



### description

RBD Instruments' IG2 Ion Source Package is the ideal solution for sputter cleaning of samples under UHV conditions. The IG2 Ion Source Package consists of the Model 04-165 2 kV Backfill Ion Source and the Model 32-175 Ion Source Control. These units are interchangeable with the PHI® 04-161 and 04-162 ion guns and the PHI® 20-045 control, respectively.

The Model 04-165 Backfill Ion Source generates an energetic inert gas ion beam for sputter-etching solid surfaces. The source requires a static pressure of  $5 \times 10^{-5}$  torr with an inert gas such as argon. Ions are generated by electron impact within the ion source's dual filament ionization chamber and are then focused at the target with energies of up to 2 kV. The impurity content of the ion beam is minimized by using an off-axis filament geometry. A focusing lens permits high ion current density to be obtained for a given operating pressure and source-to-sample distance. A dual tungsten filament assembly permits continued operation when the first filament opens. The expected lifetime of the filament assembly is several years under normal usage at the recommended operating conditions. The filament assembly is easily replaced in the field.

The Model 32-175 2 kV Ion Source Control provides all the necessary voltages and currents required to operate the Model 04-165 2 kV Backfill Ion Source. The beam voltage may be activated manually or remotely. The built-in emission current meter makes it easy to set the appropriate filament current.

### benefits

#### 04-165:

- **Long Filament Lifetime:** Expect several years of use from the filament assembly. Additionally, there are two filaments: If one opens, simply use the filament switch to select the second filament so that the 04-165 continues to work without breaking vacuum.
- **Easy to maintain:** The filament assembly is easily replaced in the field.

#### 32-175:

- **Multiple Ways to Sputter:** Activate the beam voltage manually or remotely.
- **Easily Set the Filament Current:** The built-in emission current meter makes it easy to set the appropriate filament current.

# 2 kV backfill ion source and control

## IG2 ion source package

### 04-165 ion source specifications

|                           |  |
|---------------------------|--|
| Source Type               | Hot filament electron impact (dual filament, backfill type)  |
| Beam Energy               | ≤ 2 keV in 500 eV increments   |
| Beam Diameter             |  |
| at 25 mm working distance | 2.5 mm FWHM (at target)  |
| at 50 mm working distance | 3.5 mm FWHM (at target)  |
| Target Current            | 5 $\mu$ A @25 mA of emission current at $V_B = 2$ kV, Maximum emission current 35 mA   |
| Current Density           |  |
| at 25 mm working distance | 200 $\mu$ A/cm <sup>2</sup> when $V_B = 2$ kV, Emission Current = 30 mA  |
| at 50 mm working distance | 100 $\mu$ A/cm <sup>2</sup> when $V_B = 2$ kV, Emission Current = 30 mA  |
| Mounting                  | Standard 70 mm (2.75") CF bored flange OD, approx. 34.3 mm (1.35") ID minimum tube required<br>15 foot cable source to control |
| Flange to End-of-Optics   | 7.00" or 9.25", 2.25" less with optional X-Y Aligner (RBD P/N IG2-EA)  |
| Working Distance          | Typically 25-50 mm from end-of-optics to target  |
| Source Gases              | Typically Argon, but can also use He, Ne, Kr & Xe  |

### 32-175 ion source control specifications

|                     |   |
|---------------------|---|
| Input Power         | 90-264 VAC @ 47-63 Hz, single phase, 300 mA |
| Beam Supply Voltage | 500 to 2000 V in 500 V increments           |
| Controls            |   |
| Beam Control        | Manual, Remote (TTL low → on)               |
| Beam Voltage        | 4-position switch                           |
| Focus Voltage       | 5-turn potentiometer                        |
| Emission Current    | 5-turn potentiometer                        |
| Front Panel Monitor |   |
| Emission Current    | 25 mA nominal                               |
| Cooling             | Convection                                  |
| Dimensions          | 19" rack mount x 14" deep x 3" high         |

All specifications are subject to change without notice.

