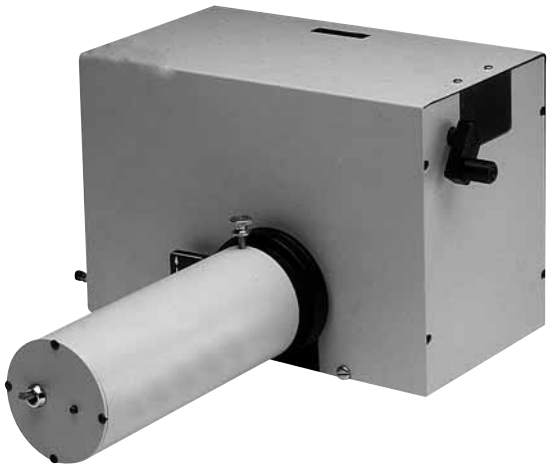
Oriel 77250 Series 1/8 m Monochromator



77250 1/8 m Monochromator with 6025 Hg(Ar) Spectral Calibration Lamp.

- Low cost, compact size and high performance
- Very efficient - high throughput and low stray light
- Usable from 180 nm to 24 µm with interchangeable gratings
- Wide range of bandpasses with interchangeable slits

For general-purpose laboratory work or academic applications, the Oriel 77250 1/8 m Monochromator is a smart and economical choice. This simple, manually operated 1/8 m instrument has good resolution, low stray light and is very versatile. A large family of slits and gratings give a wide range of bandpasses and broad spectral coverage.

Optical Configuration

The optical configuration of the 77250 is the reason why throughput is so high while stray light performance is unrivaled. Fig. 1 shows the Ebert-Fastie design with two inline slits and an out of plane grating. Having the slits opposite each other lets you mount the complete optical system on a bench or rail. Having the grating out of plane eliminates re-entrant spectra.

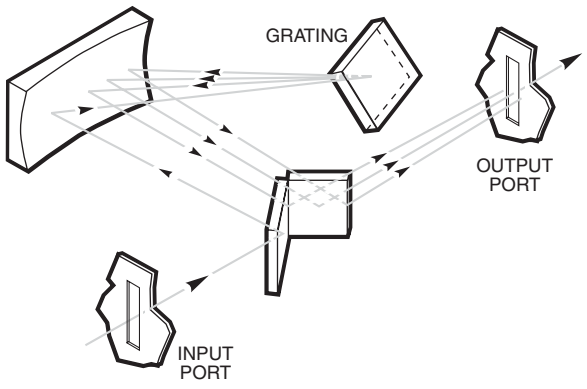


Fig. 1 Optical configuration of 77250 1/8 m Monochromator.

Manual Wavelength Drive and Readout

The 77250 uses a hand crank to turn the grating. A 3-digit counter displays the wavelength directly in nanometers when using a 1200 l/mm grating. A calibrated wheel marked in 0.2 nm divisions lets you position and read the wavelength to 0.1 nm. For gratings with other line spacings, multiply the wavelength on the counter by the “Wavelength Counter Multiplier” listed in Table 1. The readout is factory set so the wavelength indicated is correct to within 1 nm through the full range of a 1200 l/mm grating. For greater accuracy, you can reset the readout within any restricted spectral region. The precision of this instrument is better than 0.2 nm, limited by backlash.

Interchangeable Gratings

Each grating is mounted in a protective frame. The frame has a tab for quick and easy insertion and removal without touching the surface of the grating. The following 30 x 30 mm replicated gratings are for the 77250 only; they cannot be used in any of our other Monochromators.

Table 1 Grating Specifications for 77250 1/8 m Monochromator

Line Density (l/mm)	Blaze Wavelength	Type	Wavelength Counter Multiplier	Reciprocal Dispersion (nm/mm)*	Peak Efficiency (%)	Primary Wavelength Region **	Instrument's Upper Wavelength Mechanical Limit (for specificed grating)	Model
3600	405 nm	Holographic	0.33	60	60	180 - 330 nm	330 nm	77310
2400	250 nm	Holographic	0.5	3.3	65	180 - 500 nm	500 nm	77308
1800	500 nm	Holographic	0.67	4.1	80	300 - 670 nm	670 nm	77309
1200	250 nm	Holographic	1	6.7	65	180 - 650 nm	1000 nm	77296
1200	350 nm	Ruled	1	6.6	80	200 - 1000 nm	1000 nm	77298
1200	750 nm	Ruled	1	6.2	85	450 - 1000 nm	1000 nm	77306
600	200 nm	Ruled	2	13.3	70	180 - 500 nm	2000 nm	77304
600	750 nm	Ruled	2	13.2	75	450 - 2000 nm	2000 nm	77305
600	1 µm	Ruled	2	13	90	600 - 2000 nm	2000 nm	77299
600	1.6 µm	Ruled	2	90	90	900 - 2000 nm	2000 nm	77316
300	2 µm	Ruled	4	26	90	1.1 - 4.0 µm	4 µm	77300
200	1 µm	Ruled	6	40	85	0.6 - 2.2 µm	6 µm	77307
150	800 nm	Ruled	8	80	80	425 - 1600	8 µm	77317
150	4 µm	Ruled	8	52	75	2.5 - 8 µm	8 µm	77301
75	7 µm	Ruled	16	105	80	4.5 - 16 µm	16 µm	77302
50	12 µm	Ruled	24	157	80	7 - 23 µm	24 µm	77303

* At blaze wavelength
** The primary wavelength region is where the grating efficiency is >0.2. System efficiency will also be affected by the reflectivity of the mirrors and the grating angle at any wavelength.

Three Types of Slits

We offer three types of slit assemblies for the 77250 in various slit sizes. Choose the same type and size for the input and output. Our slit assemblies have a 1.5 Inch Series male flange.

Micrometer Driven Slit Assembly

- Slit width is continuously variable from 4 µm to 3 mm
- Slit height is adjustable from 1 to 15 mm
- ±10 µm repeatability
- ±10 µm accuracy from 4 µm to 250 µm; ±5% from 250 µm to 3 mm

Multiple Fixed Slit Assembly

- 8 fixed slit positions from 50 µm to 3.16 mm
- Slit height is adjustable from 1 to 12 mm

Fixed Slits

- Most economical for single slit size
- Fixed width and height

Mounting

Rod mounting the 77250 allows the greatest flexibility; you can vary the optical axis height to match your source or detector. To rod mount the 77250, order the 77387 Monochromator Mounting Plate and two optical rods and rod holders (see page 708) for rods and rod holders.

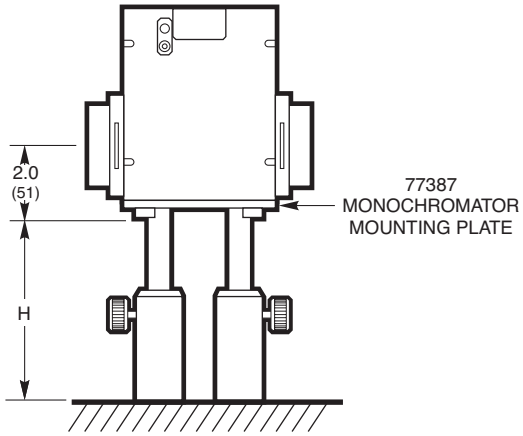


Fig. 2 77250 Monochromator rod mounted to an optical table using the 77387 Mounting Plate.

Specifications

Focal Length	125 mm
Effective Aperture	F/3.7
Usable Wavelength Range	180 nm to 24 µm with interchangeable gratings; dry nitrogen purge lowers the limit to 175 nm
Resolution	0.5 nm with 1200 l/mm grating and 50 µm slit
Stray Light	0.03 %
Wavelength Readout	3 digit counter in nm with index marks every 0.2 nm
Wavelength Precision	0.4 nm
Weight	4 lb (1.8 kg)

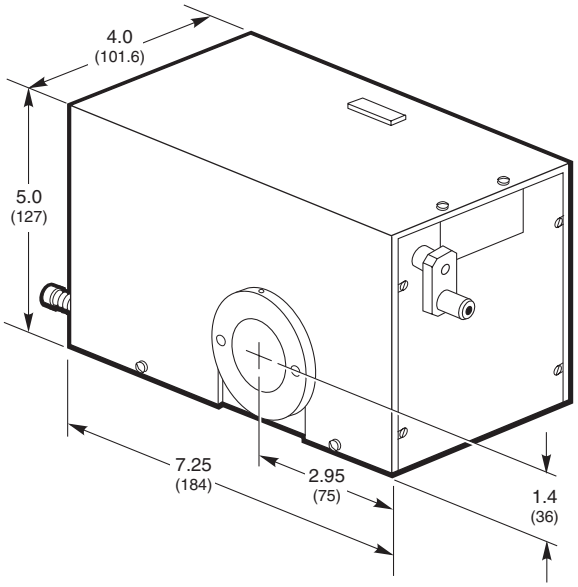


Fig. 3 Dimensional diagram of 77250 1/8 m Monochromator.

Ordering Information

Monochromator and Accessories

To order a complete 77250 Monochromator, order a grating and (2) slit assemblies separately.

Model	Spectrometer System
77250	1/8 m Monochromator
74001	Micrometer Driven Slit Assembly
77269	Multiple Fixed Slit Assembly
77294	Fixed Slit Holder (order 1 fixed slit for each holder from table below)
77387	Inch Monochromator Mounting Plate (order 2 rod and rod holders separately)

Fixed Slits

Model	Slit Width (μm)	Slit Height (mm)	Resolution at 500 nm at 500 nm (nm)**
77219	50	6	0.5
77218	120	18*	1
77217	280	18*	2
77216	600	18*	4
77215	760	18*	5
77214	1240	18*	8
77213	1560	18*	10
77212	3160	18*	20
77211	6320	18*	40

* Actual slit height is 18 mm, usable height is 12 mm.
** For 1200 l/mm gratings to obtain the resolution with other gratings multiply by the "Wavelength Counter Multiplier" in Table 1.

Gratings

Model	Line Density (l/mm)	Blaze Wavelength	Type	Primary Wavelength Region	Instrument's Upper Mechanical Limit (For Specified grating)
77310	3600	405 nm	Holographic	180 - 330 nm	330 nm
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77309	1800	500 nm	Holographic	300 - 670 nm	670 nm
77296	1200	250 nm	Holographic	180 - 650 nm	1000 nm
77298	1200	350 nm	Ruled	200 - 1000 nm	1000 nm
77306	1200	750 nm	Ruled	450 - 1000 nm	1000 nm
77304	600	200 nm	Ruled	180 - 500 nm	2000 nm
77305	600	750 nm	Ruled	450 - 2000 nm	2000 nm
77299	600	1 μm	Ruled	600 - 2000 nm	2000 nm
77316	600	1.6 μm	Ruled	900 - 2000 nm	2000 nm
77300	300	2 μm	Ruled	1.1 - 4.0 μm	4 μm
77307	200	1 μm	Ruled	0.6 - 2.2 μm	6 μm
77317	150	800 nm	Ruled	425 - 1600 nm	8 μm
77301	150	4 μm	Ruled	2.5 - 8 μm	8 μm
77302	75	7 μm	Ruled	4.5 - 16 μm	16 μm
77303	50	12 μm	Ruled	7 - 23 μm	24 μm

WEB *See our website for more info*