The Dresden ECRIS-2.45M is an electron cyclotron resonance ion source designed to produce low charged single particle and molecular ion beams in the range of several 100 \( \mu \text{A} \). Because of its compact design and few infrastructural requirements the Dresden ECRIS-2.45M can easily be integrated into existing beamlines or mounted on a high voltage terminal of electrostatic accelerators.

A set of permanent magnet rings is used to generate the magnetic field for plasma confinement. The plasma is heated by a tunable 2.45 \( \pm \) 0.15 GHz solid state microwave generator with a power of up to 200 W. The working gas is provided by a highly reproducible and stable mass-flow controller.

The source features an advanced ion extraction system including an electrostatic einzel lens which also electrically insulates the source from the beamline. Using the standard setup, a maximum ion extraction voltage of 30 kV can be applied. Larger extraction potentials can be realized on request. The Dresden ECRIS-2.45M is delivered including all power supplies and with a control system including computer and software.

### Extracted Ion Currents

Various extracted atomic and molecular ion beam intensities are given in the following table. The specified currents are examples and depend on the applied ion source parameters.

<table>
<thead>
<tr>
<th>Ion Species</th>
<th>Ion Beam Current (( \mu \text{A} ))</th>
</tr>
</thead>
<tbody>
<tr>
<td>H(^+)</td>
<td>1200</td>
</tr>
<tr>
<td>H(_2)(^+)</td>
<td>3200</td>
</tr>
<tr>
<td>H(_3)(^+)</td>
<td>250</td>
</tr>
<tr>
<td>He(^+)</td>
<td>3200</td>
</tr>
<tr>
<td>Ne(^+)</td>
<td>1200</td>
</tr>
<tr>
<td>Ar(^+)</td>
<td>450</td>
</tr>
</tbody>
</table>
Ion extraction spectra derived from the Dresden ECRIS-2.45M are shown above. The measurements were performed with an Ion Irradiation Facility-M developed and build by DREEBIT GmbH, an applied extraction voltage of 20 kV and a microwave power of 150 W - 200 W.

**Technical Parameters**

**Dresden ECRIS-2.45M Parameters**

- Microwave power: 200 W
- Source potential: 30 kV, 10 mA
- Extraction potential: −6 kV, 50 mA
- Lens potential: −30 kV, 10 mA
- Length: 460 mm
- Diameter: 340 mm
- Weight: 35 kg (77 lbs)
- Beamline flange: DN 160 CF
- Power consumption: 2 kW
- Cooling: air cooled, no cooling water required
- Vacuum conditions: 5 \cdot 10^{-8} \text{ mbar} (1 \cdot 10^{-5} \text{ mbar with working gas})

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03/2020
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