

GEMÜ news

NEW PATHS IN COMMUNICATION AT GEMÜ

Product news

Innovations

Application reports

Apprenticeship and working

Commitment and initiatives

Magazine for the
customers, partners
and friends of the
GEMÜ Group

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Dear Readers,

Progressive digitalization and recognizable climate change are subjects that have already been much discussed at GEMÜ for a long time. In many sectors, we see ourselves as pioneers, always forging new paths. It is characteristic for GEMÜ to strive onwards in an experimental way, rather than continuing down traditional paths. This has meant that organizing a purely digital event in these extraordinary times is the next logical step for us. The digital world offers many new opportunities to inform and surprise visitors. We have made the most of these opportunities with G:motion. Over three days, we presented trends and product highlights in our new GEMÜ digital showroom. The effort we put in beforehand was worthwhile, as the event received thoroughly positive feedback. At this point, we would like to say a huge "thank you" to everyone who was involved with G:motion. In the future, we will continue to forge new paths in communication and at trade fairs, and continue to refine G:motion. That was just the beginning!

Alongside progressive digitalization, commitment to the environment also plays an important role for us. For this reason, we have recently had the carbon footprint for GEMÜ Germany calculated, meaning we have been able to become a carbon-neutral company firstly by purchasing checked and certified certificates. We have already been committed to environmental protection for many years. Our strategy in this regard includes construction of photovoltaic systems on company buildings and using electric vehicles to take employees around sites. Our objective is to continue to minimize our CO₂ emissions in the future with in-house measures. Currently, for example, many factors regarding CO₂ reduction are also being taken into consideration in building our new headquarters in the Hohenlohe business park. We are delighted that a few weeks ago we were able to continue with the delayed schedule and begin the build.

The last few months have been a challenging time for everyone – emotionally, health-wise and economically. We wish you all the best and perseverance for the future. We would like to take this opportunity to thank our customers for the trust they have placed in us. We are glad that you



have remained with us through these extraordinary times. We hope that, together with you, we will soon leave the critical period of the pandemic behind us. We are confident that we will ultimately come out of this challenging period stronger than ever. Our employees, with their extraordinary dedication and intensive collaboration, are making an crucial contribution to accomplish this. We are very proud

of the tremendous achievement that every one of you has made. And so, on behalf of the whole Müller family and the Divisional Managers, thank you!

Wishing you the best of health.


Gert Müller

Managing Partner



Stephan Müller

Managing Director

GEMÜ IS RECOGNIZED AS ONE OF 2021'S TOP EMPLOYERS

FOCUS-Business has listed valve, measurement and control system specialist GEMÜ as one of 2021's top employers in the Industry category.

The compilation of the best 1,000 employers in Germany for 2021 was based on an analysis of more than 950,000 companies and over 4 million ratings on the internet platform kununu.

Roughly 1,300 companies met the selection criteria. This required at least 50 ratings on kununu with an average rating of at least 3.0 points, a recommendation rate of at least 60 percent and a company base in Germany, plus at least 500 employees. Using these criteria, the 1,000 best employers, divided into 36 categories, were chosen and listed in the FOCUS-Business ranking.

With 1,900 members of staff worldwide, 1,100 of which are in Germany, headquarters in Ingelfingen-Criesbach in Baden-Württemberg plus above-

average ratings on kununu, GEMÜ met all of the criteria. GEMÜ was therefore judged to be one of the 70 best employers in Germany in the Industry category.

"We are delighted to be recognized in this way, as it shows our members of staff are very satisfied with GEMÜ as an employer," said Gert Müller, Managing Partner at GEMÜ. "This is also evident from our employees' years of loyalty to our company. In the past year, we celebrated 92 members of staff for clocking up 1,875 years at the

TOP

NATIONALER
ARBEITGEBER

2021

FOCUS

DEUTSCHLANDS
BESTE ARBEITGEBER
IM VERGLEICH

IN KOOPERATION MIT

kununu

FOCUS
08 | 2021

company between them. We want to build on this and continue putting our corporate culture, which embraces family values such as respect, appreciation and reliability, into practice in our everyday professional lives," added Mr Müller.

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GEMÜ HONoured AS "GLOBAL MARKET LEADER" FOR THE FIFTH TIME IN A ROW

GEMÜ has once again been listed in the global market leader index of the University of St. Gallen and the Academy of German Global Market Leaders.

WirtschaftsWoche has awarded the owner-managed valve specialist GEMÜ the WirtschaftsWoche quality seal "Global Market Leader – Champion 2021" for what is already the fifth time in a row. In doing so, WirtschaftsWoche has recognized GEMÜ's renewed inclusion in the global market leader index in the segment "Valves and automation components: Valves, Process and Control systems for sterile applications".

The global market leader index is created in accordance with objective criteria and transparent selection processes under the scientific direction of Professor Dr Christoph Müller from the University of St. Gallen, in cooperation with the Academy of German Global Market Leaders (ADWM). Using this framework, the business magazine WirtschaftsWoche annually lists the 500 global market leaders in their respective sectors in a special issue.

The researchers designate companies as "Global Market Leader Champions" if they are first or second in the relevant market segment, are represented on at least three continents with their own production and/or sales companies, have an annual turnover of at least €50 million, and can demonstrate an export share or foreign share of at least 50% of their turnover. Another important criterion for a company to obtain the accolade of "Global Market Leader Champion" is to be (owner-)managed with headquarters in the German-speaking region (Germany, Austria or Switzerland).

As a family-owned, owner-managed business headquartered in Ingelfingen-Criesbach (in the German state of Baden-Württemberg), with 27 subsidiaries as well as six manufacturing sites in Germany, Switzerland, China, Brazil, France and the USA, GEMÜ fully satisfies these requirements. In addition to these prerequisites, it was the cutting-edge technology and market leadership in the field of valves, process and control systems for sterile applications that served as a crucial factor for WirtschaftsWoche in awarding

the accolade and WirtschaftsWoche quality seal of "Global Market Leader – Champion 2021" to GEMÜ.

"In this unique and challenging year, we are very proud of the accolade of global market leader. It shows us that focusing on our innovative strength and customized customer solutions at the same time as investing in digital future issues has been the correct path," says Gert Müller, Managing Partner of the GEMÜ Group.



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GEMÜ RECOGNISED AS A "VALUABLE EMPLOYER FOR THE COMMON GOOD"

German weekly business magazine "WirtschaftsWoche" has certified the GEMÜ Group as making a "high contribution to the common good" and stated that the Ingelfingen-based family-owned enterprise is one of Germany's most valuable employers.

For the first time, analysis institute ServiceValue, in cooperation with German weekly business magazine "WirtschaftsWoche", has asked Germans throughout the country to judge the value 2138 companies with respect to their contribution to the common good. The largest German manufacturers, distributors and service providers (in terms of number of employees) were assessed by at least one thousand people.

This survey, which was carried out without the involvement of the companies concerned, found that GEMÜ was among Germany's most valuable employers and that the company makes a high contribution to the common good.

Nowadays, it is no longer just a company's turnover, profit and market share which are important, but also its contribution to the common good. For example, this can be measured by job creation, tax payments and sustainability programmes. In addition, an organisation's positive impact on society is heavily influenced by the social commitment made by the company and its employees.

Since the beginning, GEMÜ has focussed on having a comprehensive approach which involves members of staff, a commitment to the local region, as well as social initiatives all over the world. "It is our mutual understanding at the GEMÜ Group that economical, ecological and social sustainability and integrity form the basis of our company's success. We're delighted that our commitment has been viewed so positively and acknowledged by wider society," remarks Gert Müller, Managing Partner at the GEMÜ Group.

Of the 2183 assessed companies, WirtschaftsWoche certified 442 as making an "excellent contribution to the common good", while 558 were deemed to make a "high contribution to the common good". You can find further information about the survey at www.wiwo.de and www.servicevalue.de.



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WE DO A GREAT JOB TOGETHER. THAT'S WHY WE SMILE

INNOVATIVE CONNECTION CONCEPT EFFICIENT MAINTENANCE OF SINGLE-USE DIAPHRAGM VALVES

The further development of the first single-use diaphragm valve worldwide, GEMÜ SUMONDO, enables even faster and more efficient maintenance of single-use systems.

Thanks to the newly developed, innovative connection concept of the actuator and body, putting the actuator in the open position is sufficient for a safe valve function. Then the unit conveying the media, comprising the valve body and internally welded diaphragm, only has to be connected to the actuator via a clamp ring. The valve is ready for use and can be operated.

Should the unit conveying the media be replaced, it is sufficient to open the valve, undo the clamp ring again and put the actuator in the closed position. The components can then simply be disconnected from each other.

The unit conveying the media does not change with the new connection concept. Components in stock can consequently be reused without limitations.

The new connection concept is available with immediate effect as a pneumatic design (GEMÜ SU40 SUMONDO) or as a motorized version (GEMÜ SU60 SUMONDO).



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GEMÜ G:MOTION VIRTUAL EVENT HIGHLIGHT WITH INTERACTIVE PROGRAMME

In this unprecedented year, GEMÜ invited customers and sales prospects to a special digital event – G:motion – presenting trends and product highlights over three days in the new GEMÜ digital showroom.

GEMÜ relied on digitalization and organized quite a special highlight this year – a very real event in the virtual world, appealing to all customers and sales prospects around the globe. From 8th to 10th June 2021, G:motion created a special digital experience and an all round successful event. Presentations, panel discussions and specialist talks by leading experts as well as by specialists from GEMÜ business units formed the main area of interest of the virtual show. The focus here was on current issues, such as the valve designs of the future, power-to-X and automation and electrification in plant engineering. The option of interacting with the speakers, GEMÜ employees and other visitors in the lounge was used enthusiastically.

"As at live events, GEMÜ also presented trends and the latest products from the world of valves, measurement and control systems at G:motion. In the product and applications area, visitors could even view the valve from within," says Gert Müller, Managing Partner of the GEMÜ Group.

Furthermore, international GEMÜ subsidiaries made an appearance in the GEMÜ world. The HR corner rounded off the opportunities offered. Here, contact persons from the Human Resources department were available to those interested in questions regarding working at GEMÜ.

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SPEAKING WALLS WALL DESIGN IN THE PRODUCTION AND LOGISTICS CENTRE

After the expansion of the Speaking Walls on the façade in Criesbach, Germany, local artist Max Grüner has also creatively brought another wall to life in the Production and Logistics Centre in Kupferzell.

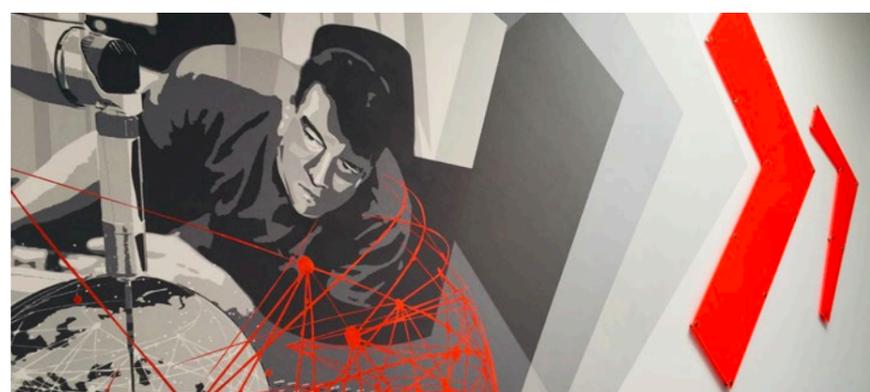
The corridor's main motif incorporates the wireframe face depicted on the GEMÜ company headquarters in Criesbach so as to create continuity in the content of the Speaking Walls independent of how they are presented on-site. The focus of the redesigned wall resides in the graphic representation of the production hall, where the red button constitutes a central point. The wireframe figure places a finger on it, thereby symbolically pressing the start button. This is always an exciting moment: Getting started in the morning – starting a new project – starting off towards new opportunities and challenges. Every development, from large to small, begins with a starting point – every work step, in every role in the company. Everyone has their own experience of starting something.

The red elements comprise fluorescent acrylic glass cut to shape, fittingly positioned with the skylights, meaning the red colour vibrantly takes centre stage. In the dark, the panels glow by themselves for a long time afterwards. On the other side of the wall, an abstract depiction of a precision measuring procedure draws the eye. But it is not a technical product being scanned, but rather the world itself. A globe with continents can be seen on the measurement device. The network of light from the measurements is

depicted larger in the room. The shapes moving outwards are not as linear as those that can be seen opposite. The image symbolizes GEMÜ as a global player and global market leader, which knows its markets and brings together local and international processes into a successful interaction – where ideas flow.

With this wall creatively brought to life in the Production and Logistics Centre, GEMÜ is continuing its concept of Speaking Walls. The new, inspiring artwork is now telling its story to every employee and visitor who walks down the corridor from the production hall to the canteen.

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DIGITAL SERVICES ADDED VALUES AS PART OF THE INDUSTRY 4.0 PLATFORM

Well-performing and disruption-free production through autonomous procedures is right at the top of the agenda both for users and for GEMÜ. What future options for monitoring process valves are there? This has already been a subject for a long time, to which new developments of different technologies will contribute.

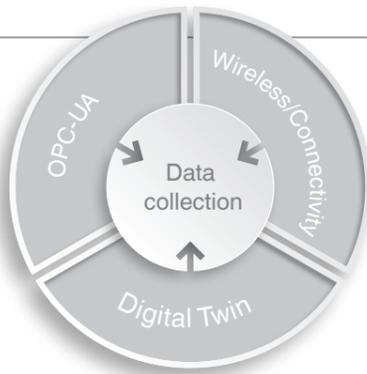
We have an idea of how GEMÜ will go down this path. We are already working on a few trailblazing projects in order to shape a path to local autonomous systems and offer our customers additional added value.

Standards – prerequisite of digitalization

A review:

The successful model of the Industry 4.0 platform for making processes more effective, for example by automating data handling, is now ten years old. Artificial intelligence (AI) and predictive maintenance are often mentioned, and figures such as "around a third of medium-sized enterprises use AI" and "a further 25% are planning its launch" are circulating. According to the Industry 4.0 Maturity Index, most users (approx. 80%) are only at maturity level 2 of "connectivity" here out of a total of six maturity levels. A Bitkom survey, however, did conclude that more and more people are discovering the opportunities of artificial intelligence. In many cases, therefore, data is currently just being collected for findings to be derived.

That seems realistic and also logical as a procedure. After all, with OPC-UA, wireless/connectivity and digital twinning, important prerequisites have been created in standardization, so as to be able to profitably collect and evaluate the required data.



OPC Unified Architecture (OPC-UA) is a standard for data exchange in a platform-independent, service-oriented architecture.

Wireless/Connectivity Used here in a general context, wired and radio (wireless) network connection.

Digital Twin: A digital twin is a digital representation of a material or immaterial object or process from the real world in the digital world.

Data – the key to added value and performance

Many of the GEMÜ products for control and regulation have already been working with digital data for a very long time. Digitalization and AI enable expanded solution approaches for monitoring process valves. Nevertheless, it takes more than an AI tool to allow automated monitoring of an operating medium over its service life on-site in a system environment.

For servicing and maintenance, knowledge and experience are a major focus, so as to be able to point to the cause of an effect.

This includes, for example, the following considerations:

- ⇒ Are the parameters of a control module not correctly set?
- ⇒ Is there perhaps a leakage in the pneumatic supply?
- ⇒ Are there interferences due to temperature or humidity?

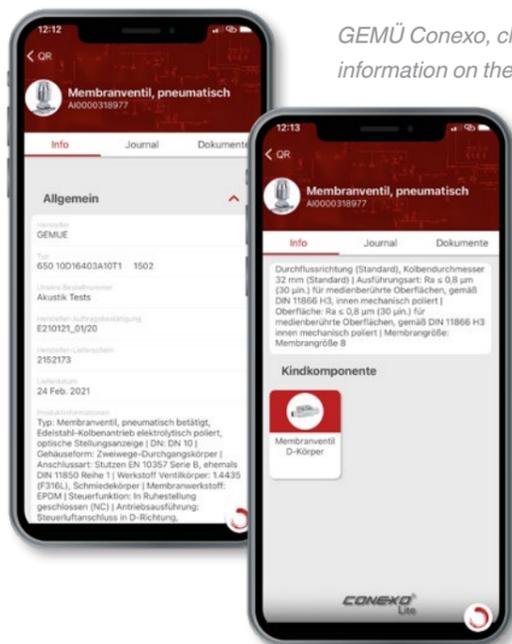
Situation today

The practical and proven GEMÜ solutions provide support for determining appropriate data in order to recognize operating changes and thus be able to define maintenance tasks in a forward-looking way – very much in the spirit of developing into autonomous functions and systems.

Products for connectivity/data interfaces



Likewise, the ability to positively identify operating media is part of successful digitalization. A digital type plate is required for this, which also positively allocates the collected data.



GEMÜ Conexo, clear information on the product

And tomorrow?

Data analysis and data use will be a permanent component of work in the future. In particular, this will facilitate the activities of service employees in servicing and maintenance – both on-site and remotely. A reliable data basis and analysis are decisive factors for quality and effectiveness in order to overcome challenges in the future. The most important bases and their standards, including OPC-UA and Asset Administration Shell, are attractively defined, and the phases of realization and implementation are next. [See picture 2]. **Gaia-X**, the GDPR-compliant cloud for a digital European ecosystem and secure data retention, is an example to this end.



The subject of sustainability, for example for the reduction of water consumption or energy consumption, will also accompany us. Decentralization, for example with the modularization of plants according to the principle of module type packages, is another trend towards reducing complexity and increasing recyclability. The same applies to flexibilization (batch size 1 to x) with the next step in the direction of autonomy.

All these subjects are based on data, the evaluation and analysis of which are supplemented with action recommendations and lead to the rectification of anomalies.

Simple – carrying people along

State-of-the-art computer engineering helps to master the data. After all, data should be as automated as possible and processed in real time, in order to make it simple for the user to flexibly increase performance through digital changes.

It is simplest if the products generate and report the required data themselves, and if the service employee has clear facts on which to base decisions. All in line with **plug and play**.

MATURITY LEVELS:
The Industry 4.0 maturity level can be downloaded from acatech (German National Academy of Science and Engineering).

- The maturity levels are described as:
- ⇒ 6 – adaptability
 - ⇒ 5 – forecasting ability
 - ⇒ 4 – transparency
 - ⇒ 3 – visibility
 - ⇒ 2 – connectivity
 - ⇒ 1 – computerization

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DIGITAL MAINTENANCE

GEMÜ MAINTENANCE TEAM RELIES ON THE CONEXO APP

Long searches for test reports and recording maintenance procedures in folders, on shelves and in compartments is now at an end. The GEMÜ Maintenance team has been relying on digitalization for more than two years and has introduced the CONEXO system, developed by inevvo solutions, to this end.

What was the original idea behind introducing the CONEXO system for maintenance at GEMÜ?

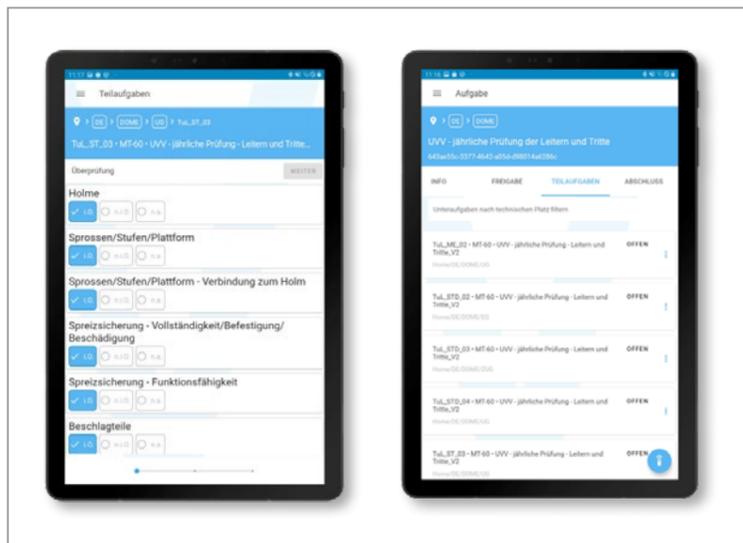
Friedrich Frerichs, working student at GEMÜ, has been occupied with the subject of maintenance digitalization. It was clear to him that Maintenance too requires a flexible and mobile solution for maintenance procedures. The CONEXO system, developed by GEMÜ's subsidiary inevvo solutions, was the perfect answer. The Maintenance team considers the technology based on RFID engineering to be very interesting and, above all, trailblazing. For this reason, Maintenance made itself available for a pilot project and has already been using the CONEXO system for maintenance procedures for more than two years.

How many people have been trained to date in handling CONEXO?

There are currently seven Maintenance employees with various areas of responsibility who have been trained in handling CONEXO. The extent of the tests and the duties is constantly growing, and so another two employees will be added to this number in the summer. Whenever particular areas are added, the relevant employees learn how to handle the trailblazing system.

What test is currently carried out with CONEXO?

The test of steps and ladders according to accident prevention regulations was carried out for the second time already. To this end, a total of 184 steps and ladders were equipped with RFID chips and the data incorporated in the CONEXO system. Here, too, the Maintenance employees were pioneers and have extensively tested the new and natively developed CONEXO app V2 – with the result that this is "a great further development in combination with an excellent, state-of-the-art design".



How is such a test carried out?

In the case of steps and ladders, a test certificate must be completed that is now in a paperless format via a maintenance template in CONEXO. An inspection test (visual inspection) is then carried out. The employee enters and stores the entire test procedure directly in the CONEXO app. After the test, an inspection sticker is affixed as usual. This test is due every 12 months. The previously required test post-processing is a thing of the past, as every step has already been documented in the CONEXO app during the test. In addition, CONEXO automatically creates the date for follow-up maintenance next year immediately after completion of the maintenance. After subsequent synchronization between the app and portal, the data is available on every connected device.



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How much time do you save by logging the test with CONEXO?

Searching for test certificates in paper format and browsing folders and trays is a thing of the past. This saves approximately 20% of the time previously required for such a testing operation.

How are the future prospects?

More and more employees are being trained in handling CONEXO, as the aim is for all work materials subject to testing to be documented, step by step, via CONEXO. Furthermore, there is still the option of introducing a dashboard, which can be customized in how it is configured. An overview of the work materials still to be tested, the ones already tested and the faulty ones would be possible here. This would give a fast overview of the current status in each case.

LEAN ADMINISTRATION

ELECTRONIC DRIVING LICENCE CHECKS

Driving licence checks are an essential process and should be carried out at least twice a year. The process has been digitized using CONEXO.

This guarantees seamless documentation, which can be downloaded and includes daily updates.

In the past, many different documents were needed in order to carry out a legally sound, full driving licence check. To undergo a check, all owners of a company vehicle had to present a valid driving licence and fill in a wide range of paper documents twice a year. The individual documents then had to be manually collated in an electronic format.



To simplify this process, inevvo solutions, a subsidiary of GEMÜ, has developed its own electronic driving licence check based on the latest RFID technology. Every driving licence held by a company car owner is allocated a CONEXO batch, in which their driving licence data is stored in the CONEXO database. Now, company car owners simply have to evaluate the batch using a CONEXO pen twice per year and the updated data automatically enters the driving licence database.

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CONEXO®		Wartung				
Offen	Freigabeprozess nicht festgelegt	Zur Bearbeitung freigegeben	In Bearbeitung	Abgeschlossen - Bewertung ausstehend	Al >	
Wartung	Standort	Geplanter Durchführungszeitraum	Zeitraum bis	Turnus	Aktionen	
Führerscheinkontrolle BS SEM	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	
Führerscheinkontrolle BU IND	GEMÜ/Dienstwagen	30 Sep 2020	29 Dez 2020	6 Monate	[edit] [delete]	
Führerscheinkontrolle BU PFB	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	
Führerscheinkontrolle Fuhrpark	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	
Führerscheinkontrolle Geschäftsführung	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	
Führerscheinkontrolle inevvo	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	
Führerscheinkontrolle Produktion	GEMÜ/Dienstwagen	30 Mär 2021	29 Jun 2021	6 Monate	[edit] [delete]	

Elemente gesamt: 7

FROM BRAZIL TO THE WORLD

The GEMÜ Group is investing in the São José dos Pinhais manufacturing site in Brazil. This site will now produce diaphragms for industrial areas and deliver them to all continents.



GEMÜ has been relying on its site in Brazil – one of its six production centres worldwide – for more than 40 years. The site employs around 100 members of staff and produces in line with the group-wide quality and security standards. In order to guarantee this, GEMÜ Brazil invested in machinery and tools imported from Europe. The Brazilian subsidiary was supported by German colleagues from the GEMÜ Group and by the French subsidiary Intercarat – a specialist for high-quality moulded parts made from elastomers and polytetrafluoroethylene as well as composite parts made from rubber, plastic and metal.



Lean Manufacturing

Investments were not only made with regard to quality. By introducing lean manufacturing, GEMÜ Brazil exceeded its goal of increasing production by 20% in the past year. Other areas, for example raw materials storage and material transport, were restructured and optimized. "Thank you to the entire team in Brazil for their commitment and dedication! With the support of GEMÜ Germany and Intercarat, the reorientation as a competence centre for industrial process diaphragms was a complete success," says Andreas Gohringer, Managing Director of the Brazilian subsidiary.

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GEMÜ PRODUCT NEWS

PRODUCT EXTENSION

New nominal sizes for GEMÜ 567 BioStar control, 567 eSyDrive and 567 servoDrive

The GEMÜ 567 BioStar control, 567 eSyDrive and 567 servoDrive control valves are designed for aseptic applications and are based on a unique sealing concept: PD design. This type of design has been developed by GEMÜ in order to unite the advantages of diaphragm valves with the advantages of globe valves. The valve's geometry allows for a hermetic separation of the actuator from the media flow and a high level of control accuracy. Quantities of 80 l/h right up to 63,000 l/h can be safely controlled, as well as batched quickly and precisely. The GEMÜ 567 BioStar control, 567 eSyDrive and 567 servoDrive aseptic control valves are now available in nominal sizes DN 8 to DN 50.



GEMÜ 567 eSyDrive, motorized *GEMÜ 567 servoDrive, motorized*

GEMÜ 567 BioStar control, pneumatically operated *GEMÜ 567 BioStar control, manually operated*

New nominal sizes for single-use pinch valves

Additional nominal sizes for the GEMÜ Q30 and Q40 single-use pinch valves are now available. These valves feature a secured retainer, into which the tube is inserted. To control and regulate the guided medium, the tube is compressed from above by a compressor. Thanks to the specially developed contour of the compressor, the strain on the tube is minimized, which extends the service life of the tubes. The single-use pinch valves are now available in the following tube sizes:



Single-use pinch valves GEMÜ Q30 and Q40

- ⇒ ID 1/8" / OD 3/8"
- ⇒ ID 1/4" / OD 7/16"
- ⇒ ID 1/4" / OD 1/2"
- ⇒ ID 3/8" / OD 5/8"
- ⇒ ID 1/2" / OD 3/4"
- ⇒ ID 1/2" / OD 7/8"
- ⇒ ID 3/4" / OD 1 1/8"
- ⇒ ID 3/4" / OD 1 3/16"
- ⇒ ID 1" / OD 1 13/32"
- ⇒ ID 1" / OD 1 7/16"
- ⇒ ID 1" / OD 1 1/2"

Further nominal sizes available for the globe valve bodies for the GEMÜ 536 globe valve

New globe valve bodies for the GEMÜ 536 globe valve are now available in nominal sizes DN 32 and DN 40. The globe valve bodies are made from stainless steel (1.4408, investment casting material) and can withstand high operating pressures.



Globe valve GEMÜ 536

Further nominal sizes for the GEMÜ R629 eSyLite diaphragm valve

The GEMÜ R629 eSyLite motorized diaphragm valve is now also available in the diaphragm size of 25.



Diaphragm valve GEMÜ R629 eSyLite



NEW GEMÜ CODE 71 DIAPHRAGM FOR DEMANDING CHEMICAL APPLICATIONS

The new GEMÜ code 71 diaphragm is the first three-piece diaphragm developed by GEMÜ. It comprises a PTFE face, an intermediate layer made of PVDF and an EPDM backing. The GEMÜ Code 71 is based on the tried and tested design and construction of the GEMÜ code 5M diaphragm. However, the diaphragm is expanded to include an intermediate layer. Diaphragm sizes 10 to 100 are available with immediate effect.

The diaphragm has been developed for particularly demanding applications. It is particularly impressive due to the low permeation of gases. By permeation is meant the process, by which a material, for example a gas or a solid penetrates.

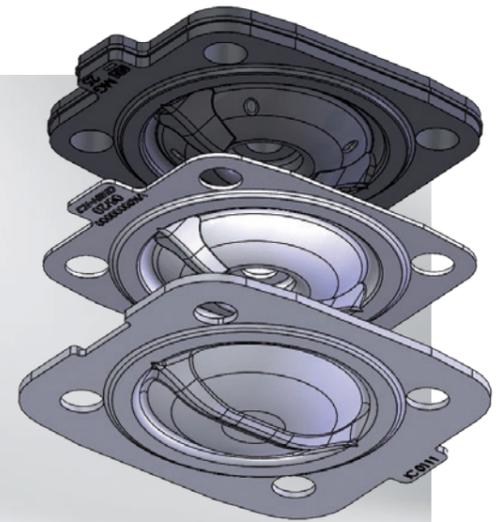
The excellent permeation properties of the GEMÜ code 71 diaphragm have been obtained through specific research & development. The PVDF material used for the intermediate layer is the fluoroplastic with the best permeation properties of this type of material. Moreover, the intermediate layer made of PVDF has a much greater wall thickness than comparable products on the market and with significantly better results in terms of endurance. Alongside this, the omission the leak detection holes in the backing diaphragm ensures a reduction in the permeability of the diaphragm. During benchmarking examinations of three-piece diaphragms, the GEMÜ code 71 diaphragm demonstrated a lower level of permeation by gases, by a factor of up to 6, in comparison with similar products.

Tried and tested resistance

The diaphragm face has a threaded pin made of grade 7 titanium, allowing optimal assembly over a stop. This combination provides tried and tested resistance to highly corrosive and chloride media and is suitable for use



GEMÜ code 71 diaphragm



Representation of the GEMÜ code 71 diaphragm face, intermediate layer and backing diaphragm

particularly in chlor-alkali electrolysis process steps. The GEMÜ code 71 diaphragm is the correct choice for consistently high temperatures and is therefore, within the GEMÜ diaphragm portfolio, the solution for demanding applications in the chemical industry.

These results were confirmed and certified TÜV SÜD based on DIN EN 1779 via vacuum procedure B6 and resistance to chlorine examinations based on ISO 1817.

Furthermore, the GEMÜ code 71 diaphragm was qualified in all available sizes in a comprehensive test programme. As for all GEMÜ diaphragms, it undergoes intensive testing in various endurance tests, in order to receive approval. The diaphragm complied with all internal specifications.

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NEW QUARTER TURN ACTUATORS FOR SIMPLE APPLICATIONS GEMÜ GDR AND GSR BASIC ACTUATORS

The new GEMÜ GDR and GSR pneumatic quarter turn actuators are a lucrative "basic" alternative which expands the existing actuator portfolio for the construction of butterfly valves and ball valves for simple applications. These actuators offer an attractive price-performance ratio and are compliant with standard EN15714-3.

In addition to the GEMÜ DR/SC premium actuator for maximum functional reliability and the tried and tested GEMÜ ADA/ASR "all-rounder actuator", which is universal and is versatile, the cost-optimised GEMÜ GDR and GSR basic actuators for pneumatically operated butterfly valves and ball valves will also be available in the future.

The single acting design of GEMÜ GSR and the double acting design of GEMÜ GDR are suited to simple open/close applications in non-corrosive

environments. The setting range for the end positions $\pm 5^\circ$. The clockwise rotation quarter turn actuators can be operated with a control pressure of 2.5 bar minimum and 8 bar maximum, and are designed for low to medium cycle duties. The optical position is indicated via a trigger cam with scale ring, which indicates the actual position of the butterfly disc in the piping to the user quickly and easily.

The standardized flanged connection in accordance with DIN EN ISO 5211 from F03-F14 also permits simple and quick installation on GEMÜ quarter turn valves in the nominal sizes DN 15 to 300 with a torque of between 2 and 1500 Nm. The actuators also have an interface according to VDI/VDE3845 for position feedback, pilot valves and other mountable accessories. Because of the aluminium housing and the epoxy-coated cover, actuators are protected against corrosion. The colouring and design of the painted cover has been adjusted to the GEMÜ butterfly valve series.



GEMÜ GDR pneumatic actuator for quarter turn valves

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	Chemical engineering	Surface finishing	Industrial water treatment	Mechanical engineering and processing industry	Power generation and environmental engineering	Foodstuffs and beverages	Microelectronics and semiconductor industries	Medical	Pharmaceutical, biotechnology and cosmetics industries
GEMÜ DR/SC	■	■	■	■	■	■	■	■	■
GEMÜ ADA/ASR	■	■	■	■	■	■	■	■	■
GEMÜ GDR/GSR	■	■	■	■	■	■	■	■	■

FREE FROM VIABLE MICRO-ORGANISMS

EXPANSION OF CAPABILITIES AT GEMÜ SWITZERLAND

The GEMÜ site in Emmen, Switzerland expanded its capabilities and customer services in the sterilization division at the start of the year. This has strengthened the subsidiary's position as a provider of solutions from a single source for customers in the Medical Systems and Pharma, Food and Biotech business units.

To expand its capabilities, the company had to describe the required processes, create documentation and provide evidence of sterility using a product. The process and documentation were audited and confirmed by TÜV Rheinland. As a result, the scope of the (EN) ISO 13485:2016 certificate was extended to include "Sterile packaging and management of radiation sterilization processes (X-ray)".

Special thanks go to the team led by Biljana Gampp, which has worked intensively on creating the required processes and associated certification over the last few months. This created the basis for enabling (EN) ISO 13485:2016 to be officially extended to include sterile packaging and management of radiation sterilization processes. The expansion of capabilities at the Emmen site means both current and future customer requirements can be met. The GEMÜ subsidiary



FREE FROM VIABLE MICRO-ORGANISMS

GEMÜ subsidiary as an interface

Through this step, GEMÜ is extending its range of services for sterile products and sterilization management. The site in Switzerland manufactures packaged products and acts as an interface to all external partners who are part of the process, such as microbiological and physical test laboratories and contract sterilization companies.

The details of the expansion for both business units are as follows:

Medical Systems

Sterile medical products (in accordance with ISO 11137) are being offered to medical system customers. This guarantees the use of state of the art techniques to validate packaging processes for sterile medical products and provides evidence.

Pharma, Food & Biotech

Depending on customer requirements, sterile products (with proof of sterility) and irradiated products (without proof of sterility; product is "quasi-sterile" after radiation) are being offered to customers in the Business Unit Pharma, Food & Biotech. The advantage of the process for irradiated products is that it is less cost-intensive and guarantees a shorter lead time. The establishment of these two processes means customers' individual requirements can be met.

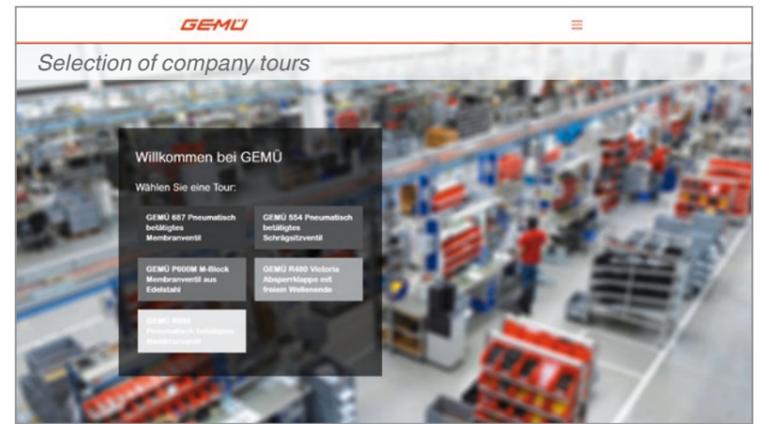
is proud of the fact that it has raised the company's appeal as a result, making a significant contribution to the future success of the GEMÜ group.

For more information, visit www.gemue-medical.com

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GEMÜ DIGITAL VIRTUAL FACTORY TOUR

A guided tour around a modern production facility? Where you can become more familiar with GEMÜ and have a conversation with partners? That's almost inconceivable in the times we're currently living in. Yet you can have this very experience as part of the GEMÜ digital virtual factory tour. Talk to your tour guide, ask them your questions, let them show you interesting things – just as if you were at GEMÜ in person.



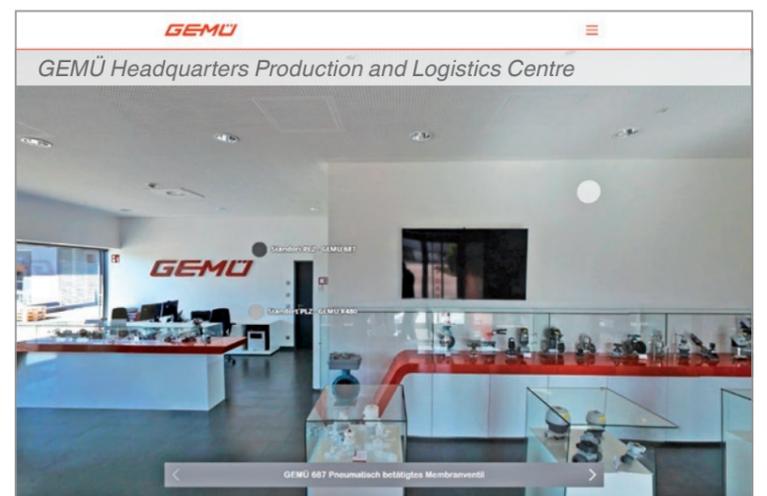
3D virtual tour – Almost like in real life

A look behind the scenes: Where are your products manufactured? What logistics processes ensure that your delivery is trouble-free? Find out this and more very easily on our virtual tour. Have a 3D experience where you can look in all directions and go to the locations that particularly interest you. Your guide will be there with you.

You can select the focal areas of your tour and tailor them to your personal interests. Would you prefer to become more familiar with logistics, or how the assembly environment for your products is organized?

A bird's eye view is also impressive, where you can see the shapes and scale of the GEMÜ world as if from an aeroplane.

Simply request a tour booking from your contact person at GEMÜ Sales. Your contact person will put you in touch virtually with our specialists so that you can then experience a digital tour. Enjoy a digital experience.



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THE SECRET OF LONG-TERM TIGHTNESS

GEMÜ DIAPHRAGM CODE 5M

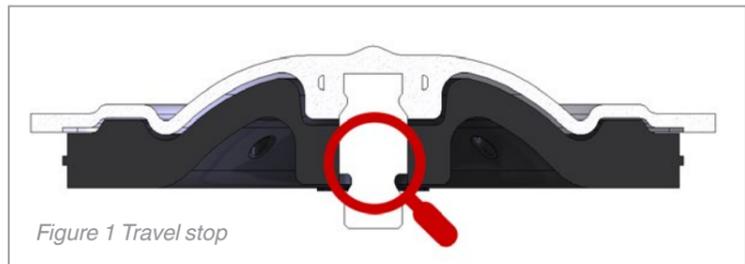


Today we are searching for the secret of the long-term tightness of the GEMÜ code 5M diaphragm. What is the reason why the GEMÜ diaphragm Code 5M practically never need to be re tightened?

To accomplish this, we will consider below in the following the individual features of the GEMÜ 5M diaphragm and will discover, which parameters are responsible for its particular properties.

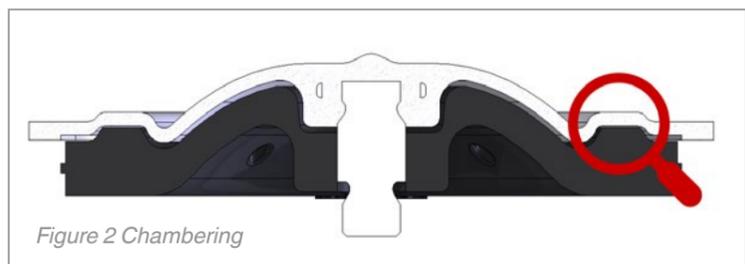
Is the threaded pin travel stop perhaps responsible for the high level of long-term tightness?

The GEMÜ code 5M diaphragm travel stop (see Fig. 1) offers the advantage of a defined mounting. This means that the diaphragm cannot be screwed in too little or too far, due to its defined mounting point.



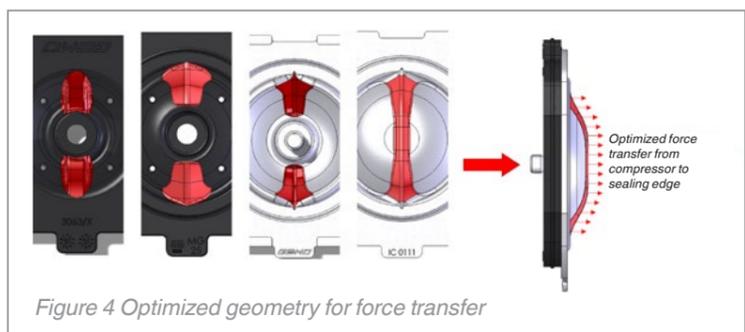
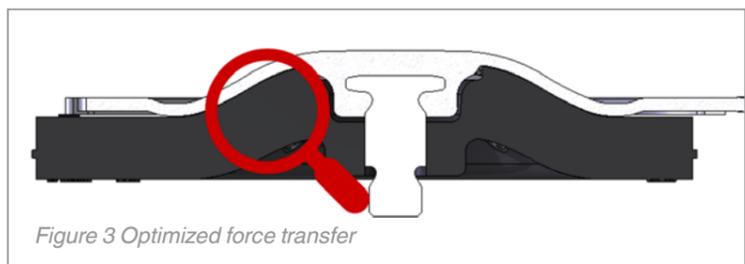
Or is chambering responsible for the high level of long-term tightness of the code 5M diaphragm?

The additional chambering on the diaphragm face and the diaphragm backing (see Fig. 2) prevent the diaphragm face pulling into the centre during vacuum applications. The chambering also provides a fixed seat for the diaphragm face in the backing. This prevents the diaphragm slipping during assembly.



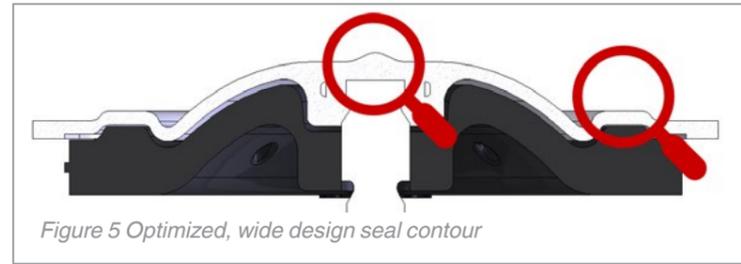
Could the optimized sealing surface force transfer, which acts specifically on the sealing edges, be responsible for the high level of long-term tightness?

Yes! Due to optimized geometry, the force transfer acts directly on the sealing edges of the diaphragm (see Fig. 3). This increases the long-term tightness. The compression of the compressor is channelled directly over contours on the backing diaphragm and diaphragm face to the sealing edge (see Figure 4). We are expecting to find even more properties of the GEMÜ code 5M diaphragm which are responsible for the high level of long-term tightness, and are continuing our search.



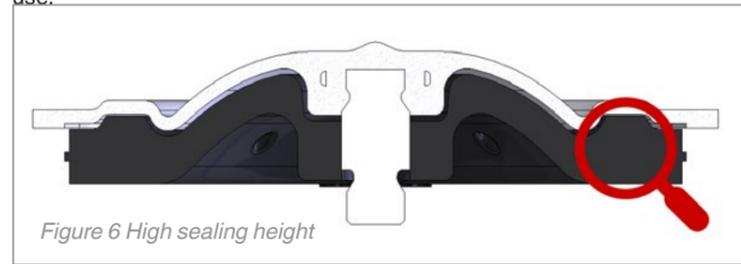
Is the optimized and reinforced design of the seal contour and seal height of the GEMÜ code 5M diaphragm responsible for the long-term tightness?

Yes! The wide design of the seal contour (see Figure 5) is advantageous in terms of contact stress of the diaphragm and therefore also for the long-term tightness of the GEMÜ code 5M diaphragm. This enables consistent sealing over the valve seat and consistent external sealing. This prevents there being any dead space, in which media could collect. In addition, the reinforced sealing edges provide increased clearance during assembly and application of the diaphragm. The sealing edge of the diaphragm and valve body are always flush and must therefore be compressed together necessarily. We are expecting to find more properties of the GEMÜ code 5M diaphragm which are responsible for the high level of long-term tightness, and are continuing our search.



Could it be possible that the high seal height of the backing diaphragm is responsible for long-term tightness of the GEMÜ code 5M diaphragm?

Yes! The seal height (see Figure 6) is the main feature of the high level of long-term tightness. The operating window, in which the diaphragm tightness holds, increases. For applications in accordance with examination in accordance with ASME BPE, the diaphragm must not be re tightened in use.



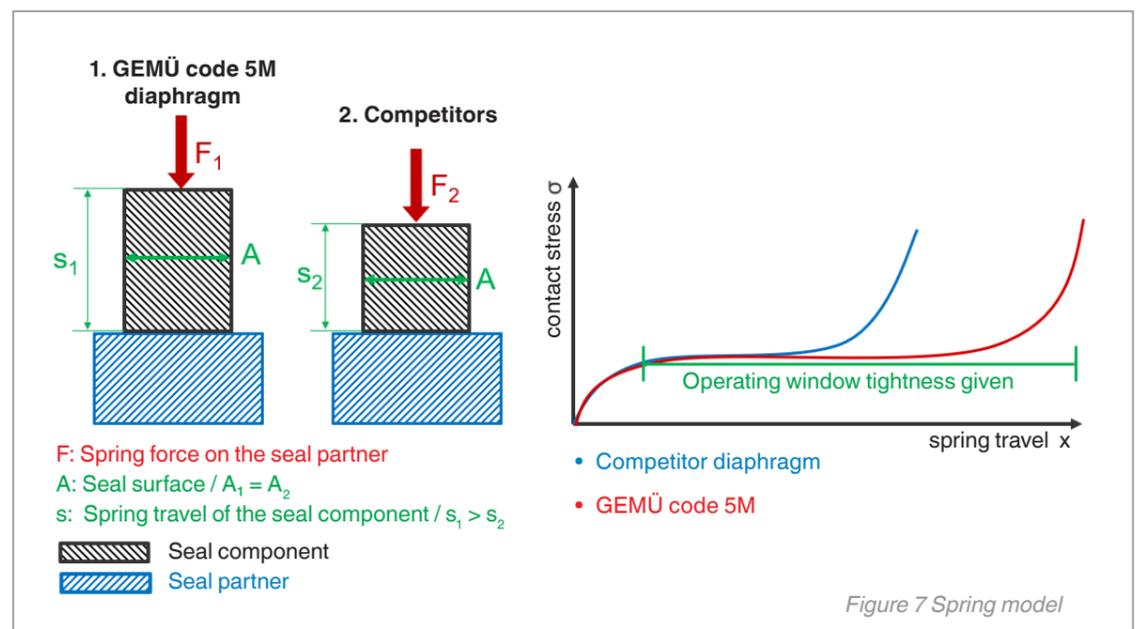
This results from the geometry of the backing diaphragm. If the backing diaphragm is considered an elastomer spring, this can explain the clear advantage in terms of the long-term tightness. Elastomer springs behave as follows: As the travel increases, the force required to move the spring also increases. If the spring is released, the force falls again. The force at the sealing area and therefore also the contact stress, which is responsible for the sealing effect, is consequently directly dependent on the spring travel of the backing diaphragm. This behaviour is also reflected during assembly of a diaphragm. Here the diaphragm is compressed and is considered as a spring with the aid of the appropriate model.

Due to the decompression effects and the consequent contact stress relaxation of the elastomer, the sealing capability of diaphragms falls

during application of diaphragms. The spring travel of the GEMÜ diaphragm Code 5M extends the operating window significantly and thereby ensures adequate contact stress, in order to ensure the tightness of the valve.

The circumstances explained should be illustrated again in Figure 7. The left part shows a model, illustrating the seal components (black) of a GEMÜ code 5M diaphragm and those of an optional competitor's diaphragm. The area shown in blue is the seal partner. In the model, for the two seal components under consideration, contact surface A and spring force F are constant. The spring travel of the GEMÜ code 5M diaphragm is higher than on conventional diaphragms. In the right-hand graph, the contact stress resulting from the force and the seal surface, is shown by spring travel x. It can be seen in the graph that the operating window of the GEMÜ code 5M diaphragm features a longer spring travel, which ensures that a stress level can be maintained over a longer travel. The operating window is also longer.

As shown, the GEMÜ code 5M diaphragm has many advantages and innovative features. The most outstanding of which is the high level of long-term tightness of the diaphragm, resulting from the reasons listed above and its geometric features.



STAINLESS STEEL COMPONENTS FOR THE SEMICONDUCTOR INDUSTRY

GEMÜ VCR CONNECTION AS STANDARD

The Business Unit Semiconductor has made it their central objective to offer customers comprehensive solutions for all areas of semiconductor manufacturing. Depending on the medium used, different materials are used.

For most process media, valves made of ultra pure plastics are used, as there is a risk with other materials that particles will be flushed out that could then contaminate the process.

Solvents have a special feature. They are used for removing special photoresists, for dissolving substrates or for cleaning. At the same time, however, they are slightly flammable and highly corrosive with some plastics. In addition to the purity of the components and the connections, care must therefore also be taken regarding explosion protection when handling the solvents. As valves made of ultra pure plastic do not comply with these requirements for explosion protection, stainless steel valves are used for solvent handling in most cases.

Only a few connections are suitable for the high purity requirements. In the past, many users therefore used valves with butt weld spigots, which were then either firmly encapsulated in the system or equipped with the corresponding connections on-site. GEMÜ already had experience with these connections established on the market as part of various special projects. GEMÜ is now introducing the VCR connection as standard so that customers can directly order the corresponding configuration in the future.

No compromises when it comes to purity

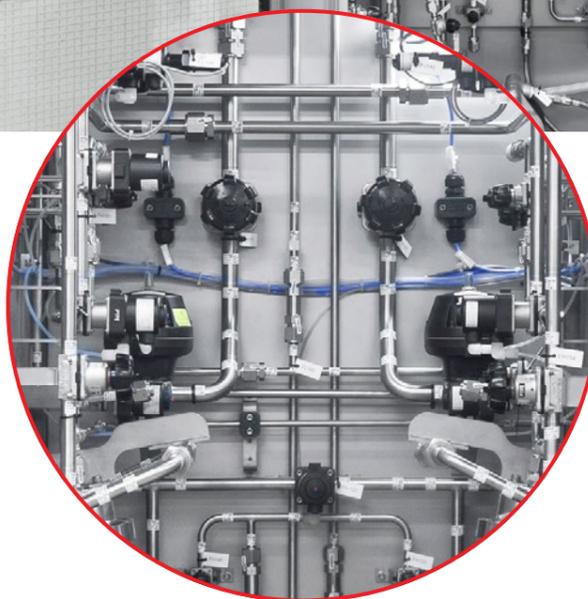
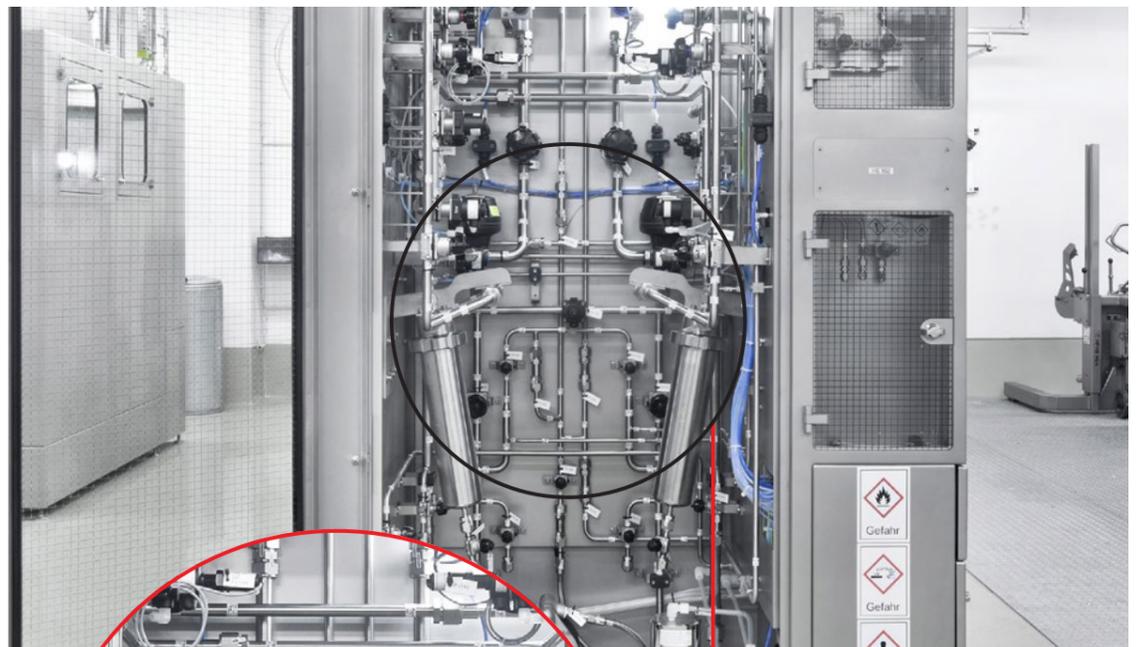
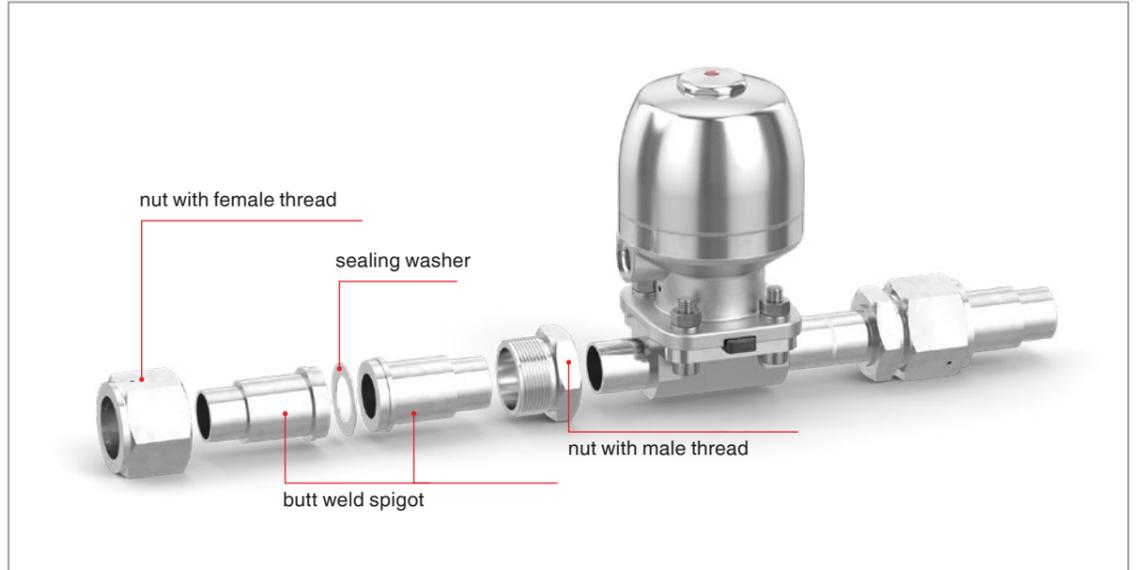
The connection with the special metal-face-to-face seal system originates from gas applications. Sealing with a compressed stainless steel disc is also suitable for applications with high purity requirements, which prevail in semiconductor manufacturing. The connection consequently offers the option of also flexibly replacing stainless steel components, without accepting compromises in purity.

As described, the connection is detachable. The component is installed in the system by positioning the sealing washer between the welded on connections and bolting the nut with male thread together with the nut with female thread according to the instructions, which compresses the sealing washer.

GEMÜ offers the connection options MV (nut with male thread) and FV (nut with female thread). The connection is available for the valves of nominal sizes DN 8 to DN 25 typically used in the solvents sector.

Thanks to the new connections, the connections no longer need to be welded on on-site. Users therefore save themselves an extra work step on-site and benefit from faster availability of final components of the usual high GEMÜ quality.

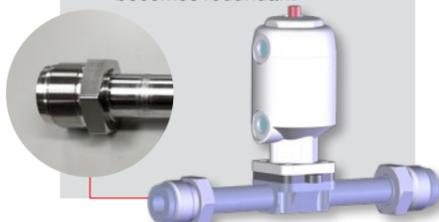
The newly introduced connections represent a further step towards the GEMÜ system construction strategy, which aims to offer simple tandem welded configurations for VMB stick manufacturing plants and complex welding assemblies in addition to single components in order to support customers in as many areas as possible.



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Welded on VCR joint

- ⇒ Common connection type for simple installation and replacement of components
- ⇒ Flexible installation and assembly in the supply systems
- ⇒ Laborious welding work becomes redundant



Simple welding configurations

- ⇒ Different configurations possible
- ⇒ Savings on fittings
- ⇒ Maximum functionality in minimum space



Stick welding

- ⇒ Stick configurations are designed according to customer requirements
- ⇒ Various valve types, connection types and pipe diameters are possible



Sub-assemblies/ welding assemblies

- ⇒ Complex sub-assemblies designed and constructed according to customer requirements
- ⇒ Integration of measurement and control systems possible



INCREASED COMPLEXITY

GEMÜ SYSTEMS

SYSTEM SOLUTIONS FROM A SINGLE SOURCE

Since this year, GEMÜ has been offering customers a new service with GEMÜ Systems. As a supplier of systems, GEMÜ Systems offers customized solutions that go beyond the provision of standard products. The new department specializes in combining various components into systems.

GEMÜ Systems supports customers, from inquiries about individual components and ready-to-fit assemblies through to the joint development of complete systems. Differentiation is made into three "levels" here:

- ⇒ Level 1: Simple component assembly
- ⇒ Level 2: Component assembly with control unit
- ⇒ Level 3: Control systems and system development

The System Construction main department comprises the System Construction and Special Engineering departments. Both areas focus on special solutions.



System Construction department

The team in System Construction is, broadly speaking, the creative department, focusing on customer requirements "beyond" the GEMÜ product modular system. The department optimizes internal processes and products, or recreates customers' previous personal contributions in order to generate added value for both sides.

This reduces the customer's effort in the areas of purchasing, incoming goods, quality assurance, warehouse and logistics. In addition, lead times are reduced and the effort in the areas of capacity planning and capital commitment is reduced.

A further area of application is in process or product requirements, which are not yet represented with current products or solutions. To this end, the System Construction team find creative and cost effective solutions.



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Special Engineering department

The Special Engineering department takes on the role of "problem-solver" and "implementer" of improvement ideas within production plants – mainly at the site in Germany, but also further afield.

In this way, in addition to quick fixes to deal with loss of production during plant shutdowns for short periods, strategic plant design and process improvements are also implemented and new technologies and processes are tested, qualified and introduced into manufacturing.



Leading through experience

Thanks to many years of experience in measuring, valve and control systems technology, the GEMÜ Systems team has specialist skills and technical expertise in various scopes of application, which directly benefit the customer.

Professional project processing

The GEMÜ Systems team has a wide range of knowledge regarding plants and products and understands customer processes. Thanks to knowledge and use of the latest technologies and manufacturing processes, the team is optimally prepared and works together with the customer to take the next step towards the future.

Contact GEMÜ Systems via your consultant

With the help of a specification sheet and drawings, the GEMÜ team discusses requirements together with the customer and develops solutions.

NOW AVAILABLE ON THE CANADIAN MARKET

Selected GEMÜ diaphragm valves for industrial applications are now available to Canadian customers. They have been given a Canadian Registration Number (CRN).

It is obligatory to give pressure equipment for the Canadian market a CRN, depending on the scope of application. CRNs are issued by the provincial authority following an examination of the equipment's compliance with the directives and regulatory codes of the relevant province or territory.

Within GEMÜ's product range, CRN approval has already been obtained for diaphragm valves for sterile applications as well as for globe valves. Approval has now also been given for GEMÜ 620, 628, 675, 687, 655 and 656 diaphragm valves. This is part of a strategy to develop the international orientation of GEMÜ's product range in compliance with technical standards.



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NEW GEMÜ B SERIES BALL VALVES COMPLY WITH THE STRINGENT REQUIREMENTS OF THE FOOD INDUSTRY

The GEMÜ B series ball valves are used in a wide variety of industrial processing and product preparation steps, as well as in supply processes for food production. Regulatory requirements are especially stringent in the food industry.

Due to these requirements, it is essential that the media wetted materials of the valves already comply with all certificates for food grade suitability in the auxiliary production processes. A wide range of migration tests have confirmed compliance with limit values in accordance with US-FDA 21 CFR 177.1550, EU Directive No.1935/2004 and EU Regulation No. 10/2011 for the GEMÜ B series ball valves. Therefore, use and contact with foodstuffs is harmless for the entire B series.

These conformities are valid for the PTFE and PTFE TFMTM seals, as well as for the cast stainless steel bodies made of 1.4408 (CF8M), 1.4404 (CF3M) and 1.4435 (316L).

In addition, the GEMÜ B24, B44 and B54 ball valves comply with the requirements of USP Class VI, meaning they can be used not only in industrial processes and in the food industry, but also in the pharmaceutical industry.

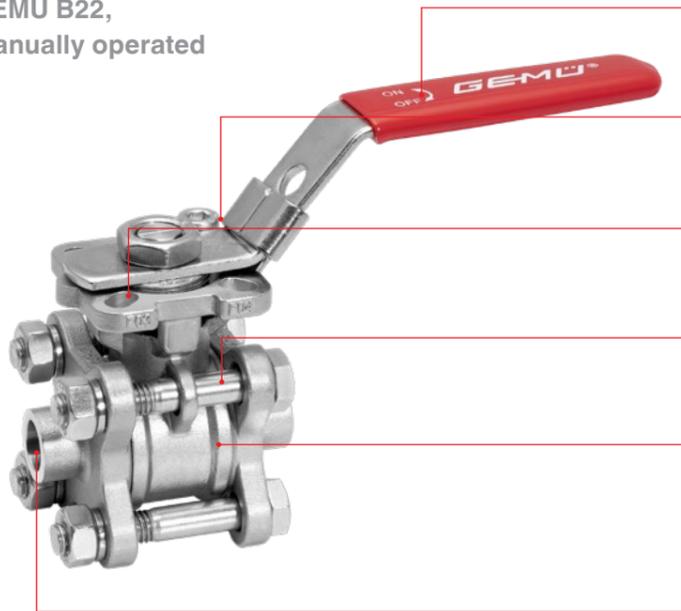
GEMÜ B SERIES BALL VALVES:

- ⇒ GEMÜ BB02 with bare shaft
- ⇒ GEMÜ B22, manually operated
- ⇒ GEMÜ B42, pneumatically operated
- ⇒ GEMÜ B52, motorized
- ⇒ GEMÜ BB04 with bare shaft
- ⇒ GEMÜ B24, manually operated
- ⇒ GEMÜ B44, pneumatically operated
- ⇒ GEMÜ B54, motorized
- ⇒ GEMÜ BB06 with bare shaft
- ⇒ GEMÜ B26, manually operated
- ⇒ GEMÜ B46, pneumatically operated
- ⇒ GEMÜ B56, motorized

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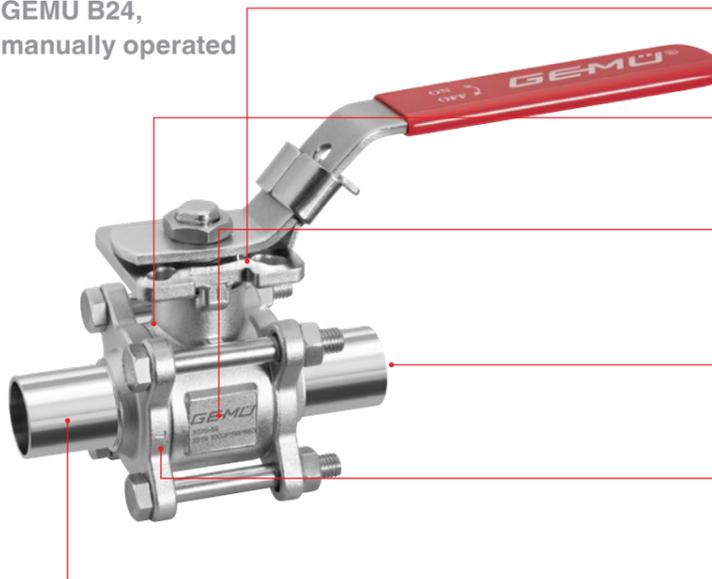
 **Dennis Bezold**
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**GEMÜ B22,
manually operated**



- Flexible**
freely selectable, different actuators can be mounted
- Modular**
3-piece body design enables simple mounting
- Automation-capable**
ISO 5211 top flange for simple actuator mounting
- Qualitative**
design acc. to DIN12516-2, ASME 16.34
- Seals**
FDA compliant seal materials
- Variable**
various connections. Butt weld spigots in extended orbital welding design

**GEMÜ B24,
manually operated**



- Automation-capable**
ISO 5211 top flange for simple actuator mounting
- Seal**
FDA, USP Class VI and Regulation (EU) No. 10/2011 compliant seal materials
- Quality**
PED 2014/68/EU Module H1, design to DIN 12516 EU Directive 1935/2004
- Connection options**
Butt weld spigots in extended orbital welding design
- Material**
1.4435 investment casting with low ferrite < 3% for body, ball and end caps
- Surfaces**
Media wetted inside standard electropolished Ra ≤ 0.51 µm



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 **Matthias Wolpert**
Product and application manager
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FLEXIBLE AND MORE FLEXIBLE – GEMÜ P600S MODULAR M-BLOCK DIAPHRAGM VALVE WITH FLEXIBLE CONNECTION SYSTEM

The new GEMÜ P600S multi-port valve block solution allows for flexible combination of standardized single components. The new modular system therefore offers advantages regarding procurement and inventory-keeping, whilst simultaneously ensuring achievement of highly individual actuator travel and flow paths.

In addition to multi-port valve blocks manufactured on a case by case basis, today modular and partly standardized block systems made of plastic or stainless steel are already in use in many sectors. Thanks to the systematic construction of the modules, complex valve assemblies can be paired in a variable way based on fewer basic bodies, meaning complex actuator travel and flow paths can be produced with different layouts of basic bodies. The new, innovative GEMÜ P600S M-block solution now goes one step further, facilitating later modification to connections via a flexible connection system, so that different types can be integrated

individually into the respective processes.

The modular basic bodies and connections can be kept in stock as single components and paired depending on requirements on a case by case basis. GEMÜ thus provides plant engineers and operators with the option of flexibly adapting or expanding their process plants at any time directly on location.

GEMÜ P600S is available in various plastics as well as stainless steels.



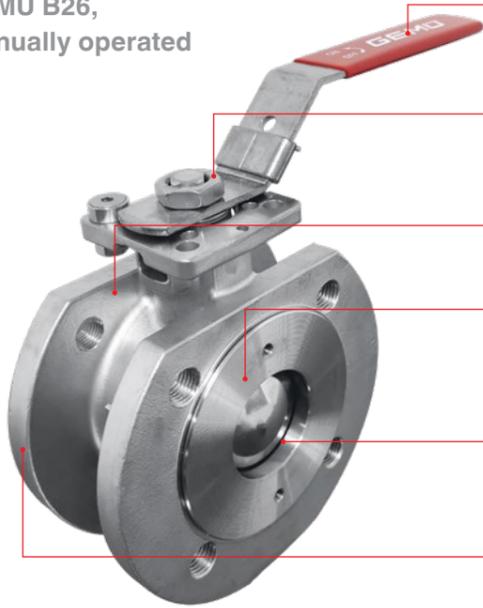
TRADE FAIRS 2021 (INTER)NATIONAL

Bio Asia Taiwan	22.07. – 25.07.	Taipei (TW)
FCE Pharma	17.08. – 19.08.	São Paulo (BR)
ISPE Conference Singapore	25.08. – 27.08.	Singapur (SG)
Semicon Taiwan	08.09. – 10.09.	Taipei (TW)
Expoquimia Spain	14.09. – 17.09.	Barcelona (ES)
MSR-Spezialmesse	15.09.	Ludwigshafen (DE)
CHEMUK	15.09. – 16.09.	Birmingham (GB)
SIMER Martigues	29.09. – 30.09.	Martigues (FR)
Aquarama BE	30.09.	Leuven (BE)
Battery Experts Forum	05.10. – 07.10.	Frankfurt (DE)
HI Industri Herring	05.10. – 07.10.	Herring (DK)
Abwasser und Umwelt	06.10.	Rennerod (DE)
Pollutec	12.10. – 15.10.	Lyon (FR)
Pharmapack	13.10. – 14.10.	Paris (FR)
Interpex USA	19.10. – 21.10.	New York (US)
Ilmac Basel CH	19.10. – 21.10.	Basel (CH)
KHIMIA Russia	26.10. – 29.10.	Moscow (RU)
MSR-Spezialmesse Landshut	27.10.	Landshut (DE)
BioProcessUK Conference	01.11.	Brighton (GB)
Europort Netherland	02.11. – 05.11.	Rotterdam (NL)
Farmaforum Spain	03.11. – 04.11.	Madrid (ES)
InnoPack (CPhi worldwide)	09.11. – 11.11.	Mailand (IT)
WIN Türkei	10.11. – 13.11.	Istanbul (TR)
Semicon Europa	16.11. – 19.11.	Munich (DE)
Inchem Plant Show Japan	17.11. – 19.11.	Tokyo (JP)
Pharmtech Russia	23.11. – 26.11.	Moscow (RU)
Interpex Japan	08.12. – 10.12.	Tokyo (JP)
Semicon Japan	15.12. – 17.12.	Tokyo (JP)

Subject to changes due to the Corona Pandemic!

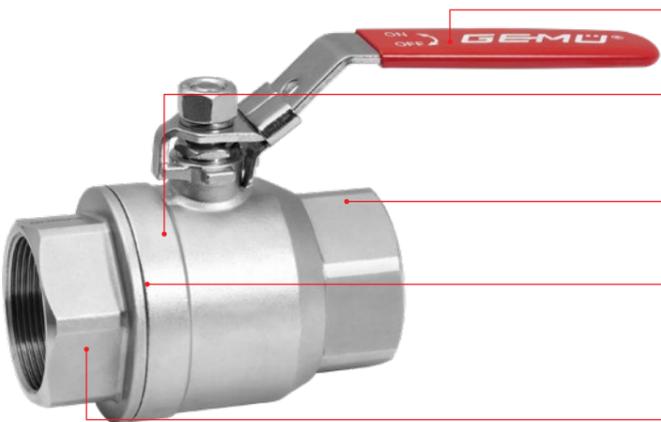


GEMÜ B26, manually operated



- Flexible**
freely selectable, different actuators can be mounted
- Automation-capable**
ISO 5211 top flange for simple actuator mounting
- Compact**
thanks to short flange design
- Qualitative**
design acc. to DIN12516-2, ASME 16.34
- Seals**
FDA compliant seal materials
- Variable**
various connections, PN40, PN16, ANSI #150

GEMÜ B20, manually operated



- Lockable**
manually operated and lockable
- Compact**
length standardized to DIN EN 3202 M3
- Lightweight**
optimized low weight design
- Seals**
FDA compliant seal materials
- Flexible**
different standard connections DIN, NPT thread

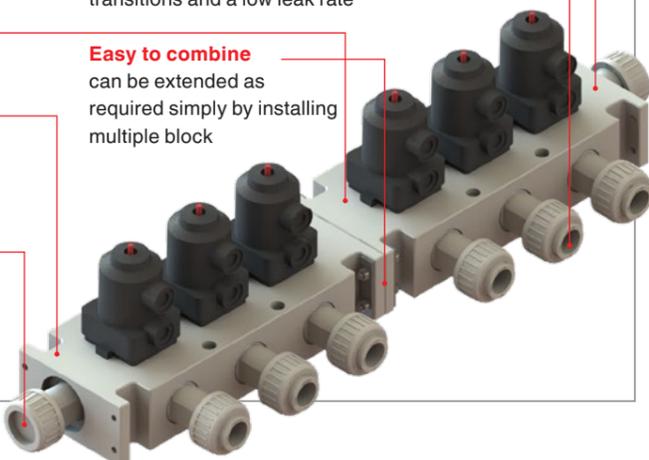
GEMÜ P600S made of plastic for chemically corrosive media

With the plastic series of the new GEMÜ P600S, GEMÜ provides a multi-functional solution for blending, diverting, draining or feeding chemically corrosive media. The modular M-block diaphragm valve is available in materials PP-H and PVC, and in nominal sizes DN 8 to DN 25. Spigots, threaded sockets and union ends on the basic body can be adapted to individual requirements via the flexible connection system.

- Flexible and cost-optimized**
competitively priced, even in small quantities
- Space-saving**
reduction of the footprint
- Modular**
combining several valves and pipe sections in one compact unit
- Customized**
customized design thanks to interchangeable connections

- Maintenance friendly**
reduced number of welded and solvent cemented joints, meaning fewer transitions and a low leak rate

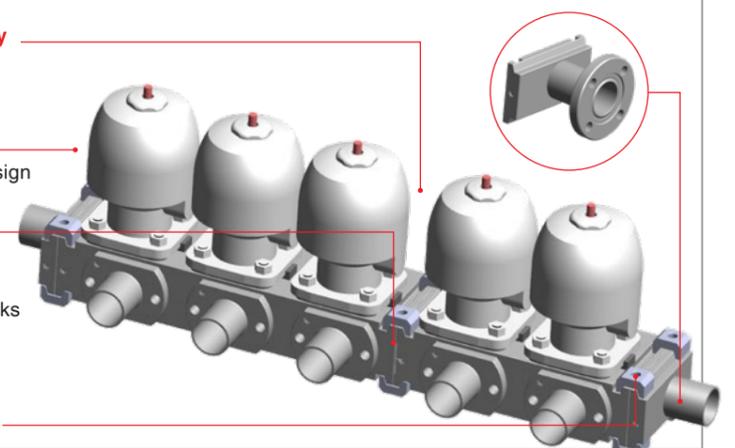
- Easy to combine**
can be extended as required simply by installing multiple blocks



GEMÜ P600S in stainless steel for aseptic applications

With the stainless steel series of the new GEMÜ P600S, GEMÜ provides a multi-functional solution for blending, diverting, draining or feeding demanding media in the pharmaceutical industry, biotechnology industry and the food industry. The modular M-block diaphragm valve is available in various stainless steel materials, and in nominal sizes DN 20 to DN 25 – other versions are available on request. Spigots, flanges and clamps on the basic body can be adapted to individual requirements via the flexible connection system. The interfaces for individual components have been designed based on a standardized aseptic connection.

- Maintenance friendly**
easily accessible interfaces
- Space-saving**
thanks to compact design
- Modular**
can be extended as required simply by installing multiple blocks
- Flexible**
thanks to various connection adapters





MICROELECTRONICS THE BACKBONE AND CENTRAL NERVOUS SYSTEM OF GLOBAL COMMUNICATION

In the future, the competitive ability of countries and companies will depend, to an increasing degree, on how digital transformation is promoted.

The Internet, cloud-based software and data storage solutions for modern, highly efficient mobile networks, social networks and the Internet of Things (IoT) are all technologies which require sophisticated microelectronics and can only be efficient thanks to these.

Virtual communication and online meetings have experienced something of a boom over recent months, and are now a fixed part of our lives. The same applies to artificial intelligence, which we already come into contact with on a daily basis, for example when using speech commands on mobile phones, navigation systems in cars or home entertainment systems. From a technical point of view, these digital communication systems can be thought of as the central nervous system of the economy and society.

It must be emphasized here that, in addition to its importance in industrial processes, the majority of us as "consumers" are using these technologies to an increasing degree in our personal lives as well.

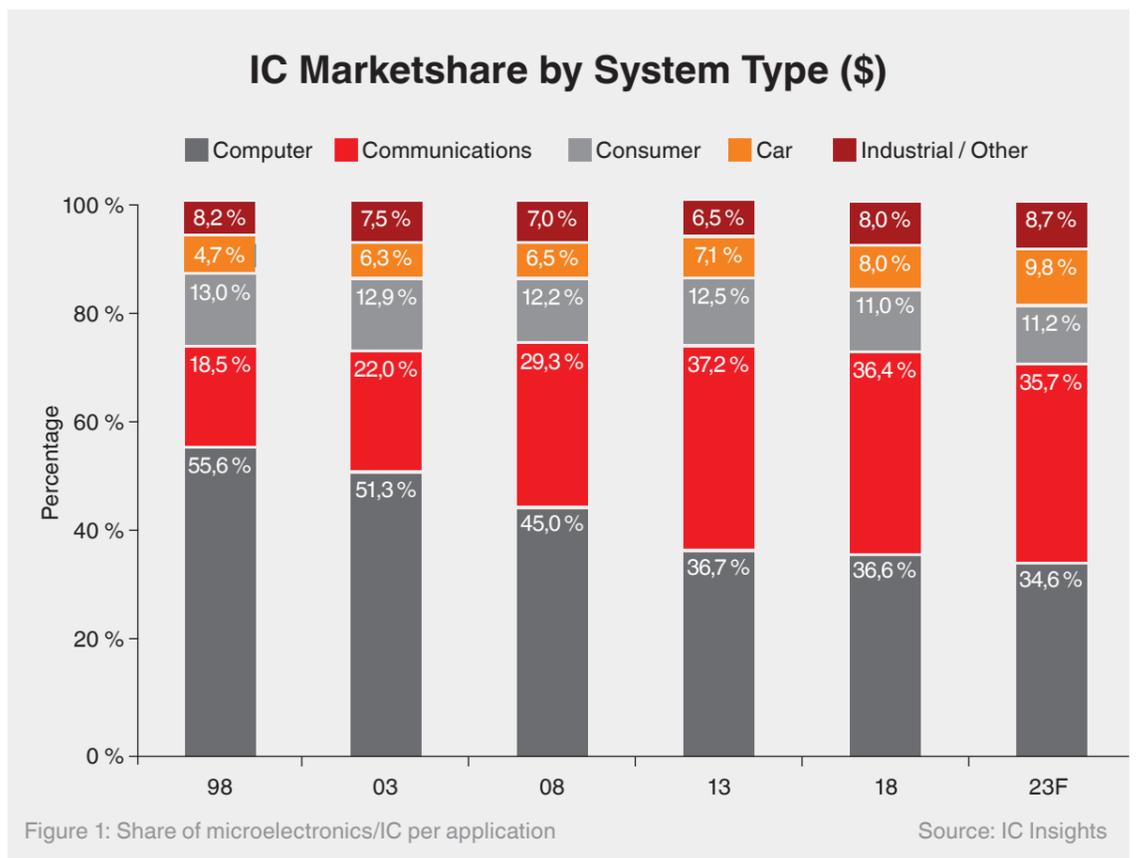
Fears that the coronavirus pandemic and its economic impact would severely curb investments have therefore not materialized in the semiconductor industry. The drivers of growth in the semiconductor industry remain as they were.

Many consumers have used expenditure saved on restaurant visits and holidays, for example, to buy a new smartphone or entertainment electronics. The coronavirus pandemic has highlighted existing weaknesses in various infrastructures for electronic and virtual communication. As a result, the coronavirus pandemic has actually sped up the trend towards digitalization and the resulting investments.

Companies which were already catering for virtual communication to a reasonable extent before the pandemic, such as by using Skype and Teams, were able to react more quickly to the situation. Due to its high proportion of international business, GEMÜ had already moved its entire telephone communications to Skype for Business in 2019 and started to introduce the project management and communication system Microsoft Teams. Preparing in this way was an excellent decision and, when confronted with the coronavirus situation, was supplemented with specific training courses, both online and virtually.

Major areas of application for microelectronics/ICs

While computers, machine control systems and sensor systems of most varied types used to be the major area of application for microelectronics previously, nowadays there are significantly more areas where microelectronics is used. Communications technology has since overtaken computers and is the largest area of use at over a third. (see Figure/Table 1).



The new oil of industry in the 21st century

The importance of these areas of application, which in principle also reflect our behavioural changes in use of technology in the professional and personal environments, can also be seen in the development of global market leaders.

What must be considered here is that highly efficient microelectronics are also required for displays on flatscreen TVs, mobile phone touch screens, as well as many other functions in mobile phones (cameras, memory, etc.), servers for social networks and cloud providers, solar cells and many other products.

A world in motion, the global players of communications technology and the basis of the semiconductor ecosystem

A comparison between the world's largest companies in 2020 with those from 2010 (see Figure/Table 3) makes clear the importance of these applications and

the companies relevant to the "ecosystem" of the semiconductor industry.

Building a smarter and better world

What a well-known saying that is! Critics will say that those are just general marketing slogans. Of course, there is a wide range of other industrial areas, such as the food and pharmaceutical industries or water treatment. Yet without microelectronics, the lights would certainly go out – quite literally.

Let's take a look at three specific examples:

Firstly, e-mobility, electric car technology and charging infrastructure mean a higher proportion of electronic systems/microchips. It must be noted that for products such as power chips and MEMS, European companies are among the market leaders and are constantly expanding their capacities. GEMÜ valve solutions are well represented in these production plants.



Two leading European power chip and MEMS manufacturers, currently building new factories to increase capacity, rely on GEMÜ solutions. Designed VMB manifolds are used together with designers, end users and plant engineers.

Process media are distributed with the help of GEMÜ manifolds. They represent the connection between the generally central supply system and the processing devices in the actual production departments.

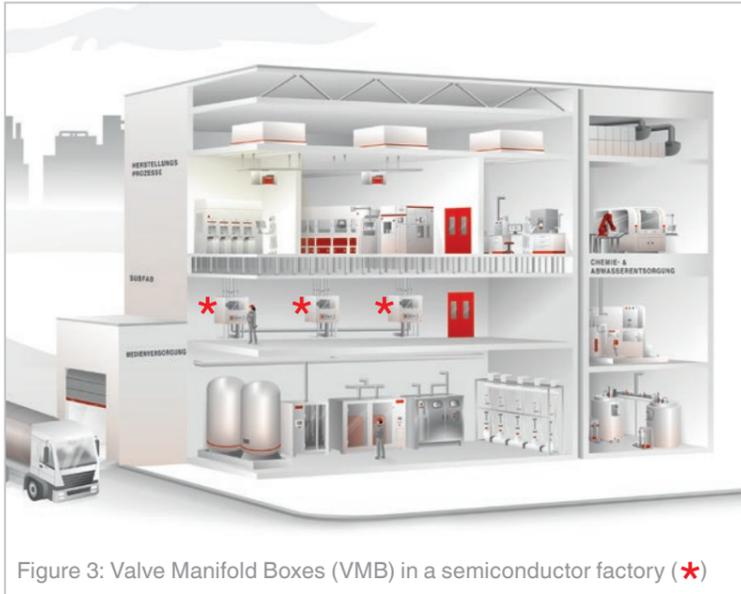


Figure 3: Valve Manifold Boxes (VMB) in a semiconductor factory (*)

The general construction of a manifold is always the same:

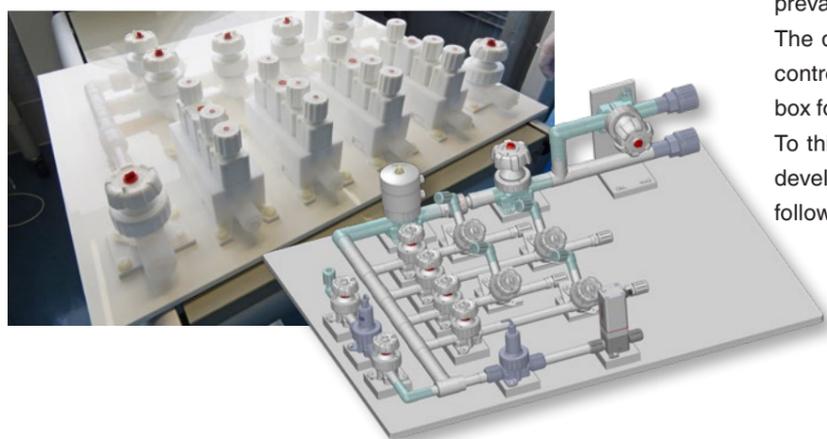
- ⇒ Feeding the medium through the inlet
- ⇒ Guiding the process medium through the main pipe (main), then distributing to individual sticks (pipe trains)
- ⇒ The sticks guide the medium to the application or process
- ⇒ Option for integrated back pressure control to ensure adequate supply of medium to the sticks for a loop construction
- ⇒ In the event of maintenance, the manifold can be drained completely via the drain.

The major advantages of the manifold are as follows:

- ⇒ Turnkey solutions, which can be quickly and easily mounted in the factory
- ⇒ Use of valve types with high Kv values
- ⇒ Manifold design with a low space requirement/low number of connection points
- ⇒ The hold-up volume of media in the system is reduced in a measurable way, the flow is optimized and draining is improved
- ⇒ Low danger from leakage thanks to a reduction in the number of connections
- ⇒ This enhances the performance capability of the entire system and reduces media consumption

Manifolds manufactured by GEMÜ are tried and tested leak-proof units. In addition, depending on requirements, measurement and control systems can be used alongside the valves and fittings.

Prerequisites for processing customized subassemblies like this are a high level of transparency of the requirements and precise planning, since errors in the planning of production plants result in high consequential costs due to delays and extra costs: For validation, late commissioning, contaminated batches and later modifications to the plant. GEMÜ therefore works together with customers very closely in planning and implementation. GEMÜ offers manifolds in PFA as well as stainless steel.



2010			2020		
Ranking	Company	Company value	Rank	Company	Company value
1.	Exxon	406	1.	Apple	2290
2.	PetroChina	321	2.	Saudi Aramco	1870
3.	Apple	315	3.	Microsoft	1690
4.	ICBC (China)	288	4.	Amazon	1670
5.	Petrobras	243	5.	Alphabet (Google)	1190
6.	China Construction Bank	230	6.	Facebook	788
7.	Microsoft	227	7.	Tencent (China)	692
8.	Shell	220	8.	Alibaba (China)	639
9.	BHP Billiton	217	9.	Tesla	631
10.	Nestle	212	10.	Berkshire Hathaway	539

The world in motion – The world's largest companies in 2020 compared to 2010 (in billions of US dollar)

Secondly, we are seeing rising demand for semiconductor products due to the energy transition. Photovoltaic systems and storing energy also require a high proportion of application specific semiconductor products, and customized valve and system solutions to manufacture them.

Thirdly, there is the health sector. Here, too, we have come full circle; for example, in the transformation from analogue to digital cameras, or from inefficient light bulbs to LEDs, or in the replacement of CDs (with plastic sleeves and packaging) with music downloads or streaming services, we ourselves are essentially the end consumer by buying and using wireless headphones for jogging, a smart watch or a fitness tracker..

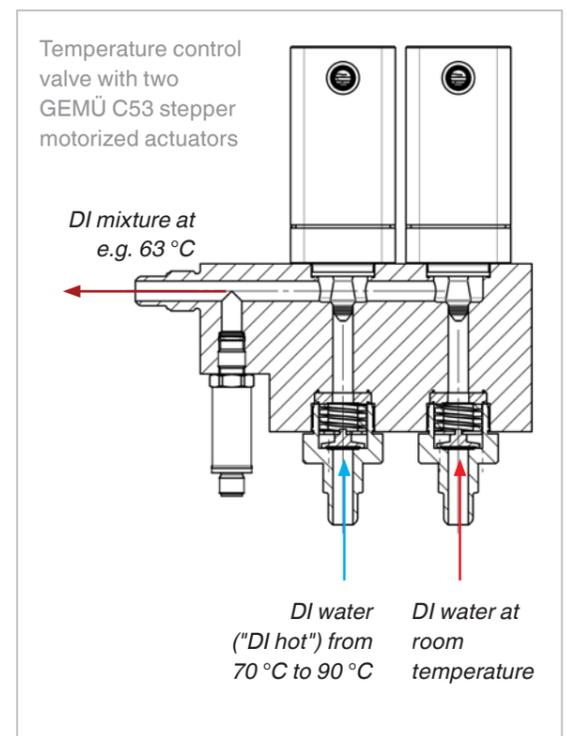
Valve, measurement and control systems for production plants manufacturing microelectronics

In order to comply with the variety of requirements for individual production processes in which ultra pure water and chemicals are used, valve, measurement and control systems made of various plastics or stainless steel are employed. The components find numerous uses in manufacturing steps, such as ultra pure silicon production and wafer production, wet and coating processes or chemical cleaning processes in high purity water treatment plants, chemical supply and wet process equipment. They ensure reliable handling for the various process media, precise control of media flows, precise positioning of mixing (also in the on-site blending procedure), precise batching and filling, as well as media recycling.

Let's take the example of a mixing and temperature control valve for what have become known as EUV mask boxes. Together with a leading plant engineering company, the solution has been designed, tested and now used in series. When cleaning EUV mask boxes, it is usual to work at elevated temperatures in order to speed up the cleaning process. The challenge here is very precisely mixing and controlling the plant supply's prevailing room temperature and hot DI supply.

The design shown in Figure 1 allows for very precise control of the warm water flow for cleaning the transport box for the highly sensitive and expensive EUV masks. To this end, two GEMÜ C53 stepper actuators, newly developed by GEMÜ, are used, which offer the following main advantages:

- ⇒ Both actuators control in parallel in order to achieve the required mixing ratio as quickly as possible and maintain constancy in the supply lines despite fluctuations.
- ⇒ The "hot DI" temperature in the plant is approx. 70 to 90 °C
- ⇒ This allows a mixture at 63 °C, for example, to be kept very constant by the valve block.
- ⇒ Integrated check valves prevent a backflow of DI water in order to prevent the two supply lines from being mixed up.
- ⇒ The interaction of the PLC, temperature sensor and control valve is decisive for a precise temperature controller result.



Increasingly integrated system solutions are used here, which are characterized by their resource saving use of materials, adjusted function, exceptional service life, as well as cost efficiency. Therefore, they also provide a specific, valuable contribution to long-term usage of products in the plants and in production for end users, microchip, MEMS, LED, touch panel and flat screen manufacturers.

Burkhard Müller
 Head of Business Unit Semiconductor
 burkhard.mueller@gemue.de

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.

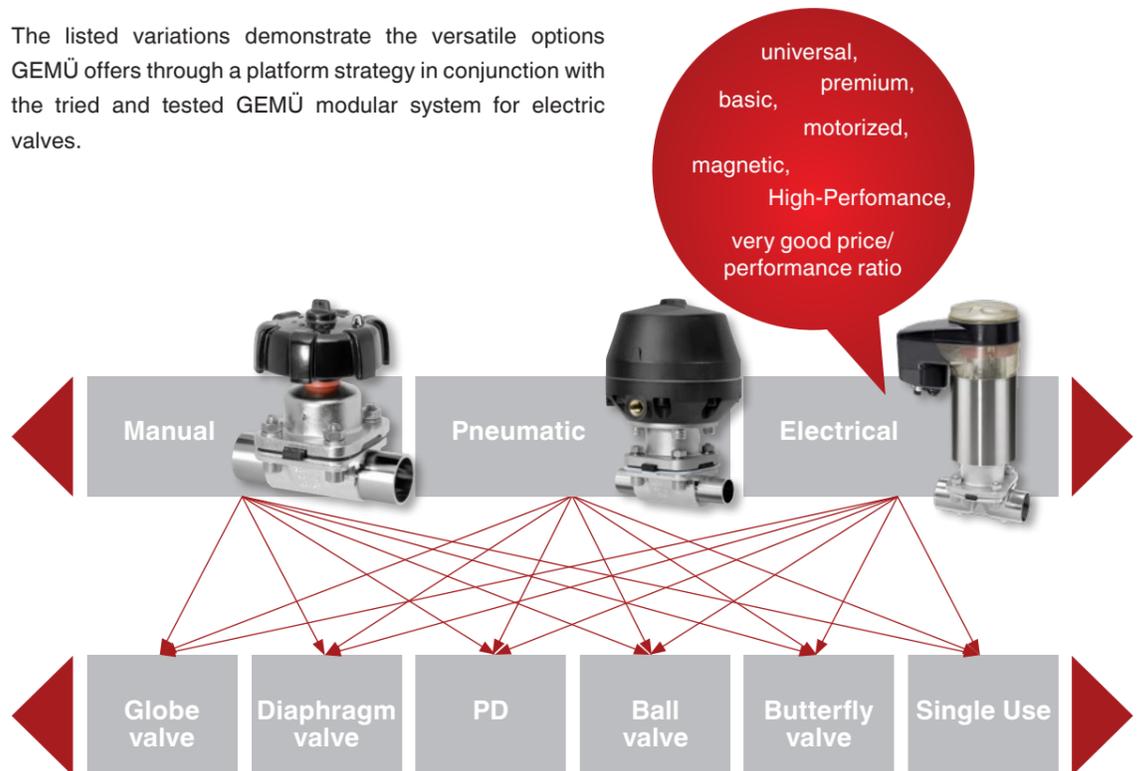
Ball valves, butterfly valves

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.



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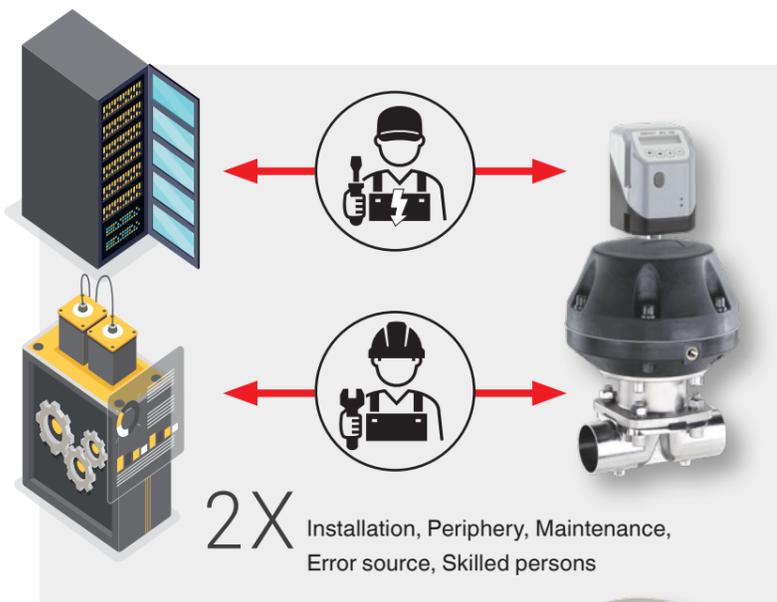
What are hybrid systems?

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 electrics (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?

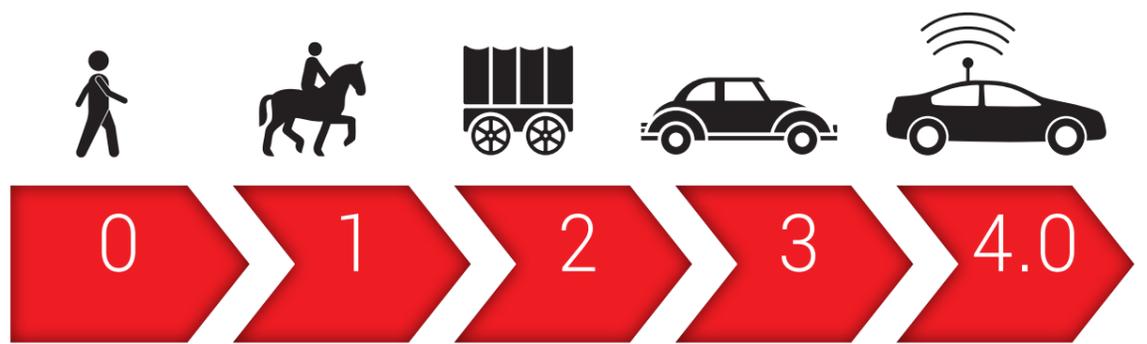
Many systems would gain added value from being purely electrical and would consequently also make sense. However, a complete 1:1 replacement of pneumatic with electric valves in existing systems is often difficult. Both actuator designs have intrinsic features that have a positive effect depending on 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.

Ready for innovative customers

CHALLENGE!

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

2021 training dates

ON-SITE TRAININGS (CRIEBACH, GERMANY)

⇒ Product training in measurement and control systems

- PM0101GB Measurement devices and measurement principles for pressure, temperature, level and volumetric flow
5th July 2021, 06:00 am – 10:30 am
2:30 pm - 7:00 pm
- PM0201GB Positioners: Function and application
6th July 2021, 06:00 am – 10:30 am
2:30 pm – 7:00 pm
- PM0301GB Process controllers: Function and application
7th July 2021, 06:00 am – 10:30 am
2:30 pm – 7:00 pm

SERVICE TRAINING

SPECIALIST LEVEL

⇒ Qualified service fitter in accordance with GMP/FDA

- SM1001GB Servicing and changing replacement and wearing parts in diaphragm valves for hygienic and sterile applications, attachment and readjustment of valve accessories. On-site briefing, approx. three hours, appointments by arrangement, minimum five participants
- SM2001GB Servicing and changing replacement and wearing parts in HP Cleanstar diaphragm valves, attachment and readjustment of valve accessories.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants
- SM2002GB Expert manufacture of ultra pure PFA tube connections for the GEMÜ FlareStar/TubeStar tubing and fitting system.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants
- SM3001GB Servicing and changing replacement and wearing parts in globe valves, attachment and readjustment of valve accessories.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants

- SM3002GB Servicing and changing replacement and wearing parts in elastomer butterfly valves, attachment and readjustment of valve accessories.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants
- SM3003GB Servicing and changing replacement and wearing parts in diaphragm valves for industrial applications, attachment and readjustment of valve accessories.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants

- SM4001GB Installation and commissioning of valve accessories such as stroke limiters, electr. position indicators and positioners.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants

- SM5001GB Servicing for various GEMÜ products, upon consultation.
On-site briefing, approx. three hours, appointments by arrangement, minimum five participants

EXPERT LEVEL

⇒ Qualified Service expert in accordance with GMP/ FDA

- ET1001GB Training as authorized service expert for GEMÜ diaphragm valves. Suitable for external service and maintenance personnel with the skills of an experienced mechanic
8th July 2021, 06:00 am – 10:30 am
2:30 pm – 7:00 pm

The training courses will be held in English.

Subject to changes due to the Corona Pandemic!

 **Jessica Donner**

Assistant of the Service Department |
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