

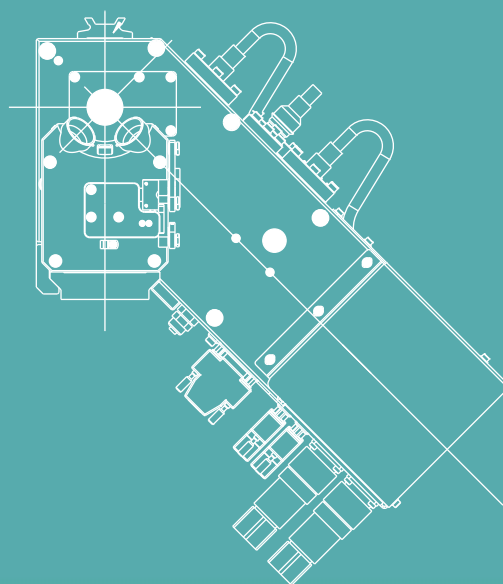
Your Decision for Precision



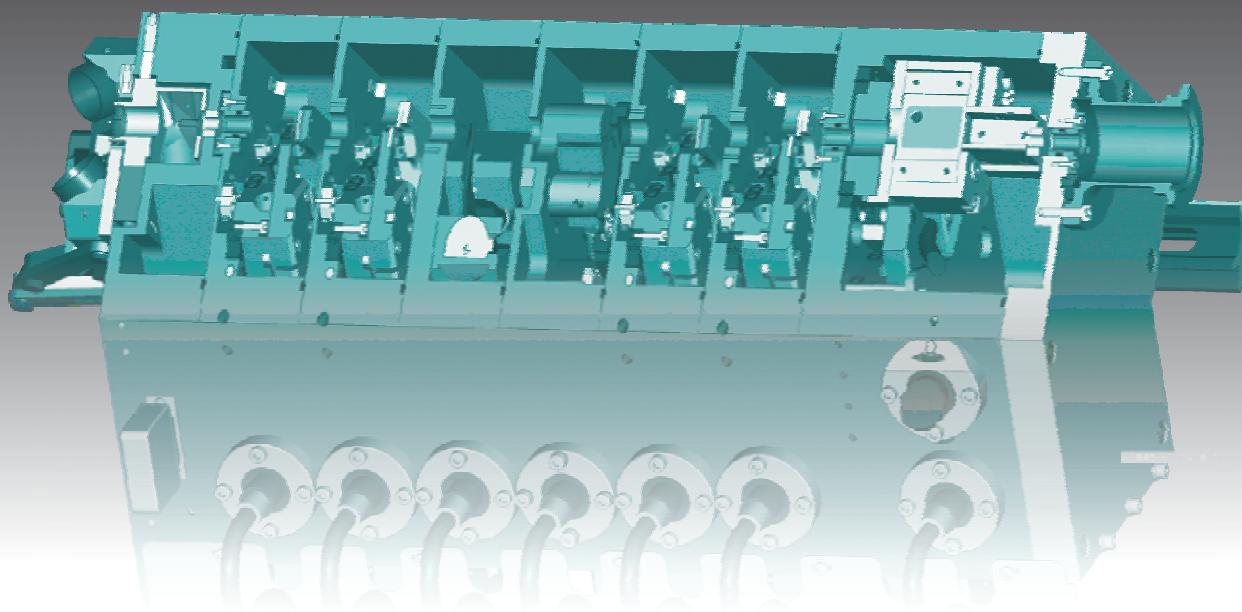
BCU 3100

Beam Conditioning Unit

- Beam Position and Intensity Monitor
- Slit Module
- Shutter Module
- Filter Module
- Protein Crystallography Unit



Optic
 Slit Module (vert.)
 Slit Module (horiz.)
 Shutter Module
 Filter Module
 Slit Module (vert.)
 Slit Module (horiz.)
 Beam Monitor



General

The new HUBER BeamConditioningUnit* is a modular system of different beam handling devices. The modules can be individually configured and combined. Special emphasis was put on the flexible and space saving design.

In the example above the first Stage after the beryllium entrance window is a split ion chamber beam monitor with sub micron resolution allowing for online measurement of the exact beam position.

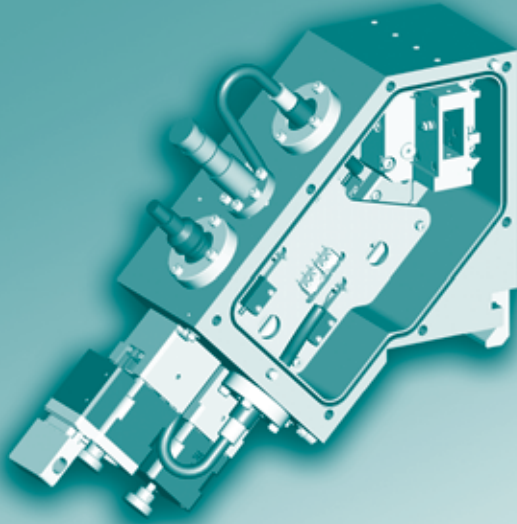
After that two pairs of slits are following for in situ beam definition. Between the first pair of slits and the second one an ultra fast shutter enables the realization of very accurate exposure times. The shutter is placed behind a 12 fold filter wheel. Right before the exit of the beam (which is window free) an optical system for inline observation of the sample is integrated. Together with the differential sample illumination this allows for very efficient orientation of sample crystals via differential image techniques.

At the end of the unit a motorized and online adjustable beam stop for user friendly sample handling is integrated. The diffuse scattering of the beam at the beam stop/sample is recorded by a pin diode in order to determine the exact exposure time.

The devices are exchangeable and individually combinable. Please contact us for further details and information.

* The BeamConditionenUnit was developed together with Wilfried Schildkamp (ESRF and CELLS)

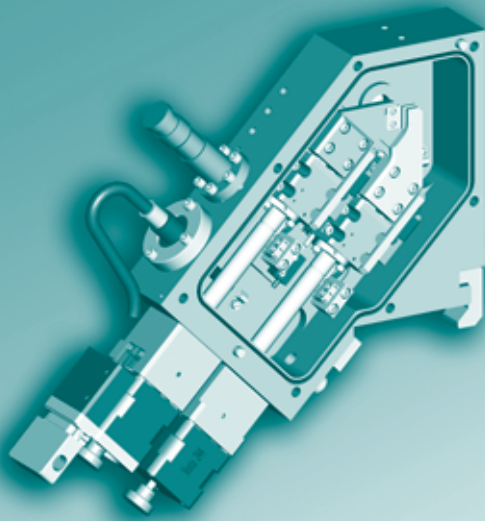
Position and Intensity Monitor 3100.10



- Principle: Split Ion chamber
- Resolution <math>< 2 \mu\text{m}</math> (typically 0,8 μm)
- Voltage: 1400V
- Amplifier: Differential Amplifier LoCum4
- Atmosphere: N_2
- Anode / Cathode: Au
- Active Area: vertical 6mm, horizontal 10mm
- Driver coarse Adjustment
 - Resolution: 0,884 μm @ 400 Steps/rev.
 - Range: +/- 4 mm
 - Drive: Stepper Motor Controller
 - Limit switch, Home switch
- Encoders*: Optional
- Dimension (in Beam Direction): 93 mm + 20 mm for cover plate, flange and entrance window

* depending on user side calibration

Slit Module 3100.20

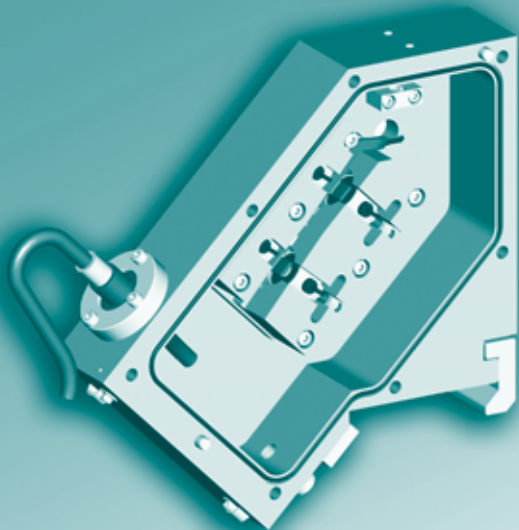


- Principle: vertical or horizontal asymmetric slit pairs
- Blade material: 2mm tungsten (others on request)
- Resolution: 0,884 μm @ 400 Steps/rev.
- Range: +/- 3mm
- Repeatability <math>< 0,5 \mu\text{m}</math> (typically <math>< 0,2 \mu\text{m}</math>)
- Backlash: <math>< 3 \mu\text{m}</math>
- Drive: Stepper Motor Controller
- Limit switch, Home switch
- Dimension (in Beam Direction): 46 mm
- Encoders: optional
- Atmosphere: He or vacuum (additional windows required)
- Available Slit Module:

Vertical Horizontal

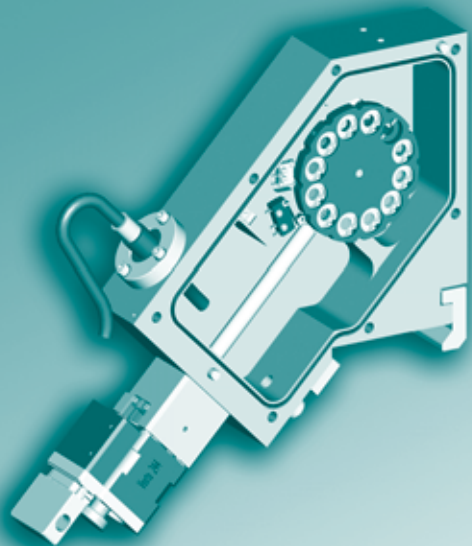


Shutter Module 3100.30



- Opening time: <math>< 1 \text{ms}</math>
- Closing time: <math>< 1 \text{ms}</math>
- Minimal Opening Time:
 - One shutter: <math>< 3 \text{ms}</math>
 - Two shutters: <math>< 1 \text{ms}</math> (additional external logic required)
- Drive: TTL input, manual mode, programmable opening time
- Shutter Material: Steel = 1mm
- Feedback: integrated Pin Diode
- Atmosphere: He or vacuum (additional windows required)
- Dimension (in beam direction): 46 mm

Filter Module 3100.40

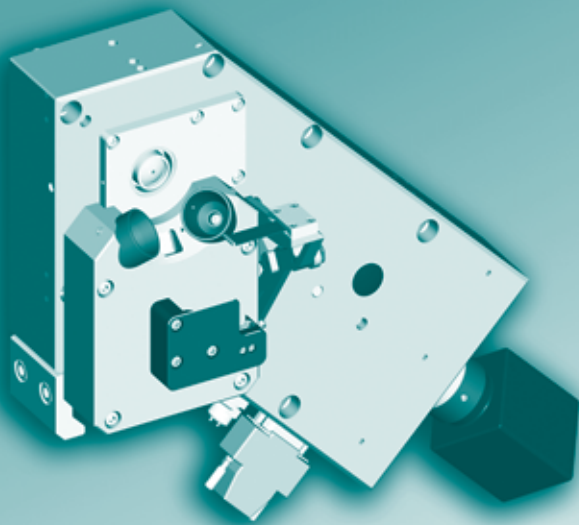


- No of filters: 11 (+ one free position)
- Driver: Stepper Motor
- Position information: Position Switch
- Aperture \varnothing 7mm
- User changeable Filters (\varnothing 14mm)
- Atmosphere: He or vacuum (additional windows required)

Filter positions	Material (s)	thickness [µm]	10% @ E [keV]	50% @ E [keV]	Edge [keV]
0	empty				
1	Al	12,5	3,0	4,9	
2	Al	12	4,1	6,5	
3	Al	50	5,2	8,0	
4	Al	100	6,7	10,1	
5	Al	200	8,5	12,8	
6	Al, V	50, 25	9,1	14,2	
7	Al, V	50, 50	11,0	17,0	
8	Al, V	50, 125	16,4	25,0	
9	Al*, Cu	40, 5			8,9789
10	Al*, Au, Al*	25, 4, 25			11,9187
11	Al*, Au, Al*	25, 8, 25			14,3528

0: empty, 1-8: magnitude/50% filters, 9-11:energy calibration filters
* Al foil as carrier material

Protein Crystallography Unit 3100.50



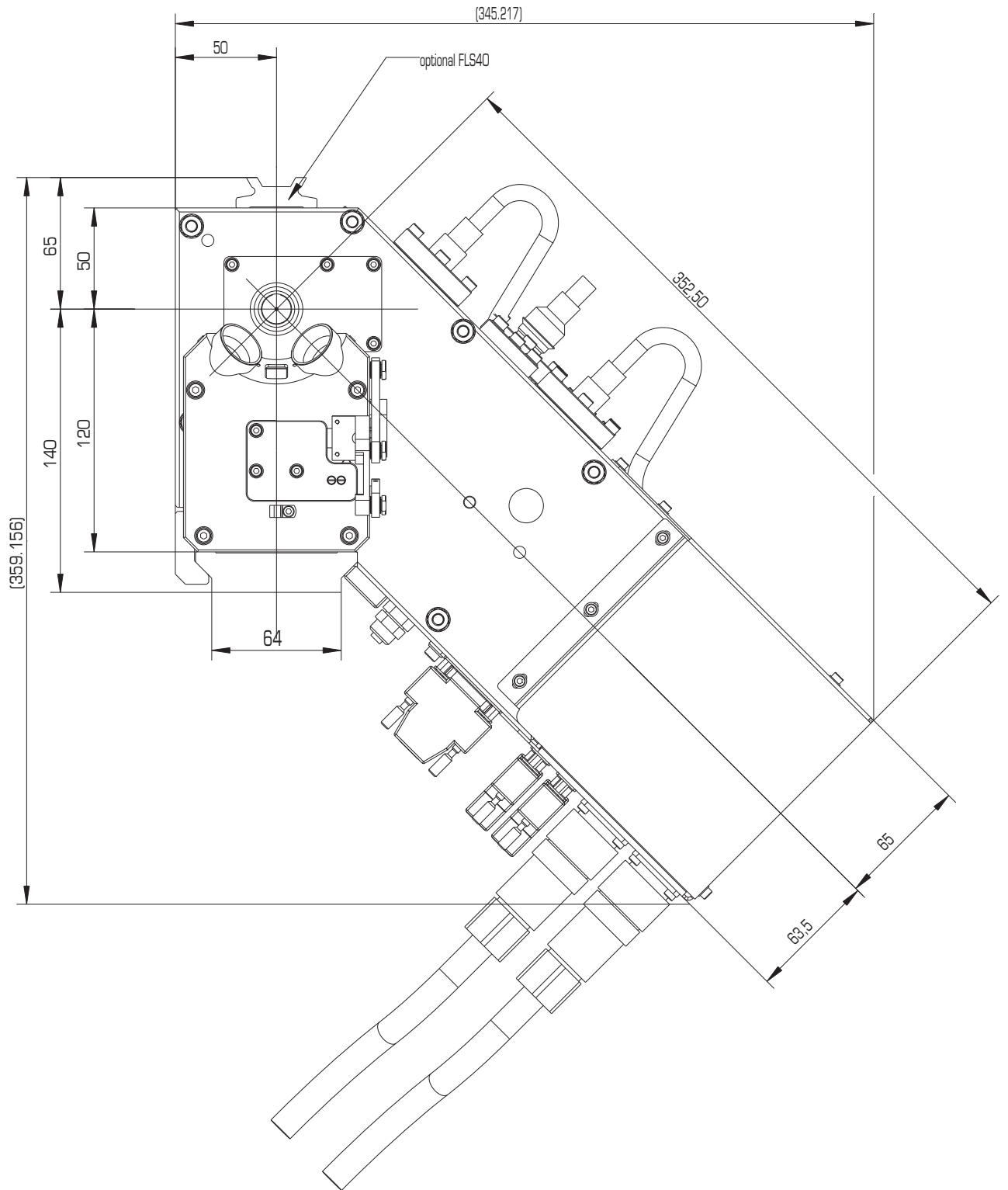
- Camera Module
 - Method: In line observation of the sample position
 - Camera: Sony XCL 5000 (2448 x 2050 pixels)
 - Sample Distance = 40 mm from beam exit
- Atmosphere: He, no vacuum possible
- Sample Illumination
 - 2x 3W LED Wavelength: min: 440 nm, nominal: 455 nm, max: 460 nm
 - Optics: Wolter focussing optics
- Radiation monitor (PIN Diode)
- Beam Stop
 - Material: Ag \varnothing 2mm x 10mm
 - Save park position during sample change
 - with Piezoelectric fine adjustment
- Dimension (in Beam Direction): 46 mm

Controller 3100.90



The Beam Conditioning Unit comes together with a modular controller. Depending on the possibilities available on the beamline facility more or less tasks can be integrated in the controller.

The controller is equipped with a RS232 interface for control of the different units. With simple commands which also can be sent from SPEC the BCU can be addressed. Most signals and controls are also accessible via BNC TTL connectors directly on the back panel of the controller.



Service

Flexibility

Quality

Innovation

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