

VELO UPGRADE MECHANICS MINUTES

Attendees: Freek, Raphael, Wolfgang, John, Karlis, Kieran, Vinicius, Edgar, Oscar, Claudia

ACTION LIST

- No actions listed

DISCUSSION

1.1 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) has started to be followed up in parallel.

No news this week, likely next week!

1.2 MEASUREMENT OF THE FOIL – DUMMY MODULE DISTANCE AT FOIL REPLACEMENT

Following an email from Marco, not only 2 bares have to be modified, but also the basic alignment frame (dummy base) has to be adapted to the new modules. Needed for beginning of December at latest! Will be tight!

LIV has no personnel to work on the beep-model.

An alternative using e.g. a laser is now envisaged, Kazu should send a half-box to CERN to test this idea. Freek contacted Pascal Saintvitu for using a new laser scanner with a precision of $\sim 100\mu$, we could use for this the half-box or AI after finishing the NEG coating trial (not before end of next week!). Question is the reflexivity of the etched/torlon coated Al.

1.3 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.

The alternative plan with different routing is now the standard, reduces cables cost down to 1500 pounds. Intermediate Tefzel cable ties plus a change in the peak cable constraint piece are needed.

Allectra offers as well pt100s, heat-shrinks etc. to be considered to buy all there.

The cable for pt100 foil cabling is under discussion (4 or 2 wire r/o) and pt100 base heating T-measurement needs to be as well identified.

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

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!

Pt100 to pipes fixation again under discussion: clamped or glued. Pt100 sensors could be ordered from Allectra. Oscar sends the pt100 type offer which they are using (SMDX) to Kieran.

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. # design have been discussed.

Kieran has send 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 (17H) to be checked.

CERN has a rupture disk, which should be sent to LIV (Oscar) to use first at LIV at longest line before mounting this expansion volume a safety valve/rupture disk of ~100bar to doublecheck.

1.6 VELO DETECTOR INSTALLATION ISSUES

The crane has to lift up higher the trolleys than before since trolleys have been changed and are no larger (tertiary vac, etc.). Needs to be checked on both sides. -> Something has to be changed at the VELO surroundings: Now Problem solved!

1.7 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 890mu 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.

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

I.8 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.

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.