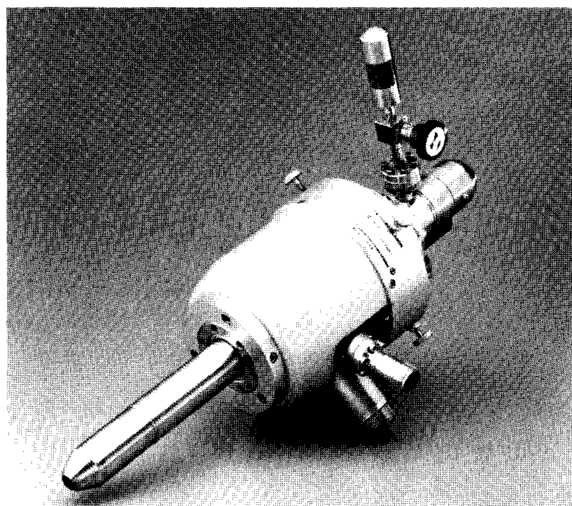
# PERKIN-ELMER

# 5 kV DIFFERENTIAL SPUTTER ION GUN

## PHI Model C04-303



*(Shown, for reference, with manual leak valve and argon gas capsule)*

## Description

This 5 kV Differential Ion Gun is controlled by the PHI Model 11-065 Ion Gun Control. It uses a gas either to sputter etch the surface of a specimen or to serve as a source of primary ions for performing Secondary Ion Mass Spectroscopy (SIMS) analysis. The gas to be ionized enters the ionization chamber, through a leak valve, from the gas source. Ions are created through electron impact, accelerated through condenser, objective, and deflection lenses, and directed onto the specimen with energies up to 5 keV. The condenser lens focuses the ions from the first aperture plate to the second; providing a double aperture arrangement for maintaining a differential pressure between the ionization chamber and the main chamber.

The ion gun can utilize differential pumping, by an external turbo pump, in order to obtain a lower operating pressure in the main chamber. This results in cleaner specimen surfaces and an increased mean free path for both ion and electron beams. Two pairs of plates deflect the path of the ion beam with respect to the static x- and y-axes coordinates. A built-in mechanical alignment adjustment, via four thumb screws, is included. All materials used in construction are UHV compatible and bakeable to 200°C.

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## Ordering Information

**Order Number:** 601474

**Includes:**

- Model 04-303 5 kV Differential Ion Gun
- Spare Ionizer/Filament Assembly
- Installation Kit
- Instruction Manual

## Specifications

**Source Type**: Hot filament, electron impact, with accelerating grid and ion extractor.

***Beam Energy**: up to 5 keV.

**Maximum Total Target Current**: 5 $\mu$A.

**Focusing:** Condenser and objective electrostatic lenses.

***Beam Diameter:** Adjustable from <200 to 800 microns at 4.75 cm from gun.

***Current Density**: >600 $\mu A/cm^2$ at 4.75 cm from gun when using argon, $I_{EM}$ = 30 mA @$V_B$ = 5 kV; 125 $\mu A/cm^2$ @ $V_B$ = 2 kV.

**Pressure Differential:** 1,000:1 with 30 l/sec argon pumping speed in the main test chamber. 10,000:1 with auxiliary 110 l/sec pumping on the ion gun.

**Beam Deflection**: Mechanical: ±4 mm via built-in port aligners. Static: ±0.5 mm via two 10-turn pots. Raster: independent x- and y- rastering with a maximum area of 10 mm x 10 mm centered on the static beam position (@$V_B$ = 5 keV).

**Gas Systems Available**: Manual or regulated leak valves with single or multiple (3) gas capsules.

**Mounting**: Flange Size: 7 cm (2.75 in) OD CF flange, 4.5 cm (1.75 in) OD tubulation min.

**Working Distance**: 18.12 cm (7.14 in) flange to end of optics, 22.86 cm (9.0 in) flange to target.

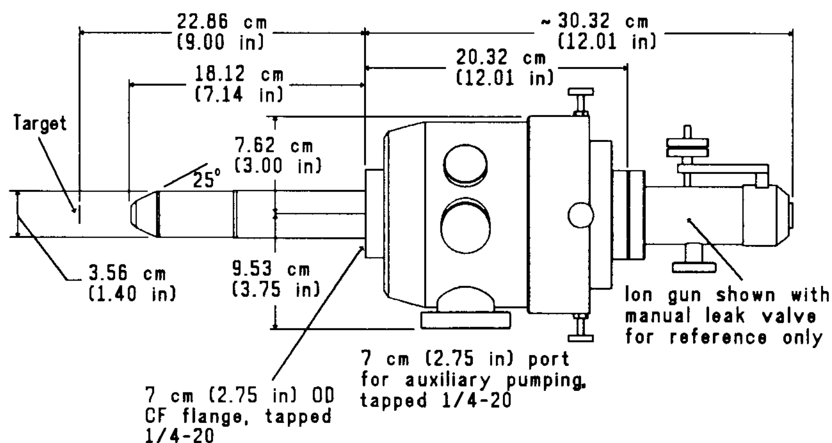
**Bakeout**: 200°C max.

**Shipping Weight**: ~ 20 kg (45 lbs).

## Related Equipment

Model 11-065 5 kV Differential Ion Gun Control
Model 04-250 Multiple Gas Inlet Manifold
Manual Leak Valve
Model 6033-LV-02 Regulated Leak System
Gas Capsules
Model 6033 5 kV Differential Sputter Etching Base System

## PHI Model 04-303 Sputter Ion Gun




*Performance specifications
Specifications subject to change without notice.

Specification sheet part no. 615109.

**PERKIN-ELMER**

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