

ZEBR[®]

SCIENCE



Palacký University
Olomouc



Raman Optical Activity Spectrometer
Data sheet / Specification

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Spectrometer

Excitation Wavelength	532 nm	The gold standard for ROA signal reliability
Laser power at sample	1 – 1200 mW	high stability for all laser powers
Spectral range	80 – 4500 cm ⁻¹ ; modifications possible upon request	Apart from standard spectral range, low-f and high-f modes and circularly polarized luminescence can be studied
Spectral resolution	~7 cm ⁻¹	
Scattering geometry	Back-scattering	With specular beam analysis for damage control
Modulation scheme	SCP, ICP, DCP _I , DCP _{II}	Enabling artifact discrimination and robust interpretation, distinguish CPL from ROA
Wavenumber calibration	Automatic, no customer handling and calibration source needed	Measure ready system
Intensity calibration	Raman intensity calibration accessory	Instrument spectral transmission compensation. Enables direct comparison with published catalogues and <i>ab initio</i> simulations in broad spectral ranges

Detectors

Detector Type	Spectroscopic CCD, 1024 x 255 pixels
Detector Temperature	Down to -65 °C, stabilized
Quantum Efficiency	>85 % in spectral range 500-700 nm
Binning	Flexible and automatically adjustable to minimize readout
Gain	Adjustable

Samples & Measurement Options

Sample holders	3D fully motorized sample stage unit with automatic positioning	Micrometer-precision alignment and focus control; enables XYZ mapping
	Rotational cell 0-20 Hz	Homogeneous sampling of turbid or crystalline suspensions
	Temperature cell -10 to +95 °C	Resolution 0.1 °C; condensation protection
Cuvettes	Macro cuvette <70 µL	For standard measurements in solution
	Micro volume <5 µL	For scarce samples and low concentration measurements
Custom solution	Capillary system	<5 µL capillary array for automated batch measurements
	Microfluidic design	Custom specific multiple cells
	Double goniometer holder for angular positioning of crystalline samples	For precise alignment and/or ROA angular and positional dependence of solid samples



Translational motorized XYZ sample positioner

Motorized XYZ sample positioning	range 50 mm in each axis
Horizontal positioning accuracy	1 μm
Vertical positioning accuracy	10 μm
Maximum load	0.3 kg
Cell type mount	temperature control cell, capillary, micro-cell, macro-cell, various designs available upon special request,
Multiple sample	automatic motorized positioning, 5 sample positions
System integration	full, sample positioning during measurement possible
Safety	This item allows full control of sample position while maintaining laser safety class 1.

Control System & Software

PC	Industrial type; integrated
OS	Windows 11 or Linux
Monitor and keyboard position	adjustable
External control	Remote desktop connection, various options
Backup	HDD hot swap technology, RAID 1

Instrument Layout

Layout	Single standalone unit
External dimensions W x D x H	880 x 1070 x 1800 mm
Weight	max. 620 kg
Environmental temperature	+20 °C to +25 °C
Temperature stabilization	Internal, ± 1 °C
Support	4 stable legs with wheels for easy transport
Power supply backup	Fully integrated UPS with safety features
Safety	Class 1 laser device (advanced laser safety, laser interlocks, motorized XYZ sample positioner built-in)

Requirements

Power supply	220-240 V, 110 V available upon request
Input power	< 700 W
External UPS	Not required
Pressurized Air	> 6 bar, external compressor available upon request
Ethernet connection	Yes; for optional external control
Outside temperature stabilization	Within 3 °C
Clean room environment	Not required

