

Status of

AIM

Alternative Installation Method for the VXD

VXD mechanics meeting, MPI, Munich (Germany), Mo. 7.9.15



MAX-PLANCK-GESELLSCHAFT



Max-Planck-Institut für Physik
(Werner-Heisenberg-Institut)



Speaker: David Kittlinger

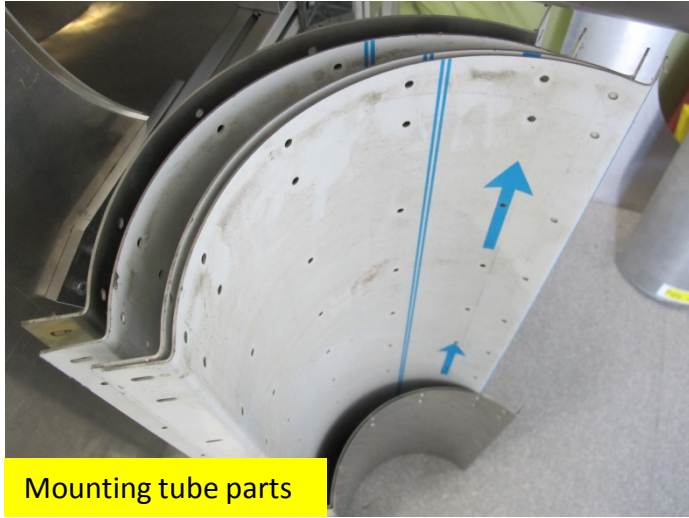
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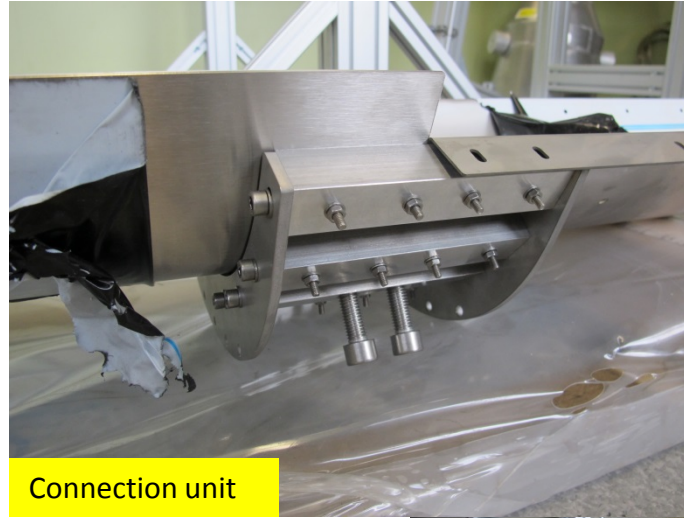
Overview

- Manufactured **Mounting-Tube-System**
- Designed **VXD-Installation-Ring**
- Connection **Cable Tray / VXD-Installation-Ring**
- Connection VXD / CDC (**brackets, pin**)
- Possible plan for checking the **VXD-position** during installation
- **Crane-transportation-tool**

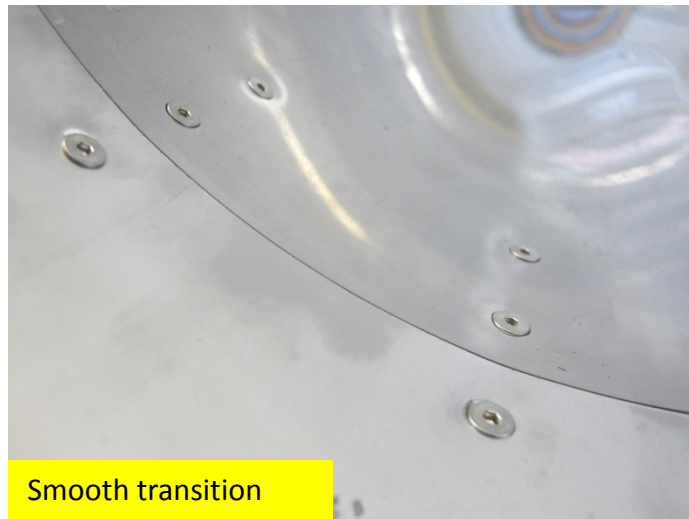
Manufactured Mounting Tubes



Mounting tube parts



Connection unit

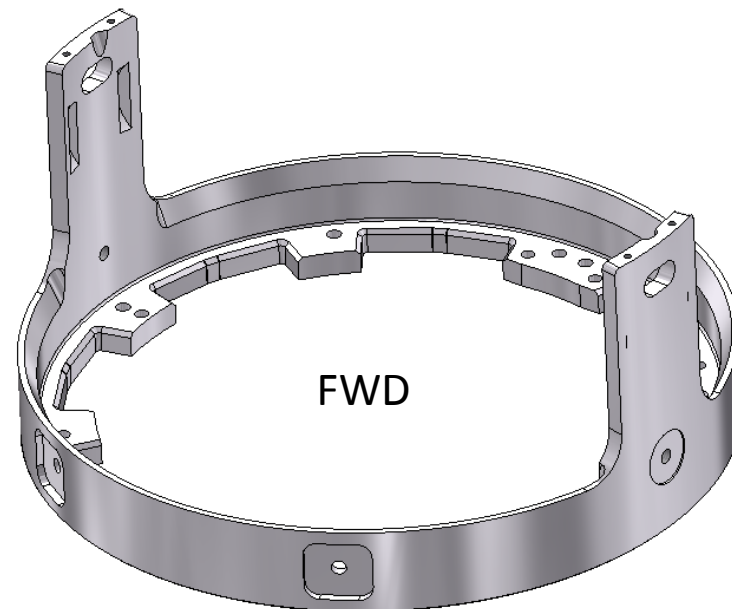


Smooth transition



Connected MT 2100 to MT 1100

Design VXD-Installation-Ring



Only BWD features:

- Height adjustment (KEK)
- Connections to CDC (KEK)
- Connection to cable trays (MPI)
- Connection to cran (MPI)

Same features for BWD&FWD:

- Notches for sliding parts (MPI)
- Hole-pattern for VXD-halves (KEK)

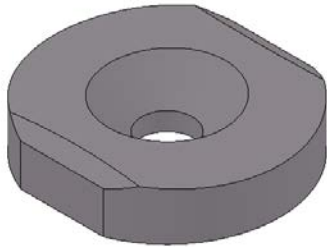
Only FWD features:

- Notches for EDI-hooks (MPI/DESY)
- Ear-design (MPI/DESY)
- Connection to cable trays (MPI)
- Connection to cran (MPI)
- Connections to CDC (MPI)
- Chamfers for cable-laying (MPI)

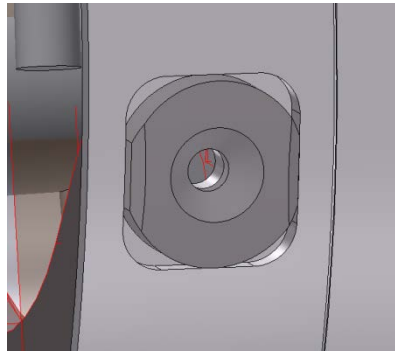
Gliding Pads

We should use the same design and material for the glide pads in FWD and BWD.

Design-suggestion:



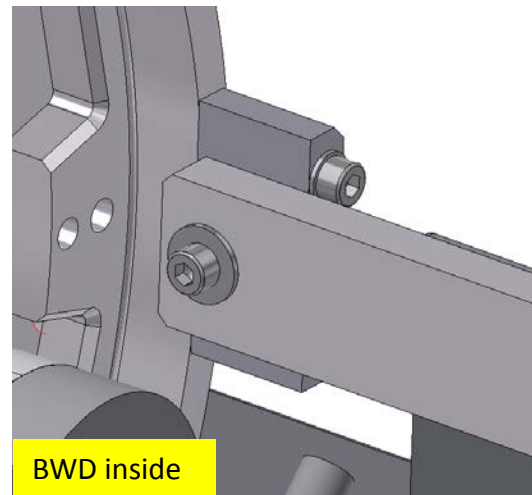
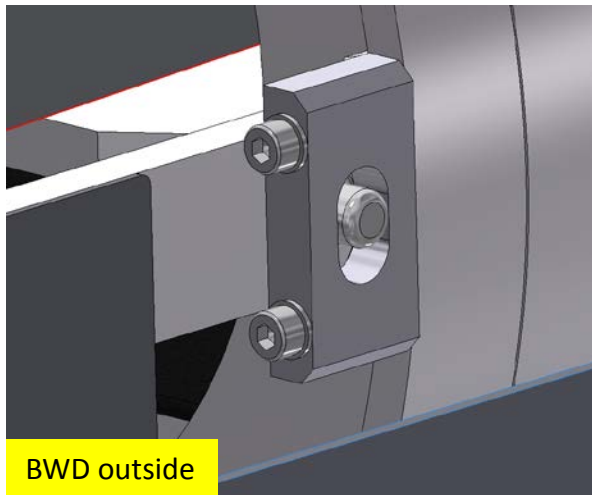
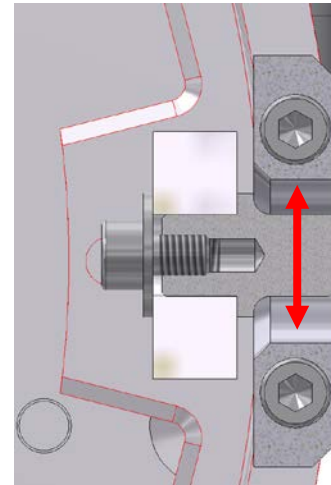
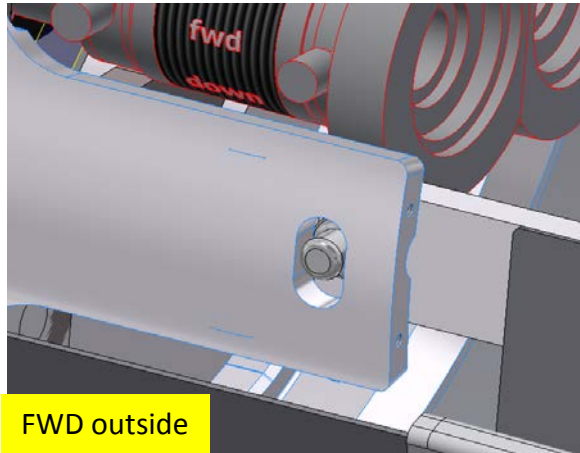
Assembled on the VXD-Installation-Ring



Material: **Murpec** by Murtfeldt

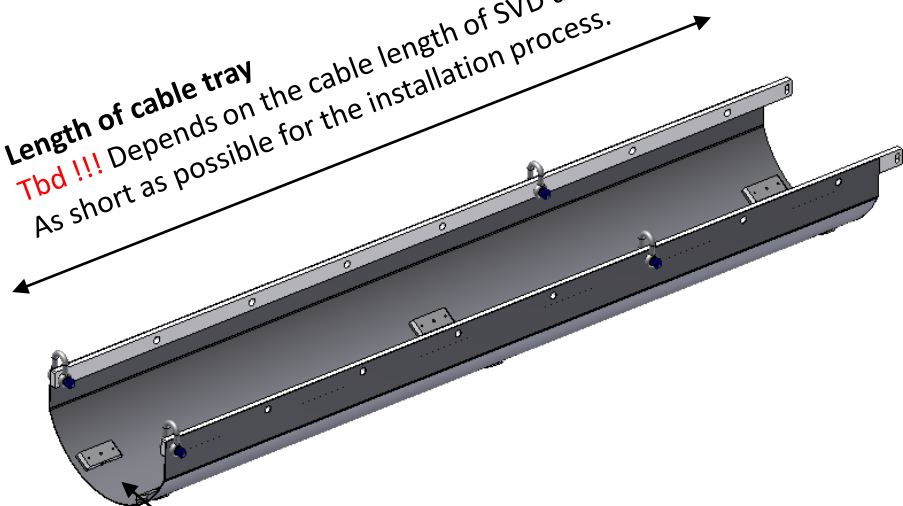
- Based on PEEK
- Radiation resistance
- Low frictional coefficient
- Electrical insulation
- Compressive resistance

Connection Cable Trays / VXD

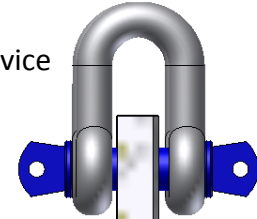


Cable trays

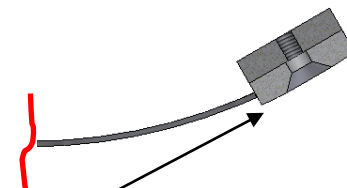
Length of cable tray
Tbd !!! Depends on the cable length of SVD and PXD
As short as possible for the installation process.



shackle
as lifting device



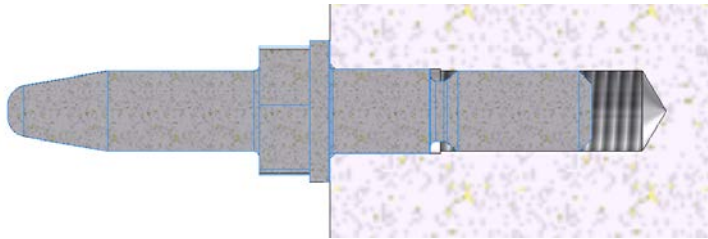
Murpec-gliding pads
with an adapter for fixation



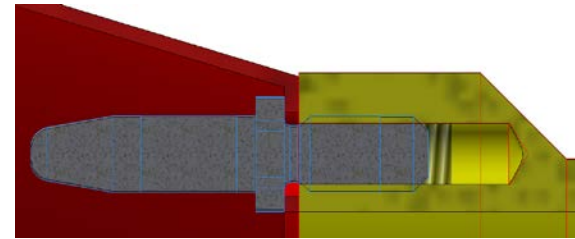
Connection VXD/CDC

Pin-Design

OLD DESIGN

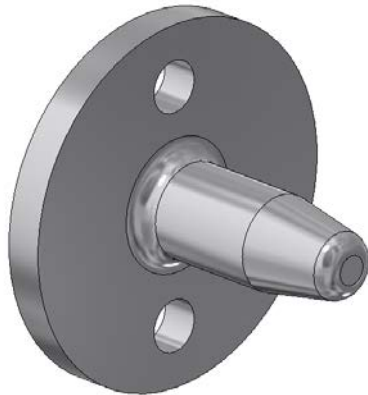


With shaft fit and thread

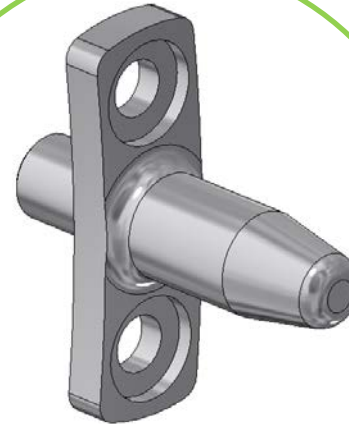


Only with thread

NEW DESIGN



Ideal design

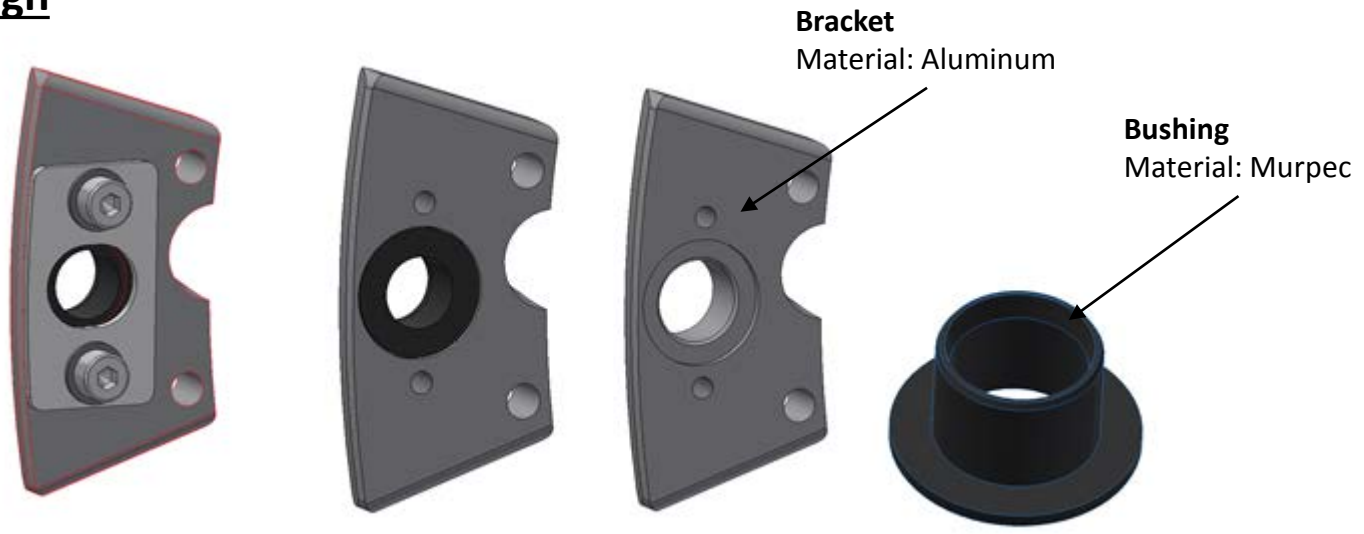


modified design

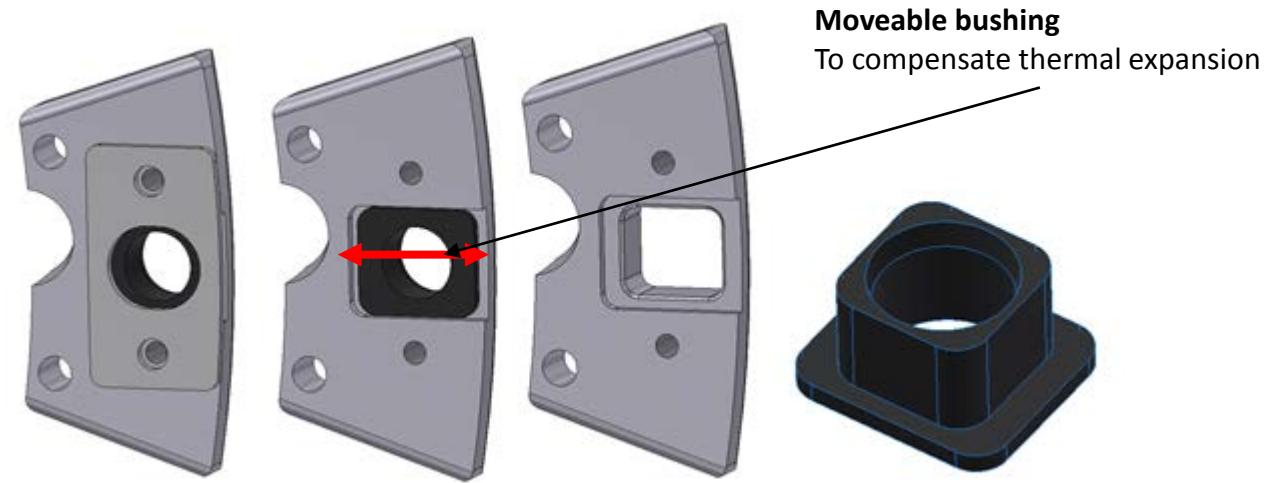
Connection VXD/CDC

Bracket-Design

LEFT SIDE

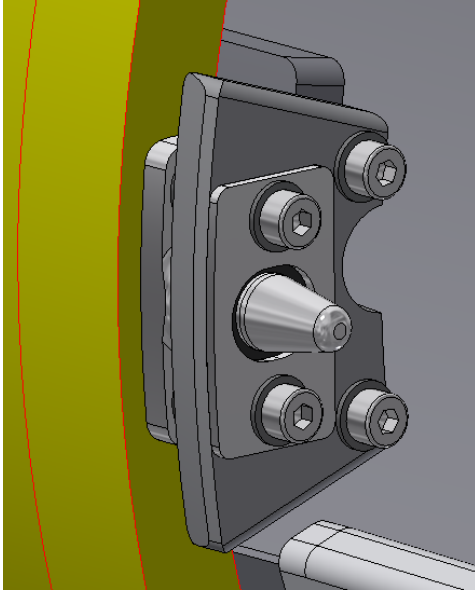


RIGHT SIDE



Connection VXD/CDC

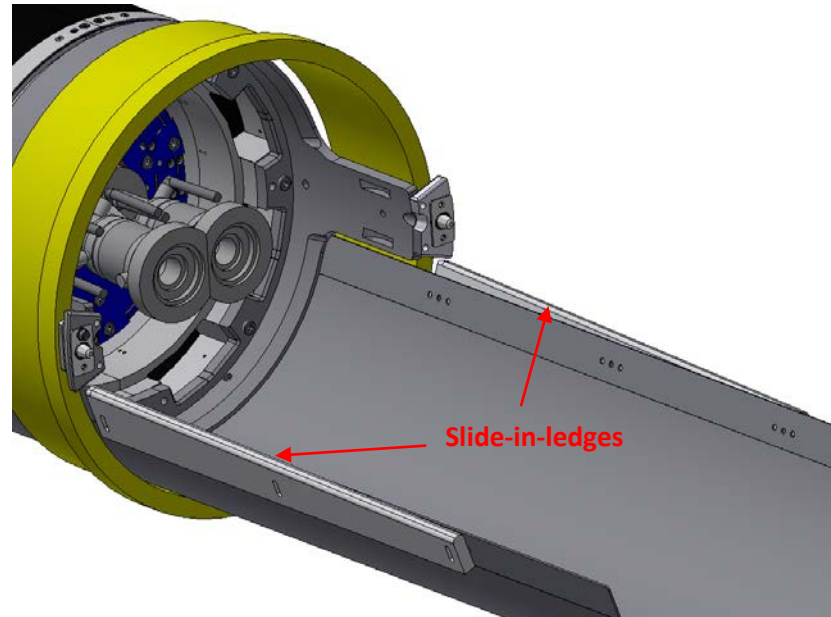
Installation situation



Slide-in-ledges

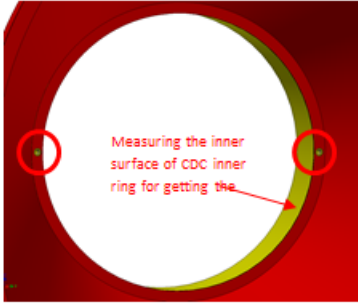
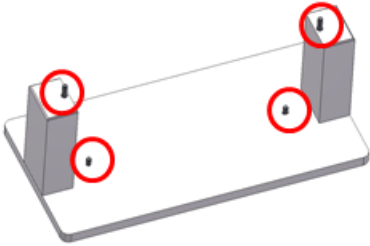


Bring the VXD smoothly in position to align with the pins

Material: Plastic



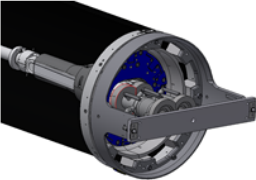
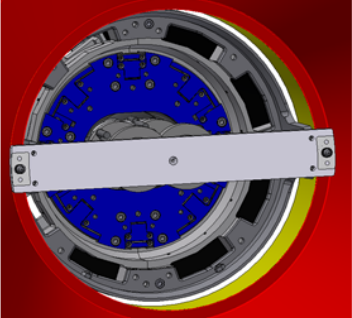
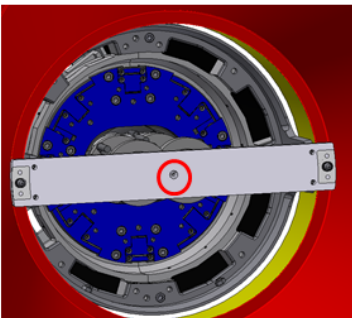
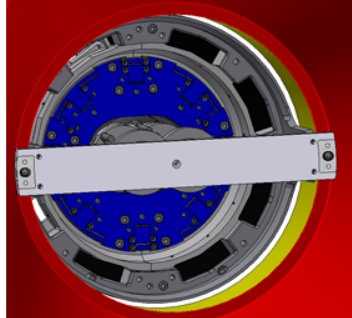
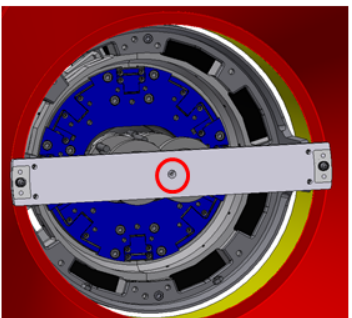
Connection VXD/CDC

Possible plan for checking the VXD-position during installation

No.	Installation/Mounting	Measurement
1	-	<p>Measure CDC – Center and pin-position</p> 
2	-	<p>Measuring ring adjustment JIG – pin-position</p> 
3	<p>Mounting VXD-installation-ring & mock-up-shield on the JIG</p> 	<p>Measuring mock-up-shield on the JIG – center</p> 

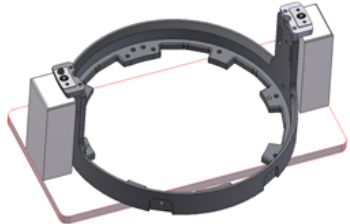
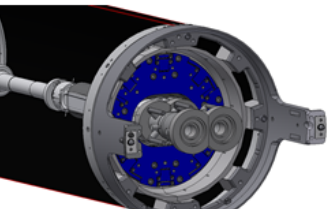
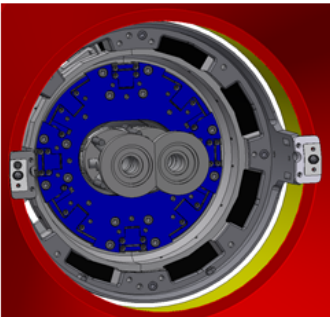
Connection VXD/CDC

Possible plan for checking the VXD-position during installation

4	<p>Mounting VXD-installation-ring with mock-up-shield on the VXD-Dummy (without load)</p> 	
5	<p>Installing VXD-Dummy (without load) in the CDC</p> 	<p>Measuring VXD-Dummy (without load) in the CDC – Center</p> 
6	<p>Installing VXD-Dummy (with load) in the CDC</p> 	<p>Measuring VXD-Dummy (with load) in the CDC – Center</p> 
7	<p>Now we know the actual position of the VXD relative to the CDC!!!</p>	

Connection VXD/CDC

Possible plan for checking the VXD-position during installation

8	<p>Mounting VXD-installation-ring & brackets on the JIG</p> 	
9	<p>Mounting VXD-installation-ring with brackets on the VXD (original)</p> 	
10	<p>Installing VXD(original)in the CDC</p> 	
11	<p>VXD should be in the same position like the VXD-Dummy (with load) before!!!</p>	

Connection VXD/CDC

TOLERANCES: For the installation of the VXD in the CDC

For the installation of the VXD in the CDC will be a tolerance of $\pm 0.5\text{mm}$ in x- & y-direction. It will be controlled by the FARO 3D-measurement-arm.

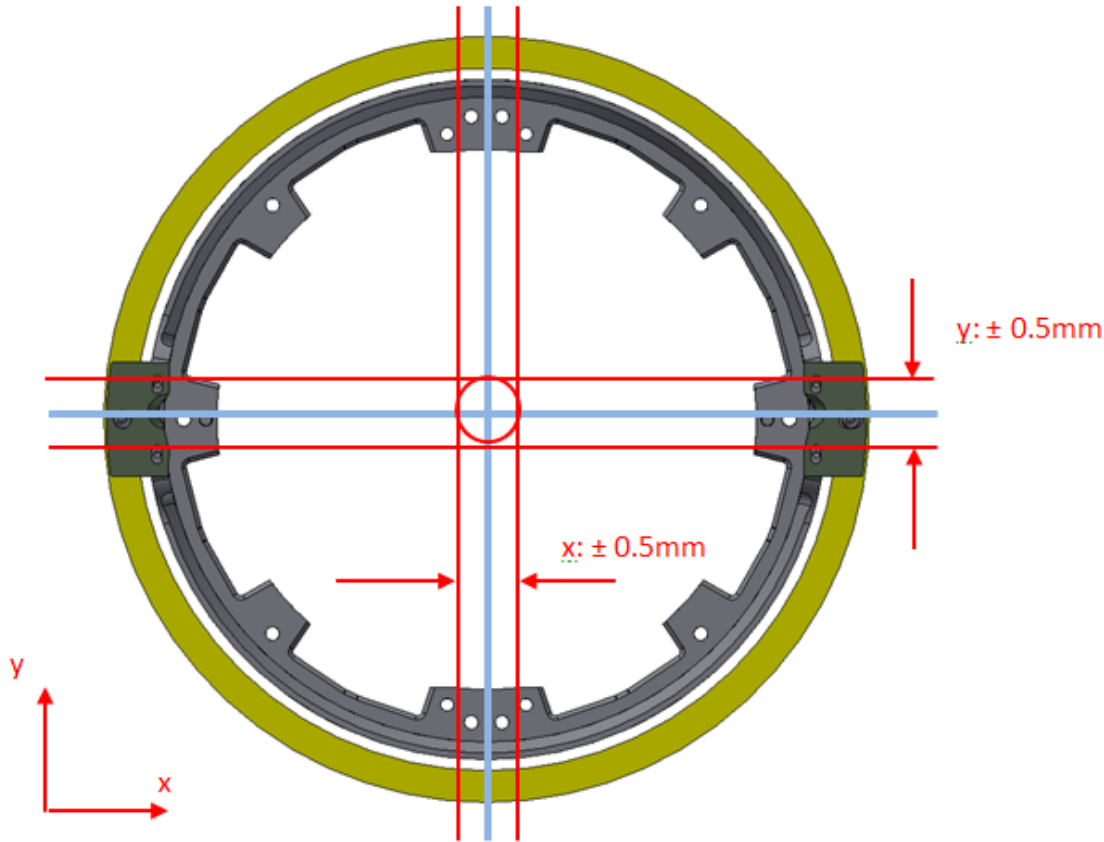
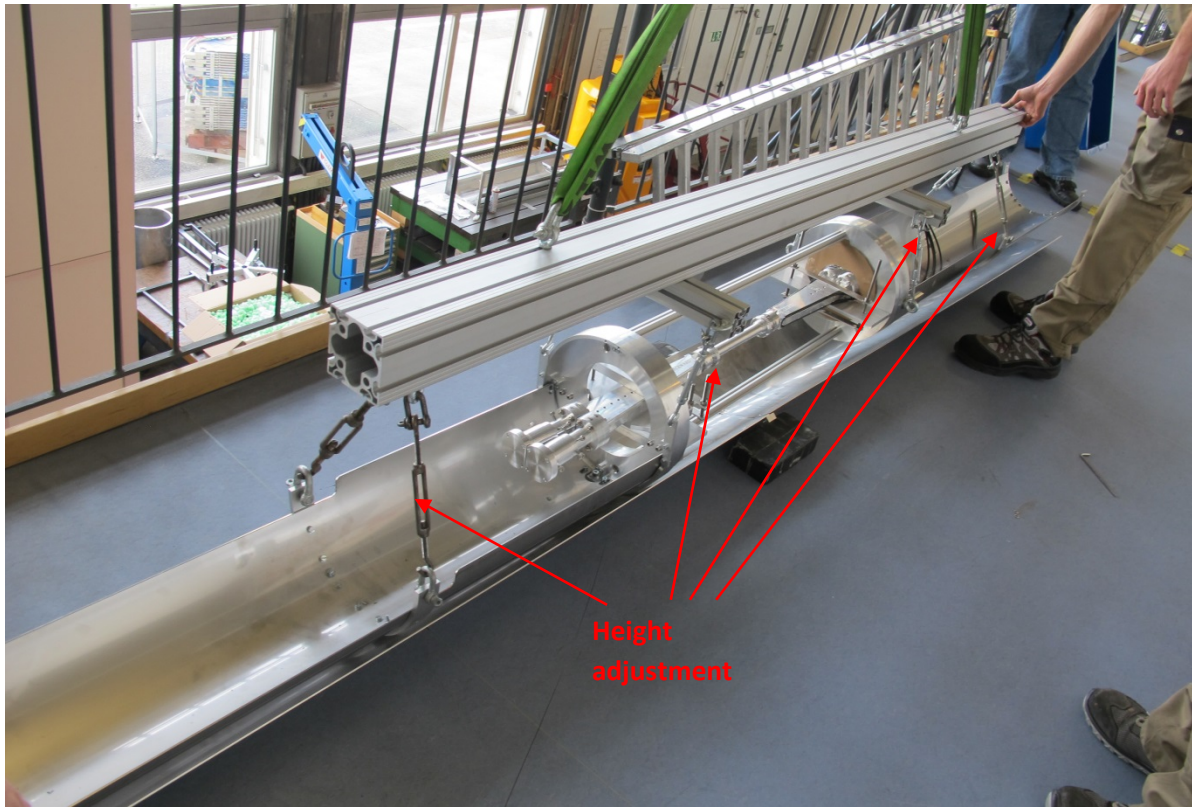


Fig. 13: positioning-tolerance ($\pm 0.5\text{mm}$ in x-y-direction) for the VXD in the CDC for the installation

Crane-transportation-tool

Modify the existing crane-tool from the AIM-mock-up for the AIM-process

GOAL: Separate support for cable trays and VXD

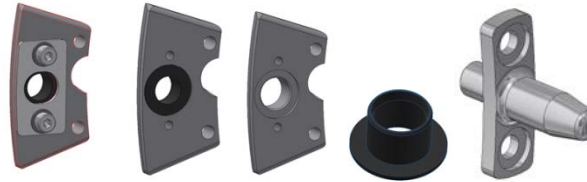


Summary

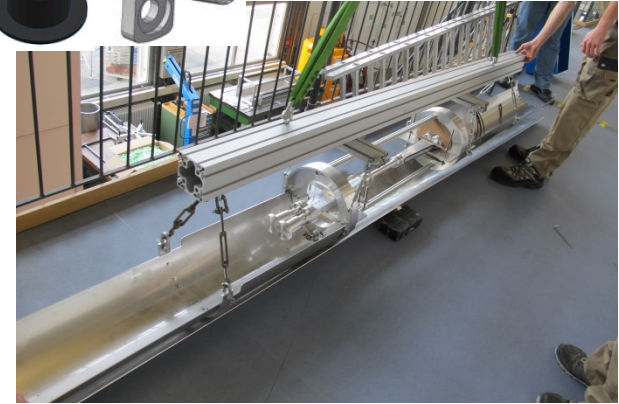
- DONE: Manufactured **Mounting-Tube-System**
- DESIGN-PREVIEW: Design- and manufacturing-details for:
 - **VXD-Installation-Ring**
 - **Pin** and **bracket** connection between VXD/CDC
 - **cable tray** / VXD connection
- PLAN: **Position-check of the VXD during the installation**

Next

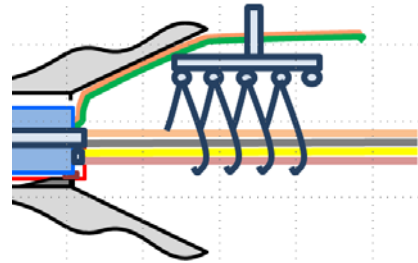
- Manufacturing pins and brackets



- Modify the mock-up-cran-tool for AIM



- Cable handling device



- Testing the new installation-equipment at the AIM-mock-up in MPI-Munich



Thank you for your attention!

Do you have any questions?



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