

ZEBR[®]

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data sheet / specification

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

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|-------------------------------|--|
| 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

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|-----------------------------------|---|
| 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 |

