

_nanofilm_accessories



Objectives



| | Field of View | Lateral Resolution |
|-----------------------|---------------|---------------------------|
| 2x | 2.0 mm | down to 10 μm |
| 5x | 0.8 mm | down to 4 μm |
| 20x | 0.2 mm | down to 1 μm |
| 50x | 0.07 mm | down to 0.6 μm |
| UltraObjective | | down to 2 μm |

The objectives are calibrated by Accurion to offer an automatic scaling of maps and images with the EP4-View software. The field of view is quadratic at 42° AOI. The field of view in Y direction increases at higher AOI. These objectives are only useable in the visible range (360 to 950 nm).

General note: the usable light intensity at the detector, and thus the signal-to-noise ratio, is influenced by the magnification of objective. For example, the 20x objective images only a quarter of the area compared to the 10x, and therefore receives a significantly lower amount of total light flux. This effect has to be considered in particular for low-reflectivity surfaces like water or glass. Using a laser as light source, a beam expander is required for the 2x objective and recommended for the 5x. When using a spectroscopic light source, a beam expander is not needed.

50x: note that this objective may only be used on small samples (ca. 20mm diameter), because of its lower working distance. The lower edge of the objective will be positioned below the plane of the sample surface for usual angles-of-incidence. This objective cannot be used for BAM.

Knife-edge Illumination

For measurements on transparent substrates



Internal beam cutter

For nanofilm_ep4se only, the internal beam cutter cannot be used for nanofilm_ep4sw due to optical reasons. Applicable for substrates thicker than 60 μm (Cannot be combined with UV-extension)

External beam cutter

For nanofilm_ep4se and nanofilm_ep4sw – applicable for substrates thicker than 20 μm .

In case of measurements on transparent substrates (e.g. glass, mica, etc.) one part of the incident beam is reflected at the top side of substrate, the other part of the beam is transmitted into the substrate, where it is reflected at the bottom of substrate. Both reflected beams interfere on the CCD-camera of the ellipsometer if the beam diameter is larger than the substrate thickness. Nanofilm's beam cutter can be put half into the beam, close before the beam meets the sample, in order to generate a dark area where the bottom side reflected beam is cut off. The region of interest (ROI) over which the delta and psi is averaged should be placed within the shadowed (lower half) area of the image.

Automatic Sample Handling Stage

100 mm Sample Handling Stage

Repeatability: 1 μm (X/Y)

Resolution: 1 μm (X/Y)

Travel Range: 100 mm (X/Y)

200 mm Sample Handling Stage

Repeatability: 1 μm (X/Y)

Resolution: 1 μm (X/Y)

Travel Range: 200 mm (X/Y)

Theta Stage

Rotation stage for in plane anisotropy measurements

Support Frame bam/ie

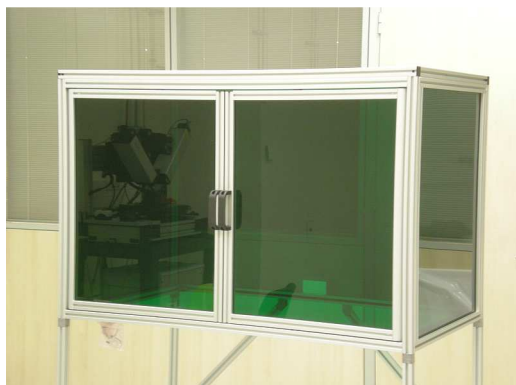
Stiff support structure for optimal set-up of the instrument



Dimensions: 810 x 600 x 985 mm

We recommend this frame if a rigid table is not available at customer site.

Laser Safety Cabinet

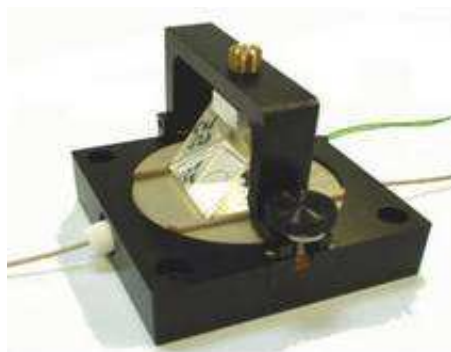


The Laser safety cabinet serves two purposes in one. It protects the instrument from dust and air convection at the same time protecting the user from scattered laser light. The acrylic glass is colored to absorb the laser wavelength, still allowing visual control of the instrument.

The laser interlock closes a mechanical shutter if the doors are opened.

Kinetic/SPR cell

In situ cell for imaging SPR experiments, Kretschmann setup

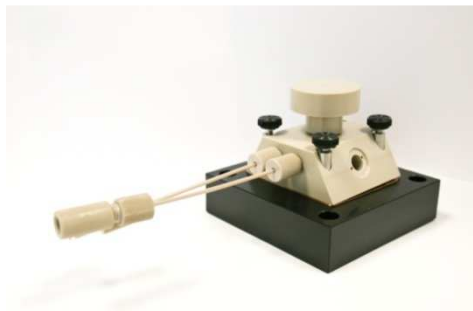


Specifications:

- Sample dimensions: 15 x 22 x 1...10 mm³ to 26 x 76 x 1...10 mm³
- For OptiSlides or standard microscope slides
- Volume: 0.1 ml + tubing (>0.1 ml minimum)
- Observable area: 4 x 8 mm
- Field of view: 2 x 3 mm (2x objective)
- Material: PEEK® (cell and tubing) and Viton® for O-Rings
- Exchange of the internal volume within 20 to 30 s (at a flow rate of 0.5 to 1.0 ml/min).
- Standard HPLC fittings (1/4"-28)
- O-rings, screws, suitcase, manual

Solid/liquid cell

In situ cell for adsorption experiments at nontransparent substrates



Specifications:

- Sample dimensions: 15 x 22 x 1...10 mm³ to 26 x 76x 1...10 mm³
- Observable area at 60° angle of incidence (10x-objective): 3,8 x 5,4 mm²
- Liquid volume: 0.7 ml (plus volume for tubing > 0.1 ml)
- Angle of Incidence range: 58°- 65° (recommended 60°)
- Material with liquid contact: PEEK® cover, Teflon® tubing, Viton® O-rings, electrode material
- Exchange of the internal volume: 1 min (at flow rate 1.0 ml/min)
- Standard HPLC fittings (1/4"-28)
- O-rings, screws, cleaning equipment, syringes, suitcase, manual

Light-Guide Set-up

The light guides allow perpendicular transmission of light into a liquid - independent to the angle of incidence.

Electrochemical upgrade

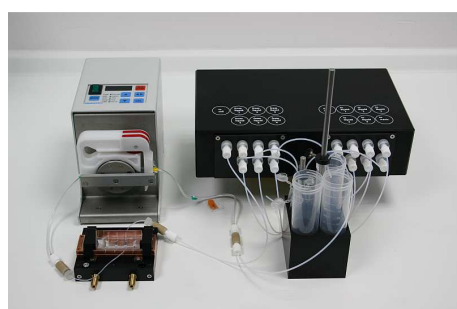
for Solid Liquid (SL) cell and Kinetics/SPR cell

Peltier temperature control device for Solid Liquid (SL) cell and Kinetics/SPR cell



- Temperature range: 5° - 75°C
- Temperature stability: +/- 0.1°C
- Temperature sensor
- Resistance thermometer PT100
- 40 x 40 mm and 53 W for the Solid-Liquid (SL) cell
- 30 x 30 mm Peltier and 34.5 W Peltier for the Kinetics/ SPR-cell
- Rapid temperature ramps possible*
- Controller: IMAGO 500 (JUMO GmbH & Co KG)
- Size: 350 x 260 x 210 mm
- Proportional integral derivative controller (PID)
- Electronic relay output
- 5" colour display with 27 colours
- Self optimization system
- New step-response autotune option avoids overshoot while tuning
- Serial interface RS 232
- Control and data exchange via EP³View
- Heat exchange system to transfer heat apart from the peltier
- Size: 350 x 260 x 210 mm
- Water based heat exchange system

Liquid handling



(cell not included)

The liquid handling system consists of a valve unit, a peristaltic pump, tubings and a measuring chamber.

Specifications:

Valve unit

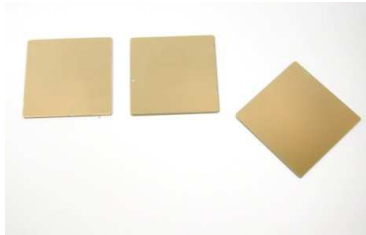
- Handling of three different liquids automatically
- Further handling of up to six liquids on request
- Controlled by the software EP³View

Tubing Pump

- Flow rates: 0.05 – 2.0 ml/min
- 8 or 12 roles for minimal pressure fluctuations
- Controlled by the software EP³View

Slides

Taylored Substrate



SF10 Glass slides

5x
25x
100

Gold coated SPR slides

5x
25x
100x

OptiSlides

The OptiSlides from Nanofilm are especially designed glass slides with optimal optical properties for measurements of bio-relevant layers - e.g. proteins, DNA, lipids, etc. Their advanced optical properties enable ellipsometric measurements on glass substrates in liquid ambient conditions with the highest sensitivity.

5x
25x
100x

High sensitivity OptiSlides

5x
25x
100x

Prisms

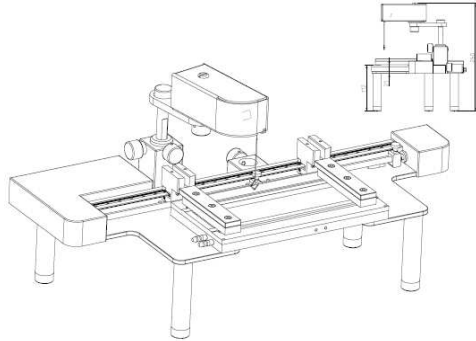


In a Kretschmann setup, It is necessary to to use a prism with the same refractive index like the substrate and an angle of incident close to the Brewster angle or SPR – resonance angle

- BK 7 (45°, n = 1.52)
- BK 7 (60°, n = 1.52)
- SF 10 (60°, n = 1.70)
- SF 10 (60°, gold coated for SPR)
- SF 10 (65°, for SPR)

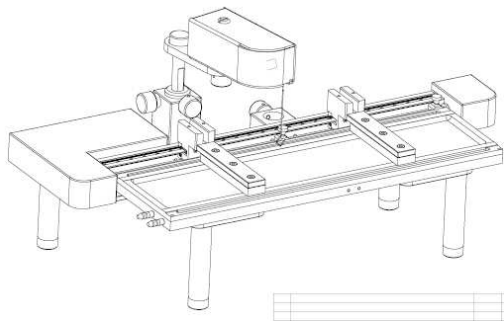
Langmuir-Blodgett trough

Nanofilm_lb-small



Langmuir-Blodgett trough

Nanofilm_lb-medium

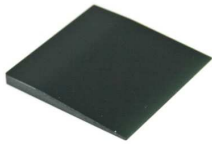


Liquid/Liquid trough

Model: lb_large

For LL and LG interfaces with minimized volume
incl. all accessories for ellipsometry on LL interfaces

Black plate



A black glass plate, which directs the reflected laser beam from the bottom of the trough out of the field of view of the BAM.

Dimensions:

Thick 30 mm x 40 mm x (3 to 1) mm

Thin 30 mm x 40 mm x (2 to 0.5) mm

halcyonics_variobasic_40

Active vibration isolation system



Modular, multifunctional vibration isolation systems – the halcyonics-variobasic series consists of two active vibration isolation elements and an external controller

- AC power from an electrical outlet is sufficient; no compressed air supply is needed
- Provides better vibration isolation (> 98.75% isolation above 10 Hz) than is normally possible with complicated, large optical tables
- Active isolation in all six degrees of freedom