



MASTER GRADUATION PROJECT

DESIGN OF A MINIATURE PRESSURE REGULATOR

Autonomous systems, like hand prostheses and walking bipeds, are to be powered by pneumatic actuators for reasons of overall mass, speed, reliability, and size. With the proper system choice made, a relatively small gas container holds sufficient energy to power the system during its duty cycle. In the container the gas is stored at saturation pressure. In general the saturation pressure level does not correspond with energy efficient operation of the system. Therefore, a pressure regulator is needed to reduce the saturation pressure to the desired supply pressure for the system. Pressure regulators are available from many different commercial firms. These regulators are all characterized by a relatively large size and mass. Although several prototypes of pressure regulators have been made at MMS that are small compared to the commercially available regulators, they are still large compared to other system components in hand prostheses and/or walking bipeds.

ASSIGNMENT

Design, construct, and build a miniature pressure regulator. Typical dimensions: \varnothing 5 x 25 mm. Pressure range: 0.35 – 1.5 MPa. Output flow > 20 ltr/hr. Demonstrate the proper working order of the new design in an experimental setup.

ADDITIONAL INFORMATION:

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