

# „Efficient“ valves

A customer-oriented solution using “best practice“ and high-quality standards

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Shut-off and control valves are important components in industrial piping systems. Compared to other system components and related fittings, the procurement costs are relatively low, while costs at failure or early wear are enormous. Therefore, some important factors must be observed in light of service life and cost efficiency.

## Cost-efficient purchase – expensive operation

Valves are exceptionally important elements within a process control system. Amongst other considerations, they must seamlessly contribute to provide a functional, safe and reliable process system. It's anticipated that these parts, which are not extremely expensive to buy, operate reliably and without breakdowns. Very little consideration is given to the fact that the costs to repair or replace these items in the event of a failure far outweigh the original purchase cost of the item. Therefore, the decision-making criteria when selecting a valve should not only depend on the procurement costs, but consider the entire costs of a technical system throughout its service life. This also includes any consequential costs such as operating, maintenance and failure costs, i.e. all costs arising across the service life, which are also referred to as life cycle costs. In times of increasingly scarce resources, the consideration of total operating

costs and thus energy efficiency of automated valves also is of special importance.

## Look through the neutral glasses

Objective evaluation criteria such as approvals and certificates provide the purchaser and operator with secure information on the quality of the components to be procured. Essential service and quality requirements are documented by compliance with binding standards. Specifically the pressure device directive 97/23 EC, including the marking, but



Fig. 1  
High-performance butterfly valve with electrical actuator

Fig. 2  
High-performance butterfly valve with pneumatic actuator and control box



Fig. 3  
Soft-sealing butterfly valve with spring-ret-run pneumatic actuator

also certificates as according to ISO 9001, the declaration of conformity to be drawn up by the manufacturer for each valve with operating instructions and technical delivery conditions (e.g. DIN EN 12569) and the AD rules and standards harmonised for the DGRL provide safe information on the suitability of a valve for a specific purpose.

### The more the better...

Increasingly high system outputs and the increasing degree of automation in production systems leads to specifically designed valves being required to meet the demands of the application. Valve manufacturers are consequently faced with technical challenges often requiring multi-discipline, industry wide knowledge platform as a basis for providing a sound solution.

### Selecting the correct actuator

The performance capacity of a system decisively depends on how well the individual components harmonise with each other. The selection of valve and actuator is particularly important, since the running costs of the system are decisively influenced by use of the selected auxiliary energy (electricity or compressed air).

Differing valve designs exhibit unique torque characteristics as a function of their design. A ball valve requires an actuator with high run torque output, while a comparable butterfly requires an actuator with lower run torque but higher seating & unseating torque. The market offers actuator technology for these different requirements; therefore, selection of the correct actuator is very important - especially for reasons of energy efficiency and reliable functionality of an automated valve.

Qualified manufacturers are able to optimise the components of valve and actuator independently of each other in their constructions, so that they will demand the lowest torque or energy for actuation.

Once the required torque of the valve and the output torque of the actuator are properly selected, the valve and actuator package is said to be energy-efficient in its design.

A higher efficiency is achieved when the actuator and control components are direct mounted. Direct mounted actuators and position controllers render hoses unnecessary in pneumatic drives, additionally reducing air consumption. Intelligent accessories for pneumatic and electrical components usually belong to the scope of delivery, offering the optimal solution for its application to the end user.

In addition to harmonisation of the torques that depend on pressure and medium, consideration of the plant parameters such as switching frequencies, ambient conditions, etc., is also indispensable as a factor for the degree of efficiency.

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