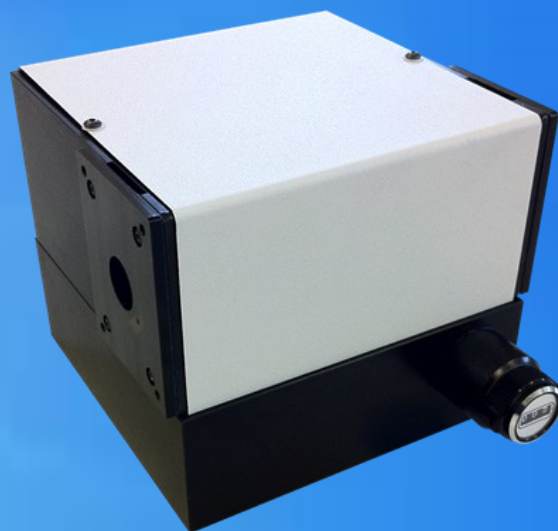


MONOCHROMATORS AND SPECTROGRAPHS

SMALL SERIES - 9030, 9030DA/DS MONOCHROMATORS



Features

- High-throughput, aberration-compensated design
- Grating options covering the UV,VIS and NIR spectral ranges
- USB2.0 communication for motorized version
- Fully integrated software and development libraries available

Applications

- Tunable monochromatic light source
- Spectroscopic systems:
 - Emission and source characterization
 - Absorbance, transmittance and reflectance measurement
 - High dispersion or high power density spectral illumination system
 - Electrochemical spectroscopy
 - Fluorescence spectroscopy
 - Scanning spectrophotometer system
 - Raman spectroscopy

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SCIENCETECH



Version 3.4.0, September 2016

9030, 9030DA/DS MONOCHROMATORS

A. Overview

- The Sciencetech 9030 series monochromators are our most economical scanning monochromators. The standard model features a manually controlled wavelength selector and removable, fixed-width slits.
- The compact design features a Seya-Namioka optical layout, using a single concave holographic grating with an f/3.2 aperture. A pair of removable fixed-width slits are included for the input and output ports. Several accessories are available, and an optional external motor drive for computerized control is available.
- For applications requiring better signal to noise, reduced stray light and better resolution than the standard model a double additive model (9030DA) is available. For applications requiring a tunable bandpass light source the double subtractive model (9030DS) is an ideal choice.

B. Specifications

Model	9030	9030DA	9030DS
Part Number	120-9003	120-9029	120-9015
Input Focal Length (mm)	100	100 x 2	100 x 2
Output Focal Length (mm)	100	100 x 2	100 x 2
Wavelength Selection [‡]	Manual	Manual	Manual
Communication	USB 2.0 with motorized version	USB 2.0 with motorized version	USB 2.0 with motorized version
Readout Mechanics	Sine Drive	Sine Drive	Sine Drive
Spectral Range (nm) [†]	250-2000	250-2000	250-2000
Aperture	f/3.2	f/3.2	f/3.2
Maximum Grating Size [§] (mm)	32 x 32	32 x 32	32 x 32
Number of Gratings	1	1 x 2	1 x 2
Grating Types	Concave Holographic	Concave Holographic	Concave Holographic
Optical Resolution (nm) [†]	< 1	0.5	1 nm bandpass
Stray Light	10E-4	10E-7	10E-7
Dispersion [†] (nm/mm)	8	4	Effectively 0
Wavelength Accuracy [‡] (± nm)	1.0	1.0	1.0
Wavelength Reproducibility [‡] (± nm)	0.25	0.25	0.25
Optical Axis Height (mm)	76.2	76.2	76.2
Compatible Detector Types	Single channel	Single channel	Single channel
Dimensions (mm)	130 x 130 x 104	260 x 260 x 125	260 x 260 x 125
Dimensions (in)	5.1 x 5.1 x 4.1	10.2 x 10.2 x 5	10.2 x 10.2 x 5
Weight (kg)	2	4.5	4.5

[†] Grating dependent; [‡] With readout counter (0.1nm); [§] Substrate size. Active area is 30 x 30 mm.

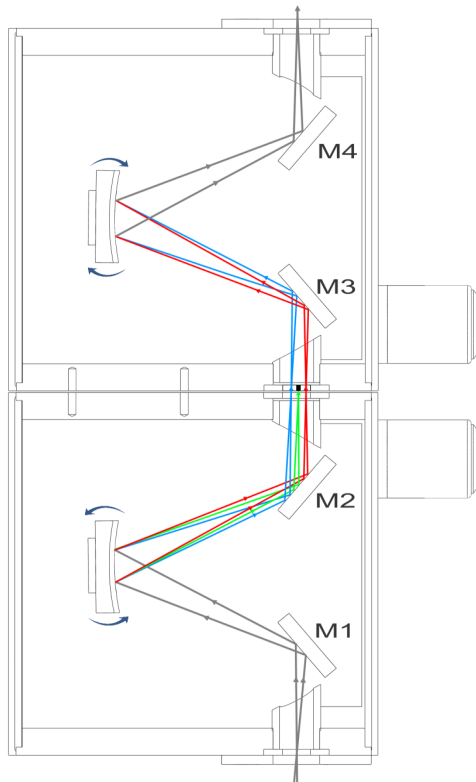
[Browse Small Series Monochromators on the Sciencetech Website](#)



9030, 9030DA/DS MONOCHROMATORS

C. Configurations

9030DS Double Subtractive Monochromator Configuration



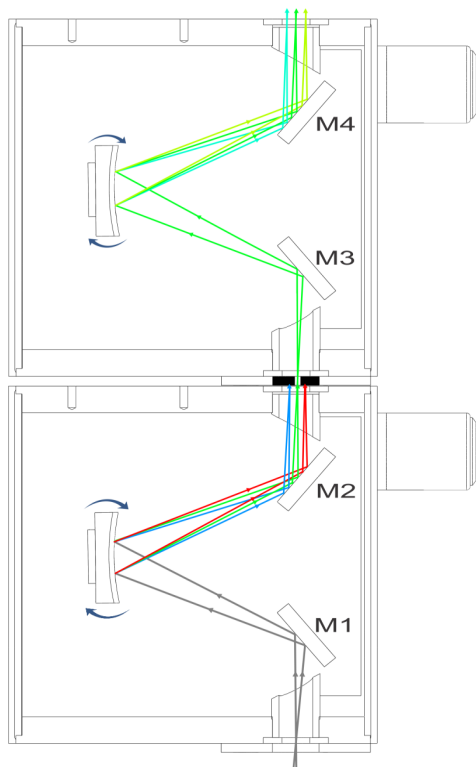
The 9030DS (Double Subtractive) is made of 2 back-to-back 9030 monochromators in a **subtractive** mode: the dispersion of the second monochromator is in the opposite direction of that of the first one. The gratings are calibrated to rotate synchronously in opposite directions.

Stray light is drastically reduced in a double monochromator, and in the 9030DS it is further minimized by the use of concave holographic gratings. This makes the 9030DS an ideal instrument for applications where stray light is a problem, such as in spectroradiometry, Raman or UV measurements of solar radiation.

The 9030DS can act either as a tunable bandpass filter or a tunable notch filter. As a tunable bandpass filter, the bandpass is determined by the width of an intermediate slit. As a tunable notch filter, the width of the notch is determined by the physical width of an opaque notch placed at the intermediate slit position. Attenuations of better than -30dB have been achieved with a notch filter in place.

The Model 9030DS can also be used to pass or filter out several selected wavelengths by using a custom intermediate multi-slit mask instead of a single width intermediate slit. Please contact a Sciencetech Applications Specialist to tell us about your custom requirements. The 9030DS can be motorized with the addition of a motor drive system. Only one motor drive system is required. Standalone software is provided by Sciencetech.

9030DA Double Additive Monochromator Configuration



The 9030DA (Double Additive) is made of 2 back-to-back 9030 monochromators in an **additive** mode: the dispersion of the second monochromator adds to that of the first one. The gratings are calibrated to rotate synchronously in the same direction.

The inbound light is dispersed by the first grating then passes through an intermediate slit where stray light is rejected and then spectrally dispersed again by the second grating. The double dispersion of 9030DA results in a better optical resolution compared to a single 9030 monochromator while the bandpass is half that of a single 9030.

The 9030DA is a fully integrated unit. The diffraction gratings in the 9030DA are mechanically connected and calibrated for accurate wavelength tracking. The standard 9030DA includes standard 0.25mm fixed straight input and output slits and a 1 mm intermediate slit. The 9030DA can be motorized with the addition of a motor drive system. Only one motor and one drive system is required, enabling control via user-friendly software provided by Sciencetech.

9030, 9030DA/DS MONOCHROMATORS

D. Accessories

I) Grating selection

There are three basic parameters to consider when choosing a grating for your monochromator.

- **Required Wavelength Range**

The wavelength range available to you is determined by the grating groove density chosen and the angular mechanical limitation of the monochromator.

- **Grating Efficiency**

Ruled gratings may be blazed to increase their efficiency over a specific wavelength band. Holographic gratings can be modulated such that they are more efficient at some wavelengths than at others. Grating efficiency curves are the best tool for determining the most efficient grating available for your application.

It is important to note that grating efficiency curves do not represent the exact efficiency that should be expected when the grating is used in a monochromator as grating efficiency curves are taken at Littrow angle.

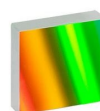
- **Required Resolution and Bandwidth**

Resolution is a measure of an instrument's ability to separate adjacent spectral lines. Resolution is generally given in nm. The bandwidth (or bandpass) is the wavelength range that falls on the output port at any one time and is also given in nm.

9030 Grating selection

Grating Selection Guide for 9030 Series					
Grating Model #	630-0009	630-0038	630-0008	630-0022	630-0035
Grating (l/mm)	1200	1200	1200	600	800
Blaze Wavelength	250	350	450	N/A	N/A
Dispersion (nm/mm)	8	8	8	16	12
Resolution (nm)	< 1	< 1	< 1	< 2	< 2
Spectral Range (nm)	200-600	325-700	400-1000	400-1600	300-1200

[Browse Gratings on the Sciencetech Website](#)



9030, 9030DA/DS MONOCHROMATORS

2) Slit assembly options

All 9030 series monochromators come standard with two fixed width slits and adjustable slits are available separately. Sciencetech can manufacture custom slits. Please talk to a technical support representative about your custom requirements.

Fixed Slit Options		
Part Number	Model	Description
120-9033	SF01-0.1MM	Removable 100 μ m (0.1mm) Fixed Width Slit
120-9013	SF025-0.25MM	Removable 250 μ m (0.25mm) Fixed Width Slit
120-9012	SF05-0.5MM	Removable 500 μ m (0.5mm) Fixed Width Slit
120-9011	SF1-1MM	Removable 1mm Fixed Width Slit
120-9010	SF2-2MM	Removable 2mm Fixed Width Slit
120-9034	SF2-3MM	Removable 3mm Fixed Width Slit

Can't find what you are looking for?

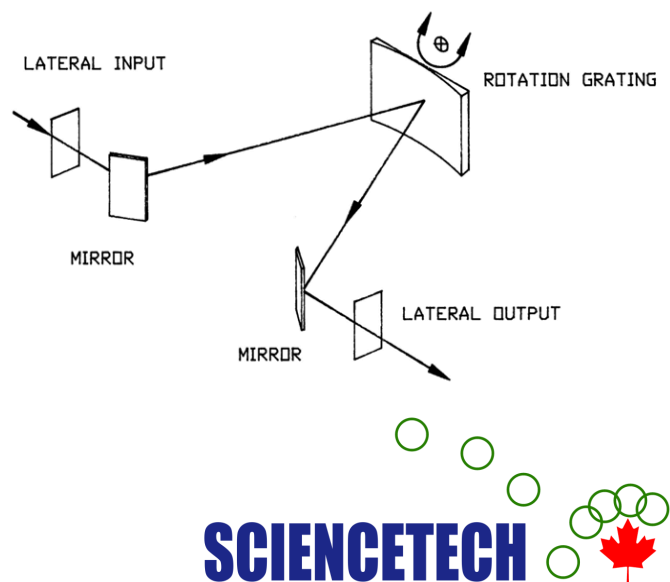
Sciencetech has built our reputation on custom solutions. Whether you need a small modification to an existing system or a completely novel design built from the ground up to meet your technical specifications, Sciencetech's engineering and optical design teams are ready to help.

[Browse Slit Assemblies on the Sciencetech Website](#)



3) 9030 motorized control option

Sciencetech 9030 series monochromators use a precision sine drive system to rotate the grating for wavelength selection. This sine drive maintains a linear correlation between wavelength selected and readout counter which is essential in a manual control system. With the optional motor drive, the precision sine drive system is maintained and the rotation is performed by a computer-controlled stepper motor. A Windows-based Active-X control module (Sci-Mono) is included with the optional motor drive so the wavelength can be selected through software. The Active-X control module can be used as stand-alone control software, or through a more sophisticated software application such as Lab-View.



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Sci-Spec, Sciencetech's standalone data acquisition and monochromator control software is available at an additional cost. Sci-Spec automatically coordinates motorized wavelength scanning actions and data acquisition from a suitable detector mounted at the monochromator output port. Sci-Spec can also coordinate other hardware such as automatic filter wheel selection. For more information about [Sci-Spec](#) see the Sciencetech website.

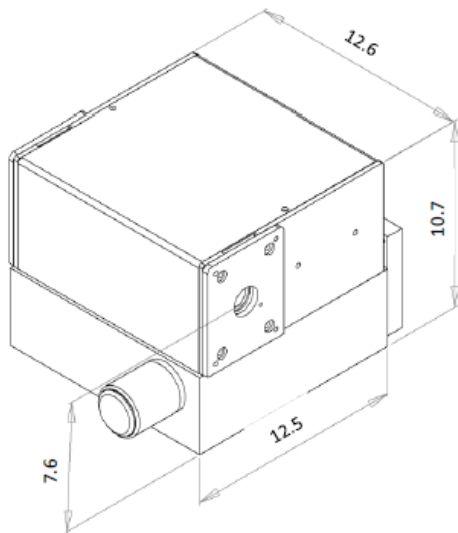
Motorized Control Options		
Part Number	Model	Description
120-9027	-USB	Motorization option with USB 2.0 interface

[Browse Configuration Options on the Sciencetech Website](#)



E. Dimensions of 9030 (cm)

The dimension of 9030DA/DS is to double the single unit dimension of 9030.



Sciencetech manufactures and integrates a full line of input and output couplings as well as a selection of beam line connections. Visit our [website](#) to look at all the possibilities:

- [Slit Assemblies](#)
- [Adapters and Connectors](#)
- [Optical Choppers](#)
- [Sample Chambers](#)
- [Manual and Motorized Filter Wheels](#)
- [Single Channel Detectors](#)
- [Line and Area Detectors](#)
- [Data Acquisition Equipment](#)
- [Software](#)

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