

VELO UPGRADE MECHANICS MINUTES

Attendees: Freek, Wolfgang , Karlis, Kieran, Vinicius, Oscar, Claudia, Kazu

ACTION LIST

- No actions listed

DISCUSSION

I.1 METROLOGY

Vinicius and Kayleigh are still working on the measurements with the photogrammetry method using a few modules already at LIV, to understand what precision can be achieved on the different axes.

Alternative metrology method (Raphs idea) including costing has started to be followed up in parallel.

Karlis: To be re-discussed in 2 weeks

I.2 MEASUREMENT OF THE FOIL – DUMMY MODULE DISTANCE AT FOIL REPLACEMENT

Freek explained, that Pascal has now an etched and Torlon coated half box, to try to do measurements this week with a laser scanner. We will try to get a precision of better 200mu to see if the box is deformed.

Paula is looking with a different metrology group at CERN into another measurement setup.

Marco agreed to work on the beep-model, which may be used for the moment of RF foil replacement. This is very tight, as the basic alignment frame (dummy base) has to be adapted, Kazu may find a way of using a machine for those adapted pieces in AMS. Stp file of the alignment frame changes should be send to Marco.

I.3 PT100 CABLE ROUTING INSIDE SECONDARY VAC

Kieran proposes to use the cable Allectra 301-KAP-RIB4-300M: KAPTON RIBBON CABLE, 7x0.12mm, 4 WIRES, TYPE 'KAP301' (= RADIATION RESISTANT) (from Quote #75673 see 6 weeks indico).

PCB production on both ends of these cables should be now launched (Edgar)

Peek cable constraint pieces for the new routing of the cables are in production.

SMDX pt100 sensors are now envisaged.

Tefzel cable ties to be ordered soon (delivery time)

We need to define as well the base heating power cables. Sasha is proposing the Allectra 301-KAPM-200 cable with an outer dia of 2.15mm

Pt100 at foil has been ordered, position and number (now 4 per side) are attached at indico page (Kazu).

1.4 PT100 POSITIONING AT ISOLATION VAC

Allectra 301-KAPM-060-PAIR1-100M is proposed to be used (listed at same quote as above). Length of ordered cable to be determined.

On the 3rd feedthrough now 10 pins are still free to be used, Proposal: 2 pt100s on pressurized air capillaries (one at first line, second at last line). 1 pt100 on one capillary arriving at one expansion volume, 1 redundant pt100 at output manifold, 1 pt100 flying in the air. The number of pt100s in tertiary vacuum from Kieran does not correspond to Wolfgang's number! Kieran to revise.

SMDX pt100 envisaged.

1.5 EXPANSION VOLUME, FILLER INSIDE THE EMPTY VALVE VOLUME

Input safety valve of C-side (and likely output safety valve for A-side) is not installed in the orientation as we would have liked to minimize CO₂ leakage volume in case of accident. This would increase the liquid volume of CO₂ substantially which has severe consequences for possible transfer of CO₂ into prim vac.

Kieran has sent a prototype of his new design for the filler to CERN. A spring which will prevent that filler is moving during flow. Checks at CERN are ongoing. Material of the spring (17-7 PH) to be checked to be used 10 years in CO₂ (Wolfgang will ask Bart). Some Mangan is part of this stainless steel. Kieran will check if the spring is magnetic.

Rupture disk was sent to LIV to use first at LIV at longest line before mounting this expansion volume a safety valve/rupture disk of ~100bar to doublecheck.

The expansion volumes pieces (6,5ml) have been ordered.

1.6 BASE METROLOGY AT LIV

John presented last time measurements for the C-side base (see slides). He was asked to produce a plot with x (slot number) and y (distance between tip of a perfect module to a perfect foil position) with this base to see deviation from the 890μm nominal distance. Then we could choose for installation shorter modules where the margin is smaller etc.. John promised to do this in the coming weeks at least for the 4 worst slots.

A-side metrology later. Comparison of Oxford to LIV metrology needed.

1.7 OTHER BUSINESS

Should continue to think about a mech system to insert whole VELO detector with a preset offset to nominal (shimming is a possibility) to have more flexibility for foil-module distance.

UT pipe oxidation issue should be followed up including VELO participation since the CO₂ is shared in between us.

The topic “VELO feedthroughs” was not discussed due to the absence of John and Raphael.

Raph showed the almost final design (pumps, valves etc) of the tertiary vac system outside of this volume and the pressurized air distribution system for the safety valves. CAD should be sent to Kieran in 1-2 weeks.