

# DRESDEN EBIT

- THE MOST COMPACT ION SOURCE OF THE DRESDEN EBIS/T FAMILY -



Dresden EBIT

The Dresden EBIT, is a compact electron beam ion trap originally designed for x-ray spectroscopy purposes ('T' in EBIT means 'Trap' while 'S' in EBIS stands for 'Source'). Its ion trap length has a small design value of 20 mm which offers very precise control of the electron beam properties but limits the ion trap capacity resulting in lower extractable ion currents. However, the Dresden EBIT, is also a very cost-efficient alternative as an ion source of low, intermediate and highly charged ions or molecule fragments if the ion output is not the most critical point of an application.

## OVERVIEW OF MEASURED ION OUTPUT

Ion Species	Ions per Pulse
Carbon 6+ (fully ionized)	$2 \cdot 10^6$ at 5 Hz
Argon 8+ (neon-like)	$9 \cdot 10^5$ at 50 Hz
Argon 16+ (helium-like)	$4 \cdot 10^5$ at 1 Hz
Argon 18+ (fully ionized)	$5 \cdot 10^4$ at 0.5 Hz
Iron 22+ (beryllium-like)	$1 \cdot 10^4$ at 0.7 Hz
Iron 24+ (helium-like)	$9 \cdot 10^3$ at 0.3 Hz
Iron 25+ (hydrogen-like)	$2 \cdot 10^3$ at 0.3 Hz
Xenon 44+ (neon-like)	$5 \cdot 10^3$ at 0.2 Hz
Xenon 46+	$7 \cdot 10^2$ at 0.2 Hz

## SCOPE OF DELIVERY

- EBIT incl. all electron and ion optical electrodes, bakeable permanent magnet system and high voltage protection shields readily installed
- power supply units for the operation of the ion source
- control system including computer and software

## OPTIONAL EQUIPMENT

- vacuum system (turbo pump, fine vacuum, vacuum gauge, precision gas inlet valve)
- spare electron gun head (with 0.5 mm / 1.0 mm cathode)
- 19" rack for power supplies and measurement equipment
- injection kit for element injection through volatile compounds (MIVoC)
- metal ion injection kit incl. quadrupole beam bender and liquid metal ion source
- x-ray spectroscopic equipment (detector, Be-window, time and energy resolved x-ray detection electronics TERX)
- heating tent incl. temperature control
- small, medium or large ion beamline for ion charge state separation
- ion acceleration / deceleration solutions

## TECHNICAL PARAMETERS

### DRESDEN EBIT PARAMETERS

max. electron current	50 mA
max. electron energy	15 keV
magnet system	bakeable SmCo permanent magnets
magnetic induction on axis	250 mT
trap length	20 mm
beam emittance	< 10 mm mrad
ion pulse width	50 ns to 100 $\mu$ s
ionization factor	> $1 \cdot 10^{21} e/cm^2$
weight	20 kg (45 lbs) with magnets
dimensions (length x width x height)	ca. 400 mm x 300 mm x 460 mm
cooling water	1.5 l/min at 3 bar
vacuum conditions	UHV ( $1 \cdot 10^{-8}$ mbar and better)

## CONTACT

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