



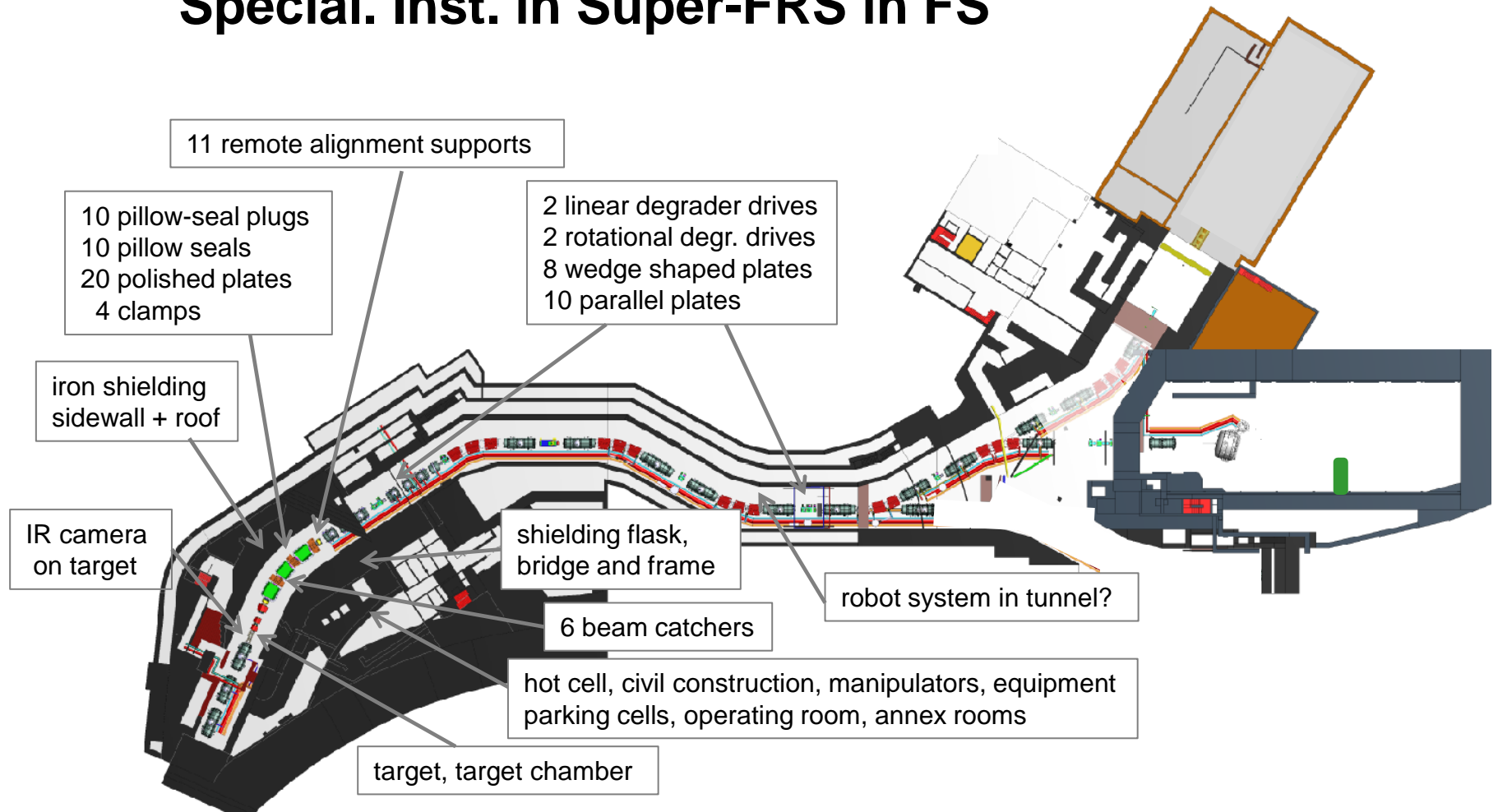
Target Area for Controls

Helmut Weick, GSI

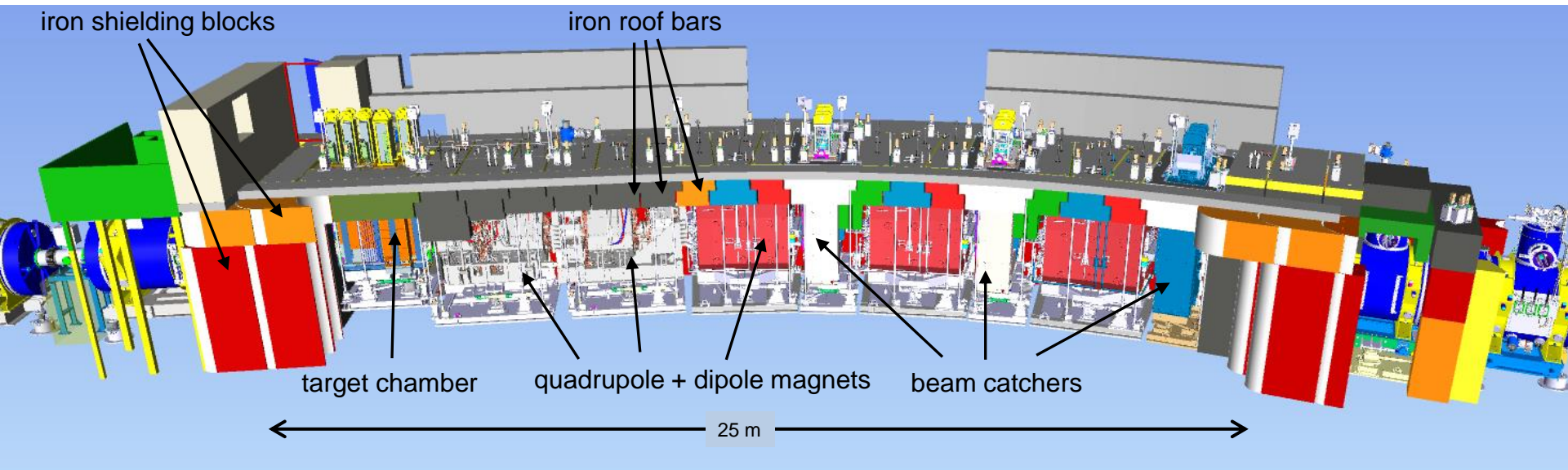
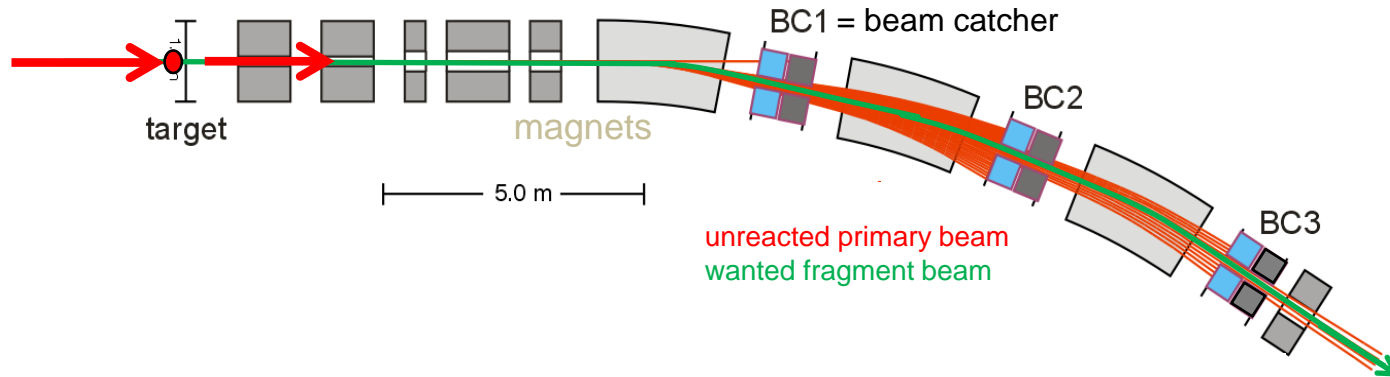
Super-FRS controls workshop 11.11.2024

- **Devices:**
Target, Beam Catchers, Pillow-Seals
- **Special motors / monitoring**
- **Other Areas Hot Cell / Shielding Flask**

Special. Inst. in Super-FRS in FS



Target Area



Target



swinging arm
for target



extra ladder
for strippers
and few targets



Phytron motor
in vacuum, ~1 Hz
rad. hard

motor



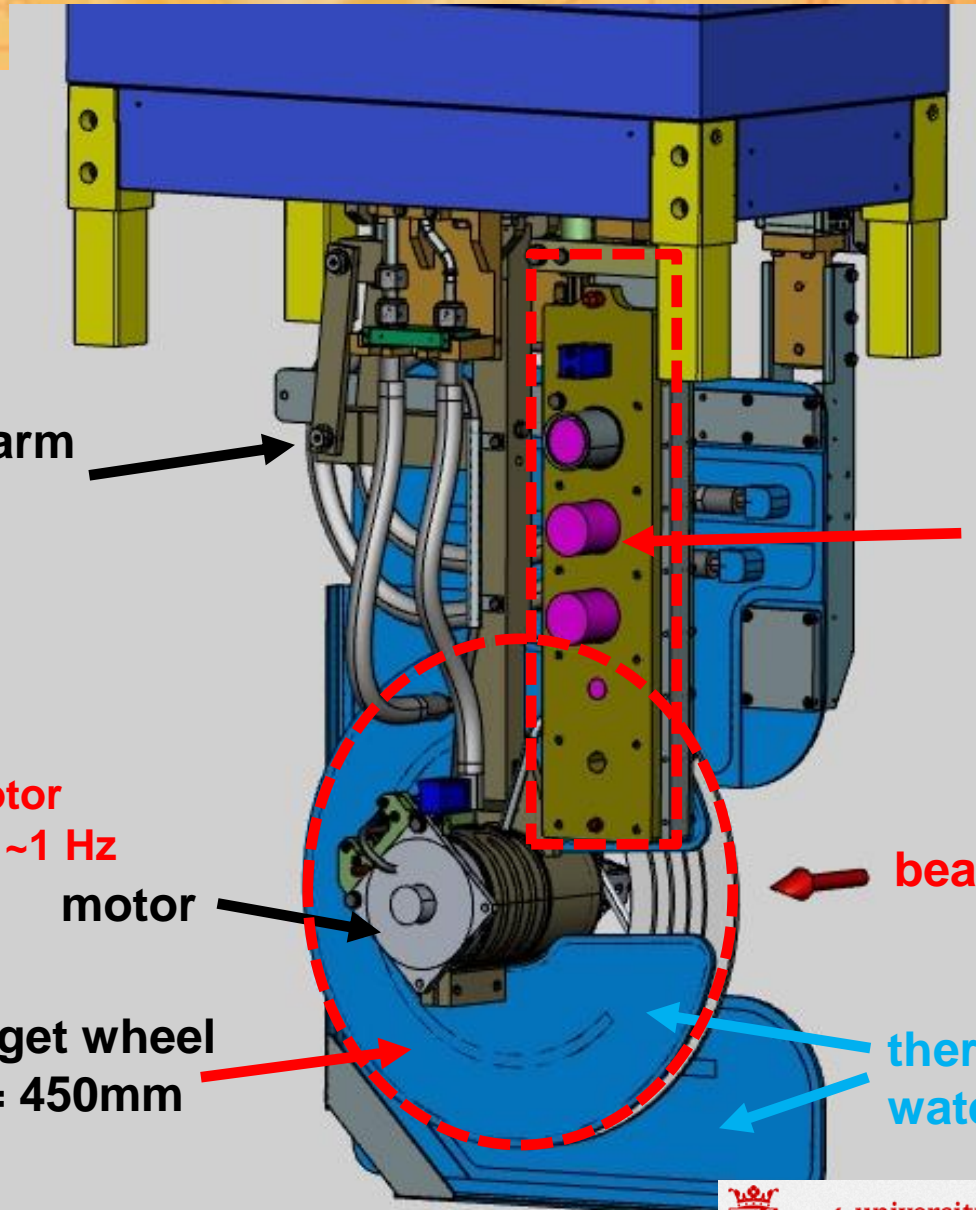
beam



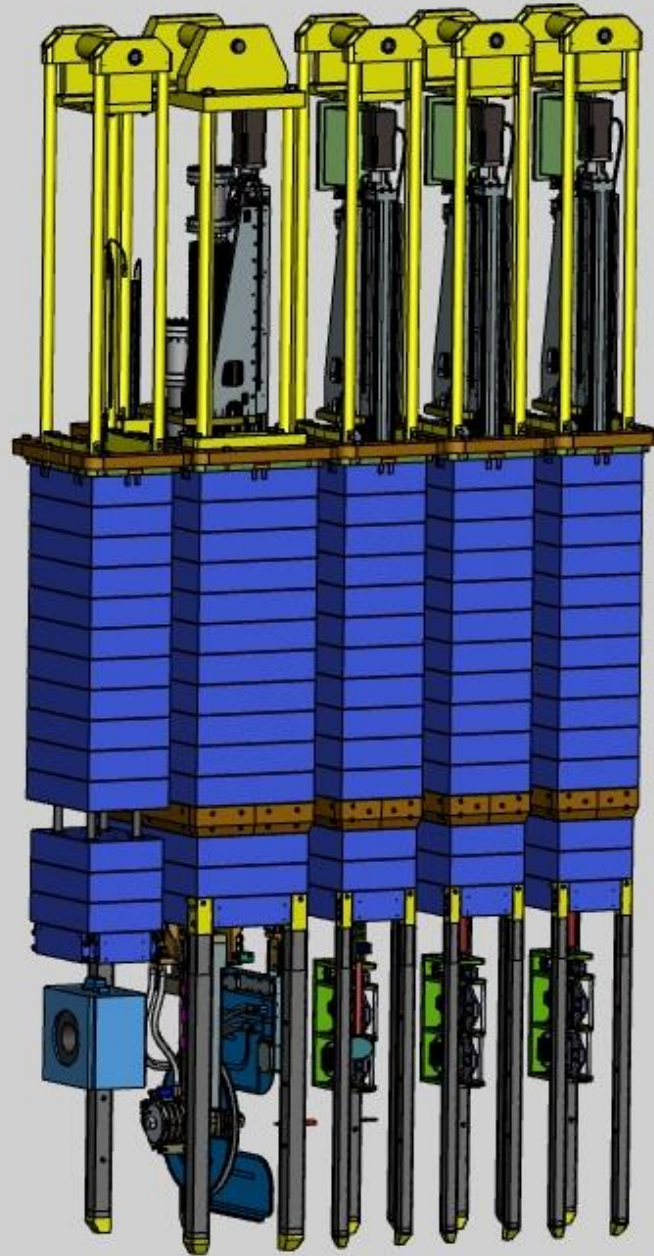
target wheel
d = 450mm



thermal shields
water cooled

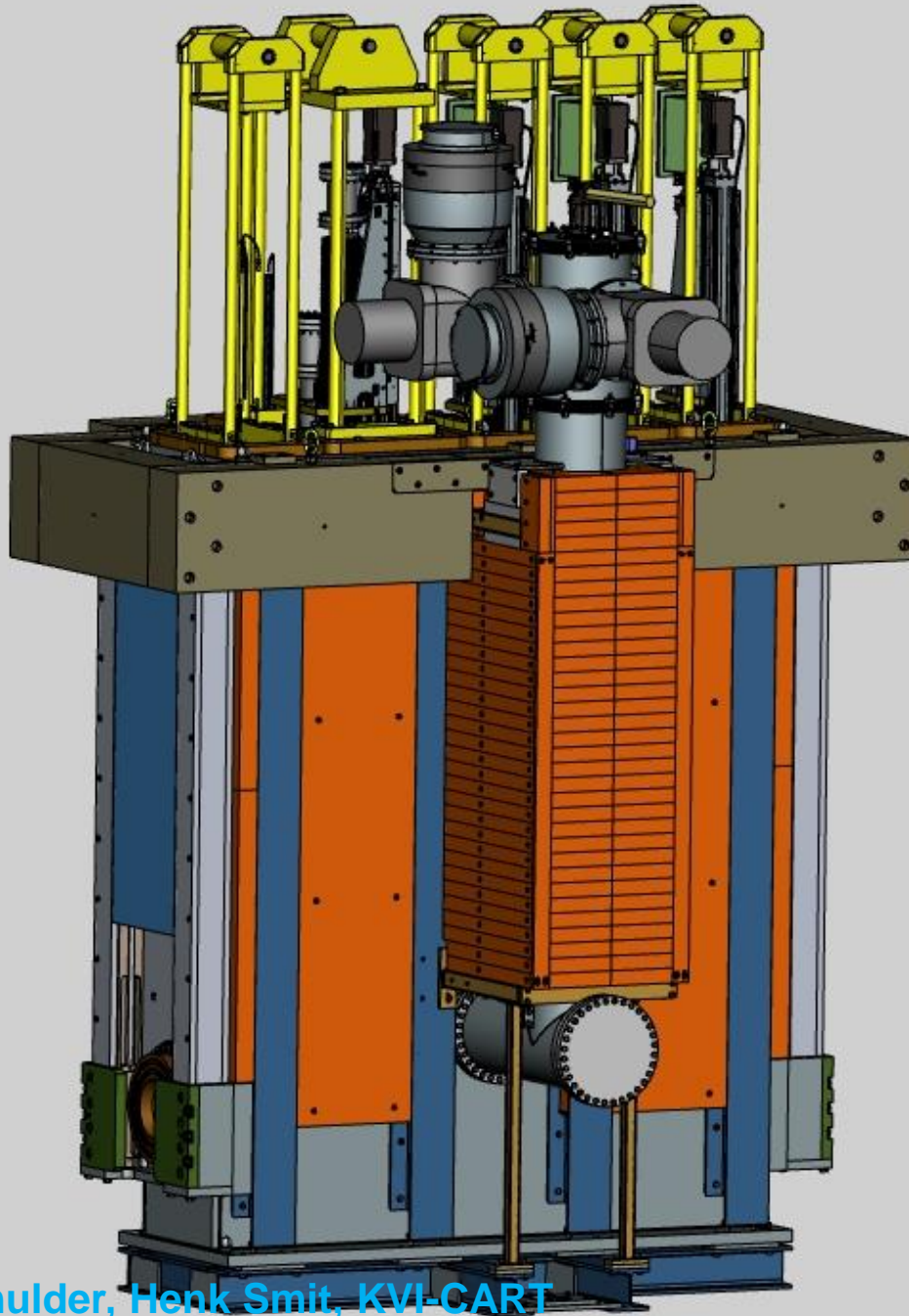


Target Chamber



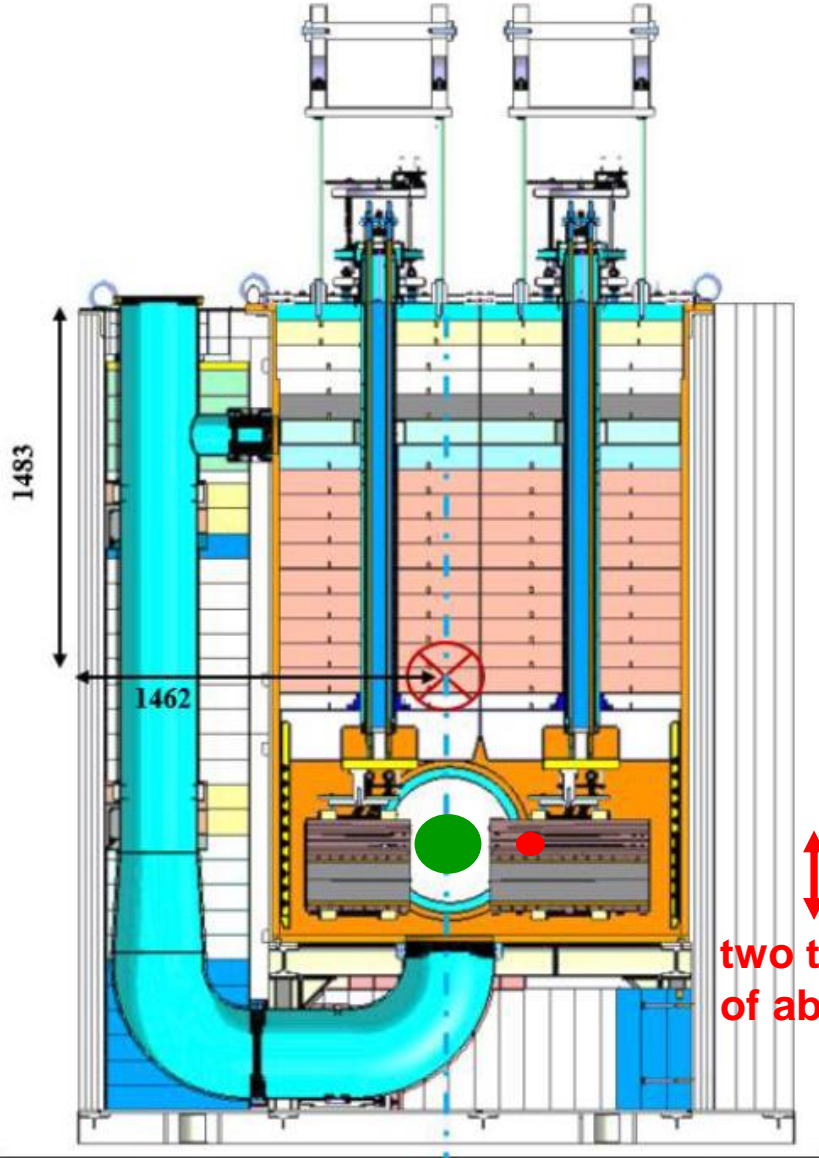
**target plug
+ collimator
+ detectors
+ chamber
+ pumps and
shielding**

Target Chamber

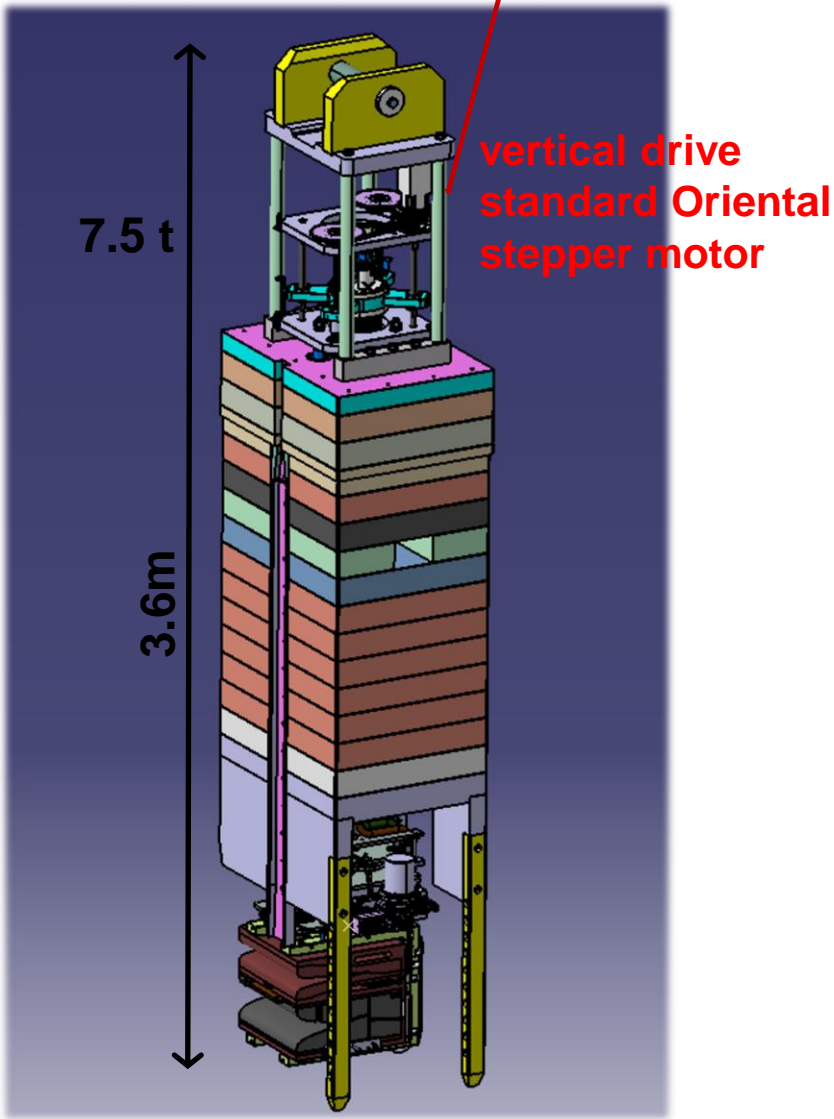


**target plug
+ collimator
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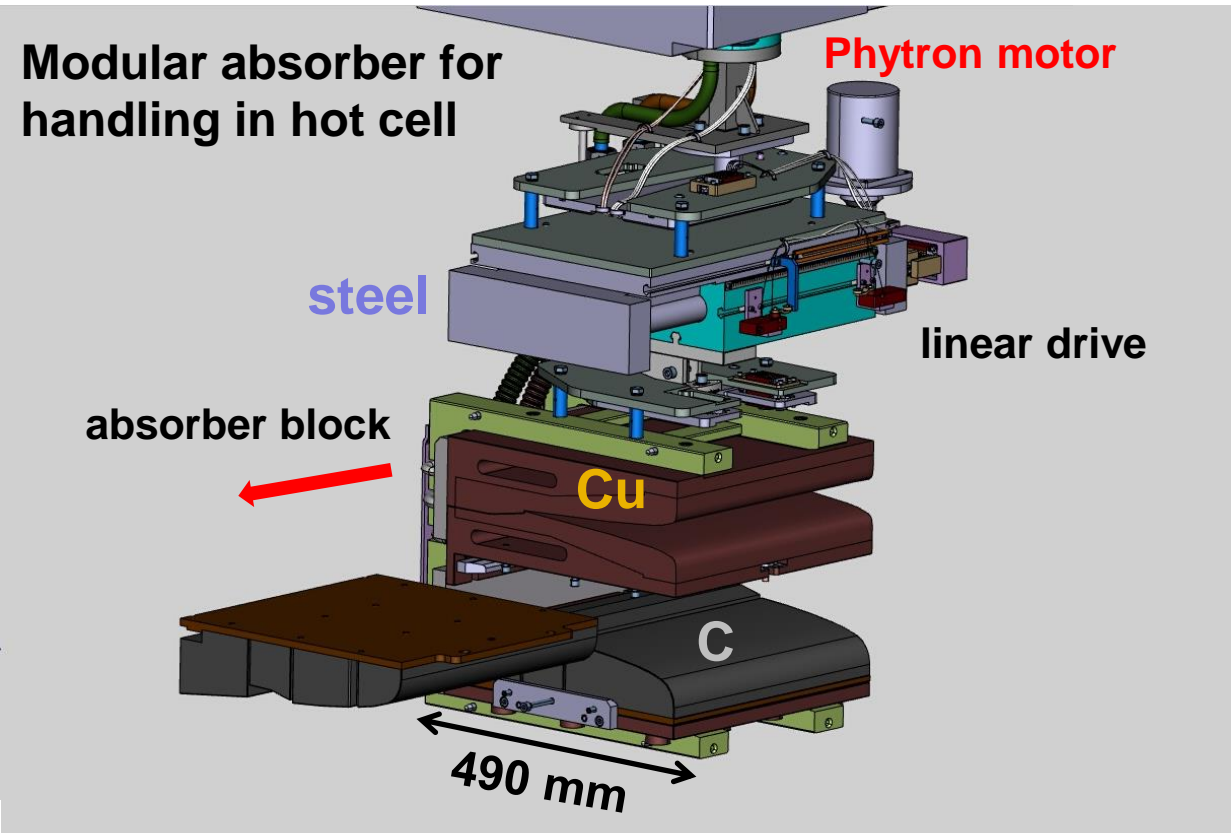
Beam Catchers



↕
two types
of absorbers



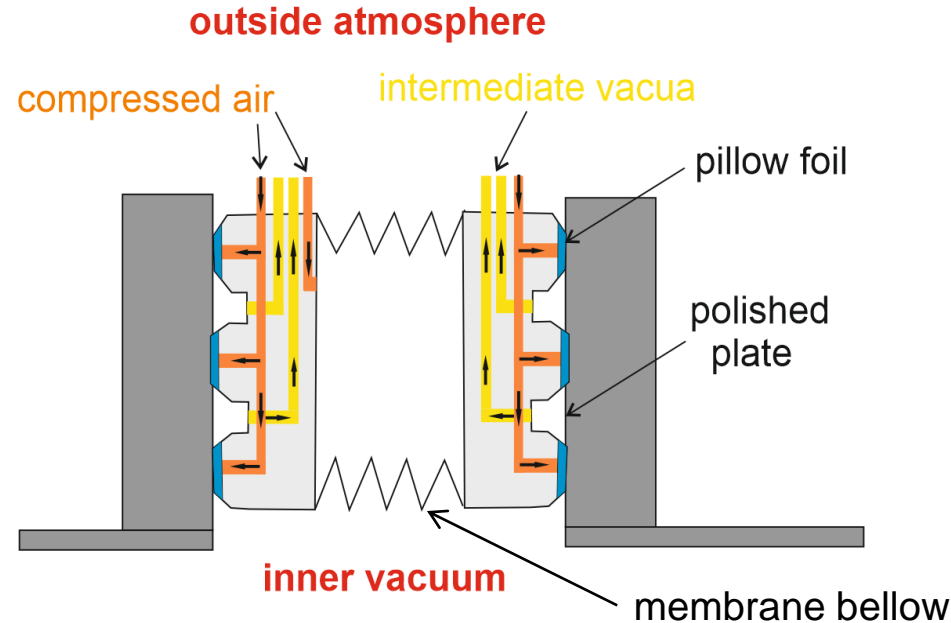
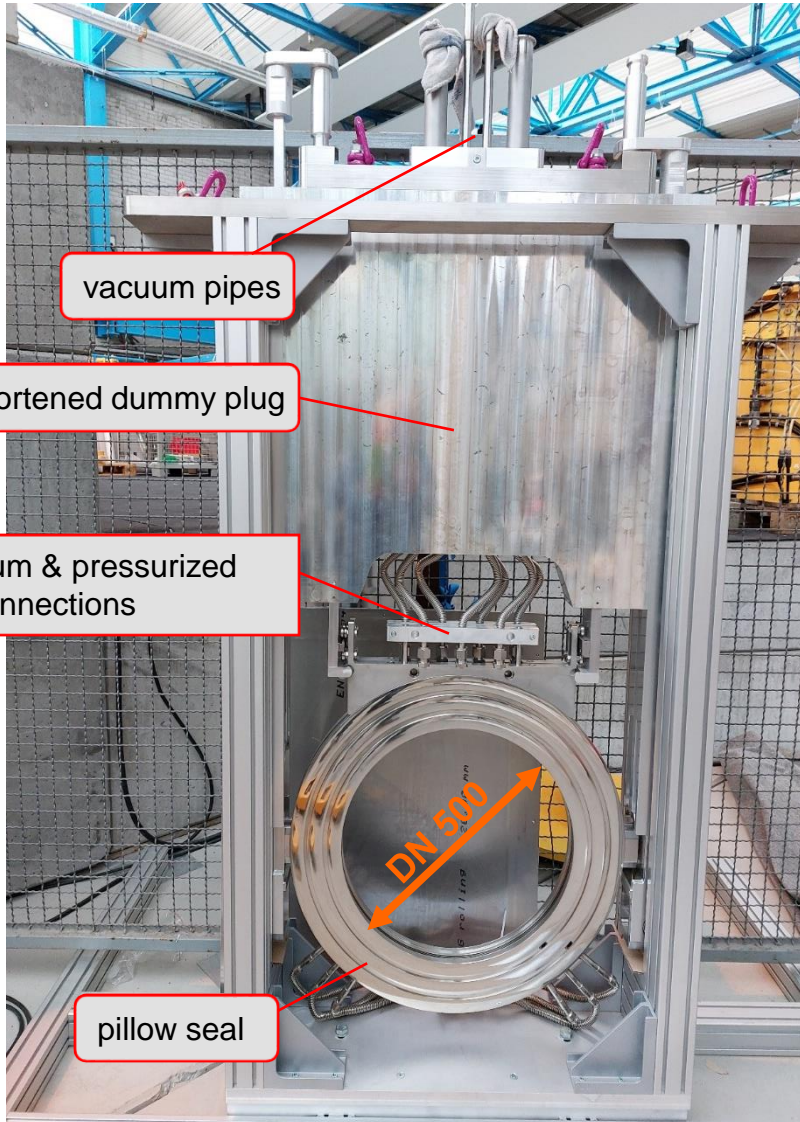
Movable Beam Absorber on BC3



- 2x radiation hard stepper motors in vacuum
- temperature sensors

handling test setup

Pillow Seals



He leak rate $\sim 5e-8$ mbar l/s

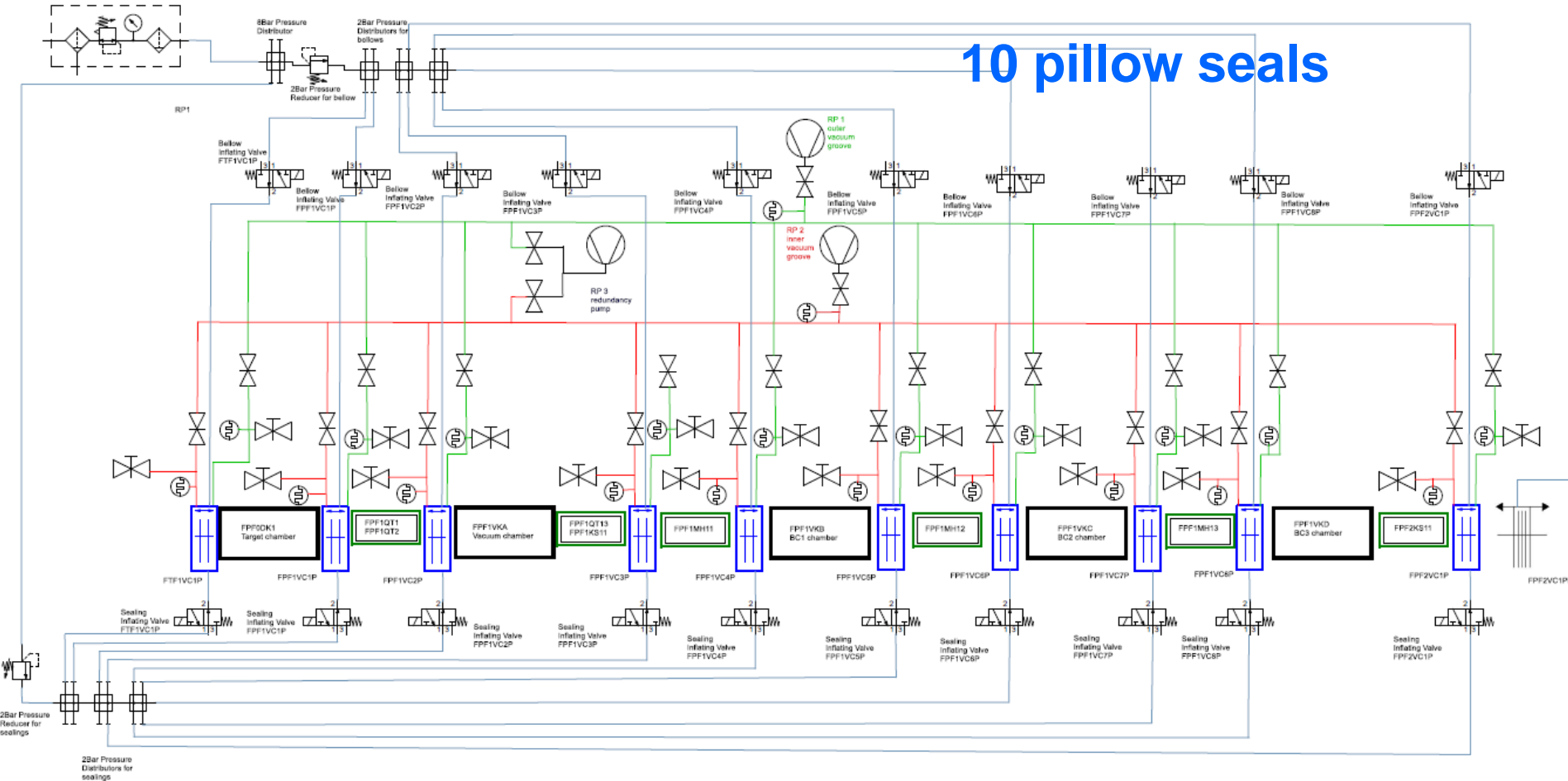
P = 1.5 - 2 bar overpressure
F = 59 kN with 2 bar (large area)
pressure must never be higher,
and must not go to zero.

Intermediate vacuum by roughing pump,
should always run.

Pillow Seal Vacuum / Pressure Controls



10 pillow seals

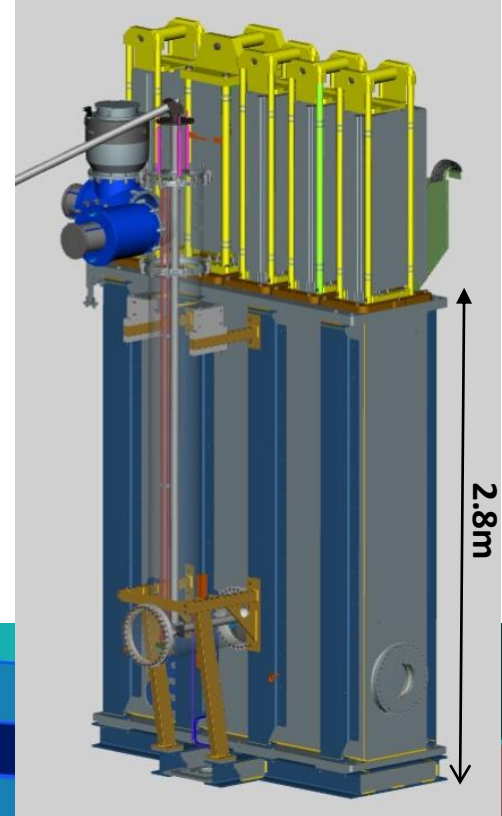
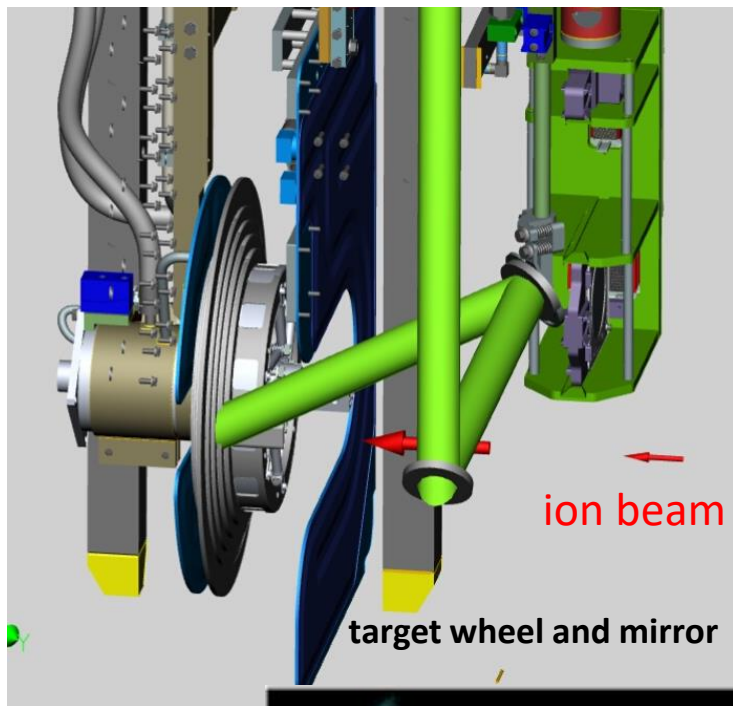


Standard industrial parts, but system not constructed yet.

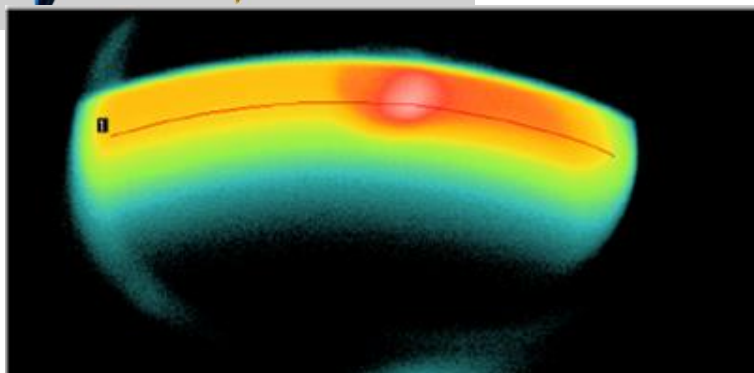
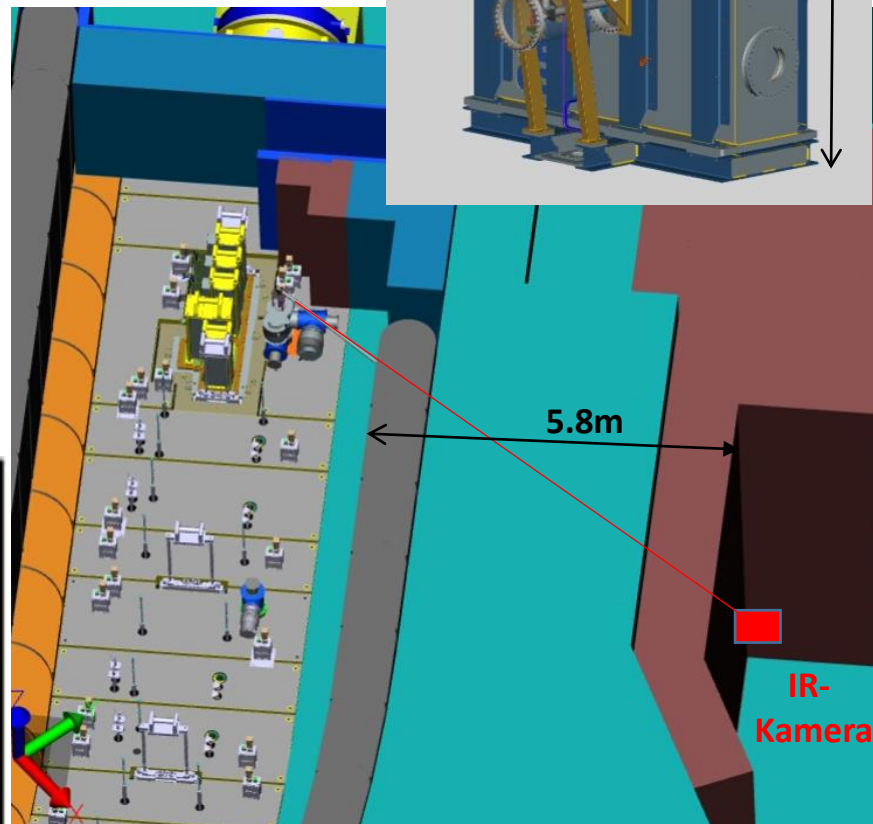
Target Monitoring

- motor current
- hot beam spot
- drives in beam

→ interlocks,
→ setting protection

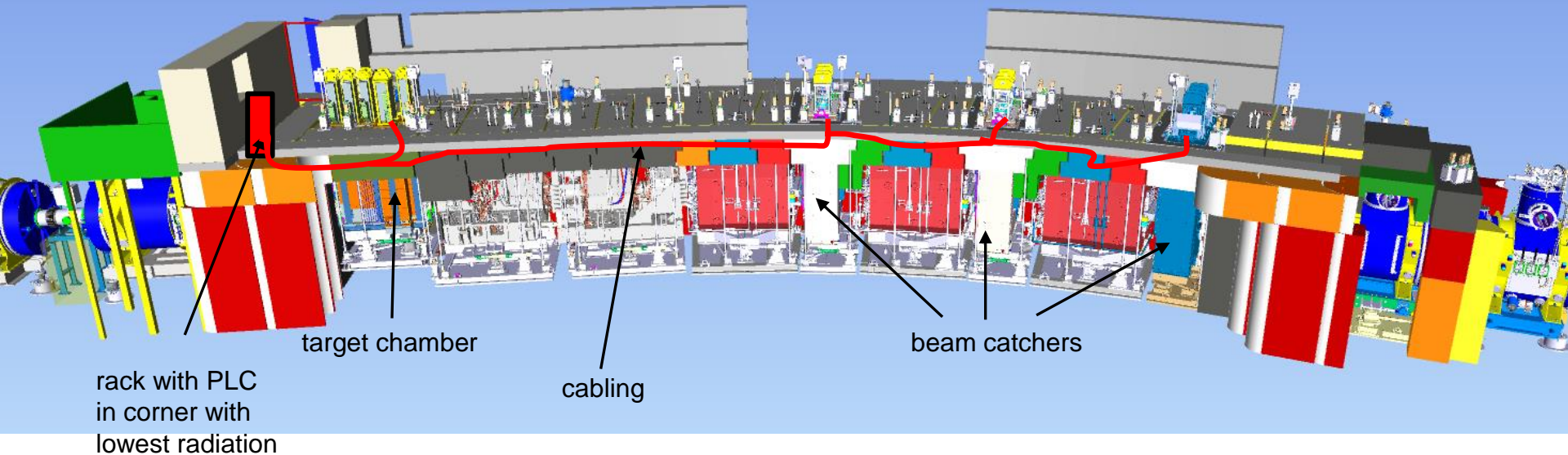


Chamber with mirrors
in pumping duct and
camera behind wall



IR camera
measurement
on FRIB target
[W. Mittig]

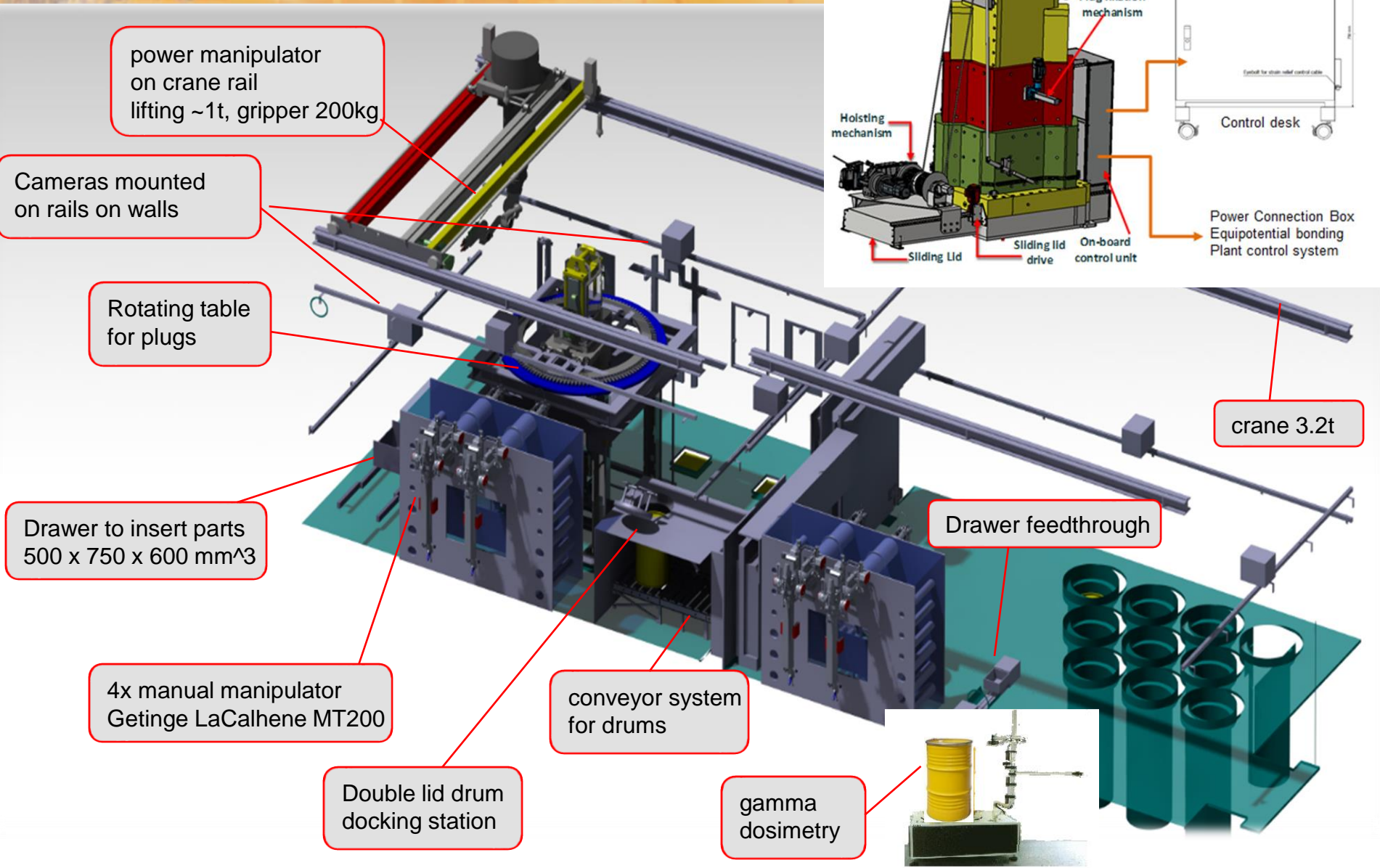
Local Controls Interface



Interface to ACC and Vacuum controls
for Phytron motors under development by COSYLAB,
same needed for pressure controls of pillow seals.

**Cooling water also needs monitoring
flow meter at exit to each distribution column.**

Equipment in Hot Cells



power manipulator
on crane rail
lifting ~1t, gripper 200kg

Cameras mounted
on rails on walls

Rotating table
for plugs

Drawer to insert parts
500 x 750 x 600 mm³

4x manual manipulator
Getinge LaCalhene MT200

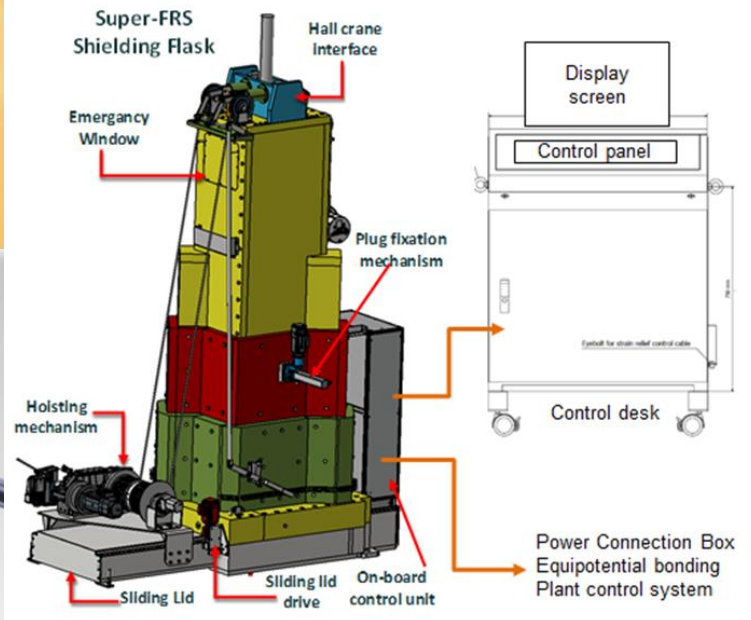
Double lid drum
docking station

conveyor system
for drums

gamma
dosimetry

crane 3.2t

Drawer feedthrough



Super-FRS
Shielding Flask

Hall crane
Interface

Emergency
Window

Plug fixation
mechanism

Display
screen

Control panel

Hoisting
mechanism

Control desk

Sliding Lid

Sliding lid
drive

On-board
control unit

Power Connection Box
Equipotential bonding
Plant control system

Hot Cell so far



3 doors



2 window frames



roof covers



feedthrough drawers

Building controls:
Door motors + controls, safety switches
(Dockendorff)
smoke detectors, theft protection alarm

**Crane, power manipulators missing,
will come with independent controls**