Assessment of the required effort on the sealing elements in pneumatic and vacuum systems

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When operating the actuator in pneumatic and hydraulic systems with large nominal diameters and significant pressure difference, there arises a task of ensuring error-free performance of regulators directly, i.e. single-seat valves, the disks of which are experiencing significant unbalanced forces. This brings to the necessity of using drives with a larger capacity. The article shows the calculated data to evaluate produced forces on the disc of the valve of the shutoff device, the results of experimental studies of the dynamic characteristics of pneumatic actuators ensuring rate of valve motion specified for piston travel. We consider methods of actuator braking, give specific recommendations on the selection of braking device parameters. When applying pneumatic actuators in vacuum systems it is necessary to ensure the tightness of the joint cover–camera. We offer schemes of actuating mechanism control by using pneumatic automation componentry. The calculated and experimental data evaluate leakage through the sealing elements, depending on the pressure drop and the sealing material used.

Keywords: *pneumatic valve, developed force, sealing element, the tightness of the seal.*

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