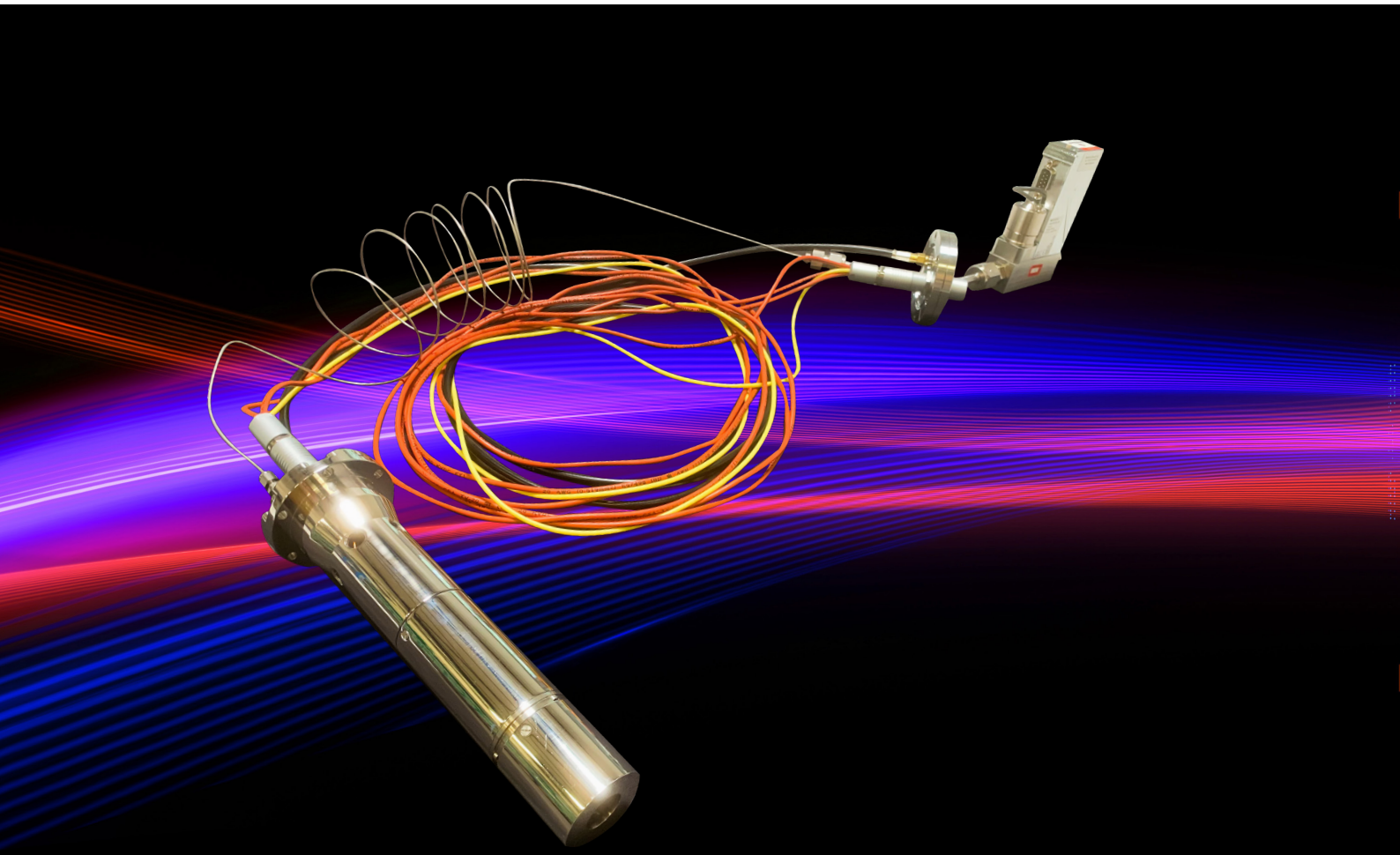
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# TES-GO

## IONS HIGH BRIGHTNESS WITH EINZEL LENS

### FLEXIBLE TO SUIT YOUR SPECIFIC APPLICATIONS

Etching • Sputtering • Figuring • Surface Activation • Beam Line

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# TES-GO IONS HIGH BRIGHTNESS WITH EINZEL LENS

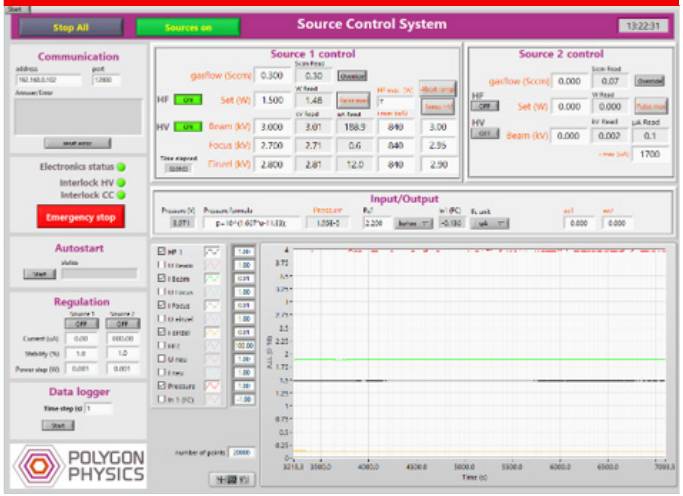
## TES-GO GENERAL CHARACTERISTICS

| | |
|---|---|
| **Discharge** | ECR filament free |
| **Gas** | $H_2$, He, $N_2$, $O_2$, noble gas, molecular gas |
| **Microwave power typ. (2.45 GHz)** | 0.5 to 5 W |
| **Maximum Energy** | 5 kV |
| **Diameter in vacuum** | 36 mm (without customizable fixation ring) |
| **Flange type** | Mobile under vacuum. CF40 for HV, HF & gas feedthroughs |
| **Cooling** | None |
| **Cable length outside vacuum** | 2 m<br>Option: 5 m |
| **Cable length inside vacuum** | 2 m<br>Option: customizable |
| **Electronics** | Two 19" racks :<br>Control command (inc.HF) and HV |
| **Hardware control** | API available via Microcontroller |
| **Communication protocol** | Ethernet UDP, RS232 |
| **User interface** | GUI executable (ethernet UDP only) |
| **Source gas control** | Mass-Flow Controller (MFC) |

## TES-GO-IONS-HIGH BRIGHTNESS

| | |
|---|---|
| **Applications** | Etching, sputtering, figuring surface activation, beam line |
| **Energy range** | 0.5 – 5 kV |
| **Current** | 10 to 500 µA |
| **Current density** | Up to 100µA/mm² |
| **Beam size (typ. at 4 cm)** | 0.3 to 15 mm |
| **Source length (exc. connectors)** | 200 mm with Einzel |
| **Options** | Pulsed mode, bipolar mode, neutralizer, longer cables |

## GUI SOFTWARE



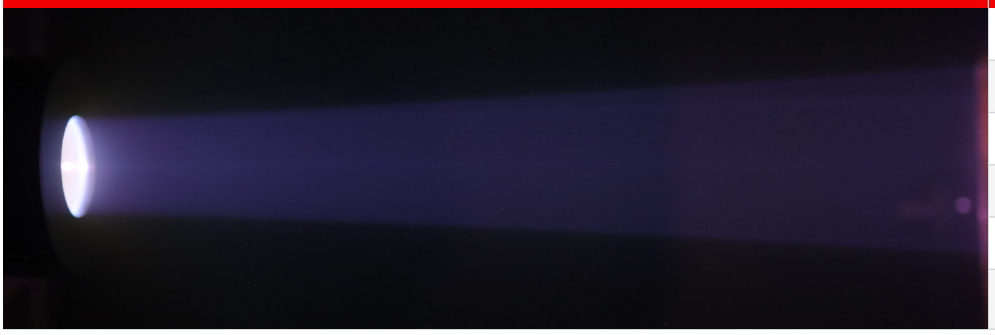






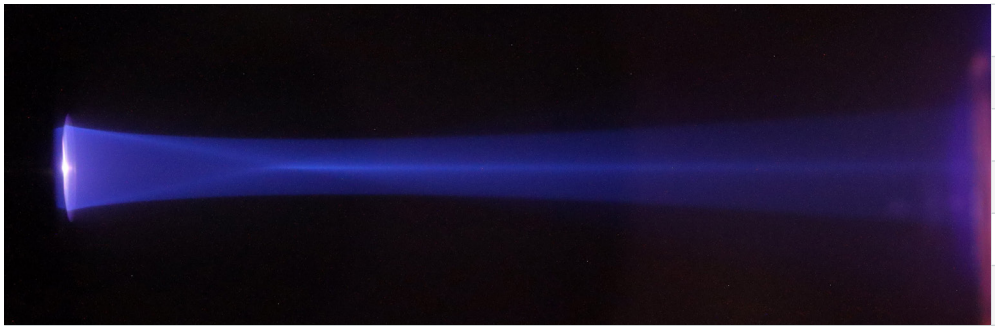
# BEAM EXTRACTION CASES

Example : Ar extraction at 2 kV

| BEAM SHAPE CONTROL WITH EINZEL LENS | SOURCE PARAMETERS | |
|---|---|---|
|  | **Gas (sccm)** | 0.15 |
| | **Pressure (mbar)** | 6E-6 |
| | **$U_{beam}$ (kV)** | 2 |
| | **$U_{focus}$ (kV)** | 0.38 |
| | **HF Power (W)** | 0.95 |
| | **$I_{beam}$ (µA)** | 200 |

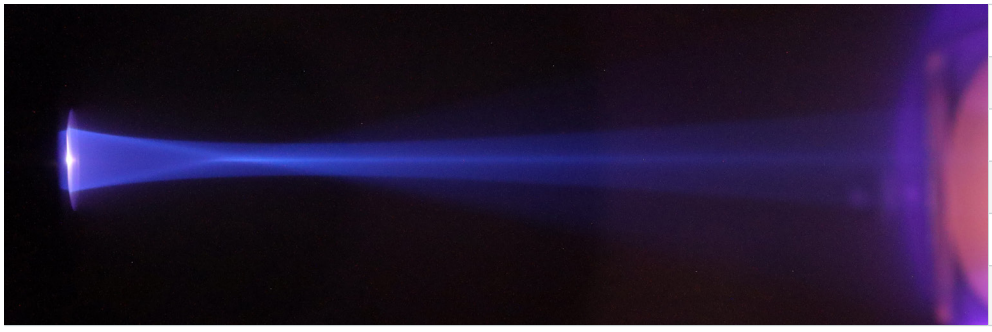
**Divergent beam**

$U_{Einzel}$ 1.3 kV
Measured spot size at 100mm: 25.2mm
Current density at 100mm: 0.4µA/mm²

| | | |
|---|---|---|
|  | **Gas (sccm)** | 0.15 |
| | **Pressure (mbar)** | 6E-6 |
| | **$U_{beam}$ (kV)** | 2 |
| | **$U_{focus}$ (kV)** | 1 |
| | **HF Power (W)** | 1.87 |
| | **$I_{beam}$ (µA)** | 200 |

**Slightly focused beam**

$U_{Einzel}$ 1.6 kV
Measured spot size at 100mm: 12.3mm
Current density at 100mm: 1.7µA/mm²

| | | |
|---|---|---|
|  | **Gas (sccm)** | 0.15 |
| | **Pressure (mbar)** | 6E-6 |
| | **$U_{beam}$ (kV)** | 2 |
| | **$U_{focus}$ (kV)** | 1 |
| | **HF Power (W)** | 1.8 |
| | **$I_{beam}$ (µA)** | 200 |

**Focused beam**

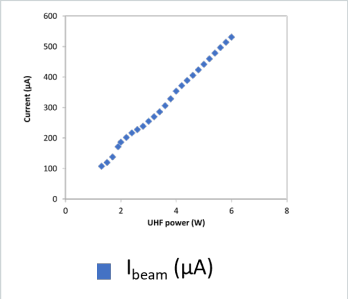
$U_{Einzel}$ 1.7 kV
Measured spot size at 100mm: 11.2mm
Current density at 100mm: 2µA/mm²

Actual working point/data on system delivered may be different depending on user's environment.

## BEAM CURRENT TUNING WITH HF POWER

Example : $Ar^+$ extraction at 2kV

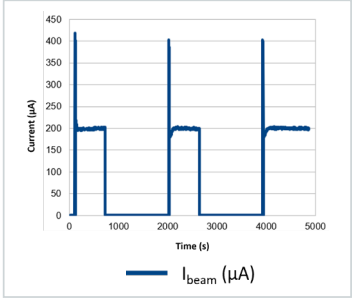
| SOURCE PARAMETERS | |
|---|---|
| **Gas (sccm)** | 0.3 |
| **$U_{beam}$ (kV)** | 2 |
| **Pressure (mbar)** | 2E-5 |




## IGNITION REPEATABILITY

3 successive autostarts - Reproducibility test

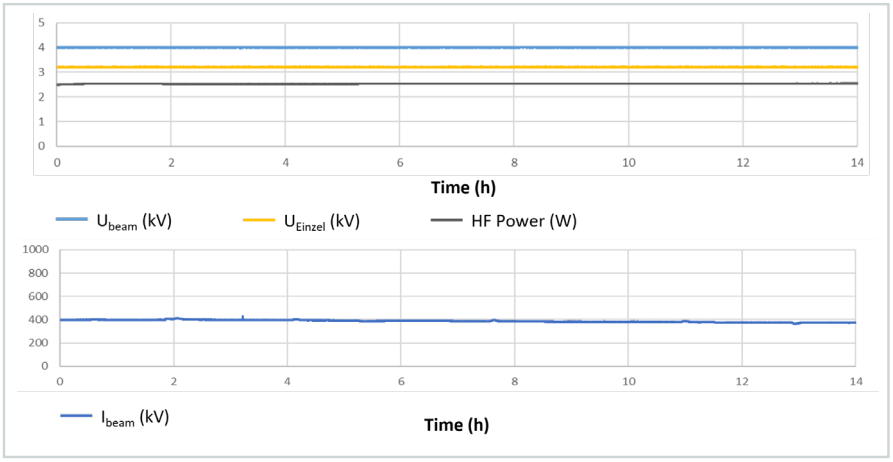
| SOURCE PARAMETERS | |
|---|---|
| **Gas (sccm)** | 0.17 |
| **$U_{beam}$ (kV)** | 2 |
| **$U_{focus}$ (kV)** | 0.5 |
| **$U_{einzel}$ (kV)** | 1.6 |
| **Pressure (mbar)** | 8E-6 |




## BEAM LONG-TERM STABILITY

Example : $Ar^+$ extraction at 2kV

| SOURCE PARAMETERS | |
|---|---|
| **Gas (sccm)** | 0.17 |
| **HF Power (W)** | 2.85 |
| **$U_{beam}$ (kV)** | 4 |
| **$U_{focus}$ (kV)** | 0.5 |
| **$U_{einzel}$ (kV)** | 3.1 |
| **$I_{beam}$ (µA)** | 400 |
| **$I_{Faraday\ Cup}$ (µA)** | 375 |
| **Pressure (mbar)** | 6E-6 |





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