

HIGH SENSITIVITY COMPACT SPECTROMETER

SC125

The compact high-sensitivity spectrometer SC125 is developed for low light applications such as measurements of Raman scattering, fluorescence, etc., which require especially high sensitivity or enhanced specifications in the UV spectral range.



FEATURES

- **Up-to-date model based on back-thinned arrays for operation with low signals**
- **Enhanced UV sensitivity**
- **Monolithic housing for optimum stability**
- **Internal light traps to reduce stray light**

The high-aperture optical bench of the SC125 has no moving parts and minimises the number of reflective surfaces. The SC125 features a monolithic housing, thus ensuring long-time measurement stability. The housing has internal fins: light traps that allow reducing stray light – a typical problem of compact short-focal length instruments.

The IMAGING Version (Optional) features an astigmatism compensator – cylindrical lens – installed after the entrance slit. This further enhances of system sensitivity.

The SC125 may contain as a detector either one of two non-cooled Hamamatsu back-thinned CCD-arrays without a charge-storage section (back-thinned FFT CCD), operating in the binning mode. Both

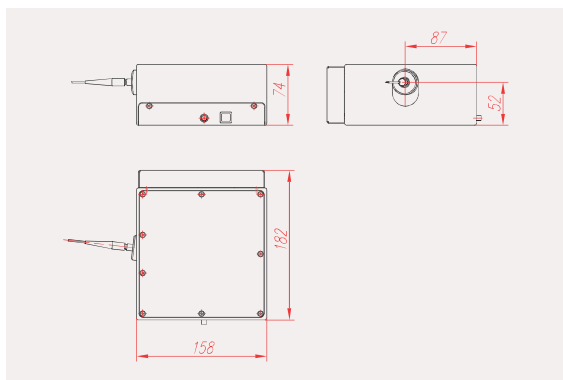
APPLICATIONS

- **Raman scattering, fluorescence measurements**
- **Application with high sensitivity requirement**
- **Analysis of any light source in the 190-1100 nm spectral range**

arrays have wide spectral range and excellent sensitivity in the UV (see below for the curves of each detector spectral sensitivity and their specifications). These two arrays differ in quantum efficiency, data reading rate, dynamic range, and in pixel active area size.

The detector based on the S7030-1006 CCD-array is more sensitive, has lower noise, better dynamic range and uniformity. The detector based on the S10420-1106 CCD array is faster, has anti-blooming and, since it has a greater number of pixels and smaller pixel size, ensures better spectral resolution than the S7030-1006.

Upon your request, SC125 may be supplied with an order-sorting filter installed. We recommend this option for operation with broadband spectra.



SC125 dimensions.

SC125 SPECIFICATIONS

SPECTROMETER MODEL	SC125- S10420	SC125- S11510	SC125- S7030
Spectral range, nm	200 – 1100		
Focal length, mm	125		
F/number	1 : 3.9		
Entrance slit (one to choose)	fixed width: 14µm, 30µm and 50 µm		
Spectral resolution	depends on selected diffraction grating (see table below)		
CCD-detector model	S10420-1106 Hamamatsu	S11510-1106 Hamamatsu	S7030-1006 Hamamatsu
Number of pixels	2068 x 70		1024 x 64
Number of active pixels	2048 x 64		1024 x 58
Pixel size, µm	14 x 14		24 x 24
Active area size, mm	28.672 x 0.896		24.6 x 1.4
Maximum spectral sensitivity, nm	500	700	650
Maximum quantum efficiency %	>75		>90
Non-uniformity of sensitivity ¹⁾ , %	± 3		± 3
Anti-blooming ²⁾	Yes		No
ADC Resolution	16bit, 250 kHz		16bit, 125 kHz
Mean-square reading noise, ADC counts	<4		<2
Dynamic range in the binning mode	~ 16000 : 1		~ 33 000 : 1
Exposure time	8.3 ms – 5 s ³⁾		8.2 ms – 2 s ³⁾
Frame processing time in the binning mode, ms	9.39		9.12
Thermoelectric cooling	No		
Operating temperature	10 – 30 °C		
Computer interface	Full Speed USB		
Triggering	internal / external		
Optical input	– Direct input through the SC125 entrance slit – Optical Fiber ⁴⁾ : 0.6 (0.4) mm diameter, 1m length, SMA-905 connector		
Dimensions, weight	158 x 182 x 74 mm; 2.2 kg		

¹⁾ Signal level ≥ 50% of saturation.

²⁾ Anti-blooming — sensor's feature eliminating overflow of charges from over-exposed pixels to the neighboring ones.

³⁾ Maximum storage time is deemed to be the time at which dark signal reaches 25% of the dynamic range at the ambient temperature +25°C.

⁴⁾ As an option.

At the time of placing your order you should choose grating grooves density (i.e. spectral resolution of your instrument), as well as the spectral range for operation. For your convenience, the table below lists the average values of grating dispersion, spectral resolution and multichannel array bandpass (average).

Diffraction grating, grooves/mm	1800	1200	900	600	400	300	200
Spectral range of grating operation, nm	180–600	180–900	180–1100	180–1100	190–1100	200–1100	200–1100
Multichannel array bandpass (average), nm ¹⁾	105 ²⁾	170 ²⁾	230 ²⁾	350 ²⁾	540 ²⁾	720 ²⁾	1000 ²⁾
	92 ³⁾	145 ³⁾	200 ³⁾	300 ³⁾	460 ³⁾	620 ³⁾	920 ³⁾
Reciprocal linear dispersion (average), nm/mm ¹⁾	3.8	6.0	8.2	12.5	19.0	25.4	38.0
Spectral resolution (average), nm	0.16 ²⁾	0.25 ²⁾	0.34 ²⁾	0.5 ²⁾	0.8 ²⁾	1.0 ²⁾	1.6 ²⁾
	0.22 ³⁾	0.36 ³⁾	0.5 ³⁾	0.75 ³⁾	1.1 ³⁾	1.5 ³⁾	2.3 ³⁾

¹⁾ For 300nm wavelength.

²⁾ For SC125- S10420 model.

³⁾ For SC125- S7030 model.