

Compact - Rugged

**Adjustable Bilateral Slits,
Horizontal or Vertical**

**Precision Rowland circle
accurate to ± 4 microns**

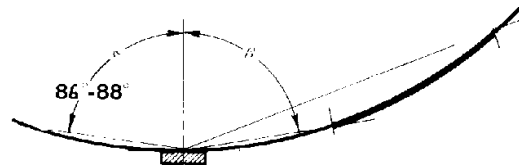
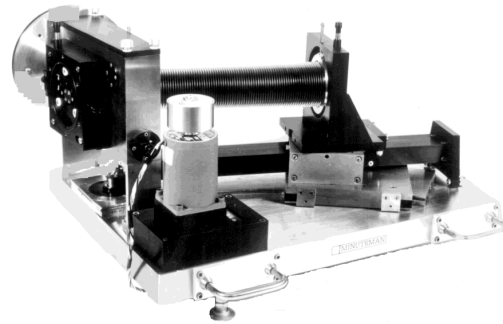
Variable Angle of Incidence

Broad Selection of Gratings

**Scanning or Multichannel
detection (interchangeable)**

**Slit Assemblies Equipped
with Isolation Valves**

Integral Filter Slide



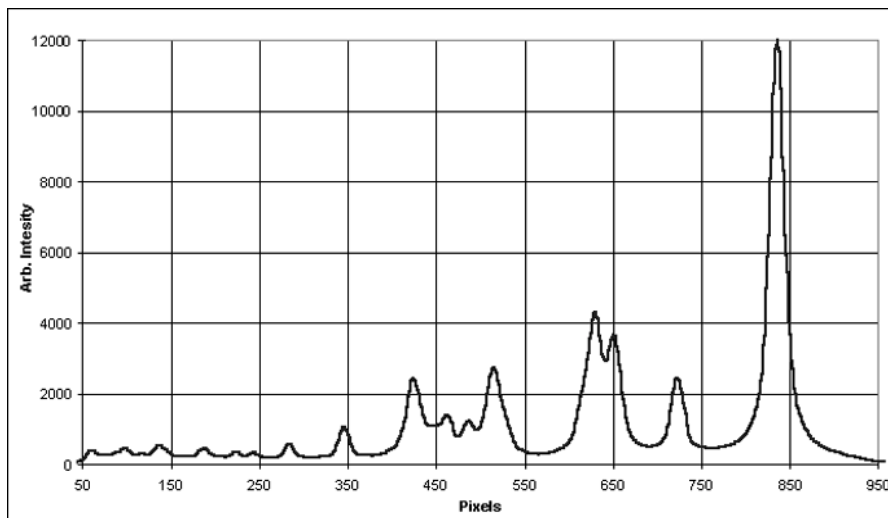
equipped with a standard 4.5" conflat™ all metal sealed pump port. The grating chamber provides the kinematic grating mount, in vacuum adjustable focus micrometer, filter and aperture slide, entrance slit and exit bellows mounting.

The monochromator scans wavelengths by moving the exit slit along the Rowland circle. The diameter of the circle is equal to the grating radius of curvature.

The most popular instrument for the 10 - 1,000 Å region is the 1.0 meter focal length grazing incidence spectrometer, Model 248/310G. This instrument is well designed and packed with features simplifying measurement in the Soft X-ray region of the spectrum. A similar version is available with a 2.2 meter focal length inquire for other focal lengths.

Offering wavelength coverage from 10 Å to 3,100 Å with a single grating, calibration and alignment of this instrument can be completed at atmospheric pressure using non-vacuum UV emission lines. Kinematically mounted gratings insure that after alignment the grating used for experiments repeats its position. The grating chamber is stainless steel and is

The Model 248/310G is available as a single channel scanning instrument, a multichannel spectrometer (using microchannel plate intensifier) or, when configured to operate in reverse, a variable source of Extreme UV and Soft X-ray emissions. All versions can be supplied with o-ring sealed vacuum or UHV all metal sealed compatibility.



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| <p>Model 248/310G part #: 8181-3365-0</p> <p>Focal length: 1,000 mm Grazing angle: 4° typical f/number: 44 Resolution: ** 0.018 nm* Dispersion:** 0.05 to 0.27 nm/mm Reproducibility: 0.005 Base vacuum: 10⁻⁷ torr</p> <p>* with 1200 G/mm, measured with 10 um slits x 4 mm high.</p> <p>**Varies with chord length, other gratings available</p> |
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Figure 1. Soft X-ray Neon spectra collected with the Model 248/310G and MCP.

Scanning Monochromator

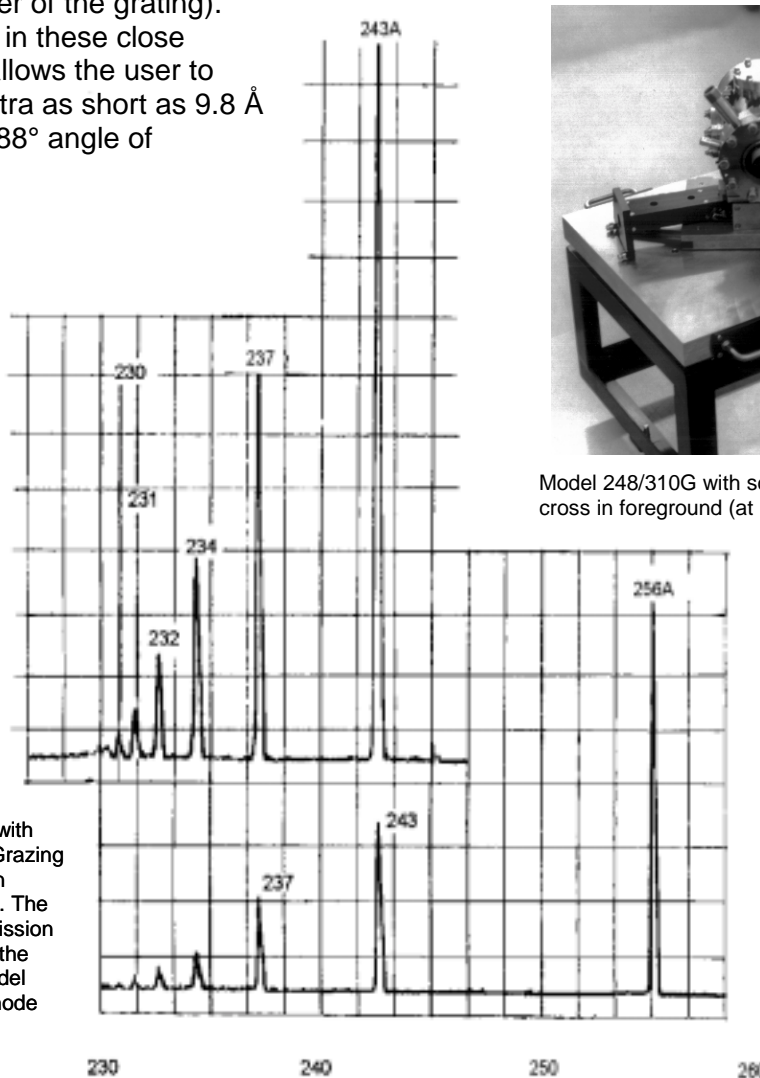
Most commonly the Model 248/310G is supplied as a scanning monochromator. Used as a scanning system best resolution and broadest wavelength coverage are achieved. The exit slit is connected to the grating chamber by a welded bellows assembly. The bellows combined with the low profile exit slit assembly permit to scan within 50 mm of the grating pole (center of the grating). Operating in these close confines allows the user to scan spectra as short as 9.8 Å using the 88° angle of incidence.

Used with the scanning system Model 789A-3 (36,000 steps /rev.) 0.0004" increments are made in chordal distance. This distance relates directly to wavelength and depends on the grating groove density and angle of incidence.

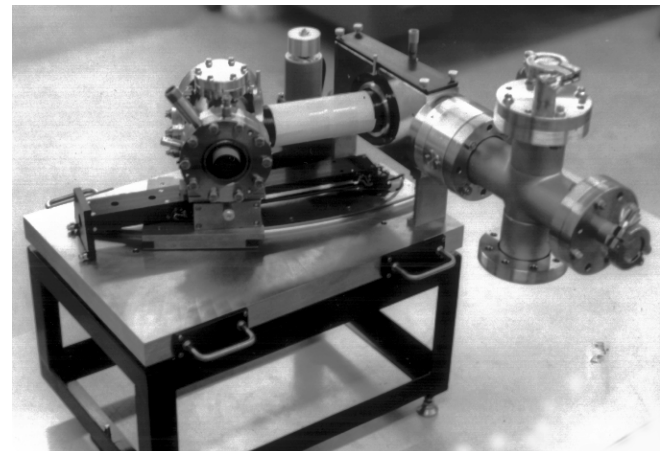
The bilateral entrance slit (5-3000 μm) is mounted to the wall of the grating chamber. An adjustment of slit position across the Rowland circle is provided. Ports are provided in

the slit assembly for installing a vacuum gauge, air admittance valve and a roughing valve.

To improve performance at wavelengths shorter than 300 Å thin film metal filters can be employed to block scatter from central image and longer wavelength extreme UV. To operate at the low wavelength extremes VYNS type filters should be employed.



Data collected with the 248/310G Grazing Spectrometer in scanning mode. The He II series emission is produced by the McPherson Model 629 hollow cathode source.



Model 248/310G with scanning MCP chamber and mounted MCP, cross in foreground (at right) is for pumping and gauging.

**Model 248/310G
Attachment
part #: 8181-3366-0**

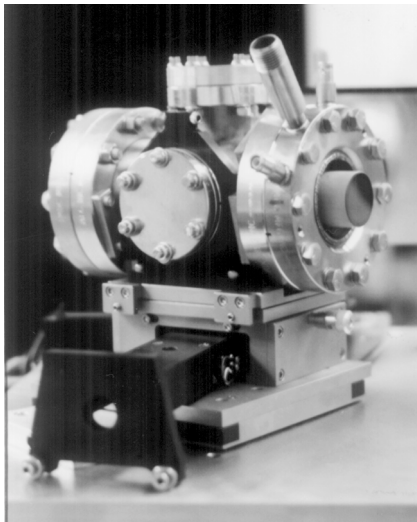
**Scanning exit slit assembly for
use as a Scanning Monochromator**

Multichannel Detection at Grazing Incidence

A technique popular with experiments requiring temporal data in the extreme UV is to employ a gateable microchannel plate intensifier (MCP) to collect spectra. The MCP is mounted tangentially to the Rowland circle and intercepts a 40 mm region of spectra simultaneously. While not capable of reaching 9.8 \AA the low limit of approximately 20 \AA insures that most x-ray laser or laser harmonic experiments can be accommodated. The photocathode materials and the MCP vacuum requirement

preclude alignment while the instrument is at atmospheric pressure. The MCP mount however includes a full complement of adjustments, for focus, roll, angle, etc. permitting to optimize spectral interception while under vacuum.

The MCP typically used at McPherson is 40 mm wide so several shots need to be taken to cover broad wavelength regions. Data readout is by fiber taper (60%) connected CCD or PDA array. The entire MCP assembly can be scanned from the 20 \AA low limit (at MCP's edge) to about $2,500 \text{ \AA}$ (at MCP center) where CsI photocathode no longer responds.



The scanning MCP assembly - note coherent fiber ready for attachment of CCD or PDA detector.

**Model 248/310G
Attachment
part #:8181-3390-0**

Scanning chamber / MCP mount