

# THE (ELECTRIC) CIRCUIT CLOSES ELECTRIFICATION IN VALVE DESIGNS

Over the past few years, GEMÜ has worked consistently on the implementation of an electric valve platform and positioned itself as a pioneer of electrification in process systems.

## What is the purpose of electric valves?

The reasons for using electric valves are just as different as they are numerous. Reduction of energy costs and noise pollution, mobile systems or small systems without compressed air supply, high control performance, digitalization, flexible functions, parametrization options, diagnosis options – these are only some of the reasons for using electric valves.

However, the options that electric valves offer for reducing risks and increasing system availability are often underestimated. On the one hand, they reduce the risk of potential contamination due to compressed air in critical applications, such as in cleanrooms or insulators. In these applications, an attempt is made to reduce the residual risk as much as possible through time-consuming and cost-intensive compressed air conditioning, removal of exhaust air and other measures.

But why live with a residual risk if there are alternative possible solutions?

On the other hand, electric valves reduce the risk of failure and malfunctions from compressed air. There are often trivial causes such as contaminated compressed air lines in the commissioning of maintenance units that then have far-reaching consequences. "Contaminants" in the compressed air system often lead to maintenance-intensive or even irreparable damage of, for instance, pilot valves, combi switchboxes or controllers. The consequences are high maintenance costs and falling system availability.

The subject of safety positions can also be solved more intelligently in conjunction with electric valves. At first glance, pneumatic valves are at a clear advantage. They travel through the installed springs into a defined position in the event of a compressed air supply failure and consequently have the safety position "on board".

But what happens when the system is restarted?

In this condition, the greater effort is required to avoid water hammers and create defined pressure states in order to put the system safely back in a defined condition. Emergency power solutions (uninterruptible power supplies or UPS) offer the advantage of clearly definable system conditions both when shutting down and when restarting the system – not only for the electric valves, but also for the automation components and the sensor system. To this effect, GEMÜ offers emergency power solutions for all electric valves.

These arguments alone indicate that there is no one single argument in favour of electrical solutions. Rather, there are the most varied approaches depending on industrial sectors and applications, a combination of which often influences the decision to go electrical. The decisive component in process systems is, however, first and foremost the process valve itself. There are the most varied valve designs for the various process requirements, such as diaphragm valves, globe valves, PD valves, pinch valves, filling valves, butterfly valves or ball valves.

When we speak of electrification, the process requirements naturally remain as a basis. The most important thing is consequently to be able to offer electrified versions of all the tried and tested valve designs. This means that the respective ideal valve designs can be paired with the respective ideal actuator design (best of both worlds).

## Diaphragm valves, globe valves, PD valves, pinch valves

EVERYTHING eSy!

The motorized eSy series by GEMÜ forms the basis of electrical linear valves. With the expansion of the eSyLite series to metal diaphragm valves and globe valves, the eSyLite (basic actuator), eSyStep (universal actuator) and eSyDrive (premium actuator) series can be universally combined together in a modular system with the tried and tested diaphragm valve, globe valve, PD and pinch valve designs.

The modular range of operators always ensures an appropriate price/performance ratio, from the simplest Open/Close applications to highly precise control applications.

All three eSy series set new standards in relation to motor technologies, compact design, speed and functionality, and need not shy away either from comparison with other series of electric valves available on the market or from comparison with pneumatic valves.

## Filling valves

UNIQUE PERFORMANCE

Could they be even faster?

The motorized GEMÜ F60 servoDrive valve range pairs the new filling valve platform based on a PD design with an uncompromising high-performance actuator and consequently sets new standards for speed and precision in filling and control applications.

Technical data, such as electrical protection class IP69K, up to 200 mm/s or filling accuracies of ±0.5% for a filling weight of 1 g, indicates that we are speaking not only of a new valve, but of totally new options both in filling pharmaceutical products and for applications in foodstuffs, battery and chemicals filling.

## Solenoid valves

UPGRADED!

The company is also setting new standards with the new GEMÜ M75 solenoid valve series. Through an innovative, pressure-compensated bellows system, it enables consistent operating pressures of up to 6 bar in conjunction with a very compact design.

Thanks to the available PVC, PP and PVDF body materials, GEMÜ M75 is suitable for various corrosive process media. An electrical position indicator that can be optionally retrofitted offers the additional option of integrating the solenoid valve into the automation system of the process plant.

## Ball valves, butterfly valves

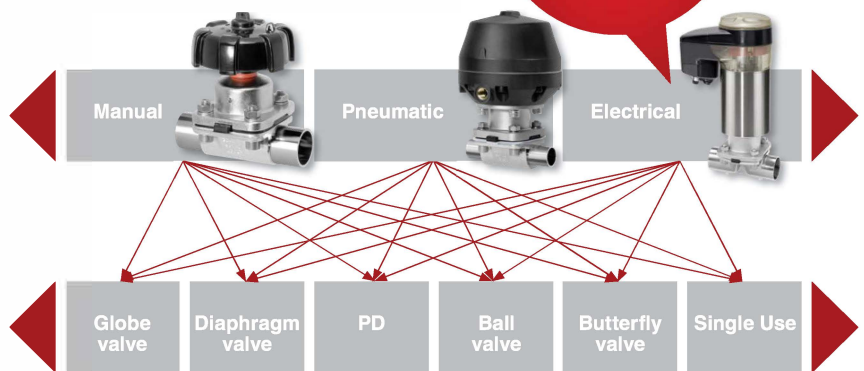
ELECTRIFIED!

In the area of electrified quarter turn valves, virtually anything is possible. Due to standard interfaces, GEMÜ offers pure flexibility with the GEMÜ 9428, GEMÜ AQ, GEMÜ BC and GEMÜ J4C series. From standard actuators for indoor and outdoor applications, right up to extreme conditions such as in the marine sector, or at low and high temperatures.

Even approvals such as ATEX or SIL are possible without trouble. The concept of a modular range of operators, from simple, cost effective On/Off actuators right up to complex control actuators, is consequently ensured for quarter turn valves just as it is for linear valves. In collaboration with well-known partners, GEMÜ is in the position of flexibly catering to all customer requirements.

The listed variations demonstrate the versatile options GEMÜ offers through a platform strategy in conjunction with the tried and tested GEMÜ modular system for electric valves.

universal,  
basic,  
premium,  
motorized,  
magnetic,  
High-Performance,  
very good price/  
performance ratio





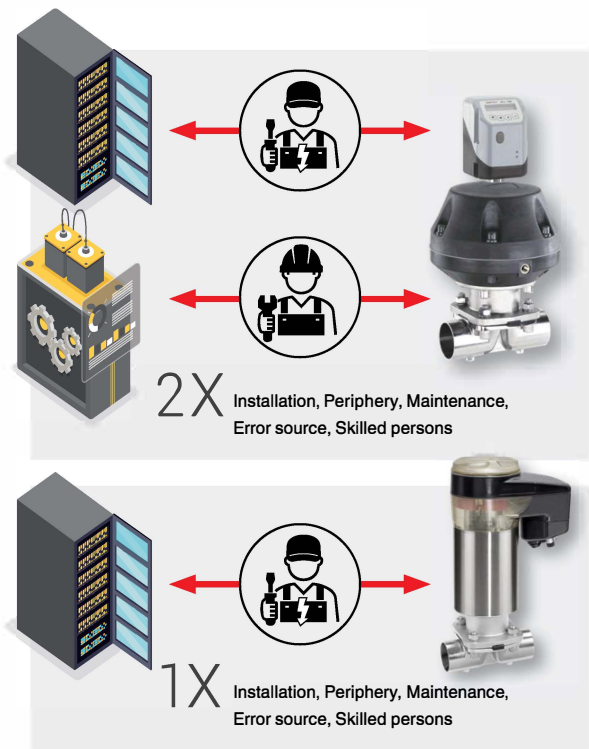
### What are hybrid systems?

In the technical sector, "hybrid" is generally used to refer to the combination of two technologies. In principle, many systems that previously used solely pneumatic valves are already hybrid systems. Due to the increasing level of automation in systems, additional electrical components, such as electrical position indicators, combi switchboxes or controllers, are a permanent electrical part of many current system generations. So both pneumatics (valves) and electric components (additional components, automation components) are generally used in the systems.

Due to the existing electrical automation infrastructure, hybrid systems that combine pneumatic and electric valves are the logical first step in relation to electrification of the systems and offer the appeal of combining the advantages of the respective actuator design depending on the system component.

As a next step, for example, why not replace electro-pneumatic control valves with purely electrical control valves that can make use of the existing automation technology and infrastructure and offer considerable added value thanks to higher control accuracy? This step generally requires no or only very minimal design changes to the existing system generations and consequently represents a good upgrade option for existing system generations with regard to selective problem-solving, performance enhancement and many other features.

However, hybrid systems also have disadvantages. Hybrid always means that two forms of energy (pneumatic and electrical) must be retained with all associated consequences. Every energy network requires effort when it comes to installation, peripheral devices, maintenance, trained personnel, error sources and risk of failure. But using only one form of energy (purely electrical) reduces these risks considerably.



### So why not go purely electrical?

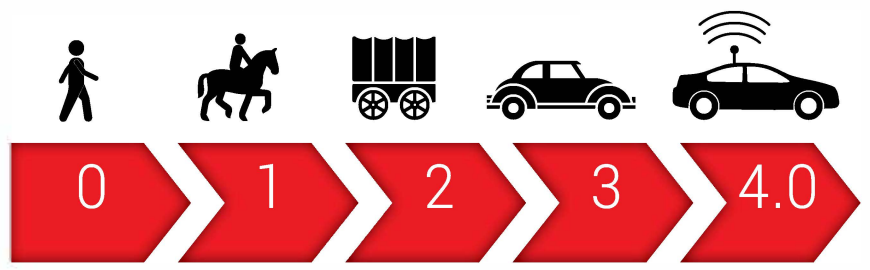
Many systems would gain added value from being purely electrical and would consequently also make sense. However, a complete 1:1 replacement of pneumatic with electric valves in existing systems is often difficult. Both actuator designs have intrinsic features that have a positive effect depending on use. The decision to use an actuator design is based on the weighing up of all aspects. A certain measure of rethinking and also a conceptual reconsideration of the systems results from this "technological leap". This issue should, however, definitely be taken into account in the redesign of new system generations.

**CHALLENGE!**

Ready for innovative customers

Of course, every "technological leap" requires a certain measure of creativity and innovation, but also courage. Nothing ventured, nothing gained. GEMÜ as a component supplier has been consistently pursuing this "technological leap" for years and will continue along this path. The wide product range of electric valves is an impressive illustration of this. In order to reduce the reluctance of customers somewhat, the company is at their side for this step – not only in an advisory capacity, but also as a partner. GEMÜ is looking forward to joint pilot projects.

### PERIPHERAL DEVICES/INFRASTRUCTURE



### TECHNOLOGICAL LEAP:

- ⇒ 1:1 replacement of pneumatic valves with electric valves only conditionally advisable
- ⇒ Reconsideration of the system advisable
- ⇒ Reconsideration of the peripheral devices and infrastructure advisable
- ⇒ Re-evaluation of the requirements/advantages/disadvantages required
- ⇒ **Rethinking required**

"IF I HAD ASKED PEOPLE WHAT THEY WANTED, THEY WOULD HAVE SAID: FASTER HORSES." HENRY FORD