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Pneumatic free valve actuators

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Present cryogenic valves are mostly driven by pneumatic actuators. In general, PLC generated electrical analogue or digital signals are guiding control valves via an electro-pneumatic positioner and digital valves by switching an electromagnetic pneumatic pilot valve. One important advantage of pneumatic actuators is the failsafe function, either closed or open, in case of energy loss. However, the pneumatic air supply system and the electric signal cabling is complicated and the complexity increases with the number of valves. The pneumatic system is energy intensive, needs space and continuous servicing. Therefore operation and capital costs for such an electro-pneumatic system are quite high.

There are new developments in in the refrigeration, natural gas and energy industries which use pneumatic free electric driven control and shut-off valves.

Based on the positive experiences in these industries, innovative cryogenic and warm valves, actuated by an electrical stepper motor were developed. Together with the control module the full functionality including fail open or fail closed positions as well as many further control advantages are available. Using this type of valve allows a highly simplified installation. These advantages open a possibility to reduce operation and capital costs remarkably.

Already available are valves driven by an electrical stepper motor up to size DN40 depending on the requested shut-off pressure. For larger valves and higher shut-off pressures, innovative actuator systems with their own electro-hydraulic drive control system are available.

Examples of such valves will be shown and described. Development perspectives will be discussed.

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