User Manual

7IMS1022 Monochromator

Optics Focus Instruments Co., Ltd.

Contents

1. Features

- Czerny-Turner optical design for high resolution & maximum throughput while minimizing stray light & aberrations
- Single ruled grating used for high efficiency ultraviolet to visible wavelength scanning
- Single output port version
- Fixed slits
- Wavelength range covers silicon detector's range
- Nitrogen connector is available for UV and NIR testing
- Entrance is compatible with our light sources and fiber interface
- Exit is compatible with our single-point detector and other accessories
- Precise ground lead screw provides the high accuracy and repeatability
- Ultra wear-resisting linear slide guides provide steady movement, long life and low noise
- The wavelength is controlled manually by the wavelength counter
- Optics chamber and mechanical drive chamber are separated to reduce stray light and pollution to optical components

2. Description

This series of Monochromators is a high performance, economical and user-friendly monochromator – an ideal instrument for research and OEM applications.

This series of Monochromators uses an asymmetrical in-plane Czerny-Turner optical configuration. The optical configuration is designed to ensure high resolution and maximum throughput. The F/3 monochromator is optimized to provide excellent stray light rejection while minimizing aberrations. Its wavelength drive is designed to increase speed as much as possible without sacrificing accuracy or precision.

3. **Specifications**

Model	7IMS1022
Focal Length	100mm
F/#	F/3
Stray Light	$5x10^{-4}$
Minimum Step	0.0625nm (1200g/mm Grating)
Number of Gratings Supported	1
Grating Name	Grating S30x30x6
Grating Size	30mmx30mm
Standard Grating	OG1200-500(1200g/mm, λp=500nm)
Wavelength Selection Method	Manual
Output Ports	1
Slits	Fixed Slit Holders
Slits Height	5mm
Slits Width	300μm
Communication Interfaces	N/A
Size	190mmx150mmx133mm
Weight	3.5kg

4. **Specifications of Optional Gratings**

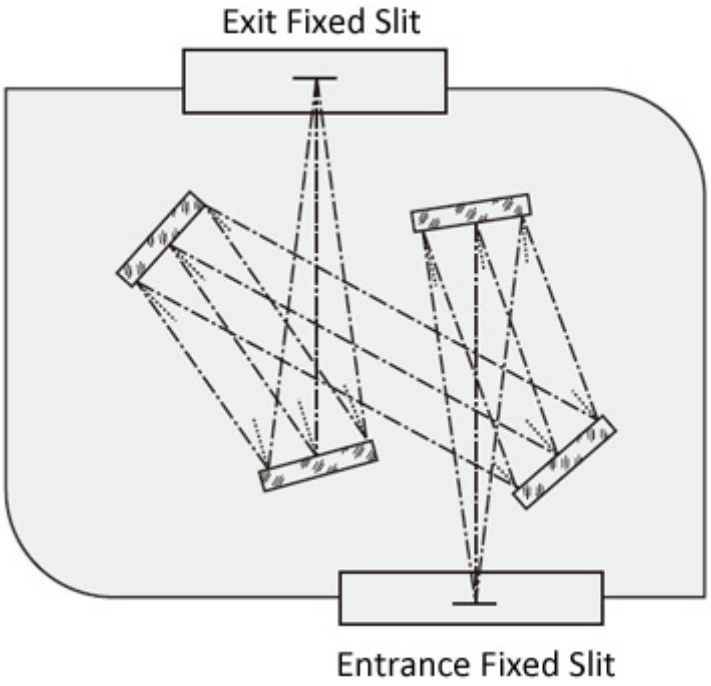
Grating Model	Linear Dispersion (nm/mm)	Accuracy (nm)	Repeatability (nm)	Resolution (nm)	Theoretical Spectral Range (nm)	Mechanical Spectral Range (nm)
OG1200-250	8	0.5	0.25	0.5	185-500	0-1100
OG1200-300					200-600	
OG1200-500					330-1000	
OG600-300	16	1.0	0.5	1.0	200-600	0-2200

OG600-400					260-800	
OG600-500					330-1000	
OG600-750					500-1500	
OG600-1000					660-2000	
OG600-1250					830-2200	
OG300-500	32	2.0	1.0	2.0	330-1000	0-4400
OG300-1250					830-2500	
OG300-1800					1200-3600	
OG300-3000					2000-4400	
OG150-4000	64	4.0	2.0	4.0	2600-8000	0-8800

5. Optical Design

This series of monochromators uses unsymmetrical horizontal light paths and changes the off-axis angle to correct coma, improves symmetry of spectral lines and improves resolution.

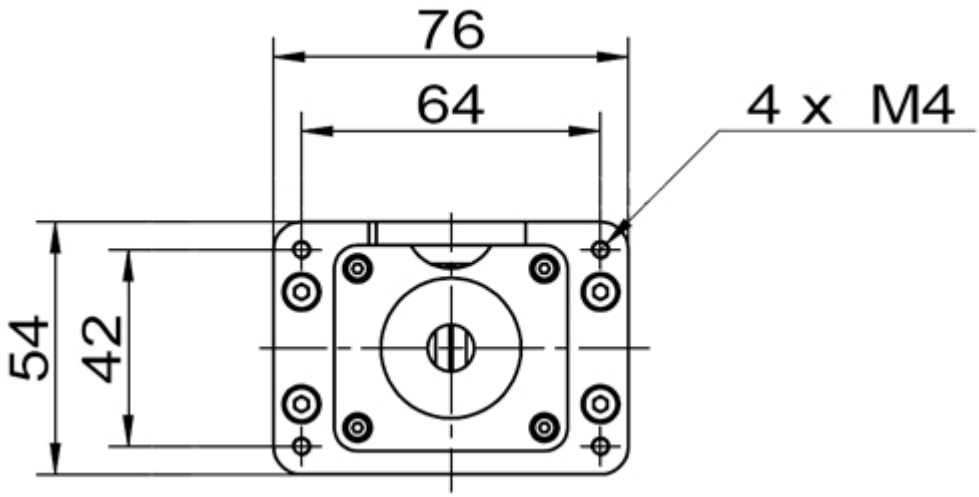
Eliminating secondary dispersion is designed to restrain stray light. The F/3 monochromator is optimized to provide excellent stray light rejection while minimizing aberrations.



7IMS1022 Monochromator optical design

6. Fixed Slits

7IMS1022 uses a pair of semi-fixed slits with 5mm height and 300μm width. This pair of slits should be used together. Do not use two slits that have different width. If you need custom slits, please contact us.



7. Manual Wavelength Drive and Readout

The 7IMS1022 uses a hand wheel to position the grating. A calibrated wheel lets you position and read the wavelength to 1 nm. For gratings with different line densities, the wavelength shown on the hand

wheel is multiplied by the appropriate scaling factor.

Actual wavelength= reading of hand wheel x 1 (nm) (1200g/mm grating)
Actual wavelength= reading of hand wheel x 2 (nm) (600g/mm grating)
Actual wavelength= reading of hand wheel x 4 (nm) (300g/mm grating)
Actual wavelength= reading of hand wheel x 8 (nm) (150g/mm grating)

8. Others

Fiber adapter

If you have bought the adapter for SMA905 fiber from us, please replace the cover of the slits with the fiber adapter and connect the fiber directly.

Nitrogen connector

To avoid the absorption of air, you can fill the monochromator with nitrogen in ultraviolet and near infrared band to improve the efficiency. There is a specific nitrogen connector with the monochromator.

When you need to use it, remove the cover and install the nitrogen connector, then connect the nitrogen pipe. Note: The nitrogen connector can't be used for other gases.

The nitrogen is a kind of non-toxic, pollution-free, non-irritating and non-corrosive gas, so you can keep filling it during the whole experiment to keep the nitrogen concentration and positive pressure in the instrument. The excess gas will leak off through gaps.

9. Accessories

1 x Power adapter (24V/5A)

1 x Nitrogen connector