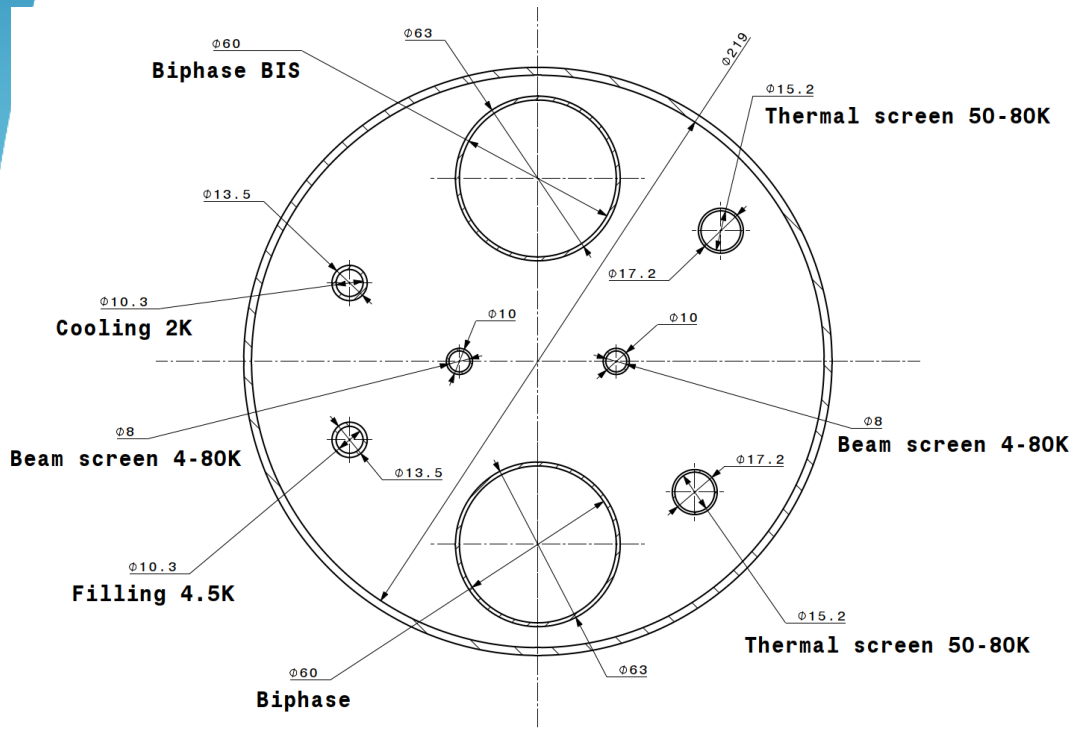




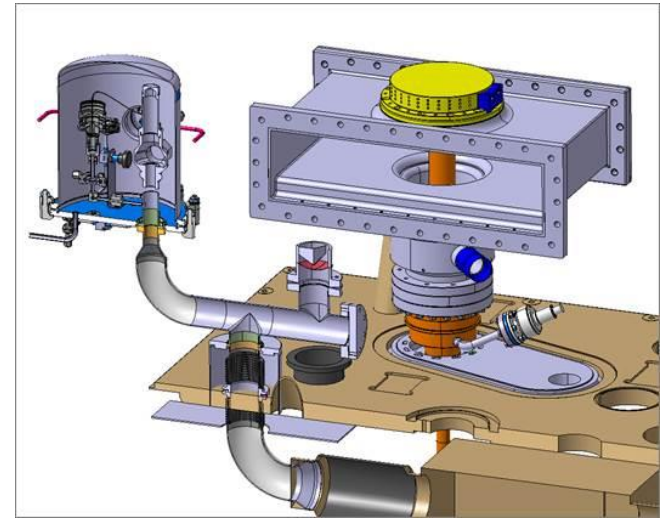
CERN/STFC – Cryomodule design update

11th Dec 2018

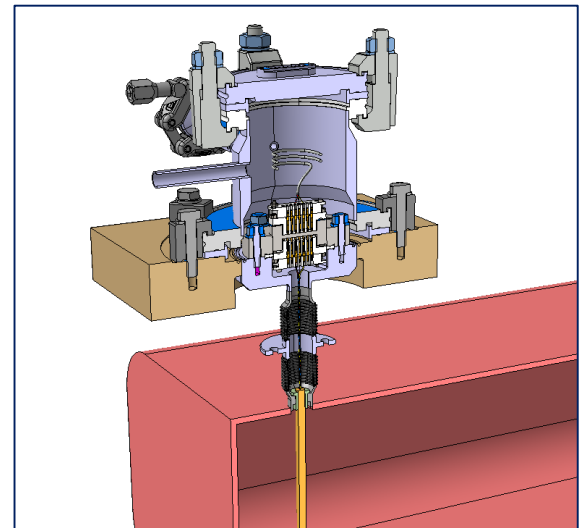
Cryogenic work



Layout for jumper connexion (preliminary)

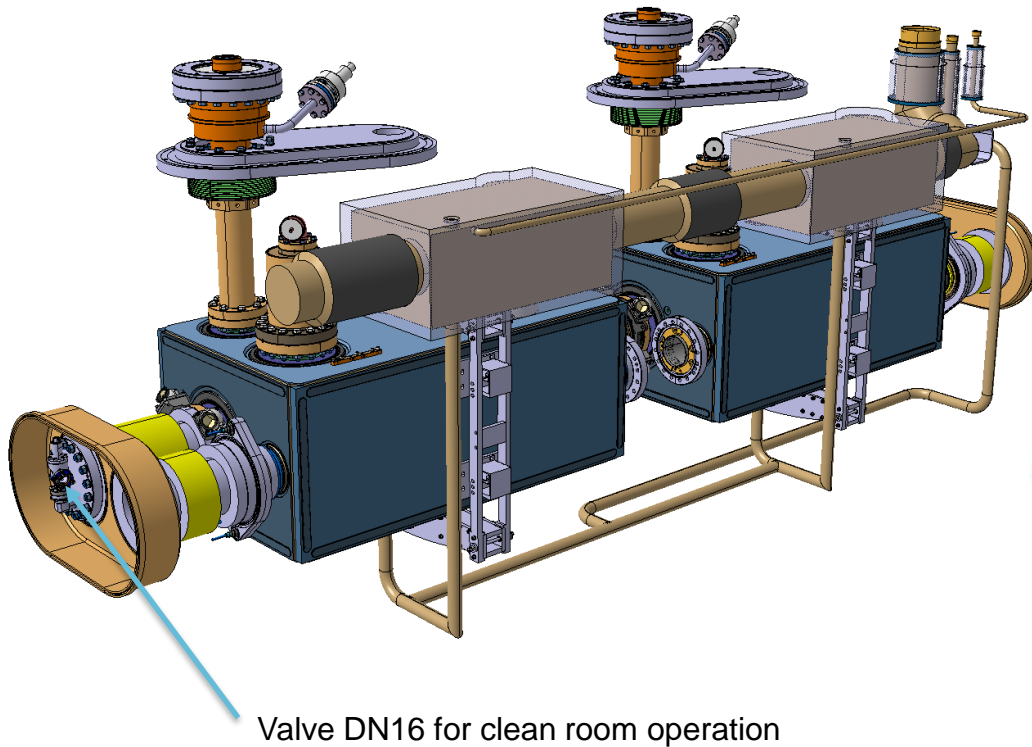


Safety valve and rupture disk preliminary integration



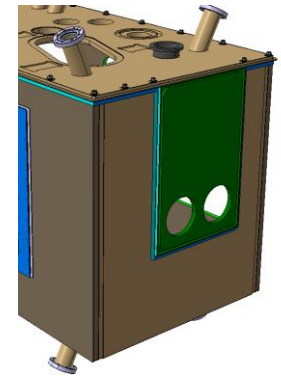
Level gauge interface (possibility of maintenance from outside)

Simplified strategy without extremity valves



Valve DN16 for clean room operation

Old vacuum tank



New vacuum tank design

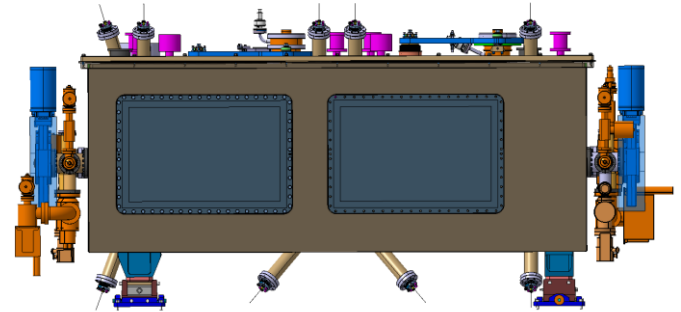
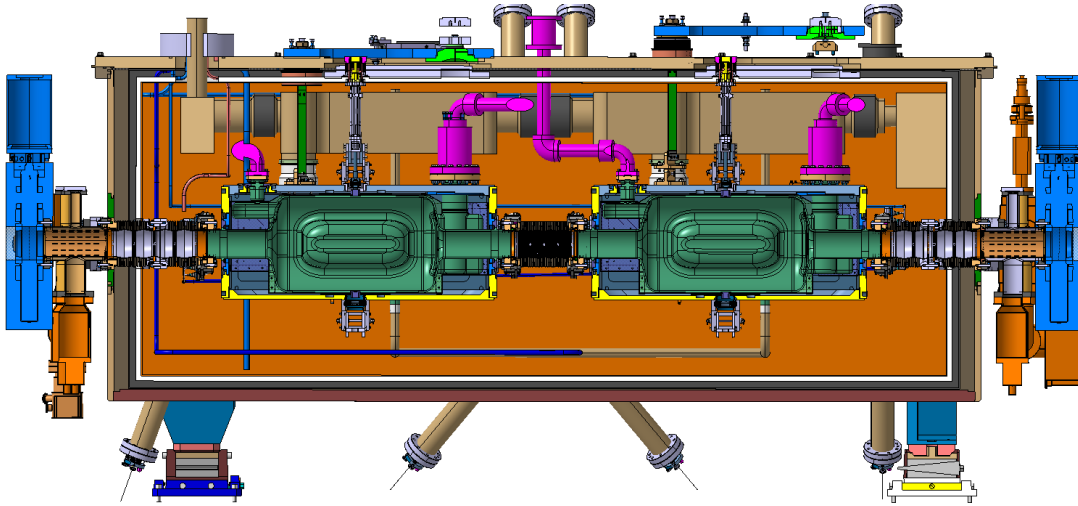


Work on-going :

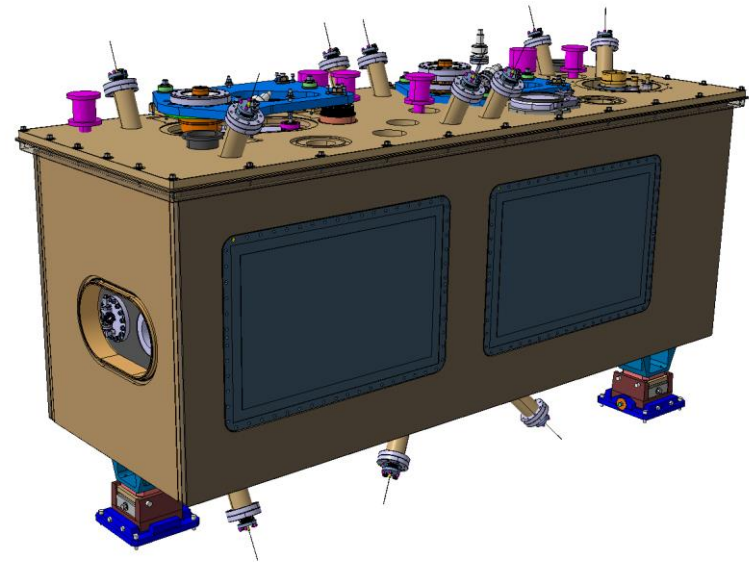
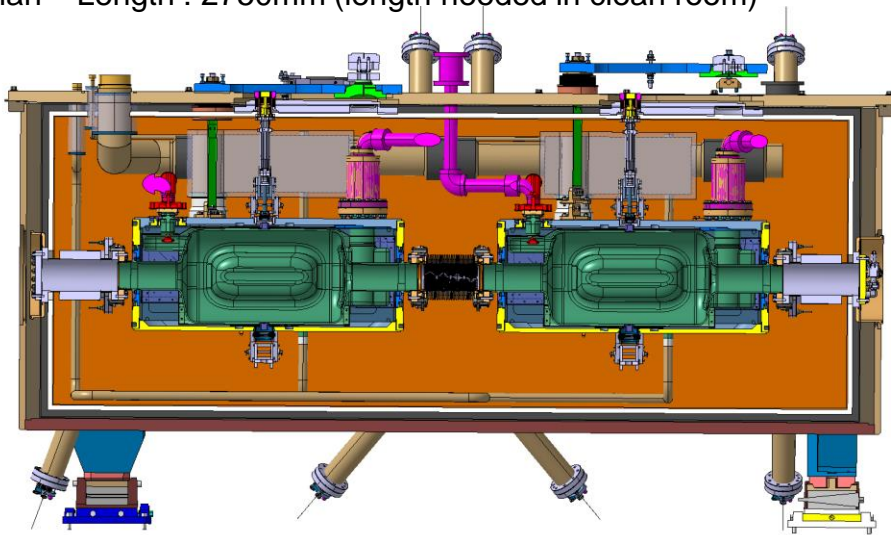
- Define the compression needed for insertion in the lower tank
- New vacuum vessel under design : No problem foreseen
- New Cold warm transition under study (see next slide for preliminary calculations)
- Possibility to use a gasket for leak test = OK

New assembly strategy

Previous plan – Length : 3250 mm

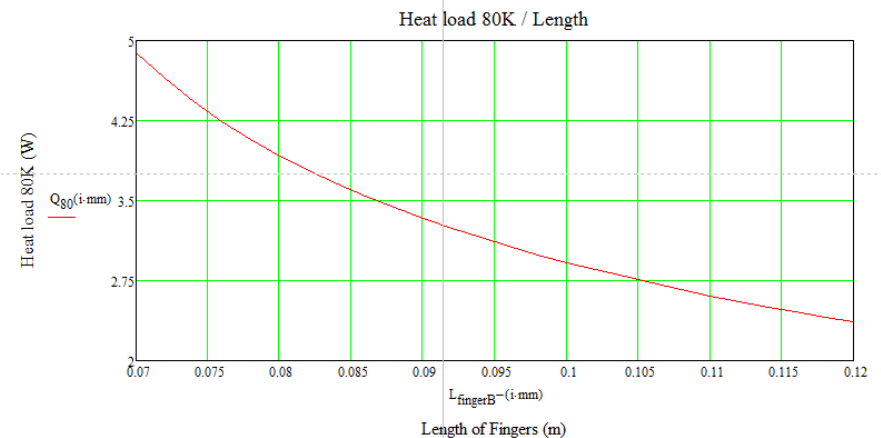
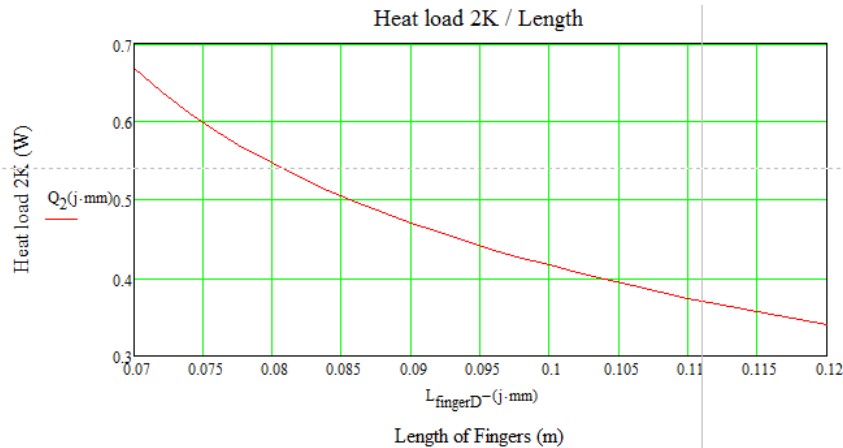


New plan – Length : 2750mm (length needed in clean room)



Cold/Warm transition

The new assembly strategy affects the length of the cold/warm transition. Here are the result of a rough calculation to evaluate the heat load on 2K and 50K :

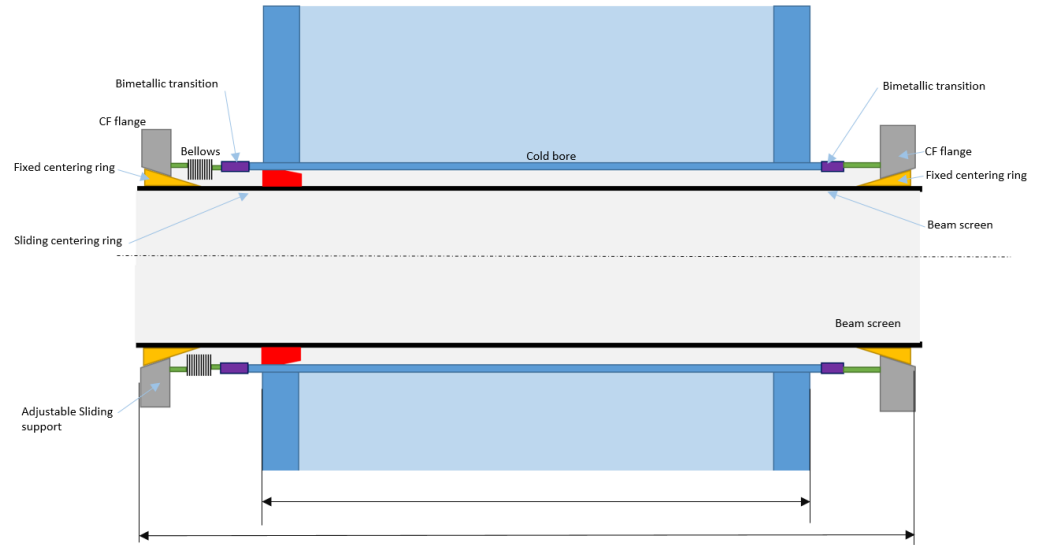


Length before change : 120mm

Value per transition, to be multiplied by 4.

Beam screen configuration

#	Name	Type	Designation	Value	
COLD BORE					
1	Cbi	Dim	Cold bore internal diameter	84 mm	
2		shape	Cold bore cylindricity	0.3 mm	
Bimetallic TRANSITION					
3		Position	Welding with cold bore	0.2 mm	Radius
4		Shape + pos	Machining tol of bimetallic in/out	0.1 mm	
CF FLANGE (fixed side)					
5		Shape + pos	Position of positioning shape WRT out pipe	0.1 mm	
6		Pos	Welding with pipe tolerance	0.2 mm	
FIXING RING (POS BEAM SCREEN IN CF FLANGE)					
7		Shape	Shape outer shape (cone)	0.2 mm	
8		Shape + pos	Tolerance of inner shape with respect to outer shape	0.4 mm	
SLIDING RING (in contact with beam screen)					
9	Rsr	Auto room	Minimum room with cold bore	0.25 mm	Radius room
10		Shape	cylindricity shape ext	0.1 mm	
11	Sri	Auto	Sliding ring external diameter maxi	83.100 mm	Calculated value
12		Tol	pos + shape internal with respect to external shape	0.2 mm	
13	Srt	Dim	Thickness	1 mm	
13b			Internal nominal diameter (calc from Sri)	80.500 mm	Calculated value
COOLING PIPE					
14	Rcp	Room	Minimum room with sliding ring	0.1 mm	
15	Cpe	Dim	External diameter	4.76 mm	
16		Shape	Tolerance on external diameter	0.05 mm	
17		Position	Welding tolerance	0.1 mm	Pipe pushed outwa
BEAM					
18	Dim		Vertical and horizontable	55.2 mm	To be confirmed
19	Dim		45°	52 mm	To be confirmed
Helium tank + cavity position and alignment tol					
20		Align.	Position of cavity magnetic center	0.5 mm	Diameter
21		Align.	Alignment tol 0.3° along beam axis	1 mm	Radius
22		Position	Cold bore position tolerance WRT Cavity magnetic center	1.75 mm	Radius
CIRCULAR BEAM SCREEN					
23	Bst	Dim	Thickness	1 mm	
24		Dim	Coating	0.075 mm	
25		Shape	Tol.on thickness	0.05 mm	
26		Shape	Cylindricity	0.5 mm	
27	BsD	Dim	External diameter maxi	70.480 mm	Calculated value
28	Bsd	Dim	Internal diameter mini	67.230 mm	Calculated value
28b			Internal nominal diameter (calc from Bsd) before coating	67.930 mm	Calculated value
RESULTS					
29		Room	Room beam/beam screen	3.015 mm	Radius



Values to be confirmed

- Use bimetallic transition or brazed transition (Ss to Ti)
- Verification of the minimal aperture on going
- Validation of the circular shape

Nominal internal diameter of beam screen before coating : 67.930mm

Nominal room with beam = 6.05mm

Minimal room beam / beam screen = 3.015mm (worst case)

Other activities on-going

- List of main components and responsibilities (design, supply, assembly, safety, tests...)
- Update of the design planning



End