

Universität  
Zürich<sup>UZH</sup>

# AMC development



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# Outline

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- Load calculations / Safety factors
- Drawings, STEP files, cost
- Status for possible LST prototype production

# Requirements (from Masahiro)

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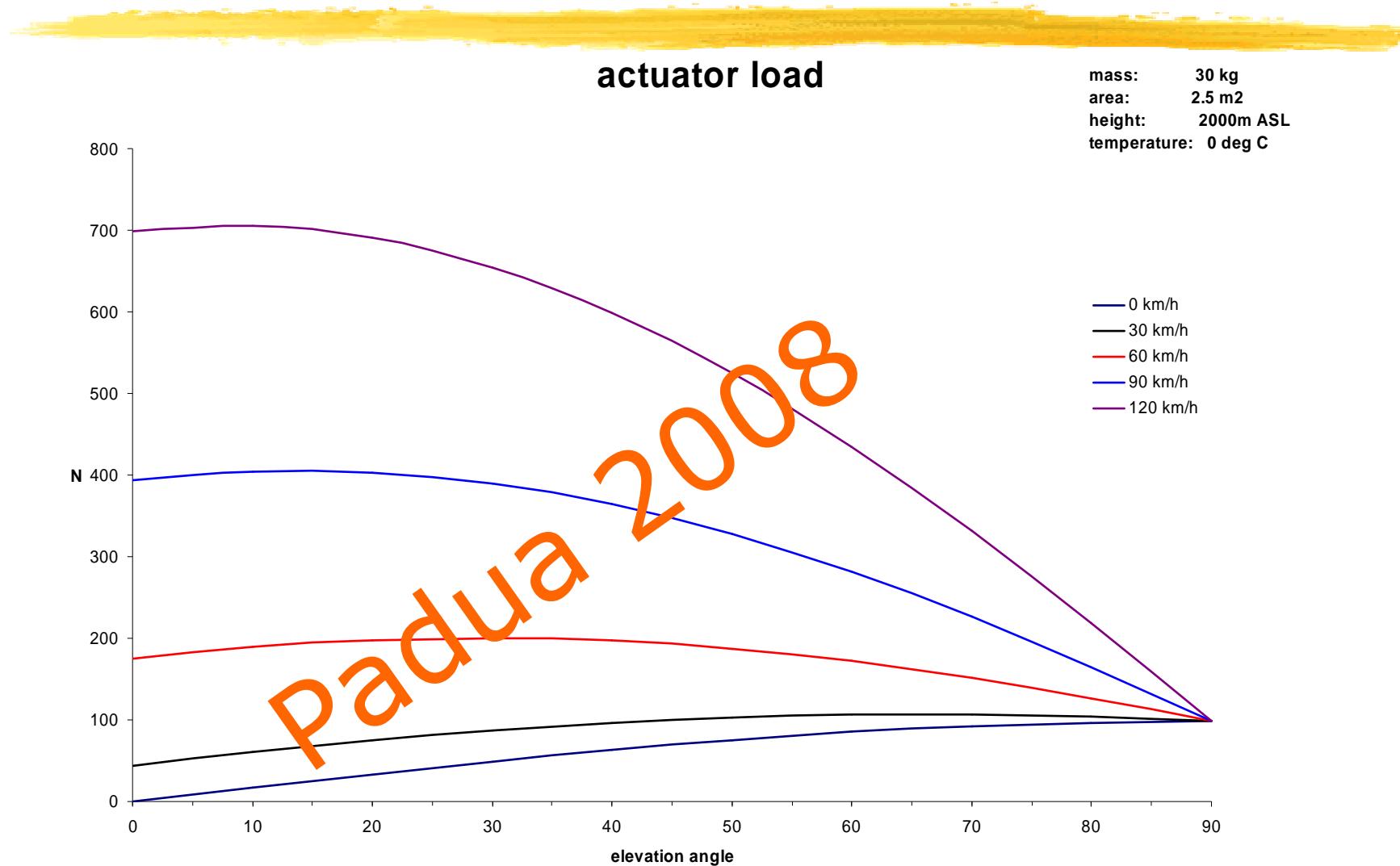
- The self weight of mirror facet is 40kg. Air density is 1.23kg/m<sup>3</sup>. Cd = 1.2-1.3 for the panel like structure.
- We need to consider the worst case for the operation of the telescope. Telescope must be operational under the wind velocity of 50km/h. Our mirror facet will have an area of 2m<sup>2</sup>.
- The telescope must survive under the storm with 200km/h.
- The mirrors will be supported by three points (one universal joint and two actuators). Assume each point will have a load of 1/3.

## Modifications:

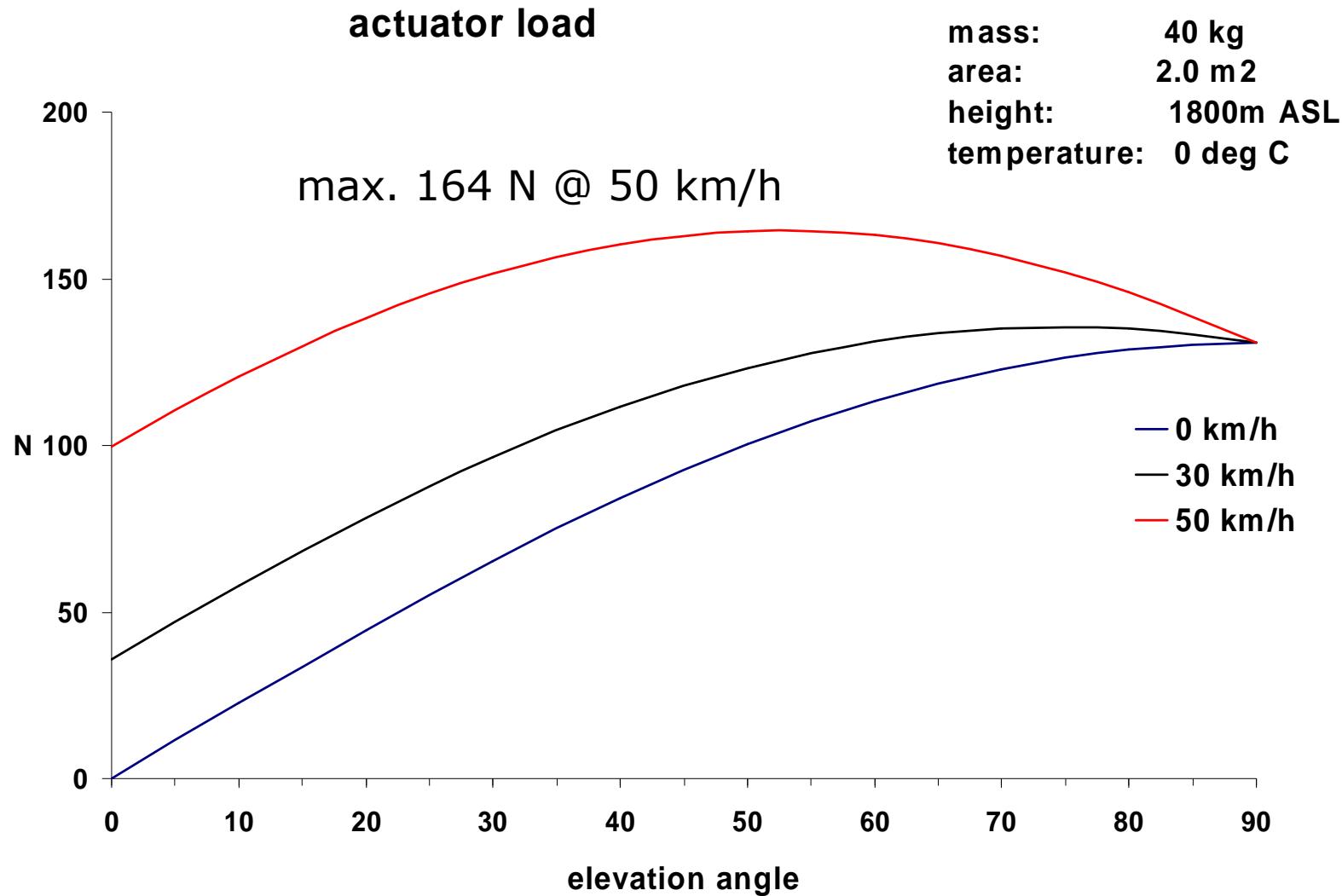
- Air density 1.03 kg/m<sup>3</sup> (1800m ASL)
- Set Cd=1.5



# Actuator load, 2.5 m<sup>2</sup> area



# Revised loads



# Safety factors

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- Current specification of AMC:
  - > 350 N operation
  - > 9000 N survival
- Safety factors
  - operation up to 50 km/h:  $350/164 = 2.1$
  - survival up to 200 km/h:  $9000/1600 = 5.6$
- Improved set (easier to manufacture, improve robustness)  
completed simulated 10-year outdoor test (394200 moving cycles) last week without problems

<http://www.physik.uzh.ch/wetter>

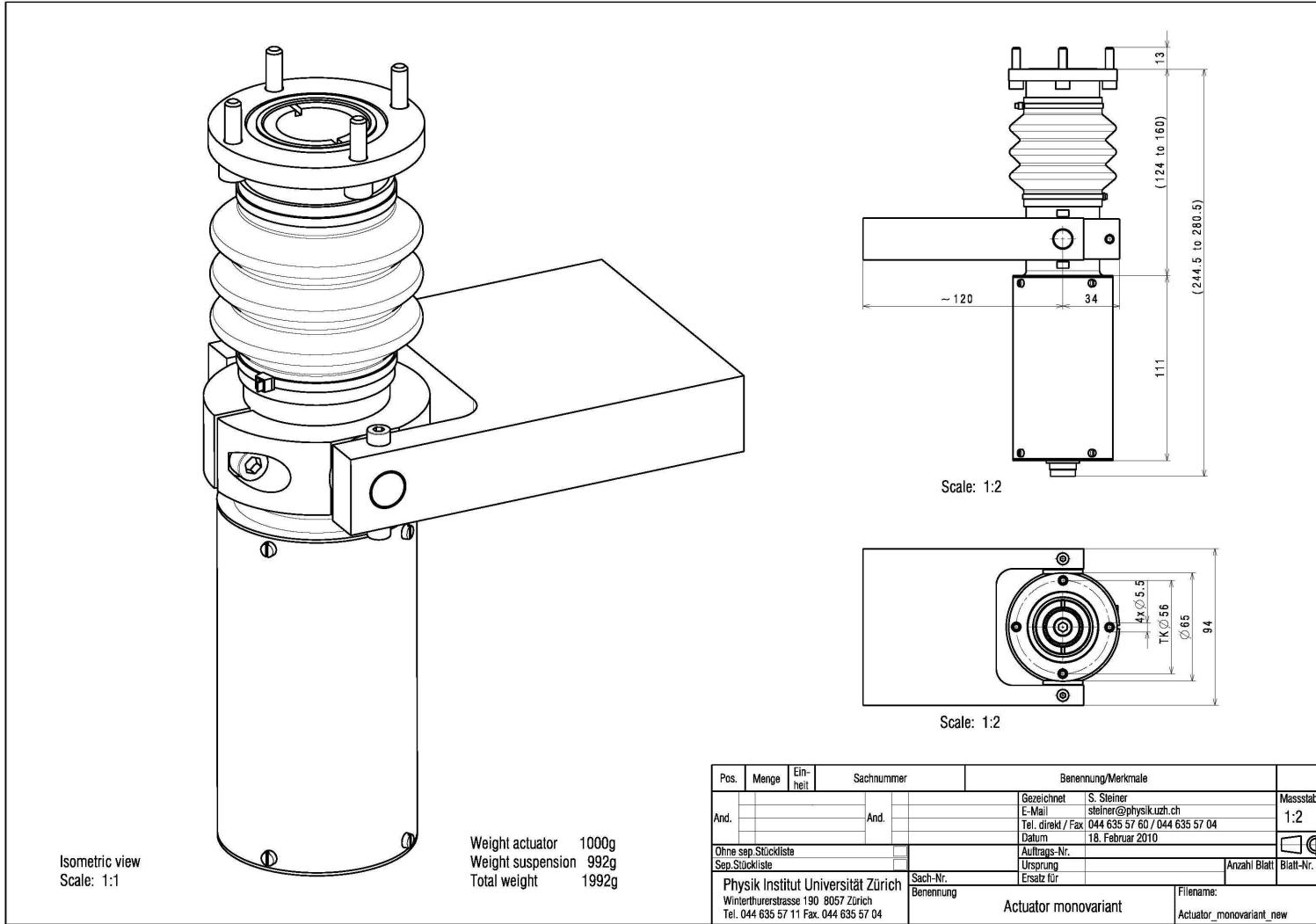
# One AMC 'set'

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- One fixpoint
- One AMC monovariant (1 dof)
- One AMC doublevariant (2 dof)
- (up to now, no common structural plate like MST triangle)
  
- Drawings and STEP files available under:  
  
<http://cta.physik.uzh.ch/public/amc/>
  
- Estimated cost (2010) ca. 500 EUR (@500 sets!)  
without power cabling/supplies  
*needs to be confirmed !*

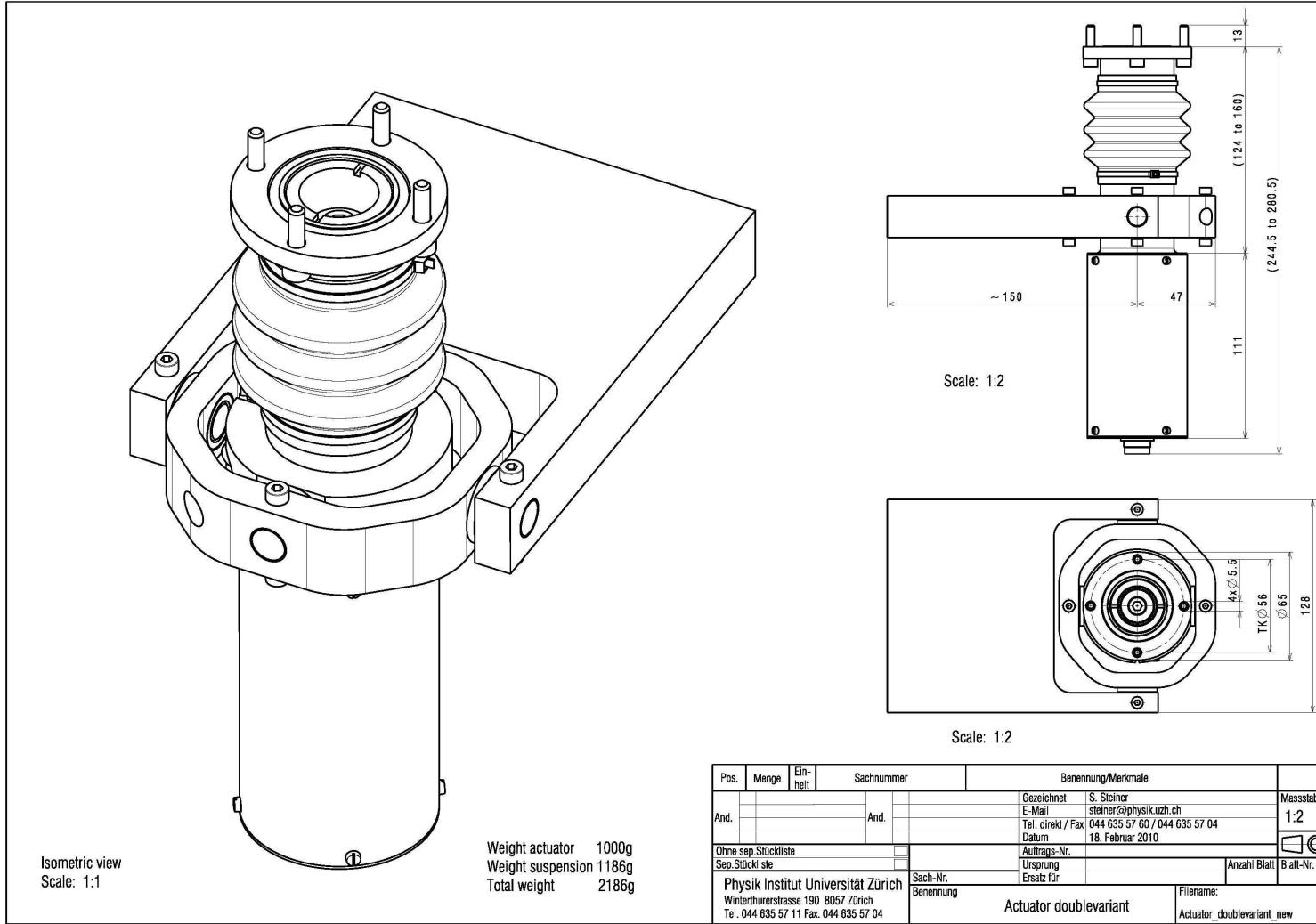


# AMC monovariant

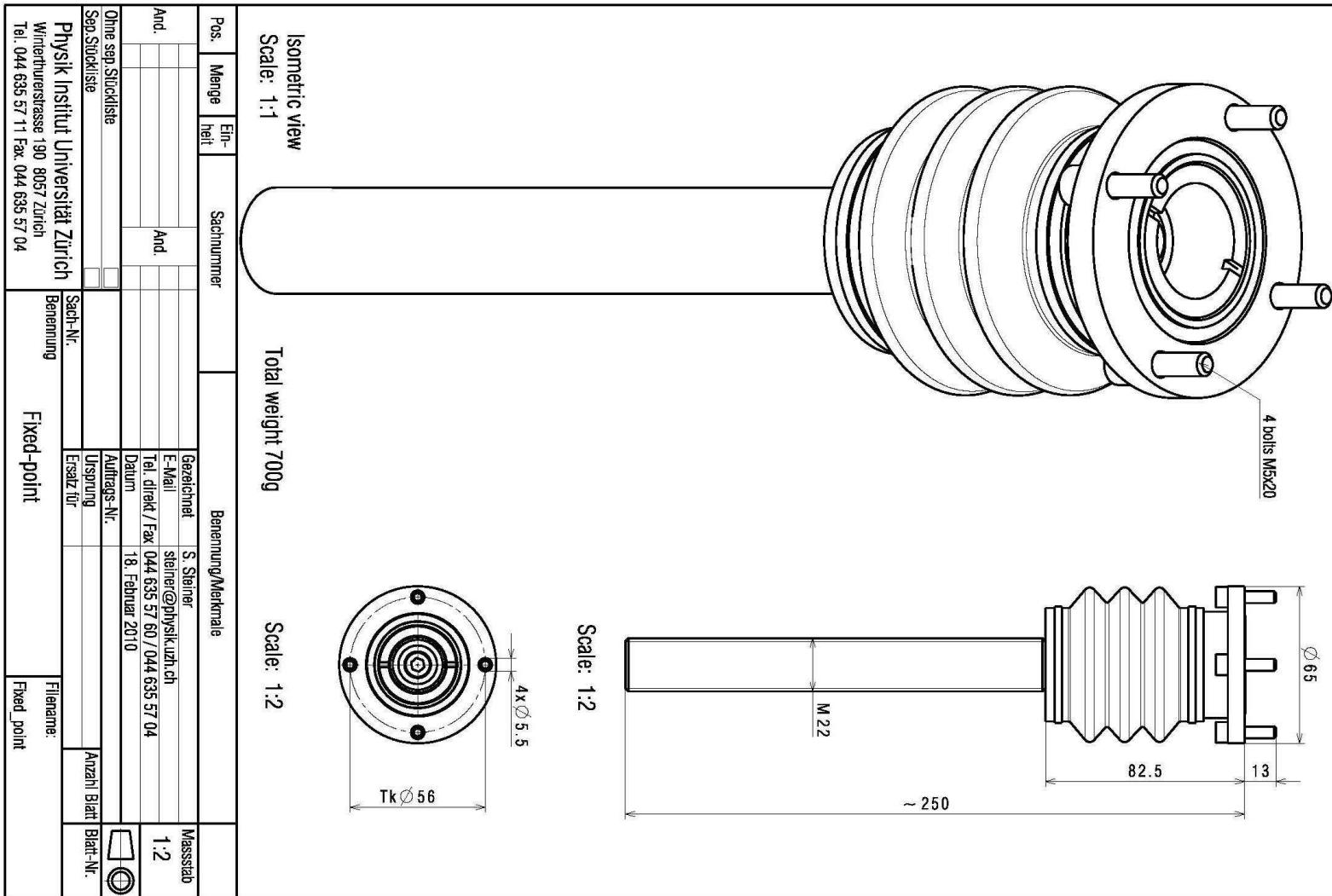




# AMC doublevariant



# Fixpoint



# Status Zürich AMC

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- 100 AMC sets produced for MST prototype, to be installed this summer.
- B. Beghera (DESY-Zeuthen) working on ACTL-compatible control software for MST → usable for LST?
- UZH able and willing to produce 220 AMC sets for LST prototype until Q2/2013 (if funding provided).
- Interfaces (mechanical and organisatorial) still tbd.