

Radiation tests by AT/VAC

Purpose:

To test the radiation resistance of a Pfeiffer TCP 350 turbo pump controller (hereafter controller).

The installed equipment is:

One Pfeiffer turbo pump equipped with a Pfeiffer penning gauge and a primary pump, the controller (to be tested) is connected to the turbo pump.

The equipment was installed on Tuesday 9/10 and controlled to work correct, the first beam/radiations arrived on Thursday 11/10 and very shortly after the controller stopped working and sent us an error status back, no remote reset or stop - start commands worked on the controller, during the next week the error status disappeared (no signal at all returned).

Thanks to gauge readings we can conclude that the penning gauge and the primary pump continued working.

On Monday 20/10 we accessed the radiation test facility and noticed that the controller was stopped with error E037 -> "Error in motor stage or control, please inform Pfeiffer vacuum service".

After an OFF - ON the controller reset the error and we started it remotely, the controller accelerated the turbo pump to 500 Hz (it was programmed to continue to 1000 Hz) then it didn't deliver any more accelerating power (0 Amp) but kept on running without any error.

We noticed that the error status still didn't work that the speed indication didn't return any value and that the nominal speed indication didn't work.

We noticed that it was possible to get into the controllers program mode and change certain settings.

We connected a new controller to the turbo pump and noticed that the turbo pump accelerated correctly to 1000Hz and that all status and speed indications worked.

The allowed time of intervention in the experimental zone is limited.

It was decided not to leave the new controller in the radiation zone and we changed the experiment to a test of the turbo pump.

The turbo pump was left in the maximum radiation and the rest of the equipment was pulled as far back as possible we will now come back when the beam/radiations is over and test in a similar way if the turbo pump is still working.

The "broken" controller was brought out of the zone by the radio protection and will reside in their decontamination lab until it can be taken to our normal lab for further examinations by us/Pfeiffer.

Interventions by Jan + Henrik