Oriel Mini Monochromator

78024 Mini Monochromator

- Low cost, very compact instruments for general spectroscopy applications
- 74 mm focal length, moderate resolution
- Manual and stepping motor driven models
- VIS - NIR (190 nm to 1.2 μm) models
- Optional VIS-NIR light source

These new Monochromators are low cost, compact and simple-to-use instruments for moderate resolution applications. They are ideal for general laboratory experiments and educational studies covering fixed wavelength ranges and not requiring sub-nanometer resolutions. The focal length of these instruments is 74 mm; the F/# is 3.9.

For demanding spectroscopy applications, please refer to our long focal length, high resolution bench-top instruments detailed on pages 1184 through 1196.

Manual and Motorized Versions

We offer two families of Mini Monochromators:

Manual Monochromators

These models have a knurled knob, which causes a precision lead screw/sine bar mechanism to rotate the grating. A digital counter displays the wavelength in nanometers, to 0.2 nm.

Motorized Monochromators

For scanning applications, we recommend that you choose a motorized monochromator. These instruments use a stepping motor driven by an external motor controller with RS 232 interface. Included with the controller is an application program with over 25 commands to control a variety of operations of the grating drive. These motorized models also include a manual drive and a digital counter that displays the wavelength to 0.2 nm.

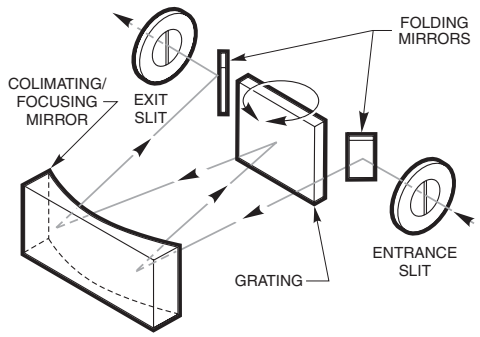


Fig. 1 Optical configuration of Mini Monochromator

Optical Configuration

Fig. 1 shows the Ebert-Fastie design of these monochromators. Full spectrum radiation is focused at the entrance slit and reflected by a folding mirror onto a spherical collimating/focusing mirror. This mirror collimates the radiation and directs it onto the grating, where it is diffracted.

Once diffracted, the radiation is directed back to the collimating/focusing mirror, and a segment of the dispersed radiation is focused at the exit slit via a second folding mirror.

Resolution

The resolution of the instrument is a function of its focal length, the dispersion of the grating, the width of the entrance and exit slits, and to a lesser degree, wavelength. As standard models, these instruments include two 300 μm x 4 mm slits. You can increase the resolution by using narrower slits. Request different slits at the time of purchase, or purchase extra sets so you can vary the throughput and resolution. The slits are easily interchangeable. Table 1 shows the resolutions possible with the standard and optional slits.

Table 1 Resolution of Mini Monochromators

Instrument's Usable Wavelength Range	Linear Dispersion (nm/mm)	Resolution With These Slits (nm)*					
		50 μm	100 μm	150 μm	300 μm	600 μm	1000 μm
190 - 650 nm	5.54	0.28	0.55	0.83	1.66	3.32	5.54
200 - 800 nm	7.41	0.37	0.74	1.11	2.22	4.44	7.41
300 - 800 nm	7.21	0.36	0.72	1.08	2.16	4.32	7.21
500 nm - 1.2 μm	11.29	0.56	1.13	1.69	3.39	6.77	11.29

* Instruments include 300 μm x 4 mm slits; other slit sizes are available as options. Resolution = (slit width) X (linear dispersion)

Optional Accessories

We offer various accessories specifically for these Mini Monochromators (note: these accessories cannot be used with our fully featured instruments.)

Order Sorting Filters

Block the unwanted higher orders with an order sorting filter. Because of the unique input slit assembly of these monochromators, you cannot use our traditional flanged filter assemblies with these instruments. The assemblies for these monochromators have an integral slit; simply replace the entrance or exit slit assembly of the instrument, with a filter assembly. The filter assemblies come standard with 300 µm slits (as do the instruments).

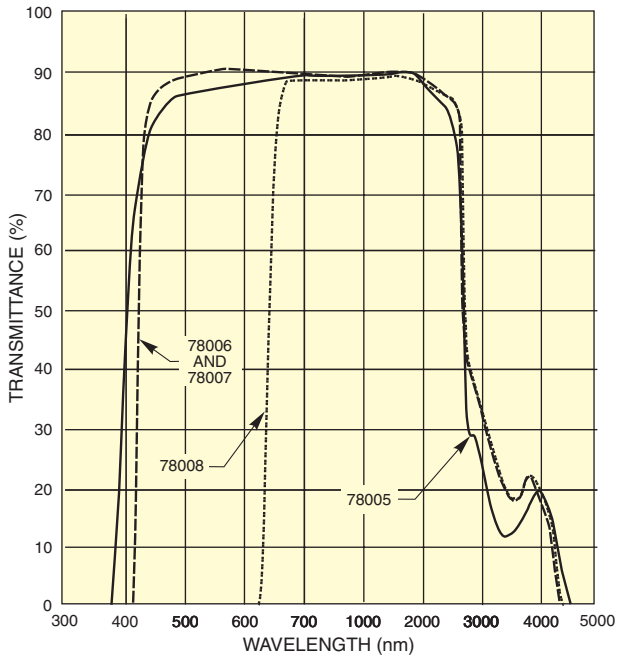


Fig. 2 Transmittance of Order Sorting Filters

Fiber Optic Assemblies

As with the filter assemblies, dedicated fiber assemblies are needed for these monochromators. Our flanged fiber adapters will not mount to the slit assemblies of these Mini Monochromators.

We offer two glass fiber bundles for these instruments. One end of the bundle has an integrated 600 µm x 4 mm slit, which replaces the slit assembly on the instrument. The other end of the 78040 Fiber Assembly has a 4.8 mm OD ferrule. The other end of the 78041 Fiber Assembly has an SMA termination. Both fiber bundles are 5 ft (1.5 m) long.

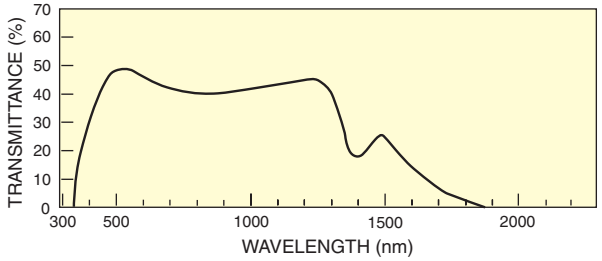


Fig. 3 Transmittance of 78040 and 78041 Glass Fiber Bundles

Tunable Source

Build a tunable source with one of our Mini Monochromators and the 78042/3 Tungsten Halogen Light Source. The 78042/3 Source includes:

- 20 W Tungsten Halogen Lamp
- 12 V DC power supply
- Variable aperture assembly
- Mounting baseplate

The spectral output of the source is 340 nm to 3 µm, and is matched to the entrance slit of the monochromator.

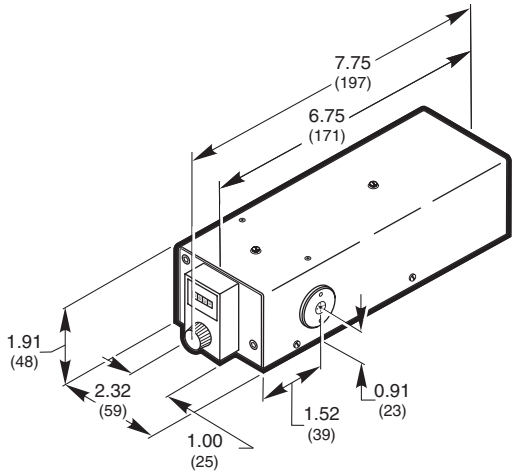
Specifications

Focal Length	74 mm
Effective Aperture	F/3.9
Wavelength Readout	4 digit counter in nm with index marks every 0.2 nm
Wavelength Accuracy	± 0.2% (as a % of wavelength)
Weight (Manual Models)	0.7 kg (1.5 lbs)
Weight (Motorized Models)	0.9 kg (1.9 lbs)

78085/6 Stepping Motor Controller

Motor Type	Bi-polar stepping motor
Number of Phases	2
Step Modes	Full and Half Step
Step Rate	16 - 23,000 / s
Max Step Range	± 8.388.607 Schritte
Max Current	1.2 A / phase Max.
Voltage	24 V DC
Motor Leads	4, 6, or 8
Computer Interface	RS 232
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	Aucune
Flow Control	XON / XOFF
I/O	Limit A Limit B Moving Go Soft Stop LogiCom
Memory	Non-volatile, 2048 bytes

MOTORIZED MONOCHROMATORS



MANUAL MONOCHROMATORS

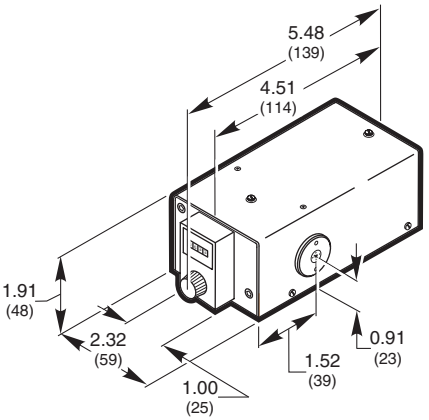


Fig. 4 Dimensional diagram of Mini Monochromators

Ordering Information

Mini Monochromators

These monochromators include two 300 µm x 4 mm slits. To replace these slits with a set listed in the second table, contact a Sales Engineer at the time of purchase.

Type	Usable Wavelength Range	Model
Manual Mini Monochromator	190 - 650 nm	78020
	200 - 800 nm	78021
	300 - 800 nm	78022
	500 nm - 1.2 µm	78023
Motorized Mini Monochromator	190 - 650 nm	78024
	200 - 800 nm	78025
	300 - 800 nm	78026
	500 nm - 1.2 µm	78027

Optional Slit Assemblies (Set of Two Slits)

These assemblies mount to any of the monochromators listed above.

Model	Slit Dimensions
78091	50 µm x 4 mm
78092	100 µm x 4 mm
78093	150 µm x 4 mm
78094	300 µm x 4 mm
78095	600 µm x 4 mm
78096	1000 µm x 4 mm

Optional Accessories

Accessory	Description	Model
Stepping Motor Controller	110 V AC, 60 Hz	78085
	220 V AC, 50 Hz	78086
Ordering Sorting Filter Assemblies (For These Spectral Range Monochromators)*	190 - 650 nm	78005
	200 - 800 nm	78006
	300 - 800 nm	78007
	500 nm - 1.2 µm	78008
Glass Fiber Optic Assemblies**	4.8 mm OD Ferrule	78040
	SMA Termination	78041
Tungsten Halogen Light Source	105 - 126 V AC Tungsten Halogen Light Source	78042
	210 - 252 V AC Tungsten Halogen Light Source	78043
	Replacement 20 W Lamp (Package of 2 Lamps)	78044

* These assemblies include a 300 µm x 4 mm slit; please contact a Sales Engineer if you'd like a different slit size.
** These assemblies include a 600 µm x 4 mm slit; please contact a Sales Engineer if you'd like a different slit size

WEB *See our website for more info*