

SUPPORT STRUCTURES, POSITIONING SYSTEMS AND SPECIAL ENCLOSURES

SUPPORTS / ENCLOSURES

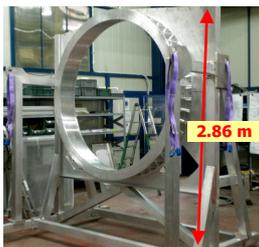
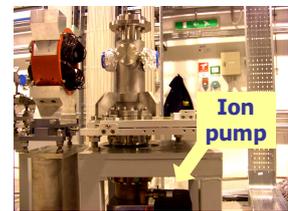
High stability supports and precise positioning systems are always required for the installation and the alignment of components installed in experimental stations, storage rings and beamlines of particle accelerators. Several types of positioning systems for the alignment of beamline components have been *developed, designed and manufactured by CECOM*.



Both manual and remotely-controlled actuators can be provided for the precise adjustment of *up to 6 degrees of freedom*. Usually these positioning systems are based on a 3-point kinematics mount for height/pitch/roll adjustment and further stages for horizontal translations. Vibration damping systems can be provided.

Special solutions have been studied in order to maximize the compactness of support structures and positioning systems, taking into account the mechanical arrangement of components to be installed.

An example is represented by the supports used for vacuum components which require to be connected to an ion pump: the support for the ion pump is included in the main support frame, on which a 3 point kinematics mount is placed. A central hole in the top plate of the support allows the connection to the ion pump and suitable edge-welded bellows can be used for allowing the relative movements between the ion pump and the top vacuum components. The support can be equipped with sliding mounts.



Stiff and big support structures can be designed, constructed and tested by us, even carrying out the related weight load test. This was done, for example, for the **ESO Handling and Integration Stand Structure**. The main structure and the integration flange ($\varnothing 2048$ mm) are made up of aluminium, and the flange is screwed on a stainless steel plate. The complete welding and assembling process were performed in CECOM, including the thermal treatments of welded parts for the stress relief. All structural welds were checked by means of non destructive tests. The assembled product was tested for static stability and crane handling with an applied weight load of 1840kg and 1450 kg respectively. The calculations, the project and the production of the weight load for the tests were carried out by CECOM.



We can also supply **special protective enclosures** and housings for electronics and for vacuum system, aimed at maintaining the operating conditions of inner components independently on the variations of the environmental conditions. A relevant example is represented by the **Protective Enclosures for ALMA**, designed and optimized for hosting the electronics and the compressors of the cryogenic system of ALMA antennas. ALMA is installed at 5000m altitude, so all parts operates in extreme environmental conditions. The enclosures for the electronic control units include a thermal control system and are insulated by means of suitable panels. The enclosures for the compressor units are installed outdoor, close to the antennas, and must guarantee the correct operation of the compressors in all seasons, independently on the weather conditions.



References: **CERN, INFN, CNAO, ESO**