

## BEAMLINE COMPONENTS

# MIRROR-HOLDER FOR SOFT X-RAY AND UV BEAMLINES

### Purpose

This precision handler is designed for UV and soft X-ray mirrors under UHV conditions on beamlines of second and third generation synchrotron sources in the 4 eV to 20 KeV range.

The vacuum chamber and mechanism are suitable for mirrors up to 100 mm.

The mirror holder enables:

- position adjustment in the three axes of rotation (pitch, roll, yaw)
- mirror height adjustment
- permutation of two mirrors with different coating without any re-adjustment of the optical axis
- cooling of the two mirrors.

The mirrors are housed in a vacuum chamber which ensures reliable UHV conditions ( $< 2 \times 10^{-10}$  mbar) so that the system can be installed close to the storage ring.

All settings are by remote control.

### Design features

A vacuum chamber consisting of a 400 mm vertical axis cylinder with two flanges, the upper flange equipped with view port and vacuum gauge port.

Two 150 CF ports are available for ion pump and sublimator and two 35 CF ports oriented for the incoming and exit beam.

The cooling inlet and outlet tubes pass through the lower flange for easy assembly, adjustment and connection to the mirror.

Inside the vacuum chamber, rotation in the two horizontal planes (Rx, Rz) is by means of a swing frame and vertical rotation by a cam actuated by a pushrod ; the vertical translation of the mirror-holder is achieved by a finger. The relative positioning of the two mirrors can be adjusted in air. The mirror-holder is connected to the cooling loop by braids.

Outside the vacuum chamber, four identical encoded motor-driven high-precision tables provide the above movements, two of which are reserved for the joystick controlling the movements of the swing frame.

The movements are transmitted by rods passing through bellows.

### Key features

Overall dimensions

Height 1100 mm  
Length 800 mm  
Width 800 mm

Support

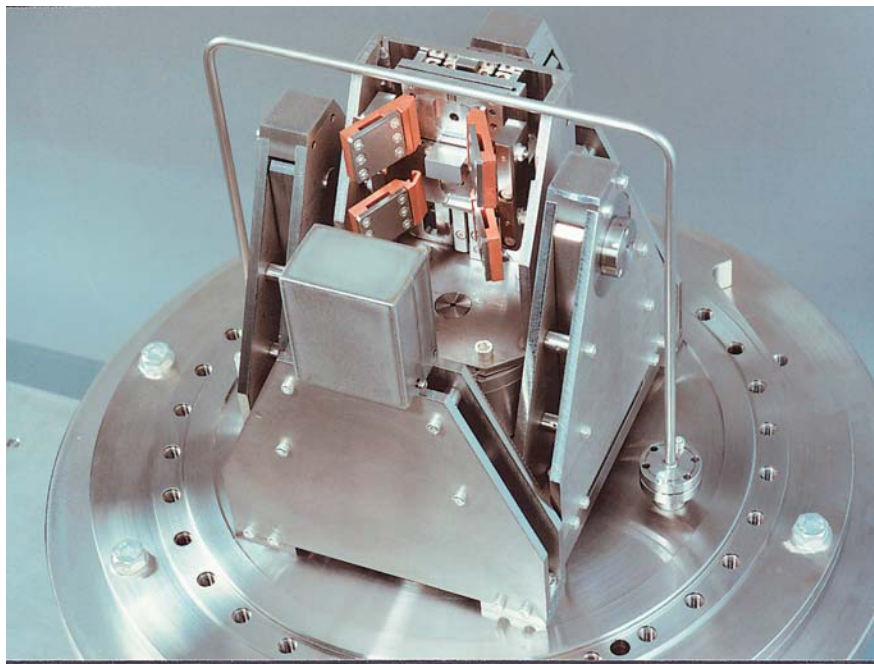
Coarse adjustment in rotation and translation  $\pm 10$  mm

Vacuum chamber	Vacuum < $2 \cdot 10^{-10}$ mbar
Baking temperature	200°C
Flanges	2 x CF150 for the pumps 1 view port 1 flange for camera
Heat removed	4 W
Pumping	Ion pump 230 l/s
Orientation mechanism	4 independent motor-driven encoded axes

#### Double mirror system

<i>Axis</i>	<i>Range</i>	<i>Sensitivity</i>	<i>Repeatability</i>
Rx	- 4° to + 1°	4 µrad	4 µrad
Ry	± 1°	4 µrad	12 µrad
Rz	- 1° to + 3°	4 µrad	4 µrad
Trans Y	43 mm	1 µm	5 µm

This mirror holder mechanism was developed in collaboration with C.N.R.S.–Laboratoire LURE (Orsay-France).



IRELEC is specialised in the supply of :

- components for beamlines (mirror-holders, bending systems, mirrors, control systems, ...) and complete beamlines
- scientific equipment

IRELEC reserves the right to change these specifications without prior advice in the scope of the improvement of the product

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