



TGS300 SPECTROGRAPH

SYNCHROTRON Compatible

VUV Spectrograph:

The TGS300 is a Toroidal Grating Spectrograph which has been designed to analyze and study Vacuum Ultraviolet (VUV) emission. As a Spectrograph, the TGS300 allows large VUV spectral range analysis thanks to its bi-dimensional flat field with high spectral resolution. A full spectrum range is simultaneously acquired in a single acquisition when adding with an array detector. With a standard DN100CF exit flange mounted on XY table, an array detector will be easily optimized in wavelength centering and focusing.

An original HORIBA JOBIN YVON Concept:

Based on HORIBA Jobin Yvon's patented technology, the TGS300 is built around a single toroidal holographic grating with 140° deviation angle (grazing incidence). This simple optical design dramatically reduces astigmatism and results in excellent luminosity and spectral purity over 40 mm exit flat field.

Three Platinum-coated Toroidal Master Gratings are available:

2105 gr/mm	9.5 – 32 nm spectral range Max efficiency: 12nm
450 gr/mm	10 – 110 nm spectral range Max efficiency: 15nm
290 gr/mm	15.5 – 170 nm spectral range Max efficiency: 35nm

APPLICATIONS:

- EUV and UV Plasma analysis
- Light Source characterization
- Laser Harmonic Studies

Specifications:

Optical design	HJY patent
Focal length	300 mm
Aperture	f/20
Resolution	Down to 0.04 nm (*)
Wavelength Drive	Fixed
High Vacuum	10 ⁻⁶ mbar
Pumping flange	DN40 KF
Slits	Insert
Array flange	DN100CF

Options:

Slits	Manual or Motorized
Internal grating selection	Slide up to 3 gratings under vacuum
Ultra High Vacuum	10 ⁻⁹ mbar with DN63CF pumping flange



TGS300 VUV Spectrograph

Features

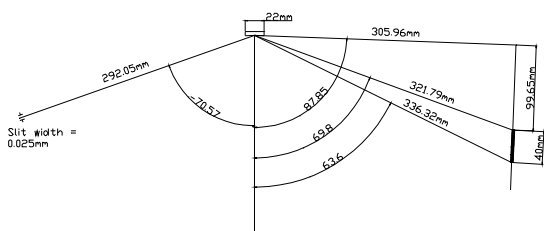
- Single Master Grating design
- Choice of three gratings
- Low Astigmatism level
- High Vacuum compatible
- Fixed grating position
- Array flange adjustable in Exit focal plane
- Optional Three gratings in slide holder

Benefits

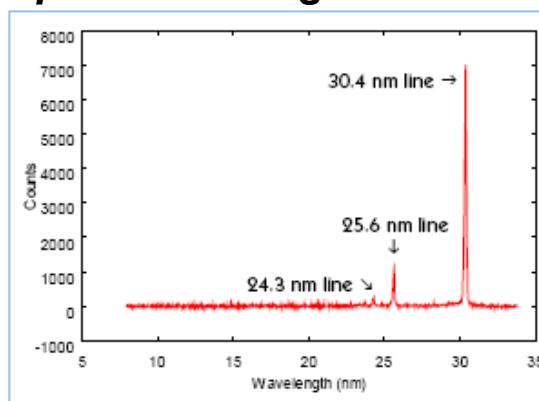
- Optimized for Throughput
- Optimized spectral range and resolution
- 40 mm exit flat field
- HV (10⁻⁶ mbar) – Optional UHV (10⁻⁹ mbar) operation
- Robust
- Central wavelength selection
- Do not need to brake vacuum at grating exchange

(*) using 2105 gr/mm grating at 20nm with 10 micron slit

A grazing angle and a single toroid optic for the highest Efficiency



TGS300 Optical layout



Courtesy of GREM/IGETECH

9 – 32 nm Helium spectrum using 2105 gr/mm grating

ORDERING INFORMATION:

TGS300HV: TGS300 core, fixed wavelength drive. High vacuum (10^{-6} mbar) vessel uses with DN40KF pumping flange. Requires one slit.

Grating selection:

54100220	2105 gr/mm grating 9.5-32 nm (39 – 130 eV) Best measured resolution: 0.036nm
54100200	450 gr/mm grating 10-110 nm (11 – 124 eV) Best measured resolution: 0.075nm
54100210	290 gr/mm grating 15.5-170 nm (7 – 80 eV) Best measured resolution: 0.11nm

Our working spectral ranges are indicated for the 40 mm flat field of the instrument.

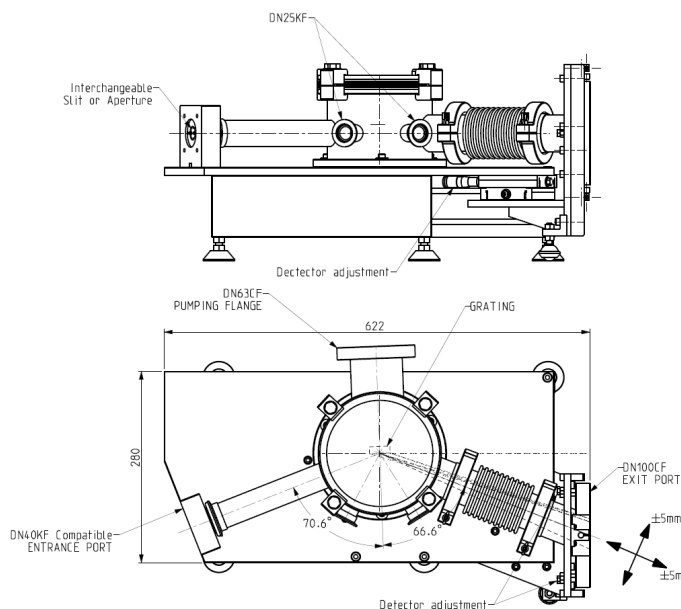
OPTIONS:

TGS-UPUHV: Ultra High Vacuum (10^{-9} mbar) vessel using DN63CF pumping flange.

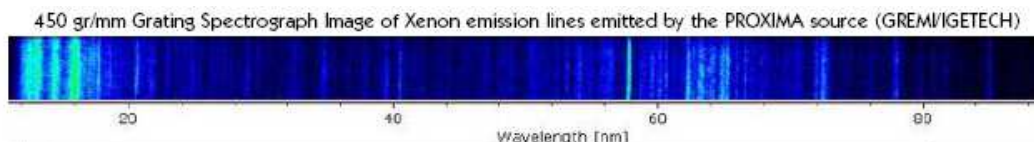
TGS-UP-MOS: Motorized slit (0-2 mm)

All our VUV packages do not include pump and gauges which are necessary for the use of this instrument

TGS-MIS: Micrometric slit (0-2 mm)



TGS300 Monochromator



All TGS300 spectrographs are equipped with a fixed grating. At its working angle, each torroid grating has been calculated for improving the image quality over the 40mm exit focal plane of the instrument. The wavelength range adjustment is therefore obtained by translating the array on the focal plane of the spectrograph by an XY table.

In the USA:
HORIBA Jobin Yvon Inc
3880 Park Ave,
Edison, New Jersey,
08820 USA
Tel : (1) (732)-494-8660
Fax: (1) (732)-549-9309

In France:
HORIBA Jobin Yvon SAS
16-18 rue du Canal
91165 Longjumeau cedex
France
Tel: (33) (0)1 64.54.13.00
Fax: (33) (0)1 69.09.93.19
Email: info@jobinyvon.fr

China, Beijing office: (86)-(0)-10 6849 2216
China, Shanghai office: (86)-(0) 21-6447 9785
Germany: (49)-(0)-89 46 23 17 0
Italy: (39)-(0)-2 57 60 30 50
Japan: (81)-(0)-3 3861 8234
U.K.: (44)-(0)-20 8204 8142
Korea : (82)-2 753 7911

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