

A model to investigate the urinary bladder's thermal behavior during transurethral resection of prostate tissue

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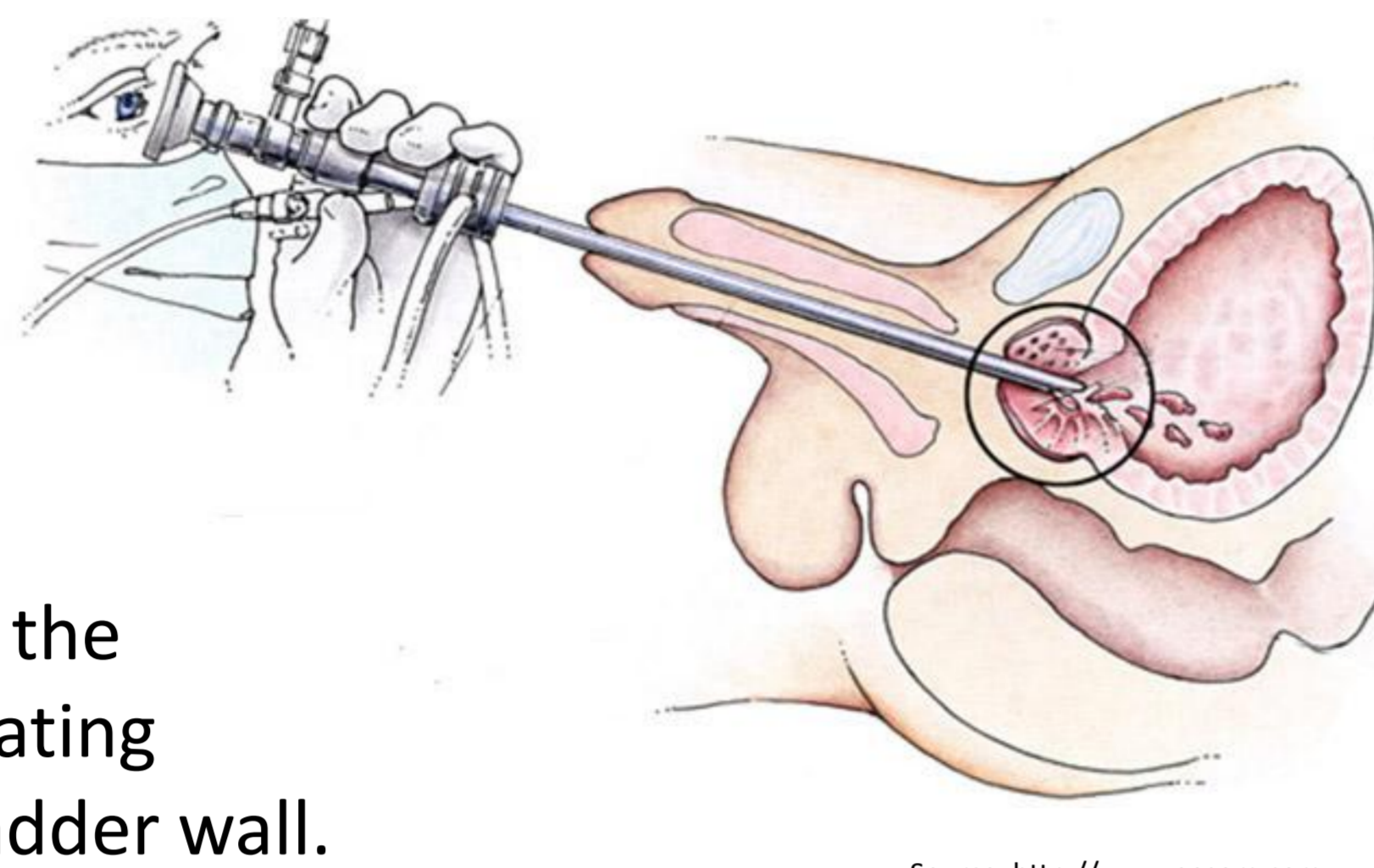
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Motivation

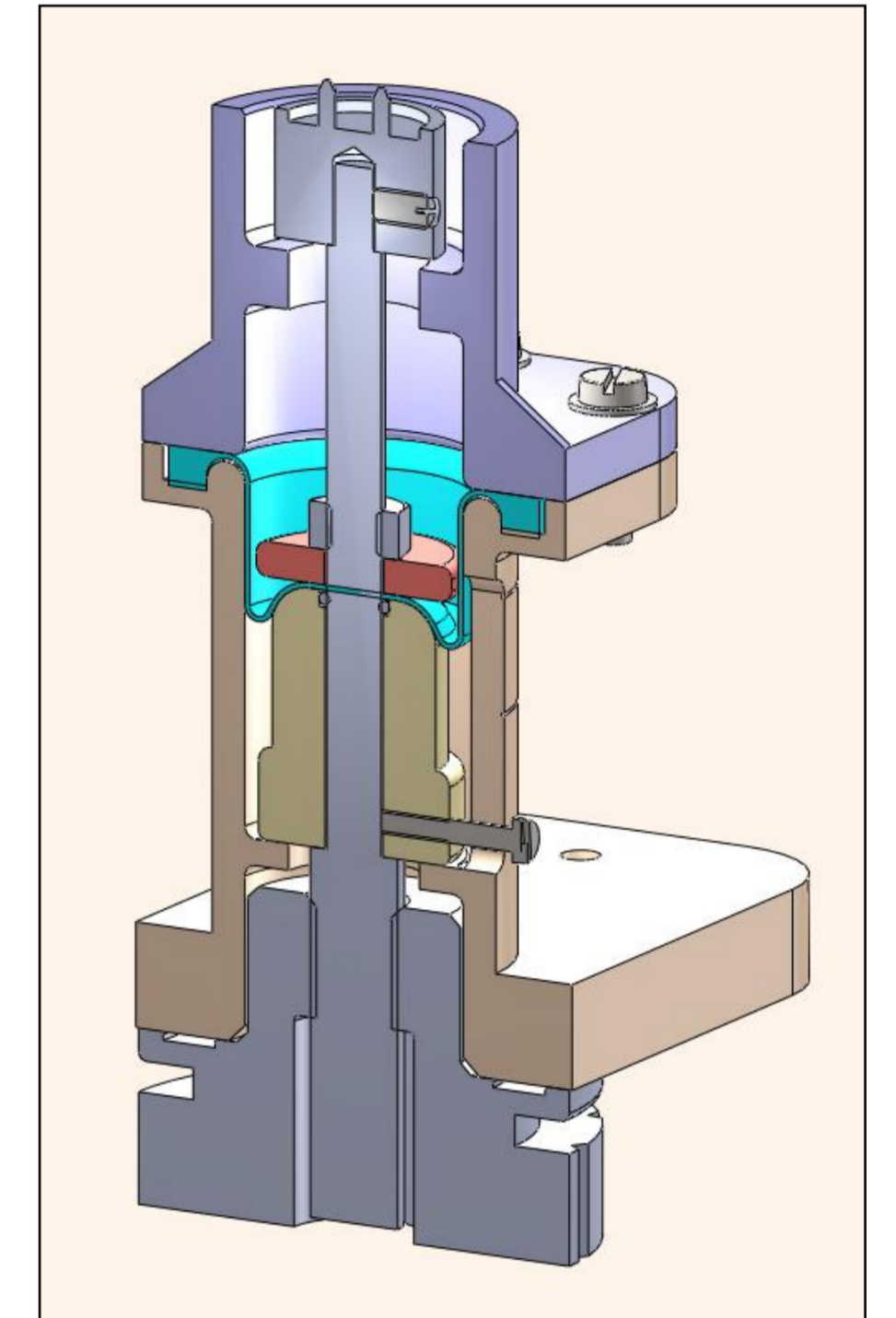
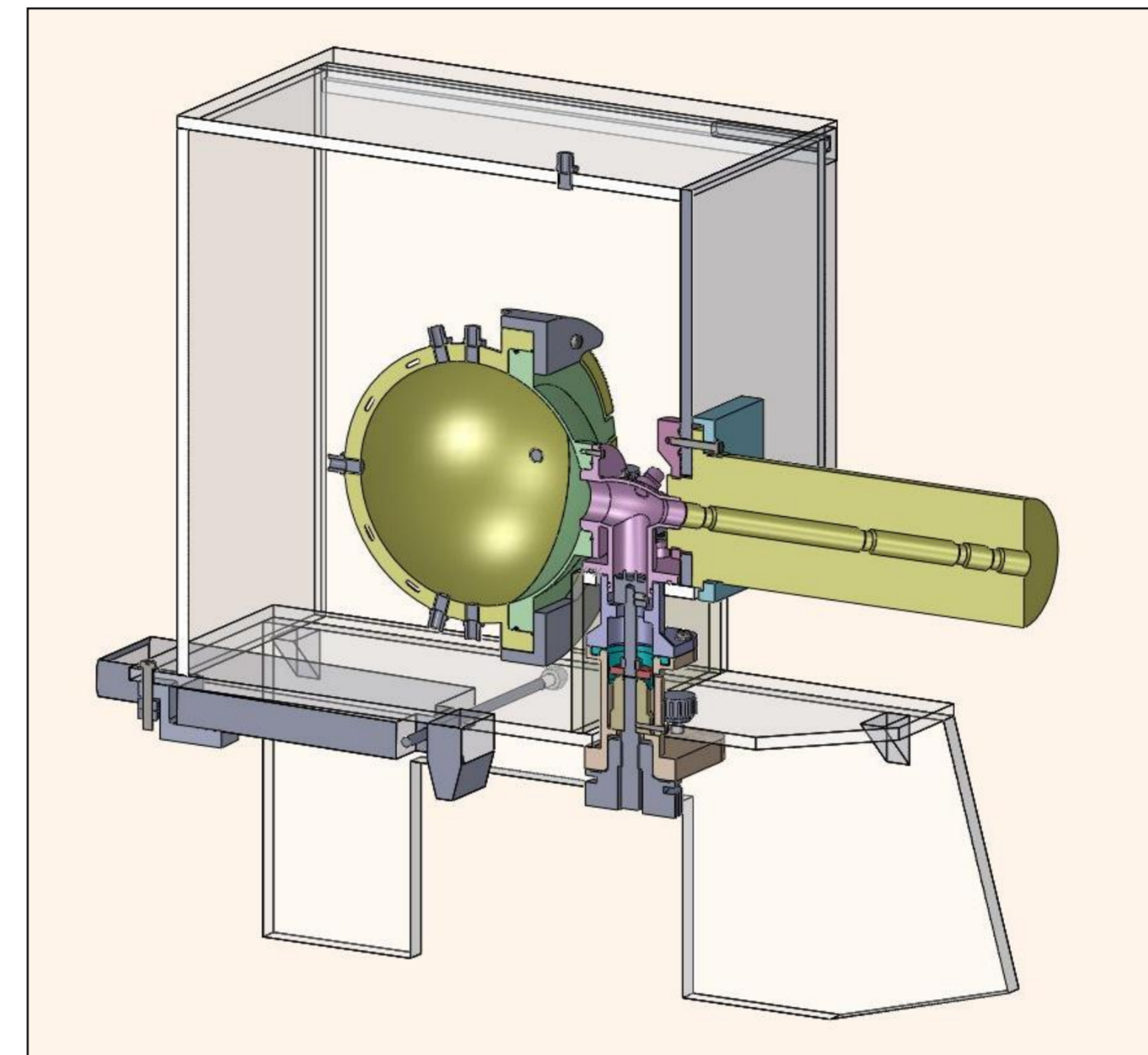
Up to now, the thermal state of the bladder-wall during RF-resection of prostate tissue is unknown or not understood in detail.

This poster describes the requirements, the concept and the building of a model for investigating the thermal situation of the bladder wall.



Source: <http://www.eesom.com>

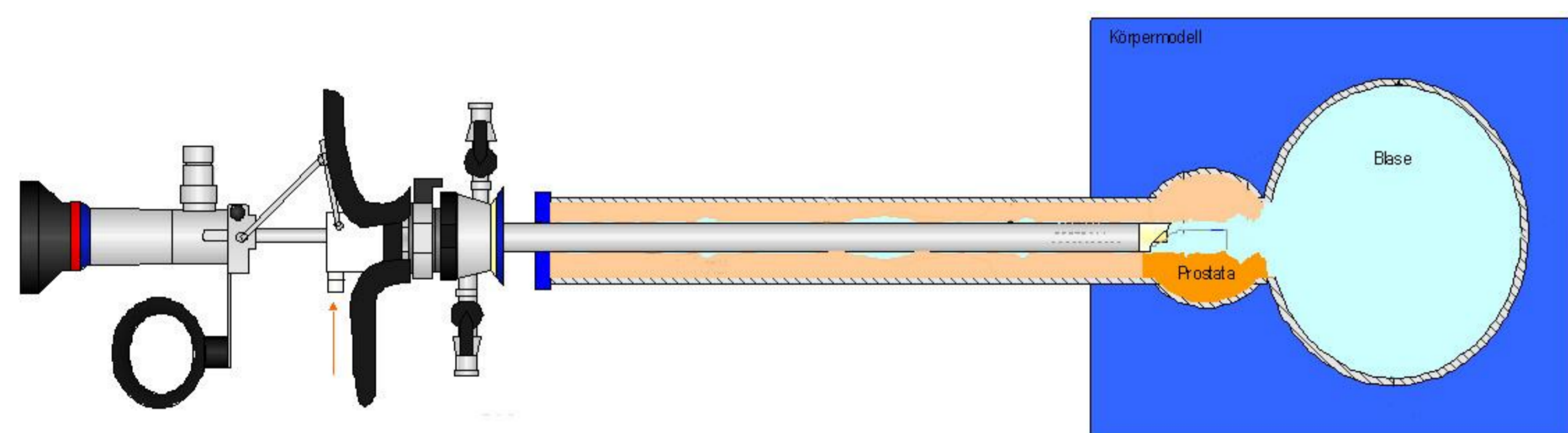
CAD-Model



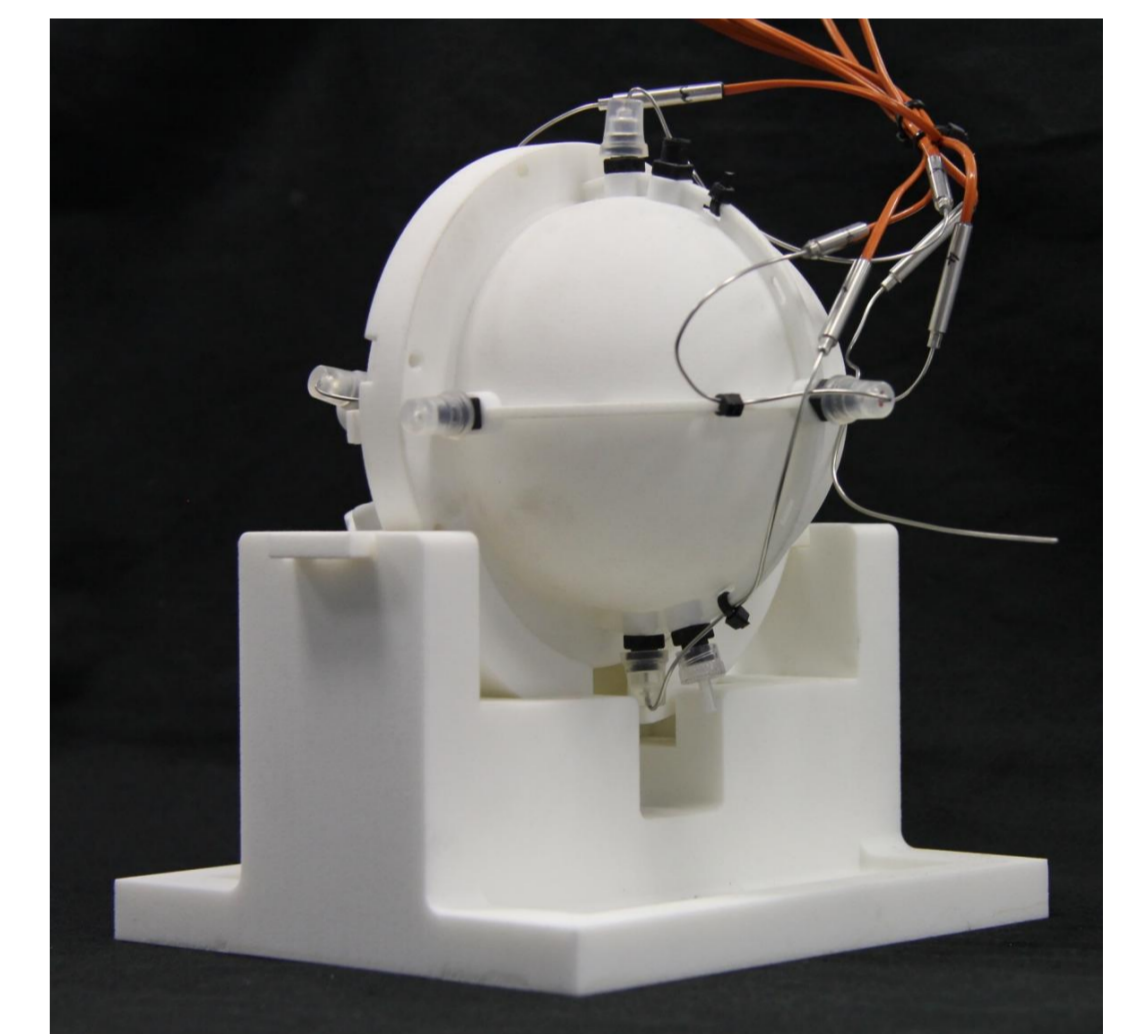
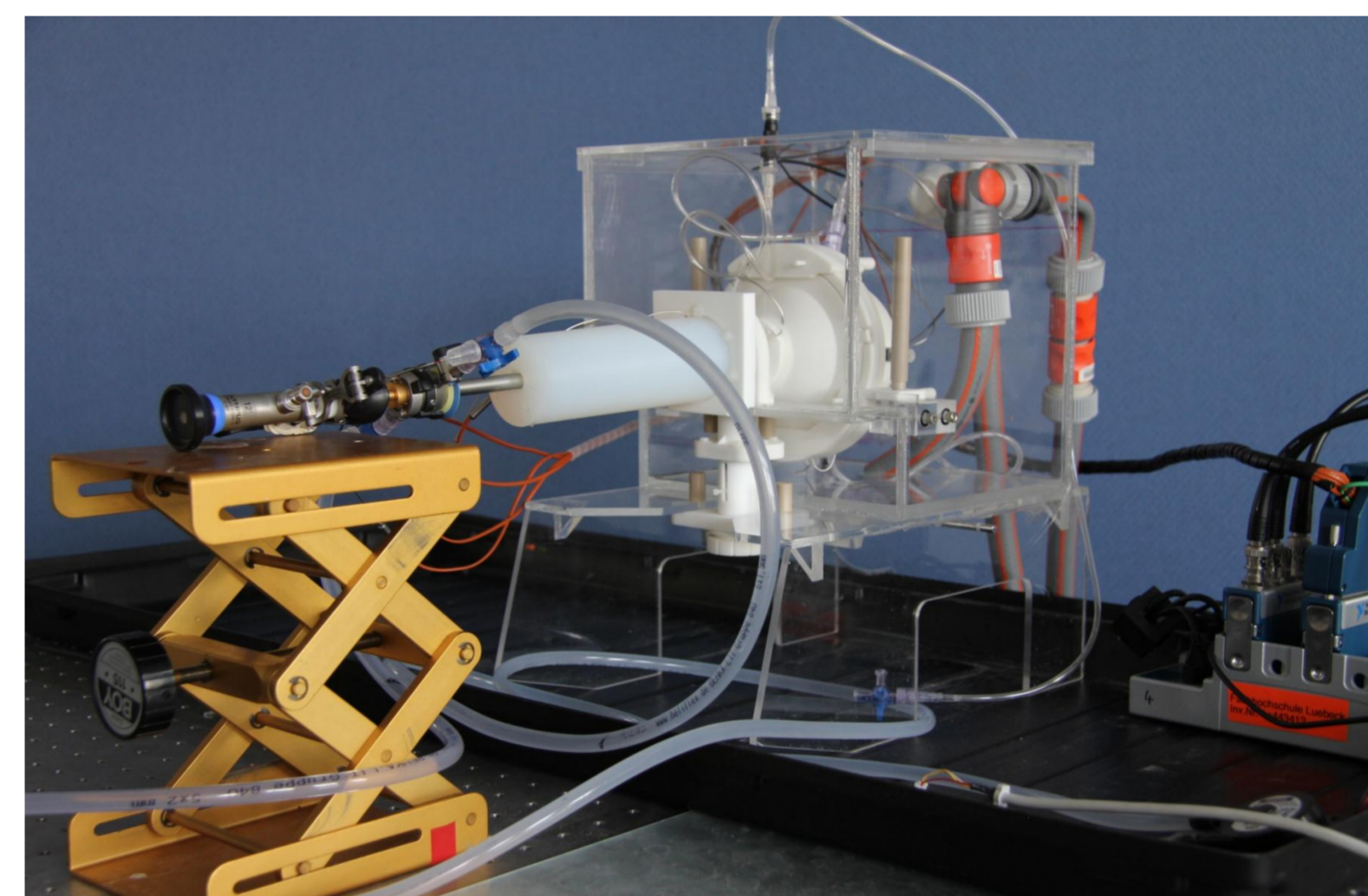
Cross sections of whole model and detail (tissue supply)

Requirements

- Modeling the thermal situation inside the human body adequately
- Measurement of the temperature at several metering points at the bladder wall, prostate, urethra, and irrigation fluid
- Flow of irrigation fluid from up to 0.5 l/min
- Enabling an easy change of artificial prostate tissue
- Easy cleaning of components between experiments
- Temperature measurement with a sampling rate of 2 sec with thermo-couples

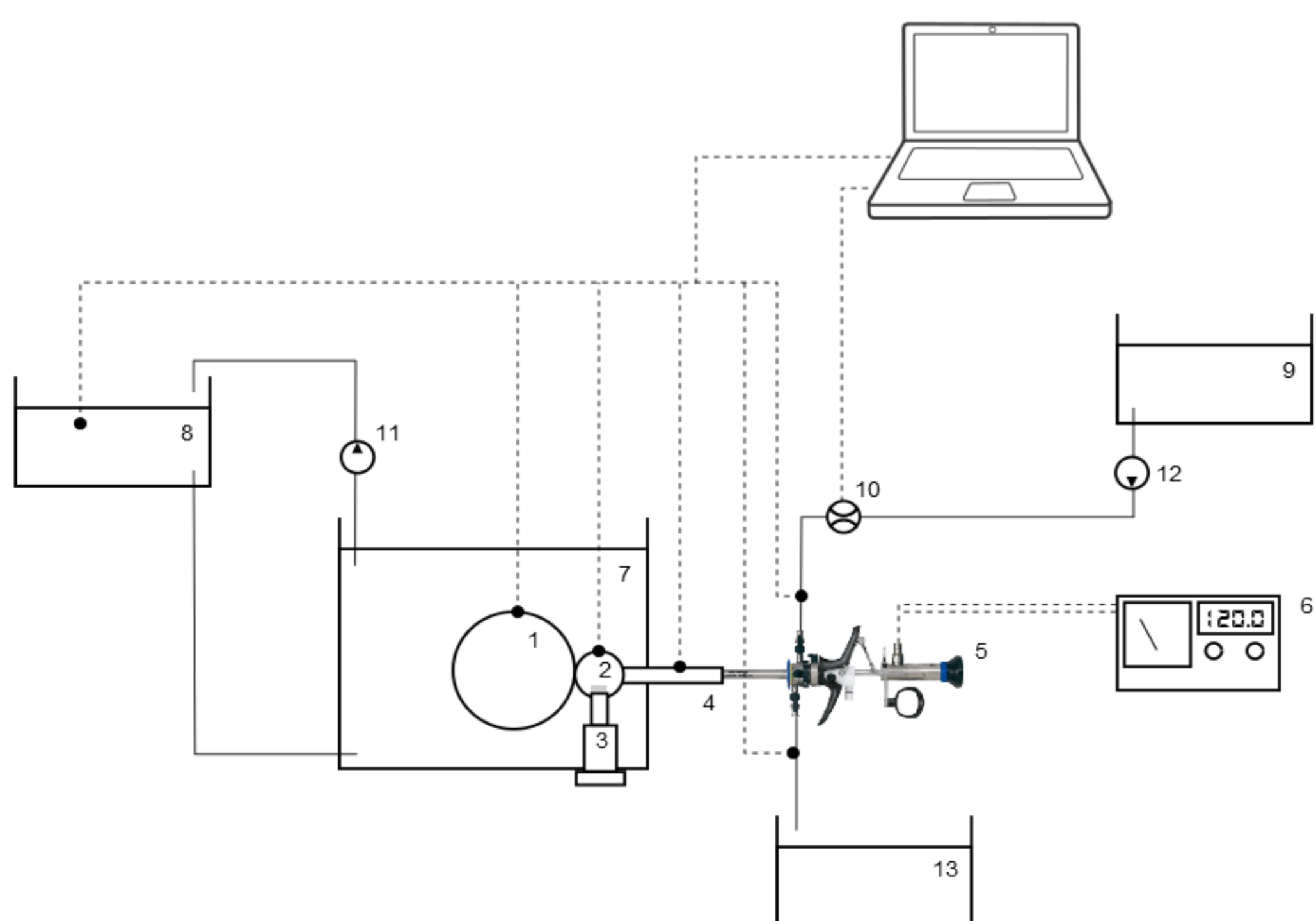


Realisation



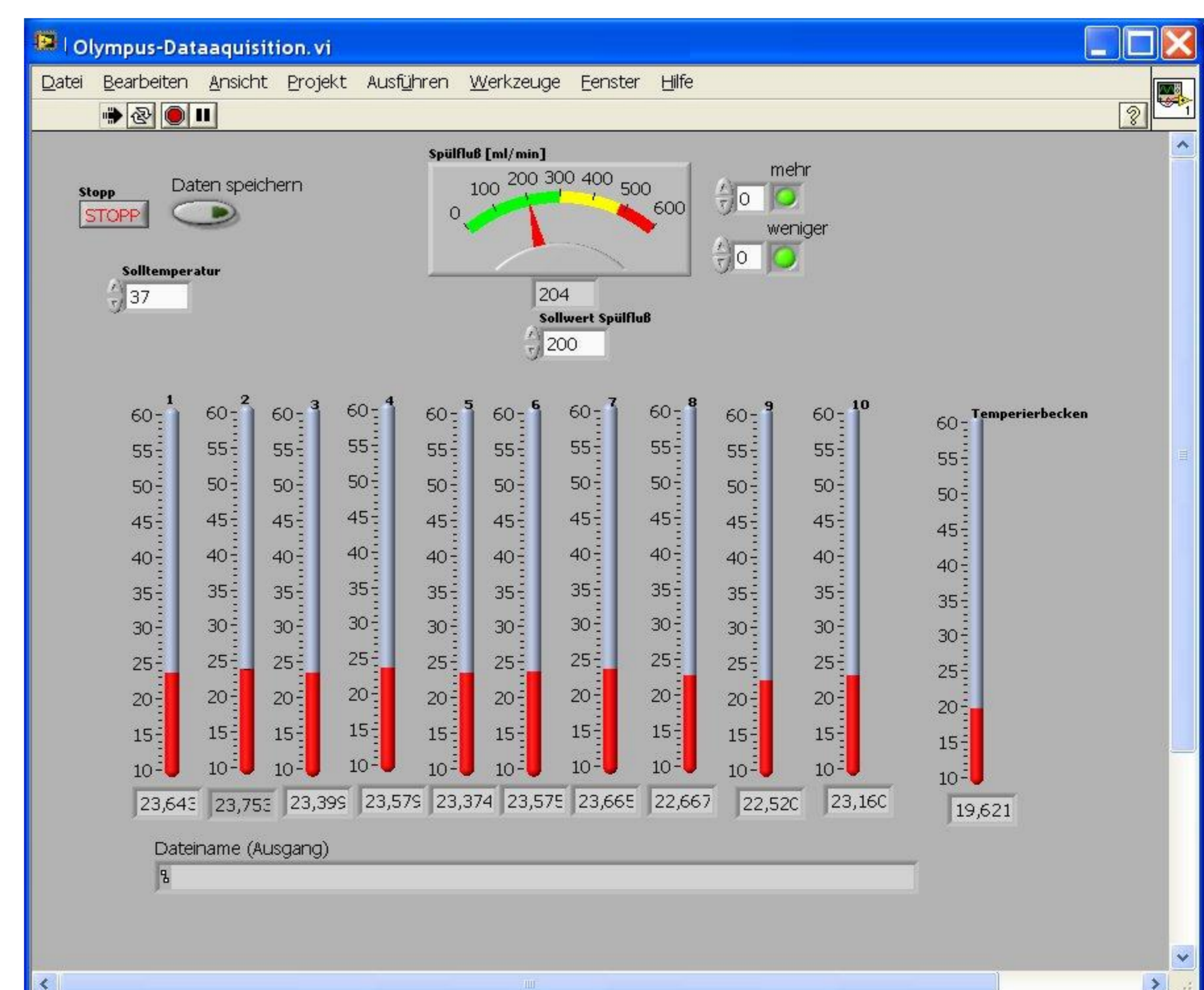
View of whole model and bladder with thermo-couples

Concept



- 1 bladder
- 2 prostate
- 3 tissue supply
- 4 ureter
- 5 resectoscope
- 6 RF-generator
- 7/8 heating
- 9 irrigation fluid
- 10 thermal sensors
- 11/12 pumps
- 13 collecting tank

Control System



Screen shot of control system