

GENERAL DESCRIPTION

The Model 275D is a dedicated double grating monochromator providing additive or subtractive dispersion. The 275D's compact housing contains the scanning mechanism and mechanical linkage of one sine drive to two gratings. Wavelength control is via a single motor and scan drive. The stepper drive (refer to Model 789A-3) is interfaced for operation via PC.

Double monochromators are used for a variety of applications that require extremely low levels of scattered or stray light. The most popular applications include:

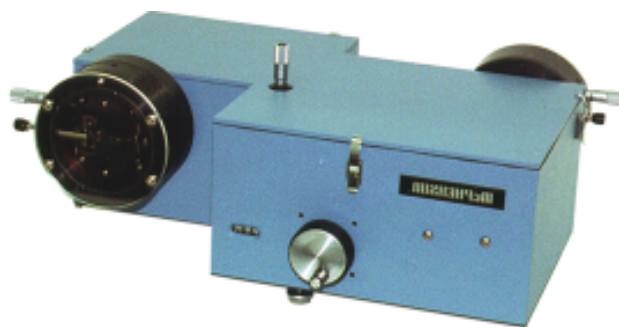
- **Additive Double Spectrometer** – higher resolution with low stray light
Source / Detector Standardization
- **Subtractive Double Spectrometer** – bunched spectral energy with low stray light
Raman Spectroscopy
Photoluminescence

OPTICAL SYSTEM

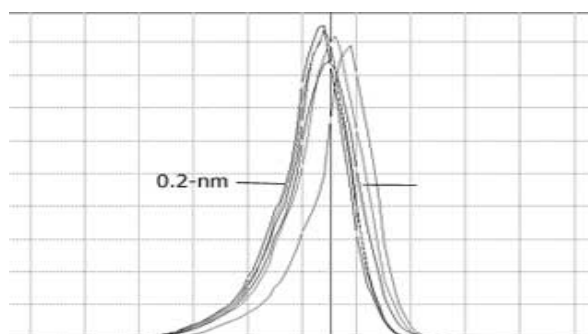
Model 275D's focal length is 0.2 meters and it can be configured for additive or subtractive dispersion. The optically and mechanically coupled modified Seya-Namioka systems are equipped with aberration corrected concave holographic gratings. Spectrally agile, the model 275D features all first surface optics for the best *UV-Vis-NIR* response.

275D PERFORMANCE

The Model 275D is reliably pretested with secondary monochromators and selected filters. It is a useful building block in customized test systems.



Model 275 DA, Additive Mode Double Spectrometer



Model 275DA, Repeatability Scans at Hg 253.6 nm

SPECIFICATIONS

Specifications are for subtractive mode and assume use of a 1200 g/mm where applicable. Other gratings are available (e.g. 300, 600, and 2400 g/mm) for range or performance alteration.

Focal Length	(2X) 200 mm
Aperture Ratio	f/4.2
Wavelength Range	185 - 1000 nm
Dispersion*	4 nm/mm
Resolution*	0.15-nm
Accuracy	±0.06 nm Vis (measured) ±0.5 nm UV-Vis-IR
Repeatability	± 0.05 nm <i>UV-Vis-IR (measured)</i>
Stray Light (measured)	< 6.4 x 10 ⁻⁴ (UV NPL procedure) < 5.0 x 10 ⁻⁴ (UV-Vis NPL procedure) < 1.3 x 10 ⁻⁶ , 10 nm from 632.8 nm (100 μm slits)

* Divide by 2 for Additive mode specification

LOW STRAY LIGHT

Stray light is frequently characterized by laser sources. This approach yields impressive stray light data. Unfortunately, this is not pertinent for many applications. Using a laser source and measuring at 10-nm from a laser line indicates only scatter of its narrow band of spectral light. It does not address stray light produced by broad band or sources providing continuous light, i.e. Xe, XeHg, halogen or tungsten, etc. The 275D suppresses stray light produced by such sources. The 275D is a powerful analytical tool to select narrow stray light deprived pass bands. Source and detector characterization and many analytical procedures disturbed by stray light benefit by employing the 275D for more accurate profiling of background impaired investigative procedures.

SPECIFYING STRAY LIGHT

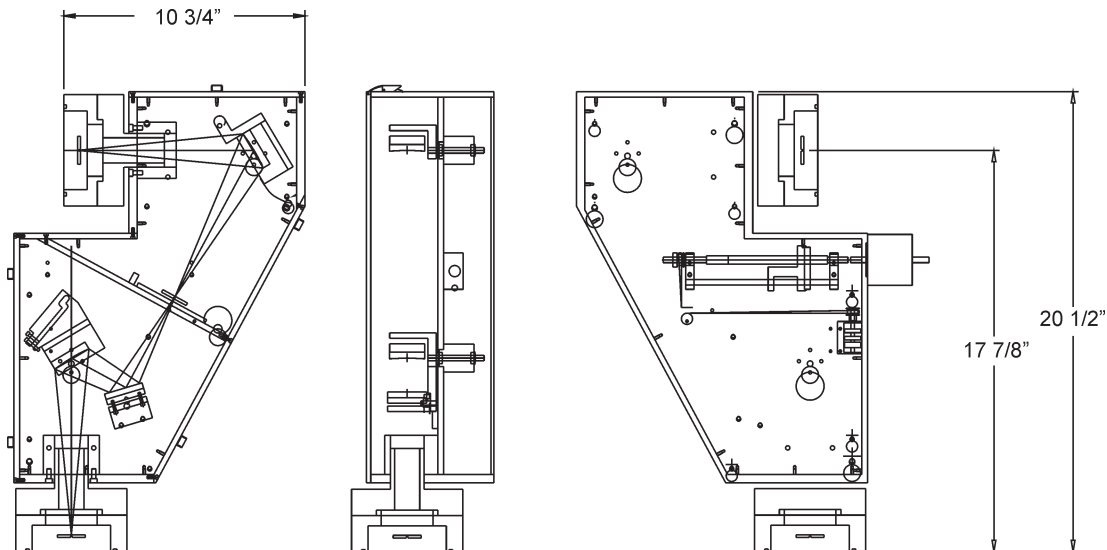
The United Kingdom's standards organization, National Physics Laboratory (NPL) defined this

procedure for specifying stray light when continuum sources are used. Scattered light is measured at a particular wavelength with and without a particular long pass filter in front of the slit.

λ	With GG395 Filter	Without GG395 Filter	Ratio (w/wo Filter)	%
340 nm	1.5×10^{-10}	2.1×10^{-5}	0.714×10^{-5}	0.0007
350 nm	1.6×10^{-10}	1.7×10^{-5}	0.941×10^{-5}	0.0009

λ	With GG475 Filter	Without GG475 Filter	Ratio w/wo Filter	%
400 nm	1.6×10^{-10}	3.5×10^{-5}	0.457×10^{-5}	0.0005

Stray light figures for 275D additive monochromator using 100 Watt Tungsten source. Entrance slit 100 μm , intermediate slit 100 μm , and exit slit 200 μm . Slit height of 4 mm.



Model 275DS, Subtractive Model Double Spectrometer