

Primux 50 Microfocus Source Systems



Primux 50 Microfocus X-ray Source System

We provide a microfocus X-ray source system equipped with high performance ASTIX X-ray optics for two-dimensional beam shaping. The system is made for upgrades of existing X-ray instruments and it can be applied for customized solutions. Main applications are XRD, SAXS, WAXS and μ XRF. Benefits are an intense and symmetric beam of high spectral purity and low power consumption of the X-ray source. The properties of the beam can be matched to customers' requirements. For example, high-flux optics with a large convergence angle are designed for single crystal XRD, low-convergence optics with a sharp beam edge are of interest for SAXS, whereas small spot sizes are crucial for μ XRF.

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X-ray source

Water cooled sealed microfocus X-ray sources are available with all typical anode materials such as Cu, Mo, or Ag. The source is mounted in a compact housing which includes: radiation shielding, heat exchanger, beam shutter, temperature sensor and two sets of warning lights. The same housing and controller can be used for all different anode types.

ASTIX X-ray optics

This type of compact X-ray optics takes advantage of a side-by-side geometry to achieve a symmetric two-dimensionally focused (ASTIX-f) or collimated beam (ASTIX-c). Hybrid optics (ASTIX-h) are available upon request. Two subsequent multilayer reflections select the desired photon energy, e.g. $K\alpha$ or $K\beta$ radiation, and suppress other radiation. We offer standard optics with fixed parameters and tailored optics for customized solutions. Depending on the application, optics can be designed to achieve a high brilliance. ASTIX⁺⁺ X-ray optics with extremely low slope errors are of interest for selected high-end applications.

X-ray controller

The X-ray controller fits in a 19" rack housing. The single enclosure contains controller and high voltage generator. The X-ray generator provides high voltage up to 65 kV for the X-ray source. The integrated interlock system ensures X-ray safety. The controller communicates via Ethernet. A Windows software tool is included. It provides GUI, control and monitoring of all parameters. Other integrations are available on request.

Optics installation and alignment

The AXO vacuum mirror housing is directly attached to the X-ray source. Manual or motorized adjustment ways are available to align the optics with respect to the X-ray source and the resulting beam with respect to the experiment. An external collimating system or a cross slit screen downstream the optics stop remaining direct X-rays and perform final shaping of the X-ray beam in terms of size or convergence.

Due to the intelligent design of the Primux 50 system tube exchange is easy and can be carried out by the customer. The new tube is already pre-aligned. Thus, only minor fine-alignment is necessary after tube exchange.



X-ray source

X-ray focus size	50 μm (others on request)
Max. power	50 W (others on request)
Max. voltage	65 kV
Anode materials	Cr, Co Cu, Mo, Ag, W (others on request)
Cooling	water-cooled
Mass	8 kg (incl. mirror housing)

ASTIX X-ray optics (typical values)

Types	focusing (ASTIX-f) collimating (ASTIX-c) hybride (ASTIX-h)
$K\beta$ suppression	$>10^3$
Beam size	30-600 μm (ASTIX-f) 300-2000 μm (ASTIX-c)
Focal length f_2 (from optics center to secondary focus)	100-3000 mm (ASTIX-f)

UMH mirror housing

Alignment	manual or motorized
Vacuum	possible
Beam shaping	crossed-slit screen / pinhole

X-ray Controller

Rack-mount	19", 4U
Voltage input	100-240 V (AC), 50/60 Hz
Max. output	65 W, 65 kV
Communication	Ethernet
Control software	Windows, Linux
X-ray safety	door interlock, external shutter status lights
Dual source	Optional

