

MULTI-SCREEN WIDE STATION

Application

The *Multiscreen-station Wide* module is a beam diagnostic component produced for "Sincrotrone di Trieste (ITALY)".

The main scope of this component is to allow the beam monitoring by means of a dedicated camera, which is pointed towards suitable targets. Different targets are used for monitoring the electron beam and the photon beam.

The operating modes of the Multi-screen station are:

- Open (let the beam pass through)
- > Target 1
- > Target 2

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1 References

This product was produced, tested and delivered by CECOM for "Sincrotrone di Trieste" (Trieste – ITALY). The references of contact persons for this work are available under request.

2 CECOM activities

CECOM carried out the following activities:

- Review of manufacturing drawings (engineering design and development of tools and equipments needed for the manufacturing): see section 6.2.
- > Purchase of raw materials and commercial components
- Manufacturing of components
- Assembling and welding
- Cleaning (for UHV application)
- Quality check:
 - Dimensional check of components and assembly
 - Test of pneumatic devices
 - Preliminary alignment (in factory)
 - UHV leak test



3 Materials

Used materials:

- > Stainless steel "AISI 316 L" for vessel walls and vacuum components
- > Lead for the shielding cover of the camera

4 Manufacturing and assembling

The most critical applications concerning the machining and cleaning of the vessel are:

- > Machining of the shaft from a unique piece of stainless steel AISI 316L (Fig. 1a)
- Machining of the UHV "Conflat cube" from a un unique piece of stainless steel AISI 316L (Fig. 1b and Fig. 1c)



Fig. 1: Shaft and Conflat cube

The structure frame of the Multi-screen Wide station was assembled and checked separately. Each part of the structure was UHV cleaned and then assembled in clean room.

Preliminary test of mechanical parts were performed before proceeding with the final assembling of UHV components.

Pneumatic actuators were installed on the support frame and checked before installing other movable parts

A preliminary setting of all mechanical stops were performed on the assembled support frame.







All UHV components were assembled in clean room and the movement along the required vertical stroke was checked manually before the final installation on the support frame (Fig. 2).



Fig. 2: Assembling of UHV components

The final check of the Multi-screen Wide station was performed on the assembled module and the following tests were executed:

- Movement between the three operating modes (after preliminary alignment of in-vacuum components)
- > Movement of the shaft under-vacuum
- > UHV leak test (see section 5)

Some relevant pictures of the assembled device are shown in section 6. Reference drawings are shown in section 6.2.



5 Vacuum test (UHV leak test)

The completely assembled module was leak tested and a leak rate lower than $10^{\text{-}10}\ \text{mbar-I/s}$ was measured.







- 6 Pictures
- 6.1 Factory Test







6.2 Installation







Reference drawings 7

