SCIENCETECH
Making Light Work Better

Features

- High-throughput, aberration-compensated design
- Grating options covering the UV, VIS and NIR spectral ranges
- USB 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

Monochromators and Spectrographs
Small Series- 9030 Monochromators

MADE IN CANADA · FABRIQUÉ AU CANADA

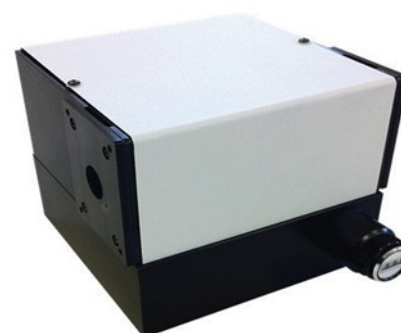# Small Series –9030 Monochromators
OVERVIEW

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.

B. Specifications - 9030 Series Monochromators

Table 1. General Specifications of 9030 Series Monochromators

Input Focal Length (mm)	100 (per monochromator)
Output Focal Length (mm)	100 (per monochromator)
Wavelength Selection[2]	Manual standard, motorized option available
Communication	USB 2.0 with motorized version
Readout Mechanics	Sine Drive
Spectral Range (nm)[1]	Table 3, 4, & 5
Aperture	f/3.2
Maximum Grating Size[3] (mm)	32 × 32
Number of Gratings	1 per monochromator
Grating Types	Concave Holographic
Grating Selection	Table 6
Mirror Types	UV-Enhanced Aluminum or Protected Aluminum
Optical Resolution (nm)[1]	Table 3, 4 & 5
Stray Light	Table 3, 4, & 5
Dispersion[†] (nm/mm)	Table 3, 4, & 5
Wavelength Accuracy[1] (± nm)	1
Wavelength Reproducibility[1] (± nm)	0.25
Optical Axis Height (mm)	76.2
Compatible Detector Types	Single Channel
Dimensions (mm)	Table 2
Weight (kg)	Table 2

9030 Single Monochromators

9030 Double Monochromators

[1] Grating dependent

[2] With readout counter (0.1nm);

[3] Substrate size. Active area is 30 × 30 mm.

Browse Small Series Monochromators on the Sciencetech Website

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Small Series –9030 Monochromators
SPECIFICATIONS

B.1. Specifications - Single Monochromators

Table 3. 9030 Single Monochromators

Model 9030	UVVIS	VISNIR
Spectral Range (nm)[1]	250-700nm	500-2000nm
Grating Selection	Refer to Table. 6	Refer to Table. 6
Mirror Types	UV Enhanced Aluminum	Protected Aluminum
Optical Resolution (nm)[2]	< 1	< 1
Stray Light	1.00E-03	1.00E-03
Dispersion[1] (nm/mm)	8	8

There are 5 grating choices (sold separately) covering from UV to near-IR.

B.2. Specifications - Double Monochromators

- 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.

Table 4. 9030DA Monochromators

Model 9030DA	UVVIS	VISNIR
Spectral Range (nm)[1]	250-700nm	500-2000nm
Grating Selection	Refer to Table. 6	Refer to Table. 6
Mirror Types	UV Enhanced Aluminum	Protected Aluminum
Optical Resolution (nm)[2]	0.5	0.5
Stray Light	1.00E-06	1.00E-06
Dispersion[1] (nm/mm)	4	4

Table 5. 9030DS Monochromators

Model 9030DS	UVVIS	VISNIR
Spectral Range (nm)[1]	250-700nm	500-2000nm
Grating Selection	Refer to Table. 6	Refer to Table. 6
Mirror Types	UV Enhanced Aluminum	Protected Aluminum
Optical Resolution (nm)[2]	1	1
Stray Light	1.00E-06	1.00E-06
Dispersion[1] (nm/mm)	<4	<4

[1] Grating dependent

[2] With 1200 l/mm grating and 0.1 mm slit

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Small Series –9030 Monochromators
SPECIFICATIONS

## C.1. Double Subtractive (DS) 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. 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.
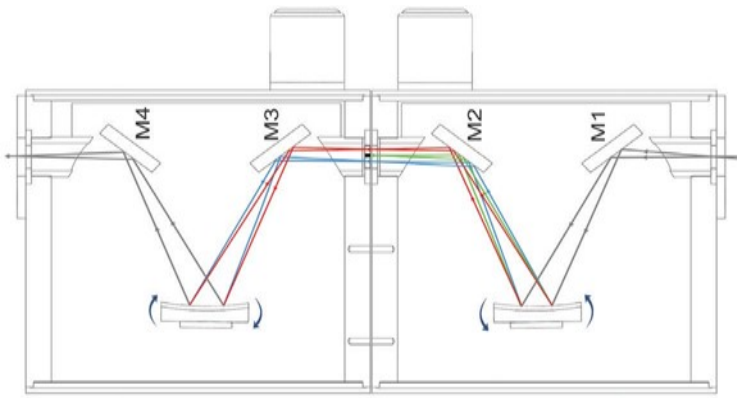
C.2. Double Additive (DA) Monochromator Configuration

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 diffraction gratings in the 9030DA are mechanically connected and calibrated for accurate wavelength tracking. The 9030DA can be motorized with the addition of a motor drive system.
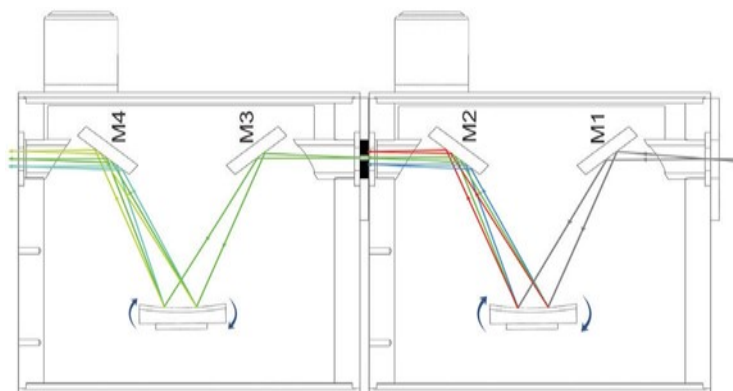
Note: The 9030DS and 9030DA can be motorized with the addition of a motor drive system. Only the one motor and one drive system is required enabling control via user-friendly software provided by Sciencetech.

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Small Series –9030 Monochromators
ACCESSORIES

1) Grating selection

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

Grating Efficiency

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

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.

Table 6. Grating selection

Grating Selection Guide for 9030 Series					
Grating Model #	635-0009	635-0038	635-0008	635-0022	635-0035
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	< 1.6
Spectral Range (nm)	200-600	325-700	400-1000	400-1600	300-1200
Compatible Mono-chromators	9030-UVVIS	9030-UVVIS	9030-VISNIR	9030-VISNIR	9030-VISNIR
	9030DA-UVVIS	9030DA-UVVIS	9030DA-VISNIR	9030DA-VISNIR	9030DA-VISNIR
	9030DS-UVVIS	9030DS-UVVIS	9030DS-VISNIR	9030DS-VISNIR	9030DS-VISNIR

2) Slit assembly options

Browse Gratings on the Sciencetech Website

Slits are included with the purchase of a 9030 or 9030 DA/DS system. Generally, input and output slits are chosen with the same slit width. The intermediate slit for a 9030DA or DS system may be different from the input and output slits. Notch filters are not included and are usually custom made depending on application. Sciencetech can manufacture custom slits. Please talk to a technical support representative about your custom requirements.

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Small Series - 9030 Monochromators
ACCESSORIES

The 9030-series monochromators have 2 or 3 fixed width slits included (depending on model chosen). The desired width slits must be selected at the time of order. Additional slits at alternative widths may be purchased and easily replaced in the monochromator

Fixed Slit Options	
Model	Slit Selection*
9030	Choose 2 slits
9030DS / DA	Choose 3 slits

Available slits for 9030   series

SF01-0.1MM   **120-9033**

Removable 100µm (0.1mm) Fixed Width Slit

SF025-0.25MM   **120-9013**

Removable 250µm (0.25mm) Fixed Width slit

SF05-0.5MM   **120-9012**

Removable 500µm (0.5mm) Fixed Width Slit

SF2-2MM   **120-9010**

Removable 2mm Fixed Width Slit

SF3-3MM   **120-9034**

Removable 3mm Fixed Width Slit

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# Small Series - 9030 Monochromators
ACCESSORIES

9030 motorized control option and Software

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.

Sci-Mono, A Windows-based software module with a simple graphical user interface for controlling Sciencetech stepping monochromator wavelength selection. SciMono is provided free of charge with a Sciencetech motorized monochromator when SciSpec software has not been purchased.

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.
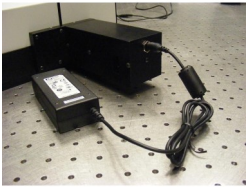
COMPUTER CONTROL	120-9027

Motorization option with USB 2.0 interface

E. Custom Engineering Solutions & OEM

Sciencetech has built its 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.

OEM Division is ready to assist original equipment manufacturers with standard or custom monochromators to suit their equipment.

Browse Configuration Options on the Sciencetech Website

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Small Series - 9030 Monochromators
DIMENSIONS

Table 2. Dimension and Weight of 9030 Series

Model	Width	Depth	Height	Optical Height	Weight
Single Monochromators	12.5 cm	12.6 cm	10.4 cm	7.6 cm	2 kg
	5.0 in	4.9 in	4.1 in	3.0 in	
Double Monochromators	26.0 cm	12.6 cm	10.4 cm	7.9 cm	4.5 kg
	10.2 in	4.9 in	4.1 in	3.1 in	

CAD models of Sciencetech standard monochromators are available upon request. Please contact our application scientist team for more information.
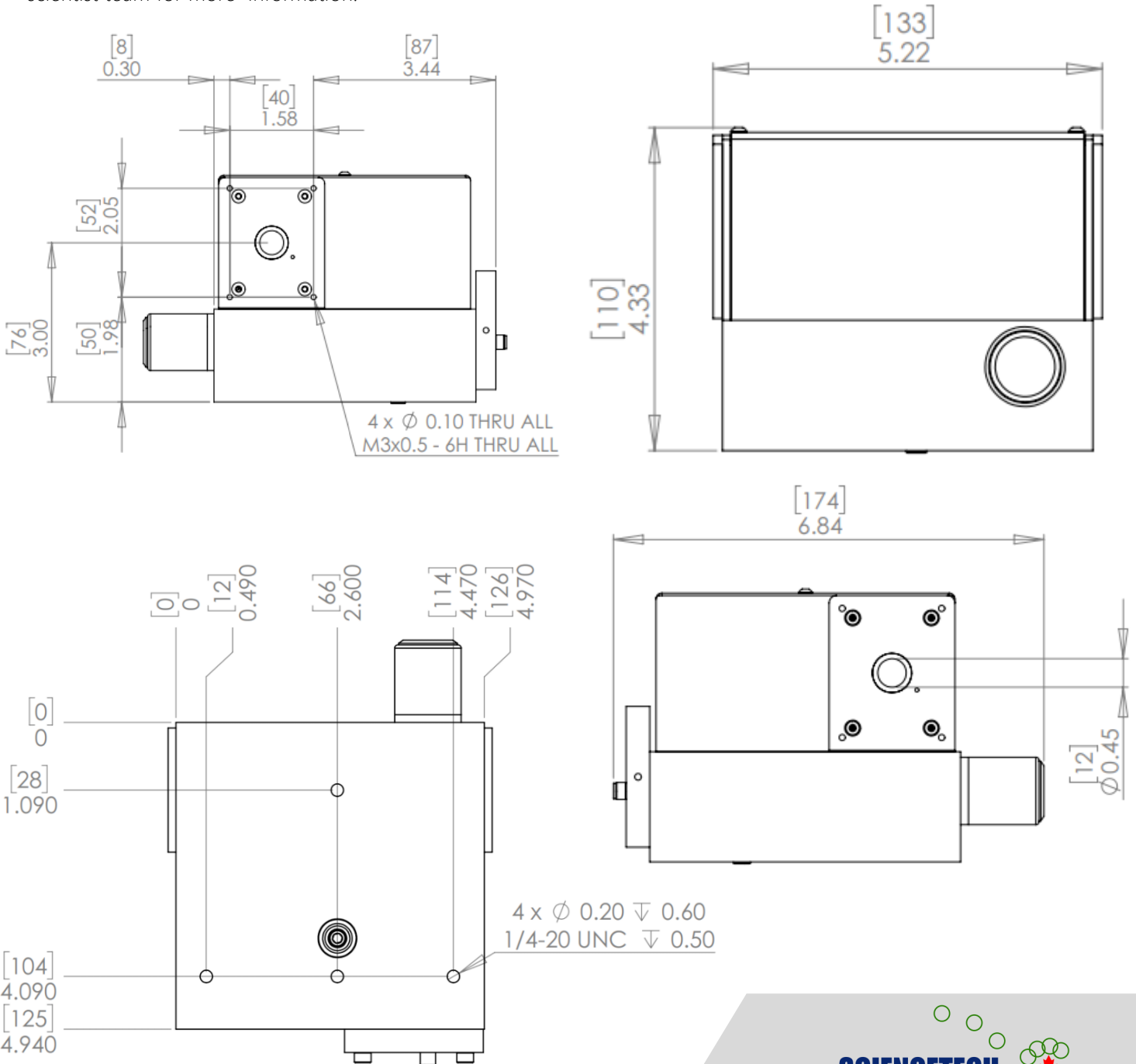
Small Series - 9030 Monochromators
ORDERING INFORMATION

Model	SKU	Description
9030-UVVIS	120-9016	Compact 0.1 m Monochromator - UV/VIS Range
9030-VISNIR	120-9003	Compact 0.1 m Monochromator - VIS/NIR Range
9030DS-UVVIS	120-9081	Double Subtractive 0.1 m Compact Monochromator - UV/VIS Range
9030DS-VISNIR	120-9015	Double Subtractive 0.1 m Compact Monochromator - VIS/NIR Range
9030DA-UVVIS	120-9080	Double Additive 0.1 m Compact Monochromator - UV/VIS Range
9030DA-VISNIR	120-9029	Double Additive 0.1 m Compact Monochromator - VIS/NIR Range
9030-MOT	120-9027	9030 Motorized Upgrade—USB 2.0
SCI-SPEC	SOFT-0103	Software, Sci-Spec
SF01-0.1mm	120-9033	Removable 100µm Fixed Width Slit
SF025-0.25mm	120-9013	Removable 250µm Fixed Width Slit
SF05-0.5mm	120-9012	Removable 500µm Fixed Width Slit
SF1-1mm	120-9011	Removable 1mm Fixed Width Slit
SF2-2mm	120-9010	Removable 2mm Fixed Width Slit
SF3-3mm	120-9034	Removable 3mm Fixed Width Slit
GR-9030-H-032-1200/0250	635-0009	Grating, Concave Holographic 32x32x8mm 1200l/mm @250 nm
GR-9030-H-032-1200/0350	635-0038	Grating, Concave Holographic 32x32x8mm 1200l/mm @350 nm
GR-9030-H-032-1200/0450	635-0008	Grating, Concave Holographic 32x32x8mm 1200l/mm @450 nm
GR-9030-H-032-0300/0800	635-0084	Grating, Concave Holographic 32x32x8mm 300l/mm (800-3200nm)
GR-9030-H-032-0600/0400	635-0022	Grating, Concave Holographic 32x32x8mm 600l/mm (400-1600nm)
GR-9030-H-032-0800/0300	635-0035	Grating, Concave Holographic 32x32x8mm 800l/mm (300-1200nm)

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