiz} that are designed in such a manner that they can process the measured value U_{float} as control signal, and in doing so the potential drop can be maintained constant and thereby the temperature of the filament can be maintained nearly constant.

2. Device with a plurality of plasma sources according to claim 1, ~~characterized in that~~wherein the plasma sources are surrounded respectively by at least one source coil and the plasma sources are surrounded by an outer coil comprising several plasma sources extending above the processing height.

3. Device comprising a plasma source according to claim 1 or comprising a plurality of plasma sources according to claim 1 or 2, ~~characterized in that~~wherein the heater voltage is fed by means of at least one switched-mode power supply, wherein preferably a discharge voltage U_{disc} required for the discharge is applied centrally and opposite the filament.

4. Method for generating a plasma in a vacuum chamber, wherein a plasma source according to claim 1 with source housing and filament is placed on the vacuum chamber, and, in order to maintain the plasma, the source housing is maintained opposite the vacuum chamber and the filament on a floating electric potential, i.e. in a floating manner, and wherein, in order to maintain the plasma, the potential drop between the filament and the source housing inside which a plasma is burning is measured and the measured potential drop is used for regulating a heater voltage applied to the filament, wherein the heater voltage results in a current heating the filament and thus in an emission of electrons.

5. Method according to claim ~~3~~4, ~~characterized in that~~wherein the heater voltage is regulated in such a manner that the potential drop between the source housing and the filament is essentially maintained constant.

6. Method according to one of the claims ~~3 and 4~~ or 5, ~~characterized in that~~wherein the potential drop between the source housing and the filament is maintained at values between 0V and -10V.