



PAUL SCHERRER INSTITUT



SLS-SPE-TA-2008-313
August, 2008

Specifications of Aperture Unit For X09LA-OP SIS Beamline

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1. Introduction

The Swiss light Source (SLS) is a dedicated high brightness synchrotron radiation source at the Paul Scherrer Institute (PSI) in Villigen, Switzerland.

These specifications cover the design, manufacture and modification the existing Aperture Unit (AU) for X09LA-OP. Tenderers are requested to comment upon the specifications and are encouraged to make alternative proposals to PSI in addition to the quotation according to these specifications. However, after the contract has been placed, departures from the agreed specifications will not be allowed, except with written permission of the PSI.

2. General Description

The AU is shown in the drawing 0-30040.51.532 and manufactured in July 2000. The location of the existing AU for X09LA-OP is shown the drawing 2-30040.50.168, Layout SIS Beamline.

The new AU will be located in the new OP layout, shown in the drawing 1-30040.51.2172.

The following document is an integral part of these specifications:

- UHV materials and technologies for SLS front ends and beamlines, SLS-TME-TA-1998-0014

2.1 Components

The new AU is shown in drawing 1-30040.51.2173.

1. Chamber

It is a cylinder of 100 mm inner diameter. Laterally two CF100F flanges coaxial to the beam are used to connect to the parts of the X09LA-OP. The total axial length is 600 mm.

In the side to the ring there are three CF100F flange for inserting:

- 2 Horizontal-ring slits
- 3 Horizontal-wall slits
- 6 Horizontal wire monitor

At the top there are two CF100F flange for inserting:

- 4 Vertical-up slits
- 7 Vertical wire monitor

At the top there is a tilted CF40F flange for mounting:

- 9 View port

A CF40 window will be mounted on a CF40 flange. The vacuum pipe together with this flange has an outside of diameter 70 mm and a tilted angle of 35°.

At the bottom there are two CF100F flanges for inserting:

- 5 Vertical-down slits
- 8 ion pump

For fitting the existing parts all CF100 flanges must have the same distance to the chamber center as indicated in the drawing 0-30040.51.561.

Four reference holes of 6^{H6} mm diameter on the top of the chamber serve for alignment purposes.

The chamber is supported by three feet. The feet must be able to adjust this system to a certain position within ± 0.1 mm and to be able to fix it in this position. Therefore a kinematic mounting is required.

2. Horizontal-ring slits

It consists of a water cooled copper head with bellows assembly and manipulator.

Manipulator and the bellows assembly will use the existing parts. The water cooled copper heads must be made according to the drawing 30040.51.2174.

This is a L-shape copper plate. The heads edge is used to define the beam dimension and has to be straight. A bent OFHC copper pipe is brazed to the copper plate for cooling. On the copper plate surface there is central line with a division of 0.5 mm and total length of 40 mm.

One K-type thermocouple is inserted on the plate to monitoring the temperature. This thermocouple will supply by PSI.

The manipulator is shown in the drawing 0-30040.51.534. It has a maximum travel of 25 mm, a resolution of 0.05 mm and a backlash of less than 0.05 mm. A load capacity of 300 N is required. A handle wheel should be mounted for manual movement.

3. Horizontal-wall slits

It consists of a water cooled copper head with bellows assembly and manipulator. All the existing parts will be used.

4. Vertical-up slits

It consists of a water cooled copper head with bellows assembly and manipulator. All the existing parts will be used.

5. Vertical-down slits

It consists of a water cooled copper head with bellows assembly and manipulator. All the existing parts will be used.

6. Horizontal wire monitor

It consists of a monitor head with bellows assembly and manipulator. All the existing parts will be used.

7. Vertical wire monitor

It consists of a monitor head with bellows assembly and manipulator. All the existing parts will be used.

8. Ion pump

Through a vacuum pipe a 150 l/s, CF150 ion pump will be mounted.

9. View port

The view port will be supplied by PSI.

From the CCD camera setting 200 mm from the view port must be able to observe the centre part of slits heads in horizontal-ring, vertical-up and vertical-down directions.

10. Kinematic mounting

Existing set will be used.

11. Frame

The beam height is 1400 mm above the floor. It must be highly stable; if a lateral load of 3000 N is applied, the supported components should not move more than 2 mm. All resonant frequencies of the loaded support must be higher than 50 Hz.

The supports must be made of steel; therefore surface painting is required. Each part must be painted with at least one primer and one high-grade coat of paint. The paint should be insoluble in acetone. The color will be dark blue with the number of 160. No painting is allowed on machined surfaces or stainless steel parts.

When all the components are assembled, it must be possible to move it with a crane; the supplier must provide suitable eyebolts. In drawing 30040.51.2174, the maximum dimensions of frame are given.

There are three fixed feet which should be attached to the floor by bolts.

3. Scope of Supply

3.1 Components

The chamber, horizontal-ring slits head and the Frame, described in the section 2, will be delivered to PSI.

3.2 Time schedule

The supplier will provide a detailed time and manpower plan for all the work in this specification within three weeks after placing the contract. The manpower plan will include and specify the key personnel concerned with this contract.

3.3 Drawings

The supplier will produce all the drawings which are necessary to manufacture each component as required in this specification.

All the drawings will be sent to PSI as soon as they are available. The PSI will require approximately two weeks to check the drawings. This check is needed to verify the compatibility of the drawings with the specification, and the manufacturing of the components can only begin after completion of this check. The PSI will then take possession of all the drawings and will be free to use them to manufacture items elsewhere. CAD drawings are required.

3.4 Tools and temporary fixtures

The supplier will provide PSI with a list of all tools and jigs required during the manufacture, together with drawings and descriptions of these items. After completion of the contract, the PSI will take possession of them.

3.5 Certificates and reports

The following material certificates must be provided by the supplier:

- AISI 316LN, Copper OFHC

The following set of inspection documents is required at the end of the contract:

- reports of leak test and vacuum test
- records of bake-out temperature, brazing process and alignment reference
- technical documents concerning components purchased by the contractor

4. Packing and Delivery

The supplier is required to take responsibility for packing and transportation to the SLS site at PSI. Adequate packing and protection must be provided to prevent damage during transportation.

The following is to be displayed clearly on the outside of the packaging:

-addressed to:

SLS Building

Attn.: Q. Chen CH-5232 Villigen-PSI **Switzerland**

-the PSI contract number

-the weight of the loaded package

-support points for transport and lifting

5. Drawing lists

1/	0-30040.50.168	Layout of SIS beamline
2/	0-30040.51.2172	Layout of XIL-SIS beamline
3/	1-30040.51.2173	Aperture unit assembly
4/	2-30040.51.2174	Horizontal-ring head

The drawings of existing version

5/	0-30040.51.532	Slits assembly of SIS OP
6/	0-30040.51.533	Slits head
7/	0-30040.51.534	Manipulator 25 mm
8/	0-30040.51.561	Chamber
9/	2-30040.26.087	Kinematic mounting