

PETER

SPM Design Report

13.06.2018

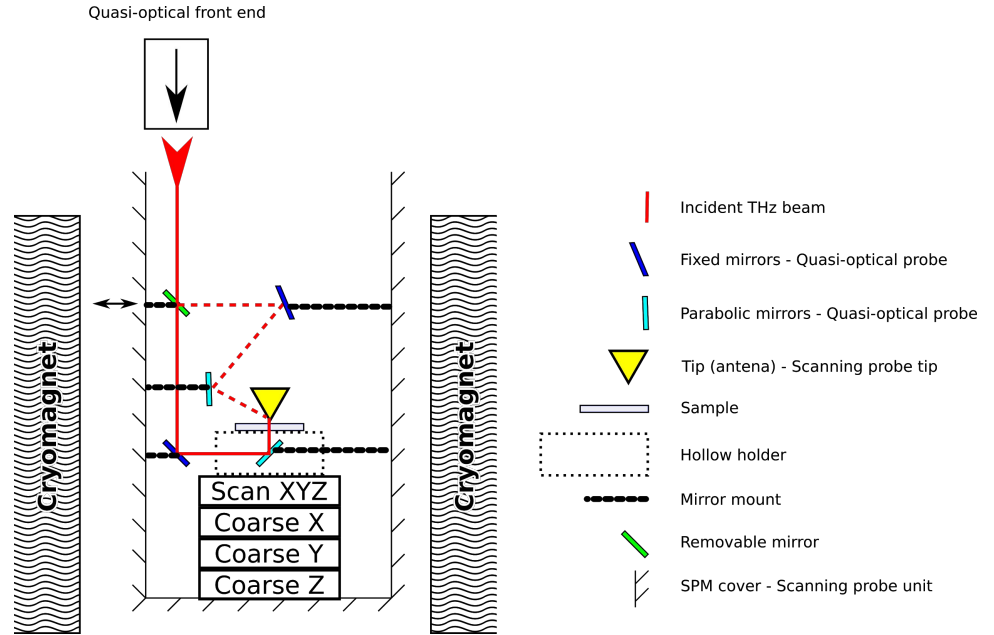
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Concept

- Cryomagnet
- Quasi-optical front end

- **Scanning probe unit**

- Quasi optical probe
- Scanning probe tip

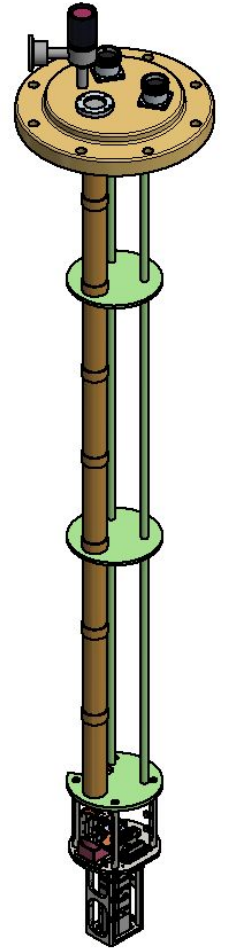
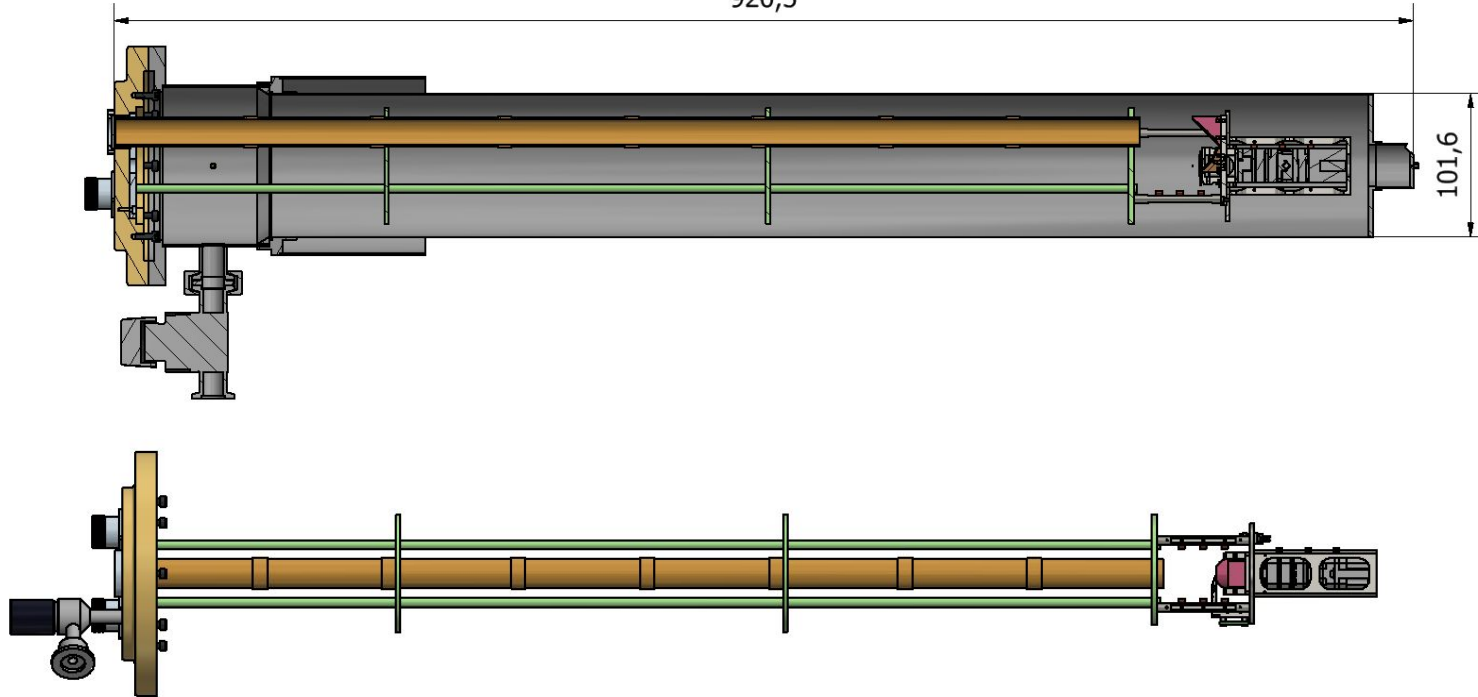


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Overview

920,5

101,6



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Positioners selection

Scanner

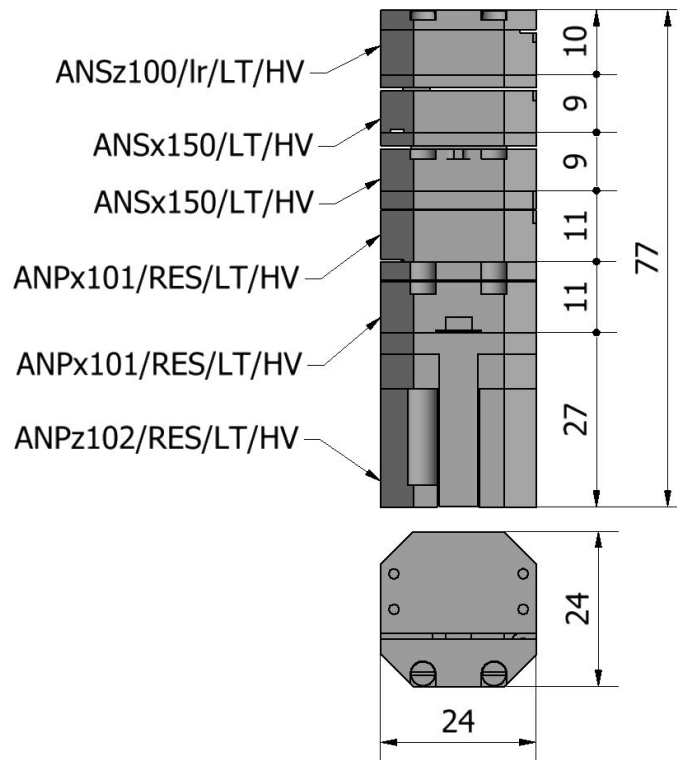
- ANSx150/LT/HV (2 pcs) - 80 μm @ 300 K, 125 μm @ 4 K
- ANSz100/lr/LT/HV (1 pcs) - 50 μm @ 300 K, 30 μm @ 4 K

Coarse positioners

- ANPx101/RES/LT/HV (2 pcs)
- ANPz102/RES/LT/HV (1 pcs)
- temperature 1 K - 300 K
- minimum pressure $1\text{e-}8$ mbar
- magnetic field 0 T - 31 T

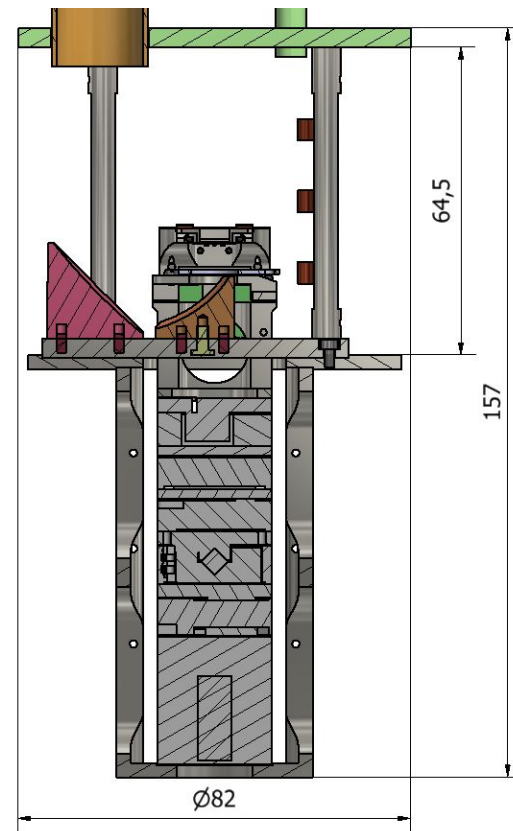
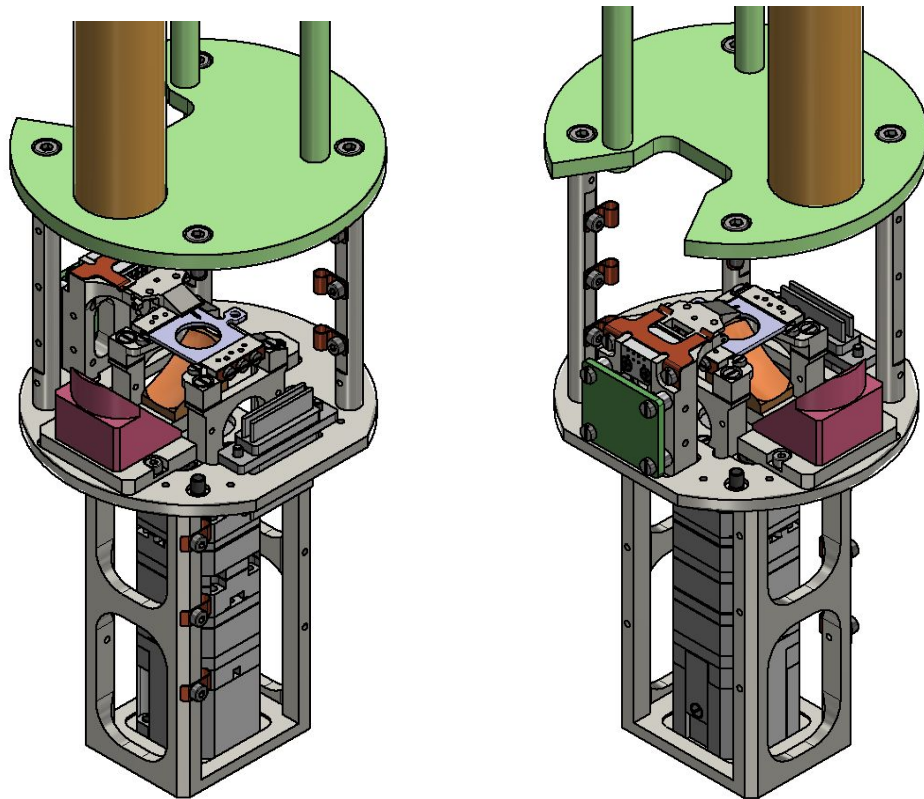
Coarse positioners controller

- closed-loop positioners controller ANC350/RES (1 pcs)



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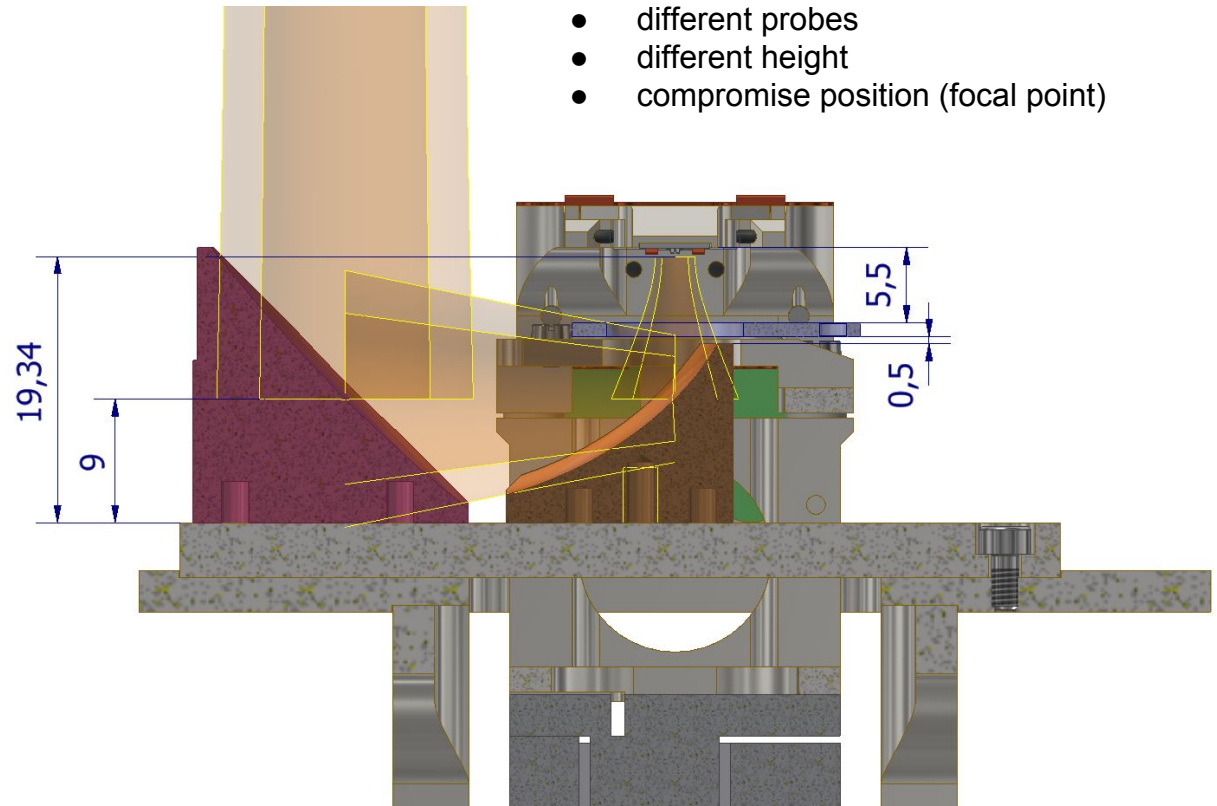
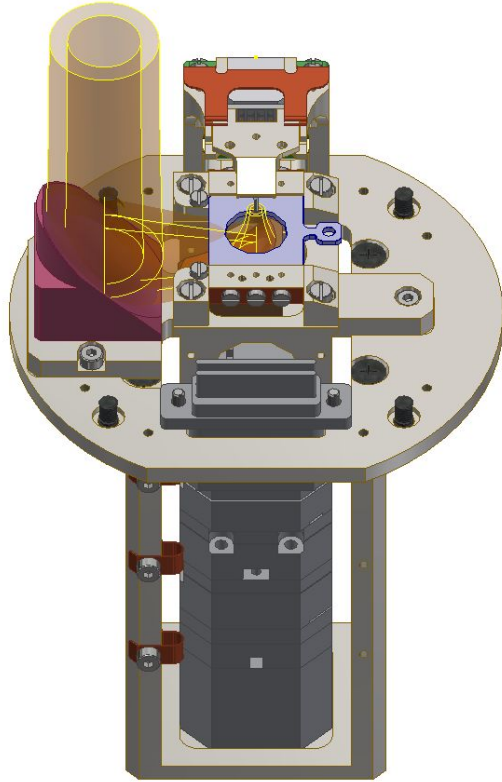
SPM mechanical design



- space for mirrors

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SPM mechanical design



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Connectors

CMR-Direct

- 25-way Microminiature-D
- cryogenic use



Molex

- Pico-Clasp type connectors
- wire to board multipin connector



Standard D-Sub connectors

- 25-way D-Sub connectors



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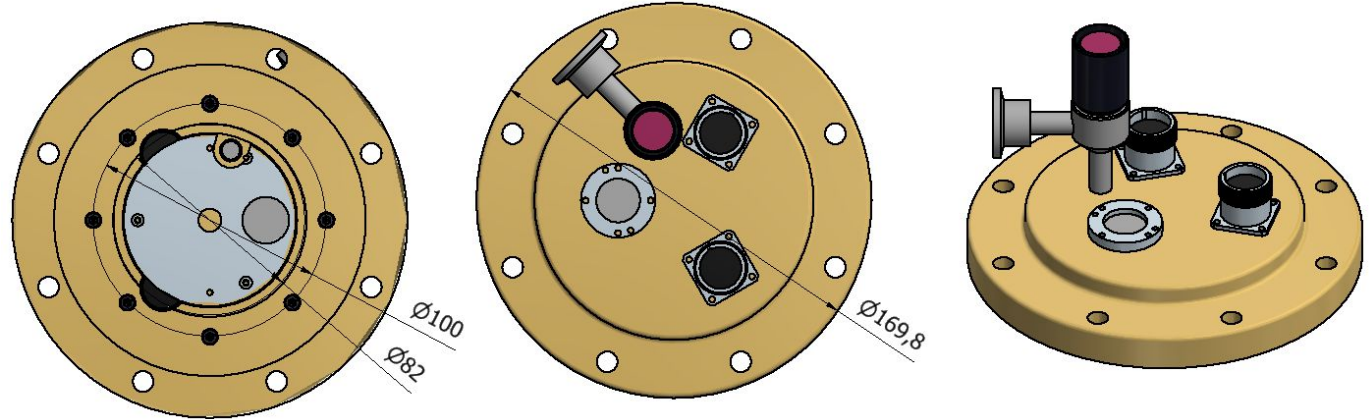
Flange

Available ports/space

Adaptor (plus KF flange)/welded connector

2x D-Sub 25 way

- 2x KF63 flange (one connector each)
- 1x KF100 flange (with both connectors)

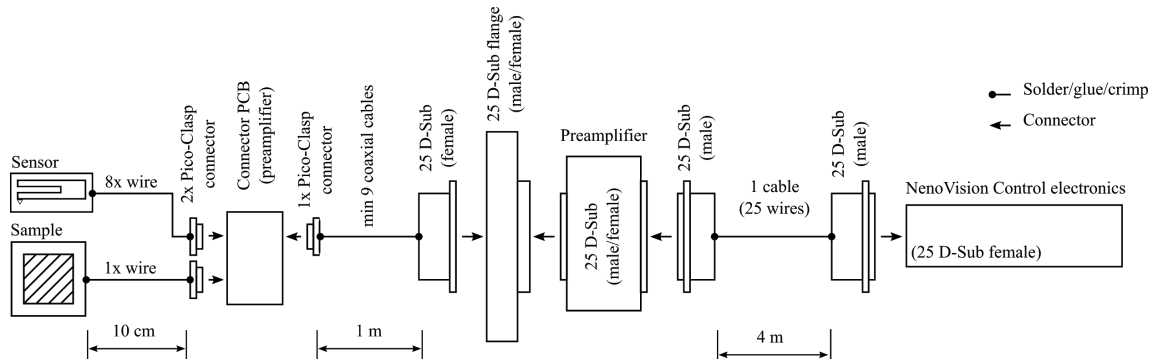


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Electronic/cable management

Motors

- ANPx101/LT/HV – 5 wires (10 wires total)
- ANPz101/LT/HV – 5 wires
- ANSx150/LT/HV – 2 wires (4 wires total)
- ANSz100/LT/HV – 2 wires

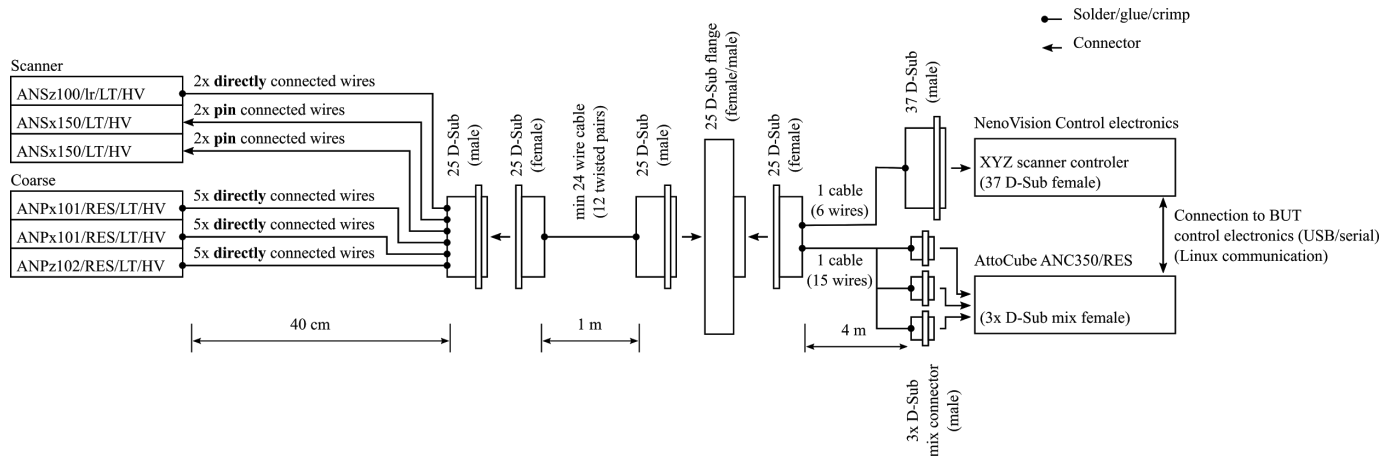


Sensor

- min 8 coaxial cables

Sample

- 1 coaxial cable



Total: 30 wires/cables

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Control electronics

NenoVision - NenoBox

- PLL frequency up to 75 kHz
- software NenoView
- output signal for three axis scanner (± 200 V)
- compatibility with ANC350
- 5 external inputs
- possibility of connection external lock-in/PLL



AttoCube ANC350/RES

- three axis piezo controller
- closed loop coarse positioners

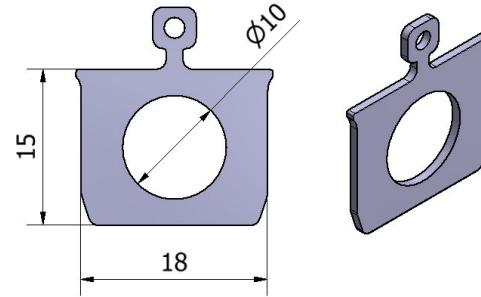


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Sample holder, probe holder

Sample holder

- standard SHOM sample holder



Probe holder

- universal probe holder
- tuning fork based probes
- piezoresistive probe types

