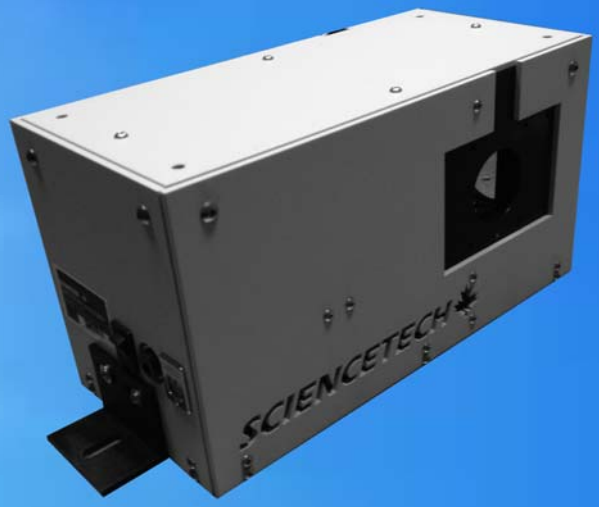
MONOCHROMATORS AND SPECTROGRAPHS

SMALL SERIES - 9072, 9072DA/DS MONOCHROMATORS



Features

- 3 or 4-grating turret
- Grating options covering the UV, VIS and NIR
- Scanning or multichannel configurations available
- USB2.0 Communication
- 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

1450 Global Drive, London, Ontario Canada, N6N 1R3
Phone: 519 644 0135 / **Fax:** 519 644 0136
Email: sales@sciencetech-inc.com
www.sciencetech-inc.com

SCIENCETECH

Version 3.4.1, March 2017

9072, 9072DA/DS MONOCHROMATORS

A. Overview

- The Sciencetech 9072 series monochromators are an economical and compact choice with the full functionality afforded by motorized wavelength control and a multiple grating turret.
- The compact design features asymmetric Czerny-Turner optical layout, using up to 3 plane-ruled gratings with an f/3.5 aperture. An adjustable slit is included for the input port. Additional slit options and several accessories are available.
- For applications requiring better signal to noise, reduced stray light and better resolution than the standard model, a double additive model (9072DA) is available. For applications requiring a tunable bandpass or notch filter light source, the double subtractive model (9072DS) is an ideal choice.

B. Specifications

Model	9072*	9072DA*	9072DS
Part Number	120-9125	120-9126	120-9127
Input Focal Length (mm)	100	100 x 2	100 x 2
Output Focal Length (mm)	125	125 x 2	125 x 2
Wavelength Selection‡	Motorized	Motorized	Motorized
Communication	USB 2.0	USB 2.0	USB 2.0
Readout Mechanics	Direct Drive	Direct Drive	Direct Drive
Spectral Range (nm)†	180-20000	180-20000	180-20000
Aperture	f/3.5	f/3.5	f/3.5
Maximum Grating Size§ (mm)	30 x 30	30 x 30	30 x 30
Number of Gratings	3**	3** x 2	3** x 2
Grating Types	Plane Ruled	Plane Ruled	Plane Ruled
Optical Resolution (nm)†	0.5	0.25	0.5
Stray Light	4E-4	4E-6	4E-6
Dispersion† (nm/mm)	7	3.5	N/A
Wavelength Accuracy† (± nm)	0.3	0.3	0.3
Wavelength Reproducibility† (± nm)	0.1	0.1	0.1
Optical Axis Height (mm)	76.2	76.2	76.2
Compatible Detector Types	Single- or Multi-channel	Single- or Multi-channel	Single- or Multi-channel
Dimensions (mm)	254 x 127 x 139	254 x 254 x 160	254 x 254 x 160
Dimensions (in)	10 x 5 x 5.5	10 x 10 x 6.3	10 x 10 x 6.3
Weight (kg)	4.5	10	10

* Imaging option available - see ordering information.
† Grating dependent.
§ Substrate size. Active area is 27 x 27 mm.
**3-grating turret standard, 4-grating turret available on request.

Ordering Information

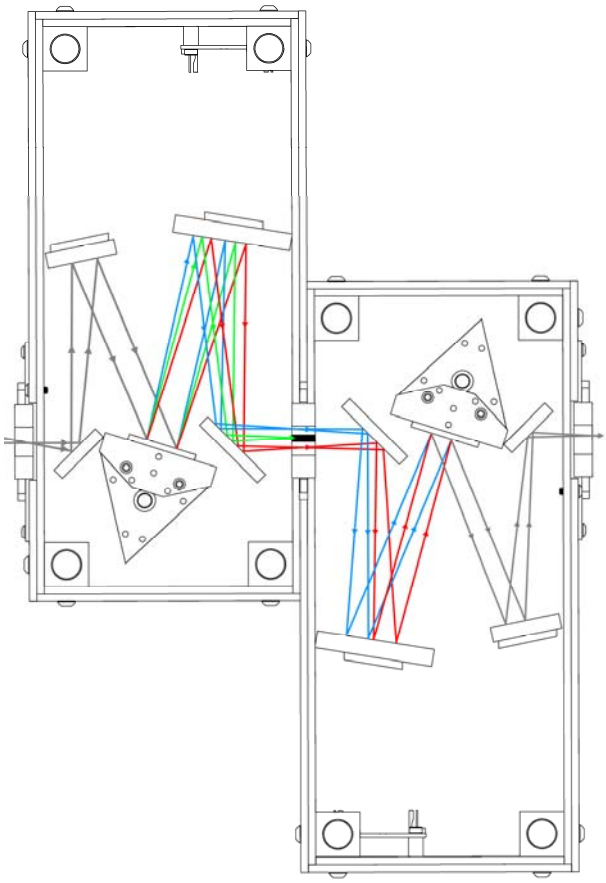
Example order: 9072DA-4-i is a double additive 9072 with a 4-grating turret and imaging option.

Browse Small Series Monochromators on the Sciencetech Website

SCIENCETECH

C. Configurations

9072DS Double Subtractive Monochromator Configuration

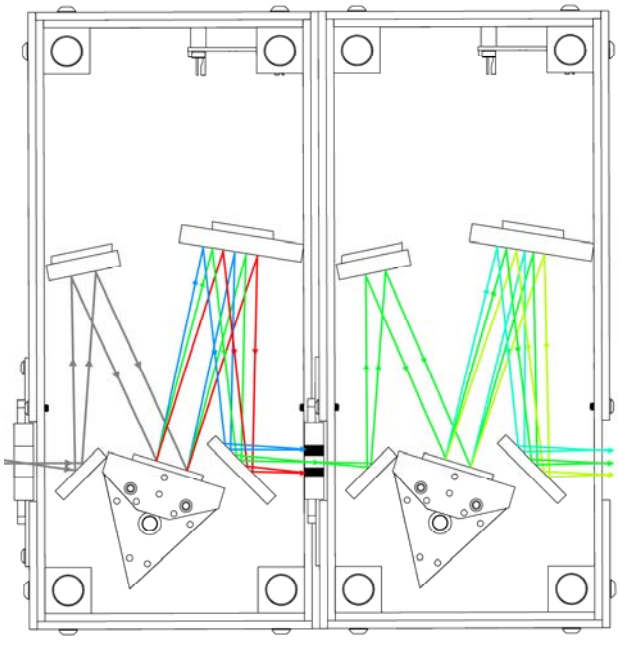


The 9072DS is made of 2 single monochromators in a **subtractive** mode: the dispersion of the second monochromator is in the opposite direction of that of the first one. The two gratings are mechanically connected and accurately motorized together. This leads to a spectrally homogenized beam at the output port of the second monochromator and greatly reduced stray light, ideal for spectroradiometry, Raman or UV measurements of solar radiation.

The arrangement of the 9072DS allows it to act either as a tunable bandpass filter or a tunable notch filter. As a tunable bandpass filter the bandpass of the device 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.

The 9072DS 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. Standalone software is provided by Sciencetech.

9072DA Double Additive Monochromator Configuration



The 9072DA is made of 2 single monochromators in a **additive** mode: the dispersion of the second monochromator adds to that of the first one.

The inbound light is dispersed by the first grating then passed through an intermediate slit where stray light is rejected and then spectrally dispersed again by the second grating. The two gratings are mechanically connected and calibrated for accurate wavelength tracking.

The double dispersion of 9072DA results in a better optical resolution compared to a single 9072 monochromator while the bandpass is half that of a single 9072.

SCIENCETECH

D. Accessories

1) 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. This is an important parameter when integrating a camera such as a linear array or CCD on the output port of the monochromator.

9072 Grating selection

Grating Selection Guide for 9072 Series*					
Grating Holder Model †	120-8232				
Grating Model #	630-0089	630-0090	630-0091	630-0088	630-0092
Grating (l/mm)	1200	1200	1200	830	600
Blaze Wavelength (nm)	250	300	500	800	1250
Dispersion (nm/mm)	7	7	7	10	14
Resolution (nm)	0.35	0.35	0.35	0.5	0.7
Grating Efficiency Range (nm)	200-400	250-650	400-1300	500-1500	900-2700
Maximum Suggested Wavelength** (nm)	840			1260	1680
Maximum Wavelength Attainable *** (nm)	1200			1800	2400

* Several additional gratings available. Please contact a Sciencetech Application Scientist to find alternative gratings to suit your application.
** <30% of a properly F matched input beam will be incident on the grating at this wavelength due to the monochromator geometry
*** At this wavelength the grating is perpendicular to the input radiation and therefore the throughput is 0.
† Each grating requires its own holder to protect it during handling.

Browse Gratings on the Sciencetech Website

SCIENCETECH

2) Slit assembly options

All 9072 series monochromators come standard with one adjustable slit and more options are available separately as shown below. Sciencetech can manufacture custom slits. Please talk to a technical support representative about your custom requirements.

Fixed Slit Options		
Part Number	**Model**	**Description**
120-9046	SS-F	Fixed Width Slit Holder (One holder is required per port, different slits can be exchanged.)
120-9033	SF01-0.1MM	Removable 100µm (0.1mm) Fixed Width Slit
120-9013	SF025-0.25MM	Removable 250µm (0.25mm) Fixed Width Slit
120-9012	SF05-0.5MM	Removable 500µm (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

Adjustable Slit Options		
Part Number	**Model**	**Description**
120-9004	SS-80	Bilaterally Adjustable Slit – Manual Control with Height Adjustment Sliders 0-10mm, 10-20mm, 20-30mm
120-9053	SS-80-M	Bilaterally Adjustable Slit – Motorized Control with Height Adjustment Sliders 0-10mm, 10-20mm, 20-30mm
120-9048	SS-84	High Resolution Slit – Manual Control 0-6mm Wide (Ideal 2µm) with Height Adjustment Sliders 0-10mm, 10-20mm, 20-30mm
120-9054	SS-84-M	High Resolution Slit – Motorized Control 0-6mm Wide (Ideal 2µm) with Height Adjustment Sliders 0-10mm, 10-20mm, 20-30mm

Can't find what you are looking for?

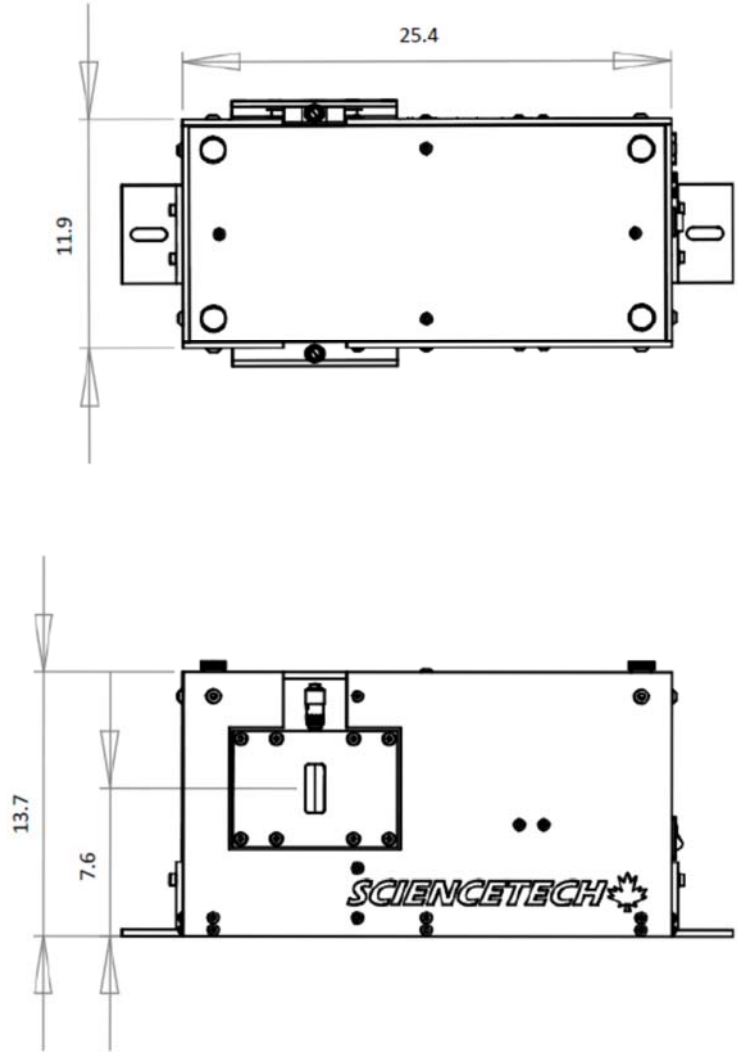
Sciencetech has built our reputation on custom solutions. Whether you need a small modification to an existing system or a completely novel design built from the ground up to meet your technical specifications, Sciencetech's engineering and optical design teams are ready to help.

Browse Slit Assemblies on the Sciencetech Website

SCIENCETECH

E. Dimensions of 9072 (cm)

The dimension of 9072DA/DS is to double the single unit dimension of 9072.



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

1450 Global Drive, London, Ontario Canada, N6N 1R3
Phone: 519 644 0135 / **Fax:** 519 644 0136
Email: sales@sciencetech-inc.com
www.sciencetech-inc.com

SCIENCETECH