Status of the $\overline{\text{P}}$ANDA Cluster-Jet Target and its Spherical Joint

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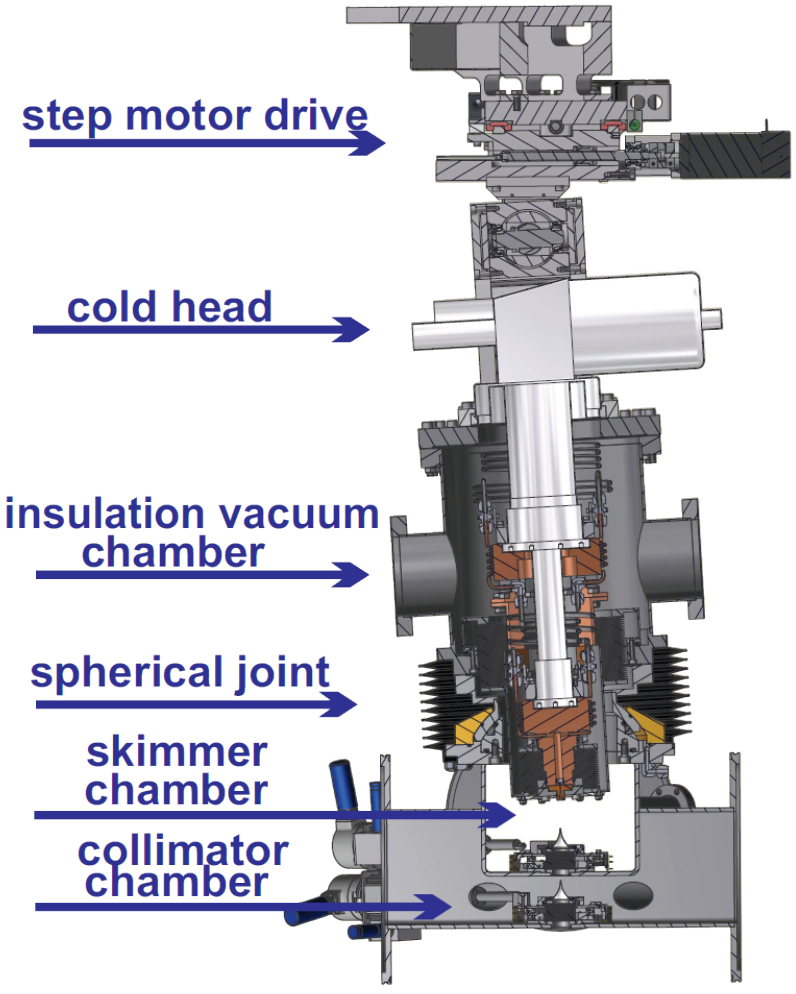
Cross Tables of Spherical Joint

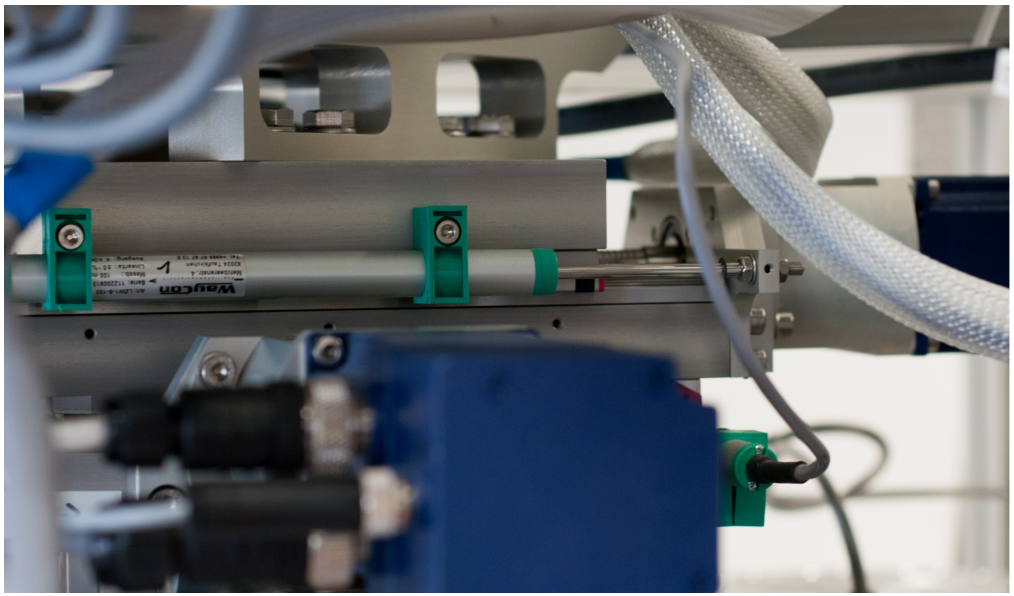
Target Positioning

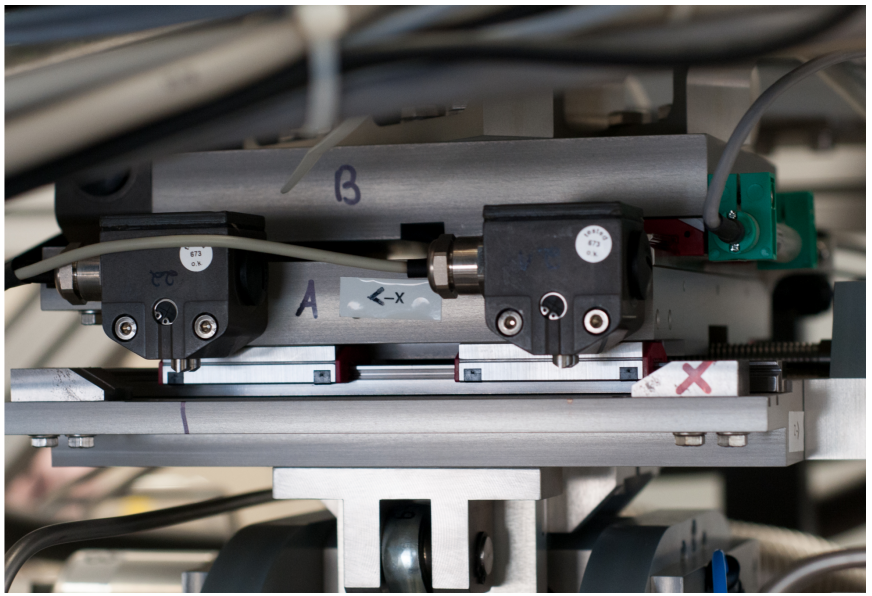


- Completely ready for operation.
- Stepper motors using full step operation mode.
  - 100 Steps = 1 mm
  - Mean error per step 0.03 mm given by axial play.
  - Uncertainties of rotation encoder are 2 steps.
- Maximal tilting angle of spherical joint is 3.5°.
- Minimal tilting angle resolution of spherical joint is 0.006°.

Linear Potentiometer

Target Positioning

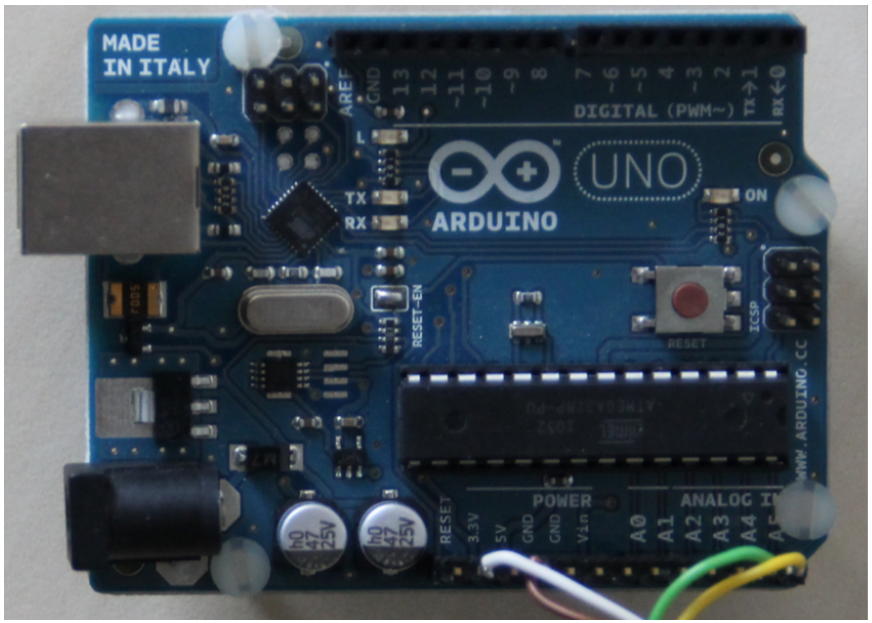


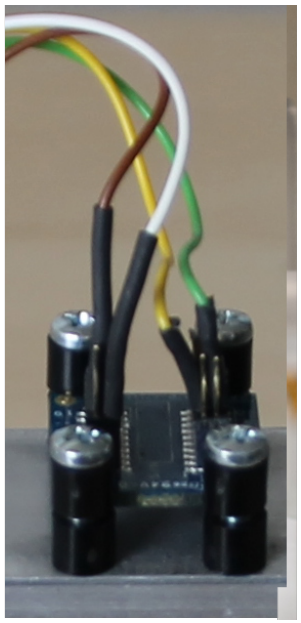


- Metering of absolute position of current cross table position is done by a linear potentiometer of type LZW1 by WayCon on each axis.
- Measured position by potentiometers are normal distributed around set point with a FWHM of 5 steps.

Level

Target Positioning

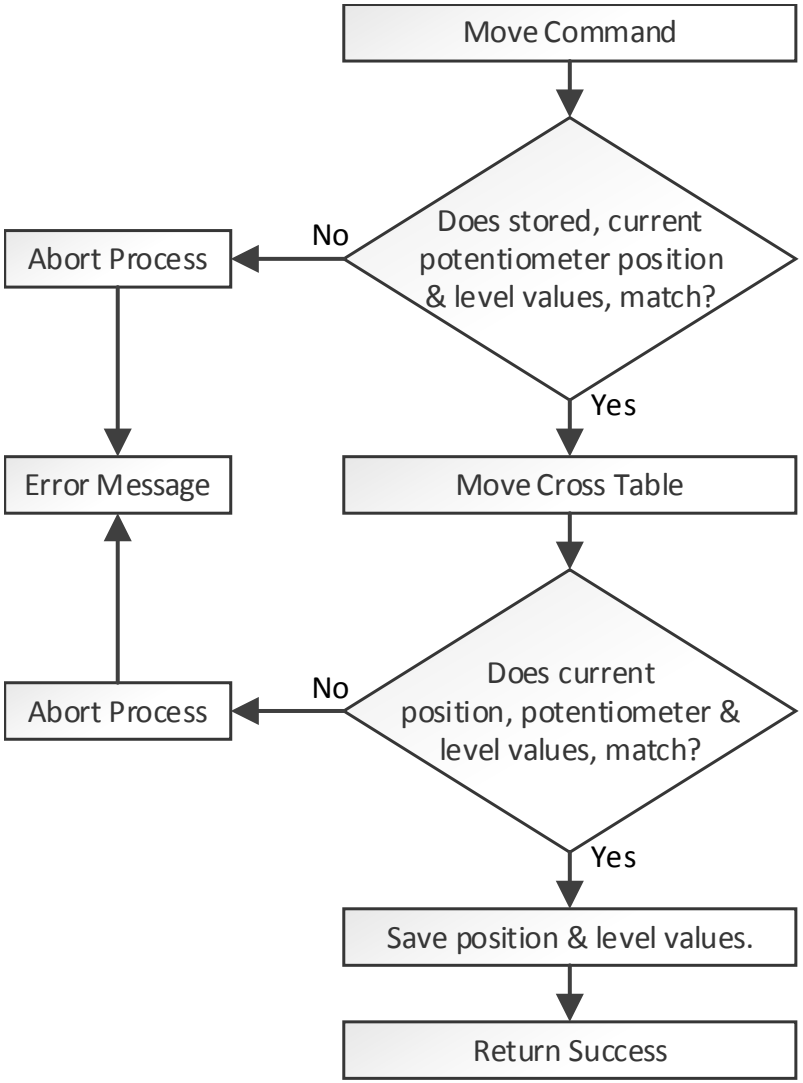





- Second control measuring position is done by an electronic level using an ARDUINO UNO and a digital accelerometer.
- Uncertainty of $\pm 0.04°$ which equals 50 steps.

Movement of Cross Table

Target Positioning



Only for test operation. Not forseen for the target slow control.

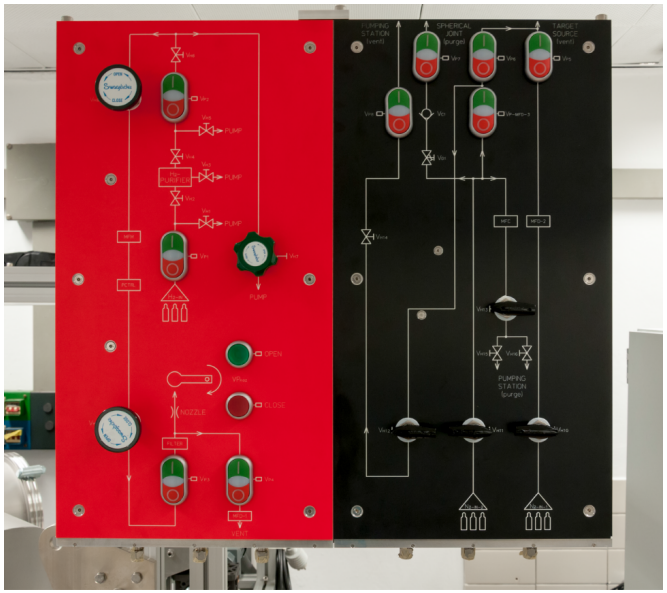
Movement of Cross Table

Target Positioning

Press here to play...

Next Steps

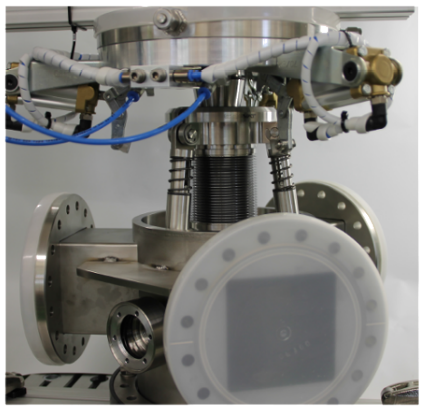
Cluster Target Setup

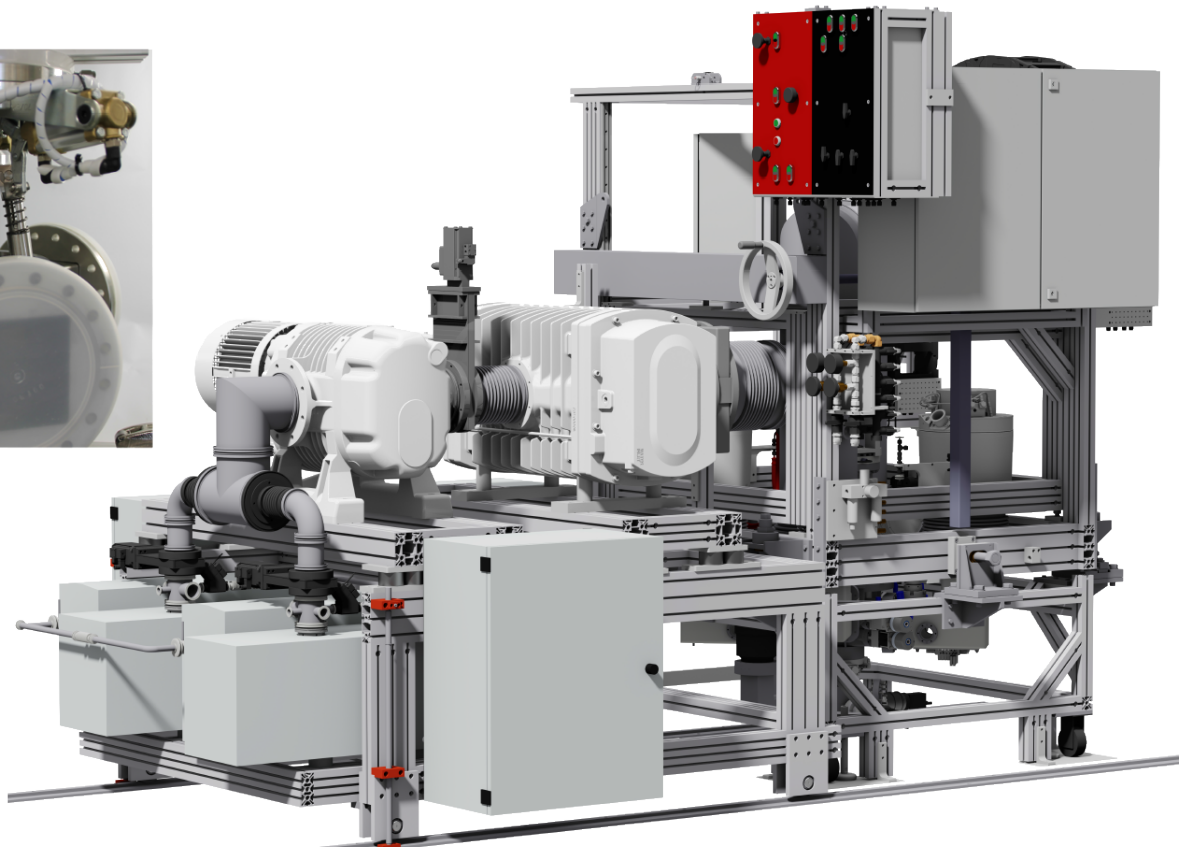


- ☑ Hydrogen purifier and gas modules operable.
  - Wiring needs to be done.
- Mounting, wiring and electrical installation of skimmer/collimator xy-tables.
  - Integration into (temporary) slow control system for testing/measurements.
- Installation of control cabinet with PLC (Programmable Logic Controller).

Next Steps

Cluster Target Setup





- Installation of transition vacuum chamber and snap connectors.
- Integration of the final pumping station with the cluster source.
- Setup of scattering chamber, beam dump and vertical beam pipe.

Investigations and Tests

Cluster Target Setup

- Tests of:
  - vacuum,
  - mounting system,
  - gas supply requirement,
  - long term beam stability tests,
  - different Laval nozzles.
- Investigation of the best skimmer, collimator and spherical joint position.
- Determination of the maximal target thickness.