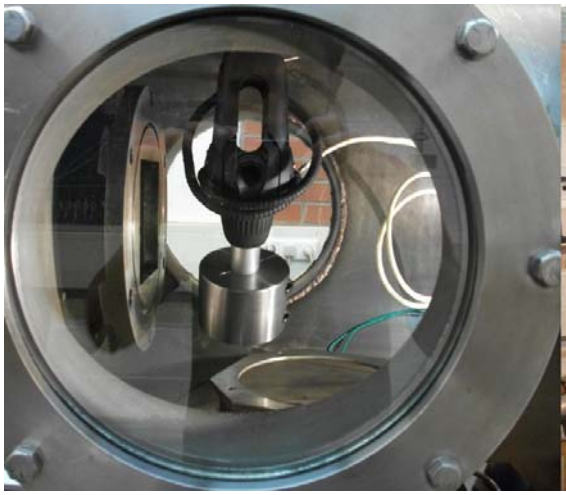
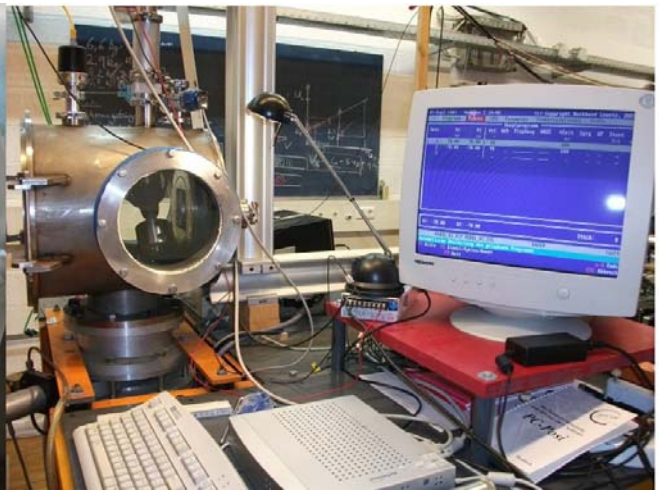
User Info

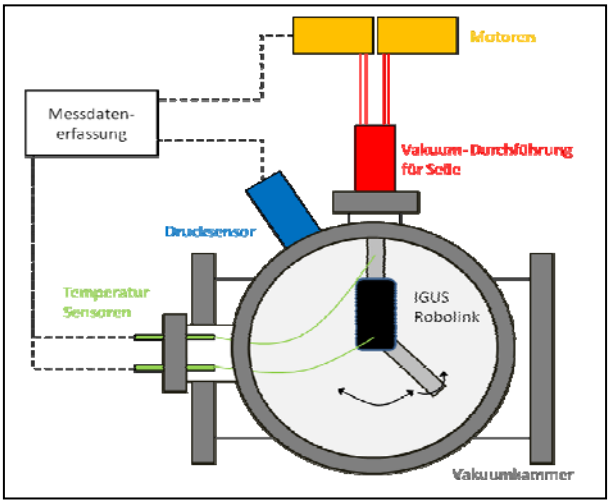
Technical University of Munich

igus-robolink Function test in rough vacuum





Test set-up
Robolink, drive with step motor Nanotec (holding torque 1.6 Nm), PC Posi controller from the company Lewetz (program: Robol_01); Step motor cards: Leadshine ND556; longitudinal movement by trapezoidal spindle 12x3 and Zedex100 dry sliding nut; path of the trapezoidal nuts (X/Y): 70 mm; speed 15 mm/s; vacuum feedthrough: (4x) Silver steel round bar conducted in sintered bronze bearings, sealing via (4x) slightly tensioned o-rings, (leakage ~2.7e^{-2} mbar l/s);
- Vacuum chamber 200 l volume; Pirani pressure sensor / cold cathode (Penningvac PTR90), 2 type K thermocouples; measurement recording NI-cRIO 9074 with cards 9201 and 9213; measuring resistance 0.56 Ω



Test procedure and results
Test 1: Evacuated chamber with no feedthrough led to the outgassing rate of the IGUS arms of 6.87e^{-2} mbar l/s.
Test 2: Rough vacuum of 4 mbar, 2 Nm torque load; operation for 3 hours. Temperature difference of 4°C to reference tests in operation under atmospheric conditions. Voltage and current remain unchanged after three hours, compared to tests under atmospheric conditions.

In the aforementioned configuration, the IGUS robolink arm can be used, according to our knowledge, under rough vacuum. Vacuum of higher quality can only be achieved by changing the material (e.g. aluminum) and by improving the feedthrough.

Conducted at the Department of Aerospace Engineering at the Technical University of Munich.

Measurement data recording, Motors, Vacuum feed through for ropes, Temperature sensors, Pressure sensor, Vacuum chamber