HORIBA
Scientific

H30-UVL

Monograph for Far and Extreme Ultraviolet

The next stage
of the vacuum spectroscopy

Compact

True flat field

versatile

Fast drive

USB2

High EUV-UV

Controller less

JOBIN YVON
Technology

Variable Line spacing Gratings

The H30-UVL is using an aberration-corrected VLS toroidal grating which disperses and refocus the light from the entrance slit onto the exit focal plane of the monograph.

The wavelength selection and the scanning are obtained through a simple rotation of the grating.

The groove spacing of these gratings is computer-optimized to produce high quality images with a minimum of astigmatism and coma over a large spectral range and even at high numerical aperture.

The VLS grating grooves are no longer straight and parallel, but instead correspond to confocal hyperboloids or ellipsoids. Optimizing the position, angles and arm lengths of the two recording beams provides the optical designer with the degrees of freedom necessary to minimize aberrations.

A monograph to explore the 50–300nm spectral range

The H30-UVL is especially designed for analyzing from high EUV to UV range in high vacuum environment and can be used as a monochromator (slit-slit) or spectrograph (slit-CCD).

H30-UVL in spectrograph mode

The H30-UVL is built around a single toroidal aberration corrected grating using the holographic VLS technology. It has been especially calculated to reduce astigmatism not only on its optical axis but over a large exit plane in all directions (25 x 10 mm corrected plane) making it ideal for one inch arrays. Its single grating layout has the other advantage to reduce the number of optics in the instrument to the minimum, increasing its throughput in EUV and FUV regions.

Applications

- Tunable light source
- FUV Reflectometry/Absorption
- Plasma Physics Study
- High Harmonic Generation

Features

- Single Toroidal Grating design
- Low astigmatism level
- Corrected imaging plane
- MgF_2 coating UV optimized
- Interchangeable Exit port
- Automated drive
- Built-in USB2 interfaces
- High Vacuum compatible

Benefits

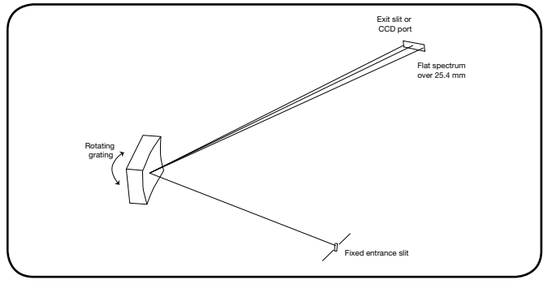
- Optimized for throughput
- High S/N ratio measurement
- Flat field monograph
- Better efficiency in FUV range
- Choice of exit slit or CCD port
- Fast and easy to operate
- No additional controller and easy computer control
- 10^{-6} mbar – optional 10^{-9} mbar (UHV)

Toroidal rotating grating providing a flat field spectrum

A corrected grating for a compact and simple design

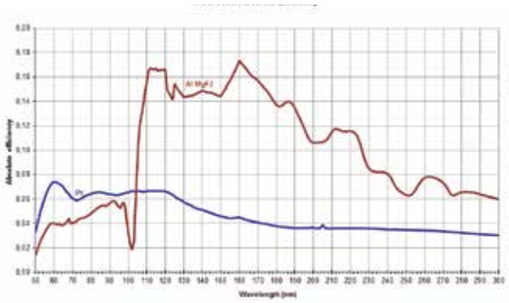
The H30-UVL design with two fixed ports and a rotated grating for the wavelength selection, simplifies any alignment in your experiment compared to Rowland circle based instruments equiped with a rotating arm.

Thanks to the corrected grating that provides a true flat field spectrum whatever the selected wavelength, the exit port can be either a slit or a CCD port.

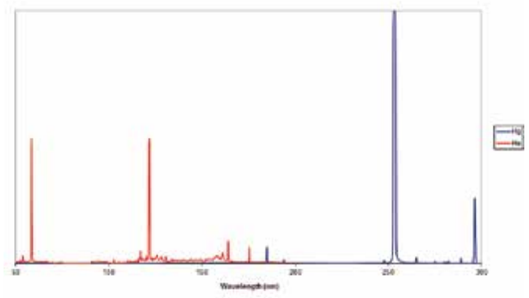


H30-UVL optical layout

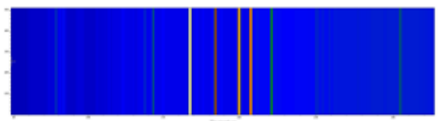
Exit port easily interchangeable by user from slit to CCD port



Theoretical absolute efficiency of H30-UVL with a Pt and $AlMgF_2$ coating



He and Hg spectra recorded with a H30-UVL in monochromator mode



He spectrum recorded with a H30-UVL in spectrograph mode
VLS gratings make proper corrections to have the best image at the exit of instruments.

Options

- Exit port can be adjustable slit and/or adjustable CCD port
- Removable entrance arm
- Laser kit for easy alignement

Accessories

- UV Light Sources
- Single channel detection
- CCD detectors

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H30-UVL Specifications

Optical design	Toroidal VLS Grating (single optic)
Focal length	274 mm
Aperture	f/6
Grating density	1200 gr/mm
Grating type	Replica (Master in option)
Optic coating	$AlMgF_2$ optimized at 121 nm or Pt
Deviation angle	70°
Dispersion	2.3 nm/mm at 50 nm
Drive	Fast worm drive
Resolution	Better than 0.2nm (*)
Vacuum	10^{-6} mbar
Pumping flange	DN63 CF
Entrance port	Micrometric slits (10 µm to 2 mm)
Exit port	Micrometric slits (10 µm to 2 mm) or adjustable CCD port
Entrance flange	DN40 KF
Exit flange	DN40 KF for slit version, DN100CF for CCD version
Software	HORIBA Scientific software
PC Interface	Built-in USB2 – No additional controller

Variation of the dispersion with wavelengths

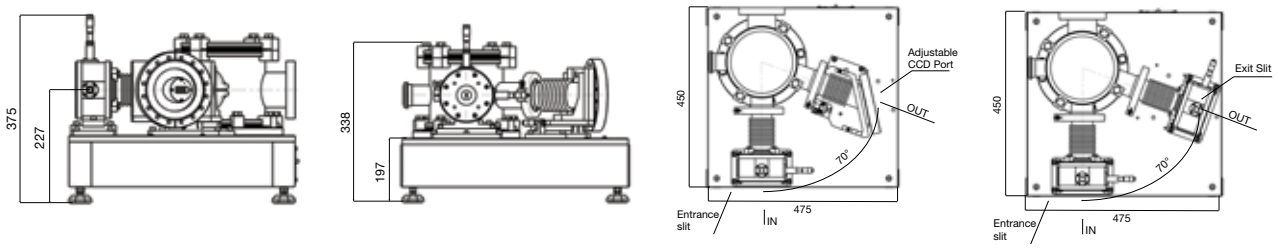
As the spectral dispersion at the exit of a monochromator varies with the wavelength selection, the maximum spectral resolution of the monochromator depends on wavelength changes.

Wavelength (nm)	Dispersion (nm/mm)
50	2.3
175	2.5
300	2.6

Spectral range analyzed with 1 inch CCD in Spectrograph Mode

Central wavelength (nm)	Spectral range on the CCD	
	nm	eV
50	21 - 80	15 - 60
150	120 - 180	7 -10
300	270 - 330	4 - 5

* using 10 micron slit and 2 mm slit height at 121 nm in monochromator mode



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